

Qimera Documentation

21 January, 2026

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- Getting Started, Learn Qimera quickly and effectively with our guides;
- How-to Articles, Find articles on everything you need to know about using Qimera;
- Tutorial Videos, Use our in-depth videos to help guide you in using the more complicated parts of our software packages;
- Webinars, Watch our software experts guide you through processing and tools in Qimera;
- Qimera Reference Manual, More info on what each dialog an button does;
- Questions & Answers, See what others have asked us about and quickly find the answers you need;
- Technical Information, All technical information about our software.

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- Qimera 2.8.0 Release (Early Access)
- Qimera 2.7.6 Release
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Qimera 2.8.0 Release (Early Access)

December 16th, 2025

We're pleased to present Qimera version 2.8.0. In this release, we introduce a few new features, with a focus on stability and efficiency. Read below for details.

This release serves as an Early Access, giving access to new features and the opportunity to report issues to QPS for resolution before the official launch.

If you encounter problems or have questions, contact support via Jira. We plan to release version 2.8.1 in early 2026.

This official version will be available for download from the website.

Contact Sales or Support if you wish to receive the early access installer.

Before you use this version, please read the important notes since this version includes upgrades or changes for:

- QPS Project;
- Database;
- QPD;

Highlights

- Grid Coverage attribute
- Grid Date/Time attribute
- Qimera-command additions
- Intensity Beam Average Gridding
- and more!

Voting System

In this release, we have completed 1 feedback items, which satisfies 5 votes. For more information, see our Voting system Policy and Using the Voting System.

The Feedback Project helps us to continue improving our software products. At the moment, our Voting System is down as described at the top of the Voting system Policy

page. Despite the system being inaccessible for voting for a short period, we still use it to prioritize developments while we await a solution from our provider, Atlassian.

- Qimera 2.8.0 - Important Notes
- Qimera 2.8.0 - New Functionality
- Qimera 2.8.0 - Improvements
- Qimera 2.8.0 - Resolved Bugs
- Qimera 2.8.0 - All Implemented Feedback
- Qimera 2.8.0 - Documentation
- Qimera 2.8.0 - Known Issues

Qimera 2.8.0 - Important Notes

Licensing

With this release there is a new License Manager version 1.10.2.

The new License Manager fixes the issue where an error would appear in the dialog “Failed to Activate License” with the message *“There are network adapters on the system that are disabled, please enable them and try again.”* when trying to activate the softlock license. Older versions of Qimera may still experience this issue.

If you activate the license in Qimera 2.8.0 and then open an earlier version, the softlock license may be lost. The fix is to manually copy the DLLs into that older version:

- https://qpssoftware.scrollhelp.site/lm/network-adapter-error-troubleshooting-steps

Existing Qimera users with a license that is under maintenance will be able to install and run Qimera 2.8 alongside Qimera 1, using the same license.

If you have a Qimera Offshore license only, you will not be able to run versions 2.3 and earlier of Qimera since the older versions are not aware of the new product license code for Qimera Offshore.

Installers

The Qimera installer will install by default into sub-directories with the version name under the typical install path, which is usually C:\Program Files\QPS\Qimera. This allows multiple installations quite easily and follows the trend that Qinsy has been using for some time. Users with Qimera 1.X or 2.X already installed will find that Qimera 2.8.0 will install into the Qimera 1 directory, but in the 2.8.0 sub-directory of the Qimera 1 installation folder.

QPS Project and file format versions

The Qimera project version has been incremented. Projects opened in Qimera 2.8.0 are not able to be opened in Qimera 2.7.x and previous versions.

The QPS database (.db) format version has been incremented, .db files recorded in Qinsy 9.8.0 will need to be opened in Qimera 2.8.x and newer versions.

The minimum supported QPS database (.db) version has been increased to version 14. This version was released with Qinsy 8.18 in November 2017. Older .db versions will need to be replayed in Qinsy to upgrade.

The QPS .qpd file has been upgraded with the Qimera 2.8.0 and Qinsy 9.8.0 release to version 2.12. New .qpd files from Qimera 2.8.0 and Qinsy 9.8.0 are not able to be opened by older versions.

HIPS I/O SDK

The HIPS I/O SDK now only supports version 12 CARIS licenses. This is due to the new HIPS I/O version requiring a HIPS 12 license. Older HDCS files are still able to be opened with the HIPS I/O SDK. Support for version 9/10 CARIS licenses has been dropped for increased installer security.

Qimera 2.8.0 - New Functionality

Introduction

In this release, we introduce additions to Qimera command, Grid Coverage, Grid Date/Time, Grid Overlap report, beam average intensity gridding and more. Read on below for more detail.

Please contact our Sales team if you'd like to arrange for an evaluation of Qimera.

Qimera-command

A new add-on is required on your license to run qimera-command.exe, reach out to our Sales team to have this add-on added to your license.

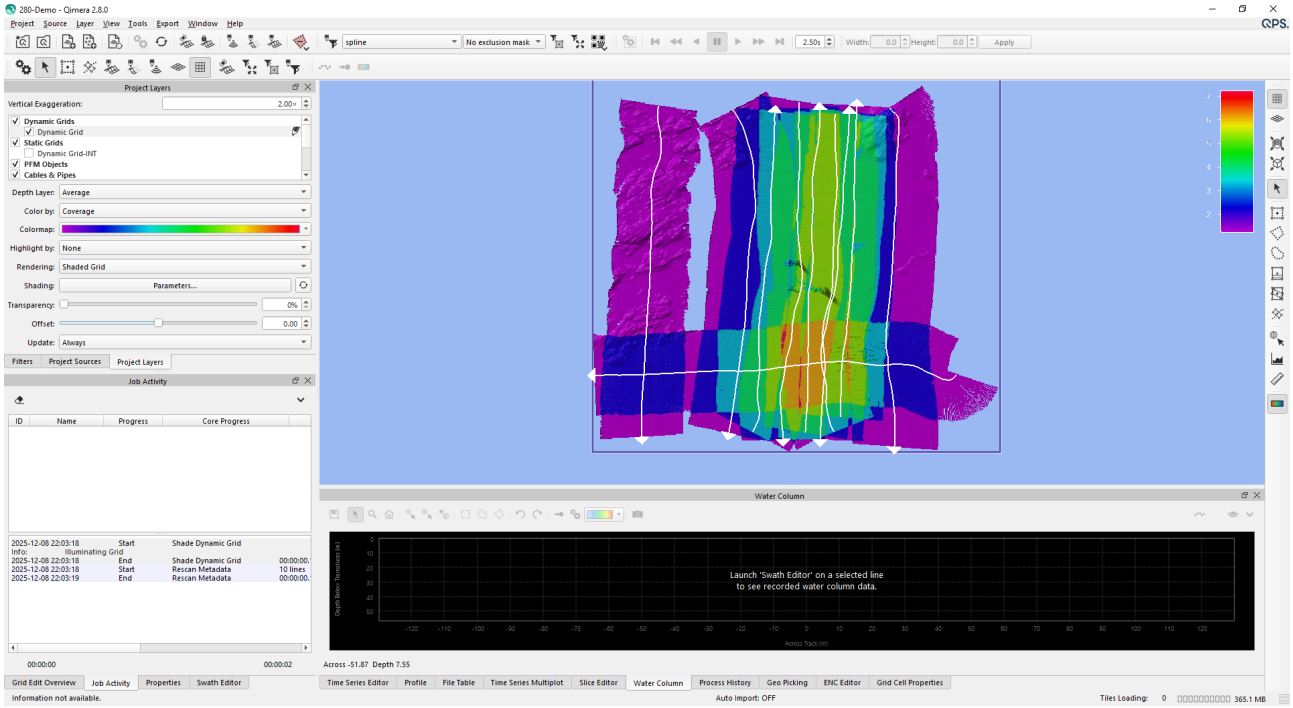
Ten new jobs have been added to Qimera-command:

1. Configure the specified grid for visualization (`configure-grid`)
2. Remove files from grid (`remove-from-grid`)
3. Remove source files from project (`remove-from-project)`
4. Export the grid to ascii xyz (`export-grid-ascii`)
5. Export the grid to a floating point geotiff (`export-grid-floating-point-geotiff`)
6. List the available colormap files (`list-colormaps`)
7. List the source files in the project (`list-source-files`)
8. List the grids in the project (`list-grids`)
9. List the SD Objects in the project (`list-sd-objects`)
10. List the vessels in the project (`list-vessels`)

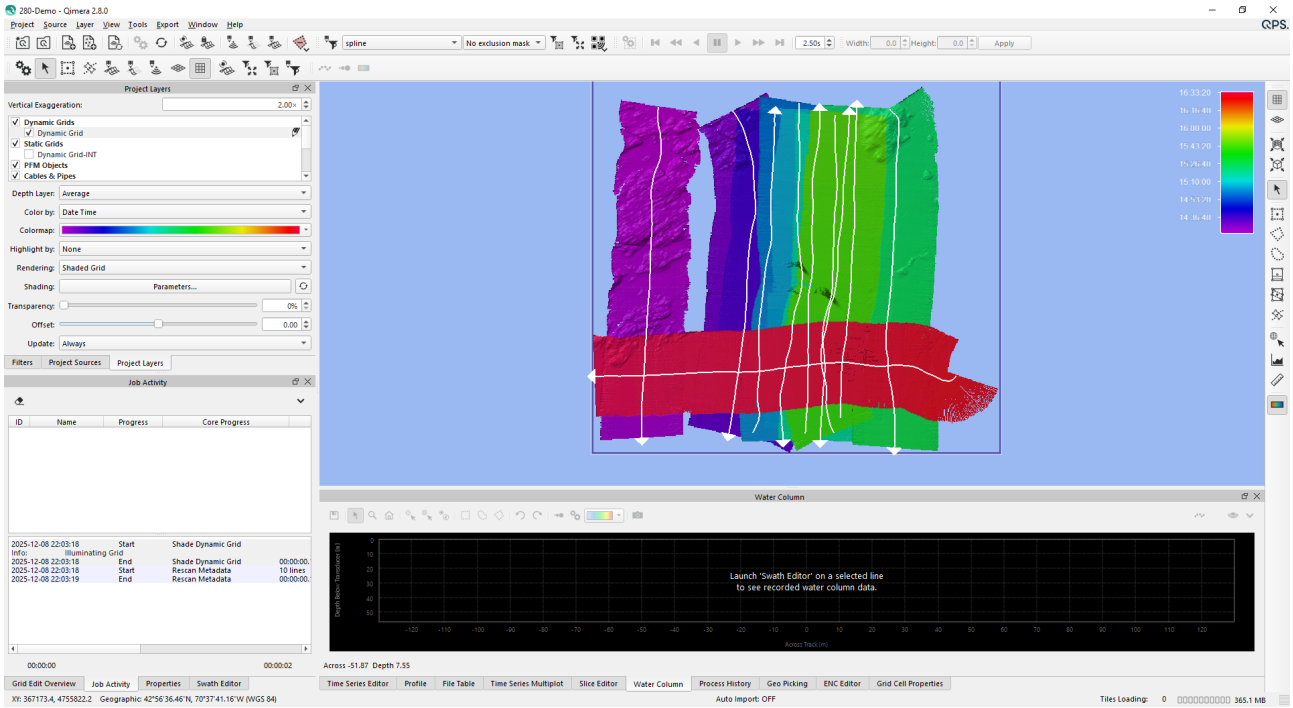
Grid Coverage and Date/Time attributes

Grid coverage and date/time attributes have been added to new Dynamic Grids. These new grid attributes are optional, and will use slightly more disk space. If coverage and date/time attributes are included when creating a Dynamic Grid, these attributes are displayed by selecting them in the *Color By:* attribute of the selected Dynamic Grid.

Grid coverage is the number of times a grid cell has been covered by a unique survey line.



Grid date/time is the latest timestamp from a footprint that contributed to the grid cell.



Grid Overlap Report

A new grid overlap report generates an ASCII text report outlining the amount that a given line is overlapped by other lines. It uses a user defined percentage which determines if a

given line meets an overlap percentage criteria. The resulting text file lists the line name, number of grid cells within the line, number of grid cells with coverage >= 2, percentage with coverage >= 2, and a pass/fail result. You can generate this report by right clicking on a *Dynamic Grid > Grid Operations > Generate Overlap Report…* Note that the Dynamic Grid must contain Coverage and Date/Time attributes.

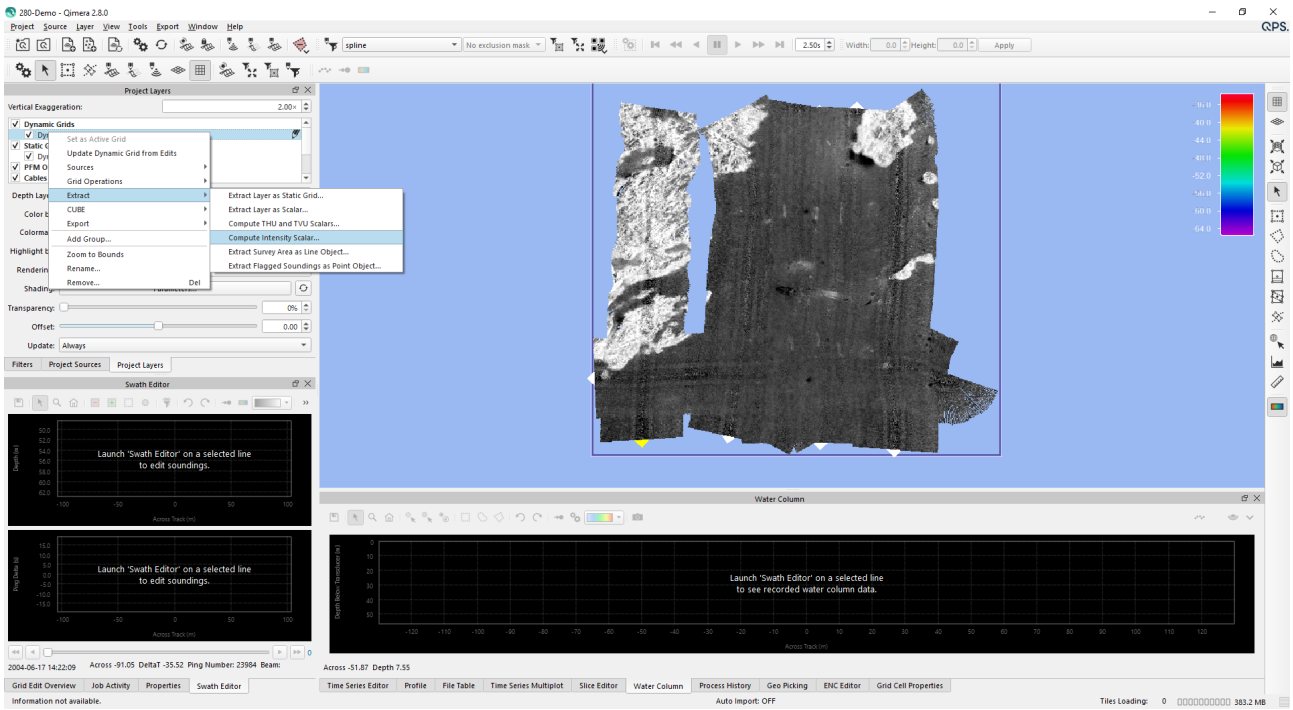
```
# Qimera Line Overlap Report
# Generated by Qimera
# Date: Mon Nov 10 22:33:00 2025
#
# Each line in the report corresponds to one QPD file.
# A grid cell is considered to be overlapped if it has a coverage value of 2 or greater.
# The overlap threshold is the percentage of cells in the QPD polygon that must be overlapped for the QPD to be considered as passing.
# A QPD is considered to have passed if the percentage of overlapped cells in the QPD polygon is greater than or equal to the specified overlap threshold.

   Specified Overlap Threshold: 30
   Grid File: C:\Users\james.muggah\QPS-Data\Projects\280-Demo\GridData\Dynamic Grid\Dynamic Grid.dyngrid
   Total QPDs Analyzed: 10
   QPDs Passing: 10

The columns are:
QPD filename, # of grid cells within QPD polygon, # of cells in polygon with coverage >= 2, % with coverage >= 2, Result (Pass/Fail)
0001_20040617_142314_Pingeline,43874,18755,42.75,Pass
0003_20040617_143308_Pingeline,47679,15853,33.25,Pass
0004_20040617_143854_Pingeline,43199,26669,61.74,Pass
0005_20040617_145627_Pingeline,48871,31723,64.91,Pass
0006_20040617_150251_Pingeline,44653,26263,58.82,Pass
0007_20040617_151728_Pingeline,46730,25672,54.94,Pass
0008_20040617_152321_Pingeline,41789,24833,59.42,Pass
0009_20040617_152801_Pingeline,49156,26105,53.11,Pass
0010_20040617_154021_Pingeline,44643,27731,62.12,Pass
0017_20040617_163020_Pingeline,56938,38105,66.92,Pass
```

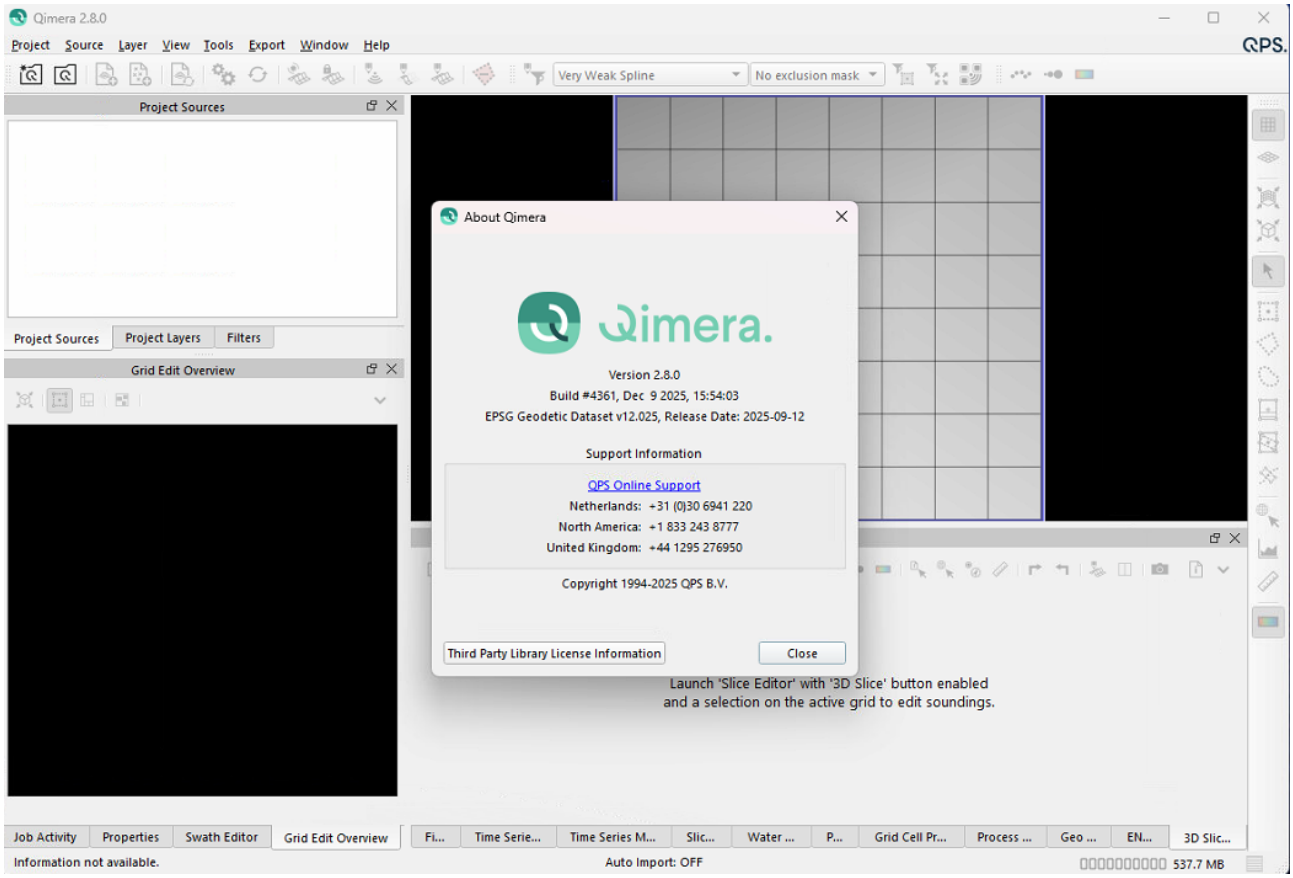
Beam Average Intensity Gridding

A new option was added to grid beam average intensities if present in the source files. You can create an intensity grid by right clicking on a *Dynamic Grid > Extract > Compute Intensity Scalar…*



Geo Config - EPSG Version 12

As part of the X.8 Release we updated the EPSG database version to 12.025.



Geo Config - New workflow for adding/creating Geoid models

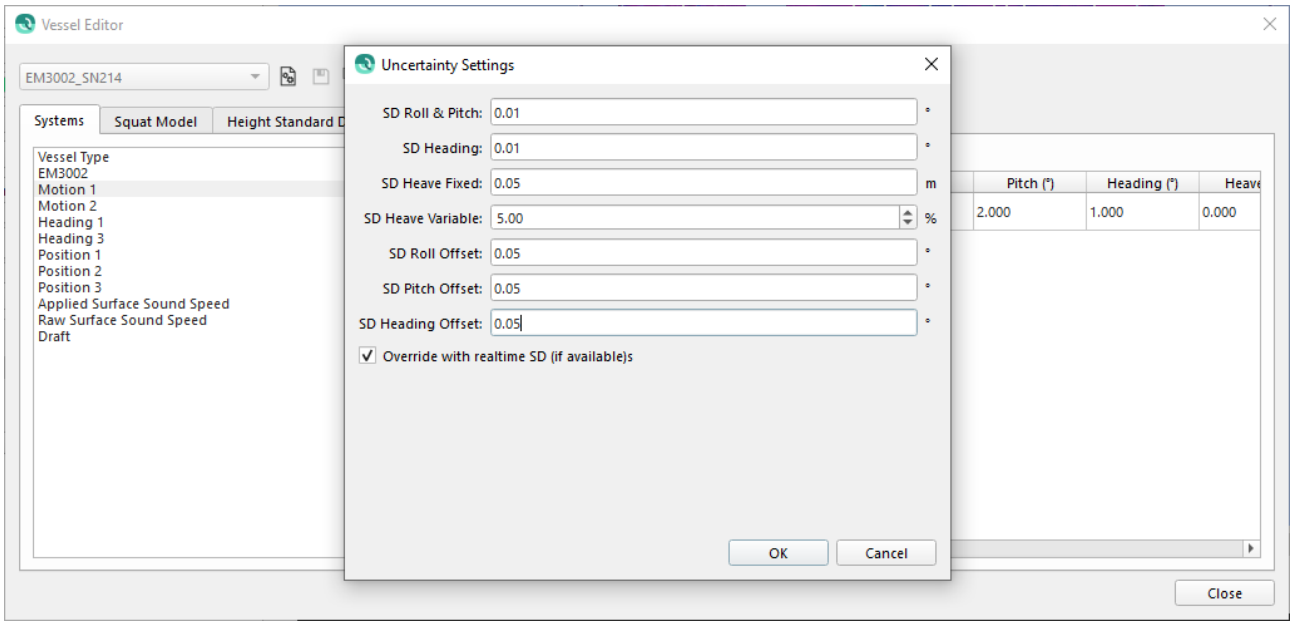
A new workflow has been added to the Geodetic Configuration UI, which makes it easier to add or create Geoid models. It is available in Qinsy, Qimera and Fledermaus X.8.

- How-to Create Geoid Model (.bin) Qinsy version 9.8 and onwards

Qimera 2.8.0 - Improvements

TPU

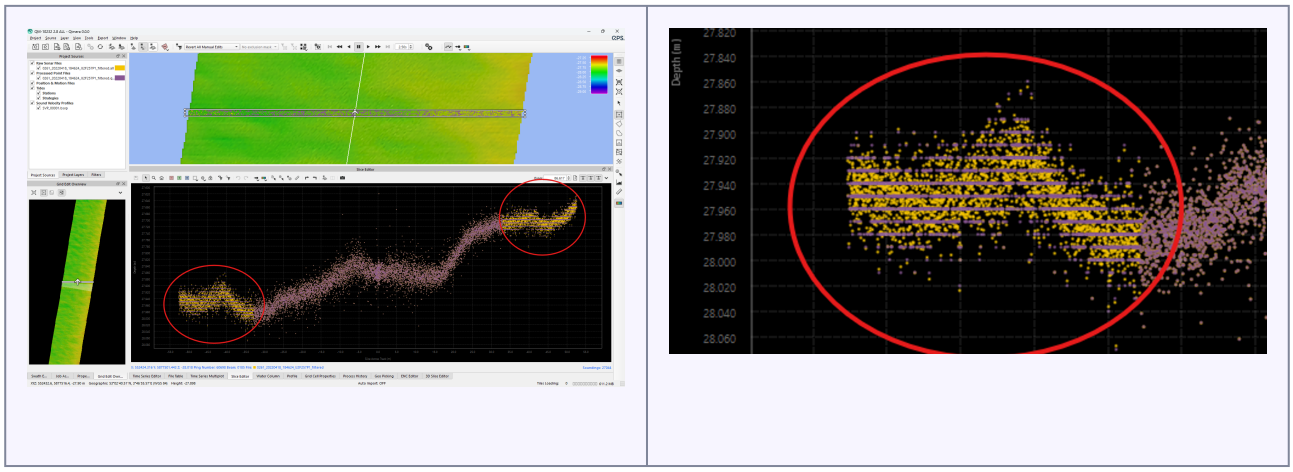
Qimera now provides the option to use the realtime Standard Deviation (SD) if available or override with the a-priori object SD values. This can be adjusted in the Vessel Editors, TPU settings.



QPD update

In the X.8 release, the QPD format was updated to provide increased footprint precision.

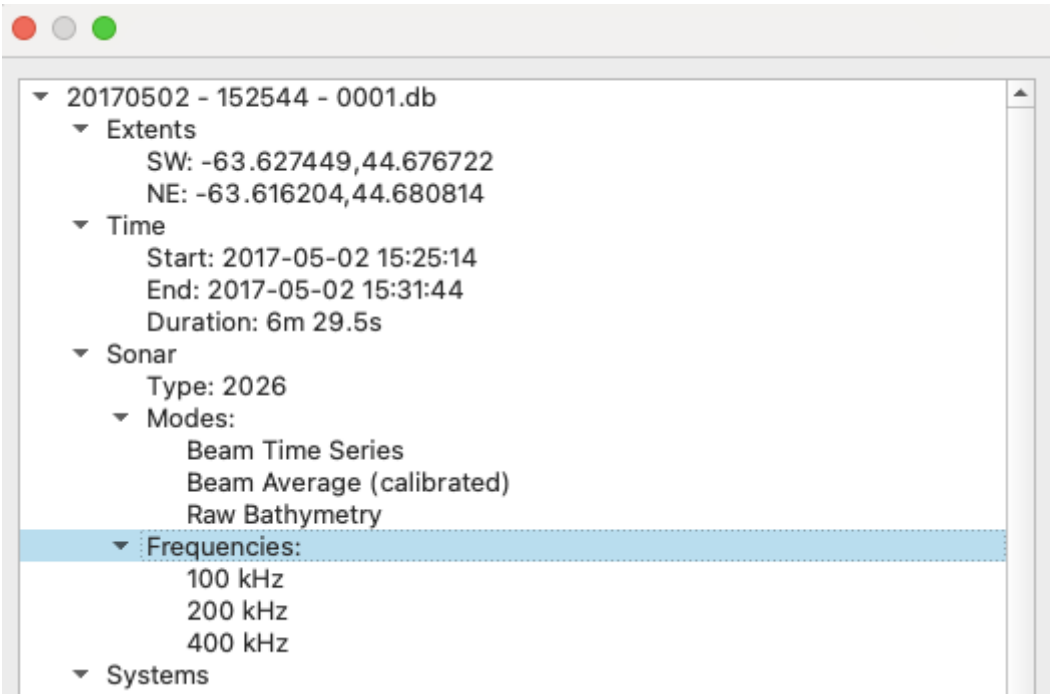
Previous QPD version (purple), New QPD version (yellow)	Previous QPD version (purple), New QPD version (yellow)



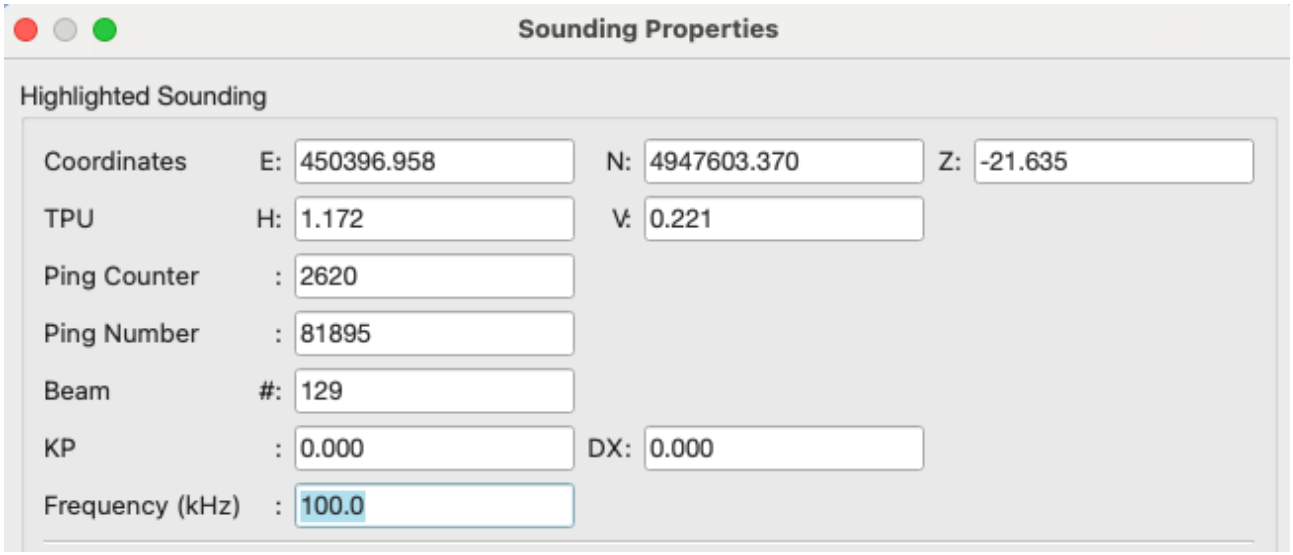
Frequency

Improved frequency support by extracting frequencies from more hardware vendors. The speed of filtering specific frequencies has been improved.

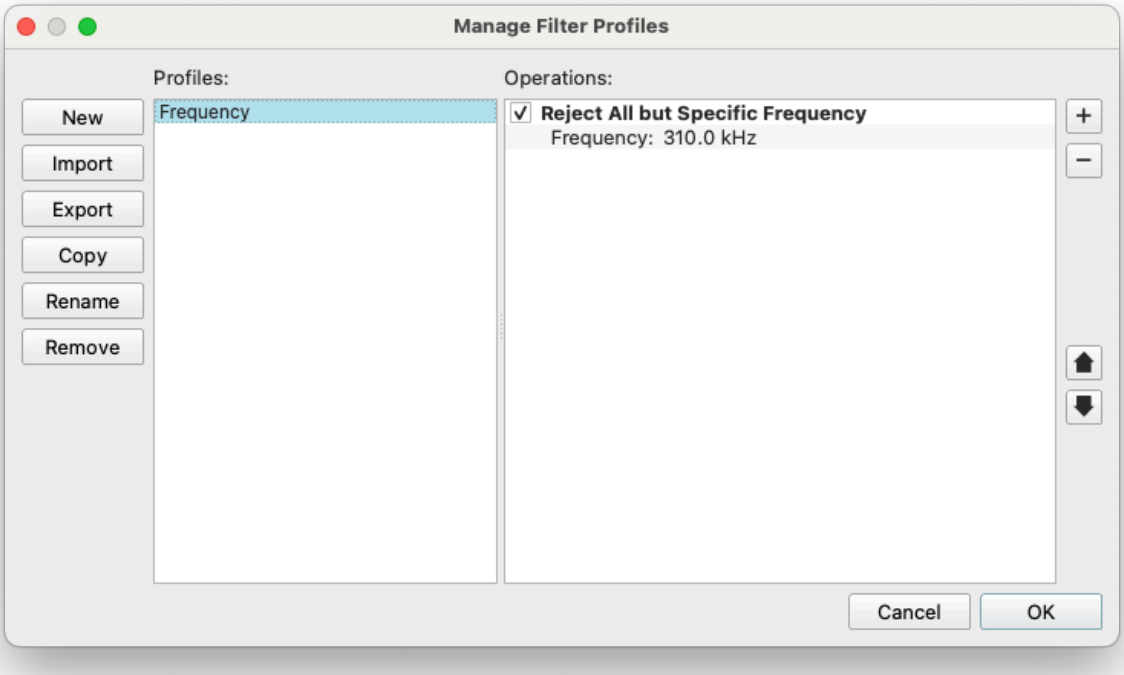
Use the Datagram Viewer to quickly see which frequencies are stored in a sonar file:



The frequency of a specific ping / beam can be seen via the Sounding Properties dialog in the Slice or Swath Editors:



Frequency filters:



Qimera 2.8.0 - Resolved Bugs

Below you will find listings of bugs which have been reported in previous releases and which have been solved for the Qimera 2.8.0 release.

Issue Key	Summary	Affects Version
CQM-8457	Network Adapters Error - impossible to activate license	Qimera 2.7.6
CQM-8418	Processing Settings - Other- Qimera crashing everytime I try to process a db lines	Qimera 2.7.6
CQM-8297	Cable Tracker Sensor Editor - No Relation to Processed track - missing red dot.	Qimera 2.7.6
CQM-8290	Tools - Navigation Editor - When hovering in navigation editor the red ball is not visible in the main screen	Qimera 2.7.6
CQM-8285	Tools - Patch Test - Different values in 3D Editor and Patch Test Tool	Qimera 2.7.3, Qimera 2.7.6
CQM-8281	Unable to Apply Licenses.	Qimera 2.7.6
CQM-8236	Docks - Filter - Crashing during filtering and then the crash has affected the metadata	Qimera 2.7.6
CQM-8232	Filters - Reject frequency; extend beyond 800kHz	Qimera 2.7.7, Qimera 2.7.5
CQM-8225	Slice Editor - Vertical Exaggeration - Not correctly locked for first new selection?	Qimera 2.7.5
CQM-8197	Source Files - Import kmall - Kongsberg ME70 Bathymetric option	Qimera 2.7.5

Issue Key	Summary	Affects Version
CQM-8125	Import - Raw Sonar - HSX - Ping DSP Data is treated as single head and not dual	Qimera 2.7.5, Qimera 2.7.6
CQM-8124	General - Qimera Command - Option to Remove Files from Grid via Command-Line	Qimera 2.7.4
CQM-8070	Dynamic Grid - % of overlap of files/lines per cell	Qimera 2.7.4
CQM-8048	Docks - Geopicking - Export to point file does not warn to overwrite	Qimera 2.7.4, Qimera 2.7.5
CQM-8046	Dynamic Grid - Tool to calculate grid coverage(number of lines per cell)	Qimera 2.7.4
CQM-8003	General - Qimera-Command - Floating point GeoTIFF	Qimera 2.7.4
CQM-7318	Message: Network Adapters on the system are disabled	Qimera 2.6.2
CQM-7236	Import - Grid - Irregular spaced ASCII grid	Qimera 2.6.0, Qimera 2.6.2
CQM-7189	Import - Processed Points Incorrect XYZ value imported	Qimera 2.5.3, Qimera 2.6.0, Qimera 2.6.2, Qimera 2.6.3, Qimera 2.7.0
CQM-6584	Online - Session Setup - Storage - Add attribute date and time to a dynamic grid	Qimera 2.6.1
CQM-6246	Layers - Grids and SDs - Difference between raw and processed points surface	Qimera 2.5.3, Qimera 2.5.4

Issue Key	Summary	Affects Version
CQM-6193	Source files - KMALL/ALL - Weird stripes in data	Qimera 2.4.3, Qimera 2.5.3, Qimera 2.5.4
CQM-898	Source File Import - Processed Points - Precision of re-exported ASCII lower than import precision.	2.0.2, Qimera 2.6.3
CQM-1986	Refraction filter run from Filter Operation Toolbar introducing artifacts	1.5.2, Qimera 2.7.0

Qimera 2.8.0 - All Implemented Feedback

Key	Summary	Votes
FQM-57	Surface / Backscatter: Color surface by beam averaged backscatter	5

1 issue

Qimera 2.8.0 - Documentation

Documentation has been updated to capture the changes to existing dialogs and workflows and new features.

Documentation can be found here: Qimera Documentation

Qimera 2.8.0 - Known Issues

Installer - EPSG database not updated to latest version

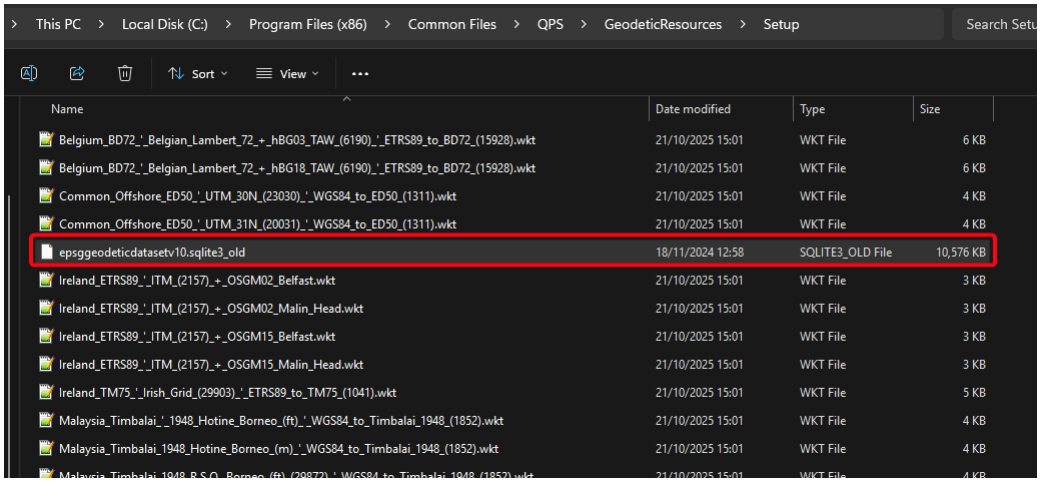
Problem

The problem is the EPSG database included in the Qimera 2.8.EarlyAccess installer will not update previous versions of the EPSG database during installation.
This problem occurs if you have Qimera 2.7.6, Qinsy 9.7.11, Fledermaus 8.7.2 or an earlier version installed.

Workaround

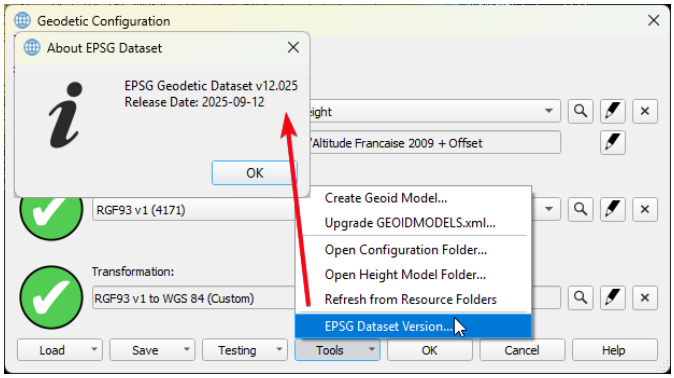
You will need to manually remove the old EPSG database and copy the new version 12.025 into the Geodetic Resources folder.
Optionally, in case you would like to keep the earlier version and update the EPSG database, you can do the following:

- Close all QPS applications.
- Rename the following file to the example shown in the picture:



  - File location: `C:\Program Files (x86)\Common Files\QPS\GeodeticResources\Setup`
  - Rename file: `epsggeodeticdatasetv10.sqlite3_old`
- Download and unzip the following file in your downloads folder:
  - EPSGGeodeticDatasetV10.zip
- Place that file into the following folder:
  - `C:\Program Files (x86)\Common Files\QPS\GeodeticResources\Setup`

You can now check your EPSG database here in the Help > About menu or in the Geodectic Configuration:



Planned fix
This is planned to be fixed in Qimera 2.8.1.

Licensing - Opening older versions of Qimera may deactivate your license

There is a known issue with licensing in older versions of Qimera. An error would appear in the dialog “Failed to Activate License” with the message *“There are network adapters on the system that are disabled, please enable them and try again.”* when trying to activate the softlock license. In order to fix this issue, we’ve updated the licensing in Qimera 2.8.0 and License Manager 1.10.2.

This update may cause accidental license deactivation if you activate your license in Qimera 2.8.0 and then open an earlier 2.7.x version. The fix is to manually copy the DLLs (found in the link below) into that older version’s installation folder as noted in steps 1 and 2:

- https://qpssoftware.scrollhelp.site/lm/network-adapter-error-troubleshooting-steps

Older Known Issues

Issue	Summary	Affects Versions/s	Expected Fix Version
Limitation	Filter toolbars to "Accept All Soundings" and "Revert Manual Edits" do not have the intended effect when used in a Cooperative Cleaning project to override cleaning that was done manually in the Master project prior to creating the Cooperative Cleaning project. Suggested workflow is to use the manual re-accept tools in the Slice Editor and 3D Editor.	2.1.0	2.8.x

Issue	Summary	Affects Version/s	Expected Fix Version

Qimera 2.7.6 Release

September 9, 2025

We are pleased to present Qimera 2.7.6.

Highlights

- Added the ability to use a route as a Profile.

Bugs

- Processing / Source Files
- Tools and Editors
  - Fixed an issue when using *Filter by System* to apply a filter to a single multibeam system.
  - Fixed an issue where grid cells disappeared after re-accepting soundings in the slice editor.
  - Fixed the syncing of the TX/RX node offsets when editing a common node for .db files.
  - Multibeam and laser SD offsets are now applied for all vertical referencing methods.
  - Fixed the Z range in the Grid Statistics when the attribute selected was not a height, but a scalar value.
  - Fixed an issue in the Slice Editor where a sounding selected with the 'Select Info' button was not rendered in the scene.
- Importing / Exporting
  - Fixed an issue where only the first Dynamic Grid was able to be selected when using *Automatic raw file import*.
  - Support for Surfer Binary GRD 7+ has been added.
  - Fixed an issue where the Color Bar labels were not displayed when exporting the color bar to image or KML on Windows.
  - Fixed an issue where the SD delayed heave from navigation files was not used in the TVU calculation.
  - Fixed a crash on Linux when importing a specific GSF file.
  - Adjusted the warning message for "*vertical offsets are all zero, there may be a problem in reading geoid"* if an .sd model is available and used.
- Other

- The shared preferences 'HIPS Version' was adjusted as the HIPS I/O now requires a version 12 license.

Known Issues

Issue	Summary	Affects Versions	Expected Fix Version
License Manager - Activate Softlock	**Problem** Our License provider LimeLM needs to have all Network Adapters enabled when trying to activate a softlock license. In some situations, the dialog "Failed to Activate License" with the message *"There are network adapters on the system that are disabled, please enable them and try again."* might appear when trying to activate the softlock license. This will prevent you from activating the softlock license. **Workaround** Follow the steps on https://qpssoftware.scrollhelp.site/lm/network-adapter-error-troubleshooting-stepsfor potential solutions. **Planned fix** The fix depends on our license provider. When we have an official solution it will be part of our installers	2.6.X	2.8.0

Qimera 2.7.5 Release

July 25, 2025

We are pleased to present Qimera 2.7.5.

Highlights

- You can now adjust multiple SD Sound Speed values in the SVP editor using multi-select.
- BAG metadata export now includes survey start and end dates.
- Qimera command now supports .s7k file import.
- New License Manager 1.10.1 Release.

Bugs

- Processing / Source Files
  - Fixed an issue with tide inside boundary with multiple strategies. This caused the tide inside the boundaries to not be properly represented in a single file.
  - The *Interpolate Grid* dialog will now remember the *Use Selection* checkbox state.
  - Automatically adjust the vertical referencing method to Tide if an SBET is added as depth and there is a tide file present. If no tide file is present, the vertical referencing method will be set to None.
  - Added entries into the *Job Activity* monitor to inform about the vertical referencing method change when adding an SBET as height or as depth.
- Tools and Editors
  - Fixed an issue with the *Varying Vertical Shift tool* where the profile would disappear from the plot.
  - Fixed a crash when taking a snapshot of the water column side stack.
  - Fixed a crash in the SVP Editor that occurred when inserting a row before where the mouse selection was outside table entries.
  - Fixed the H TPU and V TPU label in the *3D Editor* attributes panel, which was mis-labelled V TPU and V TPU.
  - Fixed being prompted to save a water column fan snapshot twice for a dual head system with an empty system.
- Importing / Exporting
  - Fixed an issue with .R2SC file import from NavAq when CR/LF line endings were added to the raw R2Sonic packets.

- Fixed an issue exporting .kmall to GSF with negative heading angles.
- When a GSF is imported with latency already applied to the footprints, Qimera will not extract the latency value to ensure it is not applied twice. This will show up as a warning in the job activity.
- Fixed an issue with project encapsulation where the file path for the source files had the same starting file path as the project. The source files will now be copied into the project.
- Fixed an issue with Vessel Editor time entries when importing an SBET/ASCII navigation as Depth.
- Fixed an issue where a Dynamic Grid had to be selected when exporting soundings to ASCII.
- Harmonized the Processed Point file import and Import and Split Large Processed Point import dialogs. File configuration will now be shown in both for .las/.laz.

- Other
  - Fixed an issue with custom labels from geopick points where a label field had no value set.

Known Issues

Issue	Summary	Affects Versions/s	Expected Fix Version
License Manager - Activate Softlock	**Problem** Our License provider LimeLM needs to have all Network Adapters enabled when trying to activate a softlock license. In some situations, the dialog “Failed to Activate License” with the message *“There are network adapters on the system that are disabled, please enable them and try again.”* might appear when trying to activate the softlock license. This will prevent you from activating the softlock license. **Workaround** Follow the steps on https://qpssoftware.scrollhelp.site/lm/network-adapter-error-troubleshooting-stepsfor potential solutions. **Planned fix** The fix depends on our license provider. When we have an official solution it will be part of our installers	2.6.X	2.7.X

Qimera 2.7.4 Release

May 22, 2025

We are pleased to present Qimera 2.7.4.

Highlights

- Qimera command now supports importing Kongsberg .kmall files
- Qimera command now supports running filter profiles on specific lines
- Qimera command now allows for extracting the geodetics from .db or .qpd files in the create-project job
- Added an option to export the color bar to an image
- The color bar will be exported to an image with the TIFF and KML export from a grid
- Added support for Valeport TideMaster tide files
- Added an option to create custom labels when creating point files or ascii files from Geo Picking points
- Display the number of soundings present in a selection on the slice editor status bar

Bugs

- Processing / Source Files
  - Fixed an issue with .db file import causing a crash due to a special character in the filename
  - Fixed an issue where a filter was removing points from a system not present in the active dynamic grid
  - Fixed an issue where navigation import was setting the vertical referencing method to tide even if no tide was available. This caused no pings to be written after processing
  - Fixed an issue with Find New File Location not working on Linux
  - Fixed an issue where a suffix was being added to single cleaning projects with no tiles
- Tools and Editors
  - Fixed an issue with water column display where the fan view and side stack was not displayed properly
  - Fixed a crash when saving a fan snapshot from a multi-head system
  - Fixed a crash when selecting certain features in the ENC Editor
  - Fixed an issue with the dialog and inside/outside range spin boxes in *Flag Grid Cells, Generate X Point Listings, and Tide Strategy*

- Importing / Exporting
  - Fixed an issue with Kongsberg .kmall absorption values not being written to the exported GSF
  - Fixed an issue with Qimera's *Automatic Raw File Import* where existing files in the directory were not being imported
  - Improved exporting Kongsberg .kmall systems to GSF to ensure matching the correct ping
  - Fixed an issue with HSX file import causing a gap in the resulting grid
  - Fixed an issue when importing Norbit STX scanning files in HSX format
  - Fixed an issue with dual swath multibeams in HSX format
  - Fixed an issue when exporting a grid to KML which had an incomplete image result
  - Fixed an issue with ENC display where not all features were shown
  - Fixed an issue exporting dual head Kongsberg kmall files to GSF. The second head was dropping pings
  - Fixed an issue exporting a corrupt Kongsberg kmall file to GSF. The good pings are now written to the GSF
  - ENC file import is now limited to .000 files
  - Fixed an issue exporting dual head HSX files to GSF, where the second head had incorrect beam information
- Other

Known Issues

Issue	Summary	Affects Versions	Expected Fix Version
License Manager - Activate Softlock	**Problem** Our License provider LimeLM needs to have all Network Adapters enabled when trying to activate a softlock license. In some situations, the dialog “Failed to Activate License” with the message *“There are network adapters on the system that are disabled, please enable them and try again.”* might appear when trying to activate the softlock license. This will prevent you from activating the softlock license. **Workaround** Follow the steps on https://qpssoftware.scrollhelp.site/lm/network-adapter-error-troubleshooting-stepsfor potential solutions. **Planned fix** The fix depends on our license provider. When we have an official solution it will be part of our installers	2.6.X	2.7.X

Qimera 2.7.3 Release

March 7, 2025

We are pleased to present Qimera 2.7.3.

Bugs

- Fixed an issue where the brightness and colinearity blocking filters were not shown in the blocking settings.

Known Issues

Issue	Summary	Affects Versions/s	Expected Fix Version
Navigation - Import	**Problem** Importing depth observations through ASCII Navigation or Binary Navigation import automatically sets the vertical referencing method in the processing settings to Tide, even when Tide data is unavailable. This can prevent processing from occurring. **Workaround** Open the processing settings and ensure that the Vertical Referencing Method is adjusted to the appropriate setting required for your data. **Planned fix** This will be fixed in the next bug release	2.7.1/2.7.2/2.7.3	2.7.4

Issue	Summary	Affects Versions	Expected Fix Version
License Manager - Activate Softlock	**Problem** Our License provider LimeLM needs to have all Network Adapters enabled when trying to activate a softlock license. In some situations, the dialog “Failed to Activate License” with the message *“There are network adapters on the system that are disabled, please enable them and try again.”* might appear when trying to activate the softlock license. This will prevent you from activating the softlock license. **Workaround** Follow the steps on https://qpssoftware.scrollhelp.site/lm/network-adapter-error-troubleshooting-stepsfor potential solutions. **Planned fix** The fix depends on our license provider. When we have an official solution it will be part of our installers	2.6.X	2.7.X

Qimera 2.7.2 Release

February 14, 2025

We are pleased to present Qimera 2.7.2.

Highlights

- Added the option to apply the filter when in filter preview mode in the slice editor. Just use the *Run Filter Profile* button to apply the filter.
- When saving a vessel configuration, you can now choose your own filename and the save folder.
- Improved shading of features to make them more pronounced.
- A new option was added to resize selections from only the opposite edge or corner. This is stored in Qimera's *Preferences, General* tab.
- Added a new button to add additional tide stations, when creating a new tide strategy.
- Added a new option to *Save* and *Load* Qimera's preferences. This allows for sharing preferences between users or computers.
- Added a new option to *Save* and *Load* Workspaces. This allows for sharing workspaces between users or computers.

Bugs

- Processing / Source Files
  - Fixed an issue with water column not displaying for certain Norbit .s7k files.
  - Fixed an issue where lines would fail to remove from a dynamic grid.
  - Fixed an issue with the *Grid Difference*. There will not be interpolation for grids with the same resolution and a warning was added for grids of different resolutions where interpolation can affect the results.
- Tools and Editors
  - Fixed an issue with the grid statistics showing an incorrect *Count* for grids that contain cells with hit counts larger than 500.
  - Fixed an issue with the *Free Slice Select* continuously saving the visited areas while dragging the sub selection.
  - Fixed a crash on selected areas with no data and large number of points in the *3D Editor*.
  - Fixed an issue where rejecting the SD values in the *Time Series Editor* wasn't rejecting the actual observations and triggering reprocessing.

- When loading an SD object into the *Geopick Tool* with an active Route, KP and DX values will be automatically computed.
- Added the ability to resize the *Crosscheck* plot.
- Fixed an issue with the *Varying Vertical Shift Tool* when systems are disabled.
- Zoom home in the *SVP Editor* will now zoom to the extents of the checked SVP profiles. To zoom to a single SVP profile, right-click and “Check Only Selected”, then click Zoom home.
- Fixed an issue displaying Kongsberg water column data.

- Importing / Exporting
  - Fixed an issue with BAG export from qimera-command where holes would appear in the exported BAG grid.
  - Fixed an issue with dual swath Norbit systems exporting to GSF to ensure ping alignment between swaths.
  - Added an option to *Configure for “Apply Edits From…”* when exporting to FAU. This allows for FAU edits to be applied back to the QPDs in Qimera.
  - Fixed a crash when importing .vel sound velocity files.
  - Fixed an issue where True Heave file import was not completing due to a long filename.
  - Added an option to export the vertical referencing method to the NOAA CSV export.
  - Fixed an issue with the grid uncertainty export to KML showing a single color.
  - Fixed an issue when exporting to GSF with extended ASCII characters in the filename.
  - Fixed an issue with .nav files not being imported.
- Other
  - Changed the default behavior when a selection is present to work on the entire grid rather than just the selection. For example, if a selection is present and a new grid is created it will default to not limit the grid bounds to the selection.
  - Fixed a Geodetic issue where Points export was not in the same geographic location as the grid. The affected CRS was NAVD88 and the vertical datum was affected.

Known Issues

Issue	Summary	Affects Versions/s	Expected Fix Version
Navigation - Import	**Problem** Importing depth observations through ASCII Navigation or Binary Navigation import automatically sets the vertical referencing method in the processing settings to Tide, even when Tide data is unavailable. This can prevent processing from occurring. **Workaround** Open the processing settings and ensure that the Vertical Referencing Method is adjusted to the appropriate setting required for your data. **Planned fix** This will be fixed in the next bug release	2.7.1/2.7.2	2.7.3
License Manager - Activate Softlock	**Problem** Our License provider LimeLM needs to have all Network Adapters enabled when trying to activate a softlock license. In some situations, the dialog "Failed to Activate License" with the message *"There are network adapters on the system that are disabled, please enable them and try again."* might appear when trying to activate the softlock license. This will prevent you from activating the softlock license. **Workaround** Follow the steps on https://qpssoftware.scrollhelp.site/lm/network-adapter-error-troubleshooting-stepsfor potential solutions. **Planned fix** The fix depends on our license provider. When we have an official solution it will be part of our installers	2.6.X	2.7.X

Qimera 2.7.1 Release

December 16, 2024

We are pleased to present Qimera 2.7.1.

Highlights

- Qimera Live will now support CSV format for importing. Kongsberg is able to output CSV files for lightweight ship to shore transfers
- Qimera-command now supports exporting to GSF files
- Updated HIPS I/O for local Caris 12 license support

Bugs

- Processing / Source Files
  - Fixed an issue where an empty source file (not pings) caused the project to crash
  - Fixed an issue with the filter preview not resetting the refraction or z-shift filter points until the selection was moved
  - Fixed an issue with tide priorities coming from Qinsy .db files
  - Fixed an issue with CUBE hypothesis being created at zero depth when using the neighborhood algorithm
  - Fixed an Error message that was shown in Qimera command "*Could not find or create Software\Qps\LM*"
  - For custom CRS, in geotiff exports, which can't be defined by an EPSG #, we'll output information that is available but will not fall back on WGS84 defaults if they are not. If the tag cannot be filled properly it will now be left empty which results in a 'not found' or 'name unknown' text string.
  - Fixed an issue with a mid-file corruption in an SBET file. Qimera will now parse and use the good data up to the point of corruption
  - Fixed an issue with the QPD object track not being used with the *Include time series data from adjacent lines closer than* Processing Setting. This caused a gap in the grid after reprocessing
  - Fixed an issue where the Dynamic Grid color would change back to height after changing the resolution
  - Limited the *Compute THU and TVU Scalars* to the systems included in the Dynamic Grid

- Fixed an issue where opening a Qimera 2.7.0 project with an SBET would take a long time to load
- Fixed an issue where Static Grid creation was not using the latest cleaning edits
- Fixed an issue with water column not being displayed from a Reson 7150 system

- Tools and Editors
  - Alt+left click will now move the slice box to the mouse location in the Patch Test tool
  - Fixed an issue where the calibration's plot location was not updated correctly in the patch test report
  - Set *Very Weak Spline* as the default filter on new installations
  - Fixed an issue with the Water Column setting's *Beams* and *Range* slider not applying changes
  - Fixed an issue with rejected soundings being included in the *Slice Editor* zoom home
  - Fixed an issue when editing *Offsets* in the *Generate/Edit X Point Listings* where the lower offset would update before the upper offset was finished typing.
  - Fixed an issue when editing *Offsets* in the *Flag Grid Cells* where the lower offset would update before the upper offset was finished typing.
  - Fixed an issue with the slice box rotating after adjusting the slice box size
  - Fixed some point rendering issues in the slice editor when auto-zoom was disabled
  - Fixed the Time Series Multiplot - Relative Nadir Z to use the beam closest to nadir
  - Improved the water column side stack view for Kongsberg dual swath where only the first of 2 pings has water column
- Importing / Exporting
  - Fixed an issue where imported SVP files had the incorrect time stamp
  - Qimera-command will now support exporting CUBE depth layers to BAG file and Geotiff
  - Fixed an issue with CUBE grids being exported to ASCII containing holes
  - Fixed an issue when exporting a Dynamic Cable/Pipe to QGFLine where the KP values were not forced to the active route
  - Fixed an issue with exported QGFLine not able to be renamed in Survey Manager
  - Sign conventions are not shown when creating a positioning system in the Binary Navigation import
  - Fixed an issue where the SVP Export wasn’t working for certain export formats
  - A warning has been added if the Grid to be exported needs updating
  - Added support to import tide files with date/time in descending order
  - Added support for importing SBET files as depth. This is to support post processing position from ROVs and including tide and geoid model in the resulting heights

- Added the datum used when exporting the GSF to the GSF Parameters
- Exporting a Static Grid of sounding density will now export integer values to floating point geotiff

Known Issues

Issue	Summary	Affects Version/s	Expected Fix Version
License Manager - Activate Softlock	**Problem** Our License provider LimeLM needs to have all Network Adapters enabled when trying to activate a softlock license. In some situations, the dialog "Failed to Activate License" with the message *"There are network adapters on the system that are disabled, please enable them and try again."* might appear when trying to activate the softlock license. This will prevent you from activating the softlock license. **Workaround** Follow the steps on https://qpssoftware.scrollhelp.site/lm/network-adapter-error-troubleshooting-steps for potential solutions. The fix depends on our license provider. When we have an official solution it will be part of our installers	2.6.X & 2.7.X	2.7.X

Qimera 2.7.0 Release

October 4th, 2024

We're pleased to present Qimera version 2.7.0. In this release, we introduce a few new features, with a focus on cleaning, speed and usability. Read below for details.

Highlights

- Colormaps
- Flag Grid Cells
- New Cleaning Project
- Usability updates
- QPD edit files
- Parallel Gridding
- and more!

Voting System

In this release, we have completed 4 feedback items, which satisfies 47 votes. For more information, see our Voting system Policy and Using the Voting System.

The Feedback Project helps us to continue improving our software products. At the moment, our Voting System is down as described at the top of the Voting system Policy page. Despite the system being inaccessible for voting for a short period, we still use it to prioritize developments while we await a solution from our provider, Atlassian.

- Qimera 2.7.0 - Important Notes
- Qimera 2.7.0 - New Functionality
- Qimera 2.7.0 - Improvements
- Qimera 2.7.0 - Resolved Bugs
- Qimera 2.7.0 - All Implemented Feedback
- Qimera 2.7.0 - Documentation
- Qimera 2.7.0 - Known Issues

Qimera 2.7.0 - Important Notes

Licensing

With this release there is a new License Manager version 1.10.0 with several improvements.

Existing Qimera users with a license that is under maintenance will be able to install and run Qimera 2.7 alongside Qimera 1, using the same license.

If you have a Qimera Offshore license only, you will not be able to run versions 2.3 and earlier of Qimera since the older versions are not aware of the new product license code for Qimera Offshore.

Installers

The Qimera installer will install by default into sub-directories with the version name under the typical install path, which is usually C:\Program Files\QPS\Qimera. This allows multiple installations quite easily and follows the trend that Qinsy has been using for some time. Users with Qimera 1.X or 2.X already installed will find that Qimera 2.7.0 will install into the Qimera 1 directory, but in the 2.7.0 sub-directory of the Qimera 1 installation folder.

QPS Project and file format versions

The Qimera project version has been incremented. Projects opened in Qimera 2.7.0 are not able to be opened in Qimera 2.6.x and previous versions. Both Qimera 2.6 and 2.7 projects are compatible with Qinsy.

The QPS .qpd file has been upgraded with the Qimera 2.7.0 and Qinsy 9.7.0 release to version 2.10. The latest release of Qimera 2.5.4 will be able to read Qimera 2.7.0 and Qinsy 9.7.0 .qpd files, but older versions of Qimera (2.5.3 and earlier) will not be able to read the newer .qpd version.

QPD 2.10 is backwards compatible with the following application versions:

- *Qinsy 9.5.5* or greater
- *Qimera 2.5.4* or greater
- *Fledermaus 8.5.3* or greater
- *FMGT 7.10.3* or greater

The Dynamic Grid Menu has been removed from the main menu bar. The items contained in that menu have been moved to other menus or the right click context menu of the Dynamic Grid. A full list can be found in the Qimera 2.7.0 - Improvements.

Colormaps

With the release of Qimera 2.7.0 user defined colormaps are prompting users to save in: C:\Users\Public\Documents\QPS\Shared\ColorMaps which allows for sharing colormaps between users. Qinsy colormaps can be read by Qimera.

Qimera default colormaps are still always installed in the Qimera install directory.

End of support for Qimera on Linux RHEL 6

Please note that Qimera has dropped support for Linux RHEL 6 in all versions. The minimum supported version is now RHEL 7.

Windows 11 is officially supported

Qimera 2.7.0 - New Functionality

Introduction

In this release, we introduce colormap changes, flagging of grid cells, QPD edit files, new cleaning projects, default cell sizes, active grid and more. Read on below for more detail!

Please contact sales@qps.nl if you'd like to arrange for an evaluation of Qimera.

Colormaps

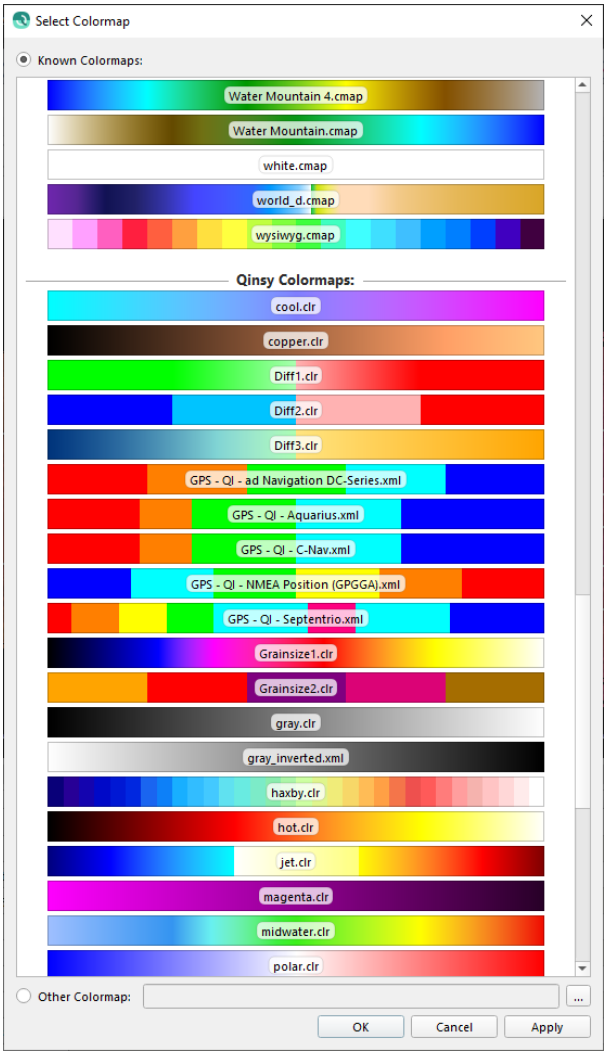
With this release we have improved the way you work with colormaps.

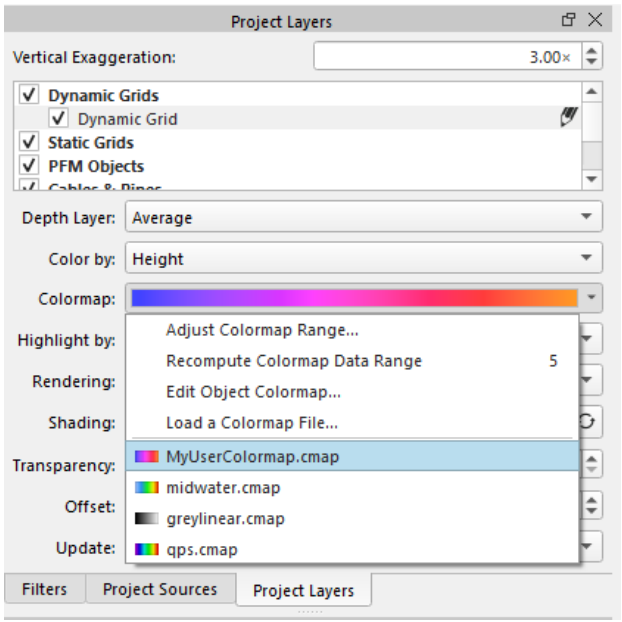
Load Colormap

Each colormap now displays a preview when selecting. In addition you can see the overflow and underflow colours as well as if it is percentage based or fixed range.

The colormaps are ordered with *Recent Colormaps* on top followed by *User Colormaps, System Colormaps* and *Qinsy Colormaps*.


Select Colormap
Known Colormaps:
Recent Colormaps:
0%
MyUserColormap.cmap
100%
midwater.cmap
greylinear.cmap
qps.cmap
User Colormaps:
MyUserColormap.cmap
System Colormaps:
colorsinterp.cmap
cool.cmap
copper.cmap
Diff1.cmap
Diff2.cmap
Diff3.cmap
editor.cmap
fire.cmap
geof.cmap
gmt.cmap
gmtglobe_d.cmap
gmtocean_d.cmap
gmttopo_d.cmap
GPS - QI - ad Navigation DC-Series.cmap
GPS - QI - Aquarius.cmap
GPS - QI - C-Nav.cmap
GPS - QI - NMEA Position (GPGGA).cmap
GPS - QI - Septentrio.cmap
Other Colormap:
...
OK
Cancel
Apply


Select Colormap
Known Colormaps:
Water Mountain 4.cmap
Water Mountain.cmap
white.cmap
world_d.cmap
wysiwyg.cmap
Qinsy Colormaps:
cool.clr
copper.clr
Diff1.clr
Diff2.clr
Diff3.clr
GPS - QI - ad Navigation DC-Series.xml
GPS - QI - Aquarius.xml
GPS - QI - C-Nav.xml
GPS - QI - NMEA Position (GPGGA).xml
GPS - QI - Septentrio.xml
Grainsize1.clr
Grainsize2.clr
gray.clr
gray_inverted.xml
haxby.clr
hot.clr
jet.clr
magenta.clr
midwater.clr
polar.clr
Other Colormap:
...
OK
Cancel
Apply



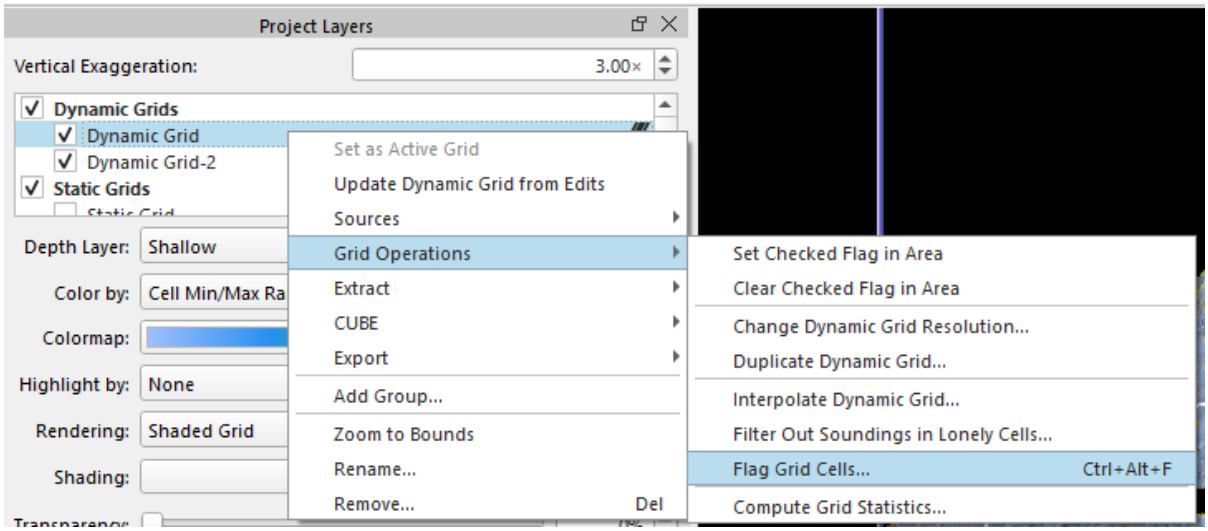
A shortcut to the recently used colormaps is present with a small preview when selecting the Colormap attribute of a grid.

Save user colormaps

User colormaps are now prompting users to save your colormaps in *C:\Users\Public\Documents\QPS\Shared\ColorMaps* so they can be shared across different users.

Flag Grid Cells

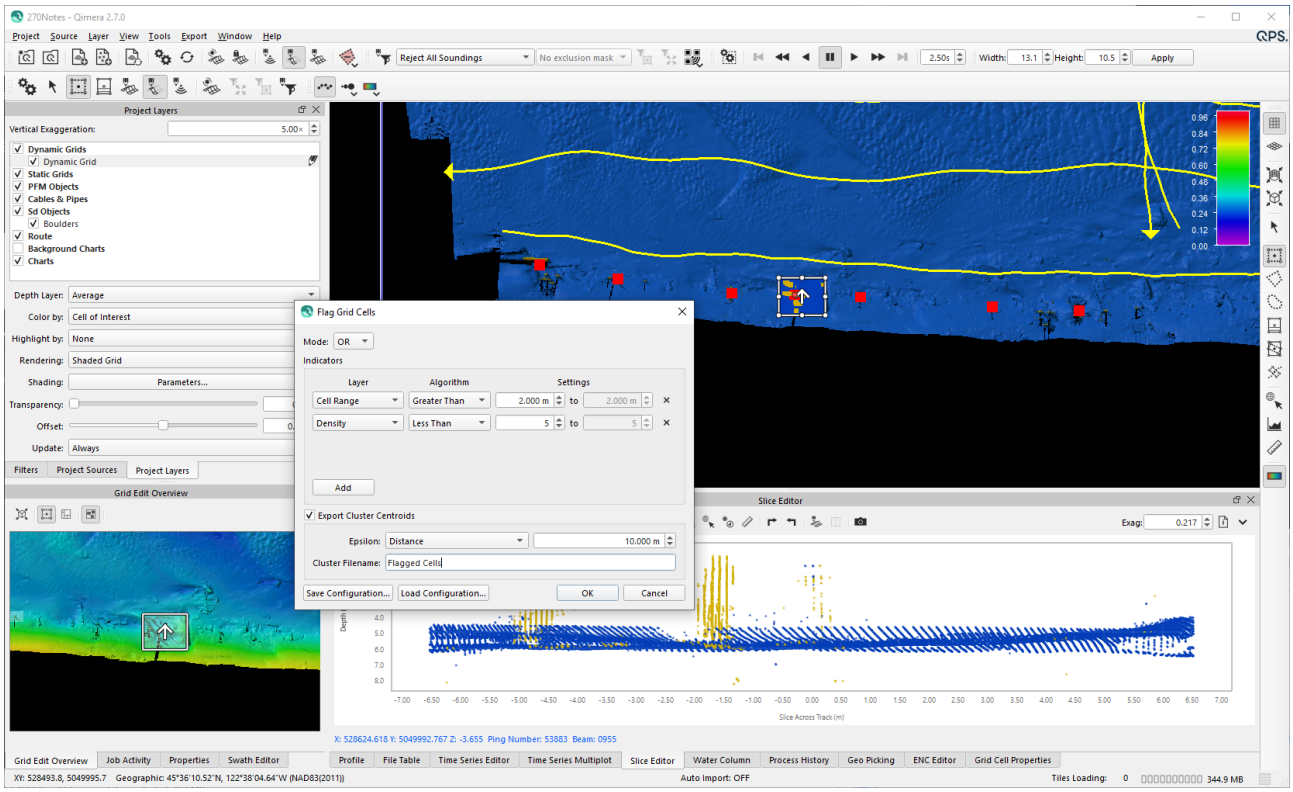
A tool was developed to flag grid cells based on user defined criteria. Properties of the Dynamic Grid (Cell Range, Density, Uncertainty, Depth Layer) can be selected or combined to flag a cell in the grid. The tool is run by right-clicking on the Dynamic Grid > Grid Operations > Flag Grid Cells.

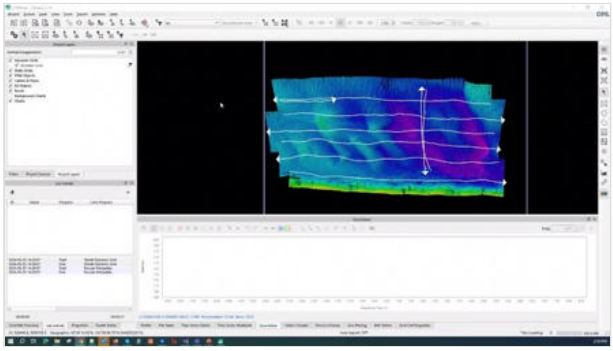


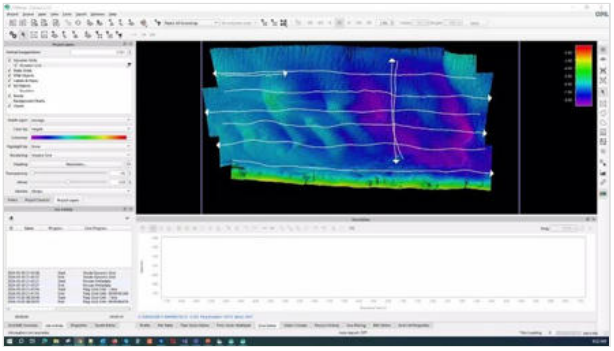
When defining criteria for flagging a grid cell, you can select the *Mode: OR*, which flags a cell if any of the criteria are true, or *Mode: AND* which flags a cell if all criteria are true. Several Indicators can be added or removed. There is also an option to *Export Cluster Centroids* which exports a point file containing clusters of flagged grid cells. The options to define the clusters *Epsilon* are *Distance* or *Multiple of Cell Size*. Finally you can save and load configurations you find helpful.

Once the tool is run on a Dynamic Grid, change the *Color By* attribute to *Cell of Interest* and look for the gold color to see your flagged grid cells. Once you determine an area should be investigated, start the slice editor and color the plot by *Cell of Interest* to get the Blue/ Gold colors showing in the slice editor. The points that contribute to the flagged grid cell will be gold.

Finally, if you have exported Cluster Centroids, you can click on the new point file under *Sd Objects*. To help investigate each cluster you can right-click on the cluster point file and select *Load points into GeoPick Tool*. In the Geo Picking dock, you can select a point and click the *Locate Point* button to center the view on that point.

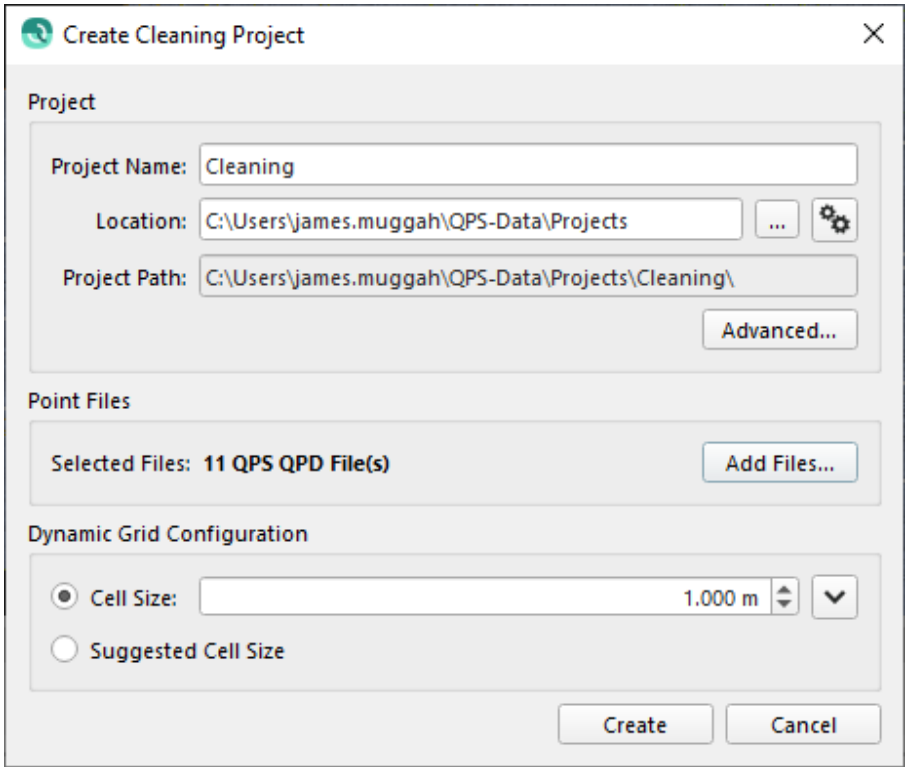






New Cleaning Project

A new cleaning project wizard was created in order to get a project created more quickly so users can get directly to reviewing their data.



The wizard is divided into 3 sections: Project properties, Point Files to add and Dynamic Grid Configuration. Custom geodetics, and additional project metadata can be set in the Project's *Advanced…* button. Adding of Processed Point Files can be set with the *Add Files…* button. Finally a Dynamic Grid cell size can be set or a suggested cell size based on the input files. The *Create* button will create a new cleaning project, add the selected files and generate a Dynamic Grid automatically.

QPD Edits

In this release, a new QPD edits file has been created. This is a lightweight file that contains the edit flags from cleaning or filtering. These small files can be used as cleaning or filtering backups, they can be passed from offline team to offline team or online team, or as a way to combine the edits from cooperative cleaning projects. The default path for these *.qpdedits* file is in the project's *Export* folder. To export QPD edits, right click on the source file and select *Export QPD Edits*. To apply the edits, select *Apply Edits from…* and choose the .qpdedits files.

New Parallel Gridding

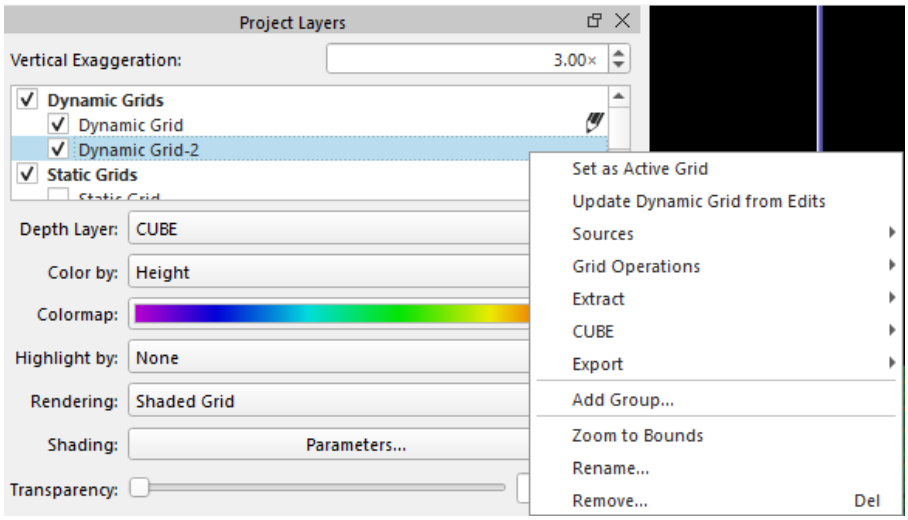
When creating new Dynamic Grids or performing grid updates after edits, we have enabled parallel gridding which makes use of multiple cores on your machine. You should see a large speed improvement for new grids, with the exception of CUBE Dynamic Grids which are still single core.

Cell Min/Max Range

A new property has been added to the Dynamic Grid *Color By* attribute called *Cell Min/Max Range*. This will color the Dynamic Grid by the range between the minimum and maximum sounding in the cell. It can be useful for spike hunting.

Active Grid

The concept of an *Active Grid* (denoted by a pencil icon) has been introduced to remove ambiguity for which grid is being edited or exported.
Dynamic Grids can be set as active by using the right click context menu *Set as Active Grid*. The active grid will be used by the slice editor and 3D editor during editing regardless of the selection.



Qimera-command

Four new options have been added to Qimera-command:

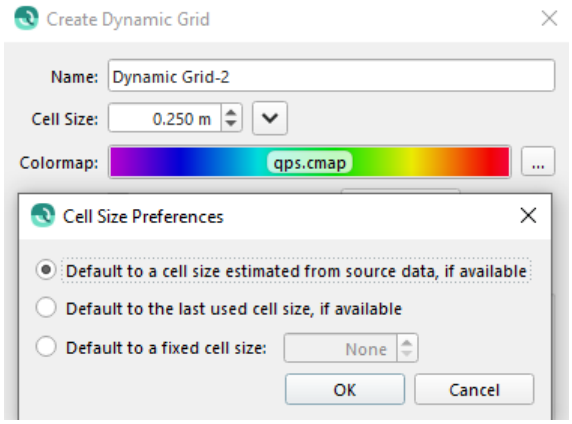
1. Generate THU/TVU layers
2. Export to BAG,
3. Export to NOAA CSV
4. Export to GeoTiff.

```
C:\Program Files\QPS\Qimera\2.7.0\bin>qimera-command.exe --help
Usage: qimera-command.exe [options]
Qimera Command: A subset of Qimera processing operations for use on the commandline.

Options:
  --job <job-name>  The name of the command line job to run. See
                    `--job=<job-name> --help` for more details. Must be one of
                    the following.
                       create-project
                       add-raw-sonar-files-db
                       add-raw-sonar-files-all
                       create-dynamic-grid
                       auto-process
                       run-filter-profile
                       append-to-grid
                       export-bag
                       export-noaa-csv
                       export-geotiff
                       generate-thu-tvu-layers
  -?, -h, --help    Displays this help.
  -v, --version     Displays version information.
```

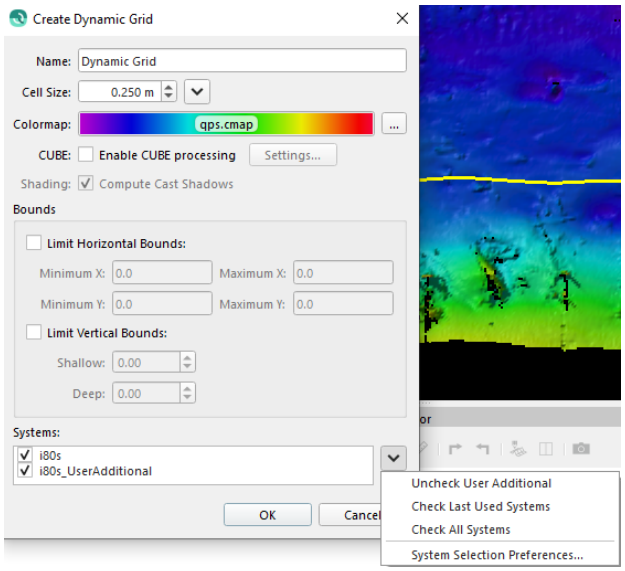
Remembered Cell Size

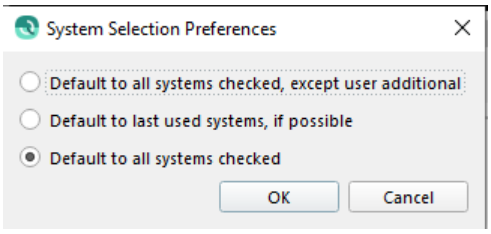
There are new defaults for cell sizes when creating a Dynamic or Static Grid. Default to the estimated cell size, Default to the last used cell size, or Default to a fixed cell size.



Remembered Systems

There are new defaults for systems when creating a Dynamic or Static Grid. Default to all systems checked except user additional, Default to last used systems if possible, or Default to all systems checked.





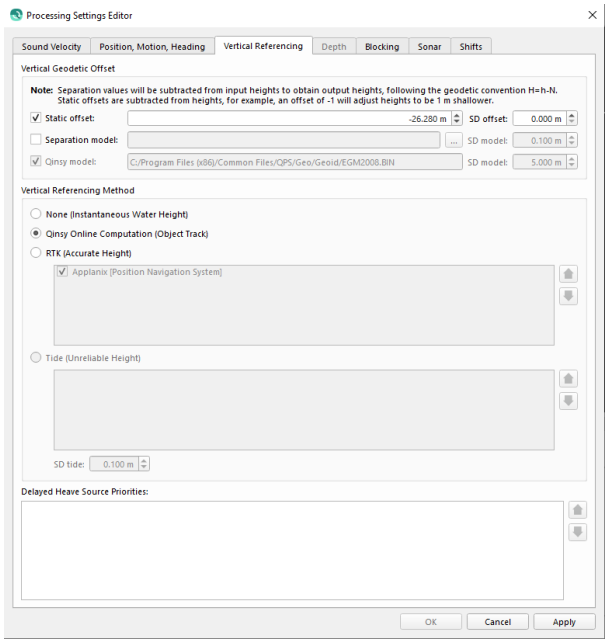
Teledyne Reson Deep water HydroSweep MBES now supported

We have added support for (7047) the Reson HydroSweep deep water multibeam echosounder systems.

Qimera 2.7.0 - Improvements

Qinsy Model

Qinsy model will now show a checkbox to indicate that it is in use as well as show the Standard Deviation (SD model).



Dynamic Grid menu

To go along with the Active Grid theme of removing ambiguity, the Dynamic Grid menu has been removed. All of the functionality remains in Qimera, they just found a new home in places such as the Attribute Panel, Project Layer Dock, and Context Menus.

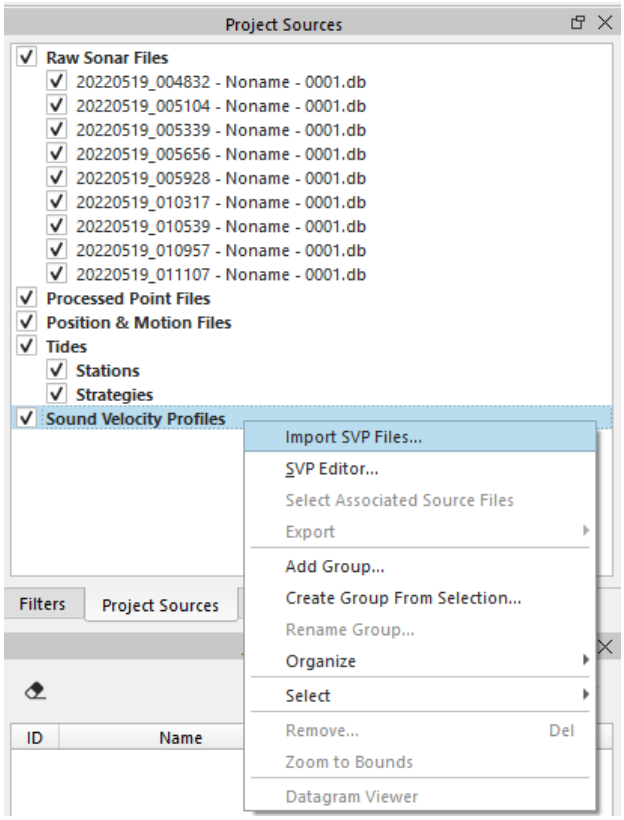
For a full list have a look at the reference manual:https://qpssoftware.scrollhelp.site/qimera/qimera-dynamic-surface-menu

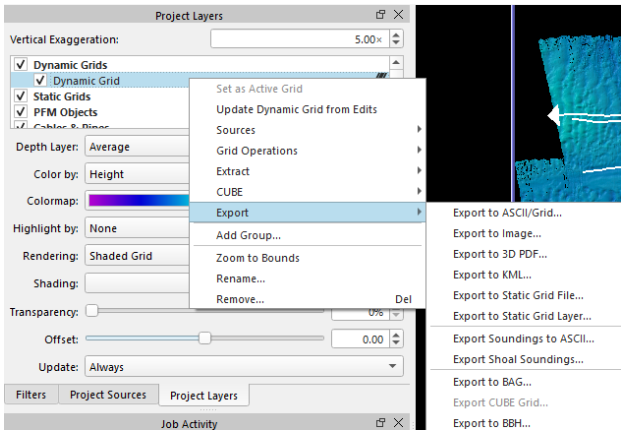
View menu

The scene menu has been renamed the View menu. Several menu entries have been changed from Scene to View, for example *Zoom to Scene* has been changed to *Zoom to View*.

Context menus

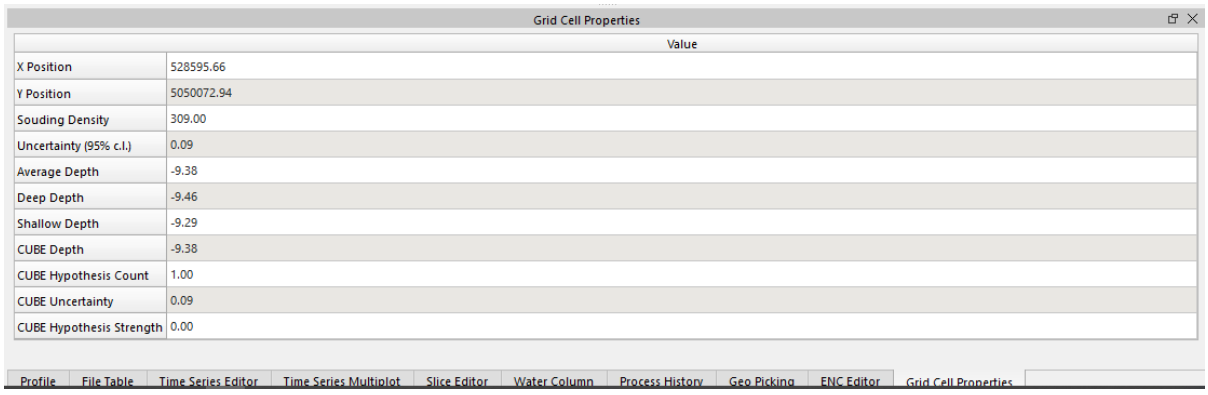
Several actions have been moved into context menus. Some changes include importing files when right clicking on Project Sources; Export options when right clicking on Project Layers and other dock menus, for example the Slice Editor will now show a context menu with some useful options.





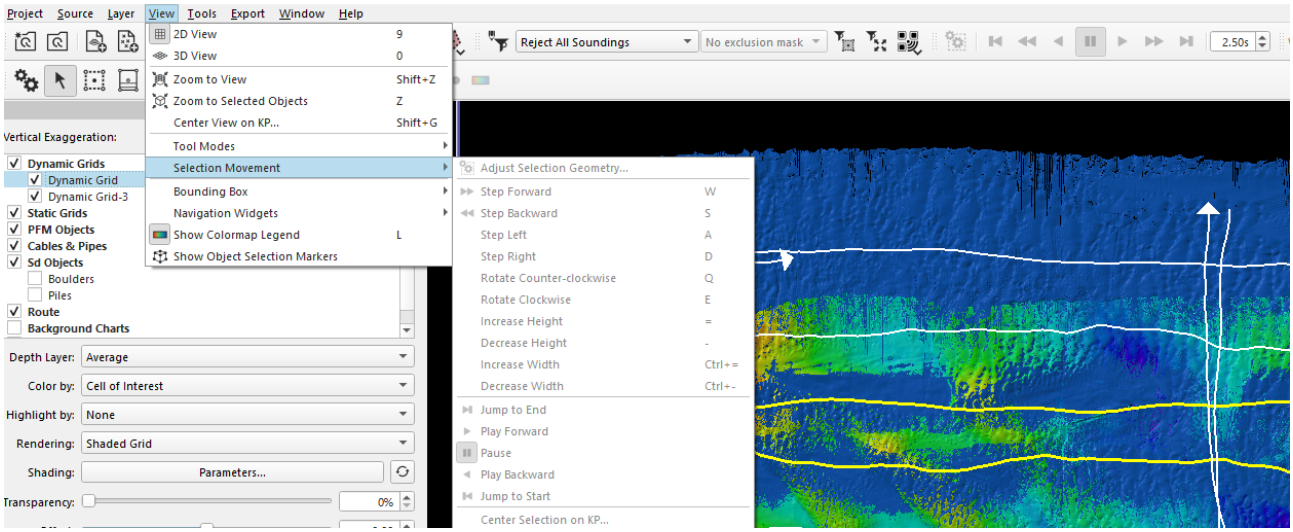
Grid Cell Properties Dock

The grid cell properties window has become a dock to allow for easier viewing of the grid cell properties when moving the mouse over the grid.



Menu icons

Icons have been added to the menus to easily associate menu options with toolbar buttons.



HIPS I/O upgraded to support version 12 of Caris licenses.

GSF version updated to 3.10

The GSF Export has been updated to the latest version 3.10 and

GSFv03.10, released July 11, 2024 is a maintenance release that:

- Added support for the Kongsberg ME70 sonars
- Added new data fields to support backscatter processing of data sourced from KMALL
- Improved the overall robustness of the library.

Source: https://www.leidos.com/products/ocean-marine

Qimera 2.7.0 - Resolved Bugs

Below you will find listings of bugs which have been reported in previous releases and which have been solved for the Qimera 2.7.0 release.

Issue Key	Summary	Affects Version
CQM-7367	Source File Import - SVP - Simplify and improve the import of ASCII SVP files	Qimera 2.6.2 Qimera 2.6.3
CQM-7321	Varying Vertical Shift crashes during compute	Qimera 2.6.3
CQM-7315	Tools and Docks - Varying vertical shift tool > Crash	Qimera 2.6.3
CQM-7305	Project - Opening and Creating Project - Qimera Crashes when opening Qinsy project	Qimera 2.6.2 Qimera 2.6.3
CQM-7302	Tools - Varying Height shift - Crashes immediately when you calculate the shift	Qimera 2.6.3
CQM-7294	Tools and Docks - Varying vertical shift tool > Crash	Qimera 2.6.3
CQM-7285	Source File Import - Large processed points - PTS file not visible	Qimera 2.6.3
CQM-7156	Layers - CAD and ArcGIS - QGFArea results in a Crash	Qimera 2.6.1, Qimera 2.6.2

Issue Key	Summary	Affects Version
CQM-7107	Slice editor - Filter preview not highlighting soundings when rejected soundings turned off	Qimera 2.6.2
CQM-7106	Tools and Docks - Slice Editor - Soundings disappear with select and edit	Qimera 2.6.2, Qimera 2.6.3
CQM-7058	Qimera - Processing Settings - Height shift at end of QPD	Qimera 2.6.2
CQM-6978	Licensing - Other - Could not verify HIPS License (v12)	Qimera 2.6.2
CQM-6737	Source File Import - Navigation - Last ASCII navigation import configuration not remembered	Qimera 2.5.4 Qimera 2.6.0 Qimera 2.6.1 Qimera 2.6.2
CQM-6736	Source File Import - Navigation - Import ASCII Nav to import more than one file at a time and remember last settings and mapping or allow for batch import	Qimera 2.5.4, Qimera 2.6.0 Qimera 2.6.1
CQM-6716	Surfaces - Color Maps - Interpolation over grey color when choosing black	Qimera 2.6.1
CQM-6667	Surfaces - Color Maps - Have a visual representation of the colormap	Qimera 2.6.1

Issue Key	Summary	Affects Version
CQM-6653	Tools and Docks - Slice Editor - Reject outside of angle range - Not effective in Slice editing	Qimera 2.6.0 Qimera 2.6.1 Qimera 2.6.2
CQM-6581	Export - Dynamic Surface - No shoal layer export with BAG	Qimera 2.6.0
CQM-6543	Qimera - Color Maps - Change location to Public Documents	Qimera 2.6.0
CQM-6416	Export - Other - Export TOP to QGF format	Qimera 2.5.4 Qimera 2.6.0
CQM-6322	Processing - Data Cleaning - Allow for an edits file	Qimera 2.5.3
CQM-6199	SVP - Add right-mouse-click to SVP files	Qimera 2.5.3
CQM-5765	License Manager - No response when using command to connect to a license server	Qimera 2.5.0
CQM-5759	Remember grid size for Dynamic Surface	Qimera 2.4.9

Qimera 2.7.0 - All Implemented Feedback

Key	Summary	Votes
FQM-59	ASCII SVP Import - Improve import dialog and import procedure	23
FQM-60	ASCII Nav Import - Improve import dialog and import procedure	13
FQM-561	Color maps - Unify storage location of color maps across product line	8
FQM-468	Add context menu to export surfaces and other scene objects	3

7 issues

Qimera 2.7.0 - Documentation

Documentation has been updated to capture the changes to existing dialogs and workflows and new features.

Documentation can be found here: Qimera Documentation

Qimera 2.7.0 - Known Issues

For this release, the following are known issues which we plan to address in upcoming releases.

Issue	Summary	Affects Version/s	Expected Fix Version
Limitation	Filter toolbars to "Accept All Soundings" and "Revert Manual Edits" do not have the intended effect when used in a Cooperative Cleaning project to override cleaning that was done manually in the Master project prior to creating the Cooperative Cleaning project. Suggested workflow is to use the manual re-accept tools in the Slice Editor and 3D Editor.	2.1.0	2.7.x
License Manager - Activate Softlock	**Problem** Our License provider LimeLM needs to have all Network Adapters enabled when trying to activate a softlock license. In some situations, the dialog “Failed to Activate License” with the message *“There are network adapters on the system that are disabled, please enable them and try again.”* might appear when trying to activate the softlock license. This will prevent you from activating the softlock license. **Workaround** Follow the steps on https://qpssoftware.scrollhelp.site/lm/network-adapter-error-troubleshooting-steps for potential solutions. **Planned fix** The fix depends on our license provider. When we have an official solution it will be part of our installers	2.6.X	2.7.X

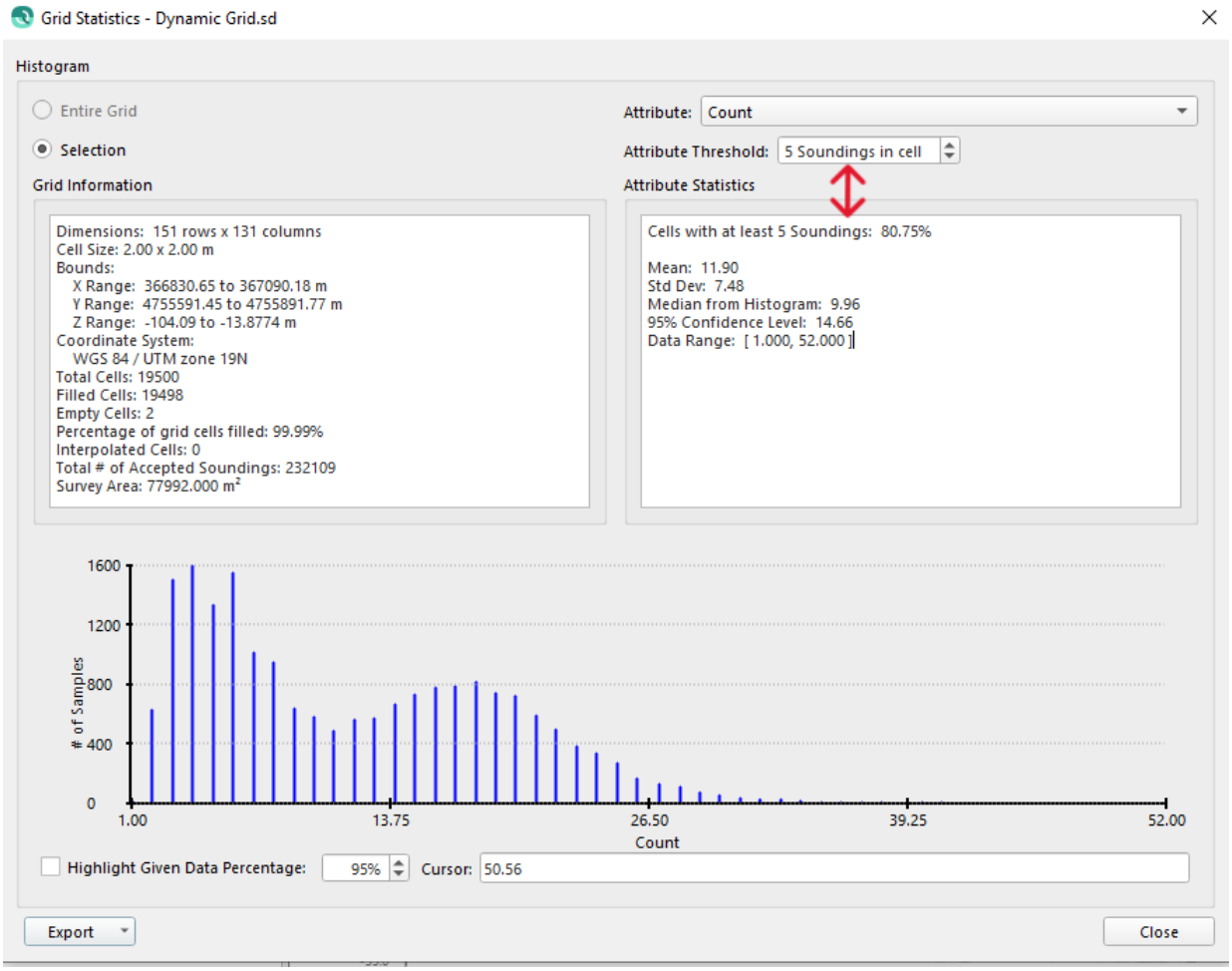
Qimera 2.6.3 Release

August 8, 2024

We are pleased to present Qimera 2.6.3.

Highlights

- Fixed the known issue from the Qimera 2.6.2 release where a crash could occur when working with the *Slice Editor or Cable/Pipe TOP Detection Tool*. This affected all related actions on the Dynamic Grid, such as cleaning.
- Added a new *Attribute threshold* to the *Grid Statistics* tool, which is user defined and provides the resulting number of cells in the grid that meet the user defined threshold in the Attribute Statistics.



- Fixed some issues with the *Water Column* dock that occurred with the Qimera 2.6.0 release. Items such as geopicking and stacked view have been improved.
- Added the option to copy the ASCII format help strings when using the ASCII parser during import.
- Added the option to select the Grid Depth Layer (Shallow, Average, Deep, CUBE) when exporting to a BAG file.
- Added new GSF file naming options when exporting to GSF. A filename pattern can be specified to customize the GSF export name.
- Added a file list of the lines and the reference grid that are used in the *Cross Check tool*.

Bugs

- Processing / Source Files
  - Fixed an issue with *Spot Sounding* generation when a project has extended ASCII characters in the name.
  - Fixed a crash that occasionally happened when selecting a source file after running *TU Delft Sound Speed Inversion*.
  - Fixed unloading point edits to GSF where the first unload was unloading all points that were not accepted, regardless if their status was changed after import.
  - Aligned the spin box values in the blocking settings.
  - Fixed a crash when importing old version .all files.
  - Fixed a crash when the last detection of a dynamic cable/pipe was deleted.
  - Fixed the import processed point filter options when importing geographic points.
  - Fixed an issue with kmall files where the position and height information was not being extracted.
  - Fixed an issue where a navigation file would not import if the filename exceeded 256 characters.
  - Made the motion sensor SD Heave Variable uncertainty value clear in the uncertainty settings. 5%.
  - Fixed an issue where the z shift filter was shifting nadir soundings incorrectly.
  - Fixed an issue with secondary depth/pressure system priorities when coming from Qinsy.
- Tools and Editors
  - Fixed the *Cable/Pipetracker TOP Detection tool* saving the DX smoothing after closing and re-opening the tool.
  - Added more intervals to the X axis of the *Grid Statistics* histogram.
  - Fixed an issue with the background color of the *profile plot* when it was changed, and did not update right away.

- Fixed a crash when using the *2D slice editor* in a master project.
- Fixed an issue with the *Cable/Pipe TOP Detection tool* where the next detection was being shown for the current location.
- Fixed the link between the mouse location in the *time series editor* and the vessel track lines, red ball.
- Fixed an issue when renaming a Dynamic Grid would cause it to lose it's association with dynamic cable/pipe objects.
- Fixed an issue where the Squat model was not applying to all survey lines if there were multiple vessel entries.
- Fixed a crash in the time series multiplot after removing all previous parameters and adding a new parameter.
- Fixed an issue with the *Line Height Matching Tool* where running the tool a second time was overwriting rather than appending the result.
- Fixed the auto line pairing when the file selection was reversed.
- Adjusted the vertical exaggeration value in the *Profile* dock when using Ctrl + scrollwheel to zoom vertically.
- Fixed some invalid values in the shifting tools that appeared as straight lines after using the *Navigation* editor.
- Grid statistics will now prompt for a Plane Height value, which can be left at 0.0, and will specify the Volume above and below the plane height in the Grid information section.
- Fixed an issue with the Qinsy Object track height not being used in the *Navigation Editor*.
- Fixed an issue with the *Cable/Pipe TOP Detection tool* where detections would be skipped with a 0.5m step interval.
- Fixed an issue with CUBE hypothesis editing after the CUBE surface resolution was changed.
- Fixed an issue where the 3D slice editor would not re-open after closing it while in free dock mode.
- Fixed an issue with the *Cable/Pipe TOP Detection tool* where the initial press of the "w", move selection forward, was not registering.

- Importing / Exporting
  - When creating a *BAG* from a CUBE grid, grid nodes that do not contain a TVU value are trimmed on export.
  - Fixed an issue with SBET import in Qimera 2.6.2 where heights were not being correctly transformed.
  - Added options to export a screenshot of the *Grid Statistics* window.
  - Added text output for the *Grid Statistics* histogram.

- Fixed an issue after importing a SVP file and the zoom to bounds wasn't working.
- Fixed a plotting issue when exporting the *patch test* results to PDF.
- Added the option to type in the date/time for SBET import as well as use the calendar.
- Fixed a half cell offset when exporting a Dynamic Grid to Static Grid and then re-importing the static grid.
- Fixed a crash when importing a kmall dual head file when one head is turned off.
- Fixed a shift between a static grid and imported TIFF file.
- Fixed an issue when exporting multiple SVPs to Hypack v2 where the first entry in the second SVP was the last entry from the first SVP.
- Fixed a crash when exporting a S7K file to GSF.
- Fixed an issue when importing GSF files as raw sonar files where the Rx sign convention in the vessel editor would sometimes be auto-detected improperly, resulting in a reversed positive direction.
- Fixed a kmall export to GSF that was getting stuck at 100% progress.

- Other
  - Fixed a graphics related crash that would occur randomly.
  - Fixed an installation issue where the installer would not finish when installing Qimera or FMGT.
  - Fixed an issue where the progress in the Job Activity info message would list higher than 100%.
  - Fixed an issue with the *Grid Edit Overview* not showing edited areas.
  - Fixed an issue when upgrading projects from Qimera 2.3.5 and earlier versions.

For Kongsberg EM3000, EM3002, EM2040, EM2040C, EM2040P, and EM2040M systems with internal array offsets, certain workflows where a full Sound Velocity Correction was not the last processing update (Direct-to-QPD or Renav operations were used instead) had the internal array offsets applied incorrectly in versions prior to this release.

For EM2040M this was at most a 7 cm depth error. For all other systems this is seen as a 1-2 cm depth error. The magnitude of the error is dependent on the rotation of the transducer so tilted dual head systems will see more and horizontally mounted single head systems will see almost no error.

A full reprocess (*Tools -> Manual Processing -> Sound Velocity Correction*) of any files suspected of being impacted will correct the issue.

Known Issues

Qimera 2.6.2 Release

December 20, 2023

We are pleased to present Qimera 2.6.2.

Highlights

- Added Autozoom capability to the Patch Test Tool and Wobble Analysis Tool to better handle plot updates.
- GSF import will now try and auto-detect the source datum if it was populated in the .gsf. Only geographic coordinate systems will be available for selection when importing to avoid confusion.
- Added auto reporting to the *Line Height Matching Tool*.
- The filter preview in the slice editor will allow you to continue to use Qimera if an expensive filter is being previewed.
- Editing the cable/pipe TOP detection will now regenerate the X-Point listings (if available) position for that detection.

Bugs

- Processing / Source Files
  - Fixed the *Filter Profile* selection when running a filter on selected files.
  - Fixed the *Systems to Filter* option when running a filter on selected files.
  - Added back the warning in the *Activity Log* when creating an empty grid.
  - Fixed a loop of warning messages displayed when using the *time series editor* and autoprocessing was selected.
  - Fixed a string comparison error that caused GGK position strings to not be read from .kmall files.
  - Fixed an issue with *recompute colormap range* not working for processed point files.
  - Fixed an issue reading the sensor depth from .kmall files.
  - Fixed a crash when importing a .jsf file with no sound speed recorded in the file.
  - Added a warning message when files fail to process, potentially due to being open elsewhere.
  - Fixed a crash when adjusting the colormap range of .sd point files.
  - Fixed a crash when reading .kmall watercolum packets with a large number of samples.

- Fixed a crash when importing a .kmall file where one head of a dual head system was turned off.
- Fixed an issue when extracting a CUBE hypothesis strength layer when the values are 0.
- Fixed an issue creating TVU layers when the soundings are in the colormap underflow or overflow color.
- Fixed an offset issue when viewing water column from a Reson T-series dual head multibeam.
- Fixed an off by one beam numbering issue when filtering or blocking.

- Tools and Editors
  - Fixed the filter preview in the *cable/pipe TOP detection tool* when the filter profile was changed.
  - Fixed the *Systems to Filter* option when running a filter in the *cable/pipe TOP detection tool*.
  - Fixed an issue with the *slice editor toolbar* buttons being disabled when using the polygon selection.
  - The ctrl key will now invert the accept/reject selection in the *Swath Editor*.
  - Fixed an issue when saving snapshots in the *Slice Editor*.
  - Improved the speed of the *cable/pipe TOP detection tool*.
  - Fixed the sounding selection in the *water column* viewer when using a stacked buffer.
  - Fixed an issue with the *patch test tool* not removing temporary files when it was run from Qinsy.
  - Disabled the geopicking dock when using the *patch test tool*.
  - Fixed an issue where the first ping was not being displayed in the Water Column viewer.
  - Fixed an issue where sounding flags were not being preserved in the *slice editor* after moving the selection off and back onto the dynamic grid.
- Importing / Exporting
  - FAU export will now have include rejected soundings on by default, to ensure beam number alignment if re-importing cleaned .fau files.
  - Fixed a crash when exporting to CAD objects.
  - Fixed a column alignment issue when exporting a cable/pipe to ASCII with X-Point Listings created.
  - Fixed an issue importing SVPs with negative sound speeds.
  - Fixed an issue with the layer extents from a multi-layer static grid.
  - Fixed a crash when exporting to GSF from a raw sonar file with a corrupt packet.
  - Fixed an issue when converting feet to meters when importing binary navigation.

  - Fixed a crash when the metadata for a tide file is corrupt or missing.
  - Disabled the *Include raw backscatter imagery* checkbox when exporting to GSF if the raw bathymetry and snippets are not present.
  - Exporting to a Static Grid Layer and overwriting a layer will preserve the layer order.
  - Fixed an issue when exporting files to GSF with extended ASCII characters.
  - Added a better warning when the path length or filename is too long for Windows to handle.
- Other
  - Fixed an issue with the Dynamic Lighting (old Fledermaus 7 shading).

Known Issues

- When opening projects created in Qimera 2.3.5 and earlier, we recommend encapsulating the project to get around a bug when upgrading Dynamic Surfaces. Occasionally the upgrade process will fail due to a filepath issue, and a new Dynamic Grid will need to be created in the current Qimera version.
- When working with the Slice Editor or Cable/Pipe TOP Detection Tool, a file relating to the Dynamic Grid may become corrupt. This will affect all related actions on the Dynamic Grid, such as cleaning, and might cause a crash. If this occurs we recommend closing Qimera and renaming/removing the .grdtrail file (ie."*Grid name*.grdtrail") in your *Project Folder*/*GridData*/*Dynamic Grid* folder. UPDATE: This has been fixed in Qimera 2.6.3.

Qimera 2.6.1 Release

November 7, 2023

We are pleased to present Qimera 2.6.1.

Bugs

This is a hotfix release to address crashes during the update of a Dynamic Grid with excluded systems. This issue was introduced in Qimera 2.6.0.

Qimera 2.6.0 Release

October 4th, 2023

We're pleased to present Qimera version 2.6.0. In this release, we introduce a few new features, with a focus on speed improvements, and many other improvements that were requested. Read below for details.

Highlights

- New Filter Dock
- Filter Preview
- Filtering by system
- Grid name changes
- Qimera Live searching subfolders

Voting System

In this release, we have completed 3 feedback items, which satisfies 23 votes. For more information, see our Voting system Policy and Using the Voting System.

The Feedback Project helps us to continue improving our software products. At the moment, our Voting System is down as described at the top of the Voting system Policy page. Despite the system being inaccessible for voting for a short period, we still use it to prioritize developments while we await a solution from our provider, Atlassian.

- Qimera 2.6.0 - Important Notes
- Qimera 2.6.0 - New Functionality
- Qimera 2.6.0 - Improvements
- Qimera 2.6.0 - Resolved Bugs
- Qimera 2.6.0 - All Implemented Feedback
- Qimera 2.6.0 - Documentation
- Qimera 2.6.0 - Known Issues

Qimera 2.6.0 - Important Notes

Licensing

Existing Qimera users with a license that is under maintenance will be able to install and run Qimera 2.6 alongside Qimera 1, using the same license.

If you have a Qimera Offshore license only, you will not be able to run versions 2.3 and earlier of Qimera since the older versions are not aware of the new product license code for Qimera Offshore.

Installers

The Qimera installer will install by default into sub-directories with the version name under the typical install path, which is usually C:\Program Files\QPS\Qimera. This allows multiple installations quite easily and follows the trend that Qinsy has been using for some time. Users with Qimera 1.X or 2.X already installed will find that Qimera 2.6.0 will install into the Qimera 1 directory, but in the 2.6.0 sub-directory of the Qimera 1 installation folder.

QPS Project and file format versions

The Qimera project version has been incremented. Projects opened in Qimera 2.6.0 are not able to be opened in Qimera 2.5.x and previous versions.

The QPS database (.db) format version has been incremented, .db files recorded in Qinsy 9.6.0 will need to be opened in Qimera 2.6.x and newer versions.
The database version upgrade includes:

- Multibeam Record has been upgraded.
- A new system type for Forward Looking Sonars

The QPS .qpd file has been upgraded with the Qimera 2.6.0 and Qinsy 9.6.0 release. The latest release of Qimera 2.5.4 will be able to read Qimera 2.6.0 and Qinsy 9.6.0 .qpd files, but older versions of Qimera (2.5.3 and earlier) will not be able to read the newer .qpd version.

Dynamic Surface and Static Surface names and extensions have been changed to Dynamic Grid and Static Grid (.dyngrid and .statgrid). This change is only for the extensions and names, however new or upgraded grids cannot be opened in Qimera 2.5.x and older versions.

EPSG version 10

With the release of Qinsy 9.6.0 (including Squire), Qimera 2.6.0 and Fledermaus 8.6.0 we have upgraded to EPSG version 10.
These Geodetic Resources will be installed with Qinsy 9.6.0, Qimera 2.6.0 or Fledermaus 8.6.0. and will be installed in a new location:

C:\Program Files (x86)\Common Files\QPS**GeodeticResources**

The User Defined WKT configurations are located at:

C:\Users\Public\Documents\QPS\Shared**Geo**\wkt\config\user

Geodetic Resources 4.0

This is a new installer with 3 new geoid models added.
To prevent you from downloading an additional large installer, the EPSG v10.082 database and all WKT files are already part of the Qinsy 9.6, Qimera 2.6 and Fledermaus 8.6 (X.6) installers (and newer versions).

Install Geodetic Resources 4.0 only in case you don't have the geoid models installed or when you want to use the in this version added geoid models:

- Poland
  - KTH-PL-GEOID2015 (EVRF2007-PL height)
- Germany
  - GCG2011 (DHHN92 height)
  - GCG2016 (DHHN2016 height)

Geodetic resources 4.0 - Release notes

End of support for Qimera on Linux RHEL 6

Please note that Qimera has dropped support for Linux RHEL 6 in all versions. The minimum supported version is now RHEL 7.

Windows 11 is officially supported

Qimera 2.6.0 - New Functionality

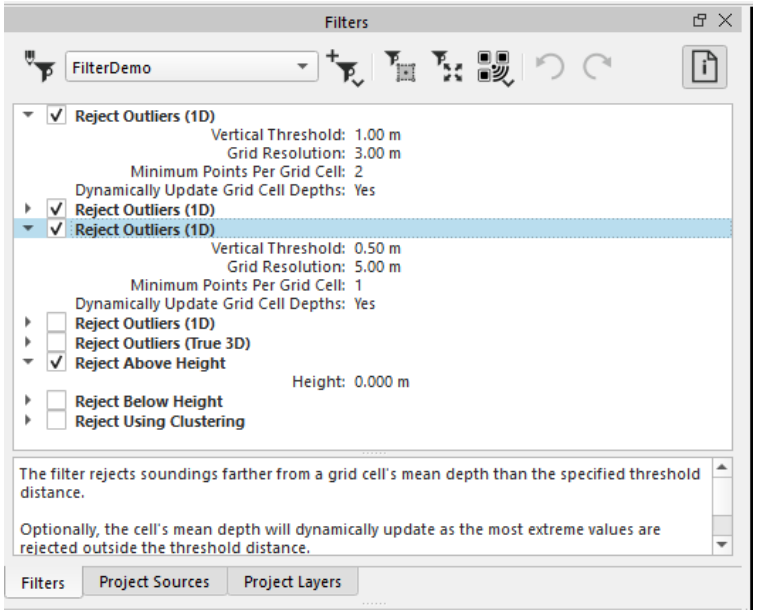
Introduction

In this release, we introduce a new filter dock, filter by system, changes to grids and more. Read on below for more detail!

Please contact sales@qps.nl if you'd like to arrange for an evaluation of Qimera.

Filter Dock

With this release we have improved the way you can author filters with a new Filter Dock.

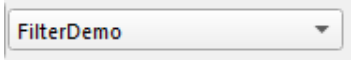


The new filter dock works in tandem with the Filter Operations toolbar and improves the way filter profiles are created, modified and tested.

Filter Dock Toolbar



The manage profile button will open the Manage Filter Profiles window where new filter profiles can be created, imported, exported, copied, renamed or removed.



The active filter selection box allows you to quickly select different filter profiles.



The new filter button allows you to quickly add new filters to your active filter profile. Hovering your mouse over a filter will display a tooltip that provides the filter information.



The filter operations apply the active filter inside a selection or everywhere and allows for choosing which systems in the dynamic grid the filter is applied to.

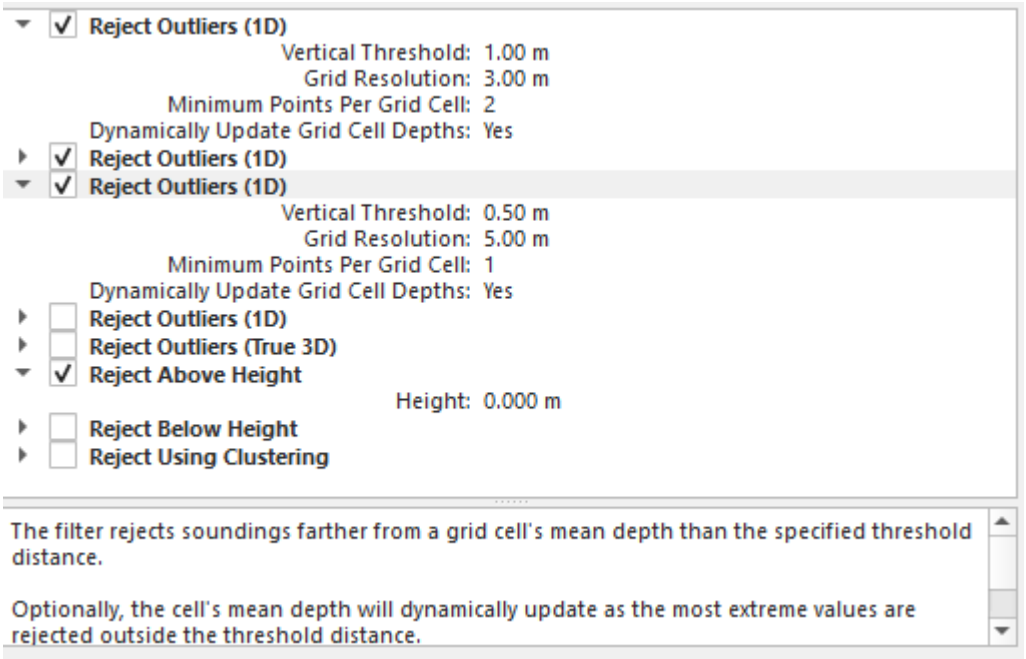


The undo and redo buttons keep track of every change made to your active filter profile. All changes, such as re-ordering the filter stack, turning on or off a filter and adjusting filter parameters, can be undone or redone with these buttons. This is not for undo or redo after running a filter.



Filter information button is used to quickly see details about each filter and also quickly find information on the selected filter's parameters. This height of the filter information window can be adjusted.

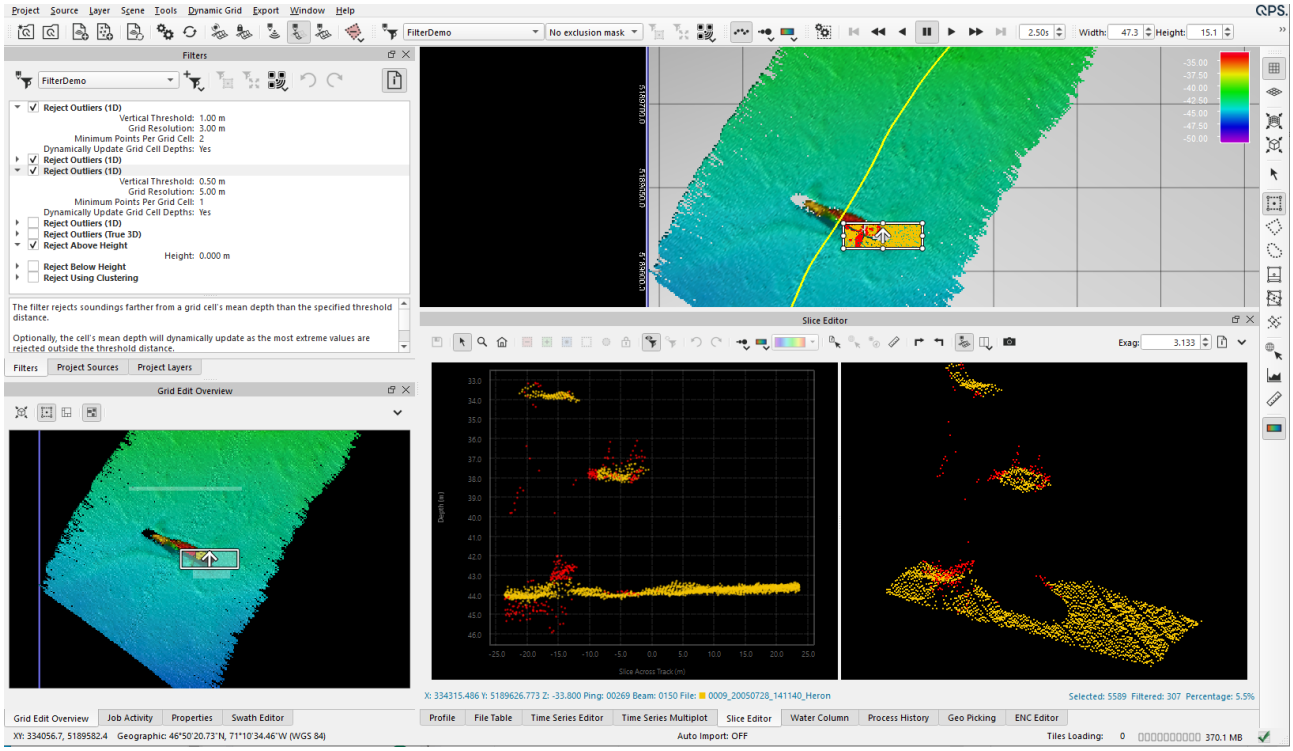
Filter Stack



The filter stack shows which filter operations will be applied in your current filter profile. Filter operation order can be adjusted by dragging filters up or down. The checkboxes will turn on or off filter operations. Filter operations can be expanded or collapsed as needed (use ctrl+left click to expand or collapse all filters). A context menu allows for deleting, duplicating, order adjustment, expanding or collapsing and showing filter information.

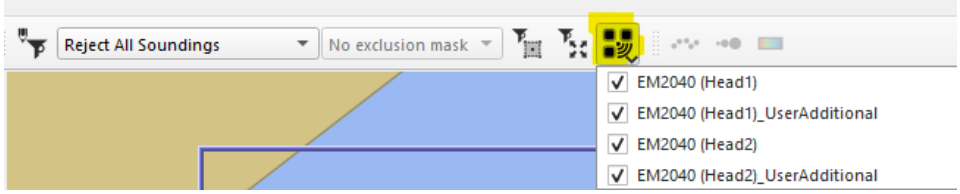
Filter Preview

A filter preview has been added to the slice editor to quickly view and fine tune your filter profiles. The filter preview mode works well with the new Filter Dock where changes to the filter operations can be reviewed easily before being applied. Turn on the preview mode to see what points will be filtered by your active filter profile. The colour of points that are filtered when previewing can be adjusted in the *Preferences* > *Plotting Colors* tab under *Plot filter preview*. A progress bar is shown on the bottom of the slice editor and some information about how many points are selected, filtered and the percentage filtered is displayed on the slice editor status bar.



Filter by System

Filtering by System has been added to the filter toolbar and the new Filter Dock. This allows for control over which systems in the selected dynamic grid are filtered. For example, in a dual head system a filter can be run on the port head to filter out beams 1-10 and a separate filter can be run on the starboard head to filter out beams 501-511. To enable or disable filtering per system, look for this icon:



Changes to Grids

In this release, Dynamic and Static Surfaces names and extensions have been changed to Dynamic and Static Grids (.dyngrid and .statgrid). This was required to align naming in Qinsy, Qimera and Fledermaus. All tools and editors in Qimera and Qimera command have been updated with these name changes. Dynamic and static surfaces created in previous versions will prompt you to upgrade (change the extension) in the Qimera 2.6.0 release, Qinsy 9.6.0 release and Fledermaus 8.6.0 release. Once the grids are upgraded to the new extension, they will not be able to be opened with Qimera 2.5.x and earlier versions.

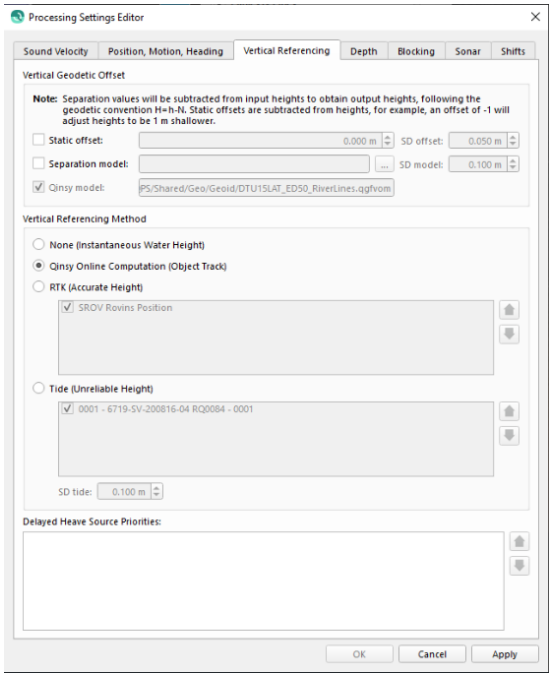
Qimera Live will now search sub-folders

Qimera live is now set up to search sub-folders of the main folder for sonar files. This work was done for Norbit users where a main folder is used for the project but each line file is recorded into separate sub-folders with a date and time.

Qimera 2.6.0 - Improvements

Qinsy Object Track

Qinsy Object Track has been broken out to a separate Vertical Referencing option. The Qinsy Object track will use the computed height from Qinsy (as defined in the Computation Settings) to vertically reference the data.. The Object Track used to fall under the RTK (Accurate Height) option. Note that using the Qinsy Object track means that there will no longer be a fall through to a secondary height source, however if this is desired, it can be done with Qinsy replay.



FAU Z-Shifts

Qimera will now read z-shifts stored in .fau files. In this workflow, sonar files are exported from Qimera to .fau, for processing (editing and z-shifting) in a different software package. When the edits from these .fau files are applied back to the sonar files, edits and delta z values will be applied either as a ping shift, if all footprints have a similar z-shift, or a footprint shift in the case of sound velocity correction. These shifts will maintain the footprint - transducer relationship for downstream backscatter processing in FMGT. You can clear these shifts by using *Tools>Manual Processing>Sound Velocity Correction*. You can re-apply edits and z-shifts from .fau files at anytime and they will overwrite previous edits and z-shifts.

X-Point Listings

An option to toggle the visibility of X-Point Listings has been added to the TOP detection control dock. When X-Point listings are present their visibility can be toggled on and off.



Gridding Speed Improvements

When creating new Dynamic Grids, the gridding speed has been improved by 40-50% when using faster hard drives, eg. solid state drives.

Qimera 2.6.0 - Resolved Bugs

Below you will find listings of bugs which have been reported in previous releases and which have been solved for the Qimera 2.6.0 release.

Issue Key	Summary	Affects Version
CQM-6387	Processed point - Add option to read z-shifts from FAU into the QPD	Qimera 2.5.4
CQM-6325	Export - Raw Sonar File - Some GSF files are not related SVPs when re-imported in Qimera	Qimera 2.5.3
CQM-6262	Tools and Docks - Properties - Intensity and Beam times series set to yes while not present	Qimera 2.5.3
CQM-6258	Scene - Selection Modes - Slice jumps back to beginning of area	Qimera 2.5.3
CQM-6245	Slice Editor - Rejected points still shown	Qimera 2.5.3
CQM-6243	SVP Editor - Unable to reaccept empty entry	Qimera 2.5.3
CQM-6228	Static Surface - Export - TFW not being writted	Qimera 2.4.9
CQM-6187	Source File Import - SVP - Issues with one of the sonar system turned off	Qimera 2.4.8
CQM-6180	Processing - SVP - Surface Sound Speed causes depth range anomaly	Qimera 2.5.1
CQM-6173	Tools and Docks - Patch Test Tool - Dual head data with Dark Theme is missing the Calibration Plot (Before)	Qimera 2.4.8

Issue Key	Summary	Affects Version
CQM-6159	Processing - Data Cleaning (WC) - Crashing	Qimera 2.5.1
CQM-6156	Tools and Docks - Slice Editor - 3D View Zooming Issues	Qimera 2.5.1
CQM-6088	Warning for Tide Strategy with multiple stations	Qimera 2.5.1
CQM-6035	offline server license activation	Qimera 2.5.1
CQM-5793	Source File Import - Raw Sonar - Reading incorrect mounting angles for 6205 Bathymetry	Qimera 2.5.1
CQM-5477	Source File Import - Automatic Import - Have Qimera live check subdirectory folders	Qimera 2.5.1
CQM-5259	Shading calculation	Qimera 2.4.5
CQM-5130	Issue with Dynamic Surface when doing Instant Surface Reject	Qimera 2.4.1
CQM-3425	Tools and Docks - Filtering - Reject Specific Beams for Dual Head MBES	Qimera 2.2.1
CQM-1046	GSF files exported from Qimera files have incorrect sound velocity strategy set when re-imported	Qimera 2.2.5

Qimera 2.6.0 - All Implemented Feedback

Key	Summary	Votes
FQM-467	Filtering - Augment filters to allow selection of system	12
FQM-407	Slice Editor - Preview of Filter Toolbar filters in Slice Editor	9
FQM-383	Slice Editor - Add Auto-zoom capability to 3D Slice	2

3 issues

Qimera 2.6.0 - Documentation

Documentation has been updated to capture the changes to existing dialogs and workflows and new features.

Documentation can be found here: Qimera Documentation

Qimera 2.6.0 - Known Issues

For this release, the following are known issues which we plan to address in upcoming releases.

Issue	Summary	Affects Version/s	Expected Fix Version
Limitation	Filter toolbars to "Accept All Soundings" and "Revert Manual Edits" do not have the intended effect when used in a Cooperative Cleaning project to override cleaning that was done manually in the Master project prior to creating the Cooperative Cleaning project. Suggested workflow is to use the manual re-accept tools in the Slice Editor and 3D Editor.	2.1.0	2.6.x
Bug	There is a bug in the GSF export tool when batch exporting many files, typically several hundred files. Sometimes Qimera will crash and other times the snippets are not exported. A workaround if you experience this is to export in smaller batches and re-export GSF files that are missing snippets.	2.3.0	2.6.x
Bug	When working with the Slice Editor or Cable/Pipe TOP Detection Tool, a file relating to the Dynamic Grid may become corrupt. This will affect all related actions on the Dynamic Grid, such as cleaning, and might cause a crash. If this occurs we recommend closing Qimera and renaming/removing the .grdtrail file (ie."*Grid name*.grdtrail") in your *Project Folder*/*GridData*/*Dynamic Grid* folder. We are looking into this and aim to fix this in Qimera 2.6.3.	2.6.0	2.6.x

Qimera 2.5.4 Release

July 18, 2023

We are pleased to present Qimera 2.5.4.

Highlights

- Improved the speed of point filters
- Added the line colour indicator to the slice editor status bar when colouring by file to easily identify the file being edited
- Added editing TPU for processed point files
- Importing tide will now trigger files to be ready for processing
- Improved the import HIPS processed point files dialog

Bugs

- Processing / Source Files
  - Extracted the raw surface sound speed from Kongsberg .kmall files
  - Qinsy .db subsurface files that used online tides will set the vertical referencing to RTK in the processing settings to correctly use the online QPD object track
  - Fixed a crash when an empty surface sound speed metadata file was present
  - Added a checkbox to indicate when a Qinsy model is being used for vertical referencing
  - Fixed an issue with dual head Kongsberg .kmall files where the head offsets were being applied to the wrong head
  - Fixed *duplicate dynamic surface* to ensure limit horizontal bounds are preserved
  - Improved height shifting to catch first or last pings not being properly shifted
- Tools and Editors
  - Fixed an issue with points not updating in the slice editor after filtering.
  - Fixed an issue with the line height matching tool where the plot was not updating after applying the shift
  - Fixed an issue where no time bubbles were displayed when saving a vessel configuration
  - Selecting associated files will now prompt you for which file type to select when a Dynamic Surface contains processed point files and raw sonar files
  - Fixed a position issue of the TOP detection when manually snapping the position of the TOP detection to a sounding

- Fixed an issue with the slice editor toolbar being greyed out when making a polygon selection and right clicking
- The result of the heave/swell removal tool can now be edited with the time series editing tools
- Fixed an issue with dual head R2Sonic water column offsets not applying on one head
- Fixed a draw order issue of the points in the slice editor when using edit only selected files
- Added a better warning message when launching the navigation editor and height is not available
- Edit flags from the 3D editor will now behave the same as the slice editor, specifically the manual edit flag
- Fixed the interpolate colors between selected rows in the color map editor
- Fixed point loading when auto load points is turned off, and the slice editor has been closed and re-opened
- Fixed the plot resizing in the wobble and patch test tool

- Importing / Exporting
  - LAS/LAZ files exported using version 1.4 will now have CRS information stored in the file
  - A warning message has been added when importing a QGF as a line file that KP information will be lost during the conversion to .sd. To preserve the KP, load the QGF directly as a Route
  - Fixed the Edit Status in TOP ASCII exporting when the actual diameter was less than the diameter used for detection
  - Fixed the bottom of cable/pipe ASCII field when the actual diameter was different than the detection diameter
  - Fixed exporting to GSF when a filename has extended ASCII characters
  - Fixed exporting Kongsberg .kmall files to GSF when extra detections are present
  - Fixed a crash with an improperly formatted GSF file
  - Fixed ascii navigation height import when the units are in US Feet
  - Clarified a warning message if importing newer QPD versions
  - Fixed an issue where the second frequency was not being exported to the GSF file from a S7K file
  - Fixed an issue so BAG files can be overwritten if creating a second BAG with the same name
  - Fixed an issue where QPD files were being auto removed from out of project locations if the preference was set to *auto remove source files containing no usable points* was selected

    - Added an error message when SVP import failed
- Other
    - Removed spaces from the end of Dynamic Surface names that caused issues with surface creation
    - Fixed some issues with the new triple click selection box drawing

Voting System

In this release, we have completed 1 feedback items, which satisfies 1 votes. For more information, see our Voting system Policy and Using the Voting System.

The Feedback Project helps us to continue improving our software products. At the moment, our Voting System is down as described at the top of the Voting system Policy page. Despite the system being inaccessible for voting for a short period, we still use it to prioritize developments while we await a solution from our provider, Atlassian.

Qimera 2.5.3 Release

March 31, 2023

We are pleased to present Qimera 2.5.3.

Bugs

- Processing / Source Files
  - Fixed a bug with Qinsy .db files where the extracted surface sound speed was not always set to the applied surface sound speed.
- Tools and Editors
  - Fixed an issue with the line height matching tool not launching after point editing in the slice editor. This was a regression in Qimera 2.5.2.
  - Fixed an issue in the slice editor where the eraser tool was not deleting points with a single click.
  - Added the hot keys ctrl+z and ctrl+y to undo and redo in the 3D slice editor.
  - Fixed an issue with soundings that should have been flagged as rejected in the patch test tool.
  - Fixed some random crashes that occurred in the slice editor when point cleaning.
  - Fixed an issue in the slice editor where a message would appear after undoing point cleaning or filtering that mentioned you have unsaved edits and you can't proceed with the active filter until the edits are saved

Known Issues

- Importing Tide does not trigger processing prompt. To fix this, select your source files and select *Tools > Manual Processing > Re-Nav XYZ*

Voting System

In this release, we have completed 0 feedback items, which satisfies 0 votes. For more information, see our Voting system Policy and Using the Voting System.

The Feedback Project helps us to continue improving our software products. At the moment, our Voting System is down as described at the top of the Voting system Policy page. Despite the system being inaccessible for voting for a short period, we still use it to prioritize developments while we await a solution from our provider, Atlassian.

Qimera 2.5.2 Release

March 23, 2023

We are pleased to present Qimera 2.5.2.

Highlights

- New Heave/Swell Removal tool. This tool will remove heave or swell type artifacts from your surface. This tool is part of the automatic height matching add-on, please contact sales@qps.nl for a demo.
- X-Point listings can now be viewed and manually moved in the TOP detection control dock.
- You can now define the lat/long format when exporting TOP detections to ASCII.
- The cable/pipe diameter has been added to the ascii export for TOP detection.
- Smoothing in the *TOP detection tool* will now allow a user specified range.
- You can now pick the default line color when importing line objects in the preferences. It will now automatically swap the line color if it is the same as the plot background color for white and black backgrounds/lines.
- You can now export to a Qinsy Sounding grid layer from Qimera.
- You can now apply edit flags to your source files from .fau files that were created by Qimera.
- Added an option to export/import your filter profiles.
- Added the ability to compute a delta when in the TOP profile analysis tool.
- Added a *recompute colormap range* entry under the dynamic surface menu to recompute the colormap range after editing soundings. This can be useful for spike hunting.
- Added an option to export multiple boundaries to ASCII XYZ for static surfaces and THU, TVU layers.

Bugs

- Processing / Source Files
  - Fixed an issue where TPU values were not updating after processing when position or height settings were changed in the processing settings editor.
  - Fixed GSF export for R2Sonic .r2sc files that were not exporting snippets due to a custom formatted .r2sc file.
  - Improved the robustness of the .kmall file import to handle issues with corrupt packets in the middle of the file.
  - Fixed dual head GSF export for kmall datagrams stored in QPS .db format.
  - Fixed an issue where Innovatum pipetrackers were missing positions.

- Fixed an issue where the .fau tide plugin was removing the existing tide twice.
- Fixed an issue with Seapath delayed heave having the wrong sign.
- Fixed a crash after importing a QTM file.

- Tools and Editors
  - Improved the speed of the slice editor plot to make it more responsive.
  - Fixed an issue where the slice editor toolbar would become disabled when editing.
  - Adjusted the X-Point listing computation to use the bisect of the previous and next segment heading.
  - Fixed a crash when saving vessel configuration to disk and no time bubbles were detected.
  - Fixed a disappearing slice box when using the new triple-click rectangular selection in the patch test tool and wobble analysis tool.
  - Fixed a bug in the slice editor when holding the ctrl key and making a selection to invert the accept/reject logic.
  - Fixed a crash in the 3D slice editor when editing points.
  - Fixed an issue with rotated rectangular selections not displaying all the points when slice editing.
  - Slide editor will now warn you when loading more than 3 million points rather than silently failing to load the points.
  - Fixed a crash in the height matching tool.
  - The surface edit overview is now saved to disk.
  - The surface edit overview colormap is now updated immediately after adjustment.
  - Fixed an issue with curved routes in the cable/pipe TOP detection tool where the slice box was not following the curve.
  - Fixed an issue when selecting *Show unselected files* in the slice editor.
  - Fixed a crash when closing the patch test tool before it was fully loaded.
- Importing / Exporting
  - Fixed an issue with the BAG export where the TVU layer included the full surface area rather than a clipped area. This resulted in TVU values in cells that did not have depth values.
  - Fixed a crash when exporting to GSF and the raw sonar file had special characters in the name.
  - Fixed a BAG export crash.
- Other
  - The threshold for the Reject Outliers 1D filter can now be set lower than 0.1.

- Fixed an issue where the 2D bounding box was hiding CAD labels.
- Added the ability to zoom vertically in the profile dock when holding the ctrl key and using the mouse wheel.

Known Issues

- Importing Tide does not trigger processing prompt. To fix this, select your source files and select *Tools > Manual Processing > Re-Nav XYZ*

Voting System

In this release, we have completed 2 feedback items, which satisfies 9 votes. For more information, see our Voting system Policy and Using the Voting System.

The Feedback Project helps us to continue improving our software products. At the moment, our Voting System is down as described at the top of the Voting system Policy page. Despite the system being inaccessible for voting for a short period, we still use it to prioritize developments while we await a solution from our provider, Atlassian.

Qimera 2.5.1 Release

November 4, 2022

We are pleased to present Qimera 2.5.1

Highlights

- BAG export will now export the TVU layer or Slope corrected uncertainty, with the option to select the uncertainty code
- Exporting a Dynamic Surface to ASCII will now remember the depth resolution
- Exporting raw sonar files to ASCII can now be limited to include just additional soundings
- Exporting soundings to ASCII will now allow you to select the number of decimal places for fields that contain decimals. The date/time format and lat/long format can also be set
- TU Delft Sound Speed Inversion will now work in projects with units set to Feet

Bugs

- Processing / Source Files
  - Fixed an issue with DB-QPD matching when the project was opened in Survey Manager before being opened in Qimera
  - Fixed an issue with Heading standard deviation not being extracted from binary navigation SMRMSG files
  - Fixed an issue with text orientation in CAD files and failure to import some CAD files
  - Fixed an issue with an incorrect warning message about some systems appearing to be turned off for raw sonar files
  - Squat table will now be loaded from Qinsy .db files
  - Fixed an issue where you could edit soundings while the TU Delft Sound Speed Inversion process was running
- Tools and Editors
  - Fixed an issue with the slice editor losing the selection after the ESC key has been pressed. The selection area was no longer being displayed
  - Fixed an issue with TU Delft Sound Speed Inversion tool that was giving strange results when using a full search
  - Fixed an issue when opening the 3D editor or slice editor without a selection
  - Fixed an issue with DB-QPD matching when launching Qimera Patch test from Survey Manager

    - Fixed an issue with the water column settings changing when the workspace was changed
    - Changed the ping buffer slider in the swath editor to be a spin box for more accurate adjustment of the number of pings in the swath buffer
- Importing / Exporting
    - Exporting shoalest soundings will now write out all the selected attributes
- Other
    - Fixed a Dynamic Surface rendering issue where parts of the surface were not rendered. Previously there was a need to hit F5 to redisplay the surface
    - Fixed a crash on Mac and Linux when closing or switching projects and a dynamic cable/pipe was visible in the project
    - Added a cancel button for Create Survey Area

Voting System

In this release, we have completed 8 feedback items, which satisfies 78 votes. For more information, see our Voting system Policy and Using the Voting System.

Voting system Policy

The Feedback Project helps us to continue improving our software products. At the moment, our Voting System is down as described at the top of the page. Despite the system being inaccessible for voting for a short period, we still use it to prioritize developments while we await a solution from our provider, Atlassian.

Qimera 2.5.0 Release

August 11th, 2022

We're pleased to present Qimera version 2.5.0. In this release, we introduce a few new features, with a focus on speed improvements, 3D solid display, surface statistics and many other improvements that were requested. Read below for details.

Highlights

- QPD speed improvements
- 3D solid mesh display
- Improved surface statistics
- Standard deviation corrected for slope
- Support for importing large processed point files (.las/.laz, ASCII, .b93)
- Improved rectangular selection drawing
- TU Delft sound speed inversion, added an option for a custom grid resolution

Voting System

In this release, we have completed 8 feedback items, which satisfies 78 votes. For more information, see our Voting system Policy and Using the Voting System.

Voting system Policy

- Qimera 2.5.0 - Important Notes
- Qimera 2.5.0 - New Functionality
- Qimera 2.5.0 - Improvements
- Qimera 2.5.0 - Resolved Bugs
- Qimera 2.5.0 - Known Issues
- Qimera 2.5.0 - All Implemented Feedback
- Qimera 2.5.0 - Documentation

The Feedback Project helps us to continue improving our software products. At the moment, our Voting System is down as described at the top of the page. Despite the system being inaccessible for voting for a short period, we still use it to prioritize developments while we await a solution from our provider, Atlassian.

Qimera 2.5.0 - Important Notes

On this page:

- Licensing
- Installers
- QPS Project and file format versions
- End of support for Qimera on Linux RHEL 6
- Windows 11 is officially supported

Licensing

Existing Qimera users with a license that is under maintenance will be able to install and run Qimera 2.5 alongside Qimera 1, using the same license.

If you have a Qimera Offshore license only, you will not be able to run versions 2.3 and earlier of Qimera since the older versions are not aware of the new product license code for Qimera Offshore.

Installers

The Qimera installer will install by default into sub-directories with the version name under the typical install path, which is usually C:\Program Files\QPS\Qimera. This allows multiple installations quite easily and follows the trend that Qinsy has been using for some time. Users with Qimera 1.X or 2.X already installed will find that Qimera 2.5.0 will install into the Qimera 1 directory, but in the 2.5.0 sub-directory of the Qimera 1 installation folder.

QPS Project and file format versions

The Qimera project version has NOT been incremented.

End of support for Qimera on Linux RHEL 6

Please note that Qimera has dropped support for Linux RHEL 6 in all versions. The minimum supported version is now RHEL 7.

Windows 11 is officially supported

Qimera 2.5.0 - New Functionality

On this page:

- Introduction
- QPD Speed Improvements
- 3D Triangular Mesh in 3D Slice Editor
- Support for more large processed point import formats (ASCII, LAS/LAZ, B93)
- Merging multiple ASCII files into a single polyline
- Improved Rectangular Selection Drawing
- Surface Statistics
- Slice Editor Improvements
- Standard Deviation Corrected for Slope
- TU Delft Sound Speed Inversion, added an option for a custom grid resolution
- New Source Identifier for ASCII import/export
- Cross Check Tool supports IHO S-44 6th Edition

Introduction

In this release, we introduce QPD speed improvements, 3D meshes in the 3D slice editor, improved surface statistics and more. Read on below for more detail!

Please contact sales@qps.nl if you'd like to arrange for an evaluation of Qimera.

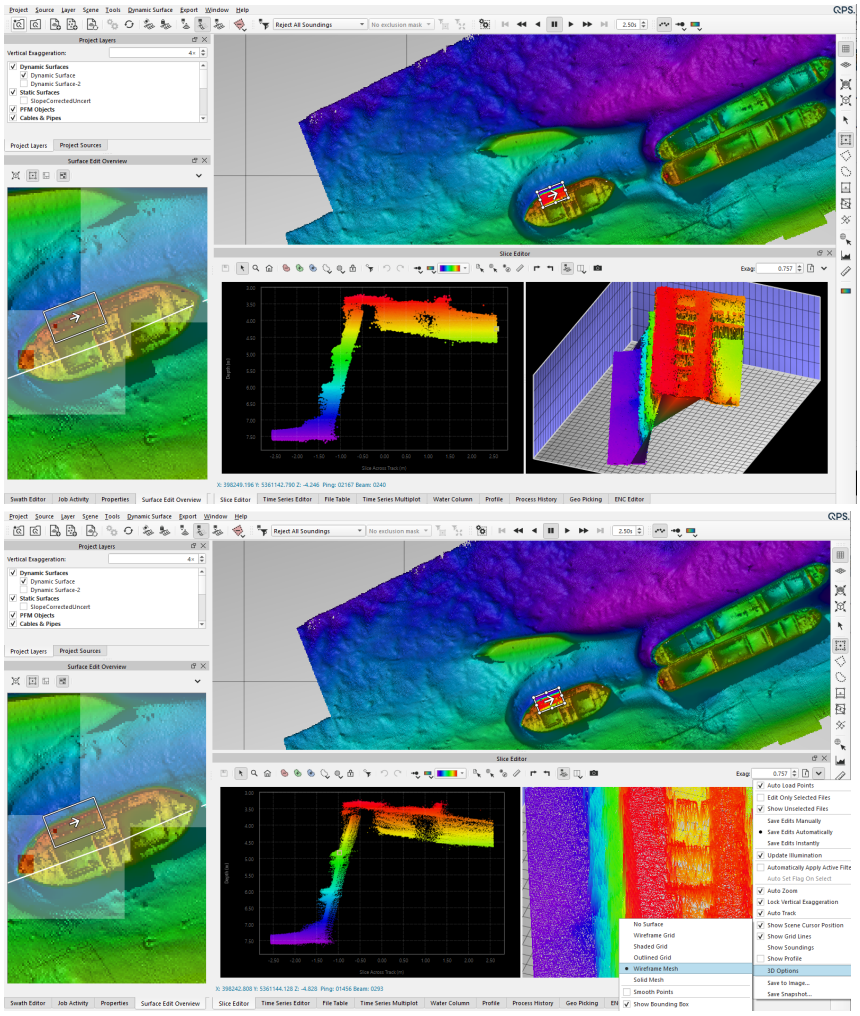
QPD Speed Improvements

With this release we have improved the spatial indexing of the QPD, which Qimera more efficiently determine if a point falls within a particular selection. This will benefit larger data sets, allowing for faster QPD point loading, improving responses in tools like slice editor, filtering, TOP detection, and more.

The QPD format has historically been a multibeam first storage format, but we are increasingly seeing more diverse datasets like LiDAR and SfM bathymetry being used. We have looked at some of the assumptions built into the format, and with a minor extension to the format, which is backwards compatible, some smart usage of open-source tools (boost::geometry::index::rtree) and better in memory caching, we achieved a performance improvement across the board. In one case, where the data didn't conform to the expectations of being organized like multibeam (ping and beam) we saw a 300× speed improvement in point loading. For plain old multibeam, we typically saw a 50% speed improvement.

3D Triangular Mesh in 3D Slice Editor

Two new options were added to the 3D slice editor *Wireframe Mesh* and *Solid Mesh* which will generate a wireframe, non-filled or filled triangles, based on the soundings in the slice selection. These new options are great at visualizing objects or to give more context when cleaning points. Accepting or rejecting points in the 3D view is supported. There is a limit of 1.5 million points for this mesh display, it is meant for on-the-fly or quick inspection. Beyond 1.5 million points in the selection, the 3D slice view will only display points.

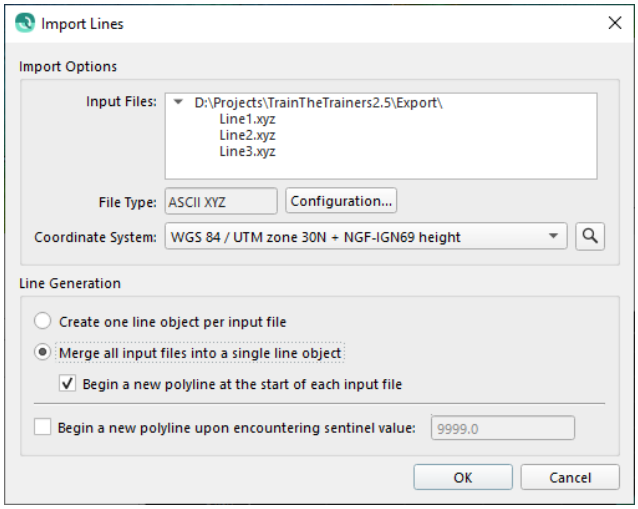


Support for more large processed point import formats (ASCII, LAS/LAZ, B93)

Adding larger processed point files is now possible with ASCII, LAS/LAZ, and B93. This can be found under the *Source > Import and Split Large Processed Point Files* menu option. Qimera will import these large files and split them into several .qpd files. As a note, unloading changes back to the original source file will not be possible with this import.

Merging multiple ASCII files into a single polyline

Importing Lines into Qimera now has new functionality. You can add multiple input files and create one line object per input file, or merge all input files into a single line object either continuous or beginning a new polyline at the start of each input file. An option was also added to begin a new polyline upon encountering a user specified sentinel value.

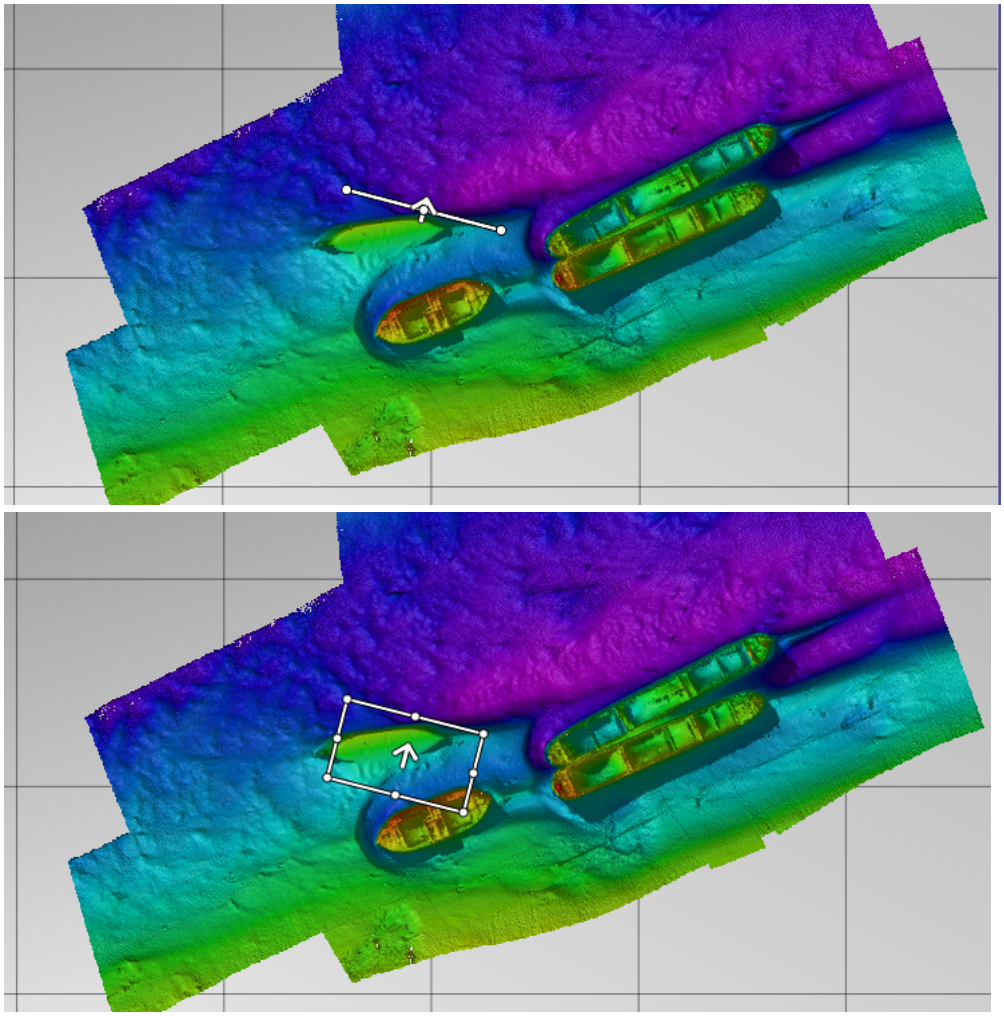


Improved Rectangular Selection Drawing

Drawing and orienting a rectangular selection has been improved in Qimera 2.5.0. The old behavior of drawing a box is still present, but it is now possible to use 3 left-clicks to draw the rectangle. The first left-click will set the first corner of the rectangle, the second left-click will set the orientation and the third left-click will set the dimension. This is possible in the 2D and 3D views.

Holding the *ctrl* key on any corner of a rectangular selection will now allow for the orientation to be adjusted.

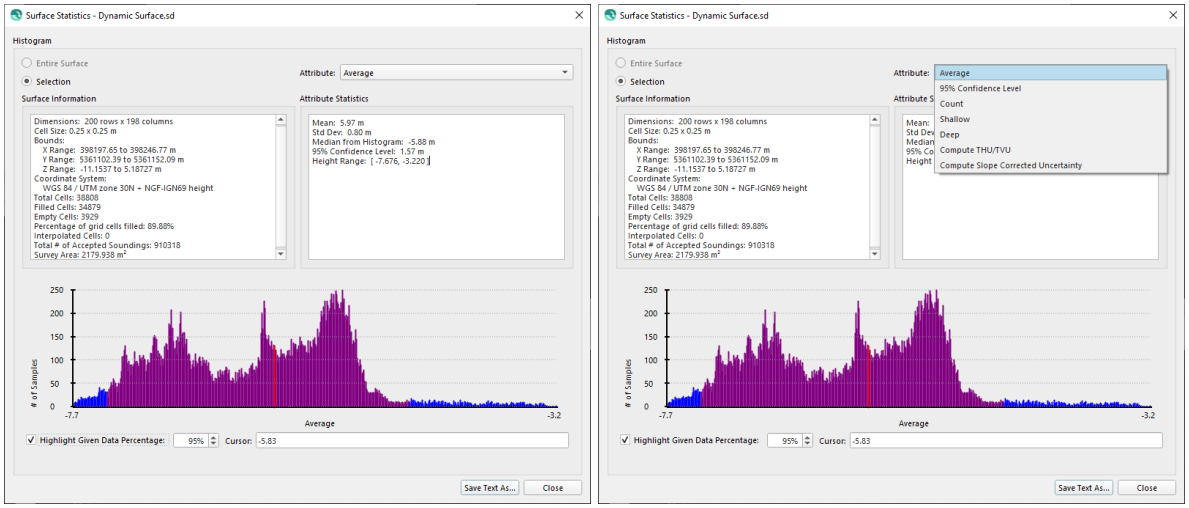
When in the 3D display, drawing a rectangle will now set the orientation as *up* on the screen, whereas previously, it was always north oriented. You can return to the old north oriented behavior by holding down the *ctrl* key while drawing the rectangle.



Surface Statistics

Improved surface statistics with a scalable histogram is now available for Dynamic Surfaces. You can use the entire surface or a selection and pick which attribute you want to view the statistics for. You can access these statistics by selecting a Dynamic Surface, under the Dynamic Surface > Surface Statistics... menu option.

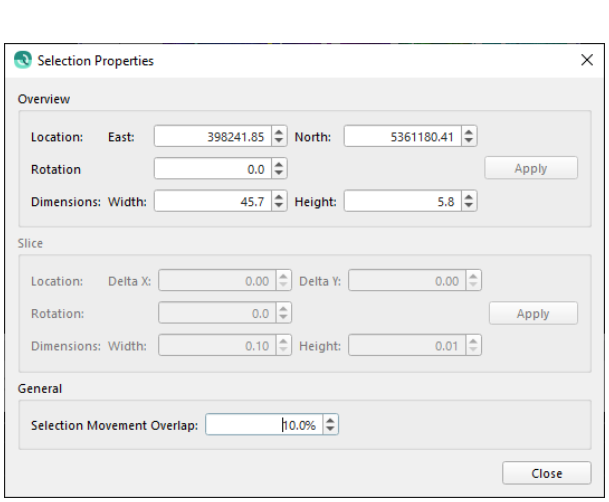
Attributes are: Average, Shallow, Deep, 95% Confidence Level, Count, THU and TVU layers, and Uncertainty corrected for slope.

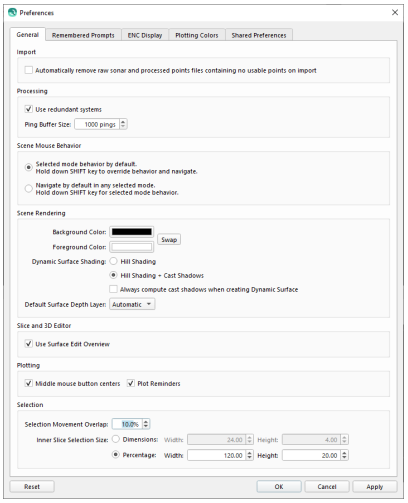


Slice Editor Improvements

Percentage of slice overlap

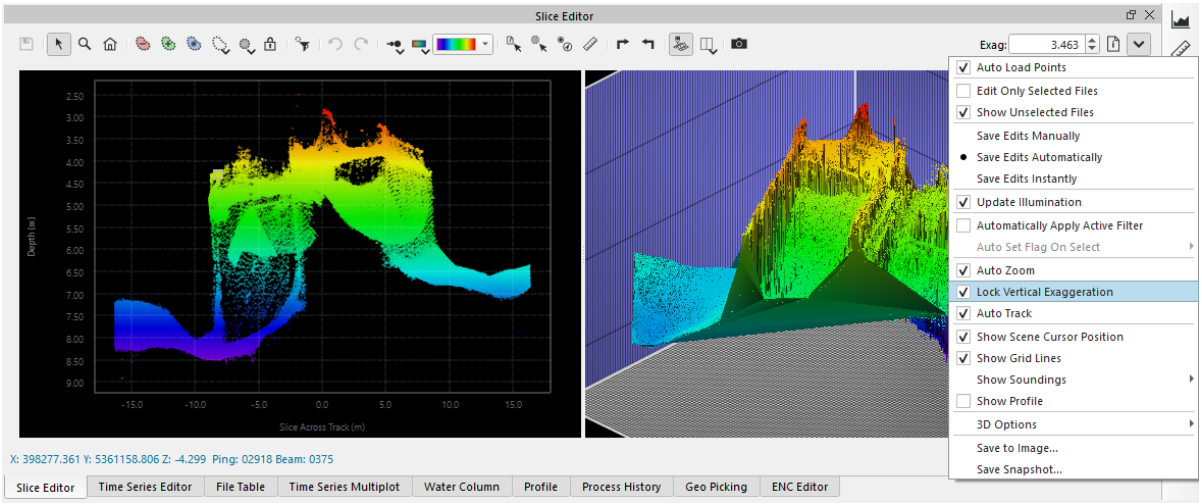
It is now possible to specify the percentage of slice selection overlap. There are a few scenarios where this will be benefit cleaning, when you are following a survey line and the heading varies, specifying a larger percentage of overlap will ensure that no soundings are missed. A second scenario would be when applying filters in the slice editor, setting the percentage of overlap to 0% will ensure soundings aren't filtered twice. Setting the Selection Movement Overlap can be done in the Selection Properties dialog, or the Project Preferences dialog.





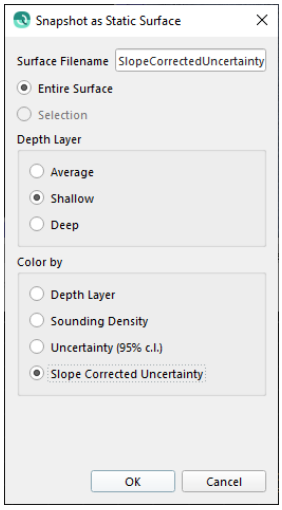
Lock Vertical Exaggeration

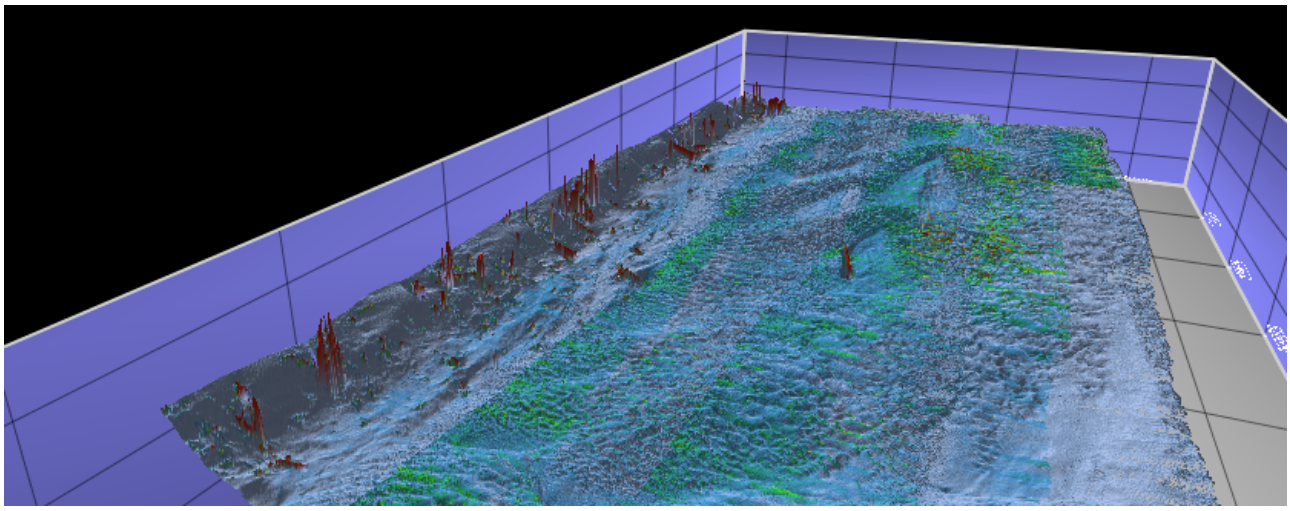
Vertical exaggeration can now be locked using the checkbox found in the context menu. This will ensure that the aspect ratio will stay the same when used in conjunction with the Auto Zoom checkbox and moving the selection.



Standard Deviation Corrected for Slope

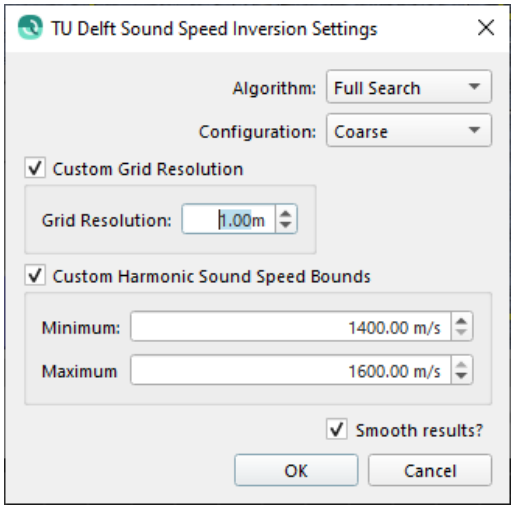
There is a new option when snapshotting a Dynamic Surface to a Static Surface, which is to generate an uncertainty static surface layer which is corrected for localized slope. This removes the slope effect from the uncertainty layer, thus improving the overall QC&QA of the surface and providing a better uncertainty value.





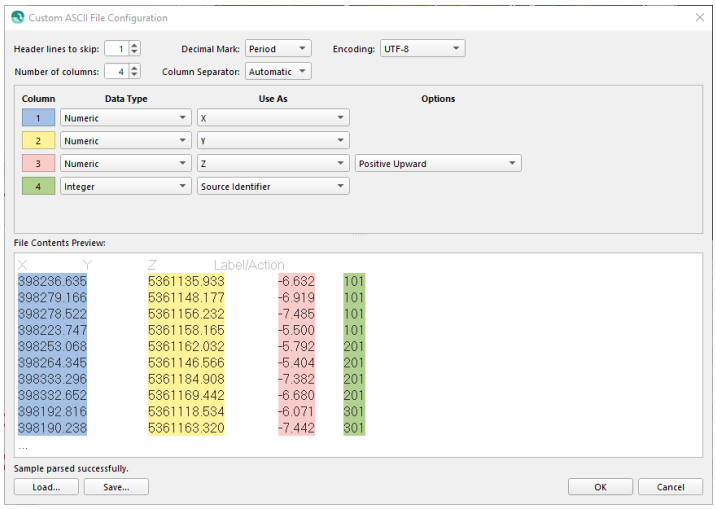
TU Delft Sound Speed Inversion, added an option for a custom grid resolution

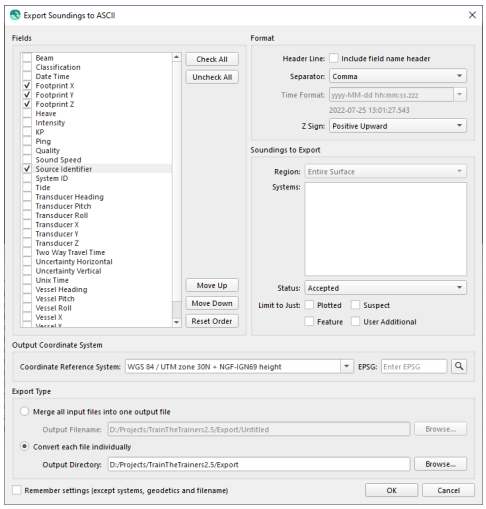
Users can now specify a custom grid resolution for the TU Delft Sound Speed Inversion Settings. When working in challenging sound velocity areas, setting a larger custom grid resolution can lead to improvements in the harmonic sound speed calculation by lowering the standard deviation values in the overlap areas.



New Source Identifier for ASCII import/export

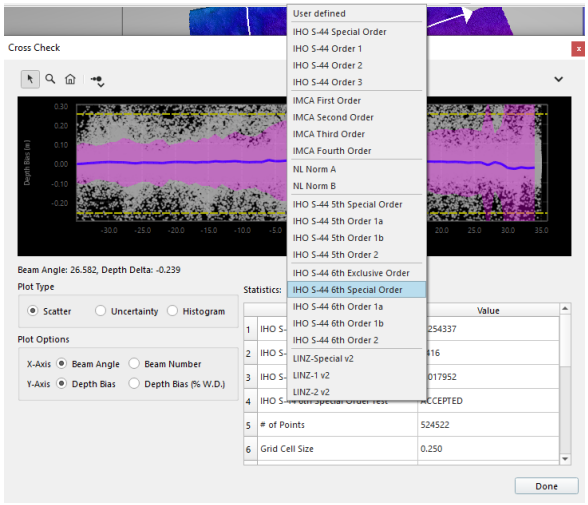
A source identifier field was added when importing ASCII processed points when the field data type is an integer. This source identifier field will be preserved in the QPD and will also be available during export soundings to ASCII. The source identifier can be used to specify projects/surveys associated with that processed point file.





Cross Check Tool supports IHO S-44 6th Edition

The Cross Check Tool now supports the latest IHO S-44 6th Edition standards. In addition, LINZ standards have also been added to the Cross Check Tool.


Cross Check
User defined
IHO S-44 Special Order
IHO S-44 Order 1
IHO S-44 Order 2
IHO S-44 Order 3
IMCA First Order
IMCA Second Order
IMCA Third Order
IMCA Fourth Order
NL Norm A
NL Norm B
IHO S-44 5th Special Order
IHO S-44 5th Order 1a
IHO S-44 5th Order 1b
IHO S-44 5th Order 2
IHO S-44 6th Exclusive Order
IHO S-44 6th Special Order
IHO S-44 6th Order 1a
IHO S-44 6th Order 1b
IHO S-44 6th Order 2
LINZ-Special v2
LINZ-1 v2
LINZ-2 v2
Beam Angle: 26.582, Depth Delta: -0.239
Plot Type
Scatter
Uncertainty
Histogram
Plot Options
X-Axis
Beam Angle
Beam Number
Y-Axis
Depth Bias
Depth Bias (% W.D.)
Statistics:
Value
# of Points
524522
Grid Cell Size
0.250
Done

Qimera 2.5.0 - Improvements

On this page:

- Add context menu to zoom to extents of surfaces and other scene objects.
- Swath Editor
- Slice Editor

Add context menu to zoom to extents of surfaces and other scene objects.

Right-click on a layer item now has the option to zoom to the extents of that object. There is also a hotkey for this, where if you select the object and hit the "z" key, it will zoom to the extents. This addresses the feedback case FQM-389.

Swath Editor

The swath editor was thoroughly gone over to fix any inconsistencies and to also see if there were areas for improvement. The swath editor was also updated to prepare for a future application wide improvements. Some general improvements:

- in the scene
  - Left click - updates the current ping and only updates the buffer if the click is outside the current buffer
  - Ctrl + Left click - updates the current ping and recenters the buffer on the ping
- in the Water Column side view
  - Left click - updates the current ping and **does not** update the buffer
  - Ctrl + Left click - updates the current ping and recenters the buffer on the ping
- in swath editor Above and Side plot while using the "explore" tool mode
  - Left click - no effect, because the current ping is updated by the cursor position already
  - Ctrl + Left click - recenters the buffer on the ping (note that the current ping will continue to update based on cursor position)
- depth synchronization between the Behind and Side (or Across and Along) plots, and added Ctrl + Scroll for vertical exaggeration in the Side plot.

Slice Editor

The slice editor was thoroughly gone over to fix any inconsistencies and to also see if there were areas for improvement. The slice editor was also updated to prepare for a future application wide improvements. As mentioned already there is a significant speed

improvement for loading points in the slice editor. Percentage of slice overlap and an option to lock the vertical exaggeration have also been added to this release.

Qimera 2.5.0 - Resolved Bugs

Below you will find listings of bugs which have been reported in previous releases and which have been solved for the Qimera 2.5.0 release.

Issue Key	Summary	Affects Version
CQM-5596	Overwrite a Dynamic Surface that has been removed from a project	2.4.9
CQM-5593	Source file import - Navigation - Delayed heave from POS MV	2.4.8, 2.4.9
CQM-5546	Slice Editor - 3D slice - Central 3D slice render issue	
CQM-5496	[Urgent] Duplicated and missing soundings from GSF exported in Qimera	2.4.5
CQM-5467	Slice editor movement	2.4.7
CQM-5457	Processing - Other - Why is my exclusion mask not working?	2.4.8
CQM-5446	Problem exported data from a dual head system in Qimera to a single GSF file for FMGT	2.4.8
CQM-5402	Slice Editor causes strange effect	2.4.7
CQM-5385	Tools & Docks - 3D Editor - 3D Editor Select Outlier Selects Almost All Soundings	2.4.5, 2.4.6, 2.4.7

Issue Key	Summary	Affects Version
CQM-5381	Harmonics not available in Processing Settings Editor	2.4.5
CQM-5337	Tools and Docks - Crosscheck - Does the IHO equation change per project survey unit	2.4.5
CQM-5270	Slice Editor - 2d/3d editing - 3D central display visualization bug	2.4.5
CQM-5262	Source File Import - Navigation - SBET data - cannot be imported correctly.	2.4.5
CQM-5260	Source - TrueHeave data acquired by Qinsy - impossible to read the binary data correctly	2.4.5
CQM-5090	Data share for testing - b93	2.3.1
CQM-4945	LAZ files too big to import	2.4.1
CQM-4823	Surface Statistics with scalable histogram where applicable	2.4.0
CQM-4819	Hit Count in Qimera is incorrect when appending files to Dynamic surface	2.4.0
CQM-4812	Slice Editor: Option to specify percentage of overlap for moving slice box	2.4.0
CQM-4756	Qimera - Sounding Density	2.3.2

Issue Key	Summary	Affects Version
CQM-4601	Using filter in slice editor	2.3.2
CQM-4576	Layers - Grids and SDs - sounding density information after appending lines	2.3.2
CQM-4544	Processing - TU Delft Sound Speed Inversion - on flat surface - enable user control over bin size	
CQM-3670	Swath Editor does not go to end of line leaving behind pings that can't be deleted	2.2.5
CQM-2707	Tools and Docks - Slice Editor - Maintain vertical exaggeration when auto zoom is disabled	2.0.0
CQM-1332	3D main View - Wireframe and Solid - Support wireframe between soundings and Show Solid	1.5.1

Qimera 2.5.0 - Known Issues

For this release, the following are known issues which we plan to address in upcoming releases.

Issue	Summary	Affects Version/s	Expected Fix Version
Limitation	Filter toolbars to "Accept All Soundings" and "Revert Manual Edits" do not have the intended effect when used in a Cooperative Cleaning project to override cleaning that was done manually in the Master project prior to creating the Cooperative Cleaning project. Suggested workflow is to use the manual re-accept tools in the Slice Editor and 3D Editor.	2.1.0	2.5.x
Bug	There is a bug in the GSF export tool when batch exporting many files, typically several hundred files. Sometimes Qimera will crash and other times the snippets are not exported. A workaround if you experience this is to export in smaller batches and re-export GSF files that are missing snippets.	2.3.0	2.5.x

Qimera 2.5.0 - All Implemented Feedback

Key	T	Summary	Votes
FQM-66	↑	Surfaces - Calculate Standard Deviation corrected for slope	29
FQM-13	↑	Surface Statistics with scalable histogram where applicable	23
FQM-4	↑	Slice Editor - Option to specify percentage of overlap for moving slice box	13
FQM-204	↑	Add visualization options for wireframe and mesh to points in the Scene when running Slice and 3D Editors	6
FQM-556	↑	Slice Editor - Lock for Vertical Exaggeration	2
FQM-465	↑	Profile - Allow profile start point selection off the grid in 2D mode	2
FQM-389	↑	Add context menu to zoom to extents of a surfaces and other scene objects	2
FQM-487	↑	Slice Editor - Add modifier key to switch easily between resizing and rotating the current selection	1

8 issues

Qimera 2.5.0 - Documentation

On this page:

Documentation has been updated to capture the changes to existing dialogs and workflows and new features.

Documentation can be found here: Qimera Documentation

Qimera 2.4.9 Release

2 June 2022

We are pleased to present Qimera 2.4.9.

Highlights

- Significant changes to how the cable/pipe tools reference position:
  - The Cable/Pipe TOP Detection tool now works in survey units **along the chosen line**, rather than KP.
  - The Cable/Pipe Analysis tool and its ASCII export now work in survey units **along the cable/pipe itself**, rather than KP.
  - These changes allow support for detecting along slack loops and other scenarios where the KP does not necessarily increase with the distance along the line/cable/pipe.
  - These changes also avoid several problems when using "non-metric" routes.
  - KP/DX information is still available in the tool status bar's when hovering over the plots.
- Add a new tool to manually snap a cable/pipe detection to a specific sounding. Unlike the older manual move tool, this will tie the TOP detection to that sounding, allowing for the cable/pipe to dynamically update if the sounding is later move during reprocessing.
- New detections and manual edits made in the cable/pipe TOP Detection Control dock are now applied instantly.
- It is now possible to save the cable/pipe to disk without closing the Cable/Pipe TOP Detection tool. Also, an option was added automatically save all changes to disk automatically.
- When canceling a long TOP detection process, one can choose to keep all detections made up until the point of cancellation.
- When doing an interpolated ASCII export of a cable/pipe, one can now specify the maximum detection gap over which the export will attempt to interpolate.
- Added the ability to import cable/pipes from different projects for analysis/editing/export. This allows users to work on the same dataset simultaneously but doing TOP detection in different KP ranges. These cables/pipes can then be merged for a final deliverable, with ability to specify priority in the areas where they overlap.
- Reference lines can now be imported from within the Cable/Pipe TOP Detection Tool and their locations will be drawn in the TOP detection control dock.
- Added the ability to smooth between lines in the Navigation Editor and Cable/Pipe Tracker Sensor Editor.

- Added the ability to show or hide rejected points in the Navigation Editor and Cable/Pipe Tracker Sensor Editor.
- Added the ability to select and manually shift a section of the height data in the Navigation Editor.
- Added support for up to 10 tide stations in a single tide strategy.
- Improved the performance of point loading for imported Large ASCII Processed Points Files. This is an improvement to the spatial index used in QPD files for point loading. To use the new spatial index with existing imports created previous to version 2.4.9, you can use *Tools > Manual Processing > Update Spatial Index*.

Bugs

- Processing / Source Files
  - Added support for the Ouster OS laser scanner.
  - Dry run timestamp for shift tools now have a date/time format rather than seconds from 1970.
  - Fixed the datagram viewer sonar type for EM3002 files.
  - Fixed a crash when processing KMALL files with only 2 positions.
  - Fixed a crash when viewing water column on S7K files with no 7004 packets.
  - The properties dock will now list if a file has water column when it is stored in a separate file (eg. .kmall and .kmwcd).
  - Fixed an issue where the depth layer would change back to Average after a resolution change.
  - Fixed an issue with the *Reject Outside of Angle Range* when using FAU files.
  - Fixed an issue with CUBE surface generation when creating a second CUBE surface.
  - When importing large ASCII point files, the guided workflow will now only prompt you once to generate a dynamic surface.
  - Fixed a geodetic issue when using a compound CRS that would display as a heading issue after reprocessing in Qimera.
  - Fixed a geodetic issue where height shifts were no longer applied properly after exporting a dynamic surface.
  - Fixed an issue where the custom BIN files are not selectable in the dropdown in geodetic configuration dialog.
- Tools and Editors
  - Zooming behavior has been improved when navigating in the cable/pipe TOP detection tool.

- Fixed an issue where the first few pings of a line were not being shifted when running the Vertical Shift Tool.
- Improved the line height matching tool when no reference line was selected. The offsets between the lines are minimized.
- Fixed an issue with smoothing in the cable/pipe tracker sensor editor where the first and last ping were not being smoothed.
- Fixed an issue with dual head sonars not shifting one head correctly.
- Fixed an issue when launching the cable/pipe TOP detection tool with a route that extends beyond the surface bounds.
- Fixed an issue when inserting a cable/pipe TOP detection within 5mm of another detection.
- Fixed an issue with the color not changing when adjusting the plotting colors in the cable/pipe TOP detection tool.
- Fixed an issue with the cable/pipe diameter display when the actual cable/pipe diameter was different than the detection diameter.
- Fixed an issue when using a reference line in the cable/pipe TOP detection tool that caused the detection group to be treated as interpolated.
- Fixed a crash in the time series multiplot when adding/removing observations.
- Fixed an issue with TU-Delft sound speed inversion on very short lines.
- Improved the TOP detection settings to make it clear what systems are being used for the TOP detection as well as the preferred solution.
- Fixed a plotting display issue in the plotting tools that would show lines drawn to random locations. This was a display issue only and did not affect the actual data.

- Importing / Exporting
  - Importing a line that is not on a surface will now have better vertical bounds.
- Licensing
  - New options have been added to copy the Tag ID or copy the Dongle ID/Activation String/Server Address.

Qimera 2.4.8 Release

18 April2022

We are pleased to present Qimera 2.4.8.

Bugs

- Fixed a bug introduced in Qimera 2.4.6 that caused the first 64 pings of a file to sometimes not be loaded into point editors.

  The issue is caused by a malformed QPD spatial index. Affected files can be fixed by upgrading to Qimera 2.4.8, selecting the files, and choosing *Tools → Manual Processing → Update Spatial Index*.

Qimera 2.4.7 Release

21 March 2022

We are pleased to present Qimera 2.4.7.

Highlights

- Fixed a crash when performing a patch test on systems with two or more heads.

Qimera 2.4.6 Release

14 March 2022

We are pleased to present Qimera 2.4.6.

Highlights

- Multi-Frequency filtering support for Kongsberg kmall files
- More smoothing options in the navigation editor, cable/pipe tracker sensor editor and TOP detection tool
  - Smooth the original solution or smooth current solution
  - Remove all smoothing
  - Preview the smoothing settings before applying
- All detections, including unused detections, will now be saved with the dynamic cable/pipe
- Allow any dynamic cable/pipe to be loaded back into the TOP detection tool even if it isn't parallel to the route, by selecting the dynamic cable/pipe as the line to follow
- Improved the speed of the TOP detection tool when working with large ascii files
- Added the ability to load a reference line from a file directly in the TOP detection tool
- Manual Edit button in the TOP detection tool will now stay activated when stepping along a dynamic cable/pipe

Bugs

- Processing / Source Files
  - Fixed an issue extracting Hypack HSX files with the wrong start of file time
  - Allow contours to be generated when the contour interval falls outside the range of the surface, these contour intervals are skipped
  - Allow contour files in the Qimera project to be overwritten if saving new contours with the same name
  - FAU files that have all soundings rejected can now be brought into Qimera
  - Fixed an issue with NOAA CO-OPS tide import that was rounding negative tide values
- Tools and Editors
  - Smoothing Depth, Across or Both is now found in the smoothing options dialog
  - Changed the title bar for the Wobble Tool warning message, it was previously listed incorrectly as the patch test tool

  - Fixed an issue with the mouse pointer staying as the loading icon when the wobble tool was launched
  - Fixed an issue with the Cross Check plot not updating when the custom parameters were changed
  - Fixed a revert to original issue in the cable/pipe tracker sensor editor that did not update the surface after reverting
  - Fixed the issue causing a warning message to be displayed when editing the dynamic cable/pipe when it contained reference line detections
  - Fixed an issue that caused the first TOP detection to be at 0 depth and 0 dx
  - Improved canceling the TOP detection when processing the entire line. Qimera would previously take much longer to cancel and would appear to hang
  - Fixed a Qimera slowdown when saving a water column snapshot
- Importing / Exporting
  - Fixed an issue with Kongsberg kmall export to GSF when the project was created in older Qimera versions
  - Fixed an issue with Kongsberg kmall files not automatically detecting different vessel
  - Added an extra warning for unsupported processed point files during import
  - Fixed a 0,0,0 x,y,z position when exporting to ascii from the cable/pipe analysis tool using a custom step interval
  - Fixed an issue with OSGB geodetic transform causing QPD files not to match to .DB files
  - Dynamic Surfaces can now be exported with better support for character encoding
  - Added a warning if a project was opened and the QGFVOM was not found
- Other
  - Min and max range in the colormap will now return the correct color, not the underflow / overflow color
  - Fixed a crash when changing a Dynamic Surface from displaying height to uncertainty 95%cl
  - Fixed an issue with CUBE histograms that had a 0.0 data range

Qimera 2.4.4 Release

November 30, 2021

We're pleased to present Qimera version 2.4.4, the next bugfix release in the 2.4 series. Read below for details.

Bugs

- Fixed a failure when creating or updating a Dynamic Surface with more than 2 billion points.

Qimera 2.4.3 Release

November 4, 2021

We're pleased to present Qimera version 2.4.3, the next bugfix release in the 2.4 series. Read below for details.

Highlights

- Qimera Command now supports DB processing.
- Improved stability of large Dynamic Surfaces.
- Improved CUBE surface creation performance and reporting.
- Kongsberg KMALL revision I is now supported.

Bugs

- Processing / Source Files
  - Dry Run will now show the status of the harmonic sound speed processing.
  - A warning will now be shown when mixing Processing Setting shifts with shifts set via Filters.
  - Changed the default TPU blocking settings for the second head in dual head setups.
  - Improved Qimera Live import of QPDs.
  - Prevent new systems being created during raw sonar file import.
  - SVP Crossfade now works better with SVPs of differing depths.
  - Multisector KMALL data with head(s) rotated 180 degrees will now be processed correctly.
  - Updated the Coordinate Reference System configuration tool that is used when creating a tide station.
  - Improved initial Dynamic Surface creation for Qimera Live.
- Tools and Editors
  - The Patch Test Tool will now show height shifts.
  - Improvement to the Spline and Cluster filters when run together.
  - Slice Editor point sizes have been adjusted slightly.
  - The Dynamic Surface - Surface Area calculation has been improved.
  - Fixed a crash when performing TU Delft Sound Speed Inversion.
  - CUBE settings are now remembered.

- Improved display of Extents in the Datagram Viewer.
- Improved how the Time Series editor plots the line during zooming.
- Added a buffer around Time Series plots.
- The Water Column tool will now do a better job of determining the maximum range for a file and the value can be manually increased.
- Fixed Time Series Multiplot x-axis shift issue.
- Improved warnings when creating contours.
- Improved performance of Patch Test Tool, Swath Editor, and Scroll Line Select Slide Editor when working on a long route / line.
- Added Average Sounding Density and Total Number of Sounding attributes to the Surface Statistics dialog.
- Fixed an issue that occurred when right clicking on Raw Sonar Files to start the Vessel Editor.
- Added information regarding Smoothing in the Varying Vertical Shift dialog.
- Fixed a crash that occurred when adjusting colormap range for SD objects.
- Prevent a Pipe / Cable object from being saved if there's a known problem.

- Importing / Exporting
  - Multiple ASVP files can now be imported at once.
  - QTMs will now properly set a new project's coordinate reference system when imported.
  - DXF export now supports text.
- Other
  - Certain geodetic setups were showing an unexpected WGS 84 datum in the Geodetic Test Tool, this has been fixed.
  - Cached coordinate reference systems could cause a problem with object compatibility within a project. This is now fixed.
  - Scene object rendering has been improved on Linux platforms.
  - Modified the OpenGL warning so it is only shown when many OpenGL errors occur.

Qimera 2.4.2 Release

September 8, 2021

We are pleased to present Qimera 2.4.2, the next bugfix release in the 2.4 series. This is the first release in the 2.4 series to add support for macOS and Linux operating systems.

Highlights

- Added support for HIPS I/O SDK version 11 licensing. We now support HIPS licenses for versions 9, 10 and 11
- The *Add Large ASCII Processed Points* import now supports geographic coordinate reference systems
- BAG export now supports time dependent transformations in the WKT by simplifying to a compatible instantaneous 7 parameter transform using the BAG metadata *Creation Date*
- Cable/Pipe TOP detection tool will now support Processed Point files

Bug Fixes

- Processing / Source Files
  - Removing processed point files will now delete the corresponding QPD in the project DtmData folder
- Tools and Editors
  - Fixed an issue when displaying/saving patch test results for laser files
  - Fixed the *Color by depth* color range in the 3D Editor
  - 3D Editor will now show the *Don't ask again* checkbox when prompted to save edits
  - Added a warning message when Running Sounding Filter on files with an editor open
  - Improved clarity when working with revisions in the SVP Editor
  - Fixed a display issue in the Cable/Pipe Analysis tool that showed a fully buried cable/pipe as exposed
- Importing / Exporting
  - KML will now export the correct colormap
  - Fixed issues related to rendering arcs when importing CAD files
  - Made CARIS tide files importer more robust in the face of non-standard date-time formatting
  - Fixed the date detection when importing HMS tide files
- Surfaces

  - Fixed storage of CUBE settings in projects with non-meter coordinate systems
  - Fixed Colormap Editor issues related to colormaps with an insufficient number of rows
  - Fixed a selection issue after the surface resolution was changed if there was more than one surface in the project
- Other
  - Improved source file selection/navigation speed with large projects
  - Fixed the Datagram Viewer's display of Time, Extents and Datagrams for specific file types
  - Corrected the Column header "Difference E/N" in the Static Horizontal Shift Tool
  - Fixed a crash when opening a Qinsy project for Point Editing with CAD files present in the project

Voting System

For more information, see our Voting System Policy and Using the Voting System.

The Voting System helps us to continue improving our software products. Vote or provide feedback and participate in the process by tracking, watching and commenting on issues!

The Feedback Project helps us to continue improving our software products. Vote or implement feedback and participate in the process by tracking, watching and commenting on issues!

Vote



Click on the icon above and vote on or create a Suggestion issue!

Qimera 2.4.1 Release

July 12th, 2021

We are pleased to present Qimera 2.4.1, a maintenance release addressing a crash when editing processed point files, as well as other bug fixes.

Improvements and Bug Fixes

- Fixed a crash in the slice editor when working with QPDs loaded as processed point files.
- Made several improvements to how raw sonar files are marked for reprocessing after times series edits.
  - Editing an external time series like an SBET or tide file will mark *all* affected raw sonar files for reprocessing.
  - Editing the beginning or end of a single file series may mark adjacent files for reprocessing if they have the *Include time series data from adjacent lines* setting enabled.
- Fixed an issue with CRS suggestion when adding processed point files. Projected point files could default to WGS 84, resulting in a project projection of UTM 60N.
- Switched to a nicer CRS selection dropdown in the *Add Raw Sonar Files* and *Add Processed Point Files* dialogs.
- Fixed a context menu issue in the Process History dock where it would automatically select the first item in the context menu. This fixes the workaround of holding the right mouse button down while making a selection.
- Fixed an issue in the SVP editor where edits were being saved even when choosing not to save.
- Fixed an issue with transparency for CAD files.
- Fixed an issue with the *Geo Pick* and *Create ENC Point Object* water column tools on data with multiple systems.
- Fixed a bounding box issue when creating a new ENC chart
- Fixed an issue with the time series editor not automatically scaling/zooming correctly on the loaded data.
- Fixed an issue where specific project geodetics could cause the VALSOU update of chart objects to be noticeably incorrect.

Voting System

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Vote



Click on the icon above and vote on or create a Suggestion issue!

Qimera 2.4.0 Release

June 16th, 2021

We're pleased to present Qimera version 2.4.0. In this release, we introduce a few new features, with a focus on Qimera Offshore tools along with many improvements that were requested. Read below for details.

Highlights

- Cable/Pipe TOP Detection tool for detecting the top of product, generating X-Point listings, cable/pipe analysis and exports
- Cable/Pipe tracker sensor editor for viewing and editing the raw sensor information
- Navigation editor for viewing and editing navigation data

Voting System

In this release, we have completed 3 feedback items, which satisfies 61 votes. For more information, see our Voting system Policy and Using the Voting System.

Voting system Policy

- Qimera 2.4.0 - Important Notes
- Qimera 2.4.0 - New Functionality
- Qimera 2.4.0 - Improvements
- Qimera 2.4.0 - Resolved Bugs
- Qimera 2.4.0 - Known Issues
- Qimera 2.4.0 - All Implemented Feedback
- Qimera 2.4.0 - Documentation

The Feedback Project helps us to continue improving our software products. At the moment, our Voting System is down as described at the top of the page. Despite the system being inaccessible for voting for a short period, we still use it to prioritize developments while we await a solution from our provider, Atlassian.

Qimera 2.4.0 - Important Notes

On this page:

- Licensing
- Installers
- QPS Project and file format versions
- End of support for Qimera on Linux RHEL 6

Licensing

Existing Qimera users with a license that is under maintenance will be able to install and run Qimera 2.4 alongside Qimera 1, using the same license. The navigation editor is licensed for use with a Qimera or Qimera Offshore license.

A new Qimera Offshore License has been added that is the same tier as Qinsy Offshore. This new license tier supports all the functionality of the Qimera license in addition to the new cable/pipe TOP detection tool and the cable/pipe tracker sensor editor. Qimera Offshore also gives access to all of the horizontal and vertical shifting tools that are normally available with the Automatic Height Matching add-on in Qimera. In other words, this add-on is included with Qimera Offshore. The TU Delft add-on is also included with Qimera Offshore, to make a full package for complex offshore workflows.

If you have a Qimera Offshore license only, you will not be able to run older versions of Qimera since the older versions are not aware of the new product license code for Qimera Offshore.

Installers

The Qimera installer will install by default into sub-directories with the version name under the typical install path, which is usually C:\Program Files\QPS\Qimera. This allows multiple installations quite easily and follows the trend that Qinsy has been using for some time. Users with Qimera 1.X or 2.X already installed will find that Qimera 2.4.0 will install into the Qimera 1 directory, but in the 2.4.0 sub-directory of the Qimera 1 installation folder.

QPS Project and file format versions

The Qimera project version has been incremented. This means that projects created or upgraded to Qimera 2.4.0 will no longer be able to be opened in previous versions of Qimera. Older projects opened in Qimera 2.4.0 will be upgraded. It is suggested to create a backup of your project prior to upgrading in case problems are encountered.

With the Qinsy 9.4.0 release, the Qinsy .db file database version has been incremented to support new record types in the Qinsy 9.4 release. Qimera will support the previous database versions as well as the new version. Older versions of Qimera will not be able to read the newer Qinsy .db files.

End of support for Qimera on Linux RHEL 6

Please note that Qimera has dropped support for Linux RHEL 6 in all versions. The minimum supported version is now RHEL 7.

Qimera 2.4.0 - New Functionality

On this page:

- Introduction
- New Offshore Cable/Pipe Tools
- Navigation Editor

Introduction

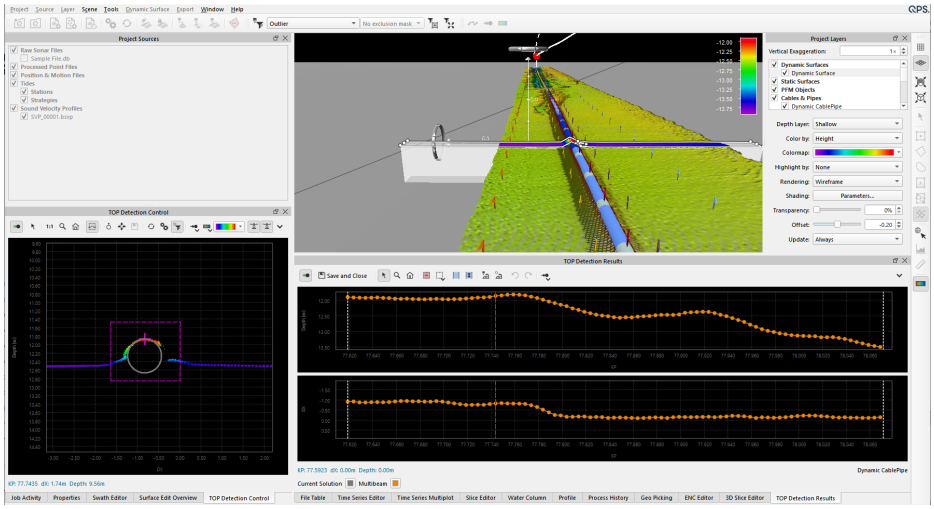
In this release, we introduce Qimera Offshore focused tools, the cable/pipe TOP detection tool and the cable/pipe tracker sensor editor. These are meant for use offshore to detect cable/pipeline routes and editing cable/pipe tracker sensor raw data.
Contact sales@qps.nl if you'd like to arrange for an evaluation of the Qimera Offshore license.

We've also added a navigation editor to easily review and edit the XY and height time series. Read on below for more detail!

New Offshore Cable/Pipe Tools

Cable/Pipe TOP Detection Tool

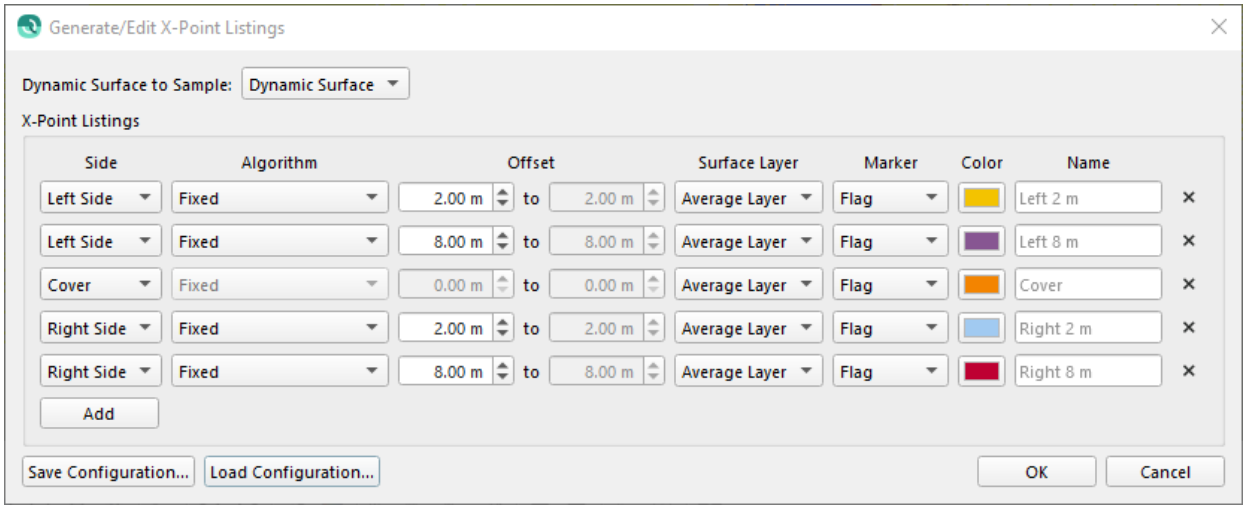
Building off Qinsy's Validator tool and Fledermaus's 4D pipeline tools we have built Qimera's cable/pipe TOP detection tool to detect the position of a cable or pipe from the QPDs in a dynamic surface. The main advantage of this tool is that it can use multibeam footprints and/or cable or pipe tracker sensors detections when computing the position of the cable or pipe. There is also the ability to import and use ASCII XYZ or quickly draw a line in the scene for use as a reference. When combined with seamless switching between the different systems or references to compute your solution, this new workflow provides a unique way to detect the top of product. Once a set of detections has been made they can be inspected, edited, smoothed, or discarded. Detection can be rerun with different parameters over all or part of the range. Once you are satisfied with with the quality of the detections, the detections are saved to produce a dynamic cable/pipe object. Dynamic cables/pipes are rendered as tubes in the 3D Scene and appear in the Cables & Pipes section of the project layers. These files store not only the 3D location of the pipe sections, but also data about the footprints from which they were detected, allowing the pipe to automatically update its position should those footprints later be moved due to reprocessing. Once a cable or pipe object is created there is a new operation that allows you to filter points below the detected pipe. This is accessed from the context menu of the cable/pipe object.



Cable/Pipe TOP Detection tool interface

Generate and Edit X-Point Listings

After the cable or pipe has been detected and saved to your project, Qimera has added the ability to generate a variable number of X-Point Listings as well as saving and loading different configurations. X-Point listings are sometimes referred to as cross sections in Qinsy. In this dialog you can generate 3/5/7/9 or whatever configuration you want and specify the different parameters necessary. Once the X-Point listings are generated they will show up in the 3D Scene with the marker type and color specified. The X-Point listings are later used for cable or pipe analysis and during export to ASCII.

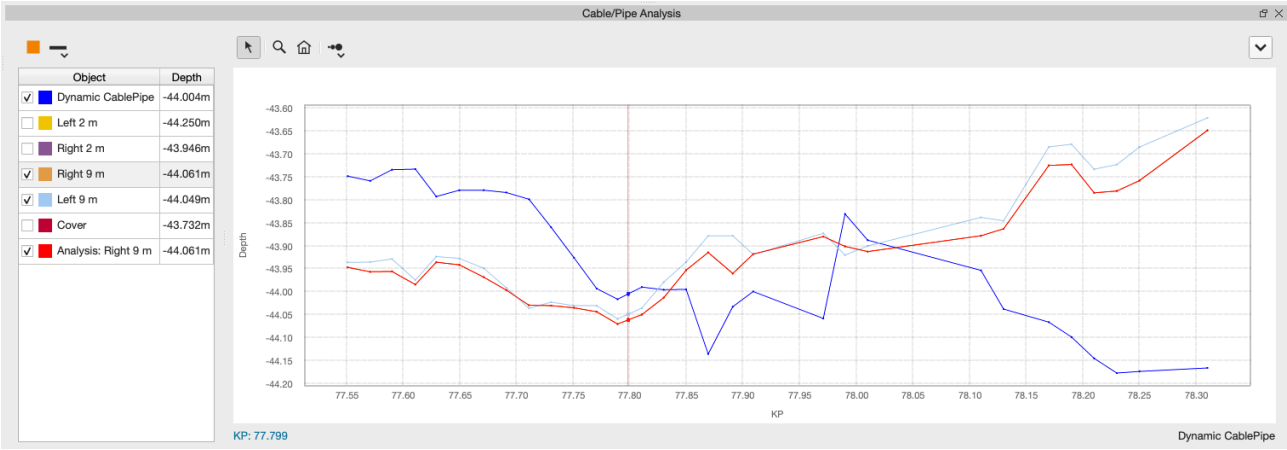


Generate/Edit X-Point Listings

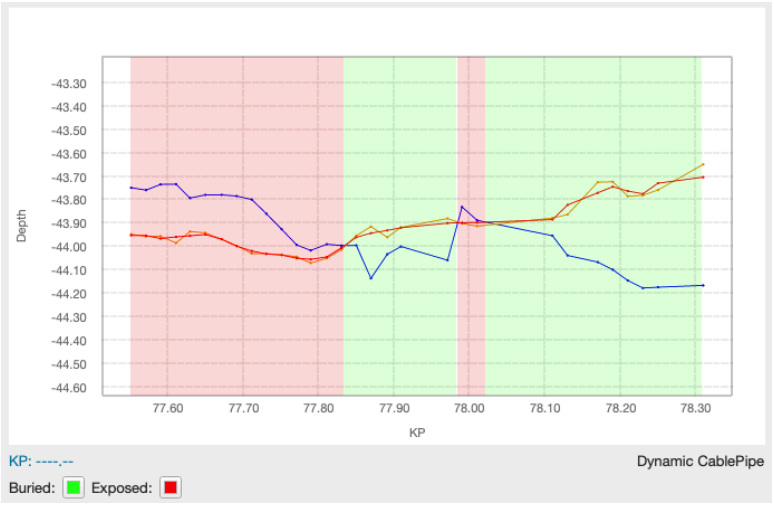
Cable/Pipe Analysis Tool

The Cable/Pipe Analysis Tool is accessed from the context menu of your Dynamic Cable/Pipe object. This tool allows for review the top of product and x-point listings to determine if the cable/pipe is buried or exposed. If you want to quickly scan your TOP detections for review, use the mouse cursor in the plot and the red ball will display that location in the 3D Scene. A quick ctrl + left click will center the scene on the specified KP. In this tool there are two options for computing the depth of burial, a single reference line or an average of two reference lines. These can be x-point listings or an imported reference line. The depth of burial computation also allows for smoothing the results with a boxcar moving average.

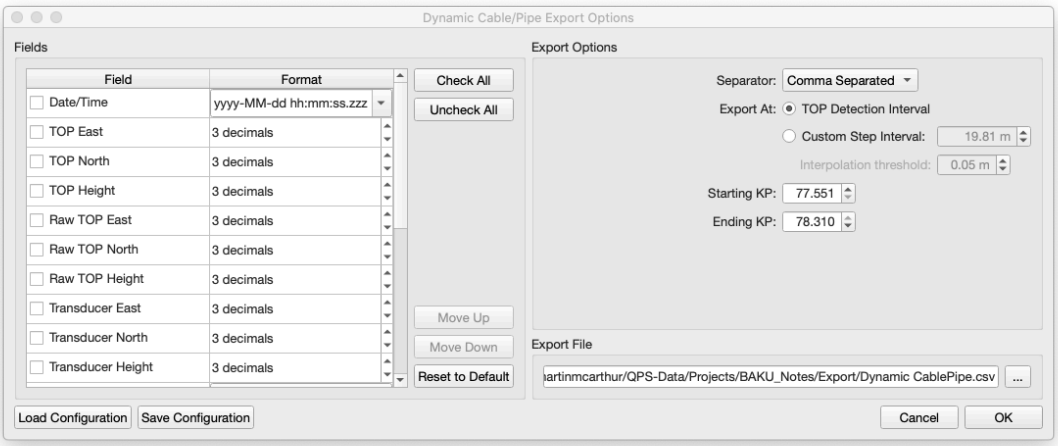
After reviewing the TOP detections and calculating the depth of burial, you can export the results to ASCII in a fully customizable export dialog. Here you can select and re-order all of the computed fields, use the TOP detection interval or a custom step interval, and specify a starting and ending KP range. The configurations you choose can be saved and loaded for future projects.



Cable/Pipe Analysis tool showing the X-Point listings along with the Dynamic Cable/Pipe that was detected



Cable/Pipe Analysis tool showing where the cable/pipe is buried or exposed along the route

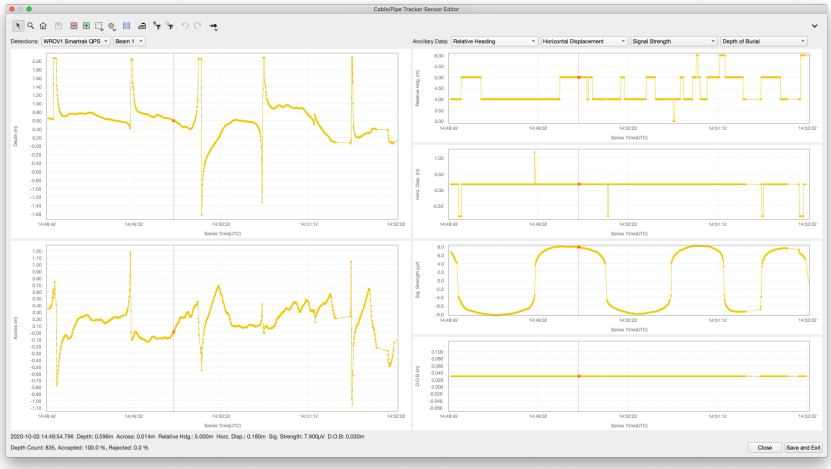


Cable/Pipe ASCII Export Options are fully customizable

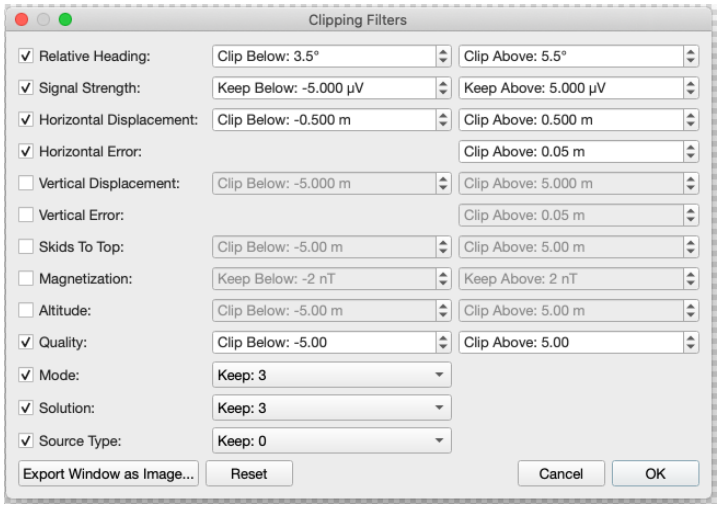
Cable/Pipe Tracker Sensor Editor

In this release, we have added a new cable/pipe tracker sensor editor. This tool is aimed at the offshore industry who use Smartrak and TSS cable/pipe tracker systems. The resulting data from these systems is sometimes noisy and the solution requires a lot of manual editing to improved the quality of the detections. This tool aims to simplify the manual editing and save time by using clipping filters and smoothing. Any edits or smoothing are saved back to the QPD and preserved if reprocessing is necessary. You can also visualize many sensor parameters to help understand the nature of any observed noise.

The cable/pipe tracker sensor editor loads selected lines and displays the detections stored in the QPD and raw ancillary data for Smartrak and TSS cable/pipe tracker systems. You can view, edit or filter, and smooth the QPD detections to improve the quality of your results. In this tool, manually rejecting or accepting points as well as applying the results from min/max clipping filters will apply changes to the QPD ping. Smoothing via boxcar moving average or LOWESS locally weighted scatterplot can be done on the depth and/or across track final solution. Any edits or smoothing will update the QPD files and associated dynamic surfaces automatically. The edited and smoothed results can be used directly by the cable/pipe TOP detection tool for detecting cables or pipes.



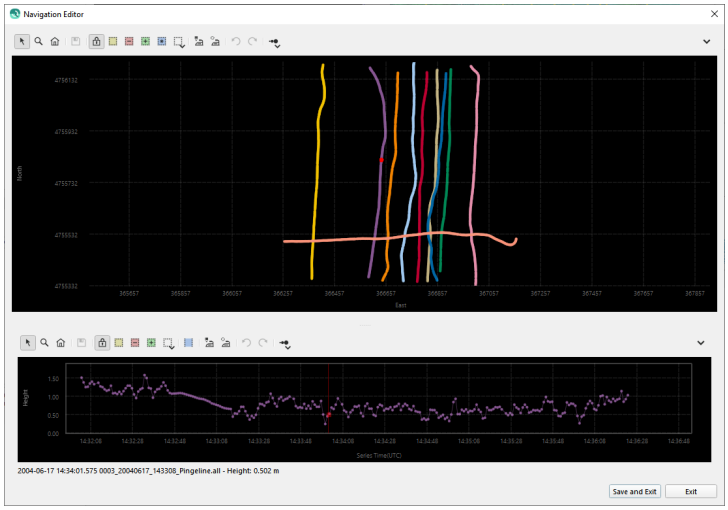
Cable/Pipe Tracker Sensor Editor showing the detections depth and across track values as well as any ancillary data that can be used to improve the detection results



Clipping filters for Smartrak sensor data

Navigation Editor

We have added a new Navigation Editor that will allow you to easily review and edit/de-spike/smooth navigation lines loaded in your project. The editor allows editing via accept, reject and fall through to secondary solutions or skip and interpolate samples. Boxcar smoothing on all or part of a line(s) allows you to smooth the XY or height series based on a moving window average where the window sample size is modifiable. Any edits or smoothing that is performed on the navigation data can be undone and upon saving your edits, Qimera will automatically keep track of the files that need processing and prompt you to reprocess. This new tool provides an alternate to the previous editing methods in the Time-Series Editor.



Navigation Editor showing the XY and Height time series

Qimera 2.4.0 - Improvements

On this page:

- Link Tool vessel type is now supported
- Link Tool, ROV, AUV vessel types now read transducer depth from QPD
- Colormap adjustment for multiple selected surfaces
- Horizontal and Vertical shift tools now log messages to the Process History
- Create Route/Lines/Dynamic Cables or Pipes from selection modes, profile tool, or measure tool
- Toolbar items hidden
- Improved warnings for Geodetic issues
- New support for custom spheroids
- Update EPSG database to v9.9.1
- Qinsy Tide Priorities
- Attach scroll selection to line object
- Vertical and horizontal zooming

Link Tool vessel type is now supported

Qimera has added support for the Link Tool vessel type as defined in Qinsy.

Link Tool, ROV, AUV vessel types now read transducer depth from QPD

For underwater vehicles that have no depth or pressure systems and a QPD was saved online, or generated by Qinsy's replay tool, Qimera will now read the transducer depth from the QPD and use it as the first entry for raytracing (unless overridden in the processing settings). Previously, the first entry for raytracing when using an underwater vehicle was available only with a depth or pressure sensor present.

Colormap adjustment for multiple selected surfaces

Qimera will now show the histogram and allow for left click, right click histogram adjustment for the color range when multiple surfaces are selected. This allows for easy matching of different surface color ranges. This works for Dynamic Surfaces, Static Surfaces and Scalar Surfaces.

Horizontal and Vertical shift tools now log messages to the Process History

The horizontal and vertical shift tools added in Qimera 2.3.0 will now log messages to the project history. These can be reviewed in the Process History Dock by double clicking on the process name.

Create Route/Lines/Dynamic Cables or Pipes from selection modes, profile tool, or measure tool

Qimera now allows for the creation of routes, lines, and dynamic cables or pipes from selection modes (like lasso and polygon), using the profile tool or measure tool. After drawing in the Scene, right clicking in the Scene or by opening the Layer menu, you are presented with three options to create line object/route/dynamic Cable/Pipe from current selection. This will add the newly drawn line, route or cable/pipe to the project layers. Line objects can also be turned into a project route by right clicking on the line object and selecting use line object as route.

Toolbar items hidden

Fixed a toolbar issue where some toolbar items would be hidden unless the toolbar was expanded to it's full size.

Improved warnings for Geodetic issues

More warning messages will be displayed when Qimera encounters geodetic issues or models that aren't found during project opening (Qinsy and Qimera projects alike). For example Qimera will now provide a warning on project opening if a project was moved to a different machine where the geoid model cannot be found.

New support for custom spheroids

It is now possible to define custom spheroids when configuring the geodetics for a Qimera project. The custom system's parameters will only be stored in the project's WKT, it will not be stored in the EPSG database.

Update EPSG database to v9.9.1

The EPSG database has been updated to version 9.9.1

Qinsy Tide Priorities

Qinsy 9.4.0 has released tide priorities allowing for cascading tide strategies. Qimera will read the online tide priorities from the QPD object track (.db and .qpd paired on import).

Attach scroll selection to line object

It is now easier to attach a scroll selection to a line object, simply by right clicking on a trackline in the Project Sources or a line or route in the Project Layers. Previously the was only available by ctrl + left clicking on a line in the scene.

Vertical and horizontal zooming

Vertical zooming is now available in several of Qimera's plots by using the ctrl + mouse wheel zoom. Horizontal zooming is also available by using ctrl + shift + mouse wheel zoom.

Qimera 2.4.0 - Resolved Bugs

Below you will find listings of bugs which have been reported in previous releases and which have been solved for the Qimera 2.4.0 release.

Summary	Issue key	Priority	Affects Version/s	Component/s
Exporting Raw Sonar file to GSF was causing a crash with R2Sonic Snippets with some .r2sc files	CQM-4660	☐	2.3.5	Export
Surface interpolation does not work on entire selection	CQM-4565	☐	2.3.5	Dynamic Surface
Project Opening and Creating Project has duplicate entries for projections	CQM-2616	☐	2.3.4	Geodetics, Project Creation

Summary	Issue key	Priority	Affects Version/s	Component/s
Unable to process patch test data when using the Qinsy "Link Tool" vessel type	CQM-2436		2.3.0	Vessel Editor, Patch Test
EPSG code not shown when exporting soundings	CQM-318 CQM-387 CQM-981		2.3.1, 2.3.3	Export
Uncertainty Histogram has a very small range	CQM-371 CQM-934 CQM-1181 CQM-3627		2.3.0	Color Maps

Summary	Issue key	Priority	Affects Version/s	Component/s
Qimera doesn't handle large .db (>2gb) files that failed to split when recording in Qinsy	CQM-332	☐	2.2.5	Import
Not able to process db files with no depth or pressure sensor present but height is available	CQM-1064 CQM-1948	☐	1.4.1	Processing

Qimera 2.4.0 - Known Issues

For this release, the following are known issues which we plan to address in upcoming releases.

Issue	Summary	Affects Version/s	Expected Fix Version
Limitation	Filter toolbars to "Accept All Soundings" and "Revert Manual Edits" do not have the intended effect when used in a Cooperative Cleaning project to over-ride cleaning that was done manually in the Master project prior to creating the Cooperative Cleaning project. Suggested workflow is to use the manual re-accept tools in the Slice Editor and 3D Editor.	2.1.0	2.4.x
Bug	There is a bug in the GSF export tool when batch exporting many files, typically several hundred files. Sometimes Qimera will crash and other times the snippets are not exported. A workaround if you experience this is to export in smaller batches and re-export GSF files that are missing snippets.	2.3.0	2.4.x

Qimera 2.4.0 - All Implemented Feedback

Key	T	Summary	Votes
FQM-101	↑	Processing: Ability to smooth, filter, freehand and/or shift segments of navigation and other time-series data	33
FQM-312	↑	Support for cable/pipeline functionality from Validator	22
FQM-514	↑	Processing - Improve workflows for complex Qinsy configurations	6
FQM-577	↑	Navigation Editor	1

4 issues

Qimera 2.4.0 - Documentation

On this page:

Documentation has been updated to capture the changes to existing dialogs and workflows. The new documentation is the cable/pipe TOP detection tool, cable/pipe sensor editor, and navigation editor.

Documentation can be found here: Qimera Documentation

Qimera FMGT - 7.11.3 Release

December 15, 2025

We are pleased to present FMGT 7.11.3

Highlights

- Supports the new .DB and .QPD versions released with Qinsy 9.8.0 and Qimera 2.8.0.
- EPSG database updated to the current version 12.025.
- New License Manager version 1.10.2. The new License Manager fixes the issue where an error would appear in the dialog “Failed to Activate License” with the message *“There are network adapters on the system that are disabled, please enable them and try again.”* when trying to activate the softlock license. Older versions of FMGT may still experience this issue.
  If you activate the license in FMGT 7.11.3 and then open an earlier version, the softlock license may be lost. The fix is to manually copy the DLLs into that older version:
  - https://qpssoftware.scrollhelp.site/lm/network-adapter-error-troubleshooting-steps

Bugs

- Fixed a crash when importing a NaviEdit GSF that did not have all fields correctly populated.
- Fixed an issue where the main progress bar would report 100% progress after the first 100 files.
- Improved a warning message about minimum backscatter being out of range.

Other

The HIPS I/O SDK now only supports version 12 CARIS licenses. This is due to the new HIPS I/O version requiring a HIPS 12 license. Older HDCS files are still able to be opened with the HIPS I/O SDK. Support for version 9/10 CARIS licenses has been dropped for increased installer security.

Known Issues

Qimera FMGT - 7.11.2 Release

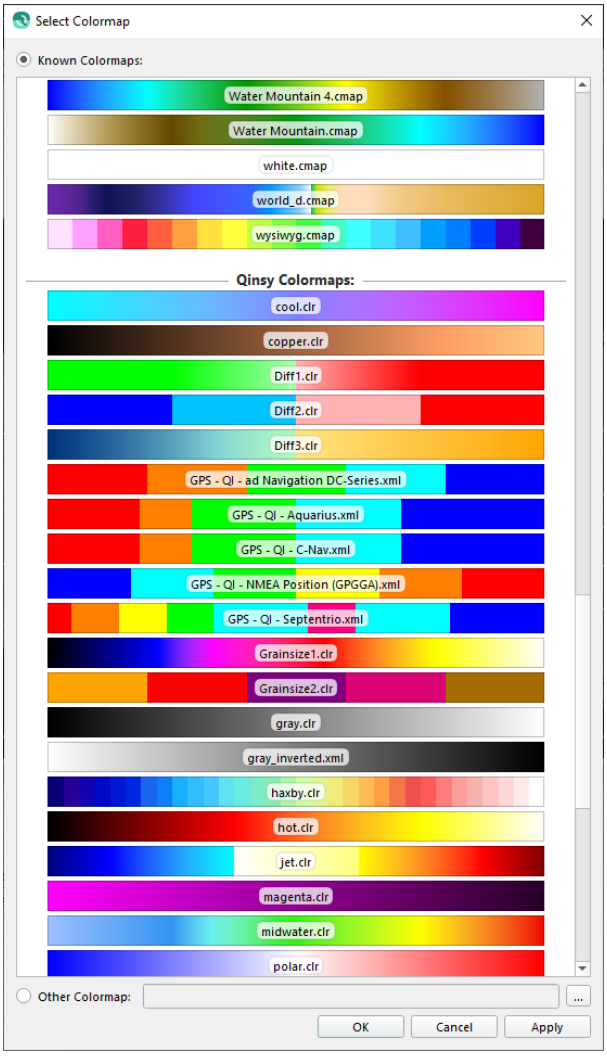
June 2, 2025

We are pleased to present FMGT 7.11.2

Highlights

- Directory Monitor now supports .kmall files.
- Dual head R2Sonic pairing with GSF is now supported.
- Fixed an issue with the HIPS I/O local license for Caris 12 users.
- Set the system id in the GSF for s7k files containing only beam average. The settings are correctly populated.
- New License Manager version 1.10.0.
- With this release we have improved the way you work with colormaps.
    - Change Colormap - Each colormap now displays a preview when selecting. In addition you can see the overflow and underflow colours as well as if it is percentage based or fixed range.
    - The colormaps are ordered with *Recent Colormaps* on top followed by *User Colormaps, System Colormaps* and *Qinsy Colormaps*.





Bugs

- Fixed the nominal frequency of the EM304 MKII in kmall format, resulting in a more accurate backscatter correction.
- Fixed an issue with Absorption values for Kongsberg KMALL systems not being correctly populated when merging files to create a GSF.
- Fixed an issue with Override Real-Time Absorption not applying for Kongsberg .kmall systems in GSF format.
- Fixed an issue extracting the correct navigation priorities for kmall files. The bug appeared as smearing in the mosaic.
- Fixed an issue with the map view having a pixel offset when launched on a second monitor. This affected mouse clicking on the mosaic/grid.
- Fixed a gap that appeared between lines, where *Use adjacent lines within time window of* was not working correctly.

- Fixed an issue when importing an EdgeTech 6205 where the second head was not importing for beam average.
- Fixed an issue with FMGT's histogram slider ranges showing valid bounds.
- Fixed a crash when generating a mosaic from .all.mb58 files.
- Fixed an issue with Norbit dual swath GSF pairing ping lookup.
- Fixed an issue with KMALL and HDCS pairing causing an incorrect auto time sync lookup.

Known Issues

Qimera FMGT – 7.11.1 Release

February 21, 2024

We are pleased to present FMGT 7.11.1

Highlights

- Improved anti-aliasing filtering. This fix removes some ambiguity between lines that could show up as speckle noise between lines. It will also make the results consistent when adding new lines to the mosaic. If you are working with an existing project created in FMGT version 7.11.0 or earlier, you should clear the filter flag and re-mosaic. Changing the mosaic pixel size will now always prompt you to clear the Filter flag so the anti-aliasing will be re-run.

Bugs

- Fixed an issue with the cascading backscatter normalization tool color map not using the mosaic color map.
- Fixed a crash when exporting a tiled mosaic as a surface or floating point geotif.

Known Issues

- Due to the change in internal backscatter file storage size (made smaller), if you open a project from a previous version of FMGT (version 7.10.3 or earlier) you will need to manually clear the Adjust flag to continue with new processing, such as Mosaic, Statistics / Grid, or ARA layers. This is done by selecting the Manual Processing tab, clicking the Clear Flags button, checking the Adjust checkbox and selecting OK. Similar items like patch selection will not work without clearing the Adjust flag.

Qimera FMGT – 7.11.0 Release

December 22, 2023

We are pleased to present FMGT 7.11.0

Important notes

- With the FMGT 7.11.0 release the internal file formats have changed to reduce the amount of storage. This also means that projects created in FMGT version 7.11.0 are not able to be opened in earlier versions of FMGT.
  - **NOTE:** if you open a project from a previous version of FMGT (version 7.10.3 or earlier) you will need to manually clear the Adjust flag to continue with new processing, such as Mosaic, Statistics / Grid, or ARA layers. This is done by clicking on the Manual Processing tab > hitting the Clear Flags button, checking the Adjust checkbox and selecting OK.
- The QPS database (.db) format version has been incremented, .db files recorded in Qinsy 9.6.0 will need to be opened in FMGT 7.11.x and newer versions.
  The database version upgrade includes:
  - Multibeam Record has been upgraded.
  - A new system type for Forward Looking Sonars
- The QPS .qpd file has been upgraded with the Qinsy 9.6.0 and Qimera 2.6.0 release. FMGT version 7.11.0 and newer releases will be able to read the new .qpd files.

Highlights

- Improved support for large projects. An effort was made to improve support for large projects by ensuring all files are extracted and processed during mosaic creation. A few crashes were fixed, files that failed to filter and mosaic will now filter and mosaic correctly, and a speed improvement has been observed in the filtering stage (8x faster filtering on a large project).
- Roll compensated beam pattern correction. There is a new entry in the Processing Parameters > Adjust tab to *Allow Beam Pattern Roll Compensation* which allows for an adjustment of the beam angle by the amount of sonar roll before calculating the beam pattern. This setting works for systems that do not roll stabilize their transmitters (ie. Norbit, R2Sonic, Reson and some Kongsberg shallow water systems). This functionality requires that a beam pattern be selected or created.
- The Absorption correction processing parameter was made clearer by adding a checkbox to indicate that you will override the real-time absorption value when it is checked.
- Gridding backscatter has been improved by using the Statistics / Grid button. New use cases for using a gridded product over the mosaicing would be in areas of heavy overlap, for dealing

with pings stepping forward and backward (ie heavy pitching or the Norbit STX system), and for dealing with interference problems. Here is what's been done:

- An improvement was made to properly georeference snippet pixels for use in the Statistics gridding routine.
- The default statistics / gridding suggested pixel size is now 5x the mosaic pixel size, which can be adjusted independently (ie. 1x) for gridding of backscatter.
- A new option for Gridding Diameter in pixels and Nadir Distance Weighting was added to the pixel size edit window. The *Gridding Diameter* defaults to 1 pixel, meaning a snippet will only contribute to the pixel it lands in, for 3 pixels it could be up to 9 grid cells (3x3 box), and so on. The *Nadir Distance Weighting* applies a lower gridding weight to nadir snippets and increases linearly to the outer beams.
- When gridding backscatter, all the statistics layers are generated. Typically a Mean, Median, or Mode Backscatter layer can be viewed to determine the best result. For instance, a Statistics Grid of backscatter Mode is much less sensitive to interference problems. Areas with heavy overlap can also benefit with improved imagery as you have more samples contributing to each pixel.

- Georegistered Snippet Export. We have added the ability to export georegistered snippet samples with AVG applied to allow for gridding in other packages, like Qimera or Fledermaus.
- Support for EdgeTech 6205 sonars. You will need to manually set the Sonar Type in the *Processing Parameters > Sonar Defaults* tab and use Custom Override All. This should be done before importing the source files to save re-extracting the coverage.
- Support for Kongsberg EM2042 sonars.
- Support creating a multispectral image with only 2 bands.

Bugs

- Processing / Source Files
  - Frequency used in processing is now displayed properly in the Beam Pattern viewer, ARA patch analyzer, and in the ARA creation.
  - Fixed .kmall dual swath loading for single and dual head systems. This has an improvement in resolution for small features.
  - Fixed a bug where the snippet sample lookup relative to the central sample was incorrect, resulting in small loss of resolution for finer features.
  - Fixed an issue when viewing raw Norbit snippets.
  - Fixed an issue when viewing raw Kongsberg beam average intensities.
  - Updated the lookup of absorption coefficients for Kongsberg systems to use the values reported in the sector packet headers per ping. This would only have affected EM2040 users who were attempting to correct for errors in data entry of the absorption in real-

time. This improvement was only necessary for .all and .gsf formats, the .kmall format was not affected.
    - Fixed an across track scaling issue when pairing with HDCS data.
    - Read and apply HDCS ping flags.
    - Fixed a depth resolution issue when creating GSF files during import pairing.
    - Fixed a depth corrector issue when pairing with HDCS files.
    - Support dB offsets for Kongsberg Very Shallow mode
    - Fixed an issue with the ARA layers having an incorrect histogram resulting in a mis-match between the display and histogram.
    - Fixed an issue with Norbit normalized backscatter absorption values being read as 0.
    - Fixed an issue in the pairing file selection if there were more bathy files than snippet files or vice versa.
    - Fixed an issue when pairing R2S and Hypack GSF files when snippets are missing.
    - Fixed an issue with noisy beam average values when pairing R2S and Hypack GSF files.
- Other
    - Changed the HIPS Licensing version selection to be either CARIS 9 / 10 or CARIS 11 / 12 licensing.
    - Improved the speed of the multispectral image creation dialog.
    - Added mosaic name to the status bar to make it clear which mosaic the mouse value came from.

Known Issues

- Due to the change in internal backscatter file storage size (made smaller), if you open a project from a previous version of FMGT (version 7.10.3 or earlier) you will need to manually clear the Adjust flag to continue with new processing, such as Mosaic, Statistics / Grid, or ARA layers. This is done by clicking on the Manual Processing tab > hitting the Clear Flags button, checking the Adjust checkbox and selecting OK. Similar items like patch selection will not work without clearing the Adjust flag.

Qimera FMGT – 7.10.3 Release

May 29, 2023

We are pleased to present FMGT 7.10.3

Highlights

- Improved Kongsberg .kmall corrections
- A new opt-in processing parameter *Calculate and apply AVG across line breaks* has been added in the Filter tab. This will allow the AVG to continue across line breaks by using the line before and after the line that is currently being filtered. You might want to consider using this feature if you are in deep water and have short survey lines or you are noticing backscatter differences at line breaks.
- Support has been added for the new Yaw stabilization mode with Norbit Winghead Sonars.

Bugs

- Processing / Source Files
  - Fixed an issue when pairing dual head Kongsberg .kmall format logged in Qinsy. The backscatter processing would fail. Users with existing projects will need to re-pair the .db and .qpd or re-export the GSF from Qimera in order to complete backscatter processing.
  - Fixed an issue with Kongsberg .kmall installation parameters.
  - The snippet scale factor in GSF for Kongsberg systems is now being used by FMGT.
  - Fixed a beam numbering mis-match in particular files between HDCS files and Reson backscatter files in XTF format.
  - Fixed a crash when importing a GSF from NavAQ with missing sensor specific subrecords.
  - Mosaicing Parameter *Fill gaps using adjacency* now correctly works (doesn't fill the gap) when vessel turning is logged, but pings are flagged as rejected.
  - Improved fault tolerance of the code that creates GSF files for dual-head Norbit setups where the FM pulse bandwidth was reported as a negative number. Users with existing projects with dual-head Norbit systems may notice a significant dB shift between the two heads. In this situation, the best course of action is to re-create GSF files since the original GSF files have a corrupt pulse bandwidth.
- Importing / Exporting
  - Exporting a one merged floating point geotiff will now prompt you to select a no-data value.

    - Exporting *One Merged Floating Point Geotiff* and *Export Surface > Export Floating Point GeoTiff Grid* will now product the same backscatter results.
- Other
    - Updated the *Use All Soundings (Rejected and Interpolated)* label found in the Processing Parameter Kongsberg Format tab. If soundings are rejected in .all or .kmall format and you do not want them included in the mosaic, uncheck this box.

New License Manager v1.9.7

- New license manager containing bug fixes and performance improvements.

Qimera FMGT – 7.10.2 Release

For FMGT Release notes, please click on this link Fledermaus 7.10.2 - FMGT Release to be redirected to the correct page. Sorry for the inconvenience.

Archived Release Notes

- Qimera 2.0.3 Release
- Qimera 2.1.1 Release
- Qimera 2.0.2 Release
- Qimera 1.0 Release Notes
- Qimera 1.1 Release Notes
- Qimera 1.2 Release Notes
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- Qimera 1.5.0 Release
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- Qimera 2.3.1 Release
- Qimera 2.3.2 Release
- Qimera 2.3.3 Release
- Qimera 2.3.4 Release
- Qimera 2.3.5 Release

Qimera 2.0.3 Release

24 October 2019

We're pleased to present Qimera version 2.0.3. maintenance release addressing small issues. Read below for details.

Releases

- Qimera 2.0.2 Release
- Qimera 2.0.1 Release
- Qimera 2.0.0 Release
- Qimera 1.7.6 Release
- Qimera 1.7.5 Release
- Qimera 1.7.4 Release
- Qimera 1.7.3 Release
- Qimera 1.7.2 Release
- Qimera 1.7.1 Release
- Qimera 1.7.0 Release

Highlights

- GSF 3.0.9 is now supported. This format supports Kongsberg KMALL systems.

Bugs

- Processing / Source Files
  - OSGB36 Geodetics were not working correctly. This is now fixed.
  - Removing certain files from a project will now trigger a new warning explaining that associated files will be removed.
  - Cleaning projects can now be made from QPDs loaded as processed points.
  - Fixed a problem where certain data experienced incorrectly high TPU values near transducer boresight.
  - Running a blocking filter will no longer cause footprints blocked with Despiked, Collinearity, or Relative Depth flags to become accepted.
  - Certain R2Sonic data was triggering a crash in the Swath Editor. This has been fixed.
- Tools and Editors

- Some data experienced improper processing with the TU Delft Quick Search algorithm. This has been fixed.
- Dual head R2Sonic systems with one head disabled will now be roll correct properly in the Water Column dock.
- Fixed an issue where some data was not having the flags applied correctly in the 3D Editor.
- Fixed an issue that occurred while the Surface Edit Overview was turned on while the Slice Editor was active.
- Certain data was causing a crash when opened for the first time in the Water Column dock and the Side View was activated.
- Fixed a problem where very high sounding counts were being calculated for empty grid nodes.

- Importing / Exporting
  - Importing several batches of HS2 files will no longer cause a crash.
  - Importing an empty ASCII XYZ file will no longer cause a crash
  - Importing files using a project's custom transformation will now result in that transformation being applied correctly.
  - Imported Kongberg ASVP files will now have the correct time extracted from the file.
  - QPDs imported as Processed Points will now correctly set the project geodetics.
- Surfaces
  - Appending processed points files to a Dynamic Surface will no longer incorrectly present a TPU dialog.
  - Large projects containing many lines and surfaces were running into problems when building or appending to surfaces. This has been fixed.
  - It is now possible to manually append data to a Dynamic Surface while Qimera Live is running.
- Other
  - Projects with corrupted project XML files will no longer cause a crash when opened.
  - Qimera will now ensure that the user coordinate system file is present when a project is opened.

Licensing

- It is now possible to configure various network license settings from the command line.
- An issue where licensing warnings would wrongly appear is now fixed.

Qimera 2.1.1 Release

5 February 2020

We're pleased to present Qimera version 2.1.1, a maintenance release addressing small issues. Read below for details.

Releases

- (2.6) Qimera 2.1.0 Release
- (2.6) Qimera 2.0.3 Release
- (2.6) Qimera 2.0.2 Release
- Qimera 2.0.1. Release
- Qimera 2.0.0 Release
- Qimera 1.7.6 Release
- Qimera 1.7.5 Release
- Qimera 1.7.4 Release
- Qimera 1.7.3 Release
- Qimera 1.7.2 Release
- Qimera 1.7.1 Release
- Qimera 1.7.0 Release

Bugs

- Processing / Source Files
  - Resolved an issue where a warning was shown incorrectly when using GNSS heights.
  - Surfaces in Cleaning Projects will no longer include footprints from systems that were not used in the original master surface.
  - Soundings accepted in a cleaning project will now be accepted correctly in the master project when the edits are merged.
  - Improved the error message that appears when ray tracing dependent tools are invoked for files that don't support ray tracing.
  - Tide files that include very sparse data, one point per day for instance, will now work correctly.
  - SVP Crossfade will no longer cause a crash for mixed MBES and Laser data.

- Tools and Editors
  - Swath Editor: When Auto Zoom is turned off it will now respect that setting when rejected soundings are toggled.
  - Center clicking with the mouse and dragging will no longer invoke a selection tool.
  - Improved the matching and visualization of water column files that are separate from the bathymetry source file.
  - Fixed an issue with some laser points not working correctly in the Swath Editor.
  - Sounding properties will now be updated in the Slice Editor correctly, even if a tool other than 'Explore' is selected.
  - Stopped a crash in the Patch Test Tool that occurred when loading data from submersible objects that had no associated depth or pressure.
  - The background colour of the 3D Slice editor window can now be changed.
  - Some laser data caused a crash in the Wobble Test Tool. This has been fixed.
  - Improved water column visualization for dual head MBES systems that have ping rate inconsistencies between heads.
  - Stopped a crash that occurred in the 3D Editor when 'Select File' was used.
- Importing / Exporting
  - Fixed a geodetics issue that occurred during import of QPDs from a Qinsy project.
  - Exported coordinates from the Geopicking utility will now have an appropriate number of decimal places.
  - An incorrect geodetics warning that appeared when draping an image on the scene has been fixed.
  - It is now clearly stated that ASCII files are supported for tide import.
  - POS/MV files that start with a partial datagram will now import correctly.
  - Fixed a crash that occurred when exporting certain Kongsberg data to GSF.
- Surfaces
  - Improved detection of corrupt surfaces and how they are recreated.
  - Fixed an issue where updates to surfaces were not being carried out properly after changing from Manual Updates to Always.
  - The CUBE Capture Distance setting names have been changed to match Survey Manager and DMagic.
  - Shading of surfaces created in Qinsy has been improved.
  - Setting TPU values when creating a CUBE surface is now much faster.
  - Fixed a problem that was stopping Dynamic Surfaces from being created in Qinsy projects.

- Other
  - Improved how focus is removed from the Vertical Exaggeration settings box in the scene.
  - Fixed an issue that affected installations on Mac OS where the separate QPS geodetics were not installed.
  - Stopped a crash that occurred when ENCs with revisions were imported.
  - Licenses that include the FM Midwater product will now be acknowledged correctly by Qimera.
  - The classification filter information now clearly states that this filter is intended only for LAS/LAZ type data.
  - Improved the information presented when the required version of OpenGL is not found.
  - Improved handling of a situation where a project is inadvertently created in the C:\ root folder.

Other

- If you are a Caris/QPS workflow please read the following how-to How-to Caris Licence check as QPS products do not currently support Caris 11 Licensing.

Qimera 2.0.2 Release

4 September 2019

We're pleased to present Qimera version 2.0.2. maintenance release addressing small issues. Read below for details.

Releases

- Qimera 2.0.1 Release
- Qimera 2.0.0 Release
- Qimera 1.7.6 Release
- Qimera 1.7.5 Release
- Qimera 1.7.4 Release
- Qimera 1.7.3 Release
- Qimera 1.7.2 Release
- Qimera 1.7.1 Release
- Qimera 1.7.0 Release

Highlights

- Tide or height shifts will now also be unloaded to FAU files.

Bugs

- Processing / Source Files
  - Fixed problems related to how User Additional soundings extracted from Water Column data were created and handled.
  - Fixed a problem where certain FAU files created very large QPDs.
  - Motion sensor data will now correctly be extracted from Kongsberg KMALL files.
- Tools and Editors
  - The frequency filter will now work correctly when run from within the Slice Editor.
  - When using the Free Slice Select, you can now select a new partition in the Surface Edit Overview as intended.
  - A mouse pointer offset issue in various docks has been fixed.
  - The Undo and Redo functionality will now work as expected for points cleaned by the Cluster filter.

    - Fixed a crash that occurred when using the Profile tool.
- Importing / Exporting
    - Geodetic CRS configuration for applicable exports now work as expected..
- ENC
    - SOUNDG features will now correctly include a Z value.
    - Various fixes regarding importing and adding, removing, and adding QNC files to a project.
- Other
    - Banded colour maps will now correctly reflect the grid node value for Uncertainty and Sounding Density.
    - It is now easier to enter coordinates in the Test Coordinate Reference Systems dialog.

Qimera 1.0 Release Notes

RELEASE 1.0.7 - October 29th, 2015

Fixes

Stability

- Better handling of water column import and viewing with corrupt, invalid and/or missing water column files.

Processing

- Improved ray tracing speed performance.
- Fixes to handle cases of ping packets being out of time order in Kongsberg .all files.
- Improved exception handling when geoid/ellipsoid separation lookup fails when using separation models.
- Corrected bug with unit conversion for QINSy users with non-metric heighting systems.

User Interface

- Add orientation to spatial selection box to improve visibility of look direction.
- Wobble Analysis tool now correctly toggles visibility for different heads in dual head configuration.

User Experience

- Better auto-selection of newly created position and/or motion systems during import of external navigation and motion data.

3D Editor

- Fixed bug in 3D Editor that prevented selection by blocked sector.
- Improved readability of z-value labels in the 3D Editor to match the size of labels in the main display.
- Corrected menu item text to reflect correct configuration for left/right movement of current selection.

Gridding and Surfaces

- Fixed problem with color map failing to adjust to change in z-range after a height shift is applied to processed data.
- Corrected logic to allow for creation of sounding density objects.

Import and Export

- Update z-range metadata when Z values inverted to allow for correct surface generation during point data import.
- Improved stability of GSF export when missing supporting information and/or imagery data packets.

- Fixed bug blocking launch of Export Surface Dialog.
- Better reporting for cases of empty sounding files on export.

QA List:

Issue	Summary
QM-1874	Vertical datum offset not applied
QM-1932	add orientation to selection box
QM-2021	Ray tracing is very slow compared to Caris
QM-2036	Export GSF causes crash
QM-2040	Water column view crashes on invalid water column file.
QM-2051	Wobble Tool ability to plot data from one head at the time
QM-2061	When creating new position and motion systems the dropdowns should default to the new ones
QM-2064	Fail to launch Export Surface Dialogue
QM-2065	Kongsberg EM710 direct to QPD solution is incorrect compared to ray traced version
QM-2074	Make tested fixes to Pio_LinearInterp and raytracing to improve multicore performance
QM-2080	Select by blocked sector doesn't work in the 3D editor
QM-2086	Re-heighting with separation model disabled is adding 1000000 meters to the dtm heights

Issue	Summary
QM-2088	No error message to say that no soundings were exported and a zero byte file is created
QM-2089	Spikes in refracted data
QM-2092	Z-value labels not readable
QM-2097	Create Sounding Density Object Does not work
QM-2098	Create Sounding Density Object creates gap in the surface
QM-2104	3DEditor menu text for move left/right are backwards.
QM-2109	Invert Z value for file configuration of processed point file doesn't update metadata
QM-2135	Vertical offset must be converted from project units to meters for transform

RELEASE 1.0.6 - October 7th, 2015

Fixes

- **Stability**
  - Improved handling of sounding data with invalid bounds crashing during creation of a Static Surface.
  - More robust handling of data file removal during processing operations.
  - Better handing of importing time-series data that covers the same time range.
  - Fix crashes with color map editing and/or color selection.
- **Processing**
  - Improvements in consistency between re-heighting and re-raytracing QPD data originating from QINSy .db/.qpd files.
  - Allow for vertical offset surfaces to be used with QINSy .db files.

  - Fixed problem where file updates were incorrectly queued when a backup time-series data source was edited.
  - Fixed problem with preservation of prioritized list ordering of time-series data sources that are disabled.
- **UI**
  - Fixed bug where SVP and Time-Series Editor zooming had problems when zooming near the edge of the plot.
  - Fix for Swath Editor "small points" visualization mode.
  - Plot data from both heads for dual-head HSX data when using Wobble Tool.
- **Import and Export**
  - Performance improvement for import of .db files.
  - Corrected bug with exporting Processed points as "Inverted".
  - Corrected bug with exporting Processed points flagged as "Rejected" or "Feature".
  - Corrected bug with exporting Dynamic Surface data that previously was leaving gaps.

QA List:

Issue	Summary
QM-1686	Qimera crashes when creating a Static Surface
QM-1714	Qimera crashes when selecting single colour while editing colour map
QM-1879	Weird goings on when editing time series
QM-1922	Removing raw sonar file while converting to QPD freezes application
QM-1950	Wobble tool not showing points in dual head HSX file
QM-1953	Time Series Surface Sound Speed Edits don't make it through to processed files
QM-1966	Using back-up motion data
QM-1981	Having to manually crash Qimera as window not visible

Issue	Summary
QM-1982	HSX files with M3 data not extracting vessel config
QM-1989	Vertical offset via SD surface is not working with .db files
QM-1992	SVP and Time-Series Editor Zooming does not work near the edge of the plot.
QM-2002	Problems importing updated sbet with same time range
QM-2010	Swath editing doesn't work when plot size is "small points"
QM-2017	Qimera crashes from 'Select Color' window.
QM-2030	Import of .db files is very slow compared to Caris (which imports an XTF exported from QINSy)
QM-2033	Bug with Inverting export Processed points
QM-2034	Rejected soundings not being exported. Specifically Rejected and also flagged as Feature
QM-2038	Gaps with data after exporting accepted soundings

RELEASE 1.0.5 - September 17, 2015

Bug Fixes

The following issues have been resolved:

- Workflow fixes for working with Kongsberg SISQA and patch test tools;
- Increased fault tolerance during Dynamic and Static Surface construction and more warning messages when encountering unprocessed files;
- Improved fidelity of GSF export for Kongsberg systems;
- Fixed interpolation bug for external navigation files at beginning/ending of survey line files;
- Bug fix for SVP time/distance calculations when working over very large distances;

- Added sanity checking for SVP position relative to the project geographic location;
- Fixed error in vertical datum shift when working with QINSy .db files in a non-metric projection;
- Improved fault tolerance when missing translation files;
- Bug fix for dual head import via HSX file format;
- Fixes for Swath Editor when working in map projections with non-metric units;
- Water column display more fault tolerant in cases of missing data packets;
- Improved warning message for older unsupported versions of QINSy .db files;
- Fixed bug in loading of older color map files.

QA List:

Issue	Summary
QM-1818	Workflow fixes for working with Kongsberg SISQA and patch test tools
QM-1910, QM-1920, QM-1965, QM-1988	Increased fault tolerance during Dynamic and Static Surface construction and more warning messages when encountering unprocessed files.
QM-1917, QM-1969	Improved fidelity of GSF export for Kongsberg systems
QM-1942	Fixed interpolation bug for external navigation files at beginning/ending of survey line files
QM-1951	Bug fix for SVP time/distance calculations when working over very large distances
QM-1952	Added sanity checking for SVP position relative to the project geographic location.
QM-1955	Fixed error in vertical datum shift when working with QINSy .db files in a non-metric projection.
QM-1959	Removed unused UI component
QM-1960	Improved fault tolerance when missing translation files

Issue	Summary
QM-1967	Bug fix for dual head import via HSX file format
QM-1972	Fixes for Swath Editor when working in map projections with non-metric units
QM-1975	Water column display more fault tolerant in cases of missing data packets
QM-1977	Improved warning message for older unsupported versions of QINSy .db files
QM-1990	Fixed bug in loading of older color map files

RELEASE 1.0.4 - August 18, 2015

Bug Fixes

The following issues have been resolved:

- Data import fixes for filenames with non-ASCII characters, affected primarily QINSy and Hypack data;
- Memory leak fixes for water column data originating from QINSy .db files;
- Improved handling of data from Kongsberg .all files with missing Installation Parameters datagrams;
- Improved handling of Hypack data from Edgetech (binned data) and ELAC systems;
- Updates to geodetic resource files;
- Fix for dynamic surface updating;
- Various graphical user interface bug fixes in the Swath Editor, SVP Editor, Wobble Tool and Time-Series Editor;
- Initial draft of Simplified Chinese translation. Users will be prompted for language preference at startup.

INTERNAL CASES:

- QM-966 Support for HSX binned coming from Edgetech
- QM-1761 Problems with shift data

- QM-1807 Qimera crash when pressing swath select (R)
- QM-1832 ELAC 3050 data in HSX file not being loaded correctly or not applying SV correctly
- QM-1835 unable to delete SVP spikes manually
- QM-1851 Point data is not always shown in WobbleTest
- QM-1852 Selection in swath view is not correct after using PageUp / PageDown
- QM-1855 Update Geodetic Installed files
- QM-1862 DB file with é in line name doesn't import
- QM-1865 Memory leak for DB files containing water column data
- QM-1884 HSX files containing non-ASCII characters fail import
- QM-1897 Qimera Crashes with file that doesn't exist
- QM-1900 Problem importing older simrad files
- QM-1902 Time-series widget fails to display time-series where min and max Y are same.

RELEASE 1.0.3 - July 22, 2015

Bug Fixes

The following issues have been resolved:

Source Files

- Fixed issue with computed PPK navigation, Re-Nav Z will apply the processing settings to all lines fix the motion artifacts;
- Fixed issue with the load of a POS file;
- Fixed issue with QPD points that were rejected outside of Qimera coming back after reprocessing;
- Fixed issues with detecting sensor types from HSX files.

INTERNAL CASES:

- QM-1827 Changing Height System seems to remove the MBES Transducer Offset.
- QM-1825 Batch application of vertical referencing file creates motion artifacts
- QM-1817 Set Sounding shape to Points by default or improve render speed.
- QM-1808 Rejected flags not retained during reprocessing
- QM-1796 Problem with loading POS file
- QM-1791 External dynamic surface SDs should not be allowed to open in Qimera
- QM-1790 Kongsberg .all cyclops mode does not extract surface sound speed when primary head is disabled.

- QM-1789 HSX does not report sensor type and reports incorrect number of heads in Properties tab.
- QM-1771 TruePix data not being ignored, being treated as MBES
- QM-1562 Create static surface gives strange results

RELEASE 1.0.2 - June 30, 2015

Bug Fixes

The following issues have been resolved:

General

- Fixed spatial index issue affecting main re-navigation loop;
- Fixed problem where re-CUBE interfered with previous hypotheses;
- Fixed issue of import of true heave not causing full ray trace;

Sound Velocity Profile

- SVP tool updates including date/time stamp, editing, and UTC-to-local-time;

Vessel Editor

- Vessel updates for fixes to renaming and squat table support;

Patch Test

- Patch test tool fixed to support dual head with one head off during acquisition and non-metric units;

Tides & Height

- Fixed GNSS/GPS height priority widget to prevent deselection of all entries as is done with other prioritization widgets;

Source

- Add user preference to disable non-primary time series data for all incoming MBES data types on import;

Fixes with file type dependency

QINSy

- Fixed problem with south oriented Transverse Mercator projections incoming from QINSy .db files;
- Fixed support for dual head in DB files with one head off during acquisition;

Kongsberg

- Fixed problem where Dynamic Surface would not update after SISQA reprocessing;

- Fixed problem where surface sound speed used in beamforming was extracted from depth records instead of range/angle records for Kongsberg .all data;
  Improved support for Kongsberg M3 sonar;
- Fixed problem with dual head Kongsberg .all file when only data from a single head is present;
- Improved GSF export for Kongsberg systems

Hypack

- Fixed problem where motion sensor data was not being extracted from an HSX;
- Fixed problem where HSX interpretation of angle encoding for multibeam system was incorrect;

QA Internal list of fixes for Qimera-1.0.2.45:

- QM-1788 - Corrected problem where .db file dual head system file did not import surface sound speed when the first MBE system was disabled;
- QM-1784 - Improved capability to ignore laser systems from .db files;
- QM-1781 - Fixed problem where Dynamic Surface would not update after SISQA reprocessing;
- QM-1779 - Edits to SVP date/time stamp can now be saved;
- QM-1778 - Fixed bug where SVP editor claimed the current profile needed to be saved when no changes were actually made;
- QM-1777 - Disabled edit capabilities of stored revisions of an SVP;
- QM-1776 - Fixed problem where crash occurred if user renamed a vessel file;
- QM-1775 - Fixed problem where surface sound speed used in beamforming was extracted from depth records instead of range/angle records for Kongsberg .all data;
- QM-1774 - Fixed problem with importing motion from .all files from M3 systems. Found some issues with the M3 .all file that were reported to the manufacturer. These were corrected and Qimera now supports M3 .all files from the upcoming M3 software version 1.61. M3 .all files from earlier versions may require manual configuration of some vessel sensor offsets;
- QM-1770 - Corrected a failure to extract project geodesy settings for QINSy .db file;
- QM-1769 - Fixed problem where import of Caris SVP applied an unintentional UTC-to-local-time shift;
- QM-1764 - Added flexibility to Caris Tide format definition;
- QM-1760 - Fixed problem where motion sensor data was not being extracted from an HSX;
- QM-1759 - Enabled support for QINSy .db files for dual head systems where one of the heads is disabled or has no data;
- QM-1758 - Ensuring full ray trace after editing processing settings for delayed heave
- QM-1757 - Fixed spatial index issue affecting main re-navigation loop;
- QM-1755 - Fixed GNSS/GPS height priority widget to prevent deselection of all entries as is done with other prioritization widgets;
- QM-1754 - Fixed patch test tool display to accommodate data in non-metric units;
- QM-1750 - Colourmap editor dialog had no window title;

- QM-1749 - Fixed patch test to allow case of dual head systems when only data from a single head is present;
- QM-1748 - Fixed problem with dual head .db file when only data from a single head is present;
- QM-1746 - Fixed problem with dual head Kongsberg .all file when only data from a single head is present;
- QM-1744 - Fixed problem where squat table did not sort entries numerically;
- QM-1736 - Add user preference to disable non-primary time series data for all incoming MBES data types on import;
- QM-1732 - Custom Spline Filter settings in GUI were enabled when they shouldn't have been;
- QM-1730 - Fixed problem where squat model could not be saved;
- QM-1726 - Fixed GSF export to report correct number of beams in Sensor Specific information for Kongsberg systems;
- QM-1725 - Fixed GSF export to correct units of sector specific absorption coefficient for Kongsberg systems;
- QM-1724 - Fixed GSF export to include previously missing Sensor Specific information for Kongsberg systems;
- QM-1723 - Fixed GSF export to include previously missing Runtime Parameters for Kongsberg systems;
- QM-1720 - Fixed problem where HSX interpretation of angle encoding for multibeam system was incorrect;
- QM-1719 - Fixed problem with missing navigation data from QINSy .db file;
- QM-1702 - Fixed problem where re-CUBE interfered with previous hypotheses;
- QM-1677 - Extract Information log message only on first add of lines;
- QM-1659 - Fixed problem where project coordinate frame was not set when QINSy QPD file contains no multibeam data;
- QM-1522 - Fixed problem with south oriented Transverse Mercator projections incoming from QINSy .db files;
- QM-1733 - Need to centralize magic system number values in SHLIBS;
- QM-846 - Image mask not working correctly with dynamic surface. Duncan has confirmed that it is fixed, so nothing to report in release notes, this was fixed in v1.0;
- QM-1642 - Annoying warning dumps to the console that we might want to fix;

RELEASE 1.0.1 - June 16, 2015

Bug Fixes

The following issues have been resolved:

- [QM-1697] - Fixed a problem when DB files contained others sensors in addition to a multibeam sonar and crashers the swath editor.
- [QM-1697] - Improved the rendering of high resolution surfaces when appending additional raw sonar lines.
- [QM-1699] - Improved labeling of surfaces in 3D Editor to be consistent with the main 4D view.
- [QM-1704] - Fixed a problem with clipping of the static surface after re-navigation of Z.
- [QM-1707] - Fixed an issue with ALL files that had mixed depth and height records.
- [QM-1709] - Fixed a problem when contouring was attempted a second time.
- [QM-1711] - Fixed a problem with loading Binary Navigation Files.
- [QM-1716] - Not allow opening of color map editor for points and lines, that cannot be adjusted.
- [QM-1718] - Fixed links to images in patch test report.
- [QM-1727] - Fixed ASCII export from time series plots.
- [QM-1729] - Fixed vessel editor Tx and Rx transducer offsets for certain DB files setup.

Documentation Updates

Qimera is packaged with the complete offline Knowledge Base, however these documents are under continual revisions and ***you should always check the QPS webpage for the most up to date version*** .

Latest updates include:

- [QM-1700] - This update contains a significant update to the Qimera Reference Manual.

RELEASE 1.0.0 - June 2015

Introduction

Qimera™ is a totally new multibeam processing application for production MBES processing. It is also the beginning of the transition of the various QPS applications and modules into new products and modules to provide an efficient mapping workflow.

The Qimera software:

- strives for a paradigm shift in processing by automating those steps in the workflow that have been mundane or error prone, and minimizes and focuses the user interaction to stages when they provide valuable input,

- has been built from the ground up and provides an intuitive and easy to use interface that also minimizes training required,
- supports the QINSy data logging format in addition to sonar file formats from other hardware and software manufacturers,
- extracts as much information as possible from incoming data files, including all ancillary data and survey vessel information,
- intelligently and interactively guides the operator through the typical data processing stages with a Dynamic Workflow™,
- offers the advanced tools such as the Wobble Diagnosis Toolkit for troubleshooting, in addition to the typical complement of multibeam data review and editing tools such as a Time-Series Editor, Sound Velocity Profile Editor, a Patch Test Calibration Tool, Swath Editor and 3D Area based Editor, and
- uses a unique I/O Balanced Multi-Core engine specifically designed to process sonar data as rapidly as possible. Processing is done as a background task and the user can continue to interact with the project.

Operating Systems

The initial release of Qimera is for Windows Platforms only. Future versions will extend the platform to Mac and Linux. The following operating systems are officially supported under Windows:

- Windows 7 (64bit)
- Windows 8.1 (64bit)

Windows computers also require a modern 3D graphics card with good OpenGL support.

Bug Fixes

This is the initial release of Qimera and there are no bugs ;-)

There was an extensive external beta and pre-release program, and we thank all those testers that provided great feedback. Their feedback and contributions have no doubt helped to bring the product to the current level for the initial release.

Knowledge Base and Reference Manual

Qimera is packaged with the complete offline Knowledge Base, however these documents are under continual revisions and ***you should always check the QPS webpage for the most up to date version*** . Information provided includes:

- Getting started – installation, licensing, and Quickstart guides,
- Howto Articles – covering major workflow processes, and
- Reference Manual.

Technical Support

If you need technical support or to log feedback or a bug, please go to: https://jira.qps.nl/

When providing feedback or reporting a bug please create an issue in Jira. Please select the Qimera Support (SQM) project from the selections in the Project drop down menu.

Other Online resources

- Geoid and separation models. If you are surveying to the ellipsoid and require separation models for transformation you should check that the one you require has been included in the installation package. Not all worldwide geoid and separation models have been included to keep the installation download to a manageable size. Other models are available for download on the Qimera download page.

Qimera 1.1 Release Notes

RELEASE 1.1.3 - February 23rd, 2016

Note for Kongsberg .all users:

This release of Qimera contains a change that affects users who work with Kongsberg .all files. For additional information please see this page: Changes affecting Kongsberg .all users - Qimera 1.1.3 and later

Fixes and Improvements

- Fixed an issue where Qimera wasn't reading SIS Navigation time tag preferrence: See the following page for more information: Changes affecting Kongsberg .all users - Qimera 1.1.3 and later
- Fixed an issue with opening some QINSy projects that caused a crash
- Added a warning to notify user if a geoid that is specified in a QINSy database isn't configured in Qimera's geoidmodels.xml file.
- Fixed an issue that prevented changes made to an SVP from being saved
- Fixed an issue with surface exports and contouring
- Fixed a problem with using lasso and polygon selection for CUBE filtering
- Fixed a problem with changing Vertical Referencing Method for vehicles that use a depth sensor

RELEASE 1.1.2 - January 13th, 2016

Building off the success of the multi-platform releases of Fledermaus, we are very pleased to announce that Qimera is now available for Mac OS X

Fixes and improvements

- Improved navigation verification upon import of raw source file
- Blocking now available based on Reson Colinearity and Brightness beam flags
- Fixed issue with CUBE surface Hypothesis Strength
- Fixed problem with blocking filters when reprocessing multiple lines
- Improvement to SBET import messaging
- Improved warnings and suggestions regarding actions that can cause loss of edit flags
- Fixed issue with GSF export of dual head systems

- Fixed issue with multiple GSF exports
- Improved warnings when building static or dynamic surfaces for data with unreasonable bounds
- Fixed problem where the Processing Settings Editor window was too tall for a display

RELEASE 1.1.1 - December 3rd, 2015

Fixes and improvements

- Added capability to copy source files into project during import while using Qimera Live
- Improved stability when cancelling file import
- Fixed problem with QINSy .DB files for systems without valid soundings
- Fixed issue with Kongsberg .ALL files raw surface sound speed time-series editing
- Improvement on reading of navigation source files in seconds for x positions
- EdgeTech .JSF binned beam intensity values now can be displayed in the Swath Editor
- Dynamic Surface appending functionality now ignores files that are already included in the surface
- Fixed issue with file selection being lost when toggling visibility
- Added support for entering numbers with comma as decimal separator
- Fixed problem with Dynamic Surface export ASCII xyz + attributes functionality missing soundings information
- Fixed issue with 3D Editor and scene selection getting out of sync
- Added some missing exports to source file context menus
- Fixed issue with editing vessel file not prompting to re-process affected data
- Fixed bug with multiplot Time series functionality for cursor modes of zooming and dragging

Regarding the recent update to the QPD format that came with Qimera 1.1, a new version of Qloud is now available for download. The only change is that it is compatible with QPDs made by Qimera 1.1 (and the upcoming QINSy release).

Documentation

The Qimera Team continues to work in updating and providing you new user documentation, please see the following new articles that are part of the Qimera user Knowledge Base:

- Tech Tip - 3D Editor and Scroll referencing
- New Features for Managing and Applying Tides in Qimera
- How-to Tide Strategy
- Howto Qimera - Scroll referencing

The Qimera Reference Manual continues to be reviewed and updated in regular bases:

- Qimera Automatic Import Dialog

RELEASE 1.1 - November 16th, 2015

Following up on the successful launch of Qimera in June of 2015, QPS is pleased to release Qimera 1.1, the first full feature release since its initial launch. With this release, we're expanding upon the vision that we've set out for ourselves: to make hydrographic data processing intuitive and as simple as possible, all the while offering powerful capabilities to those that need them without cluttering the workflow for those that don't.

- Fixes and Improvements
- Fixes and improvements
- Fixes and improvements
- Documentation
- What's New
  - Highlights
    - New File Formats
    - New Capabilities and Controls
    - New Workflows
    - New Analysis Tools
    - New Home for Existing QPS Tools and Capabilities
  - Full Feature Set
- Installation, Upgrade and Ongoing Support Information for Existing Users
- Documentation
- Known Issues

What's New

Highlights

There are several features to highlight in this release, as you'll see below. Some of the features being offered in Version 1.1 are new to Qimera but they come from existing tools and capabilities in the existing QPS software suite. This is in line with our long term vision to migrate capability between our applications to provide a smooth and streamlined workflow from one application to the next. Expect more along these lines as we carry on with our work of re-organizing capabilities across our product line in future feature releases. Many of the other new features are driven by client feedback and feature

requests and for these we thank our clients for getting in touch with us with their great ideas!

New File Formats

Raw Sonar Formats

Based on client demand, we now offer raw sonar data import support for the EdgeTech JSF format and the NavO GSF format. As we do with other raw sonar file formats, we extract as much information as possible from the data file and make it available to you for your processing needs. The EdgeTech format does not provide vessel information or sound velocity profiles whereas a GSF file may or may not provide these. For Qimera 1.1, we're also only supporting bathymetry processing for the EdgeTech format, sidescan visualization and processing will come in a future release. Be sure to consult the extensive notes we've prepared for both data formats in these documents: Qimera Sonar Source Data Import Capabilities and Qimera Supported Data Formats.

Navigation Formats

We've also added support for Applanix True Z from the Group 114 record, which is a filtered and improved height signal in the PosPAC recording files that is similar to True Heave.

Tide Formats

Several new tide formats are available for import as well. The tide data importer now works harder to automatically match your incoming data to known and supported formats to streamline the import process.

Export Formats and Capabilities

Export capabilities have been expanded to include the FAU format, with the option to exclude rejected soundings so that the exported file only contains validated soundings. A regrouping of Qimera's export capabilities into a single menu also makes it very easy to export your results whether it's a Dynamic Surface, sounding data or even a track-line.

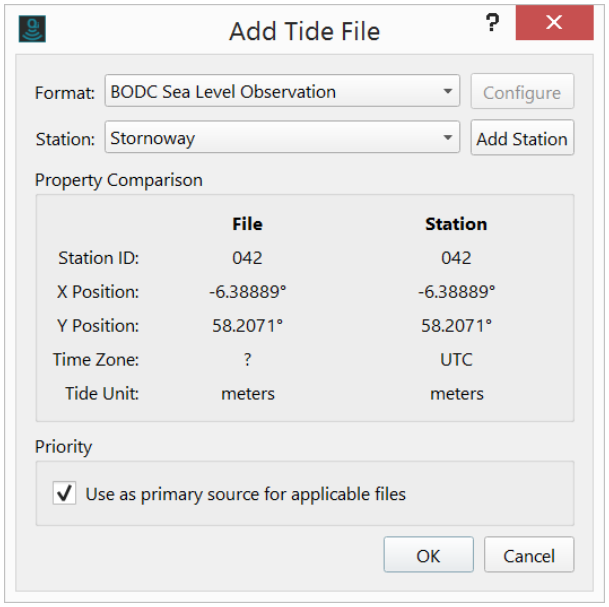
New Capabilities and Controls

Better Controls on Dynamic Surface Updates

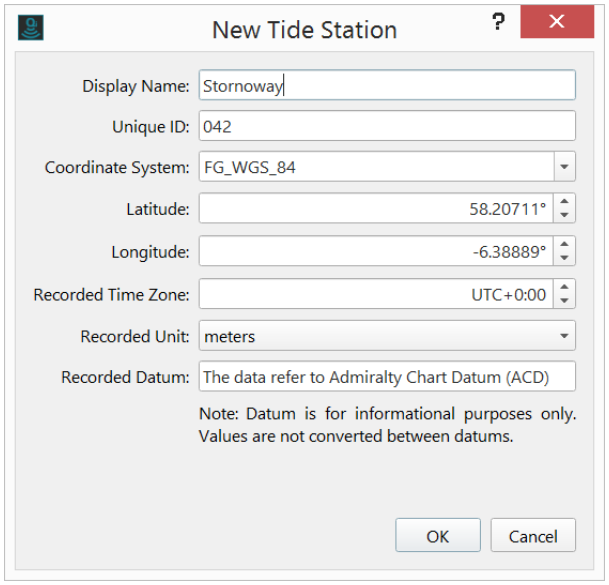
Dynamic Surface updating can now be controlled to be as dynamic as you like it. For users that want to delay the updating of one or multiple Dynamic Surfaces, there is a new control that lets you decide when you want the surface to update: Always, Only After Re-Processing, or Never. Of course, you can switch back to Always at any point and your Dynamic Surfaces will update. The control state is a property of the Dynamic Surface itself, so you can have small surfaces updating all the time whereas larger surfaces may be set to update less frequently.

Tide Station Handling

Tidal correction data are now managed by creating and/or specifying a tide station during the import stage. Some incoming data formats specify this and this information can be used to define the tide station properties during import. Of course, these can be changed after import by editing the Tide Station properties. The Add Tide File dialog below demonstrates the streamlined tide import process.

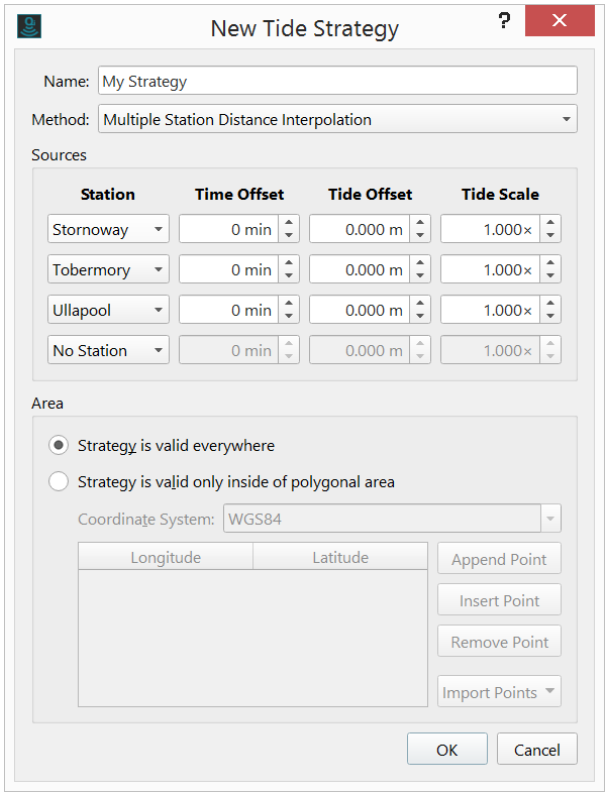


If an incoming file has station metadata, it is checked against existing stations in the project and the user can choose to confirm the match or to create a new tide station. The New Tide Station dialog below shows the information that Qimera is looking to parse from the incoming file. Some of the tide station information can be used to inform particular tide strategies, e.g. the position of the station, whereas other properties are purely for metadata purposes currently, like the vertical datum that the tide signal is referenced to.



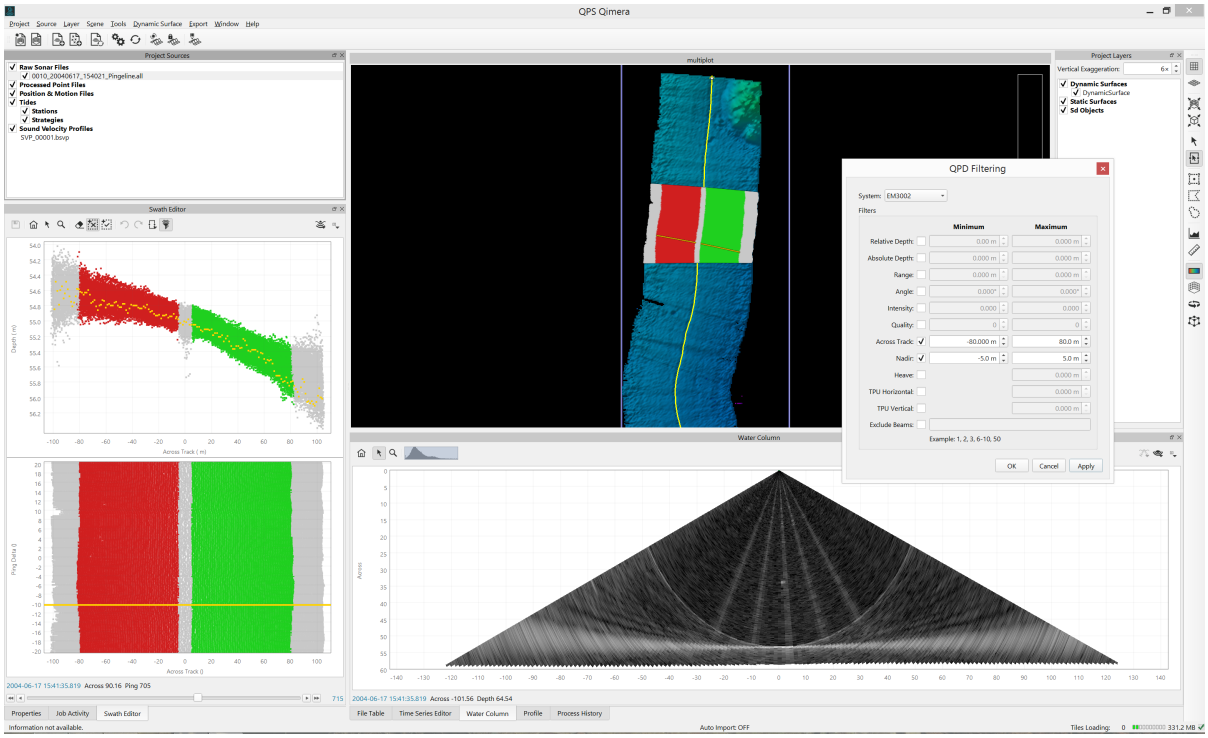
Multi-station Tide Processing

Multi-station tide processing is now available along with data management that allows you to specify tide stations and tide strategies. This makes it easier to manage the tide data itself separately from how the tidal corrections are applied. New strategies allow users to interpolate between two tides stations or to use an inverse-distance-weighted schema when more than two stations are supplied. In any of the tide strategies, individual tide station data can be adjusted for phase, amplitude and datum offsets on a strategy-by-strategy basis and spatial limits can be used to specify an area for which a strategy can be applied.



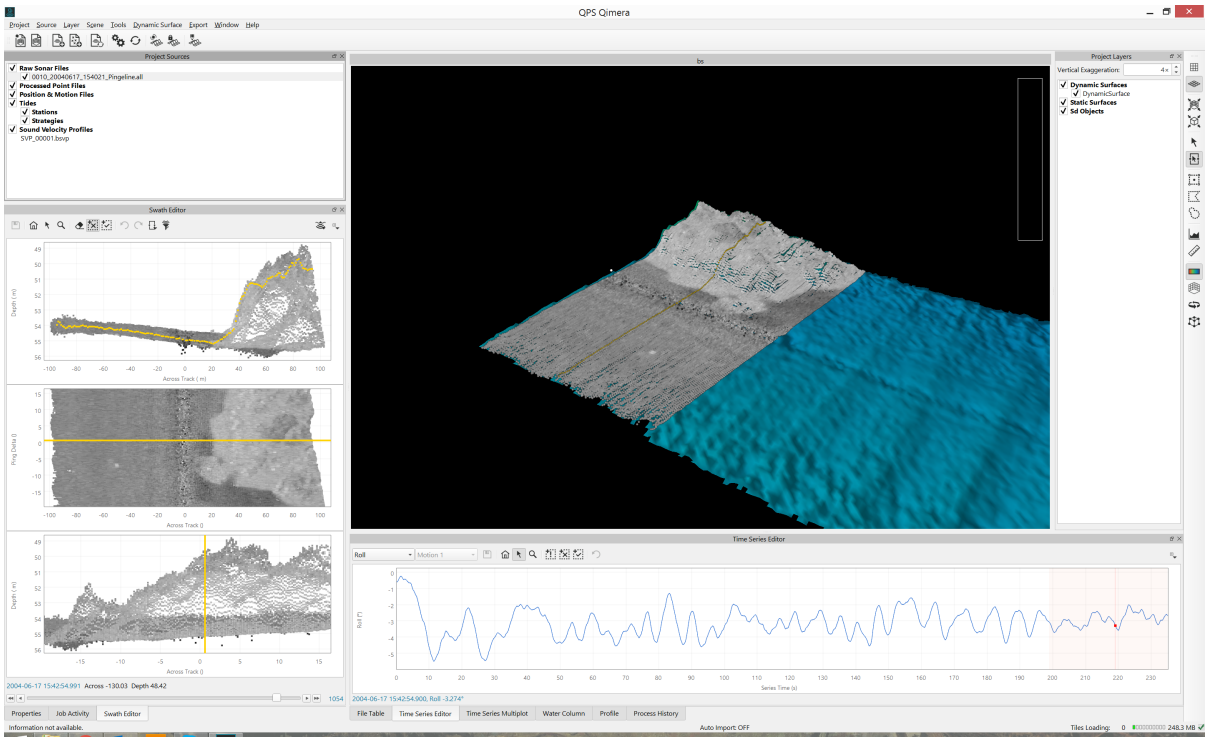
Faster Blocking with New Blocking Methods

Blocking now has a more intuitive workflow with a preview mode in the Swath Editor, as shown in the image below. The sounding plots in the Swath Editor and the 4D Scene all update to show the effect of Blocking Filters, allowing users to make better decisions on how to tune their Blocking Filters. In addition, a few new blocking filters have been added as requested by clients: filtering by maximum distance from nadir and also a nadir "notch" filter that removes a notch of user-specified width at nadir. Both of these are demonstrated below. Furthermore, the blocking computations have been decoupled from the QINSy multibeamer engine and now run much more quickly, allowing users to iterate to desired blocking settings much more quickly without having to re-process their data.



Swath Editor Improvements and Upgrades

The Swath Editor can also display soundings by echo intensity, giving a sneak peek at some of our plans for backscatter visualization and processing as well.



New Workflows

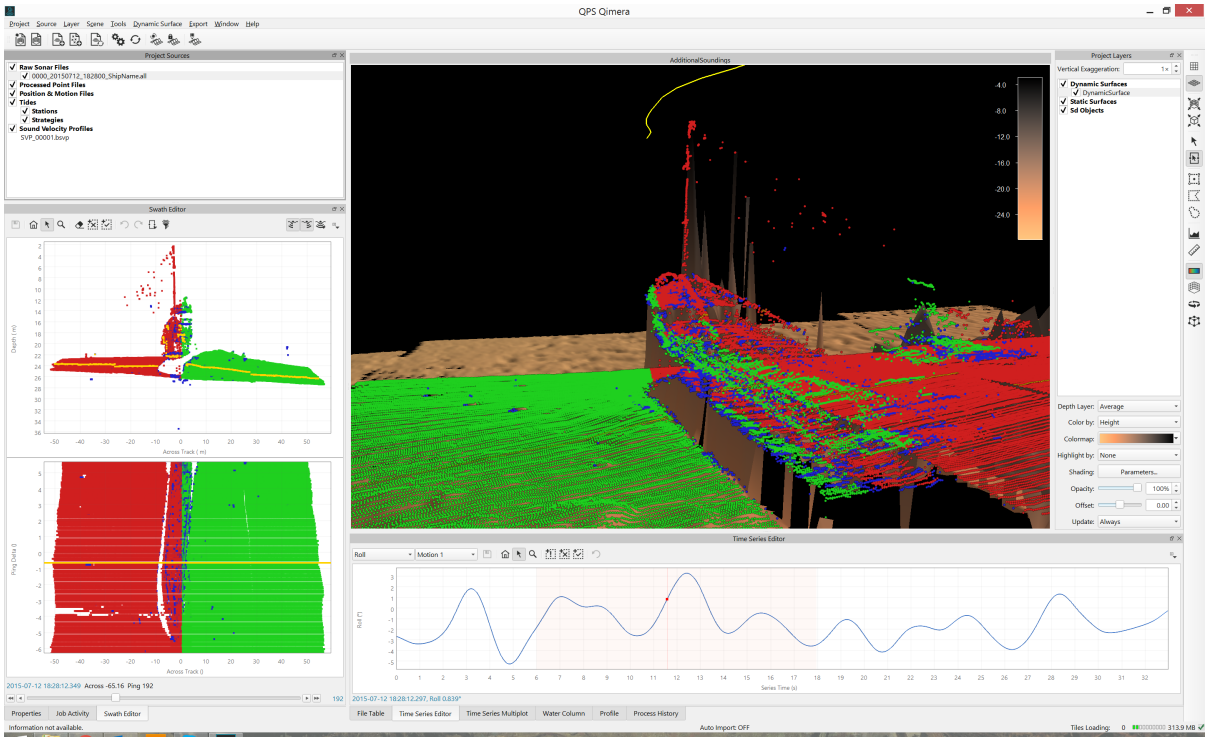
Qimera Live

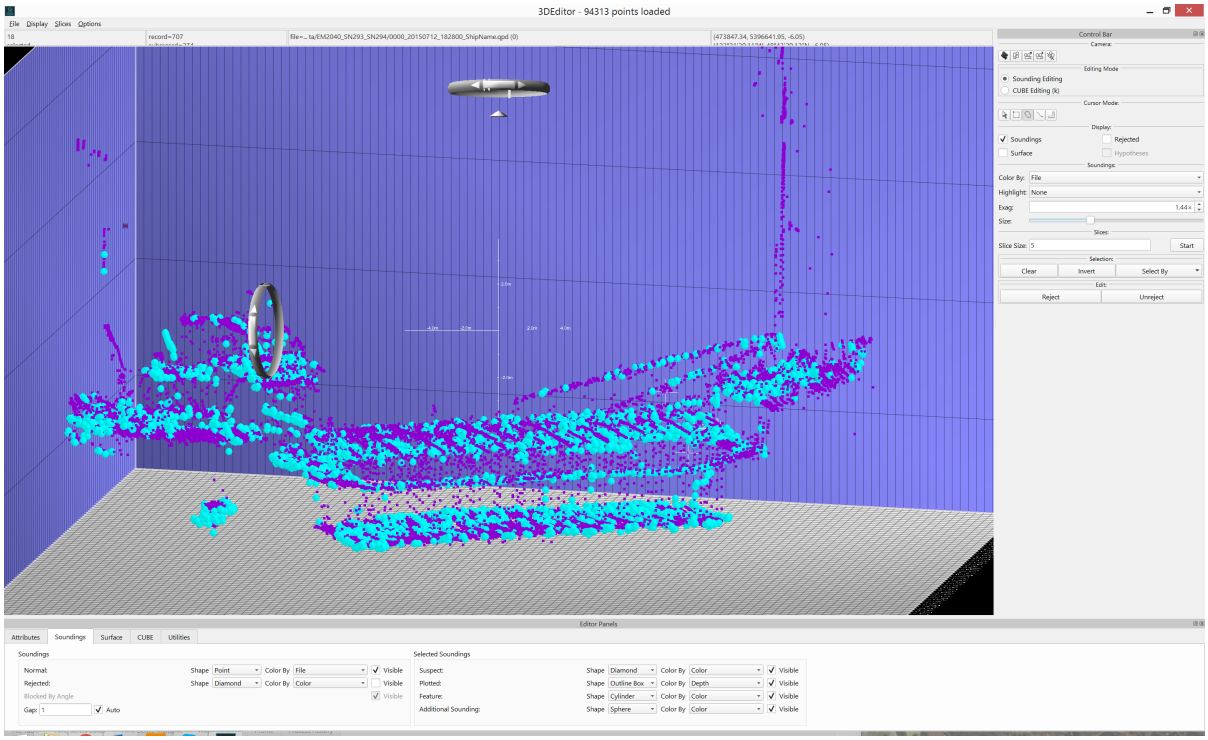
Following along with capabilities that were developed quite some time ago for FMGT, Qimera can now monitor a user-specified directory for new raw sonar data files. We're calling this mode of operation Qimera Live. When new files are found, for example at the end of acquisition for a survey line, they are imported, processed and added to a user-specified Dynamic Surface. This enables users to use Qimera as a near real-time quality assurance tool that helps monitor the quality of data during acquisition. Even if you trust your acquisition system to do this for you, Qimera Live gives you a second opinion, and it also highlights problems in the workflow early in the process so that they don't get discovered back in the office when it may be too late to fix the problem. In operations where data rates are relatively low, like in deep water mapping, Qimera Live stages the data for onboard processing efforts without having to worry about data transfer and data management. The data simply appear in the project and the Dynamic Surface is updated and data processors can get straight to work cleaning the data. For high data-rate projects where real-time cleaning is not an option, Qimera Live speeds up data transfer and import/ processing procedures to let you walk off the boat with your data ready to go when you hit the dock. Comments from one of our Beta testers sum it up best:

> *"I think that Qimera Live will offer some benefit to our operations, particularly for the typical end-of-day effort. This becomes especially helpful during projects with high data production rates."*

Additional Soundings

Qimera now also supports Kongsberg "Extra Detections" and Reson "multi-detect", along with providing upgrades in processing, visualization and editing modules to support a new type of workflow that elegantly handles this new capability from hardware vendors. Users will be able to clearly identify which soundings are Additional Soundings, and they can make decisions accordingly. The Swath Editor images below show the Additional Soundings in blue, the 3D editor draws them as teal spheres.





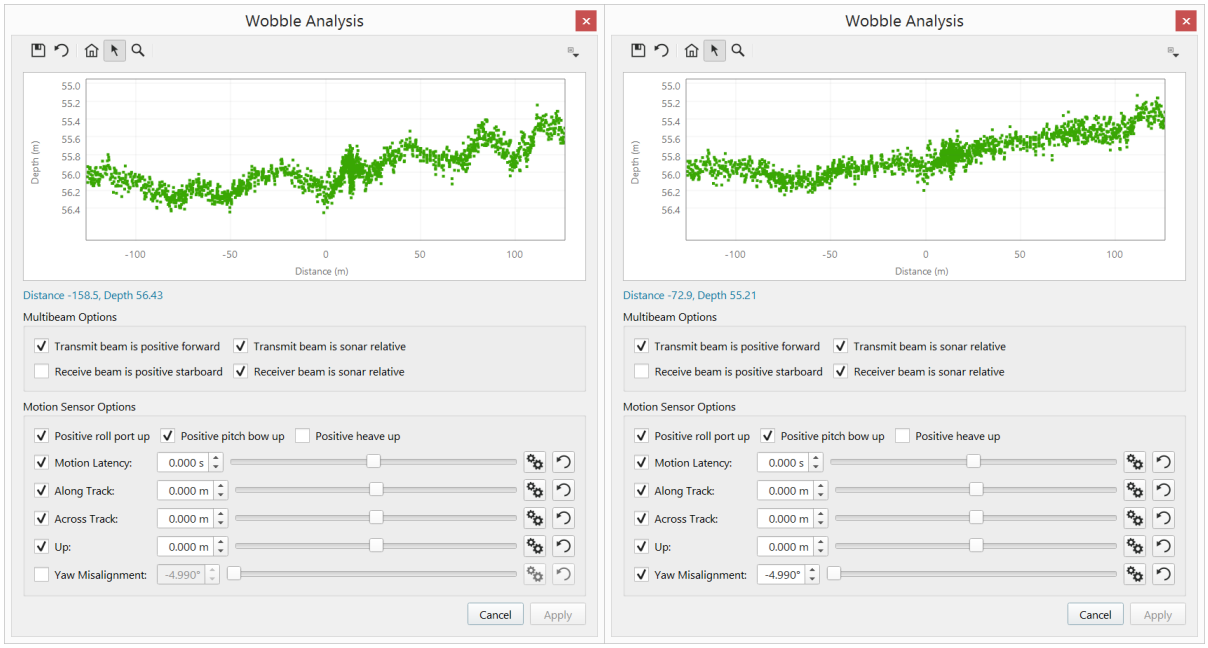
New Analysis Tools

Wobble Analysis for yaw misalignment

We've added the capability to correct for yaw misalignment for motion sensors, this is accessible as a new motion sensor configuration parameter in the Vessel Editor. Furthermore, we've augmented the Wobble Analysis Tool to assess yaw misalignment, which has been very well received by the community as evidenced from feedback from one of our Beta Testers who took the Beta version of Qimera 1.1 into the field to help him prepare for a demo on a vessel after a quick installation:

> *"This works well! I had a very rough mobilization for a demo and it definitely had a misalignment of around 1 degree. Basically this made a big difference, so very impressed."*

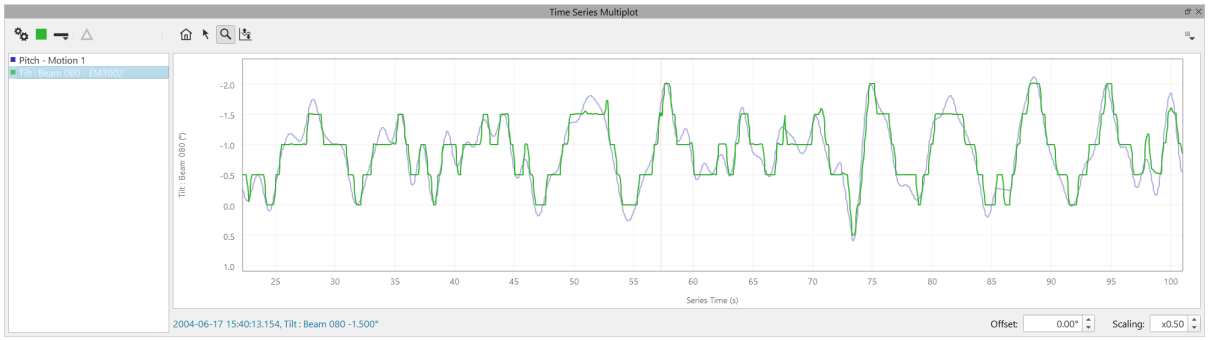
The before and after images below show the Wobble Analysis Tool being used to diagnose a yaw misalignment of 5 degrees.



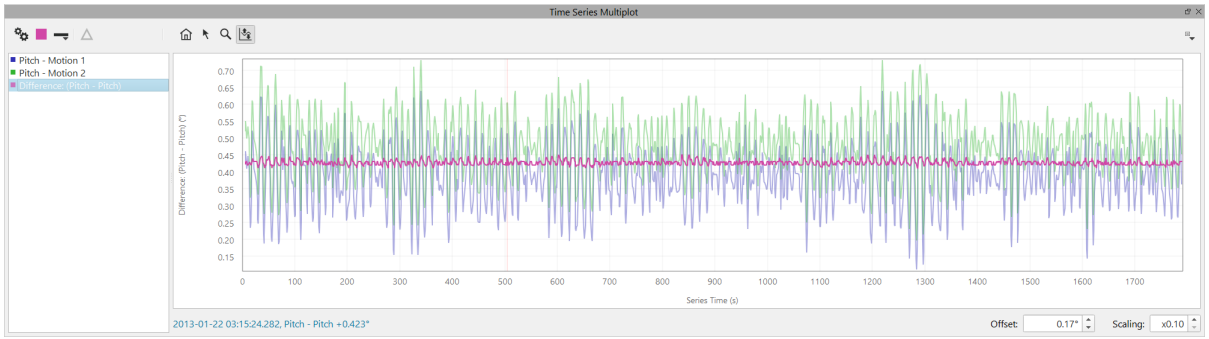
Multi-Plot

Based on the popularity of QINSy's Analyzer capability to handle multiple observation and computation time-series, we've developed a Multi-Plot tool that enables intuitive and quick analysis of multiple time-series. The interactive plot allows users to plot data with different units together on the same plot, with shifting and scaling capabilities to enable quick visual analysis of correlations, biases, etc. Signals with the same units can be differenced, with the difference signal being plotted on the same plot.

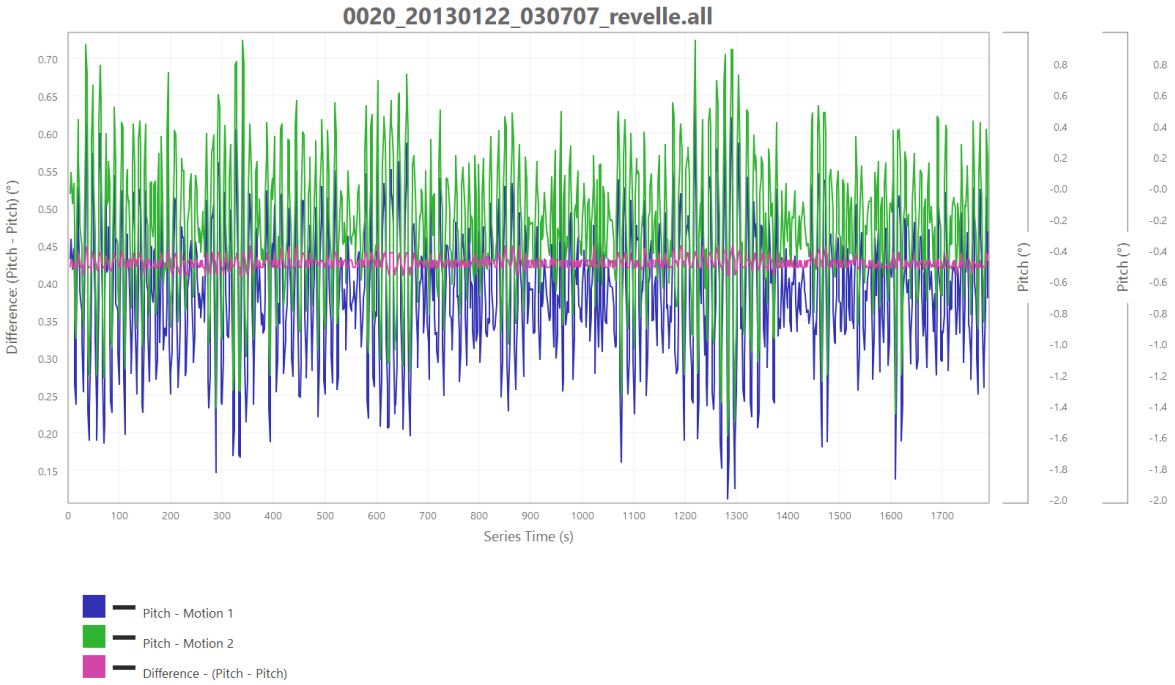
In the example below, we see how the Multi-Plot tool could be used to verify that a multibeam echosounder's pitch stabilization is functioning as intended. The blue time-series is the observed pitch and the green is the nadir beam transmit steering angle. The immediate visual correlation of these two signals proves the point in this particular case, whether you're commissioning a system and you need to demonstrate this to a client or perhaps you're troubleshooting an installation and need quick confirmation that pitch stabilization is working.



In this second example below, Multi-Plot is used to difference the pitch signals from two sensors to determine the pitch bias of the backup sensor relative to the primary sensor. The difference signal, in magenta, shows how the difference between the two pitch measurements varies in time, and allows the user to estimate a pitch bias of approximately 0.43° quickly and accurately.



Multi-plot graphs can be exported as images directly from the tool for inclusion in a report with full markup of the y-axis for all time-series in the plot. The image below exported image from the example above, with the difference signal labelled on the left y-axis and the two pitch signals being labelled on the right hand y-axes and a legend at the bottom of the graph.



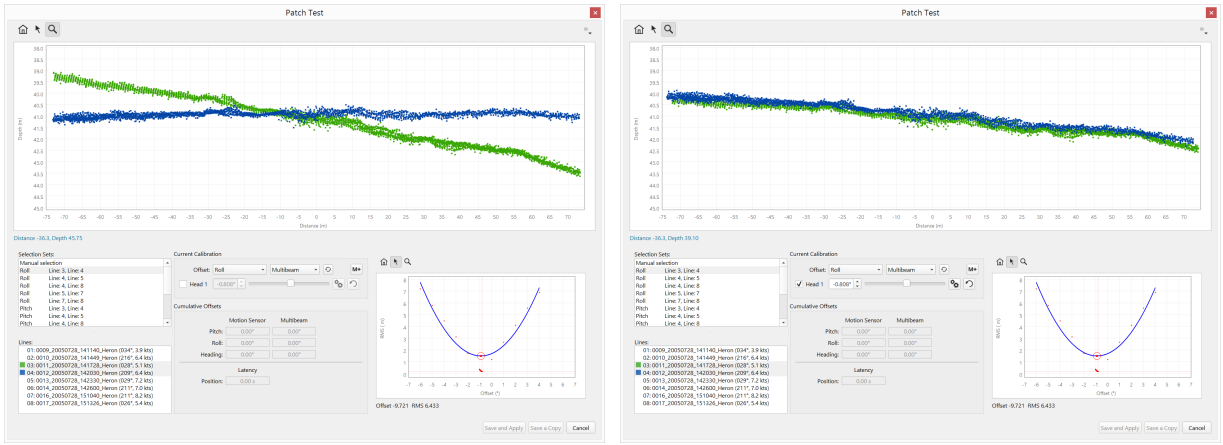
New Home for Existing QPS Tools and Capabilities

Patch Test Auto-Solve

We've brought the auto-solving capability from the QINSy Validator tool to the Qimera Patch Test tool. One Beta Tester was particularly impressed:

> *"The patch test tool works great. I liked the automatic positioning of the box and the information of each line within the patch test tool and the 'auto solve tool' worked perfect."*

Referring to the images below, the auto-solve capability comes with an RMS graph that plots the auto-solve results as red dots as is steps through its evaluation, and also the blue parabola curve that is fit to the red dots. The RMS graph also updates with additional red dots when the user adjusts the slider bar mechanism when they refine the result from the auto-solve.



Processed Point File Edit Unloading & Suspect Flag now supported

We've also successfully ported over capabilities from the Fledermaus FM Hydro workflow in that users can now unload edits back to processed point files that support this. If you're a Fledermaus user who's previously used Fledermaus, DMagic and 3D Editor to clean data and export cleaning back to the original data files, then now's the time for you to give Qimera a try to take advantage of the intuitive workflow and improved user experience that Qimera offers in a single application and user working environment. With our new flagging capabilities that came with our upgrade to the QPD format, you can now also use the Suspect flag, which was used by many of our FM Hydro clients to designate suspect soundings.

Full Feature Set

The full list of new features is provided below, grouped roughly by category. All new features are fully documented in the Reference Manual.

1. Project Management
    a. Remove project from welcome dialog
    b. Encapsulated Project
    c. New Export menu that centralizes all export capability in one location
2. Improved support of QINSy Geodetic configurations for QINSy users
    a. Construction Grids
    b. EGM2008
3. New Data Formats and capabilities
    a. Import
        i. Directory Monitoring (Qimera Live)

   ii. NavO GSF
   iii. Edgetech JSF
   iv. Additional Soundings workflow to support Kongsberg "Extra Detections" and Teledyne-Reson "Multi-detect"
   v. Applanix TrueZ now supported as part of binary navigation import
   vi. ASCII import of delayed heave
   vii. Streamlined tide importer that auto-detects file type if possible
   viii. Improvements to ASCII parser for tide formats
   ix. Additional tide file formats: Finnish, QINSy ASCII, SHOM, NOAA
2. Export
   i. FAU
   ii. Invert Z with ASCII export

4. Multi-Plot: Correlated time-series plot
5. Patch Test & Wobble Tool
   a. Auto-solve with RMS graph
   b. Locked node for common TX in patch test
   c. Wobble Analysis capability for pitch/roll crosstalk due to yaw misalignment
6. Multibeam Data Processing, Visualization, Filtering and Editing
   a. Blocking filters decoupled from QINSy engine, much faster and more agile, available in processing settings and in swath editor for preview mode
   b. New blocking filter by distance from nadir
   c. Tide Station management
      i. Improves tide file management
      ii. Improved metadata capabilities: Vertical datum, position
   d. New tide correction strategies and capabilities
      i. Phase, amplitude and datum shift
      ii. Single station
      iii. 2 station interpolation along projected line
      iv. 3+ stations IDW
      v. Area based application limits for any supported strategy
   e. Swath Editor support for triple MB head
   f. Swath Editor display intensity
   g. Undo option for Spline Filter
   h. Multibeam data file start and end time is now shown in the properties tab
   i. Disable/Enable processing of sonar head for multi-head systems
   j. Select raw sonar sources files that use a particular SVP
   k. Time-Series editor now plots with system latency, calibration offsets and sign conventions for improved QA

7. 3D Point Editing and Gridding
    a. Unload edits to points
    b. Dynamic Surface update control
    c. Scroll Reference Line
    d. Suspect flag now supported
    e. Additional heave, intensity and multi/extra detections display attributes in 3D Editor
    f. Ability to always hide soundings in 3D Editor that are flagged as both rejected and blocked by angle

Installation, Upgrade and Ongoing Support Information for Existing Users

Users with existing Qimera 1.0 projects will need to upgrade their QPD files when opening their older projects in Qimera 1.1. This upgrade is required to accommodate the new beam flagging and blocking capabilities in Qimera 1.1. You will be prompted to upgrade the QPDs in your project when it is first opened and you will have the option to decline the upgrade. If you accept the upgrade, no further action is required on your part. This is a reasonably fast operation, however, it will understandably take longer for larger projects. If you decline the upgrade, the project will not open and it will remain usable in Qimera 1.0. If you attempt to open this project again at a later stage in Qimera 1.1, it will continue to prompt you to upgrade. If you are a QINSy and or Fledermaus user and you expect to be able to process your QPD files in other QPS applications, it is advised that you delay the upgrade to Qimera 1.1 until the next QINSy release and/or the next Fledermaus release, at which point QINSy and Fledermaus will be able to correctly handle the new QPD format. The QINSy and Fledermaus releases are currently slated for some time shortly after the Qimera 1.1 release.

During the development phase for Qimera 1.1, we paid close attention to incoming bug reports from our Qimera 1.0 clients and we've streamlined our release process to get fixes out to clients in a timely manner, as often as required. This new, streamlined process enabled delivery of seven bug fix releases since the launch of Qimera 1.0 in June. We will continue to provide this quick turnaround level of service to our customers with Qimera 1.1. If you find a bug, please contact us and we'll attempt to get a fix to you as quickly as possible.

When we first released Qimera 1.0, we purposely kept it lean and mean with the intent of focusing on client feedback to help direct us on how best to hone existing capabilities and also to help us decide which new functionality clients need most. We've done the same with Qimera 1.1, so please keep ideas and feedback coming, it helps us to make Qimera better for all users! Please feel free to contact us via the online support system for feedback, feature requests and bug reports.

Documentation

Several new "How To" style documentation is available to give some guidance on how to use some of the new features in Qimera 1.1.

- How-to Work with Additional Soundings
- How-to Work with Qinsy and Qimera Live
- How-to EGM2008 Geoid
- How-to Time Series Multiplot
- How-to Make Qinsy Vertical Datum resources available to Qimera

Reference Manual:

- The Reference Manual has been updated for all features in this release
- A minor re-organization has been done in that the Supported Data Formats documentation has had much more detail provided about the various raw sonar data file formats, this was previously documented in the Add Raw Sonar Files Dialog documentation.
- We're continuing to update other Knowledge Base articles.

Known Issues

We are continuing to improve the support of geodetic configurations for our QINSy users. In particular, users may find that geodetic resources that are available with a QINSy installation and/or module upgrade are not available with Qimera's baseline installation. We are currently devoting resources to harmonizing the geodetic resources between all of our software applications and improvements will be coming soon. In the meantime, QINSy users may find that they need to copy various geodetic resource files from their QINSy installation to their Qimera installation. We have a new Howto document describing how to deal with these scenarios.

Qimera 1.2 Release Notes

Note for Qimera 1.2 Users:

An important fix was implemented in 1.2.1. We recommend that anyone using Qimera 1.2.0 upgrade to 1.2.1 immediately. Please go to RELEASE 1.2.1 - March 18th, 2016 for further information.

RELEASE 1.2.0 - March 15th, 2016
RELEASE 1.2.1 - March 18th, 2016
RELEASE 1.2.2 - April 20th, 2016
RELEASE 1.2.3 - May 10th, 2016
RELEASE 1.2.4 - May 19th, 2016
RELEASE 1.2.5 - June 14th, 2016

RELEASE 1.2 - March 15th, 2016

QPS is pleased to release Qimera 1.2, the second full feature release since its initial launch in June of 2015. With this release, we're continuing to expand upon the vision that we've set out for ourselves: to make hydrographic data processing intuitive and as simple as possible, all the while offering powerful capabilities to those that need them without cluttering the workflow for those that don't. We are also making a very big step towards our goal of providing a replacement for Qloud with our new Slice Editor. With this release, we provide capability that gives the look & feel and user data interaction from Qloud, with the next release (1.3) we will be focusing on bringing the Qloud filtering tools. Read on for details below and, as always, please get in touch with us via the online support system if you have any questions about how the new features may fit into your existing workflows.

There are several features to highlight in this release, as you'll see below. Some of the features being offered in Version 1.2 are new to Qimera but they come from existing tools and capabilities in the existing QPS software suite. This is in line with our long term vision to migrate capability between our applications to provide a smooth and streamlined workflow from one application to the next. Expect more along these lines as we carry on

with our work of re-organizing capabilities across our product line in future feature releases. Many of the other new features are driven by client feedback and feature requests and for these we thank our clients for getting in touch with us with their great ideas!

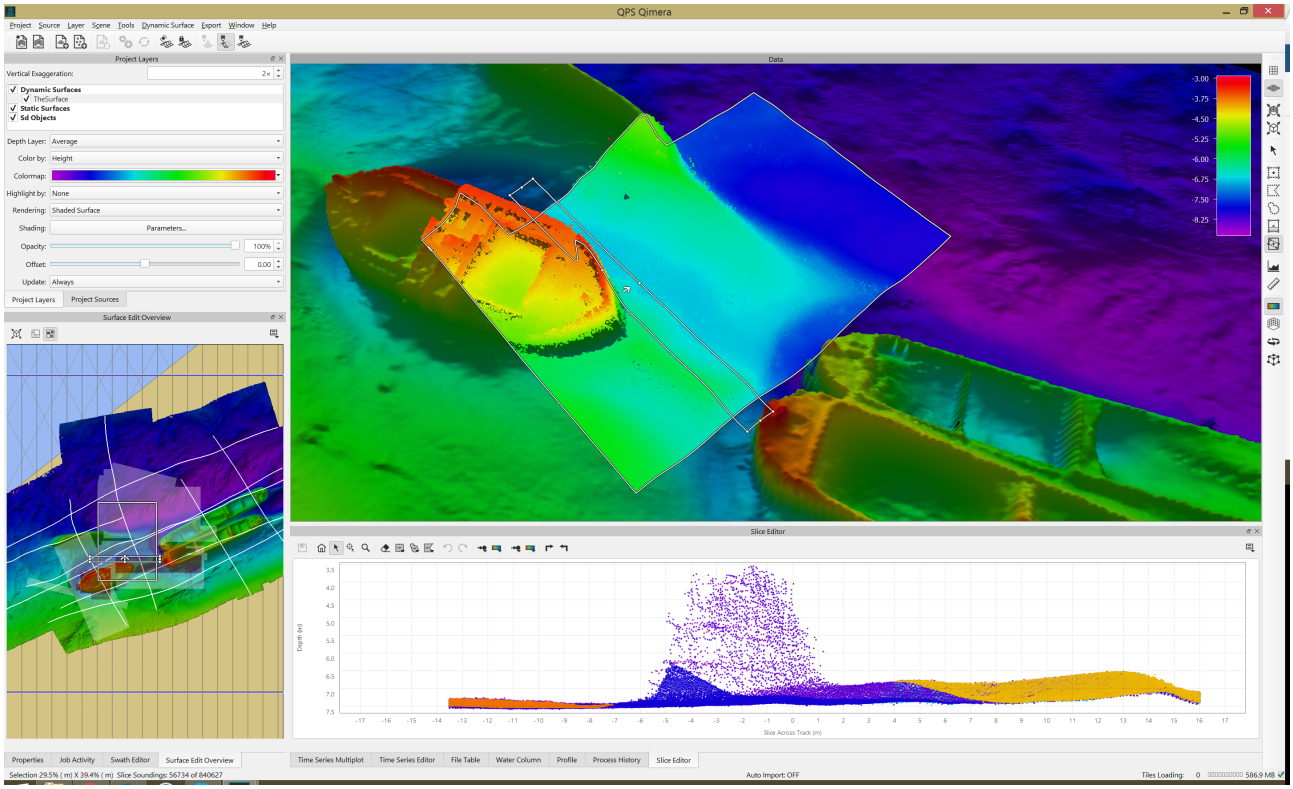
- What's New
  - New Capabilities & Workflows
    - Slice Editor: Select, Edit, See.
    - QPS Seamless Workflow: Going from QINSy to Qimera
  - New Supported Input File Formats
    - Navigation Formats
    - Tide Processing Improvements
    - Export Formats and Capabilities
  - New Analysis Tools
    - Cross line Statistical Analysis
    - Cross-Correlation Plot
  - Improvements to Existing Features and Workflows
    - Improvements to Plotting Widgets
    - Guided Workflow
    - Improved subsurface vehicle data extraction and vehicle handling
    - Miscellaneous Improvements
    - Bug Fixes
- Installation, Upgrade and Ongoing Support Information for Existing Users
- Documentation
- Known Issues
- Fixes and Improvements
- Fixes and Improvements
  - Highlights
  - Technical Notes
- Fixes and Improvements
  - Highlights
  - Technical Notes
- Fixes and Improvements

- Highlights
- Technical Notes
- Fixes and Improvements
  - Highlights
  - Technical Notes

What's New

New Capabilities & Workflows

Slice Editor: Select, Edit, See.



We are very pleased to offer a new Slice Editor. The Slice Editor allows you to easily select, review and edit slices of points directly from the 4D Scene, all launched with the single click of a button. We have purposely designed the interface to require as little mouse or keyboard action as possible for the most common task in a Slice Editor: editing data. With auto-reject/auto-update modes and ergonomic keyboard shortcuts, the user can easily review data sets quickly without breaking gaze from the Slice Editor to reposition the Slice or to click a Save button. The user chooses from a set of selection widgets in the 4D Scene toolbar allows and draws a spatial selection in the Scene and these soundings are loaded immediately into the Slice Editor, along with drawing the points in the Scene. A 2D

overview map widget has also been added to provide the overview scale context while slice editing since the 4D Scene may be zoomed in somewhat to accommodate the user's desired view. An ENC background can also be shown in the overview map based on global and regional scale shorelines that are part of the standard QINSy installation.

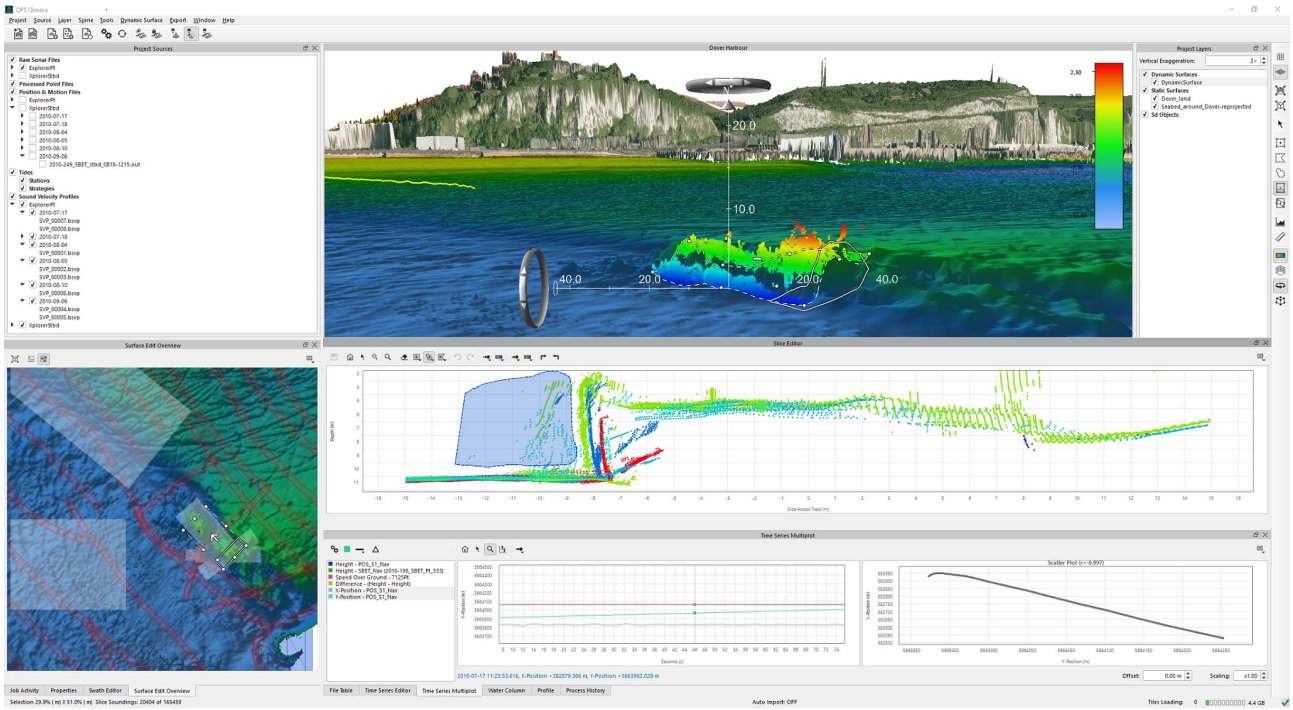
Many of the features that our clients love about Qloud have been brought over to Qimera:

- You position a spatial selection tool and move it to where you need to review in the Scene, a 3D point cloud is drawn directly into the Scene instantly
- The points in the selection box are drawn in a 2D Slice Editor where you can select, review and flag soundings
- Once editing is completed, both the 3D point cloud and the underlying Dynamic Surface are updated to provide immediate feedback on whether you've cleaned the data enough, or too much
- An overview plan view keeps track of areas you've visited and areas you've edited all the while providing spatial context to assist in decision making
- The spatial selection box can be tied to a user specified survey line object to follow a particular ship track

As you review your data, the Slice Editor updates the soundings flags in the QPDs and also updates the Dynamic Surface. When you are done, you are done. The soundings have been edited and the surface reflects your edits. There is no re-gridding to do, nor do you have to export your cleaning back to your QPD sounding files.

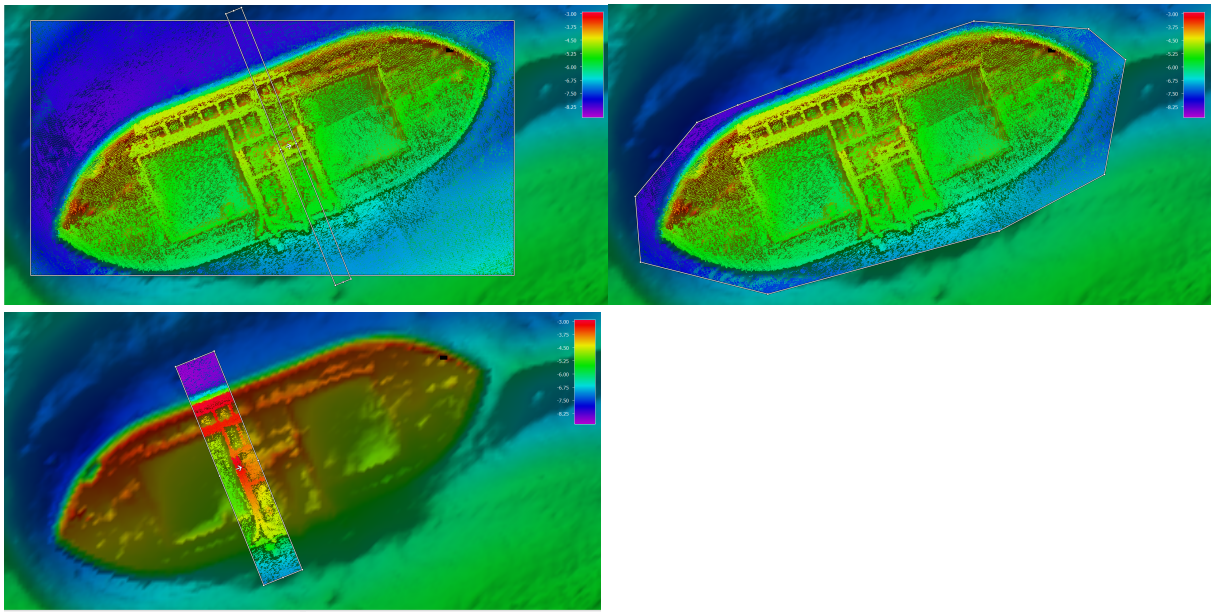
For QINSy and Qloud users, this will feel very familiar. This is by design: our Qloud clients liked Qloud for a reason and we have worked hard to bring the look & feel and data interaction experience of Qloud into Qimera. Of course, we have made improvements along the way that we feel will provide an enhanced experience over what Qloud provided. Qimera is 64-bit and allows for large data sets in a way that would have been difficult in Qloud. The Fledermaus Visualization Engine that is used by Qimera allows you to see your point clouds with as much contextual, 3D information as you feel that you need, as shown below. This is a major enhancement over Qloud and other point editors currently on the market.

For users of the Fledermaus 3D Editor, which has been bundled with Qimera since it was released, this will also feel familiar in that you can select, edit and mark up points as features, suspect or plotted soundings in addition to doing data cleaning. Several show/hide capabilities allow you to display soundings in a granular manner based on sounding type, accept/reject, filter status, etc. The big difference for 3D Editor users is that the experience is now integrated directly into Qimera so your edits are tracked with the new overview and if you say, find a tide error, you can fix it in Qimera, open up the 3D Editor and continue where you left off.



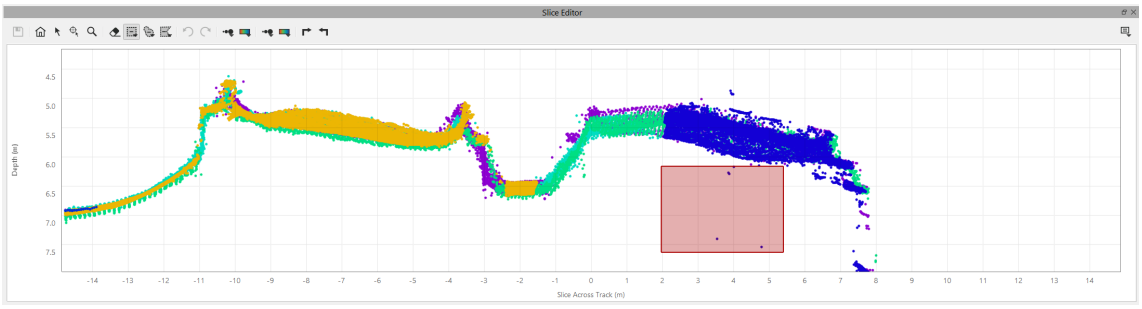
Select

There are several spatial selection modes that give a toolbelt to choose from when you need to validate your data. Rotating rectangular selection, rectangular slice selection with a fixed sub-slice and a rectangular slice selection with a freely rotating internal sub-slice selection mode. Also, polygon and lasso tools can be used to choose which chunk of your data you'd like to review. Each tool is best suited for particular purposes. For example, the rotating rectangular selection is great for hunting down a few spikes: you draw a rectangle, re-position it on a spike and clean it, then you re-position on the next spike and clean it. Fixed Slice mode is perfect for systematic data review where you find yourself needing to scan through an entire data set in a systematic manner. No matter which you choose, the data loads quickly and you get straight to work.

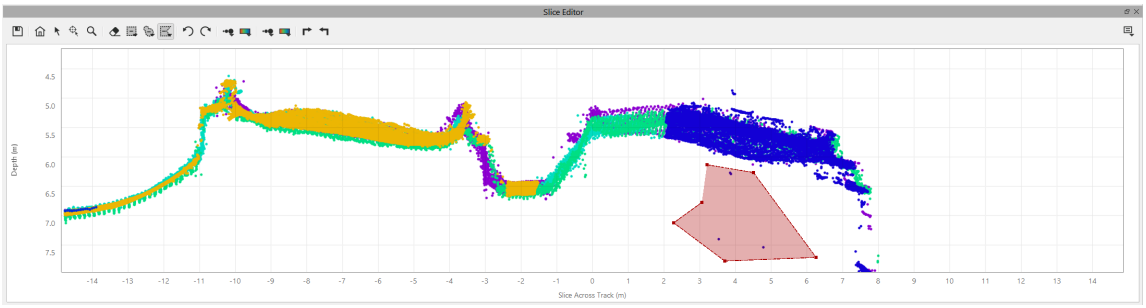


Edit

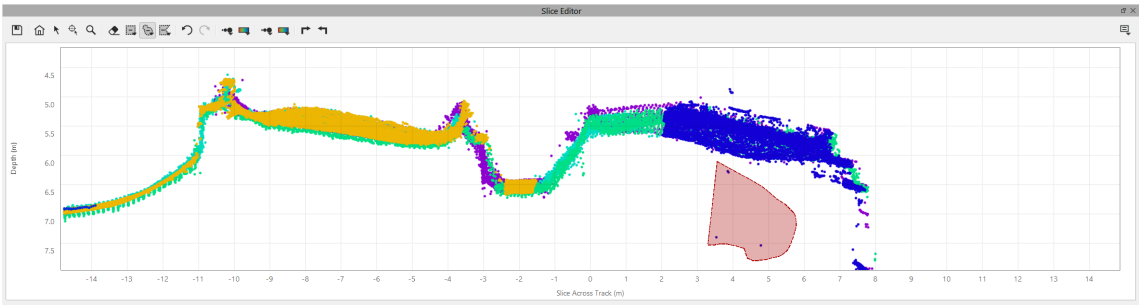
The Slice Editor provides a number of point selection modes, depending on your preference. Rectangular Select has you click and drag a rectangle to define an area to edit. It is a single mouse click and drag so it is efficient but perhaps not the best tool to use when the seafloor is not flat. Polygon Select has you click points to define an edit polygon, the polygon is closed when you click on the start point. Some users prefer this when working at sea where it can be difficult to do fine scale mouse manipulation in rough sea states. Lasso Select lets you click and drag a lasso around the points, the points are edited when you release the mouse button. This has been the most popular editing tool so far in our testing! We have also ported the popular eraser tool from the Qimera Swath Editor that lets you control the eraser circle size with the scroll wheel. Porting works both ways, and we have brought the Slice Editor's rectangle, polygon and lasso selection capabilities to the Swath Editor as well in response to client feedback about the Swath Editor.



Rectangular Select



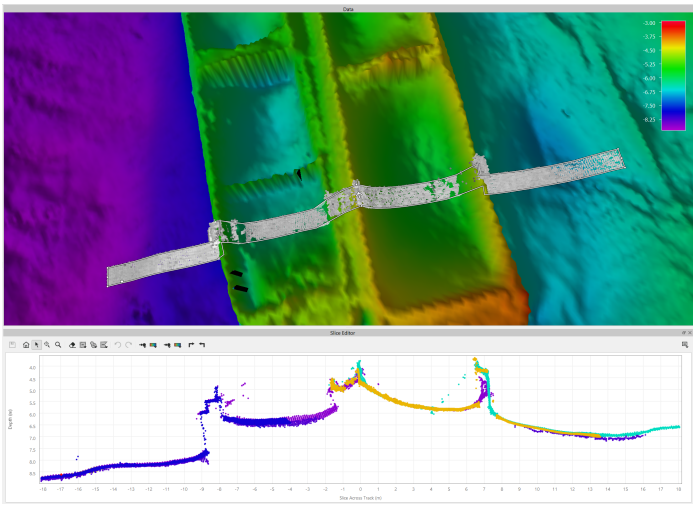
Polygon Select



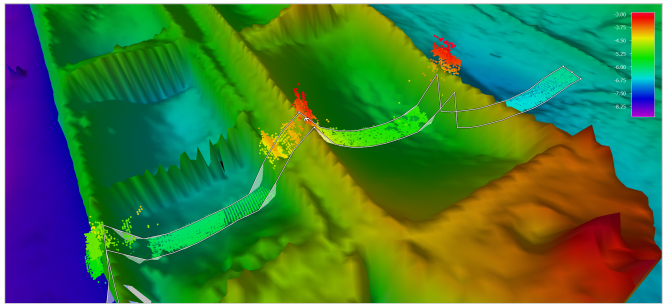
Lasso Select

See

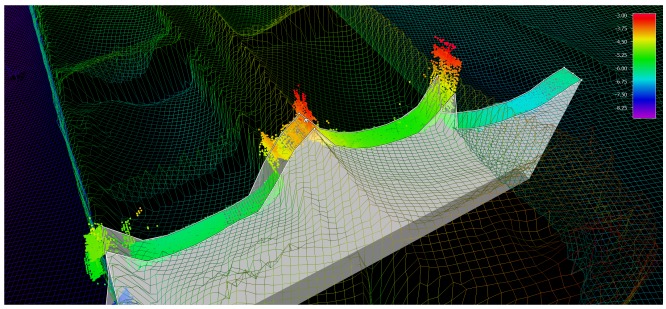
It does not make sense to paint things in the dark, nor does it make sense to edit point data without being able to see your results. We have streamlined the disk I/O and grid updating so that you can evaluate the effectiveness of your cleaning efforts immediately before moving on to assess another area. When you edit points, the soundings in the Scene are updated automatically and so is the Dynamic Surface. Visibility controls on the points and the Dynamic Surface allow you to craft a view that makes the most sense for your task at hand. Point sizes in the Slice Editor and the Scene can be controlled independently or can be locked together. Having the points very large in the Slice Editor, for example, is good for seeing outliers, but having them small in the Scene allows you to better assess the point relationship with respect to the underlying surface. You can also set colouring options used to display the points, again, these can be controlled independently between the Slice Editor and the Scene, or they can be locked together. One use example is to colour Slice Editor points by survey line and to colour points in the Scene by beam backscatter to provide more context when deciding on the fate of a sounding, as shown in the image below. This is the PFM functionality that Fledermaus users loved with the 3D Editor, so we made sure to bring it to the Slice Editor.



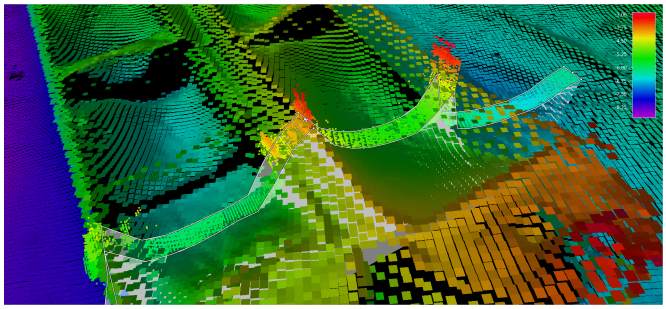
The Dynamic Surface also has new visualization controls to display a shaded surface, a wire frame or plates. The wireframe mesh mode allows you to see 3D points both above and below the surface during editing. As with previous versions of Qimera, you can color the Dynamic Surface by depth, standard deviation, sounding density, etc, to help guide the data assessment process.



Shaded surface



Wireframe

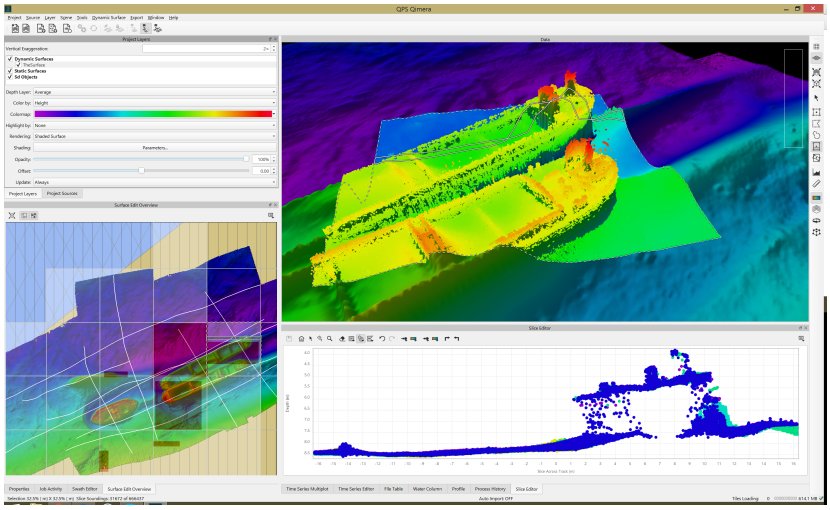


Plates

Streamlined and Intuitive User Interaction

Ergonomic keyboard shortcuts and minimal mouse interaction is the rule in the design that we've used. We've tried to take the button clicking and key pressing out of the way as much as possible. The Slice Editor is easily configured to work in a way that allows the user to easily review data sets quickly without breaking gaze from the Slice Editor to re-position the Slice or to click a Save button. Keyboard shortcuts for movements come from the ergonomic default settings used by the computer gaming industry: W and S move you forward and backward, A and D move you to the left and right, Q and E rotate you left and right. You can tailor your workflow to update instantly or when you choose, depending on your needs. If you need updates to happen immediately, you can easily configure it that way. On the other hand, if you are working over a network connection and response times are not optimal, you can delay the updates to maintain a responsive experience. Over very slow network connections, you can delay updates to the grid entirely using the Dynamic Surface update controls that were introduced in Qimera 1.1. It's easily configurable and you can tune your workflow to match your hardware and network capabilities.

The Surface Edit Overview map provides spatial context and users can now also visualize ENCs in the Surface Edit Overview and the 3D Scene (when in 2D view only) using the global and regional scale charts that ship with QINSy. In upcoming versions, we'll be adding capability to load custom ENCs. The Overview map also allows you to track the areas that you've seen and areas that you've edited separately in a way that lets you easily manage data validation tasks for large surveys. The Slice Editor automatically marks areas that have been reviewed and edited as an overlay area in the overview map. This allows a pushbroom trail to follow you as you edit to help you maintain awareness of what has and has not been reviewed or edited. The image below shows this clearly in the lower left hand overview map where semi-transparent white tiles indicate areas that have been reviewed and red areas indicate where the user has made edits. This same capability is now used with the 3D Editor as well.

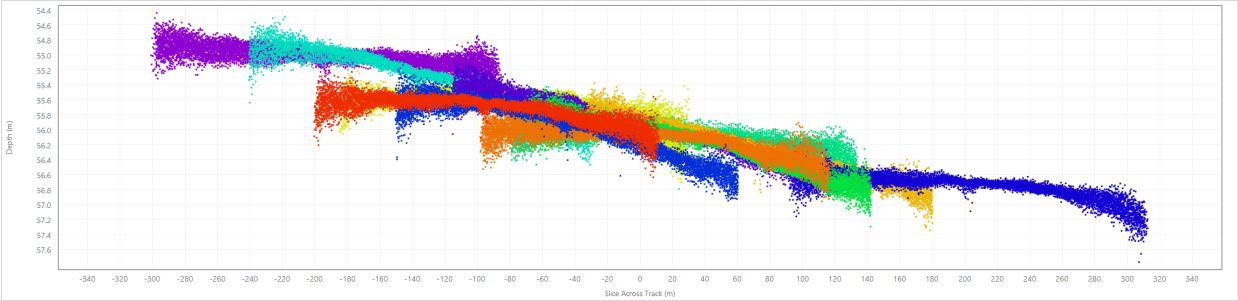


For particularly large data sets, the user can generate a set of validation areas that covers the spatial area associated with the Dynamic Surface inline with what is currently done in Qloud. For responsiveness, the default area generation scheme creates square tiles that limit the total number of soundings loaded at any one point. Combined with the validation area markup, this provides a great mechanism to manage the process of systematically reviewing and validating data sets.

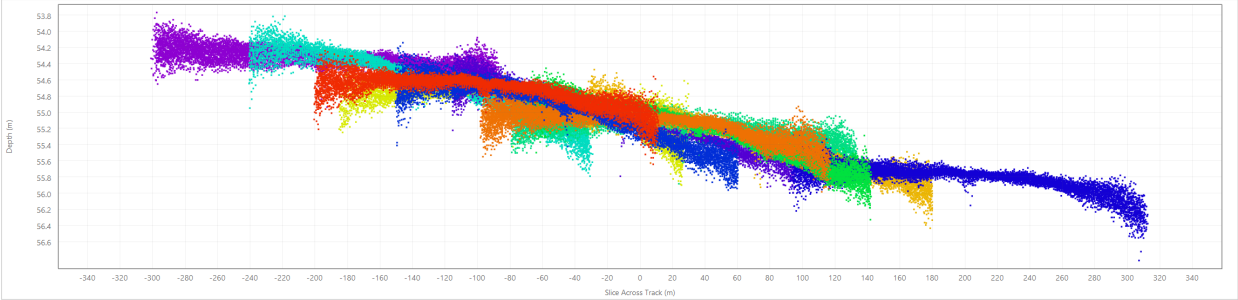
As mentioned earlier, Qloud users will find that the Slice Editor experience gives them a tool that is familiar in terms of the look & feel and also the user interaction with points. We have planned a two-stage approach to bringing Qloud capability to Qimera and building the Slice Editor was the first stage. The second stage will have us porting over the filtering capability from Qloud into our next feature release, Qimera 1.3.

Dynamic Workflow

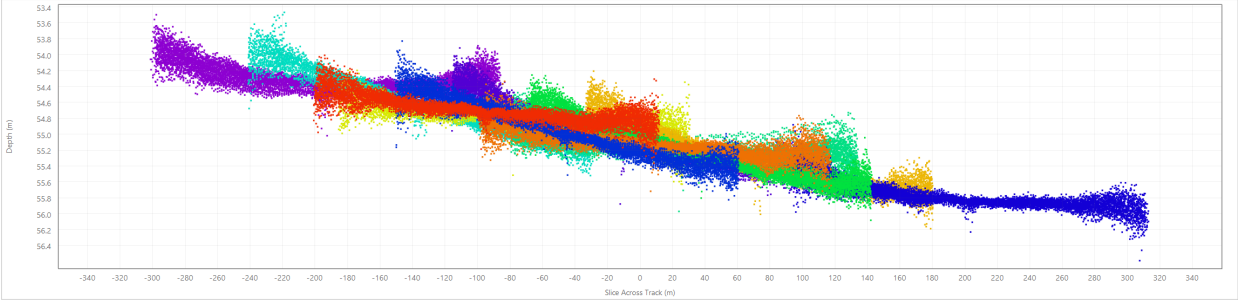
Perhaps one of the most powerful features of the Slice Editor is that it is hooked up to Qimera's Dynamic Workflow. This means that the Slice Editor allows you to see the effects of processing changes immediately. It's not only a Slice *Editor*, it's a Slice *Viewer* in that you get a live and dynamic window into your sounding data that updates with processing configuration changes in a way that gives you intuitive and simple before/after analysis capability. If you make the processing configuration changes of any kinds (e.g. change sensor offsets, switch to a different SVP, add a tide datum offset, change blocking parameters, etc), Qimera's Dynamic Workflow will update the Dynamic Surface and it will also update the soundings that are currently loaded into the Slice Editor. You make a change, you see the results, you assess whether it had the desired effect. Simple and easy, but very powerful as a live QA tool. If you need to have an immediate assessment of whether or not your processing configuration made an improvement, the Slice Editor gives you a live window into your data to help make this decision, as shown in the sequence of images below where raw data is viewed before tide is applied, after tide is applied and finally after an edit to an incorrect SVP cast.



*Slice editor view **before** tides applied.*



*Slice editor view **after** tides applied.*



Slice editor view after SVP edited for errors in SVP measurements.

QPS Seamless Workflow: Going from QINSy to Qimera

QINSy users will be very pleased to learn about a major improvement to the way Qimera loads QINSy projects. Many QINSy users pride themselves on getting the data integration correct during acquisition, leaving only the task of data validation after acquisition is complete. For these users, we now prompt to import the online QPD files as points, this now allows them to jump straight to the data validation tasks with only a very short wait while Qimera scans the QPD headers. This is a much faster scan than what users previously experienced since Qimera was extracting information from the DB files in earlier releases, even if the users did not intend to recompute their soundings.

In the rare case that a QINSy user has imported points and they need to re-process, we've added the capability to "promote" QINSy QPD point files to be raw sonar files. This can be

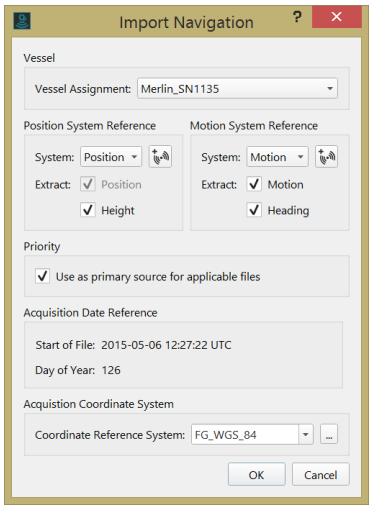
done for only as many files for which it is required and the other QPD files that don't need re-processing can remain as QPDs in the project. For files that are "promoted" to raw sonar processing capability, you have the same re-processing capability that has always existed in Qimera but now you only pay the price of data extraction and re-processing for the files for which it is needed.

The final step in making the post-acquisition workflow faster is to take advantage of work that QINSy has done during acquisition. The QINSy 8.12.0 release that coincides with the Qimera 1.2 release is now capable of generating a Dynamic Surface while online. When the QINSy project is opened in Qimera, the QPDs and the Dynamic Surface are found right away. In previous releases of Qimera, QINSy users had to create a Dynamic Surface and this took valuable time. Now QINSy can be configured to stage you for immediate processing. When the last ping is acquired and you go offline from QINSy, Qimera can open your QINSy project and get you to data cleaning very quickly. Combined with the single button click to launch the Slice Editor, you are quite literally a minute or two away from getting to data cleaning and getting your job done. For QINSy users who have taken the time to get it right during acquisition, this provides a significant improvement in workflow times.

New Supported Input File Formats

Navigation Formats

We've added support to import Post-Processed SBTC/SBIC Files from NovAtel Inertial Explorer. This provides 3D position and attitude, along with their associated uncertainties, similar to other 3rd party navigation formats that are already supported in Qimera. The existing import experience for external navigation format remains the same so this is easy capability to try out if you are already familiar with that workflow.



Tide Processing Improvements

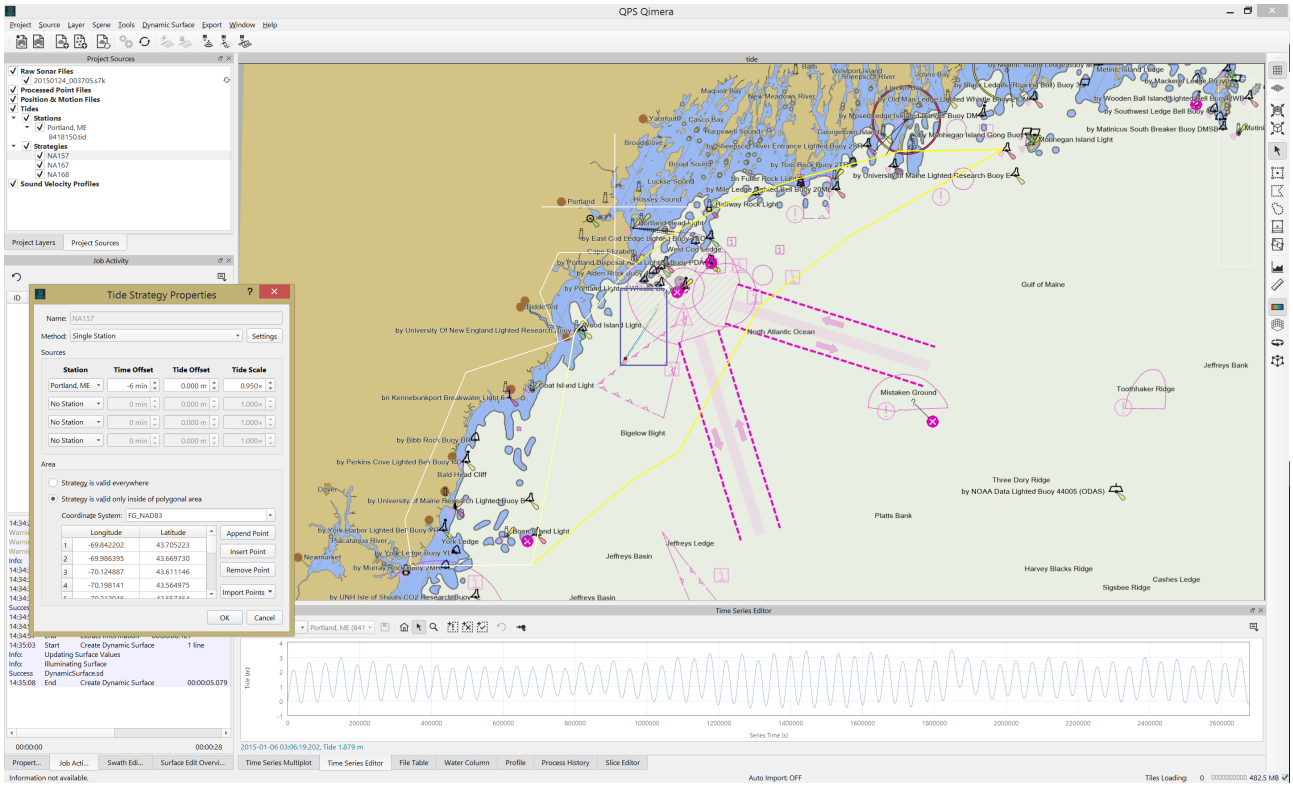
We've added support for all of the QTD/QTF capabilities supported by QINSy and Qimera is now fully compliant with QINSy tide processing method configurations. Qimera now supports the following tide strategies:

- Single Station
- Average
- Two Station Linear Interpolation
- Multiple Station Distance Interpolation
- Linear Co-Tidal Interpolation

Additional processing tweaks can now be specified as well, in addition to enhanced QA tools to help you verify your tide strategy settings:

- Tide offsets, e.g. datum shifts, can be applied before or after tide scaling
- A maximum time interpolation gap can be specified
- Tide strategies now plot in the time-series editor, they are editable and respond to changes to tide station offsets, scaling and time-shifting.

This release of Qimera now also supports the NOAA Zoned Tides format (ZDF, zone definition file) and the NOAA COOPS Tidebot format. As with previous releases, you point Qimera to the file and it determines what type of tide file it is and it acts accordingly. For the NOAA ZDF, the zones can be graphically displayed to provide easy QA capabilities to ensure that your multibeam data files fall within the zones that you've specified, as shown in the image below. Being able to plot ENCs in the background also provides helpful contextual information that lets you easily confirm that you have the correct ZDF loaded.



Export Formats and Capabilities

- Full GSF export capability with the SVP, vessel sensor offsets, and high-rate motion data that were used to generate your results. Earlier versions of the GSF export only provided bathymetry, seabed imagery data and sonar specific subrecord information (ping metadata). Now the GSFs hold as much information as possible.
- Export BAG for surfaces that have no CUBE uncertainty layer, the Dynamic Surface's standard deviation layer is exported in these cases.
- Export GeoTIFF and JPEG (with World file) for Dynamic Surfaces and Static Surfaces

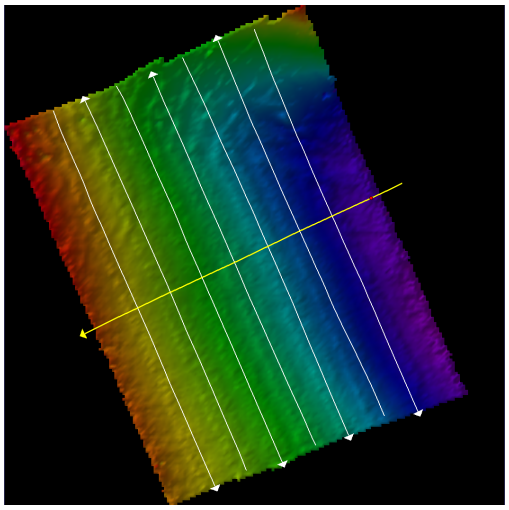
New Analysis Tools

Cross line Statistical Analysis

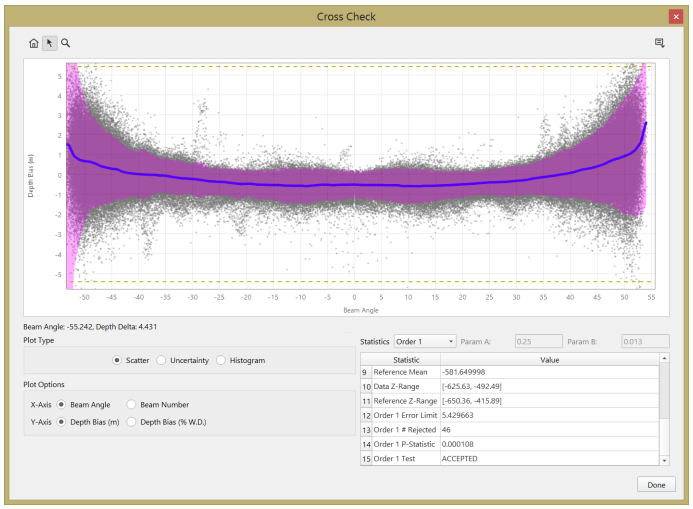
We've taken the Fledermaus *Crosscheck* tool, something that's very familiar to clients using our FM Hydro bundle, and we've ported the capability to Qimera. We've also augmented it to provide additional plotting views to help you generate the figures and statistics you need for your reports. We see this capability being of particular interest to hardware vendors who need to demonstrate a successful integration when commissioning new systems and also to clients who need to assess a system's performance for themselves. The tool is very simple, you generate a Dynamic Surface from your main

survey lines and then you select a crossline to compare against the surface. The Crosscheck tool generates a series of interactive plots, as shown below.

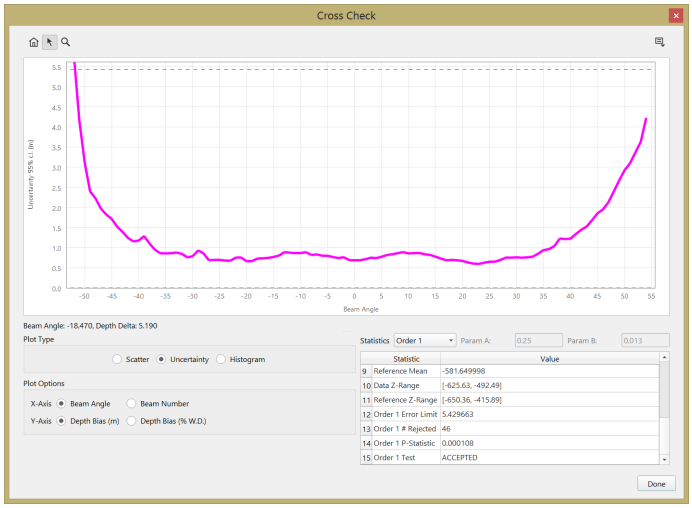
The primary plot is a scatter plot of depth differences between the crossline soundings and the reference grid. The tool is simple and quick. The data set shown in the map plot below took nearly seven hours to acquire in deep water. It took literally one minute to import and process the data and to generate the analysis plots below in Qimera. New with this release, all Qimera plot widgets can export report quality images directly from the widget. You can also export the statistical report in text format for inclusion in your report. The statistical tests can be tailored to use standard IHO survey orders or a custom survey order. The results of an IHO Order 1 test are shown below. Sea acceptance trials become much easier and go much faster when you have the right tools for the job.



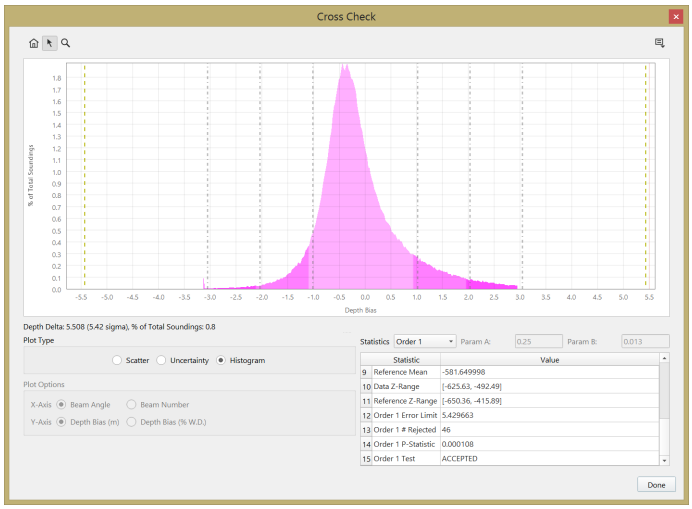
Crosscheck map view, main survey lines in white and a crossline in yellow.



Scatter plot showing depth differences between the crossline and the surface, plotted against beam angle. Mean depth difference is in blue, the magenta band indicates the standard deviation about the mean bias, i.e. error bars.



Plot of standard deviation of depth differences by beam angle. Understandably, outer beams have higher standard deviations.



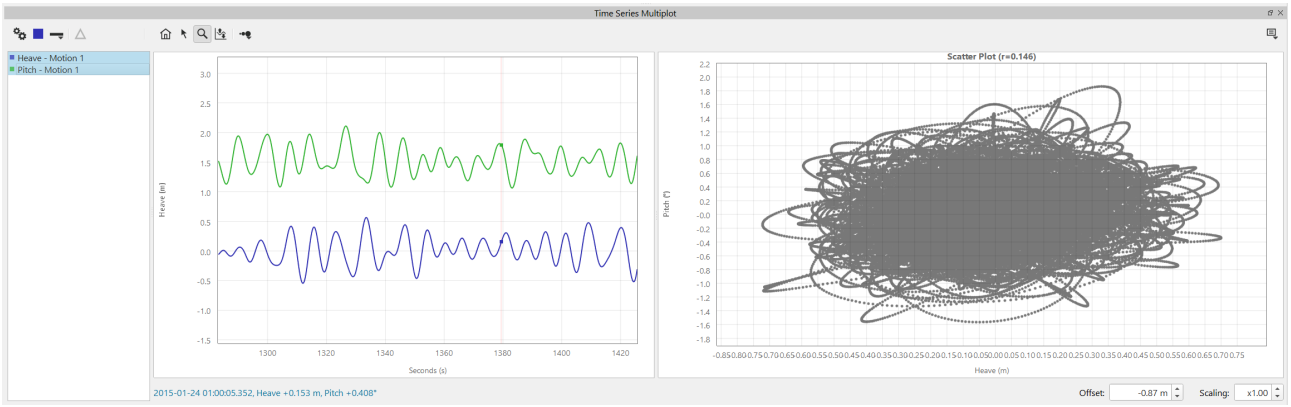
Histogram of all the depth differences. The histogram shading darkens as you progress from 1-sigma to 3-sigma away from the mean.

```
#
# Reference Surface: DynamicSurface.sd
#
# Sonar File: 0007_20140205_124055_FK140204_EM710.all
#
000000426432 # Number of Points of Comparison
-581.568904 # Data Mean
-581.649998 # Reference Mean
-0.081094 # Mean
23.163264 # Median
1.016481 # Std. Deviation
-625.63 -492.49 # Data Z - Range
-650.36 -415.89 # Ref. Z - Range
-24.73 76.60 # Diff Z - Range
2.114056 # Mean + 2*stddev
25.196226 # Median + 2*stddev
5.429663 # Ord 1 Error Limit
0.000108 # Ord 1 P-Statistic
46 # Ord 1 - # Rejected
1 # Order 1 Survey ACCEPTED
```

Statistical output generated from cross-line analysis.

Cross-Correlation Plot

The Multi-plot tool now allows for an additional cross-correlation scatter plot between two selected time-series and it computes a correlation coefficient to help determine if signals are correlated in a quantitative manner. Being able to determine if signals are correlated is particularly helpful when trouble-shooting misbehaving data sets. We've also added the capability to plot the vessel speed in the Multi-plot.



Improvements to Existing Features and Workflows

Improvements to Plotting Widgets

We have improved and standardized the mouse interaction with plotting widgets based on user feedback. All plot widgets now share the same zoom and pan capability as the 3D Scene:

- Mouse wheel zooms in and out
- Middle click to re-position to a new location
- Holding down shift when the mouse cursor mode is not in Explore mode will allow you to left-click and drag to pan to a new location

The following plot widgets now share this same interaction experience:

- Slice Editor
- Time-series Editor
- Multi-plot Viewer
- Swath Editor
- Water column Viewer
- Patch Test Tool
- Wobble Tool
- Crosscheck Tool

We've also standardized the new sounding visualization and selection methods we built for the Slice Editor into the Swath Editor. As part of the Slice Editor developments, we made a significant effort to improve the responsiveness to editing in all widgets. All plot background colours can be configured as black or white, this is a new user preference in the Preferences dialog. All plot widgets can export their plot as a report grade quality image as well.

Guided Workflow

We've made a few tweaks to the Guided Workflow and we're also providing a few more warnings. There is now an additional prompt to process data after it is imported, in the event that your data did not have pre-computed soundings (affects .s7k, .jsf, .hsx formats). We added a warning dialog when creating a second Dynamic Surface to make it clear to users that when you clean a Dynamic Surface, you are actually cleaning the underlying sounding and that any other Dynamic Surfaces that use those soundings will also be updated. For QINSy users, we've added a warning dialog upon import to make it clearer exactly which systems are not supported in QPDs that are generated online in QINSy.

Improved subsurface vehicle data extraction and vehicle handling

We've made the workflow clearer for users with data acquired on sub-surface vessels. For systems that cannot be determined to be a sub-surface vessel automatically from the source file contents, the user can now configure the Vessel type in the Vessel Editor. Some third party formats do not provide clarity on whether data is from a subsurface vessel or not, this new capability allows users to address this in Qimera. When a vehicle is designated a sub-surface platform, the refraction and georeferencing engine will use the depth or pressure time-series to compute the Z-position of the platform and will use this depth to determine the starting point of the ray trace calculation. If a user imports a depth time-series via the ASCII navigation importer, the vehicle that the data is assigned to will be converted to a sub-surface platform if it was not already configured as such.

Miscellaneous Improvements

- The property panel now shows the full WKT geodetic configuration string
- The property panel now shows more information for imported navigation files
- Accept/Reject filter can use selected surface or lines
- Set up field mappings directly in the ASCII parser configuration dialog for import of
  - Processed points
  - Line objects
  - Points for visualization
- Improved functionality for processed point export (from raw sonar file):
  - Added ping time field
  - Enabled filtering based on Accepted/Rejected and Record Flags (Plotted, Feature, Suspect)

Bug Fixes

We typically deal with bug fixes in our bug fix releases. Here are the few that we've fixed since our last bug fix release (1.1.3).

- Export processed points as individual files was exporting in the wrong location. This is now fixed and exports are written to the Exports directory.
- Spline filter was not working correctly for ROV data and was incorrectly applying user settings. This is now fixed.

Installation, Upgrade and Ongoing Support Information for Existing Users

Users with existing Qimera 1.1 projects will be able to open them in Qimera 1.2 and no upgrades are necessary to files in your project. The Qimera 1.1 release had introduced new beam flagging capabilities that required a QPD upgrade. Users with older Qimera 1.0

projects will need to upgrade their QPDs when moving to Qimera 1.2. You will be prompted to upgrade the QPDs in your project when it is first opened.

During the development phase for Qimera 1.2, we paid close attention to incoming bug reports from our Qimera 1.1 clients and we've streamlined our release process to get fixes out to clients in a timely manner, as often as required. This new, streamlined process enabled delivery of three bug fix releases since the launch of Qimera 1.1 in November. We will continue to provide this quick turnaround level of service to our customers with Qimera 1.2. If you find a bug, please contact us and we'll attempt to get a fix to you as quickly as possible.

When we first released Qimera, we purposely kept it lean and mean with the intent of focusing on client feedback to help direct us on how best to hone existing capabilities and also to help us decide which new functionality clients need most. We've done the same with Qimera 1.1 and Qimera 1.2, so please keep ideas and feedback coming, it helps us to make Qimera better for all users! Please feel free to contact us via the online support system for feedback, feature requests and bug reports.

Documentation

- The Reference Manual has been updated for all features in this release
- We're continuing to update other Knowledge Base articles. The online versions always have the freshest content.
- Several new "How To" style documentation is available to give some guidance on how to use some of the new features in Qimera 1.2. The online versions are always most up-to-date.

Known Issues

Qimera should not open QINSy projects while QINSy is running, acquiring data or generating Dynamic Surfaces. **Data loss may occur if this warning is not heeded.** Qimera is currently meant to only open QINSy projects after they are acquired. If you need to use Qimera in a real-time environment, it is recommended that you configure QINSy to copy DB files to a backup directory at the end of each line. You should then create a new Qimera project and use Qimera Live (available as of Qimera 1.1) to monitor the backup directory, import the data, process the data and add it to a Dynamic Surface.

RELEASE 1.2.1 - March 18th, 2016

Note for users who have already downloaded Qimera 1.2.0:

We recommend that anyone using Qimera 1.2.0 upgrade to 1.2.1 immediately.

We found a bug in how file formats are identified in the version of Qimera 1.2.0 that was released on March 15th, 2016. This issue affects users who try to open projects from previous versions of Qimera in version 1.2.0. Attempting to process files could result in processing errors or inaccurate licensing errors.

Qimera release 1.2.1 fixes this problem. Any projects created or opened in Qimera 1.2.0 will be automatically corrected by the next version. Please do not open projects from previous versions in Qimera 1.2.0, upgrade to 1.2.1 before you continue your work.

We apologize for any inconvenience this bug may have caused. We would also like to thank our users for relaying information on this problem back in a very timely and well described manner.

Fixes and Improvements

- Fixed a serious bug in Qimera 1.2.0 that prevented processing of data in previously created projects.
- Improved user notification when source files are moved.
- Improved support for older versions of QINSy DB files.
- Fixed a problem with patch test results not saving.

RELEASE 1.2.2 - April 20th, 2016

Fixes and Improvements

Highlights

Following the Windows release of Qimera 1.2 on March 15th, we are very pleased to now offer a Mac OS X version with this release! Now Mac users can take advantage of all the new features that were released with Qimera 1.2. Mac users should have a look at the Qimera 1.2 Release Notes to get up to speed on the new functionality that came with that release.

We have brought the FM Hydro Caris HDCS workflow into Qimera and you can now load HDCS data for cleaning and validation and then unload your data edits back to the HDCS project, including mark up of soundings as designated soundings. As with the FM Hydro workflow, you will need a valid Caris license to take advantage of this capability.

We have received a lot of great feedback on the Slice Editor that we released with Qimera 1.2 and we've acted on some of it already. You can now disable the warning regarding the number of soundings that are loaded into the Slice Editor. You can also toggle the visibility of 3D points drawn in the main 4D Scene with a visibility control in the Slice Editor visibility control drop down menu. The Slice Editor was upgraded to improve the experience for QINSy users that have Single Beam and Multibeam data in their QPDs in that it only loads the points that were used to create a Dynamic Surface.

The Spline filter performance has been improved drastically in terms of run time and is now very comparable to the performance of the Spline Filters in Qloud. We are continuing to port more of the Qloud capability into Qimera for the next feature release and any residual differences in performance and user experience will be addressed with the Qimera 1.3 release.

AUV and ROV users will see some improvements, bug fixes and tweaks as well. QINSy users will now find that their depth measurements sensors use the sensor name as configured in the database instead of the sensor type. EdgeTech JSF files now have depth measurements extracted and the vessel configuration is set to AUV/ROV for files with sensor depth records. Draft measurements that were in the Vessel Configuration are now not applied to sub-surface platforms.

Technical Notes

Reson .s7k users: We have learned that .s7k files do not flag depth (pressure) sensor readings consistently as being a sensor depth measurement in the 1008 record (it was on occasion set to indicate it was a measurement of water depth). This was preventing import of the depth sensor data for some clients who had data from sub-surface platforms. To address this, Qimera now always extracts depth records, regardless of depth record source bit flag. Qimera cannot determine from the file whether or not the platform was an AUV/ROV due to the inconsistent use of the depth/water depth measurement flag and AUV/ROV users will need to change their vessel type to AUV or ROV in the Vessel Editor to force use of depth records for vertical referencing.

- Tides
  - Fixed a problem that limited the number of ASCII tide entries that could be imported
  - Fixed crash that occurred when a tide file was removed
  - Improved Processing Settings listing of tides that are loaded into Qimera
  - Fixed problem with importing Caris .tid files
- Geodesy
  - Implemented warning when inconsistent geodetic settings found in QINSy databases
  - Qimera will now correctly determine QPD coordinate system if that file is used to initialize a project's coordinate system
  - Improved Abridged Molodensky transformation from QINSy databases

    - Fixed bug that was causing OSGB / OSGM02 heights to be calculated incorrectly
- Import
    - Improved import for JSF format to accommodate more sensor types and variations of configurations
    - Kongsberg EM2000 now supported
    - Improved HSX data import
    - QINSy template DBs will no longer be added as source files
- Export
    - Fixed crashing when exporting GSF
    - Improved GSF exports from .all files
    - Soundings in a Dynamic Surface can now be exported in geographic coordinates
- Reporting, Warnings and Error Messages
    - Patch test report now correctly contains Calibration Plot and Area images
    - Now possible to cancel QPD upgrades when prompted
    - Improved warning when clearing spline or edit flags
    - Removed warning regarding parsing of sound speed data if there was data in MBES raw datagrams
- Miscellaneous
    - Several improvements to plot labeling, scaling and updating
    - Fixed bug preventing Horizontal and Vertical TPU blocking settings from being applied
    - Fixed crash that occurred when no points were selected for 3D Editor
    - Fixed bug that caused areas along edge of Dynamic Surface to appear empty.

RELEASE 1.2.3 - May 10th, 2016

Fixes and Improvements

Highlights

- Files can now be selected geographically using the Rectangular, Polygon, or Freehand selection tools
- The CUBE Filter Soundings dialog can now be brought up with the 'U' hotkey
- There is now an 'Apply' button in the Processing Settings dialog. This will allow changes to be made and viewed immediately in the Slice Editor if automatic reprocessing is enabled

- Raw files (.all) from the Kongsberg ME70 (with bathymetric option) are now supported in Qimera
- The Measure tool now displays vertical distance (delta Z) between start and end points
- Adjacent raw sonar files will now be scanned to provide tide values to apply to data and the end of a line

Technical Notes

- Processing and Tools
  - Soundings shown in the Patch Test tool will reflect their processed heights correctly
  - A problem involving creation of Static Surfaces from Processed Point data was fixed
  - QPD files that contained laser profiling data could cause a crash when the Swath Editor was opened. This has been fixed
  - A problem that caused Qimera to freeze when Processing Settings was opened with certain dual head MBES files has been fixed
- File Import / Data extraction
  - Heights from .all files that contain incomplete GGA strings will now be extracted
  - QINSy recorded DBs that contain several positioning systems using different reference frames will now be handled correctly
- Exporting
  - Flags in GSF files exported by Qimera should no longer cause problems for other processing packages
  - Improvements to ASCII export from Dynamic Surface include:
    - More appropriate precision for projected coordinates
    - Geographic coordinates for sounding export are now in Lat / Lon order
    - TPU values exported with soundings are now expressed as 95% confidence rather than variance
- Miscellaneous
  - A bug involving dynamic surfaces was fixed:
    - It could cause Qimera to crash when opening certain projects with large dynamic surfaces
    - This should also reduce crashes that occur when building large dynamic surfaces

- Directory monitoring delay for automatic file import can now be up to 3600 seconds

RELEASE 1.2.4 - May 19th, 2016

Fixes and Improvements

Highlights

- It is now possible to apply a time latency to a surface sound speed sensor
- The Time Series Multiplot will now remember selected fields
- The Time Series zoom level is preserved after changing settings in the Vessel Editor. This will allow the effects of changes to be easily verified.

Technical Notes

- Applicable to data which use Depth or Pressure time series:
  - Fixed a bug where the height of a depth sensor was corrected for vessel motion incorrectly
  - Fixed a bug where the vertical difference between a depth sensor and the MBES (in the vessel reference frame) was not being applied
  - Changes to depth or pressure priority in the Processing Settings will now trigger the correct reprocessing steps
- Miscellaneous
  - The Slice Editor will now only show points from the dynamic surface that is selected
  - Improvements to how Kongsberg Extra Detections are handled
  - Fixed a problem with height calculation in the Wobble and Patch Test tools that affected data vertically referenced by low frequency GNSS

RELEASE 1.2.5 - June 14th, 2016

Fixes and Improvements

Highlights

- QINSy .filt.db files can now be brought into Qimera

- When a CUBE surface is built, the CUBE depth layer will be displayed by default
- GSF files that are exported from Qimera are now referenced to the project coordinate system ellipsoid rather than WGS 84

Technical Notes

- Surfaces and Tools
  - Some CUBE surfaces suffered from a bug that introduced gaps or stripes to the displayed surface. This is now fixed
  - There was a bug in the display of some dynamic surfaces when Mixed Shading was selected in the Qimera Preferences, this is now fixed
  - The Time Series Multiplot will remember which data were selected for the Scatter Plot when you change files
- File Import / Export
  - Fixed a problem with GSF export from certain EM300 .all files
  - Fixed a bug with ASCII Processed Points importing
  - Fixed a problem with importing an SD file containing points
  - Some GSF exports were causing third party processing applications to crash, this has been fixed
- Miscellaneous
  - A bug causing edits to be lost when Qimera reprocessed QINSy QPDs has been fixed

Qimera 1.3 Release Notes

RELEASE 1.3.0 - June 28th, 2016
RELEASE 1.3.1 - June 29th, 2016
RELEASE 1.3.2 - July 6th, 2016
RELEASE 1.3.3 - August 3rd, 2016
RELEASE 1.3.4 - August 30th, 2016
RELEASE 1.3.5 - October 4th, 2016
RELEASE 1.3.6 - November 8th, 2016

RELEASE 1.3 - June 28th, 2016

QPS is pleased to release Qimera 1.3, the third full feature release since its initial launch just over one year ago. With this release, we're continuing to expand upon the vision that we've set out for ourselves: to make hydrographic data processing intuitive and as simple as possible, all the while offering powerful capabilities to those that need them without cluttering the workflow for those that don't.

As promised with the last release, we have followed through on our commitment to port the point editing workflow from Qloud into Qimera. The 1.3 release offers all of the built-in and customized filters that our Qloud users have relied on previously for an easy and responsive workflow. QINSy and Qloud users will find that the acquisition and processing workflow is much more streamlined than before. Qimera is not just the "New Qloud", it also offers many features found in other QPS applications like Validator, Analyzer and Processing Manager, as well as offering the full replay processing capabilities of QINSy but in a purpose-built post-processing environment. Qimera is the new home for many of the tools that you've used before and we will continue to migrate other existing functionality into Qimera with future releases.

For users who are new to the QPS software suite, you will find in this new release a tool set that makes data editing even easier with the tools you need being easily accessible and usable typically with a single click of a button. New automated and quickly configured filters let you perform area based or global filtering operations to cut down on manual data editing time, letting you get your job done quicker than before. As with all Qimera processing and editing operations, the Dynamic Workflow updates your data products

before your eyes, allowing you to monitor your progress and to assess your work as you go.

Read on for details below and, as always, please get in touch with us via the online support system if you have any questions about how the new features may fit into your existing workflows. There are several features to highlight in this release, as you'll see below. Many of the other new features are driven by client feedback and feature requests and for these we thank our clients for getting in touch with us with their great ideas!

- RELEASE 1.3 - June 28th, 2016
- What's New
  - New Capabilities & Workflows
    - Filter Toolbar: Quick Access for Quick Editing
      - Built-In Filters
      - Custom Filters
      - Custom Filter Example: Area Based Refraction Editing
    - Slice Editor Improvements: An Even Better Workflow
      - Improved Scroll Box Mode
      - New Selection Movement Toolbar
      - New and Improved Editing Modes
      - More Detailed Sounding Query
      - Miscellaneous New Features
    - New Profiling and Measuring Tool
      - New Look
      - New Capability: Multi-Segment Profiling
      - New Capability: Multi-Surface Profiling
      - New Capability: Measure Tool
  - Improvements to Existing Features and Workflows
    - SVP Import and Editing
    - Time-Series and Multiplot
    - Export Formats
    - Displays
    - Miscellaneous

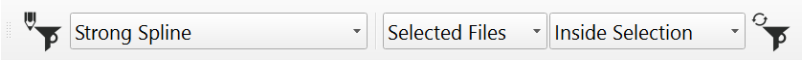
- Bug Fixes
- Installation, Upgrade and Ongoing Support Information for Existing Users
- Documentation
- Limitations & Known Issues
- Qloud Users's Transition Guide
  - Frequently Asked Questions (FAQ)
  - Qloud Custom Filters as Implemented in Qimera
  - Qloud Surface Spline Despikers as Implemented in Qimera
- RELEASE 1.3.1 - June 29th, 2016
- Fixes and Improvements
- RELEASE 1.3.2 - July 6th, 2016
- Fixes and Improvements
- RELEASE 1.3.3 - August 3rd, 2016
- Fixes and Improvements
  - Highlights
- RELEASE 1.3.4 - Aug 30th, 2016
- Fixes and Improvements
  - Highlights
  - Technical Notes
    - GSF file usage and limitations
      - Import as Processed Points
      - Import as Raw Sonar Data
      - Full Recalculation from Raw Measurements
- RELEASE 1.3.5 - Oct 6th, 2016
- Fixes and Improvements
  - Technical Notes
    - Changes to how Patch Test values are applied in Vessel Editor:
  - Additional Changes
- RELEASE 1.3.6 - Nov 8th, 2016
- Fixes and Improvements
  - Highlights
  - Technical Notes

What's New

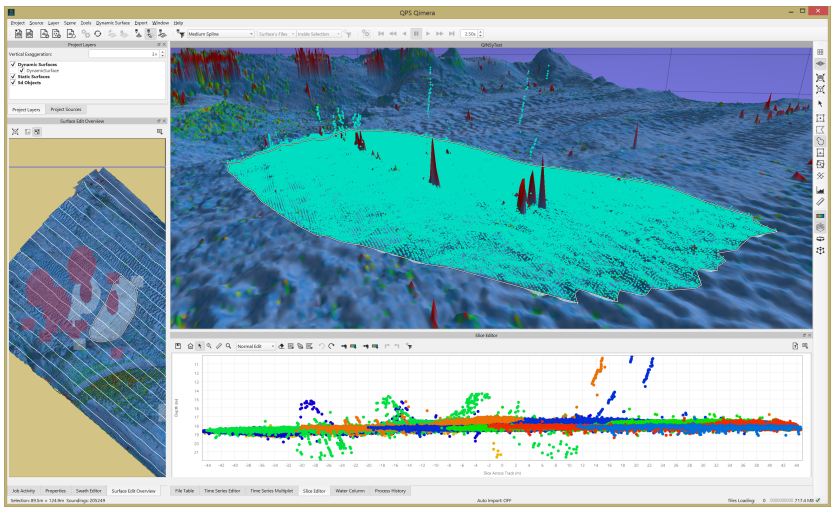
New Capabilities & Workflows

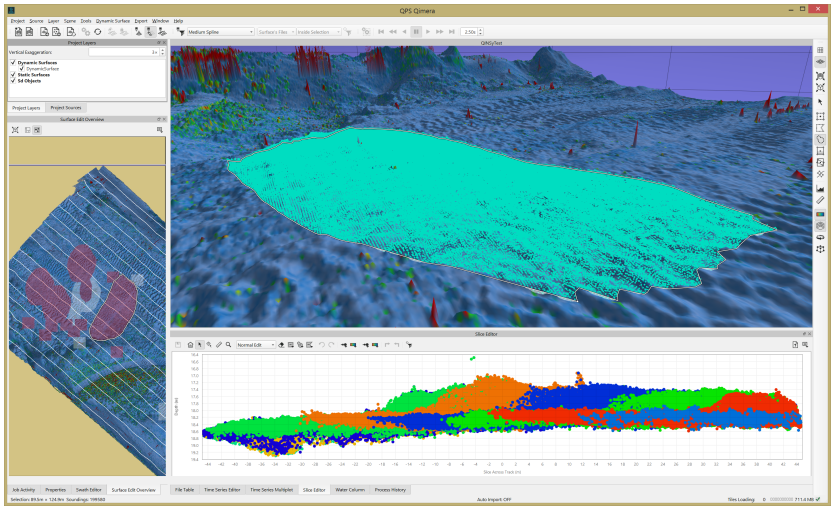
Filter Toolbar: Quick Access for Quick Editing

Qimera now offers a new filter toolbar that lets you choose a filter, followed by a selection of which surface or lines you'd like to filter, wrapping up with a final quick selection of whether you'd like to filter inside or outside of an area selection made on the Dynamic Surface. This configuration now lets you select lines, surfaces, or draw polygons to specify an area over which to apply a filter. It's quick and easy and there is a great set of pre-built filters that we will be continually adding to.



For example, you can draw a circle around a few spikes in the map and choose to apply a surface spline filter inside the area selection to remove the spikes. After a few mouse button clicks, the spikes are removed from the surface, as shown in the images below. As always, Qimera updates the map in front of your eyes so you have immediate confirmation. Continuing with the example of hunting for spikes, once the filter toolbar selection is finalized, you can easily repeat the application over and over throughout the surface by moving the area selection polygon repeatedly to hunt down and remove data spikes. This has been sped up as well by adding a new mouse modifier key to allow you to re-position the current selection by holding down the Alt-key while you left mouse click on the area you want to move to. You can even configure the Slice Editor, which will load and displays the soundings that you've selected, to pre-apply the filter for every area that you visit. If the filter is too aggressive, just click the undo button. If it didn't quite filter what you had hoped for, you can do a quick manual edit to finish the job. The Slice Editor lets you preview the effect of filters with the capability to undo very easily, a welcome new capability for our Qloud users.





Built-In Filters

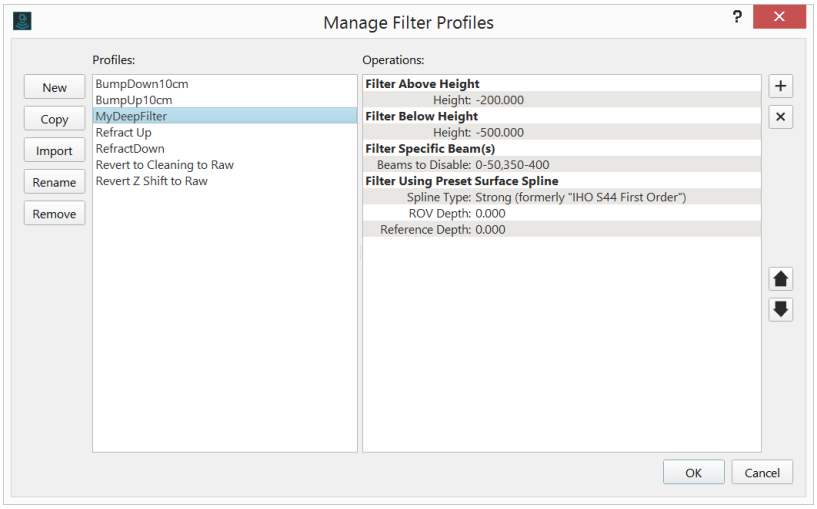
The new filter toolbar offers a number of quickly available pre-built filters that provide quick abilities to de-spike data, clip out unwanted regions, and easy undo operations that revert manual edits or filter operations. The pre-built filter line-up has been kept very lean to ensure that the interface does not become too cluttered, more sophisticated filtering is available through the Custom Filters (see below). The built-in filters currently include the following filters:

- **Surface Spline De-spiker:** The spline filter fits a mathematical spline surface through the noisy point data and rejects all soundings that lie too far from the surface. This has been very popular with our Qloud clients for a long time. The 3D spline surface is a representation of the local topography and is calculated using a weighted least squares method through the available soundings. The spline filter is area based and takes contributions from many survey lines simultaneously. The filter is available in several configurations, offering a range of filtering strengths. A custom spline filter can be built as well, allowing you to tune the filter parameters to your needs.
- **Filter/Accept All Soundings:** Have you ever needed just to graphically trim the edge of a survey area for a wayward survey line? You can quickly draw a cutting polygon and reject all soundings within the polygon. If you make a mistake, you can bring them back the same way.
- **Reject/Accept Additional Soundings:** If you have a Kongsberg Maritime echosounder with Extra Detections, or a Teledyne-Reson echosounder with Multi-Detect, you can quickly accept/reject these soundings on targets of interest. For example, you can draw a polygon around a wreck and choose to accept all Additional Soundings in that area. You then capture as much detail over the wreck without having to reclaim all of the Additional Soundings in other areas, which would have led to more data cleaning.
- **Revert All Manual Edits & Revert All Filtering:** Qimera keeps track of which soundings are rejected/accepted by a human operator and which are rejected/accepted by a filter operation.

You can choose to revert back to the original state of the soundings for either manual or filtered soundings or both. This lets you recover easily from mistakes.

Custom Filters

The custom filters allow you to create compound filters from a menu of filter options. The example below shows a custom filter which applies quick clip above/below depth filters to trim out outliers, followed by a rejection of outer beams and finished off with a Strong surface despiker. Once you create a custom filter, it becomes available in the filter toolbar and is also available for other projects since it is saved with your user preferences. Qloud users will be happy to hear that Qimera will let you import and convert pre-existing filter configurations that you may have used in Qloud.

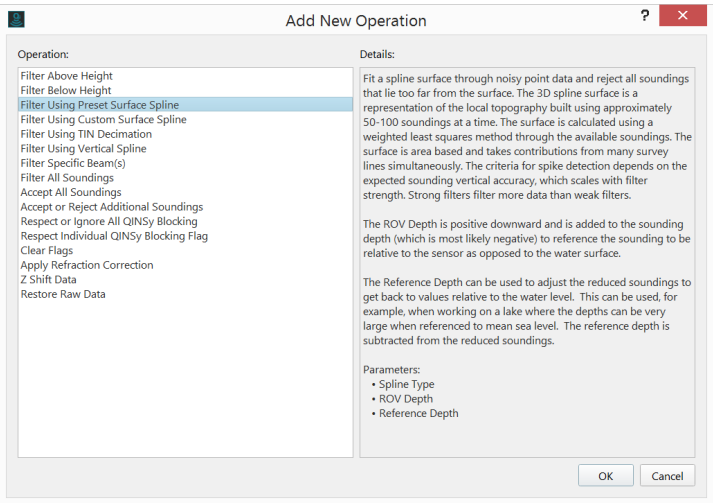


The custom filters that are available are:

- Filter Above/Below Height: Filter soundings above or below a specified height.
- Filter Using Preset/Custom Surface Spline: Use a built-in spline de-spiker or create your own.
- Filter Using Vertical Spline: Experimental filter that cleans vertical surfaces using a spline surface de-spiker that is tailored for vertical structures. Best used with a polygon selection of the area.
- Filter Specific Beam(s): Reject specified beams using a comma separated list of beam ranges.
- Filter/Accept All Soundings: Flag all soundings for rejection or accept all soundings.
- Reject/Accept Additional Soundings: For Kongsberg Extra-Detections and Teledyne-Reson Multi-Detections, you can easily choose to accept or reject these.
- Respect/Ignore QINSy Blocking: Choose to reject all soundings based on blocking results, or choose to ignore QINSy blocking to allow all soundings to be accepted.
- Respect Individual QINSy Blocking Flag: Use a specific QINSy blocking flag to reject data.
- Clear Flags: Suspect, Plotted, Feature flags can all be cleared.
- Apply Refraction Correction: Apply an empirical refraction correction that reduces the effect of refraction artifacts.

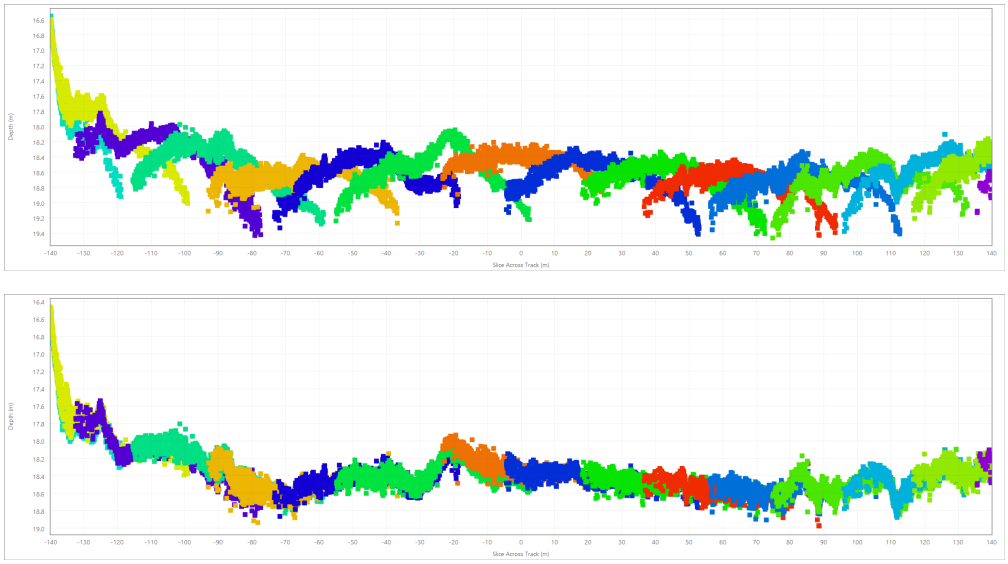
- Z Shift Data: Apply a z-shift to data to reduce offsets between neighboring survey lines.
- Restore Raw Data: Undo all beam filtering and/or undo all positional shifts from Z-Shift or Refraction Correction
- TIN Decimation: Build a TIN surface that best approximates the sounding point cloud and flag soundings that do not fit the TIN model, remaining soundings can be used to build a TIN.

The interface to add new custom filters also provides explanations of the filters within the interface to help users understand what it is they are choosing, as you can see in the image below where we show the selection of a Preset Surface Spline filter from the list of filters on the left. The panel on the right provides all the information necessary to explain what the filter does and also how to tune the filter parameters.



Custom Filter Example: Area Based Refraction Editing

The "Apply Refraction Correction" custom filter is a great way to remove unwanted refraction residuals from otherwise good data. The two images below show a before/after view of soundings in the Slice Editor that have underdone a custom refraction filter correction. As requested by Qloud users, filters that run in the Slice Editor provide a preview of the effect that you can easily undo if you are not satisfied. For this type of problem, where there is a consistent refraction problem throughout the data set, you can assess the magnitude of the required refraction corrector in the Slice Editor's preview mode, and then quit the Slice Editor to apply the corrector to the entire data set. The ability to load soundings from multiple survey lines is a big advantage of this tool over others currently on the market where you can only apply a refraction correction to a single line at a time, without the context of the neighboring survey lines.

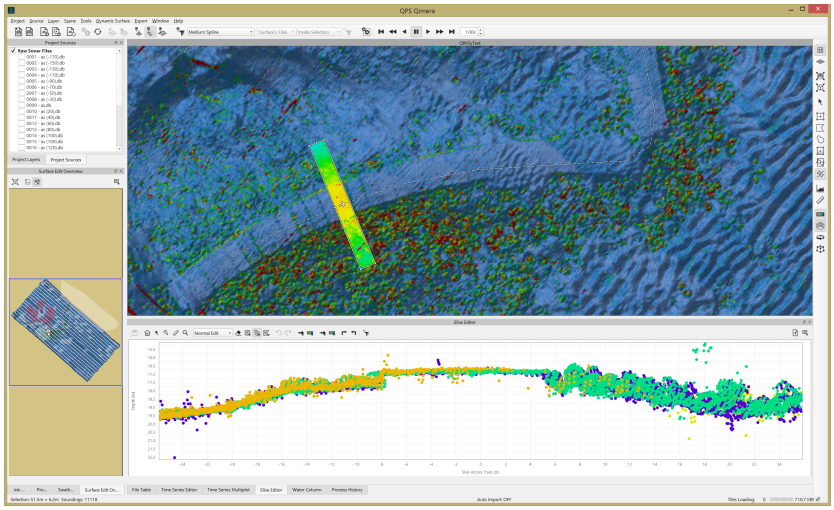


Slice Editor Improvements: An Even Better Workflow

We've added a few features and have also made a few tweaks to the Slice Editor to bring you an even better editing experience and more streamlined workflow.

Improved Scroll Box Mode

The biggest addition is an improved Scroll Box mode which lets you draw a rectangular polygon in the Scene and then you draw a line that you want to edit along in the Scene, called a Scroll Line. The line can have as many points as you like, or you can use the Ctrl modifier key and left click on an existing line in the project, a survey line for example, to have it follow. The image below shows the new Scroll Box selection mode running along a circular arc that was hand drawn to follow a structure on the seabed. This is also capability that came directly from Qloud, this is particularly useful when reviewing data along structures in port facilities, etc, where you'd like to maintain a particular editing geometry that respects the size, shape and orientation of the structures that were mapped.



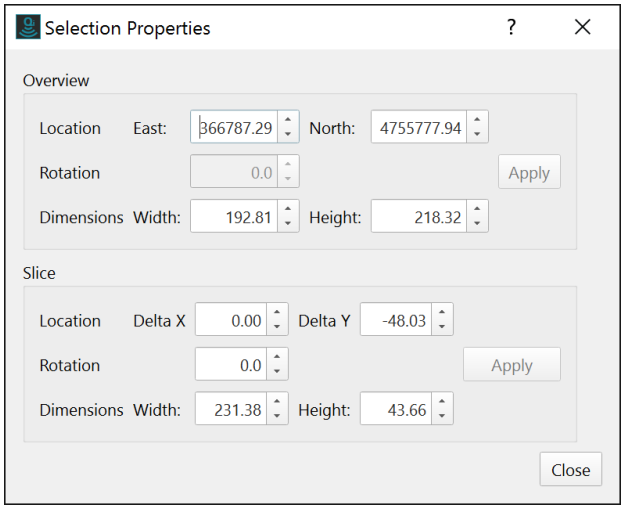
New Selection Movement Toolbar

A feature that goes hand-in-hand with the Scroll Box selection mode is a new set of playback review controls that allow for semi-automated data review. This is done through Qimera's new Selection Movement Toolbar, shown below, that lets you automatically advance along the line at a desired pace, stopping only to edit data when required.



This new toolbar works great with the Scroll Box selection mode because your workflow can become nearly hands free: You start by drawing a Scroll Line, then run the Slice Editor, then click "Play" on the toolbar, sit back and watch. Stop the review by hitting the space bar when you need to make an edit. You can control the advance speed and direction with the controls, as well as being able to advance/retreat a single step or to the beginning or ending of the line. When watching the data review, you can stop it easily by hitting the space bar to make a few edits. If you go too far past a feature or artifact of interest, you can use the space bar or backspace key to move forward and backward, respectively, in addition to the usual keyboard shortcuts. The playback review controls are not limited to the Scroll Box selection mode and can be used with the majority of the spatial selection modes in the Slice Editor. For data that needs review with only a little bit of editing, this tool will simplify the process immensely.

The toolbar also offers a new interface (see below) that lets you manually configure the exact size, shape or orientation of the spatial selection area in the event that you want more granular control above and beyond the equivalent graphical manipulation capabilities that were provided in Qimera 1.2. Different Slice Editing selection modes have different capabilities, and the Selection Properties dialog updates accordingly with your preferred selection mode.



New and Improved Editing Modes

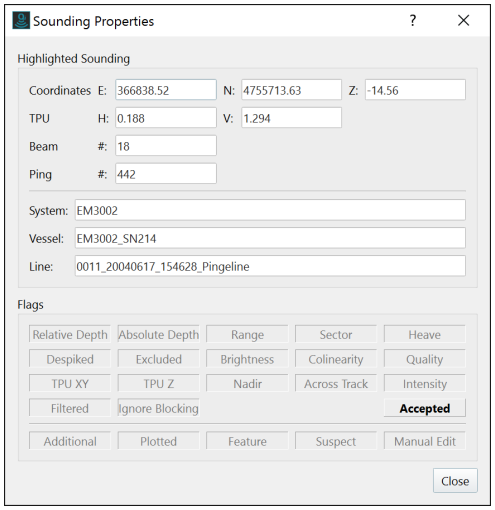
The Slice Editor toolbar has been slightly modified to bring the Editing mode to the toolbar, since it is something that requires frequent changes. You can now choose between three edit modes, the first two of which were offered in Qimera 1.2 but through the additional features menu. This is now front and center on the main toolbar.



- Select and Edit: Select your soundings, then decide what to do with them via a right-click context menu. You can accept/reject soundings, mark up soundings as a particular type of feature, select for a particular type of sounding, isolate a single line for editing, etc. A bit on the manual side but VERY powerful.
- Normal Edit: Use this when you just want to kill dots or perhaps bring previously rejected soundings back to fill some gaps in coverage.
- Fixed Area Edit (new!): Draw edit areas (rectangular, polygon or lasso) and have them persist in the plot and apply as you move through a data set. This is useful when working with seabed and port facility structures.

More Detailed Sounding Query

We've made a new display that is launched from within the Slice Editor that shows detailed information about the sounding that the mouse is currently hovering over or the sounding that was chosen by the user with the Select Info button. You can get position, depth, uncertainty, beam/ping, System/Vessel/Line information as well as a picture into the flags that are set that can explain why a particular sounding was accepted or rejected.



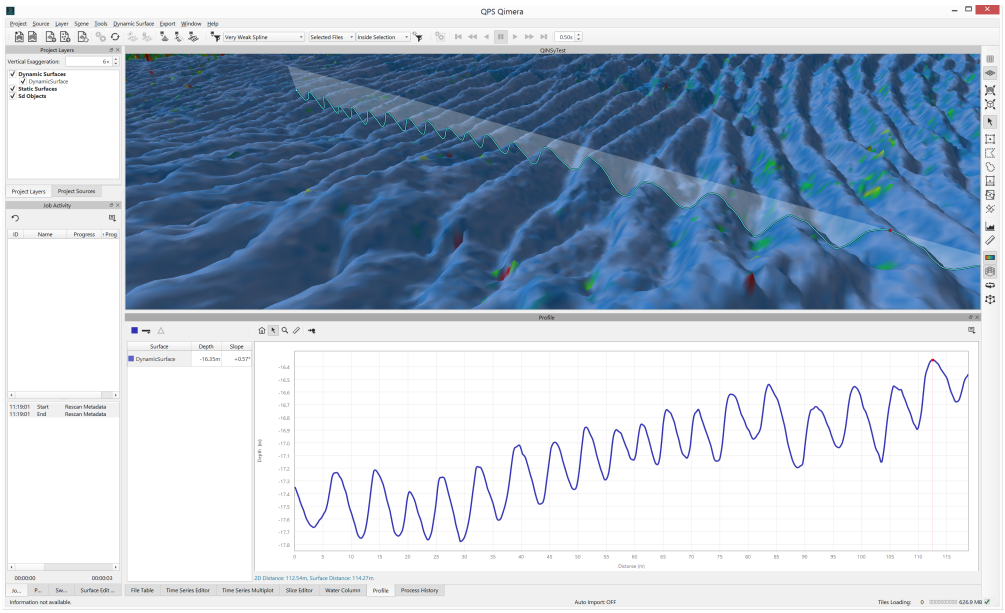
Miscellaneous New Features

- The Slice Editor toolbar now has a new measure tool that lets you take quick distance and depth measurements within the Slice Editor plot, this is useful in answering things like "How high is this structure off the surrounding seabed?", or "Is the depth difference between these two survey lines within my tolerance?".
- The right-click context menu that is enabled in "Select and Edit" mode now has the ability to Select Shoallest or Deepest in Slice Editor, as well as selecting by Line or System when you want to select or edit data from a particular line or mapping system.
- New "Edit Only Selected" mode in the additional features menu lets you focus in on the currently selected soundings. If you only want to apply a filter, like a Z-shift, to a single line, then this is the tool for the job.
- New "Alt" key mouse modifier action lets you quickly re-position your selection to another area in the scene. Draw your normal selection, and when you want to quickly hop to another area, just hold down the Alt key and then left click with the mouse on the new position in the Scene. The selection area will move there, and the Scene will recenter if the new area is too far from the center of the view. This is a great way to quickly navigate from one artifact to another when doing things like spike hunting.
- The Slice Editor toolbar has a filter apply button, but you can also have it automatically apply the currently active filter to soundings when they are loaded using a new option in the Additional Features menu. When activated, the filter apply button is drawn in depressed mode with a darker shade to indicate quickly that the Slice Editor is in this mode. The mode is reset automatically at the end of the Slice Editing session to avoid accidental application in a following editing session.

New Profiling and Measuring Tool

New Look

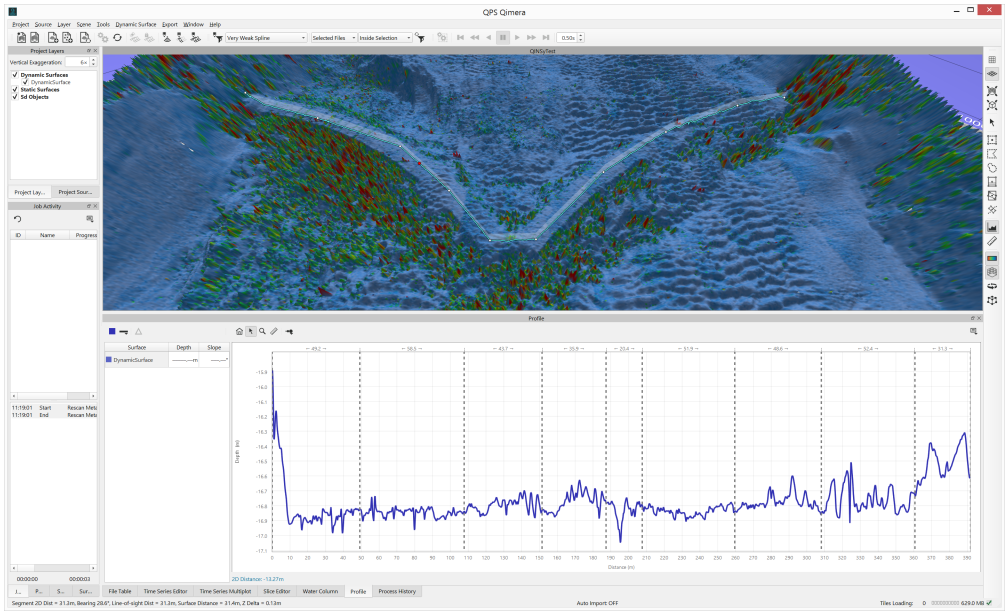
The profiling tool that originally shipped with Qimera 1.0 was the profiling tool that came directly from Fledermaus. You can still right-click in the Scene at any point and draw a quick profile, this is always very handy to quickly measure the depth or distance between points, in addition to having the profile between them. We've retooled the profile view to be consistent with all the other plotting widgets in Qimera and it now has the same look and feel, as well as capability. You can zoom/pan in the profile plot view, you can take measurements within the profile view and you can save the plot as a report quality image, just like in all other Qimera plot widgets. Just like the Time-Series Editor and Multi-Plot tool, when you move your mouse through the profile, a small red ball is drawn along the profile in the Scene so that you can visually correlate the features in the profile plot to the features in the Scene, as shown in the image below where the mouse is positioned over the shallowest point in the depth profile. Also, when you move the mouse in the profile plot display, the left panel of the widget reports the depth and slope at that location. Profiles can be exported as ASCII text for later analysis.



New Capability: Multi-Segment Profiling

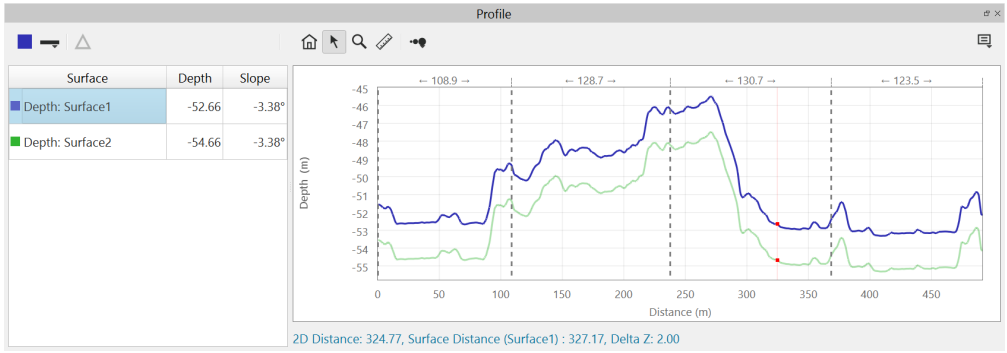
We've added new profiling capabilities as well. The simple right-click profiling tool works as it always has, but the profiling button on the 4D Toolbar lets you now draw multi-segment profiles. In this new mode of operation, you begin the profile with a left click of the mouse, then click more points with the left mouse button, finishing finally with the right mouse button. The multiple segements are drawn in the 4D Scene and the profile plot draws the different segments with a vertical dashed line separator to indicate the beginning and ending of each segment. The synchronized red ball in the profile plot and

the 4D Scene assists in correlating features between the two. Have a look at the image below to see a multi-segment profile drawn along the top of two curved seabed structures.



New Capability: Multi-Surface Profiling

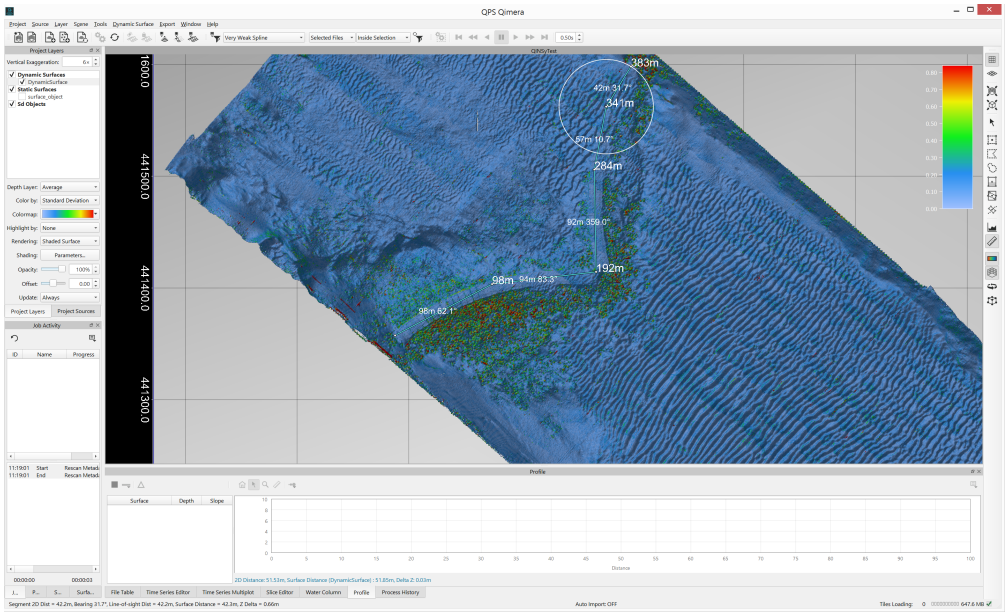
We've also added the capability to draw profiles along multiple surfaces. We've made it much clearer which surfaces are being profiled by having the tool draw profiles for only the surfaces that are visible in the 4D Scene, which is controlled with the visibility tickboxes for any given surface. This is available for both the classic right-click profiling tool or with the new 4D Toolbar profiling tool. With multiple profiles being plotted, it is possible to select profiles from the left panel of the profile widget and to also compute a difference plot between them. The ASCII export from the plot widget exports all of the current profiles, as well as a difference plot if one is created.



New Capability: Measure Tool

Sometimes you just want a range and bearing from one point to another. The 4D Scene toolbar's measure tool now lets you do this. Left click to start and right click to end, and the measurements are drawn in the Scene. It also supports multi-segment measurements,

with the range and bearing being reported along each segment, and the cumulative distance being reported at each break point between segments. After you've drawn a measurement profile, the selection remains in the Scene and you can toggle between Measure and Profiling mode, if you need to.



Improvements to Existing Features and Workflows

We've made a number of other features, tweaks and improvements. These are listed below with a bit of explanation, if necessary.

SVP Import and Editing

- You can now import QINSy .svp files. QINSy users would only need to import the .svp file if you have made changes to those SVPs using QINSy's Velocity Profile Editor after the data had been acquired and applied online.
- You can now import Reson SVP profiler .log format.
- You can now enter the geographic position of an SVP in grid coordinates in the SVP Editor. You can toggle between projected or geographic units, depending on your preference.
- The position, time, number of samples and a few other items of interest about any SVP profile are now displayed in the Properties panel. This allows for quick review of your SVPs to determine which ones may be missing critical information such as position, for example.
- The SVP Editor list of SVPs now allows for multi-select. This enables editing of one profile (just select one), or many simultaneously (select many).
- For Kongsberg .all formats, the SVP casts always extend to 12,000 m, which can obscure the actual portions of the SVP that a data reviewer may be interested in when viewing in the SVP

Editor. The SVP Editor now uses the depth range of the 4D Scene, which is largely driven by the depth range of the grids that are in the Scene, to determine sane default vertical extent limits for the SVP editor.

Time-Series and Multiplot

- The Time-Series Editor and Multiplot Tool now offer an additional view option in the Additional Features menu that lets you to plot the height of the CoG instead of the raw reported height. This is very useful in determining if the lever arms between the CoG and a particular positioning/heighting sensor are correct. With multiple sensors, the CoG plots should be very similar, and if they're not, this is a sign that the offsets for one or more sensors may be incorrect.
- Many users have asked for more friendly x-axis labeling of time plots for the Time-Series Editor and Multiplot tools. We've done this, and the time axes are now labelled in HH:MM:SS.SSS format, with the date being included in the axis title. The time labelling scales nicely when zooming in and out to best suit the time span currently being displayed.

Export Formats

- Export processed points from QPD file to MPa/CARIS ASCII.
- Export tracklines in QTR format for use in PREMO.
- Create survey area object. This creates a polygon shape that captures the outline of the surface for reporting purposes.

Displays

- Display QINSy Geoid model in WKT in Vertical Referencing. For QINSy users that have a geoid/ellipsoid separation model as part of their vertical transformation, you can now view the model that is being used in the Vertical Referencing section of the Processing Settings Editor. This field is currently read-only and is meant primarily for troubleshooting purposes.
- As per a client request, you can now see additional surface attributes in Status Bar at the bottom of the application. The mouse cursor information for the current "Color By" selection layer for the Dynamic Surface is displayed now, in addition to the usual position and depth read out for the cursor position.
- Plot vertical bounds in patch test and wobble tool buffer above/below soundings should be percentage of depth range instead of fixed value. This was previously fixed with a 5 m vertical buffer, which made it a bit cumbersome to work in shallow water. Now the plot auto-scales to the depth range of the soundings that are plotted, with a vertical buffer on the top/bottom that is a percentage of the depth range instead of a fixed size.

Miscellaneous

- Cube filtering settings are remembered after you run the filter so that they do not need to be re-entered on the next run.
- The "Delete" key on the keyboard can now be used to remove files from the project. Previously this was only available through a right-click context menu. You will still be prompted to approve the file deletion.
- The user preference for the location of ENC files, stored in QPS QNC format, is now configurable and is also shared across all QPS applications (e.g. QINSy, ENC Administrator, etc).
- We have also enabled QNCs for Mac and Linux operating systems.
- QINSy users with encrypted QNCs will find that these are now supported.

Bug Fixes

We typically deal with bug fixes in our bug fix releases. Here is a list of those that we've fixed since our last bug fix release (1.2.5).

- Improved Stability
  - We fixed the cause of a crash that would occur when changing the colormap range of Dynamic Surface while tiles were still loading.
  - We fixed a crash that sometimes occured on startup when an external monitor was attached.
- Visualization and Data Display
  - Dynamic Surface coloration of scalars (std.dev, density, cube attributes) were previous incorrect when using a depth based colormap in fast shading mode.
  - The colormap legend was previously always drawn, even if it had no colormap to display, this is now fixed.
  - Dynamic Surface colormap was not applied correctly when the data range was larger than colormap range, this is now fixed.
  - The user selection of the "Show Chart in 2D View" option was not remembered between projects or sessions.
  - Fixed Range color map not being used when chosen, resulting in incorrect colormapping of the surface, this is now fixed.
- Data Import and Export
  - Project geodesy was sometimes being incorrectly detemerined when QINSy DB and QPD files were imported for point processing when some files had different geodetic settings. This is now works as intended.

  - Improved GSF export for QINSy configurations with multiple vessels.
  - Import of multiple POSMV .000 files during a single import session no longer triggers multiple redundant prompts to re-process.
  - Vessel editor edits to SBET system (position, CmOs, TPU parameters) were not propagated to multibeam raw data files that were imported after the SBET, this is now working as intended.
- Processing, Editing and Validation
  - Improved handling of files that have no valid soundings at all during import.
  - Improved handing of vessel squat lookup for first and/or last pings in a file where vessel speed cannot be interpolated due to missing data.
  - Visited/Edited layer in Surface Edit Overview map was not correctly updated for Free Slice mode for some editing modes, this is now fixed.
  - Improved capability to select data on map edges for editing.

Installation, Upgrade and Ongoing Support Information for Existing Users

Users with existing Qimera 1.2 projects will be able to open them in Qimera 1.3 and no upgrades are necessary to files in your project. The Qimera 1.1 release had introduced new beam flagging capabilities that required a QPD upgrade. Users with older Qimera 1.0 projects will need to upgrade their QPDs when moving to Qimera 1.3. You will be prompted to upgrade the QPDs in your project when it is first opened.

During the development phase for Qimera 1.3, we paid close attention to incoming bug reports from our clients and we've streamlined our release process to get fixes out to clients in a timely manner, as often as required. This new, streamlined process enabled delivery of fifteen bug fix releases since the launch of Qimera 1.0 in June of 2015. We will continue to provide this quick turnaround level of service to our customers with Qimera 1.3. If you find a bug that stops your workflow, please contact us and we'll attempt to get a fix to you as quickly as possible.

When we first released Qimera, we purposely kept it lean and mean with the intent of focusing on client feedback to help direct us on how best to hone existing capabilities and also to help us decide which new functionality clients need most. We've done the same with Qimera 1.1, Qimera 1.2 and Qimera 1.3, so please keep ideas and feedback coming, it helps us to make Qimera better for all users! Please feel free to contact us via the online support system for feedback, feature requests and bug reports.

Documentation

- The Reference Manual has been updated for all features in this release

- We're continuing to update other Knowledge Base articles. The online versions always have the freshest content.
- Several new "How To" style documentation is available to give some guidance on how to use some of the new features in Qimera 1.3. The online versions are always most up-to-date.

Limitations & Known Issues

Qimera should not open QINSy projects while QINSy is running, acquiring data or generating Dynamic Surfaces. **Data loss may occur if this warning is not heeded.** Qimera is currently meant to only open QINSy projects after they are acquired. If you need to use Qimera with QINSy in a real-time environment, it is recommended that you configure QINSy to copy DB files to a backup directory at the end of each line. You should then create a new Qimera project and use Qimera Live (available as of Qimera 1.1) to monitor the backup directory, import the data, process it and add it to a Dynamic Surface.

If you are a QINSy and Qimera user, you should not copy the QINSy project to another location on the same computer as the original QINSy project. We are currently improving how file paths to various resource files and project file assets are managed between our applications, in the meantime, if you want to process a copy of your QINSy project in Qimera, you should copy it onto another computer. This is a known limitation that we are actively working on to fix and we will let you know when this limitation no longer applies.

Qloud Users's Transition Guide

Frequently Asked Questions (FAQ)

- Q: Qloud would let me choose which Blocking settings I wanted to apply during import of the data. How do I do this in Qimera?
  - A: We are encouraging users to choose the Blocking settings they want to use online and to configure the DTM file generation in QINSy with the "Flagged FP" option of "All footprints are stored, flagged footprints are inactive (Recommended)". This runs the blocking as usual online but then deactivates the soundings that fail the chosen blocking tests while the file is being written or replayed. This essentially rules out the need for the usual secondary step when importing data into Qloud in that the Blocking settings that were chosen while online are used already. This is done in the Session Setup for Storage in the QINSy Controller. If you have older data that you do not want to replay just to have the QPDs updated as suggested above, Qimera offers a custom filter that lets you ignore/respect the online blocking and another filter that lets you choose specifically which

blocking parameters that you want to respect. Typically these would be used together in a custom filter with the first filter being one to ignore all QINSy blocking, followed by a sequence of filters that apply the desired blocking filter.

- Q: How do I lock the slice to the pivot point?
  - A: The equivalent capability in Qimera is done by holding down the "Alt" key on the keyboard while you left click in the Scene. Your current Slice box will reposition at the point where you clicked. The view point will also update to this new point as well if it is too far from the center of the current scene.
- Q: Where is the Qlean++ filter?
  - A: The Qlean++ filter has been superseded by the equivalent functionality that was offered in the FM Hydro suite of tools. The FM Hydro capability provides more options and control on how points are flagged. The FM Hydro workflow also requires that a CUBE surface is built beforehand, this has the advantage that you can assess the quality of the surface that you are using as a filter. The Qlean++ filter generated a CUBE estimate of the seafloor depth in a black box manner that did not allow the operator to assess whether the CUBE algorithm had chosen the correct hypothesis to use for filtering.
- Q: What is left in Qloud that is still to come in Qimera?
  - A: Annotations, the "Repair area" filter and the Generate Soundings tool. These tools, or variants thereof, will be coming in a future release.
- Q: The Spline Filters have been renamed, how do they correspond with the original names that were used in Qloud?
  - Extremely High Detail: Very weak
  - NL Norm A: Weak (NL Norm A)
  - SMA Exclusive Order: Weak
  - NL Norm B: Weak (NL Norm B)
  - IHO Special Order: Medium
  - IHO First Order: Strong
  - IHO Second Order: Very strong
- Q: Can you explain what is meant by weak and strong spline filters?
  - Very Weak: The objective of a very weak filter is to only remove large blunders and not to remove many soundings close to seabed level in order to leave rocky outcrops or slopes unfiltered. This removes large outliers and keeps the detail of features on the seabed.
  - Very strong: The objective of a very strong filter is to despike very aggressively, which will remove even small spikes close to seabed. This has the potential to remove finer detail in areas where there is a lot of seabed topography.
- Q: Why were the Spline Filters renamed?

- A: Through years of training, we have found that the names are generally *not intuitive* at best and *misleading* at worst. How were they not intuitive? Most user's initial impressions of the filter strength were the opposite of what they actually were. For example, many new users thought that an **Extremely High Detail** filter would be a strong filter and that an **IHO Second Order** filter would be a weak filter in that it would allow much more noise to persist. This was corrected through training and explanation, but that has always been an indicator that the names did not convey the intent effectively. The more important reason to change the names is that they set the expectation that the data points, once filtered, would meet a certain survey specification. This was, however, never the case (the A and B parameters of the various survey orders were used to give a sense of the expected vertical accuracy of the soundings). Again, this was corrected through training and explanation but new users who were discovering the software capability on their own would continue to have the incorrect first impression. To address this, we decided to name the filters to indicate the effect of the filter. The filter parameters are EXACTLY the same as they were with Qloud and they will continue to be, it is only the names that have changed.

- Q: Why aren't the NL Norm A and NL Norm B filters included on the main toolbar presets?
  - A: The NL Norm A, NL Norm B and SMA Exclusive Order were all three "weak" filters which varied only slightly in their configuration parameters. For ease of use for all QPS clients, we chose to just present one preset in the main toolbar. Users seeking to use the NL Norm A or NL Norm B can create their own custom spline filter and this will then appear in the main toolbar preset list.
- Q: I have a lot of data in Qloud QTM files. How can I use this in Qimera?
  - A: The QTM format will no longer be used for storage of data. Qimera allows you to import your pre-existing QTM files into Qimera, it will attempt to re-create the original QPDs from this. A known limitation of this is that the Node/CoG track cannot be recreated (this was lost when creating the QTM as the footprints are only referenced to the transducer location). GRDs imported to QTM files are not extracted as there is insufficient information to rebuild them, but dynamic surfaces can easily be created. ASCII files imported into the QTM are also not extracted.

Qloud Custom Filters as Implemented in Qimera

We have renamed some of the filters to achieve improved consistency between filter names.

Qloud filter name	Qimera filter name
Clip above	Filter Above Height
Clip below	Filter Below Height
Clip on flags	Respect Individual QINSy Blocking Flag
Disable points	Respect or Ignore All QINSy Blocking
Generate Soundings	*Coming in a future release*
Qlean++	*Superseded by the Dynamic Surface "CUBE Filter Soundings"*
Raw value	Restore Raw Data
Refraction	Apply Refraction Correction
Remove beams	Filter by Beam
Spline surface despiker	Filter Using Preset Surface Spline and Filter Using Custom Surface Spline
Tin decimation	TIN Decimation
Vertical object	Filter Using Vertical Spline
Vertical shift	Z Shift Data

Qloud Surface Spline Despikers as Implemented in Qimera

We have renamed the Qloud surface spline despikers to improve user understanding and to avoid misunderstandings regarding an incorrect association with filter name and the

implication that a filtered data data set will meet a particular survey accuracy order once filtered (e.g. IHO S44 Special Order).

Qloud filter name	Qimera filter name
Extremely High Detail	Very weak
NL Norm A	Weak (NL Norm A)
SMA Exclusive Order	Weak
NL Norm B	Weak (NL Norm B)
IHO Special Order	Medium
IHO First Order	Strong
IHO Second Order	Very strong

RELEASE 1.3.1 - June 29th, 2016

Note for users who have already downloaded Qimera 1.3.0:

We recommend that anyone using Qimera 1.3.0 upgrade to 1.3.1 immediately.

We found a bug in how edits to a time series are saved back to file. This bug will only affect users that edit a time series in the Time Series Editor in Qimera 1.3.0. This has been corrected in 1.3.1.

If you have edited a time series in 1.3.0 you may find that Qimera will crash when you attempt to reprocess the data. The time series for that data file can be restored by reloading the time series from the raw data by first selecting the line that has been affected. You then navigate to the 'Tools' dropdown menu, select 'Manual Processing', and finally click on 'Rescan Time Series Data'.

We apologize for any inconvenience this bug may have caused.

Fixes and Improvements

- Fixed a bug in Qimera 1.3.0 that may cause time series to become corrupted after editing.

RELEASE 1.3.2 - July 6th, 2016

Fixes and Improvements

- Fixed a bug that was causing Qimera to crash when large surfaces were being loaded. This only happened if the surface was colored by sounding density or standard deviation.
- In certain situations, the file name that is displayed in the Slice Editor when the points are colored by line could be incorrect. This has been fixed.

RELEASE 1.3.3 - August 3rd, 2016



This release of Qimera changes the project version. Any existing project that is opened with 1.3.3 cannot then be then be re-opened later in an earlier release of Qimera.

Fixes and Improvements

Highlights

We are very pleased to make the Mac version of Qimera available with the Qimera 1.3.3 release. Also as of this release, we are now officially supporting Qimera on the Linux operating system. This brings Qimera up to the same level of multi-platform support that has long been provided with the Fledermaus tool suite. Future bug fix and feature releases for Qimera will now routinely include Mac and Linux support.

Some highlights of fixes that are available in this release include:

- CUBE surfaces now build much faster.
- Patch Test and Wobble tool now support 3+ heads.
- Labels can now be resized in Qimera.

- QINSy users that have set multiple systems to use the same node can now create new nodes. This will allow for an easy change of location for any given system.
- Qimera now supports export of GSF from a Reson T50-P MBES.
- Recomputing the sensor height is now a multi-core task, resulting in improvements in processing speed.

Additional Changes

- Surfaces
  - Improved and fixed effects of shading parameters for Mixed and Fast shading.
  - Improved how surface objects are created from a Dynamic Surface. This fixes slight horizontal shifts that sometimes occurred.
- Soundings, Points and Labels
  - Draping points on a surface now works correctly.
  - Fixed a bug where the Z column ASCII XYZ file could not be used as a label.
  - A fix was made to the Nav-O sounding selection algorithm. It now correctly spaces selected points according to minimum distance.
- Processing
  - A problem was identified with the application of heave (to calculate transducer position in the water) when post processed navigation was applied. This has been fixed. Users who have previously imported Applanix SBET motion, i.e. not just the 3D position, may wish to download Qimera 1.3.3 and recompute the ray trace solution if they have data with large heave variations over the course of a transmit/receive cycle. Data artifacts that would have appeared from this bug would have been consistent with a slight refraction like artifact where the pings bow up or down in instances of pronounced vertical movement over short time periods. New projects created with version 1.3.3 will use the same workflow as before and no change in procedures is required for SBET users.
  - Fixed a problem where system angular offsets weren't applied with the same sign convention as was specified for he system.
  - Improved memory handling during application of large post processed navigation files.
- Import and Export
  - Support for Kongsberg EM712 systems is now implemented for .all files.

- The geodetic information contained in a QPD will now be used correctly when the files are brought into Qimera.
- The GSF export workflow has been improved for multihead source files.
- Changed and improved the way Qimera handles QINSy data that contains multiple vessels.
- Fixed a bug where unloading edits to a HS2X file caused that file to become empty.

- Miscellaneous
  - Encapsulate Project will now include tide files.
  - Fixed a problem where Qimera would crash if a USB drive containing a project changed its drive letter.
  - The Time Series Editor occasionally used incorrect y-axis extents when data was plotted. This has been fixed.

RELEASE 1.3.4 - Aug 30th, 2016

> ⚠ A fix has been made to an issue concerning SBET file processing that affected version 1.3.3. It is strongly advised to upgrade to 1.3.4 if you process data with SBET files.

Fixes and Improvements

Highlights

The big news for this release is that Qimera is now available with Spanish, German and Chinese translations! To check it out, visit the *Preferences* dialog and set your preferred language under the *Shared Preferences* section. We will continue to offer updated translations with each release from this point forward.

Some highlights of fixes that are available in this release include:

- Windows 10 is now officially supported.
- Qimera will now read and honor tide settings from a QINSy database.
- Improvements to how Qimera establishes positioning priorities based on settings in QINSy database.
- A fix for 1.3.3 caused a problem with batch processing of data that has an SBET applied. This has been fixed.

- It is now possible to specify tide sign convention when creating a new tide station.
- Improved GSF export of Norbit data.
- Many other fixes related to GSF, 3D Editor, exports and others.

Technical Notes

GSF file usage and limitations

The information below can also be found here: GSF file usage and limitations

GSF files from a number of 3rd party software vendors have been giving a number of clients some trouble when importing into Qimera. The GSF format is a suitable data container for the interchange of georeferenced soundings but transferring raw sonar measurements, as well as all necessary ancillary data and sensor configuration, can be more difficult with this file format. There are three processing paths for GSF in Qimera, these are examined below with some information to help you decide the best way forward. Please get in touch with us if you find oddities or discrepancies and we can start collecting the known limitations associated with various sources of GSF files. This will help us to help other clients as well as giving us good information to feedback to other software vendors that provide the GSF format as an export option.

Import as Processed Points

When importing as processed points, the georeferenced solutions are taken "as is" and can be used directly for production of grid products. Creation of a Dynamic Surface will convert the GSF files into a QPD file, allowing for geospatial visualization and editing of your point data. This is the equivalent capabilitty that FM Hydro users would have been used to with the Fledermaus based geospatial processing tools we have offered in the past. This particular import path will not allow any georeferencing or mathematical correction of sounding positions. The GSF format is well suited for this particular application and few problems are expected as this particular workflow has been offered with FM Hydro for a number of years. This particular approach will give you the best representation of what your GSF file contains. In other words, if you are having problems importing GSF data as a raw sonar data, this is the best fall back solution in that it should give you a faithful conversion of your soundings into QPD format as the mathematics that are used to do this do not rely on any information in the GSF other than the soundings themselves.

Import as Raw Sonar Data

The second option is to import the GSF as a raw sonar file. When you do this, the GSF is mined for raw sensor data such as motion, position, surface sound speed, etc. Also, Qimera extracts the vessel geometry such as the sensor locations on the vessel and their angular orientations. After this stage, Qimera is ready to do one of two things, these are

examined below. In either of the two scenarios below, if your results are inconsistent with your expectations after import and conversion to QPD, we recommend instead importing your GSF files as Processed Points. This will allow you to generate grid products and to edit your data points, but you will not be able to re-process data. If you find yourself in this situation, please get in touch with us and we'll see if a fix is possible. It may very well be that there is no fix possible due to missing or incorrect information in the file.

Direct Conversion to QPD

You can allow for a direct conversion of the georeferenced soundings into a QPD. This is the default option in Qimera and can be disabled in the *Preferences* dialog under the *General Tab* by unticking the option to "Automatically convert Kongsberg/GSF sonar data on import" option. If you leave this option enabled, a little bit of math is done to undo the vertical correctors that were applied to the soundings in the GSF, such as tide and draft, and store them into the equivalent storage fields in the QPD. Qimera then uses the sensor lever arms that were encoded in the file along with the motion sensor measurements in the file to compute and remove the horizontal and vertical offsets between the vessel reference point and the sonar head. This creates a QPD file that is 100% consistent with how Qimera would have created had it done all of the mathematical processing itself. This is done to facilitate quick re-processing of horizontal and/or vertical positioning, including tide. Inconsistencies between the GSF soundings and the Qimera soundings can occur when vertical correctors are reported but not applied, or *vice versa*, or when sensor locations are incorrectly reported or not reported at all.

Full Recalculation from Raw Measurements

If you've opted out of the option to allow a direct conversion to QPD, or if you've changed a processing configuration option that necessitates full sounding recalculation, then Qimera will start from scratch with all of the raw sensor measurements and will ray trace and georeference the soundings according to your processing configuration. There are several ways that things can go wrong, leading to incorrect results.

Multibeam Measurements

Problems can occur when the raw sonar measurements do not conform to expectation. For example, the beam angles and/or travel-times are incorrectly encoded. In this situation, you may find that the reported depths are significantly incorrect. The sign convention for the beam angles may also vary from one software vendor to another as there is not a strict enforcement of this. In these situations, you'll notice that soundings are flipped around from port to starboard and *vice versa*. These can both be fixed to some extent in the *Vessel Editor* by setting the travel-time scale and the receiver and/or transmitter beam angle sign conventions.

Vessel Configuration

If the sensor locations and angular alignments are incorrect or missing in the GSF, you may need to track down what those values should be and then input them in Qimera's *Vessel Editor*. Furthermore, the GSF format does not strictly enforce how dual head systems are represented. There may be cases where Qimera cannot detect that data

are from a dual-head system, leading to gross errors in application of sensor offsets, etc. These scenarios may be recoverable but you should get in touch with us for some help in identifying the correct steps to achieve what you need. In the event that there is no workaround, we may be able to provide a fix but our ability to do so depends on whether the necessary information is encoded in the file.

Motion Sensor Measurements

A GSF file may or may not have the full motion sensor data stream at its full output rate. Qimera will warn you about this, watch for warnings in the *Job Activity* widget during import.

Sound Speed Measurements

Several problems can occur with sound speed profiles as well, if they are provided at all. Notably, the position and/or time of observation may be missing. Check for warnings on import in the *Job Activity* widget for information, or have a look at any profiles that are extracted using the *SVP Editor*. The GSF format lacks a mechanism to represent sophisticated sound speed application strategies. For example, you may have chosen a sound speed application strategy such as "Nearest in Distance" in a particular 3rd party software package, but this decision cannot be encoded in the GSF format. Though Qimera may have all of the raw sensor data, there is no mechanism for it to be able to choose the same strategy that you may have applied in your processing elsewhere. Understandably, there will then be discrepancies between Qimera's re-processed solutions and the original georeferenced soundings. You can set the correct sound speed profile selection strategy in Qimera's *Processing Settings* dialog under the *Sound Velocity* tab.

Vertical Referencing

The GSF format allows for encoding of a traditional tide and a GPS tide vertical corrector. There is also the possibility to store the ellipsoidally referenced height and the geoid/ellipsoid separation value. These data fields may or may not be filled out, and the sign conventions may or may not be followed.

RELEASE 1.3.5 - Oct 6th, 2016

Fixes and Improvements

Technical Notes

Changes to how Patch Test values are applied in Vessel Editor:

Previous to this release, the angular offsets that were determined in the Patch Test tool were applied to either the multibeam transmitter only (for pitch and heading) or the receiver (for roll) only. Based on user feedback that this was confusing in some cases,

we've made a change to that. Now, if Qimera determines that the transmitter and receiver elements share a common location, all angular patch test values will be applied to both the transmitter and receiver fields in the Vessel Editor. We made this change to move more in line with expectations for such systems. This change will affect any MBES systems that have a common physical location for the transmitter and receiver as well as any data recorded in QINSy that was configured to have a common acoustic centre in the driver. This is typical of very small portable systems were the separation between transmitter and receiver is small and also for systems that pre-correct the range and angle measurements for the discrepancy between the transmitter and receiver.

Additional Changes

- Surfaces
  - Surfaces colored by attribute other than height will now correctly use the overflow colors in the colormap.
  - Fixed a problem where the Surface Edit Overview wasn't correctly showing edits done in the 3D Editor.
- Tides
  - Some problems surfaced after changes made in Qimera 1.3.3 that caused tide related crashing if Multicore processing was active (it is by default). This has been fixed.
  - Qimera now properly supports the use of new QTD files from QINSy.
  - Fixed a bug that was preventing ZDF tide zoning from working.
- Processing
  - Changes have been made to how offsets from the Patch Test are applied to systems with a 'common acoustic centre.' In this case, the offsets for transmitter and receiver should both be commonly applied by the Patch Test whereas before the roll was applied to the receiver only and the pitch/heading was applied to the transmitter only. The split application of offsets will continue to be followed for transmitters and receivers that do not share a common location.
  - Fixed a bug that caused time series edits to be ignored if 'Include time series data from adjacent lines' was active.
  - Fixed a problem with Norbit dual head systems not being processed correctly.
  - Several fixes to activating and deactivating separation models used in vertical referencing.
- Import and Export

- A user can now silence the warnings regarding unsupported systems for .DB files. This improves the Qimera Live workflow for QINSy users.
- Various fixes to GSF import and export.
- Fixed a problem with Kongsberg EM2040 when running with dual swath enabled that was causing some of the second pings to be missed on import, processing and export.
- Qimera now better handles Kongsberg .all files that include NMEA navigation strings without a checksum.
- DXF files that contain points far out of the project bounds are now handled correctly.

- Miscellaneous
  - The NZ Geoid 2016 is now included in the Qimera installer.
  - There was a problem with the ENC Administrator not running on PCs that didn't also have QINSy installed. This is now fixed.
  - Improvements have been made to how ENC charts are displayed in Qimera.

RELEASE 1.3.6 - Nov 8th, 2016

Fixes and Improvements

Highlights

- New feature: You can now export the raw beam depth vs grid depth data and also the computed beam statistics curves from the Cross Check tool. This allows you to do your own analysis on the raw beam difference data or you can make your own plots from the statistics curves data. You'll find this new capability in the Cross Check menu at the top right of the Cross Check tool.

Technical Notes

- Surfaces
  - A problem with CUBE surface hypotheses not lining up with soundings was found. This has been fixed.
- Tides
  - Crash due to removing a tide file under certain circumstances has been fixed.

- Processing
  - Qimera now properly reads surface sound speed settings from QINSy DBs.
  - HSX files containing systems which report a variable number of beams are now properly supported. Data that was affected needs to be reimported.
  - Fixed a problem that was stopping a single sound speed from being used correctly as a sound speed profile.
  - DB files that contained reference to a Riverline separation model were causing Qimera to crash. This has been fixed, however these types of models are not supported.
  - DB files that contain MBES data with grossly incorrect time stamps (1970) are handled correctly.
- Import and Export
  - Processed Points files containing a single point can now be imported.
  - Improvements to GSF and ASCII imports.
  - GSF Export: Files with incorrectly populated beam time series backscatter are now handled correctly.
- Miscellaneous
  - Qimera now tests a project folder upon opening to ensure that permissions are suitable. If it is not, a warning will pop up.
  - In the Cross Check tool, a small area at nadir was not being plotted correctly. This has been fixed.

Qimera 1.4 Release Notes

RELEASE 1.4.0 - December 13th, 2016e

RELEASE 1.4.1 - December 23rd, 2016

RELEASE 1.4.2 - January 20th, 2017

RELEASE 1.4.3 - February 28th, 2017

RELEASE 1.4.4 - March 17th, 2017

RELEASE 1.4 - December 13th, 2016

QPS is pleased to release Qimera 1.4, the fourth full feature release since its initial launch 18 months ago. As always, our primary mission with Qimera is to make hydrographic data processing intuitive and as simple as possible, all the while offering powerful capabilities to those that need them without cluttering the workflow for those that don't.

With this release, we make yet another step forward on our roadmap to realign and adjust the software products from the QINSy and Fledermaus families. This time, we've turned our attention to our water column processing software, FMMidwater, another tool that comes from the Fledermaus suite of software. We have aimed squarely at providing augmented capability for hydrographic and charting applications, you can now select soundings over water column targets like wrecks and other features of significance to charting applications. The selected points are georeferenced and refraction corrected using the QINSy multibeamer engine, which brings a big improvement over the georeferencing capabilities of FMMidwater. Though we've focused on hydrographic and charting applications, users will find that we've brought over quite a few of the ideas and tools in FMMidwater such that any user of FMMidwater may find most of what they need in Qimera. For example, you can tune the water column signal to quickly isolate and quickly extract points of interest in the water column such as subsea infrastructure or naturally occurring features like gas seeps. Compared to working in FMMidwater, you will find a much improved and streamlined experience, we've summarized all of the improvements in the water column section below.

If you have Qimera or Qimera Pro and you already have FMMidwater, then this capability will work for you without any licensing upgrades. For Qimera or Qimera Pro users, this new capability is available as an add-on upgrade, please contact sales@qps.nl for more information. For FMMidwater users, we invite you to download an evaluation version of Qimera to give this a try to see if it suits your workflow. If it does, please contact sales@qps.nl for a quote for an upgrade from your Fledermaus bundle to Qimera Pro.

Read on for details below and, as always, please get in touch with us via the online support system if you have any questions about how the new features may fit into your existing workflows. There are several features to highlight in this release, as you'll see below.

Many of the other new features are driven by client feedback and feature requests and for these we thank our clients for getting in touch with us with their great ideas!

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- Highlights
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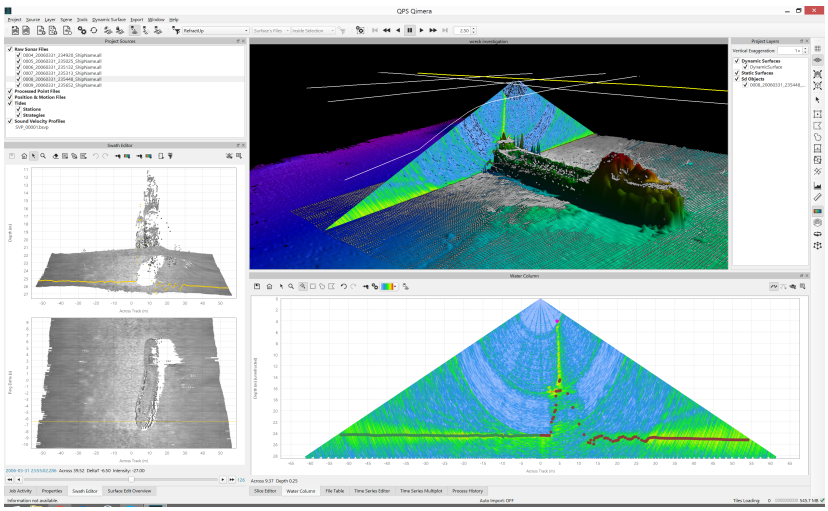
What's New

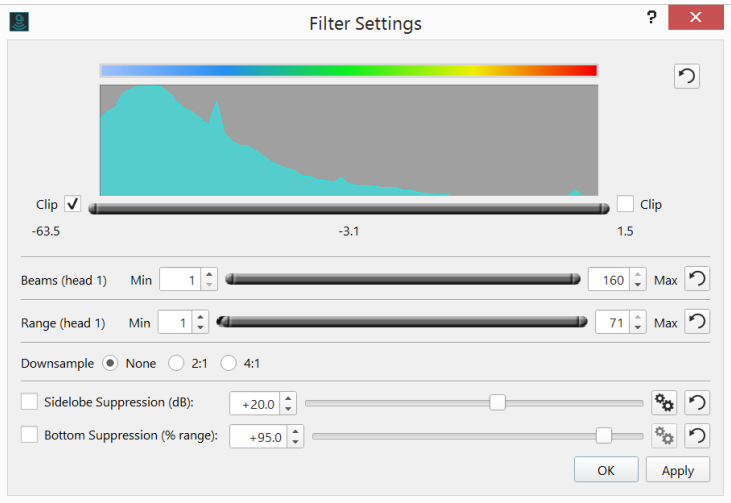
New Capabilities & Workflows

Water Column Sounding Extraction

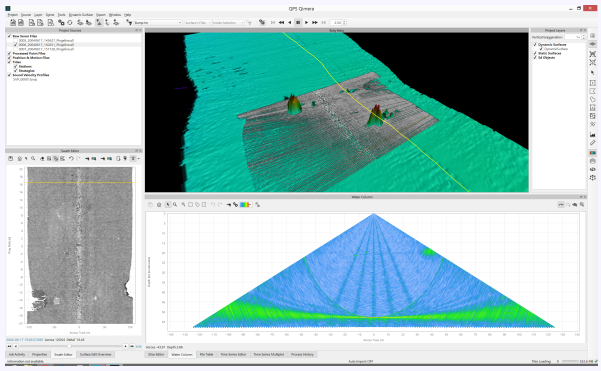
You can now digitize extra soundings from the water column display in Qimera. A single-click at a time, or threshold your signal and grab a bunch in one go with the lasso selection tool. Soundings get georeferenced using the QINSy multibeamer engine and you can even save a water column snapshot in your Scene to help you keep track of your work. We've got a fantastic workflow for wreck investigations that lets you quickly scan through data, get the bits that you want, with them being automatically included in computed soundings and gridded products. If you work with CUBE surfaces, you can have your manually detected targets automatically tagged as 'features' and then have the CUBE surface create custom hypotheses for the features that you find. The image below shows the top of a mast being added as an additional sounding, and the Fan view being added as a snapshot into the 4D Scene.



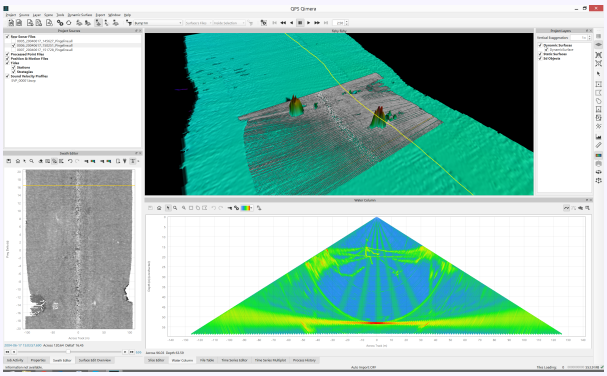
The new water column filter settings dialog lets you condition the water column imagery to help isolate the targets of interest for easy target extraction. The sidelobe and bottom suppression let you get rid of nuisance signals with ease, allowing you to refine the signal to the portion of interest to you and your application.



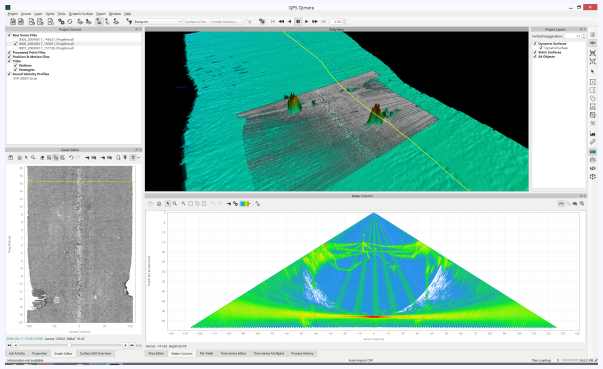
The following sequence of eight images show how the filter settings can be used to quickly refine raw water column imagery to get at exactly what you want, in this case, some aquaculture cages and mooring cables that were not adequately detected by the multibeam.



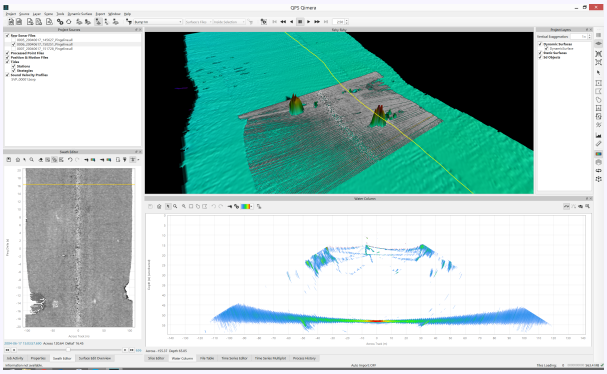
1. Raw water column fan view



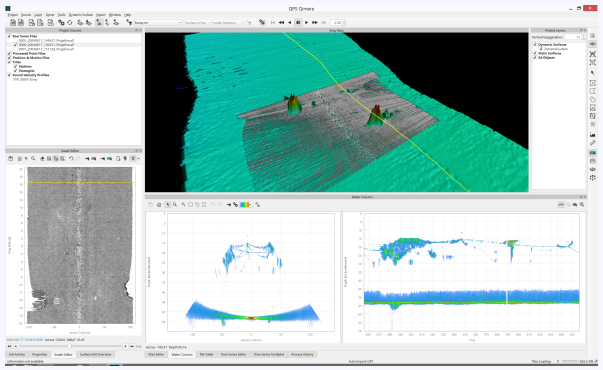
2. Stacked fan view, all pings in buffer are stacked.



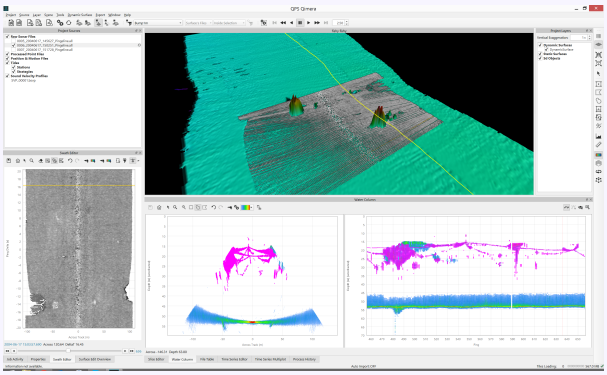
3. Apply the sidelobe filter to reduce reverberation.



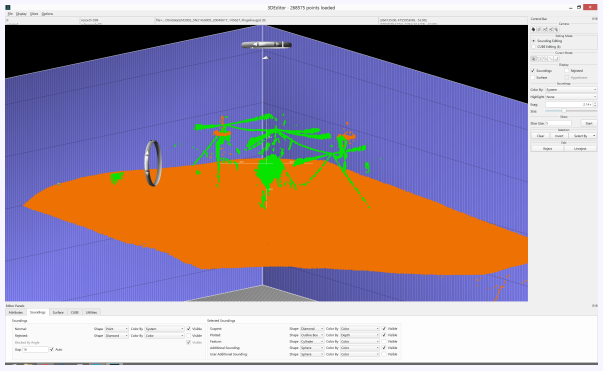
4. Set a minimum signal strength threshold.



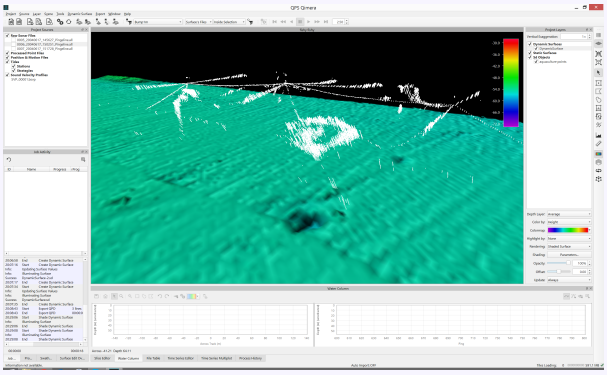
5. Enable the stacked side view.



6. Select water column targets using lasso.



7. Load points in 3D Editor for editing.



8. Extract user picked points for visualization.

Improvements over FMMidwater

We've taken some time to examine the improvements over the FMMidwater workflows to help FMMidwater users make an informed decision on whether or not they should have a look at what Qimera offers.

- Better Experience
  - You get an integrated view in the 4D Scene compared to FMMidwater's 2D view. It's like having a combination of Fledermaus and FMMidwater. You can also add Fledermaus SD objects in Qimera for quick contextual analysis to help guide feature extraction. FMMidwater required a visit to Fledermaus for this.
  - You can create a bathymetric grid within Qimera and handle this seamlessly within the app, extracted soundings are added to the grids, FMMidwater required gridding in another application and then import of the grid.
  - Integrated point editing lets you color code points to isolate your picks and to refine which points you want to keep; you can easily reject excessive points or blunders.
  - You can plot the sonar's bottom detections as an overlay to your fan to help you understand what the sonar did and did not detect. This only worked for some sonars in FMMidwater.
- Faster Workflow
  - Import files and get to your water column view in a few clicks only, FMMidwater required an import and conversion process.
  - Qimera doesn't create GWC files so the disk footprint size of a project is greatly reduced and the time to get to your first look at your data is also greatly reduced.
  - You can have your picks automatically marked with the Feature Flag, this enables quick custom hypothesis generation in CUBE processing that lets your picks over-ride the original CUBE estimate of depth.
  - It's much, much quicker to click on top of a mast, integrate and QC with original soundings. We've timed this for a test file with a wreck. It takes one minute. Literally.
- More Capability
  - Only Kongsberg .all/.wcd could be ray traced and georeferenced. Qimera now does this for .all, .s7k and .db (Kongsberg, R2Sonic, Reson and Norbit currently).
  - Qimera can elegantly handle dual head multibeam data in the same view, FMMidwater could not gracefully.
  - More point extraction methods: lasso, rectangle, polygon (FMMidwater only had polygon).
  - You can stack the fan view and you can pick in it, FMMidwater did not let you pick in the stacked fan view.
  - A new bottom suppression filter lets you easily isolate the water column portion of the signal, this capability did not exist in FMMidwater.

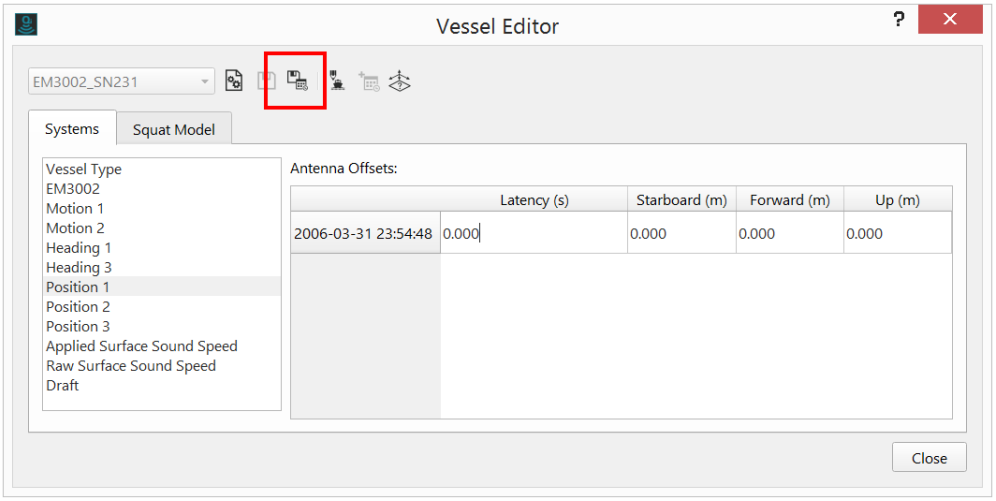
    - You can add picks to a grid, or not. Qimera marks your additional user detections with a special flag to allow you to easily keep your extra points separate from the sonar's real-time detections.
- Improved Results and QA
    - Georegistration using QINSy multibeamer engine is a big improvement over the UNB method used in FMMidwater.
    - Qimera uses the QINSy uncertainty propagation engine to compute the positional uncertainty of your extra picks (TPU, total propagated uncertainty).
    - All of the power of Qimera bathymetric processing is at your finger tips if you need it: import improved navigation, apply a tide correction or a new SVP or correct vessel configuration problems. Your soundings are updated along with all of the original sonar soundings.
    - Navigation interpolation between survey lines is the norm in Qimera, this lets you pick up the first and last few pings that FMMidwater would not have handled.
    - Extracted points are persisted to disk and reloaded every time you review water column data. You can look back at what you've previously extracted and add to it.
    - A quick fan "snapshot" within the water column widget lets you drop a Fan or Curtain object into the scene to help you keep track of your work.
- Export Improvements
    - You can export your Qimera Scene and pick right up in Fledermaus, where you can add other data types and do analysis in the way that you always have.
    - You can do batch exporting of multiple files simultaneously.
    - You can export SD point objects or point clusters for further examination in Fledermaus.
    - You can export SD points from multiple lines into a single SD.
    - You can export your raw picked data (range and angle for a beam) to a GSF file, along with the raw sensor data, for bathymetric processing in other software.

Vessel Configuration Templates

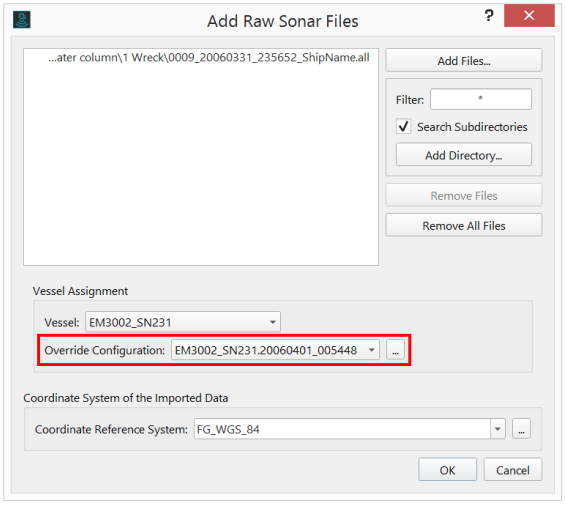
You can now save your vessel configuration setup, including XYZ sensor location offsets, angular alignment offsets, sensor uncertainty parameters (for TPU), etc, as a vessel configuration template that can be applied to files with *Qimera Live* or during manual import. This greatly improves the user experience for clients who have "lean" data formats that do not provide vessel configuration information. This is also useful for "rich" data formats that do provide vessel configuration information but have an error in the original data that you would like to systematically override in post-processing. With this capability, users will only need to enter information one time and the configuration template can preserve it for use in later import sessions and even for other projects. Qimera protects you also from human error by verifying that the vessel templates match the make, model

and sonar serial number during import to ensure that you don't accidentally apply the wrong configuration. Though this is a new option, it is not a necessary step. If your data files are in good shape already, you do not have extra hoops to jump through and your workflow is as streamlined as it was before this. You're welcome! Note that these configuration templates are different from QINSy template.db files since they must accommodate all third party file formats that QINSy's template.db file is not designed to support.

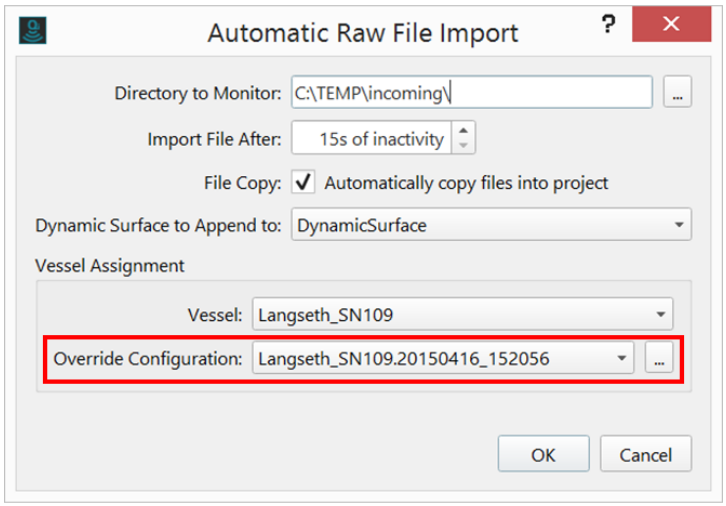
To start, you edit the vessel configuration to your desired settings in the Vessel Editor after importing one of your files. There is a new button to save your configuration on the top row of buttons, as shown below.



The next time that you import data to your project, you can choose to apply the vessel configuration and it will over-ride the configuration that is found in the incoming data files.

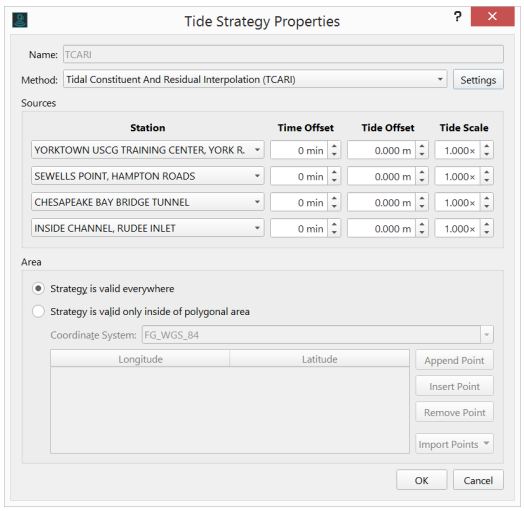


Or, if you like to work in a "just in time" fashion with Qimera Live while offshore, you can also specify the configuration when you set up Qimera Live, as shown below. We've also made some improvements to the layout and wording of the Qimera Live start up dialog to improve understanding and usability.



TCARI

Built for the North American hydrographic/charting market, this capability makes Qimera attractive for NOAA charting work. TCARI is a custom tidal computation solution that NOAA has built in-house to serve their vertical referencing needs for their charting work. We have loosely coupled Qimera with the NOAA TCARI runtime environment in the same way that we embedded Kongsberg SISQA Blackbox: this is a complete under the hood implementation that hides the TCARI engine from the user. You can download and compute TCARI tides and then manage this information using the intuitive experience in Qimera. Previous NOAA workflows using other hydrographic processing software required leaving the processing application to run the custom NOAA tools, Qimera offers an integrated experience that makes it very simple to import the TCARI file (.tc) and get straight to work. Having it integrated into your post-processing application gives augmented QA and it saves time and effort in addition to cutting down on human error when hopping back and forth between different software applications. TCARI is a tidal solution unique to NOAA, if you're curious about it, have a look at their write-up on the TCARI webpage.



Single Beam Support for QINSy Users

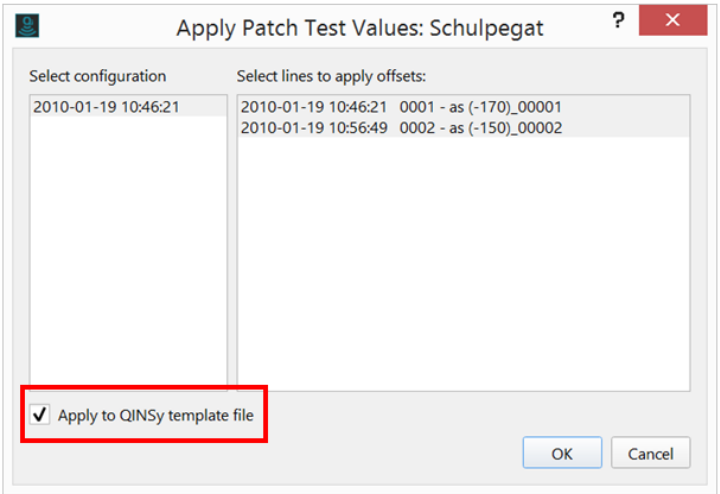
With this release, we are providing preliminary support for Single Beam Echosounders (SBE) in Qimera. This early first step at supporting SBE takes advantage of the online computations from QINSy and preserves the SBE results that are generated in the QPD while online. When you go offline and come to Qimera, you can import your QPDs for point processing and the SBE is present (this has always been the case), but now you can import the .db files as raw sonar files and the SBE data will be preserved throughout re-processing. You can now apply post-processed navigation or tide corrections to the SBE data in the same way that you can for MBE data. When you re-raytrace MBE data, the SBE data is now preserved in the QPD whereas before all non-MBE sensor data was purged from the QPD. As part of the work of preserving the SBE systems during a multibeam re-raytrace operation, the QPD now also preserves information from other sensors such as sidescan or magnetometer that are on the same platform (*object*, in QINSy terminology). This means that you can use Qimera to safely apply tide and/or post-processed navigation to QPD files instead of having to split your workflow partially between Qimera and Processing Manager.

The Slice Editor view below shows data from a dual head MBE setup with data from three SBE systems. Once the data is in Qimera, you can edit it with the Swath Editor, Slice Editor and 3D Editor. Color coding by system lets you easily distinguish between the different systems. When creating grid products, you can also choose which systems you'd like to include.



Patch Test Write-Back for QINSy Users

Also now with this release, you can apply Qimera patch test results into the QINSy template.db file. This allows users to evaluate their patch test data in Qimera and then get straight back to mapping with QINSy since the next survey line that is recorded will immediately have the patch test results applied.



The way we have implemented this is a small pivot from what has been done previously in QINSy's Validator, so we've anticipated a few FAQs, which we've collected immediately below.

Q: Why only apply to Template.db? Why not apply to recorded .db files also like we can in Validator?

A: Before Qimera, users HAD to apply to acquired .db files because the only way to apply these values was to replay the data in QINSy. We now encourage reprocessing in Qimera instead and application to the logged .db files is no longer required. If users still need this, we recommend to clone the Template.db file settings to the necessary .db files in QINSy.

Q: Which files do results get applied to?

A: The patch test tool examines the directory where the patch test .db files reside and finds any Template .db files in there. The offsets are applied to all Template files in the directory. A check is done to ensure that system IDs match to guard against application to files with different sonar systems.

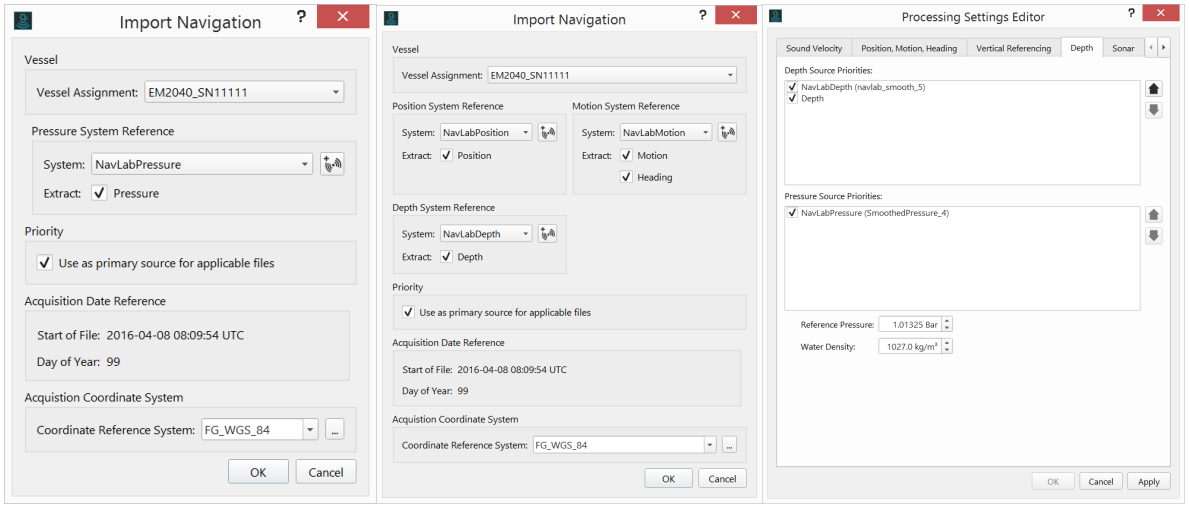
Q: Why can't I choose which template files I want to apply to?

A: We created first a simple workflow for simple setups that largely consist of a single template.db file in the raw data directory. If you require more sophisticated application abilities, please get in touch with us.

Kongsberg NavLab

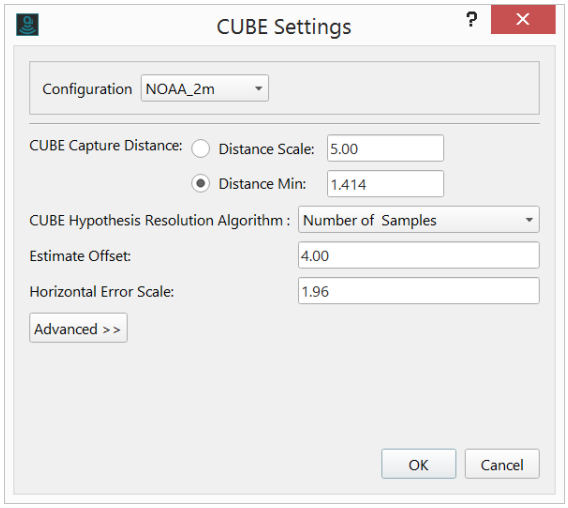
Working closely with our colleagues at Kongsberg, we have implemented support for the Kongsberg NavLab file format, which is a key capability for Kongsberg Hugin and Munin AUV users. The NavLab format provides pressure and/or depth for these submersible vehicles and it streamlines the data processing experience for these users. You can also now import pressure time-series with the ASCII importer.

The sequence of screengrabs below shows the import experience for both raw pressure and post-processed 3D navigation files, along with the Processing Configuration tab for Depth/Pressure systems. To convert pressure to depth, you configure the atmospheric pressure and average water density. If you have both pressure and depth data, depth will always take priority over pressure, but you can disable the depth systems if you'd rather use the pressure measurements.



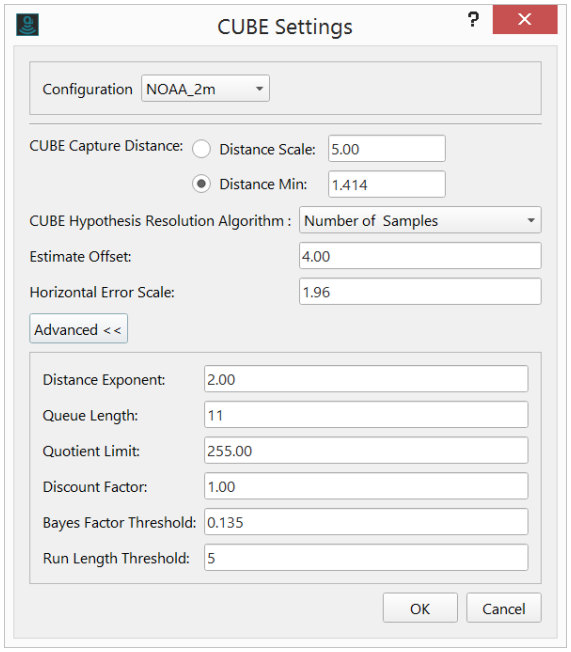
CUBE Processing Configuration

We've added new options for running CUBE that are tailored to NOAA hydrographic and charting work in North America. You can now choose from a number of NOAA CUBE preset combinations, below you can see the result of choosing the NOAA 2 m resolution preset. Though these could be useful to many users, they are largely tailored to the NOAA workflow since they have predefined sets of configurations depending on the grid resolution they are working with.



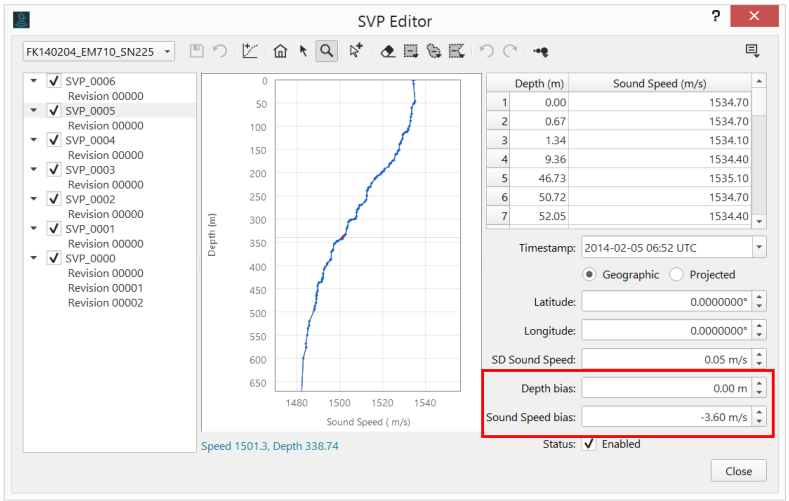
At the request of a few CUBE power users, we've added the ability to adjust some advanced CUBE parameters with an "Advanced" button on the CUBE settings dialog. Most

users will never need to adjust these, but the capability to adjust these empowers researchers and power users to explore finer grained improvements to the CUBE algorithm.



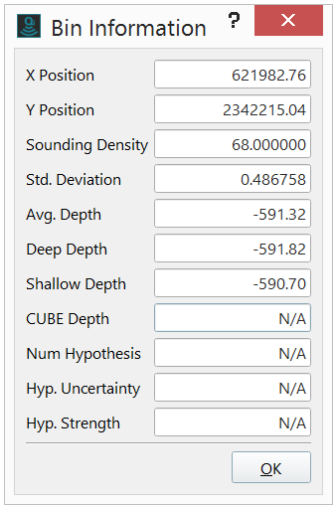
SVP Editor Improvements

You can now specify the depth and/or sound speed sensor bias for your sound speed profile data. These are used to adjust the raw measurements to correct them prior to application during the refraction correction stage in Qimera. If you have a biased sound speed profiler sensor, it's now very easy to correct for this in post-processing in Qimera. The screengrab below shows the new entry fields for these parameters.

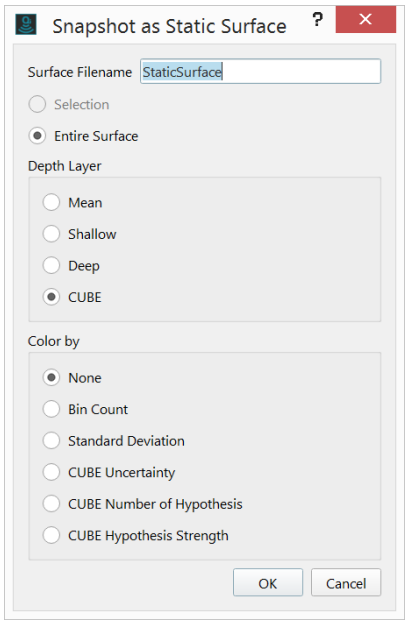


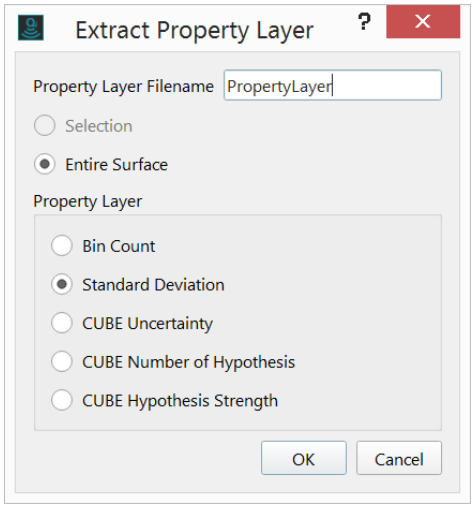
Dynamic Surface Improvements

Under the Dynamic Surface menu, you can now launch a "Bin Information" widget that reports all of the values of the various data layers stored in a Dynamic Surface for your current mouse position in the Scene. See below for an example.



You can now also extract the layers of the Dynamic Surface, such as the bin count, standard deviation, etc, for use within Qimera for Quality Assurance work or for export as a deliverable to a client as a geotiff, for example. The two dialogs shown below are accessed from the Dynamic Surface menu options "Snapshot as Static Surface" and "Extract Property Layer". Both of these generate Fledermaus .SD files that are included in your project in the Project Layers widget. They can be exported as images or grids for inclusion in project deliverables.





Feature Set List

We've made a number of other features, tweaks and improvements. These are listed below, along with all the features explored above, with a bit of explanation if necessary.

- Water Column
  - Midwater sounding extraction
    - Least depth capabilities for wreck surveys
    - Feature extraction
  - Reson Compressed Water Column format is now supported, both for .db and .s7k format
- Data Import Improvements and New Formats
  - Vessel configurations can now be saved for re-use during manual import and/or with *Qimera Live*
  - Kongsberg NavLab binary navigation format can now be imported, both pressure and/or post-processed 3D navigation are supported
  - XSE format is now supported for ELAC multibeam systems
  - ASCII conversion to QPD improvements have been made for FMHydro clients who work primarily with ASCII processed point data files
  - The ASCII parser now allows a wild card character to make it easier to import data with non-ASCII characters
- Tide
  - NOAA's custom TCARI engine has been interfaced for direct use within Qimera
  - Improved tide management for Predicted/Observed/Verified tides, you can now specify the type of tide when you import and if you have multiple types of data per station, these are now prioritized for you.
- QPS Seamless Workflow

    - Preliminary single beam support from .db. You can import db/qpd data with SBE data and it will be preserved in all operations in Qimera. You can grid it and edit it, as well as applying an updated vessel 3D track or a tide.
    - Qimera to QINSy patch test results can now be applied to Template.db files
    - Import QGF and DXF/DWG
    - Support for Common Geodetics Folder. QINSy 8.15 now has a separate geodetic resources installer that uses the "Common Files" directory. Qimera will now look in that directory for common resources. In the near future, this will enable for a smaller Qimera installer since the geodetic resources will be moving to a separate installer.
- Data Validation and QA/QC
    - NOAA CUBE parameters as an option in the CUBE configuration dialog, along with Advanced CUBE settings for power users
    - New Dynamic Surface bin information widget
    - Export additional QA surfaces, you can export the layers of the Dynamic Surface as a Static Surface or as flat image
- Misc
    - Sound velocity profiles now have the option to specify a depth bias and a sound speed sensor bias
    - Patch test can run with a single line, this is handy when you forget to break the line recording during a patch test

Bug Fixes

We typically deal with bug fixes in our maintenance releases. Here is a list of those that we've fixed since our last maintenance release (Qimera version 1.3.6).

- Correction to application of vessel squat, this was failing prior to this release
- Corrections for various geodetic problems with vertical referencing for QINSy users of OSGM15
- Custom Hypotheses now working correctly for CUBE processing, these were previously overridden during a re-CUBE operation
- Patch test calibration report PDF report now contains pictures and is consistent with the HTML report
- The reading of position data from some Kongsberg .all files was failing due to non-compliant NMEA strings
- Multi-plot is corrected to plot beam data for multiple beams simultaneously
- GSF files imported as processed point files were previously ignoring flagged data in the GSF so users could did not have the option to unflag, this has been corrected and Qimera now imports and correctly flags data that is flagged in the GSF for rejection

Installation, Upgrade and Ongoing Support Information for Existing Users

Users with existing Qimera 1.3 projects will be able to open them in Qimera 1.4 but the projects will become upgraded to version 1.4 and will not be able to be re-opened in Qimera 1.3. The water column capabilities in this release require extraction of additional information from raw MBE files, which was not done in Qimera 1.3 or older projects. Users interested in taking advantage of the new water column capabilities are advised to start with fresh projects in Qimera 1.4.

The Qimera 1.1 release had introduced new beam flagging capabilities that required a QPD upgrade. Users with older Qimera 1.0 projects will need to upgrade their QPDs when moving to Qimera 1.4. You will be prompted to upgrade the QPDs in your project when it is first opened.

During the development phase for Qimera 1.4, we paid close attention to incoming bug reports from our clients and we've streamlined our release process to get fixes out to clients in a timely manner, as often as required. This new, streamlined process enabled delivery of twenty-one bug fix releases since the launch of Qimera 1.0 in June of 2015. We will continue to provide this quick turnaround level of service to our customers with Qimera 1.4. If you find a bug that stops your workflow, please contact us and we'll attempt to get a fix to you as quickly as possible.

When we first released Qimera, we purposely kept it lean and mean with the intent of focusing on client feedback to help direct us on how best to hone existing capabilities and also to help us decide which new functionality clients need most. We've done the same with Qimera 1.1 through to Qimera 1.4, so please keep ideas and feedback coming, it helps us to make Qimera better for all users! Please feel free to contact us via the online support system for feedback, feature requests and bug reports.

Documentation

- The Reference Manual has been updated for all features in this release
- We're continuing to update other Knowledge Base articles. The online versions always have the freshest content.
- Several new "How To" style documentation is available to give some guidance on how to use some of the new features in Qimera 1.4. The online versions are always most up-to-date.

Limitations & Known Issues

Qimera should not open QINSy projects while QINSy is running, acquiring data or generating Dynamic Surfaces. **Data loss may occur if this warning is not heeded.** Qimera is currently meant to only open QINSy projects after they are acquired. If you need to use Qimera with QINSy in a real-time environment, it is recommended that you configure QINSy

to copy DB files to a backup directory at the end of each line. You should then create a new Qimera project and use Qimera Live (available as of Qimera 1.1) to monitor the backup directory, import the data, process it and add it to a Dynamic Surface.

If you are a QINSy and Qimera user, you should not copy the QINSy project to another location on the same computer as the original QINSy project. We are currently improving how file paths to various resource files and project file assets are managed between our applications, in the meantime, if you want to process a copy of your QINSy project in Qimera, you should copy it onto another computer. This is a known limitation that we are actively working on to fix and we will let you know when this limitation no longer applies. Of course, if you are willing to work directly on the QINSy project once it is offline, then this is the preferred option and you can ignore this warning.

RELEASE 1.4.1 - Dec 23rd, 2016

Fixes and Improvements

Technical Notes

- Water Column tool
  - In the Water Column tool, the bottom suppression will now work properly for multi sector MBES systems.
  - Certain data was causing a crash when Side view or Stacked view was enable in the Water Column dock. This has been fixed.
  - Exporting Water Column picks as SD objects (not merged into a single file) will no longer cause a crash.
- 3D Editor
  - Tide and Heave values from GSF files will be populated in the 3D Editor attributes table.
  - Fixed a crash that was occurring in 3D Editor when switching between lines that have Water Column picks to those that don't.
- Miscellaneous
  - The Vessel Editor will now display correct offsets when there are multiple vessels.
  - Some of the SVP Editor buttons were causing a crash when there was no SVP in the project. This has been fixed.

- Unfinished polygon selections in Slice Editor were remaining in memory after the tool was closed. This has been fixed.
- The Cross Check Tool will now display correct values for the Reference Z-Range.

- Tide
  - Fixed a bug that only affected Qimera 1.4.0 and caused the application to crash when importing certain ASCII Tide data.

Limitations & Known Issues

The EGM2008.bin geoid file must be manually moved to the Qimera\Resources\QINSy_Geodetics\Geoid folder even if it has been installed using the latest QPS installer. Please contact support if you need assistance.

RELEASE 1.4.2 - Jan 20th, 2017



Special note for QINSy Kongsberg users

This pertains to users that meet ALL of the following criteria:

1) Have a project that was opened or created with Qimera 1.3.6 or earlier.

2) Are using Kongsberg MBES data logged in QINSy

3) Modified MBES head roll offsets previous to 1.4.0

We advise those meeting the above criteria to start a new project or reset their current Qimera project by removing the qpsproject.xml file from the project folder. Crashing can occur with Qimera 1.4.0 or 1.4.1. Qimera 1.4.2 fixes the crashing but if the project is not reset, an incorrect roll offset could be introduced in the Vessel Editor.

Fixes and Improvements

Highlights

We are very pleased to announce that this release includes installers for the Linux and Mac OSX operating systems.

Additionally:

- When a Fledermaus scene is exported from Qimera it will now contain the background chart.
- Qimera now supports the EPSG 9.0 database
- GSF 3.0.7 is now supported in Qimera

Technical Notes

- Dynamic Surface
  - Qimera will no longer crash when a Dynamic Surface is built that is larger than available disk space.
  - The user will also be warned before creating a Dynamic Surface that could be too large for available space.
  - Dynamic Surfaces will now update correctly when non English characters are present in a folder name.
  - A problem with separate Dynamic Surfaces changing their bounds after updates has been fixed.
- Vessel Editor
  - Internal sonar array offsets for the Kongsberg EM2040P are now set correctly.
- Sound Velocity
  - Lags caused by adding SVPs or changing information in an SVP are now reduced.
  - Certain SVPs containing many casts will now import much more quickly.
  - Fixed a problem where certain SVPs were batch imported incorrectly.
- Slice Editor
  - When Auto Zoom is turned off, the Slice Editor will only zoom to the available points the first time a surface is edited. Any additional Slice Editor work on that surface will use the last zoom extents.
  - Scroll Select positions and Polygon selections will no longer be stored in memory.
  - While using the polygon selection tool, centre clicking will no longer create a point and will only recentre the view.
- Time Series Editors
  - Zooming, shifting and scaling of time series in the Time Series Multiplot tool have been improved.
- 3D Editor
  - Window focus now remains on the 3D Editor after changes are saved.
  - Launching the 3D Editor sometimes failed if there were non English characters in the file path name. This has been fixed.
  - The 3D Editor can now be launched with a selection that only contains flagged (rejected) points.
  - A problem with the Surface Edit Overview behaving incorrectly when the 3D Editor was minimized has been fixed.

    - Fixed a problem where certain file names were displayed incorrectly in the 3D Editor attributes table.
- GSF
    - When delayed heave is applied to data that is exported to GSF, the delayed heave time series will be exported rather than the real time heave.
    - Fixed a problem affecting the heading of GSFs exported from Qimera.
- Water Column
    - A problem with EM3002D water column data collected in QINSy was resolved.
    - With certain sonar systems, the water column data was duplicated and mirrored on both sides of the swath. This has been fixed.
    - R2Sonic data logged in QINSy is now displayed properly. This problem affected only Qimera 1.4.0 and 1.4.1.
    - Some of the metadata that was created upon loading raw sonar files was very large. This affects Qimera 1.4.0 and 1.4.1
        - Qimera now only saves this additional information if there is water column data present in the file.
        - The additional metadata that is created for working with water column data now takes up less disk space than previously.
- Patch Test tool
    - A crash that occurred when the user is prompted to save settings has been fixed.
- Miscellaneous
    - Interpolated soundings will no longer be visible in the Patch Test tool unless explicitly turned on.
    - The navigation of certain files logged in QINSy was not being read correctly. This affected data configured with a State Plane projection.
    - The 2017 leap second value (18) is now being applied correctly to imported SBTC data. The leap second value is now displayed in the import dialog.
    - ENCs are now visible through a Dynamic Surface that has its opacity reduced.
    - BAG files exported from Qimera could contain an unintended shift of half a pixel. This has been fixed.

RELEASE 1.4.3 - February 28th, 2017

Special note for Kongsberg users logging using .all files

This pertains to users that meet ALL of the following criteria:

1. Have brought Kongsberg .all files into Qimera
2. The .all files contain data from dual head EM3002 or dual head EM2040

A change has been made to when the phase centres are calculated during ray tracing. This fix corrects the footprint locations when full reprocessing is carried out but has not yet been applied for automatic conversion of soundings from the .all file. The error that has been corrected is vertical and the magnitude is between 0 and ~5 cm depending on the rotation angle of the transducer.

We advise those meeting the above criteria to do the following:

- Trigger a full reprocessing of their data to recompute the footprint locations. This can be accomplished by selecting all lines and clicking on Tools -> Manual Reprocessing -> Sound Velocity Correction.
- Disable automatic conversion of Kongsberg data. Go to Project -> Preferences -> uncheck the box next to 'Automatically convert Kongsberg / GSF sonar data on import'

Fixes and Improvements

Highlights

- This release includes updated translations for Qimera 1.4.
- When a raw sonar file is exported as a GSF file, the Plotted, Feature, and Suspect flags set will now be preserved in the resulting GSF.
- Qimera will now detect if an Intel graphics device is being used for rendering and a message will be displayed. The reason for this warning stems from instabilities, including seemingly random crashes, that have been observed with the use of Intel graphics devices. If an alternate device is available it is advised to use it instead.

Technical Notes

- Navigation and Geodetic
  - Certain raw sonar files from Mesotech M3 systems were not having their navigation extracted successfully. This has been fixed.
  - Fixed a bug where the application of an SBET resulted in the final ping of a file having incorrect height.
  - The first pings of certain sonar files did not have the correct height after applying a separation model. This has been fixed.
  - Fixed a bug where the grid convergence was applied with the wrong sign in reduction of the navigation lever arm, from the GNSS antenna location to the COG.

    - The vertical component of the Rome 1940 transformation is now applied correctly.

- Layers and CAD
    - Fixed a bug where a specific DXF was not being imported correctly.
    - Certain corrupt SD files were causing Qimera to crash. This has been fixed.
    - Fixed a problem stemming from importing CAD files with text labels. Qimera now warns the user that there is text but it is being ignored because it is not currently supported.
    - Fixed a bug that prevented the surface difference statistics dialog from being presented.

- Slice Editor
    - Under certain circumstances, rejected points were being displayed in the Slice Editor when they should not have been. This has been fixed.
    - Fixed a bug that was preventing edits done in the Slice Editor from being unloaded to a GSF.

- Multibeam processing and Filters
    - A fix was made to the calculation of the phase centres of certain transducers during ray tracing calculations. See note above for more details.
    - Fixed a problem with bottom detections not being plotted in the Water Column tool correctly. This affected systems that had a transducer head rotated 180 degrees.
    - Some blocking filters were not being applied correctly to data from .all files that were automatically converted on import. This has been fixed.

- Miscellaneous
    - Qimera will now properly detect Qimera licenses when more than one HASP keys are plugged in.

RELEASE 1.4.4 - March 17th, 2017

Fixes and Improvements

Highlights

- Raw sonar files exported as GSF will now have their flags handled correctly in MB-System. MB-System requires an additional flag to be set for edits.

Technical Notes

- A change to how HASP Licensing was handled in Qimera 1.4.3 caused some licensing to not work properly. This has been fixed.
- When a Qimera project was moved, and edits made afterwards, the Dynamic Surface(s) were not updating. Dynamic Surfaces in this situation will now update as expected.

Qimera 1.5.0 Release

Highlights on this page

- Introduction
  - New Capabilities & Workflows
  - Feature Set List
  - Bug Fixes



Thanks for your feedback

Introduction

4 April 2017, QPS is pleased to release Qimera 1.5, the fifth full feature release since its initial launch 22 months ago. As always, our primary mission with Qimera is to make hydrographic data processing intuitive and as simple as possible, all the while offering powerful capabilities to those that need them without cluttering the workflow for those that don't.

For new capability, we look this time to provide some workflows that allow multiple users to contribute to an overall processing effort. With Qimera 1.5, we introduce two new ways to share work among many people.

- **Cooperative Cleaning:** Allow multiple users to collaboratively clean large data projects while maintaining data integrity. This is done by splitting up a master project into several smaller sub projects. The master project maintains full data processing capability while cleaning sub projects only allow data editing. Data cleaning staff work in their sub projects and their cleaning efforts are checked back in to the main project once complete. In the meantime, the main project may have had reprocessing done, like SVP or SBET application, and the cleaning from the cleaning projects is copied right in gracefully without affecting reprocessing efforts done in the main project.

- **Production Line Processing:** Allow staged processing to break apart processing and cleaning tasks to spread the work among individuals much in the same way that an assembly line works in a factory. This is perfect for keeping up with daily “pulses” of data during a survey. The mathematical processing for a day’s worth of data is handled in a processing project by the surveyor, this can even be configured with Qimera Live to streamline operations even more. The processed QPD sounding output from the surveyor's project is then aggregated into a master delivery project where results can be compared against previous days and further cleaning can be done. This is done repeatedly, with a day of work being mathematically processed in a processing project and the output being added to a steadily growing main project. A link is maintained between the processing projects and the master project such that the processing project can be re-opened for further corrections if problems are identified. When it’s all done, the combined output in the master delivery project is encapsulated for delivery.

Also with this release, we make yet another step forward on our roadmap to realign and adjust the software products from the QINSy and Fledermaus families.

- We follow up on feedback from our Qloud users, who have had a nearly complete functional replacement since Qimera 1.3. We've hosted several workshops with many clients and have focused on some of the common bits of feedback that we've heard across the board. In this release, Qloud users will find a more responsive Slice Editor, and they'll find polygon creation, preservation, import and export. These polygons can then be used for spatial filtering within the application and you can also import CAD polygons and use them the same way. Also for Qloud users, we have a new Point Cleaning work area preset that greatly simplifies the display and only shows the widgets that are relevant for point cleaning. Lastly, you can now export a Dynamic Surface to a new layer in a Sounding Grid file, preserving workflows that once existed between Qloud and other QPS applications like the Sounding Grid Utility.
- We are building up yet more support for the sensor modalities that are supported in QINSy, this time you'll find Laser support. In previous releases, Qimera only allowed for point editing of laser data, now users can do full sensor processing of QINSy laser data. You can re-process for sensor offsets and alignment angles and you can apply SBET, tide, etc. Calibration and wobble analysis will come in a later release.
- We have migrated the Geoid Models that were previously bundled with Qimera into a separate installer. The separate installer is also used by QINSy, thus the QINSy/Qimera experience is improved in that you only need to download, install and manage a single set of geodetic resources. As a result, the Qimera installer is now much smaller, resulting in a quicker download which is important for those working offshore.

Read on for details below and, as always, please get in touch with us via the online support system if you have any questions about how the new features may fit into your existing workflows. There are several features to highlight in this release, as you'll see below.

Many of the other new features are driven by client feedback and feature requests and for these we thank our clients for getting in touch with us with their great ideas!

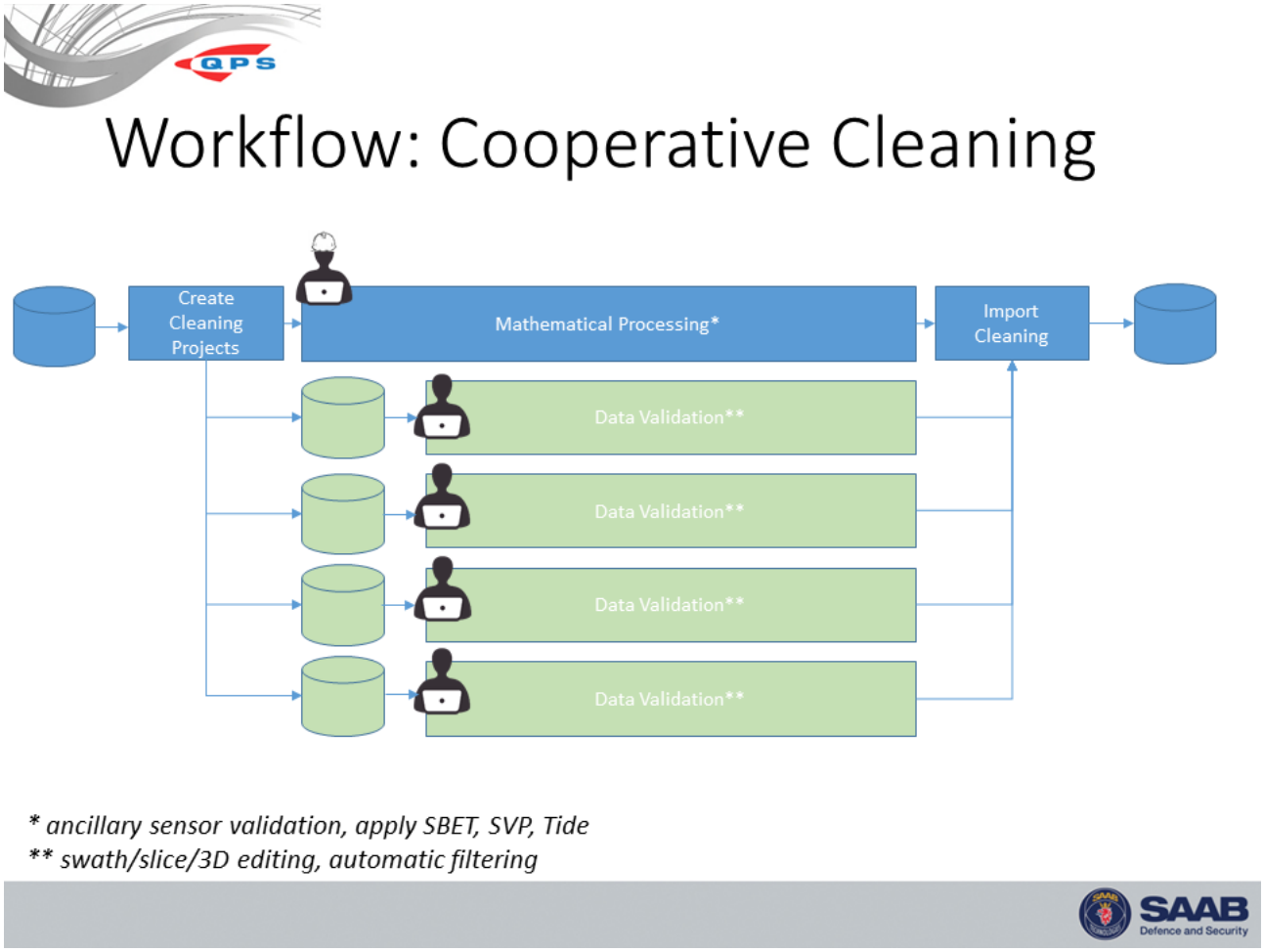
What's New

New Capabilities & Workflows

Multiple User Workflow Enhancements

Cooperative Cleaning

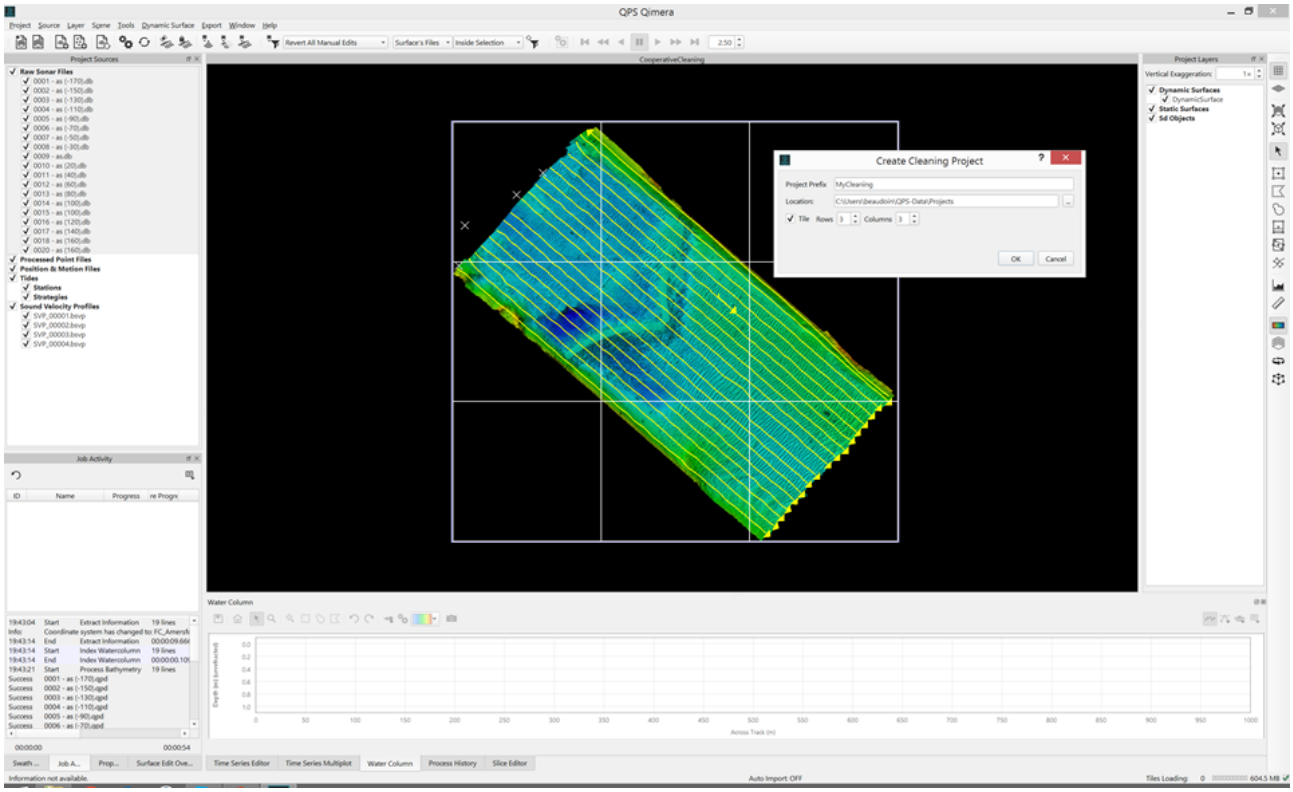
This method allows the senior data processor or Surveyor-in-charge to maintain full control of the sensor and geodetic information while farming out the data cleaning to junior and/or multiple data processors. This is done by creating sub projects from the main project, these sub projects have their own Dynamic Surface and QPDs to work on so there is no resource conflict between the main project and the sub projects. Once cleaning is done in the sub projects, Qimera then seamlessly re-integrates the data back to the master project for final quality control and product creation by the lead surveyor. The graphic below explains the basic workflow concepts.



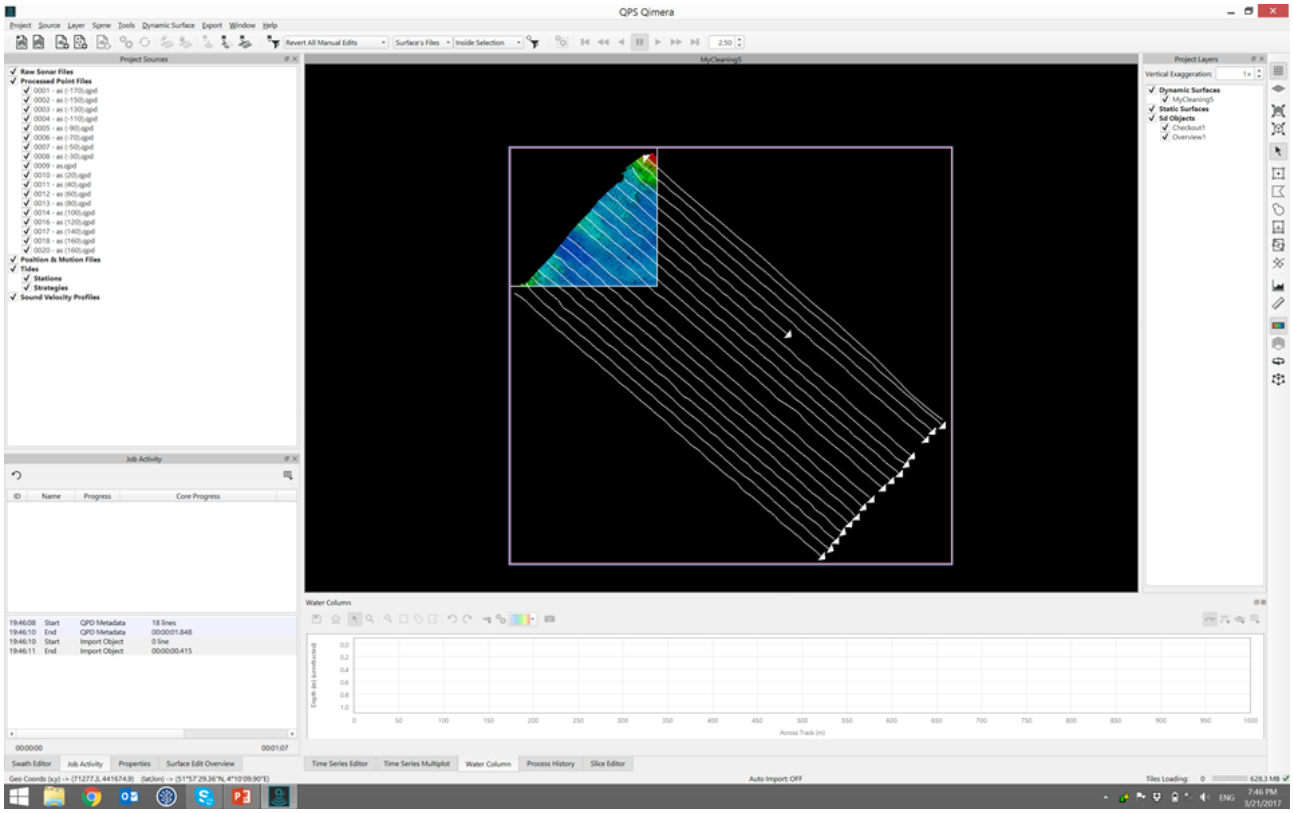
Benefits of this are:

- Multiple users can be tasked with working on the main bottleneck of multibeam sonar processing which is data cleaning, thereby rapidly reducing the time it takes to clean and validate multibeam survey data.
- All creation and re-integration of sub-projects is controlled by Qimera. There is no manual copy and paste operations, thus minimizing the effects of human error.
- Allows focused cleaning of large area surveys by multiple users while maintaining control by the senior data processor.
- Sub projects only require a Qimera Clean license and therefore will reduce the total cost of ownership of the software for a data processing team.
- Data cleaning can be performed by less experienced personnel again reducing project costs.
- Sub projects contain QPD files only and are thus limited to cleaning only. This reduces the risk of junior personnel accidentally applying correctors or making configuration changes.
- Sub projects can be moved off the network to a local machine to overcome slow network bandwidth, while maintaining the integrity of the data by keeping the master copy.

The image below shows the main project being cut into a series of nine sub-projects with the new "Create Cleaning Projects" dialog. The user specifies the cleaning project base name, location for output and the number of rows and tiles to cut the project into. Alternately, the main project surveyor can also designate a particular area for a cleaning project using the rectangular selection tool and the dialog to create a cleaning project will use this area instead.



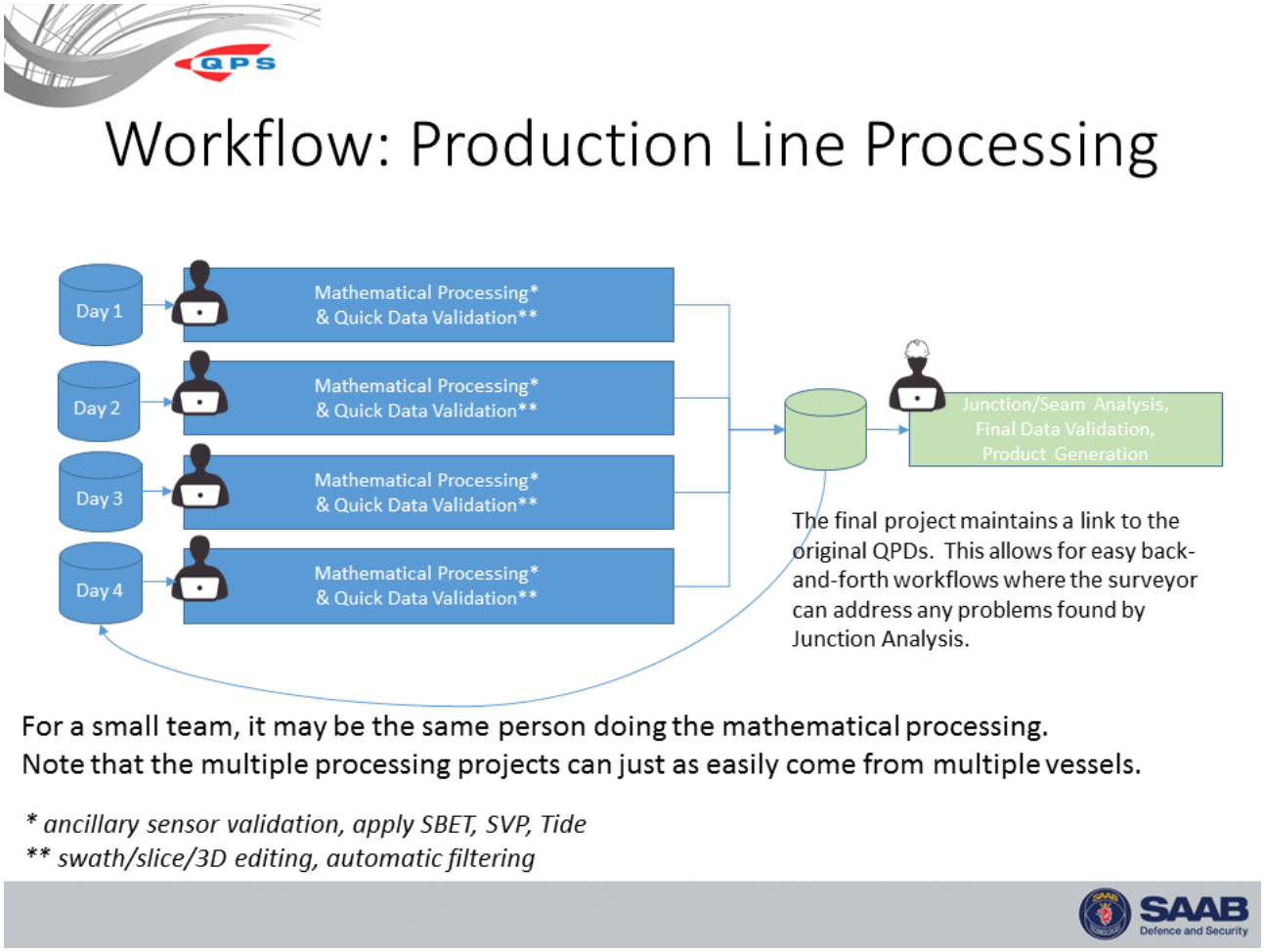
The image below shows the data from the point of view of the person cleaning one of the sub projects. They see the QPDs from the main project that overlap their work area and they see the outline of the entire project as well as the outline of their sub area. Since it is only QPDs that are brought into a cleaning project, the only actions that are permissible are data cleaning. Compartmentalizing the data into cleaning projects limits the risk of accidental re-processing from inexperienced or curious data processors who like to explore what all the buttons do.



Once the data cleaner's work is done, the main project is opened up by the lead surveyor and they can import the cleaning from the cleaning project. Only the editing that was done inside the cleaning area limit rectangle is brought back into the main project, further protecting the main project from overzealous cleaning that may have been done beyond the data cleaner's work area.

Production Line Processing

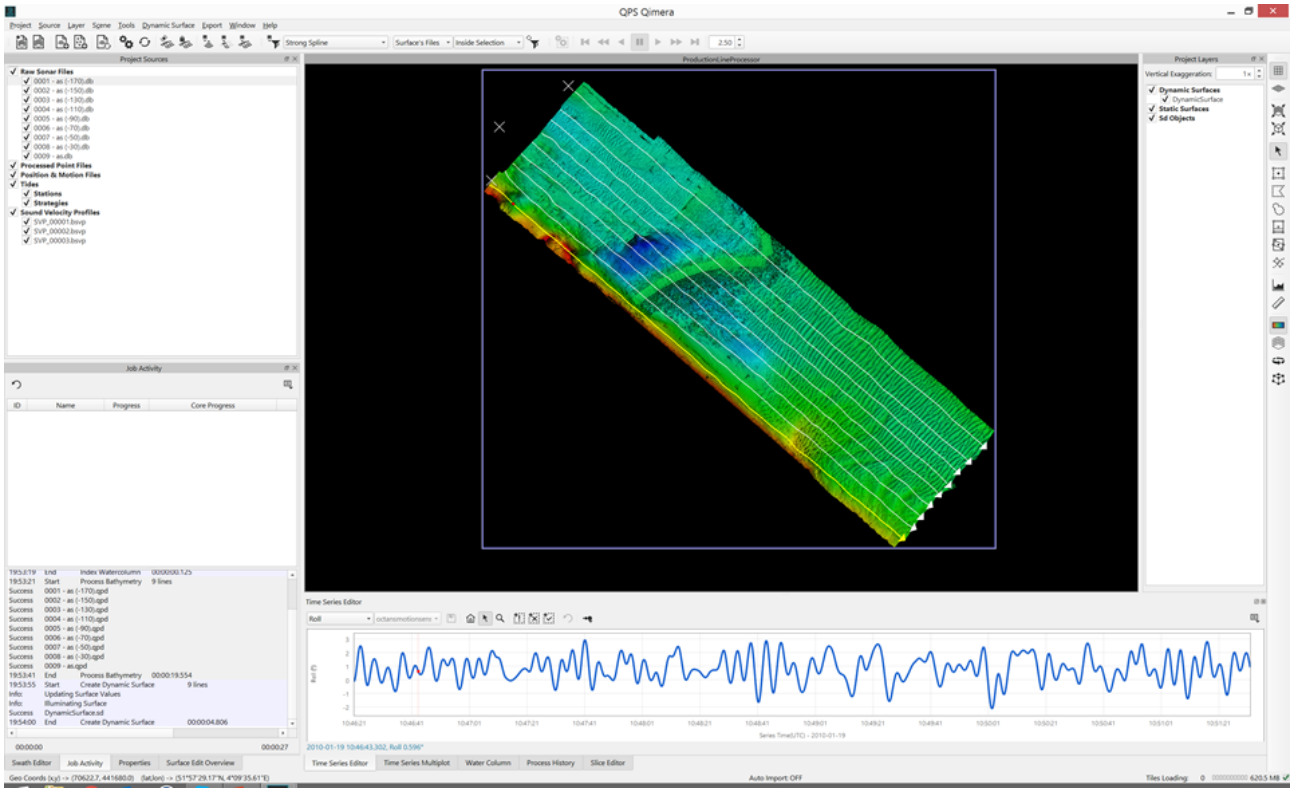
This method is used where full processing capability is required for multiple users but the final result needs to be checked and final products created from it. Production line cleaning merges multiple Qimera projects into one single project where data cleaning and QC can be performed, this is done by importing the QPD results from the processing projects into a new and final project where the results are staged for delivery. The graphic below explains the basic workflow concepts.

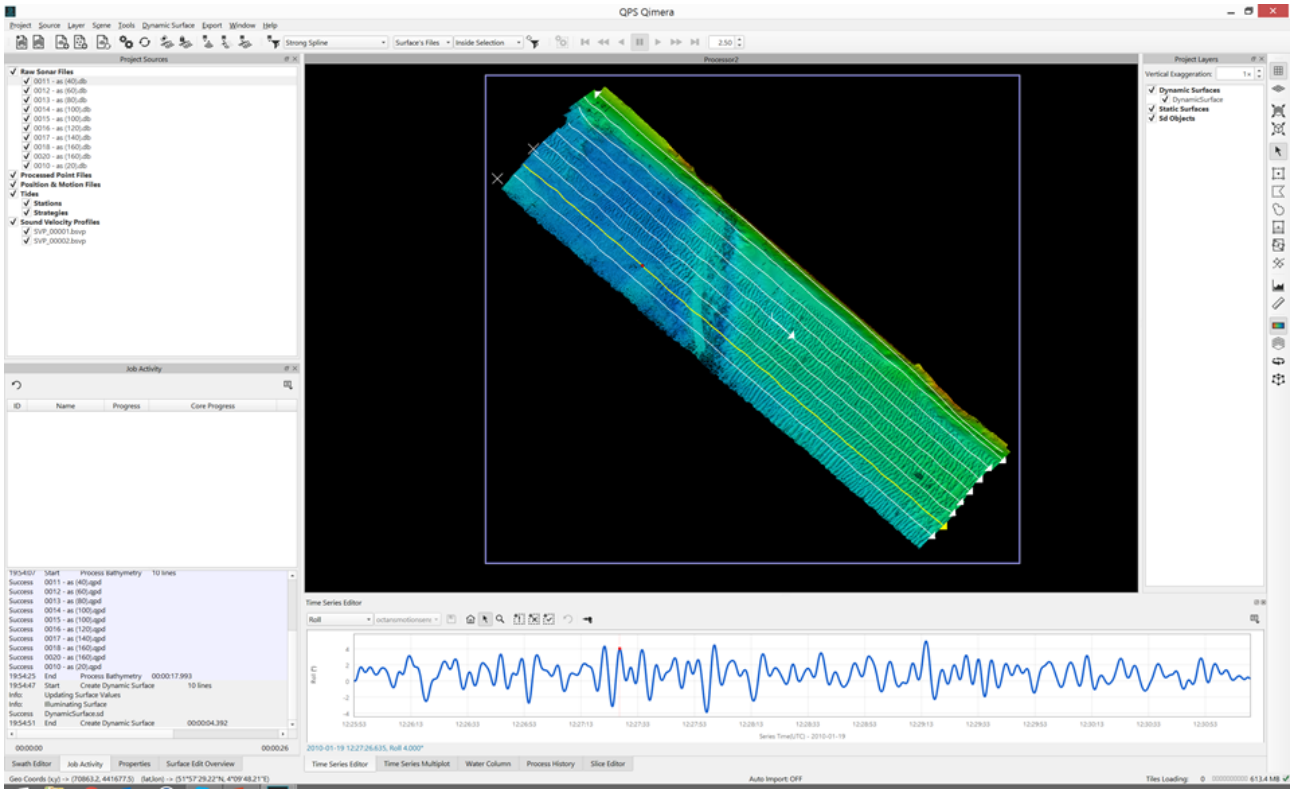


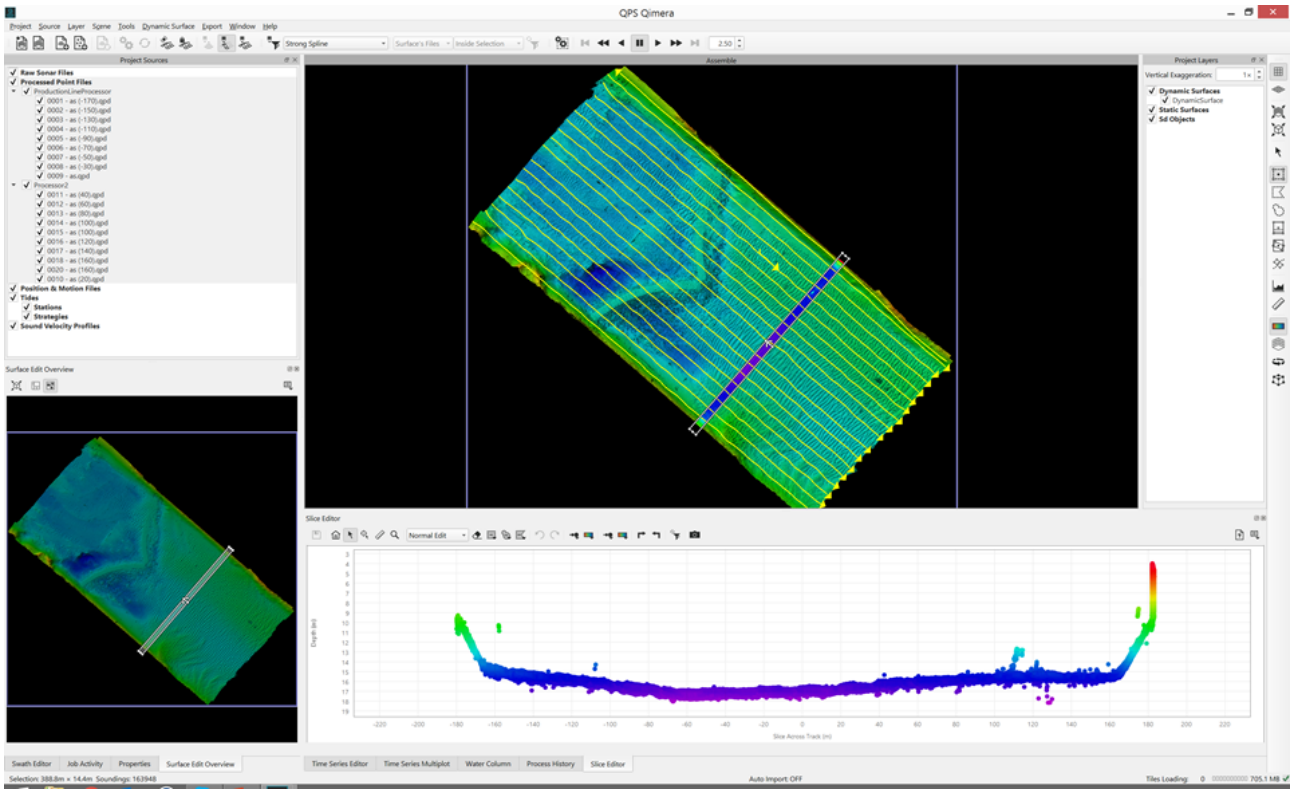
Benefits of this are:

- For a Hydrographic office, a hydrographic survey can be portioned up between the bathymetry appraisal team for full validation by each person, but then pulled together at the end for final QC and then chart production requirements.
- For Pipeline and cable surveys where the data can be divided into an alignment sheet per data processor. All of the separate projects can be brought together into one for the senior data processor to quality control the data and create the final product.
- Processing can be divided offshore into one processor per day. The mathematical processing is done in the daily project and is limited to the data and ancillary information to deal with the single day only. This reduces the complexity of managing several tens or hundreds of additional ancillary files that may accrue over the span of a project. The daily processing project only needs the ancillary data for that day, making this experience much less prone to error.
- All merging operations are performed by the software NOT by humans, therefore eliminating error.

The series of images below show two separate sets of data being processed to get from raw sensor data to georeferenced soundings. The third image shows the QPD results from the first two small projects being merged into an assembly project, with the Slice Editor being used to verify the line up between the two different data sets. It's important to note that the QPDs are shared between the processing project and the main project and it is up to you to ensure that you do not attempt to write to QPDs at the same time. The workflows for which this is meant to be used largely protect against this since data should not be submitted for inclusion in the master project until the mathematical processing is done, i.e the mathematical processing project is done and is closed. The main processor then pulls the data into the main project with the understanding that the mathematical processing project will not be re-opened unless they surveyor is directed to do so, which should only be necessary if problems occur. A little bit of human coordination goes a long way in orchestrating this and avoids complex resource locking schemes in other software packages which sometimes lock users out of their data. Humans can be smart and can coordinate, we've made just enough functionality to let you coordinate and work together.

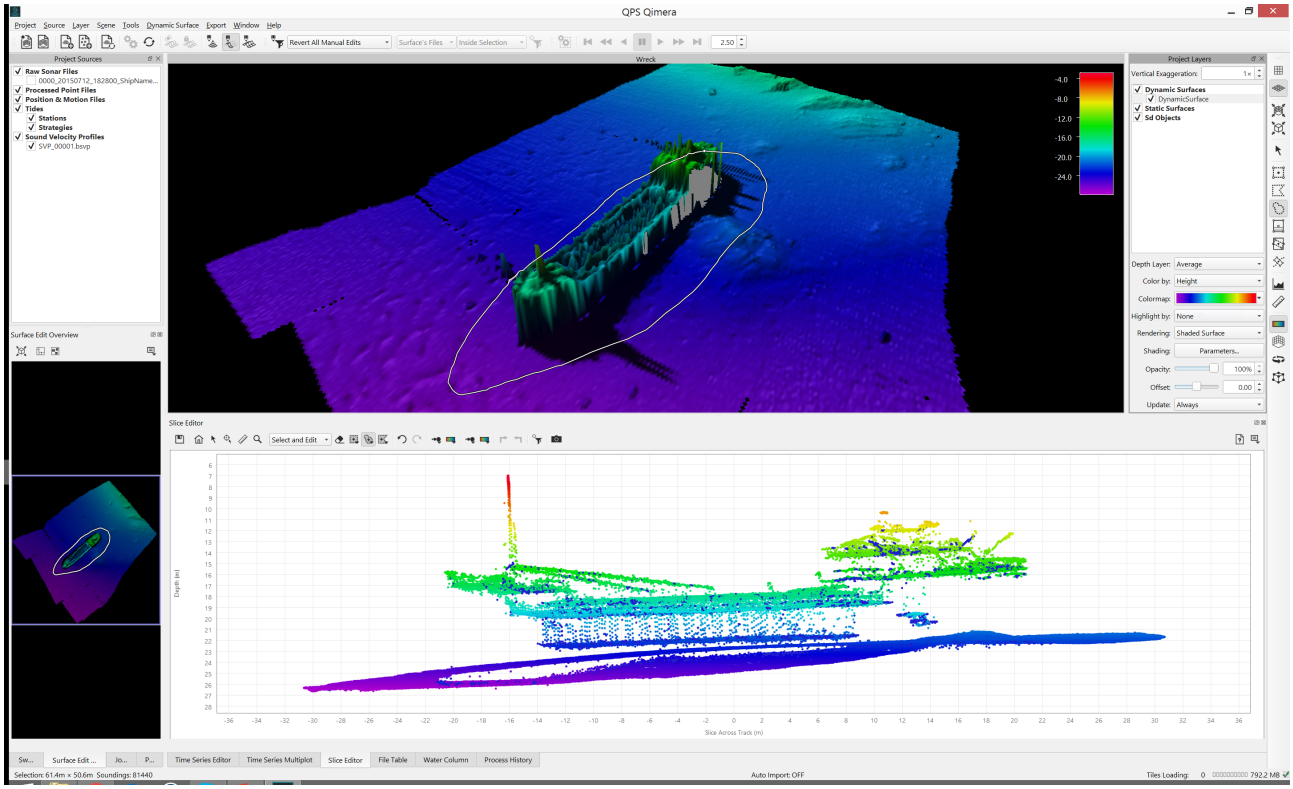



QPS Qimera

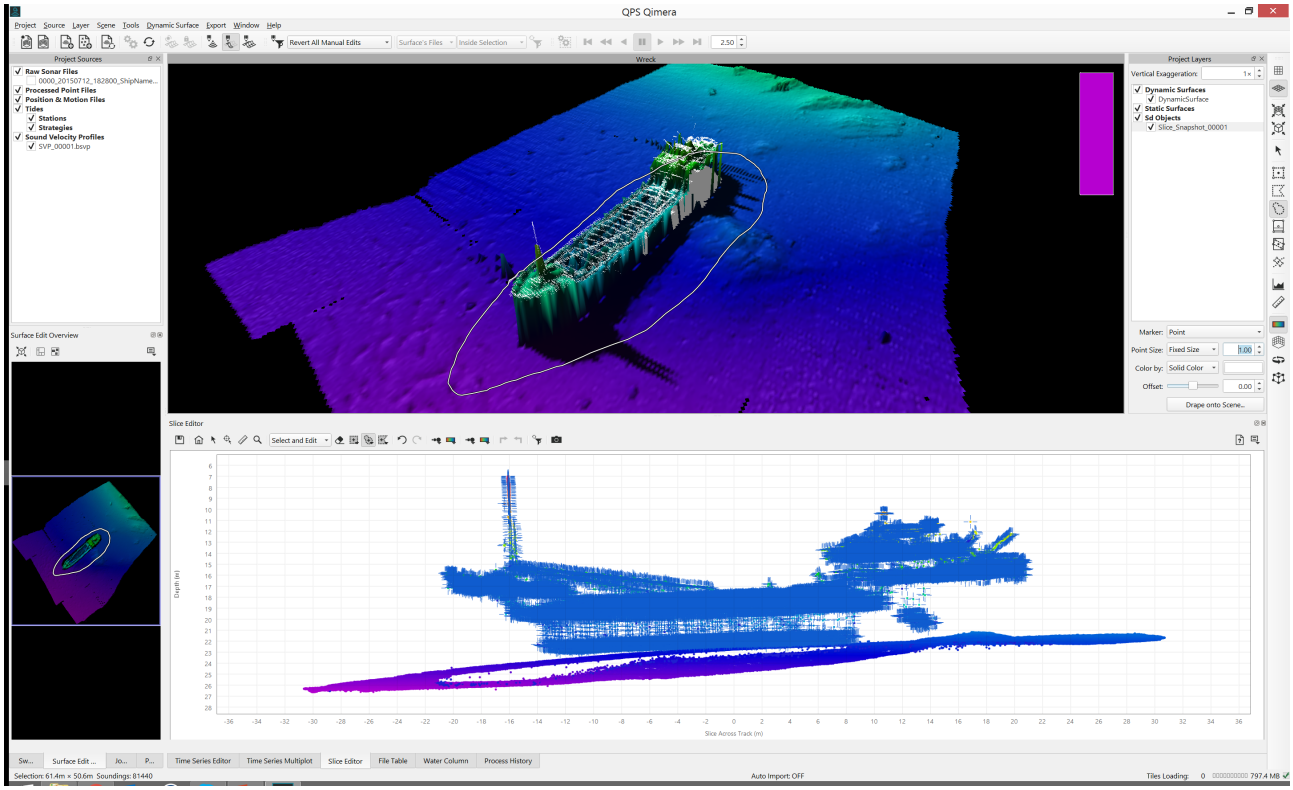

QPS Qimera

Snapshot To Scene

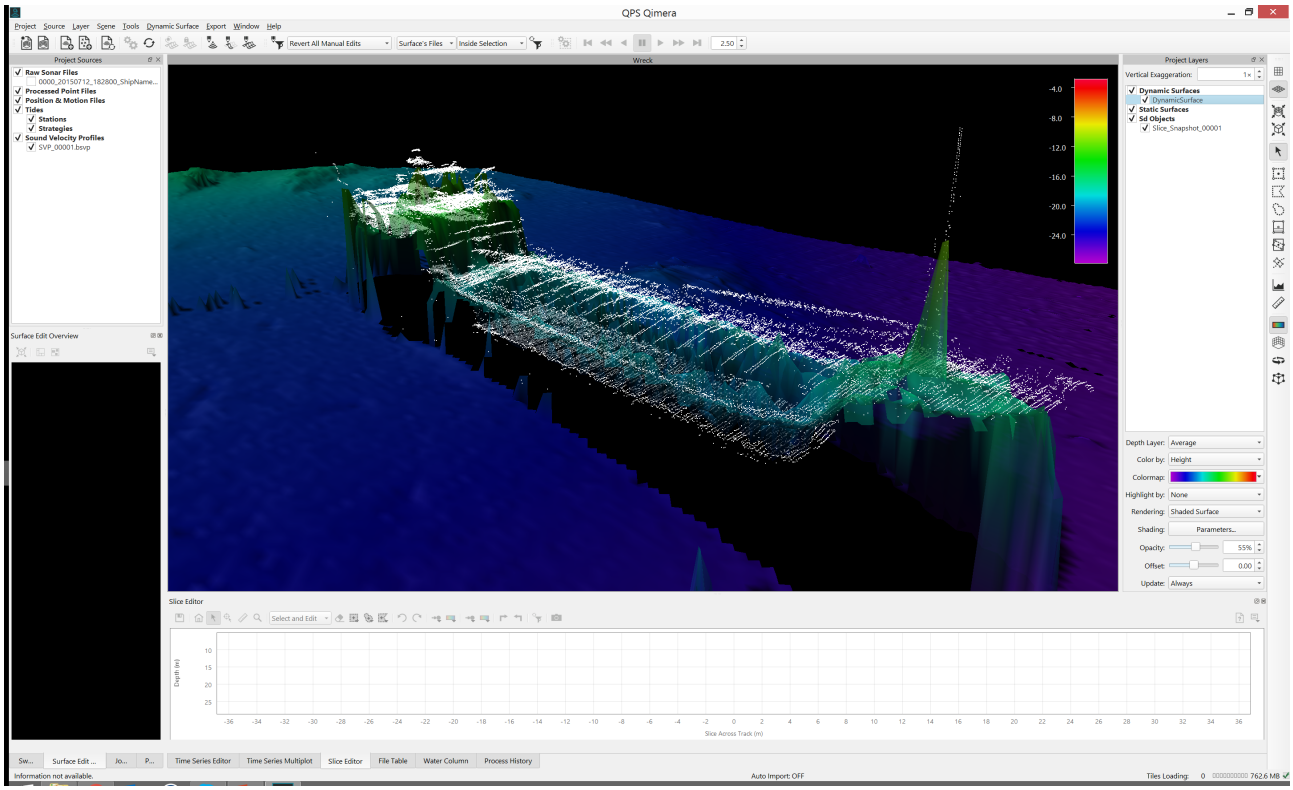
Do a quick snapshot of soundings in any sounding editor to quickly capture point clouds into the Scene to stage for further analysis or simply for marking up areas of interest. A snapshot can be done from the Swath Editor, the Slice Editor and the 3D Editor. This is a great way to mark up areas of interest that need further investigation but you can also use this to easily isolate points of interest for 4D Scene building for Fledermaus visualization, analysis or movie making. The points are saved in Fledermaus .sd format for direct use in Qimera or Fledermaus, but they can also be exported as ASCII XYZ for quick load into other software applications. The sequence of images below shows the Slice Editor being used to isolate the soundings collected over a wreck.



By switching to the Slice Editor's "Select and Edit" mode of operation, you can lasso select the exact points you want to extract, see below. Clicking the camera icon in the Slice Editor gives a snapshot of the selected soundings in the Scene by adding a Fledermaus .sd file into the project.



The points in the snapshot .sd maintain the full metadata of the soundings, including TPU and intensity; these can then be used to color the .sd points or to control their size.

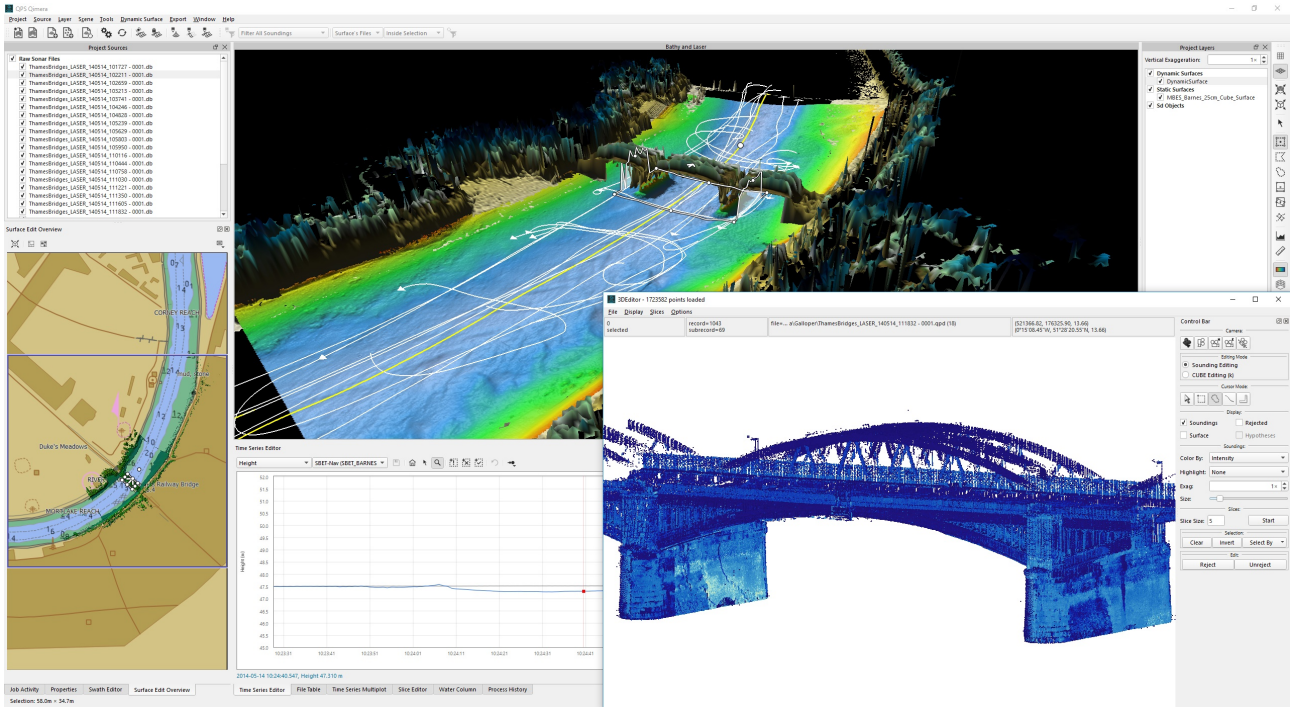


It is important to note that snapshot points are completely decoupled from the original soundings. If you re-process soundings, the snapshots will not update. This capability is meant to mark up data for review, for "bookmarking" interesting items, or isolating a set of points for creation of a complex scene in Fledermaus.

Laser from QINSy .db

Qimera 1.5 now supports full sensor processing of laser data from QINSy .db files. You can import .db files with laser, you can process them to compute footprints, you can adjust the sensor location and alignment angles in the vessel configuration, you can apply post-processed navigation like SBET, etc. We will examine augmenting the Patch Test tool for laser in a later release, along with the Wobble Analysis tool.

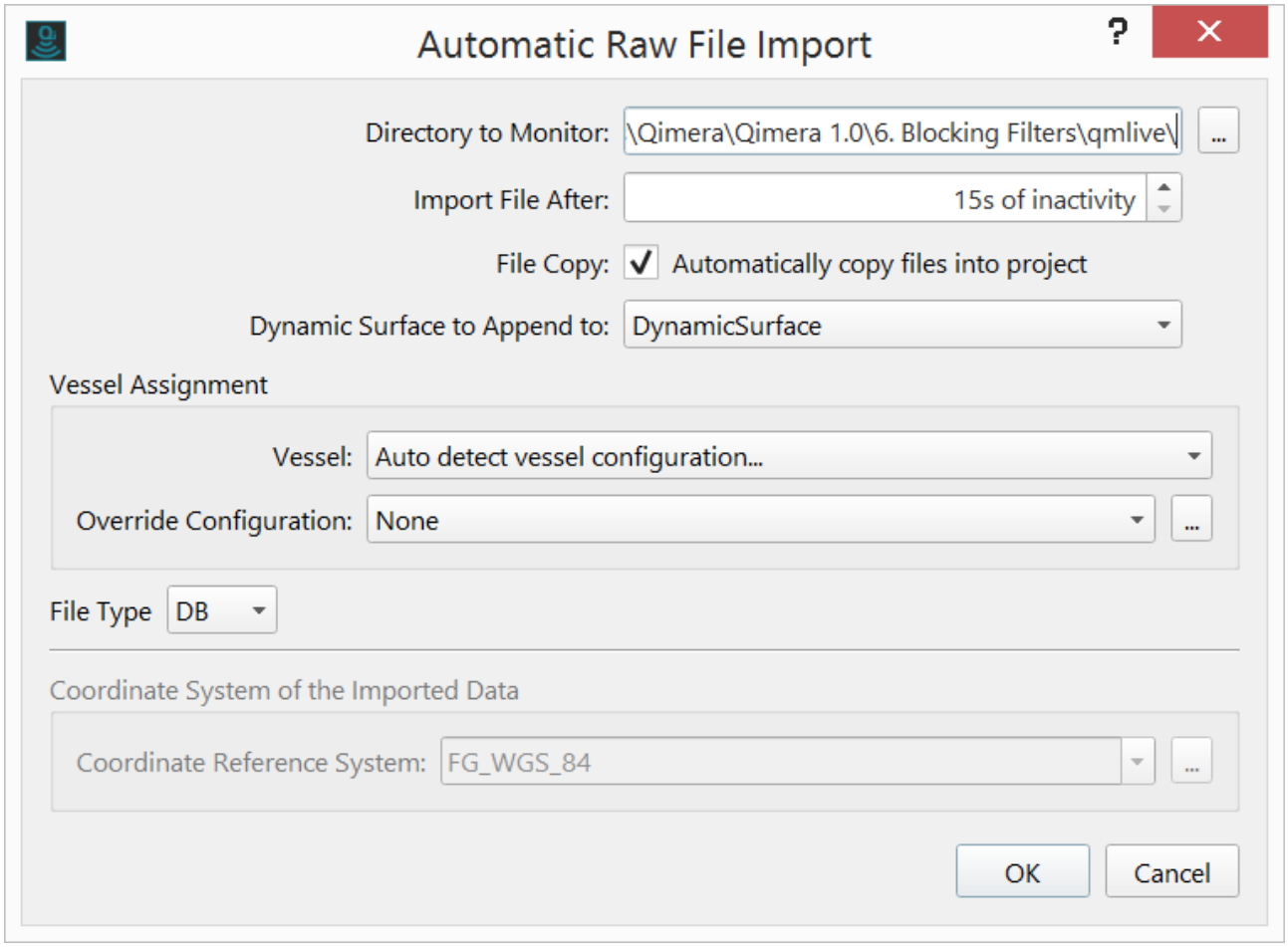
Laser data can be added to Dynamic Surfaces and the Slice Editor and 3D Editor can be used to validate points and remove outliers. The image below shows the Thames River Bridge with the point cloud being drawn in the 3D Editor. Combining this with the Snapshot to Scene capability lets you quickly grab sections of laser data for engineering analysis.



Qimera Live Improvements

Qimera Live ingests new files and automatically processes them and adds them to your grid. At the end of the day, close the lid on your laptop and go home with a project that is ready to go. This is built-in to Qimera and is available at no extra cost. Previous versions of Qimera Live required the input of at least one raw sonar file and the creation of an initial Dynamic Surface. With the 1.5 version, you can now start with an empty project and get

right to work onboard with live data import without having to import a file or create a Dynamic Surface. With this new capability, you can start with an empty project and have it hook directly up to the data directory. Qimera Live now provides a simple one-click start up that lets you process your data on the ship in near real-time. Not only is it one-click, there is no process to design or configure, it just works. For incoming data files that do not support vessel configuration data (e.g. S7K or JSF), the capability delivered in Qimera 1.4 lets you specify a vessel configuration to use on startup.



Polygon draw, save and re-use for spatially bounded filtering & clipping

Many Qloud users missed the ability to draw polygons and to be able to preserve them for use within the same project, or export them to use in other projects. These polygons were often used for spatial filtering, often times being used to clip the outer limit of a survey area to a specified boundary. Now Qimera will let you create and preserve polygons using the spatial selection tools that are already in Qimera (the *rectangle*, *polygon* and *lasso* area selection tools). Under the Layer menu, users will now find a new entry that lets you promote your spatial selections into line objects: "*Create Line Object from Current*

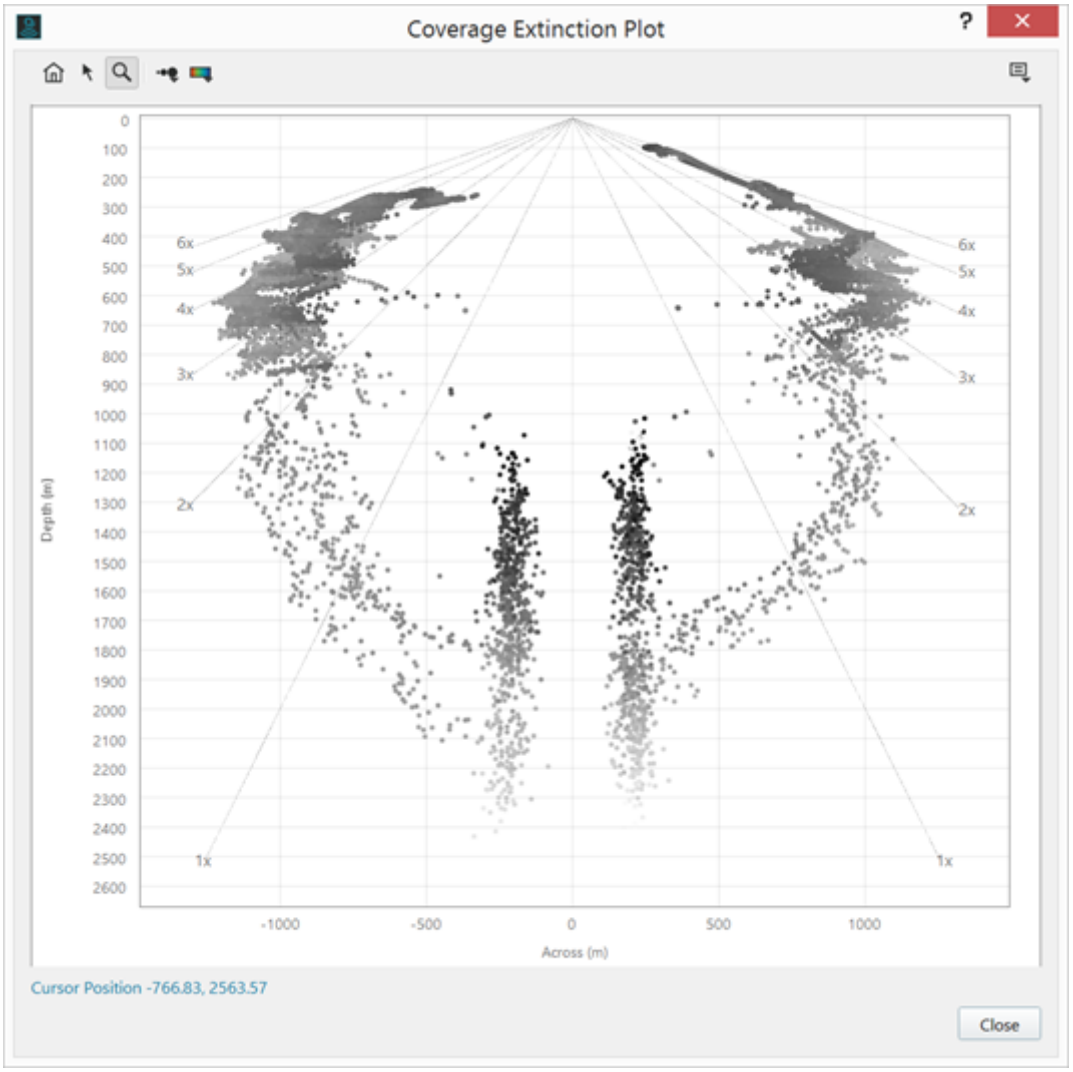
Selection". The promoted line objects will appear in the Sd Objects node of the Layers widget where you access your maps.

A polygon line object can also be created by importing a CAD file. These line objects, along with those created from a user selection, can now be used to create spatial selections for use in filtering or clipping operations. Right-click on any Sd line object and choose "*Use Line as Selection*". This will switch you to the lasso mouse mode and will create a lasso selection for you based on the points in your line object. This spatial selection can now be used for any of the usual operations in Qimera, like limiting the area for applying a filter or launching the Slice Editor for a particular location. The Sd line objects that are created can be used from one Qimera project to another since the .sd file format is supported natively in Qimera and also in Fledermaus. You can also export these line objects as CAD files or as XYZ points.

Coverage Extinction Plot

There is a new analysis plotting tool that lets you assess the swath coverage capabilities of your multibeam system. Data to fuel this type of plot usually consists of a set of survey lines running from the shallowest to deepest depth range of the system. As the depth increases, the outermost beams have a harder time picking up a detection and the coverage decreases until finally reaching a point where even the nadir beams can no longer detect the bottom. Having this type of capability is very handy during Sea Acceptance Trials since the surveyor can assess the system's swath coverage performance relative to the manufacturer's claimed specifications to ensure compliance. You don't want to take delivery of a system that isn't performing to specification, and this tool will help you assess compliance. It also helps raise attention to noise limitation issues due to mechanical, acoustic or electrical sources of interference. For example, repeating these types of field trials before and after visits to ship yards can also catch problems early on since often times there are mechanical and electrical changes made during dry dock periods, and sometimes even modifications to the hull which can create flow noise problems. Many examples of this type of plot being used to assess and diagnose overall multibeam system health can be seen in the technical reports produced by the Multibeam Advisory Committee (MAC) on their website, http://mac.unols.org/reports.

The image below repeats the analysis of a Kongsberg EM710 data set done by the MAC during a sea trial aboard R/V Falkor (look for the 2014 (Spring) report on this at the link above, specifically page 18). The graph indicates that the EM710 achieved maximum swath width at a depth of about 500-600 m, which is within expectation. Full extinction occurred near 2,000 m, which was also expected. As with all Qimera plotting widgets, the graph can be saved as a report quality PNG file with full markup of axes, etc.



Feature Set List

We've made a number of other features, tweaks and improvements. These are listed below, along with all the features explored above, with a bit of explanation.

- **New Tools and Capabilities**
  - Cooperative Cleaning. You can split up large processing projects into smaller cleaning projects to allow multiple users to contribute in data validation efforts while the lead processor does mathematical processing in the same project.
  - Production Line Processing. You can now collate data from several projects together into a master project for final validation and product preparation. Mathematical processing is done in the smaller projects, along with data validation if desired. The final validation and junction analysis in areas of overlap between projects is done in the assembly project. If problems are found, the surveyor can be directed to re-open their processing project to

make corrections, the QPDs that become corrected are then detected in the main project and the mapping products will update the next time the master project is opened.

- Snapshot To Scene. You can now quickly isolate soundings of interest and have them included in the Scene as a set of points objects. This can be used to mark up areas of interest that require further investigation, perhaps even for identifying features of note. The .sd point files that are created can be used directly in Fledermaus, but they can also be exported quickly as ASCII text files for use in other software.
- R2Sonic multi-spectral is now supported in that there is a new custom filter available via the Filter Operation Toolbar that lets you specify the frequency that you'd like to preserve in the QPDs. All other soundings remain from pings with other frequencies, however they are disabled via the filter flag. You can now choose your desired frequency for bathymetric processing. This augments the multi-spectral backscatter capabilities delivered in FMGT in Fledermaus version 7.7.0.

- **QPS Seamless Workflow Improvements**
  - Laser from QINSy .db. You can now perform raw sensor processing for laser sensors acquired with QINSy. This includes processing directly from QINSy .db files, you can also adjust sensor location and alignment angles and apply post-processed navigation like SBET. Patch test and wobble analysis support for laser will come in a later release.
  - Qimera can now be launched from the QINSy Console with your QINSy project "ready to go". Consult the QINSy 8.16 release notes for more information.
  - Geoid Model files are now fully shared with QINSy using a common installer for these files. QINSy and Qimera now share a common Geoid Model installation location and the Qimera installer has reduced accordingly in size.
  - Ability to export to a new layer in Sounding Grid file. For QINSy users who were used to sliding a new layer of a grid into an existing Sounding Grid, you can now do this from Qimera.
- **Imports and Exports**
  - Qimera Live Improvements. You can start now with a completely empty project. Previously you had to import at least one line and create one Dynamic Surface. Now you can start it up from scratch from a completely empty project.
  - R2Sonic raw format. Qimera now supports import of raw R2Sonic data records that are sometimes recorded using custom data loggers on AUVs where a traditional acquisition system is not used. Following the convention we established in FMGT in Fledermaus version 7.7, files with the extension .R2SC can now be imported and combined with navigation, motion and SVP.
  - Export track to ASCII now supports specification of the outgoing geodetic coordinate frame. Previosly, you could only export in the project's projected units.
- **CAD Format Support and Capabilities**

  - Polygon draw, save and re-use for spatially bounded filtering & clipping. You can draw polygons, have them preserved as line objects (.sd format) in the Scene. These can then be converted back into a selection and used for spatial filtering. The same capability allows imported CAD objects to be used for spatially bounded filtering & clipping. Drawn polygons that are promoted to line objects can also be exported for use in other software applications.
  - Allow for selecting multiple QGF files during CAD import.
- **Data Validation**
  - Workspace preset for just point cleaning. We did this in response to Qloud user feedback, there is a preset that minimizes the number of widgets and tools shown to users when they are only interested in editing soundings.
  - Performance improvements for Slice Editor. Based on feedback from our Qloud users, we made several efficiency improvements to the Slice Editor for increased responsiveness for the rectangular selection mode. We will be porting these advances to the Scroll select mode in a follow up release.
  - The "suspect" filter has been ported from Fledermaus to Qimera for FMHydro users. You can now flag soundings as "suspect" when they deviate from the Dynamic Surface depth by a prescribed distance.
- **Analysis**
  - Coverage Extinction Plot. You can now plot the outer soundings for a specified set of survey lines to establish the coverage capabilities of your multibeam system. This is handy for assessing coverage capabilities as a function of water depth to compare against the manufacturer's specifications.
  - More control over how patch test offsets are applied. For systems with separate transmit and receiver locations, you can now choose to have the patch test offsets be applied to both the transmitter and receiver. This is primarily for Kongsberg EM2040 systems with separate transmit and receiver locations, as requested by our colleagues at Kongsberg Maritime. Previously, Qimera followed the QINSy convention of applying the roll offset to the receiver only and the pitch/heading offsets to the transmitter only. The patch test tool will now detect when you have separate transmitter and receiver locations and will ask you for your preference.
  - Plot transducer tracks in Overview Window for patch test. When you run the patch test tool, the trackline drawn in the 4D Scene now reflects the position of the sonar head(s) to better establish which soundings are immediately below the transducer for pitch alignment.
- **Misc**

- Plot SVP locations in Scene. If SVP profiles have their position specified, they will be plotted in the Scene to aid in quality assurance of SVP metadata and also in application of SVP.
- Escape key shortcut to return to Explore mode has been disabled. The Escape key previously returned Qimera to "Explore" mode, which frustrated many non-Fledermaus users.
- Ability to organize sources and layers alphabetically. You can re-organize items alphabetically using the regrouping capability that has been available since Qimera was launched.

Bug Fixes

We typically deal with bug fixes in our maintenance releases. Here is a list of those that we've fixed since our last maintenance release (Qimera version 1.4.4).

- Fixed a bug where the 'Nearest in Distance' setting for SVP processing was not transitioning midway between casts.
- Reverting a Vessel Configuration when an SBET was applied was causing a crash. The crash and the underlying cause have been fixed.
- The Override Configuration dropdown is now correctly populated with the selected configuration.
- A CUBE update bug was inadvertently introduce in Qimera 1.4.2. This has been fixed.
- QINSy .db files that contain subbottom sounder systems will now import successfully in Qimera.
- Water Column Tool
  - Under certain circumstances, saving a fan snapshot in the Water Column Tool was causing a crash. This is now fixed.
  - Fixed a crash that sometimes happened when applying sidelobe suppression.
  - Improved support for certain R2Sonic data where the dynamic range of the water column imagery was not being converted properly.
  - Certain QINSy .db files containing single beam systems were prevented from carrying out water column point extraction. This will now work correctly.

Installation, Upgrade and Ongoing Support Information for Existing Users

Users with existing Qimera 1.4 projects will be able to open them in Qimera 1.5 but the projects will become upgraded to version 1.5 and will not be able to be re-opened in Qimera 1.4. A small number of the capabilities in this release require upgrades to some of the file formats in a typical Qimera project.

The Geoid Model files, which change infrequently, have been removed from the Qimera installer and are now provided as a separate installer. This is the same installer that QINSy uses as of the 8.15 release (released December, 2016). The Qimera installer is now much smaller, making for a quicker download. New users will need to download and install the Geoid Models. Users with pre-existing Qimera installations can install the new 1.5 version and it will continue to search for Geoid Models in the locations used by previous Qimera installations, but only if Qimera 1.5 is installed as an upgrade to a previously installed version. If users instead decide to install Qimera 1.5 alongside a previous installation by choosing a separate installation directory, the previously used Geoid Models will not be used when running Qimera 1.5. If a user decides to install the standalone Geoid Models, they will be installed in the shared common location with QINSy. The previously installed Geoid Models will not be removed unless a user uninstalls Qimera. The new Geoid Model installer file will vary between Windows, Mac and Linux operating systems in behavior only, e.g. Windows runs an installer but Linux will be a zip file that must be manually unzipped in the correct location. Refer to the installation instructions for the Geoid Model download page for more information.

The Qimera 1.1 release had introduced new beam flagging capabilities that required a QPD upgrade. Users with older Qimera 1.0 projects will need to upgrade their QPDs when moving to Qimera 1.5. You will be prompted to upgrade the QPDs in your project when it is first opened.

During the development phase for Qimera 1.5, we paid close attention to incoming bug reports from our clients and we've streamlined our release process to get fixes out to clients in a timely manner, as often as required. This new, streamlined process enabled delivery of twenty-four maintenance releases since the launch of Qimera 1.0 in June of 2015. We will continue to provide this quick turnaround level of service to our customers with Qimera 1.5. If you find a bug that stops your workflow, please contact us and we'll attempt to get a fix to you as quickly as possible.

When we first released Qimera, we purposely kept it lean and mean with the intent of focusing on client feedback to help direct us on how best to hone existing capabilities and also to help us decide which new functionality clients need most. We've done the same with Qimera 1.1 through to Qimera 1.5, so please keep ideas and feedback coming, it helps us to make Qimera better for all users! Please feel free to contact us via the online support system for feedback, feature requests and bug reports.

Documentation

- The Reference Manual has been updated for all features in this release
- We're continuing to update other Knowledge Base articles. The online versions always have the freshest content.
- Several new "How To" style documents are available to give some guidance on how to use some of the new features in Qimera 1.5. The online versions are always most up-to-date.

Limitations & Known Issues

Qimera should not open QINSy projects while QINSy is running, acquiring data or generating Dynamic Surfaces. **Data loss may occur if this warning is not heeded.** Qimera is currently meant to only open QINSy projects after they are acquired. If you need to use Qimera with QINSy in a real-time environment, it is recommended that you configure QINSy to copy .db files to a backup directory at the end of each line. You should then create a new Qimera project and use Qimera Live (available as of Qimera 1.1) to monitor the backup directory, import the data, process it and add it to a Dynamic Surface.

If you are a QINSy and Qimera user, you should not copy the QINSy project to another location on the same computer as the original QINSy project. We are currently improving how file paths to various resource files and project file assets are managed between our applications, in the meantime, if you want to process a copy of your QINSy project in Qimera, you should copy it onto another computer. This is a known limitation that we are actively working on to fix and we will let you know when this limitation no longer applies. Of course, if you are willing to work directly on the QINSy project once QINSy is offline, then this is the preferred option and you can ignore this warning.

Qimera 1.5.1 Release

Introduction

9 May 2017, We're pleased to present Qimera version 1.5.1

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Thanks for your feedback

Warning

Since Qimera 1.5.0, the installer no longer includes the QPS Geoid Height Models. A separate installer for these models can be found under the DLC section on the Qimera download page, as well as on the QINSy download page. This package is required by QINSy, so the models may already be installed on your machine.

Highlights

- We're happy to release the first Mac and Linux installers to contain the Qimera 1.5 functionality.
- This release also includes updated translations for 1.5.
- There is now a keyboard shortcut (Ctrl + R) for toggling rejected soundings in the Slice, 3D and Swath Editors.

- The same performance enhancing cache system that was introduced with the Rectangular Selection is now available for the Scroll Selection.
- In the Vessel Editor, it is now possible to apply a .vesselconfig file (created when saving a Vessel Configuration) to existing raw files.
- The threshold that triggers the warning for over-zooming into plot windows has been reduced. This will enable closer zooming.
- When using a Scroll Selection, it will now be possible to drag the slice box with the mouse.
- The wording in the activity log related to loading and indexing water column data has been changed to be more clear.
- The Water Column dock can now be made smaller due to a reduction in the vertical size of the histogram.
- The Swath Editor dock has been made smaller and won't take up as much vertical space when docked.

Technical Notes

- Source Files
  - Raw source files that contain surface sound speed values of zero will be handled correctly. The applied SVP will now provide data where the surface sounds speed is zero.
  - QINSy DB files with certain Auxiliary systems were causing Qimera to not read the multibeam data. This has been fixed.
  - QINSy DB files that point to a geoid file that is outside the default directories for geoids should now work correctly.
- Water Column
  - Fixed a problem with the Sidelobe Suppression filter not having any effect on some data.
  - The Water Column Display was displaying in metres for some non metric projects.
  - The Adjust Colormap Range functionality will no longer reset the water column histogram values the first time it is opened.
- Other
  - Interpolated soundings can now be turned off in the Patch Test Tool.
  - The filter profile 'Respect All QINSy Blocking' will no longer remove other flags.
  - Qimera will no longer crash when processing files with more than 4 multibeam or laser systems. The Patch Test tool is currently limited to 2 heads pending further development.
  - Improved handling of corrupt QPDs.

Qimera 1.5.2 Release

Highlights on this page

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Thanks for your feedback

Introduction

8 June 2017, We're pleased to present Qimera 1.5.2

Highlights

- The Raw Sonar File - Export to Processed Points dialog now includes column delimiter options.
- Select in Area now works for Processed Points files.

Technical Notes

- Exporting / Importing
  - It is now possible to cancel the export soundings from Dynamic Surface job.
  - The Dynamic Surface, export to Soundings functionality will now include all soundings as intended.
  - When exporting a source file as ASCII Processed Points, the uncertainty will now be 95% confidence interval.
  - The uncertainty expected when importing ASCII Processed Points is now expected to be at 95% confidence interval.
  - Exporting lines to an SD Point object will now include all points.

- 3D Editor
  - The 3D Editor now properly applies fixed range colormaps for depths.
  - Changes made in Qimera 1.5.1 occasionally caused the 3D Editor to be unable to save edits. This has been fixed.
- Qimera Projects
  - The opening of a point cleaning project has been improved and Qimera will not re-scan files unnecessarily.
  - Qimera will now automatically create a Tide folder for projects created in version 1.1
- Processing
  - When an SD separation model needs to be re-projected, the path will now automatically update to the re-projected copy.
  - Fixed a bug preventing draft from being applied correctly for QINSy projects opened in Qimera.
  - When applying SBET navigation files to data, some pings at the end of the line have the height adjustment applied twice. This has been fixed.
- Slice Editor
  - The surface edit overview will now update correctly if the size of the slice selection is changed.
  - When 'Auto Zoom' is turned on, editing tools will now always auto zoom, even if the extents had been changed manually.
  - The Slice Editor sounding pre-caching that was introduced in Qimera 1.5 could load too many points. Caching will now limit memory usage.
  - The Slice Editor sounding properties dialog had the horizontal and vertical TPUs reversed. This has been fixed.
  - Spline Filters will now be applied correctly to rotated Slice selections.
- Misc Tools
  - The Datagram Viewer will now show the manufacturer's datagram code when possible.
  - Multiple '.000' files containing True Heave can now be opened at once by the Tide Tool.
  - There was a bug preventing the Patch Test Tool from working correctly when 'Motion Sensor' was selected. This has been fixed.
- Dynamic Surfaces
  - The 'Update Surface' status bar will no longer bring itself to the front of all windows open in a display.
  - In the Dynamic Surface - Snapshot to Static Surface dialog, Color by 'None' is now correctly called 'Depth Layer'.

    - Suspect flags can now be cleared successfully using the Dynamic Surface - Sounding Selection dialog.
- Source Data
    - Corrupt QPDs are now properly handled and won't cause a crash.
    - Kongsberg data that had 'Extra Detections' turned off part way through a line are now handled correctly.
    - Interferometric sonars that had binning applied during logging in QINSy need to be reprocessed in Qimera. This will now be done automatically and the original QPDs will be backed up.
    - Pressure units for the Platform Depth plot are now correctly taken from a QINSy DB when applicable.
- Selections
    - The Freehand Selection outline is now visible off the surface at all times.
    - Improvements have been made to starting a Scroll Selection off the surface.
    - Center clicking to reposition will now work off the surface in 2D view mode.
    - The 'Select in Area' functionality now works correctly.
- Miscellaneous
    - The Downsampling settings in the Water Column Tool will now be remembered when switching between lines.
    - Vessel Override Configurations that have new systems added will now work correctly.
    - General performance when modifying SVP information and checking raw sonar files has been improved.
    - Uninstalling Qimera will no longer remove the NOAA Cube Parameters file.

Qimera 1.5.3 Release

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Thanks for your feedback

Introduction

19 Juny 2017, We're pleased to present Qimera 1.5.3

Users applying filters to high-density data such as Laser or R2Sonic UHD are strongly advised to upgrade to Qimera 1.5.3

Highlights

- Support for new Kongsberg Geoswath SFF processed points data format.
- Data imported as Processed Points can now be used in the Cross Check tool
- Export Track to ASCII is now populated with Date & Time instead of seconds since 1970.
- Depths in the ASCII points export are now filled to 3 decimal places instead of 2.
- A checkbox has been added to the Add Raw Sonar Files dialog that allows use of NMEA checksums to be turned off.

- The wording of the 'Project Locked' dialog has been changed to be more clear that the project could be locked because of a crash.
- The warning that appears when over-zoomed in Qimera plots now has the option 'Don't show this message again'.

Technical Notes

- QINSy Related
  - Improvements to handling of corrupt QPDs.
  - Data from QINSy Pseudo echosounders can now be toggled off when building a surface.
  - QINSy projects that have had data added since it was first opened in Qimera are now better handled.
  - QINSy Laser data was being incorrectly processed when the project was configured to use Feet.
  - QINSy Laser systems mounted with a > 90 degree heading offset could cause incorrect processing. This is now fixed.
  - Improved reading of certain QINSy DB files that have staggered data logging.
- Filtering
  - Filtering operations on large, dense datasets (ie laser) could cause QPDs to become corrupt. This is now fixed.
  - Qimera now shows a warning stating that changes made by Z-Shift or Refraction filter operations will be reverted by reprocessing.
- Source Files
  - Offsets for dual head T20-P data from HSX files are now read correctly.
- Slice Editor
  - Rectangular selection size and location can now be adjusted manually with the Selection Properties dialog.
  - The Auto Zoom functionality now works correctly in Fixed and Free Slice Select modes.
- Navigation and SVP Processing
  - Improved application of latency to imported navigation.
  - Various improvements to SVP application and processing.
  - Qimera now calculates grid convergence for each MBES line. Previously, a large SBET could cause the incorrect convergence to be used.
- Exporting
  - Various improvements and fixes to GSF exporting of dual head systems.
  - Time stamps in Time Series Editor ASCII exports are now Date & Time.
- Tools

- The Patch Test Tool will no longer prompt twice to save.
- Certain data caused the checkboxes in the Wobble Analysis Tool to behave incorrectly. This has been fixed.
- Update Dynamic Surface from Edits functionality will now only update the surfaces that are affected by edits.
- The colors of the bottom detections shown in the Water Column Tool are now correct.

Qimera 1.5.4 Release

Highlights on this page

- Introduction
- Fixes and Improvements



Thanks for your feedback

Introduction

26 July 2017, We're pleased to present Qimera 1.5.4

Users who do bathymetric processing in Qimera and backscatter processing in FMGT should upgrade both applications to their latest versions.

Fixes and Improvements

- When exporting GSF files from raw sonar files, Qimera will now follow the GSF convention and will report soundings relative to the vessel reference point and will also report the position of the reference point. Previously, the soundings were reported relative to the sonar head and the ship position was reported at the sonar head as well. Even though this previous method provided mathematically correct results, it made for difficulties during import of the GSFs into other applications as well as back into Qimera. The new method addresses these shortcomings. To be clear, GSF results from previous versions of Qimera are correct but they require manual configuration of vessel configuration files in Qimera and in other applications

when re-processing the data. These changes to the GSF export from Qimera also required some improvements to FMGT.

Qimera 1.5.5 Release

Highlights on this page

- Introduction
- Highlights
- Technical Notes



Thanks for your feedback

Introduction

14 September 2017, We're pleased to present Qimera 1.5.5

Highlights

- Qimera now supports the new Kongsberg .kmall format. Kongsberg will be releasing this format soon and Qimera is ready to handle it.
- Teledyne-Reson Integrated Dual Head (IDH) for Reson T20P and T50P systems in S7K format. Qimera previously already supported these systems when acquired in QINSy using the QPS .db format. The new T series systems allow you to log data from the two heads into a single .s7k data file and Qimera will now recognize this correctly as a dual-head system and will attempt to use any user specified mount angles and lever arms offsets for the sonar heads. Qimera extracts the sonar head mount angles, etc, from the 7503 record which may or may not be present. Even if present, the mount angles may or may not be populated depeding on the configuration in the acquisition system. In these cases, users may need to input the vessel configuration information manually. These can be saved as a vessel template file for re-use on later import sessions for files coming from the same mapping system. In the event

the 7503 record is not present, Qimera will display a Warning message in the Job Activity window, and users can check which records are contained in the .s7k file by using the Datagram Viewer tool.
- ASCII processed point file export from raw sonar files now has the option of XYZ + Time. The time is in M/D/Y H:M:S format.
- When selecting a project coordinate system from the Create Project dialog, the manual selection field now offers auto complete with searching in any part of the CRS name. Example, typing 19 into the field will display all CRS names that contain the string '19'.
- Qimera live now also finds companion QPDs along with the DBs. This will speed up Qimera Live significantly when used with QINSy as well as allow for Qimera to work instantly with QPDs that contain filtering, smoothing, or position that aren't yet available in Qimera.
- Kongsberg .all files with the MBSystem MBIO format ID of 58 are now supported for direct import into Qimera. The full extension of these filenames would be '.all.mb58'. It is no longer necessary to rename the files to '.all'.

Technical Notes

- The Standard Deviation of certain sensors that are set differently in the Computation Settings (vs the DB Setup) are now handled correctly. The value from the Computation will be used.
- There was a problem with re-exporting GSF files from SABER, this has been fixed.
- Previously, the menu buttons in the Profile Dock were not active until a source file was selected. The menu buttons will now be active as soon as there is a profile plotted.
- Shading was not being updated when switching between Fast shading and Mixed shading in the Qimera Preferences. This has been fixed.
- The NAV-O sounding selection filter was impacted by a change in a previous version. It is now working properly.
- KP values that are present in QPDs coming from QINSy are now preserved. Previously, they were lost when reprocessing in Qimera.
- Older DB files that had both R2Sonic TruePix and MBES data logged were causing problems with the water column display. This has been resolved.
- When importing a GSF, the 'Applied offsets' embedded in the GSF will now be correctly interpreted and applied to the Vessel Editor.
- Fixed a problem with exporting Reson T20P to GSF.

Qimera 1.5.6 Release

Highlights on this page

- Introduction
- Highlights
- Technical Notes



Thanks for your feedback

Introduction

31 October 2017, We're pleased to present Qimera 1.5.6

Highlights

- The depths from 'Export → Dynamic Surface → Shoal soundings' are now to a precision of 3 decimal places.
- Text on the Patch Test Autosolve dialog has been updated to provide more guidance when using the tool.
- It is now possible to shift the rendered height of a surface by up to +/- 1000m via the Offset slider. The slider operates to +/- 10m, larger numbers must be entered.
- It is now possible to specify up to 100 seconds for 'Include time series data from adjacent line closer than:' in the Processing Settings → Position, Motion, Heading tab.
- Documentation is now available in PDF form on the Qimera download page.
- When new raw source files are brought in, SVP solutions are no longer checked because this is intended for manually imported SVP. This speeds up the import of lines into large projects.

Technical Notes

Geodetics

- Improved ability to bring in custom WKT files containing a TOWGS84 specification.
- Qimera will now correctly look in both the custom geodetic folder and the default geodetic folder.

Surfaces

- Fixed issue that caused surfaces to be re-projected when a project is moved to a PC with a subtly different custom geodetic definition for the project CRS.
- The resultant surface from running a surface difference is now placed correctly under the Static Surfaces section of the Project Layers dock. This allows for easy export.

Patch Test Tool

- Updated the Patch Test Autosolve dialog to provide guidance for using the tool.
- The Patch Test tool was causing a crash when systems that were on had no corresponding points in the QPD (they were off when the QPD was created in QINSy). This has been fixed.

Exporting

- Fixed a bug where the first ping of an exported GSF sometimes did not have the correct height corrections applied.

Raw Source Files

- Edgetech JSF files that contained beams with negative roll angles were being assigned to the wrong head. This is now fixed.

Miscellaneous

- Qimera was crashing when creating a cleaning project from a surface that didn't contain all source files. This has been fixed.
- Solved a problem where removal of a line from a project by 'right click → remove' was taking far longer than it should.
- Some R2Sonic multispectral data collected in QINSy was causing a crash when trying to filter based on frequency. This has been fixed.
- 'Accept Inside' now works properly in the Slice Editor for hidden rejected soundings when in 'Normal Select' mode.
- Water Column data for Norbit systems were not lining up with bathymetry in the Swath Editor, this has been fixed.
- Fixed a problem where absolute depth blocking settings showed different results when run from the Swath Editor vs Processing Settings.

Qimera 1.5.7 Release

Highlights on this page

- Introduction
- Technical Notes
- Upcoming changes to Support Ticket (Jira) workflow



Thanks for your feedback

Introduction

30 November 2017, We're pleased to present Qimera 1.5.7

Technical Notes

- GeoTiffs exported from a project with a CRS set to Amersfoort (New) plus NAP Height correction were re-importing to the incorrect position. This has been fixed.
- Fixed a bug that was found to affect the Slice Editor when there were large numbers of files in the Dynamic Surface being used (300+).
- In certain circumstances, data collected in QINSy on the day of a seasonal time change, then brought into Qimera was off by an hour. This is now fixed.
- The date format for exporting to Processed Point is now in DD/MM/YY.
- Sometimes edits made to the points in a Dynamic Surface were not being represented when a Snapshot to a Static surface was made. This has been fixed.
- New projects, created with Qimera 1.5.7, will see improvements in the speed at which edits are unloaded to GSF files.

Users using the Slice Editor with Dynamic Surfaces that contain large numbers of files (300+) should upgrade to Qimera 1.5.7 for improved stability.

Upcoming changes to Support Ticket (Jira) workflow

- We are making a small change to the Support Ticket workflow. This will be the creation of a 'Backlog' status. All current bug support tickets that are currently 'Waiting for Development' will be transitioned to 'Backlog' while we re-prioritize and organize the tickets. This doesn't change our intention of addressing the issues in any way, but should help streamline the process internally.

Qimera 1.6.0 Release

Release Date

8 February 2018

Highlights on this page

- Introduction
- Webinars available for 1.6
- New Functionality
  - New add-on: Electronic Nautical Chart creation and editing
  - New add-on: Sound Speed correction filter
  - LIDAR
  - Water column
  - Geo picking
  - FM Hydro Workflows
  - Filters
  - Exports
  - New Preferences
  - QINSy Workflow
- Improvements
- License Manager
- Backward and Forward Compatibility
- Database version
- Documentation
- Bugs
- Known Issues



Thanks for your feedback

7 votes satisfied!

49 Suggestions and/or Feedback implemented

Introduction

We're pleased to present Qimera version 1.6.0. In this release, we are introducing two new add-ons, one for ENC light authoring and one for refraction error correction. We're also bringing many improvements that were requested to us by Fledermaus FM Hydro users, FM Midwater users and Qloud users as well. There are many small and large tweaks to workflows, user experience and interfaces in a big push to ensure that our clients using other QPS products find it comfortable to use Qimera. Read below for details, there is quite a collection of enhancements and polishing to further improve the Qimera experience.

We have successfully completed a pilot project in handling customer feedback and requests for **QINSy** in our new **Feedback Project**. Several high-priority items from QINSy have been successfully implemented as a result.

Now that we have learned from this experience with QINSy, we will begin using the **Feedback Project** to get user input into priority items to implement in **Qimera** over the next few months. In the meantime, we decided to start early and have implemented the #1 voted feature in the Qimera Feedback Project. The #1 voted feature was to have consistent cursor position read out from the Scene in all mouse modes. The position read out in the bottom status bar previously only reported the position, depth, etc, when in *Explore* mode. It now works for all mouse modes.

In tackling the top priority item for this release, we have satisfied 7 votes! Thank you for voting! We will begin tackling the Feedback Project items aggressively in the next releases and from this point forward, so please take a moment to go scan items and vote for those that you would like to see implemented. See also Voting System Policy and Using the feedback project.

Webinars available for 1.6

Qimera 1.6 Webinar - Release

Qimera 1.6 Webinar - QINSy to Qimera Clean

Qimera 1.6 Webinar - ENC / S-57

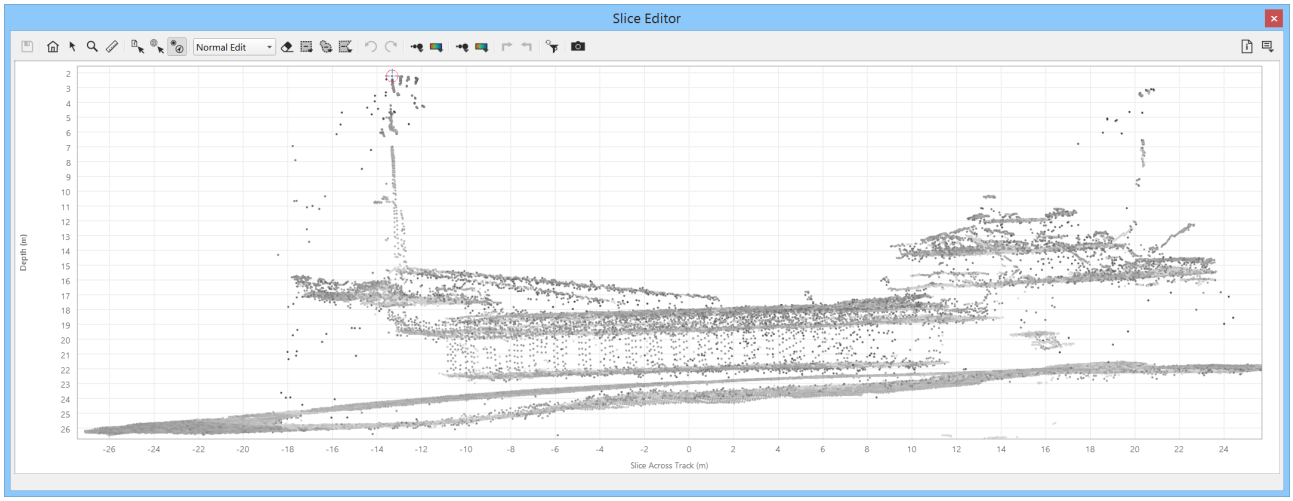
New Functionality

New add-on: Electronic Nautical Chart creation and editing

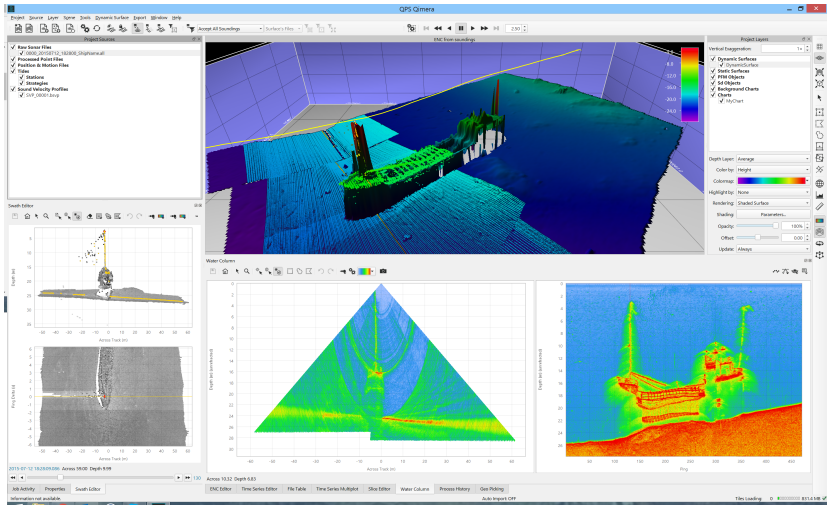
We have re-used the underlying technology in Qarto and Qomposer to bring light creation and editing of ENC objects to Qimera. Qimera now allows you to create ENC objects directly from soundings or from a Dynamic Surface. You can also import an ENC and edit attributes of the features in the ENC.

Note that contouring remains the job of Qarto, users who require contours for ENC generation should get in touch with us about Qarto by contacting sales@qps.nl.

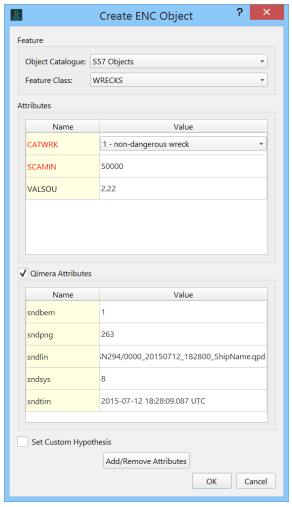
You can create new ENC features from soundings, this is available in the Slice Editor, Swath Editor, 3D Editor and also the Water column Viewer. Once you create soundings in any of the editors, the soundings for which there are features associated will have special mark up drawn on them to ensure that you are aware that they've been used to create features.



You can also do the same from the water column viewer, in the event that the echosounder did not detect the feature of interest.

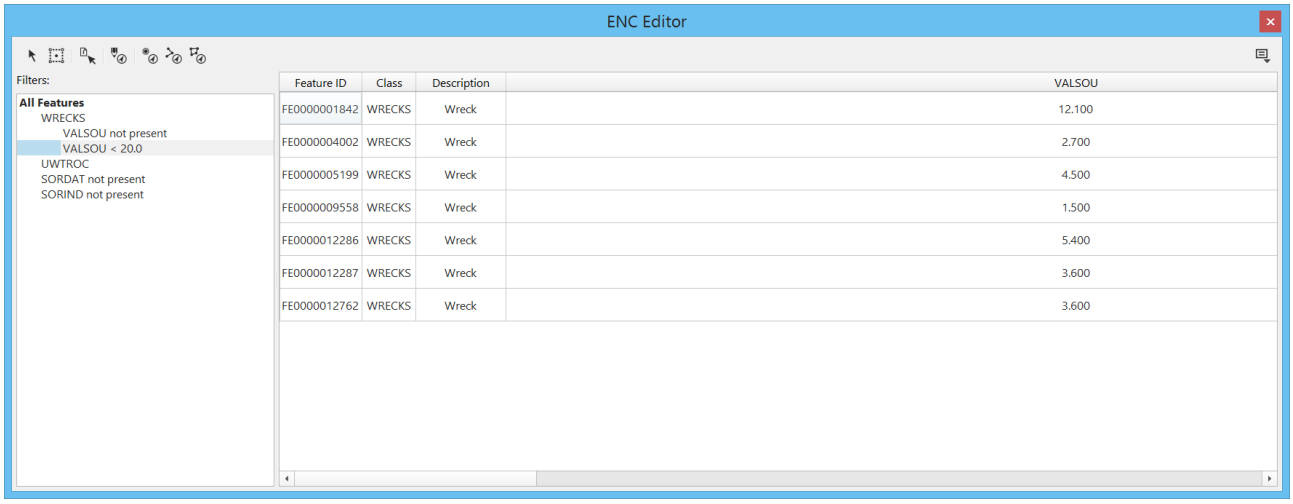


All features that are created maintain a link back to the sounding from which they were derived. This allows Qimera to update feature depths and positions if you need to update the soundings with additional correctors or to recover from faulty application of correctors. For example, you can review your data and identify chart worthy features and create them even if you don't have the final tide or post-processed GNSS height correction available. Once you import and apply these correctors, Qimera will update the soundings and then will update features that were derived from soundings. This allows you to get straight to the work of Feature management without the final correctors being applied. The ENC feature editor below shows the feature attributes in the top half, along with the metadata that is stored to link the feature to the sounding that it was generated from. You can also pick points off of a Dynamic Surface, and the metadata link fields will instead refer to a location on the Dynamic Surface. If the surface updates, for any reason, then the feature z-values will as well.

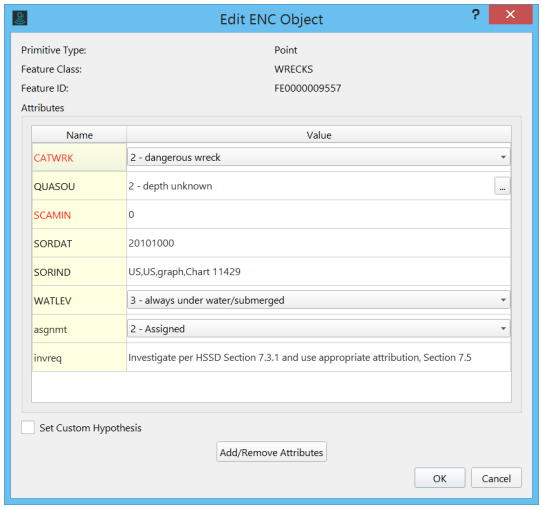


The features that you either create or import can be accessed in a new ENC Editor dock. This tabular display lists features that are in your current working ENC. The columns can be sorted by clicking on them and the individual columns can be reordered by drag and

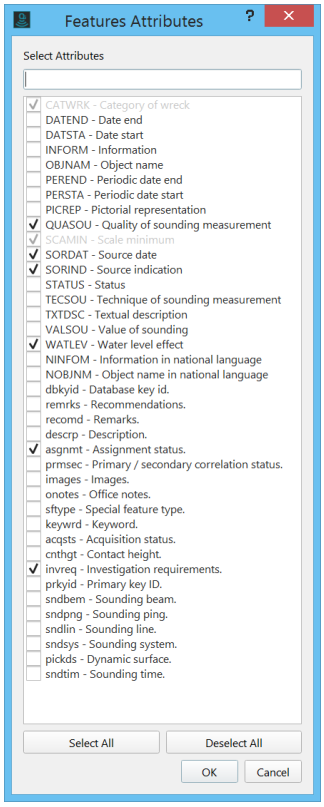
drop to help put related columns together . You can create filters that allow you to quickly get access to particular subsets of features. The filters allow for selection of feature types and/or attribute value. For example, you can create a filter that gives you access to WRECKS that have an undefined VALSOU value, as shown below. The filter settings are saved in your project and can be exported for re-use later in other projects. Being able to save and export filter sets can facilitate standardization of feature review workflows and can also speed up training for personnel tasked with feature review.



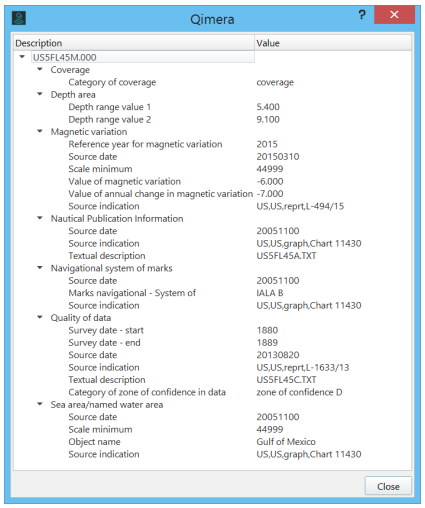
Any object in the feature table can be edited, with the exception of the Qimera custom attributes that we use to maintain a linkage to source of a particular feature.



When editing feature attributes, you can isolate the attributes that you want to focus on. You can also add your own custom attributes that allow you to capture additional metadata to aid in the management of feature addition, modification and deletion. The example below shows the selection list for feature attributes with the NOAA custom attributes being available by default to all users. The additional custom attributes are stored in an XML file in the same location as where the default ENCs are stored. Users can modify the XML to add or remove fields. We install the standard NOAA custom attributes to facilitate use of Qimera in pre-existing workflows in the USA.



You can query any point in the charts that are drawn in the Scene to learn more about which chart it is. You can also easily toggle visiblity of background ENCs. We've also added an extra ability to always draw ENCs on top of bathymetric surfaces by drawing filled area objects with transparency.



Please contact sales@qps.nl for pricing of this new add-on.

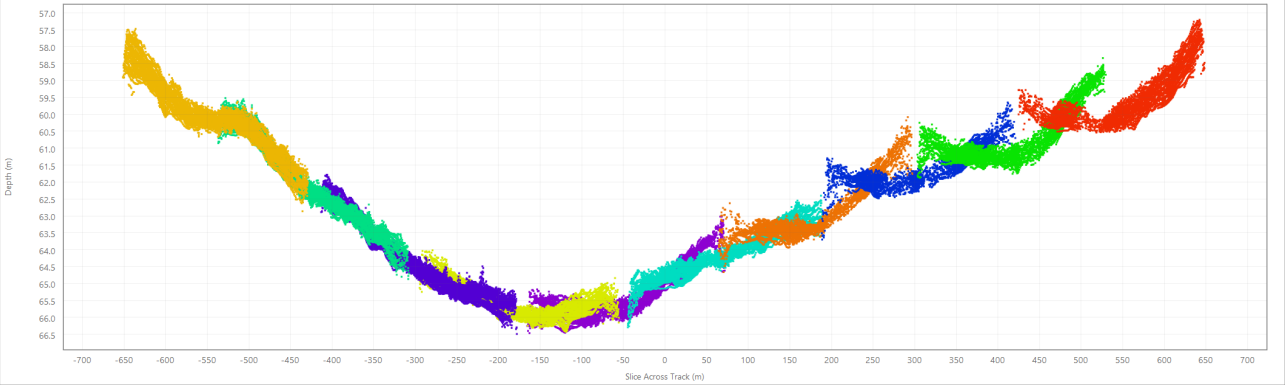
New add-on: Sound Speed correction filter

QPS has worked together with the Technical University of Delft (TU Delft), The Netherlands to implement their sound speed inversion algorithm in Qimera. The TU Delft algorithm allows for a completely automated refraction residual error correction. This is a new sound speed inversion tool that allows users to recover from refraction artifacts that occur in challenging oceanographic environments, or from not measuring enough sound speed profiles.

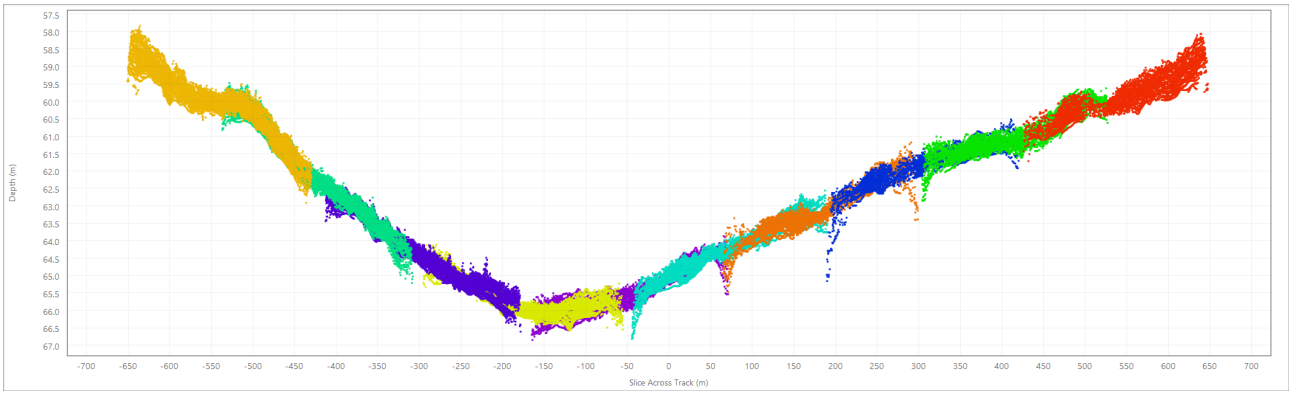
The algorithm works by taking advantage of the overlap between survey lines, harnessing the power of redundancy of the multiple observations. For a given set of pings, the algorithm simultaneously estimates sound speed corrections for the chosen pings and their neighbors by computing a best-fit solution that minimises the mismatch in the areas of overlap between lines. This process is repeated across the entire spatial area, allowing for an adaptive solution that responds to changes in oceanographic conditions. This process is completely automated and requires no operator interaction or data review.

The main advantages are that the algorithm is automated and objective. This overcomes the limitations of other solutions which require manual review and adjustment of “fudge factor” correctors that are inherently subjective. It is also physics-based in that it honors the physics of acoustic ray bending. For accountability, the algorithm also preserves the output of the inversion process for review, vetting, adjustment and reporting. Users can easily undo the correction for one or many survey lines.

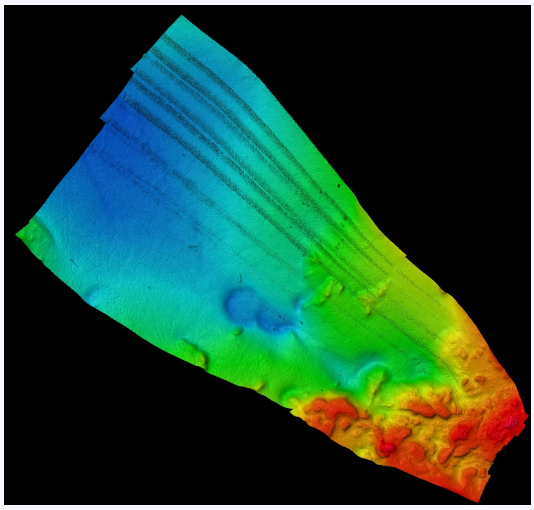
In the image below, we see a cross section view of ten survey lines with some of them suffering from a refraction artifact.



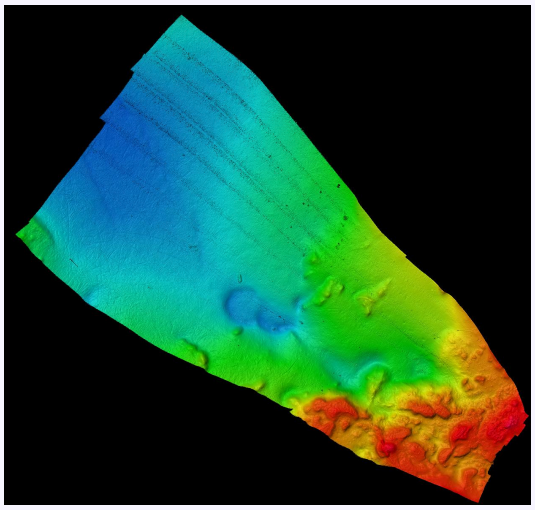
After the algorithm is run, the soundings with a poor refraction correction have been mended.



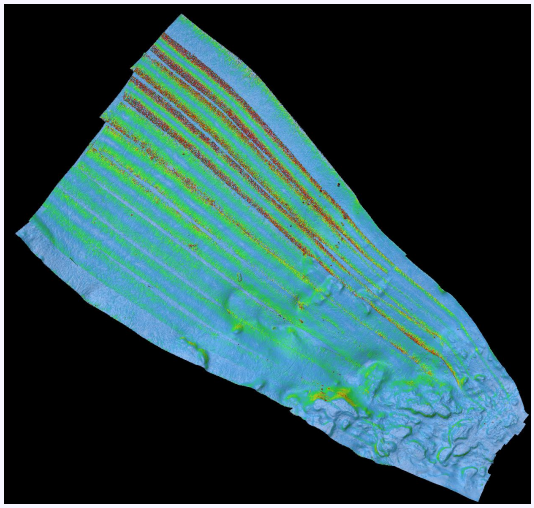
The table of four images below show before and after images of bathymetry (images (a) and (b)). Images (c) and (d) show the same but color coded by standard deviation. Refraction artifacts reaching upwards of 50 cm are easily corrected with the algorithm.



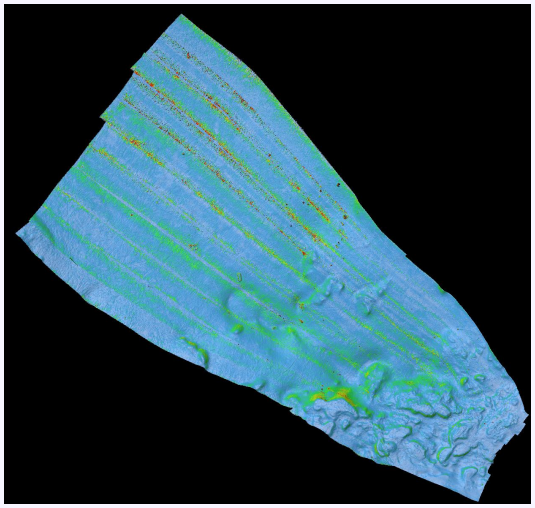
(a)



(b)



(c)



(d)

Data courtesy of R2Sonic (Multispectral Challenge data set)

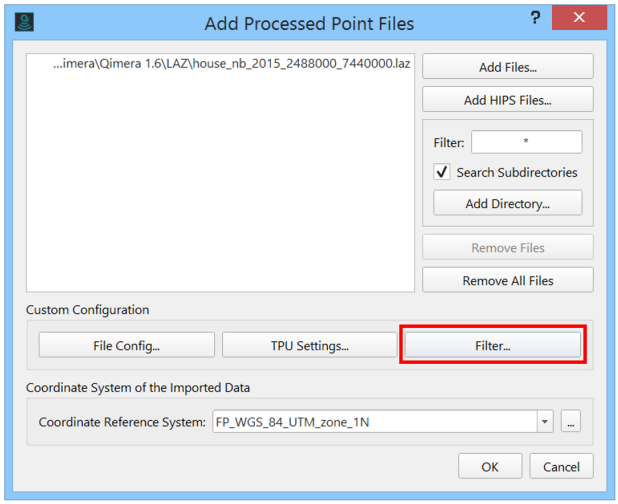
Please contact sales@qps.nl for pricing of this new add-on.

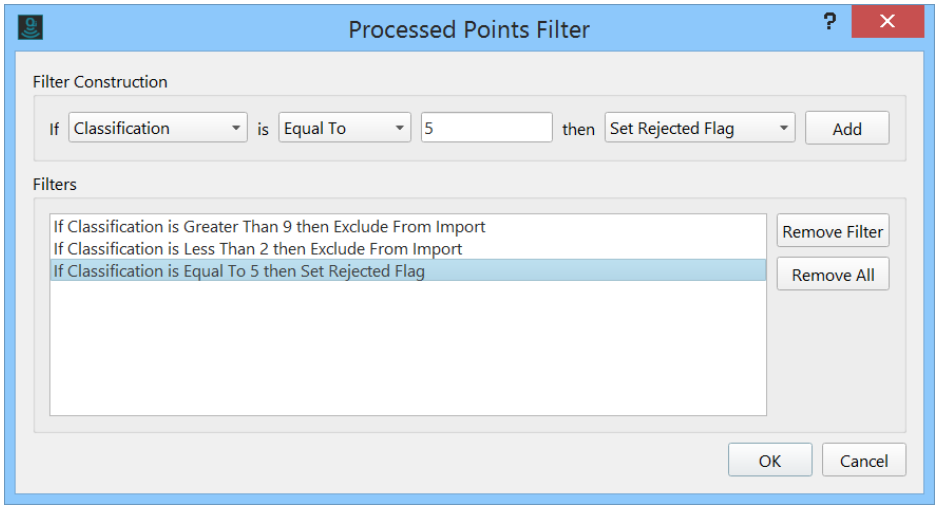
LIDAR

We've made some improvements for how LAS format LIDAR data is handled in Qimera. Qimera now supports LASzip (zipped LAS) processed point format, version 1.4. LAS support is still version 1.3, but it will be upgraded in an upcoming release to version 1.4 to match.

You can now also filter data upon import based on LAS classification results or other fields in the LAS files. The image below shows a new Filter button on the processed point import dialog, this will launch a processed points filter dialog in which you can create one or more filters that can be used to set particular flags on import, for example, you can have data rejected on import.

Also, when you import LAS or LASzip, these are now automatically converted to QPD format on import. Previously, this was only done at the stage when a Dynamic Surface was created. Now that the QPD creation steps have been moved forward to be part of the import process, users can now set the field mapping and TPU configuration in the import dialog.





Water column

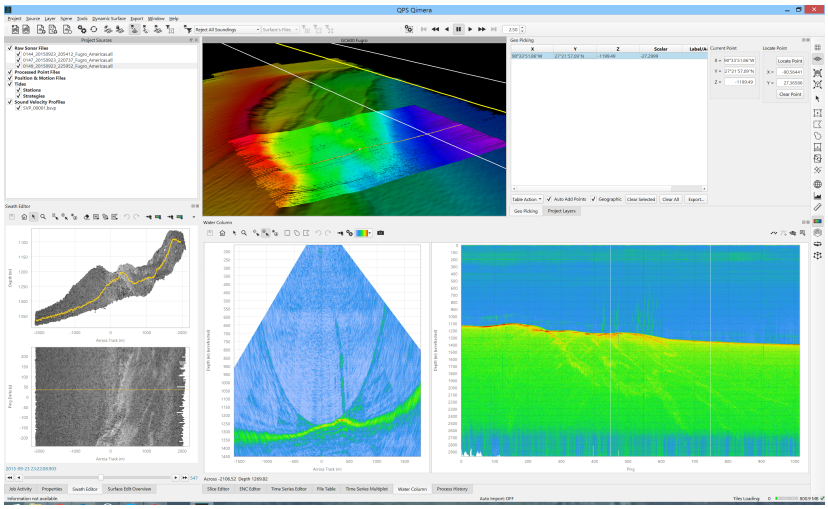
We've worked closely with clients who've tried out the water column processing capabilities for hydrocarbon plume detection in support of Oil and Gas exploration work. Their feedback has helped us tune this functionality to meet their needs. The two major improvements are a full file side view and instant georeferencing.

Providing a full water column side stacked view

Previously, users could only see the pings that were loaded up in the Swath Editor ping buffer (typically just 50-100 pings). Now the entire line can be viewed, allowing for a quick scan of the entire file for targets of interest. Users can also explore in the full side view and seek to a desired position to view the fan for that location. For efficiency, we have also designed the WC display to cache the side stacked view for the entire line, this speeds up the process when scanning from one line to the next in the event that you need to return to a previously viewed line.

Instant Georeferencing.

This release now also introduces a streamlined workflow for identifying the refraction corrected position of any target of interest. A new geopick button has been added to the water column dock, and when enabled, all user clicks in the water column fan view will populate a table as geopicks, much in the same way as FM Midwater except the position is now georeferenced with much higher fidelity, including application of a refraction correction. The image below shows how the entire file is viewed in the along-track profile, the ping of interest is quickly isolated, and the geopick tool gives the location of the base of a seep. To rapidly geo locate targets in your data, simply click a location in the side stacked view to instantly move the fan view to that ping. Then click on the target in your fan view to save a full corrected geo location of your target of interest in the geopick table (shown in the top right of the image below).

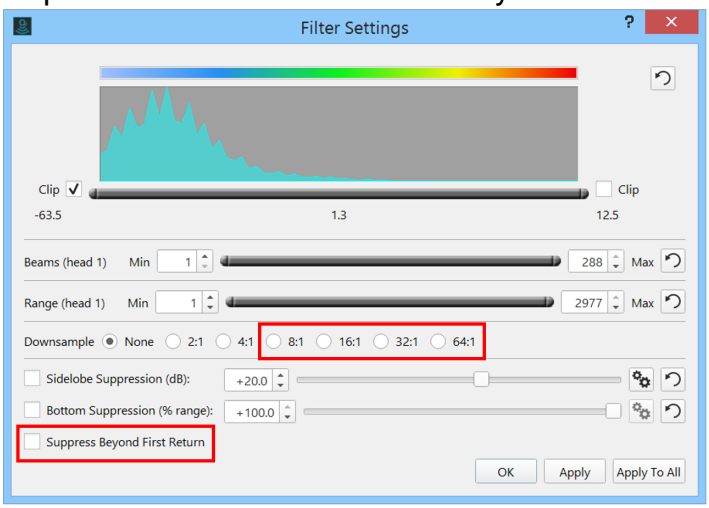


Data courtesy of Fugro

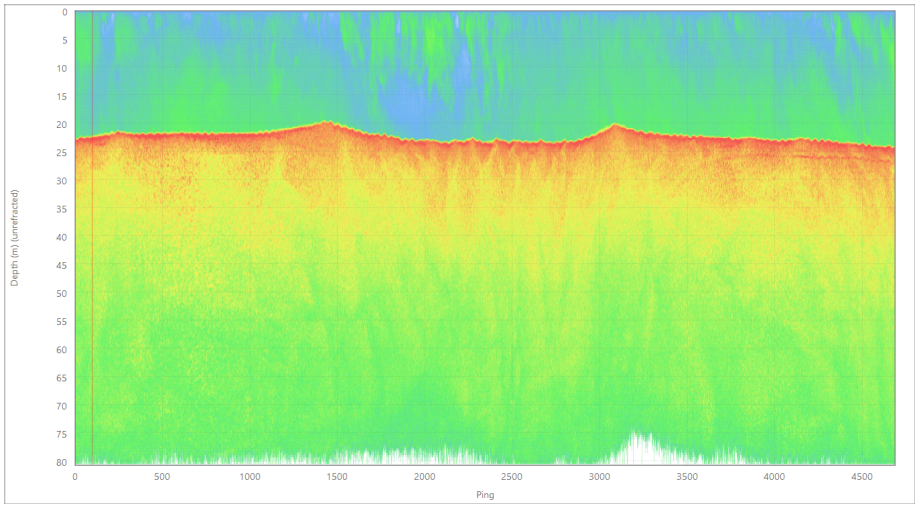
New Signal Filter Capabilities

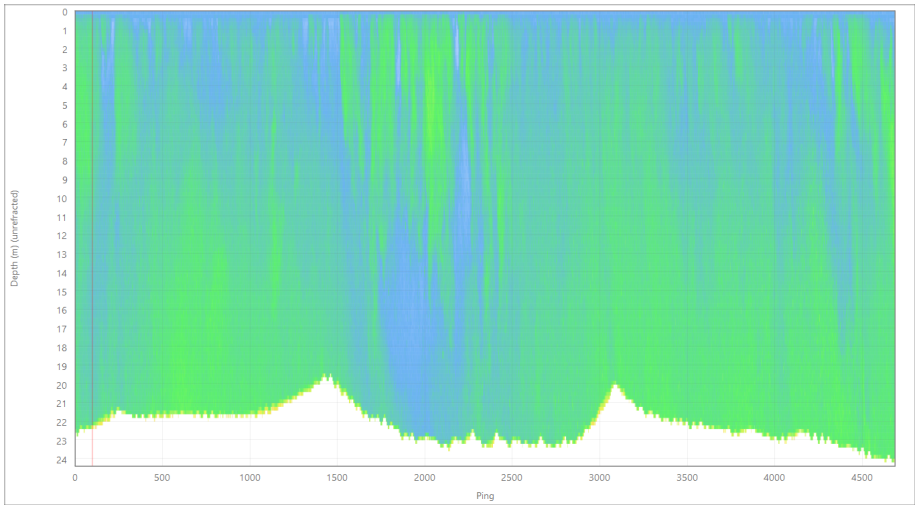
We've also added some signal refinement capabilities to the water column Filter Settings. For extremely high density data in shallow water, users can improve responsiveness with additional downsample options allowing for further signal reduction. You can also remove

all portions of the water column beyond the first return.

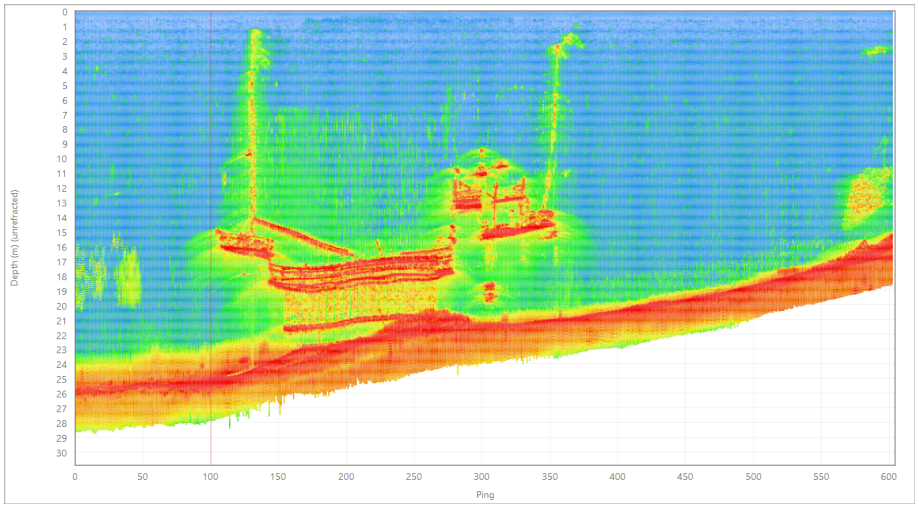


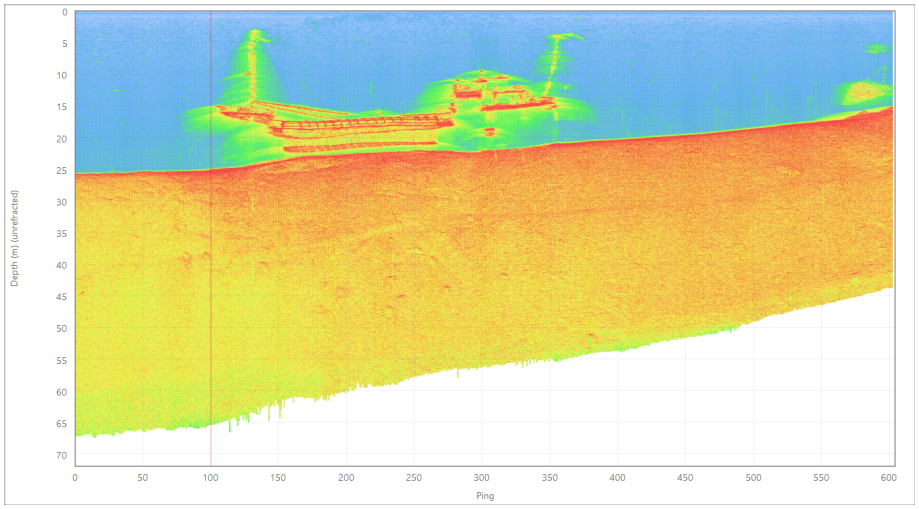
Below you see a side stack view that includes the bottom returns. By choosing the "Suppress beyond first return" option from the Filter Settings, you can isolate the water column signal to everything returning prior to the first return as shown in the image below the first. Note that this removes the portion of the water column beyond the range of the very first seabed return.





We've also added range stacking for the side view to give a cleaner image that does not suffer from sidelobe returns. The images below show depth stacking on the top, and the new range stacking on the bottom. This is now consistent with the two stacking modes in FMMidwater.





The water column tool feature extraction tools are available as an add-on, these upgrades are available to customers who have already purchased this add-on. If you'd like to use these features, please contact sales@qps.nl for more information.

Geo picking

We've brought over the Geo Picking tool from Fledermaus into Qimera. You can now click on points in the Scene and collect their geographic locations in a table. We've hooked this up to all the point editors in Qimera as well: Swath Editor, Slice Editor and 3D Editor. You can pick on soundings and their 3D position is recorded in the table. As mentioned in the water column section, you can also pick on points of interest in the water column imagery and you'll get a fully georeferenced location in the Geo Pick dock.

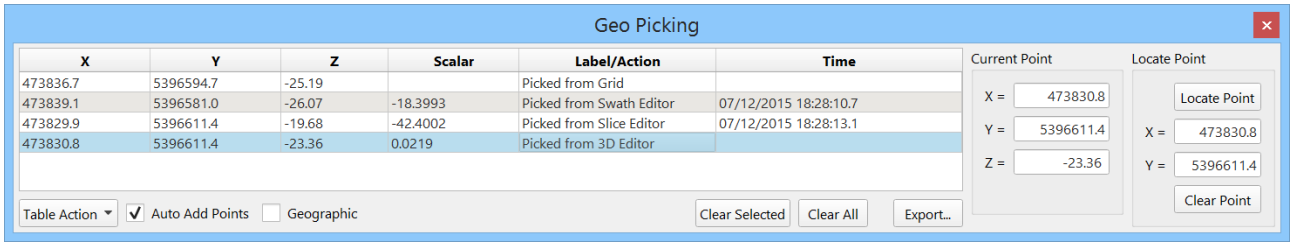
New button for Geo Picking in point editor toolbars:



New scene button for Geo Picking in the Scene toolbar:



Points in the table can be exported or converted into .sd point/line objects for preservation in the Scene. You can also click on any point and navigate to it easily with the Locate Point functionality. You can toggle between projected and geographic units as well. Lastly, if you have a particular location you'd like to zoom to, you can enter the coordinates in the Locate Point section and zoom to that location in the Scene.



FM Hydro Workflows

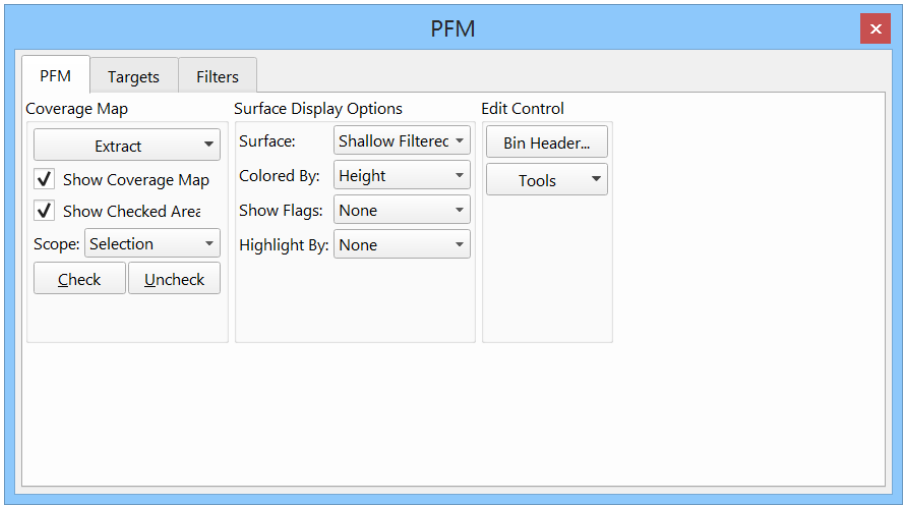
For FM Hydro users, we've made a number of improvements. Import of point files for editing will immediately trigger a conversion to QPD and we've made improvements to how the sensor track is computed from the incoming point files. Previously the data were not converted to QPD format until the stage where the user made a Dynamic Surface. This now happens as a post-import step that does not require user intervention.

Flagging Data

If you have used the Plotted, Suspect or Feature flags in Fledermaus, you'll find that we've now provided a streamlined method of setting these flags in the Slice Editor. In the Slice Editor's *Select and Edit* mode, you can choose to *Auto Set Flag on Select* from the context menu, choose the flag you'd like (Suspect, Plotted or Feature). Now select soundings and they will be automatically flagged. If you color or highlight your Dynamic Surface by your preferred flag, you'll see that it automatically updates with your mark up as you review the data.

PFM

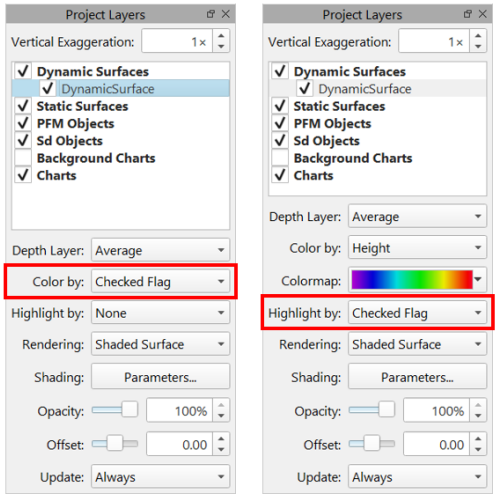
If your FM Hydro workflows relied on the use of PFMs built in 3rd party software, you can now import PFM files and work with these directly without conversion to QPDs and a Dynamic Surface. We've been able to recreate the basics of PFM workflows, including the 3D Editor and we've also adapted the Slice Editor to be able to work directly off a PFM. This will also work for PFMs with geographic (unprojected) coordinate frames. Users can import a PFM under the *Source* → *Import* menu. Once imported, the PFM will appear in the *Project Layers* dock. If the PFM is selected, then a new PFM dock widget is active, allowing access to the routine operations that users would have found in Fledermaus. The PFM dock widget combines the Fledermaus PFM, Targets and Filters attribute panels. Once your editing operations are complete, you can right-click on your PFM and unload your edits back to your source files, as was done previously in DMagic.



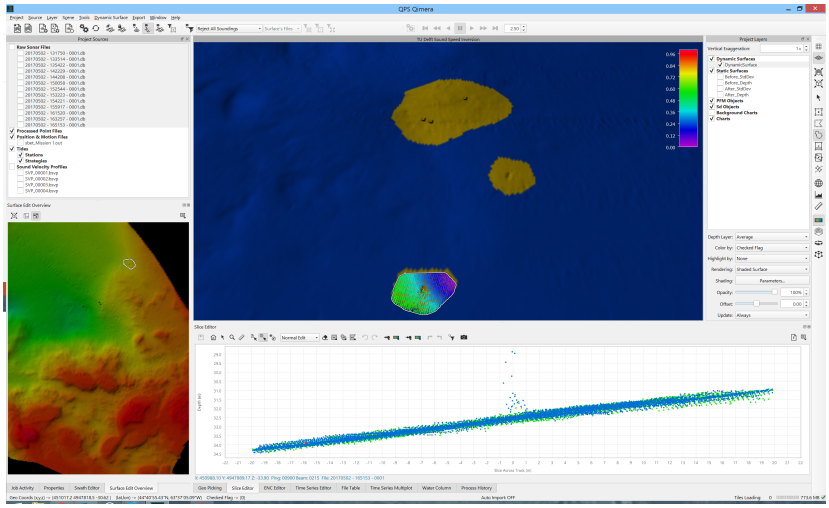
Our preferred format moving forward in the future is still QPDs and Dynamic Surfaces, but this new PFM support in Qimera will help clients with a dependence on externally generated PFMs to migrate their workflows from Fledermaus to Qimera. Please note that the QPD point filters that came from Qloud do not yet work on PFMs. We will work with clients reliant on PFMs to gauge interest in adapting these filters to run on PFMs.

Checked Area

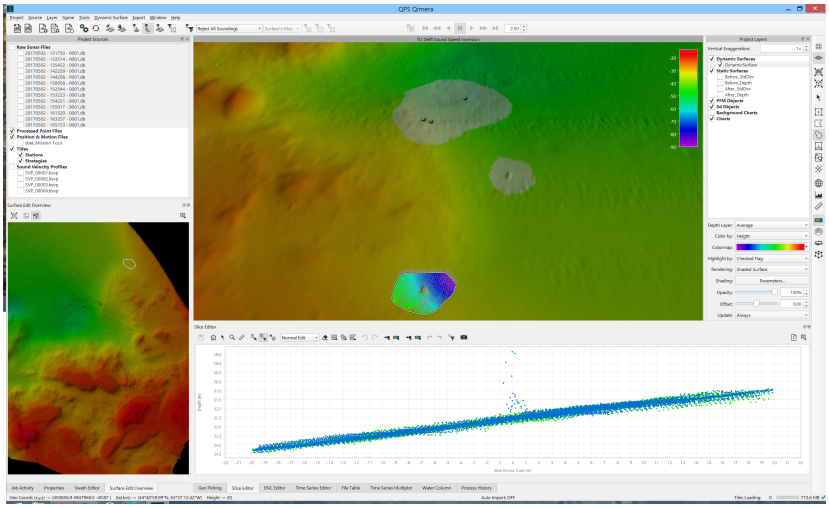
We've brought back the Checked Area capability in Qimera that was removed in an earlier version. It was removed earlier due to difficulties in maintaining the flags during grid update operations but we have since solved this problem. This allows users to select spatial areas with any of the spatial selection tools and then to mark the area as Checked or Unchecked. This was a capability from Fledermaus originally, many of those users would use this in a variety of ways to manage their review of data sets. With this new implementation, the Checked and Unchecked Area mark up will remain in the surface after gridding updates. Users can check and uncheck using menu options under the Dynamic Surface menu, or from a right-click context menu in the Scene or with keyboard shortcuts. The Dynamic Surface can be displayed in two different ways to allow you to see which areas are checked. You can color by Checked Flag, or you can Highlight by Checked Flag. Both of the display options are shown immediately below, with their effect on the surface display shown even further below. Note that this method of Checking and Unchecking areas is independent of the area markup used by the Surface Edit Overview widget. The Surface Edit Overview widget is an automatic process and is only visible in the Overview widget. In a future release, we will look to standardize these two methods of marking up a surface.



Color by Checked Flag:

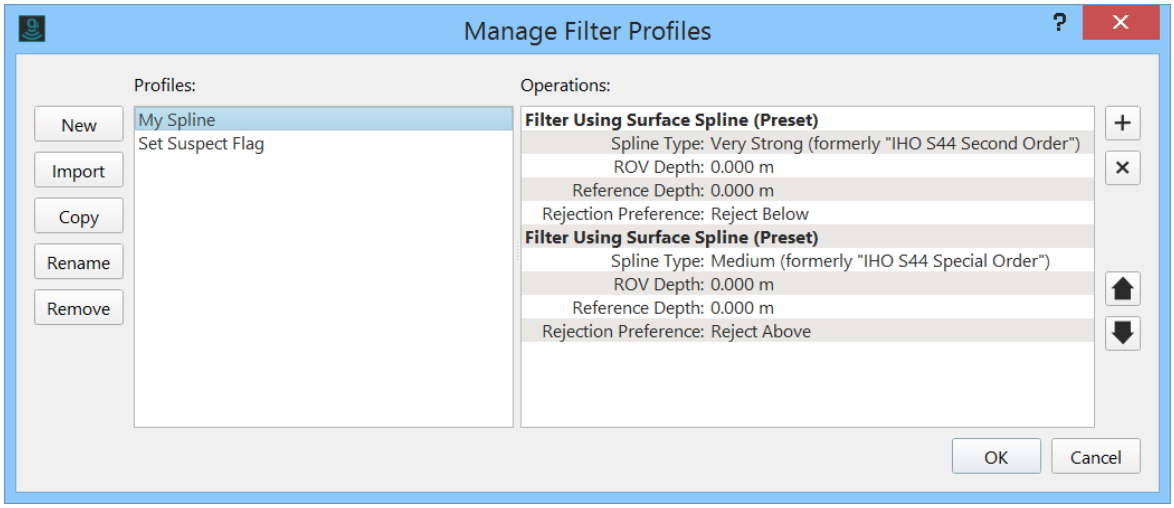


Highlight by Checked Flag:

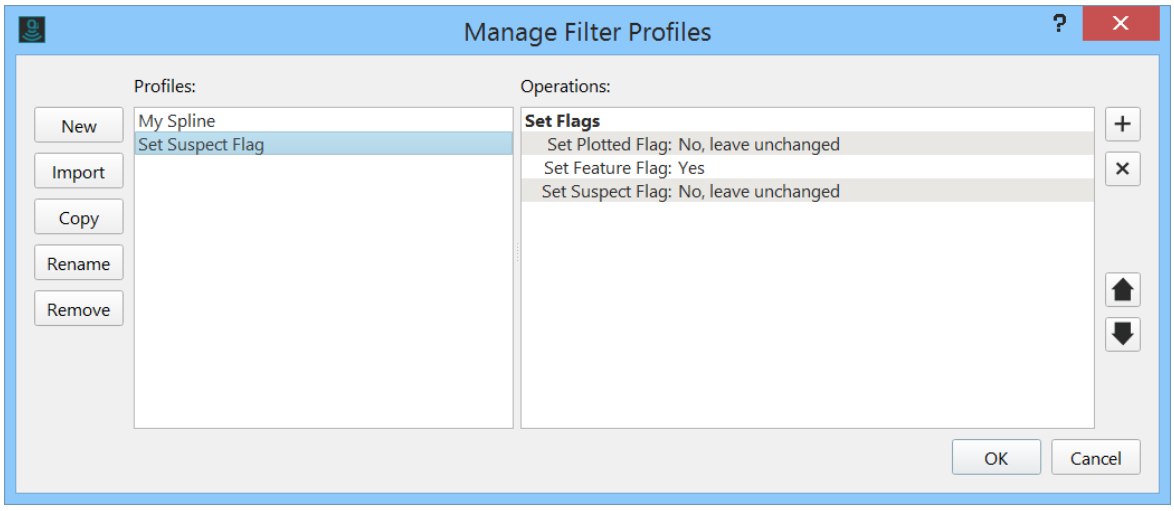


Filters

We've adapted the Spline Filter to use an extra *Rejection Preference* setting to allow you to specify it to only reject points above, below or above/below the surface. This was implemented for hydrographic charting users who might be suspicious of spline filters removing actual shoal soundings above the surface. Here's the custom filter dialog showing off how you can configure how the spline filter behaves when it removes spikes. In this case, we configure it to remove deep spikes with an aggressive filter below the surface and to to then remove shoal spikes with a much gentler filter above the surface.



We've added a new filter that lets users set beam flags from Fledermaus FM Hydro workflows (Plotted, Feature and Suspect).



We've added an Instant Surface Filtering button to the main toolbar that lets you instantly apply any of the filters to a selected area. In this mode, you can draw a polygon around an area and the filter that is loaded up in the filter toolbar is instantly applied to that area. You can do localized spline filtering, you can apply a Suspect flag (see the new filter for this

above), or you can reject all soundings in the area. This is a familiar capability for Qloud users. This filter will INSTANTLY apply, so you may want to use it with caution. A safer alternate mechanism is to use a new keyboard shortcut (Shift+R) to apply the currently loaded filter inside the currently selected area. In this second mode, you can draw an area, then choose the filter you like and hit Shift+R to apply it instead of having to click the Filter Inside Area button. Repeated drawing and Shift+R allows you to quickly apply filters with minimal mouse work.



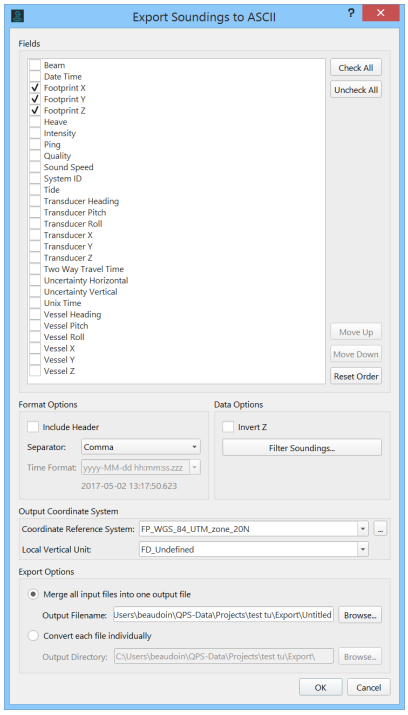
Exports

Sounding Exports

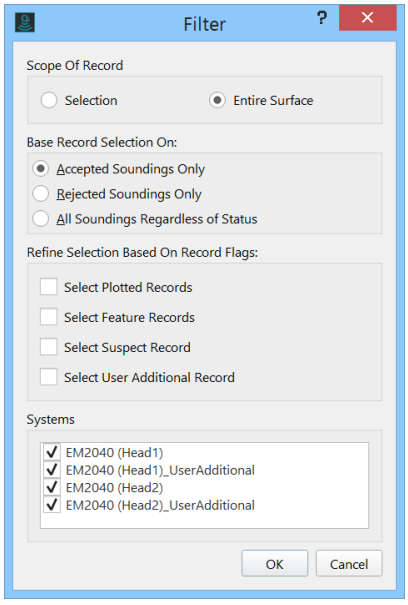
We've taken many feedback items about our ASCII point export capability and have introduced a more general purpose ASCII point export dialog. This replaces the previous method of exporting points in ASCII format, which was an option in the Export to Processed Points dialog. The Export Processed Points dialog remains, but it no longer supports generic ASCII export. This new dialog also replaces the Dynamic Surface soundings export dialog, see the section about Dynamic Surface exports below.

Advantages of this new dialog over the previous ASCII export include:

- Export multiple fields for each soundings
- Specify whether a header is required or not
- Specify the time output format
- Specify which systems to export (which head of a dual head system, for example)
- Control the order of the fields

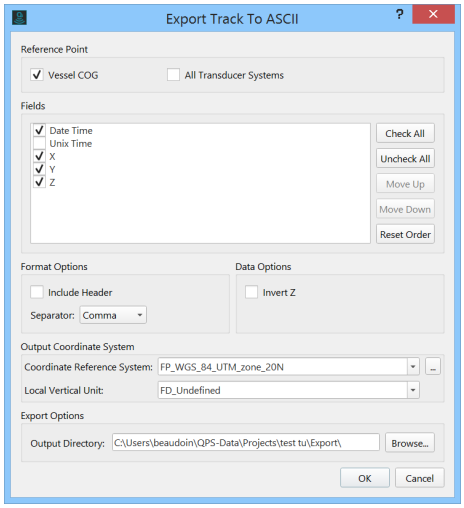


The filter button on the export dialog presents additional options to help you refine exactly what you'd like to export. You can choose to export all points, or just those from a chosen area.



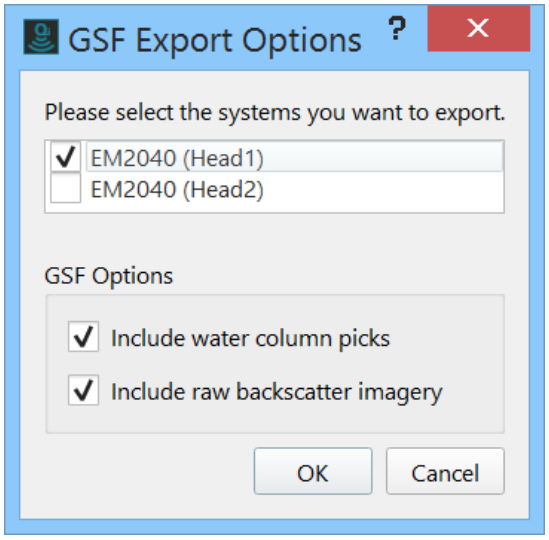
Track Line Exports

The design of the generic ASCII exporter has been reused for a new track line exporter. Previously, the trackline exporter only had the option to specify the outgoing coordinate frame.

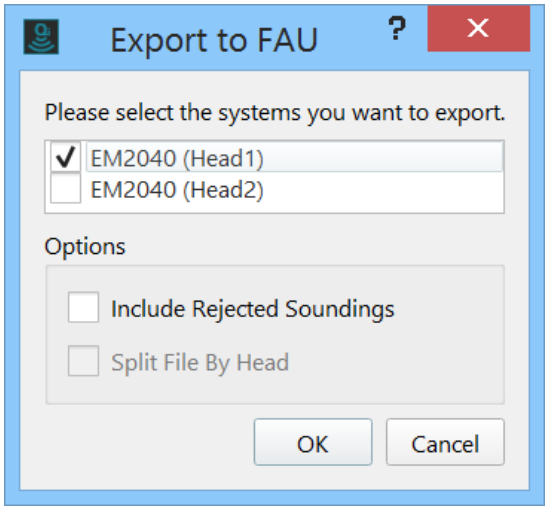


Interchange Format Exports

You can now choose to have GSF files that do not include backscatter snippet records. These records were previously always exported, but would result in much larger GSF files. Users can now choose to leave out raw backscatter imagery, resulting in a much more compact exported data set.



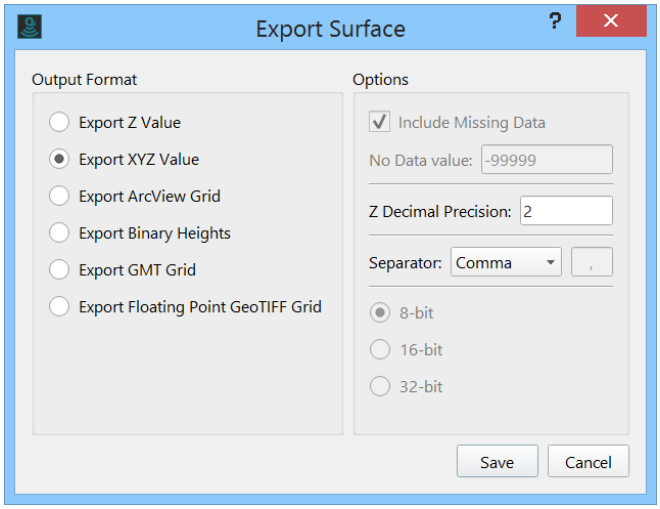
Exporting to FAU format now allows specification of which head to export, this is now in alignment with the GSF export experience.



Dynamic Surface Exports

We've added the ability to export a Dynamic Surface into BBH format (Basis Bestand Hoogte). We currently support version 2.2 of this format.

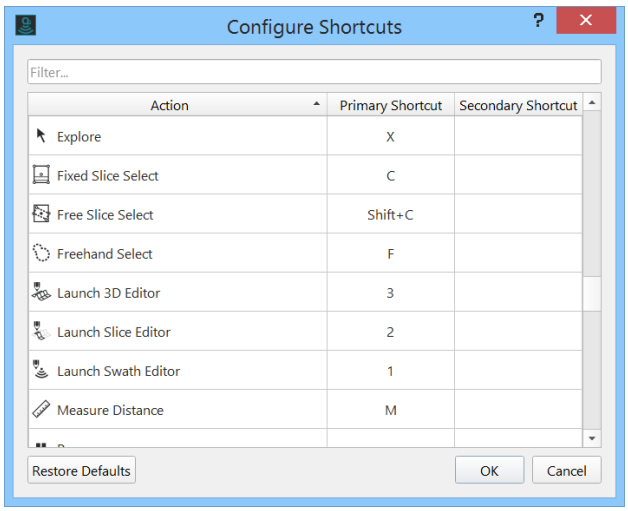
The dialog to export the surface itself (the grid XYZ values) has been updated to allow the user to specify the separator between fields, previously this only allowed for space delimiters.



As noted above in this section, the Dynamic Surface ASCII sounding export dialog has been replaced with the new generic ASCII exporter, this is launched from the same location as would have been with the original dialog. See the section above for a full description of the new capabilities. There is no loss of capability with this change, we are simply putting together common export methods into a single module.

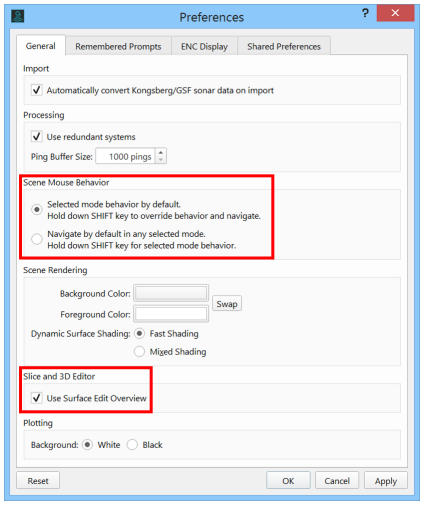
New Preferences

A very popular request has been satisfied: we now have user configurable keyboard shortcuts! The configurable shortcuts also cover the 3D Editor and some changes were necessary to help align the 3D Editor with the main Qimera application's shortcut keys. For example the reject sounding key has been remapped from 'D' to 'R' since the 'D' key is used for movement of the selected area in the Scene. Users are, of course, completely free to re-assign to how they like it.

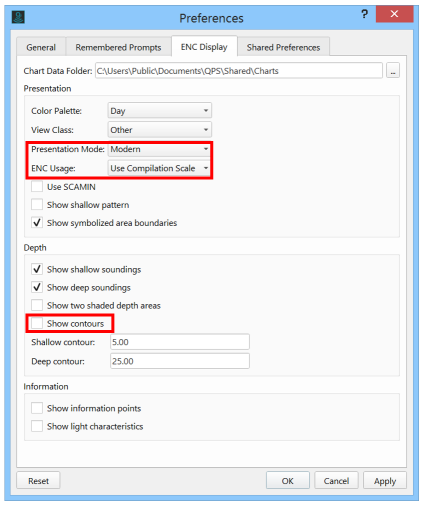


We have implemented a new option to change default left mouse button behavior based on workshop feedback with former Qloud users. The default left mouse button will remain the same in you need to hold down the Shift key to adjust the view in the Scene and in the 3D Editor when you are in another mode such as polygon selection. The new optional mode leaves the left mouse button always in navigation mode and you hold down shift to activate the secondary mode, such as to draw a polygon. Many Qloud users have found this second mode more intuitive in that you can draw a selection and then it remains where you drew it when you attempt to adjust the 3D view.

Another new preference is to disable the use of the Surface Edit Overview. This dock widget gives a 2D overview of the area and indicates which location you are currently editing, but separately from the Scene. If you do not need to use the Surface Edit Overview, you can disable it. It does cause an additional load time for large projects and disabling this will speed up responsiveness when launching the 2D and 3D Editors.



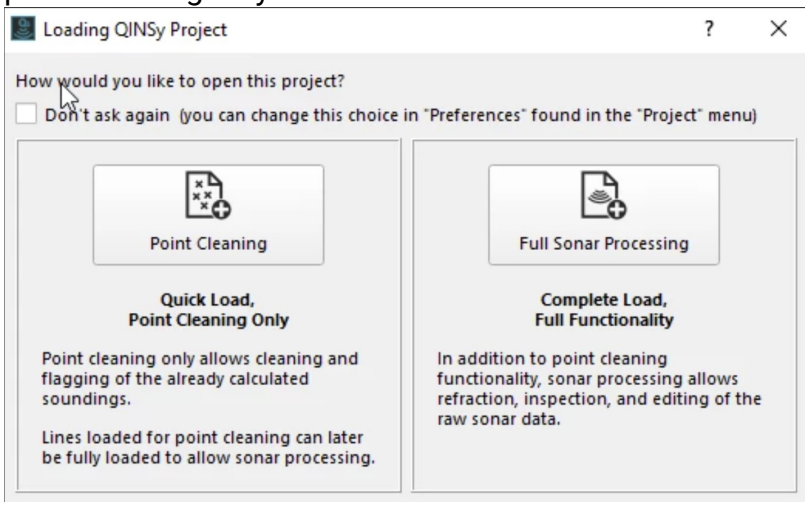
We've improved the consistency in ENC display options with other QPS applications, and also we've addressed discrepancies between how Qimera draws ENCs relative to other QPS applications. In the preferences dialog, you'll now find more options that you may typically encounter in QINSy, Processing Manager, etc. New items are highlighted in the dialog below.



QINSy Workflow

When you load a QINSy project in Qimera, it will now prompt you for your preferred start up experience. The new dialog gives more explanation and allows you to keep your preferred selection as a default choice. If you only do point cleaning, you can configure it so Qimera will start up in this mode. When in point cleaning mode, Qimera also will open the Point cleaning workspace, which contain the appropriate docks and windows for the data cleaning and nothing more. This greatly simplifies the interface for those interested in

point cleaning only.

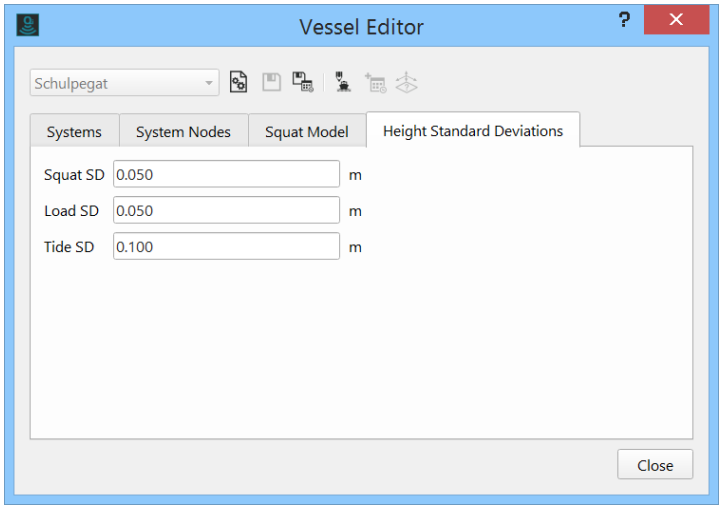


Extraction of Object Track

The *Object Track* system is extracted from paired DB/QPD to preserve the QINSy positioning solution (and uncertainty). This brings two improvements: (1) It improves the consistency between QINSy and Qimera object positioning. and (2) it enables raw sonar processing of objects positioned by means of a USBL system, layback system, or linked node. Qimera now preserves the results of the advanced computation setups computed online or in replay with QINSy. Previously, Qimera computed the object track again from the raw positioning system observations.

Improvements in Vertical TPU Calculation

Qimera now extracts and uses the QINSy SD fields for Squat, Load and Tide. These are stored in the vessel configuration file, which has undergone a version upgrade on the file number. Qimera projects earlier than version 1.6 will upgrade their vessel configuration files when the vessel file is edited for the first time when opened in version 1.6. After this, the project can longer be used in older versions of Qimera. These three new SD fields are only used for vertical TPU calculations in Qimera when the vertical referencing method is set to *None* or *Tide* in the Processing Settings. The tide SD can be overridden by the tide SD value stored in the processing settings for a particular file.



Improvements

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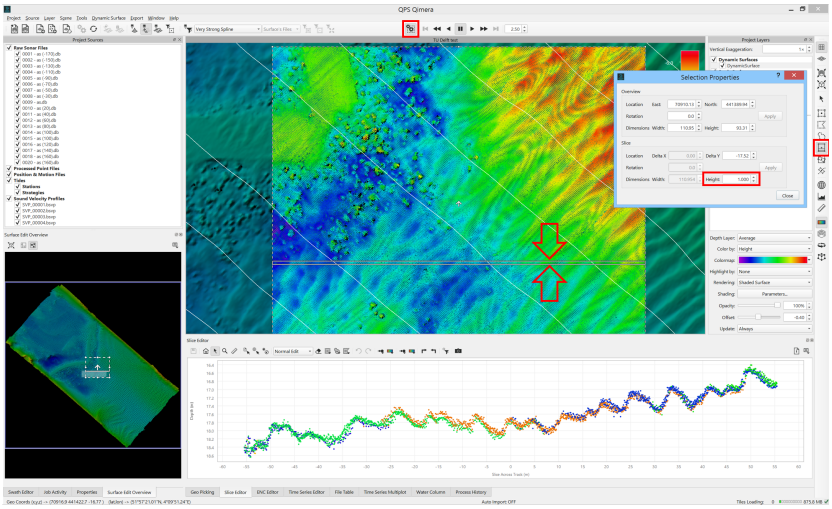
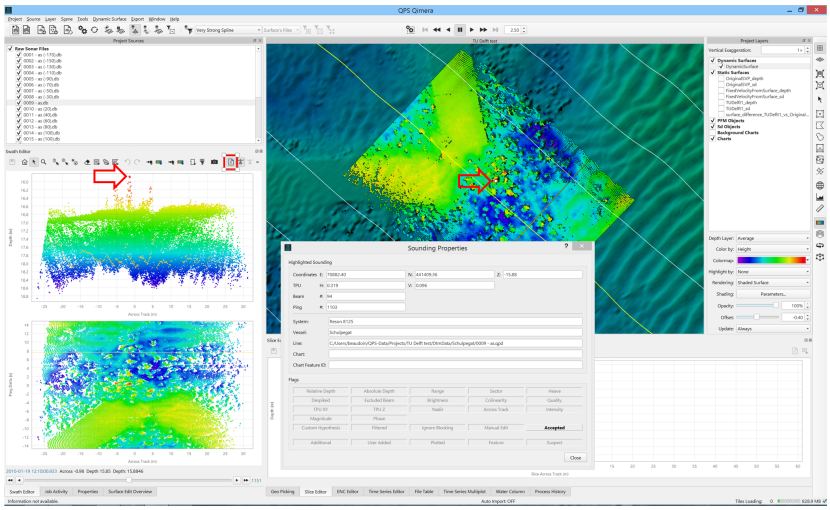
Data Editing

Slice Selection Box dimensions (via Properties dialog) now allow for specification of sub-meter slice height. This was previously limited to 1-meter. This applies to both Fixed Slice and Free Slice modes. The image below shows Qimera in Fixed Slice mode, with the Slice Selection Properties dialog active. The height field is highlighted and the height of the slice is marked up with arrows in the Scene.



We brought a few nice items from the Slice Editor to the Swath Editor. The position of the current sounding under the mouse position in the Swath Editor now draws in the Scene as a white circle, like it does already for the Slice Editor. We've also added the sounding

properties dialog, which gives detailed information about a particular sounding, just like the Slice Editor. The image below shows both of these new improvements.

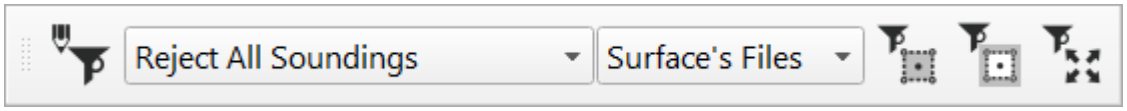


It's also now possible to quickly switch between the Slice Editor and the 3D Editor by clicking the other editor button. Previously, Qimera would force you to first close the currently running editor before launching the new one. You can now just click the other editor button and the first one closes for you.



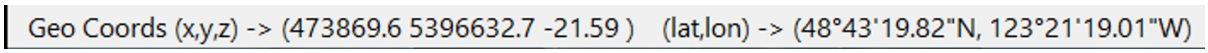


We changed the filter toolbar to be a bit more streamlined. The area based filter combo box that let you choose to apply the filter inside a selected area, or outside a selected area or everywhere has been replaced by three buttons, as shown on the far right of the toolbar below. These buttons now have two functions: (a) the button itself captures the desired way to filter by area, and (b) it runs the filter. Also, a new keyboard shortcut has been introduced to allow you to apply the current filter inside the selected area: Shift+R. Now you can choose a filter and then draw a polygon, run the filter with Shift+R, then draw another polygon and run the filter again.

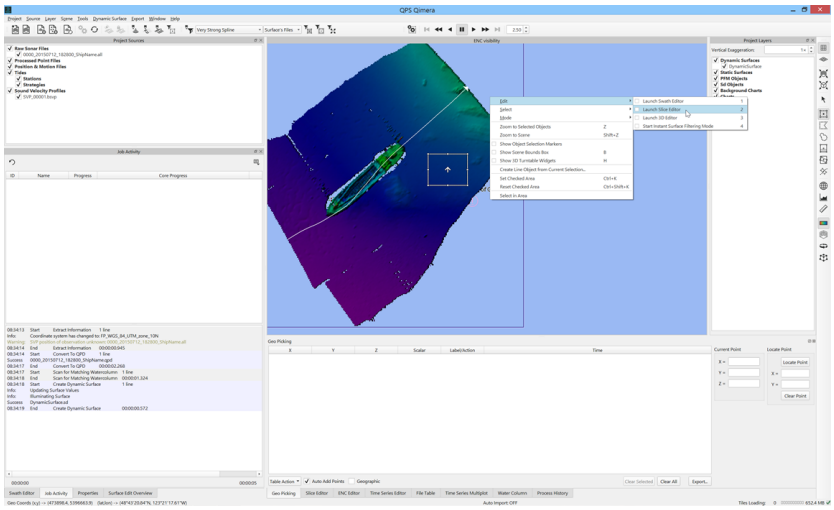


Display and User Experience

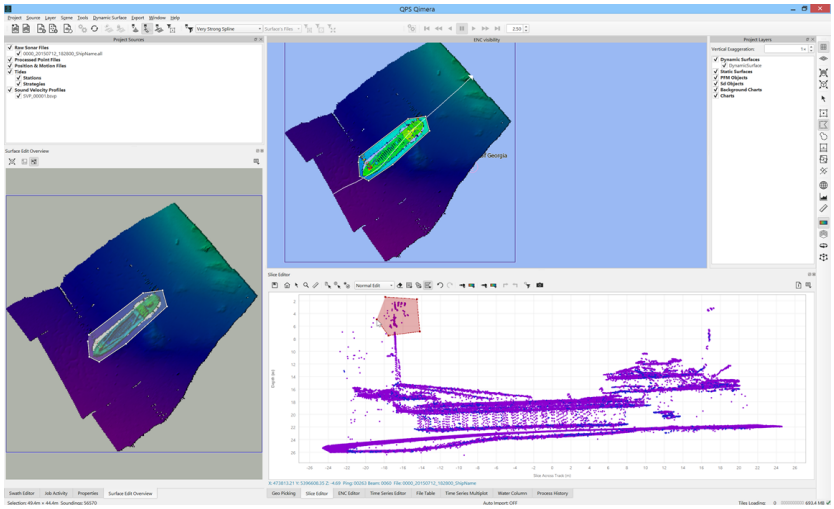
In the Main Window status bar, we now display position & color-by value in status bar for all mouse modes, previously this only worked when in *Explore* mode. This was the #1 request as decided by voters in the Qimera Feedback Project.



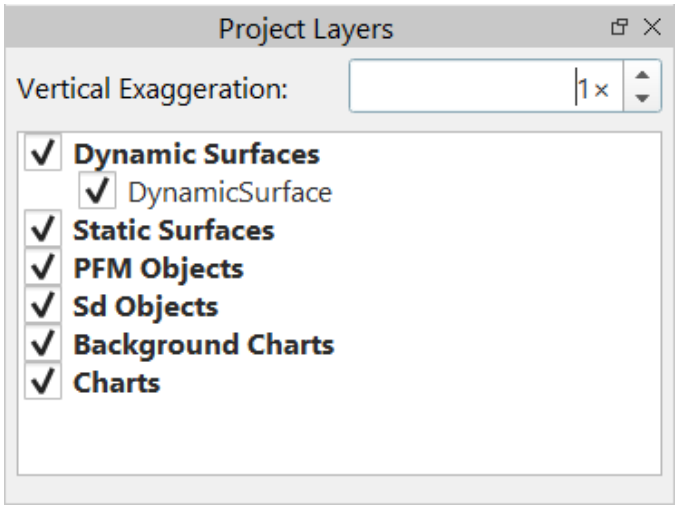
We have added a context menu under the mouse when doing work in the Scene. This improves ability for users to discover operations that can be driven from a selection or action in the Scene. You can launch editors, you can create line objects from selections and you can do area based operations like setting Checked Area or select lines that intersect an area.



Drawing multi-point polygon shapes in the Scene or any of the editors now uses the *Escape* key to allow a user to reject the last drawn point in case a mistake was made while clicking. This can be done for multiple points, all the way back to the original drawn point. The example below shows a polygon being drawn to reject points above a ship mast but the polygon accidentally clips the mast. The user can now hit the *Escape* key to remove the last selected point.



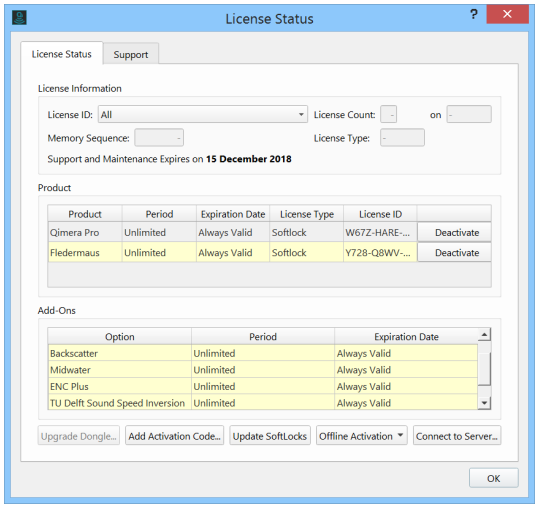
The background ENCs that are drawn in Qimera are now treated as a separate Layer object and their visibility is now controlled the same way as with other items in the Project Layers dock. The visibility of background charts is now also independent of the visibility of any user charts that they have either created themselves or have imported specifically into the project for updating.



License Manager

To accompany our new licensing system, Qimera now shares a common License Manager with QINSy 8.18 and Fledermaus 7.8. The License Manager is accessed from the Help menu in Qimera, but it can also be run standalone from the Windows Start Menu.

Use the new Knowledge Base document 'License Manager 1.0' to find out how to use the License Manager.



Backward and Forward Compatibility

This release is backward compatible in that it will open projects from Qimera 1.5. Some files in a Qimera project have had their version numbers upgraded to accommodate new capability, for example the Vessel Configuration files. Projects from earlier versions of Qimera will upgrade these files as needed. Once a project has been upgraded, it will no longer be able to be used in previous versions.

Database version

In this version the QINSy database file format has been upgraded and is therefore not compatible with previous versions of both QINSy and Qimera. Qimera will continue to work with older database versions and opening an older QINSy database file into Qimera will NOT result in a database upgrade. QINSy users should consult the QINSy release notes for more details on how this impacts their QINSy workflows.

Documentation

A few new How-tos and Technical References have been put together for 1.6.0:

- (2.6) How-to Point C
  prompt you for your preferred start up
  leaning with a Qinsy Project
- How-to ENC Editor
- How-to TU Delft Sound Speed Inversion
- License Manager 1.0
- Object Track from Qinsy projects

The Qimera Reference Manual version 1.6 is also available:

- Qimera Reference Manual

Bugs

The regular release of maintenance fixes allows us to deliver bug fixes steadily to clients during the development phase of our major releases. With the 1.5 release, we followed up with 7 maintenance releases (1.5.1, 1.5.2, ..., 1.5.7) with the last being released on Nov 30 2017. Below is a list of the important issues that have been resolved in this release since the last maintenance release (1.5.7). This list is not exhaustive.

- Quite a few bugs related to licensing have been solved with the new licensing system.
- Patch test calibration with more then 2 heads is now supported. A few crash causing bugs were solved as well.
- The behavior of some spatial selection modes has been improved and stabilized. Sometimes display artifacts would occur, or odd movements would occur during adjustment of the selected area.
- Improvements to Dynamic Surface display after updates that were previously leaving gaps in the displayed surface.
- Some improvements to various QINSy heighting configurations, specifically constant non-zero height setups and end-of-line artifacts between systems of differing priorities. The end-of-line artifacts would be stepped up pings, typically.
- ENC rendering improvements that address crashing when zooming out excessively.
- Improvements for suggested cell size for QPD files.
- Cross-check tool was using the "Param B" term incorrectly for Custom Statistics.
- Motion sensor offset in KMALL file not present in Vessel Editor and datagram viewer sensor model was incorrect for KMALL files

Known Issues

For this release the following issues have been reported:

Component	Issue description	Solution
Licensing	If you start a QPS application (QINSy, Qimera or Fledermaus) with a HASP dongle and you also have a softlock license for the same application on the sample computer, our applications will always authenticate against the HASP. If you then pull out the HASP dongle, the usual warning will appear and the application will shutdown unless the HASP dongle is not reinserted in time to prevent this. This is the exact same behavior a user would have encountered prior to introduction of our softlock licensing system in that if you pull out a HASP and do not re-insert, then the application will close. The limitation is that the current licensing system does NOT check for a softlock license after the HASP is removed, this is an improvement that we will consider in the future.	Do not start the application with a HASP if you expect to need to pull out the HASP. Do not pull out the HASP dongle.
Slice Editor	We have discovered a bug in the Slice Editor when leaving it open while running background processing, such as refraction corrections. We have a solution in mind but we were unable to complete this in time for the 1.6.0 release. Until we can implement and deploy this solution, we are disabling the ability to launch processing tasks while in an active Slice Editor session.	Close the Slice Editor prior to launching processing.

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Qimera 1.6.1 Release

Highlights on this page

- Introduction
- Highlights
- Technical Notes



Thanks for your feedback

11 votes satisfied!

5 Suggestions and/or Feedback implemented

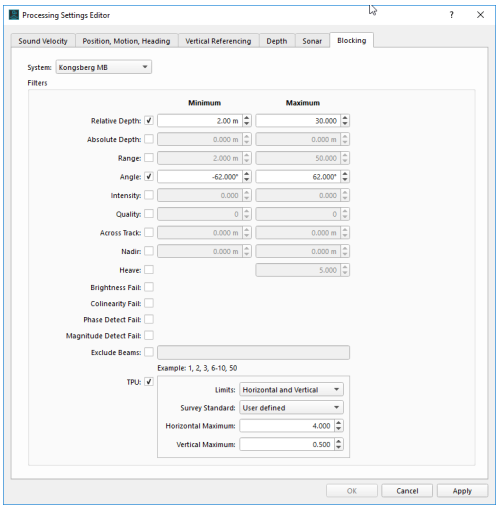
Introduction

13 March 2018, We're pleased to present Qimera 1.6.1

Highlights

- This release includes support for Softlock Server licensing.
- The TU Delft Sound Speed Inversion add-on is now functional for Qimera Clean users coming from QINSy 8.18. Previously this was only available with the raw sonar processing capabilities in Qimera.
- We also now offer Mac and Linux installers for the 1.6 series.
- The water column side viewer now responds to the A,S,D,W "gamer" keyboard shortcut movement keys to pan around, but with the use of the Shift key modifier (these keys also move the swath ping buffer forward and backward). This allows users to zoom in to areas of interest from the full side stacked view and they can pan around with keyboard shortcuts.
- The TPU blocking settings have been augmented to match capabilities available in QINSy. Previously, users could Block soundings that exceeded a fixed TPU value in their chosen

survey units. Now they can choose to have the blocking be done against a particular survey standard, like IHO Order 1.



- Further along the lines of supporting more QINSy configurations, Qimera now allows you to set the heave latency separately from the roll, pitch and heading values for an orientation system. This is a configuration that derives from some sensor drivers in QINSy, this is now matched in Qimera. Users will find an additional "Heave Delay" field in the vessel configuration. For QINSy users, this will be populated automatically as is done for all other sensors parameters. For other formats, the field will be present but will be populated with a zero value by default.
- Following up on our commitment in our most recent webinar, we have implemented TWO of the top voted Feedback issues. We had just a little bit of development time left after the webinar, so we perused the Top Ten most voted items and we found a few easy wins that could be accomplished in the time frame between the Webinar and the release date of Qimera 1.6.2.
    - FQM-54 - Dynamic Surface: Enable removing a source file from multiple surfaces at once (6 votes)
        - This is handy when you have a few odd files, like cross lines, that might appear in multiple surfaces. You can now right-click on these files and choose to remove them from All Dynamic Surfaces
    - FQM-16 - File Table dock: All selected files should have their tickboxes changed together (5 votes)
        - This makes the file table behavior consistent with the project source tree in that the visibility checkboxes will all toggle at the same time for a selected group of items.

Technical Notes

- Editors and Viewers

    - The Water Column Dock will now have a default colormap set for new installations on a PC.
    - Activating the Side View in the Water Column Dock will no longer cause a crash in OS/X.
    - Fixed a bug caused by a change in 1.6.0 that slowed the refresh rates in the 3D Editor.
    - The Slice Editor will no longer cause Qimera to freeze.
- QINSy DB related
    - Certain DB / QPD pairs were not having the Object Track extracted successfully. This has been fixed.
    - Fixed a problem with certain ED50 transformations coming from QINSy DBs.
    - Qimera will now provide an additional warning for newly imported QINSy DB files that contain a different DB setup than those previously imported.
- Importing
    - Caris SVPs that are missing a position or date/time will now come into Qimera correctly.
    - HSX files containing datagrams with the incorrect numbers of beams will now come into Qimera without problems.
- Exporting
    - Contours exported to DXF now have the correct heights for each contour.
    - Fixed a problem where Dynamic Surface exports to Surface weren't working if the file path contained certain characters.
    - Improved surface export workflow to now correctly prompt user if an pre-existing file is found with same name.
    - Depths in GSF files exported from Qimera will now have a precision of 3 decimal places for shallow soundings.
    - GSF exports now correctly include the calculated TPU values for each sounding.
- Miscellaneous
    - User created S-57 objects were in the wrong location in projects defined with an OSGB coordinate reference system. This has been fixed.
    - Slow install times for Qimera 1.6.0 have been remedied.
    - Qimera will no longer run into memory issues when processing large numbers of files that contain an MBES that uses a barrel array.

Qimera 1.6.2 Release

Highlights on this page

- Introduction
- Highlights
- Technical Notes
- List of Changes and Updates to the License Manager:



Thanks for your feedback

1 vote satisfied!

9 Suggestions and/or Feedback implemented

Introduction

24 April 2018, We're pleased to present Qimera 1.6.2

Highlights

- LAZ / LAS: It is now possible to export LAZ or LAS files directly from Qimera.
- The Cross Check tool is now available in Qimera Clean. It previously required Qimera or Qimera Pro.
- A Qimera Voting Project item has been implemented: It is now possible to specify a time or ping in the Swath Editor. The swath editor will then jump to that ping / time. The jump in time will work between files.
- Updated translations: We have updated the translations to cover the new functionality and interface changes made for Qimera 1.6.
- Qimera now supports Kongsberg kmall water column data from .kmwcd files. Prior to this, the kmall water column needed be logged in the .kmall file.

- Qimera now supports reading of LAS version 1.4 for processed point files. Omniview will also support loading those files.
- Geopick table entries are now saved automatically and will be available the next time the project is opened.
- Improvements have been made to some graphical elements in the Activity Log and Editors.
- In Windows, Qimera will now automatically use a discrete graphics card, if available.
- The default adjacent line time setting in the Processing Settings has been increased to 2 seconds to improve interpolation in some scenarios.

Technical Notes

- The QINSy DB format was modified in several areas for 8.18.0. One change was overlooked and can cause Qimera to fail to read the DB: If a USBL system is defined in a DB either logged or upgraded by QINSy 8.18.0 or later, Qimera 1.6.2 will be required to process the data.
- Patch Test Tool
  - The internal sonar offsets that accommodate for the small distances between sonar elements in some Kongsberg shallow water models of sonars were not correctly applied in the patch test tool. This would result in slight roll offset residual errors after running the patch test tool. These offsets are applied normally during standard calculations when processing data, thus normal processing has been correct, the update in this release only affects the evaluation of the patch test correctors, particularly the roll offset. The order of magnitude can be a little more than a 1/10th of a degree.
  - The Patch Test and Wobble Tools have received numerous improvements to increase performance.
  - With multi-head data, the Patch Test Tool wasn't allowing for offset values to be saved if only the second head was activated. This has been fixed.
- Raw Sonar files & Imports
  - Geotiffs with transparent backgrounds were displaying the background as black, this has been fixed and the backgrounds will be transparent as expected.
  - JSF files with heading in the position datagram instead of the attitude datagram will now work correctly.
  - ASCII processed points that were brought in with TPUs were having those TPUs adjusted inappropriately when creating a CUBE surface. This has been fixed.
- Water Column
  - Water column side view caching now works as intended. This will speed up the display of the side view when changing from line to line.
  - Fixed a crash that occurred when a .wcd file was located in a different folder than the .all file and included via mapping.

- Miscellaneous
  - ENC preferences will now be remembered correctly when restarting Qimera.
  - In certain circumstances, in multi-vessel projects, vessel configuration settings were being overwritten. This has been fixed.
  - Checked area flags will no longer have a slight offset from the selections used to create them.

List of Changes and Updates to the License Manager:

- Fixed issue when using License Server on Windows, that all users on a PC will have permission to run the software and not just the logged on user who setup the connection.
- Fixed issue when connecting to a License Server that you can specify Hostname or FQDN and not just IP address.
- In the License Status dialog, can now view the Licence ID or Tag ID. Also added option to Copy that value.

Qimera 1.6.3 Release

Highlights on this page

- Introduction
- Highlights
- Technical Notes
- List of Changes and Updates to the License Manager:



Thanks for your feedback

31 Votes

satisfied!

Plus 7 additional Suggestions and/or Feedback implemented

Introduction

23 May 2018, We're pleased to present Qimera 1.6.3

Highlights

Slice Editor

We have made numerous improvements to the Slice Editor in this release based on client feedback. We've addressed the #1 voted item in the Feedback Project: better control over vertical exaggeration in the Slice Editor.

- Vertical exaggeration can now be controlled by the user directly. There is a numeric field that shows the current exaggeration, and it can be edited manually to set a particular exaggeration. Typical use cases are to fix the vertical exaggeration, this is now achieved by first disabling

Auto Zoom from the Slice Editor context menu and then setting the vertical exaggeration to the desired amount.

- The Control key modifier can now be used with the scroll wheel to zoom in the vertical direction only. This is shared now across all plot widgets beyond the Slice Editor, like the Swath Editor, the Water Column Viewer, the Patch Test Tool, etc. In the Slice Editor, this is particularly useful to set the desired vertical exaggeration or to quickly zoom out to see outliers when working in a fixed vertical exaggeration mode.
- We've removed the default hotkeys for the various spatial selection modes. These keys were causing confusion. Users can still set their own hotkeys to choose particular spatial selection modes if they like.
- We've changed the default color table used when coloring points by survey line to give a better color spread between lines.
- When coloring points by survey line, the lines now have a color marker associated with them in the *Project Sources* widget. This helps in identifying which files are loaded and which files you are editing.
- You can now choose to not have points automatically loaded by default in the Slice Editor by disabling a new *Auto Load Points* option in the Slice Editor context menu. When this mode is disabled, the user must manually load the points by hitting either the Enter or Return key. This allows for a speedier experience when drawing and adjusting selection rectangles in the Scene.
- The middle-click mouse button pan performance has been improved to be faster by roughly a factor of 3. There is now also a preference to turn this off.
- When in *Edit Only Selected* mode, there is now a context menu preference to toggle the visibility of unselected lines.
- The *Escape* key can now be used to abandon an edit entirely in the middle of a drag operation for rectangle select and lasso select. For polygon select, the Escape key works as it did before by removing the last clicked point in the polygon.

Qimera Live

- Qimera Live works with QINSy QPD files now, this allows Qimera Clean users to take advantage of live data review and cleaning. QINSy can auto-transfer your QPDs to a remote directory at the end of the line, Qimera Live can now be configured to import these into a Qimera Project so that you can start data editing right away. Of particular note, this allows you to run CUBE in real-time by creating a CUBE Dynamic Surface in Qimera.
- For raw sonar files, you can now apply blocking parameters during import to do things like block soundings by angle, depth range, etc. For QINSy users, this will over-ride Blocking settings that are configured online, but only if enabled in the Qimera Live setup dialog.

Other improvements

- Qimera now supports import of Seapath binary delayed heave format (.srh).
- MB-System file format MB56 (Kongsberg EM300, EM1002, EM3000) is now supported, but only via direct conversion to QPD.
- Ctrl + Mouse wheel vertical zoom capability brought to all plots.
- There is now an option to apply refraction corrections to flagged soundings.
- A warning will now appear when DBs with different or edited systems are brought into the same project.
- The Qimera release version will now be displayed on the main window title bar.
- Time Series Editor: the red dot in the geographic window corresponding with the mouse location will now be shown even when in selection mode.
- Mac OS/X: There is now a way to go from Qimera directly to the crash dump folder.
- The 'X' button in the Manage Filter Profiles dialog has been replaced by a '-'.
- Footprint intensity is now supported when importing .LAS(Z) files.
- Imported HIPS data will now have the correct line names in Qimera.

Technical Notes

- Project
  - SD snapshots will now be saved to the project immediately after being created, rather than when project is closed.
  - Dynamic Surfaces with periods in the name will no longer be truncated in the 'Append to Dynamic Surface' dialog.
  - The application of cleaning filters was not working correctly when certain non-latin characters were in the project name. This has been fixed.
- Navigation
  - Imported navigation that doesn't overlap vessel motion will not be used and the solution will fall back through the navigation and height priority lists.
  - File track lines will now be generated from the MBES or Laser system with the longest time span.
  - Navigation standard deviations will now be correctly extracted from DB files logged in QINSy 8.18 and later.
- Editors
  - Line highlighting in the Slice Editor for 'Edit Only Selected' mode will now work properly.
  - Applying edits to large numbers of points in the Swath Editor will now work as intended.
  - The Swath Editor keyboard shortcuts for advancing through a line will now work when the ping buffer is set to one ping.

    - Blocking settings that are changed in the Swath Editor will now work correctly for normal and user soundings.
    - Opening and closing the 3D Editor was found to sometimes change some components of the display coordinate reference system. This has been fixed.
- Exporting
    - Static Surface Geotiff exports will now have transparency set for cells with null data values. Previously these were set to black.

List of Changes and Updates to the License Manager:

- None in this release

Qimera 1.7.0 Release

Highlights on this page

- Introduction
- Highlights
- Bugs
- List of Changes and Updates to the License Manager:



Thanks for your feedback

2 Votes satisfied!

Plus 9 additional Suggestions and/or Feedback implemented

Introduction

July 5, 2018. We are pleased to present Qimera 1.7.0. This is a maintenance release where we tackle bugs and small suggestions. We would have normally given this release the version number of 1.6.4, however, we've decided to number this release to be version 1.7.0. We've done this for two reasons:

1. We fixed a bug that was limiting the maximum size of QPDs to 2GB, they will now be able to handle 4 GB. The fix for this makes QPDs that are greater than 2GB that are created in this version of Qimera incompatible with older versions of Qimera and other QPS applications. QPDs that are less than 2GB created in this version of Qimera will still be compatible with other QPS applications.
2. We've made a series of changes to portions of the user interface that affect the majority of workflows involving the Filter Toolbar, Slice Editor, Swath Editor and SVP Editor.

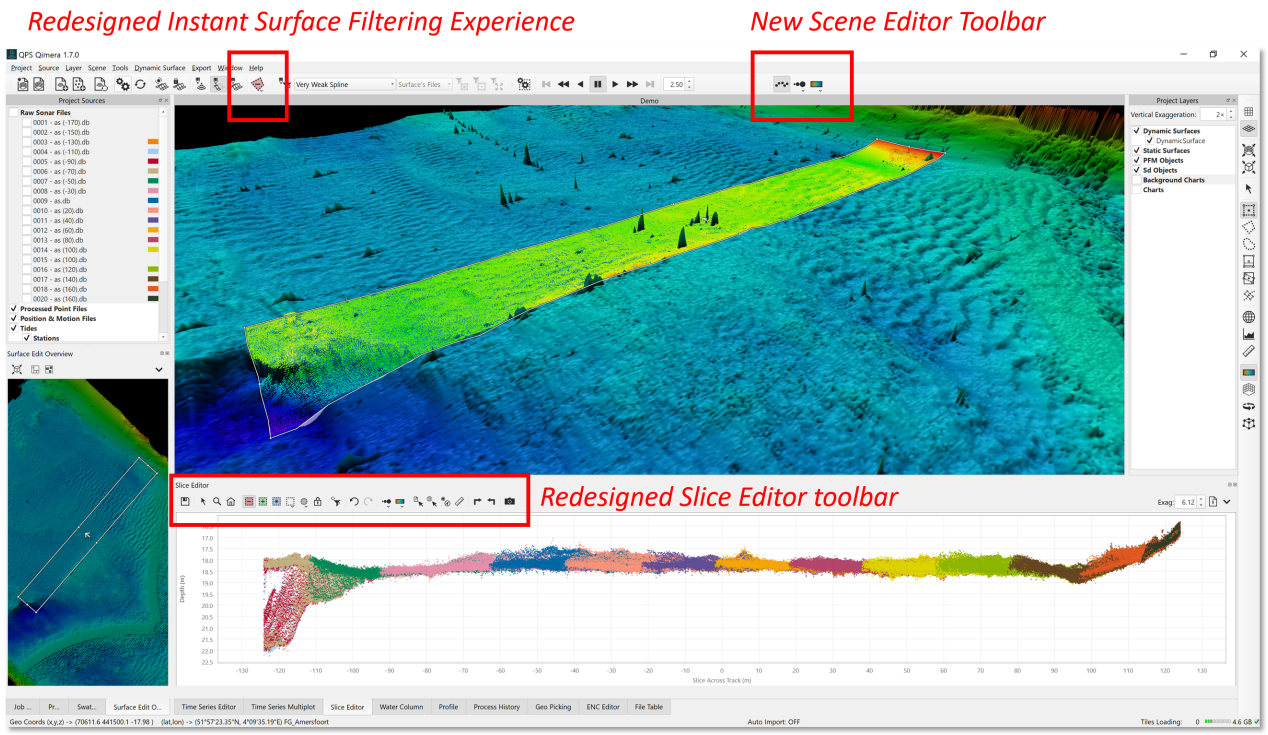
Other than these two major differences, this release contains bug fixes and small feedback and suggestion items as you would expect in a typical maintenance release.

The changes to the user interface are based on feedback from focused testing and evaluation workshops with Qloud users. In these workshops, we came to realize that some ease-of-use in the Qloud design would make the overall Qimera experience better for

all users, not just former Qloud users. Though each change is small, we feel that the cumulative effect will make a big difference for a user transitioning from Qloud to Qimera. We also feel that this will make Qimera even easier to learn for new users. With the long list of improvements to the Slice Editor that were accomplished in the previous release (v1.6.3), we feel we've delivered in a number of key areas where our users sought improvements. We care about the user experience and we'd like to thank all the users who've helped us to make these advances. We look forward to hearing what you think about the improvements!

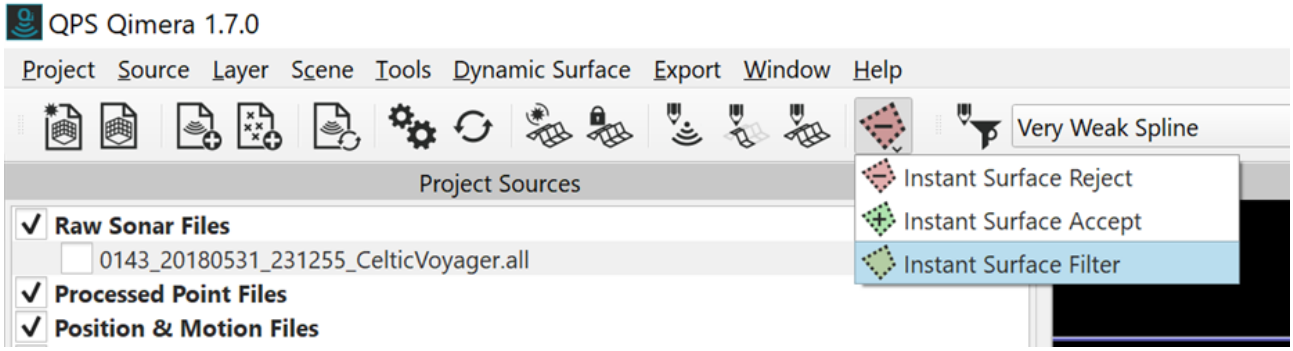
Highlights

The major differences in the user interface are shown below, with additional images and information following afterward in sections that touch on the three highlighted areas of the interface. We have made an effort to ensure that symbols, coloration and actions are mimicked as much as possible. This allows users to apply what they have learned from one toolbar or editor to others.



Improvement: Instant surface filtering

We released the Instant Surface Filter in Qimera 1.6 and have had many suggestions to make it even simpler to use. Previously, users would switch to this mode and then need to pick the filter they wanted to apply from the filter toolbar. We have mimicked what was done in Qloud and have now added colored polygon select buttons on the main toolbar. A long press of the button allows you to switch between *Reject*, *Accept* and *Filter* mode, as shown below.



The *Reject* and *Accept* modes allow users to draw polygons on their surface and the instantly accept/reject soundings in the polygon. The *Filter* mode allows users to select a desired filter from the Filter Toolbar, for example the Very Weak Spline filter shown in the image above, and then apply the filter in the polygon area. While drawing polygons, users can remove the series of selected points in the polygon with the Escape key. For safety's sake, any change in mouse mode behavior will disable the Instant Surface tool being used. This is done to prevent users from accidentally rejecting data in an area that was not intended.

NEW: SCENE EDITOR TOOLBAR

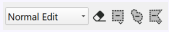
We have added a new toolbar to the application that allows user to control the coloring, size and visibility of points in the Scene when working with the Slice Editor and/or Swath Editor. This was previously controlled via the Swath Editor and Slice Editor toolbars, resulting in more clutter on those toolbars. From left to right, the buttons control visibility, point size and coloration. This toolbar is only active when the user is using the Swath or Slice editors. Controls for point size and coloration for the Slice and Swath editor point displays remains with those tools.



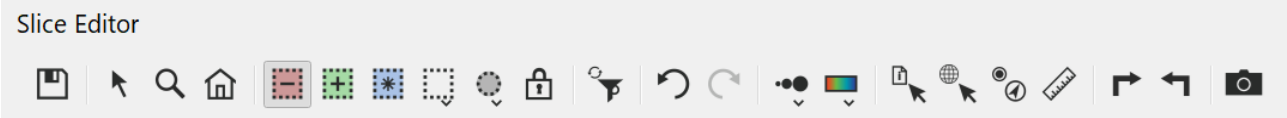
Improvement: Slice Editor toolbar

New Slice Editor toolbar

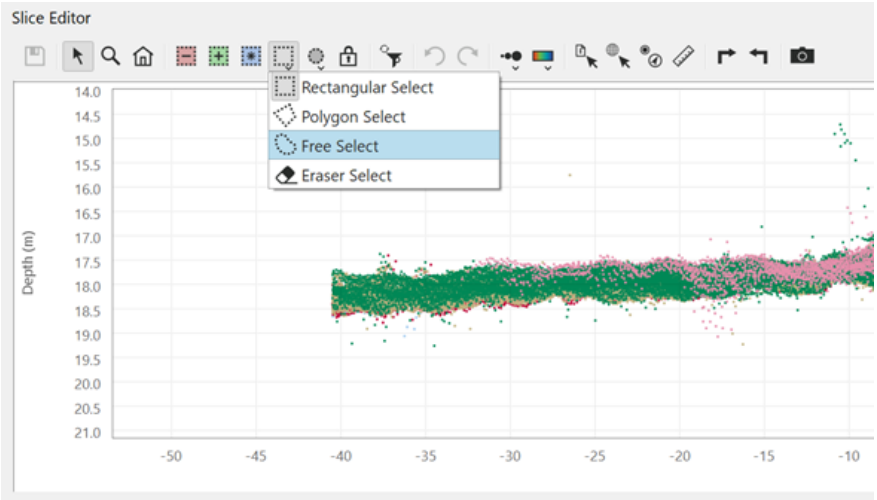
Based on user feedback on ease-of-use of the Slice Editor editing and selection tools, we have made some changes to improve how easy it is for a user to learn how to use the tool without training and/or referring to a manual. The main changes in how you work are highlighted in the table below, showing the old button layout and the new button layout.

Old		You choose how you want to work from the dropdown menu. You would then choose their preferred selection tool. Long press of the selection tool let you choose what type of action to take: reject inside, accept inside, reject outside or accept outside.
New		You select what action you want to take from the colored buttons: reject, accept or select. If you need to change the type of selection tool or whether to apply the action inside or outside their selection, you long press the next two uncolored buttons. The lock button lets you keep the selection area that you drew and apply your action on the next set of points that are loaded into the editor.

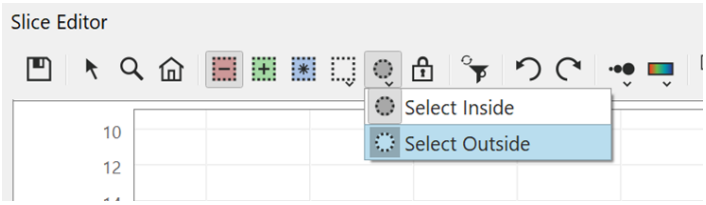
The biggest change is that the primary operation mode of rejecting, accepting and selecting has been given precedence and coloration, most users want to quickly choose between accept, reject and select mouse modes. The colored rectangle buttons with symbols internal to the shape give more visual indication on what actions are available. When operating in a particular mode, like Reject for example, users can use the Ctrl modifier key to allow to quickly transition from reject to accept and *vice versa*. The blue selection tool replaces the previous *Select and Edit* mode from the old toolbar. In this mode of operation, the user will select one or more soundings, they can then right-click and choose an action from the context menu.



Secondarily, users will sometimes want to change the selection tool, this is now collapsed into a single button where a long press will allow users to select their preferred selection tool, as shown below. Repeatedly clicking this button will also allow them to quickly change their selection tool. The reject, accept and select icons will change shape accordingly as the user chooses different tools.



Lastly, the choice of selecting inside or outside has been also reduced to a single button with the same long press and rapid click behavior as the tool selection button explained above. The coloration of the selection tools will change from inside to outside and *vice versa* with the user choice of Inside or Outside to give visual cues about the current operation mode while working.

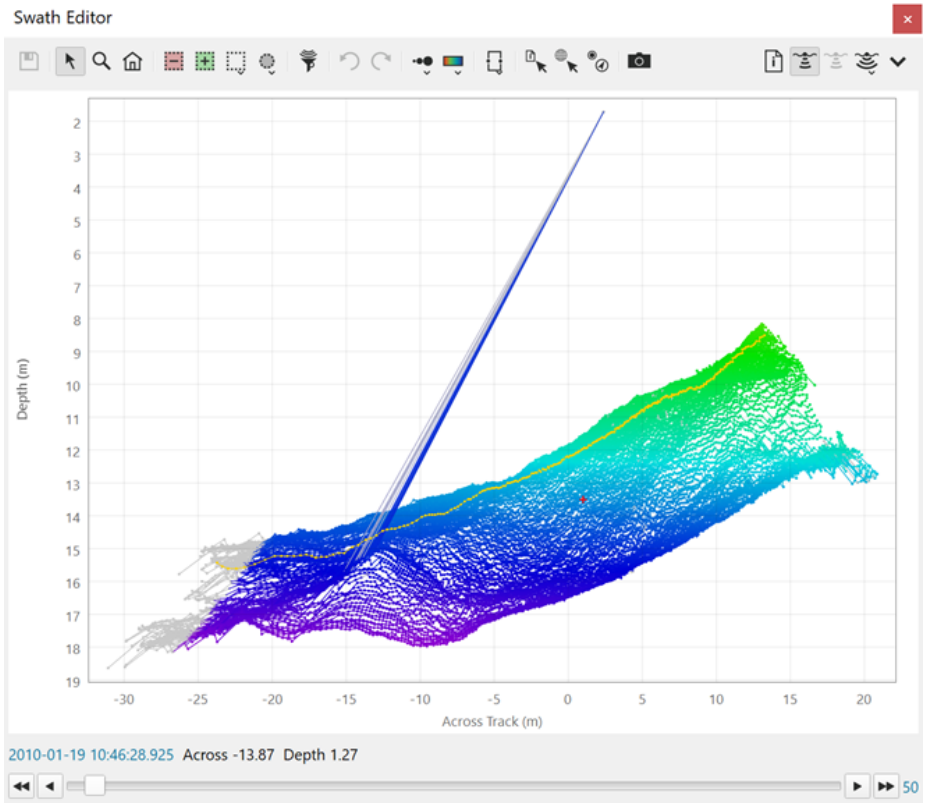


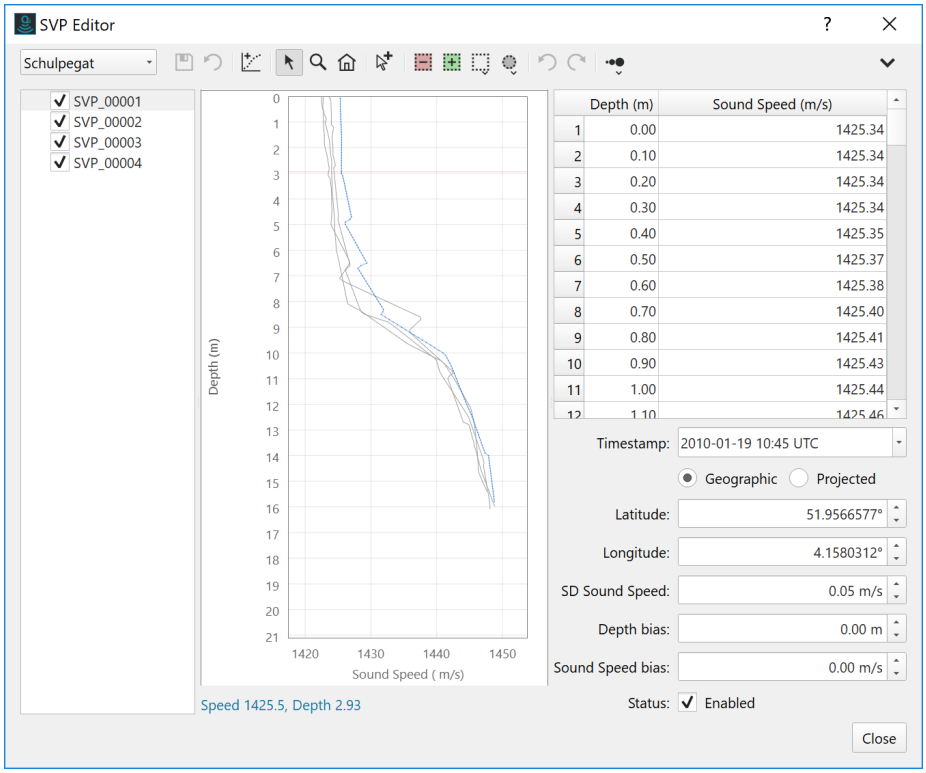
The last of the editing mode improvements is a new Fixed Area Edit button, which is now represented by a Lock icon. This was previously an option from combo box in the previous Slice Editor design. In this mode, the user can draw a shape, decide to accept/reject either inside or outside of the shape. As the user moves with the Slice box, the shape and desired action is remembered.

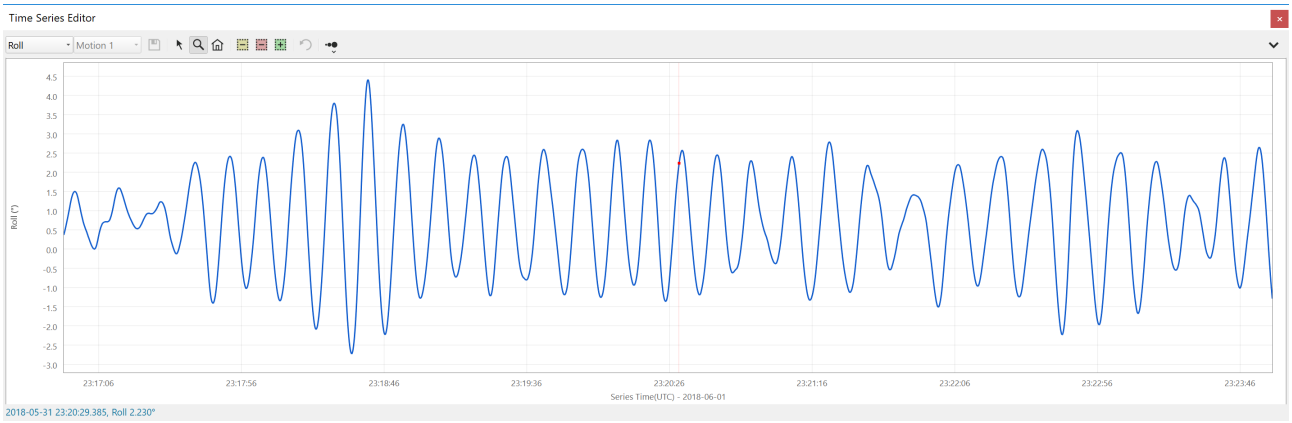
Other minor changes involve putting the *Select Info*, *Geopick Point*, *Create ENC Point Object* and *Measure* buttons off to the far right of the toolbar since these tools are used less often. The buttons controlling point size and coloration in the Scene have been moved to the new Scene Editor Toolbar to save on space and to also clarify that the new toolbar controls the Scene whereas the remaining buttons control size and coloration in the Slice Editor. The *Run Filter Profile* button has also been moved closer to the editing control buttons since it used more often than the other buttons.

Improvement: common toolbar user experience in all editors

For consistency in icons, actions and overall user experience, we have applied the majority of the changes done to the Slice Editor to the Swath Editor, SVP Editor and Time-Series Editor as well. Notably, the action and selection modes are the same in these editors. For the Swath Editor, the controls for the visibility, size and coloration of points in the Scene have also been moved to the new Scene Editor Toolbar, as was done with the Slice Editor. We've made an effort as well to keep the button ordering the same as much as possible between the editors to help users find buttons where they expect them to be. The images below show the new common toolbar and icons across the other main editors in Qimera.


Swath Editor
Depth (m)
Across Track (m)
2010-01-19 10:46:28.925 Across -13.87 Depth 1.27
50

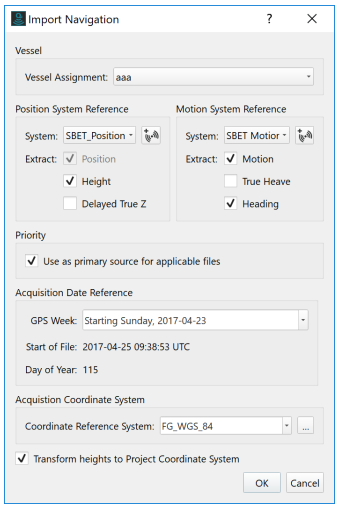

SVP Editor
Schulpegat
SVP_00001
SVP_00002
SVP_00003
SVP_00004
Depth (m)
Sound Speed (m/s)
Speed 1425.5, Depth 2.93
Depth (m) Sound Speed (m/s)
1 0.00 1425.34
2 0.10 1425.34
3 0.20 1425.34
4 0.30 1425.34
5 0.40 1425.35
6 0.50 1425.37
7 0.60 1425.38
8 0.70 1425.40
9 0.80 1425.41
10 0.90 1425.43
11 1.00 1425.44
Timestamp: 2010-01-19 10:45 UTC
Geographic Projected
Latitude: 51.9566577°
Longitude: 4.1580312°
SD Sound Speed: 0.05 m/s
Depth bias: 0.00 m
Sound Speed bias: 0.00 m/s
Status: Enabled
Close



Other improvements

Importing Navigation Data

There is now an option when importing post processed navigation, to not transform the vertical component (height) to the project Coordinate Reference System. Users will find a new option at the bottom of the Import Navigation dialog that allows them to choose to transform the heights of the incoming data source to the Project Coordinate System, see the image below. Some users need to disable this as a workaround for some projects where the raw height must be preserved. The default behavior is to transform the heights, as Qimera has always done, thus this change does not affect the majority of users and most users will not need to change their workflow configuration. This option is in alignment with how this is done in Processing Manager as well, so QINSy and Processing Manager users who apply post-processed navigation will find consistency in options and behavior now with Qimera.



Miscellaneous

- The column labels for the beam angle sign conventions for MBE systems have been relabeled for clarity. Previously, these were labeled "Positive", they now read "Positive Direction"
- The Guided Workflow prompt to reprocess data after import of external navigation data has been reworded to remove the word "binary" navigation.
- There is now direct support for import Kongsberg sound velocity profiles in .asvp format. The advantage of these files over the SVP information embedded in the multibeam files is that the .asvp files often contain the position of the SVP whereas those in the .all file do not.
- Filters available in the Filter Toolbar have been renamed and relabeled with the word 'reject' instead of 'filter'. For example, 'Filter Above' is now called 'Reject Above'. This was done to improve the understanding of what the filters do as this was unclear previously.
- The distance read-out from the measuring tool on the status bar has been changed to provide more decimal places of precision in the output.
- The option to 'Show 3D Cursor Position' option in the content menus for both the Swath Editor and Slice Editor have been relabeled with 'Show Scene Cursor Position'. This is done for clarity and for consistency with other labeling in the application.
- The 4D Toolbar has been renamed to Scene Toolbar. This is done for clarity and for consistency with other labeling in the application.

Bugs

Fixed a bug introduced in Qimera 1.6.1 where GSF exports could contain incorrect depths. Depths in the range of -65 to +65 could have been affected.

This was caused by an encoding issue, where values greater than 65535 (65.535 m at mm precision) were being stored inappropriately.

Fixed a geodetic problem related to WGS84 to ETRS89 transformations.

This affected Time Dependent Helmert transformations defined in QINSy and was causing shifts of several decimeters.

- MBES & Laser Files
  - HSX files that contained an MBES datagram in which one or more multibeam datagrams were reporting just a single beam could cause a crash. This is now fixed.

    - HSX files that span two days across the midnight boundary can now be imported into Qimera successfully.
    - S7K files for single headed systems with the System Enumerator set to 1 (instead of 0) could not be processed in Qimera successfully, this has been fixed.
    - Custom written .all files with an extra padding byte in the raw NMEA telegram in the navigation record can now be brought into Qimera.
    - For QINSy DBs, the Sonar type, shown in the Datagram Viewer, will now be populated with the name of the MBES system.
    - Unloading to LAS format 0 files is now possible.
    - AUV data from MB System's FBT format will now have the sonar depth (as recorded in the FBT file) applied during conversion to QPD.
- Filtering
    - Selecting 'Cancel' after starting the Instant Surface Filter could cause a crash, this has been fixed.
    - The 'Respect Individual QINSy Blocking Flag' filter was causing a crash. This has been fixed.
- Importing
    - The Custom ASCII Configuration will no longer treat a .depth file as a predefined format.
    - Fixed a problem with delimiters in the 'Import Points for Visualization' functionality.
- Surfaces
    - The 'Standard Deviation' layer in Dynamic Surfaces has been renamed to 'Uncertainty (95% C.I.)' for clarity and consistency with other displays
    - Changes made to a Dynamic Surface update setting will be saved immediately instead of when the project is closed.
- Misc
    - Interpolated soundings will no longer be included in Cross Check calculations
    - Fixed a bug introduced in Qimera 1.6.1 where GSF exports could contain incorrect depths. Depths in the range of -65 to +65 could have been affected.
    - 'Create Flag Markers' will now create markers for all flags, as expected.
    - Fixed a geodetic problem related to WGS84 to ETRS89 transformations.
    - Water Column Tool Geopicks and ENC object creations are now working correctly. A bug fix in the Qimera 1.6.3 release inadvertently caused a problem with this.
    - A new OBSTRN ENC object will now have the correct attributes available.

List of Changes and Updates to the License Manager:

- Each product has added option to set custom port number for license servers.

- Fixed issue loading upgrade code for brand new dongles.

Qimera 1.7.1 Release

Highlights on this page

- Introduction
- Highlights
- Bugs
- List of Changes and Updates to the License Manager



Thanks for your feedback

19 Votes satisfied!

Plus 1 additional Suggestions and/or Feedback implemented

Introduction

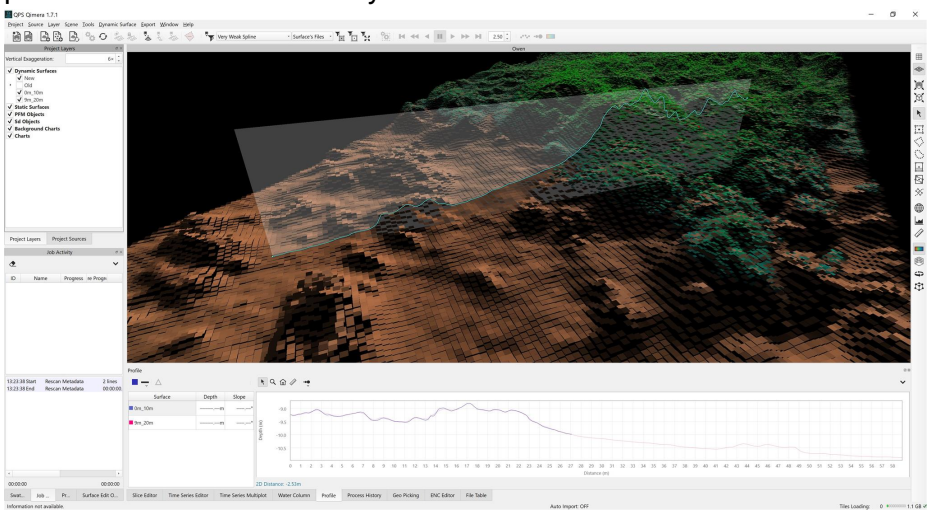
August 29th, 2018. We are pleased to present Qimera 1.7.1. This is a maintenance release where we tackle bugs and small suggestions.

Highlights

General

- Clipped Surfaces: New, depth limited Dynamic Surfaces can now be created from an existing one. This allows for the creation of a Dynamic Surface with a specified min/max depth range. This operation clips the depths of the grid cells that are not within the specified depth range. The resulting Clipped Surface will act like a regular Dynamic Surface in that a user can edit the underlying soundings and update the grid, in which case the gridding algorithm will re-clip after it is finished gridding. The following image is a composite of two Clipped Surfaces rendered as

plates and shaded differently:



- The Dynamic Surface Shoal Export now includes a time field.
- There is now an option in the Blocking tab of the Processing Settings that allows the re-application of blocking to be turned off when reprocessing. This allows quick blocking flags to be preserved when data is reprocessed. Any changes to the blocking settings will still result in the re-application of all blocking settings and the subsequent loss of any quick blocking changes made within a line during acquisition. This functionality will be of most interest for QINSy users who are actively adjusting the Quick Blocking parameters while online. Previously, the results of the Quick Blocking were lost whenever a user would make changes to any processing settings.
- It is now possible to select which workspace a new copy will be created from.

ENC Plus add-on

- There is a new button in the ENC Editor dock, 'Create ENC Shoalest Point Object', which allows you to create an object linked with the shoalest grid node within a lasso selection.
- You can now take image snapshots from the editors in which you can create an S57 object. These editor snapshots are stored as images in the Exports directory and are also used to populate the 'images' attribute of the S57 object. You can now browse the newly created images to review. You can also browse for other images on your filesystem and link them with S57 objects as well.
- The data in the ENC Features Table can now be exported to a text file. This is accessed from the context menu of the ENC Editor dock.
- The column widths in the ENC Features Table can now be adjusted.

Bugs

Surfaces

- Dynamic surfaces with periods in the surface name will now show the complete name in the Profile dock.
- The name 'Extract Property Layer' under the Dynamic Surface dropdown menu has been changed to 'Extract Dynamic Surface Layer'.

Exporting

- Exporting QPSs with only a small number of footprints to an ASCII file was failing, this is now fixed.

Raw Source Files

- Raw Sonar Files with extra periods in the file names will now have the complete name displayed in the Slice Editor dock and Sounding Properties.
- An additional check was added when loading associated DBs from QINSy project QPDs. This will warn if the DBs have different setups.
- Loading Associated QINSy DBs will now work.

Processing

- When an SD is selected as Separation model in the Processing Settings, if it requires reprojection, vertical transformation of the SD is no longer carried out if the Qimera project contains a QINSy geoid model or if a static offset is set. The vertical component will still be shifted if it's part of a 3D transform that is required to reproject the SD into the Project Coordinate System.
- The option to turn off the Automatic conversion of Kongsberg and GSF files has been removed from the Preferences. Both of these files will automatically be converted to QPD upon import.
- SBET files that span over the end of a GPS week (Saturday night at midnight) will now work correctly.
- The 'Accept Only Specified Frequency' filter was not working on several lines at a time. This has been fixed.

Docks and Editors

- Qimera will no longer freeze when going between Slice Editor (using partitions) and Explore mode.

- In the Water Column dock, the stacked side view depth units were meters in projects that had non-metric coordinate frames. This has been fixed.

List of Changes and Updates to the License Manager

- Fixed issue where License Manager did not show the correct number of seats available for NetHASP license
- Fixed issue where pasting a HASP dongle upgrade code with line breaks or other whitespace caused it to be rejected

Qimera 1.7.2 Release

Highlights on this page

- Introduction
- Highlights
- Bugs
- Other
- List of Changes and Updates to the License Manager



Thanks for your feedback

1 Vote satisfied!

Plus 2 additional Suggestions and/or Feedback implemented

Introduction

September 13th, 2018. We are pleased to present Qimera 1.7.2. This has been released early to address a serious problem affecting certain Processed Points unloading workflows. Several new features are also included in this release.

A serious bug was found that affects the unloading of edits to certain Processed Points file formats.

Users affected by this should not attempt to unload edits using Qimera 1.7.0 or 1.7.1. Please upgrade to 1.7.2 immediately.

Here is a description of the problem:

- This bug affects Qimera 1.7.0 and 1.7.1 only.
- It affects files that require file offset values to unload, most notably FAU and LAS.
- It causes the first 500 footprints to not be unloaded.
- It could also cause corruption of the source file due to modifications being made to the file using incorrect file pointers.

- Tests showed no corruption, but it was still possible, depending on the values in the uninitialized file offsets.

Here is the complete list of file formats affected:

- Swedish Binary DIS (.bdi)
- Danish Geographic FAU (.fge)
- Danish FAU/FAU2 (.fau, .fu2)
- Shoals 1K (.hof)
- RAN HTF (.htb, .htf)
- Hydro 93 Binary (.b93)
- LAS (.las)

Highlights

- SVPs can now be exported as ASCII, Caris, and Hypack formats. This functionality is available from the Export dropdown menu.
- Hypack version 3 SVPs can now be imported. Version 3 of this format includes the SVP position, previous versions did not.
- Certain Processed Points file, such as FAU and LAS, can now have data excluded from import when they are brought into Qimera. This results in smaller QPDs and less display clutter for nuisance soundings that users may not want to see at all. Filter options vary between file types.

Bugs

- Fixed a bug affecting the unloading of edits to certain Processed Points formats. See the warning above for more information.
- Images linked to an ENC feature are now separated by a semi colon rather than a comma.
- Omniviewer will now correctly read the surface sound speed from GSF files that have new sensor specific subrecords.

Other

Unloading changes to PDS2000 files is not possible in Qimera. This was incorrect in the documentation.

List of Changes and Updates to the License Manager

- None

Qimera 1.7.3 Release

Highlights on this page

- Introduction
- Highlights
- Bugs
- List of Changes and Updates to the License Manager



Thanks for your feedback

4 Suggestions and/or Feedback implemented

Introduction

October 11th, 2018. We are pleased to present Qimera 1.7.3.

Highlights

- Several processed points formats can now have footprints excluded from import based on flags within those files. These include SFF, XSE, PDS, PFM, GSF, LAZ formats. This would be used to reduce the size of point files in Qimera and improves responsiveness when there are point files that have many rejected points.
- Export Shoal Soundings now has a configurable time and date format.
- The 'Charts on Top' setting, accessible by right clicking on 'Charts' in the Project Layers dock, is now turned off by default.
- The ASCII File Configuration will now allow a maximum of 999 header lines to be skipped, up from 99.

Bugs

- Patch Test Tool
  - The Patch Test Tool will now perform better when viewing Kongsberg .kmall files.

    - Fixed an issue where some multihead setups were not displaying points properly in the Patch Test Tool.
    - A problem with the Patch Test Tool not displaying points from HSX files has been fixed.
- Surfaces
    - Instant Surface Filter edits made to a surface that contains only MBES data, when the QPD contained MBES and Laser will now only affect the MBES points. Previously, the Laser points were inadvertently flagged as well.
    - Fixed a problem with Dynamic Surface Grid Clipping that caused empty surfaces to be created.
    - Dynamic Surfaces with update set to 'Manual' will no longer have an update triggered by reprocessing.
- Source Files
    - Made a fix for Kongsberg .kmall data that wasn't displaying correctly in the Water Column dock.
    - A crash that occurred when exporting a GSF from R2SC files has been fixed.
- Mac OS
    - Certain Kongsberg .kmall files would not load position data on Mac OS. This has been fixed.
    - The Datagram Viewer will now be included in Mac OS installers, as intended.
- Other
    - BAG files exported from Pydro will no longer cause a crash upon import if re-projection is necessary.
    - The 'Set Custom Hypothesis' checkbox has been removed from the Edit ENC Object dialog.

List of Changes and Updates to the License Manager

- None

Qimera 1.7.4 Release

Highlights on this page

- Introduction
- Highlights
- Bugs
- List of Changes and Updates to the License Manager



Thanks for your feedback

1 Feedback request satisfied!

Plus 4 additional Suggestions implemented

Introduction

November 14th, 2018. We are pleased to present Qimera 1.7.4. This is a maintenance release where we tackle bugs and small suggestions.

Highlights

- Footprints shifted via the Refraction or Z-Shift filters will now keep their shifts after reprocessing.
- BAG files can now have the Z values inverted upon import.
- Sounding exports from a Dynamic Surface will only include the systems that the surface was built with.
- The M_COVR attribute will no longer be exported in an S-57 by default and is now optional.
- It is now possible to set upper and lower bounds on the Harmonic Sound Speed solution provided by the TU Delft Sound Speed Inversion tool.

Bugs

- Processing / Source Files

    - Files that have motion data end before position data, and are set to use GNSS heighting, will have the position interpolated if required. This will reduce the number of pings that fail to have GNSS heights applied in certain cases.
    - Some dual head MBES systems with a reversed transmitter were not working correctly with the TU Delft Sound Speed Inversion. This has been fixed.
    - Certain HSX dual head MBES data had both heads processed to one side. This has been fixed.
    - Corrected an issue with some DBs showing extra MBES heads in the Properties tab.
- Tools and Editors
    - The patch test report will now contain images if the project name contains a '#' symbol.
    - The SVP Editor will no longer crash when changing vessel.
    - Quick profiles that cross two surfaces or are started off a surface will now have the vertical bounds scale correctly to match the data.
    - In the 3D Editor, the surface layer name 'Dynamic Surface' has been changed to 'Average'
- Importing / Exporting
    - XSE data can now be successfully exported to GSF.
    - Processed Points files that support unloading and have flags set by filters on import, will now have those flags unloaded back to the source file.
    - ZDF files that contain spaces instead of underscores in the tags will now import correctly.
- ENC
    - OBSTRN ENC features with a CATOBS attribute set to zero will now have 'Unknown' encoded to match.
- Other
    - Existing projects moved into a folder with non-Roman characters in the file path will no longer cause a crash.

List of Changes and Updates to the License Manager

- None

Qimera 1.7.5 Release

Highlights on this page

- Introduction
- Bugs and Improvements
- List of Changes and Updates to the License Manager



Thanks for your feedback

1 Feedback request satisfied!

Plus 4 additional Suggestions implemented

Introduction

December 19th, 2018. We are pleased to present Qimera 1.7.5. This is a maintenance release where we tackle bugs and small suggestions.

Bugs and Improvements

- Processing / Source Files
  - QINSy DB files with MBES or Laser systems that have special characters like colons, quotes, slashes etc. in the system name will now export to FAU and GSF correctly.
  - Custom filter profiles with a single filter will now work as expected.
  - The Object Track heights will now be properly extracted from QINSy QPDs that contain multi transducer systems.
  - R2Sonic .r2sc files that contain Water Column but no bathymetry will no longer cause a crash when imported.
  - Reson 7150 .s7k water column data will now plot correctly in the Water Column dock.
- Tools, Editors and Docks
  - TrueHeave sign convention will now be correct in the Multiplot dock.

    - The 3D Editor button will now work correctly after cancelling the start up of the 3D Editor.
    - 'Color by Line' has been changed to 'Color by File' in the 4D Window and Slice Editor Dock.
    - In the Cross Check tool, the median value is now computed correctly.
- Importing / Exporting
    - Kongsberg .all additional soundings were not being exported in GSF files correctly. This has been fixed.
    - SVPs exported from Qimera will now exclude any data points that have been flagged.
    - Processed Points files with filenames containing special characters like umlauts or several from the cyrillic alphabet, will now work correctly when building surfaces.
    - Kongsberg .all files that were missing some datagrams were causing a crash when exporting GSFs. This has been fixed.
- Other
    - The '+' button on the number pad of the keyboard will now work to change the size of a rectangular selection.
    - Depth axis labels in the Water Column dock have been changed to note that the depths and ranges are from the transducer.
    - Keyboard tabbing order has been improved in several dialogs.

List of Changes and Updates to the License Manager

- Fix a bug that adding invalid upgrade code in the License Manager 'HASP Upgrade Code' dialog will not cause a crash now
- Added support for new Licensing Product and Add-Ons.

Qimera 1.7.6 Release

Highlights on this page

- Introduction
- Highlights
- Bugs and Improvements
- List of Changes and Updates to the License Manager



Thanks for your feedback

4 Suggestions implemented

Introduction

February 14, 2019 - We are pleased to present Qimera 1.7.6. This is a maintenance release where we tackle bugs and small suggestions.

> The merging of edits from a cleaning project back into a master project were removing Z-Shifts, Refraction Filter adjustments, and TU Delft changes. This has been fixed and a warning added to the 'Create Cleaning Project' dialog. This bug affected versions 1.7.4 and 1.7.5.

Highlights

- The FAU Export dialog now contains options for beam angle resolution and direction reference.
- Decimal precision has been increased in parts of the Slice & 3D Editor as well as the Sounding Properties and Profile dock.

Bugs and Improvements

- Processing / Source Files
  - Adding a tide that is not set to the top of the priority list will no longer force raw file reprocessing.
- Tools and Editors
  - The CUBE Parameters dialog will now remember settings after they are chosen.
  - The Reject Outside operation will no longer cause Dynamic Surface updates to fail when areas are reverted.
  - X-Axis label spacing has been changed to prevent labels from overlapping in plot windows.
- Cooperative Cleaning Workflow
  - Cleaning projects now have a new numbering scheme, starting at 1.
  - Cleaning projects opened on different computers will no longer trigger geodetic errors pertaining to the Dynamic Surface.
  - Improved the warning that appears if a master project is mistakenly merged into a cleaning project.
  - Changed 'Apply Cleaning Project Edits' to 'Apply Edits from Cleaning Project' for clarity.
  - The merging of edits from a cleaning project back into a master project were removing Z-Shifts, Refraction Filter adjustments, and TU Delft changes. This has been fixed and a warning added to the 'Create Cleaning Project' dialog. This bug affected versions 1.7.4 and 1.7.5.
- Importing / Exporting
  - When exporting a Dynamic or Static surface using 'to Surface', the 'Export' folder will now be the default location for saving the file.
  - The export filename for a QPS GRD will no longer have .txt appended to it.
  - Certain ASCII tide files were being mistakenly interpreted as MSQ Dialmace format. This has been fixed.
- ENC
  - The ENC 'Images' attribute will no longer list images with a space after the semicolon.
- Other
  - Improved an error dialog when opening a QINSy project without logged data or a template selected.

List of Changes and Updates to the License Manager

None

Qimera 2.0.0 Release

24 July 2019

We're pleased to present Qimera version 2.0.0. In this release, we introduce several new features, with a focus on cross product features between Qinsy and Qimera, along with many improvements that were requested. Read below for details.



Thanks for your feedback

187 votes satisfied!

37 Suggestions and/or Feedback implemented

Thank you for voting! *See also Voting System Policy and Using the feedback project*

Highlights

- New Geodetic User Interface
- New Project dialog
- Upgrade to new Dynamic Surface file format
- and many more feedback items from the Qimera Feedback Project have been successfully implemented

Chapters

- Qimera 2.0.0 - Important Notes
- Qimera 2.0.0 - New Functionality
- Qimera 2.0.0 - Improvements
- Qimera 2.0.0 - Documentation
- Qimera 2.0.0 - Bugs
- Qimera 2.0.0 - Known Issues
- Qimera 2.0.0 - Removed Functionality
- Qimera 2.0.0 - All Implemented Feedback

Qimera 2.0.0 - Important Notes

- Licensing
- Installers
- QPS Project and file format versions
- Support for Qimera v1.X

Licensing

Existing Qimera users with a license that is under maintenance will be able to install and run Qimera 2 alongside Qimera 1, using the same license. No changes to the license configuration have been made with this release.

Installers

The Qimera installer will install by default into subdirectories with the version name under the typical install path, which is usually C:\Program Files\QPS\Qimera. This allows multiple installations quite easily and follows the trend that Qinsy has been using for some time. Users with Qimera 1.X already installed will find that Qimera 2 will install into the Qimera 1 directory, but in the 2.0.0 subdirectory of the Qimera 1 installation folder.

QPS Project and file format versions

In this version the QPS project version has been upgraded and is therefore not compatible with previous versions of Qimera. Projects created with Qimera 1 can be upgraded to work in Qimera 2 but it will not be possible to go back. It is suggested to back up a Qimera 1 project prior to opening it in Qimera 2, in case problems are encountered.
Before the upgrade of a Qimera 1 project, a backup of existing Dynamic Surfaces will be made in the project to ease recovery in case of problems.

Support for Qimera v1.X

Summary:

Qimera 1 will be replaced by Qimera 2. This means that support will stop at 31st December, 2020.

Support for Qimera 1:

What will be supported until the end-of-life:

- Fixes and patches will in general only be for critical and blocker bugs. Less critical bugs are also candidates to be fixed but this is not guaranteed.
- The software will be tested by our test protocols for the current operating systems.
- Support questions will be answered
- Training for Qimera 1 until 31st December 2020
- On site support for Qimera 1 until 31st December 2020

End-of-Life:

Qimera 1 will reach end of support on 31st December, 2020. Following this date, no fixes or patches will be made available.

Following this date issues related to Qimera 1 versions will not be processed. Support questions will not be answered.

No training or on site support will be given.

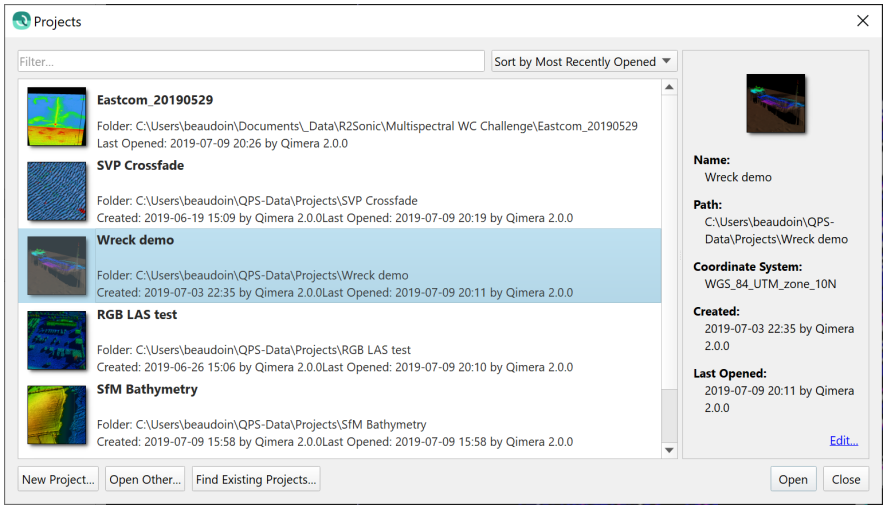
Note that perpetual Qimera 1 licenses will continue to function.

Qimera 2.0.0 - New Functionality

- New Project Dialog
- New Geodetic Configuration Interface
- Integrated 3D Editor into Slice Editor
- SVP Crossfade
- R2Sonic TruePix as Water Column imagery
- Classification and RGB support for LIDAR data
- Isolated Cluster Removal Filter
- Structure from Motion Bathymetry Refraction Corrector

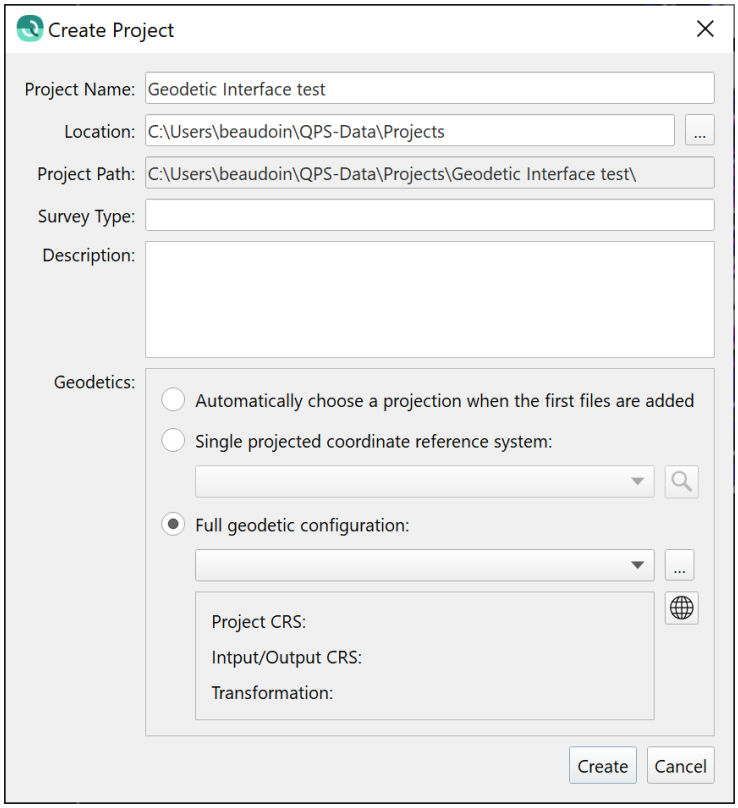
New Project Dialog

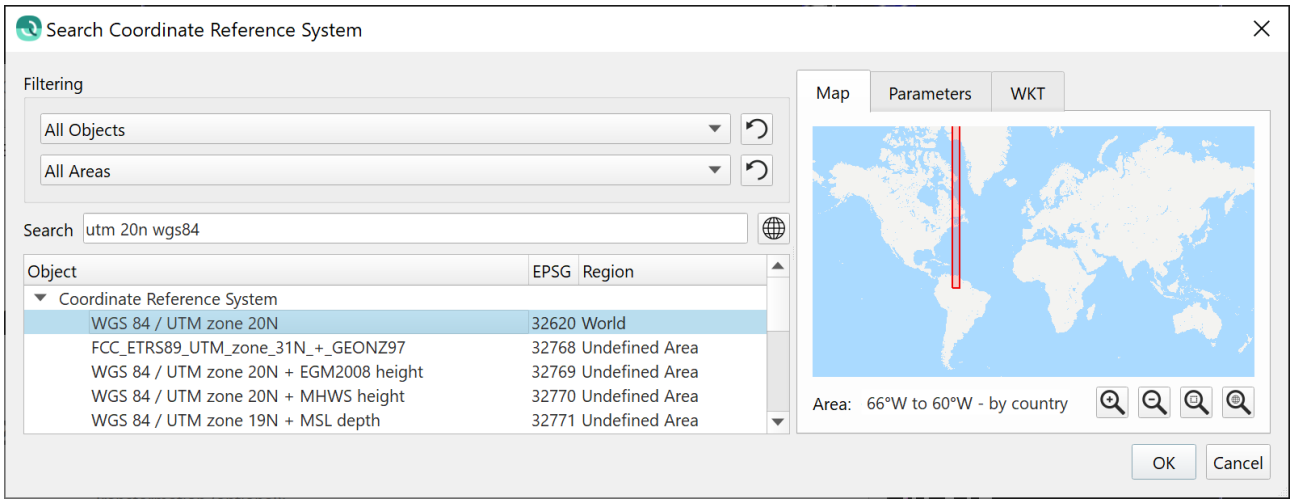
The new project dialog has had a refresh and is now common between Qinsy and Qimera, with functionality merged from the previously used dialogs in both applications.

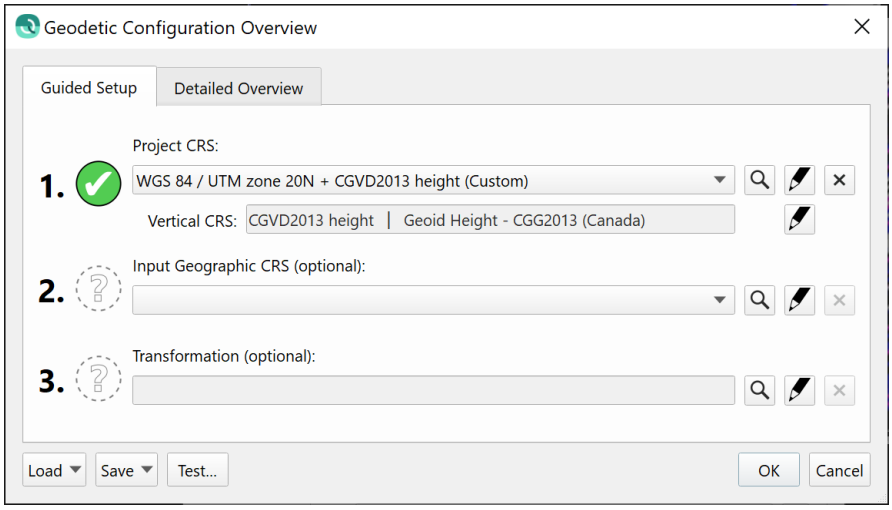


New Geodetic Configuration Interface

There is a new geodetic configuration interface that brings the full power of Qinsy's geodetic configuration abilities to Qimera. The new interface is shared with Qinsy and marks a major improvement for both applications. For example, Qimera users can now specify vertical separation models, create complex custom geodetic transformations between coordinate frames, create construction grids and more. Qinsy users can now search by EPSG code and use a Guided Workflow to configure simple setups quickly or complex setups intuitively.

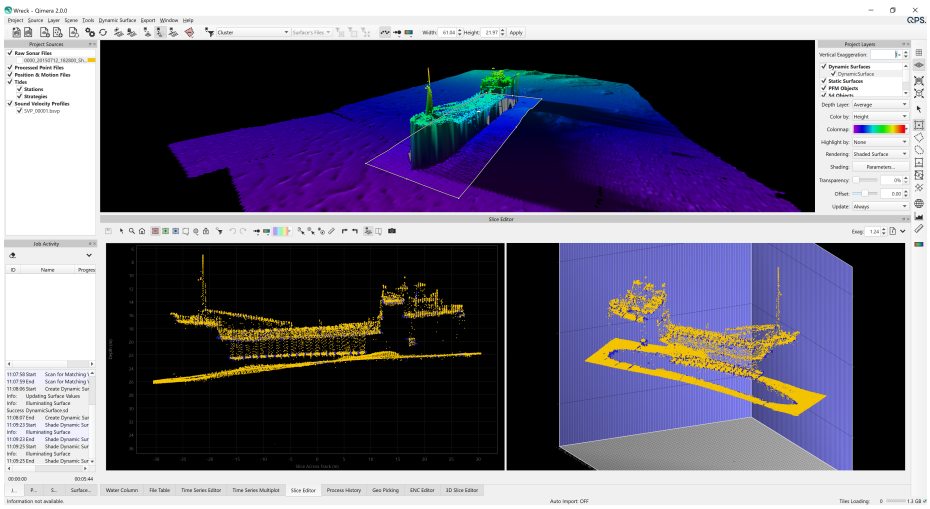

Create Project
Project Name:
Geodetic Interface test
Location:
C:\Users\beaudoin\QPS-Data\Projects
Project Path:
C:\Users\beaudoin\QPS-Data\Projects\Geodetic Interface test\
Survey Type:
Description:
Geodetics:
Automatically choose a projection when the first files are added
Single projected coordinate reference system:
Full geodetic configuration:
Project CRS:
Intput/Output CRS:
Transformation:
Create
Cancel


Search Coordinate Reference System
Filtering
All Objects
All Areas
Search
utm 20n wgs84
Object
EPSG
Region
Coordinate Reference System
WGS 84 / UTM zone 20N
32620 World
FCC_ETRS89_UTM_zone_31N_+_GEONZ97
32768 Undefined Area
WGS 84 / UTM zone 20N + EGM2008 height
32769 Undefined Area
WGS 84 / UTM zone 20N + MHWS height
32770 Undefined Area
WGS 84 / UTM zone 19N + MSL depth
32771 Undefined Area
Map
Parameters
WKT
Area:
66°W to 60°W - by country
OK
Cancel



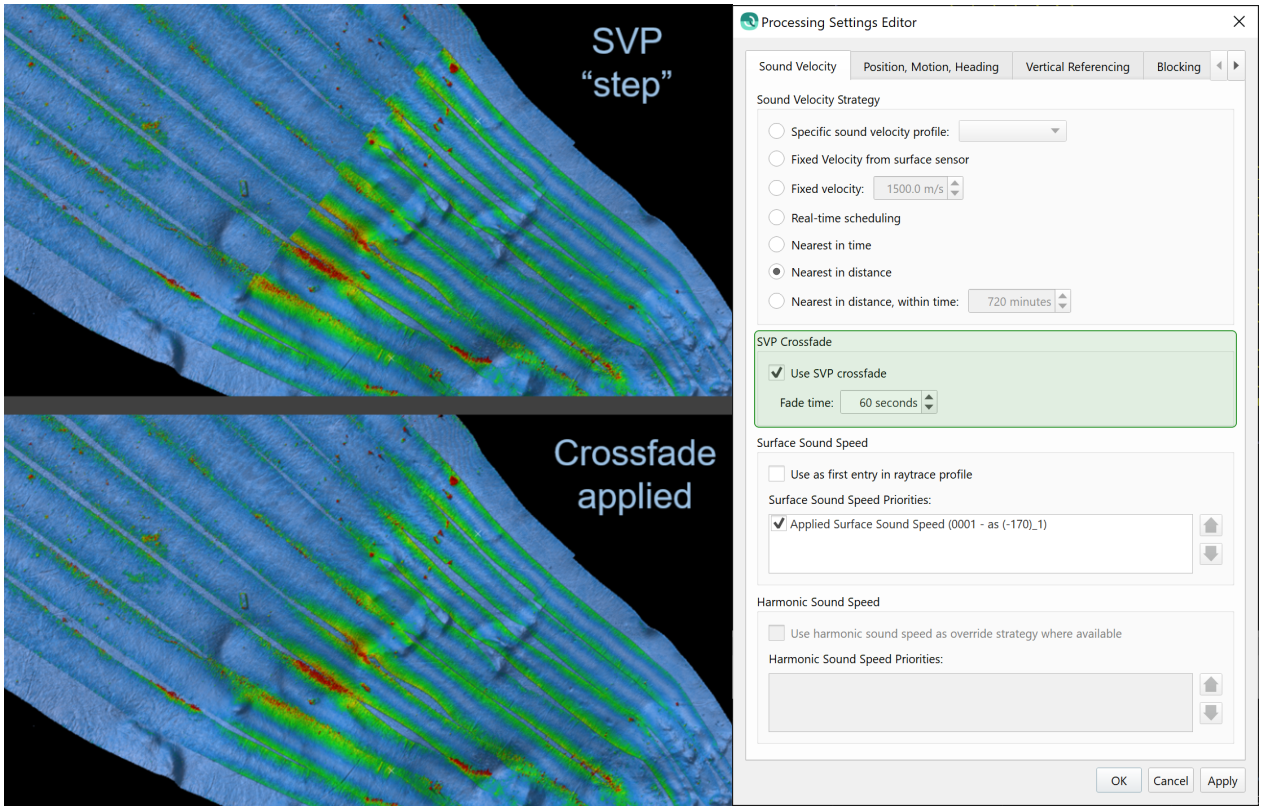
Integrated 3D Editor into Slice Editor

You will be able to simultaneously run the 2D Slice Editor and the 3D Editor. Combined with the point plot in the main 4D Scene, this gives a complete picture to data reviewers.



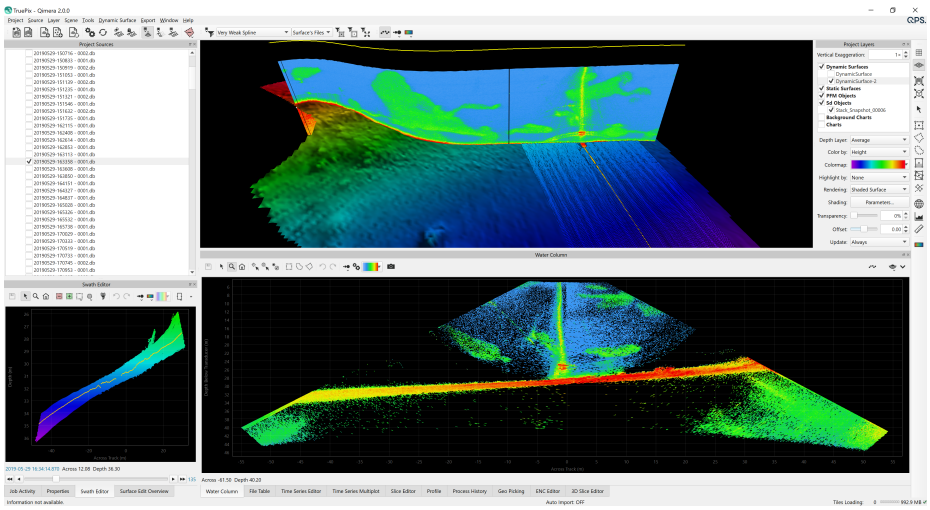
SVP Crossfade

You can apply a "crossfade" to help smooth out the transitions between SVP casts when using time/distance based SVP lookup strategies. The fade time will set the time interval over which the ray trace slowly switches from one SVP to another, avoiding the ugly seam that can occur when you suddenly switch between SVPs in the span of one ping.



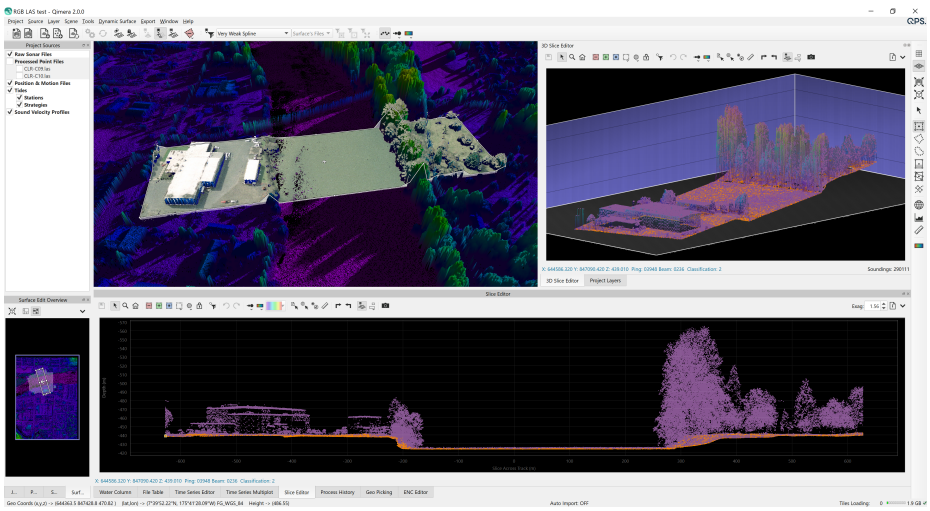
R2Sonic TruePix as Water Column imagery

Qinsy users will now be able to view R2Sonic TruePix data in our Water Column viewer, along with full water column point digitization capability: extract the least depth over a wreck, hunt for hydrocarbon seeps or even monitor suspended sediment during dredging. Shown below is imagery of a bubble plume and fish in Halifax, Nova Scotia. This feature requires recording of the magnitude and angle data, which can be configured in the R2Sonic driver in Qinsy.



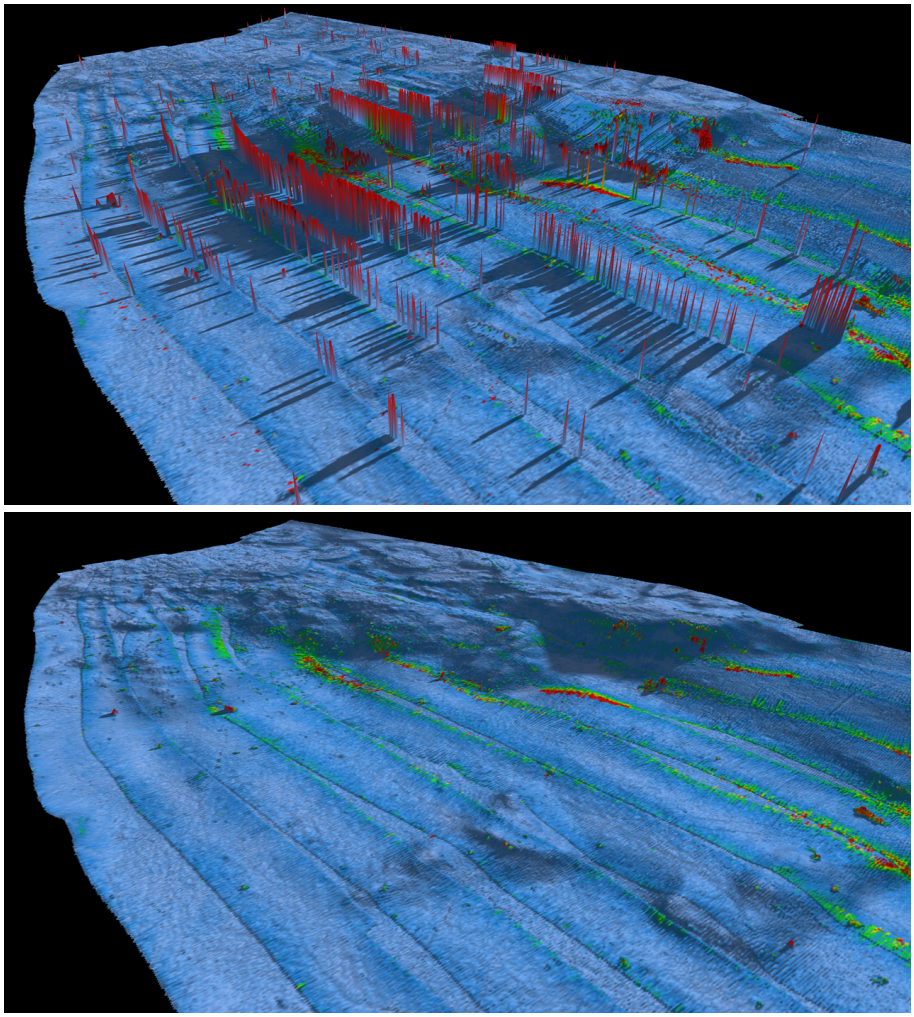
Classification and RGB support for LIDAR data

LIDAR users will find support for RGB and Classification for LAS files. You can color by RGB or classification in the Scene and Slice Editor. You'll also find new custom filters in our Filters Tollbar to Accept/Reject by Classification and to Set Classification, both of which can be done directly off a surface. The classification data can be unloaded back to the original source LAS files, or you can export the classification to new LAS/LAZ or ASCII files.



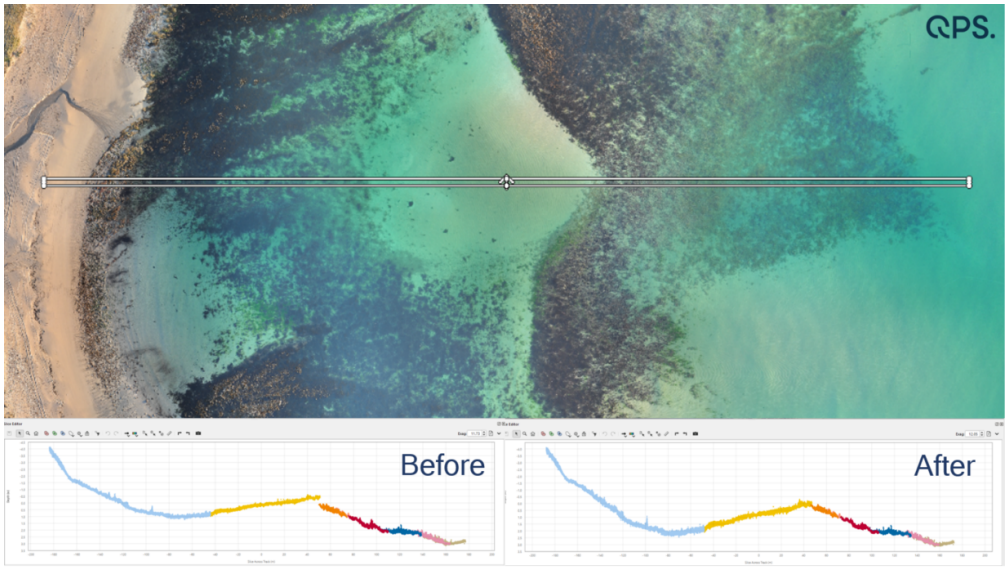
Isolated Cluster Removal Filter

There is a new filter in our filter toolbar that identifies different clusters of data based on the separation distance between groups of point clusters. We use this to identify the largest cluster, the seafloor, and then flag all other point clusters for removal.



Structure from Motion Bathymetry Refraction Corrector

There is a new add-on that allows you to perform refraction corrections for bathymetric points derived through Structure from Motion (SfM) from UAVs. This allows you to get topography and bathymetry in one pass with Qimera. (image credit to 4D Ocean)


Before
After

Qimera 2.0.0 - Improvements

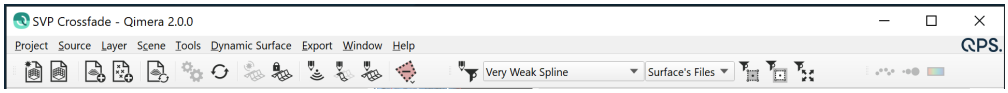
- Interface
  - Main application toolbar changes
  - New customizable toolbar
  - License and Maintenance Expiration Warnings
  - Docked Windows
- Performance
  - Start up, Import and Export
  - Interaction
- Dynamic Surfaces
  - Upgrade to GRID5
  - Shading Improvements
  - CUBE
  - Gridding and Other Grid Based Operations
  - Coloring and Visualization
- Slice Editor and 3D Editor
  - Area Selections
  - Coloring
  - Miscellaneous
- General Improvements
  - Control over color coding of plotted items throughout Qimera
  - Improvements to screen capture capability
  - Coloring, Display and Visualization
- Imports
  - Formats
  - Process Improvements
- Exports
  - New Formats
  - Improvements to GSF Export
  - Miscellaneous
- Miscellaneous Small Improvements
  - Keyboard shortcuts
  - Labeling, text, display

- Processing and Analysis

Interface

Main application toolbar changes

Starting at the top of the interface, users will notice that the project name is in the title bar of the application. Below this in the menu section, users will notice that we've added the QPS logo to the far right. Clicking this will launch web browser and will take you to the QPS website where you can access help, downloads, support information, etc. Of the default toolbars displayed at the top in the default layout, we have removed the Selection Movement toolbar to reduce clutter since this toolbar is not used as often as others.

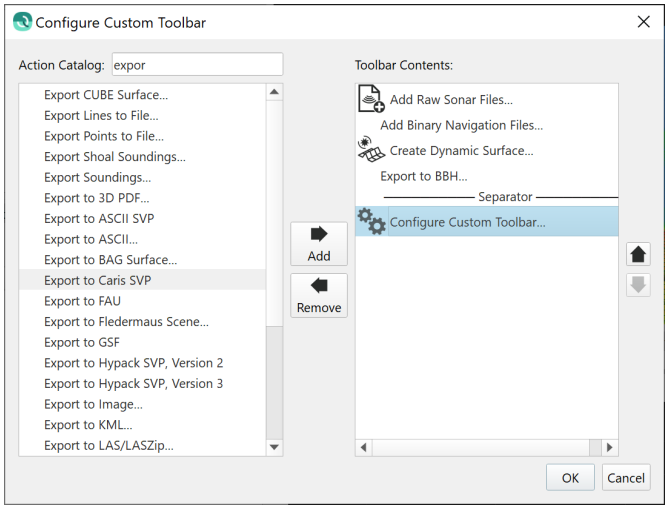


The Scene Toolbar has had some lesser used visibility control buttons removed to reduce screen clutter as well. Users can find visibility controls in the Scene menu for: Show/Hide Scenes Bounds Box, Show/Hide 3D Turntable Widget and Show/Hide Object Selection Markers.

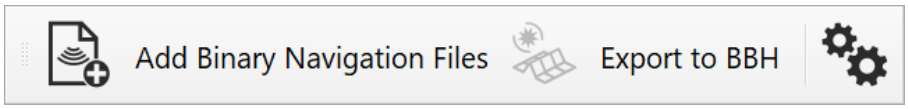


New customizable toolbar

You can display your own custom toolbar on the main application interface, you can configure it to add buttons for any action from any menu. Below we show how one might configure a custom toolbar for a simple workflow of importing raw sonar data, adding binary navigation files, creating a Dynamic Surface and exporting a BAG.



Here's what the custom toolbar would look like in the application.

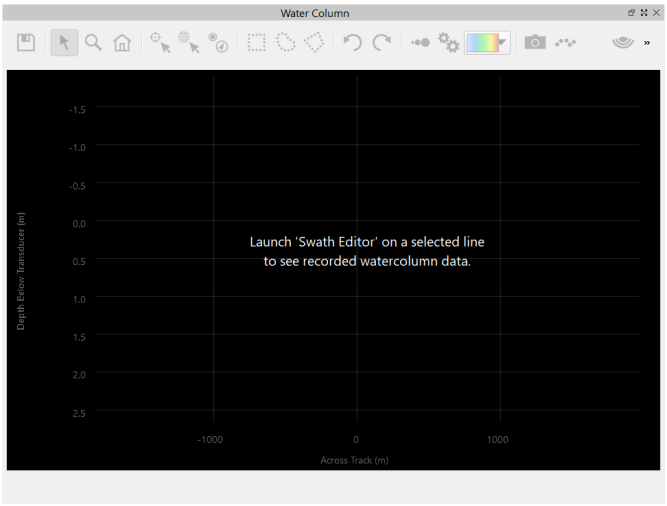


License and Maintenance Expiration Warnings

We have added warning banners to the Scene, using the same principle as the Guided Workflow banners. Users will now be informed when their licensing will expire (important for subscription, rental and short term licenses) and also when their Support and Maintenance will expire. Warning banners will appear at the bottom of the Scene, with an orange banner for Support and Maintenance expiration messages and a red banner for license expiration messages.

Docked Windows

We've made two small improvements to docked windows. There is now a button to maximize a docked window, for use when it is undocked and floating. This allows you to maximize use of screen space for docks where you need a lot of graphic interaction like the Water Column or Slice Editor docks. A maximize icon will appear in any window that is undocked from the main application panel. Also, to improve usability, we have added text overlay cues in the docks to help users discover how to launch and use the tools that they'll find in the default display layout. Below you see an example of the Water Column dock, with the text cue steering the user towards launching the Swath Editor in order to visualize water column data.



Performance

Start up, Import and Export

We've improved the start up time for Qinsy users that open their projects in Qimera Clean by optimizing how we extract navigation track lines and basic ping metadata from QPDs. Depending on contents of the QPD, speed improvements range from 2x to 15x.

Qimera 2 also improves response times for large projects by optimizing how we read, write and update processing metadata tracking files after processing operations. For very large projects with hundreds of lines and hundreds of GBs, older versions of Qimera would run slower for operations like opening the project, adding new files to the project and closing the project once any significant processing had been done, like running the TU Delft Sound Speed Inversion algorithm. The speed to add files to such projects has improved by ~100x due to the optimized processing metadata file I/O. Project shutdown times have improved by about 20x.

There is now faster import of LAS/LAZ files, due to navigation extraction and QPD conversion being combined into single stage and also optimization of QPD conversion code. We see typically an improvement of 1.5x.

Lastly, we have rebuilt the exporter routine for Dynamic Surfaces now that we have a new grid file format. Exporting routines that convert the surface to an ASCII export now run with about a 10x speed improvement.

Interaction

We've made significant I/O improvements to reduce load time for point clouds into editors and also to filter toolbar operations, and regrid operations that occur immediately after localized edits from the Slice Editor and 3D Editor. With the new grid format, we've also addressed scalability issues in that localized editing, regridding and reshading is no longer dependent on the overall size of the grid. Our benchmark tests show 3x to 7x improvement, depending on hard drive type largely.

We've made some optimizations in how point editing actions are done themselves in that the lasso, polygon, rectangle and eraser modes in the Slice and Swath Editors are now much more responsive during editing operations. Previous versions of Qimera had some lag during the draw operations for these edit modes when viewing very large point clouds and this is now dramatically improved.

Dynamic Surfaces

Upgrade to GRID5

We have upgraded our Dynamic Surface file format to Grid version 5. This new format is supported in Qinsy 9, Qimera 2 and Fledermaus 8. With this upgrade, users will find that the format supports very large surfaces more effectively, it has faster I/O, faster regridding and re-illumination (especially for large surfaces). In Qimera, users will note that there is now consistent agreement between grid lattices used for standard and CUBE surfaces. Underneath the hood, we have retooled the way we capture file paths in the grid metadata files and it is now possible to move projects to and from network mapped drives, etc. The new format is also expandable to allow for future needs, like backscatter mosaicing, or any other type of surface that may be required like a live difference surface. We have further plans for Grid 5, so stay tuned to future releases to see what new tools and capabilities we will be adding.

Shading Improvements

As part of the upgrade to Grid 5, the shading engine has been rewritten from scratch. Users will find improvements such as consistent shading between surfaces, independent of z-range. We've removed the brightness dependency on cell size, previously the overall brightness of a shaded image was somewhat dependent on the cell size. For ease of explanation, we've relabeled the shading options of "Fast Shading" and "Mixed Shading" to be "Hill Shading" and "Hill Shading + Cast Shadows"; users will see this in the user preferences now. As part of this work, there is better agreement between the overall look and feel of a Dynamic Surface when the two different shading options are used. Also in the User Preferences, you will find that you can choose to skip the cast shadow calculations to speed up regridding in the event that cast shadows are not desired.

For the shading parameters, the shading azimuth and elevation parameters can be entered in real-world units, along with text entry for both of these. We've also changed a few of the default shading parameters to enhance the Cast Shadows for when that option is used. Users will notice that cast shadows are now significantly longer, this aids the human eye in detecting spikes and other artifacts.

CUBE

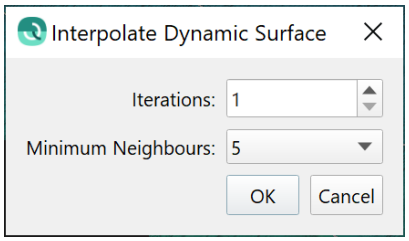
We've done a review of several grid related dialogs and have clearly and consistently named the CUBE layers that are mentioned across multiple dialogs: Dynamic Surface "Color by" combo box, Snapshot as static surface, Extract Dynamic Surface Layer, Cell Information dialog. Also, as per the advice of Dr. Brian Calder at the University of New Hampshire's Center for Coastal and Ocean Mapping (UNH/CCOM), we have changed the default CUBE parameters for the Shallow Water configuration as follows:

- Queue Length changes from 11 to 1
- Quotient Limit changes from 30 to 255

Gridding and Other Grid Based Operations

We've made some improvements to the interface used to create Dynamic Surfaces. You can now Limit the Vertical Bounds during the creation of a Dynamic Surface, this is used to create depth banded surfaces which is a typical NOAA grid deliverable. Previously, this was done by first creating an overall Dynamic Surface and then creating a Clipped Surface.

We've added some new tools for Dynamic Surfaces. First off, by popular demand, we have added the ability to interpolate small holes in the grid. For this, we have re-used the tool set that is available in Fledermaus. In the future, we will seek to standardize on how this is done by combining the methods available in Qinsy, Survey Manager, Qimera and Fledermaus.



We've added two new tools for Dynamic Surfaces that are available with a quick right-click of the file: you can re-grid to a new resolution or you can Duplicate a surface to a copy but change the gridding parameters as you do so.

In terms of workflow for Dynamic Surfaces, we've found that some users were being surprised by some of the grid creation and extraction dialogs, which were quietly using a spatial selection to constrain the bounds of the surface. The behavior now is that the user must choose to constrain the bounds of the selected grid prior to executing operations. This will happen for the following operations: Create Dynamic Surface, Snapshot as Static Surface and Extract Dynamic Surface Layer.

One last detail was taken care of regarding Dynamic Surfaces. When a user decides to delete a Dynamic Surface from the project, the confirmation dialog now defaults to delete the file from disk as well. Previously, the file remained on disk by default.

Coloring and Visualization

There are two new Color By options for Dynamic Surfaces: Color by Rejected and Color by Interpolated. Color by Rejected allows users to easily see which cells have had any soundings rejected, this is useful in quality assurance stages where one user may want to ensure that another user did not reject too many data points, for example. The Color by Interpolated option shows which cells are interpolated.

We've added a few keyboard shortcuts as well. The F5 key will now trigger a refresh of the Dynamic Surface's rendering, in the event that the tile loading/caching/display has a

problem. There are also new keyboard shortcuts to swap the view between different depth layers (Deep, Average, Shallow) and Color By options. The labeling of Opacity has been changed to Transparency, for clarity and ease of understanding.

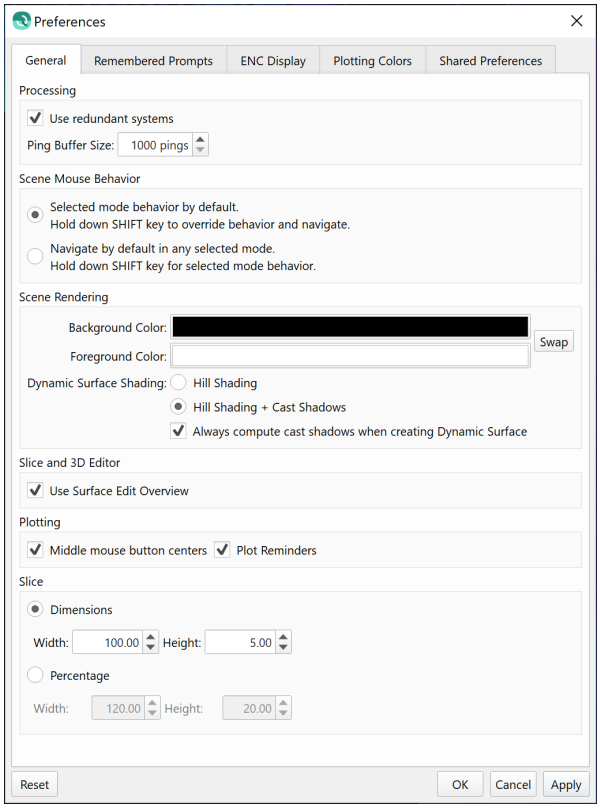
Slice Editor and 3D Editor

Area Selections

For Slice and 3D Editing, have created a new quick size Selection Dimensions Toolbar that lets users quickly adjust the size of the area selection. This toolbar is not displayed by default, users can launch it from the Window menu.

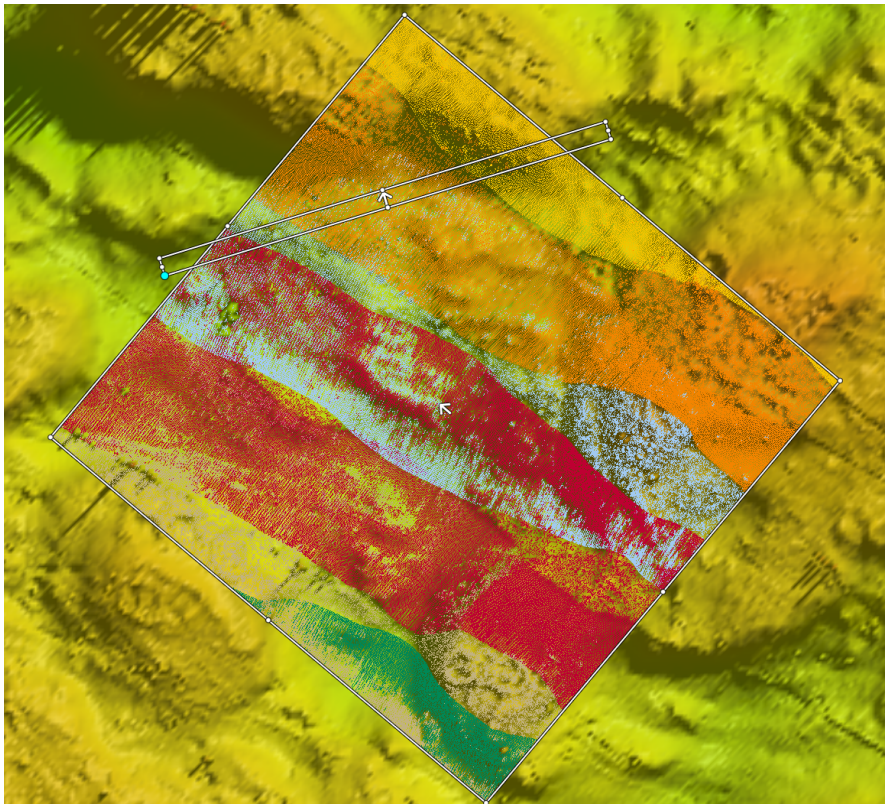


There is also now the capability to set a default set of dimensions for the inner slice for both Fixed Slice and Free Slice modes. You can access this from the General tab on the Preferences dialog, as shown in the two images below. The new capability allows users to choose a default set of dimensions, in survey units, for the width and height. Alternately, these dimensions can be configured to be a percentage of the outer selection of the Fixed or Free Slice outer rectangular selection. The two examples below show the inner box chosen to be 100 m wide by default and 5 m high. For the percentage option, the inner slice will be drawn 120% of the width of the outer selection and the height will be 20% of the outer selection's height. Setting the default inner slice dimensions to a fixed set of dimensions allows users to quick draw outer slice selections and then skip having to resize the dimensions of the inner slice.





We have satisfied a popular request as well to combine the rotation capabilities of the Fixed Slice mode into the Free Slice mode. The Free Slice mode will now allow for independent rotation of the inner and outer selection areas. Previously, the outer selection could not be rotated.



In our review of all the selection modes that are used for Slice Editing and 3D Editing, we made all the keyboard shortcuts consistent to resize the height of the Rectangle, Fixed Slice, Free Slice and Scroll Slice selection modes, both for the inner selection (+/-) and outer selections (Shift +/-). These all now act consistently with the keyboard shortcuts for quick resizing. In doing this, we also fixed a few small bugs that affected the usability of the Scroll Slice selection mode, particularly with the start up mode when a scroll line is not selected.

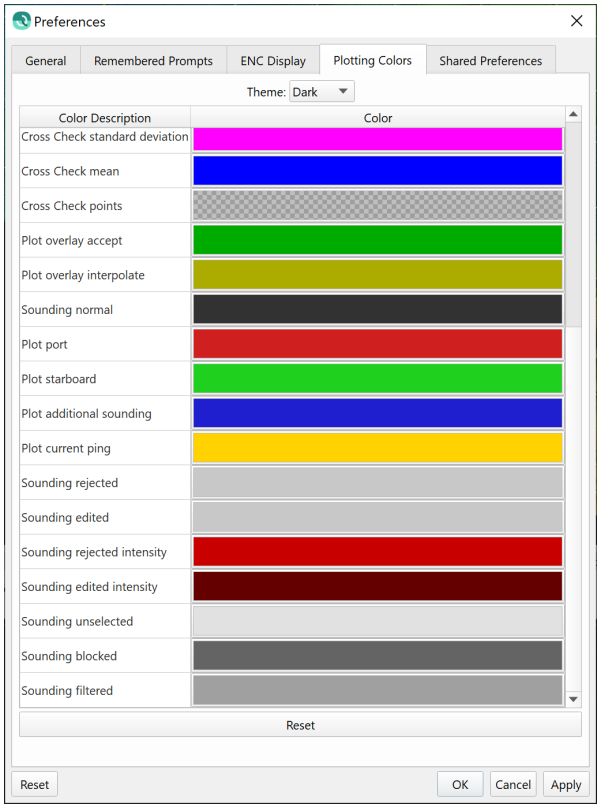
Coloring

Another popular user request was satisfied by adding control for the color map selection and range for point color coding in the Swath Editor, Slice Editor and 3D Editors. Users will notice a new color bar icon in the Slice Editor toolbar, seen below.



There is also a new color by option that lets the point cloud's color coding automatically match the color map of the Dynamic Surface that is being worked on. This can be found in the Scene Editor toolbar as well, and in all the point editors.

Lastly, as mentioned in the New Functionality section, there is now capability to configure the coloring of filtered and manually edited points. This is accessed in the Preferences dialog under the Plotting Colors tab, and is shown below, where you can see that users now have very granular color coding control over coloring of rejected soundings.



Miscellaneous

Polygon selection for point editing in the Slice Editor will now allow users to click outside of the drawing area, this is sometimes handy when editing points near the boundaries of the draw area.

A center profile from the Dynamic Surface is now drawn in the Slice Editor and also on the Dynamic Surface, this is to give quick context of the gridded depths along the profile while doing editing operations in the Slice Editor. Any edits that are saved that would normally trigger regridding will also update the profile.

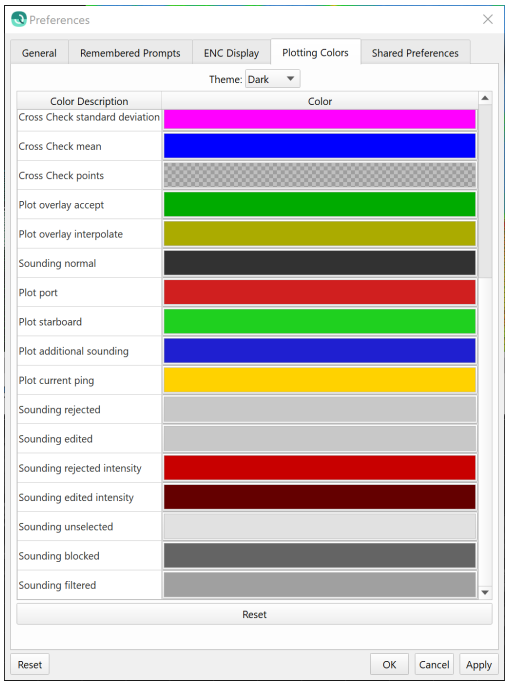
The 3D Editor has had an improvement to populate the time attribute for ENC objects that are created within the editor when using the functionality of the ENC Plus add-on.

File names for source files are consistently displayed in the point information dialogs (Slice and Swath Editors) and the 3D Editor main panel. Previously, in some locations Qimera was displaying full file paths and in others it was displaying just the file name. In all cases, it now just displays the file names.

General Improvements

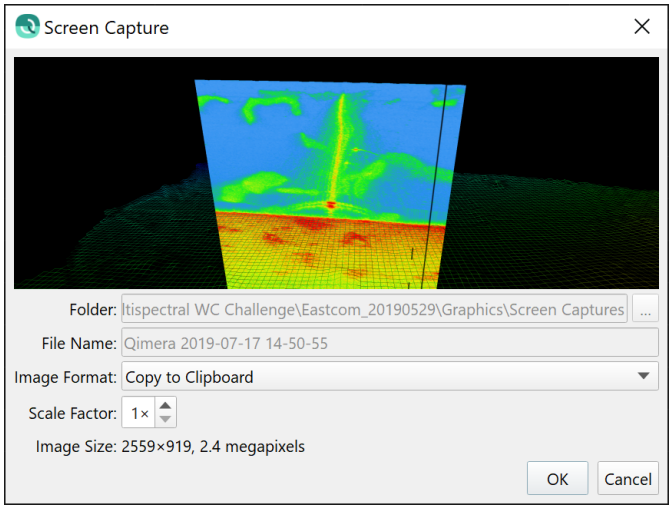
Control over color coding of plotted items throughout Qimera

Qimera has many plots, from point editors like the Slice Editor to data analysis tools like the Cross Check tool. We've centralized point and line coloring options for all of the various plotting tools in the Preferences menu in a new tab, as shown below. Users can choose from a Dark or Light theme, or come up with their own custom theme. The most common use case that drove this development was a desire to change the color of rejected points in the Slice Editor. Once we started down the path of satisfying that request, we decided to expand it to cover all of the plotting tools.



Improvements to screen capture capability

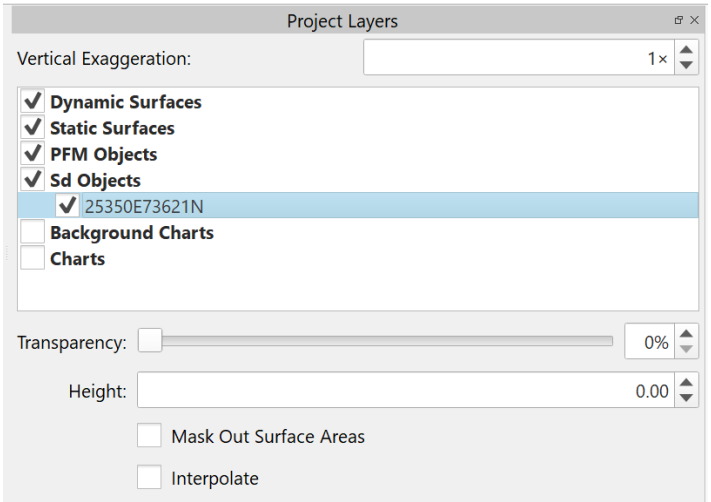
There is now a thumbnail image showing a preview of the screen capture, and the default filename is changed to a name with date and time. Users can also now copy the image directly to the clipboard, in addition to the file formats previously available.



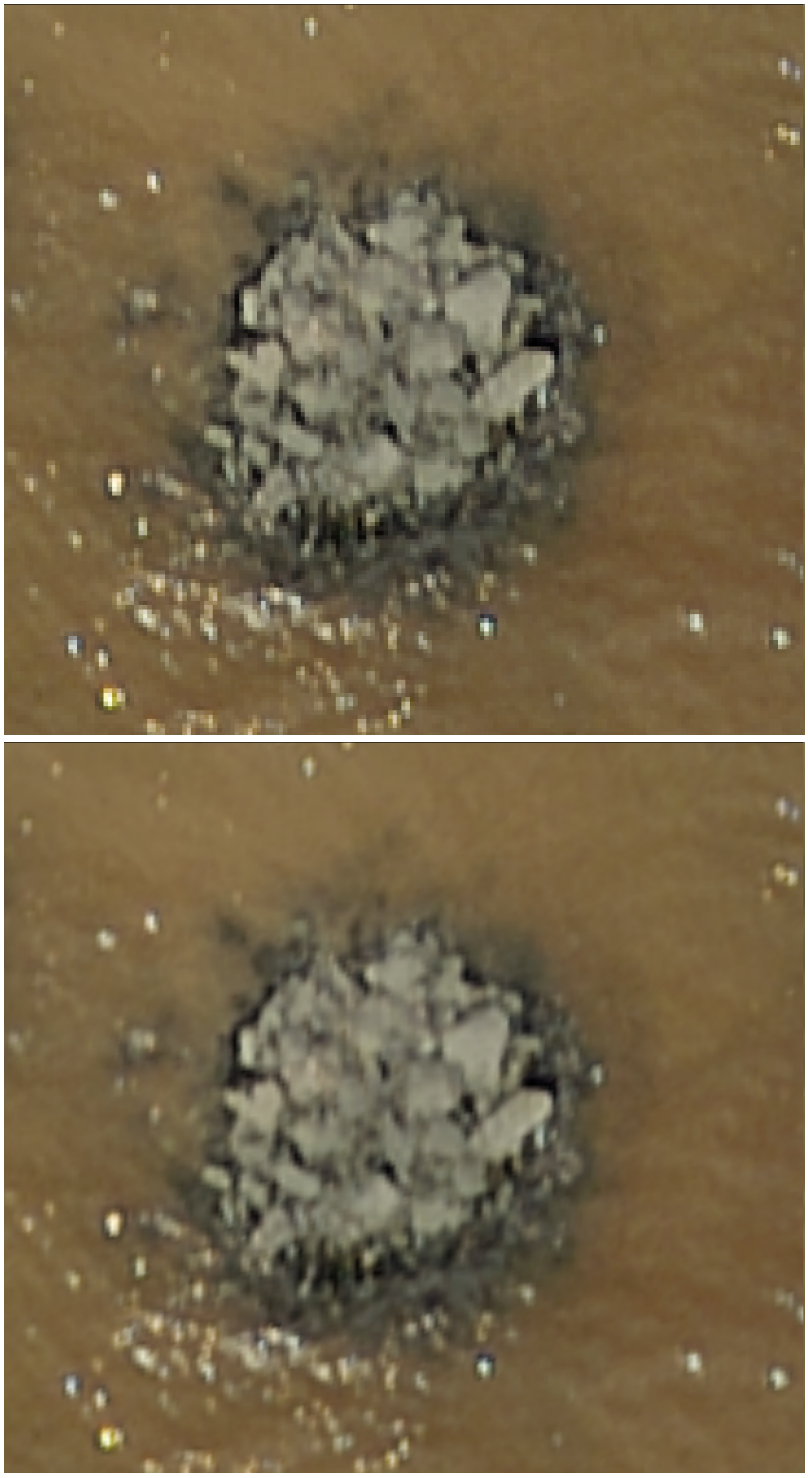
Coloring, Display and Visualization

We have chosen a new common default color map for our applications and this is now shared by Qinsy, Survey Manager, Qimera and Fledermaus. After some investigation both internally and with external input from visualization experts at the University of New Hampshire, we have decided to use the Fledermaus default color map for all our applications. There is no change for Qimera and Fledermaus users, as this was already the default color map. The only change for Qimera users is that the default color map is now named to qps.cmap, previously this was 'colorsinterp.cmap'. The default file location is different between Qinsy and Qimera, but this will be improved in future releases so that all applications share a common color map directory and resource files.

Geo-referenced images like geotiffs now let users control whether they view at the granular pixel level or with a smoothed interpolation between pixels. The previous behavior was to smoothly interpolate between pixels, however, this made it difficult to assess true georeferencing fidelity between grids and imagery derived from grids due to the smearing of object boundaries in the imported images, especially at the edges of grids. Geotiffs and other imported imagery will now default to pixel view, with the interpolation being disabled by default. The control for this is in the panel that appears at the bottom of the Project Layers dock, as shown below, when an imported geotiff is selected in the layer tree.

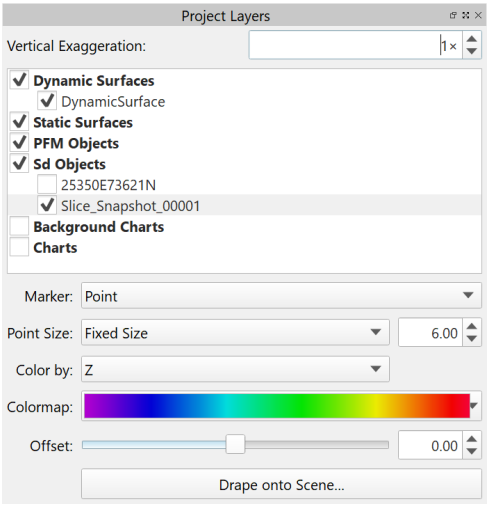


Here is an example of the difference between the two modes, with the new default pixel view on the left and interpolation on the right.



Finally, we've added the ability to adjust the color map, set the color map range and edit the color map for Point objects in .sd format. These are typically created from snapshots within Qimera (using the Swath Editor, the Slice Editor or the 3D Editor) or from importing from Fledermaus, or after importing points for visualization. An example of the change in interface is shown below. Once the Color by option is changed from Fixed Color, the

Colormap selection widget will appear below the combo box that lets you chose the variable to color the points by.



Imports

Formats

Qimera is now capable of importing BSB/KAP raster nautical charts via the Import Image import pathway, which are converted to .sd format and reprojected to the project's coordinate reference system. This is done as a background task, as will be discussed further below in the Process Improvements section, to allow the user to continue to interact with the application. Note that BSB/KAP import almost always involves some reprojection, so the import can take a bit longer than usual due to the reprojection.

We have upgraded PFM support to version v6.30, this is mainly for Fledermaus FM Hydro users who still have PFM files as part of their workflow.

Qimera has supported KMALL files for quite some time and with this release we now support Kongsberg Extra Detections for KMALL. Previous versions of Qimera only supported the normal soundings from KMALL. The support for Extra Detections via Qinsy is also possible with this release due to the new Kongsberg driver in Qinsy that supports the newer Kongsberg datagram formats associated with the change to KMALL format. With the roll out of KMALL format from Kongsberg, there are quite a number of users who are using the Kongsberg convertor tool to convert KMALL to ALL files, mostly for compatibility with pre-existing software workflows. Qimera has been augmented to handle ALL file format for these kinds of systems, starting with the EM304 model. As other data files are provided to us for other models, we will add support for them as well. Previous to this augmentation, Qimera would have rejected the ALL files since the newer sensor model numbers are not recognized by Qimera as being valid for ALL format.

Process Improvements

Several improvements have been made in general to the process of importing files of different kinds into Qimera. As mentioned earlier in the section discussing BSB/KAP support, import of georeference images is now a background processing task, allowing for interaction with the application while the import, conversion and reprojection is being completed. Prior to this, the import of images was done in the main application thread and blocked interaction with the software. During our code improvements for image import, we noticed that the import process did not recall the last directory used when importing one image after, we have corrected this and now the image import will recall the last directory used after an import.

Another improvement we've made is to clarify how VERY large ASCII files should be imported. We do have some users that take delivery of ASCII files where the data from many survey lines is delivered as a single ASCII file. These files are sometimes several tens of GBs. There is a special import procedure for these types of files that will break it up into several QPD files, but such users would sometimes accidentally try to import these files using the standard ASCII import procedure, causing instabilities and sometimes crashes in Qimera. To remedy this, we've made the special import tool more prominent on the import menu: users will now see an entry for "Import Large ASCII Processed Point File...". Furthermore, if users still miss this and accidentally import using the standard processed point import routine, Qimera will now warn users that they should instead use the Large ASCII file import option. Import of ASCII where one file is typically associated with one single survey line should follow the standard ASCII import procedure.

Lastly, along the line of improving how data can be imported into Qimera, we've upgraded Qimera Live to more elegantly handle multi-object setups in Qinsy. In this new release, Qimera Live now does not prompt for user input to append to the Dynamic Surface after each file when importing multi-object .db files from Qinsy. Previously, each imported file for a multi-object setup was launching a dialog that required user intervention. This was undermining the goal of Qimera Live, which is to automatically import, process and grid data without user intervention.

Exports

New Formats

We have two new export formats with this release. You can now export Dynamic Surfaces and Static Surfaces as a Google Earth KML and as a 3D PDF. These are export formats that were available in Fledermaus and this tech has been ported to Qimera, another example of our continual alignment of capabilities across our product line. We have a roadmap in mind for this particular topic and we are paying special attention to the

Feedback Projects for each application to see what common formats users are seeking to have available.

Improvements to GSF Export

We've made two changes to how GSF data is exported. GSF exports for R2Sonic data now have a better correction for the z-offset between transmitter and receiver for the purpose of backscatter snippet imagery coregistration with the bottom detect. Previously, this was hardcoded with the 2024 sensor offsets as default and now the z-offset is read directly from the R2Sonic datagram. This improvement has no effect whatsoever on the bathymetry, it only affects the metadata associated with the snippet imagery, particularly the determination of which snippet sample number corresponds to the bottom detection. This improvement will lead to better backscatter imagery in the nadir region for FMGT users. The same correction has been made in the FMGT code base and this will be released and available to users shortly after the Qimera 2 release.

Another change we've made is that GSF exports now only include the motion sensor data that falls within the time span of the bathymetry pings in the file. Previous versions would include the entire time-span of the sensor data stream, which was a problem with data that was merged with external navigation/motion files like SBET, since the entire SBET motion data set was included in the GSF. This would dramatically increase the size of exported GSF files. This is now fixed.

Miscellaneous

There has been some small clean up for all the export functions in that they will now all export by default to the project's export subdirectory. There were a few cases where this was not the case, for example, the export of .sd objects to line files. Further along this line, export of BAG and BBH files will now use the Dynamic Surface's name as the default filename. Previously, they were using a default export filename which the user then had to rename.

The ASCII export function from the time-series editor has been improved to allow control over whether or not rejected samples were included in the export. The sample status (accepted or rejected) is now included in the exported file as well.

Miscellaneous Small Improvements

Keyboard shortcuts

- Keyboard shortcuts now recognize number pad keys as distinct keys
- The Time-Series Editor now has a Ctrl-Z keyboard shortcut for undo

Labeling, text, display

- Improved help text for Vertical Referencing "Static Offset" to improve user understanding
- Consistent and correct use of CoG and COG throughout application: CoG is meant for Centre-of-Gravity, whereas as COG is meant to represent Course-Over-Ground. There were some instances where these were incorrect.
- Omniviewer now shows horizontal and vertical uncertainty (95% c.l.), previously it showed horizontal and vertical variance

Processing and Analysis

- Improved navigation resolution preservation throughout processing for sub-cm positioning consistency
- External navigation lines colored differently than raw/processed point files when drawn in the Scene to help differentiate visually between the two
- Cross check reporting tool can be saved as a report with graphics and statistics
- Cross check tool export of results to ASCII has more friendly and readable output
- Multi-spectral
  - The Datagram Viewer tool will now report sonar frequency to ease identification of sonar frequencies, for multi-spectral backscatter workflows
  - Frequency filter for multi-spectral backscatter workflows is now less sensitive to numeric precision of user input
  - "Select by Frequency" filter now works on GSF files with R2Sonic data. Previously this would only work for Qinsy .db files.

Qimera 2.0.0 - Documentation

The Geodetic User interface has its own documentation including a quick start guide.

Qimera 2.0.0 - Bugs

T	Summary
	Crash on import of HSX with more than three sonars and laser scanners
	Vertical exaggeration now scaling correctly for laser scanner data in the 3D Editor for non-metric units
	Export of GSF from a GSF that was imported can now support disabling inclusion of raw backscatter imagery
	Import of multiple Caris HIPS format .svp files at once no longer results in duplicate SVPs in Qimera
	Creation of median filtered static surface now handles static grid file sizes beyond 2GB
	Improved interpolation of height and position between survey lines that are broken into file segments
	Licensing system improved to make it more tolerant to slight delays in the license check over the internet for softlock
	NOAA TCARI tide solutions are working again
	Improved stability of GSF export for R2Sonic systems logged in Qinsy
	Fixed bug with SVP import and vessel assignment after renaming of a vessel
	Improved detection of SBET SMRMSG file when folder or path names contain the word SBET
	Added warnings to inform users when sub-surface vehicles do not have pressure or depth sensors

T	Summary
	Correct scaling of static vertical geodetic offsets for projects using non-metric projections
	Patch test tool was drawing soundings in white on a white background after a certain number of lines were loaded
	Vessel Editor selection of survey line for creation of new vessel configuration now uses correct date/time from the line
	Fixed updating of Dynamic Surface during Editing when it is configured to update Manually or after Only After Processing
	File table now displays corresponding QPD files names for .fau files
	QPD filenames, as reported in the 3D Editor, were incorrect after removing and appending lines from a Dynamic Surface
	HSX with more than one MBES system is now supported, previously this crashed
	Fixed alignment issues with CUBE custom hypothesis and S57 object created from it
	When you delete a Dynamic Surface from the project but leave the files on disk, you can now create a new Dynamic Surface with the original deleted name
	Browse for color map from the 3D Editor preferences now points to the correct default location for color maps
	Improved status bar read out of position, height, etc. when an active "Highlight" layer is selected for a Dynamic Surface
	Improved how Qinsy online quick blocking is handled when some pings at file beginning and/or ending do not have enough ancillary sensor data for processing in real-time but do in post-processing

T	Summary
	Removed incorrect reporting of custom geodetic configurations from geotiff geodetic file headers

26 issues

Qimera 2.0.0 - Known Issues

For this release, there are no known issues to report

Qimera 2.0.0 - Removed Functionality

- Clear Flags filter has been removed from the Dynamic Surface "Select Soundings" dialog. This has been replaced by an equivalent filter in the Filters toolbar.
- The ability to enable/disable Additional Soundings has been removed from the Processing Settings dialog. There has been an equivalent filter in the Filters toolbar for several releases and the Filter Toolbar method allows for more granularity in how the user can enable/disable settings, including area based selections.

Qimera 2.0.0 - All Implemented Feedback

Feedback Issues

Key	T	Summary	Votes
FQM-6	☐	Slice Editor: Enable control over colormap	25
FQM-71	☐	3D Editor: Enable control over colormap range	21
FQM-68	☐	Surfaces: Interpolation tools	19
FQM-21	☐	Export a surface as a 3D PDF	18
FQM-3	☐	Crosscheck: Create summary report	13
FQM-314	☐	Shading Parameters: General Improvements	10
FQM-239	☐	Color of trackline for imported navigation should be different than that of raw sonar file tracklines	8
FQM-82	☐	Dynamic Surface: Regrid a dynamic surface to a different resolution	8
FQM-35	☐	Surfaces: Export surface to Google Earth KML	8
FQM-52	☐	Slice and 3D Editor: Improve performance when switching between spatial selection types	8

Key	T	Summary	Votes
FQM-63	☐	Raw Source Files (R2Sonic): Ability to query which frequencies used when logging multispectral data	6
FQM-310	☐	Implement point cloud filters from the Point Cloud Library (PCL)	4
FQM-139	☐	Support LAS RGB value and allow color coding by RGB in point views and editors	4
FQM-133	☐	SVP processing: Allow for interpolation in distance and/or time	4
FQM-69	☐	Slice Editor: Plot average surface in Slice Editor and update after edits	4
FQM-40	☐	Dynamic Surface: Implement surface tiling	4
FQM-1	☐	Slice Editor: Add option to change point color of rejected soundings	4
FQM-231	☐	LAS: Support more attributes from LAS data	3
FQM-214	☐	Slice Editor: Allow slice box to orient to track lines in Free Slice selection mode	3
FQM-326	☐	Shading: Make shading consistent between QINSy and Qimera	2
FQM-221	☐	Dynamic Surface: Provide more control over shading to help standardize views between different data sets	2
FQM-76	☐	Toolbars: Provide customizable toolbars	2

Key	T	Summary	Votes
FQM-349	☐	Project name should be in Title Bar like FMGT	2
FQM-346	☐	Import large ASCII - Improve discoverability and add warnings	2
FQM-268	☐	Geodetics: Only show user favorite coordinate systems in the common coordinate system list	1
FQM-240	☐	Time-series editor: Improvements to ASCII export	1
FQM-342	☐	Cross Check Tool - Export of results in more friendly format	1
FQM-339	☐	Time-series editor: Add key board shortcut to Undo edits	1
FQM-294	☐	Slice Editor: Keyboard shortcuts to resize scroll box select mode	1
FQM-293	☐	Slice Editor: Slice dimension spin boxes in new slice toolbar	1
FQM-289	☐	Dynamic Surface: Ability to color by rejected	1
FQM-152	☐	Slice Editor: Allow independent resize of area selection and slice selection	0
FQM-243	☐	Geodetics: Allow viewing and configuration of Construction Grid parameters from QINSy geodetic setups	0

Key	T	Summary	Votes
FQM-196	☐	Slice Editor: Improve performance of eraser tool	0
FQM-190	☐	Slice Editor: Ability to set Default width/height for Selection Geometry	0
FQM-363	☐	Dynamic Surface - Operations such as create and extract should default to act on the entire surface	0
FQM-295	☐	Shortcuts to swap visualization between different depth layers (shallow, deep, average) and/or coloring options (height, uncertainty, density, etc)	0

Qimera 2.0.1 Release

16 August 2019

We're pleased to present Qimera version 2.0.1. maintenance release addressing small issues. Read below for details.



Thank you for voting! *See also* *Voting System Policy* *and* *Using the feedback project*

Bugs

- Fixed geodetic resource conflicts between Qimera 2.0.0 and Qimera 1.7.7, FMGT 7.8.10, FMMidwater 7.8.7 and/or Fledermaus 7.8.8. Users should upgrade to Qimera 2.0.1 to overcome this geodetic resource conflict. .

Qimera 2.1.0 Release

20 November 2019

We're pleased to present Qimera version 2.1.0. In this release, we introduce several new features, with a focus on cross product features between Qinsy and Qimera, along with many improvements that were requested. Read below for details.

Highlights

- Major Improvements to Patch Test Tool
- Support for Laser Calibration in the Patch Test Tool
- Free Qimera Patch Test mode for Qinsy users
- and many more feedback items from the Qimera Feedback Project have been successfully implemented



Click on the icon above and vote on or create a Feedback issue!

Feedback Project

In this release, we have completed 22 feedback items, which satisfies 198 votes. For more information, see our Voting System Policy and Using the feedback project.

The Feedback Project helps us to continue improving our software products. Vote or implement feedback and participate in the process by tracking, watching and commenting on issues!

Please click on the Vote button to the right to go to the Qimera Feedback Project and implement or find the item you want to vote for.

- Qimera 2.1.0 - Important Notes
- Qimera 2.1.0 - New Functionality
- Qimera 2.1.0 - Improvements
- Qimera 2.1.0 - Documentation
- Qimera 2.1.0 - Bugs
- Qimera 2.1.0 - Known Issues

- Qimera 2.1.0 - All Implemented Feedback

Qimera 2.1.0 - Important Notes

- Licensing
- Installers
- QPS Project and file format versions
- Support for Qimera v1.X

Licensing

Existing Qimera users with a license that is under maintenance will be able to install and run Qimera 2.1 alongside Qimera 1, using the same license. No changes to the license configuration have been made with this release.

Installers

The Qimera installer will install by default into subdirectories with the version name under the typical install path, which is usually C:\Program Files\QPS\Qimera. This allows multiple installations quite easily and follows the trend that Qinsy has been using for some time. Users with Qimera 1.X already installed will find that Qimera 2 will install into the Qimera 1 directory, but in the 2.0.0 subdirectory of the Qimera 1 installation folder.

QPS Project and file format versions

This is a reminder that in Qimera version 2.0.0, the QPS project version has been upgraded and is therefore not compatible with previous projects made with Qimera 1. Projects created with Qimera 1 can be upgraded to work in Qimera 2.1 but it will not be possible to go back. It is suggested to back up a Qimera 1 project prior to opening it in Qimera 2.1, in case problems are encountered.

Before the upgrade of a Qimera 1 project, a backup of existing Dynamic Surfaces will be made in the project to ease recovery in case of problems.

Support for Qimera v1.X

Summary:

Qimera 1 will be replaced by Qimera 2. This means that support will stop at 31st December, 2021.

Support for Qimera 1:

What will be supported until the end-of-life:

- Fixes and patches will in general only be for critical and blocker bugs. Less critical bugs are also candidates to be fixed but this is not guaranteed.
- The software will be tested by our test protocols for the current operating systems.
- Support questions will be answered
- Training for Qimera 1 until 31st December 2021
- On site support for Qimera 1 until 31st December 2021

End-of-Life:

Qimera 1 will reach end of support on 31st December, 2021. Following this date, no fixes or patches will be made available.

Following this date issues related to Qimera 1 versions will not be processed. Support questions will not be answered.

No training or on site support will be given.

Note that perpetual Qimera 1 licenses will continue to function.

Qimera 2.1.0 - New Functionality

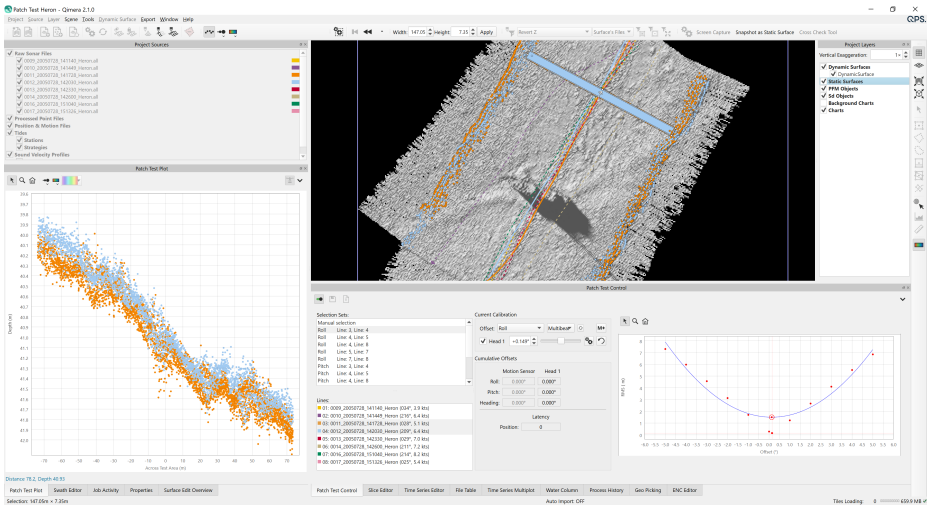
- Introduction
- Patch Test Improvements
- Report
- Patch Test for Laser Scanners
- Patch Test Workflow for Qinsy Users

Introduction

In this release, we focus on taking care of a number of patch test related issues. Two of them are the most highly voted Feedback items: General Improvements and Support for Laser Scanners. We also built a new workflow for Qinsy users to allow the use of Qimera's patch test tool without the need for a Qimera license, this was done to provide a modern alternate to Validator. Read below for details of these three main features and jump to the other sections of the release notes to learn more about all the other improvements that have come with this release.

Patch Test Improvements

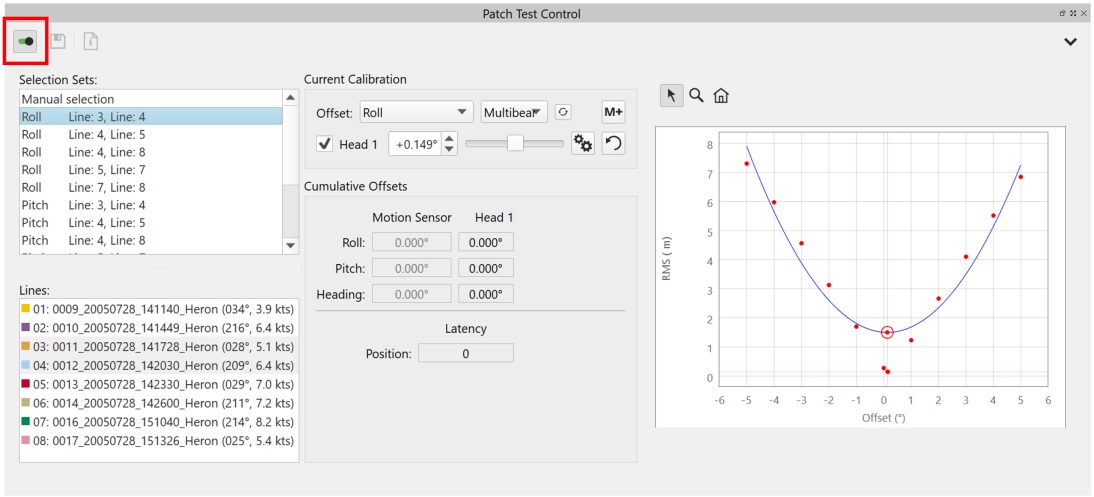
This is the highest voted feedback item for Qimera, we have finished 20 of the 25 items associated with this case. The remaining items have had new Feedback cases created for them so that they remain visible and votable.



Main Controls

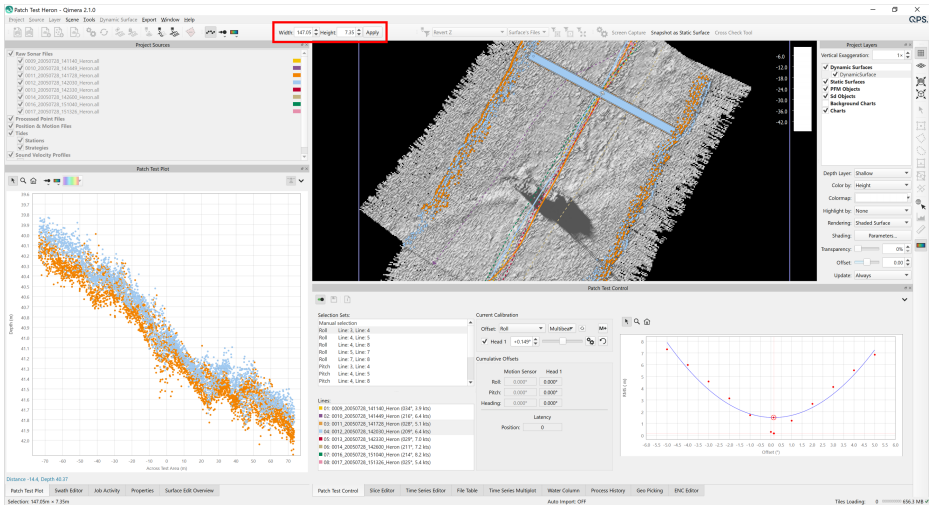
The patch test tool has been broken into 2 separate dockable widgets: one for plotting the soundings and one for the controls. Users can undock these, resize them and maximize them. This allows users to change the layout with more flexibility. The main advantage of this is that users can resize the plots to their liking, they can dock and float the components separately and they can interact more cleanly with the scene, especially on a laptop.

The patch test can be run from the Tools menu like always, when they are run the docks will launch. The user now exits the tool with an explicit on/off switch in the upper left hand corner of the control dock for each tool, as shown below.



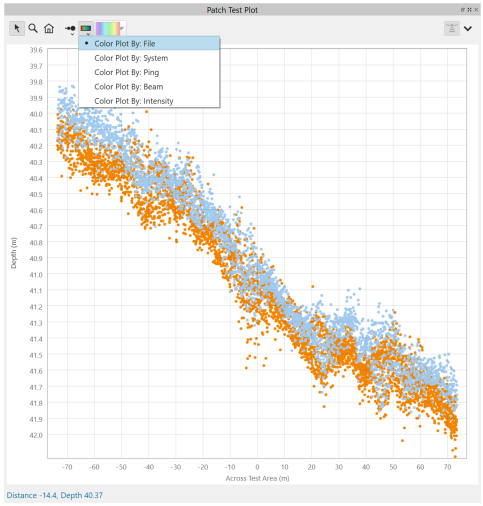
View and Interaction in the Scene

All lines are colored in the Scene to match the color coding that is assigned when the Patch Test tool is launched. Users can select lines in the Scene by using the **Ctrl** key modifier and left clicking on lines in the Scene. Once a selection box is drawn in the Scene, users can now use the "gamer" ASDW hotkeys for moving selection in 2D window, also the "+/-" keys for resizing the selection box. The Selection Dimensions toolbar is now active while in Patch Test mode, allowing you to exactly set the size of the selection as highlighted in image below on the upper toolbar. Lastly, it's now possible to adjust view parameters of Dynamic Surfaces and other layer items in the Project Layers dialog while running the Patch Test tool.



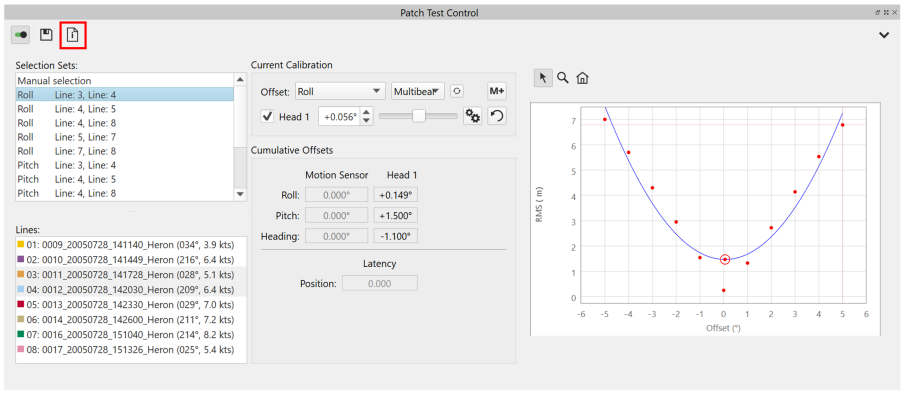
View and Interaction in the Sounding Plot

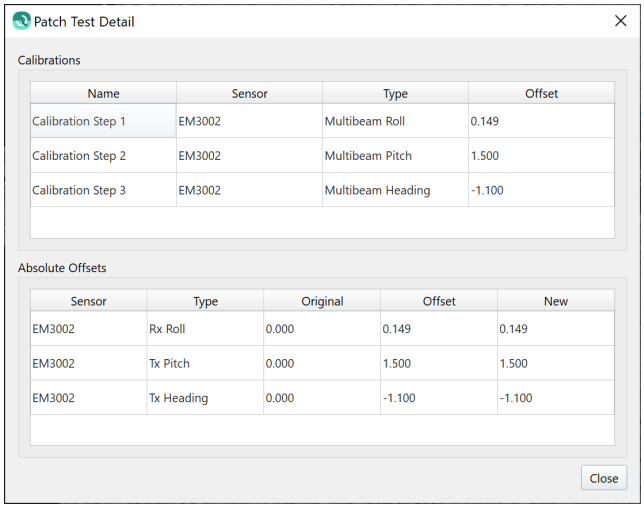
Line coloring follows what Slice Editor does now with "Kelly Colors", to maximize contrast between lines. In this new version, the line colors do not change depending on the file selection that the user makes within the Patch Test tool. Users can also select sounding coloring using the standard 'color by' tools in other Editors, but only a small set of options that make sense in the patch test tool, see below. Being able to color by intensity is useful for laser calibration, for example.



General Workflow and Usability

There is a new info dialog that provides a summary of calibration steps and the resulting before/after offsets. The button highlighted in the image below shows how to launch the info dialog, which tracks the user's steps through the calibration sequence.





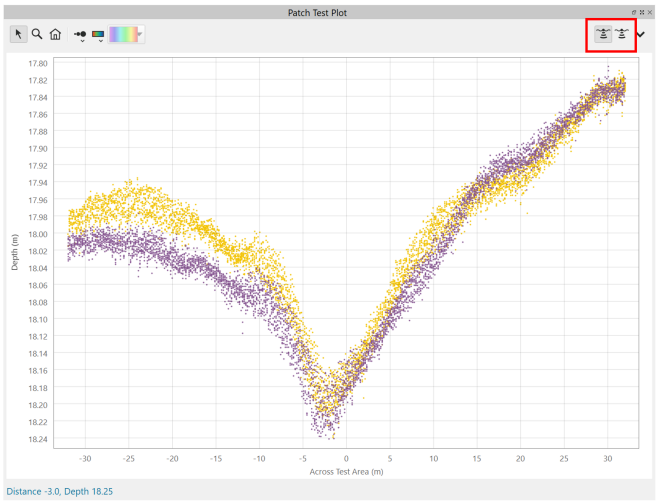
There are a few other workflow and usability improvements, listed below.

- Display order of roll/pitch/heading is used consistently in various locations throughout the tool and report, this was also updated in the Vessel Editor.
- Angular offset values are reported to 3 decimals consistently in all locations in the tool, including the report.
- Auto-solve dialog has "Do not ask again" tickbox on the pass/fail dialog that is displayed after auto-solve is run.
- You can reset the patch test tool to clear out any offsets that were saved while running. This is done with a new option under the context menu for the control dock.

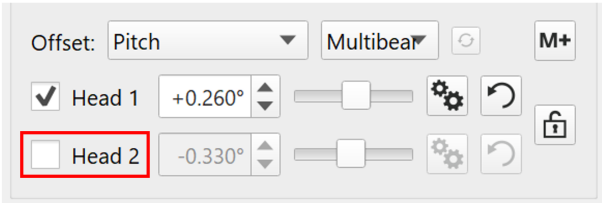
Dual-Head Configurations

We've made several improvements to workflows for dual head multibeam configurations. First off, the auto-pairing to suggest line matches now works for dual head. The algorithm behind this is based on QPS recommended best practices for dual-head calibration. You can learn more on this page, some summary figures are shown below.

We've also fixed the auto-solve to work on only one head at a time, with the chosen head being the one that is visible in the soundings plot. Visibility is controlled by the upper right toggle buttons, as shown below. Previously auto-solve would run for both heads simultaneously but then the workflow and report was very unclear.

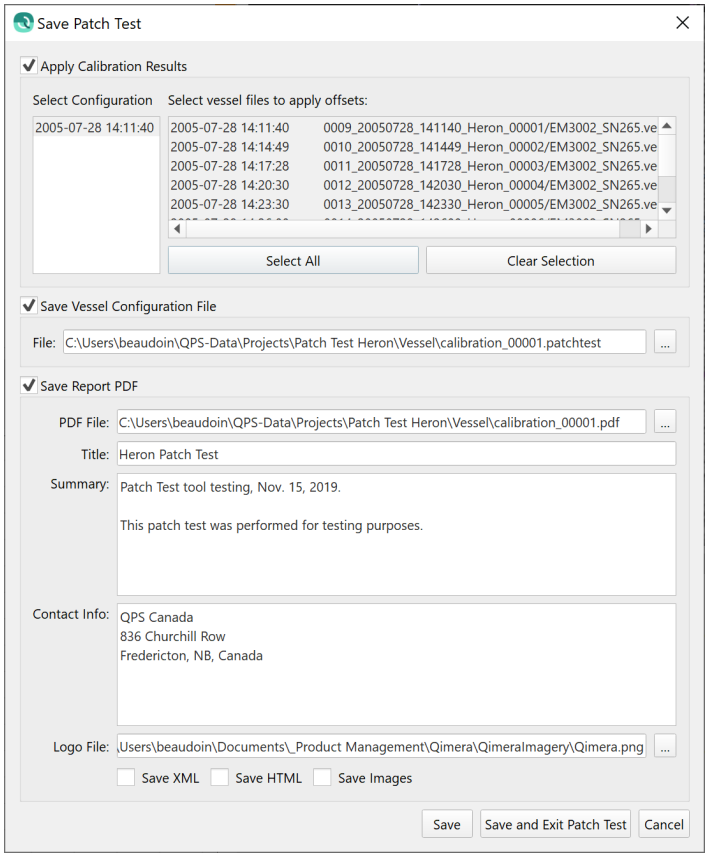


Further along the lines of clarifying the workflow, the calibration 'M+' button to apply now uses the slider bar tickbox enabled state to control which offsets get accumulated during the session. In the image below, the offset for the first head would be saved when hitting M+, but the offset for the second would not.



Report

We have made significant improvements and new features to the patch test report also. The report can now be saved during the "save" operation or from the context menu, and the user can choose the save location of the report.



You can add a logo, summary and contact information to the report, a sample output is shown below.

QPS Canada
836 Churchill Row
Fredericton, NB, Canada

Qimera.

Heron Patch Test

Patch Test tool testing, Nov. 15, 2019.

This patch test was performed for testing purposes.

Patch Test Information

Project:	C:/Users/beaudoin/QPS-Data/Projects/Patch Test Heron
Software:	Qimera v2.1.0
Time of Report:	2019-11-15 18:19:35
Username:	beaudoin
Vessel Name:	EM3002_SN265
Lines In Patch Test:	01: 0009_20050728_141140_Heron (034°, 3.9 kts) 02: 0010_20050728_141449_Heron (216°, 6.4 kts) 03: 0011_20050728_141728_Heron (028°, 5.1 kts) 04: 0012_20050728_142030_Heron (209°, 6.4 kts) 05: 0013_20050728_142330_Heron (029°, 7.0 kts) 06: 0014_20050728_142600_Heron (211°, 7.2 kts) 07: 0016_20050728_151040_Heron (214°, 8.2 kts) 08: 0017_20050728_151326_Heron (025°, 5.4 kts)

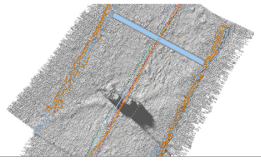
Summary of Calibration Results

System	Parameter	Original	Offset	New
EM3002	Rx Roll	0.000	0.135	0.135
EM3002	Tx Pitch	0.000	0.500	0.500
EM3002	Tx Heading	0.000	-0.600	-0.600

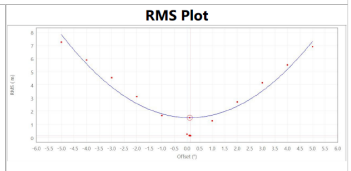
Lastly, the report now includes graphs of the RMS plot that's used by the auto-solve functionality, along with the parabolic curve fit and the suggested solution. It also includes screen captures of the soundings plot before and after the calibration. An example for a roll calibration is shown below.

Calibration Step 1	
Lines Used:	03: 0011_20050728_141728_Heron (028°, 5.1 kts) 04: 0012_20050728_142030_Heron (209°, 6.4 kts)
Calibration Type:	Multibeam Roll
Patch Location:	46°50'25.34"N, 71°10'20.26"W
Patch Heading:	28.0°
Patch Width:	147.05 meters
Patch Height:	7.35 meters
Active Motion System:	Motion 1
Active Position System:	Position 1
Calibration System:	EM3002
Head Offset Value:	0.135°

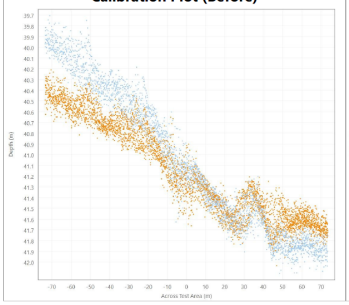
Calibration Area



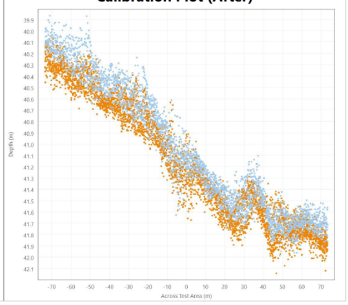
RMS Plot



Calibration Plot (Before)

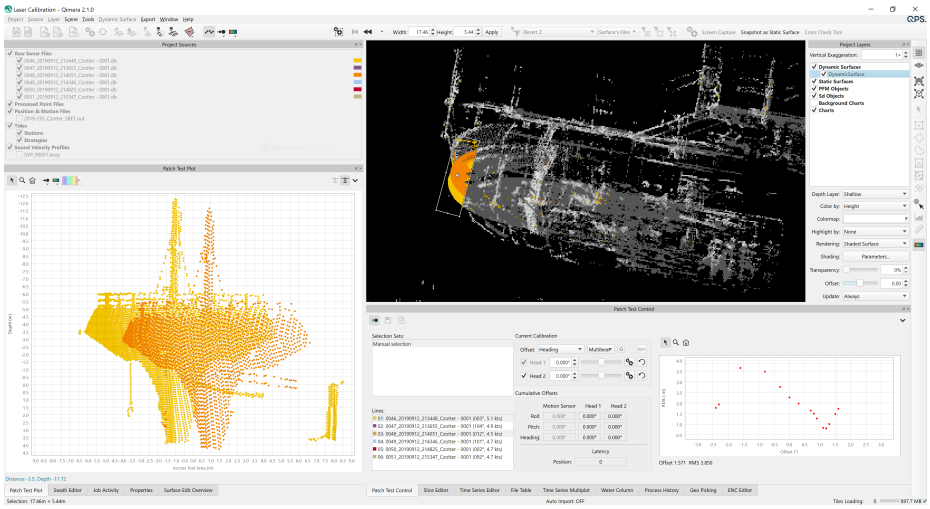


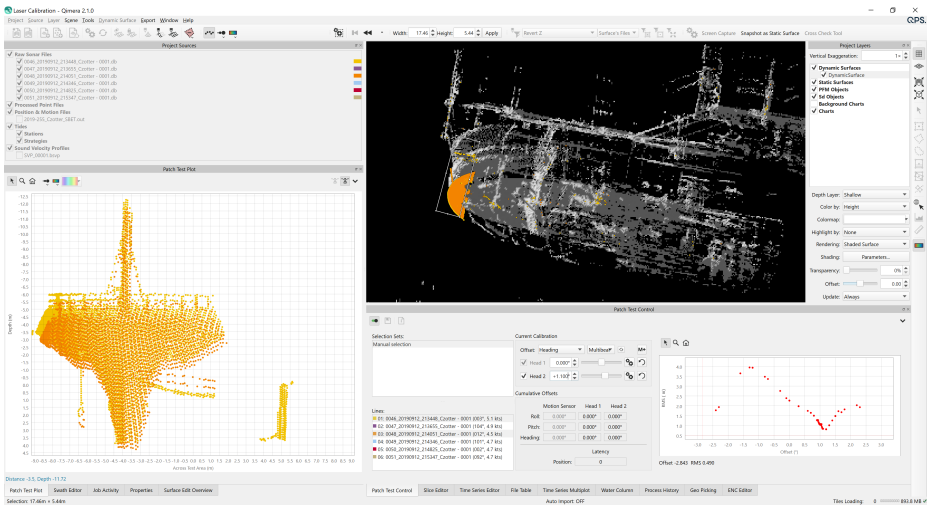
Calibration Plot (After)



Patch Test for Laser Scanners

This version of Qimera allows Qinsy users with laser scanners to calibrate their systems using the patch test tool. See the images below as an example of a laser scanner calibration data set that uses several passes around a moored vessel to calibrate (Data courtesy of Canadian Hydrographic Service).





Note that Qinsy users can still use Validator for calibration, if they prefer. The patch test tool works identically for laser scanners as it does for multibeam systems with the following two exceptions. Firstly, Qimera will not attempt to do line pairing for laser scanners since there is not the same level of consensus on what an optimal line geometry, compared to the same for multibeam systems. Secondly, the selection box placement and alignment will not adjust automatically when the user switches between different calibration parameters.

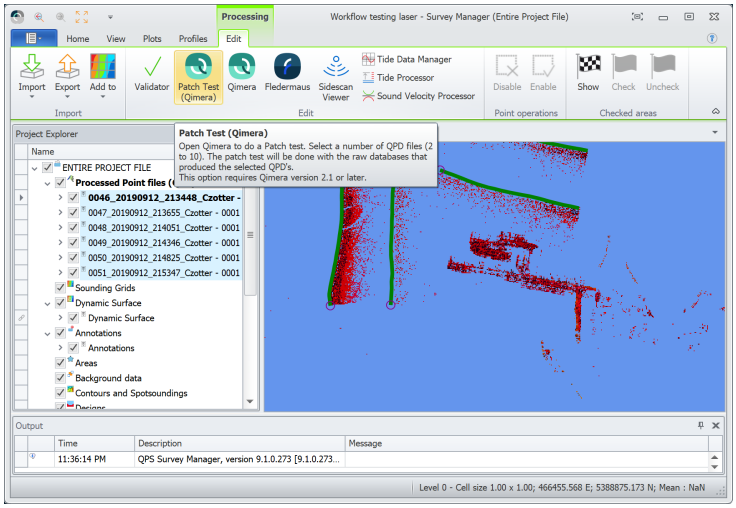
Note that we did not set out to replace the exact workflows for Validator, we instead focused on making the patch test tool in Qimera, as it was already designed, functional for laser scanners. Of course, there are some differences in the user experience, we look forward to hearing from laser scanner users about the new option to calibrate using Qimera.

Patch Test Workflow for Qinsy Users

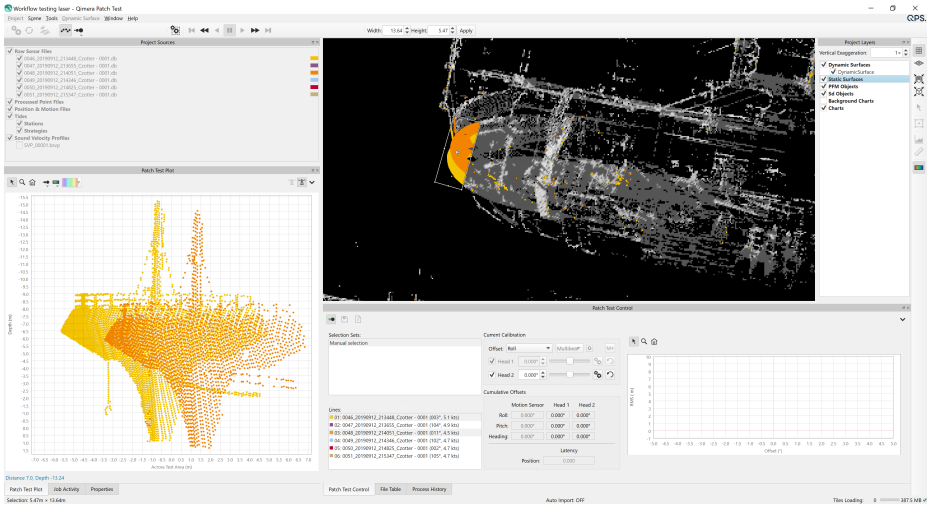
With this release, we have retooled Qimera to allow it to be run in a "Patch Test" mode from Qinsy with ONLY a Qinsy 9 license. In other words, if a Qinsy user does NOT have a Qimera license, they can still launch Qimera from Qinsy to do a patch test. All other functionality in Qimera is disabled. For example, you'll see listed below functionality that is enabled/disabled with the Patch Test mode:

- You can
  - Run the patch test tool
  - Create new Dynamic Surfaces and make snapshots of them to assess before/after results
  - Profile and measure on Dynamic and Static surfaces
  - View and adjust the Vessel Editor settings to ensure that calibration values are consistent or to recover from user error during the calibration
  - View and adjust the Processing Settings to tweak how the various raw sensor information is used in calculation of the footprints in case the real-time calculations needs some small adjustments
- You cannot
  - Clean the data points
  - Import tide, post-processed GNSS or other ancillary data like SVPs
  - Run any analysis tools like Wobble Tool, Cross Check
  - Export any results, either from QPDs or from grids

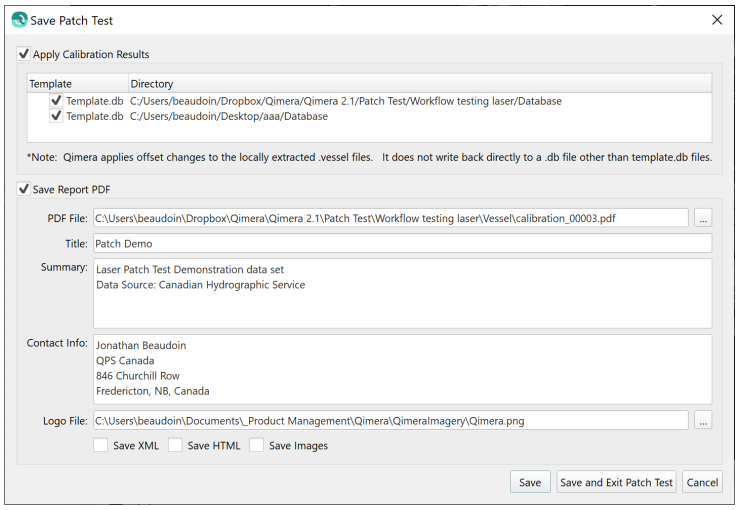
A workflow example is shown below, starting from Survey Manager, with the online QPDs selected. From the Processing ribbon, the user can launch a Qimera Patch Test. This passes the QPD and DB files to Qimera, which then creates a side project in a temporary folder, allowing the patch test to run without interfering whatsoever with Qinsy.



When running in "patch test" mode, Qimera's interface will simplify dramatically to only show the portions of the application that are necessary for calibration.



When the patch test is complete, users can explicitly choose which template .db to save to. Previously, Qimera updated any template database file that it found in the Database directory. The template database updating now also updates any template files in the Common Files folder for Qinsy users if their project is configured to use the Common Files folder. After saving to the template files, the pass/fail for each file is reported to the user. The save dialog below shows a list of template .db files at the top, for which the user can decide which templates to apply to.



There are a few other important technical notes related to the workflows and licensing.

- Licensing and Capabilities
  - Users with a full Qimera license will still be able to access full functionality by starting Qimera in the usual way and opening the Qinsy project directly. This includes both Qimera Clean users and Qimera users.

  - Users without a Qimera license will be restricted to just doing a calibration, this is ONLY launchable from Qinsy. Launching Qimera directly is not possible.
  - Users will just need to download and install Qimera, no action is required to upgrade licenses other than to upgrade a QINSy 8 license to a Qinsy 9 license.
  - The About dialog will show the application name "Qimera Patch Test", so will the application title bar. This will remind you what mode it is operating in.
- Workflow details
  - This workflow requires the calculation of QPDs while online or replay, in the same way that it did with Validator workflows.
  - The patch test is conducted in a separate project to ensure that the patch test will not interfere operationally with Qinsy. The separate project is created when Qimera is launched from Survey Manager.
  - The results are stored back in the template.db file(s), either in the source Qinsy project or in the Common Files folder.
  - The patch test offsets are NOT copied back to the patch test database files. Users who wish to update their patch test database files can do so with the database cloning utility, which we **strongly** recommend to immediately follow this by a replay of those files.
  - Running the patch test again will start again with the original offsets in the patch test database files, and it will run in a new temporary directory.

Why does Qimera not copy the patch test offsets to the patch test database files?

We designed Qimera to act this way for two reasons.

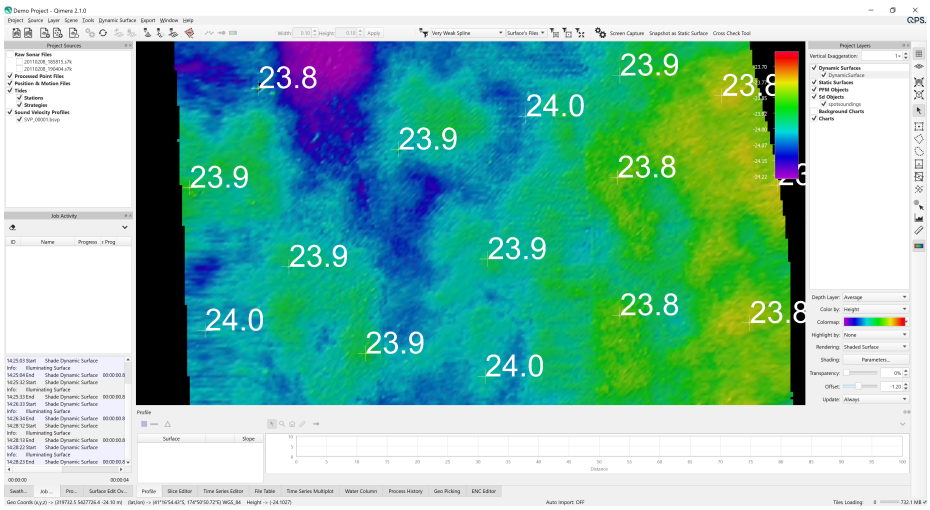
1. Copying back the results would result in database files that were out of synchronization with the computed QPD files. This would lead to outdated results when the Qinsy project is eventually opened in Qimera for cleaning or further data processing.
2. We felt that it's better to keep the patch test .db files exactly as they were recorded as a record of the state that the system was in prior to the patch test, along with the QPD files. In that way, the .db/.qpd files and the patch test report could be handed to a second data processor to double check the first processor's results knowing that they have the same start state.

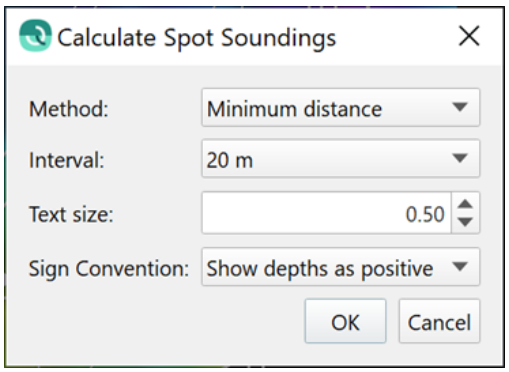
Qimera 2.1.0 - Improvements

- Dynamic Surfaces
  - Ability to create spot soundings
  - Ability to create THU and TVU surfaces
  - Remove lines from a Dynamic Surface
  - Interpolation algorithm, new option to interpolate with a fixed value
- Point Editors and Filtering
  - New "Color by fixed color" mode
  - Instant Surface Filtering
  - New Filters
  - 3D Editor Usability Improvement
- Processing and Analysis
  - SVP Editor
  - Vessel Editor
  - Cross Check
  - Improvement to Structure from Motion Bathymetry add-on
  - Miscellaneous
- Scene, Display & Preferences
  - New User Preferences
  - Interface and Behavior
- Data Import & Export
  - Import
  - Export

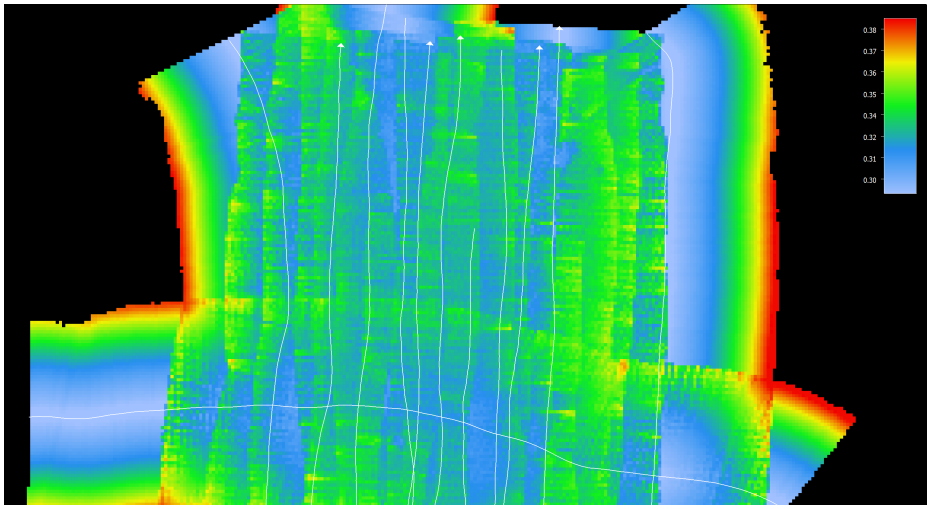
Dynamic Surfaces

Ability to create spot soundings



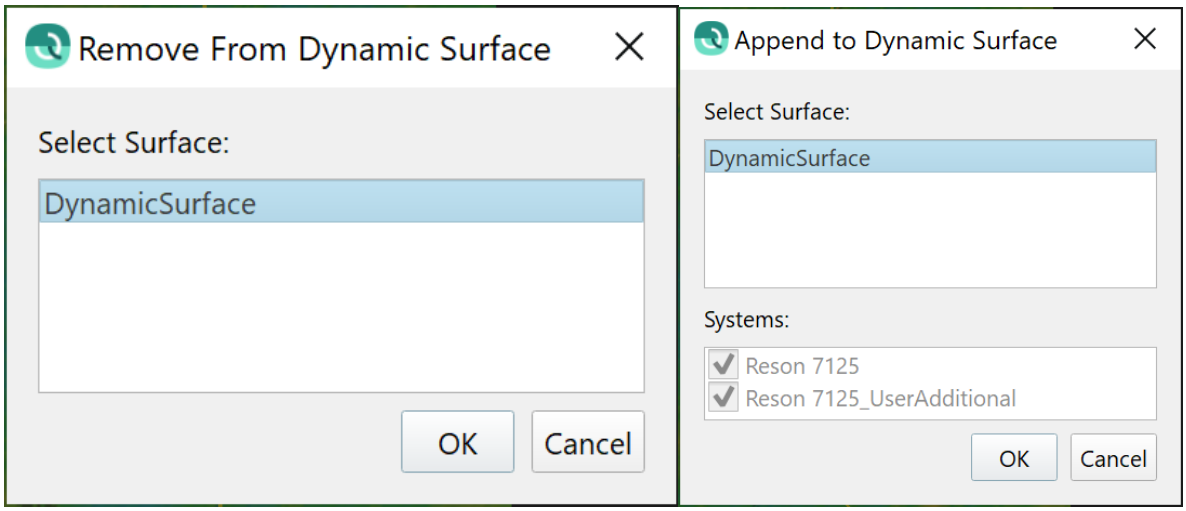


Ability to create THU and TVU surfaces



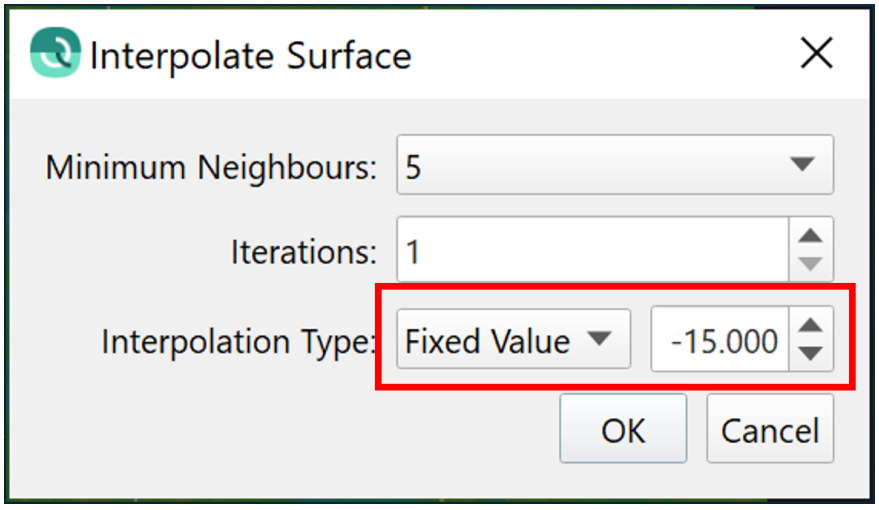
This new feature was another highly voted Feedback item. The user selects a Dynamic Surface and then runs the "Create THU and TVU layers" command under the Dynamic Surface menu. This creates two new layer files that hold the average horizontal and vertical uncertainties from the soundings in each bin. These are both saved as .sd files and they can be exported to a number of ASCII and interchange formats such as Geotiff, Floating point Geotiff, ArcView Grid, etc.

Remove lines from a Dynamic Surface



This dialog is now common for adding and removing lines from a Dynamic Surface. Select lines to be removed, right-click and choose "Remove from a Dynamic Surface". A dialog will launch that lists all Dynamic Surfaces that contain the lines selected for removal, then the user selects which surface to remove the lines from.

Interpolation algorithm, new option to interpolate with a fixed value



This comes from pre-existing Fledermaus workflows, where users sometimes need to populate empty cells with a design height or a contractually specified null value. Because

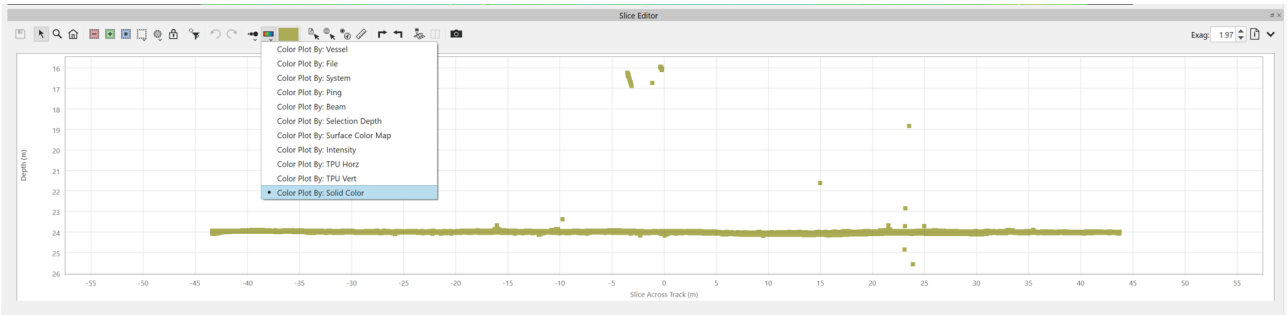
this is a shared dialog between Fledermaus and Qimera, this option is now available in Qimera as well. The default option remains to fill empty cells with an average.

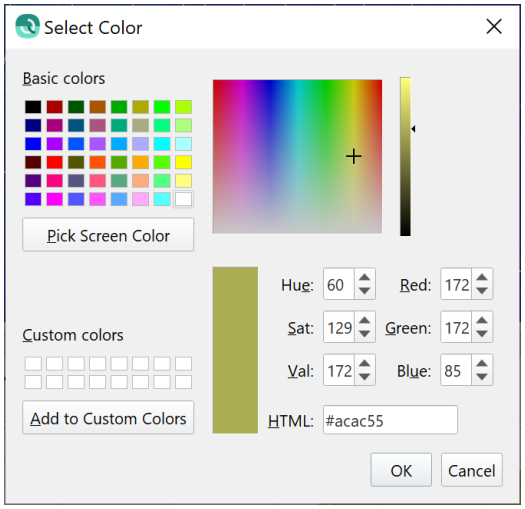
The ability to create spot soundings was a highly voted upon Feedback item. In order to accomplish this, we reused the technology from Qinsy's Survey Manager. The spot soundings are retrieved from the average depth layer and have a single .sd points file as output. The user can control the size and shape of these soundings as well as the marker type. The soundings are drawn in 3D at the correct z-level, so they will appear approximately at the surface z-level. To ensure the labels are drawn on top, the offset attribute (below the color map section) can be used to adjust the drawing height. The spot soundings will render as standard decimal numbers, as opposed to the fractional subscript used on nautical charts. The current visualization capabilities of the Fledermaus 7 engine cannot draw the fractional part as a smaller sub-script number. However, this will improve when the new Fledermaus 8 visualization engine is integrated, allowing for overall greater flexibility in the visualization of spot soundings and all other graphical elements.

Point Editors and Filtering

New "Color by fixed color" mode

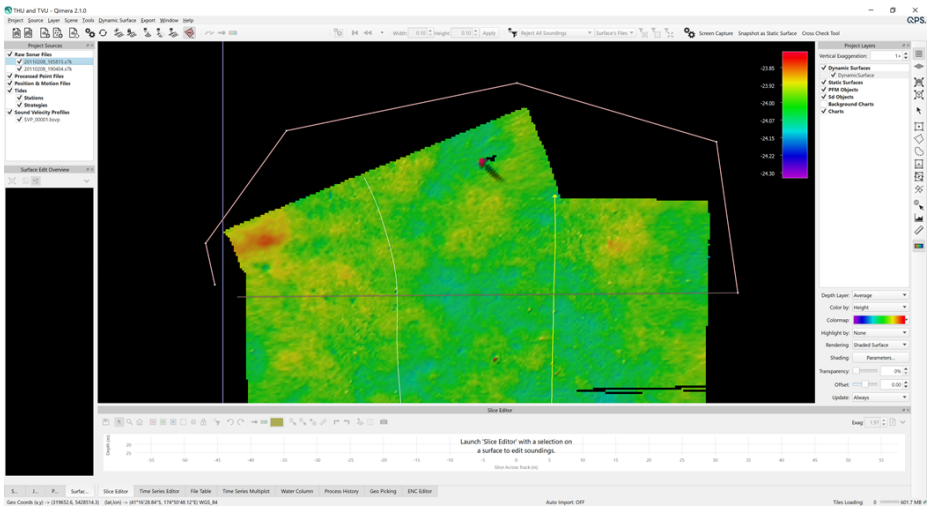
This feature allows users to pick a single color to use for coloring points in the Swath Editor, Slice Editor and 3D Slice Editor. When this option is selected, the usual color map picker dialog is replaced by a color picker dialog. Note that this option existed already in the standalone 3D Editor, this is yet another improvement that brings these two editing tools closer into alignment.





Instant Surface Filtering

Instant Surface filtering has been improved to indicate the operation mode more clearly to the user, in order to reduce the likelihood of accidentally deleting data with grid operations. The polygon that is drawn is now color coded, has a thicker line and covers all three Instant Surface Edit modes: Instant Surface Reject, Instant Surface Accept and Instant Surface Filter.



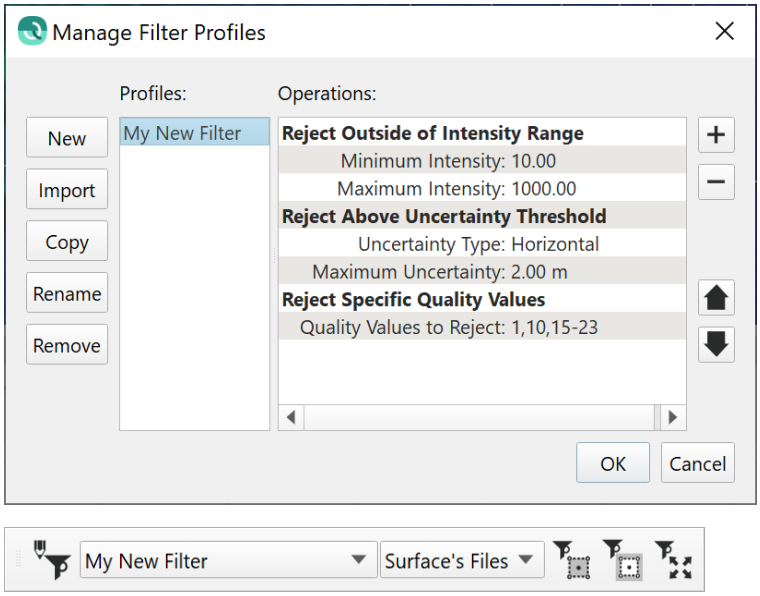
New Filters

There are a number of new filters added to the filter tool set that is available from the filter toolbar.

- Filter by Uncertainty
- Filter by Intensity
- Filter by Quality

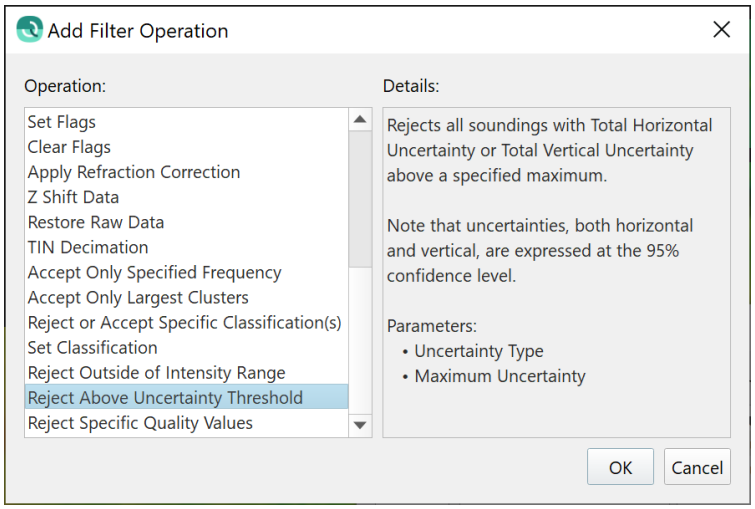
These filters offer generally the same capability that's in Blocking, however with the filter toolbar it allows the user take advantage of the spatial selection capabilities to carefully select areas that they'd like to filter.

Recall that you can use the filter toolbar to create a custom filter profile that lets you combine many filters, as shown below:

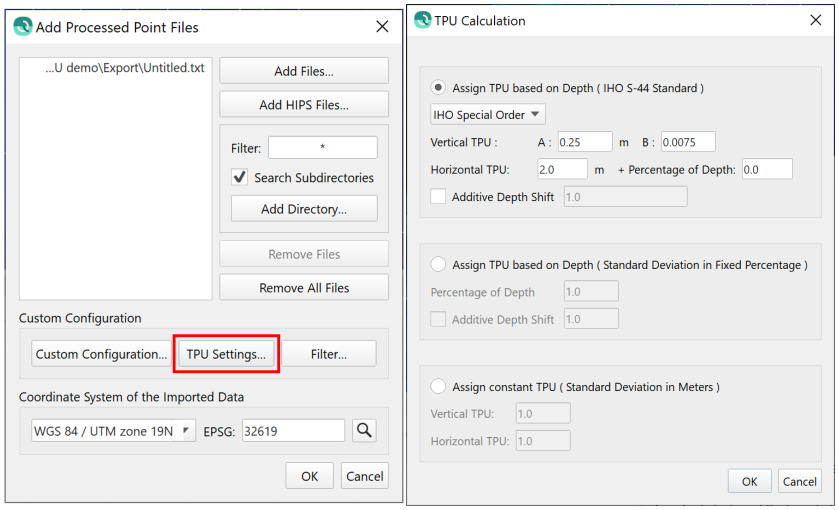


Filter by Uncertainty

For the Uncertainty filter, the user chooses to filter by horizontal or vertical total propagated uncertainty (TPU). If you need to filter by both, then create one filter for each.

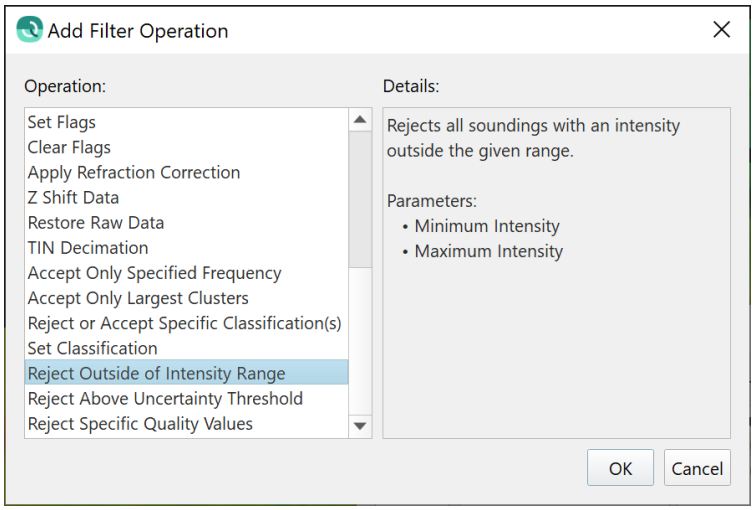


Note that users who have incoming ASCII point formats that do not have TPU available should use the TPU filter with caution; often ASCII XYZ data does not have TPU. The TPU can be estimated during import of the files by clicking the TPU Settings button on the import dialog, as shown below.



Filter by Intensity

You can now filter by intensity value, this is typically used with laser scanning or bathymetric LIDAR to remove very low intensity returns, for example. Note that users who have incoming point formats that do not contain intensity should not use this filter.

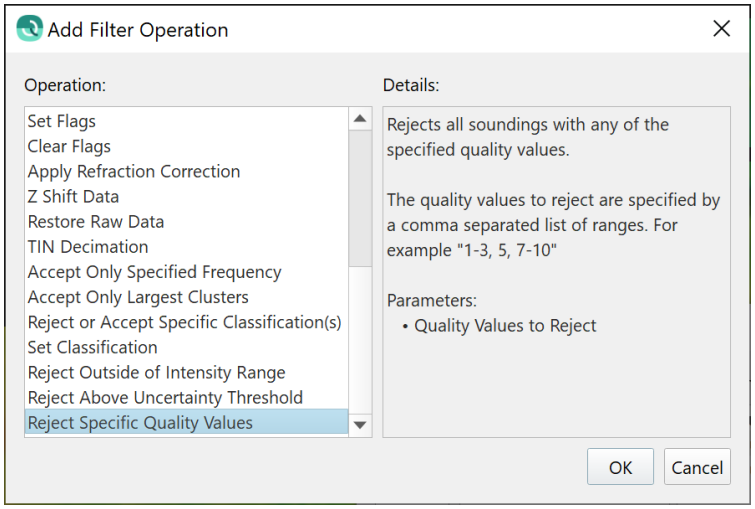


Filter by Quality

This filter lets you filter by a range of quality values.

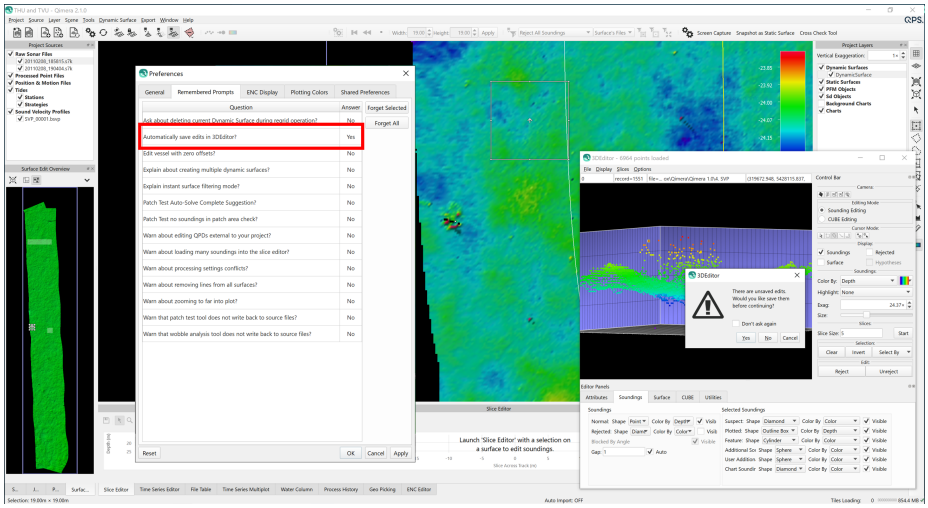
The ease and capability of this workflow from Fledermaus PFM workflows has now been brought to Qimera. The pre-existing blocking Filters only let you specify a range to keep, this filter is notably different from the other two new filters in that it lets you specify one or more ranges to REJECT, which allows for more selectivity.

The quality values are reported in units that vary from one sonar manufacturer to another, so it is best to consult the manual for your sonar system to learn more about what filter values to use.



3D Editor Usability Improvement

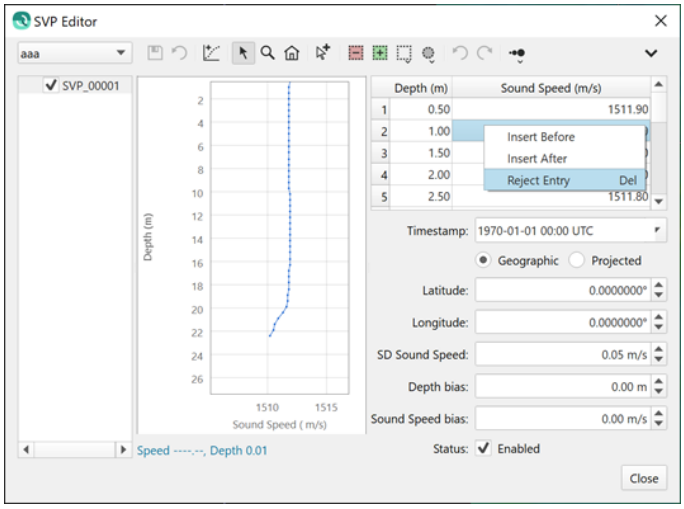
The traditional standalone 3D Editor now has a "Don't Ask Again" prompt added to the dialog that warns about unsaved edits when moving the selection box in the Scene. The decision you make the first time you are presented with this will be remembered. Most users will want it to automatically save the edits, so tick the box and choose Yes. This functionality brings the 3D Editor more into alignment with the user experience of the Slice Editor.



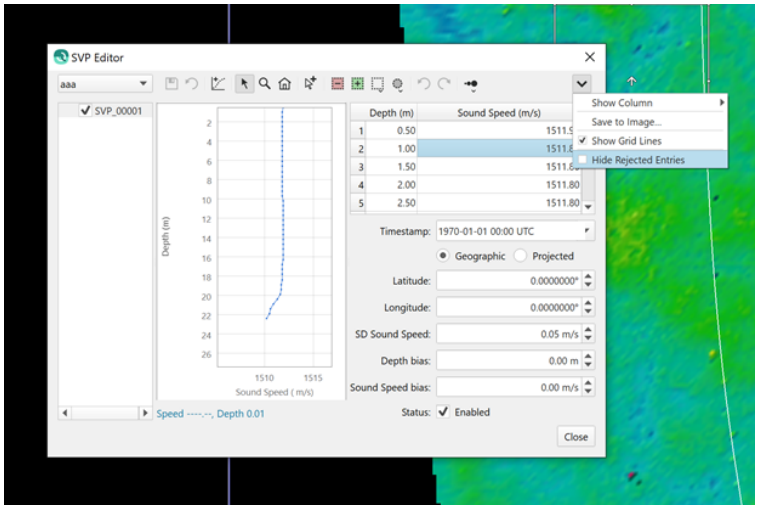
Processing and Analysis

SVP Editor

In another example of a quick win from our Feedback System, you can use the Delete key to delete rows in the tabular data of SVP entries in the SVP Editor. This is also available as a right-click context menu option when clicking on row entries.



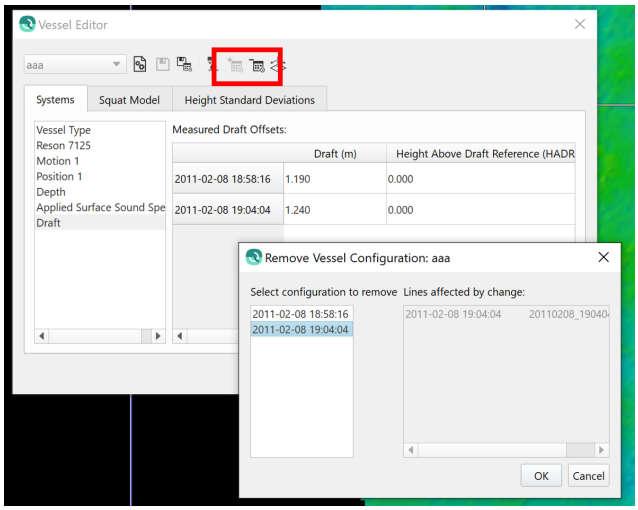
With the new row deleting capability, it makes sense that some users will want to hide the deleted entries. This can be done with a new view option in the context menu, see below.



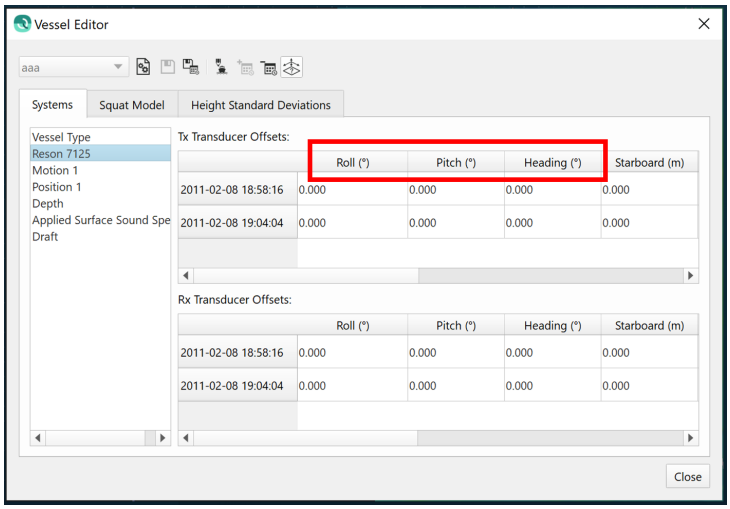
Vessel Editor

The Vessel Editor will now allow you to remove a date/time entry. Before, it was only possible to add an entry. When deleting an entry, a list of the current configurations is presented to the user for them to choose from.

When deleting the first entry in time, the next entry in time will take precedence. When deleting the last entry or a middle time entry, the previous valid configuration will take over.



The column ordering for angular offsets for MBE/MRU systems has been changed to roll/pitch/heading. Previously this was ordered as pitch/roll/heading. This previously on occasion caused human errors when manually transcribing patch test results from one project to another, or one application to another.

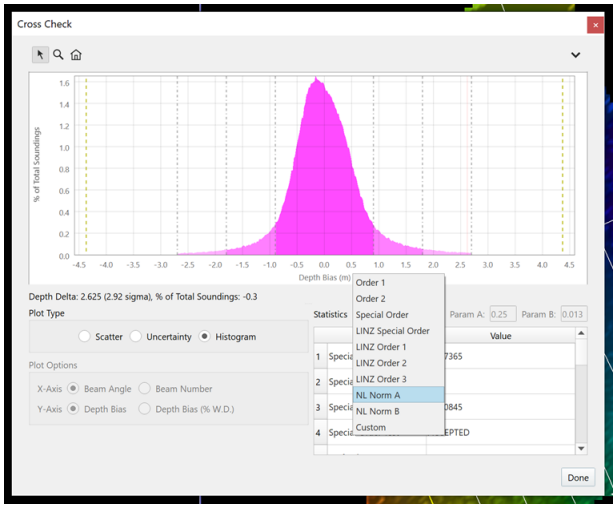


Cross Check

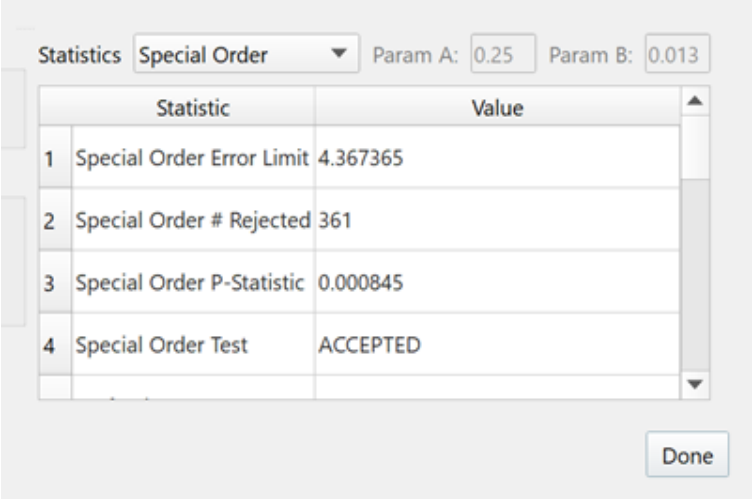
We've upgraded the Cross Check tool to allow survey order selection for several different survey specifications used by our global clients:

- Netherlands
  - NL Norm A
  - NL Norm B
- New Zealand and Australia
  - LINZ Special Order
  - LINZ Order 1
  - LINZ Order 2
  - LINZ Order 3

These are now available from the combo box that controls how which survey specification the statistical results are compared against for a pass/fail assessment.



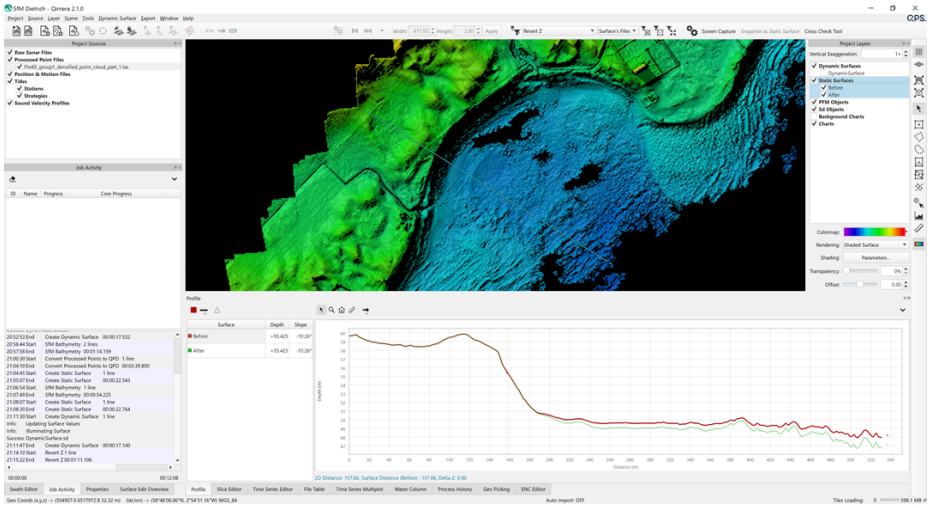
In terms of assessing pass/fail of a data set against a standard, we have changed the ordering of the tabular statistics output in this tool to emphasize the pass/fail of the test in the upper 4 table rows. We did this because pass/fail results are among the most important pieces of information in the table. Previously, this information was written at the very bottom of the list, requiring the user to scroll down to see it. This reordering of the statistical results is also done in the ASCII text export and in the report.



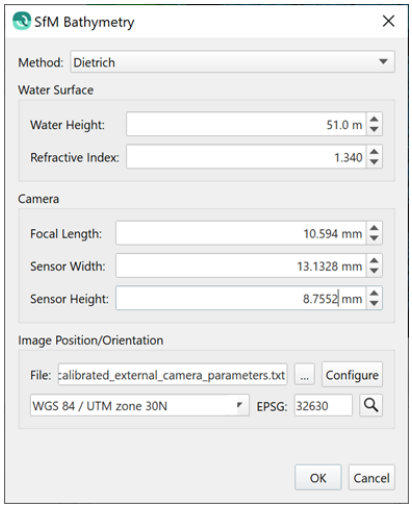
We have fixed and updated the histogram to clip the outliers on the low end of the histogram. The histogram was not clipping them previously, which typically resulted in in the lowest bin containing a spike. We have also changed the color ordering in the histogram plot so the colors become more transparent as uncertainty increases. Now, the center of the histogram is dark and the tails of the histogram grow lighter with higher levels of uncertainty.

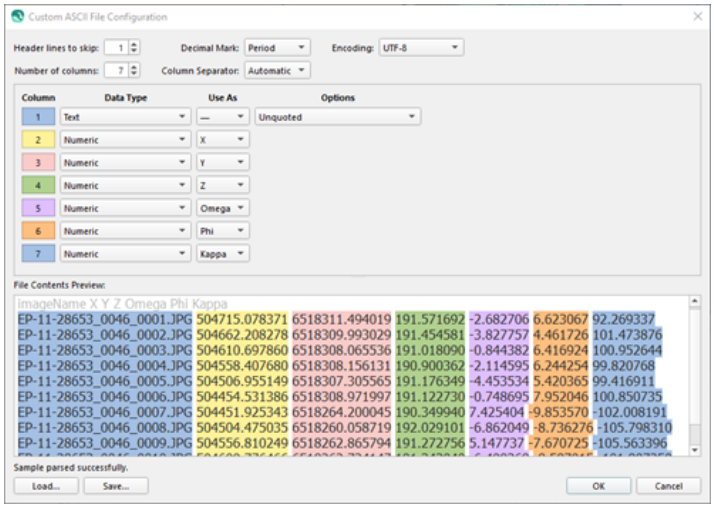
Improvement to Structure from Motion Bathymetry add-on

We have added a new computation method that takes into account camera positions and orientation to estimate view geometry for each photo, which is used to determine the incidence angle for a given pixel. The previous method could not account for the incidence angle, thus sometimes users would have to use an unrealistic refraction coefficient to force the resulting values to match against known bathymetry. This new method, based on the work of Dietrich, overcomes this previous limitation (reference: Dietrich JT. 2017. Bathymetric Structure-from-Motion: extracting shallow stream bathymetry from multi-view stereo photogrammetry. Earth Surface Processes and Landforms 42 : 355–364. DOI: 10.1002/esp.4060.). The image below, courtesy of 4D Ocean, shows a beach profile running from land to underwater with the original terrestrial and bathymetric SfM points, and the refraction corrected SfM terrain model derived from same after the correction. The original terrain model's profile is colored in Red and the corrected one in Green.



The new method requires the user to input several camera parameters such as focal length, sensor width/height. Additionally, the user must provide an ASCII input file that contains a list of the camera positions and orientations for each frame. We have some internal documentation on how to extract this camera sensor and position/orientation information from Agisoft and Pix4D SfM software. Please contact our Support team for more information on this if you need help.

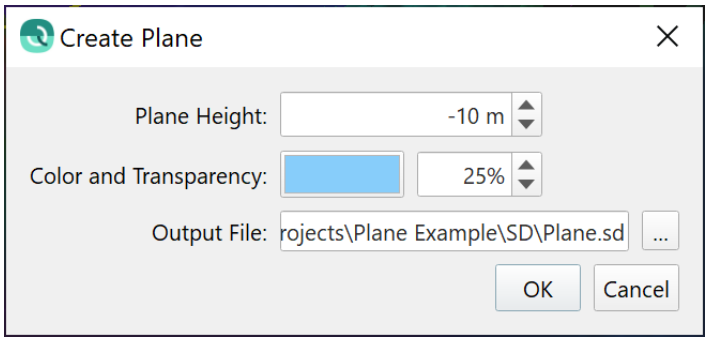




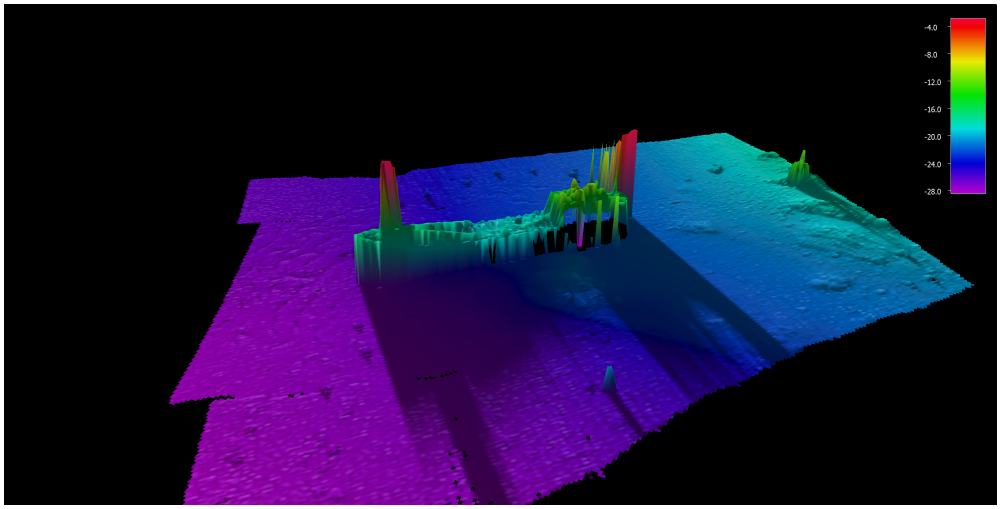
Miscellaneous

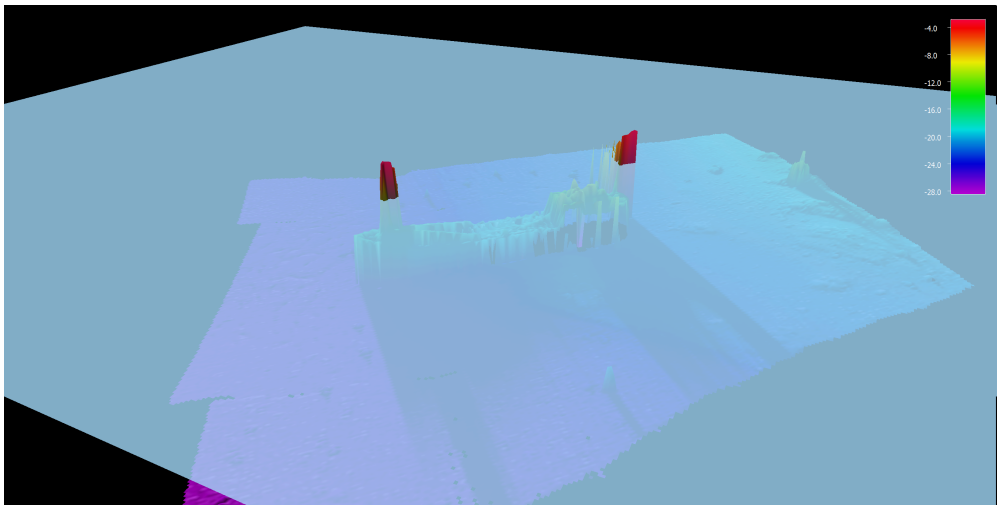
Ability to create a plane

The user can create a plane object, and specify depth, color and transparency. This is shared tech from Fledermaus, where it has been available for quite some time and is a favorite feature for Fledermaus users.



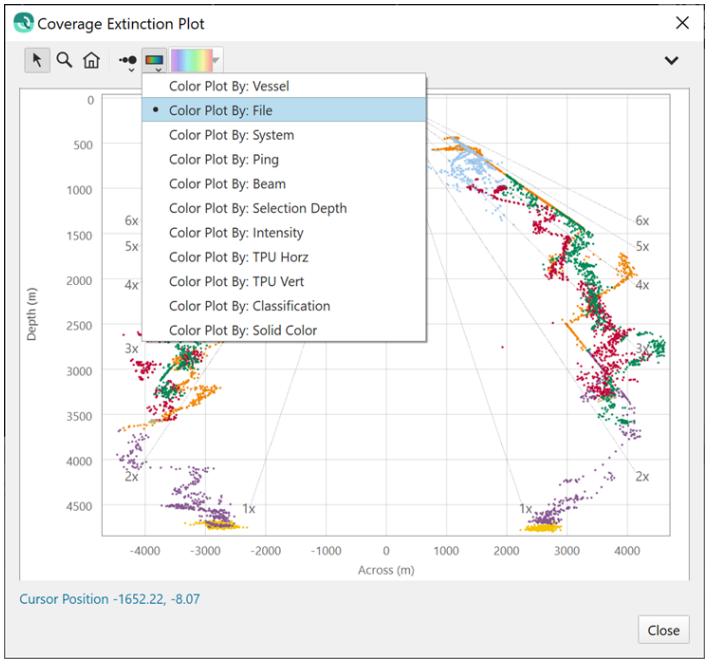
Creating a plane can have several different uses. The most typical use case, based on long established data review workflows in Fledermaus, is to create a plane at a certain depth to visually isolate areas that are shallower and deeper than the specified depth. For example, when examining navigationally significant depths you may want to create a plane that is -10 m and see the areas immediately where you should focus your attention to ensure that extra care is taken to inspect and/or clean data in those areas. The images below show this typical use case with a wreck in shallow water.





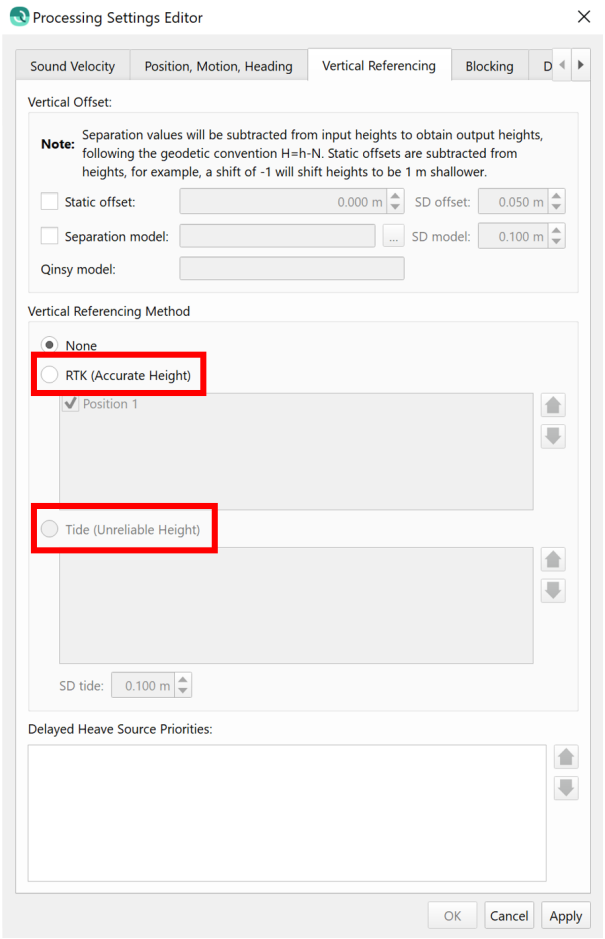
Coverage Extinction Plot

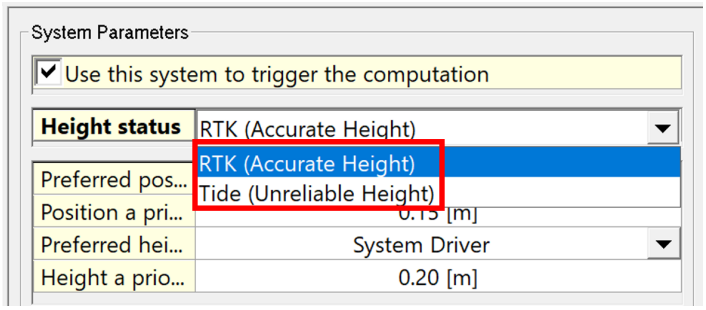
The Coverage Extinction Plot tool has been upgraded to align with the other tools for color by options, along with color map selection and adjustment capabilities. See the example below, which displays the result of coloring the data points by file. This functionality will let users make more meaningful plots when color coding by file if they design their field procedures to change the file when they change sonar parameters during sonar evaluation tests and trials.



Terminology Alignment

We have aligned terminology used in the Processing Settings Editor dialog Vertical Referencing tab with terms that were recently updated in Qinsy 9.0. Instead of GPS/GNSS and Tide, it is now "RTK (Accurate Height)" and "Tide (Unreliable Height)". See below for the dialog in Qimera and the corresponding terminology used in Qinsy's Computation Setup.





Surface Differencing

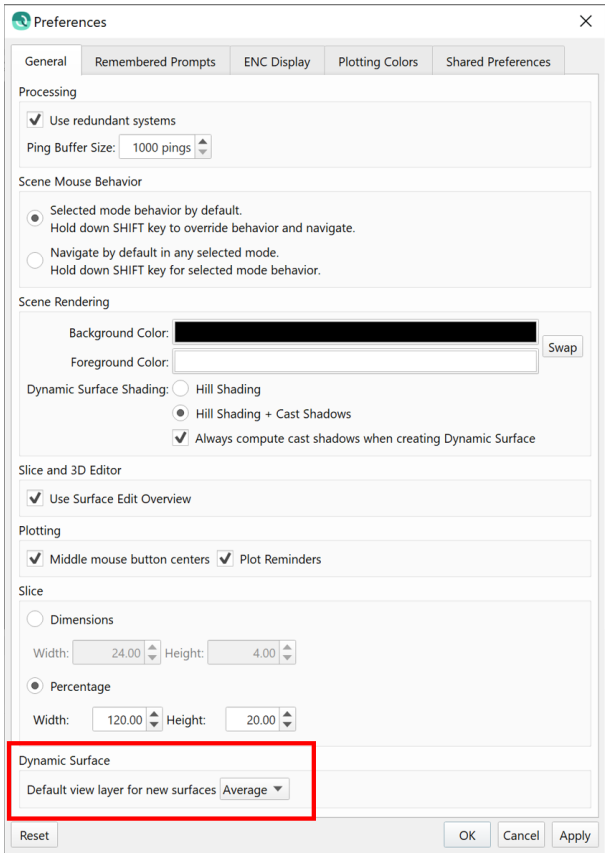
Surface differencing when using an area limitation specified by a user file is now clearly indicating that only ASCII XYZ format is supported. Prior to this, it was not made clear that only ASCII XYZ formats were supported; some users would encounter difficulty when attempting to use CAD file formats.

Scene, Display & Preferences

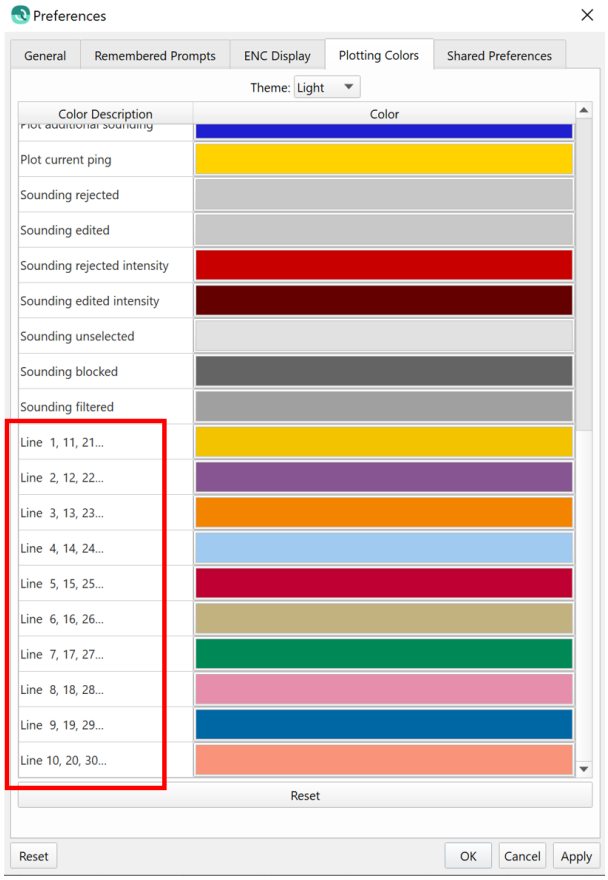
New User Preferences

We have a small set of new user preferences, described below with images showing their location in the preferences dialog.

Ability to configure default view layer for a Dynamic Surface
There is a new user preference in the Preferences dialog that allows the user to configure which depth layer they would most like to see by default with a Dynamic Surface. This is aimed primarily at users who are mainly doing QA review for point cleaning. Often these users want to see the Shallow layer instead of the Average layer, since it highlights where there are outliers remaining. The default setting for all users is to view the Average layer.

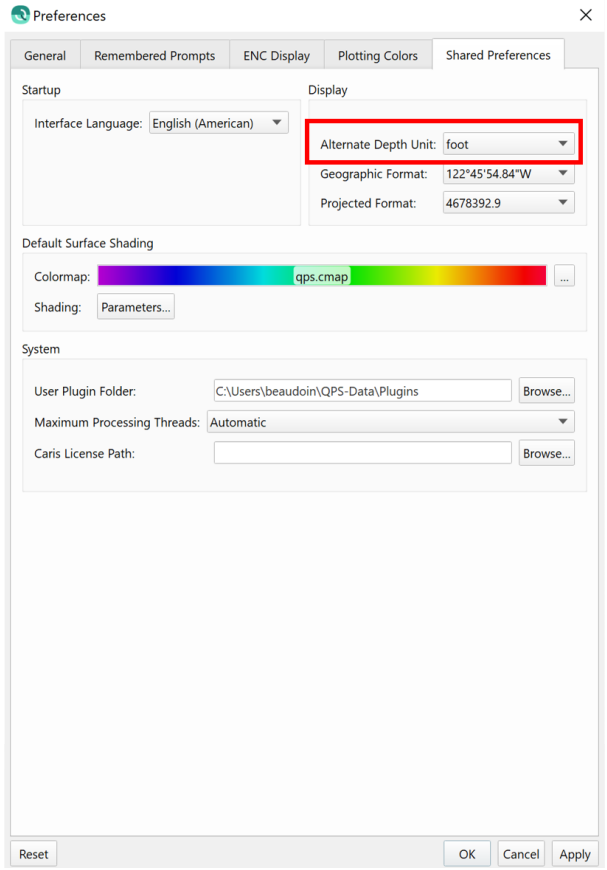


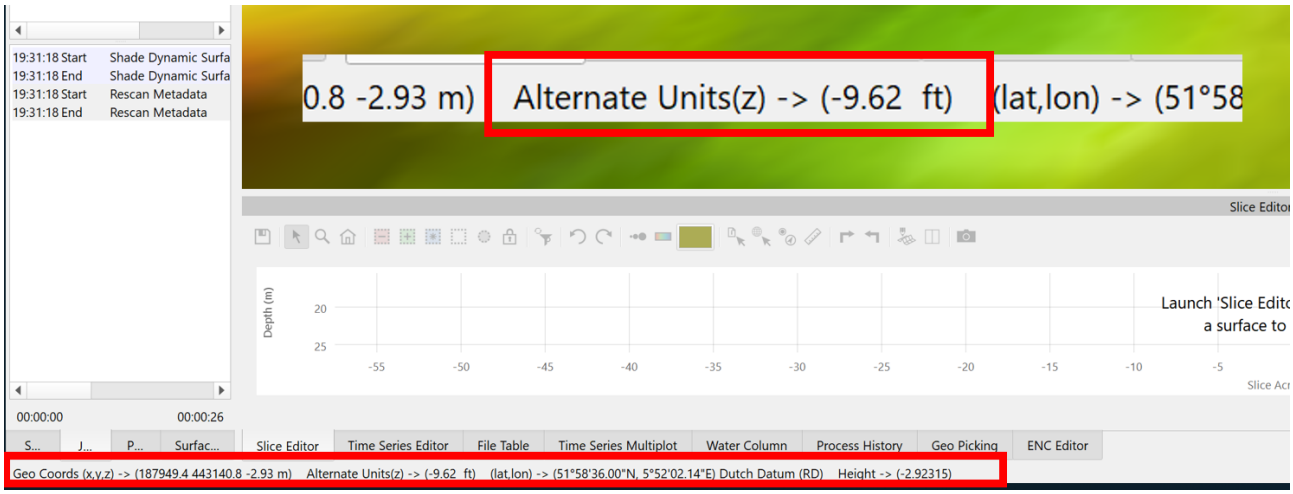
Control over default values used for line coloring
There is a new user preference to set up the colors that will be used in the automatic line coloring. These colors are used in the Slice Editor and Patch Test tool. In the Preferences, users will see the ten colors that are selected ("Kelly" colors), and they can adjust the coloration and have it saved as a custom theme. This new functionality allows the user to customize up to 10 "Color By Line" colors.



Ability to show depths in alternate units

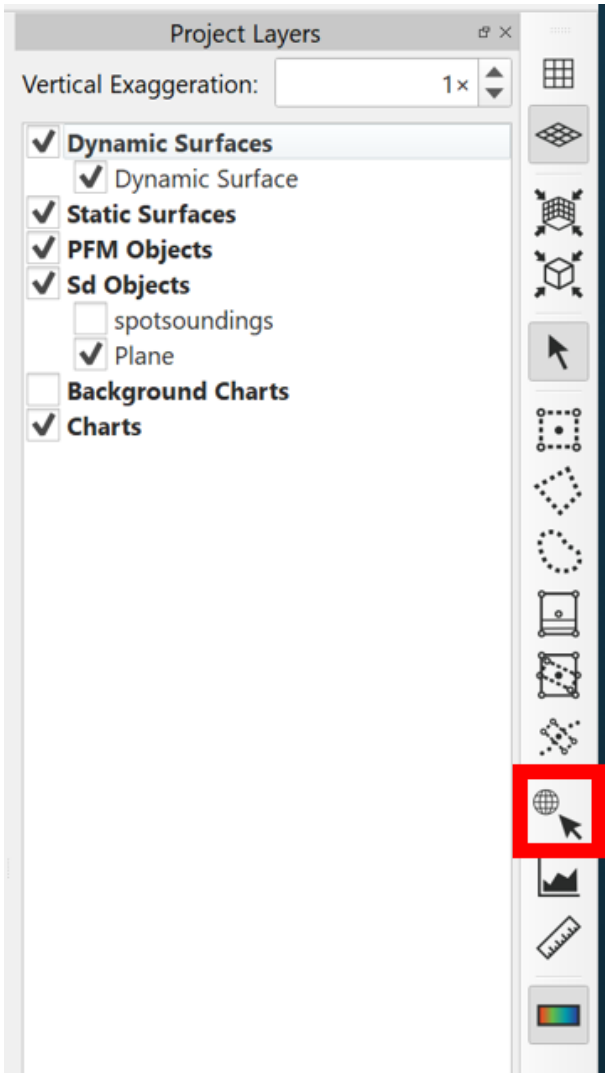
There is a new user preference that allows the user to select and display an alternate depth unit for the depth that is at the user's current mouse position, which is displayed on the lower status bar. This new user preference is under the Shared Preferences in the Display section. This is applicable for users who like to work in meters, for example, but then need to compare their depths to soundings on an imported raster nautical chart that might be in fathoms or feet. Typically, it is expected to see this only used in the US or when comparing against historic charts in differing depth units.



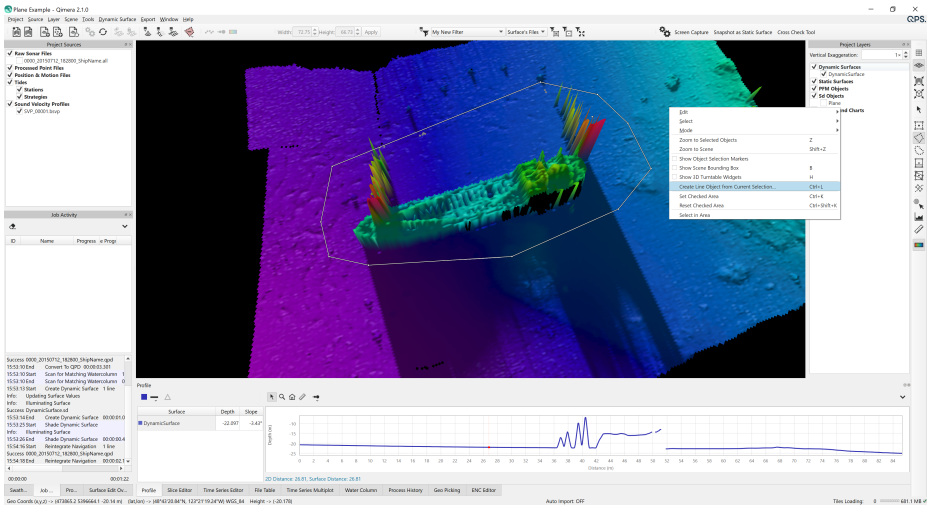


Interface and Behavior

The icon for Geopick functionality on the main Scene toolbar has been modified to match that used in the Slice Editor and Swath Editor. It now has an arrow with the graticule icon.



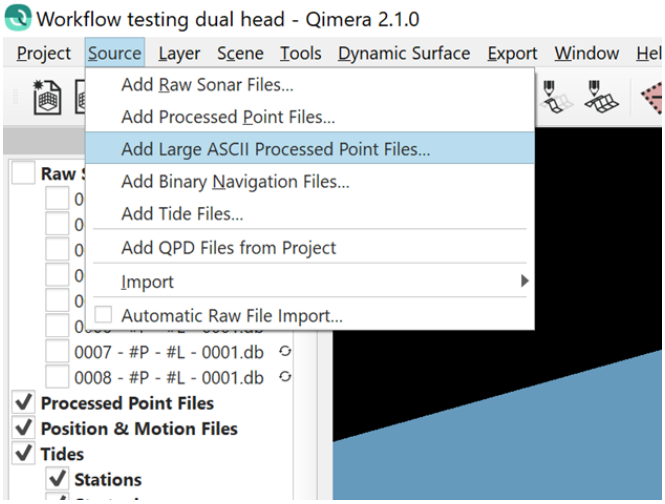
Saving line and polygon selections from the Scene as line objects now saves in the project's SD directory, having previously saved in Export directory. The image below shows a typical user action after drawing a polygon in the Scene, the right-click context menu allows you to save the current polygon as an .sd object which then appears in the Project Layers tree. This capability has been in Qimera for quite some time, so this is simply an update that we have corrected, resulting in the default save location of the resulting .sd file to be further aligned with user expectations.



Data Import & Export

Import

You can now import multiple "Large ASCII Processed Point" files at once. This is done for users who take delivery of data sets from contractors that supply a single ASCII file for the entire survey, and this file holds points from all survey lines. These users can now import several of these at the same time, previously, only one could be imported at a time.



Qimera can now import QPS QGF files with newer file extensions as CAD files. Previously, only import of files with a simple .qgf extension was supported. This now allows import of .qgfline files, etc. Direct support for QGF will come after we integrate the new

Fledermaus 8 visualization engine, in which QGF can be drawn natively without the need for file conversion.

Import of Hypack HSX files will now clear the import Coordinate Reference System (CRS) field to make it clear that the user must take action to specify the CRS during import. Previously, it defaulted to show WGS84, which was not correct, yet also did not raise awareness that user intervention was required.

Export

Export of GSF was upgraded to v3.0.9 in Qimera 2.0.2. In version 2.1, the GSF exporter has been upgraded to now populate all the sensor specific fields for Kongsberg's new KMALL binary data format, along with snippet data. This allows for workflows for the newer KMALL format from Qinsy. As a reminder, the workflow for backscatter processing is shown below. Note that FMGT will also support the KMALL file format natively in a release timed with this version of Qimera.

1. Record .db/.qpd files in Qinsy
2. Do bathymetric post-processing and data cleaning in Qimera, export GSF
3. Import GSF in FMGT to create backscatter products.

Qimera 2.1.0 - Documentation

We have significantly updated the Patch Test tool documentation to reflect the major changes to the interface and workflows.

We have also made significant additions to the Structure from Motion Bathymetry add-on that give more technical detail on the new Dietrich method of correcting bathymetric points derived using SfM techniques.

Qimera 2.1.0 - Bugs

T	Summary
	Blocking is no longer working when you disable it (introduced in v2.0.3, fixed in 2.1.0)
	Drape Image dialog does not enable ok button when selecting manual horizontal coordinate system
	Tide unloaded to FAU files. Corrupt depths resulted when unloading to FAU files that contained headers
	Surfaces - Static - Crash after trying to import second grid
	Cross check graphs do not display units for non-metric projections
	Adding Raw Sonar files where the CRS can't be automatically determined will now show a blank CRS
	Export - Scalar Object - Export to Image was not functioning
	Bug in CUBE presets after user selects Shallow mode
	Swath Editor does not gracefully handle switch between MBE and Laser lines when some systems are disabled
	Contour labels appended with white box
	Make it clear that the surface difference wizard doesn't support file types other than ASCII
	Filter flag to accept soundings not honored when applying cleaning project edits
	Cannot undo / Turn off TU Delft sound speed inversion

T	Summary
	Softlock Proxy not working with SSL / NTLM

Qimera 2.1.0 - Known Issues

For this release, the following are known issues which we plan to address in upcoming releases.

Issue	Description	Affects Version	Expected Fix Version
Bug	CUBE surfaces do not correctly handle z-range limits. There is no workaround currently, this was discovered in v2.0.3.	2.0.3, 2.1.0	2.1.x
Bug	CUBE surfaces over extend the spatial area when a user specified horizontal range is specified, i.e. a box is drawn to create a small CUBE surface for which the data extends beyond the boundaries of the surface. There is no workaround currently, this was discovered in v2.0.3.	2.0.3, 2.1.0	2.1.x
Bug	Dynamic Surfaces do not correctly recompute Cast Shadows when shading parameters or view layers are change for multiple surfaces at the same time, i.e. a user has selected multiple Dynamic Surfaces at the same time and has changed a view parameter for all of them simultaneously. Workaround is to manually trigger a surface re-illumination with the "Recompute Surface Illumination" option from the Dynamic Surface menu for each surface. This is sped up by adding this option to a Custom Toolbar, then you can select the Dynamic Surface and click the button. Alternately, you can create a keyboard shortcut for this.	2.0.3, 2.1.0	2.1.x
Limitation	Filter toolbars to "Accept All Soundings" and "Revert Manual Edits" do not have the intended effect when used in a Cooperative Cleaning project to over-ride cleaning that was done manually in the Master project prior to creating the Cooperative Cleaning project. Suggested workflow is to use the manual re-accept tools in the Slice Editor and 3D Editor.	2.1.0	2.1.x

Issue	Description	Affects Version	Expected Fix Version
Limitation	The Wobble Analysis tool does not work for Qinsy Laser systems and the Wobble Analysis Tool checks for laser at runtime and denies entry to the tool. There is a bug, however, that the check for laser will crash if the data comes from a set up that contains both multibeam and laser. This crash will be fixed in the next maintenance release.	2.1.0	2.1.1

Qimera 2.1.0 - All Implemented Feedback

Key	T	Summary	Votes
FQM-44	☐	Patch Test Tool: General improvements	44
FQM-94	☐	Patch Test Tool: Laser Support for laser data logged by QINSy	38
FQM-100	☐	Create spot soundings	26
FQM-297	☐	Dynamic Surface: Add THU and TVU layers	18
FQM-329	☐	Change cursor when in "Instant Surface Reject" mode	13
FQM-140	☐	Dynamic Surface: Change 'remove from DS' dialog to allow selection of which surfaces to remove from.	11
FQM-386	☐	Ability to import multiple files at once for Large ASCII files	9
FQM-388	☐	Filtering - TPU Filtering	9
FQM-53	☐	SVP Editor: Allow for a row of table to be removed	6
FQM-170	☐	Patch Test Tool: Standalone patch test tool for QINSy users	5
FQM-102	☐	Filter: New filter in Filter Toolbar that cleans points based on intensity	4

Key	T	Summary	Votes
FQM-387	☐	Filtering - Quality Filtering	4
FQM-200	☐	Vessel Editor: Ability to easily remove a time entry from the vessel configuration	4
FQM-213	☐	Dynamic Surface: Ability to set the default view layer for new Dynamic Surfaces	2
FQM-250	☐	Create a plane	2
FQM-368	☐	Improve patch test auto-line selection to better handle dual head	1
FQM-410	☐	Cross Check - Upgrade for other survey specifications	1
FQM-443	☐	Align terminology for accurate and inaccurate heighting between Qinsy and Qimera	1
FQM-385	☐	Slice Editor - Add "color by color"	0
FQM-395	☐	3D Editor: Add "Don't Ask Again" option when saving edits	0
FQM-376	☐	Ability to show depths in alternate units	0
FQM-55	☐	Cross Check - Show 2 sigma line in addition to the 1 sigma envelope	0

Qimera 2.2.0 Release

28 May 2020

We're pleased to present Qimera version 2.2.0. In this release, we introduce a few new features, with a focus on the final phases of our deployment of the new grid format, along with many improvements that were requested. Read below for details.

Highlights

- New filters
- New height-matching add-on
- Grid 5 scalability and stability improvements
- and many more feedback items from the Qimera Feedback Project have been successfully implemented

Vote



Click on the icon above and vote on or create a Feedback issue!

Feedback Project

In this release, we have completed 9 feedback items, which satisfies 74 votes. For more information, see our Voting System Policy and Using the feedback project.

The Feedback Project helps us to continue improving our software products. Vote or implement feedback and participate in the process by tracking, watching and commenting on issues!

Please click on the Vote button to the right to go to the Qimera Feedback Project and implement or find the item you want to vote for.

- Qimera 2.2.0 - Important Notes
- Qimera 2.2.0 - New Functionality
- Qimera 2.2.0 - Improvements

- Qimera 2.2.0 - Documentation
- Qimera 2.2.0 - Resolved Bugs
- Qimera 2.2.0 - Known Issues
- Qimera 2.2.0 - All Implemented Feedback

Qimera 2.2.0 - Important Notes

- Licensing
- Installers
- QPS Project and file format versions
- Support for Qimera v1.X
- End of support for Qimera on Windows 7

Licensing

Existing Qimera users with a license that is under maintenance will be able to install and run Qimera 2.2 alongside Qimera 1, using the same license. No changes to the license configuration have been made with this release with the exception of the introduction of a new add-on for the Height Matching tool.

Installers

The Qimera installer will install by default into sub-directories with the version name under the typical install path, which is usually C:\Program Files\QPS\Qimera. This allows multiple installations quite easily and follows the trend that Qinsy has been using for some time. Users with Qimera 1.X or 2.X already installed will find that Qimera 2.2.0 will install into the Qimera 1 directory, but in the 2.2.0 sub-directory of the Qimera 1 installation folder.

QPS Project and file format versions

This is a reminder that in Qimera version 2.2.0, the QPS project version has been upgraded and is therefore not compatible with previous projects made with Qimera 1 or Qimera 2.1. The project number is upgraded rarely, in this case it was done due to significant changes to the Grid 5 file format and ancillary files. These changes prevent the use of these surfaces in previous versions of Qimera.

Projects created with Qimera 1.X or Qimera 2.1 can be upgraded to work in Qimera 2.2 but it will not be possible to go back. It is suggested to back up a Qimera 1 or Qimera 2.1 project prior to opening it in Qimera 2.2, in case problems are encountered.

Before the upgrade of a Qimera 1 or a Qimera 2.1 project, a backup of existing Dynamic Surfaces will be made in the project to ease recovery in case of problems.

Support for Qimera v1.X

Summary:

Qimera 1 will be replaced by Qimera 2. This means that support will stop on December 31st, 2021.

Support for Qimera 1:

What will be supported until the end-of-life:

- Fixes and patches will in general only be for critical and blocker bugs. Less critical bugs are also candidates to be fixed but this is not guaranteed.
- The software will be tested by our test protocols for the current operating systems.
- Support questions will be answered.
- Training for Qimera 1 until December 31st, 2021.
- On site support for Qimera 1 until December 31st, 2021.

End-of-Life:

Qimera 1 will reach end of support on December 31st, 2021. Following this date, no fixes or patches will be made available.

Following this date issues related to Qimera 1 versions will not be processed. Support questions will not be answered.

No training or on site support will be given.

Note that perpetual Qimera 1 licenses will continue to function.

End of support for Qimera on Windows 7

Microsoft has ended Support for Windows 7 in January 2020 and QPS will also stop supporting Windows 7. For now Qimera 2.2 has been tested on Windows 7 without a problem.
Any problems with this version related to the Operating System will not be solved. Future releases will not be tested on Windows 7.

It is highly recommended to switch to Windows 10.

Qimera 2.2.0 - New Functionality

- Introduction
- New Filters
- Automatic Height Matching
- Command line scripting

Introduction

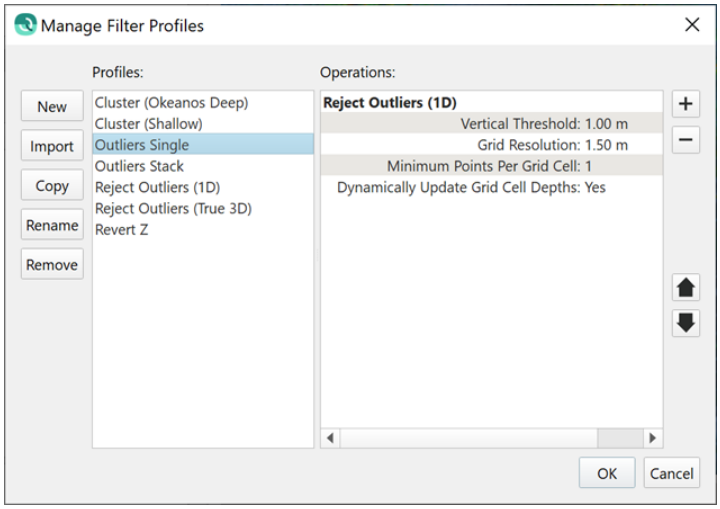
In this release, we have focused on the final phases of switching over fully to Grid 5. This process was initiated with version 2.0 and in version 2.2 we have collected all feedback about performance, stability, etc and have addressed these items. Secondarily, we have added some very interesting new filters and also a new add-on that allows for height-matching between different survey lines when there is poor vertical control. Read below for details.

New Filters

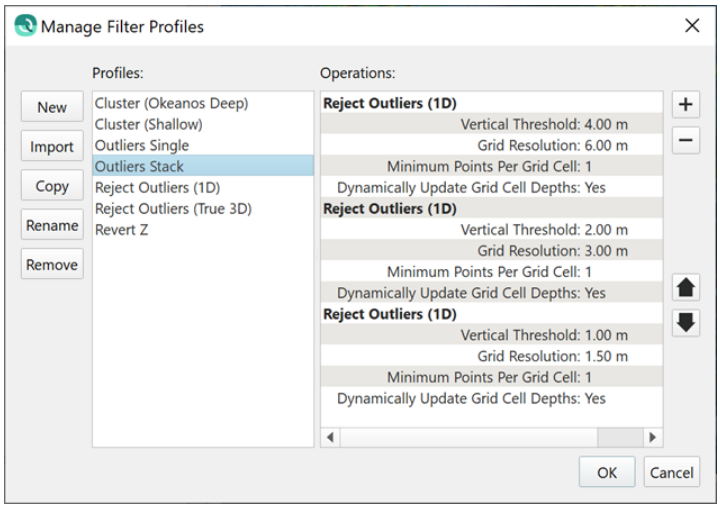
Reject Outliers (1D)

We have two new point cloud filters that reject statistical outliers from the point cloud, they both share the general name "Reject Outliers". The first, which we name "Reject Outliers (1D), is a variant that focuses on general seafloor topography, which covers most applications. We specifically highlight this as a one-dimension (1D) filter since it only examines point clouds in the cell in the vertical direction only. In this single vertical direction, there is also only one average value that can be calculated. It is a great filter for flat or gently sloping seafloors but does not handle strong variations in topography or complex objects or structures. For this we have the "True 3D" variant, which is discussed below. But first, let's discuss this filter.

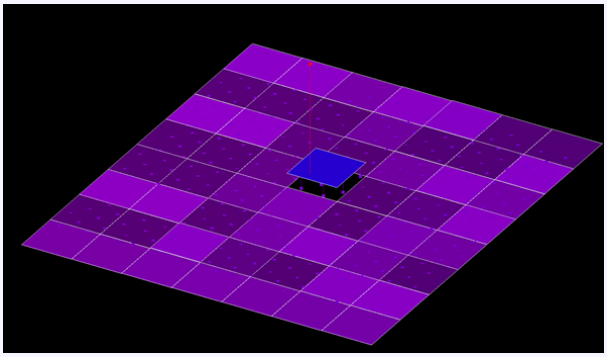
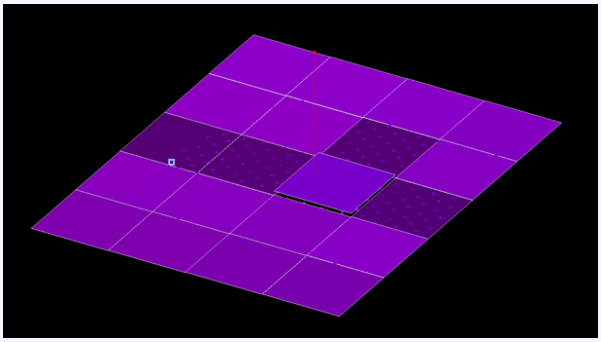
How does it work? The general theory is to establish a virtual grid cell size and then calculate the average of that virtual grid cell and then reject points that are outside of the specified distance from the average. The example below shows this general type of configuration. This particular filter works very well to remove noise that is normally distributed around a stable average surface.



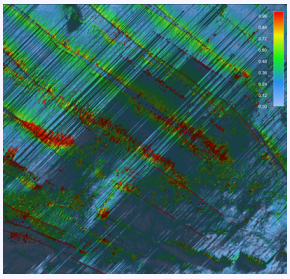
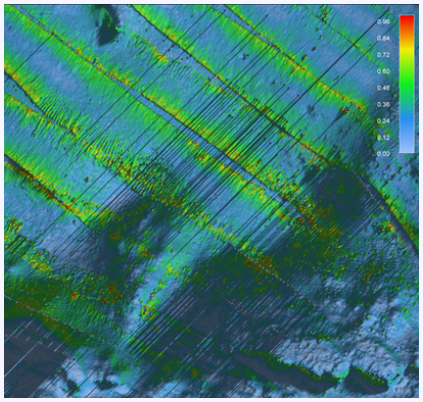
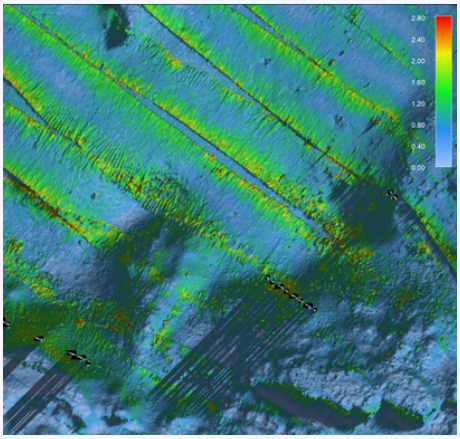
The true power in this type of filter is to create a sequence of such filters, which is possible in the dialog to manage filter profiles, as shown below. The first iteration uses a very large cell size and a large threshold; this removes extreme outliers. Once this is done, a second iteration then repeats the operation for a smaller cell size and smaller threshold. The sequencing is necessary in some cases when extreme outliers can bias the average when using a small cell size.



How is it that outliers can affect the filter performance? If the threshold is set too small, then outliers will cause the filter to remove some of the good soundings because the average is biased towards outliers. An example is shown below where a 1.5 m cell size shows the effect of a single outlier on the average calculation (on the left). Compare this to the image on the right where a 3 m cell size is used. In this case, the cell has more good points to counteract the effect of the single outlier and the average is affected less. In this case, the calculated average is safer to use to remove outliers both large and small.

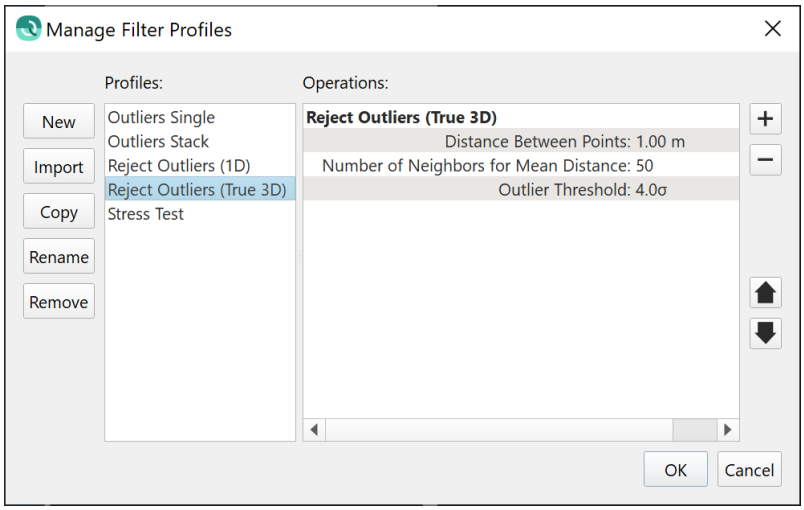
	
Point cloud with 1.5 m cell size. The single outlier has great effect on the average.	Point cloud with 3.0 m cell size. The single outlier has less effect on the average.

How does this work in practice? Here is a sequence of images showing the effects of a single pass of this new filter and also the result of a stacked iterative sequence of the filter. The grids are color coded by uncertainty and the cast shadows highlight the presence of many spikes as well as areas of general high uncertainty in the overlap between survey lines.

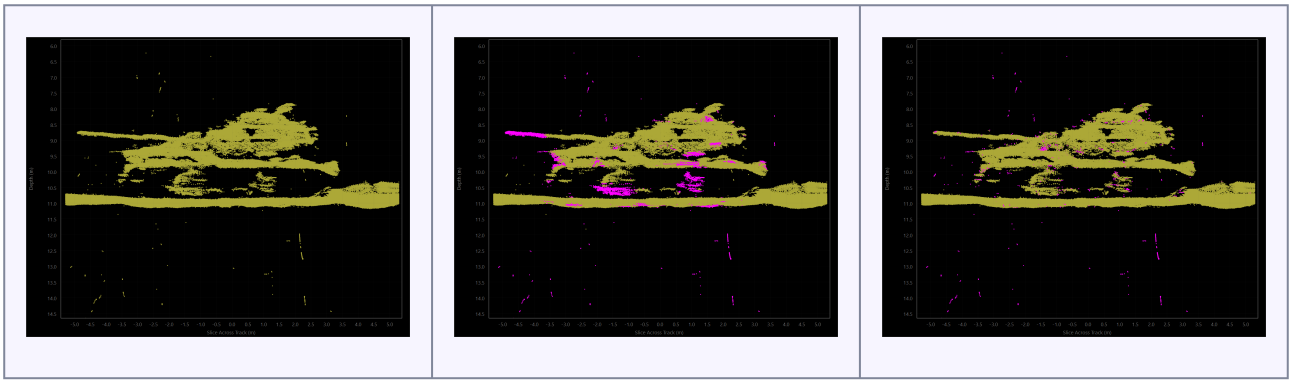
Raw Data	Reject Outliers (1D) - Single Pass	Reject Outliers (True 1D) - Three passes
		

Reject Outliers (True 3D)

This filter is the second that we have integrated from the open source PCL library, the first was the Cluster filter which was released with Qimera version 2.0. This filter is different from the 1D version because it can handle true 3D objects, like quay walls, pilings, and objects with overhangs. It also elegantly handles rough topography and strong variations in topography. It is much more powerful, but at the expense of additional computation time. An example configuration is shown below. The primary parameter that the user should specify is the distance between points that are to be considered before marking a point an outlier relative to its neighbors in the 3D point cloud in which it belongs.



Why do we name this filter "True 3D"? We do so because it handles the case of true 3D objects like you would get from laser scanning of buildings or port facilities, or mapping of seabed engineering structures where vertical objects and overhangs are the norm. All other filters available in Qimera assume a seafloor or surface for which there is only one vertical value in any given cell on the surface. There are many mapping applications where this is not true though, and this filter is designed to work for these kinds of situations. The examples below show data from an R2Sonic Sonic 2024 operating in 700 kHz UHD mode over a submerged tank in an artificial reef site. Data courtesy of R2Sonic.



Raw Point Cloud	Filtered with Reject Outliers (1D) Outliers are removed but so are portions of 3D structure.	Filtered with Reject Outliers (True 3D) Outliers are removed and 3D structure is preserved.

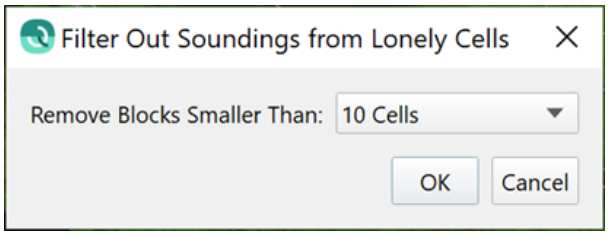
Filter by Angle

We have continued on our path of making every Blocking Filter available as a Filter in the Filter toolbar. In this release, we introduce the ability to Filter by Angle. To refresh your memory, Blocking Filters can be applied online in Qinsy or offline in Qimera, they can apply to the entire line and can be easily enabled/disabled. Being able to apply the same type of filters from the Filter Toolbar gives the additional power to select particular spatial areas to apply the filters, for example an aggressive angular filter in an area of heavy overlap can be applied by drawing a lasso selection around the area and applying the filter.

This filter works for all raw sonar formats since Qimera is able to access the beam angles for each points with raw sonar file formats. On the other hand, not all processed point file formats that Qimera supports preserve the beam angle. At the moment, the only such point file format that we have built support for are .fau files.

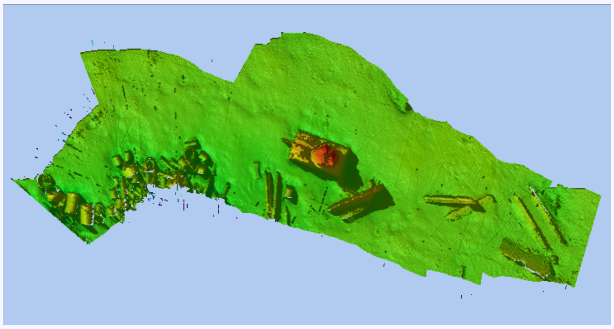
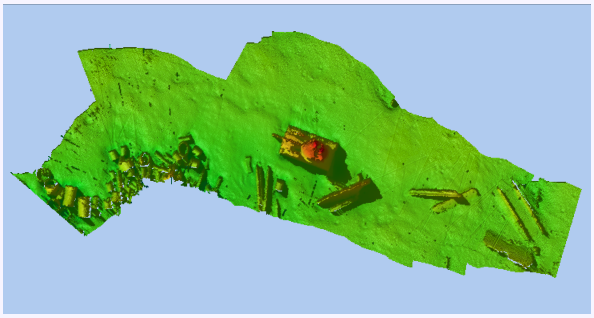
Lonely Cells Filter

We have introduced a new Lonely Cells filter, it removes isolated small clumps of grid cells that don't connect to the main surface, which usually happens at the edges of surveys. This operation, though it appears to operate on the Dynamic Surface, is actually only using the grid to identify the lonely cells. Once they are identified, the underlying points are flagged and the matching subset of the grid is recomputed. Thus, it is ultimately the points that are flagged and this prevents them from re-appearing in any new grids or in any subsequent regridding operations. The points are flagged with the Filter flag, this allows you to undo this filter via the Revert All Filtering option in the Filter Toolbar. The only parameter the user must choose when running this operation is the maximum size of a block of lonely cells cannot exceed in order to be filtered.



An example is shown below. You'll find this new filter in the Dynamic Surface menu, it currently operates on the entire surface. The typical use case is as a first pass operation to remove the lonely cells prior to further filtering or point cleaning operations. If the filter

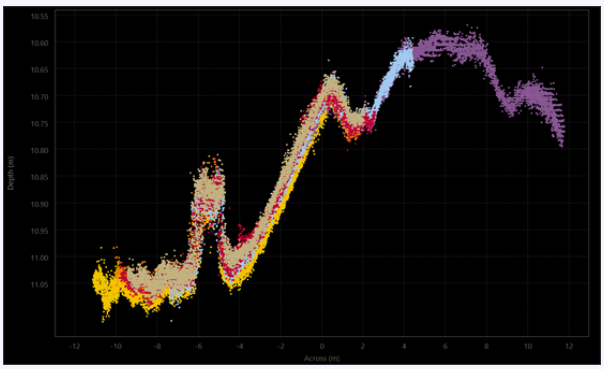
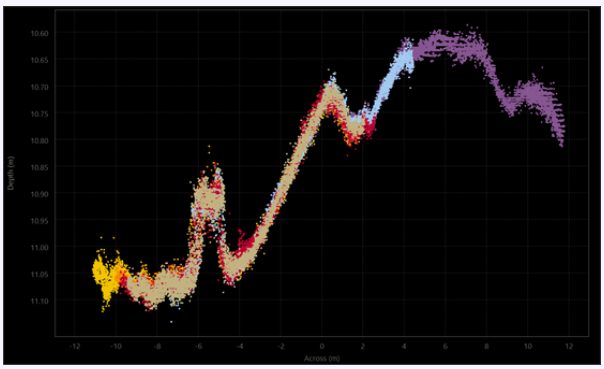
removes too much data at the edge, it is simple to use the lasso selection mode and the Revert All Filtering option from the filter toolbar to reclaim data in these situations.

	
Raw gridded data. Note the lonely cells on the left side of the grid.	Filtered gridded data, with lonely cells removed.

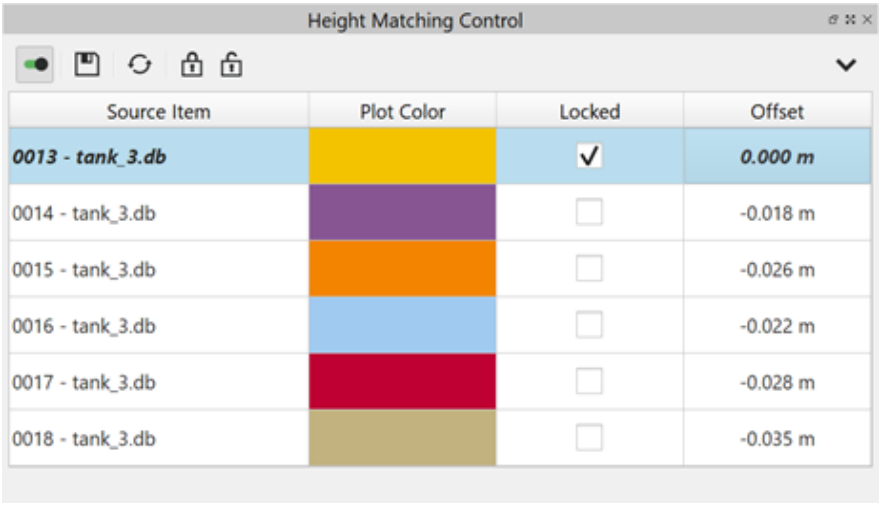
Automatic Height Matching

In this release Qimera now offers a new add-on that allows users to fix vertical offsets between neighboring survey lines using a semi-automated tool. If you are interested to try this new add-on, please contact sales@qps.nl to arrange for a demo or an evaluation. At the moment, this works only for raw sonar data formats. We have plans to add the same functionality for processed point formats such that Qimera Clean users will be able to take advantage of this as well. This is the same strategy we took when releasing the TU Delft Sound Speed Inversion add-on in 2018.

The tool uses the same principle as the Slice Editor in that the user chooses a rectangular area in which to solve for vertical offsets. The point cloud is displayed in order to guarantee that there is a "human in the loop" to override any problematic solutions. As with all plotting tools in Qimera, you can easily save screen captures of the plot for before/after comparisons and reporting purposes.

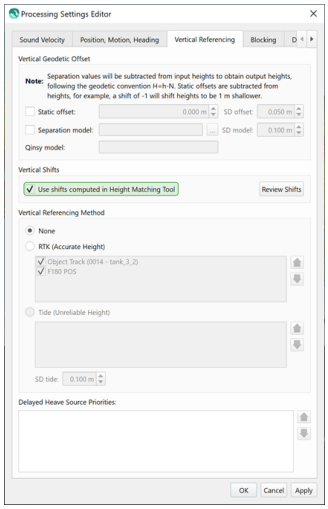
	
Point cloud before solving for vertical offsets.	Point cloud after solving for vertical offsets.

Along with the point cloud viewer, the user has a control dock from which they operate the tool. The control dock lists the files loaded in the point cloud viewer and it provides the ability to lock one or more particular files to be used as a reference. Once a reference is selected, the user clicks the auto-solve icon, which is used throughout Qimera, to solve the offsets. The point cloud display then updates for visual confirmation to the user. The offsets are displayed in the control dock after the algorithm is run, these can also be manually adjusted to make small tweaks in the event that the automatic matching did not work. If you are happy with the results, you can click the Save icon and carry on with further processing, or you can move the rectangular selection to another area that requires further intervention. In this second case, the lines for which a vertical offset is already determined will become locked as well and thus used as a reference in the remaining areas.

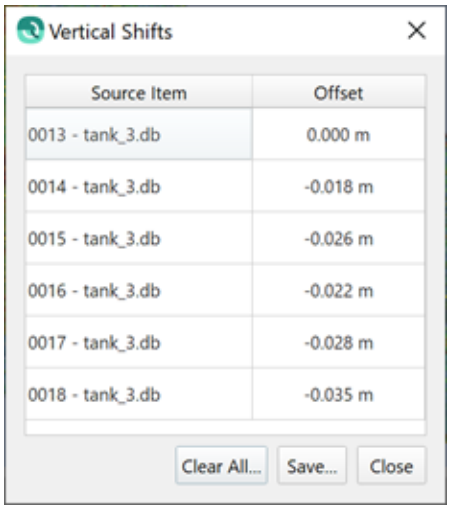


This type of tool really requires good accounting on what has been applied so that you and the recipients of your data can understand exactly what has been done to the data to counteract problems. To this end, we have followed the Qimera philosophy of allowing the

user to easily enable and disable these offsets after the tool is run. If you visit the Processing Settings after you run the tool, you will see there is a tickbox control to easily allow you to revert to a raw state, this can be done for one file or a selection of files.



Additionally in the Processing Setting dialog, you can review the offsets for all files at any time. You can save the offsets to a text file to include in any reporting.



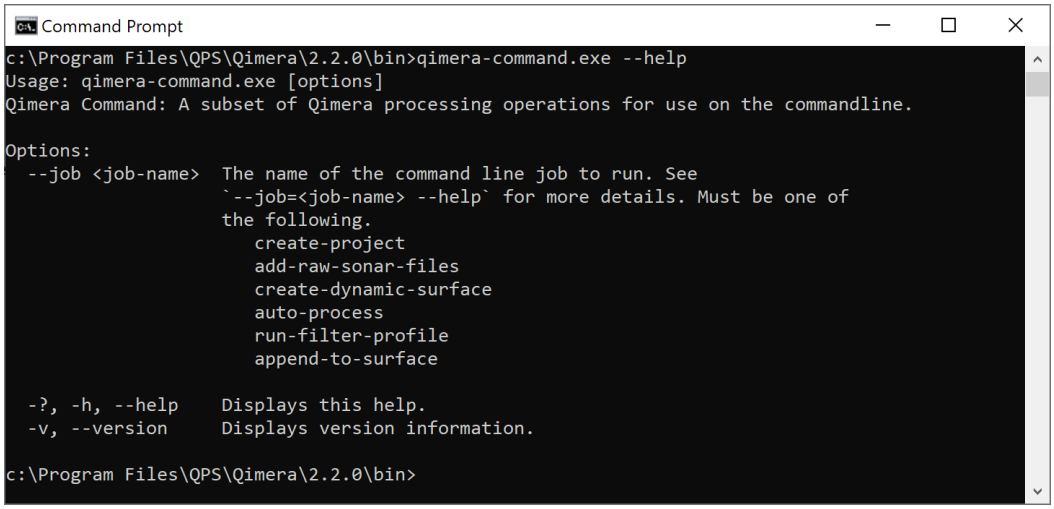
We purposefully took the semi-automated approach since the hydrographic surveying industry is generally risk averse and suspicious of black box solutions. These simple and semi-automated workflows allow users to see the effect of the tool for themselves in order to build trust in the tool. Combined with the good processing state management and easy reporting capability, this helps build trust with users of this tool and it also helps build trust with the recipients of the data that was processed with this tool.

Command line scripting

We have started down a roadmap to allow for command line scripting in Qimera. We have focused on the Kongsberg .all format at first since the QPS .db format is well supported online with Qinsy and users can already create QPDs and Dynamic Surfaces while online. With the power of Qinsy's online capabilities, there is less of a need for offline command line scripting at the moment.

Users will find an additional .exe file in the Qimera installation directory named qimera-command.exe. Running this .exe file with the --help option will give the user guidance on how to setup a script for processing. Scripts can be created and run in any user infrastructure, there is no need for interaction with a processing or scheduling server, you can run this natively on your own machine with only a little bit of scripting experience. This was specifically built to allow incorporation into the NOAA Charlene package, which allows for automated pre-processing and processing for NOAA workflows.

At the moment, only basic functionality is supported: project creation, import of .all files, convert to QPD, creation of a new Dynamic Surface, append to an existing Dynamic Surface and application of a filter profile from the Filter Toolbar. We will add more functionality in the near future, as well as additional file formats.



Qimera 2.2.0 - Improvements

On this page:

- Grid 5 Stability, Scalability & Improvements
  - Surface Edit Overview
  - Shading Improvements
  - General Improvements
- Geodetics
- Filter Speeds & Improvements
- Plotting & Editing Tools
- Imports & Exports
  - ASCII export of raw sonar files
  - Imports
  - GSF Export
  - Removed Functionality
- Miscellaneous

Grid 5 Stability, Scalability & Improvements

This release focused much effort on improving stability and scalability of the newer format version we use for Dynamic Surfaces. From a user point of view, you will find more stability in version 2.2 since we have addressed some problems that escaped our attention with the Qimera 2.0 release. Thank you to all users who reported these to us and for giving us the opportunity to investigate further and make the software stronger. We appreciate your help.

From a stability standpoint, there have been two major improvements. Firstly, there is much better control over simultaneous reading/writing of the surface, particularly when the grid tiles are streaming from disk while edits are being made. The work we have done for this results in a more stable user experience as users edit data and update the grid while simultaneously panning and/or zooming to other areas on the surface. Secondly, we have completely rebuilt the Surface Edit Overview dock.

Surface Edit Overview

In our internal investigations from user feedback, we found that many instabilities came from the use of the Surface Edit Overview window, these were due to competing access to the Dynamic Surface and dual rendering of the same surface. As you know, this dock

gives an overview of a Dynamic Surface while you simultaneously view the same surface in the main Scene. In response, we have rebuilt the Surface Edit Overview from the ground up to address issues with the previous architecture to avoid the challenges from the previous solution.

In this rebuild, we have also focused in improving load time and responsiveness while in use. We have tested with a 100 GB Dynamic Surface and we are happy to report that the load time has reduced from 36 seconds down to 6 seconds on our testing hardware. With the same 100 GB surface, we have also tested that the zoom/pan and redraw responsiveness is as good as it is with smaller data sets. Since this was a fresh rebuild, we also took the opportunity to ensure that the Overview works and behaves consistently with all mouse modes and keyboard modifiers from the Scene and other plotting tools. Additionally, we have made improvements to ensure that the Overview inherits the viewed depth layer, color map and color map range from the Scene when the Slice Editor is launched.

Shading Improvements

Many enhancements have been made to the shadows that are produced when operating in Cast Shadows mode. The look and feel of the shading is now more consistent with differing grid cell sizes and also there is improved consistency between the two different shading modes (Hill Shading vs. Hill Shading + Cast Shadows). Previously these two modes had differences, with these differences also varying with grid cell size.

We have also adjusted the default shading parameters: Specular was 0.106 but is now 0.1 and Vertical Scale is now 2x, whereas previously it was 5x. You will need to reset your Shared Preferences to the new default to activate them, otherwise your previous defaults will be honored. These new defaults are now consistent between Qinsy 9, Qimera 2 and Fledermaus 8. A Dynamic Surface that is produced online in Qinsy should match ones made in Qimera more closely, along with Fledermaus.

Additionally, shading improvements have been made on exported geotiffs in that they now match what is currently displayed in the Scene for a "what you see is what you get" experience. Previously, the geotiff exports always had cast shadows, whether the user had them enabled in the Scene or not. Also, there were slight variations in brightness and general shading with geotiff exports due to different shading algorithms being used in the Scene and in the geotiff exporter. These have been aligned.

The recalculation of shadows during editing operations in tools, like the Slice Editor, has been enhanced to recalculate the shading in the entire selection area. In previous releases, it would only locally recompute the shading in the grid cells that were actively regridded, thus a spike with a long shadow would leave a long shadow behind even after the spike was edited. In this update, the entire selection area is re-shaded when you edit. Additionally, the tool to recompute surface illumination under the Dynamic Surface menu is aware of user selections on the surface (e.g. rectangular selection). If any shading errors occur after editing, the user can isolate the area and have it recompute shading for just that area. Previously, this operation would update the entire surface. During all of the

shading improvements, we have fixed a problem that was highlighted in the Qimera 2.1 release notes as a known limitation: You can now select multiple surfaces and adjust the shading parameters and every selected surface will recompute its shading.

General Improvements

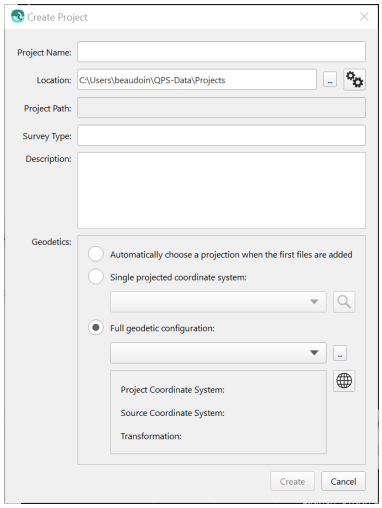
Below is a list of general improvements that have been made regarding Dynamic Surfaces.

1. The automated Update Timer has been removed from the Dynamic Surface. It would check the modification times of QPDs that are located outside the project, typical of Production Line Processing workflows, and would signal that the surface required updating. This was removed since it would cause a race condition between ongoing grid updates in the main project and the update timer, which would then cause unnecessarily long grid times. In place of a timer, the modification times of QPDs are checked at the time a project is reloaded only, or when a user right-clicks a Dynamic Surface and chooses "Update from Edits". When doing the latter operation, a dialog will warn how much of the surface will be updated, allowing the user to proceed or delay until a later time.
2. The bounds, or extents, of a grid are now displayed as edge-to-edge in the Properties tab. Previously, they were reported as center-to-center, thus under reporting the true geographic extent of the grid by a half cell size.
3. When creating Dynamic or Static surfaces, the default file name is changed to match what is done in Qinsy: "Dynamic Surface". Previously, Qimera was not adding a space between the words.
4. The behavior of the user preference for default viewing layer for a Dynamic Surface has been changed to be only applied to a newly created surface. Previously, this was applying to all surfaces each time a project was reloaded.

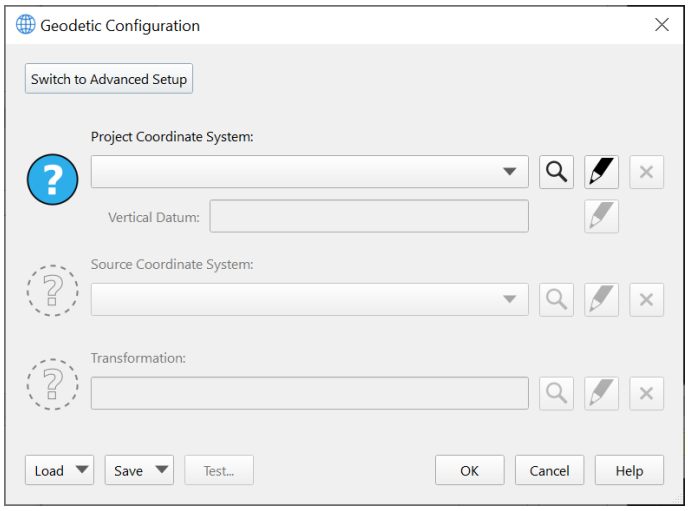
Geodetics

Several changes were made to the New Project dialog and the Geodetic configuration dialog based on user feedback on the new interfaces that were launched with Qimera version 2.0.0. Terminology has been improved in various dialogs, with the primary aim being to enhance clarity and reduce use of acronyms. Care has been taken to use terminology that is most commonly used and in some areas tool-tips have been added with further explanation. The behavior and layout of various dialogs has been improved for a cleaner and simpler user experience and workflow. All changes combined give an improved user experience. In addition a number of bug fixes have been made.

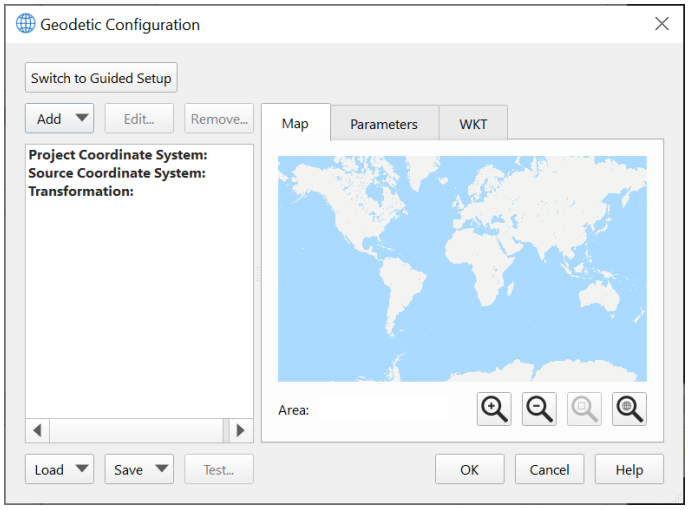
Starting with the project creation dialog, the previously used acronym CRS has been dropped in favor of full text.



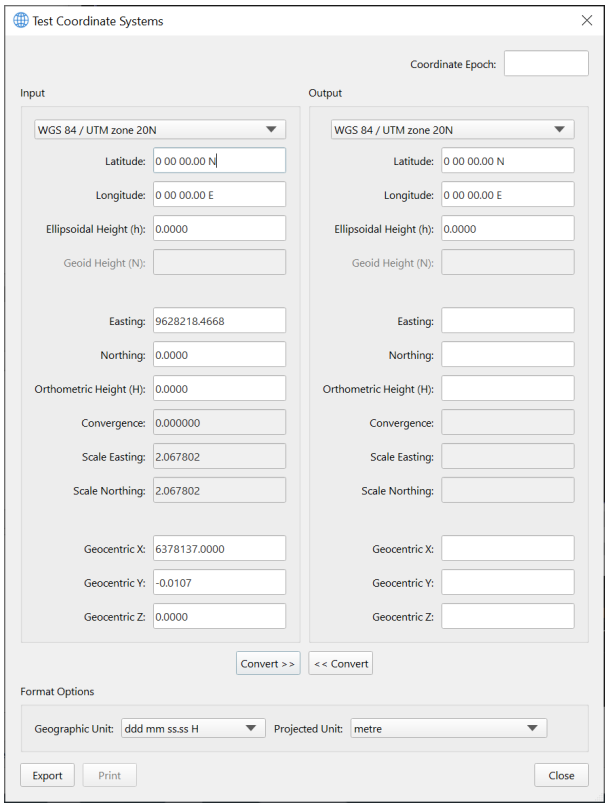
Moving next to the Geodetic Configuration dialog, there are several minor improvements as well. In particular, it is much clearer now that the Guided Setup and Advanced Setup options are mutually exclusive workflows: the Detailed Overview tab has been removed in favor of having to specifically click a button to switch to an advanced setup. Acronyms have been removed and clearer terminology has been used to make it clear what is required from the user. A help button has been added that will launch a web browser with the manual for the Geodetic User Interface.



The Advanced Configuration has improved as well, largely with a review of terminology to ensure consistency and clarity, and also removing acronyms in favor of full text to help users with limited geodetic knowledge. Action buttons are at the top left to guide the user to the logical first step to take when coming to this mode.



Lastly, the layout of the Test dialog has been improved as well to make it easier to compare geodetic test points with the current configuration, transform, vertical offsets, etc. We have used standard geodetic terms like "Ellipsoidal Height", "Geoid Height" and "Orthometric Height", along with the usual symbolic terms for these (h, N and H, respectively). As with the other dialogs, acronyms have been removed as much as possible. The vertical layout makes it easy to visually scan and compare between Input and Output systems, the previous layout of this dialog made it difficult to visually compare results between the Input and Output systems.



Filter Speeds & Improvements

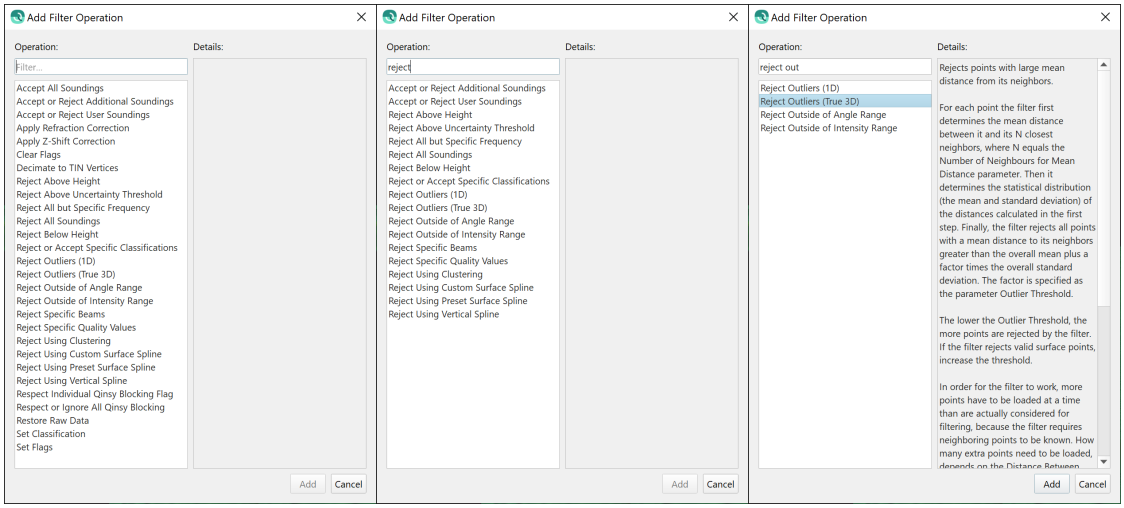
We have improved the processing speed of some of the more recently released filters. From testing of a standard "single day survey" data set:

- Cluster filter - Improvement of ~35%
- Intensity & TPU filters - Improvement of ~10x

Also, the filter selection dialog was getting quite messy so we've renamed some of the filters for consistency and clarity.

Old Name	New Name
Reject using Surface Spline (Preset)	Reject Using Preset Surface Spline
Reject using Surface Spline (Custom)	Reject Using Custom Surface Spline
Reject Specific Beam(s)	Reject Specific Beams
Z Shift Data	Apply Z-Shift Correction
TIN Decimation	Decimate to TIN Vertices
Accept Only Specified Frequency	Reject All but Specified Frequency
Accept Only Largest Clusters	Reject Using Clustering
Reject or Accept Specific Classification(s)	Reject or Accept Specific Classifications

We have added a text entry filter field where you can start typing to quickly isolate the filter you want. The image sequence below shows this in action.



Plotting & Editing Tools

In preparation for the eventual integration of the Fledermaus 8 visualization engine, we have rebuilt the plotting architecture of many of the plotting tools in Qimera. These are listed below, there are no user facing changes but we wanted to make all users aware that these tools have new architecture.

- Patch test
- Wobble tool
- Time-series Editor
- Multiplot tool
- SVP Editor
- Cross-check tool
- Profile tool
- Coverage/Extinction plot

In future releases, we will move to more complex tools such as the Swath Editor and Slice Editor. As part of the rebuild of the above tools, we did extensive testing and we have fixed several bugs and made general improvements. There are improvements made in other tools not included in the list above. These are all summarized below.

- Slice Editor
  - Improved responsiveness of editing tools, particularly the polygon selection tool
  - Auto-zoom behaviour in 3D Editor improved to adjust to vertical bounds of a new selection
  - New keyboard shortcut that applies the currently active filter from the filter toolbar: Shift + f
- SVP Editor

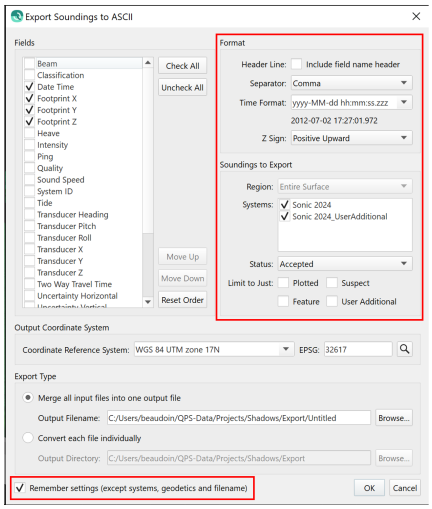
    - You can now delete multiple row entries at the same time, select the rows and hit the delete key.
    - While editing in the plot, the Control key will now allow you to quickly change from reject to accept, and *vice versa*. This is in alignment with how editing works in the Slice Editor and Swath Editor.
- Swath Editor
    - Improved text for water column viewer, it now indicates clearly when a file does not contain WC data, or if a ping is missing WC data.
    - Ctrl-Z keyboard shortcut will now undo selected soundings in the water column viewer, previously this was only possible with the undo button on the toolbar.
    - We are limiting visualization of MBE or SBE or laser and you can no longer view multiple sensors simultaneously (use Slice Editor or 3D Editor for this). The reason for this is that systems do not transmit synchronously, thus the concept of a ping by ping display breaks down. Further more, laser scanner scanning patterns are very different from multibeam, thus a Swath Editor is not always a good way to visualize the data.
- Multi-plot
    - You can double-click to add/remove items in the configuration dialog where you choose which time-series to plot.
    - Line thickness settings are remembered between sessions.
    - Home button behavior has been improved to correctly reset the view extents to the entire range of the loaded time-series.
    - The entire time-series is drawn now at full resolution. This will show any spikes. Previously, the data was decimated to speed up draw times, and the full resolution was only shown when zoomed in.
- Time-series Editor
    - The entire time-series is drawn now at full resolution. This will show any spikes. Previously, the data was decimated to speed up draw times, and the full resolution was only shown when zoomed in.
- ENC Editor
    - The TECSOU attribute for newly created S57 objects now defaults to '3' to indicate that it came from a multibeam echosounder. Previously, it defaulted to '1' to denote that it came from a single beam echosounder.
- Geo Picking dock
    - A button was added to the Geo Pick dock to promote discoverability on what this dock is used for. Previously, the user needed to know to choose the "Geo Pick" button from the main Scene toolbar.

- The "Auto Add Points" option has been removed. All Geo Picks are now added to the Geo Pick table.
- Profiling Tool
  - Line thickness settings are remembered between sessions.
- Patch Test & Wobble Tool
  - Rejected soundings are disabled for viewing by default

Imports & Exports

ASCII export of raw sonar files

The layout of the exporter dialog has been improved to have all user selection elements visible at the top level. This was done to reduce human error during export since the settings that were previously only visible when launching a secondary dialog were sometimes forgotten by users. Also, there is a new tickbox that allows users to have the dialog remember their last export settings. This covers the majority of the settings on the dialog with the exception of the selected systems (which can vary between different raw sonar files), geodetic settings and whether or not to export a merged file or single files.



Imports

Several changes and improvements have been made to various imports capabilities in this release. These are summarized below.

- GSF
  - We have cleaned up the handling of GSF beam flags so that they are treated in the same way regardless of import as raw sonar file or as processed points. This was done inconsistently before as these used different historic code paths.

    - Filtered flags in the GSF have filtered flags set in the QPD
    - Manual flags in the GSF have manual flags set in the QPD
  - The automatic Direct to QPD conversion has been disabled for GSF import.
    - The Direct to QPD process takes the GSF point solutions and re-references all point solutions to the sonar head, instead of the reference points, since this is the convention in the QPD.
    - This process is prone to incorrect results depending on the presence or absence of lever arm information between the sonar head and the reference point in the GSF, this being primarily a factor of the source of the GSF file itself.
    - Users bringing in GSF for raw sonar processing will be prompted to process the raw observations.
    - For users who wish to just do point editing, the option to import GSF as a Processed Point file provides an alternate workflow.
    - The capability to convert a GSF directly to QPD can still be triggered from manually from the Tools menu.
    - We have done this due to user feedback where the Direct to QPD results were nonsensical, but that would then be reasonable if the user decided to raytrace the solutions.
- LAS
  - Large LAS files that are imported will give users a warning about maximum file sizes supported by the QPD format in Qimera.
  - Previously, Qimera would attempt to convert the .las/.laz files into QPD, resulting in a crash or hanging software.
  - In the future, we will be working on methods to allow for import of larger .las/.laz files.

GSF Export

Several changes and improvements have been made to GSF export capabilities in this release. These are summarized below.

- We have cleaned up the handling of beam flags to improve workflows going to Teledyne-Caris HIPS.
  - Previously, beams that were rejected with a filter (as opposed to being rejected manually) were lost entirely upon import into HIPS and conversion to HDCS format.
  - This was due to a misunderstanding in how HIPS treats beam flags when coming in from GSF files.

    - We were able to clarify this with the cooperation of Teledyne-Caris and also Leidos, the maintainers of the GSF format.
- Setting a vertical separation model or a fixed vertical offset will now indicate that a GSF has had a vertical corrector applied in the book keeping that is done internally in the GSF.
    - The separation model value and/or fixed vertical offset will appear as a tide corrector when these exported GSFs are imported back into Qimera.
    - Previously, these offsets were not applied correctly for GSFs that were exported from Qimera and then re-imported into another project.
- Extra motion sensor data is written out at the end of the file in order to cover the entire transmit and receive cycle for deep water systems.
    - Since Qimera 2.0, the motion sensor data was capped at +/- 5 seconds from the beginning or ending of the time span associated with the multibeam sensor.
    - In this release, we extend the time cap at the end of the file so that deep water systems have additional motion sensor data.
- GSF export from KMALL files now includes the beam sector ID for each receiver beam.
    - Previously, this was omitted, and this would have affected re-processing capabilities if the GSF was re-imported for raw sonar processing.
    - It would not have affected the footprint positions or depths in the GSF itself.
- GSF export now has an additional option to include "Interpolated Soundings", this is for Kongsberg .all and .kmall files only.
    - It is meant primarily for .all/.kmall users who want to do backscatter processing in FMGT.
    - The GSF format does not have a natural way to highlight Interpolated Soundings as such and thus the FMGT option to include Interpolated Soundings has no effect (this is typically used to increase backscatter coverage at the edges of the swath).
    - This is a compromise mechanism for users who want to do this and it works by just flagging all Interpolated Soundings as Accepted, they are flagged as Rejected by default in Qimera.
    - This option will enable all of the Interpolated Soundings to be accepted during export to GSF, but it preserves the flagging logic in the originating QPD.

Removed Functionality

We have retired some older functionality for various reasons. We deemed these to be low risk removals, please get in touch with us if this impacts your workflows and we can help to find alternate solutions.

- Export Processed Points

- This functionality was under the Exports menu for raw sonar files. Since it provided export formats for very old formats which are no longer in use much, it was decided to remove it. It has been replaced by the Generic ASCII Exporter.

- Export Fledermaus Scene
  - We have removed the ability to export Fledermaus 7 .scene files. Fledermaus 7 does not support Version 5 Dynamic Surfaces which was released in Qimera 2.0. Fledermaus 8 can load the project directly without the need to create a Scene.

Miscellaneous

1. Project creation
   a. Added warnings to avoid users accidentally creating projects within projects.
   b. New setting that allows users to choose to have a fixed default project creation location.
      i. This was previously the behavior with Qimera 1, but it was removed with Qimera 2 when the new common New Project dialog was made in common with Qinsy, Qimera and Fledermaus.
      ii. We've brought back the ability to set a default project directory.
      iii. For now the default behavior is to change the new project start up location to be the most recent directory in which a project was created.
      iv. We may consider changing this in the future based on user feedback.
2. Processing
   a. Correct handling of dual-head Reson S7K data, previously the head tilt angles reversed. Note that this was JUST with Reson .S7K file format, data logged in Qinsy was not affected by this. This would have affected Norbit sensors as well.
   b. POSMV TrueHeave files handle the GPS week rollover now in the event that data is logged through the week rollover.
   c. Water column processing is now available for new Kongsberg KMALL when logged in Qinsy .db format, previously was only available when logged in Kongsberg .kmall format.
   d. Job Activity Log - Added date to the text entries, was previously just time
3. Scroll Selection
   a. Using Ctrl key and then left click now locks the scroll box to the closest line at the CLICKED position. Previously it would lock onto the selected line but then would place the box at the very start of the line.
   b. In the upgraded Surface Edit Overview, users can now lock the scroll box to any graphical line in the display, including track lines and imported CAD lines.

Qimera 2.2.0 - Documentation

Documentation has been updated to capture the changes to existing dialogs and workflows. The only new documentation of note is the Height-Matching add-on.

Qimera 2.2.0 - Resolved Bugs

Bug Fixes

Below you will find listings of bugs that have been reported in previous releases and have been solved for the Qimera 2.2.0 release. Many of these have been described further in the general Improvements section.

Summary	Priority	Affects Version/s	Component/s
Water column ping image out of synchronization with Swath Editor ping	☐	2.1.1	Water Column Tools
Qinsy .db database reports it contains no multibeam data	☐	2.1.1	Source Files
Interpolated Settings processing setting does not work for KMALL	☐	2.1.1	Processing Settings
Surface Edit Overview not saved after every subset move	☐	2.1.1	Surface Edit Overview
Scanning files when launching from Qinsy causes crash	☐	2.2.0	Source Files
Georeferencing error in export KML	☐	2.1.1	Exporting
Slice Editor crash	☐	2.1.1	Slice Editor
Crash when importing LAS files	☐	2.1.1	Source Files
Export CUBE surface not exporting CUBE layer	☐	2.0.2, 2.1.0, 2.1.1	Exporting

Summary	Priority	Affects Version/s	Component/s
Crash on import of LAS with WKT-2	☐	2.1.1	Footprint Generation
Qinsy split .db database reports it contains no multibeam data	☐	2.1.1	Source Files
Swath width incorrect due to grid units scaling	☐	2.1.1	Swath Editor
Filtered and Manual flags in GSFs come in differently depending on import type	☐	2.1.1	Source Files
Qimera not detecting QGFVOM when located in the project folder structure	☐	2.1.1	Heighting
Dynamic Surface won't load after crash	☐	2.1.1	Dynamic Surface
Bathymetric artifacts for FM sectors for EM302 KMALL format due to incorrect sector firing time delay	☐	2.1.1	Footprint Generation
Cell Information is showing wrong uncertainty value for Dynamic Surface	☐	2.1.0	Dynamic Surface
Licensing Error when launching Qimera Patch Test from Survey Manager when licenses split between dongle and softlock	☐	2.1.1	Patch Test
Slow editing updates with Slice Editor	☐	2.1.1	Slice Editor
Dynamic Surface export to Sounding Grid results in grid in Survey Manager without min/max layers	☐	2.1.1	Dynamic Surface

Summary	Priority	Affects Version/s	Component/s
Cube filtering with selection leaves a buffer of protected soundings	☐	2.1.0	Footprint Cleaning
Crash when navigating through Dynamic Surfaces	☐	2.1.1	Navigation Processing
Slice Editor manual rejections not updated and reject polygon rejecting extra data when auto zoom turned on	☐	2.1.1	Slice Editor
Entering negative refractor depth causes data to jump two times the value of the depth in Filter Toolbar's refraction filter	☐	2.1.1	Raytracing
Importing Hypack Sound Speed files (.vel) causing crash	☐	2.1.1	Source Files
Exported Scene from Qimera does not load into Fledermaus	☐	2.1.0, 2.1.1	Exports
After applying TU Delft Speed inversion one of the files can't be used	☐	2.1.1	Workflow
Slice Editor application of filters with Fixed or Free Slice applies to entire outer selection box	☐	2.1.0	Slice Editor
Incorrect handling of GPS week rollover with POSMV .000 files	☐	2.0.2, 2.1.0, 2.1.1	Source Files
Failure to recompute shading in selected area while Slice Editing	☐	2.1.1	Slice Editor
Time Series Multiplot "Home" button does not work properly with certain offset and scale changes	☐	2.0.3, 2.1.0	Time-Series Multiplot

Summary	Priority	Affects Version/s	Component/s
Slice Editor crash, corrupts project	☐	2.1.0	Dynamic Surface
Crash when making a line selection	☐	2.1.1	Swath Editor
Surface freezing on update or movement causing crash	☐	2.1.0, 2.1.1	Slice Editor
Slice Editor Auto Zoom not working in 3D view	☐	2.1.1	Slice Editor
Option to limit horizontal bounds are not respected for Static Surfaces	☐	2.0.3	Static Surface
Water column ping image out of synchronization with Swath Editor ping	☐	2.1.1	Water Column Tools
Cross Check Tool crash when Dynamic Surface selected	☐	2.1.0	Cross Check
Partial import of Teledyne-Reson .s7k file	☐	2.1.0	Source Files
Motion calibration values are not remembered in Patch Test Tool when applying to motion sensor instead of multibeam	☐	2.1.0, 2.1.1	Patch Test
Default view layer for new surfaces incorrect on project reload and inconsistent with displayed layer	☐	2.1.0	Dynamic Surface
Crash when building CUBE surface	☐	1.7.2	Dynamic Surface
Scroll slice selection crashes and/or jumps	☐	2.1.0	Slice Editor

Summary	Priority	Affects Version/s	Component/s
Scroll wheel click activates selection tool in 3D Slice Editor	☐	2.1.0, 2.1.1	Slice Editor
Data "Erased" in Time-Series Editor not visible anymore with Dark Theme in color preferences	☐	2.1.0, 2.1.1	Time-Series Editor
Instant Reject results not functioning correctly from Filter Toolbar	☐	2.1.1	Dynamic Surface
Default view layer for new surfaces incorrect on project reload and inconsistent with displayed layer	☐	2.1.0, 2.1.1	Dynamic Surface
Patch Test could not find matching multibeam system to update	☐	2.1.0	Patch Test
Draping an image on a static surface with illumination causes crash	☐	2.1.0	General Views
Surface no longer able to toggle in Profile View	☐	2.1.0	Workflow
Default path has second backslash for ENC installation path in user preferences	☐	2.1.0	Architecture
Dynamic Surface not updating after application of SVP changes	☐	2.0.2, 2.1.0	Processing Settings
Application freeze with large Dynamic Surfaces	☐	2.1.0	Dynamic Surface
TU Delft Sound Speed Inversion gives strange results	☐	2.1.0	Sound Velocity Correction

Summary	Priority	Affects Version/s	Component/s
LiDAR calibration slow in Patch Test tool	☐	2.1.0	Patch Test
Wobble Tool Plot buttons for window settings are inactive in some instances	☐	2.1.0	Wobble Tool
Application freeze when working with large Dynamic Surface	☐	2.0.2	Dynamic Surface
Crash when launching 3D Slice Editor	☐	2.0.3, 2.1.0	Slice Editor
Grid is incorrectly shown in cases of extreme geographic point outliers	☐	2.0.2	Dynamic Surface
Application freeze during import of large .las files	☐	2.0.2	Laser
Incorrect color bar colors after changing shading azimuth	☐	2.0.2	Dynamic Surface
Incorrect handling of GPS week rollover with POSMV .000 files for True Heave	☐	1.7.6, 2.0.2	Navigation Import
Keyboard shortcuts in Slice Editor not working after slice box is turned 90 degrees using rotation buttons	☐	2.0.0	Slice Editor
Selection box properties do not allow numeric entry to go below 1.0	Trivial	2.0.0	Slice Editor
Abnormal high CPU usage while waiting for a dialogue box	☐	1.7.3	General
Occasional failure to create cleaning projects	☐	1.5.7, 1.7.6	Workflow

Summary	Priority	Affects Version/s	Component/s
Error in reported speed and SVP filenames in NOAA CSV export	☐	1.7.6, 2.0.2	Exporting
Failure to import all objects from .shp file, only partial import	☐	1.7.6	CAD
Qimera Live double imports .db files, resulting in overwrite of existing QPD	☐	1.7.6	Source Files
Cannot apply motion sensor latency to vessel configuration from Wobble Tool	☐	1.7.2	Wobble Tool
Transparency issue with Surfaces and geo-images	☐	1.7.6	Dynamic Surface
Incorrect roll offsets when importing Reson s7k files	☐	1.7.6	Source Files
Viewed/edited layer is not updated in Surface Edit Overview after moving project folder location	☐	1.7.5, 1.7.6	Surface Edit Overview
Patch Test Tool gives incorrect results when applying to the motion sensor	☐	1.7.5	Patch Test
Error in loading TPU configuration after making change to motion sensor TPU settings	☐	1.7.3	Footprint Generation
Duplicate Hypack .hsx import cause conflicts with QPDs	☐	1.7.4	Source Files
Placemarkers for SVP & Tide Stations are underneath Background Charts	☐	1.6.2	4D View
Scroll slice select doesn't work with partitions enabled in Surface Edit Overview	☐	1.6.2	Surface Edit Overview

Summary	Priority	Affects Version/s	Component/s
Water column image does not display when laser data present in addition to multibeam	☐	1.6.1	Water Column Tools
Duplicate file import causes conflicts with QPDs	☐	1.6.1	Source Files
Surface name in Profile Tool does not change after renaming a Dynamic Surface	☐	1.6.1	Dynamic Surface
Fixed Slice Select errors when selecting in 3D view mode	☐	1.6.1	Slice Editor
Home button not working to reset view in Time-Series Multiplot	☐	1.6.0	Time Series Tools
Time properties of Navigation data incorrect in Properties dock, reporting time referenced to 1970	☐	1.6.0	Navigation Import
Duplicate file import causes conflicts with QPDs	☐	1.5.7	Source Files
Rotating Scroll Selection with 'Rotate 90' buttons freezes selection.	☐	1.5.7, 1.6.0, 1.6.2	Slice Editor
Shading remain visible even though data is rejected	☐	1.5.7, 1.6.0	Dynamic Surface
Selection box shifts down after editing when in 3D view mode	☐	1.5.7, 1.6.0	4D View
Patch Test Tool error in computed footprints when adjusting heading	☐	1.5.7	Patch Test

Summary	Priority	Affects Version/s	Component/s
Placemarkers for SVP & Tide Stations are underneath Background Charts	☐	1.5.7, 1.6.0	4D View
Multiplot does not display beam tilt angle data reasonably when beam tilt angle is constant throughout the file	☐	1.5.7	Time Series Tools
Depth difference between sectors EM2040 due to incorrect scaling of sector firing time offsets for Extra Detections	☐	1.2.5, 1.4.4	Raytracing
Vessel Editor crash	☐	1.5.4, 1.5.5	Vessel Editor

Qimera 2.2.0 - Known Issues

For this release, the following are known issues which we plan to address in upcoming releases.

Issue	Description	Affects Version	Expected Fix Version
Limitation	Filter toolbars to "Accept All Soundings" and "Revert Manual Edits" do not have the intended effect when used in a Cooperative Cleaning project to over-ride cleaning that was done manually in the Master project prior to creating the Cooperative Cleaning project. Suggested workflow is to use the manual re-accept tools in the Slice Editor and 3D Editor.	2.1.0	2.2.x
Bug	Opening QINSy 8 projects in Qimera version 2.2 will upgrade the Dynamic Surface but will not compute the shading correctly, resulting in a very dark surface. The workaround is to launch the "Recompute Surface Illumination" process from the Dynamic Surface menu. This problem only applies to QINSy 8 projects, the illumination works fine with Qinsy 9 projects.	2.2.0	2.2.1

Qimera 2.2.0 - All Implemented Feedback

Key	T	Summary	Votes
FQM-108	↑	Height matching to a reference surface or a reference line or lines	17
FQM-373	↑	Improve load time of Surface Edit Overview	10
FQM-345	↑	Improve interoperability with NOAA QC Tools	10
FQM-128	↑	Filtering - Angle Filtering	10
FQM-457	↑	Filtering - Improve speed of filters	9
FQM-110	↑	Filter: Grid-based spatial filters	9
FQM-310	↑	Implement point cloud filters from the Point Cloud Library (PCL)	8
FQM-328	↑	Clip Outliers	4
FQM-334	↑	Run Qimera from the command line	3
FQM-222	↑	Time-series editor: Subsampling should respect minimum/maximum range to always ensure spikes are visible	3
FQM-519	↑	Export - Improve layout and usability of Export Soundings to ASCII dialog	1

11 issues

Qimera 2.2.1 Release

Unknown macro: 'viewport-redirect'

Qimera 2.2.2 Release

18 June 2020

We're pleased to present Qimera version 2.2.2, a maintenance release addressing small issues. Read below for details.

Vote



Click on the icon above and vote on or create a Feedback issue!

Highlights

- Interpolation is now possible with CUBE depth surfaces, all other CUBE related fields like hypothesis count are left at zero.
- License Manager will now display disabled products to allow for proper de-activation in the event that the user would like to re-activate.

Bugs

- Tools and Editors
  - Measure Tool - Crash when enabling view of Dynamic Surface after running measuring tool
  - Measure Tool - Crash when doing a measurement for the second time
  - Profile - Red dot indicator stops when outside main dynamic surface
  - 3D Editor - Sometimes reporting no soundings loaded in selected area
  - Slice Editor - Removed maximum cap on vertical exaggeration control (50x)
  - Slice Editor - Fixed crash when warning that maximum point count is reached
  - Swath Editor - Pick/add soundings with dual swath KMALL
  - Swath Editor - Fixed crash that occured with Qinsy .db files containing multiple objects
  - TU Delft Sound Speed Inversion - Disallow algorithm from working on laser data

    - TU Delft Sound Speed Inversion - Fixed problem where some data rejected after running inversion
- Patch Test Tool
    - Tools and Docks - Patch Test Tool - Lines don't clear after deselection
    - Patch test - Tickbox to apply/unapply offset was not working
- Surfaces
    - Appending to grid - Surface was not expanding correctly when data was appended outside of grid bounds
    - Duplicating a Surface - Newly duplicated surface was including files that were removed from the original surface
    - Fixed crash when building CUBE surface
    - Surface Difference - Fixed use of area selection which was applied inconsistently depending on the order that surfaces were selected
    - Export - Fixed problem where Export to surface was not respecting the user's choice of selected layer
    - CUBE filter soundings - Option to Clear Rejected Flag was not working correctly
    - CUBE filter for soundings - Dialog was defaulting to "Selection" when there is no selection made
- Other
    - Overview Widget - Improve consistency in color map application between Scene and Surface Edit Overview after application of large z-offet to a Dynamic Surface
    - Fixed Time-Series Editor crash that occurred after selecting a particular file in the project overview
    - qimera-command now works with relative paths given on the command line
    - Project Sources - Ctrl+A was selecting files from multiple types
    - Project name was truncating in the title bar if it contained any periods in the project name
    - Color Maps - Fixed importer for GMT .cpt color map files
    - Background ENC chart SD showing up in 'Drape Imagery onto Surface' dialog

Feedback Project

For more information, see our Voting System Policy and Using the feedback project.

The Feedback Project helps us to continue improving our software products. Vote on or implement feedback and participate in the process by tracking, watching and commenting on issues!

Please click on the Vote button to the right to go to the Qimera Feedback Project and implement or find the item you want to vote for.

Qimera 2.2.3 Release

16 July 2020

We're pleased to present Qimera version 2.2.3, a maintenance release addressing small issues. Read below for details.

Vote



Click on the icon above and vote on or create a Feedback issue!

Highlights

- QGF import and conversion to .sd format now supports area objects, previously only point and line objects were supported.
- GSF export from Qinsy .db files now are fully populated with sonar ping metadata and beam average results in the case of snippets information being absent. This improves export of the following systems when acquired in Qinsy .db format: R2Sonic, Norbit and Reson systems. Previously, the sonar ping metadata was only populated if snippet records were recorded. This now allows for backscatter processing in FMGT for these systems when only beam average backscatter is recorded.
- Dynamic Surface creation dialog now has better labeling to help users with limiting the z-range. The labels z-min and z-max have been changed to Deep and Shallow, respectively, in order to guide users to correct input. The warning dialog that is launched after doing error checking on data entry of these fields has been also improved to remind users that depths require a negative sign.
- CUBE - Changed default area of application to be the *Entire Surface* instead of the *Selected Area* for following dialogs. Previously the default was set to Selected Area, even if the user did not have an area selected. This change brings these dialogs into alignment with other dialogs

that force users to take an extra step to have a selected area be used for an operation, e.g. Creating a Dynamic Surface, Exporting grid layers.

- Create Custom Hypotheses
- Re-CUBE Area
- CUBE Filter Soundings

Bugs

- Processing / Source Files
  - Fixed error that cleared the Checked flag in the grid during re-grid operations, specifically when re-enabling surface updates.
  - Fixed problem with TU Delft Sound Speed Inversion with heavily steered beam angles that are nearly horizontal.
- Tools and Editors
  - Fixed Water Column sounding picking for KMALL format dual swath configurations where a single user pick would result in two points.
  - Slice Editor now allows user to cancel loading of large point clouds, previously it would just warn and allow the user to cancel but would still attempt to load the points anyway.
- Importing / Exporting
  - Add warning on import of BAG files too large to be accommodated by .sd format. BAG files are converted to .sd format and are represented as Static Surfaces in Qimera. The .sd format is limited to 65535 rows/columns, in previous versions Qimera would hang or crash when very large BAG files were imported.
  - In Qimera 2.2.0, we released a fix that stopped import of raw sonar files that had duplicate file names. This was previously causing problems with the resulting QPDs since Qimera could not support having separate QPDs. The fix we put in place to stop import of duplicate filenames inadvertently affected import of other formats with duplicate filenames like SVP, POSMV, HIPS Processed Depths and some tide file formats. The duplicate file name fix has been narrowed in scope to only check for raw sonar files. All Qimera 2.2.0, 2.2.1 and 2.2.2 users should upgrade to 2.2.3 if your workflows involve: (a) importing SVP, POSMV or Tides, or (b) working with Caris HIPS Processed Depths for point cleaning.
  - Fixed crash on import of some Hypack .vel sound velocity files that had unexpected date/time formatting.
  - Added check on latitude/longitude range on import of Hypack .vel sound velocity files to limit conversion of positions to reasonable latitude and longitude ranges.
- Other

  - Color preference for display of Filtered Soundings has been enabled, it previously had no effect in the various point editors.
  - Text in warning messages from the Filter Toolbar have been changed to match terms in the Filter Toolbar's "File Selection" combo box. Previous warning messages used the term *Lines* instead of *Files*.
- Geodetics
  - Fixed Geoid XML file to have proper new unique ID for AusGeoid2020.
  - Fixed error in handling of transform parameters related to HARN.

Feedback Project

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Qimera 2.2.4 Release

13 August 2020

We are pleased to present Qimera 2.2.4. This is a hot fix release in which we are providing a fix for a single bug that has been reported by several users recently. The bug was an error in re-gridding after edit operations, the edge of a selected area for a re-grid would be left with a small, single-cell boundary artifact due to a misalignment between the area covered by the edit operation and the re-grid and re-shade operation. The solution was to re-compute the shading for the area. The fix in this release targets just this problem so any user who has downloaded Qimera 2.2.2 or 2.2.3 is encouraged to immediately upgrade to 2.2.4.

The bug slipped through our automated QA processes and steps have been taken to ensure this type of bug does not occur again with the addition of finer grained test suites that specifically monitor for this kind of problem.

We are still expecting to provide another maintenance release later in August with a number of other fixes, along with Mac and Linux versions for the 2.2.X feature set.

If you have any concerns or questions at all about how this might affect your workflows, please don't hesitate to contact us using our support portal or by giving us a call.

Vote



Click on the icon above and vote on or create a Feedback issue!

Feedback Project

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Qimera 2.2.5 Release

31 August 2020

We are pleased to present Qimera 2.2.5

Highlights

In the 2.2.5 release, we're pleased to make the Mac and Linux versions of Qimera available. All the features that were released in the 2.2.0 version are now available to Mac and Linux users. The last Mac and Linux release was version 2.1.1, released in February, 2020. All further maintenance releases associated with v2.2.X will now include Mac and Linux.

Bugs

- Processing / Source Files
  - Renishaw Dynascan laser processing now correctly works with imperial units.
  - Dual swath KMALL now supports WC picking.
  - Fixed bug where combined MBE and laser data created step type artifacts in QPD and Dynamic Surfaces when the MBE was using a fixed sound velocity instead of an SVP for ray tracing.
  - TVU/THU surfaces will now compute for Processed Points files for Dynamic Surfaces that were generated with both Raw Sonar Files and Processed Point Files. Previously, it was only including Raw Sonar Files when working with a Dynamic Surface with blended inputs.
- Dynamic Surfaces
  - Fixed problem with removing lines from a Dynamic Surface when the line extents were selected using any of the spatial selection tools.
  - Fixed bug where duplicating a Dynamic Surface that had depth clipping resulted in a surface without depth clipping.
  - Fixed problem with reshading of Dynamic Surfaces that had a period in the file name.
  - The Dynamic Surface update bug that was addressed in v2.2.4 was increased in scope to also handle the same update problem when appending lines to a Dynamic Surface.
- Tools and Editors
  - Fixed lag in point selection in 3D Slice editor.
  - Added more descriptive start up prompt for Slice Editor, including the embedded 3D Slice to improve discoverability.

    - Fixed crash in Swath Editor when dual head .db files are loaded in which only one of the heads contains water column data.
- Importing / Exporting
    - LAS/LAZ export now honors rejected status flag for point format 6 and includes the rejected soundings by default. Previously if the user chose to include the rejected soundings with point format 6, they were included but were no longer marked as rejected in the resulting LAS/LAZ file.
    - Tide tool now allows for POSMV .000 files with file extensions greater than *.099 to be imported.
    - Floating point geotiff export metadata now has z-range of valid data, previously it had z-range of all data which included the rejected data.
    - Fixed bug with Import Large ASCII files which resulted in false spike artifacts when breaking large ASCII files across multiple QPD files.
    - Import of Hypack .vel sound velocity files now correctly reading the date/time. A stability fix was included in v2.2.3 to better handle malformed .vel files but this accidentally introduced a bug that then prevented parsing of date/time for normal .vel files.
- Other
    - Fixed crash for updating a CUBE surface after running a Spline Filter.
    - Fixed crash when launching 3D Editor.
    - Clarified licensing messages when running Qimera without a license for cases of (a) Qinsy 9 is installed, and (b) Qinsy 9 is not installed.
    - Improved handling of QPD file paths for project with multiple external sources of QPDs in which the main project's file path is changed (i.e. the project is moved elsewhere on the file system, or to another file system).
    - Fixed bug that prevented moving of groups in the Project Sources dock.

Vote



Click on the icon above and vote on or create a Feedback issue!

Feedback Project

For more information, see our Voting System Policy and Using the feedback project.

The Feedback Project helps us to continue improving our software products. Vote on or implement feedback and participate in the process by tracking, watching and commenting on issues!

Please click on the Vote button to the right to go to the Qimera Feedback Project and implement or find the item you want to vote for.

Qimera 2.3.1 Release

December 4, 2020

We're pleased to present Qimera version 2.3 In this release, we introduce a few new features, with a focus on horizontal and vertical shifting tools along with many improvements that were requested. Read below for details.

Highlights

- Vertical Shifting tools for single and varying shifts
- Horizontal Shifting tool to correct for positioning errors
- Time series shifting, interpolation and extrapolation tools
- Re-classification tools for LAS/LAZ to set or modify classification at the point level

Voting System

In this release, we have completed 16 Suggestions from users, which satisfies 145 votes. For more information, see our Voting System Policy and Using the Voting System.

The Voting System helps us to continue improving our software products. Vote or provide feedback and participate in the process by tracking, watching and commenting on issues!

Please click on the Vote button to the right to go to the Qimera Voting Page and implement or find the item you want to vote for.

Vote



Click on the icon above and vote on or create a Suggestion issue!

- Qimera 2.3.1 - Important Notes
- Qimera 2.3.1 - New Functionality

- Qimera 2.3.1 - Improvements
- Qimera 2.3.1 - Documentation
- Qimera 2.3.1 - Resolved Bugs
- Qimera 2.3.1 - Known Issues
- Qimera 2.3.1 - Implemented from Voting System

Qimera 2.3.1 - Important Notes

On this page:

- Licensing
- Installers
- QPS Project and file format versions
- Support for Qimera v1.X
- End of support for Qimera on Windows 7

Licensing

Existing Qimera users with a license that is under maintenance will be able to install and run Qimera 2.3 alongside Qimera 1, using the same license. No changes to the license configuration have been made with this release with the exception of the Height Matching add-on now including the new Horizontal and Vertical shifting tools.

Installers

The Qimera installer will install by default into sub-directories with the version name under the typical install path, which is usually C:\Program Files\QPS\Qimera. This allows multiple installations quite easily and follows the trend that Qinsy has been using for some time. Users with Qimera 1.X or 2.X already installed will find that Qimera 2.3.1 will install into the Qimera 1 directory, but in the 2.3.1 sub-directory of the Qimera 1 installation folder.

QPS Project and file format versions

With this release, the QPS project version has NOT been upgraded and projects are therefore compatible with previous projects made with Qimera 2.2, but not with projects created in Qimera 2.1 or earlier (due to a project number change with the release of Qimera 2.2). The project number is upgraded rarely, in the case of the previous Qimera 2.2 release, it was done due to significant changes to the Grid 5 file format and ancillary files. These changes prevent the use of these surfaces in previous versions of Qimera.

Projects created with Qimera 1.X or Qimera 2.1 can be upgraded to work in Qimera 2.3 but it will not be possible to go back. It is suggested to back up a Qimera 1 or Qimera 2.1 project prior to opening it in Qimera 2.3, in case problems are encountered.

Before the upgrade of a Qimera 1 or a Qimera 2.1 project, a backup of existing Dynamic Surfaces will be made in the project to ease recovery in case of problems.

Support for Qimera v1.X

Summary:

Qimera 1 will be replaced by Qimera 2. This means that support will stop on December 31st, 2021.

Support for Qimera 1:

What will be supported until the end-of-life:

- Fixes and patches will in general only be for critical and blocker bugs. Less critical bugs are also candidates to be fixed but this is not guaranteed.
- The software will be tested by our test protocols for the current operating systems.
- Support questions will be answered.
- Training for Qimera 1 until December 31st, 2021.
- On site support for Qimera 1 until December 31st, 2021.

End-of-Life:

Qimera 1 will reach end of support on December 31st, 2021. Following this date, no fixes or patches will be made available.

Following this date issues related to Qimera 1 versions will not be processed. Support questions will not be answered.

No training or on site support will be given.

Note that perpetual Qimera 1 licenses will continue to function.

End of support for Qimera on Windows 7

Microsoft has ended Support for Windows 7 in January 2020 and QPS will also stop supporting Windows 7. Qimera v2.2 was tested on Windows 7 without a problem, but as announced with the v2.2. release notes, it is the last version that will be tested for Windows 7. Qimera 2.3 is not tested for Windows 7.
Any problems with this version related to the Operating System will not be solved.

It is highly recommended to switch to Windows 10.

Qimera 2.3.1 - New Functionality

On this page:

- Introduction
- New Horizontal and Vertical Shifting Tools
- Time-series freehand tools for shifting, interpolation and extrapolation
- Re-classification Tools

Introduction

In this release, we introduce a few vertical and horizontal shifting tools to add to the Height-Matching add-on that was released with Qimera 2.2. These are meant for use offshore where vertical and/or horizontal referencing can be more challenging, for both surface and subsurface vehicles. Contact sales@qps.nl if you'd like to arrange for an evaluation of the height-matching add-on.

We've also added some of the time-series editing tools from Qinsy's Validator tool to allow for more options and flexibility when reviewing and editing time-series data. For bathymetric lidar users, we've added some capabilities to do granular reclassification of points for LAS/LAZ files. Finally, we've also added kilometer post (KP) support for Qinsy users that have a route loaded in their project for which KP is reported along the route. Read on below for more detail!

New Horizontal and Vertical Shifting Tools

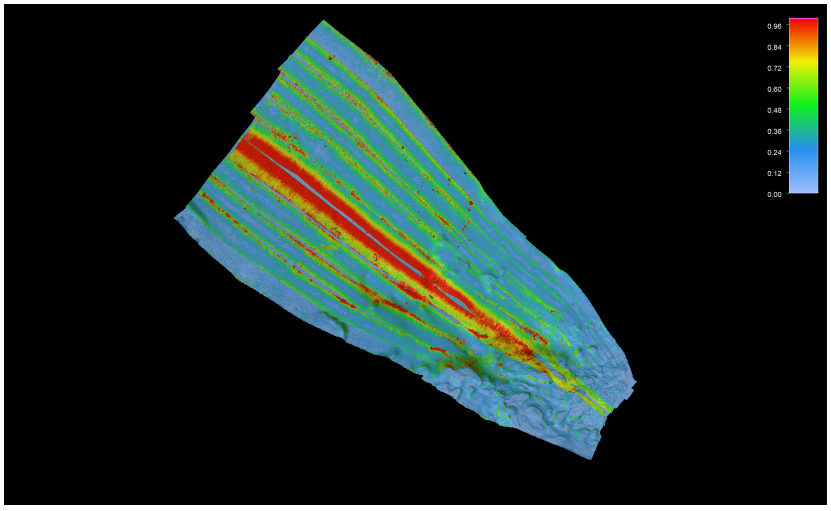
There are three new tools being added to the Auto-Height Matching add-on that was released with Qimera 2.2. Before diving into the details for each tool, let's first look at what they all have in common:

- All three new tools are included in the Auto-Height Matching add-on. Contact sales@qps.nl to setup an evaluation.
- They all have a common application use case: working offshore where horizontal and/or vertical referencing can be challenging, especially for sub-sea vehicles
- All shift the underlying point cloud, in case you need to deliver point clouds as a final product as well
- All can be reported with specialized exports within each tool
- Overview of resulting shifts can be reviewed and reported on from the Processing Settings

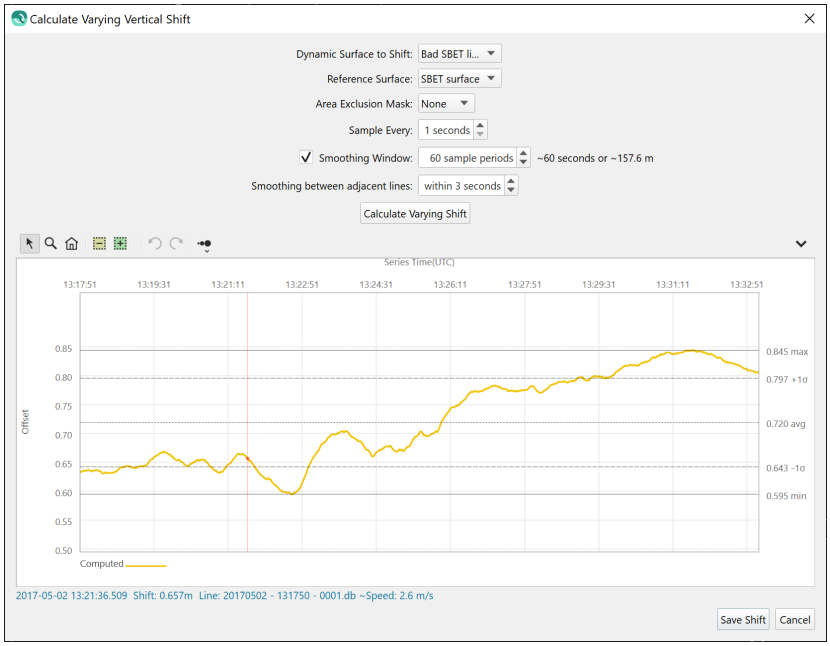
Varying Vertical Shift Tool

This tool computes a time-varying vertical offset between two surfaces using the statistical data generated by a traditional surface difference. The main advantage of this particular tool is that it examines the ping point cloud data in the Dynamic Surface that you wish to shift and uses this to determine the optimal shift along the navigation track, allowing the shift to thus vary along track. This can be used to correct for a number of dynamic errors such as tide drift, heave bandwidth, or just differences in vertical referencing in between successive surveys. The tool is designed to work optimally, for the moment, for long linear corridor surveys such as those running along a pipe or cable route where the survey must be matched against a previous survey to assess changes in seabed conditions in the vicinity of the pipe or cable. It can be used though to repair problems with height accuracy drop outs with post-processed navigation, for example, as shown in the four part sequence below where a single survey line with a poor SBET solution is repaired against a surface build from the neighboring lines.

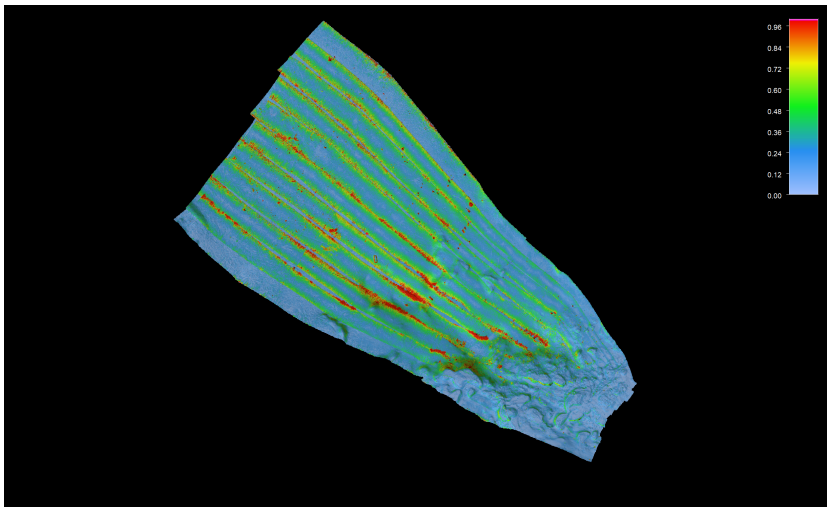
Part I - One survey line has no SBET applied, a Dynamic Surface was created for this one line. A reference surface was created with all other lines for which the SBET was successful. Coloring is by uncertainty, +/- 1.0 m.



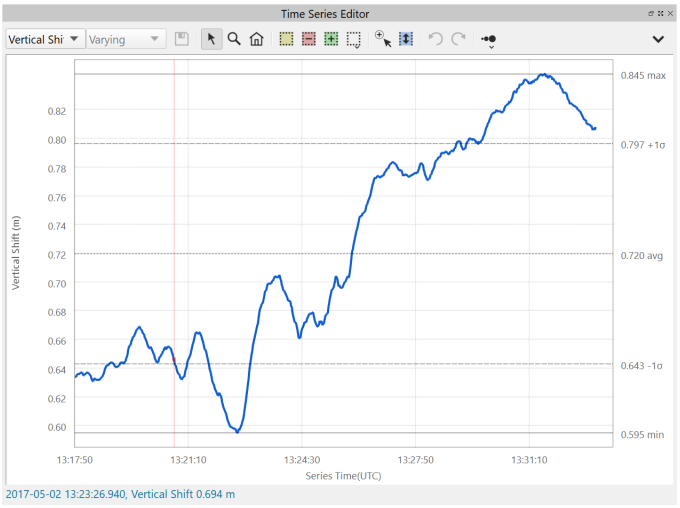
Part II - The Varying Vertical Shift Tool is run and a vertical corrector time-series is created for the survey line without SBET height. A 60 second smoothing was applied to ensure that only the low frequency tidal effects are captured in the corrector time-series.



Part III - The vertical corrector was applied and the Dynamic Surface was updated to show the final effect: the long section of high uncertainty has been removed entirely, demonstrating that a reasonable height solution has been found to remedy the missing SBET data for the survey line.

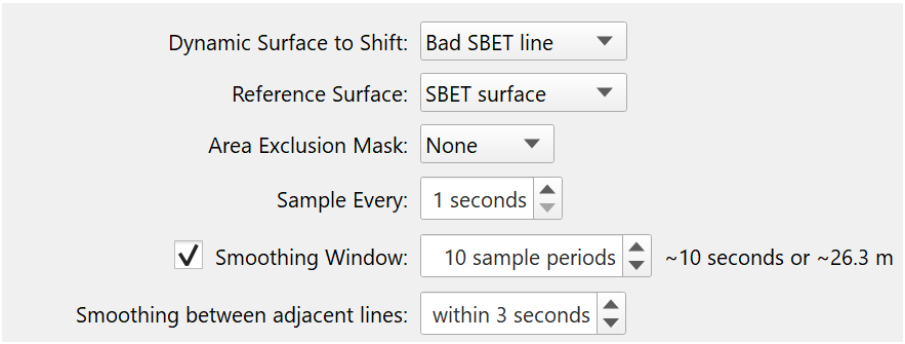


Part IV - The varying vertical shift for the survey line can be viewed in the time-series editor. It can also be EDITED using the existing tools, and can be very powerful when combined with the new time-series freehand interpolation, extrapolation and shifting tools.



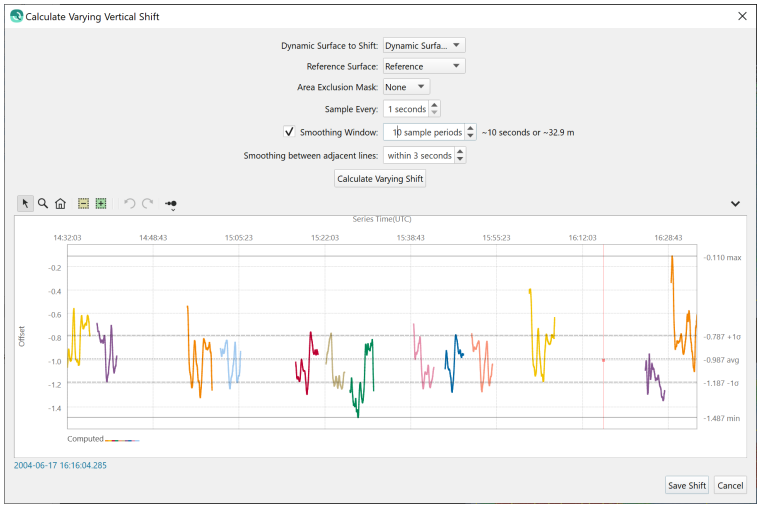
You can select a line object in the scene to use as an *Area Exclusion Mask*. This will *mask* out areas you don't want to be part of the statistical computation. For example, if the primary survey contains rock dumping and the reference surface does not, you can mask out the area of the rock dumping which allows the algorithm to compute more accurate statistics.

The results are computed as a time-series of vertical shifts for all the lines that contribute to the Dynamic Surface, this is done at a fixed time interval and you can smooth the output as well within the tool. There is also the capability to allow for joins across survey lines along the route as long as the time gap between the lines does not exceed the specified tolerance for interpolation across a file boundary. These options are shown in the subset of the main dialog, below.



Once you save the results using the *Save Shift* button, the results will be stored for each file as a time-series of shifts that can be reviewed and edited in the time-series editor as a "Height Shift" time-series. Qimera will prompt you to reprocess the relevant files after you run the tool and every raw sonar file that is part of the Dynamic Surface you are shifting will have a continuous vertical shift applied on a ping-by-ping basis. Qimera will then prompt you to update all Dynamic Surfaces containing the affected lines. A statistical summary of each file's continuous shifts can be reviewed in the Processing Settings.

The tool can run with a Dynamic Surface that contains many survey lines as well, here's a view of the tool when many lines have their Dynamic Surface matched against a reference.

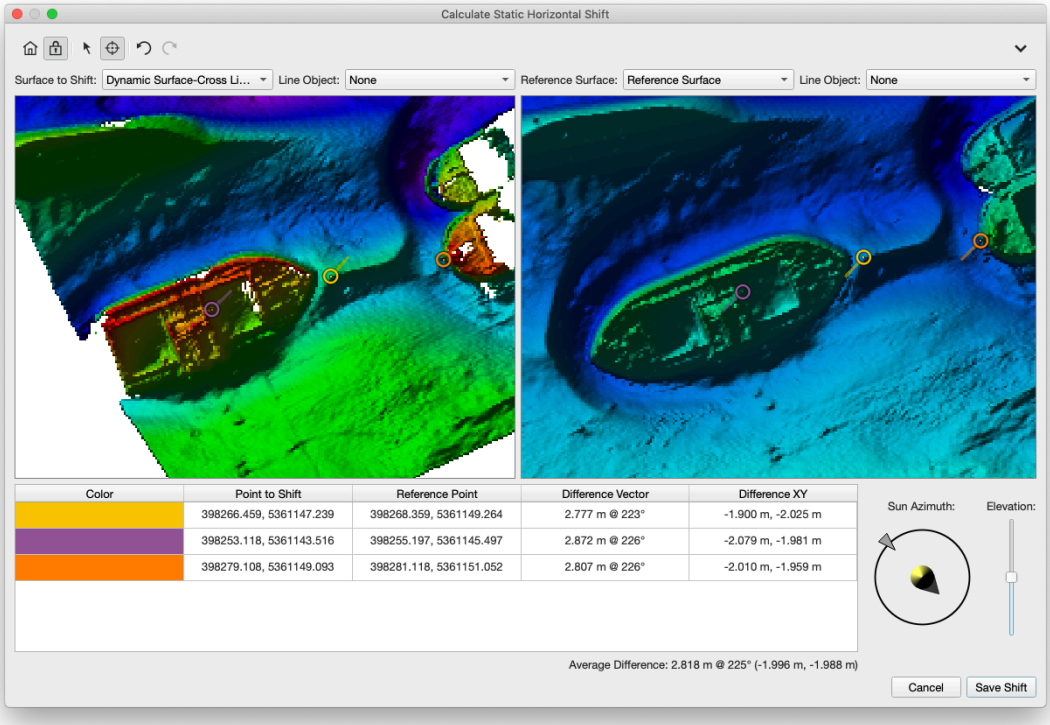


The Varying Vertical Shift tool can also be used to repair portions of a line for which the vertical referencing is poor from, for example, a short lived GNSS burst dropout. This is best done with the new time-series freehand interpolation, extrapolation and shifting tools as well to craft an optimal shift for the GNSS outage window.

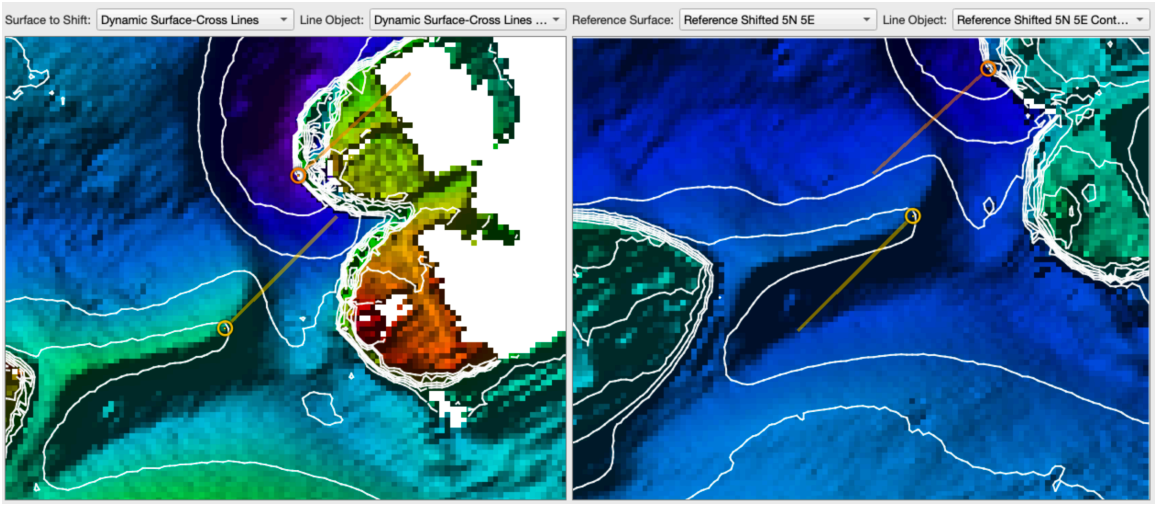
Horizontal Shift Tool

The Static Horizontal Shift Tool allows a user to align a Dynamic Surface from a survey to another reference surface that could be either a Dynamic or Static Surface. This type of tool is valuable for getting surface to match when one of the two surveys has a horizontal shift for whatever reason, this can occur with AUV/ROV missions for example. For this release, we allow for a single common horizontal shift to align surfaces, the resulting calculated shift is stored as a Processing Setting for the contributing raw sonar files that can be enabled/disabled.

The user does this by selecting a number of corresponding matching point pairs on each surface, which are referred to as fiducial points. Qimera will then compute an average XY offset between all fiducial pairs that can then be applied to the raw sonar files of the Dynamic Surface the user desires to shift. Typically, the user picks corresponding features on the seabed or corresponding features of line objects such as contours to use as fiducial points. The user can pan or zoom around either surface view and the same corresponding geographic location will be at the center of the view when the views are "locked". The average XY offset is computed by averaging the XY displacement of all fiducial pairs in the Point Table. As you register fiducial pairs by clicking on like features in each window, circular icons appear that represent the location of each pick.



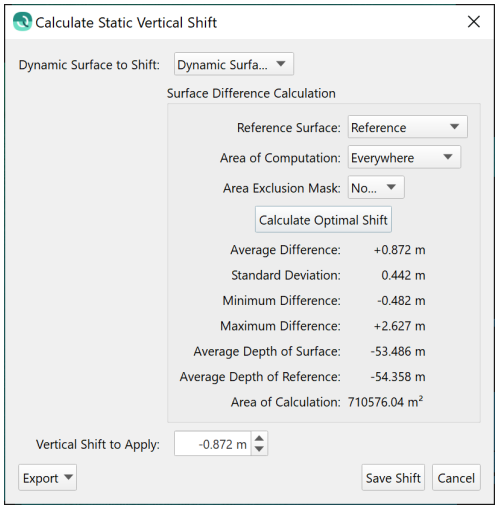
Dynamic illumination controls allow you to change the sun azimuth and elevation to highlight features on the surface. In the event that features aren't readily visible on the surface, you can also prepare contours of each surface and have these displayed as well to assist in identifying common fiducial points.



Static Vertical Shift Tool

This tool allows users to shift a Dynamic Surface, and the contributing QPD point cloud files, to a reference surface with a single shift for all files. This type of tool is useful in situations where your survey data must be made to vertically align with a reference surface

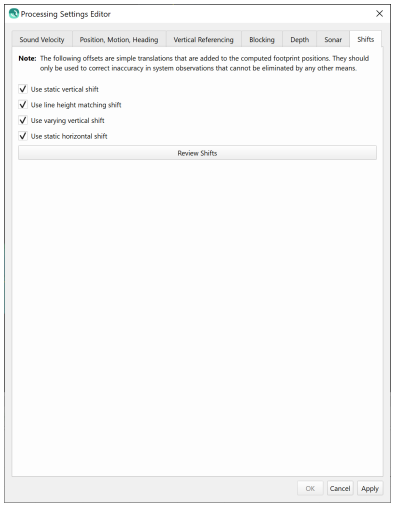
that has a constant vertical mismatch. This can occur when matching a ROV or AUV surface to one from a surface vessel. It could also be used to recover from an error in vertical referencing in either your new surface or in the reference surface. The shift is preserved in the Processing Settings for the contributing files and can be reviewed, reported and reverted with ease.



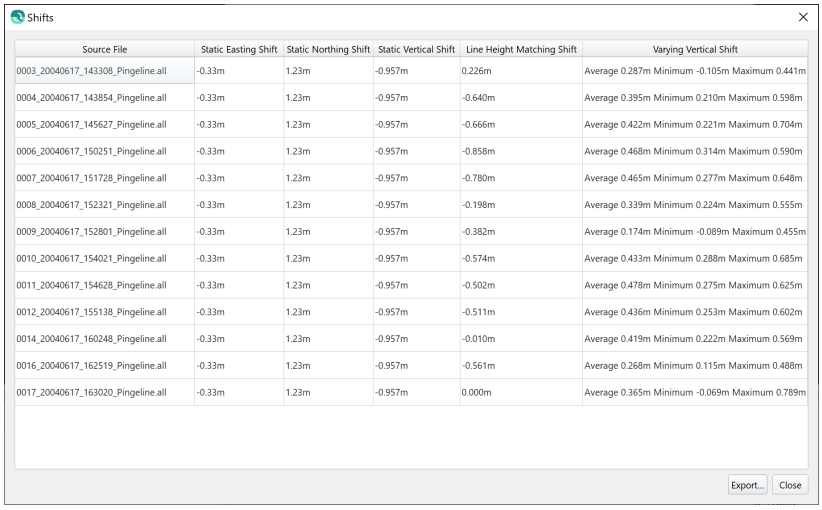
The shift is the average z-shift between the two surfaces, similar to what you would see with the surface differencing tool. The value added with this tool is that the shift is computed and then applied in the processing settings automatically for you with the correct sign convention, avoiding user error and streamlining the process. You can also set an Exclusion Mask, which is a set of polygons that prevent the use of particular areas for calculations. You can also set the Area of Computation to force the calculation to only investigate a specified area on the surfaces.

Processing Settings

As mentioned earlier, you can easily verify, enable and disable all of the results from these tools. This is controlled by a new tab in the Processing Settings, as shown below. You can quickly review which tools have been run for which files.



You can also review the shifts on a file-by-file basis from the Processing Settings dialog for the files that were selected prior to launching this dialog. The table below is an example of a data set that unfortunately required use of all of the shifting tools, including the line height matching tool that was released in Qimera v2.2. The summary table contents can also be exported from the same dialog for reporting or auditing purposes.

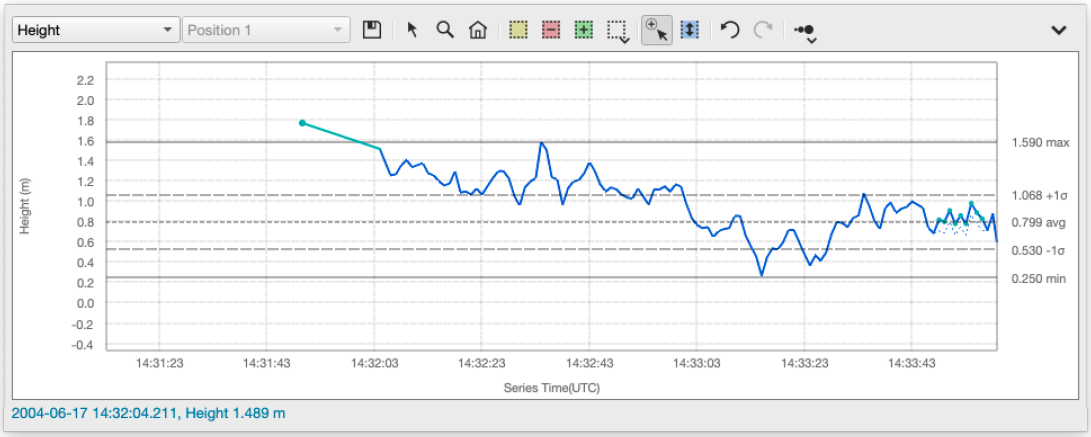


Time-series freehand tools for shifting, interpolation and extrapolation

In this release, we have added new functionality in the Time-Series Editor tool, inspired by similar tools in Qinsy's Validator and Analyse apps. The two main new features are the ability to freehand interpolate/extrapolate and also to select and shift a subset of a time-series. Both of these actions are captured in the time-series metadata such that you can report on user modifications in exports, there is also a new option to revert to the original time-series in the context menu in the event that you want to later undo all of the save edits, interpolations, extrapolations or shifts. Of course, while editing these actions are

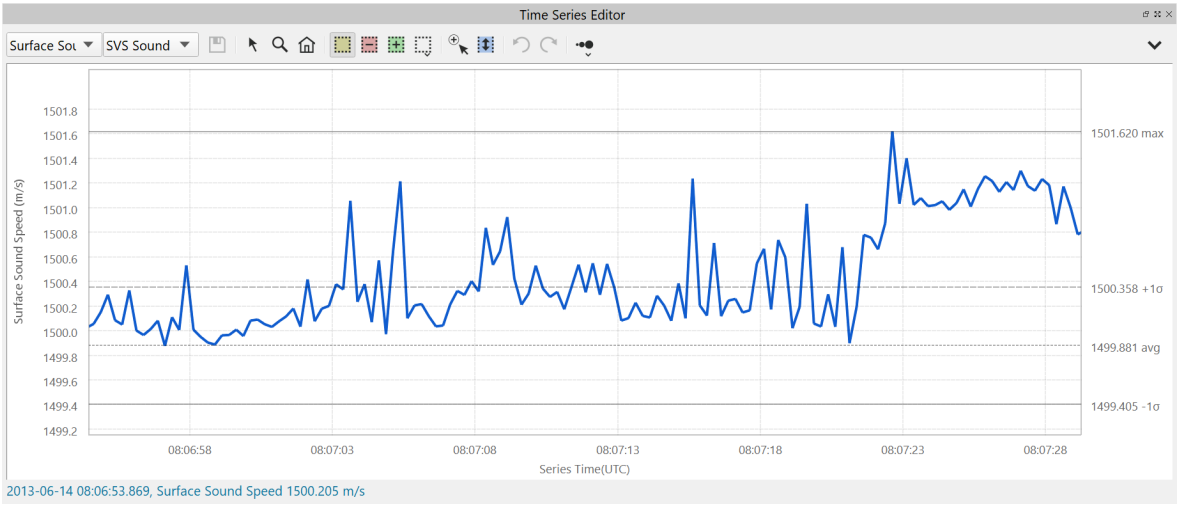
covered by the undo/redo functionality so it's safe to play with them a bit to get a feel before saving your changes. At the moment, these new features work for non-navigation sensors, a navigation editor is planned for a later release. These new tools, however, CAN be used on height time-series data, which is where they're most often required.

The new freehand draw mode lets you insert points at the beginning or end of a time-series for those cases where a small extrapolation is necessary. You can also insert points within the time-series but only at the sampling time of existing points and after removing the existing points using the existing edit functions.

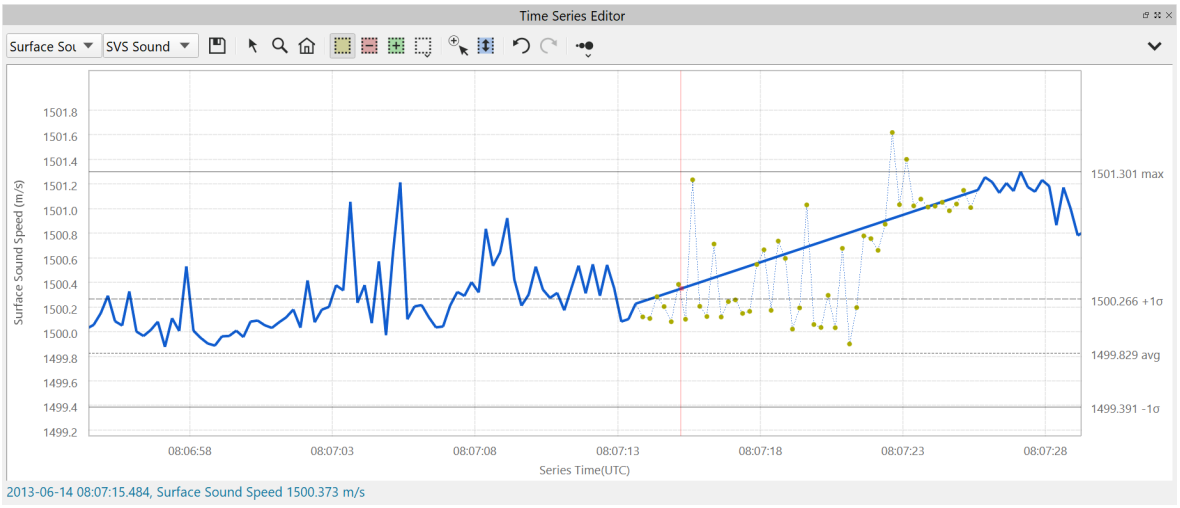


You can also edit a bad sequence of data and draw in a freehand replacement with the same mode that is used for extrapolations. To keep the design simple, you can only replace a value at the moment of time that an actual observed value occurred. The image sequence below demonstrates.

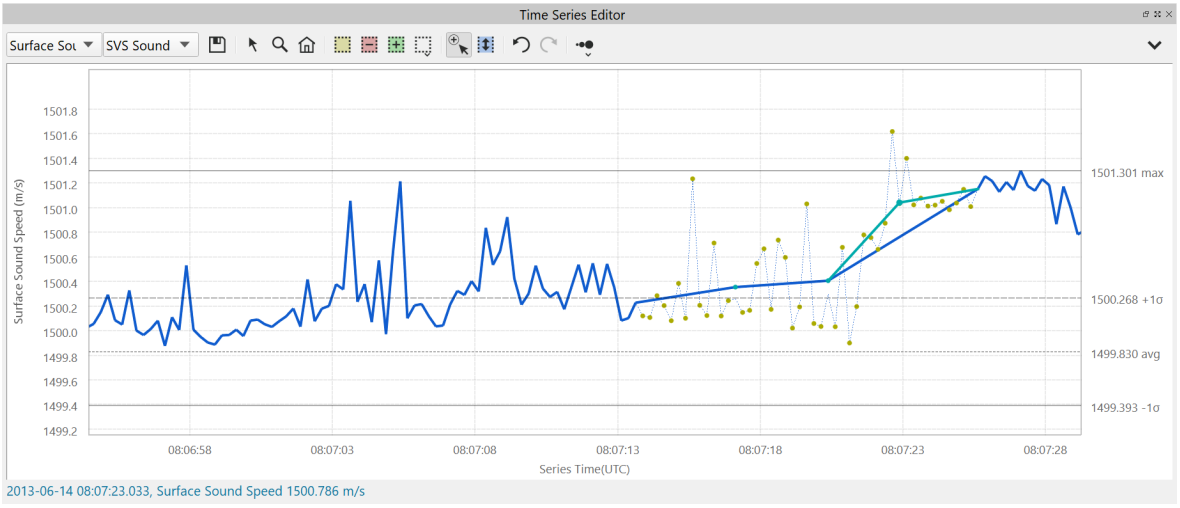
Here is the starting image, showing raw data with noisy values on the right side of the graph.



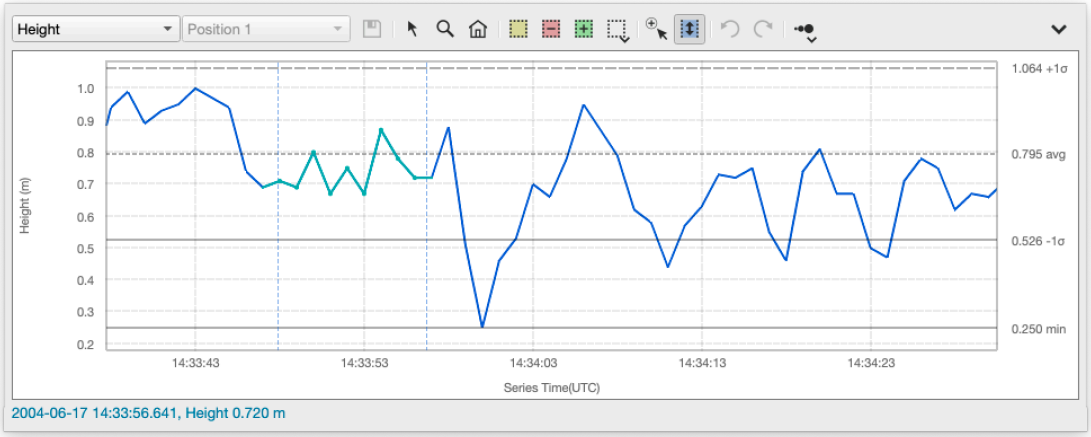
You start by editing the observations you want to ignore. It's best to use the reject with interpolation mode to prevent fall through to a backup time-series.

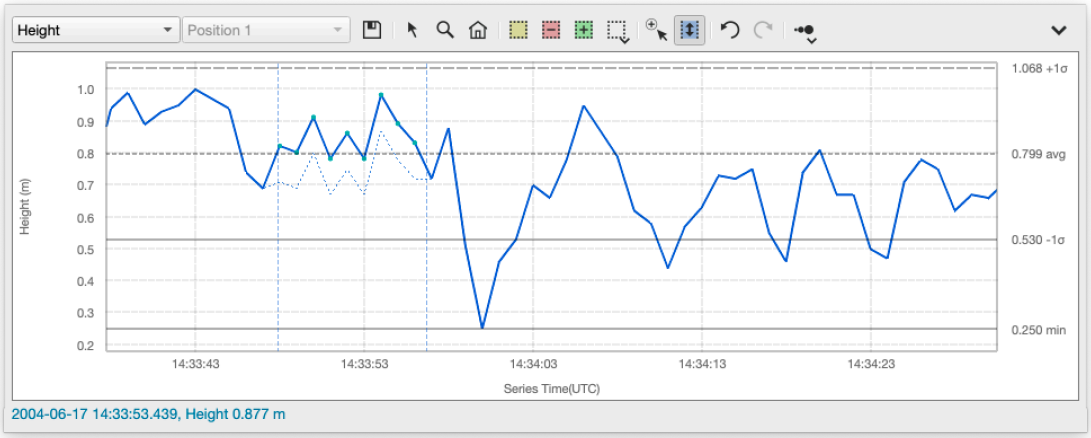


The switch to the new sample insertion mode and freehand draw the samples that you want to fill the gap to capture the desired trend.

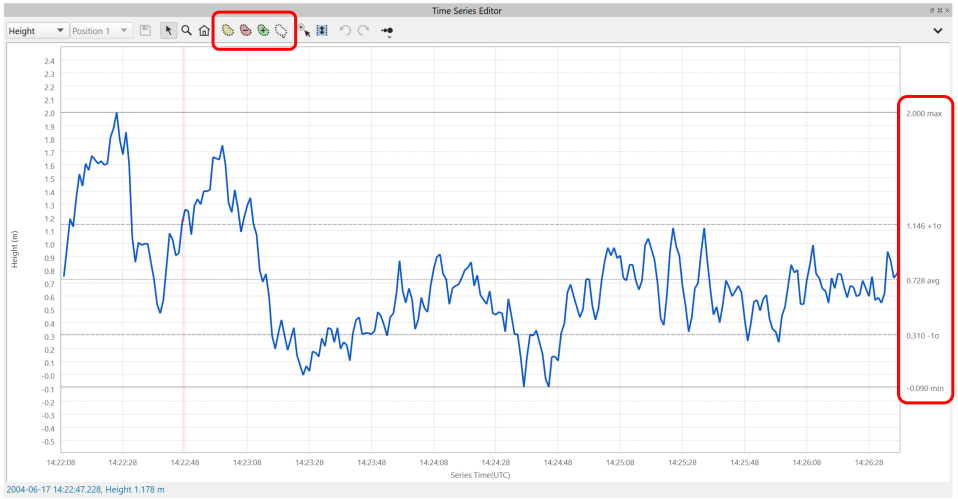


The new shifting mode allows you to select a span of the time-series for shifting. In the images below, you'll see a selected span colored in cyan, and immediately below the same section is shifted vertically.



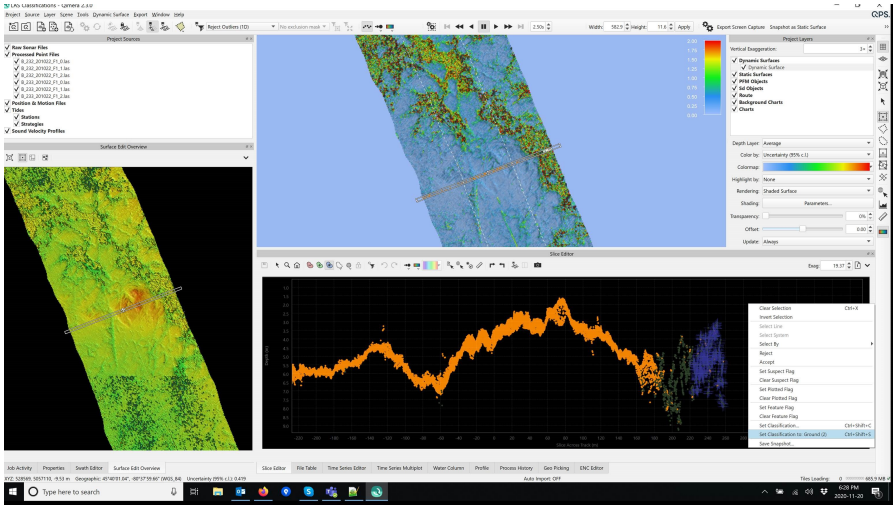


Two other improvements have been made in the time-series editor as well. Statistics about the time-series can be shown as a graphical overlay, with an option in the context menu to enable/disable the visibility of this overlay. The overlay will draw lines and will show labels for mean, minimum, maximum and also +/- 1 standard deviation. We've also copied the different manual edit tools from Slice Editor and you now have option for polygon or lasso edit, whereas before it was limited to just rectangular editing.



Re-classification Tools

Following along with our toolset for bathymetric lidar point cloud processing, we have added the ability to select soundings in the Slice Editor and to change their classification. Previous releases allowed the use of the Filter toolbar to set classifications at the map level by drawing polygons on the Dynamic Surface. This new advance takes it one step further and allows for setting the classification of individual points in the Slice Editor. The new mode takes advantage of the existing "Select and Decide" editing mode in which you select points and then right-click to get a context menu from which you can choose actions like Accept, Reject, Set Plotted Flag, etc. New additions in this menu include the ability to set a new classification and also to set the classification to the last value that was used. The keyboard shortcuts for these also make it simple to set the classification once and then to quickly select more points and set their class with a keyboard shortcut. We have also upgraded the Slice Editor to show the standard American Society for Photogrammetry and Remote Sensing (ASPRS) classification codes. At the moment, this only works for LAS and LAZ file formats, but if you're interested to do this for other file formats, please get in touch with us: sales@qps.nl.



Qimera 2.3.1 - Improvements

On this page:

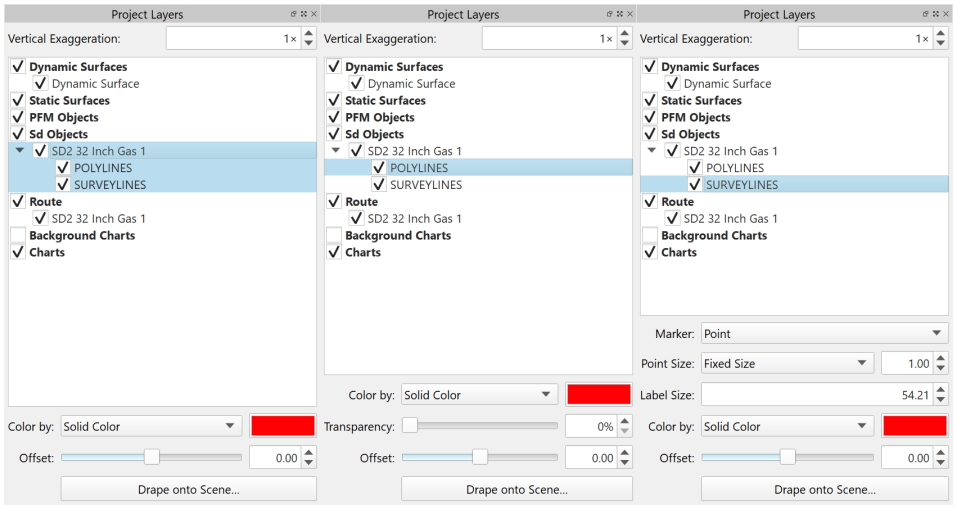
- Qinsy to Qimera Workflows
  - Auto-Import of QGF Files
  - KP Support for Qinsy users
  - Multi-object Configuration Improvements
- Multi-Polygon and Multi-Line Objects
  - Making Multi-Polygon Objects
  - Making Multi-Line Objects
- Interface and User Experience Improvements
  - Slice Editor and 3D Editor
  - Time-Series Multiplot
  - Filter Toolbar
  - Profile Tool
  - Project Sources
  - CAD and ENC
  - Miscellaneous

Qinsy to Qimera Workflows

Auto-Import of QGF Files

When opening a Qinsy project for the first time, any QGF files will be found and converted to .sd format and added to the Project Layers. Since .sd objects can only contain one object type per file (e.g. points in one file, lines in another), a QGF is "exploded" into a points and a lines .sd files. These are added under a single group with the group name coming from the QGF. Visibility can be controlled separately for points and lines as well using the normal mechanisms. Direct QGF support, i.e. support that does not require file conversion, will not come until the Fledermaus 8 Tempest visualization engine is integrated into Qimera but this provides a more streamlined experience in the meantime.

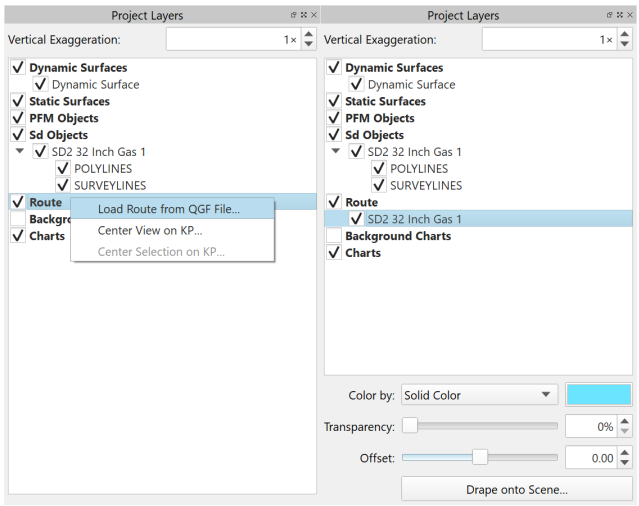
The image sequence below shows a QGF file that was automatically imported when the project was first opened. As you select separate elements, or the element top level grouping, you can change display options like coloring, etc, in the attributes panel immediately below. Note that you can still import other QGF files as well using the pre-existing method to import CAD data under the Layers menu.



KP Support for Qinsy users

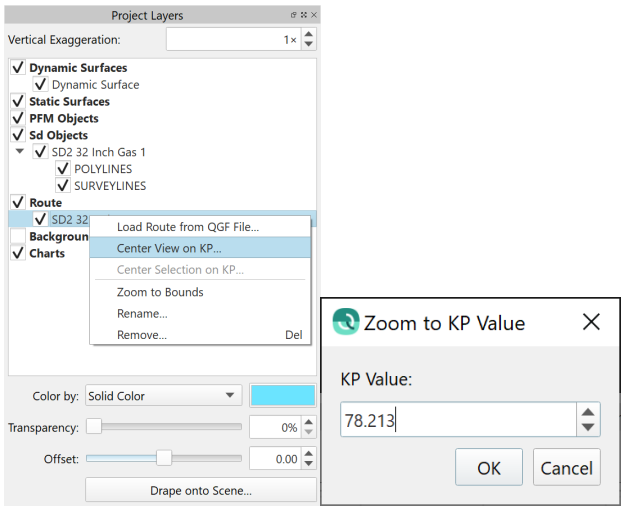
Similar to the improved support for QGF files, there is now support for KP, or Kilometer Post, in Qimera. This is common in offshore work such as cable/pipeline work where it is necessary to be able to think in terms of linear distance along a cable/pipeline corridor. To access this functionality, Qimera will let you designate a QGF file as a "Route". Note that the QGF file may have been already imported into the project via the auto-import functionality described above, setting the Route is a separate action entirely since not all QGF users will have the need for KP, nor will all QGF files have KP embedded.

The image sequence below shows how a KP Route is loaded. There is a new "Route" node in the Project Layers tree, right-clicking this will allow you to specify a QGF file to use as a route. This can also be done from the Layers menu. Once it is loaded, it has the same display capabilities and options as the .sd objects described above.

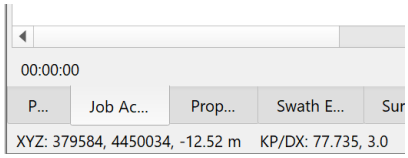


How is KP used? Another right-click on the active Route will let you center the view on a particular KP location. You can also add this as a custom button on the customizable

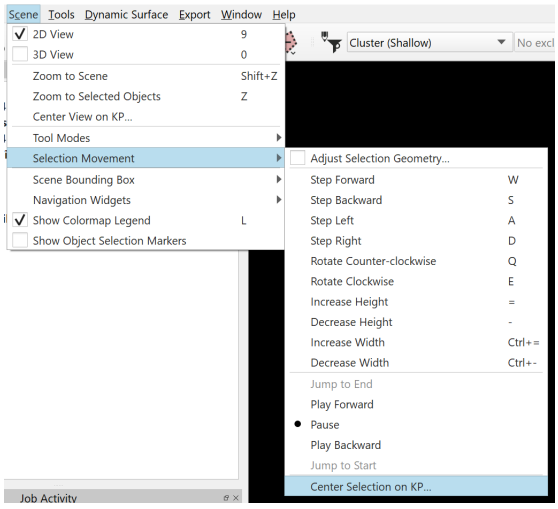
toolbar and you can setup a custom keyboard shortcut as well, if this is a feature that you'd like to use often.



The KP for the mouse cursor position is displayed in the lower status bar of Qimera next to the coordinates, so it is quite simple to get a quick sense of the KP of a particular feature or location in the Scene.



While editing point cloud data in the Slice Editor, it is also possible to move any Slice boxes to a particular KP to examine data at the desired location. This is accessed under the Selection Movement menu in the Scene toolbar menu. You can also add a custom toolbar button for this and a keyboard shortcut.



KP is also displayed in the following editors and docks:

1. Swath Editor - Cursor read out and info panel

2. Slice Editor - Cursor read out and info panel
3. 3D Editor - Cursor read out
4. Profile dock - Cursor read out
5. GeoPick dock - GeoPicked positions now look up KP and add this as an additional attribute
6. Time-Series Editor and Multiplot - Cursor read out

KP is supported in some exports as well:

1. Exports of processed points now include the KP of the object position related to each footprint
2. Time Series Editor and Multiplot include KP in their ASCII export
3. Profile dock exports now include KP in the ASCII export of points along the profile
4. The GeoPick table includes KP in ASCII export

Multi-object Configuration Improvements

With this release, we have made improvements to better support multi-object configurations, for example, a surface vessel with an ROV operating simultaneously. The major improvement is that the QPD object track is extracted for both objects, allowing for full raw sensor processing for both objects. Previous versions of Qimera did not support object track extraction in the event that both objects were simultaneously collecting multibeam data, nor was it systematically done in instances where only one object was collecting multibeam data.

During import from these configurations, the db is examined as usual and split into multiple objects as was done previously. The major improvement in this release are:

- The QPDs from online calculations are copied into object subdirectories and then stripped of data from the objects not associated with the subdirectory, leaving a smaller version of the QPD in each object subdirectory. Backup QPDs are made during this process, as usual, prior to copying and removal of objects.
- QPD object tracks are more systematically extracted from the QPD.
- QPD object tracks are more systematically set as the primary source of navigation and height and the vertical referencing strategy is more systematically set to RTK (previously known as "Accurate").
- For multi-object setups with subsea vehicles such ROV/AUV, Qimera will now also extract any pressure or depth sensor time-series for depth calculation for the ray trace start point along with the QPD object track for vertical georeferencing when the object type is configured as ROV or AUV.
- In these kinds of multi-object situations, not all objects are collecting multibeam data at the same time. In this scenario, objects without MBE, laser or SBE data can now be stopped from importing so as not to clutter the post-processing experience in Qimera with objects that have

no data associated with them for processing. This can be controlled by a new user preference, the default setting is disabled. This works by examining the QPDs after import and removing any that have no valid data in them, this works for all raw sonar and processed point file formats, though it is most applicable to Qinsy.

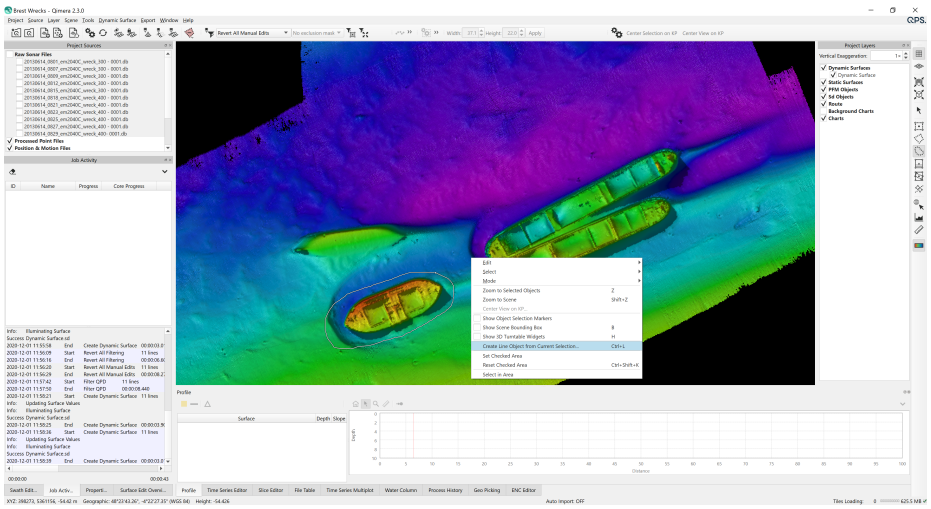
Multi-Polygon and Multi-Line Objects

In this release, you can now create multi-polygon or multi-line objects using the normal spatial selection tools like lasso and polygon. This is handy for creating a set of polygon areas in which you may want to prevent any automated filtering from happening when using the Filter Toolbar. You can also use these types of Exclusion Masks in the vertical shifting tools as a way to constrain the vertical shifting analysis away from selected areas. You can also make line objects in a similar manner with the profile tool, this is useful for quickly creating a set of infill lines to pass to the online surveyor. The resulting polygon or lines file can be exported as DXF, for example, for this purpose. A multi-polygon DXF can also be imported (and converted to .sd format) and then used as an Exclusion Mask as well.

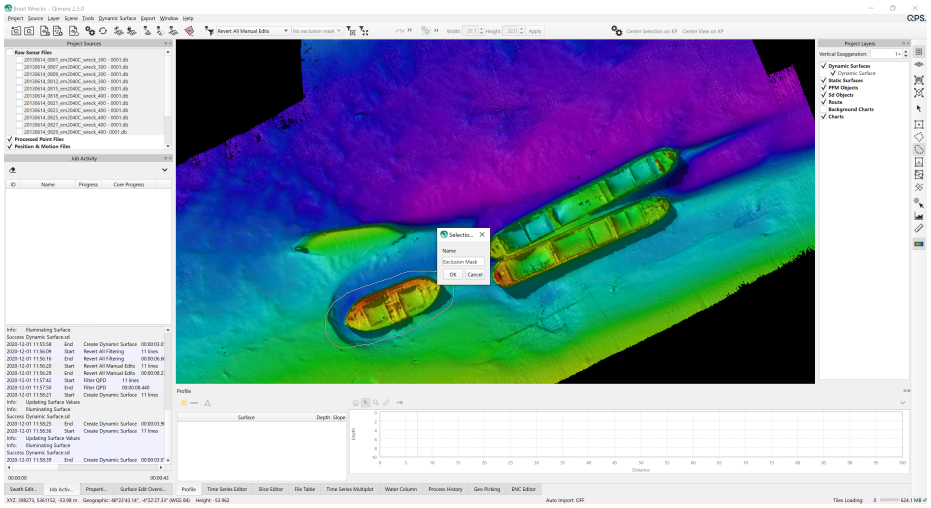
Making Multi-Polygon Objects

The image sequence below shows an example of how to create a multi-polygon Exclusion Mask.

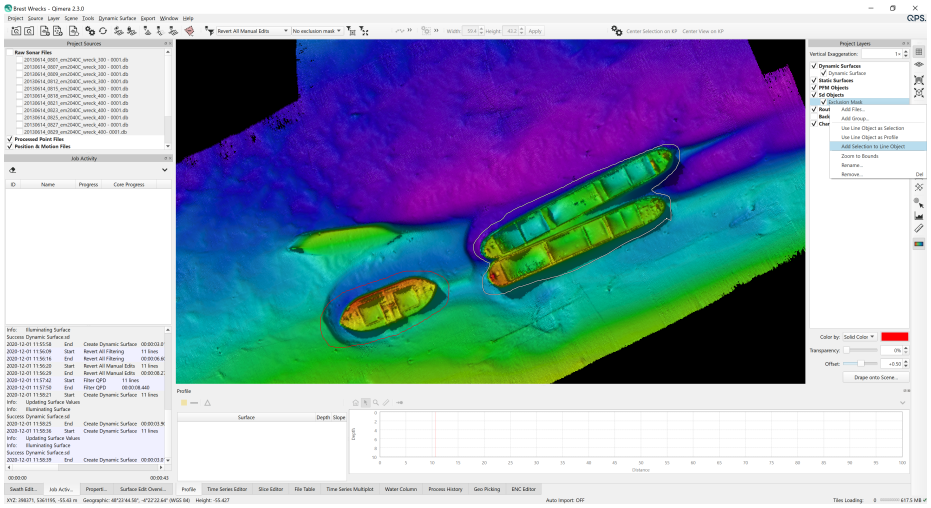
You can draw in the Scene with various selection modes, then save these as a .sd object with right-click, this has been in Qimera for quite a while now but this first step is crucial to getting started.



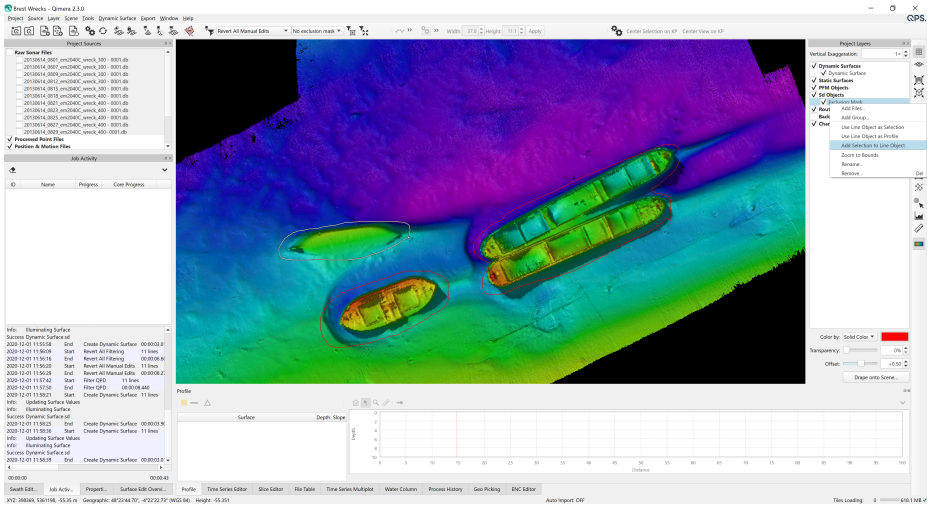
When you select the line creation option, you'll be prompted for a file name, a .sd polygon object will be saved in your project and will appear in the Project Layers.



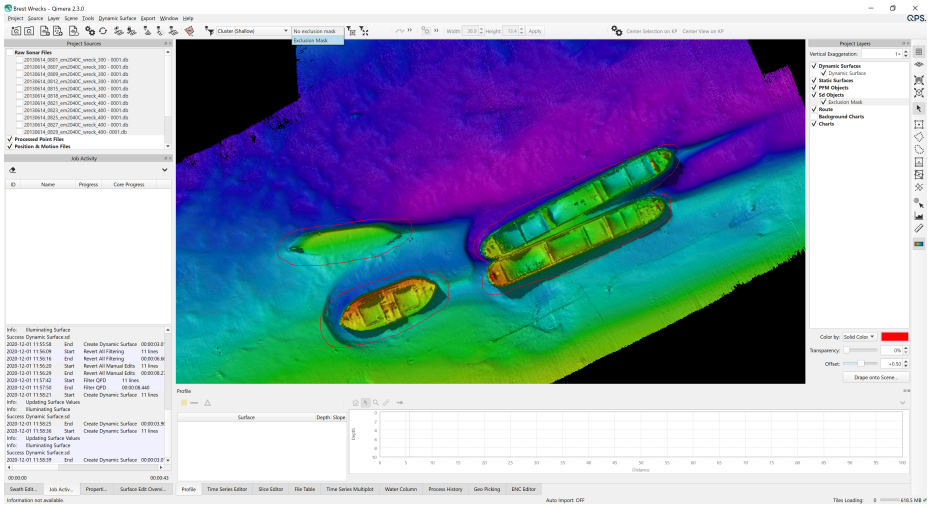
Once you have a .sd object, you can add more polygons to it by drawing new polygons or lines and then right-clicking on the existing .sd object and choosing "Add Selection to Line Object". You can use this to collect a set of areas or lines in a single .sd object, as shown below where polygons are drawn around multiple wrecks in the same area.



Finally, the last wreck's polygon is added to the .sd file.



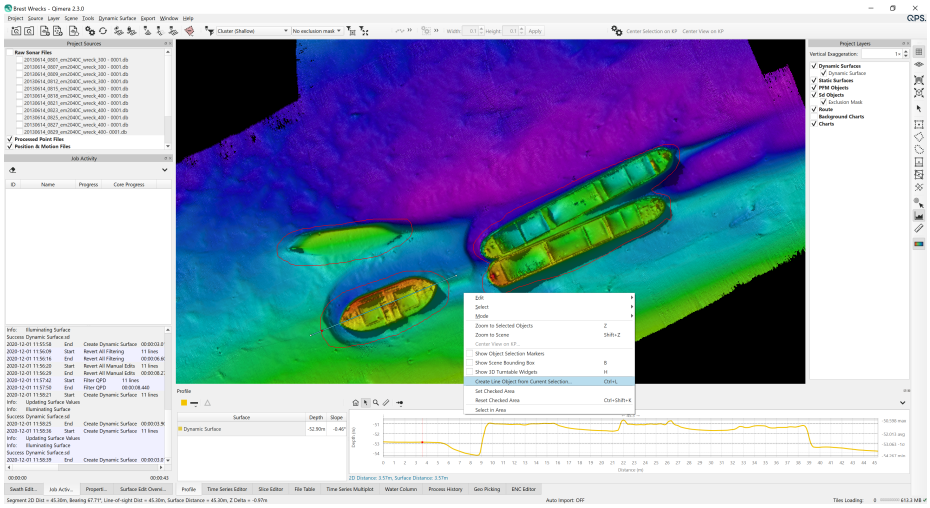
Once the multi-polygon exclusion mask is complete, it can be used as an Exclusion mask in a number of tools. Below you'll see how this is used in the Filter Toolbar to prevent running the Cluster filter over the wrecks where a manual inspection may be necessary to prevent points from being over-filtered.



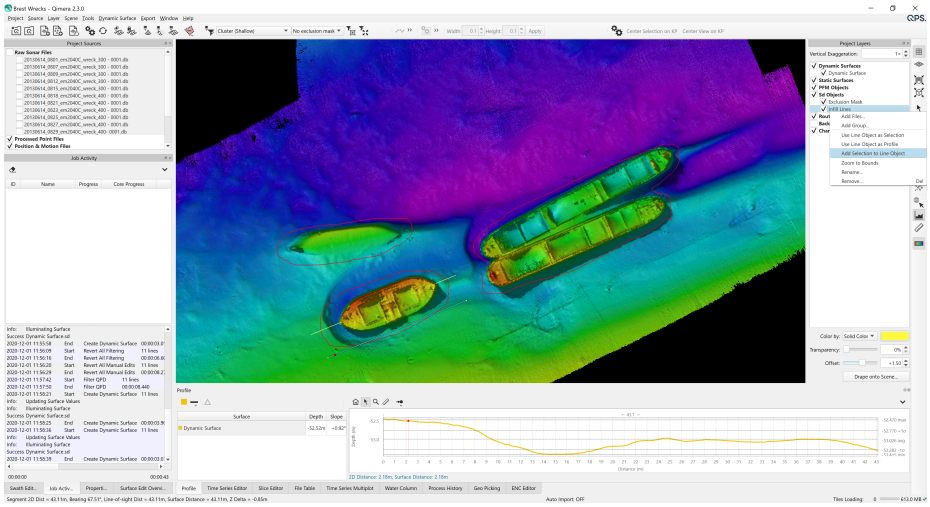
Making Multi-Line Objects

The image sequence below shows how you can use the Profile Tool to draw line objects and accumulate them into a single .sd object. In this example, you'll see that additional survey lines are being planned over a feature of interest with a line running over the center and then two winglines additionally to ensure that the feature is imaged completely on all three passes.

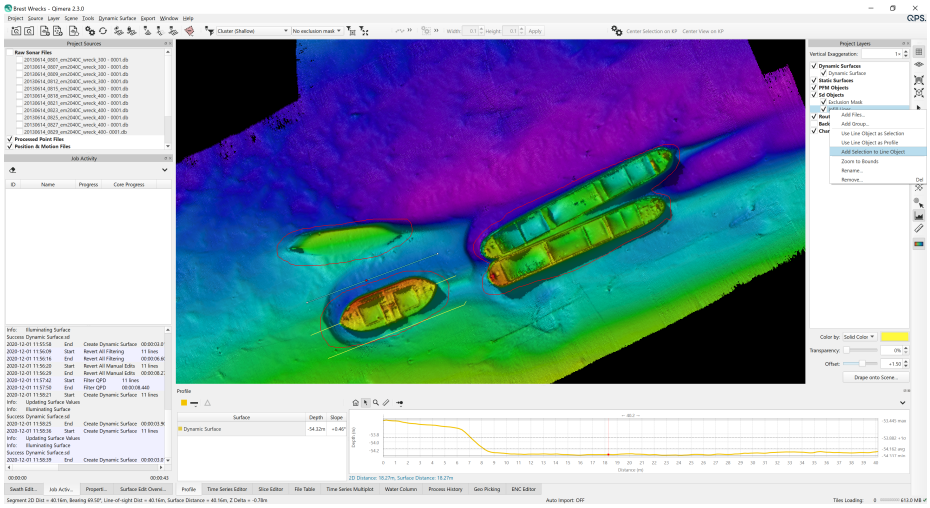
First, the profile tool is used to draw a line object, starting with left click and ending with right-click. Once the line is complete, an additional right-click will show the context menu and you use the same option to create a line object.



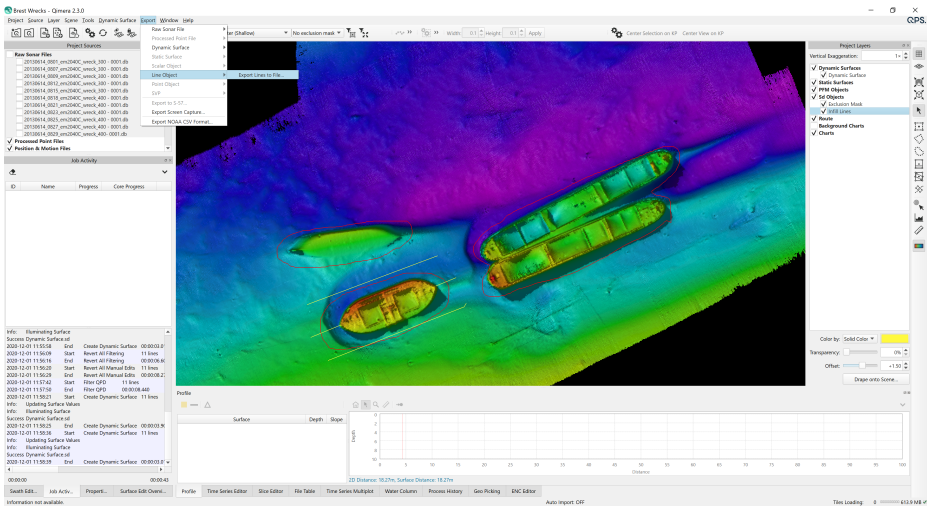
Additional lines are then drawn and then added to the exiting line object using the same right-click context menu as was done with multi-polygon creation.



The third line is added finally for the complete set of survey lines to pass to the online surveyor.



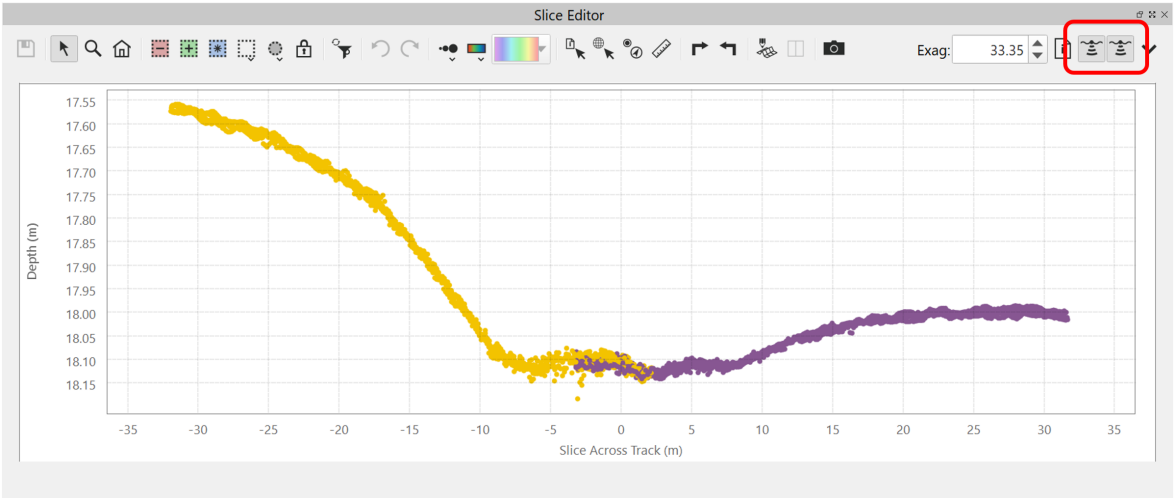
The line object is then exported, currently DXF and DWG are supported.



Interface and User Experience Improvements

Slice Editor and 3D Editor

There are now head toggle buttons to allow users to enable/disable plotting of data from each system in the Slice Editor, see below. This brings the same user experience that was in the Swath Editor over to the Slice Editor.



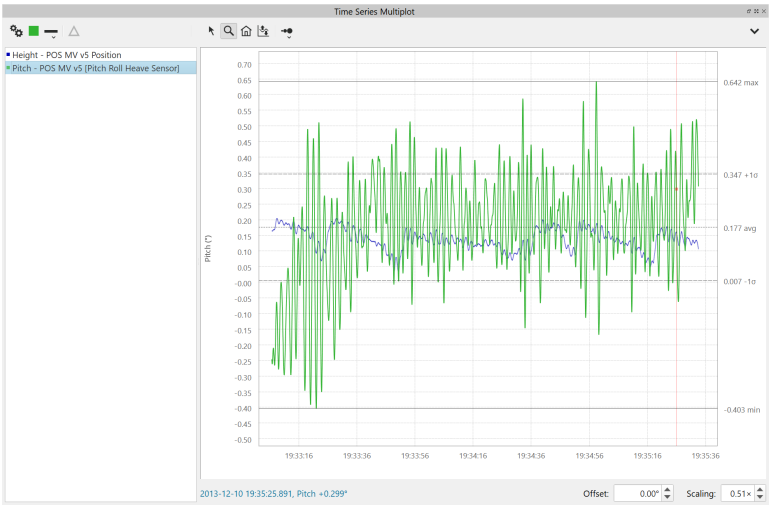
Colors for different systems, vessels and profiles can be configured in the main Preferences, this allows more control over coloring when coloring by multiple systems or multiple vessels or when examining profiles across multiple surfaces in the profile tool.



Lastly, for the 3D Editor, existing with the '3' keyboard shortcut will now prompt you to save your edits first.

Time-Series Multiplot

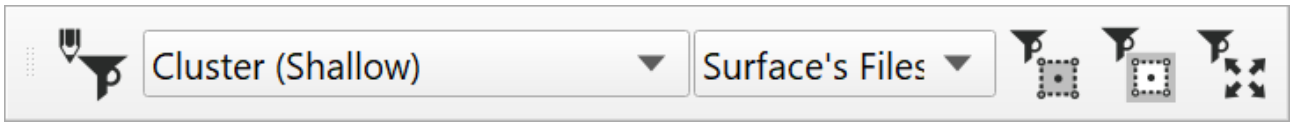
Statistics about the time-series can be shown, with an option to enable/disable in the dock's context menu. You can show mean, minimum, maximum and also +/- 1-sigma for the primary selected time-series. Also, ASCII exports of single time-series or merged time-series now have consistent time stamp format.



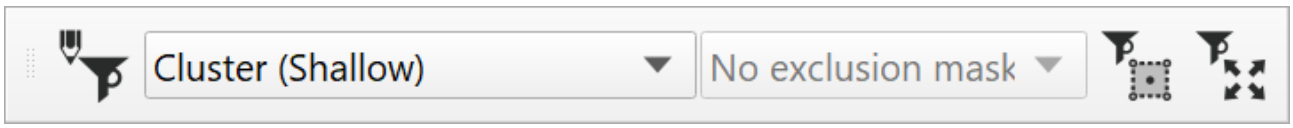
Filter Toolbar

As part of our work to add the ability to specify exclusion masks, we simplified the Filter Toolbar. Note that the Exclusion Mask combo box gets populated automatically when you create polygon .sd objects or when you import CAD files that contain polygon objects. Since an Exclusion Mask can now be specified, we've removed the button that allows for filtering OUTSIDE of a selection. The exclusion mask can collect many potential areas of exclusion and is thus more flexible and powerful then the previous method which only allowed filtering outside of a single polygon object. In its place, the second combo box on the toolbar now lets you choose an exclusion mask or no mask at all. We've removed the ability to filter selected files from the second combo box as well (this can still be done, see below), this led to confusion for many users. With these small changes, the toolbar is now focused on working on a Dynamic Surface only, which of course will filter all of the underlying point files that contribute to the surface.

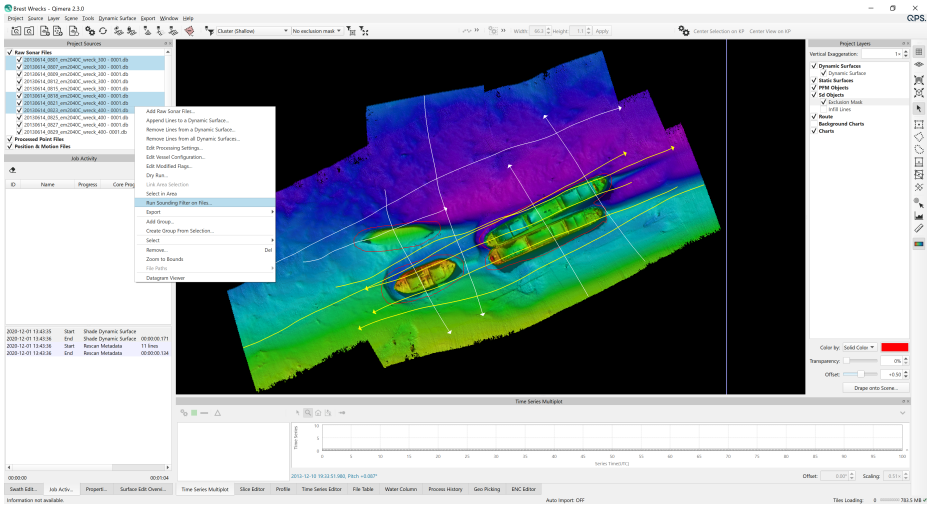
Old toolbar



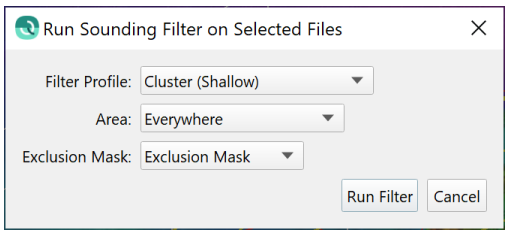
New toolbar



If you want to apply a filter to a particular set of files, you select the files as usual in the Project Sources dock, and then right-click on those files and choose to run a filter. See the image sequence below as an example.



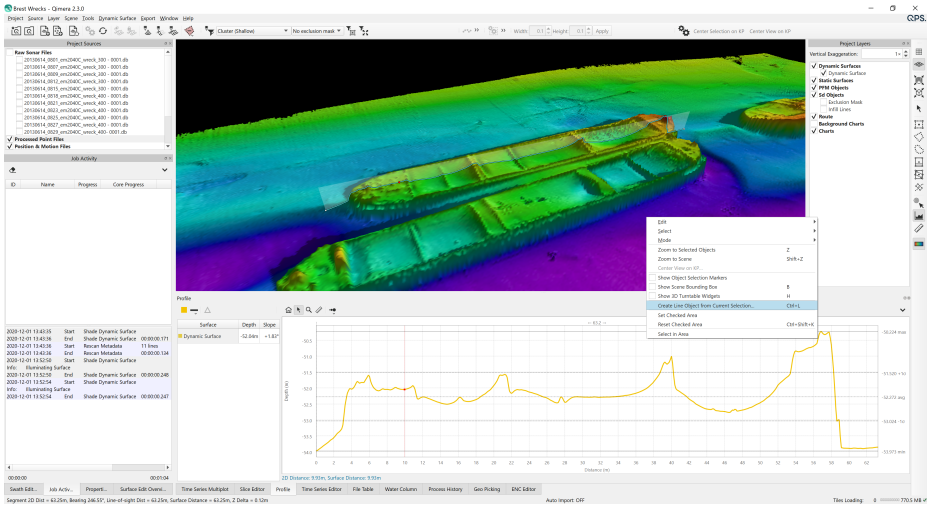
Once you select the option to filter your files, a dialog will appear that lets you choose which filter to run, which area to run it in and finally whether or not to use an Exclusion Mask.



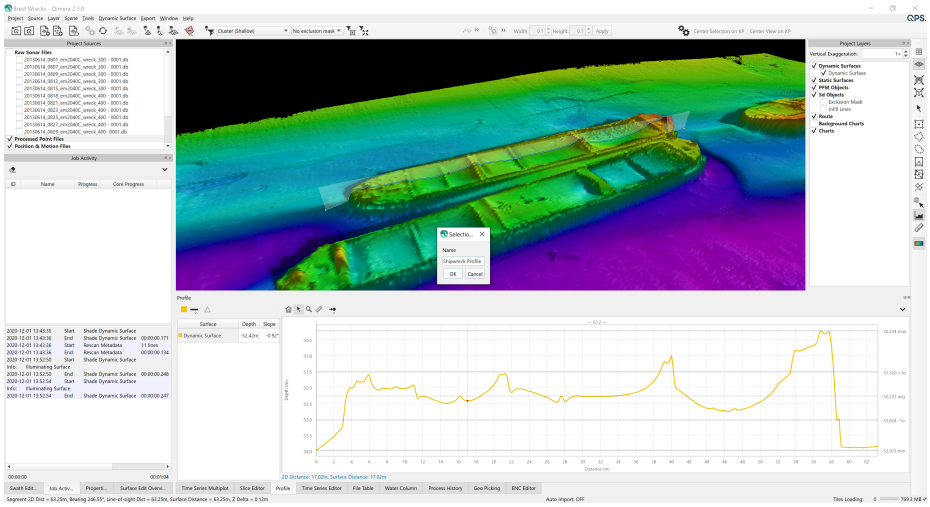
Profile Tool

Like shown previously for the time-series editor and multiplot docks, statistics can be displayed for a profile: minimum, maximum, mean and +/- 1-sigma. When setting custom colors for surfaces, these settings are cached when profiling multiple surfaces and choosing custom colors. Furthermore, as shown earlier with the ability to set custom colors for vessels and systems, you can also set custom default colors used for profiles when profiling across multiple surfaces.

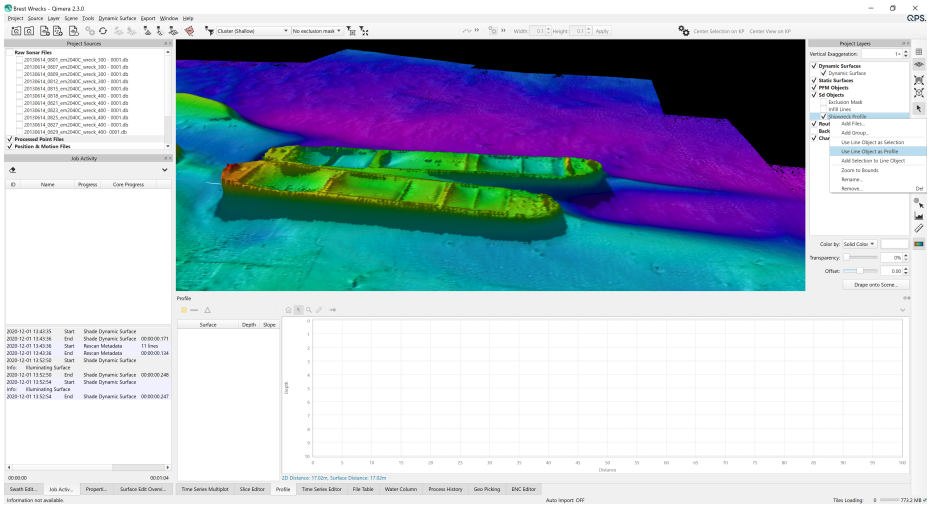
In earlier images above, we showed that it's possible to use the profiling tool to create custom line objects and to collect them into a single .sd file. In this release, you can also save a profile line and then select it for re-use for profiling. This is helpful when you want to ensure that you are taking the same profile measurements in different processing or analysis sessions. The image sequence below shows how this works, starting with creating a .sd object from a profile that is drawn in the Scene.



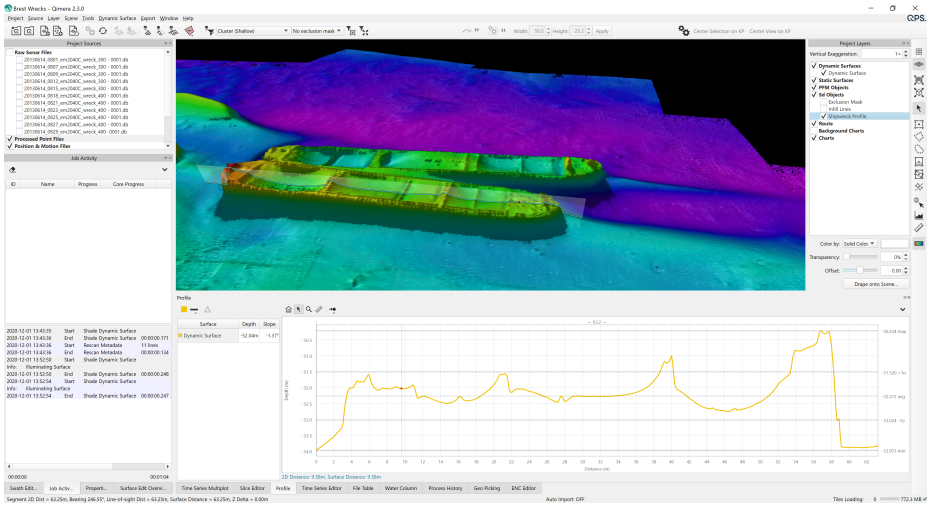
You then give the saved object a name. The resulting .sd file will appear in the Project Layers dock.



Later on, you can select the saved profile line in the Project Layers dock, right-click and use it to create a profile from that object.



The profile line is then used to sample the selected surfaces and the Profile dock is updated.



Project Sources

Project Sources now has new capabilities in the right-click context menu. You have much more flexibility when it comes to selecting, grouping and organizing your raw sonar files.

1. Selecting Files now has all of the following options:
    a. Select All Files in the Same Vessel
    b. Select All Files with the Same Start Date
    c. Select All Files in the Same Folder
    d. Select All Missing Files
    e. Select All Files with Errors
    f. Select All Files that are Ready for Processing
    g. Select All Files that are Fully Processed
    h. Select All Empty Raw Sonar Files

2. Creating Groups:
    a. We've copied Fledermaus 8's "Create Group from Selection", in the right-click context menu.
    b. You can use the enhanced Select options listed above and then create a custom group for these newly selected files using this option.
3. Organize Files: You can now choose to Order by Start Time

CAD and ENC

1. CAD has improved support for colors and labels. Since .sd objects can only contain one object type per file (e.g. points in one file, lines in another), a CAD file is "exploded" into a points and a lines .sd files. These are added under a single group with the group name coming from the DXF/DWG/QGF.
2. Visibility can be controlled separately for points and lines as well using the normal mechanisms. Labels are stored as separate .sd objects, either individually or as a group, and thus their size can be adjusted as well to suit your display needs.
3. ENC Administrator will now allow users to create an encryption key based on a softlock license to allow use of S-63 protected charts with softlock licenses.
4. We've upgraded the global scale ENCs that install with Qimera, there is now full global coverage available and more detail for lakes and rivers in inland areas.

Miscellaneous

1. Improved readability and layout of mouse cursor position info in lower status bar of the application.
2. In the Vessel Editor, TPU settings for multibeam systems will warn if you configure unrealistic pulse lengths.
3. NOAA CSV export of trackline statistics how has units in the header fields of the .csv file.
4. Contouring now gives default file name inherited from the source surface, along with the contour interval. This helps you keep track of which contour files come from which surfaces when working with multiple surfaces and/or multiple contouring intervals.
5. Geotiff import has had stability improvements in scenarios where several images are imported.

Qimera 2.3.1 - Documentation

Documentation has been updated to capture the changes to existing dialogs and workflows. The only new documentation of note is the Vertical and Horizontal Shifting Tools.

Qimera 2.3.1 - Resolved Bugs

Bug Fixes

Below you will find listings of bugs that have been reported in previous releases and have been solved for the Qimera 2.3.0 release. Many of these have been described further in the general Improvements section.

Summary	Issue key	Priority	Affects Version/s	Component/s
Cannot merge raw sonar data and ascii navigation data	SQM-5385	☐	2.2.5	Import
Surfaces - Color Maps - Colormap settings change during processing	SQM-5368	☐	2.2.5	Dynamic Surface
Surfaces - Layers and Color By - Color range on color scale resets are processing change	SQM-5362	☐	2.2.5	Dynamic Surface
Surfaces - Colormap - Colormap range reverts back to default after editing files in Time Series Editor	SQM-5321	☐	2.2.5	Colormap
Layers - Grids and SDs - Dynamic Surface - Create Survey Area is not shown	SQM-5282	☐	2.2.5, 2.2.6	Dynamic Surface
Tools and Docks - Time Series Editors - Interpolated line is disappearing	SQM-5281	☐	2.2.5, 2.2.6	Time-Series Editor
Tools and Docks - Time Series Editors - Home Function seems to be working incorrectly	SQM-5280	☐	2.2.5, 2.2.6	Time-Series Editor
Qimera is selecting wrong UTM Zone for KMALL files with incorrect SVP position	SQM-5249	☐	2.1.1, 2.2.5	Import

Summary	Issue key	Priority	Affects Version/s	Component/s
Slice Editor leaving data gaps in surface	SQM-5244		2.2.5	Workflow
Tools and Docks - Watercolumn - Crash when take snapshot	SQM-5225		2.2.5	Water Column Tools
Surfaces - Color Maps - User Defined Colormap Doesn't Save When a Filter is Run	SQM-5218		2.2.5	Dynamic Surface
Kongsberg KMALL/ALL Extra Detection class 8 not correctly handled	SQM-5216		2.2.5	Import
Swath Editor crashing while trying to examine Reson 7160 water column data	SQM-5212		2.2.5	Swath Editor
Source File Import - Processed Points - QPD(FAU) file with odd Z-range	SQM-5205		2.2.5	Dynamic Surface
Tools and Docks - Slice Editor - 3D Slice - 3D view options - Buttons frozen when using central 3D Slice in toggle mode	SQM-5204		2.2.5	Slice Editor
Tiff images in Qimera behave slower then in FM/Dmagic	SQM-5203		2.2.5	Import
Tools and Docks - Swath Editor - Swath Editor crashes when Reson 7160 file contains watercolumn data	SQM-5199		2.2.5, 2.2.6	Swath Editor
Surfaces - Static - Static Surface bounds including rejected data	SQM-5183		2.2.4, 2.2.5	Footprint Cleaning

Summary	Issue key	Priority	Affects Version/s	Component/s
Surfaces - Shading - Odd shading of static surface	SQM-5160	☐	2.2.4, 2.2.5	Dynamic Surface
Tools and Docks - 3D Editor - Edits not saved when closing with shortcut	SQM-5155	☐	2.2.3, 2.2.5	3DEditor
No position and heading data for imported .db files	SQM-5139	☐	2.2.4	Source Files
When changing Scroll Slice location, coloured line stays on colour not lines selection	SQM-5108	☐	2.2.4	Slice Editor
Surfaces updates cause Uncertainty layer range to reset to maximum range	SQM-5097	☐	2.2.3, 2.2.4, 2.2.5	Colormap
Vessel Editor - Import Patchtest file from different set up	SQM-5035	☐	2.2.3	Vessel Editor
Static Surface - Drape Image - Cannot apply illumination option when drape image	SQM-5027	☐	2.2.2, 2.2.3	Dynamic Surface
Surfaces - Dynamic - Reson T50 THU/TVU values not populating correctly	SQM-5017	☐	2.2.1	Dynamic Surface
Standard deviation colormap resets everytime after major DS update	SQM-5006	☐	2.2.2	Colormap
3D PDF vertical exaggeration is incorrect	SQM-4973	☐	2.2.2	Exporting
Tools and Docks - Patch Test Tool - Raw Source Files do not get a reference color	SQM-4927	☐	2.2.1	Patch Test

Summary	Issue key	Priority	Affects Version/s	Component/s
Can't select line in 2D slice editor	SQM-4906	☐	2.2.1	Slice Editor
Project - Opening and Creating Project - Project Path is containing small letter c:\	SQM-4891	☐	2.1.1, 2.2.2, 2.2.3	Slice Editor
When you have multiple images in a project and try to drape Qimera selects both	SQM-4516	☐	2.1.0	General Views
Layers - Grids and SDs - Error when creating THU/TVU Surfaces: Need to exit process better if max rows/columns reached	SQM-4484	☐	2.1.0	Dynamic Surface
Source File Import - Raw Sonar - Metadata failed to extract - shortening file name allows proper import	SQM-4317	☐	2.0.2	Source Files
Processing - Data Cleaning - Can no longer hover over points while cleaning with the remove and add lasso tool and having them link to the dynamic surface	SQM-4100	☐	2.0.0, 2.2.5	3DEditor
Null surface difference makes all sources and layers disappear	SQM-4054	☐	1.7.6	Surface Difference
Tools and Docks - Patch Test Tool - DB beam count does not match QPD beam count	SQM-4024	☐	1.7.6	Patch Test
Raw Sonar Files - Import - Accurate setting not captured by Qimera if there are 2 objects.	SQM-3749	☐	1.7.6, 2.0.0	Import

Qimera 2.3.1 - Known Issues

For this release, the following are known issues which we plan to address in upcoming releases.

Issue	Description	Affects Version	Expected Fix Version
Limitation	Filter toolbars to "Accept All Soundings" and "Revert Manual Edits" do not have the intended effect when used in a Cooperative Cleaning project to over-ride cleaning that was done manually in the Master project prior to creating the Cooperative Cleaning project. Suggested workflow is to use the manual re-accept tools in the Slice Editor and 3D Editor.	2.1.0	2.3.x

Qimera 2.3.1 - Implemented from Voting System

Key	T	Summary	Votes
FQM-101	↑	Processing: Ability to smooth, filter, freehand and/or shift segments of navigation and other time-series data	33
FQM-32	↑	Processing Settings - Add option to shift points in X,Y,Z directions	22
FQM-135	↑	CAD - Support for text labels when importing CAD files	19
FQM-108	↑	Height matching to a reference surface or a reference line or lines	17
FQM-158	↑	Add ability to specify areas in which automated filtering will not filter data	13
FQM-126	↑	Project Sources - Be able to organize Raw Sonar Files by processing configurations	13
FQM-72	↑	Profile - Enable Profile lines to be saved	12
FQM-359	↑	CAD - Support for colors when importing CAD files	6
FQM-127	↑	Ability to save multiple lines to a line object file and export that to xyz	4
FQM-356	↑	KP Support	2
FQM-106	↑	Slice Editor - Apply filter to entire line	2
FQM-424	↑	Add ability to create simple survey line plans for use in Qinsy	1
FQM-393	↑	Change default selection for Filter Toolbar	1
FQM-292	↑	Slice Editor: Ability to control visibility of sonar heads in dual-head configurations	1

Key	T	Summary	Votes
FQM-265	↑	Project Sources - Add ability to organize by time	1
FQM-105	↑	Read and display QINSy online annotations	1
FQM-99	↑	Time Series Editors: Interpolating and extrapolating data	1

17 issues

Qimera 2.3.2 Release

4 February 2021

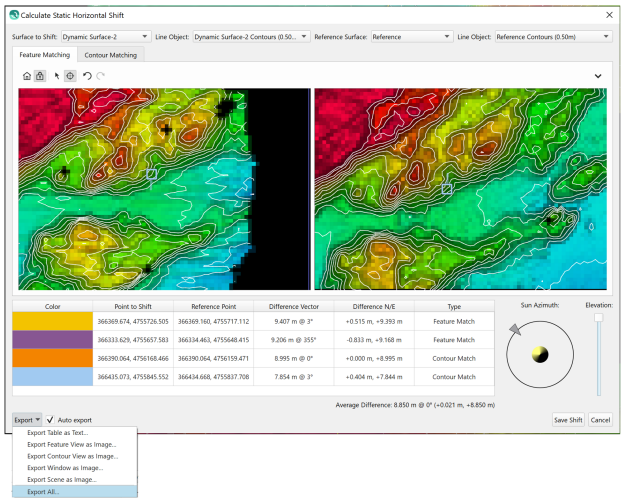
We are pleased to present Qimera 2.3.2

Highlights

In the 2.3.2 release there area few improvements made to the 2.3.0 features based on user feedback. We've also fixed several recently reported bugs.

Shift Tools - Common export user experience and auto-reporting

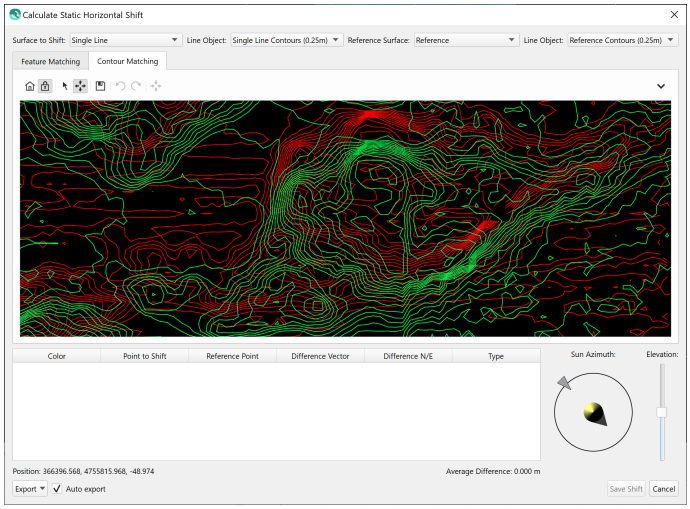
High-level access to export actions on the main interface of all the recently added shifting tools. There is also a new auto-export capability that saves critical reporting elements after the tool is successfully run.



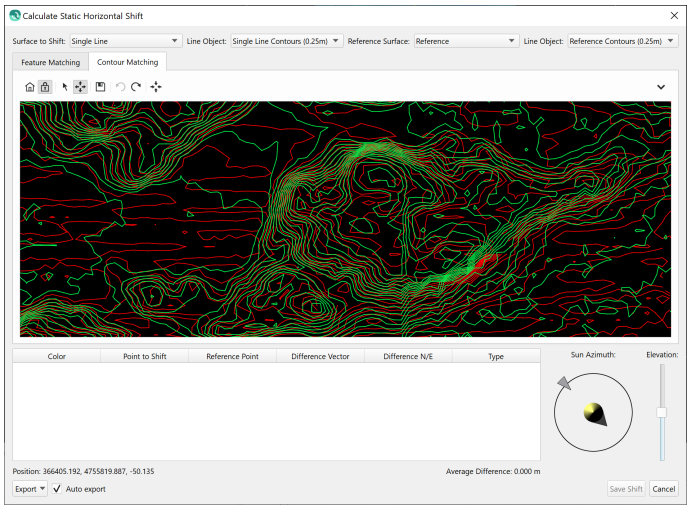
Horizontal Shift Tools - New contour matching method

We've added new capability to do contour matching as a second method of assessing horizontal shifts, primarily for areas that don't have many linear or discrete seabed features. The image sequence below shows how it can be used in conjunction with the original terrain model matching approach.

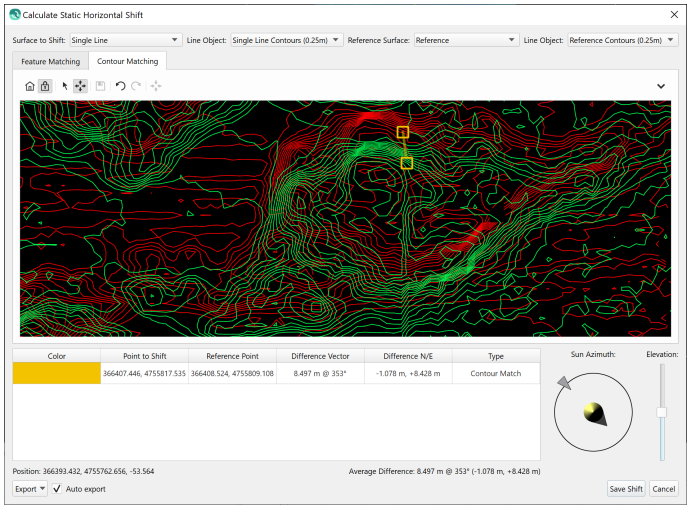
Step 1 - Examine contours with overlay to highlight misalignment.



Step 2 - Use the align button to manually align the contours.

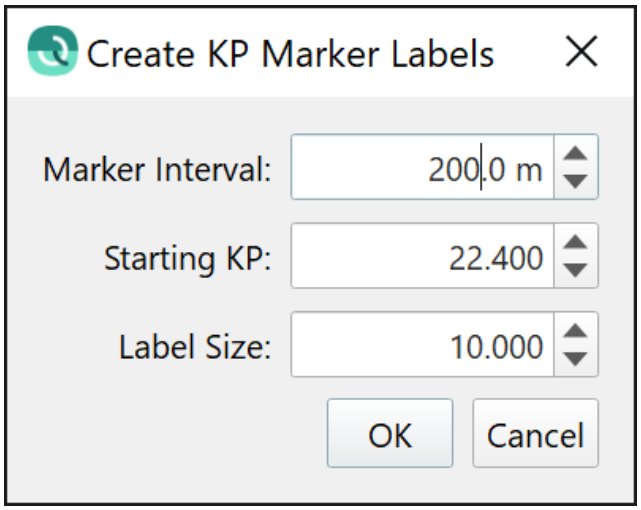


Step 3 - Hit the 'Save' button, a new fiducial pair is saved in the table. The contours are drawn in their original position with a fiducial marker. Go to another area to align the contours there and save other fiducial pairs to come up with a good average offset across the surface. Note that you can use this method as well as the terrain matching method to collect a blended set of fiducial points. The selection method is recorded in the table and is also included in the ASCII export.

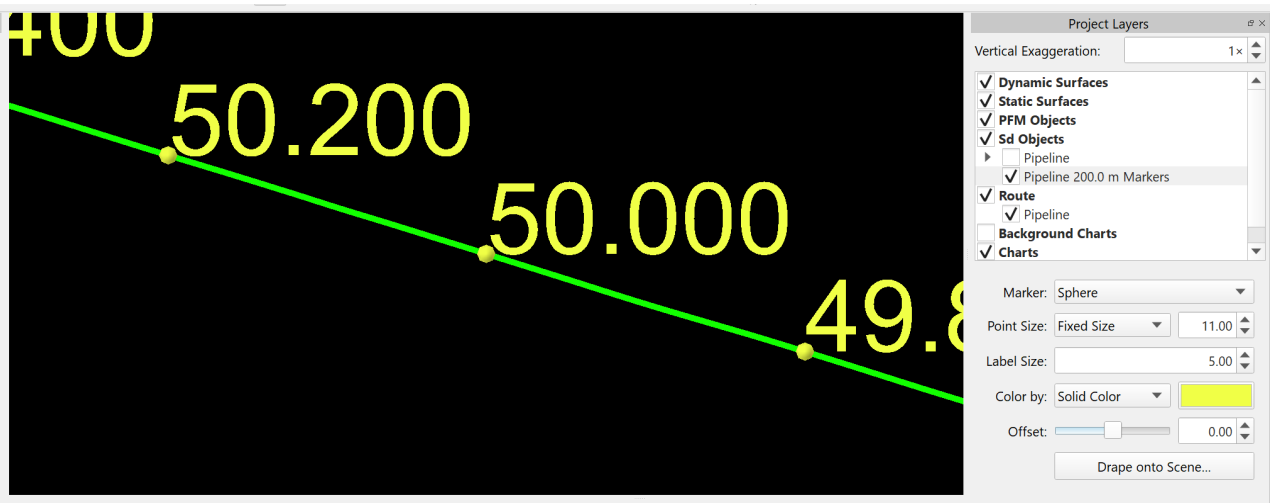


KP on Routes - Ability to add marker labels

Label markers can be added to a Route via the right-click context menu from the selected Route in the Project Layers dock. You can set the marker interval and the KP labeling starting KP, along with the label size.



Once the labels are created, you can adjust size and coloring and can also configure how the label point is rendered in the mini attributes panel. In the example below, it is a sphere.



Improvements and Bug Fixes

- Geodetics
  - Bug fixed for geodetic extraction from DB/QPD pairs
- Linked Objects
  - DB/QPD pairs working better for sub-sea platforms that do not have a heading sensor, heading is extracted from the QPD object track now
- Shifting Tools
  - Common User Experience for reporting, high-level access to export actions with new auto-export that saves critical reporting elements after the tool is successfully run (see graphic in highlights section above)
  - Common User Experience for the Adjust Vertical and Horizontal Shift Tools to force the user to select which files or Dynamic Surfaces they want to shift
- Varying Vertical Shift Tool
  - Added ability to specify Area of Computation to bring into alignment with the Static Vertical Shift Tool
  - Fixed bug where sampling interval was not set during first run of the tool
  - Added header to time-series ASCII export and changed time format to YYYY-MM-DD HH:MM:SS.SSS
  - Fixed a crash when applying a shift to lines with a blend where some lines have a pre-existing shift and some lines do not
- Horizontal Shift Tool
  - Improved consistency on how contours are displayed between the main Scene and the Horizontal Shift Tool, specifically the resolution

    - Fixed bug where shifting windows had different sizes due to length of the surface file names
    - Added new capability to do contour matching as a second method of assessing horizontal shifts, primarily for areas that don't have many linear or discrete seabed features (see graphic in highlights section above)
    - Fixed bug where depth range for the various surfaces was not correctly used when using a Static Surface as the reference surface
    - Fixed a bug where the easting/northing shifts were swapped
    - Fixed a bug where the ASCII output had the wrong sign convention for the shift values
- CAD
    - Arc sections of QGF are now drawn correctly, including when a QGF is selected for use as a Route
    - QGF files, once converted to Sd format, will inherit the QGF line thickness
    - Line thickness can now be controlled for all Sd line objects
- KP
    - Label markers can be added to a Route via the right-click context menu from the selected Route in the Project Layers (see graphic in highlights section above)
    - Geo picks export now has header, including for the KP and DX fields
- Slice Editor
    - Dock context menu has a delay added to avoid accidental selection of a menu option with an accidentally quick mouse click and release, there is now a minimum time between click and release before an action will be triggered
    - Removing an item from Sd Objects while slice editing will no longer exit the Slice Editor
- Time-Series Editor
    - Fixed a bug where the new segment shifting was applying the graphical shift in the incorrect direction due to not respecting the sensor's sign convention, only affected roll and pitch sensor shifting
    - Deleting a section in the time-series editor now correctly removes all data for the corresponding time span in the resulting QPD, previously this only removed the data if a user forced a manual ray trace calculation
    - Fixed an issue displaying True Heave data in the time series editor caused by the GPS week rollover
- 3D Editor
    - Show/Hide Files now works correctly when using slice editing in the standalone 3D editor
- Swath Editor

    - Put the internal / external selection modes back in the Swath Editor toolbar that was removed in 2.3.0
    - Fixed a water column rendering issue which would sometimes cause Qimera to freeze when viewing high density water column
- Surfaces
    - Fixed an issue where survey lines would render below a Surface when the vertical exaggeration was set to 0.01
    - Fixed an issue when using a selection to clip a Dynamic Surface when creating a Snapshot as a Static Surface
    - Fixed an issue with displaying a density grid color map ramp
    - Fixed an issue where the uncertainty color map histogram showed all values at 0.01
- Patch Test Tool
    - Fixed the Patch Test reporting when transmit and receiver multibeam locations are different but the offsets are applied to both transmitter and receiver
    - Allow for the vertical exaggeration to be changed the the Patch Test Plot and the Wobble Analysis Plot by holding the CTRL key and using the mouse wheel
- Exporting
    - Made the default folder prompt default to a project folder instead of the last imported path for image and Dynamic Surface exporting
- Vessel Editor
    - Fixed an issue where imported SBET files had duplicate time stamped vessel entries in the vessel editor
- Processing Settings
    - Fixed an off by one error when doing beam blocking
- Stability Improvements
    - Fixed a crash when appending lines to a dynamic surface and opening the 3D editor or slice editor during the append operation
    - Fixed line rendering that sometimes resulted in random crashes
    - Fixed a crash when importing 1000+ GSF files into Qimera
    - Fixed a crash when using the measure tool and switching to a different selection or tool
    - Fixed a crash when using the Time-Series Multiplot tool
    - Fixed a crash when selecting a line to view in the Time-Series Editor
- Miscellaneous
    - Cleaned up empty metadata folders that were being accidentally created in Qimera 2.3.0
    - The scroll select now supports using Alt + left click to move the selection to the mouse location

- Added option to set horizontal and vertical uncertainty columns in the Add Large ASCII Processed Points import
- Fixed a beam angle precision issue when importing FAU files and there are large outliers in the first few pings
- Fixed a zoom message pop-up when selecting a tide station

Voting System

In this release, we have completed 16 Suggestions from users, which satisfies 145 votes. For more information, see our Voting System Policy and Using the Voting System.

The Voting System helps us to continue improving our software products. Vote or provide feedback and participate in the process by tracking, watching and commenting on issues!

The Feedback Project helps us to continue improving our software products. Vote or implement feedback and participate in the process by tracking, watching and commenting on issues!

Vote



Click on the icon above and vote on or create a Suggestion issue!

Qimera 2.3.3 Release

The Feedback Project helps us to continue improving our software products. Vote or implement feedback and participate in the process by tracking, watching and commenting on issues!

17 February 2021

We are pleased to present Qimera 2.3.3.

Improvements and Bug Fixes

- Fixed a crash when importing ASCII navigation that would also re-occur when re-opening the project
- Fixed a crash when exporting KMALL to GSF when the KMALL had extra detections enabled
- Improved QPD unloading so any soundings that failed to unload could be unloaded again

Voting System

For more information, see our Voting System Policy and Using the Voting System.

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Vote



Click on the icon above and vote on or create a Suggestion issue!

Qimera 2.3.4 Release

14 April 2021

We are pleased to present Qimera 2.3.4, which has several improvements.

Improvements and Bug Fixes

- Processing / Source Files
  - Fixed an issue when unloading edits back to a HDCS file
  - Improved performance when selecting project sources, especially for projects containing large navigation files
- Tools and Editors
  - Improved the performance of the slice editor when using a rotated selection
  - Fixed an issue with pixelation and slowness in the water column side stack view
  - Fixed a rendering issue in the Time Series Editor when zooming while selecting and inserting samples
  - Fixed a height step between lines after repeated runs of the Varying Vertical Height shift tool
  - Fixed ping errors reported during Dry Run and added start and end times for the different series
  - Fixed the *Center View on Point Pair* action in the Horizontal Shift Tool's contour view
  - Vertical Shift Tools now work everywhere, inside boundary or outside boundary and can be used with an area exclusion mask which can exclude (multiple) areas from the computation
- Importing / Exporting
  - Importing large ASCII point files causing spikes due to a resolution issue has been fixed
  - Fixed the Export Kongsberg .all to GSF that was dropping the second swath when in dual swath mode
  - Fixed an FAU import precision issue causing millimeter level shifts in point depth
  - Fixed a colormap issue when exporting GeoTIFFs from a Dynamic Surface displaying 95% confidence interval
  - Added the ability to set the Plotted flag during import of Processed Points
- Layers
  - Improved the fidelity of curve rendering in routes and CAD imports. The number of line segments used to approximate curves has been greatly increased.

  - Added a warning message explaining that selection tools may not work properly on surfaces that have been given a visual Z offset
  - Fixed a graphical issue affecting surfaces with a visual Z offset
- Other
  - Fixed the loading of the geographic and projected formats in the *Shared Preferences* page of the preferences

Voting System

For more information, see our Voting System Policy and Using the Voting System.

The Voting System helps us to continue improving our software products. Vote or provide feedback and participate in the process by tracking, watching and commenting on issues!

The Feedback Project helps us to continue improving our software products. Vote or implement feedback and participate in the process by tracking, watching and commenting on issues!

Vote



Click on the icon above and vote on or create a Suggestion issue!

Qimera 2.3.5 Release

3 May 2021

We're pleased to present Qimera version 2.3.5, a maintenance release addressing small issues. Read below for details.

Improvements and Bug Fixes

- Fixed a point loading bug in the Fixed slice and Free slice where points were not being loaded when stepping through the overview box

Voting System

For more information, see our Voting System Policy and Using the Voting System.

The Voting System helps us to continue improving our software products. Vote or provide feedback and participate in the process by tracking, watching and commenting on issues!

The Feedback Project helps us to continue improving our software products. Vote or implement feedback and participate in the process by tracking, watching and commenting on issues!

Vote



Click on the icon above and vote on or create a Suggestion issue!

Getting Started

This article will help you set up a Qimera project.

For Installation information, please see How-to Install Qimera **and** How-to License Installation **or** How-to License Manager.

Getting up and running with Qimera begins with creating a Project, or opening an existing Qinsy project. Qimera projects store *bathymetry data in QPD format* and *external source data* such as SVP, vessel and tide; they also allow you to manage your data processing flow and preserve any processing steps that you have already accomplished, and provide a centralized location for storing exported products. The data used for this Quickstart is Kongsberg EM2040 single head data from Wellington, New Zealand and was part of the Shallow Survey 2012 common dataset; Download files. These files are *Raw Sonar Files* and when using Qimera they can be fully processed.

This Quickstart demonstrates a straightforward workflow with one of the more comprehensive data types, Kongsberg .ALL files.
Other data types will follow a similar workflow, but there may be additional steps or you may encounter other dialogue boxes that are not shown in this Quickstart.

For other data types, we have created How-to's that attempt to document differences in workflow.
The available How-tos are:

- How-to Work with Qinsy Data;
- How-to Work with Hypack HSX Data;
- How-to Work with Konsgberg ALL Data

> ⚠ The import and processing of raw data formats is dependent on licensing. In Qimera, go to the Help drop-down menu and choose View License Status to view your current license coverage.

On this page:

- Step 1 – Launch Qimera
- Step 2 – Create the Project
- Step 3 – Add Source Files
- Step 4 – Create Dynamic Grid
- Step 5 – Explore your data
- Step 6 – Add Vessel Information & Adjust for Motion
- Step 7 – Add Additional Source Files & Perform Processing

    - Add & Edit Sound Velocity Profiles (SVPs)
    - Add & Apply Tide Information
    - Add & Apply Other Navigation Sources
- Step 8 – Edit Bathymetry
    - Area-Based Manual Point Editing: 3D Editor
    - Area-Based Manual Point Editing and Filtering: Slice Editor
    - Spline Filtering
    - Swath-Based Manual Point Editing
    - CUBE Editing and Filtering
- Step 9 – Export Products
- Step 10 – Additional Multibeam-Related Processing
- Step 11 – Grid Analysis

We have implemented a new option to change default left mouse button behavior based on workshop feedback with former Qloud users. The default left mouse button will remain the same in that you need to hold down the Shift key to adjust the view in the Scene when you are in another mode such as polygon selection. The new optional mode leaves the left mouse button always in navigation mode and you hold down shift to activate the secondary mode, such as to draw a polygon. Many Qloud users have found this second mode more intuitive in that you can draw a selection and then it remains where you drew it when you attempt to adjust the 3D view. This setting is available in the 'General' tab of the Qimera Preferences.

Quickstart Info

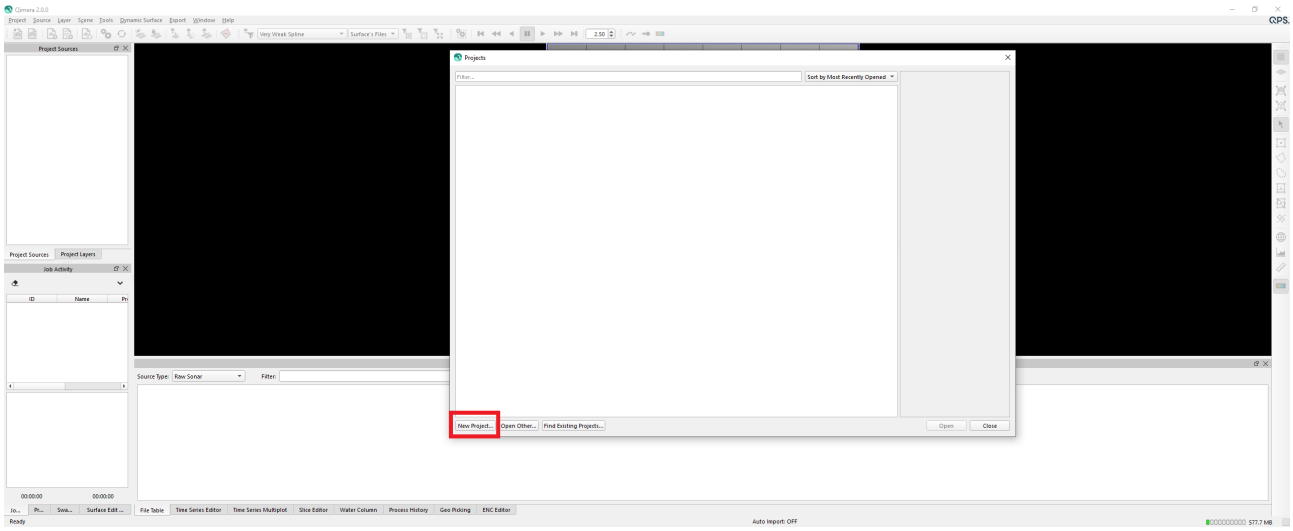
You can view a full-size version of any image in this Quickstart by clicking on the image. Numbers in images are referred to in the text preceding the image or in the image caption itself. Blue text indicates a link to the manual, another document, or data.

Step 1 – Launch Qimera

Launch Qimera by clicking on the icon, or from the applications menu of your computer (using Windows: Start > All Programs > QPS > Qimera).

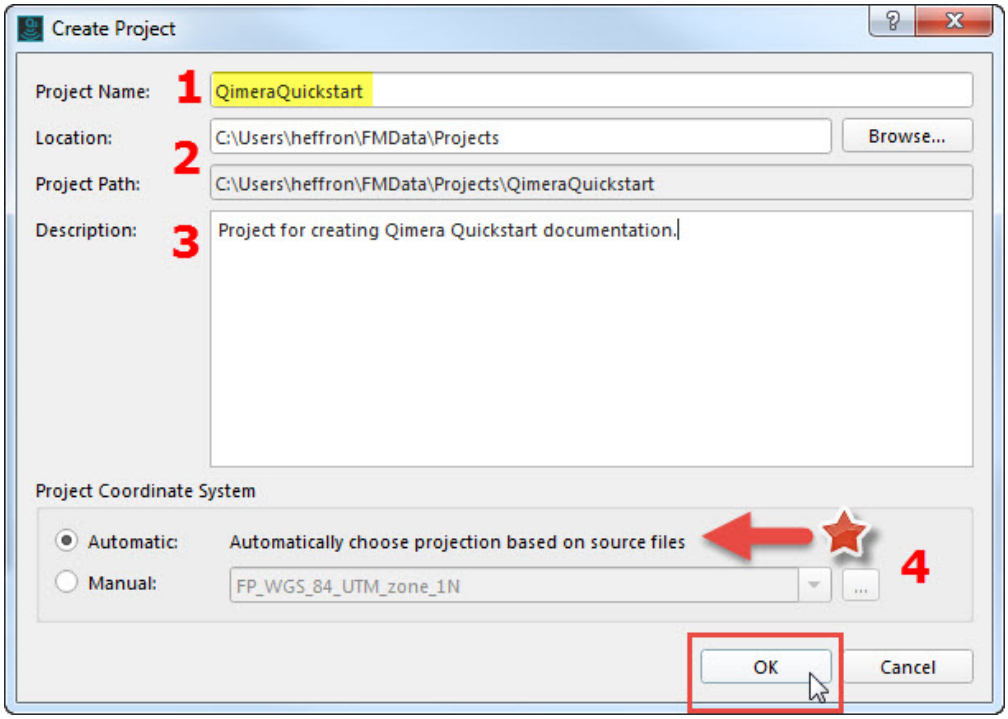
Step 2 – Create the Project

Qimera provides a guided Dynamic Workflow that can guide you through processing steps and will attempt to complete certain steps (such as vessel extraction, for example) for you. Part of the Dynamic Workflow is the Welcome Screen, which will launch automatically when Qimera is opened. From the Welcome Screen, select New Project.



Qimera Welcome Screen

The *Create Project* dialogue will launch. Add project name information (1). By default, the folder for your project will be in the '/Users/username/FMData/Projects' directory (2), though you can choose any location. Once created, the project folder will contain sub-folders for storing bathymetry files in QPD format, internal metadata, extracted external source data, and products. The Description box (3) can be used to add additional notes about the project. Finally, the default ("Automatic" option) is for Qimera to automatically set the project coordinate system based on the first imported line of source data (4). For unprojected/geographic source data, the closest UTM zone will be used; for projected data, the project projection will match that of the source data as set by the user on import. If you prefer, you can select the Manual radial button and manually select a different projection.



Create Project dialogue

Create Project

Alternatively, you can create a project by clicking the Create Project Button  or by going to the *Project* menu and choosing New Project. The default project location can be changed in the *Preferences* (Project > Preferences, Shared Preferences tab, Default Project Folder).

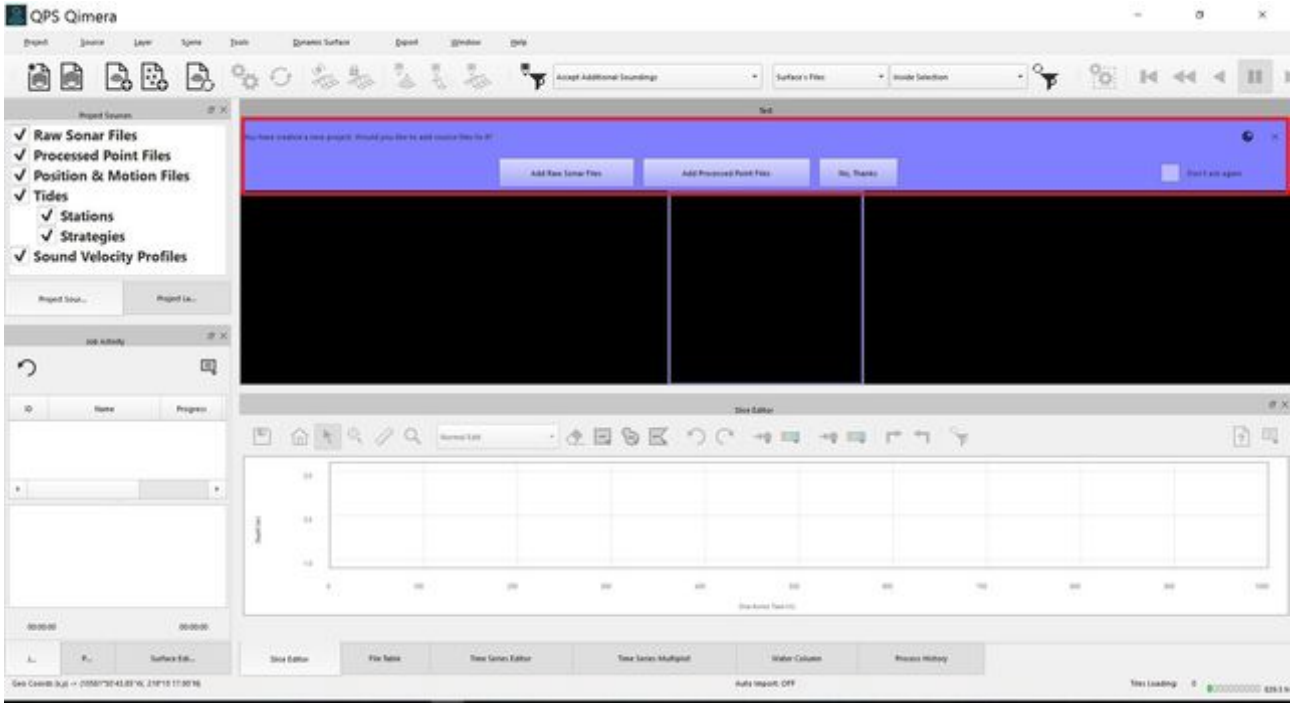
Project Projection

At this time, Qimera projects **must** be projected.

Step 3 – Add Source Files

Qimera provides tools for full bathymetric processing of Raw Sonar Files such as Qinsy DB, Kongsberg ALL, Reson S7K, Hypack HSX, GSF Files, and Edge Tech Files JSF. Qimera can also do limited geospatial processing of Processed Point Files such as ASCII XYZ, Hypack HS2, and Danish Hydrographic FAU. A list of Supported Data Formats can be found *here*.

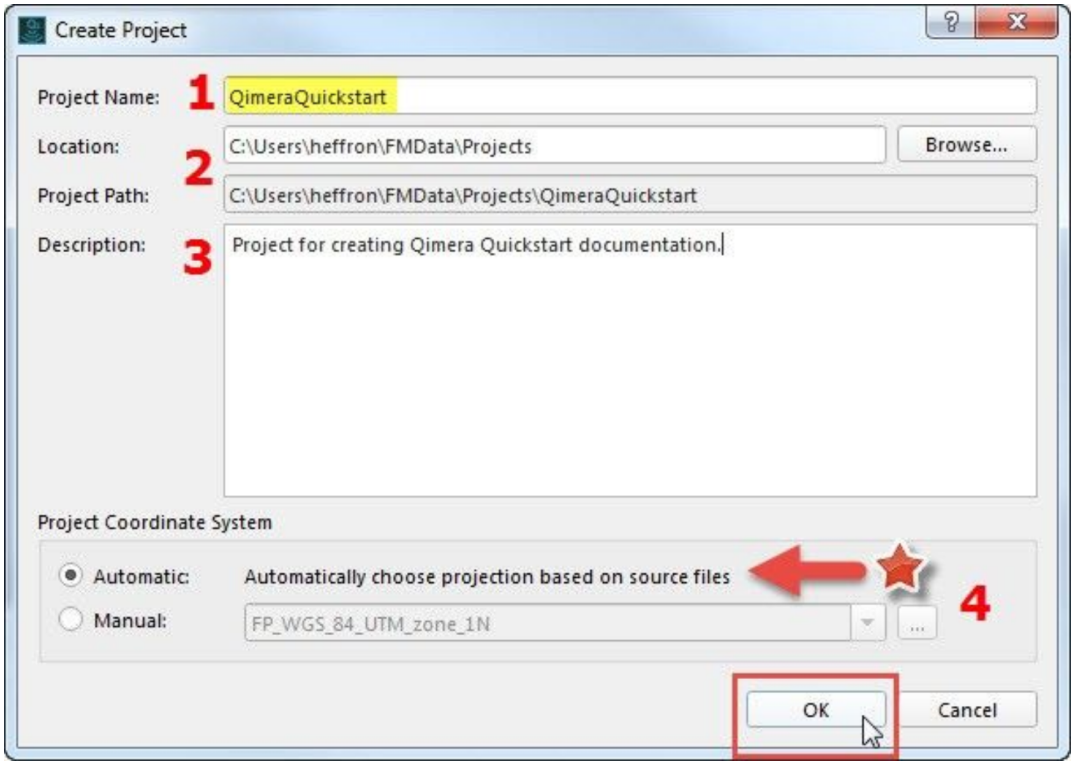
The guided workflow will next ask you if you would like to add source files to your new project. Choose *Add Raw Sonar Files*.



Add Source Files prompt.

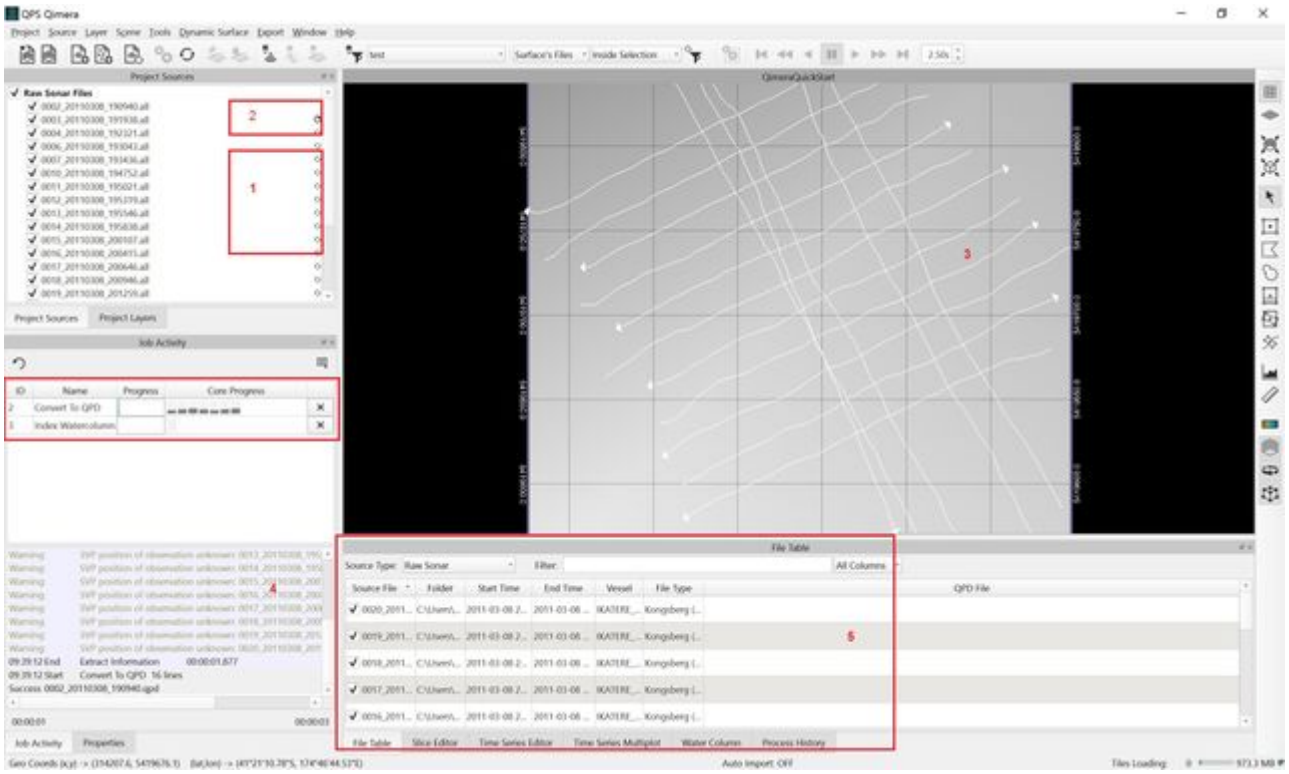
Add Source Files
Alternatively, you can add Raw Sonar Source Files by clicking the Add Raw Sonar File button or by going to the *Source* menu and choosing Add Raw Sonar Files.

The user will then be presented with Add Raw Sonar Files dialogue shown below. This dialogue lets you select specific files or a directory containing your files. Here, we choose Add Files (1) and add the raw sonar files. Set the coordinate system of the imported data (2). Click OK to start the add files process (3).



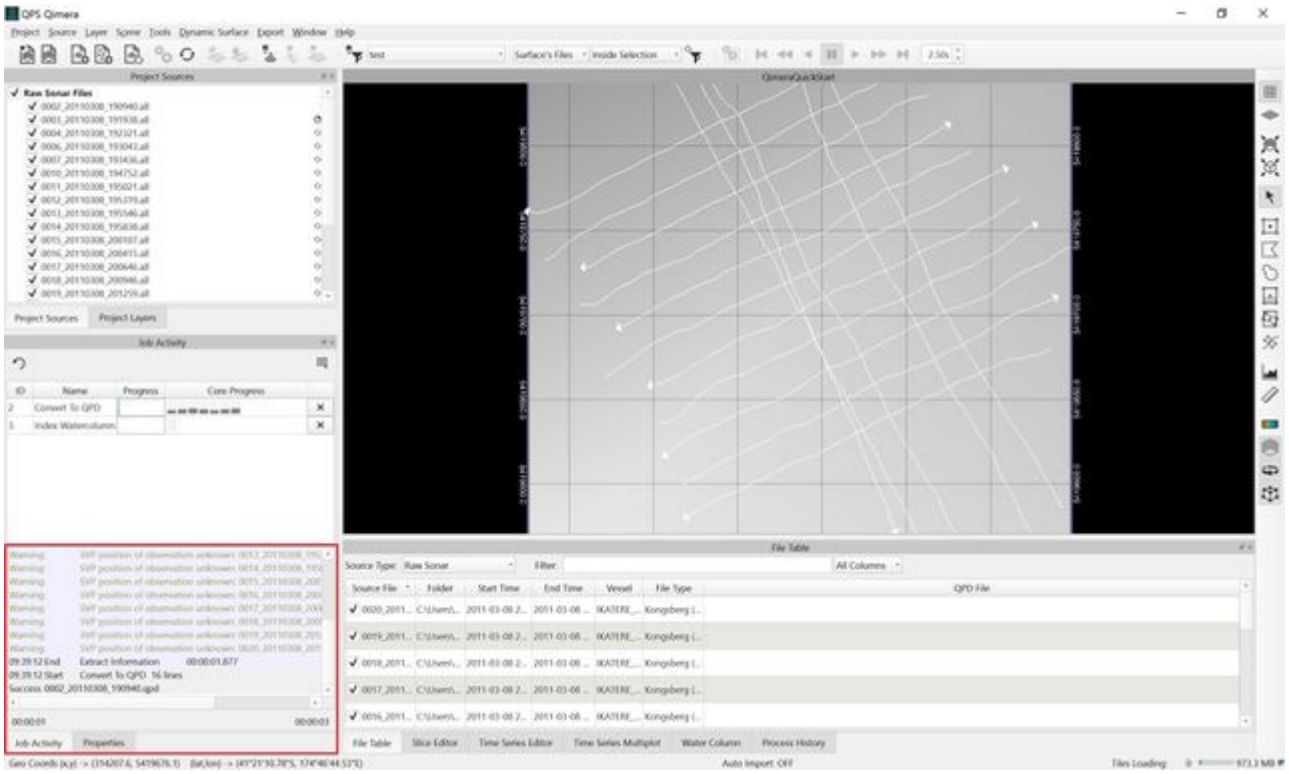
Add Files Wizard

Qimera attempts to automatically detect and extract any available information as it adds source files to the project. Extracted information includes vessel configuration, position, heading, motion, sound velocity, and tide and/or GPS/GNSS height corrections – if it is supported by the file format and available in the file (for a full list of what is extracted from each supported format, click *here*). Multibeam records are indexed and retrieved as necessary from the raw files; only minimal metadata information is extracted from the multibeam ping records. Rich formats will contain much of this information, making your processing workflow faster. Other formats may be missing this information, in which case it will have to be added separately.



Information being extracted from files during import. Individual file load progress is shown (1) and after each file loads the processing status is indicated (2), and a trackline is drawn (3). Overall progress is monitored (4), and information that is extracted populates the File Table view (5).

As the extraction progresses, Qimera will track processing and any potential issues or errors in the *Job Activity Window*.

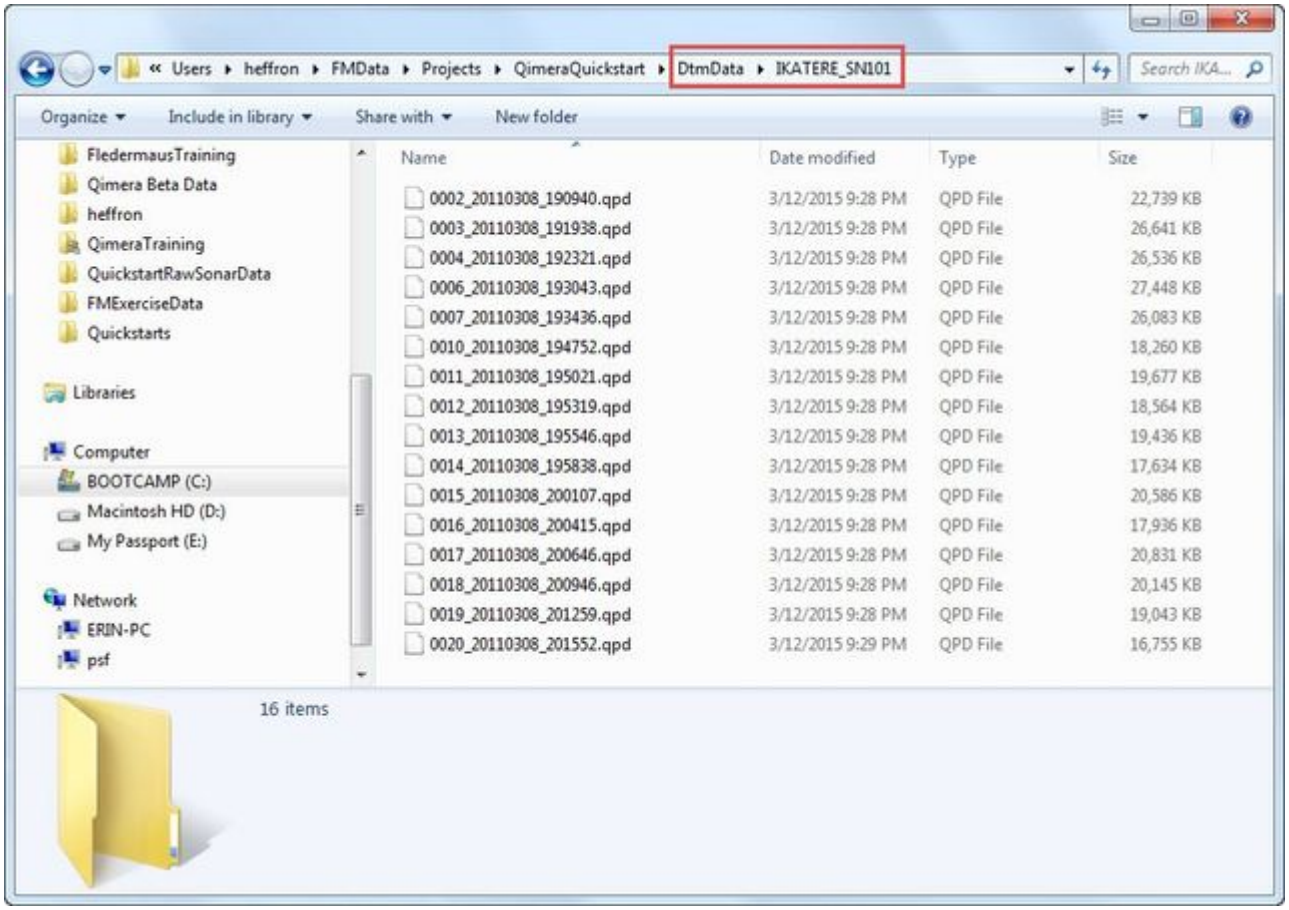


Job Activity Window showing processing stage, warnings, and errors encountered during load.

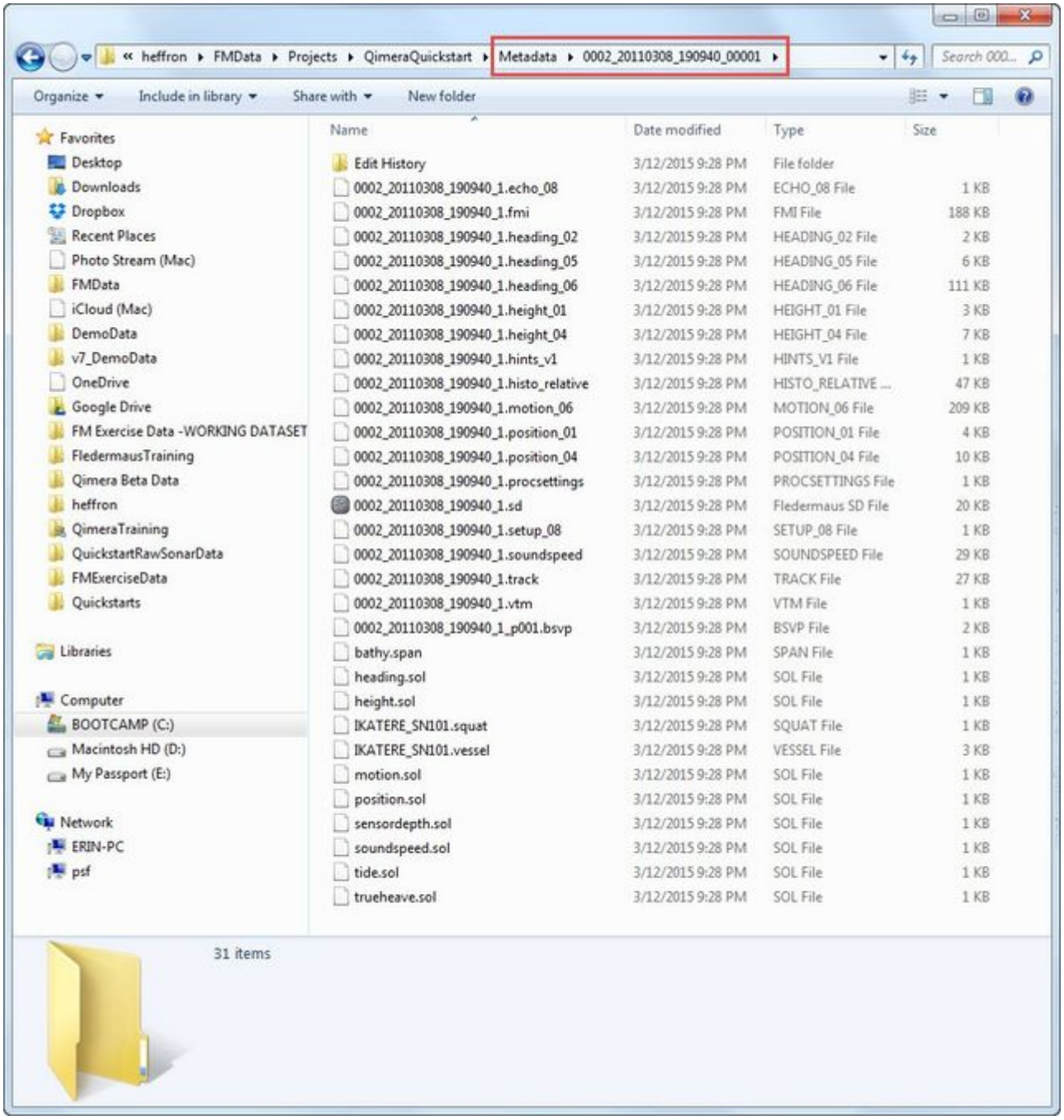
As information is extracted from the source files, it is written to the Qimera project.

For rich formats with soundings (XYZ footprints calculated during acquisition or online), Qimera can directly convert the online XYZ for each file during import and write them to a QPD, which is the QPS internal format for processed point data. The QPD files are then written to the project.

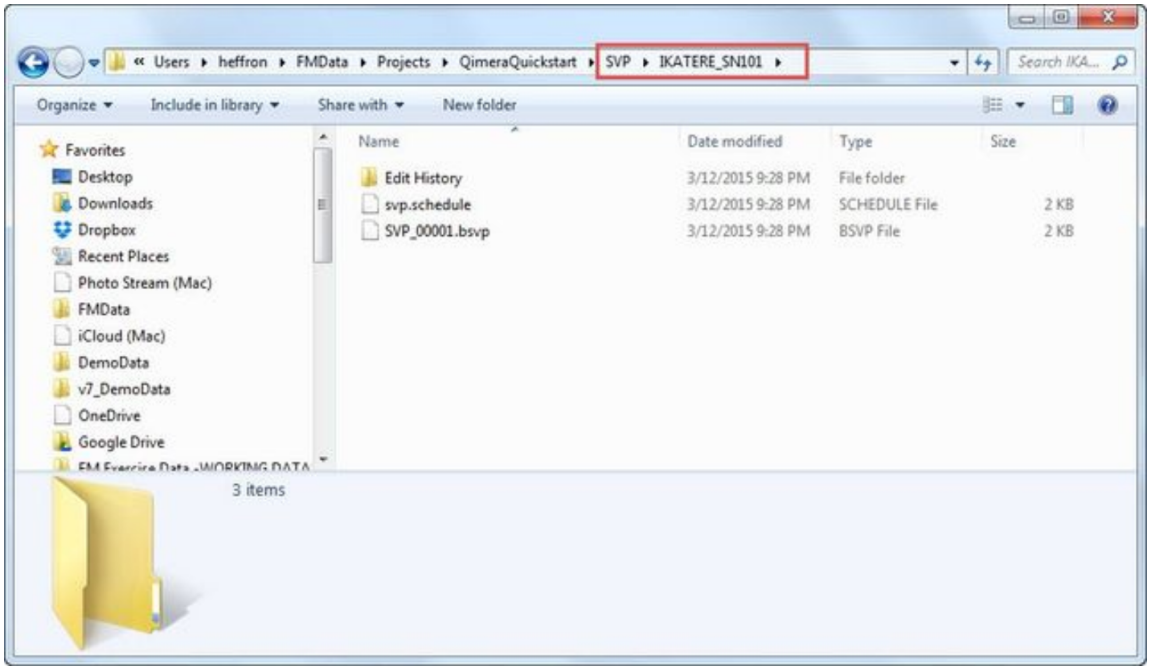
For acquisition by Qinsy users, the QPDs computed while online are used directly without recomputing. For file formats that contain complete sonar information and all supporting ancillary data, Qimera can calculate XYZ footprints for each file after import and write it to a QPD.



QPD files generated for the source files.



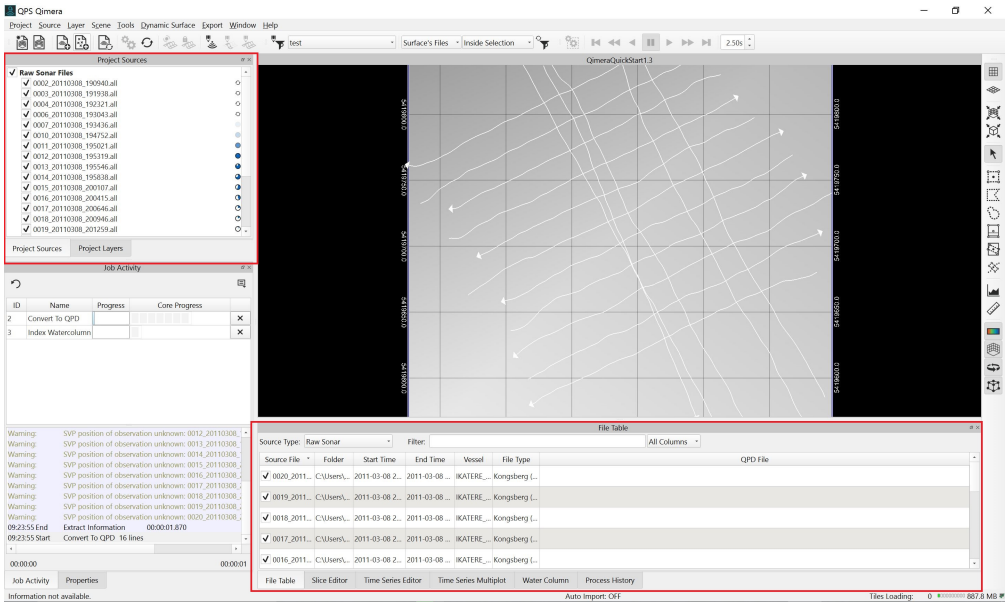
Extracted information for one source file line in the Metadata folder.



Extracted SVP information in the SVP folder.

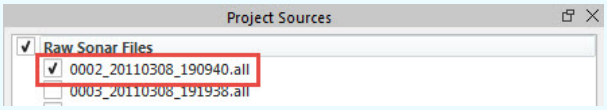
If water column data is available in the files, it will be indexed as well.

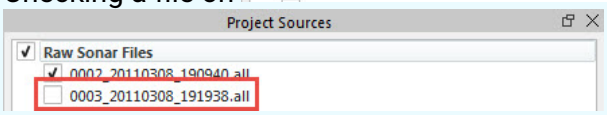
The source files for the project will be listed in the Project Sources Window, under the Raw Sonar Files (which is the Parent level) navigation track lines will also be visible. The check boxes next to each line control visibility in 4D Scene; lines that are checked are visible. Source file location and the QPD file that corresponds to each source file can be viewed in the File Table Window.



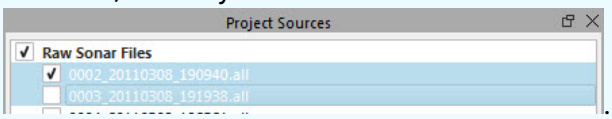
Files Loaded and visible in Project Sources , File Table , and 4D Scene.

File Visualization & Selection in Qimera

Checking a file on 

or off 

in the tree view controls the **visibility** of the trackline; it **does not** affect which files are used in grid creation and processing routines.

For files to be used in a processing routine (such as grid creation), they can be checked on or off, but they must be selected in order to be processed 

. Files can be selected by clicking on the file name or trackline with the mouse (use SHIFT-click or CTRL-click to select multiple files), or by selecting the Parent level above the files in the Project Sources Tree View – in this example, the current Parent level would be Raw Sonar Files.

This is a key part of Qimera's workflow. For an overview of the Qimera user interface, click *here*.

Note: When lines have just been added to your project and you are prompted to do a process, all of the lines that were added will automatically be included in that process.

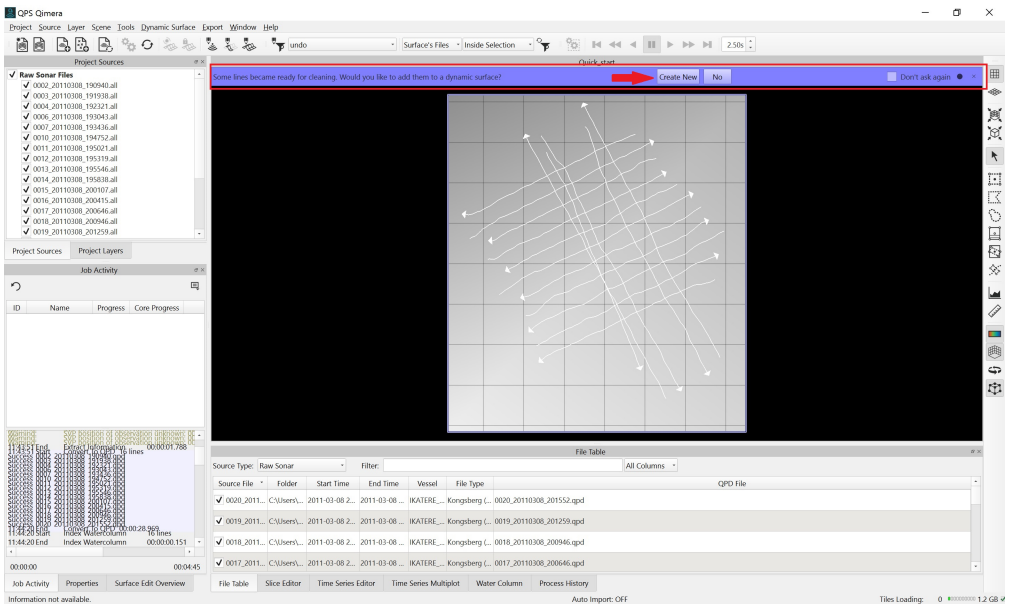
Step 4 – Create Dynamic Grid

Additional Processing

Some file formats may need additional source information and/or source files and should have additional processing applied before creation of the Dynamic Grid. This will be indicated by a prompt (for example, a message that your vessel offsets are zero and prompting you to add information) and/or by the symbol next to the file name in the Project Sources Tree View; the prompt to create a Dynamic Grid described below will not appear. Qimera only requires core ping information, vessel motion and navigation to create a Dynamic Grid and does not require that you have the full complement of ancillary data such as SVP, Tide or even vessel offsets (these are assumed to be zero until specified otherwise). It should be noted that if SVP, tide or vessel offset information

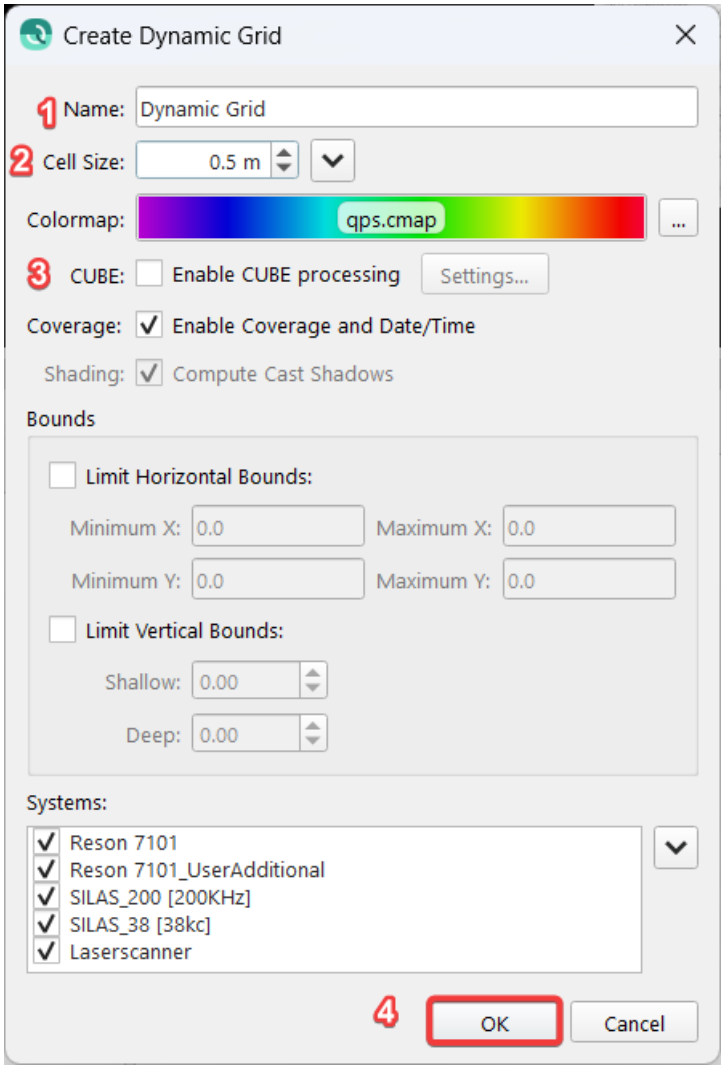
is missing, then any processed soundings or grids generated from these will be sub-optimal. If you know that your files require additional source information, source files, and processing, you may want to go to **Step 6 - Add Vessel Information & Adjust for Motion** or **Step 7 - Add Additional Source Files & Perform Processing** first. Note that the Dynamic Grid can easily be re-generated after any stage of processing.

Once the files have loaded, Qimera will prompt you that lines have become ready for cleaning, and ask whether you would like to add them to a Dynamic Grid. Dynamic Grids are gridded bathymetric grid models that can be viewed and edited in 2D or 3D; they are "dynamic" because they reflect the state of the processed data (the QPD files) and will update to reflect changes you make during various processing steps. Click Create New in the Dynamic Workflow prompt in 4D Scene to start building your Dynamic Grid. Alternatively, if the Dynamic Workflow does not activate, a new Dynamic Grid can be created by selecting from the main toolbar Layer → Create Dynamic Grid.

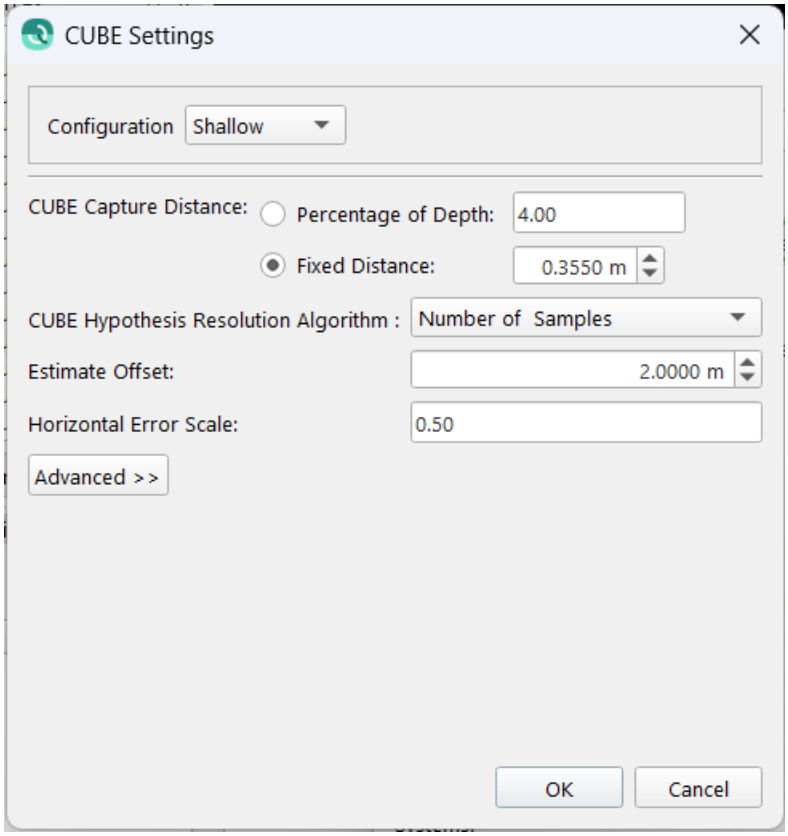


Add lines and Create New Dynamic Grid prompt. (Dynamic Workflow)

The *Create Dynamic Grid dialogue* will launch. Change the name of the grid if desired (1). Qimera will calculate a suggested cell size using an approach based on the footprint size of an average multibeam echosounder projected to the mean depth of the set of files provided to the wizard (2), though you can adjust the value. If you would like to create a CUBE grid, check on Enable CUBE Grid (3) and adjust the CUBE options by clicking on Settings (4). Click OK to start the grid build. Link to what CUBE grid is?

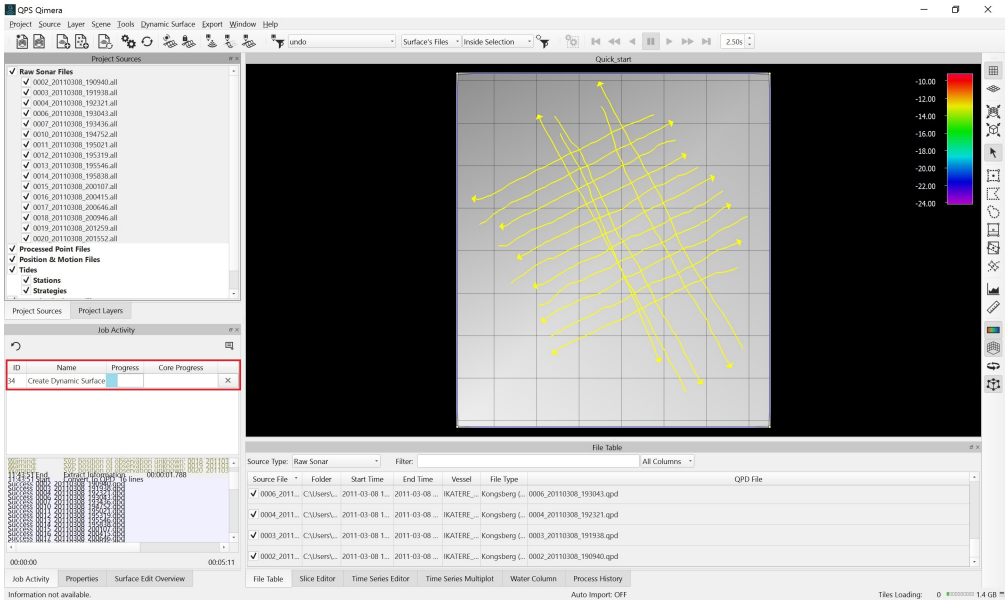


Create Dynamic Grid dialogueue



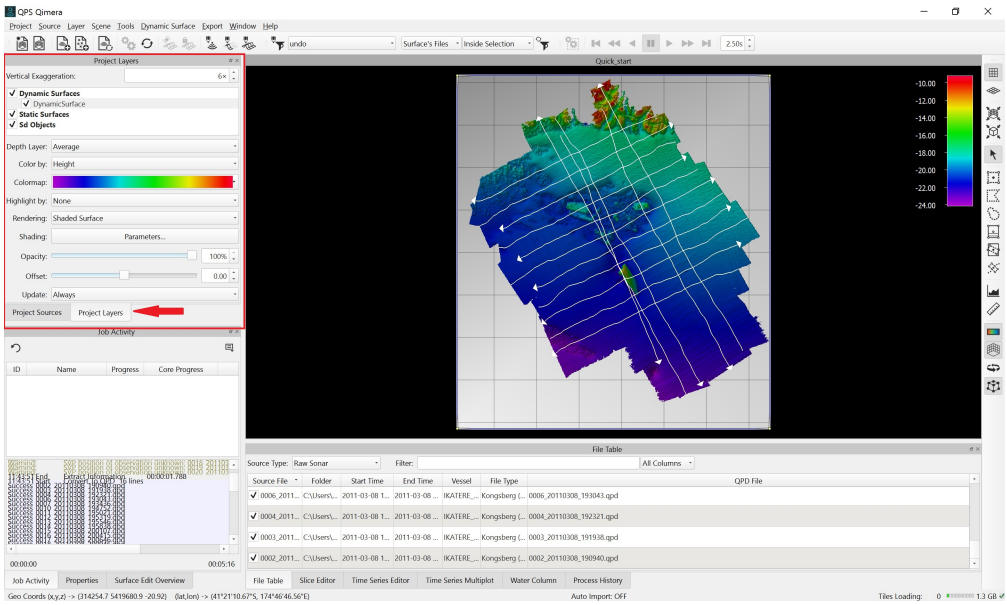
CUBE Setting dialogueue. Choosing a Configuration will auto-fill the CUBE Capture Distance, Estimate Offset, and Horizontal Error Scale; choose Custom to input your own settings.

The progress of the build can be followed in the *Job Activity Dock*.



Dynamic Grid build progress.

Once the grid build is complete, the Dynamic Grid will be visible in the 4D Scene. If you click on the Project Layers tab, the layer will be listed in the *Project Layers Dock* under Dynamic Grids. Selecting that layer (by clicking on it with your mouse) will show attributes for that grid, including the depth layer being displayed, the Colour By options for the grid, the selected Colourmap, and Opacity controls. At this point, you might choose to turn off your navigation tracklines to get a better look at the grid. You can do this by returning to the Project Sources tab and unchecking Raw Sonar Files.



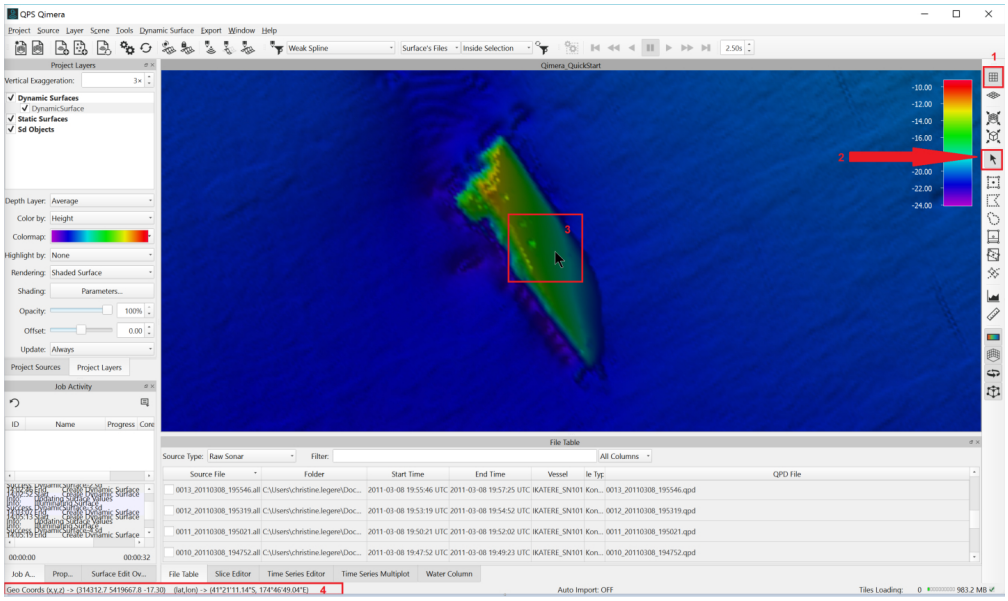
Dynamic Grid.

Create Dynamic Grid

Alternatively, you can create a Dynamic Grid by selecting the files or area of interest and clicking the Create Dynamic Grid Button  or by going to the *Layer Menu* and selecting Create Dynamic Grid. When using these options, be sure to select your lines first, either individually or by clicking on the Raw Sonar Files parent in the tree view to select all available files. More information about Dynamic Grids can be found *here*.

Step 5 – Explore your data

When you start working in Qimera, you will be looking down at your data in Plan View (this button is currently called 2D view) (1), and you will be in Simple Select Mode (this button is called Explore Mode) (2), which is used for basic navigation and simple selection tasks. To navigate through your data in Plan View, move your mouse to the 4D Scene. Click and hold your left mouse button, then drag your mouse left and right. This is how you pan through your data. Next, place your mouse on a location of interest, then push down on the scroll button. This moves the location of interest to the centre of the screen and is referred to as *middle clicking*. Use the Scroll button to zoom in and out. Right-click and drag your mouse across the grid. This generates a profile. While moving your cursor along the data (3), note the updating position on the left side of the *Status Bar* display at the bottom of the screen (4).

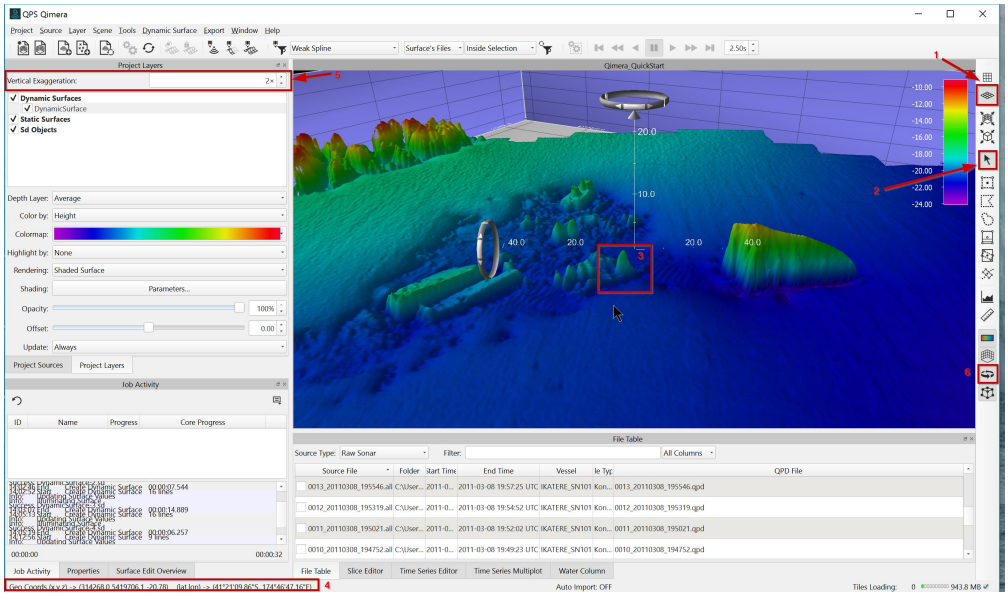


Navigating in Plan View.

Changing to Turntable View (1) will put you into a 4D working environment, making any artefacts in your data simple to spot. To navigate in Turntable View, move your mouse to the 4D Scene. Using Simple Select Mode (2), click and hold your left mouse button then drag your mouse left and right. This will start your grid rotating around the central vertical axis. Click and hold your left mouse button again, and drag your mouse up and down. This will start your grid rotating around the central horizontal axis. Place your mouse on a location of interest, then push down on the scroll button. This moves the location of interest to the center of the screen and is referred to as *middle clicking*. Use the Scroll button to zoom in and out. Right-click and drag your mouse across the grid. This generates

a profile. While moving your cursor along the data (3), note the updating position on the left side of the Status Bar display at the bottom of the screen (4).

When working in Turntable View, you may want to adjust your vertical exaggeration (5). This can be done in the *Project Layers Dock*; simply type a new value into the Vertical Exaggeration field. You may also want to turn off the Widgets; this can be accomplished by clicking the View Widgets Button (h) (6).



Navigating in Turntable View.

Navigating in Qimera

It is strongly advised that you use a 3-button mouse to work in Qimera. It greatly improves your ability to move quickly through the data.

Qimera Interface & User Interaction

You can find more information on the Qimera user interface *here*. Information pertaining to user interaction can be found *here*.

Step 6 – Add Vessel Information & Adjust for Motion

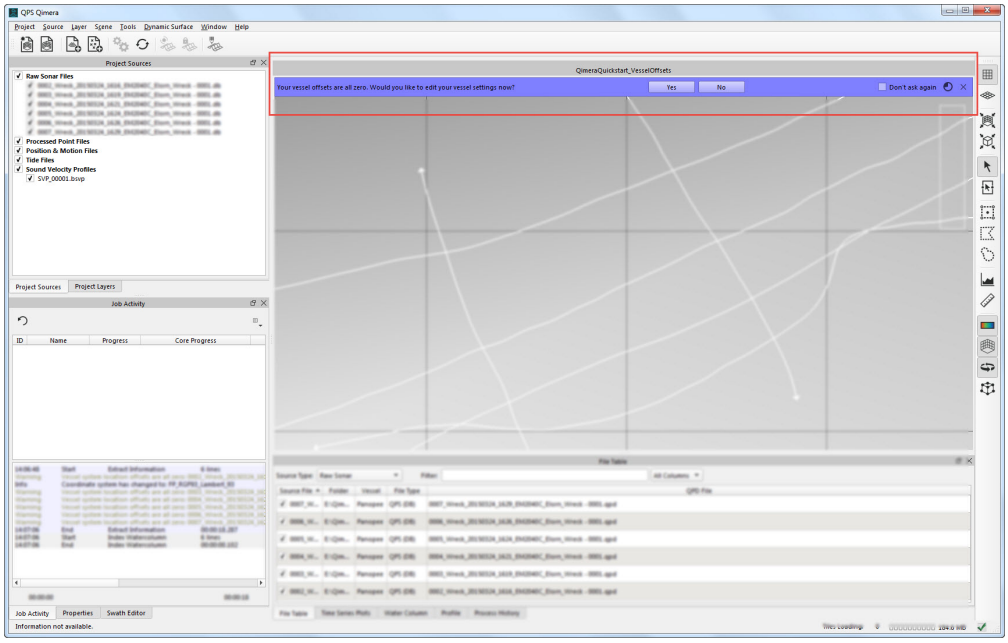
Patch Test

If you have not yet conducted a patch test in order to determine your motion offsets, do so now and if possible add the information in to your online systems so that motion artifacts are corrected online for any additional data you will be collecting. Offset values calculated using the Patch Test tool can be added to the project from the Patch Test dialogue using Add Calibration, Save, and Apply. You can find more information on the Qimera Patch Test tool *here*, and a howto on using the tool can be found *here*.

Static grids

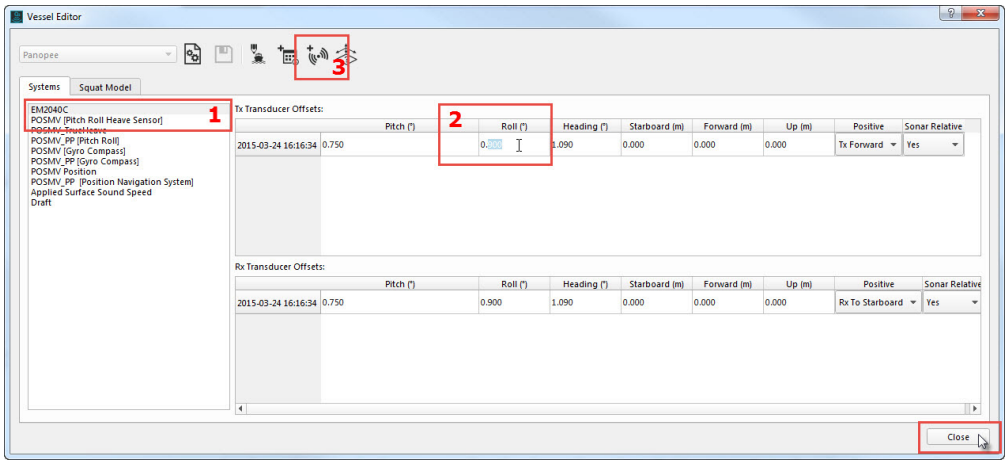
You may find it useful to create a *Static Grid* prior to performing processing steps, to use as a way of comparing the pre- and post- processing results. You can create a Static grid using the Create Static grid  Button.

In some cases, the vessel offsets and motion information may not have been populated online. This information can be added in the *Vessel Editor*. If no vessel offsets or motion information is detected when the source files are added, you will get a warning that the vessel offsets are zero, and Qimera will ask you if you want to edit the vessel information.

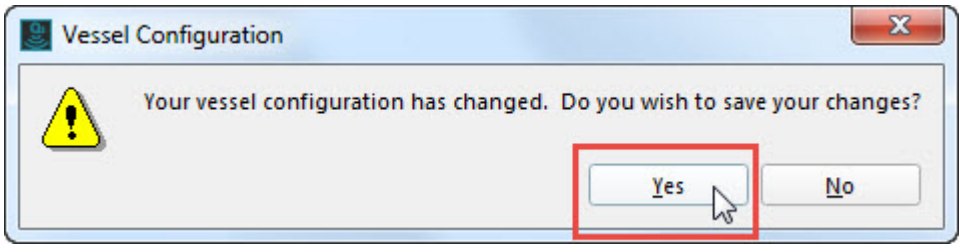


Vessel Offsets warning.

Click Yes to launch the Vessel Editor. Select the system you want to edit form the Systems tab (1). Double click on any of the boxes (2) to make the values editable, then add your offset values.



Entering offsets in the Vessel Editor.



Saving changes to Vessel Configuration.

Re-process your files and recreate the Dynamic grid to incorporate the changes.

Zero Vessel Offsets

Vessel Offsets may be zero because corrections were applied in the POS MV, in which case vessel offset information won't need to be added. This will depend on your acquisition set-up.

Vessel Editor

You can also launch the Vessel Editor by right-clicking on Raw Sonar Files in your Project Sources and selecting Edit Vessel Configuration, or by going to the *Tools* menu and selecting Edit Vessel.

Step 7 – Add Additional Source Files & Perform Processing

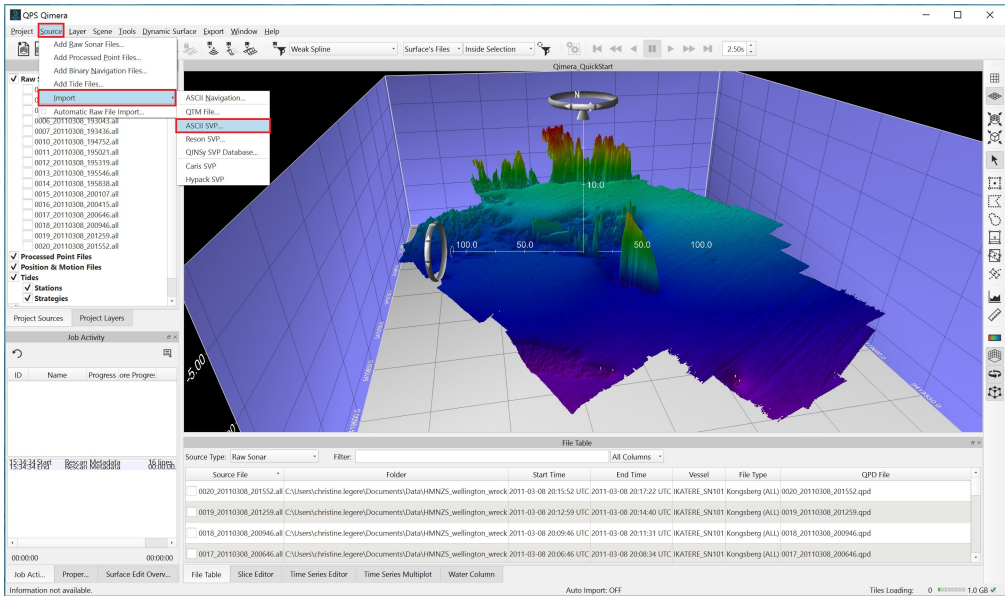
Static grids

You may find it useful to create a *Static Grid* prior to performing processing steps, to use as a way of comparing the pre- and post- processing results. You can create a Static grid using the Create Static grid  Button.

In some cases, the Raw Sonar File formats do not have all of the information stored in them for full processing – for example, Sound Velocity information is stored in Kongsberg ALL files but may or may not be present in DB, HSX, or S7K files. In other cases you may want to reprocess the position and motion using a different data source.

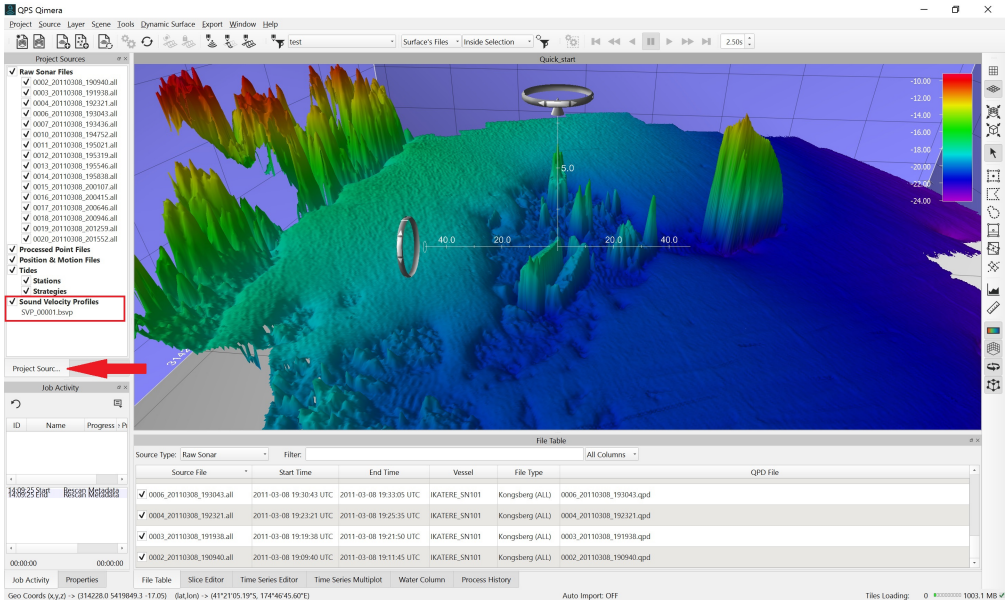
Add & Edit Sound Velocity Profiles (SVPs)

ASCII, Hypack, and Caris SVP information can be added to Qimera by going to the *Source* menu and selecting Import > *ASCII SVP*, Import > Caris SVP, or Import > Hypack SVP.



Adding SVP information to Qimera.

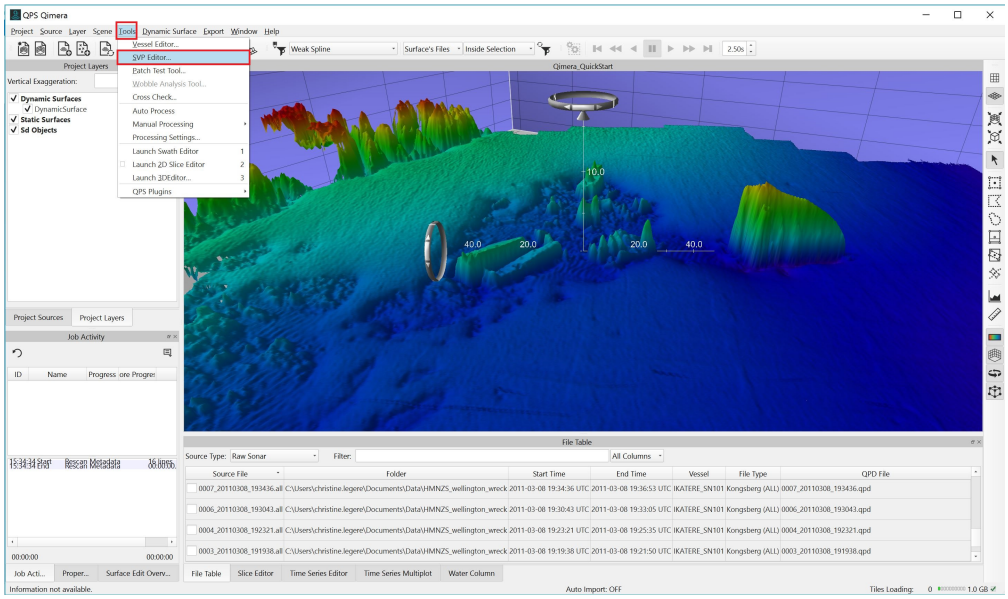
Once the SVP information has been added to the project (either via automatic extraction or through the Source > Import menu option) it will be listed in the *Project Sources Dock* under Sound Velocity Profiles.



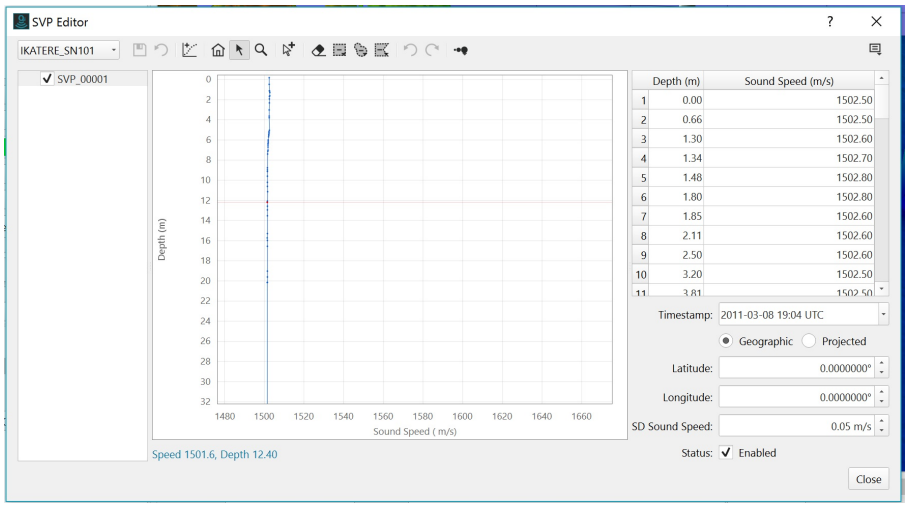
Sound Velocity Profile in Project Sources.

SVP information that is part of the source data will be used for processing and creation of the Dynamic grid from the beginning. Otherwise, the addition of new or additional SVP information will require manual intervention to link the newly imported SVP files to be applied to particular raw source files. This is done by editing the Sound Velocity Strategy in the *Processing Settings Editor* for all raw multibeam source items that require updating (accessing the Processing Settings Editor is described below).

Once SVP information is added to the project, it can be edited using the *SVP Editor*. Launch the SVP Editor by going to the *Tools* menu item and selecting Edit SVP, or by selecting the SVP of interest from the Project Sources Window, right-clicking, and choosing Edit SVP.

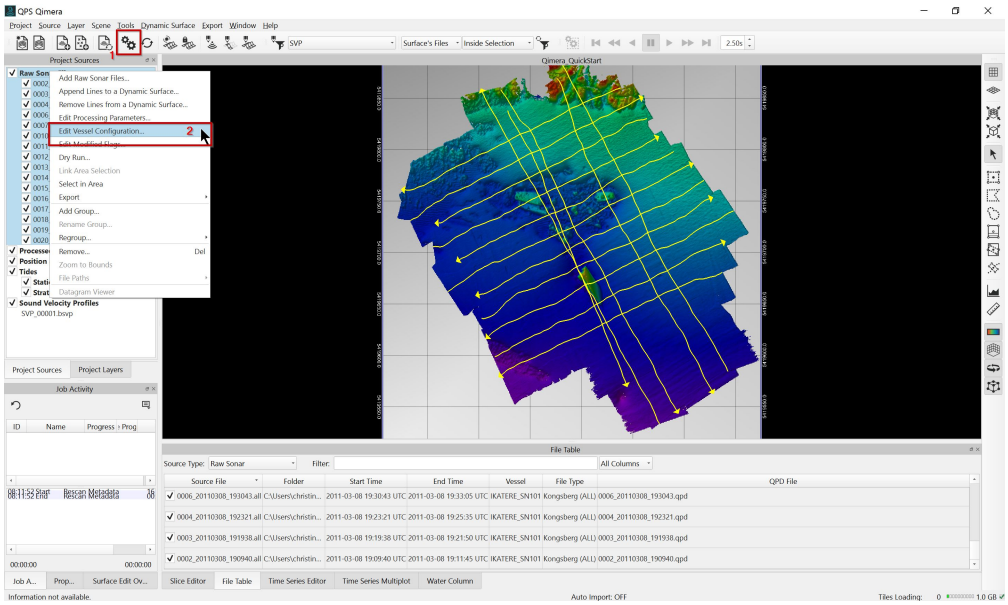


Edit SVP Tool option.



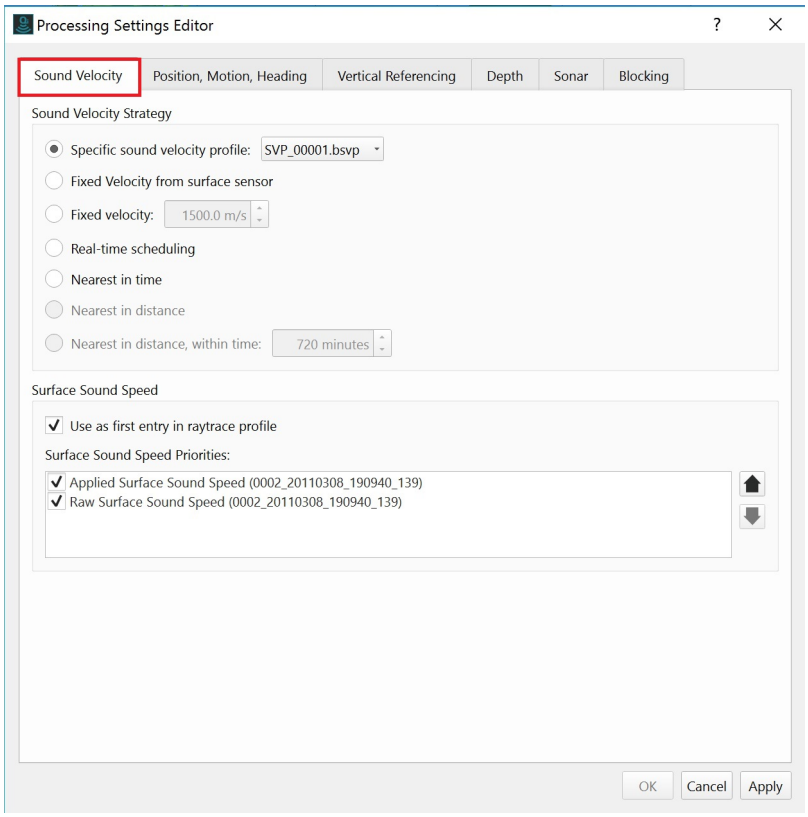
SVP Editor.

When there are multiple Sound Velocity files in your project, you can choose how they are used during processing in the *Processing Settings*. To access the Processing Settings Editor, select the file or files that you want to apply specific settings to and click on the Processing Settings Button  (1) or select the file or files of interest and right click to select Edit Processing Parameters (2).



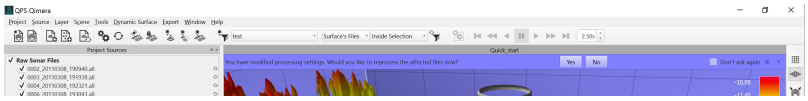
Edit Processing Settings.

Select the Sound Velocity tab to review the options for Sound Velocity strategy and prioritization. Make any necessary changes and click OK.



Sound Velocity Processing Settings.

Once this is done, Qimera will mark all affected files as needing processing, indicated by the ↻ symbol after the file names in the tree view. Qimera will also prompt you that you have modified the processing settings and that affected files should be reprocessed. Click Yes to reprocess the data with the new sound velocity information; if you plan to further edit the sound velocity profile or to reconfigure the sound velocity strategy, you may chose to select no and wait until you've completed these steps.



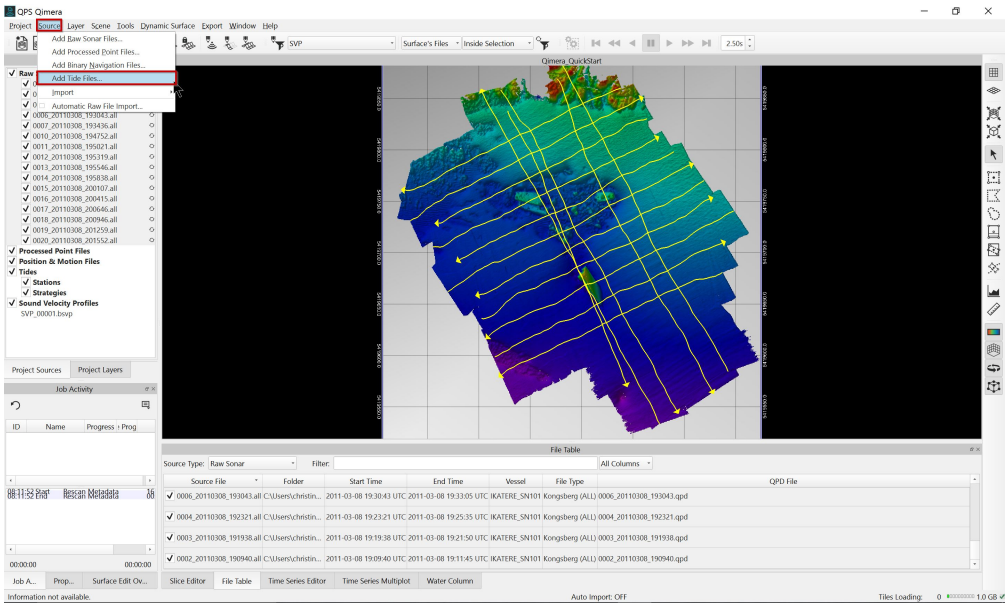
Prompt to reprocess affected files.

Sound Velocity

For more information on the SVP Editor, click *here*. For a howto on adding and editing Sound Velocity, click *here*.

Add & Apply Tide Information

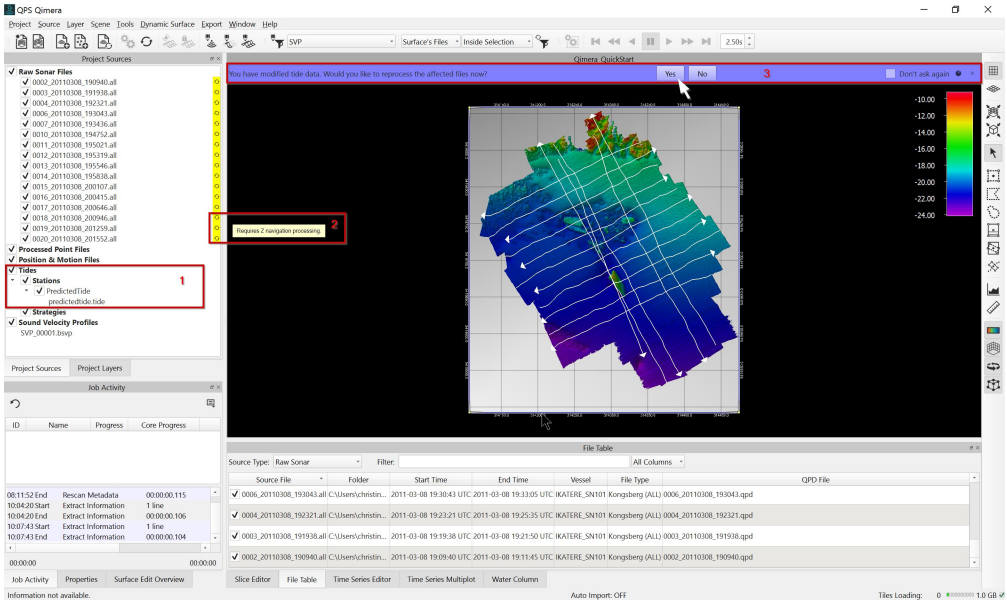
Qimera supports a variety of tide formats directly (click *here* for a list of all supported tide formats); alternatively, an ASCII file with tide information can also be imported and configured. Supported tide formats and ASCII Tide can be added to Qimera by going to the *Source* menu and select *Add Tide File*.



Adding Tide information to Qimera.

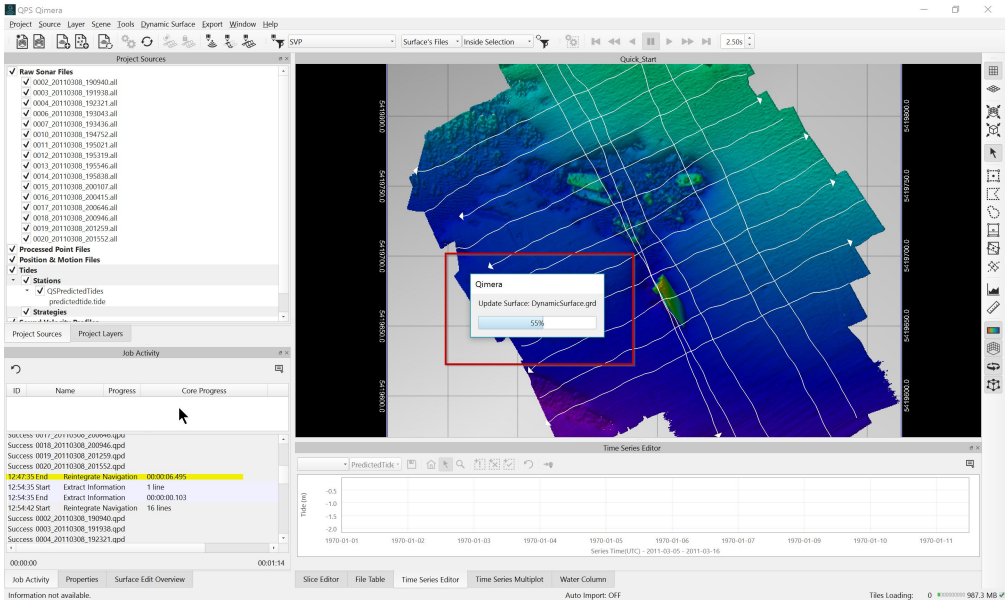
Once the tide information has been added to the project it will be listed in the *Project Sources Dock* under Tide Files (1). Adding Tide information will mark all affected files as

needing processing (2), indicated by the ↻ symbol after the file names in the tree view. Qimera will also prompt you that you have modified the navigation and that affected files should be reprocessed (3). Click Yes to reprocess the data with the new tide information.



Tide file in Project Sources and subsequent changes/prompts.

After the new information is integrated in all of the affected files, any Dynamic grids utilizing those files will automatically update.



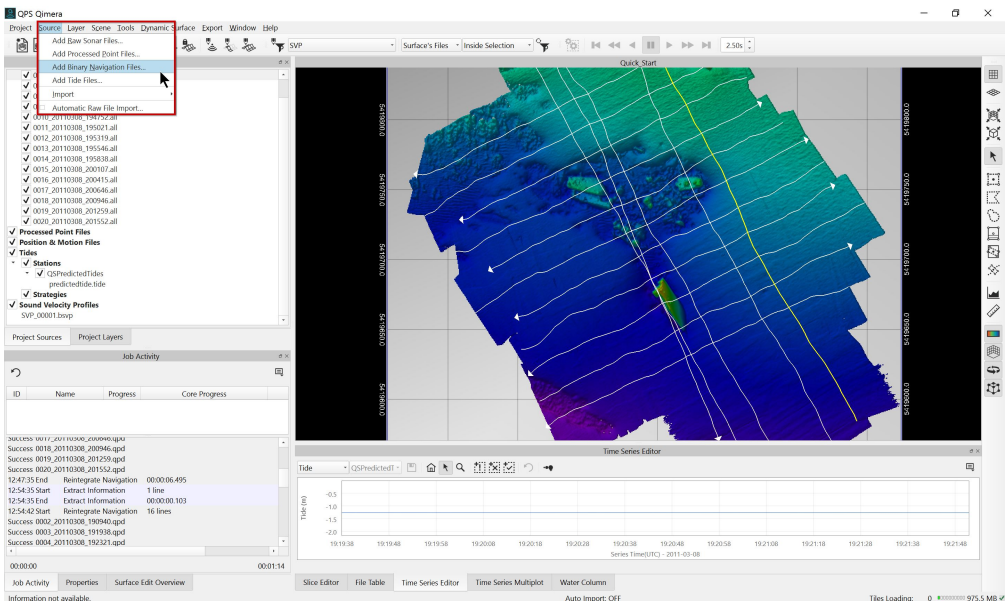
Reintegration of navigation complete; Dynamic grid updates.

Applying Tides, Vertical Referencing.

For a howto on adding and applying tides, click *here*. For more information on setting the Vertical Referencing method, click *here*; a howto on Vertical Referencing can be found *here*.

Add & Apply Other Navigation Sources

Other Binary Navigation sources (SBET or POSMV) can be added and used for vertical referencing and/or position/motion/heading. These files can be added to Qimera by going to the *Source* menu and selecting Add Binary Navigation Files.



Adding Binary Navigation Files to Qimera.

Once the Binary Navigation information has been added to the project, it will be listed in the *Project Sources Dock* under Position & Motion Files. Adding Binary Navigation information will mark all affected files as needing processing, indicated by the ⟳ symbol after the file names in the tree view. Qimera will also prompt you that you have modified the navigation and that the affected files should be reprocessed. Click Yes to reprocess the data with the new Binary Navigation information.

When there are multiple vertical referencing or position/motion/heading sources in your project, you can choose how they are used during processing in the *Processing Settings*.

To access the Processing Settings Editor, click on the Processing Settings Button  (1) or right-click on the Raw Sonar Files and select Edit Processing Parameters (2).

Select the Vertical Referencing tab to review the options for Vertical Referencing Method. Importing binary navigation for heighting will change the vertical referencing method to

GNSS/GPS, and the newly imported information will be set as the top priority item in the list of vertical referencing source streams.

Select the Position, Motion, Heading tab to review the Source Priorities for these three attributes. Newly imported data is always promoted to be the top-priority source.

Importing Binary Navigation, Vertical Referencing Method

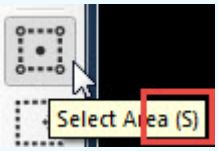
For more information on the navigation configuration dialogue when adding Binary Navigation Files, click *here*. For a howto on adding Binary Navigation Files, click *here*. For more information on setting the Vertical Referencing method, click *here*; a how-to on Vertical Referencing can be found *here*.

Step 8 – Edit Bathymetry

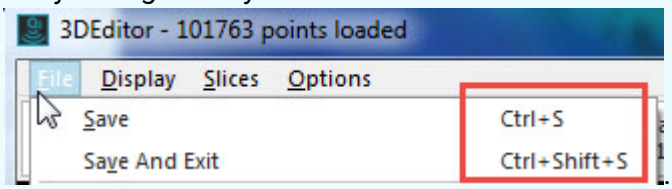
Editing of bathymetry can be accomplished using Area-Based Manual Point Editing in the *3D Editor* or Slice Editor, Swath-Based Manual Point Editing in the *Swath Editor*, by using *Filter Operations (ex. Spline)*, by using *CUBE Filtering*, or by using a combination of these methods.

Hotkeys

The speed of exploration and processing in Qimera can be greatly increased by familiarising yourself with the hotkeys. New in Qimera 1.6.0, hotkeys are now configurable. Go to 'Configure Shortcuts' in the Project dropdown menu.

Hotkey information can be discovered by hovering your mouse over a button 

or by noting the key combinations listed after menu items



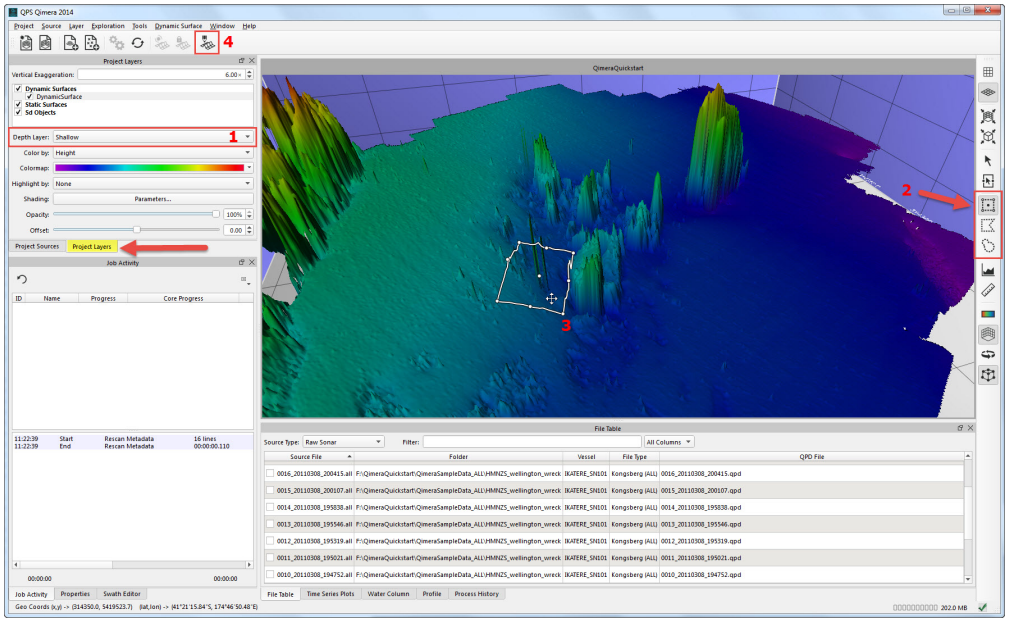
Widgets

When exploring your bathymetry in Turntable Mode of the main Qimera interface and when working in the 3D Editor, you may find it helpful to turn off the Widgets. In Turntable Mode, the widgets can be turned off using the View Widgets  Button. In the 3D Editor, turn of the Widgets by selecting Display from the 3D Editor Menu Bar and then selecting Show Widgets.

Area-Based Manual Point Editing: 3D Editor

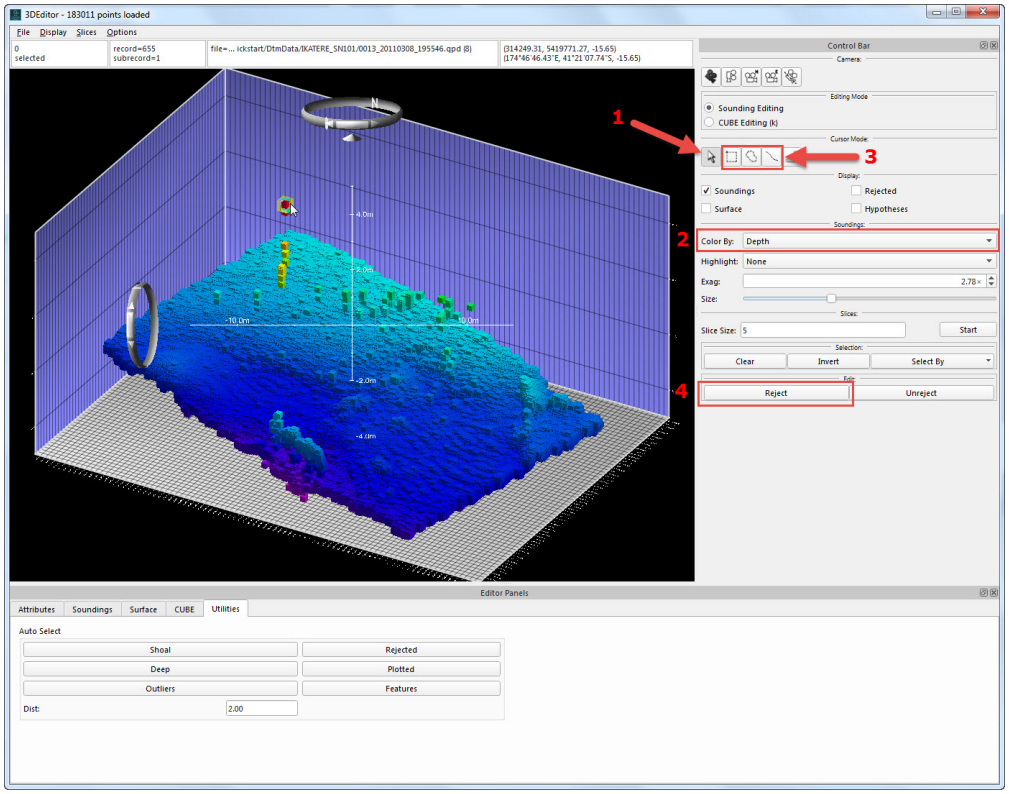
Prior to doing manual editing, you may find it helpful to change your Depth Layer in the Project Layers Window to Shallow or Deep (1). This will draw your attention to all of the spikes on the top of the grid or bottom of the grid, respectively. Note that any edits you make will flag the QPD points on save, and all depth layers will update on save to reflect those changes.

To do Area-Based Manual Point Editing, use the Select Area Mode , the Polygon Select Mode , or the Free Select Mode  (2) to select a portion of the grid that needs cleaning (3). Click the Launch 3D Editor Button  (4). The *3D Editor* Window will launch with the selected area loaded.

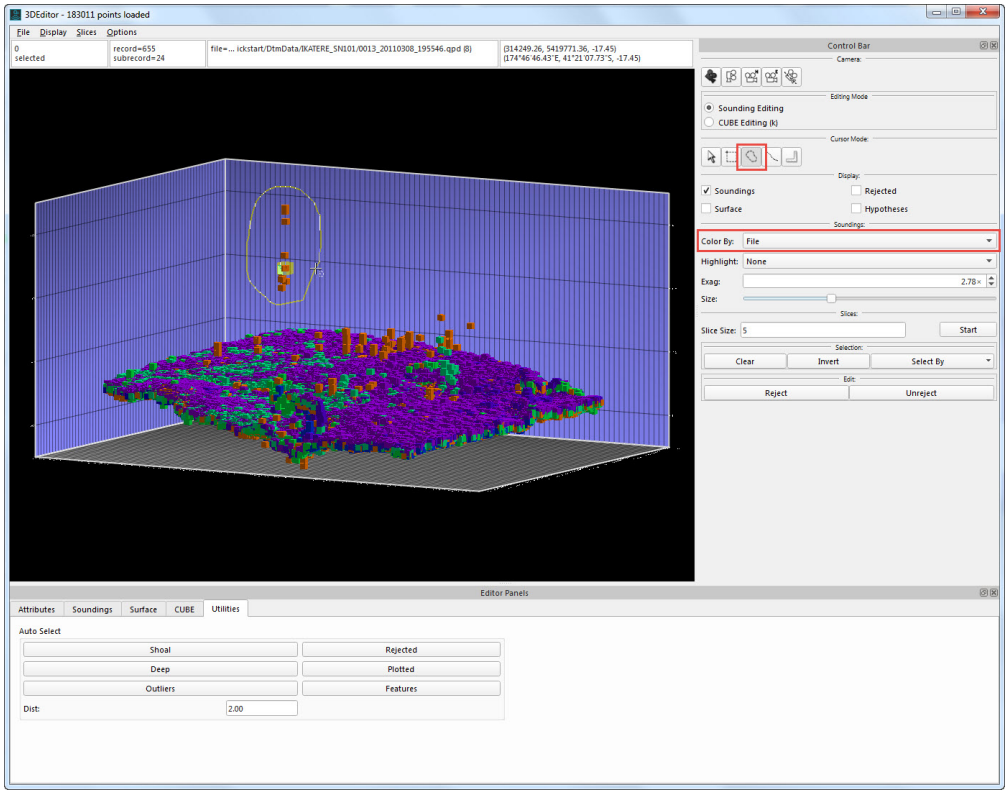


Overview of key Qimera interface elements for Manual Editing.

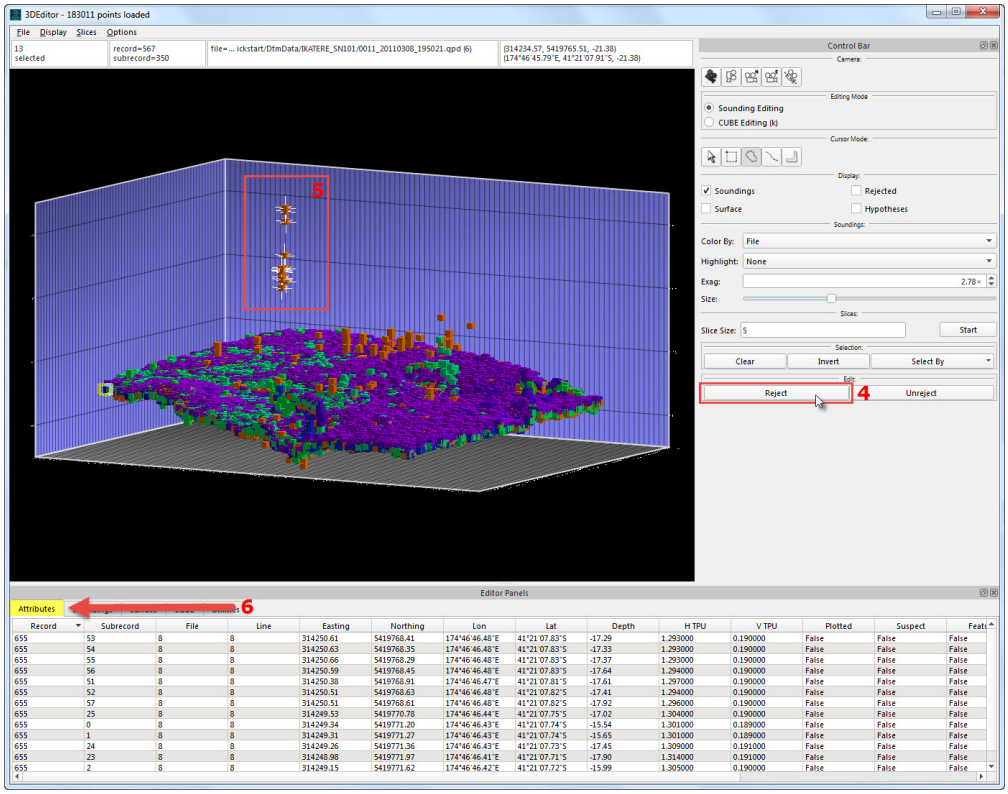
In the 3D Editor, use Explore Mode  (1) to examine the soundings. Navigation in Explore Mode is the same as using the Simple Select Mode in the Qimera Turntable View – left click and drag to rotate, middle-click to move an area of interest to the centre, and use the scroll button to zoom. Change the Colour By option (2) to File to help you decide if soundings are valid. To select soundings to reject, use the Select Mode , Area Select Mode , or Record Select Mode  (3), then click the Reject button (4). Continue until the area is clean, then go to the File menu and choose Save and Exit. The Dynamic grid will update and the 3D Editor will close.



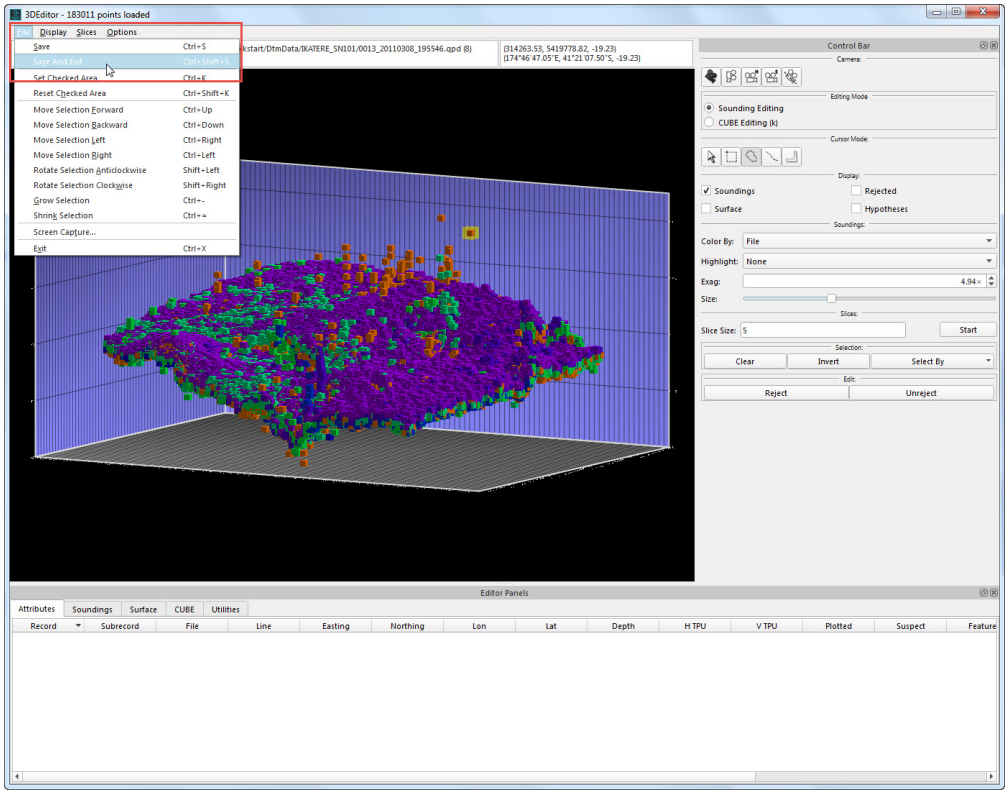
Overview of key 3D Editor interface elements for Manual Editing.



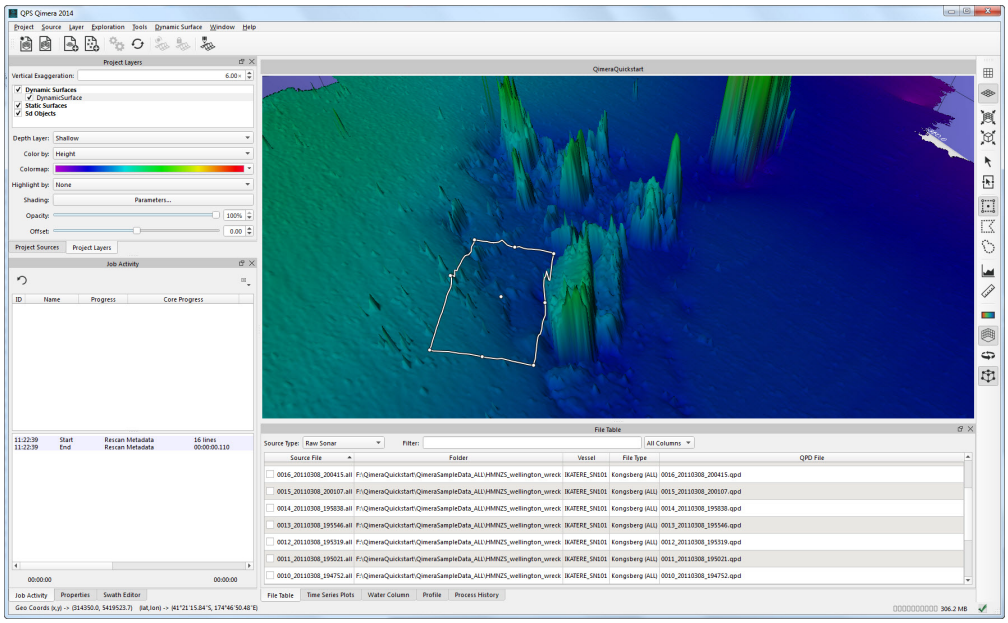
Selection coloured By File; soundings selected for Rejection.



Soundings selected (5); sounding attributes can be viewed in the Attributes tab (6). Click Reject to remove the soundings (4).



Rejected soundings are removed; Save and Exit to update grid.



Dynamic grid updated.

3D Editor User Interface

More information on the 3D Editor User Interface can be found *here*.

Area-Based Manual Point Editing and Filtering: Slice Editor

Please see the How-to Work with Slice Editor for a complete working tutorial. The filtering capability that is outline in the section below can also be applied from the Slice Editor to the data that is currently loaded and visible.

Spline Filtering

Static grids for Filter Check

You may find it useful to create a Shallow Biased *Static Grid* prior to filtering, to use as a way of comparing the pre- and post- filter results. You can create a Static grid using the Create Static grid  Button.

Filtering profiles and advanced application techniques became available in Qimera 1.3. Please see the following references and Howtos for additional information:

Qimera Filter Operation Toolbar

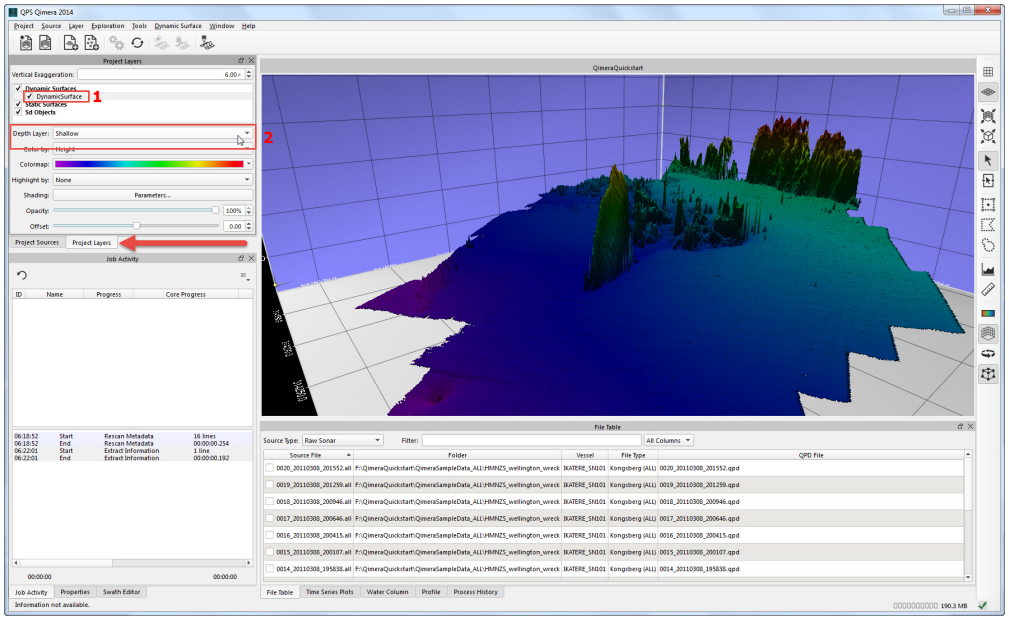
Qimera Manage Filter Profiles dialogue

How-to Spline Filtering details

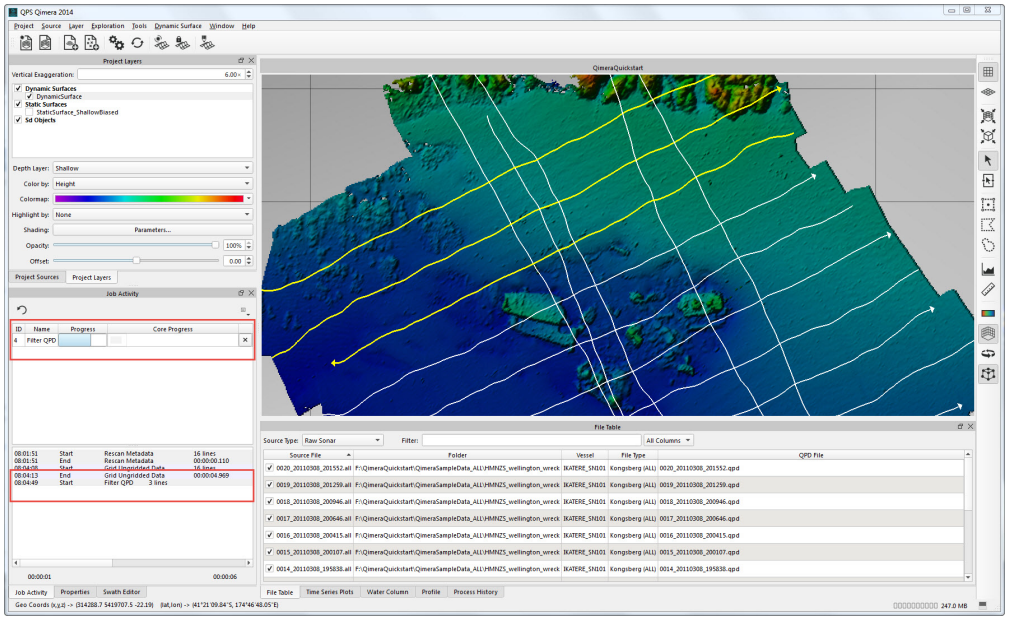
The *Spline Filter* attempts to fit a grid through noisy multibeam echosounder data and reject all footprints that lie too far from this grid. Spline filtering can be started via the Filter Operation Toolbar or inside the Slice Editor dock, once that has been loaded with points.

To use the Spline Filter, move to the *Project Layers* and select the Dynamic grid you would like to filter. Change your Depth Layer in the Project Layers Window to Shallow and preview the grid. This will draw your attention to all of the spikes on the top of the grid. Alternatively, you can set the 'colour by' setting to Standard Deviation. Note that filtering will flag the QPD points, and all depth layers will update after the filter completes to reflect those changes.

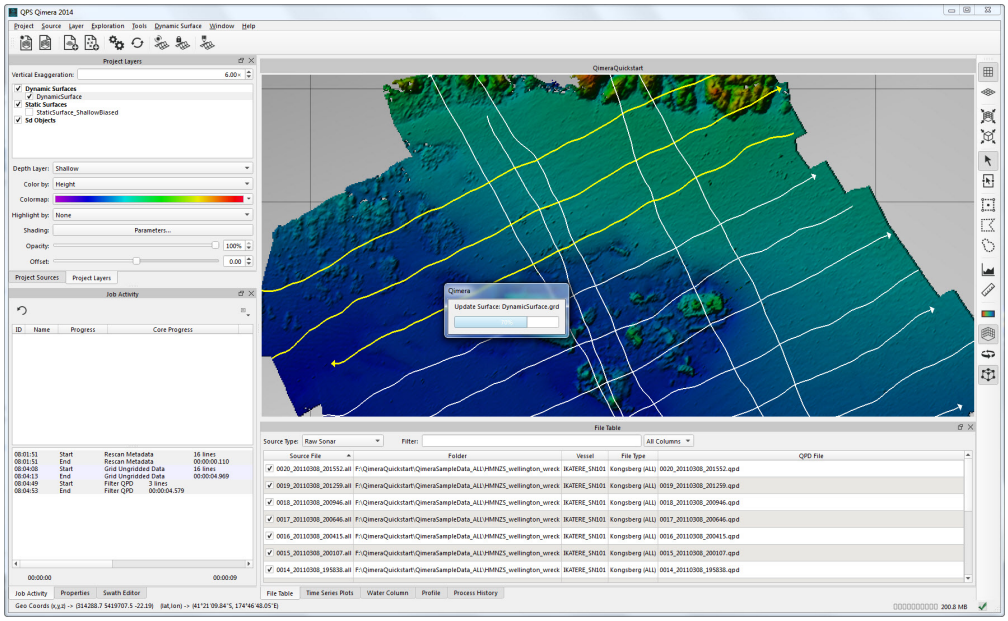
A Spline Filter can be applied to the entire selected Dynamic grid, an area selection (inside or outside) or selected lines within that grid. To limit the area filtered to a line or lines, use Simple Select  and the Control button to select several lines.



Dynamic grid selected (1) and Depth Layer set to Shallow.

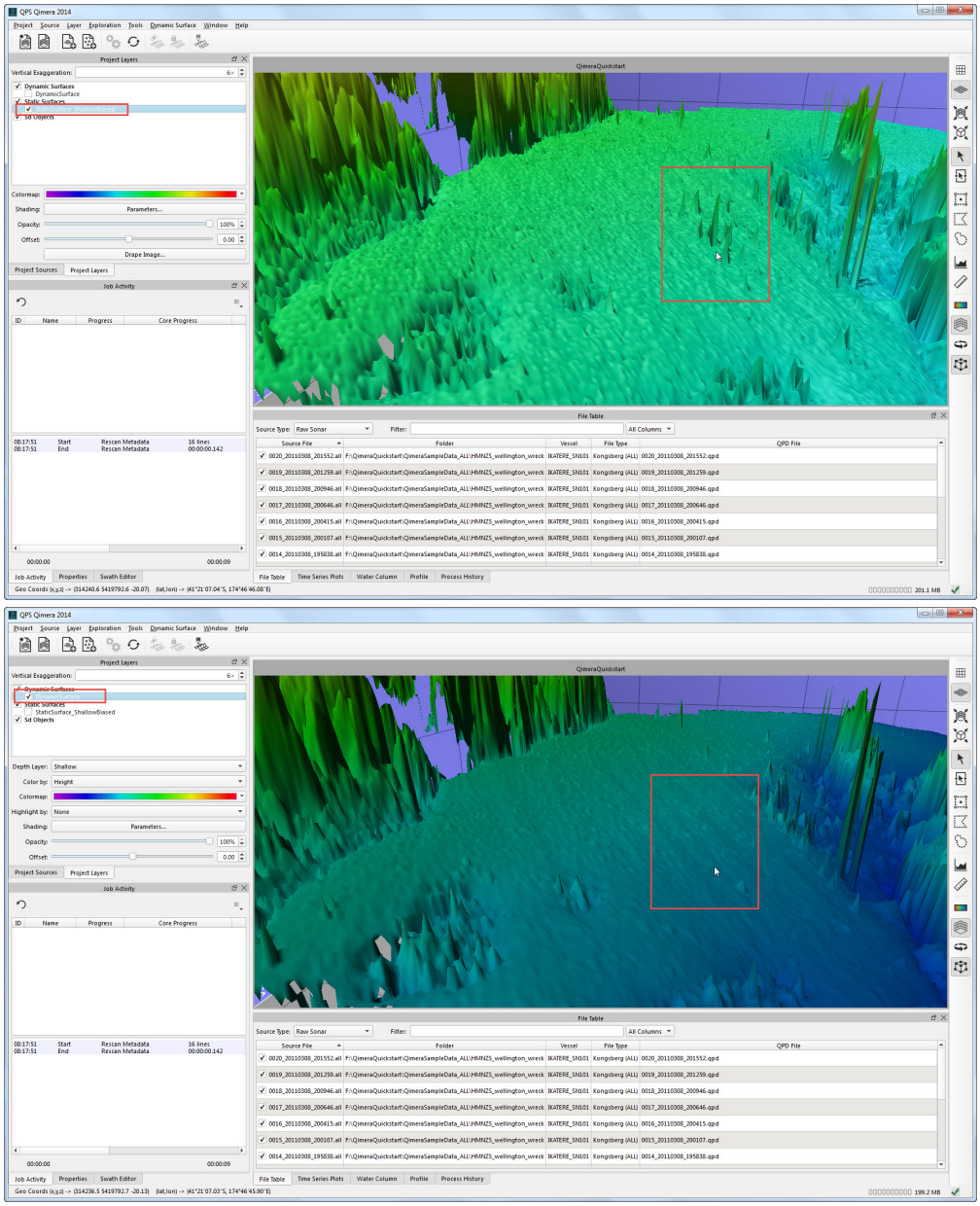


Spline Filter running on selected lines. The Filter progress can be seen in the Job Activity Window.



After the QPDs are filtered, the Dynamic grid automatically updates.

Review the results of the filter, comparing the new Dynamic grid to a pre-filter Static grid if one was created.



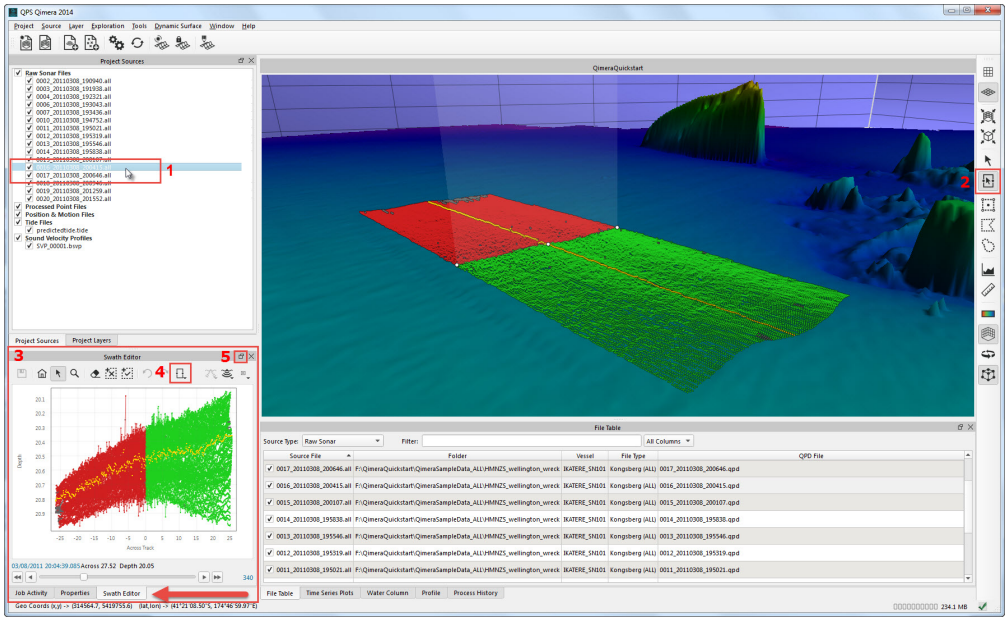
Comparison of a pre-filter Static grid and a post-filter Dynamic grid.

Swath-Based Manual Point Editing

Prior to doing manual editing, you may find it helpful to change your Depth Layer in the *Project Layers Dock* to Shallow or Deep (1). This will draw your attention to all of the spikes on the top of the grid or bottom of the grid, respectively. Note that any edits you make will flag the QPD points on save, and all depth layers will update on save to reflect those changes.

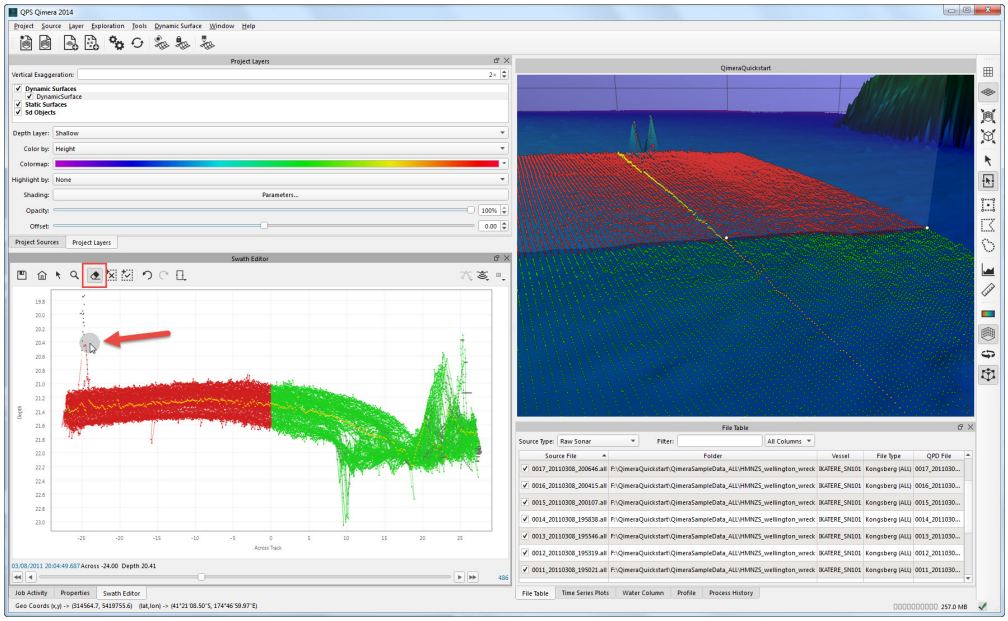
To do Swath-Based Manual Point Editing, select a line for editing either by selecting on the file in the *Project Sources* Raw Sonar Files tree view (1) or by clicking on one of the tracklines visible in the *4D Scene* (the tracklines will need to be checked on in the Project

Sources Window). Then, activate the Swath Editor in the Toolbar or press the '1' key. This will load the number of pings defined by the Buffer Width  (4) into the *Swath Editor* (3) and will visualise the points in the 4D Scene; red and green points are port and starboard soundings respectively, whereas grey points show soundings that have been rejected. To work extensively with Swath Editing, you may choose to resize or undock, resize, and reposition the Swath Editor Window.

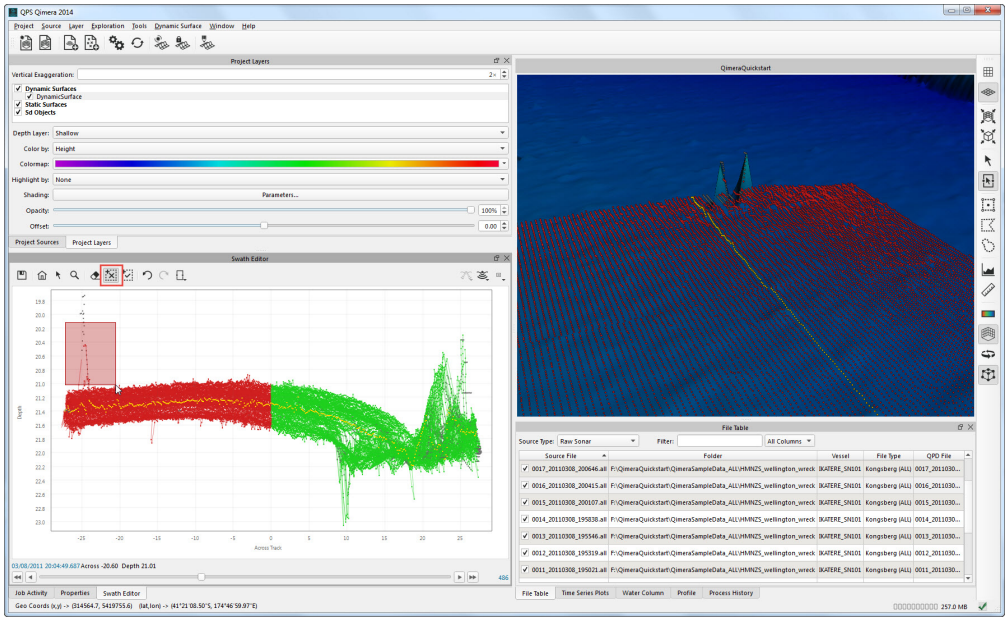


Overview of the Qimera interface when using Swath Editing. Box 1 shows the line selected for editing. Box 2 indicates the Swath Select Mode. Box 3 and the red arrow indicate the position of the Swath Editor Window. Box 4 shows the location of the Buffer Width. Box 5 shows the location of the button used to undock the Swath Editor Window.

In the Swath Editor, use Erase Invalid Mode  or Select Invalid Mode  to reject soundings.

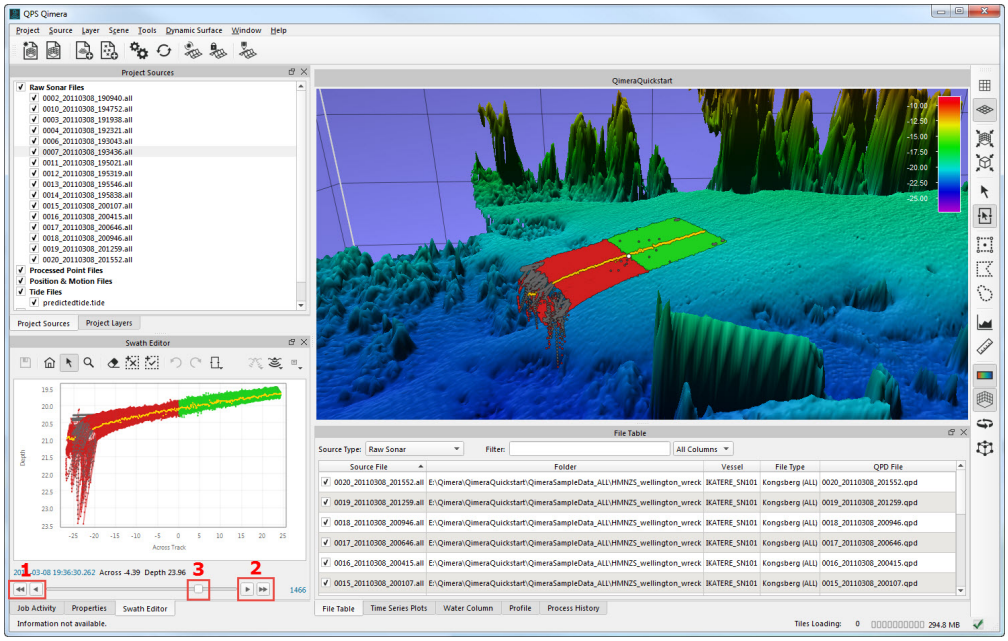


Using Erase Invalid Mode to "erase" and reject soundings.



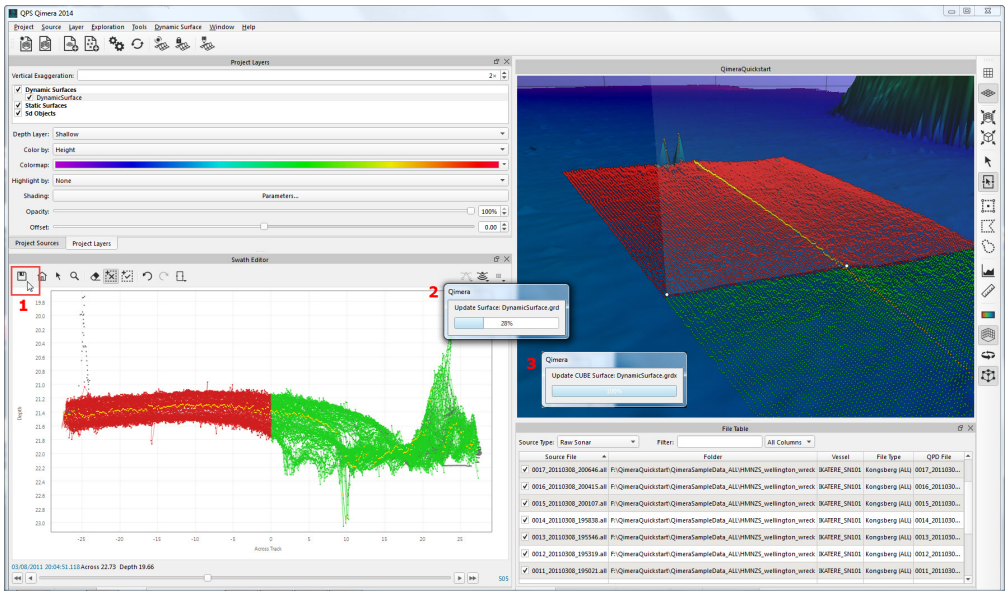
Using Select Invalid Mode to select and reject soundings.

To move along the line, use the Previous Block , Previous Ping  (1), Next Block , or Next Ping  (2) Buttons or the slider (3) in the Swath Editor Window.



Moving along the line in the Swath Editor can be accomplished using Previous Block/ Previous Ping (1), Next Block/Next Ping (2), or the slider (3).

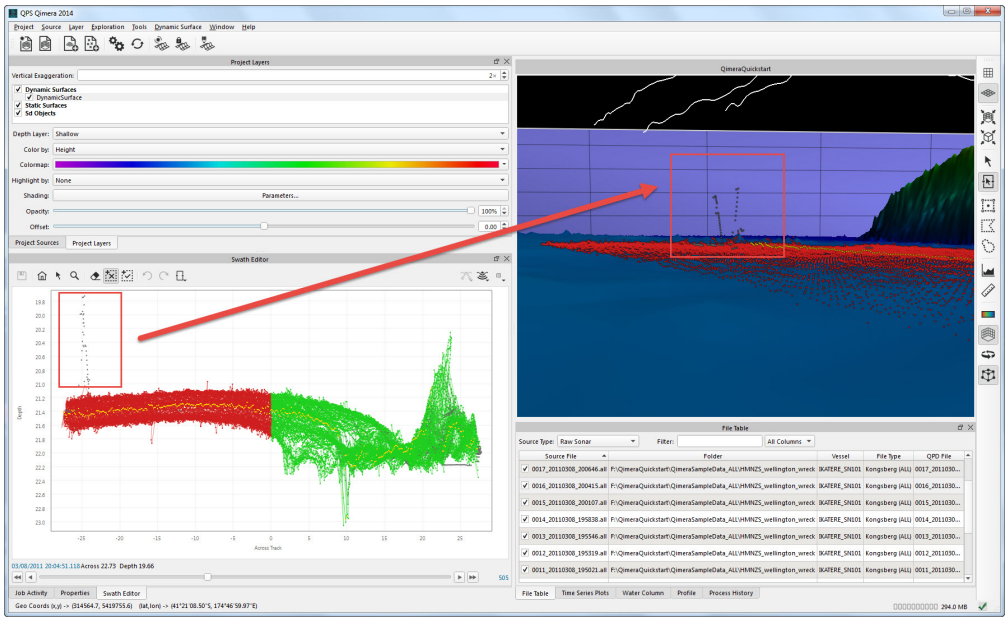
Use the Save Edits  Button to save your edits and update the Dynamic grid.



Clicking the Save Edits Button (1) will save changes to the files and force the layers of the Dynamic grid (including the CUBE grid, if one was created) to update (2,3).

Saving Changes, Swath Editor

Note that you **do not** have to save edits if you continue to work on the same line; the edits will be stored as you progress along the line. However if you don't save changes before moving to the next line, the software will prompt you that you have unsaved changes and will force you to save or loose edits at that point.



Grey rejected soundings and updated the Dynamic grid.

Swath Editing

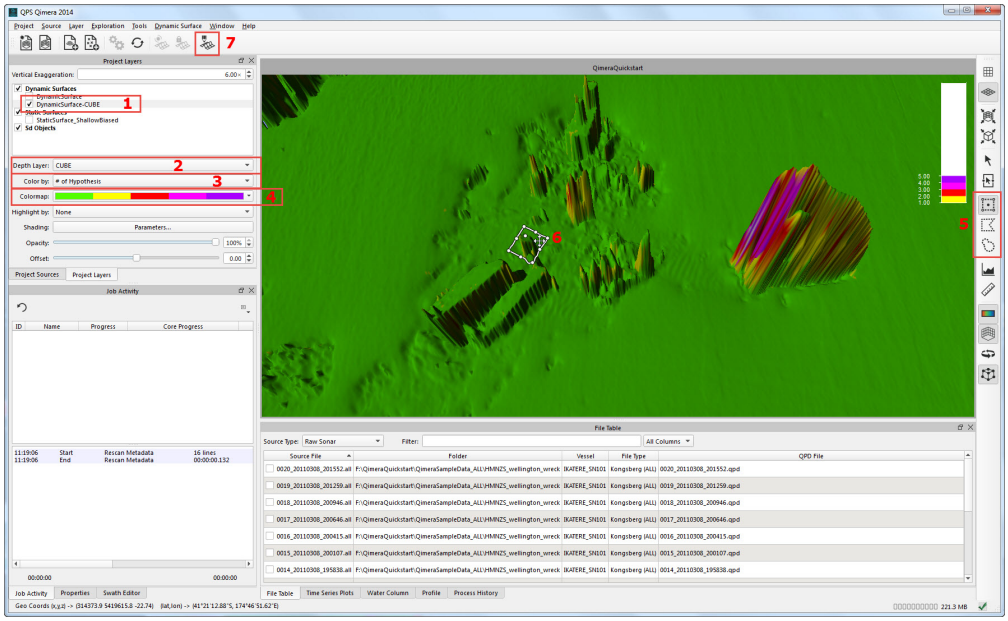
Additional information about cleaning data with the Swath Editor can be found *here*.

CUBE Editing and Filtering

CUBE Editing results in a clean CUBE grid that can be saved as a BAG (Bathymetric Attributed Grid) or used as a tool for filtering and rejecting all soundings that lie too far from this grid.

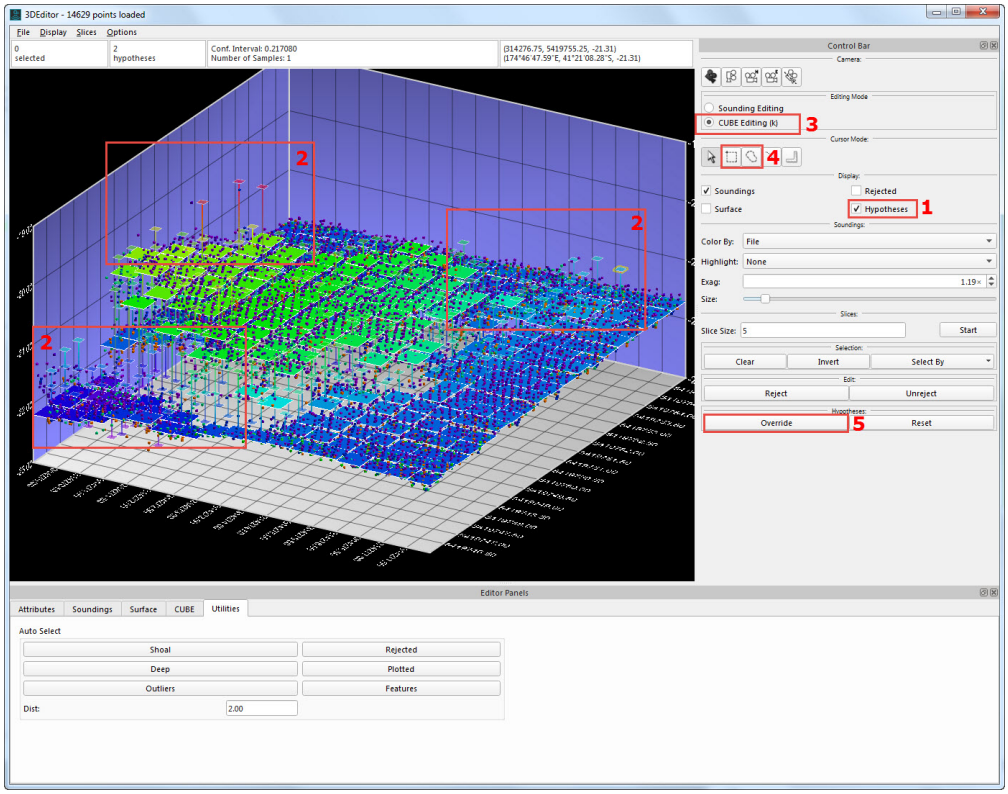
To do CUBE Editing, you first must have made the choice to Enable Cube Processing in the *Create Dynamic Grid dialogue*Qimera Create Dynamic grid dialoguewhen you built the Dynamic grid; if you have not, create a new Dynamic grid and check Enable Cube Processing. Select the Dynamic grid in the *Project Layers Dock* and change your Depth Layer to CUBE. Change the colour By to Number of Hypothesis; you might find it helpful to edit the colourmap to clearly show areas with more then one hypothesis. Review the grid, looking for obvious outliers or areas with multiple hypotheses. Use the Select Area Mode , the Polygon Select Mode , or the Free Select Mode  to select a portion of

the grid that needs review (6). Click the Launch 3D Editor Button  (7). The *3D Editor* will launch with the selected area loaded.

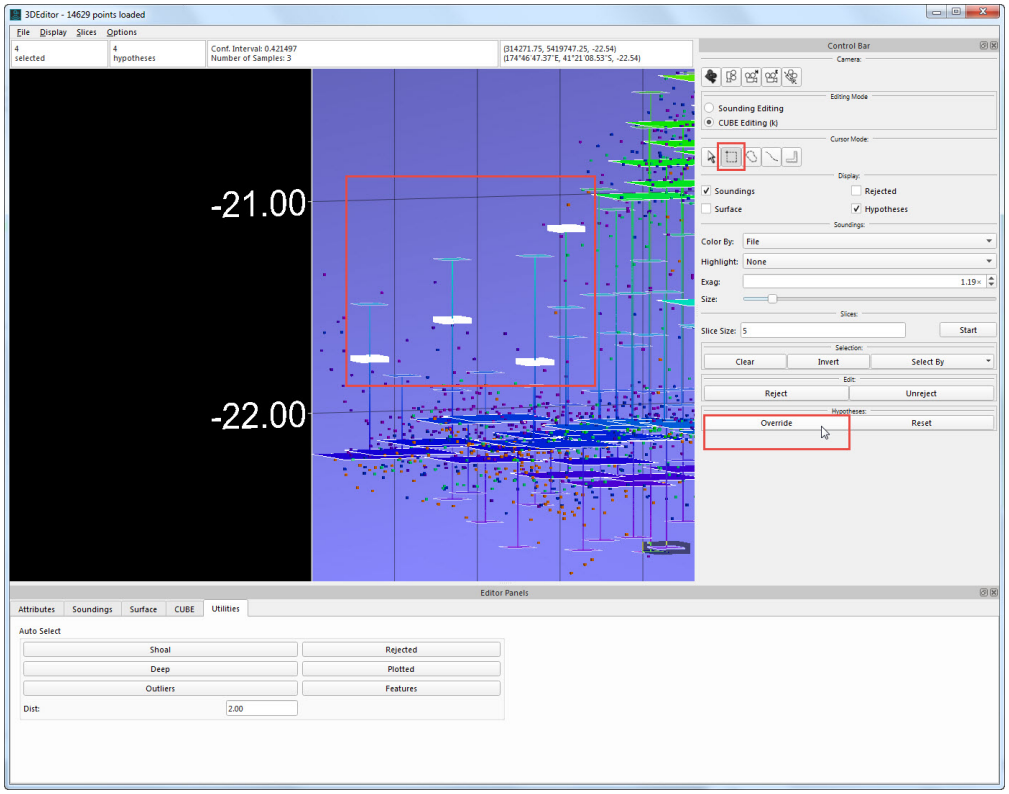


Dynamic grid with CUBE selected (1) and CUBE Depth Layer selected (2). colour By set to Number of Hypothesis (3) and colourmap edited to show areas with more then one hypothesis (4). Explore grid and use a selection mode (5) to select an area (6) with multiple hypotheses. Finally, launch the 3D Editor (7).

In the 3D Editor, check on the Hypothesis Display option (1). Review cells that have multiple hypotheses, comparing the available hypotheses to the soundings to see if the correct hypothesis was chosen (2). If an alternative hypothesis should have been chosen, use CUBE Editing mode (3) and the Select Mode  or Area Select Mode  (4) to select the alternative hypothesis for a single cell or hypotheses over multiple cells and click Override (5).

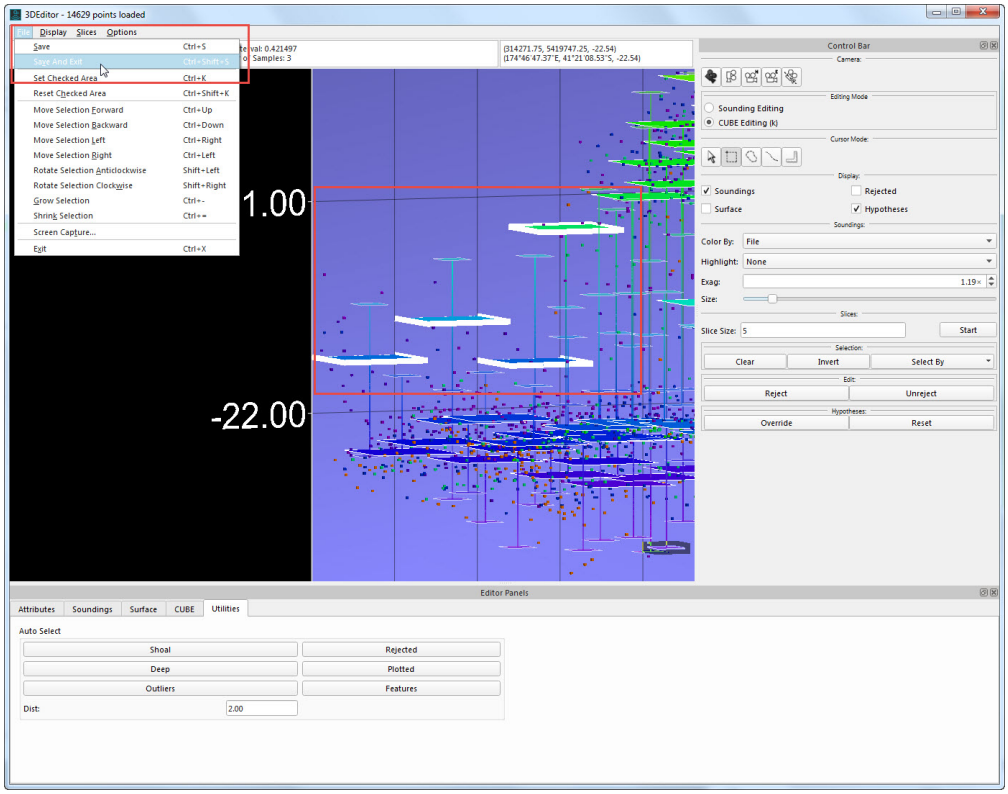


3D Editor showing CUBE hypotheses (1) as well as soundings. Areas with multiple hypotheses (2) should be reviewed. If an alternative hypothesis is more correct, use CUBE Editing Mode (3) and the Select or Area Select Mode to select the alternative hypothesis/ hypotheses and click Override (5).



Selected hypotheses in 3D Editor.

Continue until all necessary hypotheses are updated, then go to the File menu and choose Save and Exit. The Dynamic grid will update, and the 3D Editor will close.



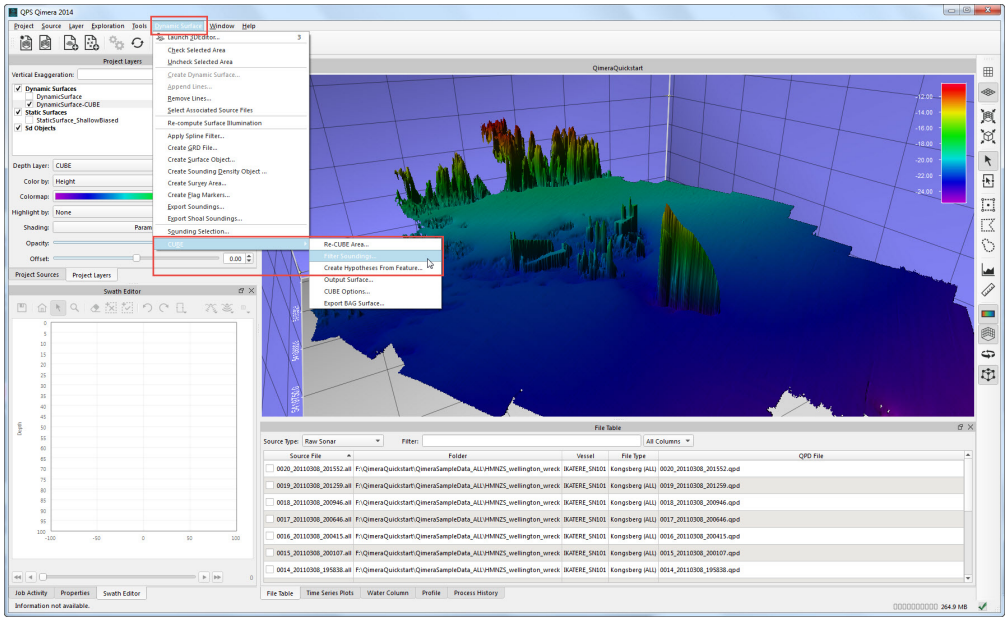
Selected hypotheses after override and the location of Save and Exit menu option.

Continue until you have validated the entire CUBE grid. After you have finished, if your product is a BAG, you only need to export the BAG (see Step 9 - Export Products below). If your product is a clean set of sounding data, you will now want to use the CUBE grid to filter the soundings. The *CUBE Filter Soundings* option can be run on the entire selected Dynamic grid or on a selected area of that grid.

Static grids for Filter Check

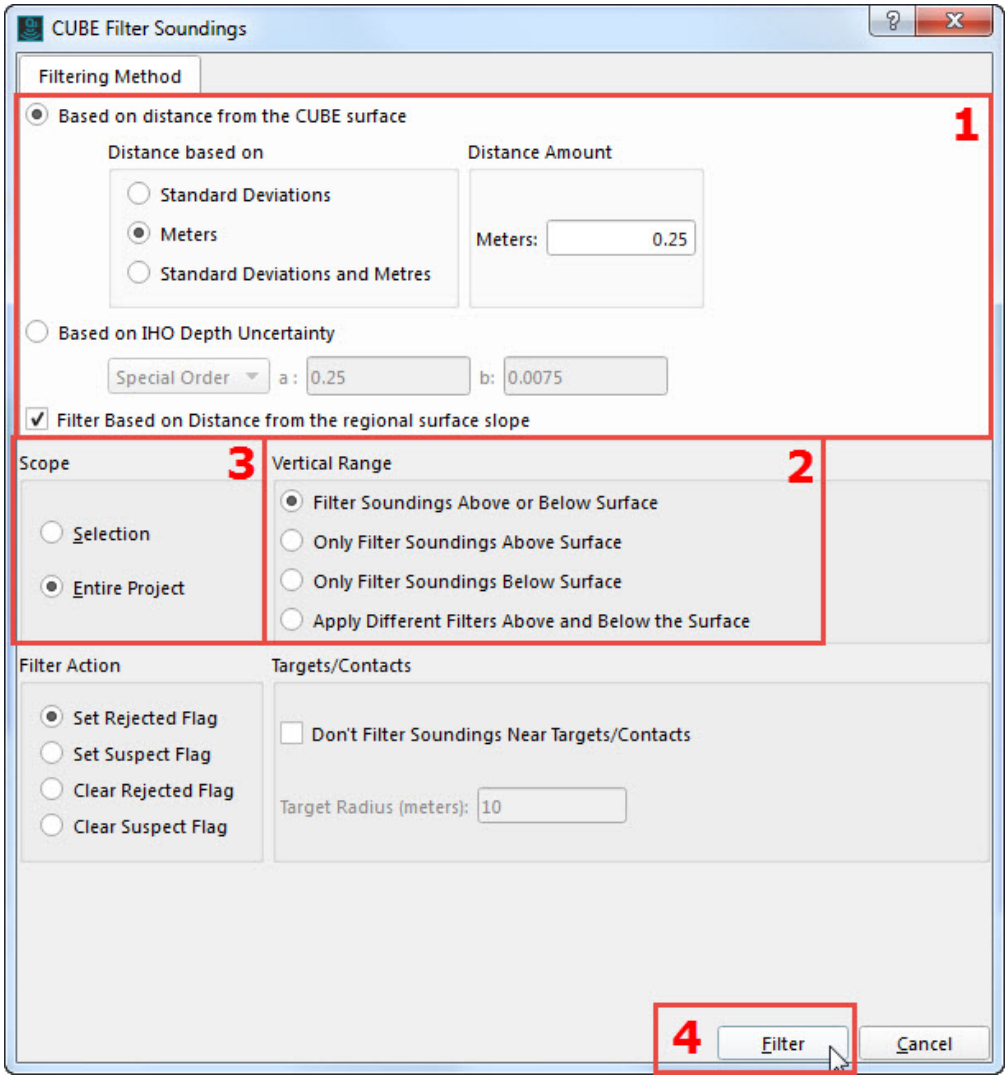
You may find it useful to create a Shallow Biased *Static Grid* prior to filtering, to use a way of comparing the pre- and post- filter results. You can create a Static grid using the Create Static grid  Button.

Select CUBE > Filter Soundings from the Dynamic grid menu.



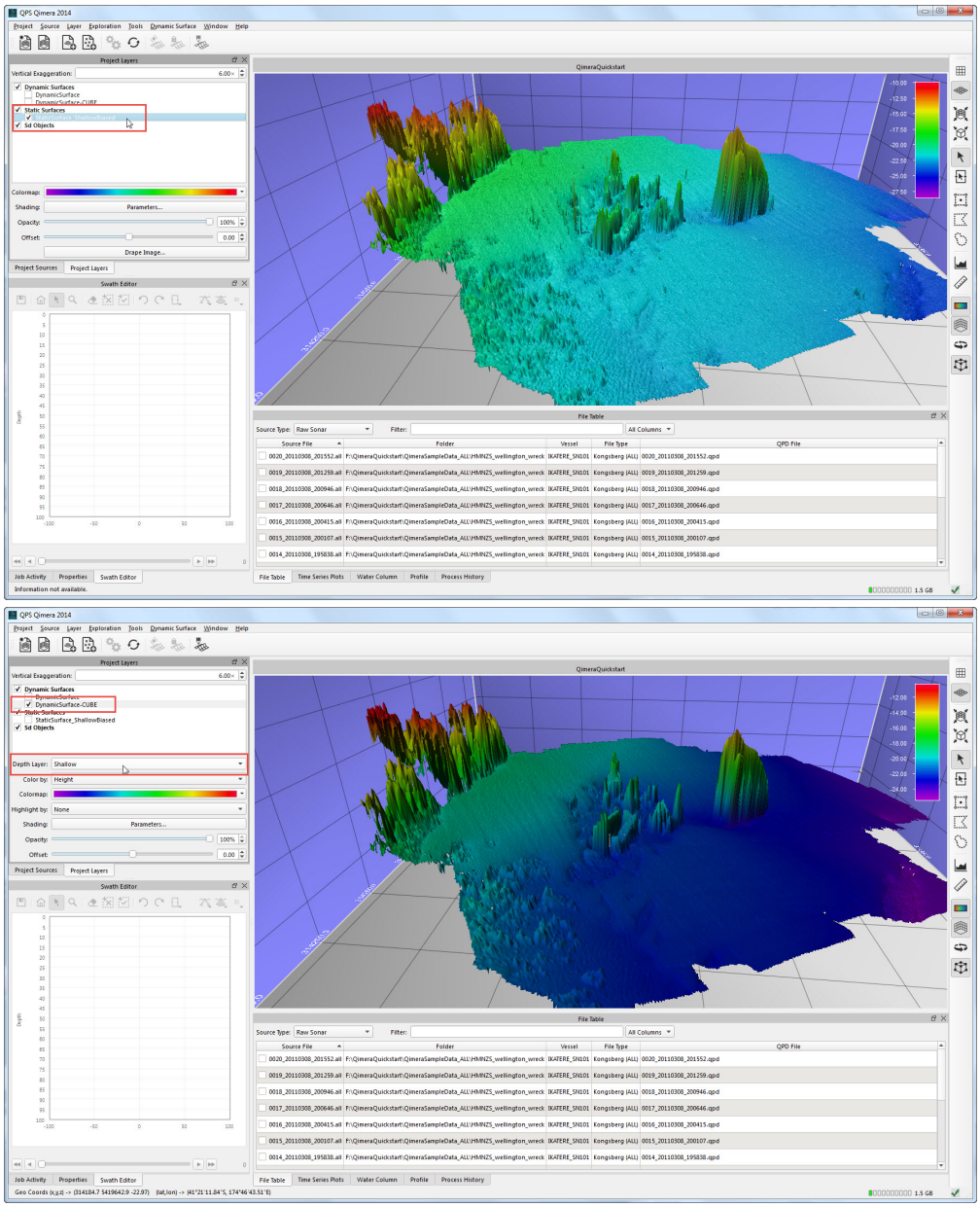
CUBE Filter Soundings menu option.

Set the Filtering Method (1), Vertical range (2), and Scope (3) and then click Filter (4).



CUBE Filter Soundings Wizard.

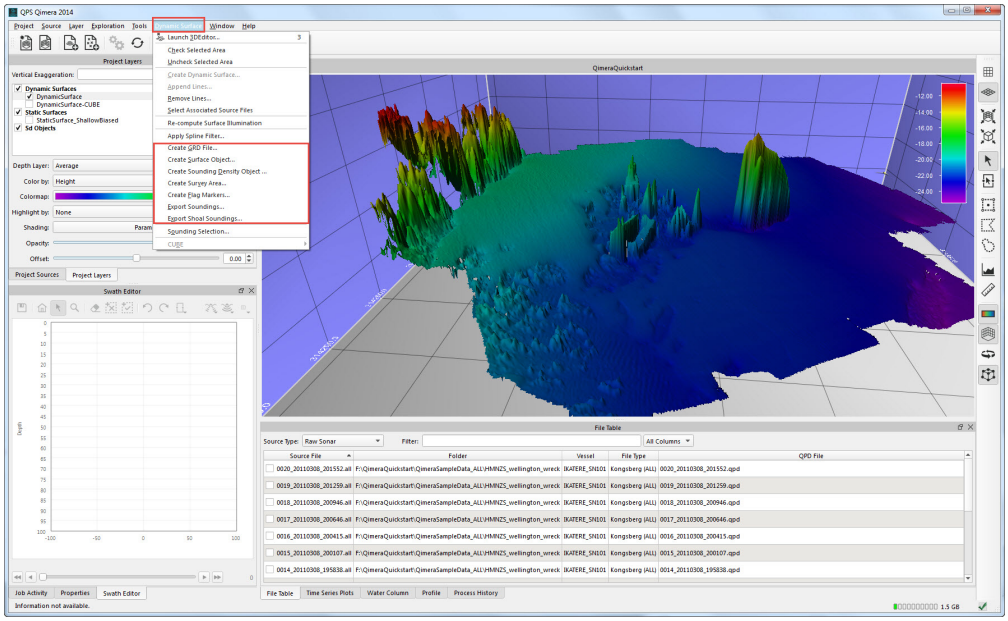
The CUBE filter will run, rejecting soundings outside of the threshold you set. The QPD files will update, as will any Dynamic grids that are utilizing the QPD files you just updated. Check your results. Note that the CUBE Depth Layer will show little or no change – check the results of the filter by comparing the Shallow Depth Layer of the Dynamic grid to the CUBE Layer of the Dynamic grid (they should now be pretty similar) or to a Shallow Biased Static grid you created prior to filtering.



Comparison of a pre-filter Static grid and a post-filter Dynamic grid.

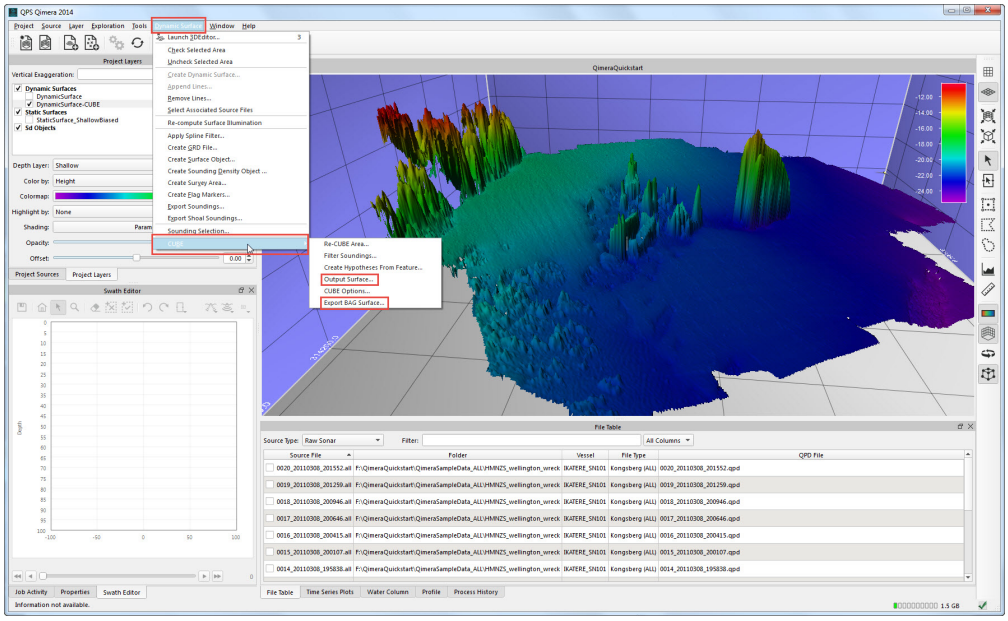
Step 9 – Export Products

Once your processing and editing is complete, you can export products. Exports related to the Dynamic grid including *soundings*, *Qinsy GRD*, and Fledermaus SD (*Snapshot as Static Grid*) exports are located under the *Dynamic Grid* Menu.



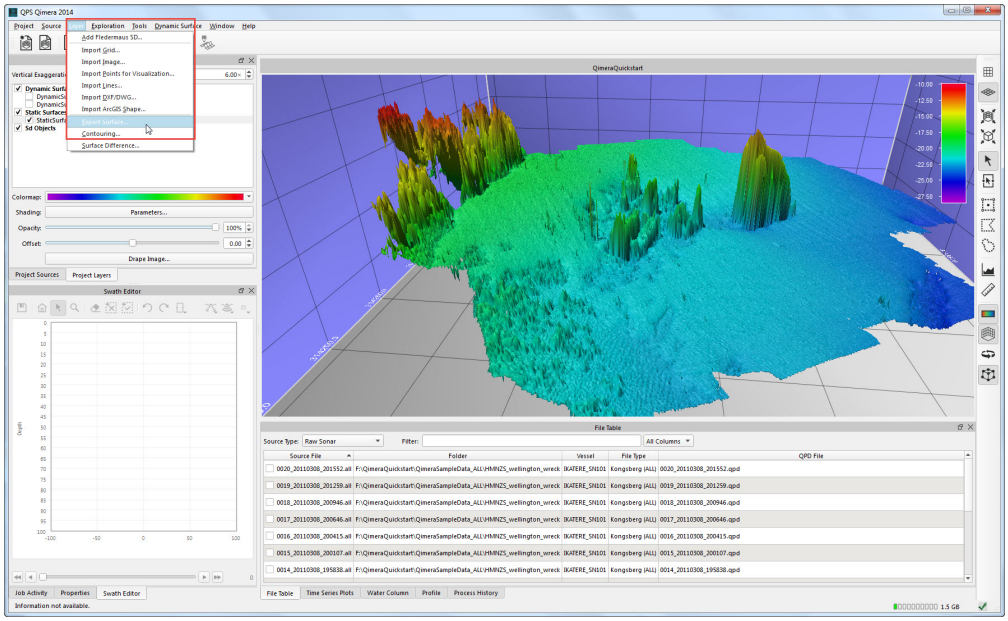
Export options related to the Dynamic grid.

If you Enabled CUBE when you built your Dynamic grid, additional options will be available under *CUBE* in the Dynamic grid Menu.



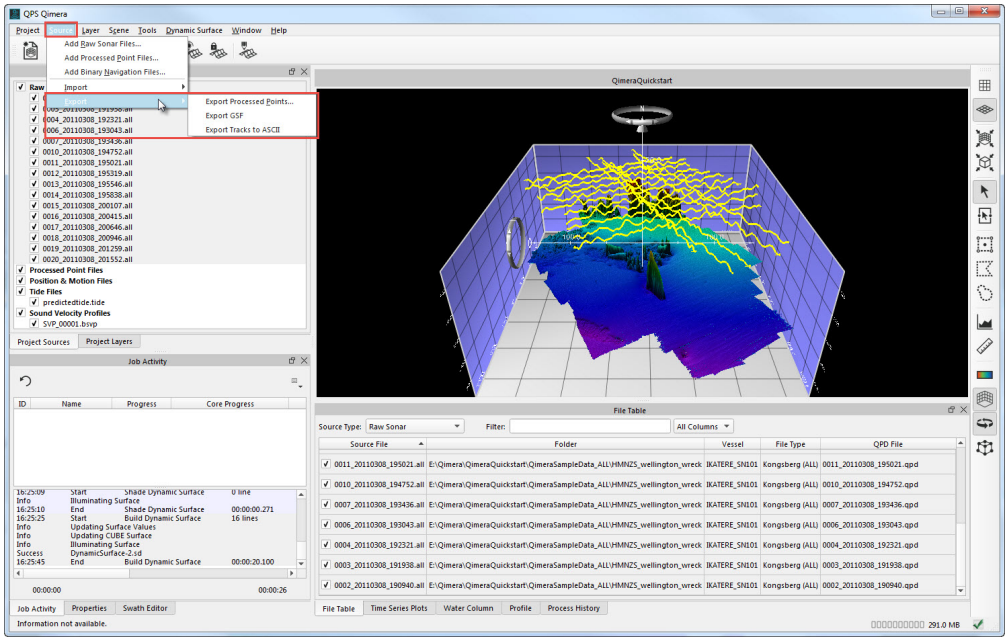
Additional export options related to the CUBE Depth Layer in the Dynamic grid.

Any grid layer – Dynamic grid Depth Layers, Static grids, or Fledermaus DTM SD Objects – can be exported to third-party compatible grid formats using *Export grid* from the *Layer Menu*.



Export grid option.

Finally, there are additional export options under the *Source Menu* for exporting processed point information and tracklines.



Source export options.

Step 10 – Additional Multibeam-Related Processing

Processing of multibeam backscatter is done using the FMGeocoder Toolbox (FMGT) module of the Fledermaus Suite. For information on migrating processed data from Qimera to FMGT, see How-to Migrate a Qimera Project to FMGT.

Multibeam water column data is processed in the FMMidwater module of the Fledermaus Suite. See the FMMidwater chapter of the Reference Manual for more information.

Step 11 – Grid Analysis

After processing, you may also choose to run grid analysis operations. Operations available in Qimera include *Contouring* and *Grid Difference*. These tools can be found under the *Layer* menu, and can be applied to Dynamic Grids, Static Grids, and loaded Fledermaus DTM SD objects.

If you are a Fledermaus user, additional analysis, export, and transfer options are available in the Fledermaus application. Opening your current QPS Project in Fledermaus will give you the ability to load all your project files into Fledermaus for further analysis.

How-to Articles

Categories:

- 1. Setup and Importing Data
  - How-to Caris Licence check
  - How-to Combine your Fledermaus and Qimera Server Licenses
  - How-to Create an SD model for Geoid separations
  - How-to Custom ASCII File Import
  - How-to EGM2008 Geoid
  - How-to Graphics card Setup and Screen Resolutions (Windows Scaling)
  - How-to Import Binary Navigation
  - How-to Import Processed Point Files
  - How-to Install Qimera
  - How-to License Installation (Qimera 1.5.7 or older)
  - How-to License Manager (Qimera 1.6.0 or newer)
  - How-to Make Qinsy Vertical Datum resources available to Qimera
  - How-to Sentinel NetHASP and HASP
  - How-to Set up a Project and Geodetic Settings
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  - How-to Apply Tides
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  - How-to Process a Patch Test
  - How-to Process Sound Speed
  - How-to Structure from Motion (SfM)
  - How-to Tide Strategy
  - How-to Tips and Tricks
  - How-to Vertical Referencing
  - How-to Water Column Sounding Extraction
  - How-to Work with Additional Soundings
- 3. Analysis and Troubleshooting
  - How-to Cable/Pipe Detection and Editing

- How-to Coverage Extinction Plot
- How-to Flag Grid Cells
- How-to Line height matching tool
- How-to Screen Capture
- How-to Shift Time Series Observations
- How-to Static Horizontal Shift Tool
- How-to Static Vertical Shift
- How-to THU/TVU Layers
- How-to Time Series Multiplot
- How-to TU Delft Sound Speed Inversion
- How-to Use the Crosscheck Tool
- How-to Use the Wobble Analysis Tool
- How-to Varying Vertical Shift

- 4. Data Cleaning
  - How-to Apply Spline Filtering
  - How-to Clean Data with the Swath Editor
  - How-to Cooperative Cleaning Workflow
  - How-to Filter Operations and Filtering Profiles
  - How-to Point Cleaning with a Qinsy Project
  - How-to Production Line Processing Workflow
  - How-to Scroll referencing
  - How-to Spline Filtering details
  - How-to Work with Slice Editor
- 5. File type and Workflow
  - How-to ENC Editor
  - How-to Migrate a Qimera Project to FMGT
  - How-to Work with Hypack HSX Data
  - How-to Work with Kongsberg ALL Data
  - How-to Work with Large Data
  - How-to Work with Qinsy Data
  - How-to Work with Reson S7K Data

1. Setup and Importing Data

- How-to Caris Licence check
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- How-to Work with Qinsy and Qimera Live

How-to Caris Licence check

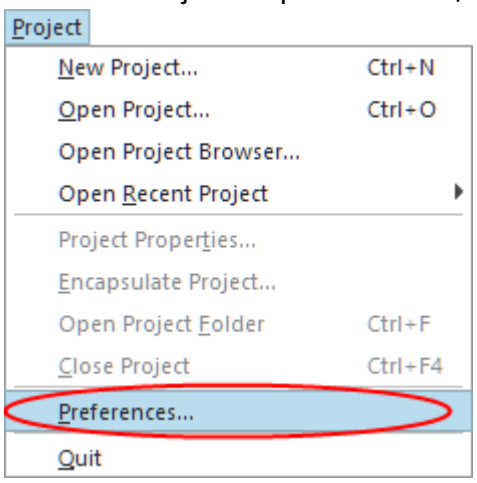
This article will help you to check the Caris licensing settings.

On this page:

- How to set up a link to your Caris license
- Troubleshooting

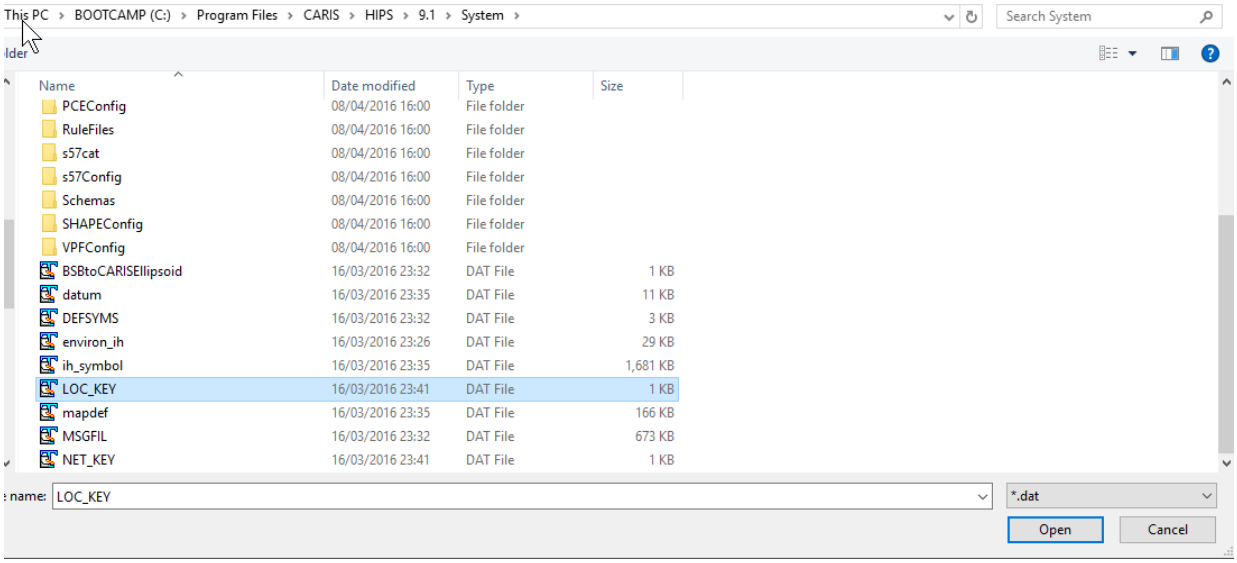
How to set up a link to your Caris license

1. Under the Project drop down menu, select the Preferences option.



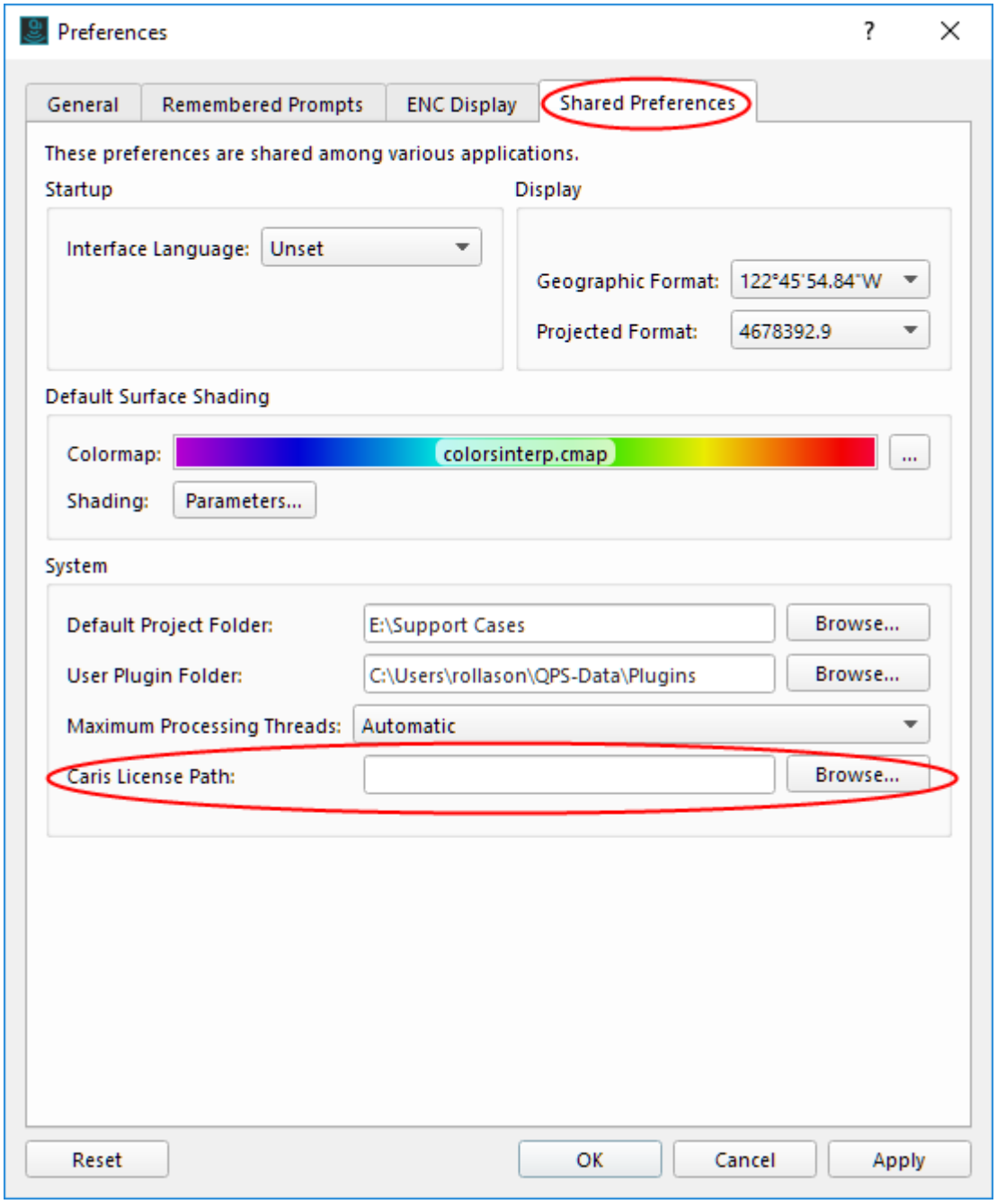
2. Go to the Shared Preferences tab and use the *HIPS Version* dropdown menu to specify the HIPS version you are using.

   If you are using a HIPS 9 dongle, ensure that it is connected and that all dongle drivers are up to date. If you are using a HIPS 9 license file, use the *HIPS License Path* field to specify the path to the file. By default, this file will be found in the C:\\Program Files\Caris\HIPS\9.1\System folder.



If you are using a HIPS 11/12 network license, you must specify the hostname of the license server in the *HIPS License Host* field. If you are using a HIPS 11/12 local license, you must enter "no-net" in the *HIPS License Host* field.

Use the Test HIPS Licensing button to verify your HIPS licensing settings.



With the release of Qimera 2.7.0, we have upgraded to Caris Version 12 of the HIPS I/O. To utilize this version, a valid HIPS 12 (or newer) license is required. If you are using Caris License 11, please note that it will only work with Qimera 2.6.3.
If you need to work with Qimera 2.7.0 or newer, please contact Caris to upgrade your HIPS license.

Troubleshooting

1) If you're using a HIPS 9 network license, choose the NET_KEY file instead of the LOC_KEY file and ensure that you've started Caris before Qimera or FMGT (files are usually .dat, but may be .sit for some network licenses). Starting Caris first helps establish the network license connection.

2) Ensure that you are using matching builds of Qimera/FMGT and Caris. Both the QPS and Caris applications need to be either 64 or 32 bit. You can't mix and match. For example, 64 bit FMGT and 64 bit Caris will work.

3) The Caris project directory needs to be at least 5 folders deep from the file system drive (C:\Folder1\Folder2\Folder3\Folder4\Folder5\bathy data). The default project space for a typical Caris install will already be setup this way (C:\Users\%username% \Documents\CARIS\HIPS and SIPS\Data\).

4) The ProcessedDepths file in each Caris line folder is the main bathy file used by FMGT, but it also reads some information from the LogFile.xml or Process.log (Time Offset, for example). To be safe, you should have all associated CARIS files present in the folder with ProcessedDepths (ie. ProcessedDepths, ProcessedDepthsLineSegments, ProcessedDepthsTmIdx, Process.log, Gyro, Pitch, Roll, Heave...).

How-to Combine your Fledermaus and Qimera Server Licenses

This article will help you combine your existing Fledermaus server license with your Qimera license.

On this page:

- Step-by-step guide
- Related articles

> This guide is for the old style server licenses, in use prior to Fledermaus 7.8.0 and Qimera 1.6.0. If you have those versions or newer, please see our new License Server documentation: License Manager Documentation

Step-by-step guide

1. Open your Fledermaus and Qimera license files in your favourite text editor.
2. Copy the license feature lines from the Qimera license and paste them in to your Fledermaus license.
3. Save this new license file as "fmqmcombined.lic" for example. See example below.
4. In the LMTools manager edit your "Path to the license file" and point it to the new combined license file. For more information on the LMTools License manager please see License Server Installation
5. Save the service then click the "Start Server" button in the Start/Stop/Reread tab in the LMTools Manager

Example combined server license

```
SERVER license7 123456789012
Vendor ivs
FEATURE fm3deditor ivs 7.2 permanent 30 SIGN="04A2 8909 E77B 755A \
    8FD4 04DA 33DD 97AD C3B3 77E7 6679 1663 73B0 9A85 0522 0DE8 \
    939B FAD3 1A59 ED68 B4B2 97A2 9488 3904 E098 4E09 029E A36C \
    1B48 A094"
FEATURE fmcmdop ivs 7.2 permanent 30 SIGN="0F71 08CB CF52 86CC 6424 \
    74FA DB24 84B9 5301 BE34 F117 D890 B860 7E3B 1CA8 12EA 9F26 \
    C5A9 EA55 D4C3 164A FE25 18B4 A334 5960 80A4 0F64 2360 EBA2 \
```

```
    D4FB"
FEATURE fmcrosscheck ivs 7.2 permanent 30 SIGN="16D5 6341 0277 B857 \
    616B 0573 F924 C95B FE1F D64E 56D9 7F90 606B 75F7 A8E1 036D \
    514E C742 E378 03AD BC69 74E1 35F2 8BE4 A5C4 E7F2 9B75 7EC1 \
    3B4C 01A7"
FEATURE fmdmagic ivs 7.2 permanent 30 SIGN="09D6 BAC7 A047 77B8 6908 \
    480C C25C 6E29 BC90 7348 1CF0 217F 0B99 7C88 7C0F 10C3 B455 \
    F6BD 245C AB8F 8CCA F239 63A0 6011 E110 6395 572D 45A2 E7AC \
    79BD"
FEATURE fmfledermaus ivs 7.2 permanent 30 SIGN="0D6C 1923 98CC 5A1D \
    7F17 6554 F37E 5388 547B D1D1 C631 E6B9 C39A DC7F C8D1 0E8F \
    574E 7B0C BF9B 4140 1F95 4814 B08E AF2C 2A71 7A95 5ED7 2304 \
    37C6 5CDE"
FEATURE fmgeocoder ivs 7.2 permanent 30 SIGN="1C61 0CA5 CB15 CDF5 \
    F750 6D95 D153 B545 F644 DED5 711C 9D08 25E9 F5F5 5FA8 14E9 \
    7611 FDFE F0EE E974 AFBE 39BE 46C1 13AF A7A1 3AF2 11C5 35CB \
    DE86 65D3"
FEATURE qmcore ivs 7.2 permanent 8 TS_OK SIGN="088D 4CCE B6E4 5E5D \
    2A0A 0E7F DD6F D8F3 30C1 C1C9 6D6D A123 2A57 7A9C A663 1F63 \
    130D 579C 84F7 2B4F 7A8B 1121 17B8 D1F5 F7C9 3459 2464 F4AC \
    C71F 1C06"
FEATURE qmqinsy ivs 7.2 permanent 8 TS_OK SIGN="0EE5 DECB 04AD 3F10 \
    1763 0255 F74F 8971 3022 2D22 BB02 1BFA D645 FE4C 78AF 01EB \
    4D50 5A06 E244 ACE7 596B 709A DEA8 F099 26B5 2CDE FDB9 2E98 \
    8C3A 2BCD"
FEATURE qmrawformats ivs permanent 8 TS_OK SIGN="0621 964C 4B48 \
    607A AD44 F24D AB00 241D D0D9 C845 4870 22E8 C4FD 71D3 BDEC \
    15E0 6E8B 497C D378 129A 5D7F FE5E ED09 E1EF D032 DCF1 3C08 \
    CF95 7F28 AA5B"
```

Related articles

How-to Combine your Fledermaus and Qimera Server Licenses

How-to License Installation (Qimera 1.5.7 or older)

How-to Create an SD model for Geoid separations

This article describes three methods to create an SD model for height model application in Qimera Vertical referencing:

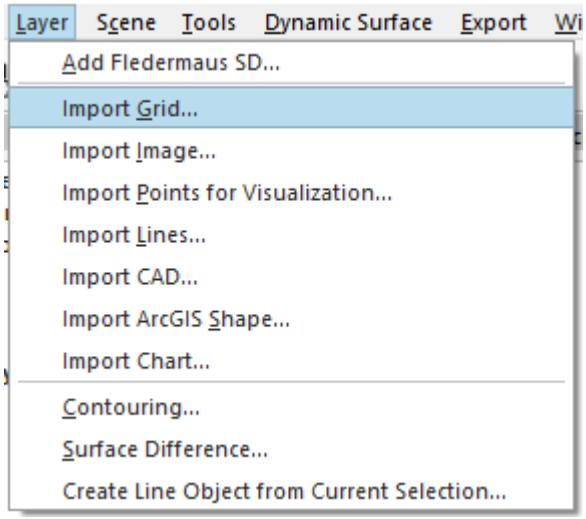
1. From a gridded file, for example a gridded ASCII file.
2. How to bring a River Lines Geoid separation model from QINSy into Qimera.
3. How to convert a binary geoid in Qinsy Processing Manager

On this page:

- Method 1: How to create an SD model from a gridded (ASCII) file
- Method 2: How to use a Vertical Offset (*.qgfvom) Model used in Qinsy during acquisition
- Method 3: How to convert a *.bin or other binary geoid in Qinsy Processing Manager

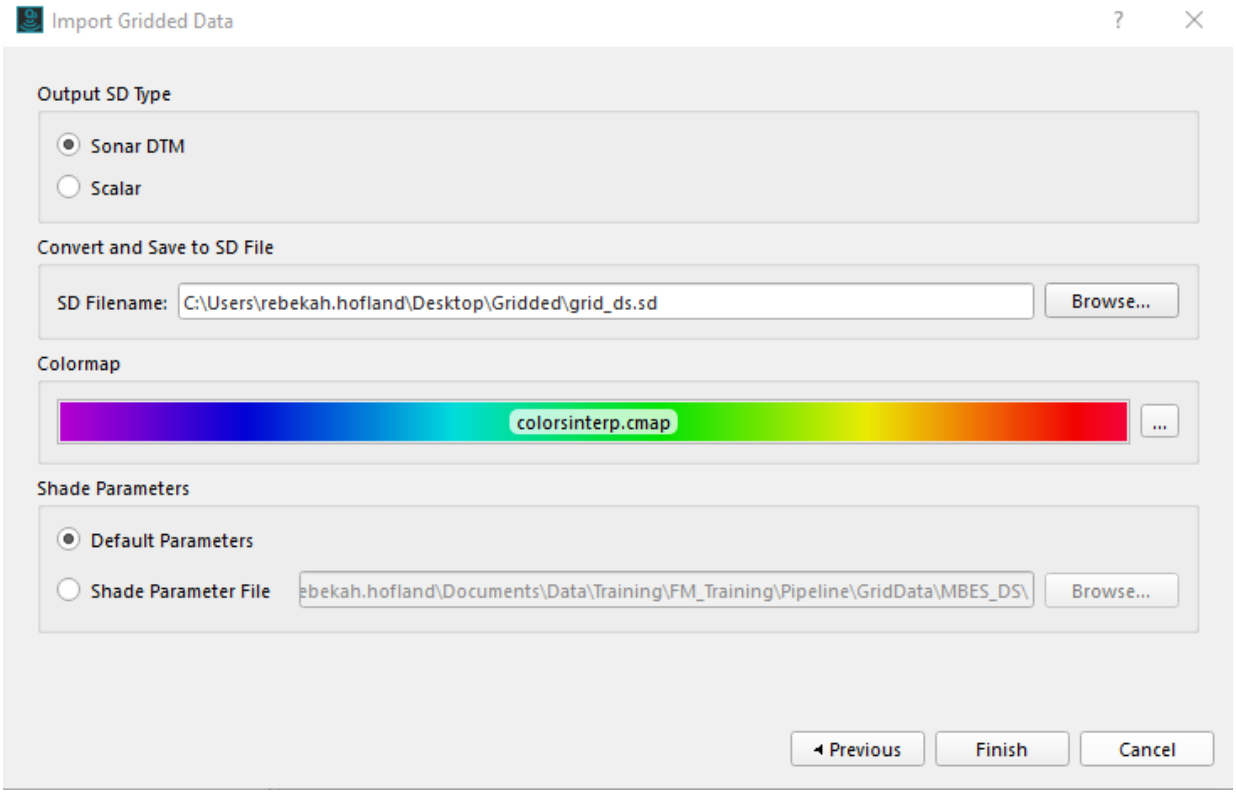
Method 1: How to create an SD model from a gridded (ASCII) file

1. From the Layer drop down menu in Qimera, select Import Grid

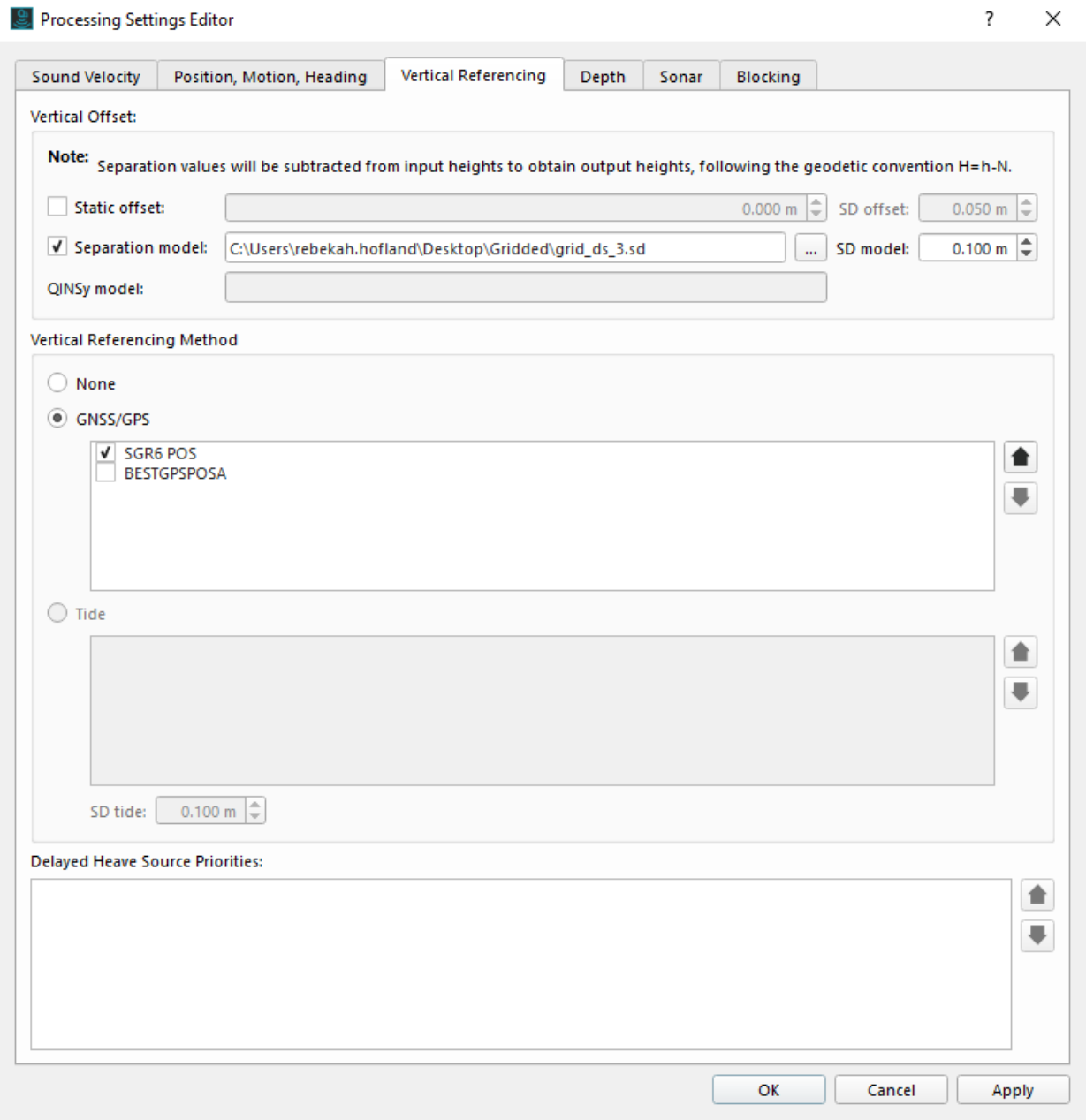


2. Choose the file and the import file format, then follow the wizard for the field mappings and set the correct coordinate systems for the input and output

3. On the last page of the import wizard, select Sonar DTM for the Output SD Type, and set the save location for the SD file.



4. Quality check the SD model and apply the model in Qimera processing Settings, Vertical Referencing tab:



Check the Separation model option in the vertical offset window. You will then be prompted to select a grid file. Apply the changes to the settings, and reprocess the the files affected.

> ⚠ Creating a custom separation model from ASCII points is making an assumption that you have an entire geoid separation model.

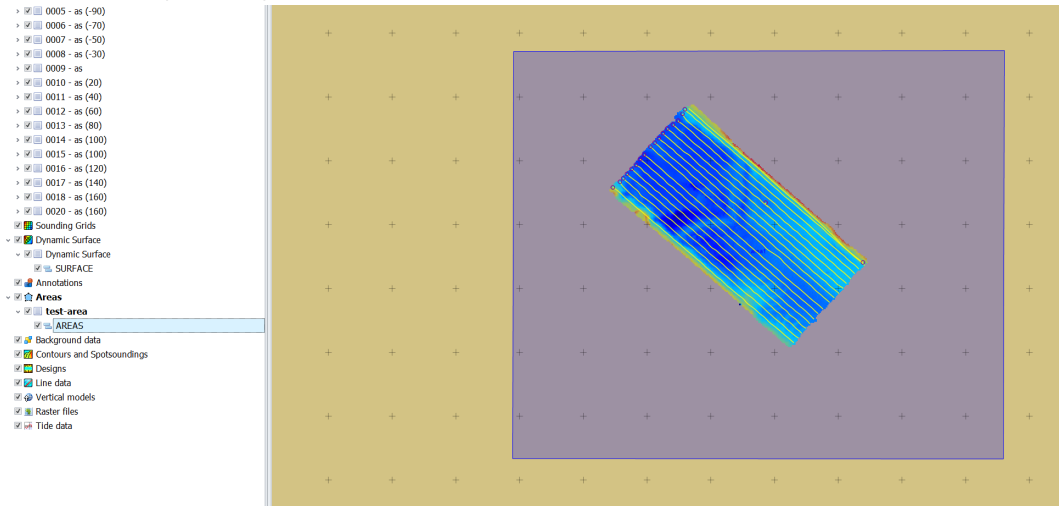
"Legacy" version of Line Data Manager(stand-alone Line Data Manager (so not Line Tools in PM.NET) can be used to check if the point spacing of the model to be imported is constant, for instructions click here.

Method 2: How to use a Vertical Offset (*.qgfvom) Model used in Qinsy during acquisition

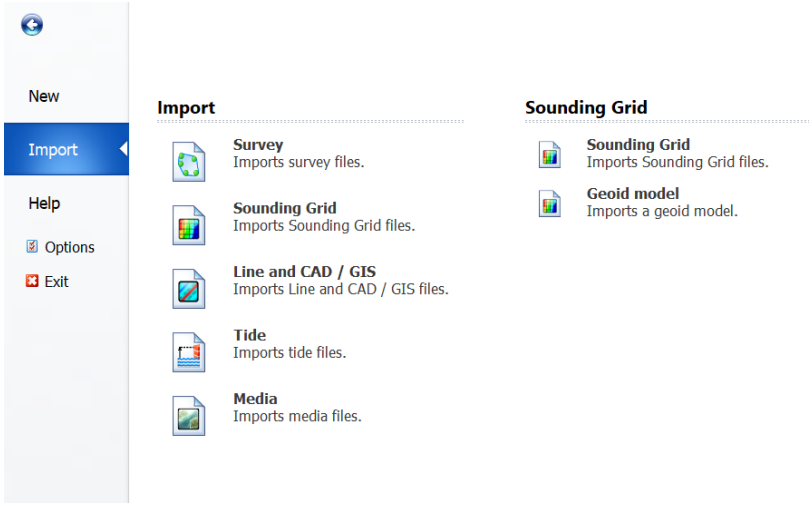
1. Please see the following pages:
   a. How-to Create a Geoid or Vertical Offset Model (VOM)
   b. How-to Create a Geoid or Vertical Offset Model (Qinsy 9.4)
   c. How-to Create a Geoid or Vertical Offset Model (v9.0 - 9.2)

Method 3: How to convert a *.bin or other binary geoid in Qinsy Processing Manager

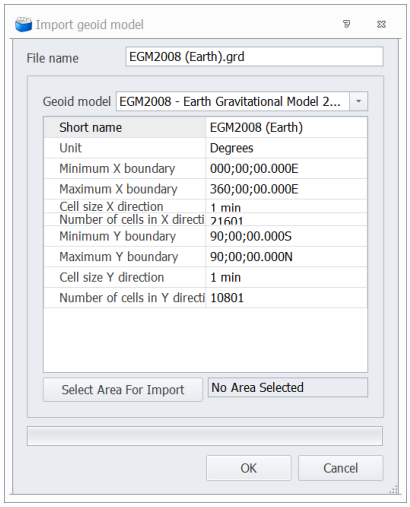
1. In Processing Manager, create an area and click *Save*



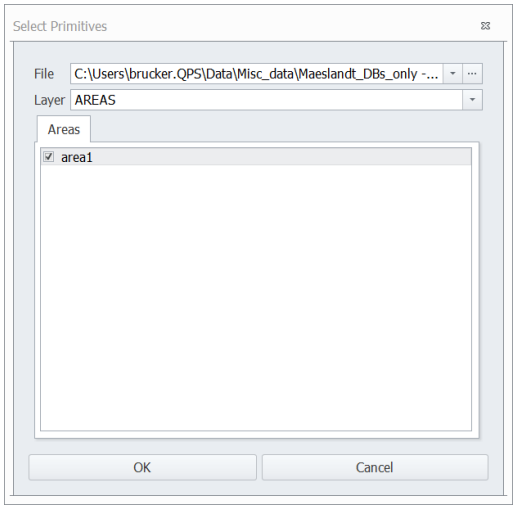
2. Click on the blue Tab button at the far top left. Then select *Import* and then *Sounding Grid* and finally *Geoid Model*:



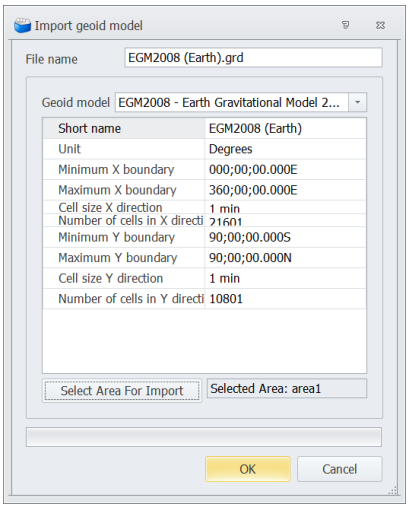
3. Select the geoid model in the *Import geoid model* dialog:



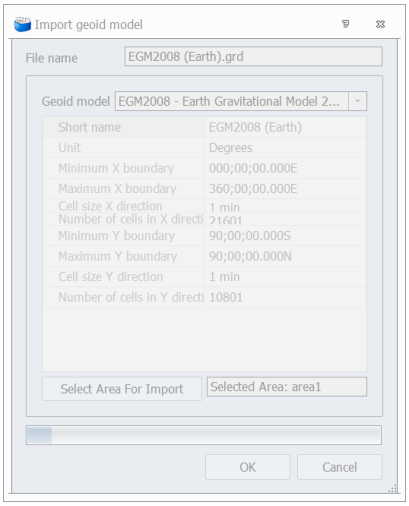
4. Click on *Select Area for Import* and choose the area file that you created in step 1



5. Click *OK* if the area for import is properly populated:



6. The dialog will grey itself out for the duration of the import. There is a progress bar at the bottom.



7. The imported GRD will now show up in the Processing Manager Project Explorer dock.
8. You may want to QC the grid: select on the grid in Project Explorer dock, right mouse, zoom to fit. Then color settings, then Autoscale. If all looks okay, then proceed to next step.
9. You can now go to Qimera and import the .grd file that has been created (Layer → Import Grid, specify QPS Grid). Alternatively, in Processing Manager, you can also export the grid as ASCII and build a new grid from that.
10. When the GRD is imported into Qimera, an SD file will be created in the project folder. Point to that from the Processing Settings - Vertical Referencing tab to apply it as a separation model.

How-to Custom ASCII File Import

When importing ASCII processed point files into Qimera the user is provided with a Custom ASCII file Configuration Wizard which assists in identifying the fields, their formats and the field mappings of the ASCII file.

This facilitates the import of ASCII files with custom fields, formats and mappings. The user can also save this configuration for subsequent use.

On this page:

- Custom ASCII File Configuration

Custom ASCII File Configuration

1. In the ASCII configuration dialog, the GUI elements include:

   a. Header lines to skip - If there are lines at the beginning of the file that should be ignored, enter the number of lines here.
   b. Number of columns - The number of columns or fields on each line of the input file.
   c. Decimal Mark - Is the decimal maker represented by a decimal place or a comma.
   d. Column Separator - The character used to separate columns. By default "Automatic", both commas and spaces/tabs will be treated as column separators.
   You can enter a comma if you don't want to accept whitespace-separated columns.
   Whitespace after a column separator is always ignored.

2. Below these, a number of widgets are displayed; each line of widgets corresponding to a column in the output file. The following widgets are displayed:

   a. A color box - The field will be highlighted in this color in the preview if the file is being read correctly.
   b. The field number
   c. A drop-down box for selecting the field type. The following options are available:
      i. Integer Field - Can contain positive or negative whole numbers. For example: 1, 23, -45, 0.
      ii. Numeric Field - Any decimal number. For example: 0, 16, 128.2398, -12.3. Also accepts trailing N, S, E or W, where S and W make the number negative, i.e.: 123.4N = 123.4, 123.4S = -123.4, 123.4E = 123.4, 123.4W = -123.4.
      iii. Delimited String Field - A string that begins and ends with the specified character, '"' by default. When this option is selected, a new box will appear where you can specify the delimiter. For example, putting "'" in the box will cause the reader to accept single-quoted strings: 'A string' rather than "A string".

iv. Fixed-Width String Field - A string column that always contains the same number of characters but has no delimiter. (e.g. no quotes). When this option is selected, a new widget will appear allowing you to enter the number of characters in the string.
v. Date-Time Field - When this option is selected, a box will appear allowing you to enter a template for reading in a time value. The following characters have special meaning; any other characters will be treated as a separator:

- y Year
- M Month
- d Day
- h hour
- m minute
- s second
- ap or AP "AM" or "PM". If the template contains 'h' but not 'ap', then the hour will be assumed to be 0-24.
- z millisecond
- Template Valid Input Example
- yyyy-MM-dd h:mm:ss.ss "1990-03-12 18:23:37.35"
- dd-MM-yyyy h:mm:ss ap "12-03-1990 6:23:37 pm"
- dd/MM/yyyy/hh/mm/ss/zzzz "12/03/1990/18/23/37/3523"
- hh:mm:ss.ssss "18:23:37.3523"
- hh:mm:ss.zzzz "18:23:37.3523"

3. At the bottom of the dialog a preview window displays the first few lines of the input file. When the reader is set up correctly, each column will be highlighted with the corresponding color in the preview. In the example above the first field is a date and time and you can see the configuration used to parse it properly. You can edit the configuration to import fairly complex ASCII files. This custom ASCII configuration dialog is also available in other areas of the software where ASCII point files are used – for example as a source for gridding.

How-to EGM2008 Geoid

This How-to describes the process for setting up the EGM2008 Geoid for use in Qimera.

On this page:

- Qimera 1.4.0 or later
  - Check if you have the EGM2008 Geoid File Already
  - Download the EGM2008 Install File
- Qimera 1.3.6 or earlier
  - Check if you have the EGM2008 geoid file already
  - Download EGM2008 Install File
  - Copy the EGM2008.BIN file to Qimera installation folder

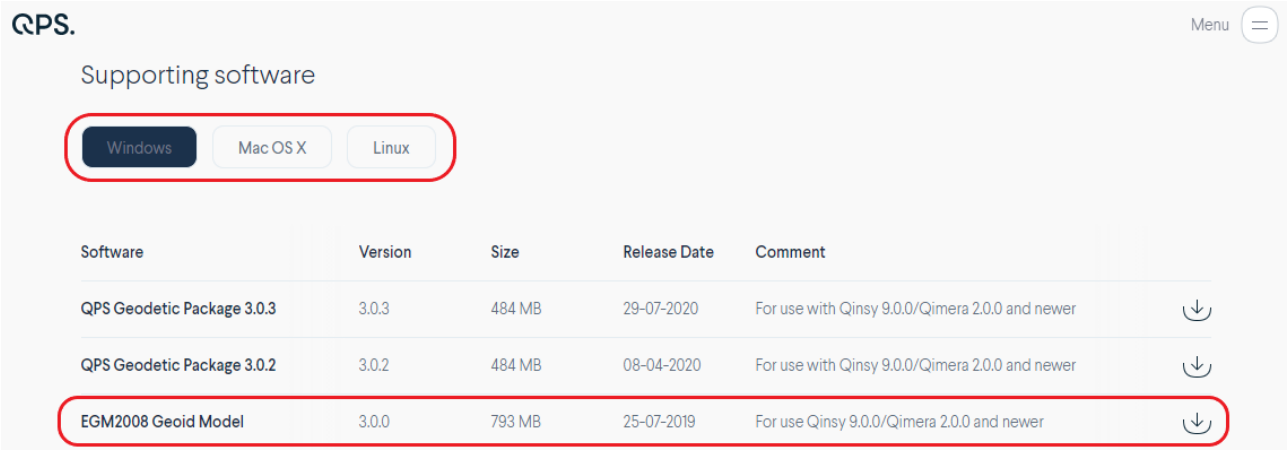
Qimera 1.4.0 or later

Check if you have the EGM2008 Geoid File Already

You can check to see if the Geoid file is already available by navigating through Windows Explorer to `C:\Program Files (x86)\Common Files\QPS\Geo\Geoid` and checking for EGM2008.BIN file.

Download the EGM2008 Install File

If you do not have the EGM2008.BIN file available, you can downlead the installer from the Qimera Download Page.



The EMG2008 geoid model should now be available for use in Qimera.

Qimera 1.3.6 or earlier

Check if you have the EGM2008 geoid file already

1. With Windows File Explorer, navigate to: C:\Program Files (x86)\QPS\QINSy 8.1\Geoid (your QINSy installation folder location may differ)
2. Look for the EGM2008.BIN file.
3. If it is present, skip to the 'Copy EGM2008' section below
4. If it is not present, see the 'Download EGM2008 Install File' section first

Download EGM2008 Install File

1. In a web browser, navigate to the QINSy download page: QINSy. Login.
2. In the table at the bottom of the page you will see an entry for the 'EGM2008 model', click the download button in that row.
3. Save the MSI file to a temporary directory, it can be deleted after.
4. Run the MSI file to start the installer.
5. The installer will place the EGM2008.BIN file in your QINSy geoid folder C:\Program Files (x86)\QPS\QINSy 8.1\Geoid (or similar).

Copy the EGM2008.BIN file to Qimera installation folder

1. With Windows File Explorer, navigate to: C:\Program Files (x86)\QPS\QINSy 8.1\Geoid (your QINSy installation folder location may differ)
2. Copy this file: EGM2008.BIN
3. Paste the file into the Qimera geoid folder: C:\Program Files\QPS\Qimera\resources\QINSy_Geodetics\Geoid (or similar)
4. Restart Qimera if you have it open.

If you have a Qimera 1.1 project that requires the EGM2008 resource file, you will need to restart the project.
If your project was created in an earlier version of Qimera, the EGM2008 vertical transform is not available and you will have to create a new project in Qimera version 1.1 or higher.

How-to Graphics card Setup and Screen Resolutions (Windows Scaling)

This How-to touches on ways to configure recent versions of Windows to work better with High and Low resolution displays

This How-to also outlines the ways to prevent an integrated Intel graphics device from being used for Qimera if there is a dedicated card available. If Qimera detects that an integrated Intel device is being used, a warning message will appear stating that this device could cause instability.

On this page:

- Monitor setup desktops
- Laptop setup
- Adjusting 'Windows Scaling'
- Configuring Dedicated Graphics Devices for Qimera
  - NVIDIA
  - AMD
- Updating drivers graphics cards

Monitor setup desktops

Make sure the monitor setup is connected to the video card. The cables need to be connected to the video card ports on the desktop (green box).
This will allow to use the high performance of the video card. When connected to the onboard graphics/motherboard (red box), it will not be possible to run applications with the high performance graphics card.

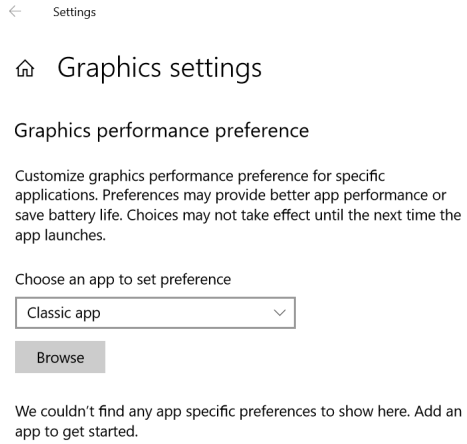


Laptop setup

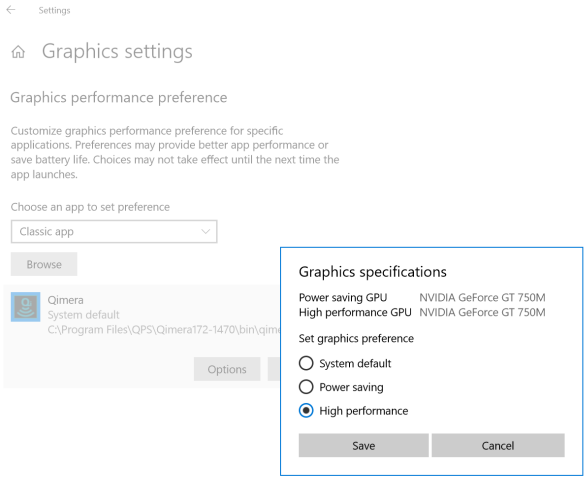
Laptops often have an integrated high performance video card. This allows to choose in windows which graphics card should be used. To set a dedicated graphics card for a QPS programm.

- Go to Settings (The gear icon in the Windows Menu) > System > Display

- Within the Display Settings, choose 'Graphics Settings'. You should now see something like this:

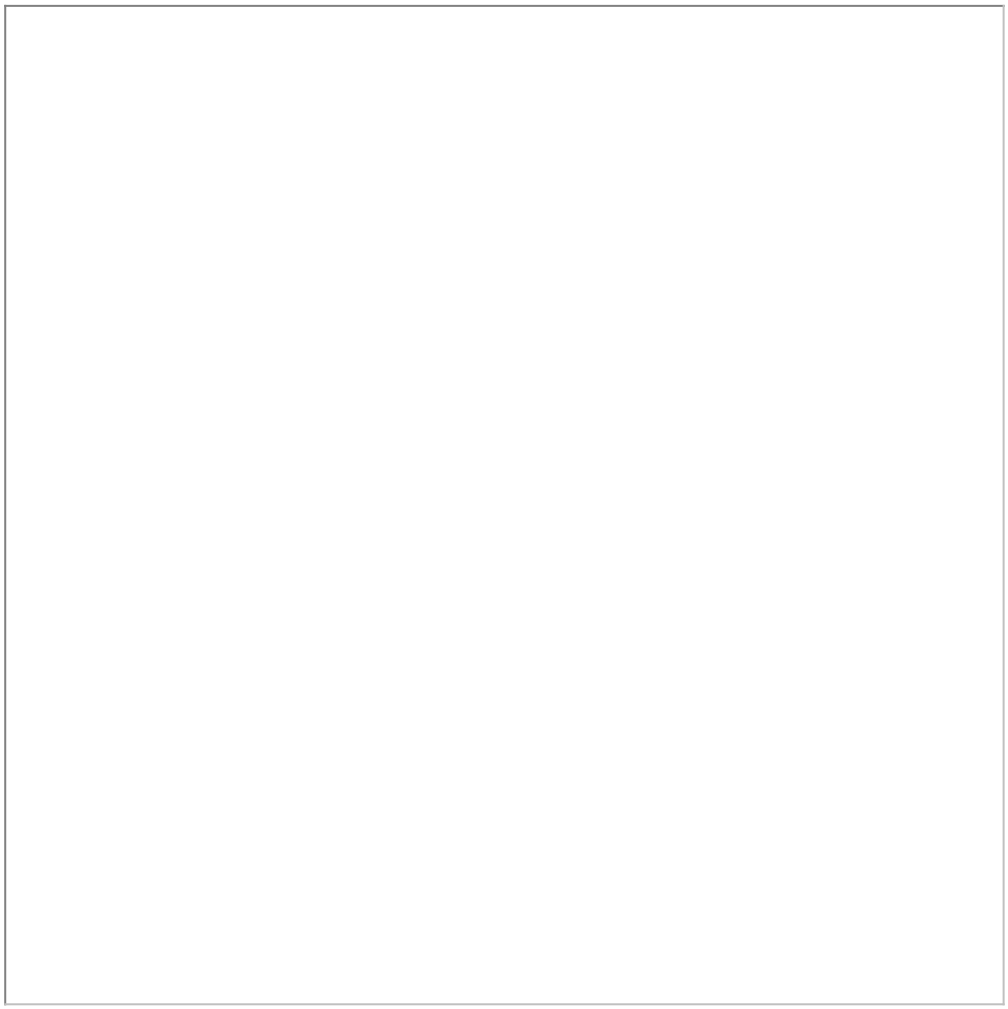


- Choose 'Classic App', click on 'Browse' and navigate to your QPS application.
- Click on the application and choose 'Options'
- Now select High Performance:



- If you see the same graphics device for both Power Saving and High Performance, then changing the settings will have no effect. If you see an integrated graphics device and a dedicated device, then the setting will have an effect.

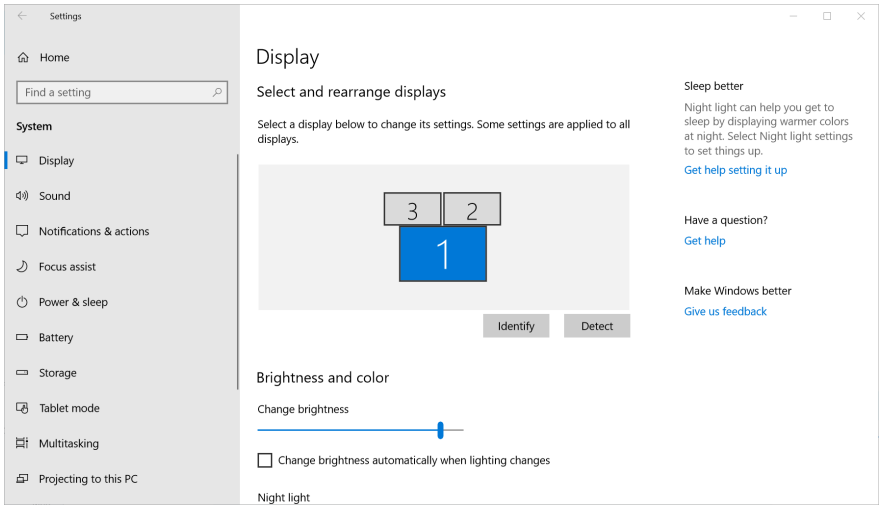
These settings can also be accessed by the right click on the application in the desktop.



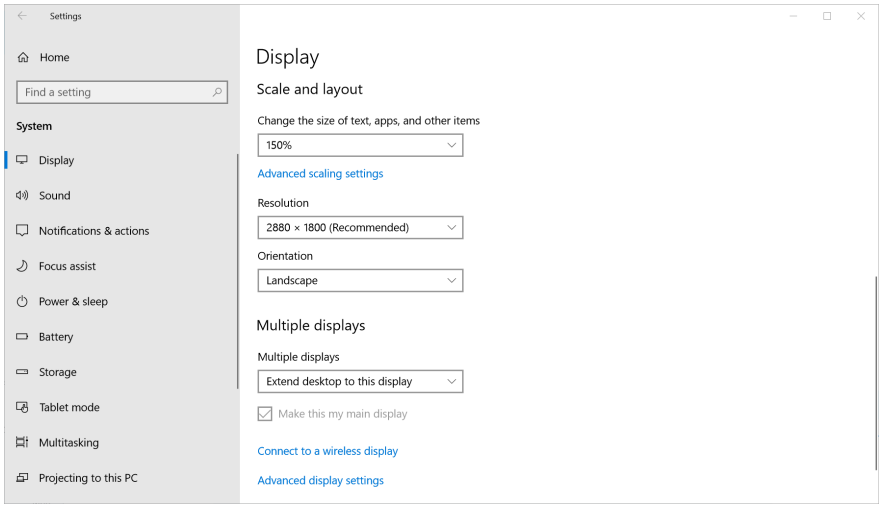
Using a USB Driver Graphic Card from a USB Docking station might result in OpenGL error, a quick workaround for this is to plug in the display cable straight in the video output of the laptop.

Adjusting 'Windows Scaling'

Go to Windows Display Settings. The easiest way is to press the 'Windows' button and type in Display, then hit enter. You should end up here:



Scroll down to the 'Scale and Layout' section:

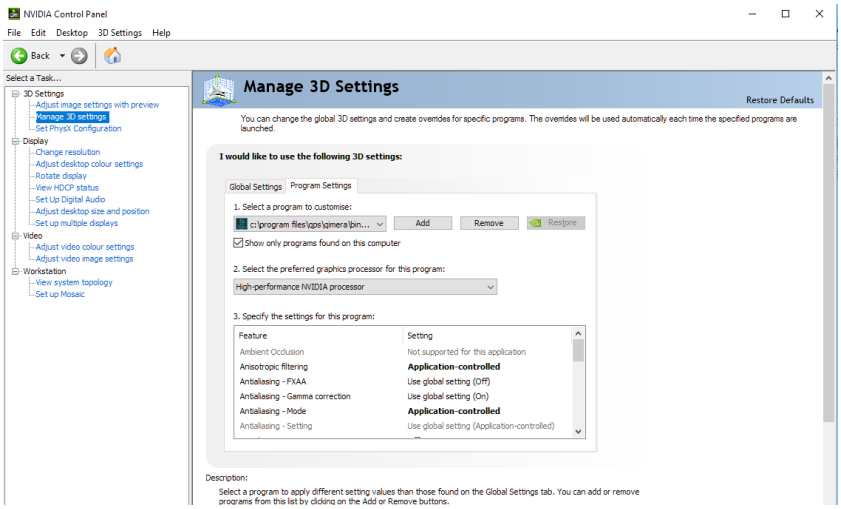


Under 'Change the size of text, apps, and other items' adjust the scale factor to suit your needs.

Configuring Dedicated Graphics Devices for Qimera

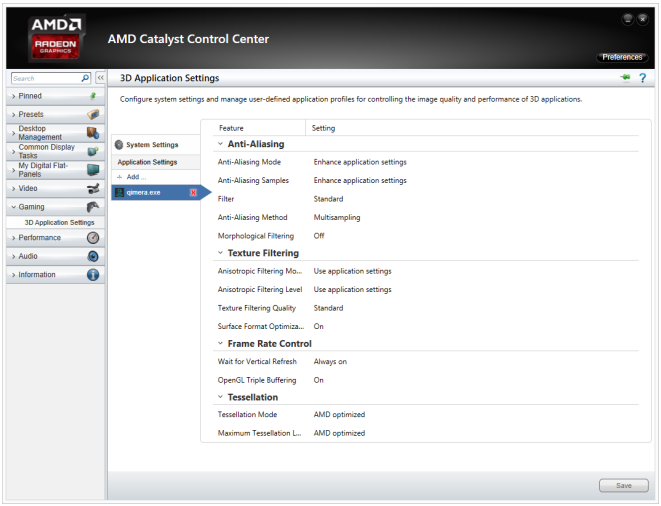
NVIDIA

The NVIDIA Control Panel allows for settings to be changed on a per-application level. If you have an NVIDIA GPU installed on your PC you can most easily start the NVIDIA Control Panel by right clicking on the desktop and selecting it from the drop-down menu. If it is not available there, you may need to install the latest drivers from NVIDIA.



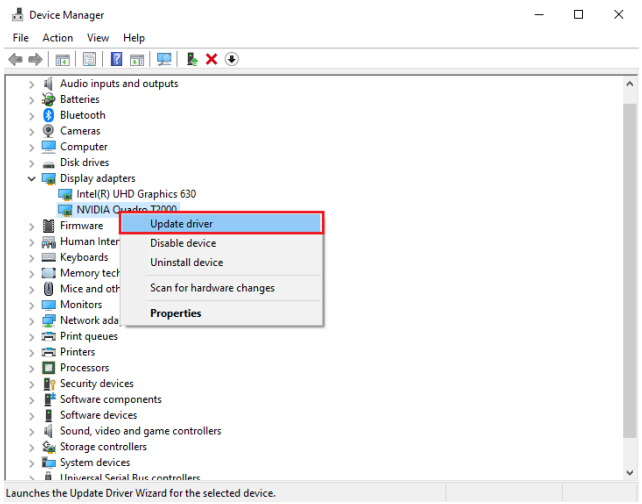
AMD

The AMD Catalyst Control Center allows for settings to be changed on a per-application level. Add Qimera to the list of Application Settings and configure the options as follows:



Updating drivers graphics cards

In some cases it might require to update the video card. When this is not done automatically, this can be done via the device manager.



Many manufactures have an overview of the latest drivers on their website, these drivers could also be installed manually in case there is not internet or windows is not able to find the latest drivers.

- NVIDEA
- AMD

Images retrieved from these JIRA tickets:

Unable to locate Jira server for this macro. It may be due to Application Link configuration.

Unable to locate Jira server for this macro. It may be due to Application Link configuration.

How-to Import Binary Navigation

This is a brief description of how to import additional position and motion files to Qimera and utilise in the reprocessing of the raw multibeam source data.

On this page:

- Import and use of position and motion files
- Navigation Import Configuration
- Create a New Position System Reference
  - New System Dialog
- Choose Acquisition Date and Coordinate System
- Reprocess with the binary navigation files
- Processing Settings Editor

Qimera supports importing and application of additional position and motion files or binary navigation files. Once imported they can be selected to process the entire Qimera project or a single line of source data.

Currently, Qimera supports Applanix POSMV and POSPac file formats. For additional information on supported formats please refer to Supported Data Formats - Position and Motion files.

POSPac SBET files

When importing POSPac SBET files, 'sbet' must be part of the base name of the file. The base name is the part of the file path preceding the extension and after the directory.

Applanix's POSPac creates SBETs which can also have an associated RMS file. This RMS file contains standard deviation information that Qimera can then use and display. This file is however not necessary in order to process the SBET into imported data.

Qimera will automatically search for the SBET's associated RMS file. If the RMS file is not found Qimera will inform the user within the Job Activity Dock.

Example of message in Job Activity Dock: "Info: No matching RMS file found for: **SBET FILE NAME"

If you have an associated RMS file, it must have the same naming except that 'sbet' is replaced with 'smrmsg' (and it must reside in the same directory). If this naming convention is not used, Qimera will not be able to auto-recognize the file type.

POSMV Files

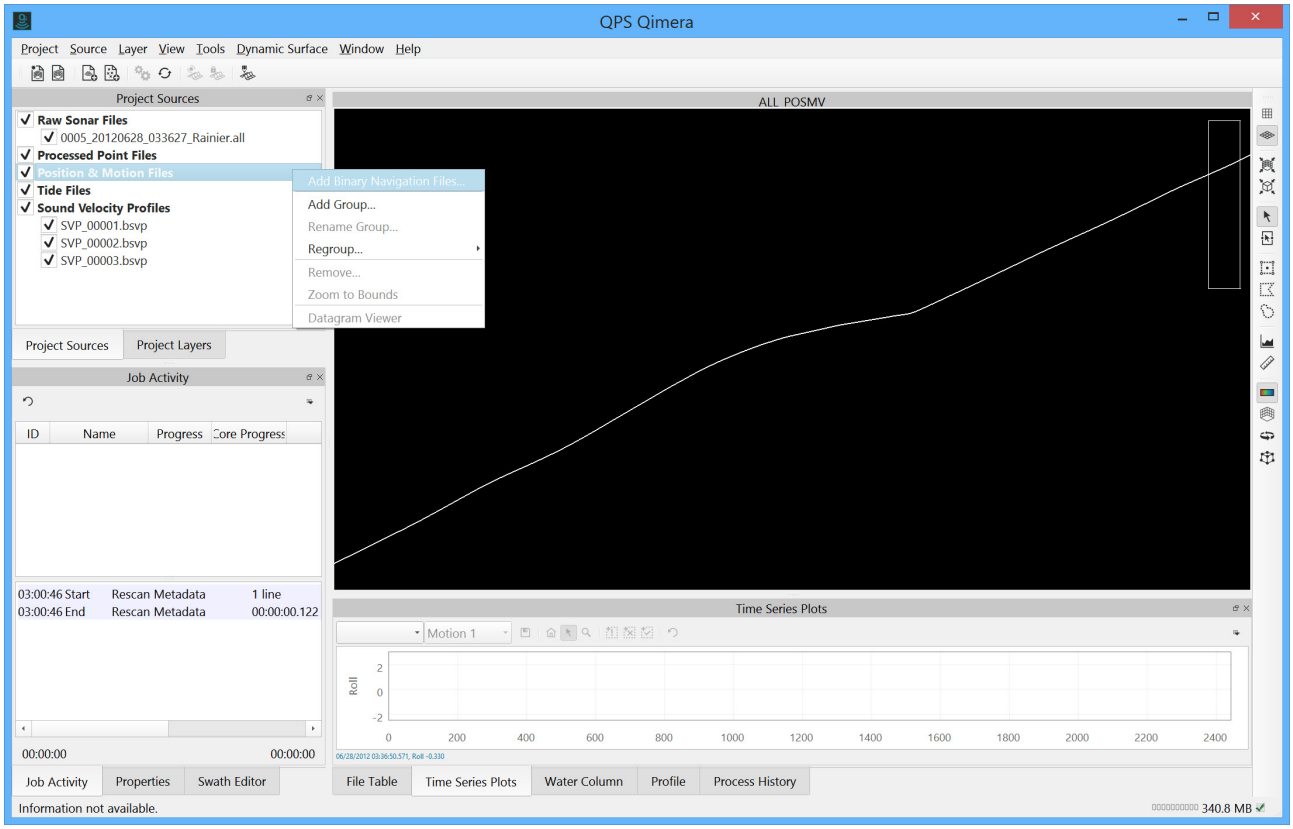
POSMV logged data can have any filename extension. The default is .000, .001, etc but extensions like .nav or .bin will also work.

Import and use of position and motion files

1. Create a Project in Qimera.
2. Import raw source multibeam data to the project.

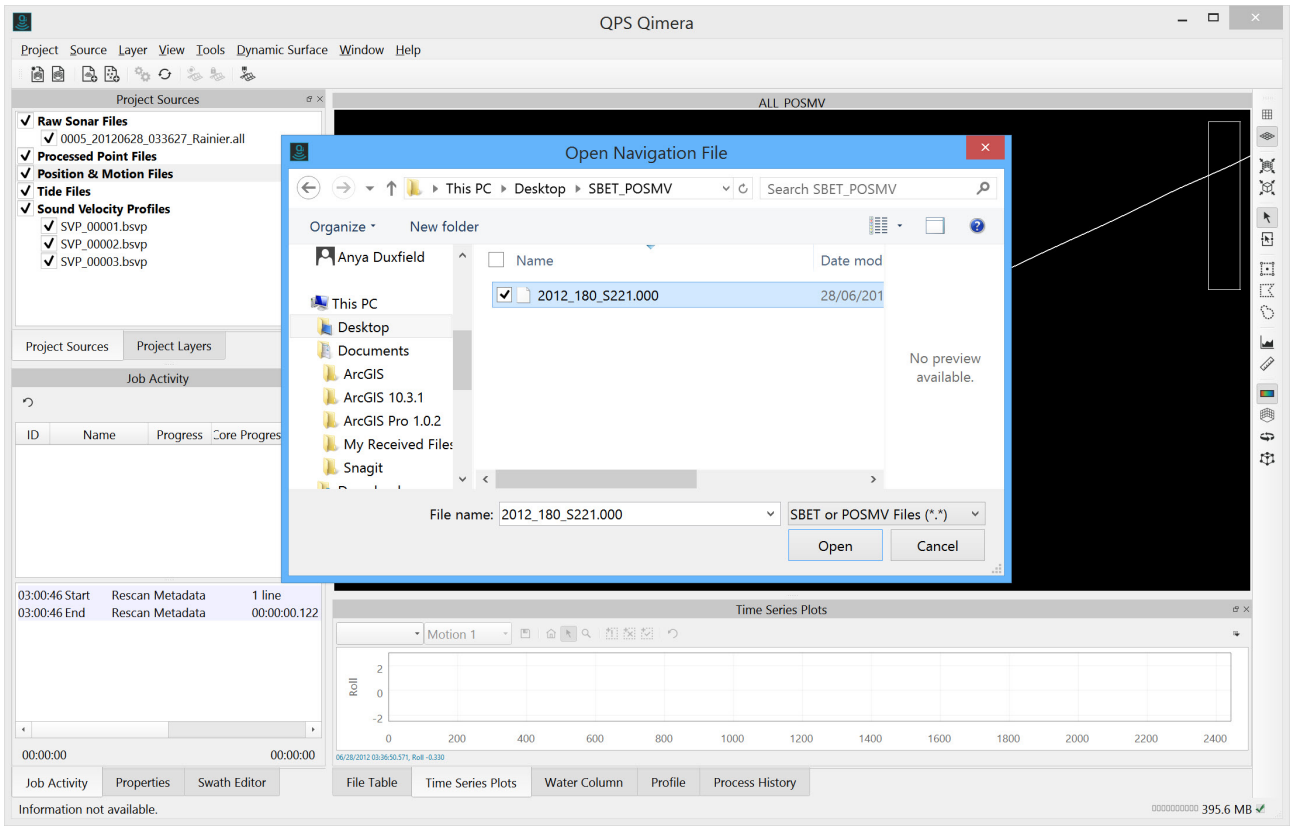
For help with Creating a Project and adding raw source multibeam data a very useful starting point is Getting Started

3. Highlight the Position and Motion Files layer under the Project Sources and select Add Binary Navigation from the drop down menu.



You can view a full-size version of any image in this How-to article by clicking on the image.

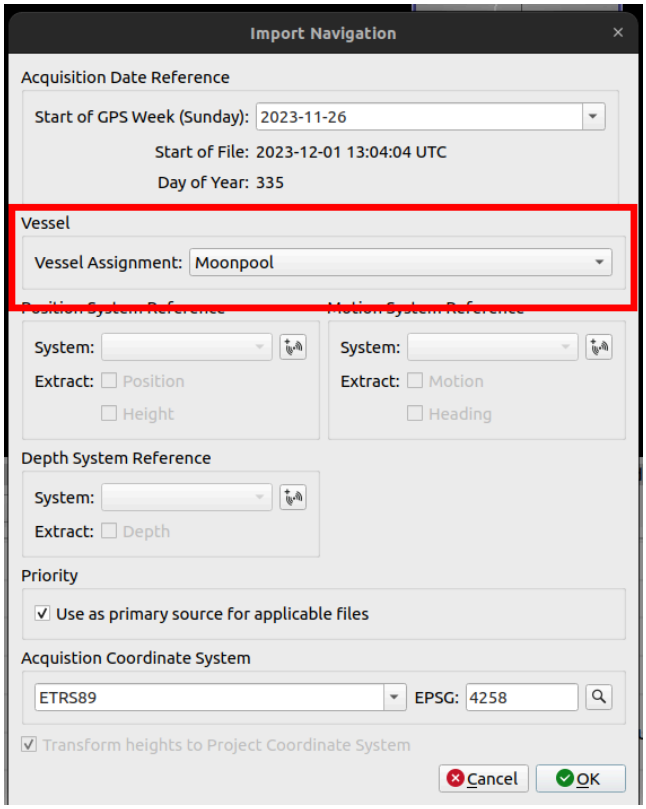
4. Browse for and select your SBET or POSMV binary file.



Navigation Import Configuration

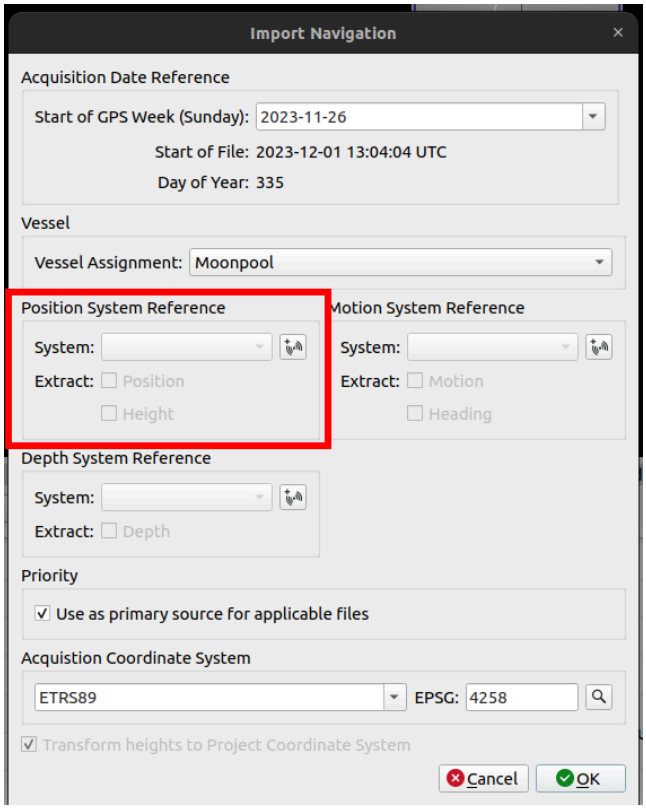
1. Once the file has been selected Qimera will present the user with the Navigation Import Configuration dialog.

2. Select the Vessel that you'd like to associate the data with.
You must have imported raw multibeam source data prior to importing binary navigation, otherwise a vessel file does not exist.



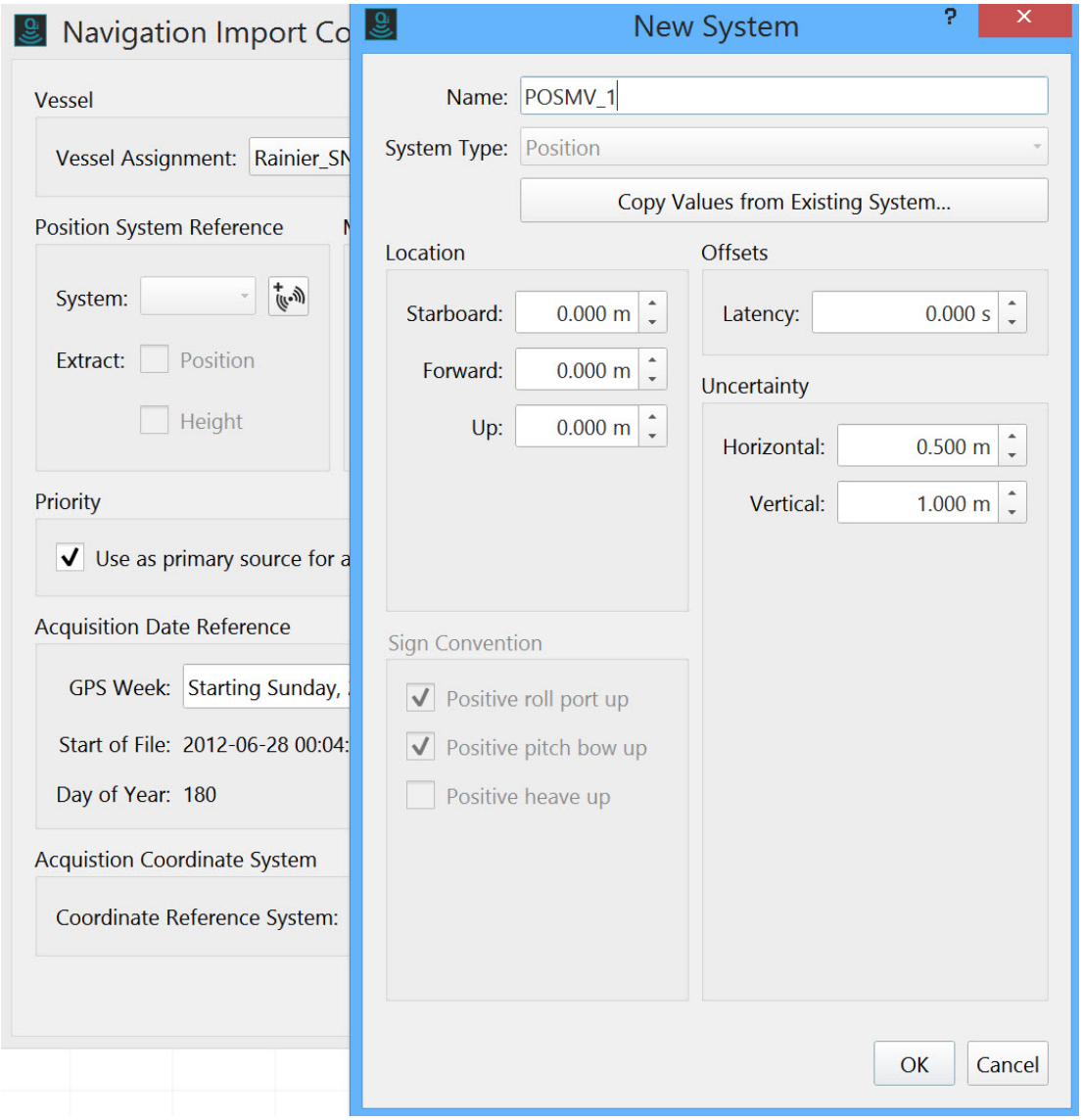
Create a New Position System Reference

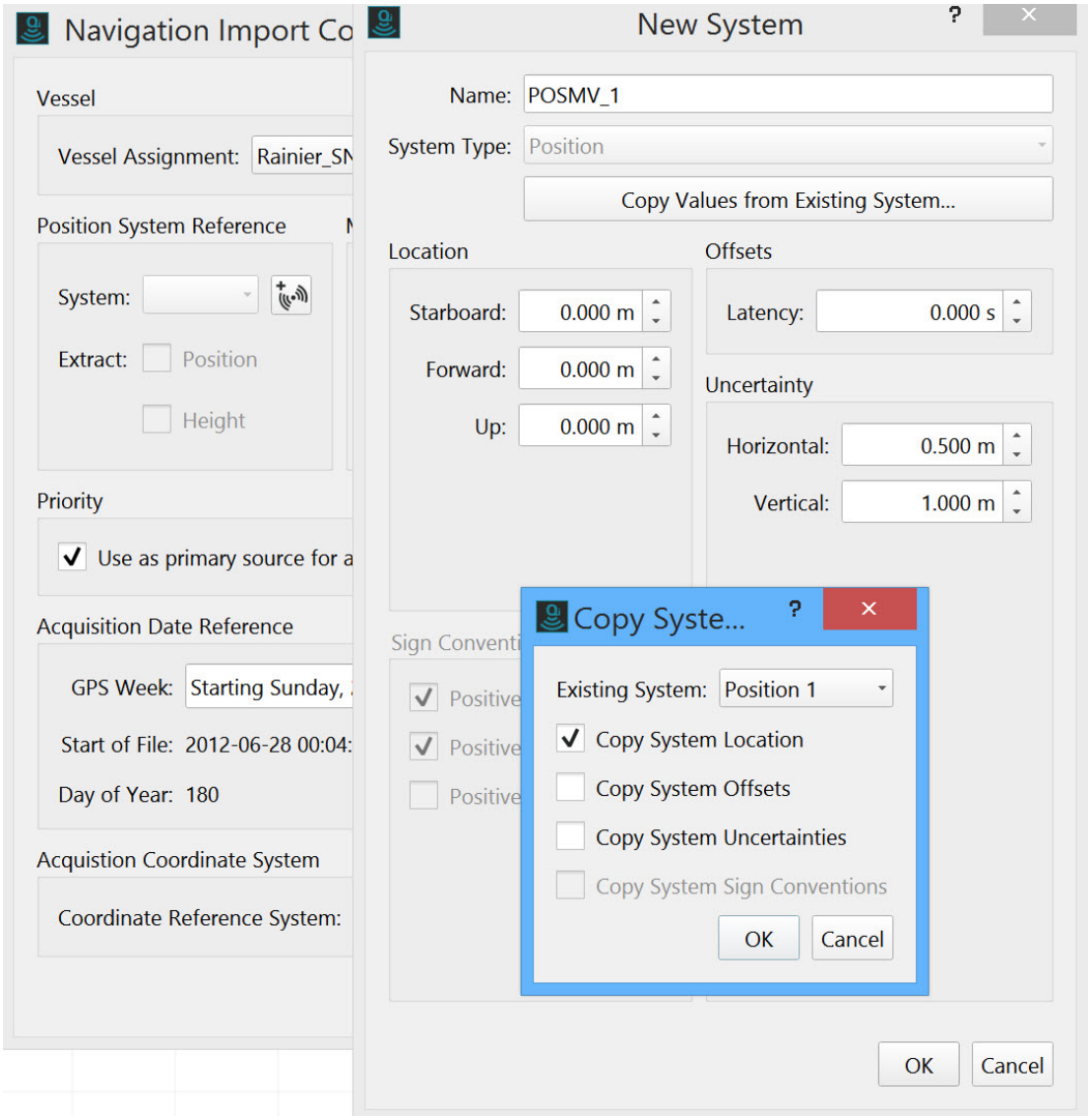
Create a new positioning and/or motion system. This is necessary to distinguish the new data's physical location in the vessel from pre-existing systems and also to allow the user to adjust the uncertainty values for the incoming data. On subsequent import sessions, the user-defined systems that have already been created will be available for selection so you only need to specify new systems when data is first imported.



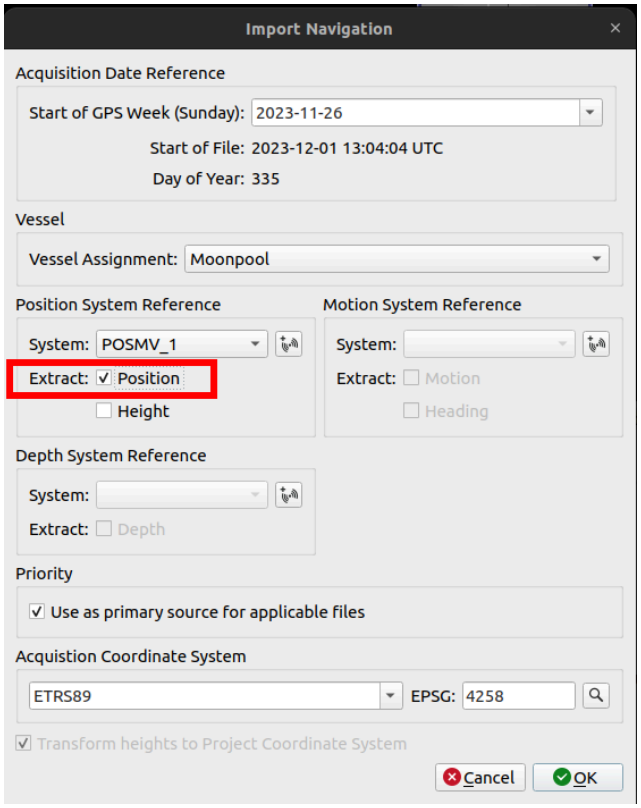
New System Dialog

The New System Dialog (shown below) allows you to specify a name and system type. You can choose to copy position, angular offsets, latencies, uncertainties, etc from existing systems in the vessel configuration file, see below. The set of properties that are allowable for copy will depend on the type of system you are going to create and the type of system that you are copying from. For example, you cannot copy the angular offsets or uncertainties of an existing motion sensor to a newly created position system. Once you have chosen which properties you wish to copy, these values will be used to populate the appropriate fields in the New System dialog. You can also edit these values after you've copied them.


Navigation Import Co
Vessel
Vessel Assignment:
Rainier_SN
Position System Reference
System:
Extract:
Position
Height
Priority
Use as primary source for a
Acquisition Date Reference
GPS Week:
Starting Sunday,
Start of File: 2012-06-28 00:04:
Day of Year: 180
Acquistion Coordinate System
Coordinate Reference System:
New System
Name:
POSMV_1
System Type:
Position
Copy Values from Existing System...
Location
Starboard:
0.000 m
Forward:
0.000 m
Up:
0.000 m
Offsets
Latency:
0.000 s
Uncertainty
Horizontal:
0.500 m
Vertical:
1.000 m
Sign Convention
Positive roll port up
Positive pitch bow up
Positive heave up
OK
Cancel

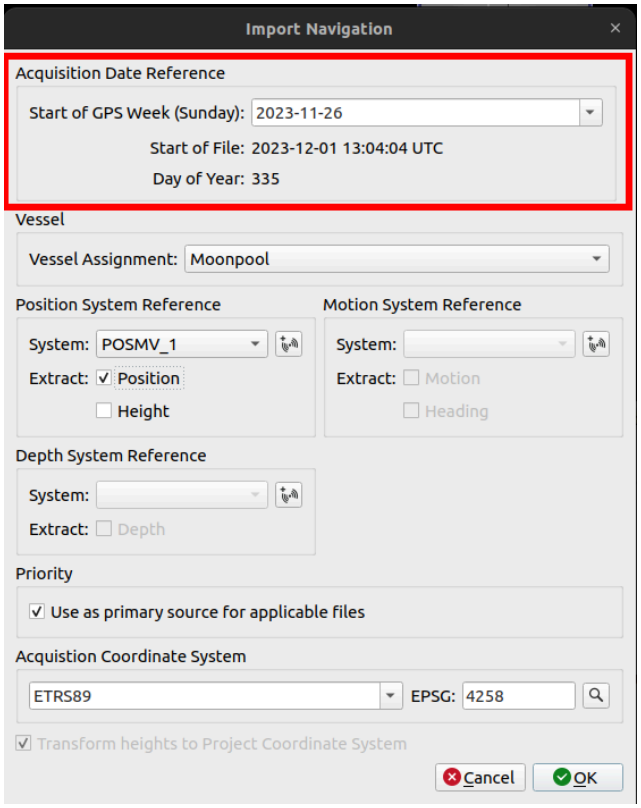


2. Choose which types of data will be extracted for the new positioning and motion systems.

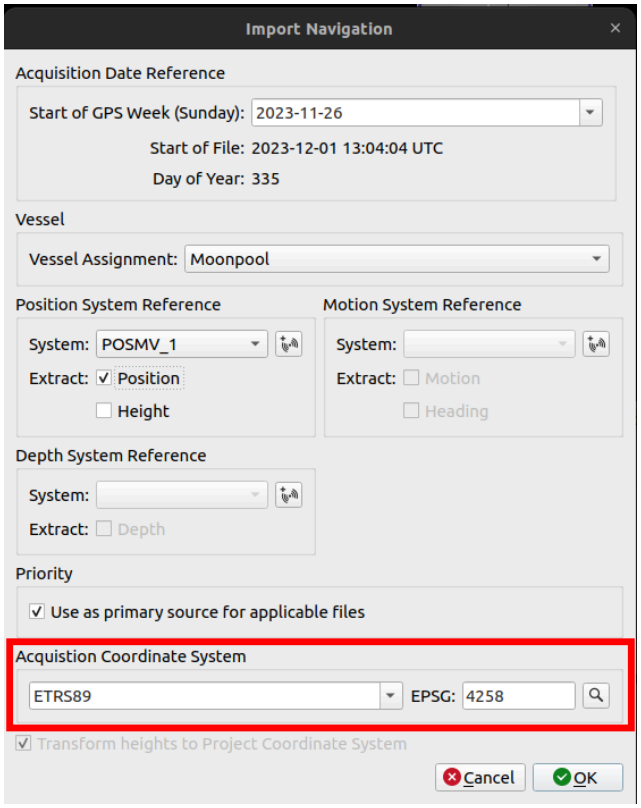


Choose Acquisition Date and Coordinate System

1. Choose the Acquisition Date Reference, this defaults to the date of the project. POSMV and SBET file time stamps are relative to the beginning of the GPS week and the week of acquisition must be specified.

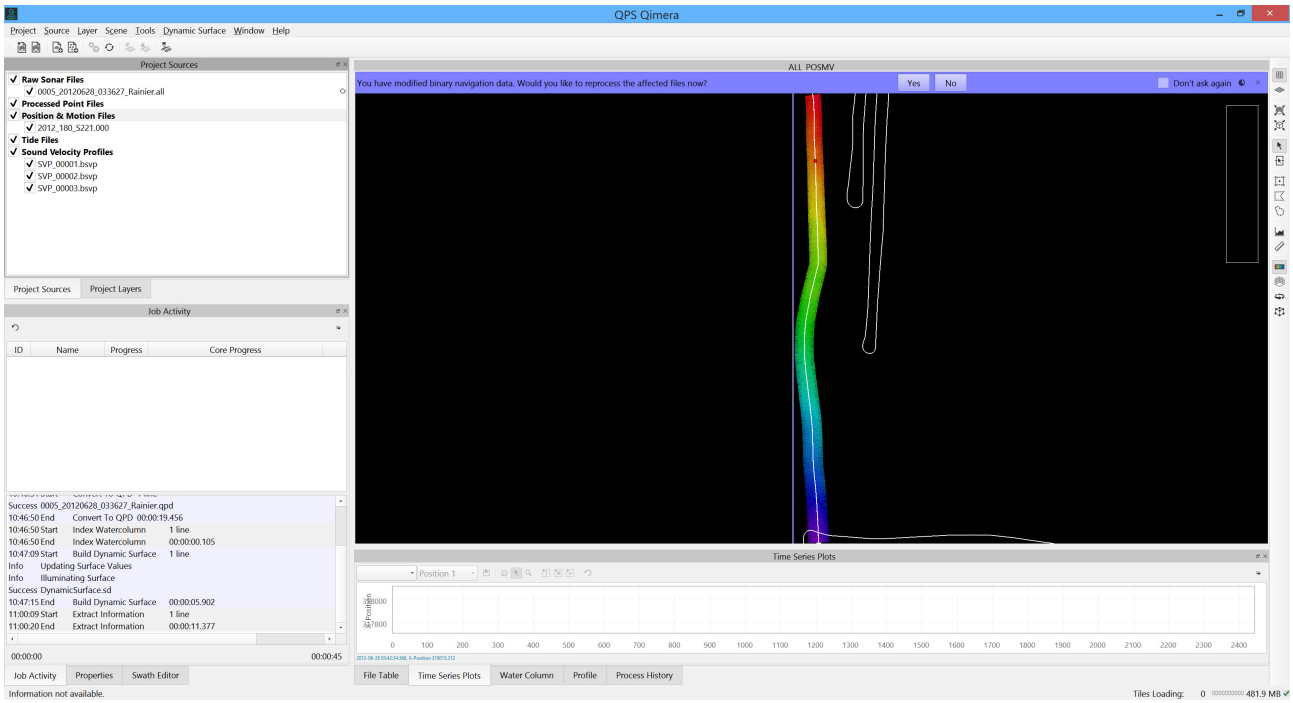


2. Select the Acquisition Coordinate system of the imported data.

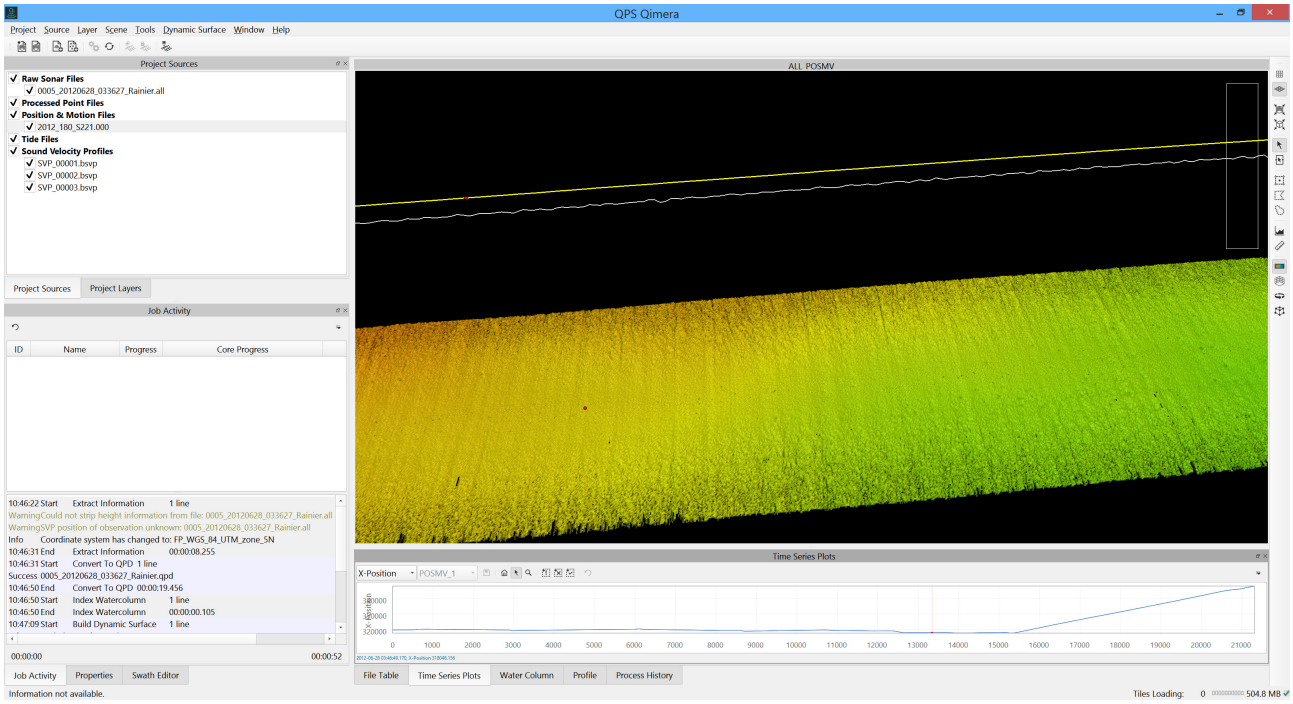


Reprocess with the binary navigation files

1. Qimera recognizes that you have added a new position system and asks whether you would like to Reprocess the affected files.



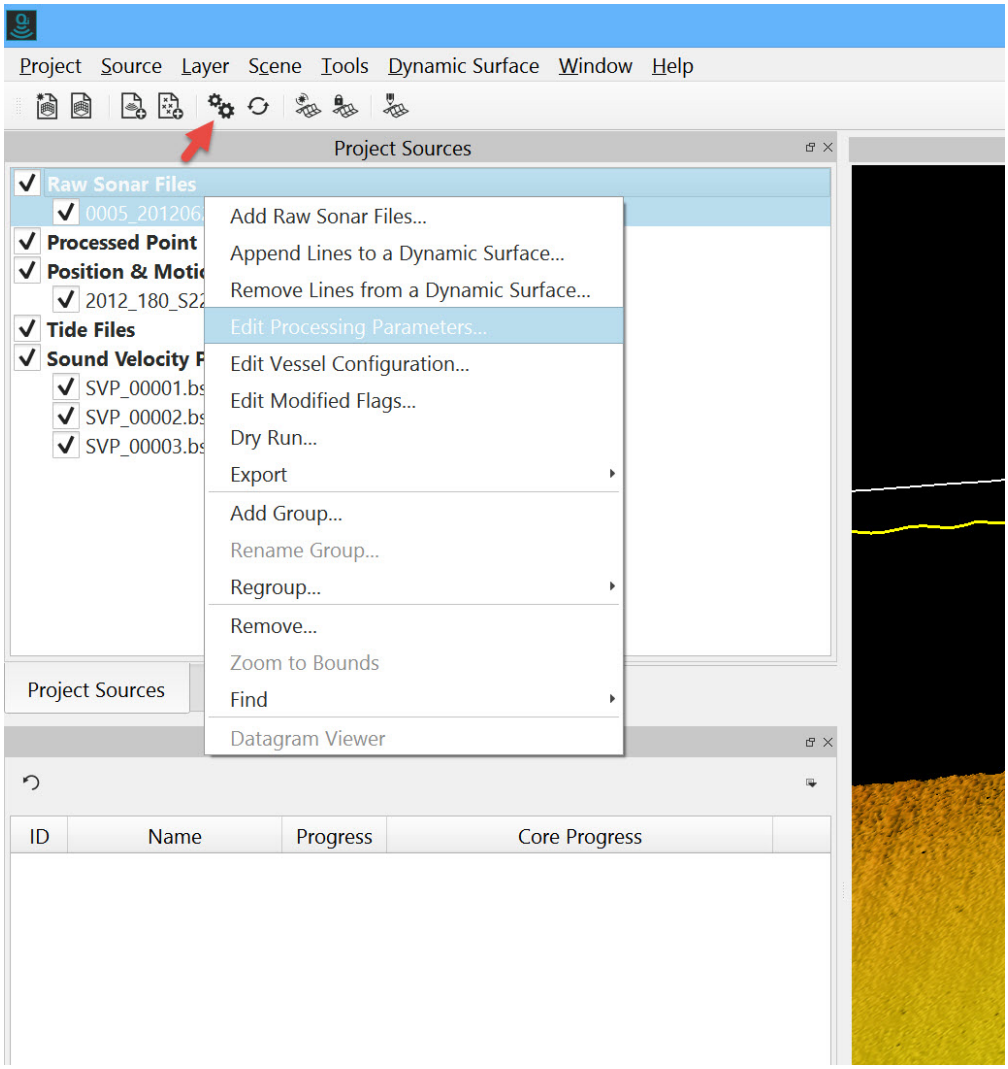
2. Once Qimera has completed the reprocessing you will see both the original position file and the new position system displayed.
Qimera updates the QPD files with the new position system applied. The Dynamic Surface will also be updated.

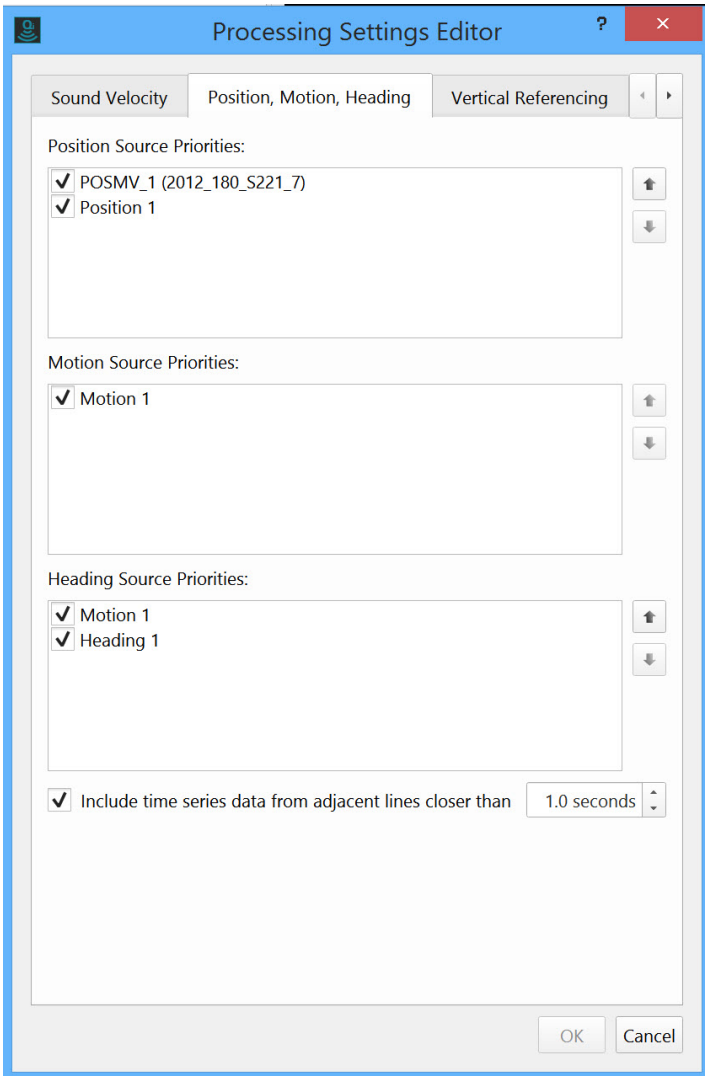


Processing Settings Editor

At any stage a change can be made to which Position or Motion System is used in Processing by highlighting the raw source multibeam file/s for which a change is required and selecting the Processing Settings widget.

This brings up the Processing Settings Editor. Select the Position, Motion , Heading tab. You can change the source of for any of these settings by changing the Priority of the Source files. They are applied in order of their position in the list. If there is a gap or lack of overlap in the first, the second will be used, etc.


Project Source Layer Scene Tools Dynamic Surface Window Help
Project Sources
Raw Sonar Files
Processed Point
Position & Moti
Tide Files
Sound Velocity F
SVP_00001.bs
SVP_00002.bs
SVP_00003.bs
Add Raw Sonar Files...
Append Lines to a Dynamic Surface...
Remove Lines from a Dynamic Surface...
Edit Processing Parameters...
Edit Vessel Configuration...
Edit Modified Flags...
Dry Run...
Export
Add Group...
Rename Group...
Regroup...
Remove...
Zoom to Bounds
Find
Datagram Viewer
Project Sources
ID
Name
Progress
Core Progress


Processing Settings Editor
Sound Velocity
Position, Motion, Heading
Vertical Referencing
Position Source Priorities:
POSMV_1 (2012_180_S221_7)
Position 1
Motion Source Priorities:
Motion 1
Heading Source Priorities:
Motion 1
Heading 1
Include time series data from adjacent lines closer than
1.0 seconds
OK
Cancel

How-to Import Processed Point Files

This How-to briefly explains how to import different types of processed points into Qimera.

- Introduction
- Importing Processed Point Files
  - Step-by-Step
    - Step 1: Open Add Processed Point Files Dialog
    - Step 2: Adding Files in the Add Processed Point Files Dialog
    - Step 3: Coordinate System and Importing Files
- Processed Point File Data Interaction
- Processed Point File Operations
- Additional Information

Introduction

Many different Processed Point files can be added to a Qimera project and used to make surfaces for cleaning and filtering the points.

Importing Processed Point Files

Step-by-Step

Step 1: Open Add Processed Point Files Dialog

There are three ways to open the Add Processed Point Files Dialog (see Figure 1).

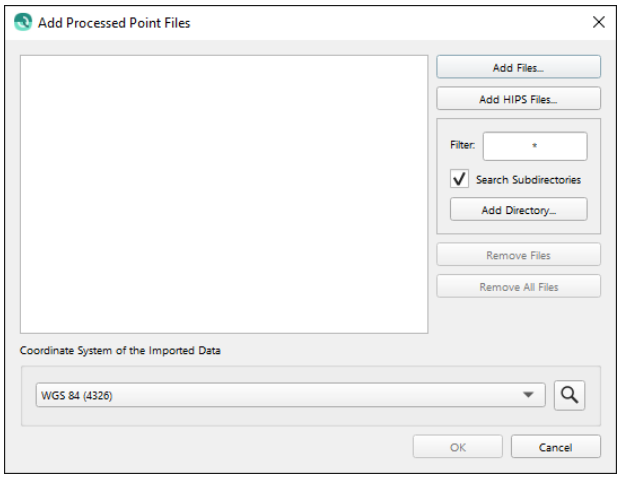


Figure 1. *The Add Processed Point Files Dialog Box.*

- By selecting the "Add Processed Point Files" button in the main toolbar (see Figure 2a).

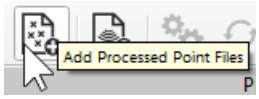


Figure 2a. *Add Processed Point Files button.*

- By Selecting "Add Processed Point Files" under Source (see Figure 2b).

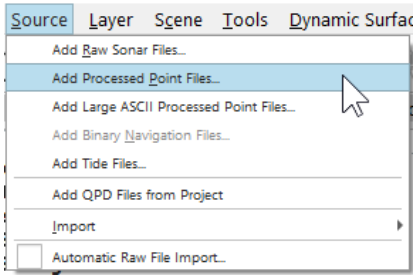


Figure 2b. *Add Processed Point Files under Source.*

- By right clicking "Processed Point Files" in the Project Sources Dock and selecting "Add Point Files" (see Figure 2c).

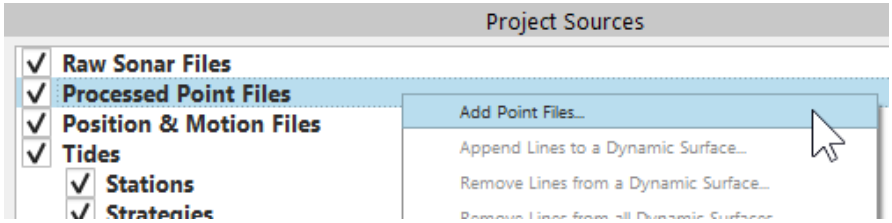


Figure 2c. *Add Processed Point Files under Project Sources.*

Step 2: Adding Files in the Add Processed Point Files Dialog

Click "Add Files" in the Add Processed Point Files dialog box (see Figure 1), to open the Add Source Files dialog box (see Figure 3), which typically opens to the last project open in Qimera or open in the dialog. Choose the type of point file that will be used, navigate and select the processed point files wanted. There are multiple types of files that are considered processed point files like .las ASCII files and QPDs, adding each one is different.

- See Qimera Supported Import Data Formats for more information.

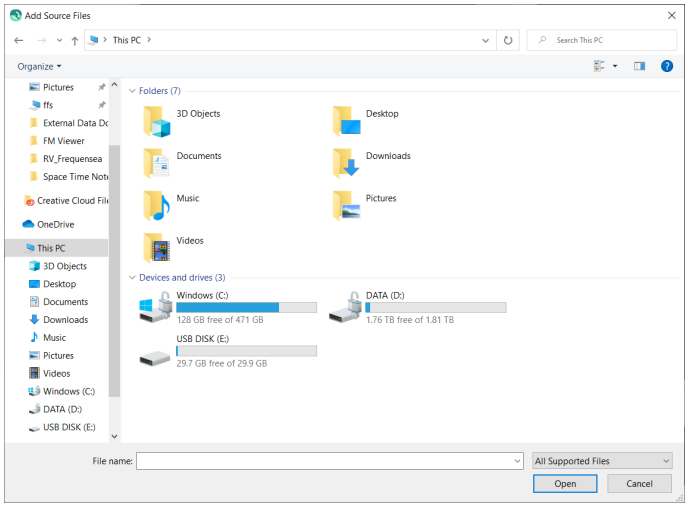


Figure 3. *Add Source Files Dialog.*

- QPDs are the easiest processed point files to add as they are already in the QPS point file format. To add QPDs select the files wanted and select "Open".
- To add .las ASCII files navigate and select on the files wanted, select "Open". This will bring up the Custom ASCII File Configuration Dialog (see Figure 4). Change the settings to correctly read the file.
    - See How-to Custom ASCII File Import for more information.

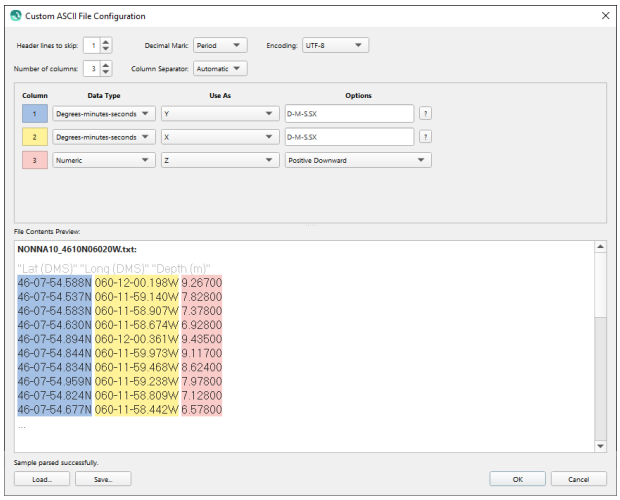


Figure 4. *Custom ASCII File Format.*

Step 3: Coordinate System and Importing Files

Once the processed point files are selected choose the Coordinate System of the file from the drop down menu or use the search button (see Figure 5), then select "Ok" to import the processed point files into your Qimera Project.

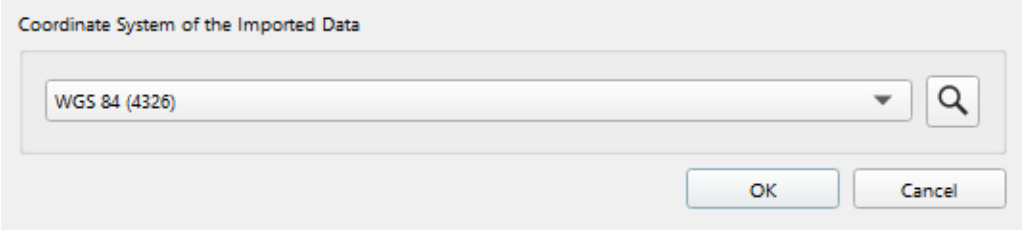
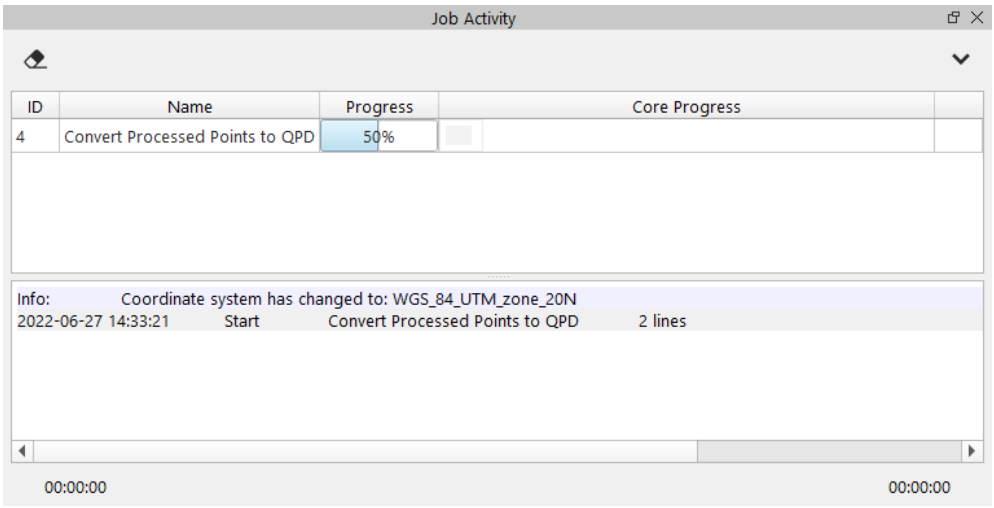
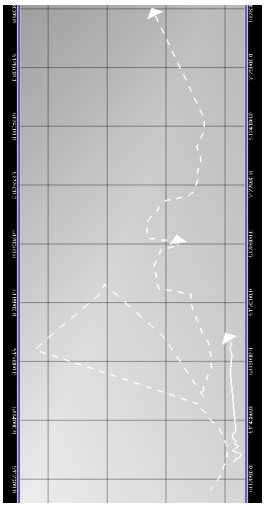


Figure 5. *Choose the Coordinate System of Imported Data and import.*

Once the Processed Points are imported to the Qimera Project, each file is scanned for metadata and converted to QPDs. You can see the progress of the scan in the Job Activity window (see Figure 6a), and after each file is scanned it will be enabled in Project Sources. You can now see the loaded center track line in the 4D scene (see Figure 6b), and can use the points to create either a dynamic or static surface. If you created a dynamic surface it is ready for either cleaning or filtering.





Figures 6a and b. *The Job Activity progress of scanning the point files, and the loaded files in the 4D scene.*

Make sure the correct coordinate system of the point files is specified. Qimera will make an educated guess on the data coordinate system, but the data can be imported with a different coordinate system than the project.

Processed Point File Data Interaction

When point file data has been imported into the project, it is added under "Processed Point Files" in the Project Sources dock (see Figure 7).

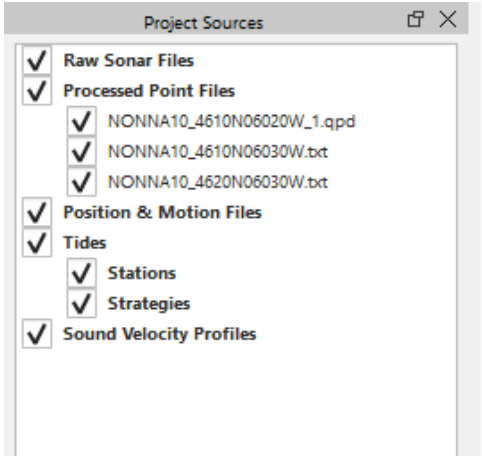


Figure 7. *Location of Processed Point Files ion Qimera.*

To see the properties and metadata for any Process Point File (see Figure 8), click on the file in the Project Sources tree and then click on the Properties window.

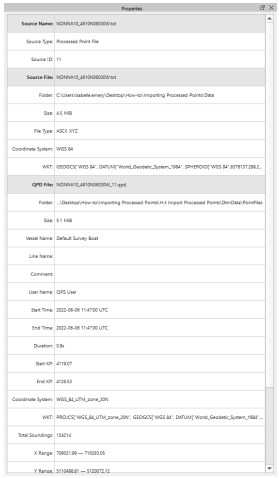


Figure 8. *Properties of Processed Point Files.*

Selecting any file in the Project Source tree will highlight the file's center track line in the 4D scene and vice versa (see Figure 9). Multiple lines can be selected from either the Project Sources tree or the Work area using the Ctrl key or the Shift key.

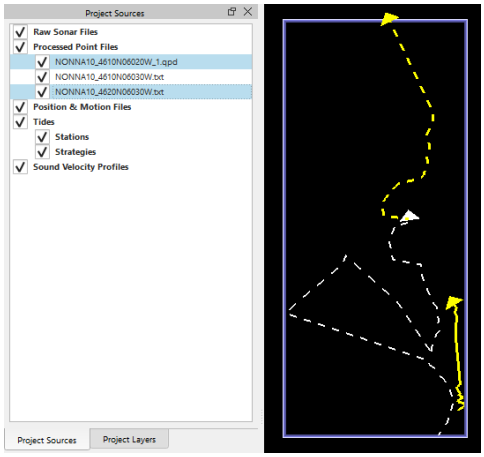
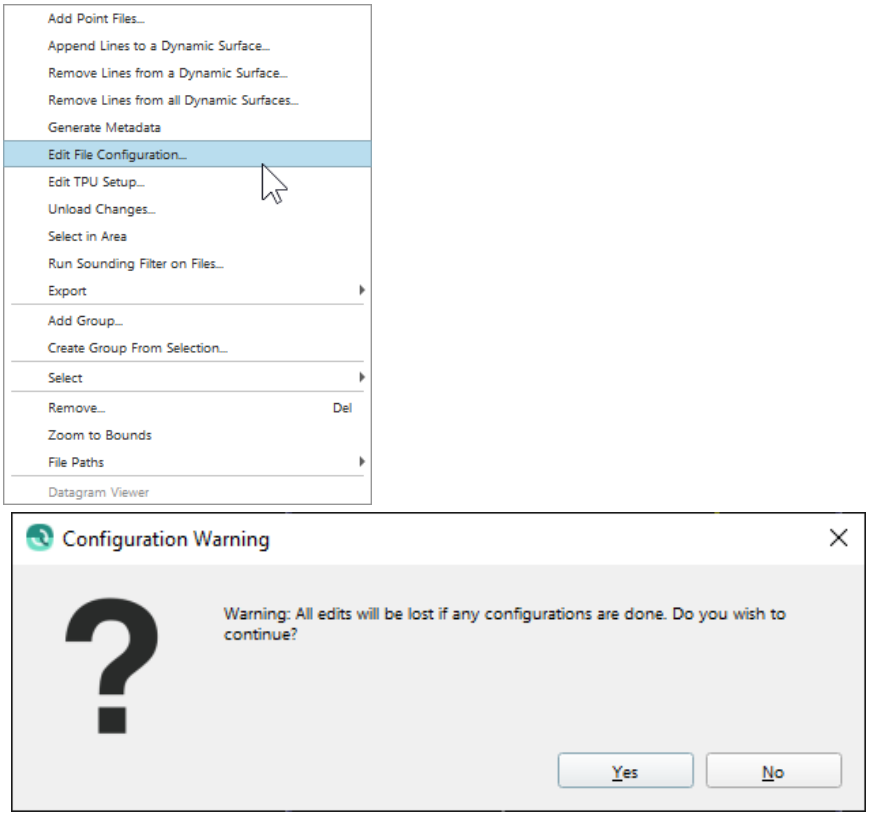


Figure 9. *Selected center lines.*

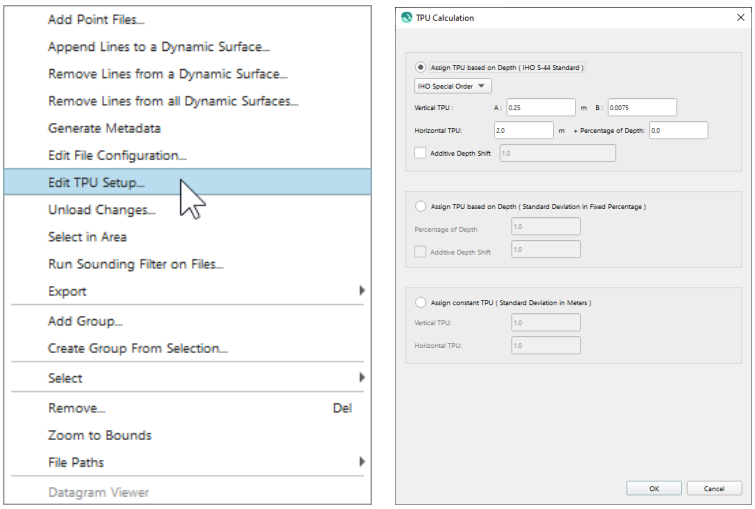
Right clicking on a Processed Point File in the Project Sources dock and selecting "Edit File Configuration..." (see Figure 10a) will open the Custom ASCII Configuration dialog box (see Figure 4). Changing anything within the Custom ASCII Configuration dialog box to a processed point file, that has an associated QPD file, will cause the QPD file to automatically be regenerated. Before the QPD is regenerated, a configuration warning will pop-up (see Figure 10b) because any edits made to the QPD file before changing the configuration will be lost.



Figures 10a and b. *Edit File Configuration for Processed Point Files, and configuration warning.*

Right clicking on a Processed Point File in the Project Sources dock and selecting "Edit TPU Setup..." (see Figure 11a) will open the TPU Calculation dialog box (see Figure 11b). This is used to calculate the Horizontal and Vertical TPU values for each sounding in the file. This setup is only necessary when building a Dynamic Surface with CUBE, and can be changed at a later time.

- See Qimera Processed Point File TPU Calculation Dialogfor more information on the source of TPU.



Figures 11a and b. *Opening and the TPU Calculation dialog box.*

In the case where an ROV collected the data, the depth value does not reflect the actual depth relative to the ROV at collection time.
For cases such as this an additive depth shift can be added. This option is under Assign TPU based on Depth (IHO S-44 Standard).

Processed Point File Operations

Qimera supports the following operations for Processed Point files:

- Build Static Surface
- Build Dynamic Surface
- Export Processed Points
- Unload Edits to original processed point file

With the exception of Unloading, all these operation can be done with Raw Data as well. When Raw Data is imported into Qimera, it creates QPD files (points files). So documenting how these operations work is not needed here.

Either the processed point file or the created QPD files will be used when creating surfaces or exporting point files in Qimera. The processed point file will be used when creating a

static surface from files or exporting the processed point files loaded in without making a dynamic surface first. The created QPDs will be created and used when creating a Dynamic surface, and then also used when creating a static surface or exporting processed point files after the dynamic surface has been created. The QPD file created for each processed point file will be stored under /DtmData/PointFiles/.

All edits made to the dynamic surface will be saved to the QPD files, these edits can be applied to the original processed point files by using the unload tool in Qimera. This tool is found under Dynamic Surface Tools in the toolbar or by right clicking on the file and selecting "Unload Changes..." (see Figure 12).

- See Qimera Supported Import Data Formats for the types of files that can be unloaded to.

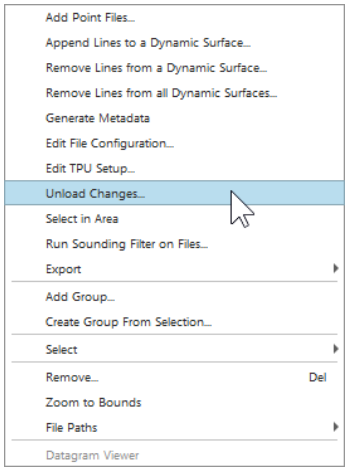


Figure 12. *Unload Changes tool from right clicking on point files.*

Additional Information

- Qimera Supported Import Data Formats
- How-to Custom ASCII File Import
- Qimera Processed Point File TPU Calculation Dialog
- Qimera Unload Processed Point File Dialog

How-to Install Qimera

This page will show you the steps for installing Qimera on Windows, Mac, and Linux.

On this page:

- Installing Qimera on Windows
  - System Requirements
  - Installation Steps
  - Subsequent Qimera Installs
- Installing Qimera on Mac OS X
  - System Requirements
  - Installation Steps
  - HASP Dongle Drivers Install
- Installing Qimera on Linux
  - System Requirements
  - Graphical Install
  - Command Line Install
  - HASP Dongle Drivers Install

Installing Qimera on Windows

System Requirements

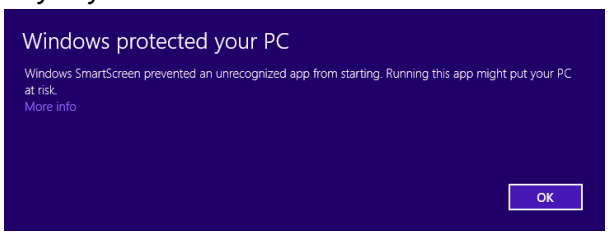
Installation Steps

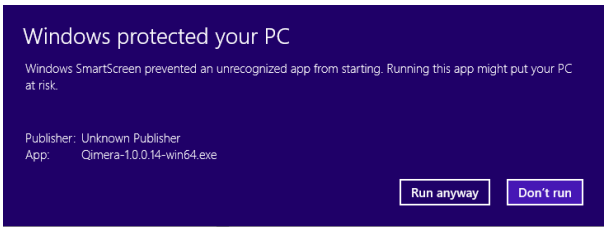
On the Windows platforms the software is installed in a similar fashion to most programs - by running the Setup program.

1. If you downloaded the software you will have an executable file named something similar to Qimera-1.0.0.14-win64.exe.

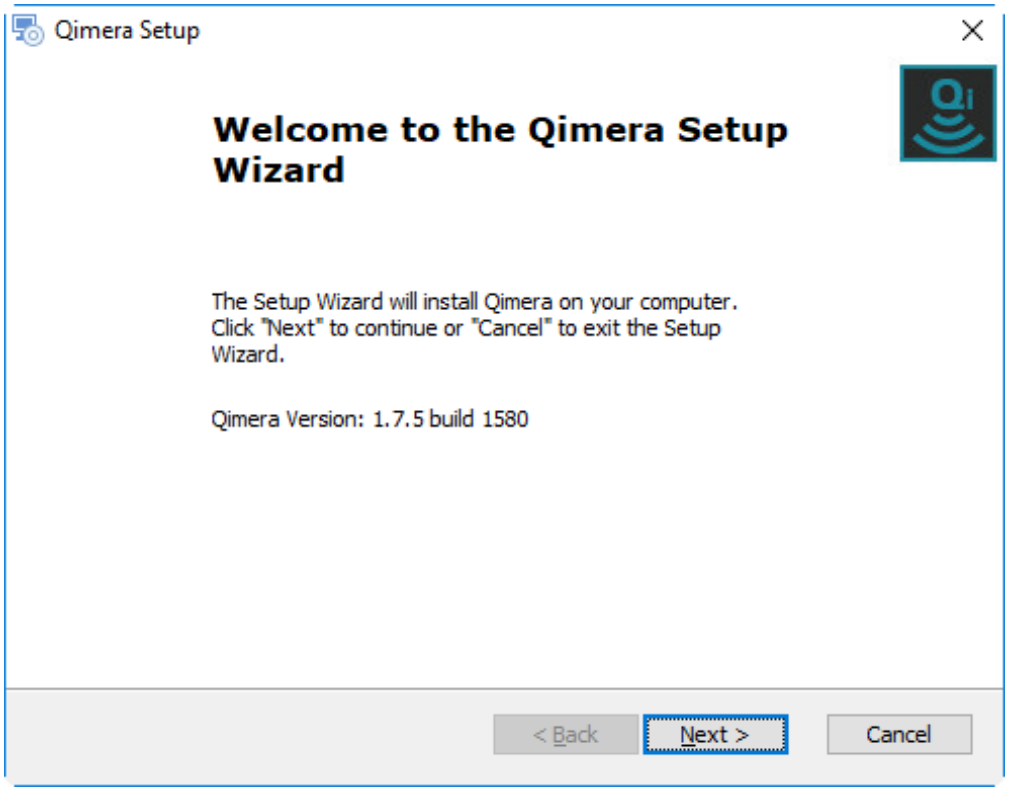
2. Double clicking the executable will extract the software and automatically run the setup program.

3. If you receive a *Windows protected your PC* warning (as below) click *More Info* and then *Run Anyway*.

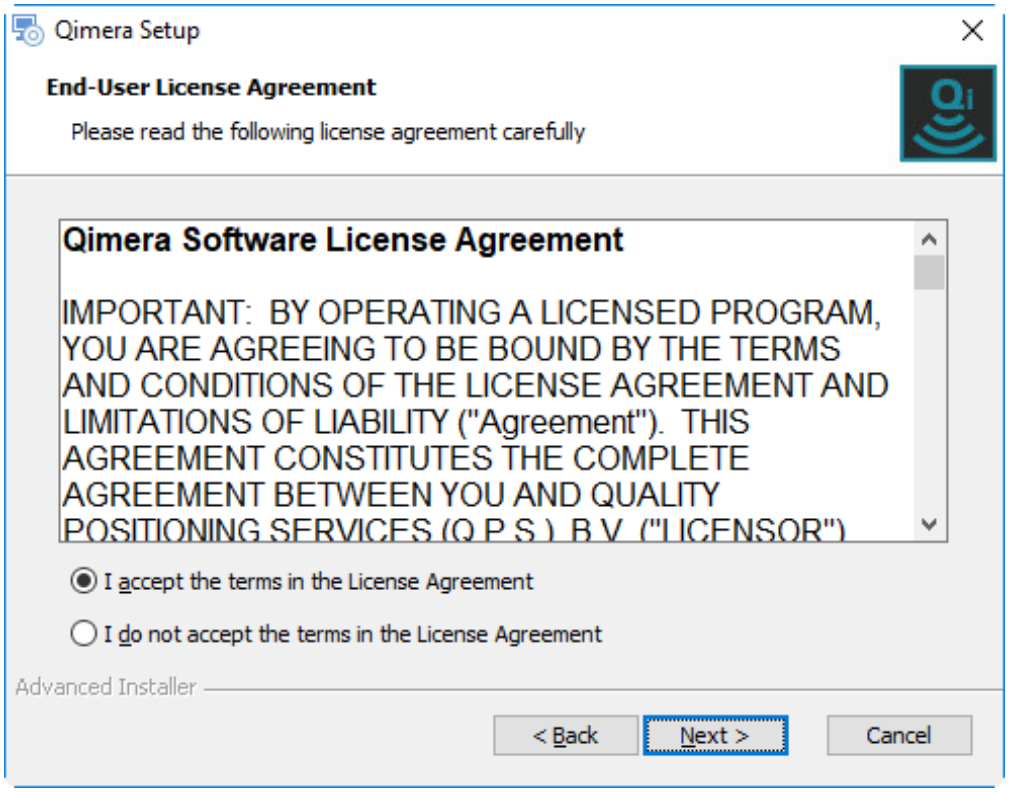




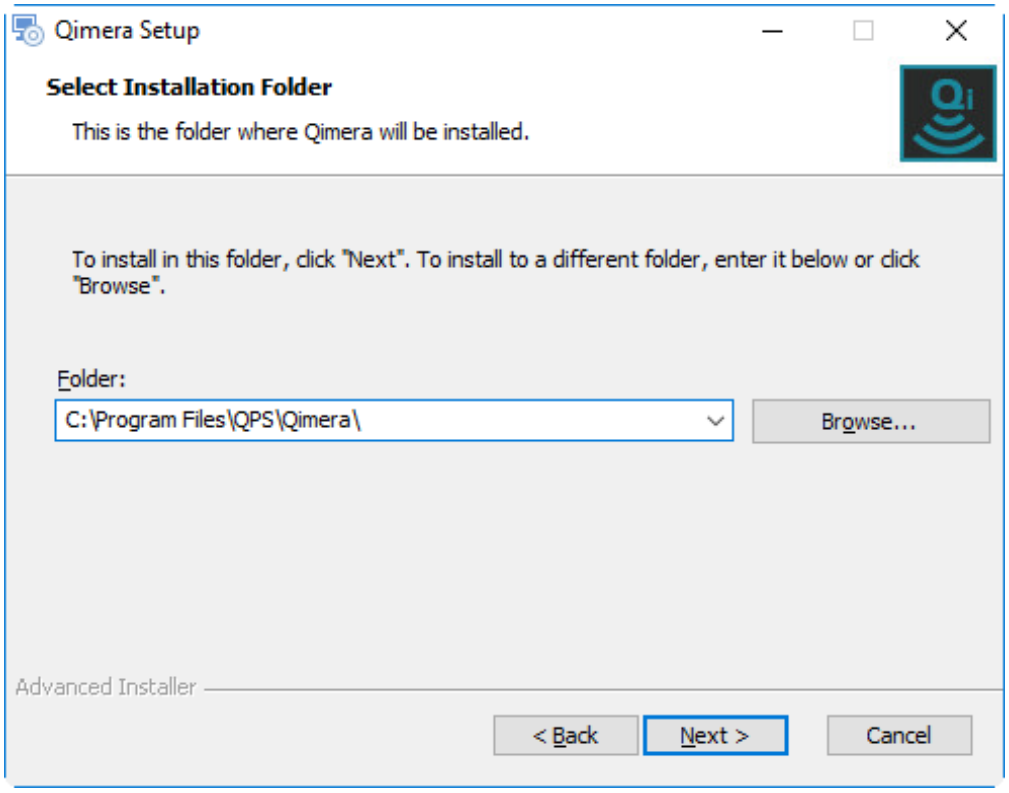
4. Upon running the setup program you will see the welcome screen for Qimera install.



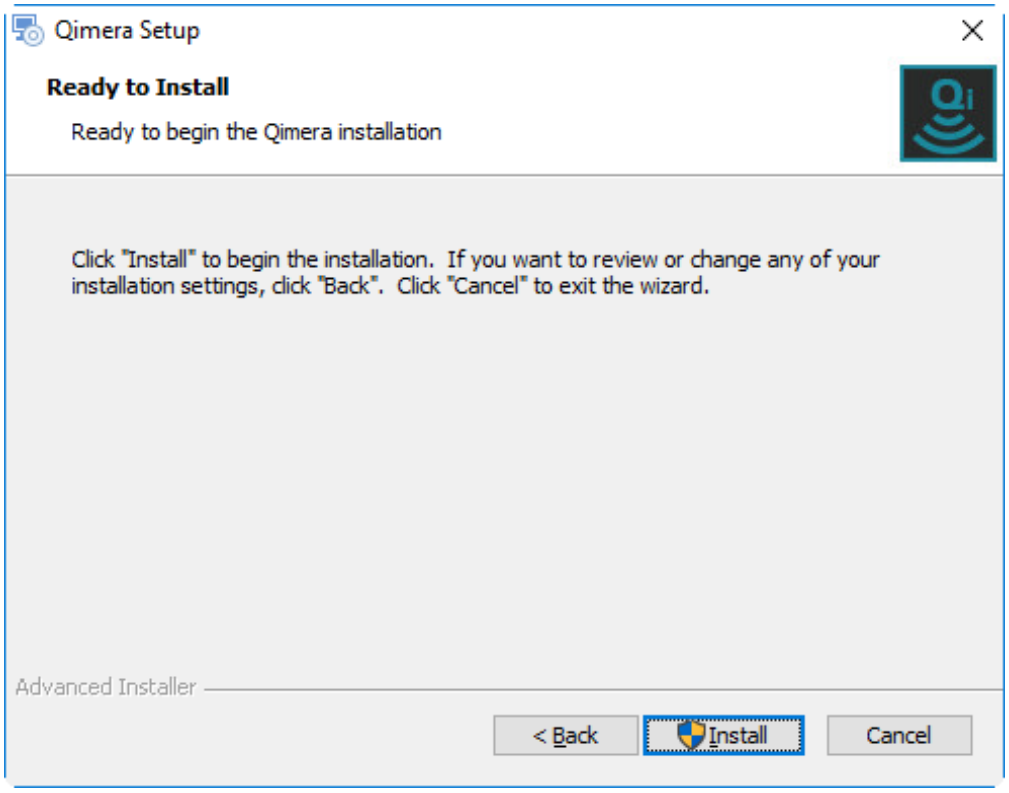
5. Click the Next button when you are ready to start. This will bring up the standard License Agreement that you must accept in order to continue the software installation.
   Check the "I accept the terms" and then the *Next* button to continue with the installation.



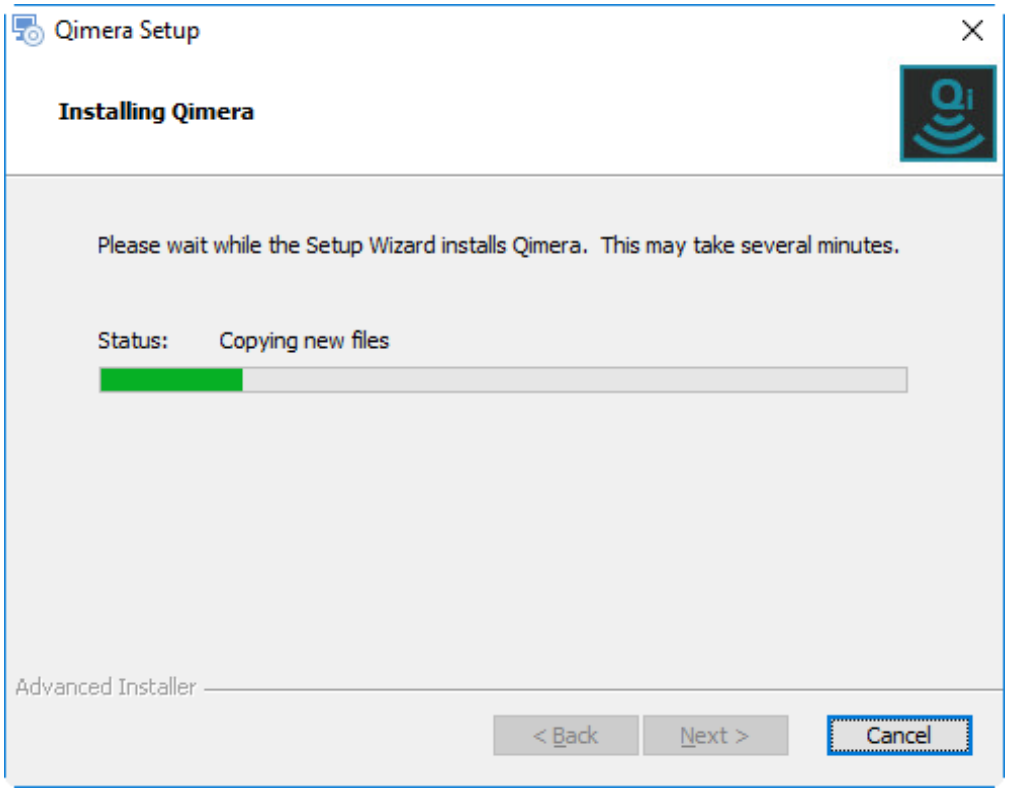
6. The next screen indicates where the software will be installed. The default location will be the "C:\Program Files\QPS\Qimera" directory but you can change it to any location you prefer.



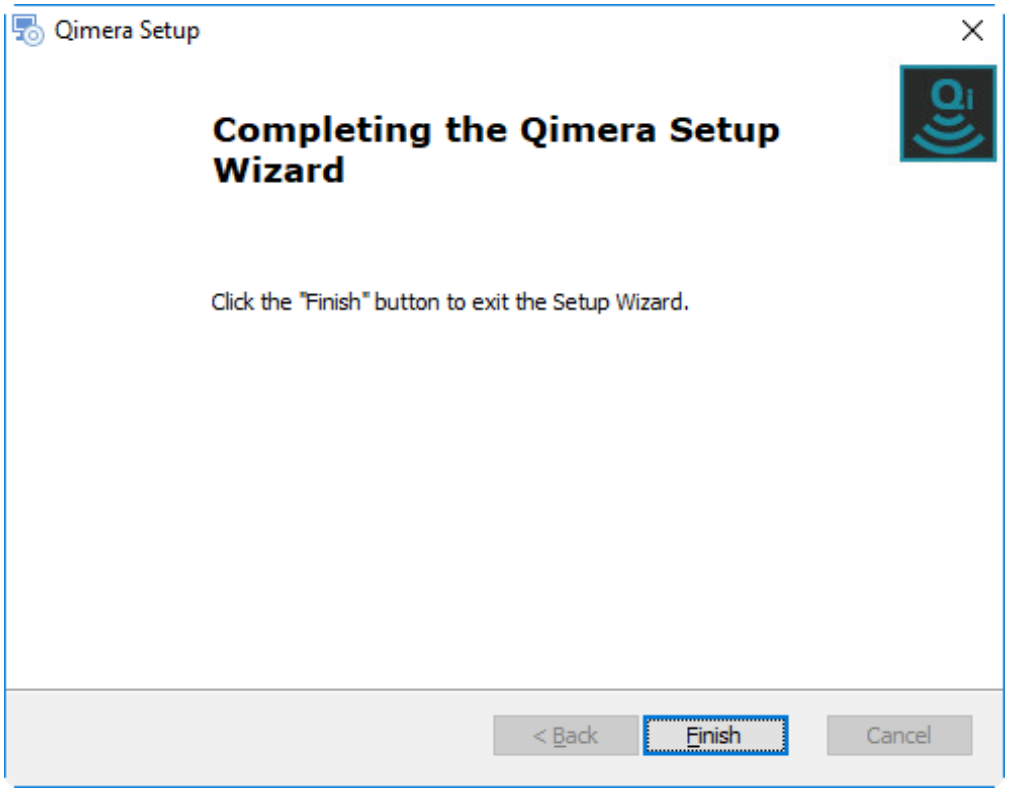
7. The Qimera Setup Wizard is now ready to install the Qimera files to your computer. It offers you the opportunity to Review your settings or Cancel or Install.



8. Once all the questions are answered simply click the Install button and the software will be installed in the specified location.



9. Once the Qimera files have been copied to your computer successfully the Setup Wizard will indicate that it has completed.

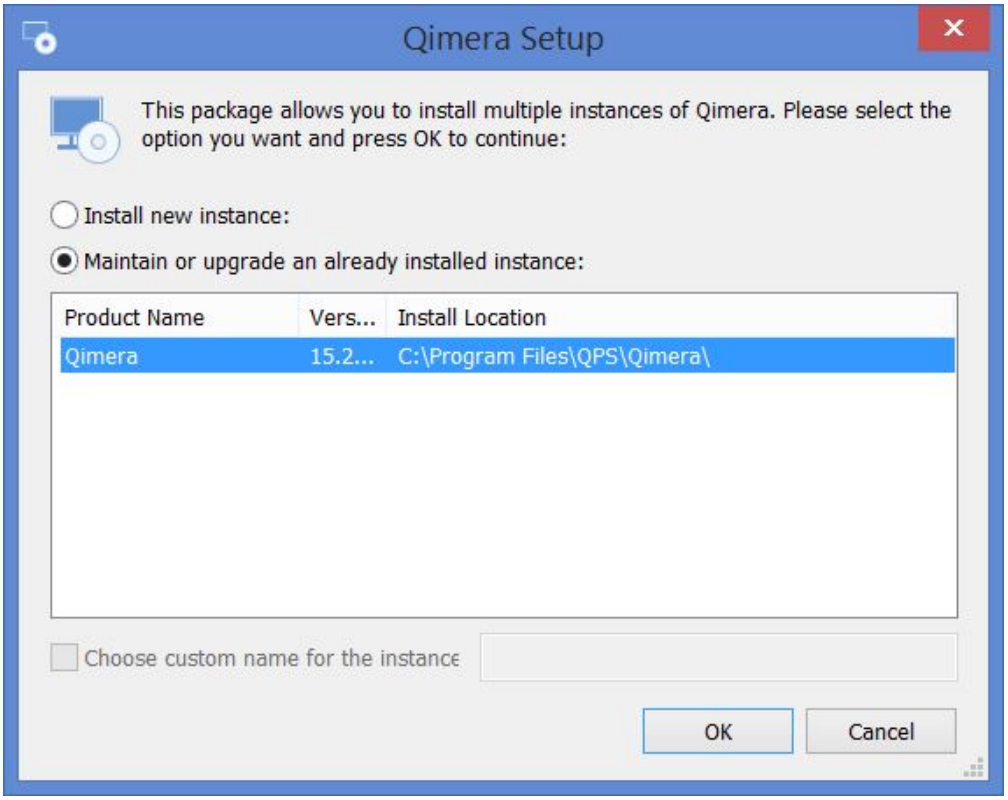


10. With Qimera there is no need to restart your computer after the installation. Simply click "Finish" to exit the installation.

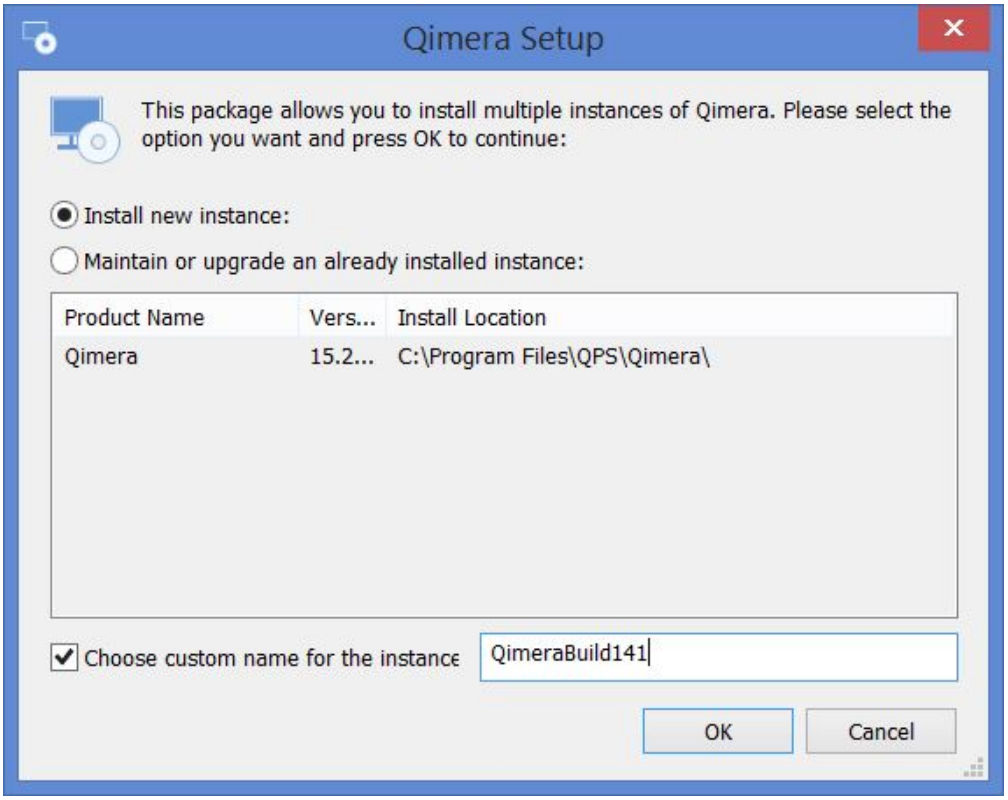
11. Before Qimera can be run, a valid license must be installed. Please see License Installation for more information on installing licenses.

Subsequent Qimera Installs

1. If a previously installed instance of Qimera is found, the Setup Wizard will request you to select either a New Install or a Maintenance or Upgrade Install.



2. If you are in the middle of a Project with Qimera it would be best to complete the Project with the same version of Qimera. In this case choose - ***Install New Instance***.
3. If you would like to start using the new version straight away but wish to preserve current preferences you should choose - ***Maintain or upgrade an already installed instance***.
4. Choosing a New Install will enable you to give the instance a custom name to differentiate it from other installs.



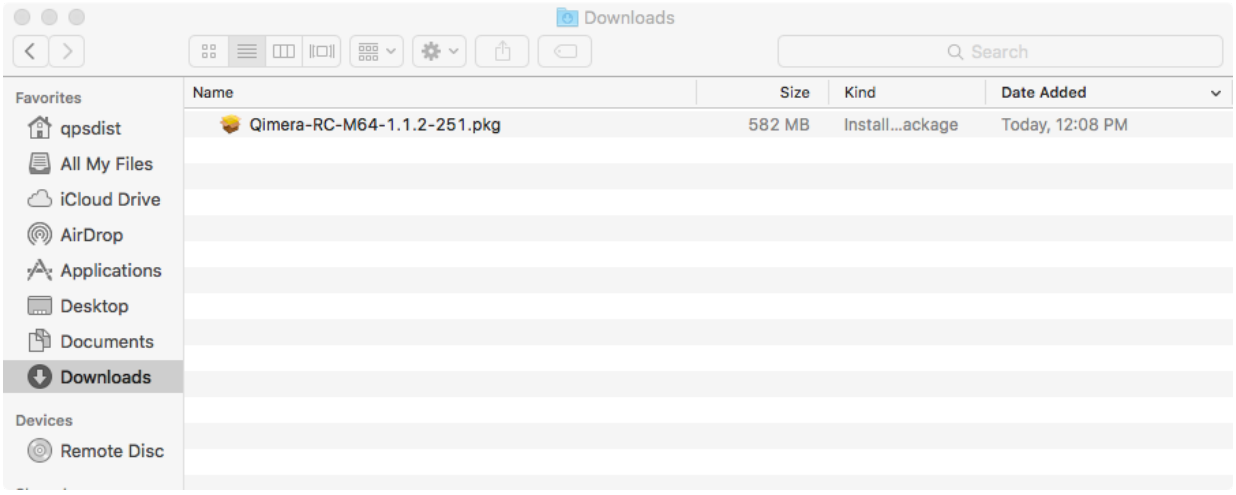
Installing Qimera on Mac OS X

System Requirements

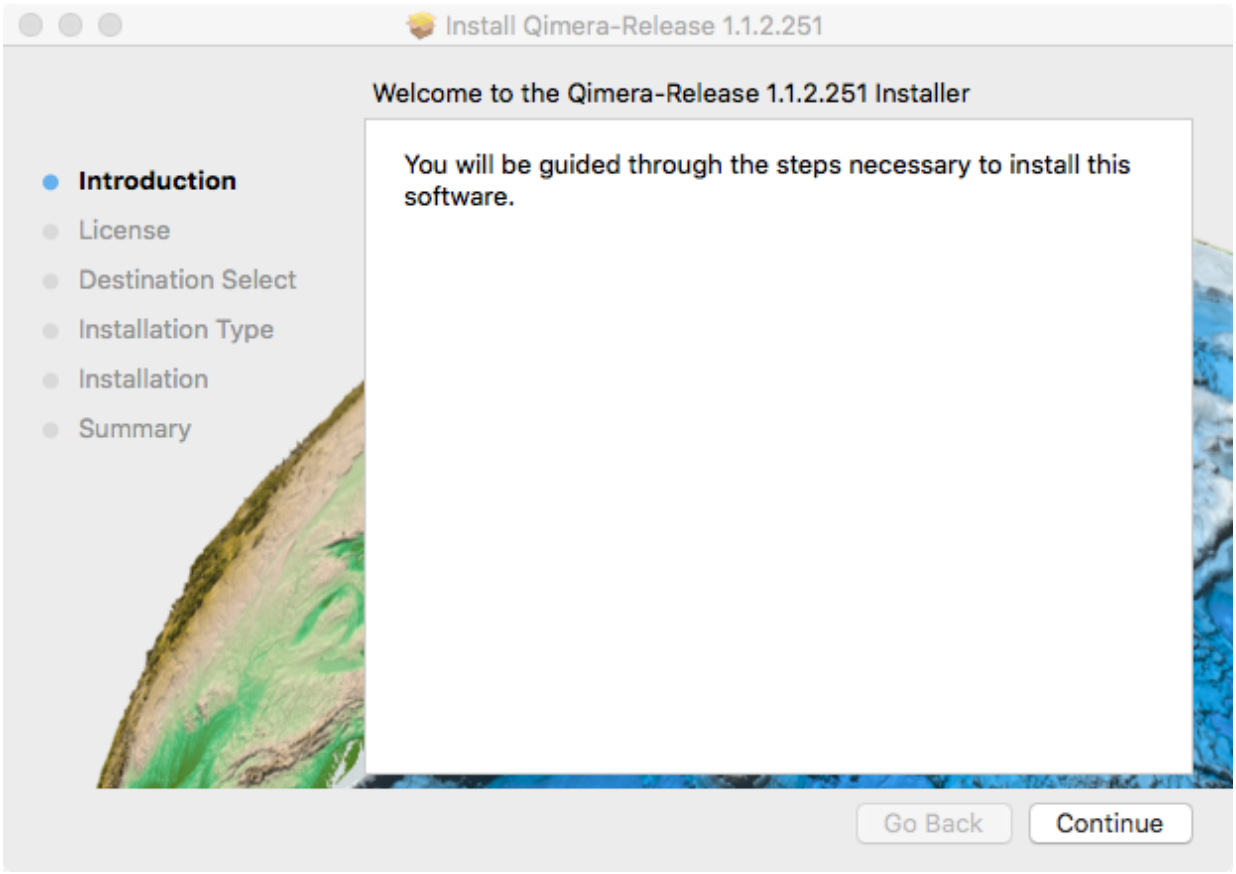
- Qimera Platform Requirements
- Qimera System Requirements

Installation Steps

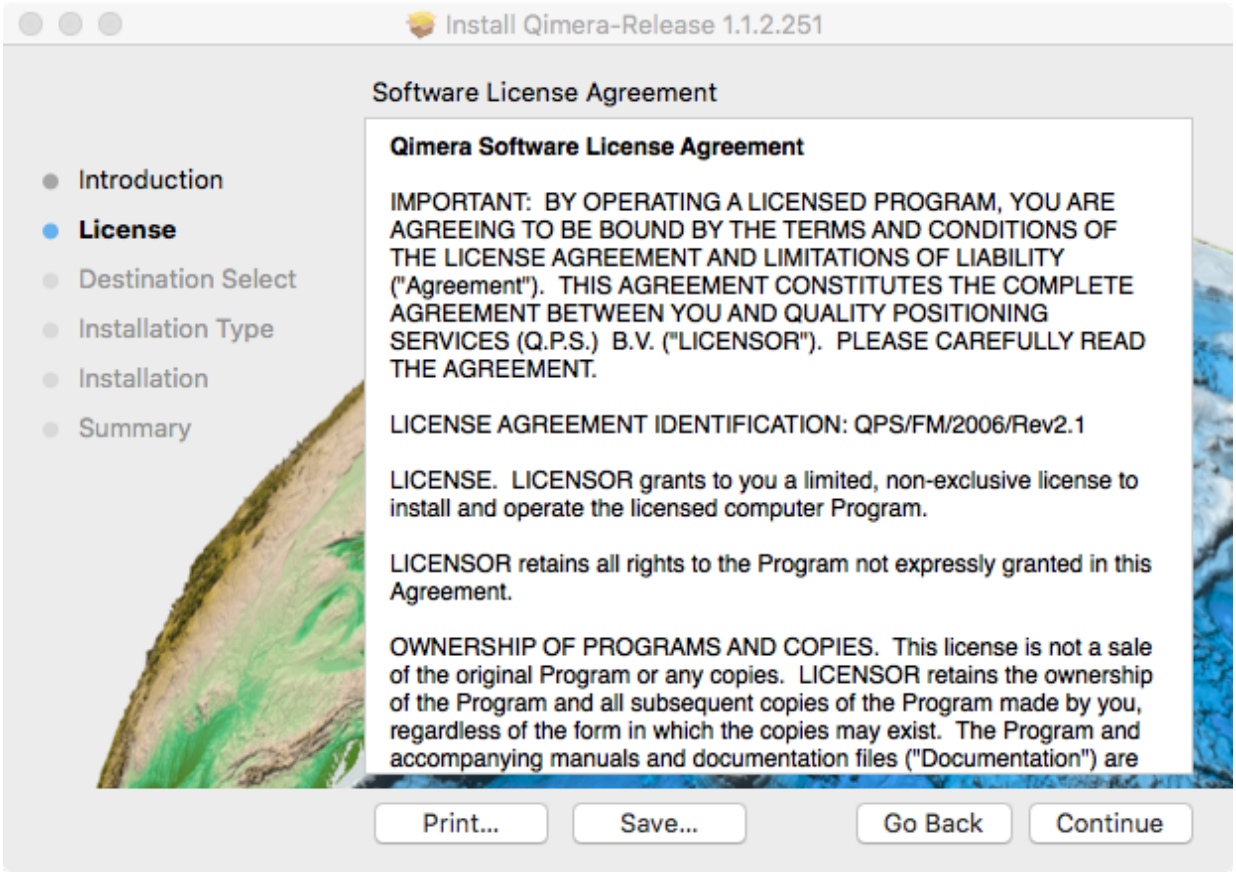
1. The Macintosh installer is distributed as a PKG package and will usually be named Qimera-X.Y.Z.BBB-mac64.pkg. Double-click on the PKG file to launch the installer.



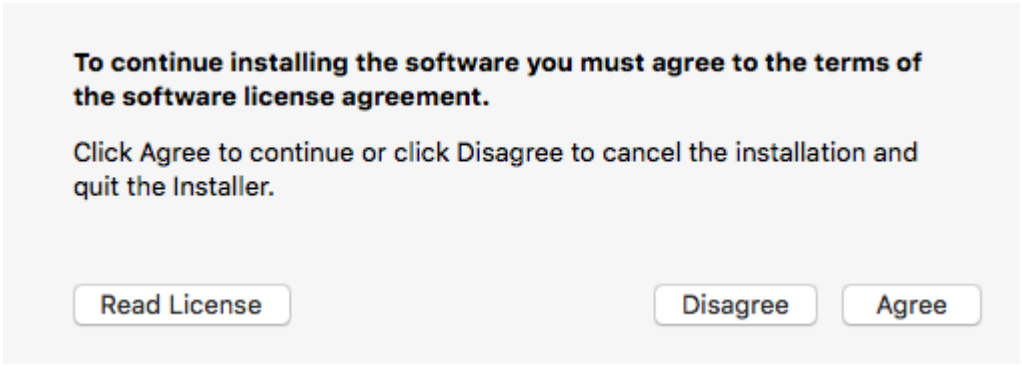
2. The installation welcome screen will appear. Click Continue.



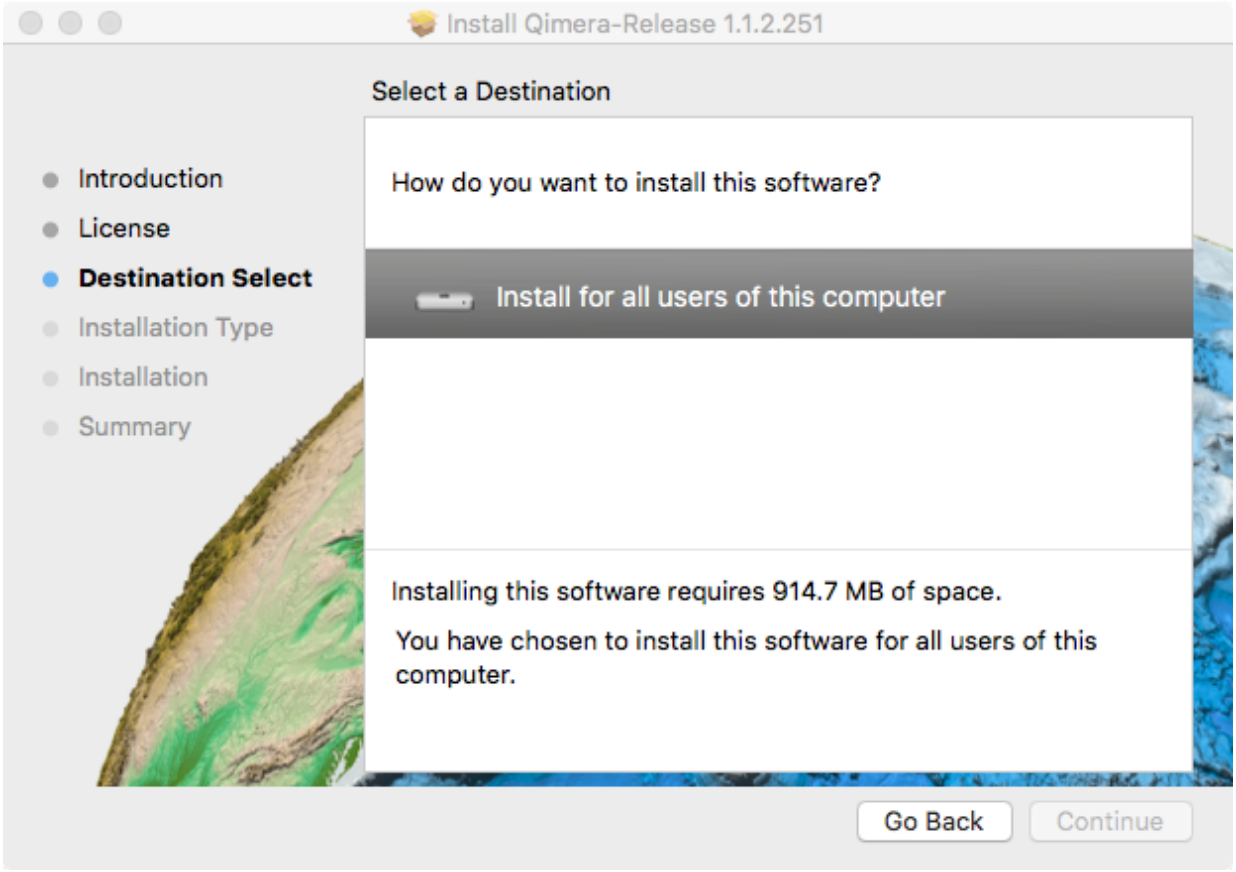
3. You will be presented with the Software License Agreement. After reading the agreement, click Continue.



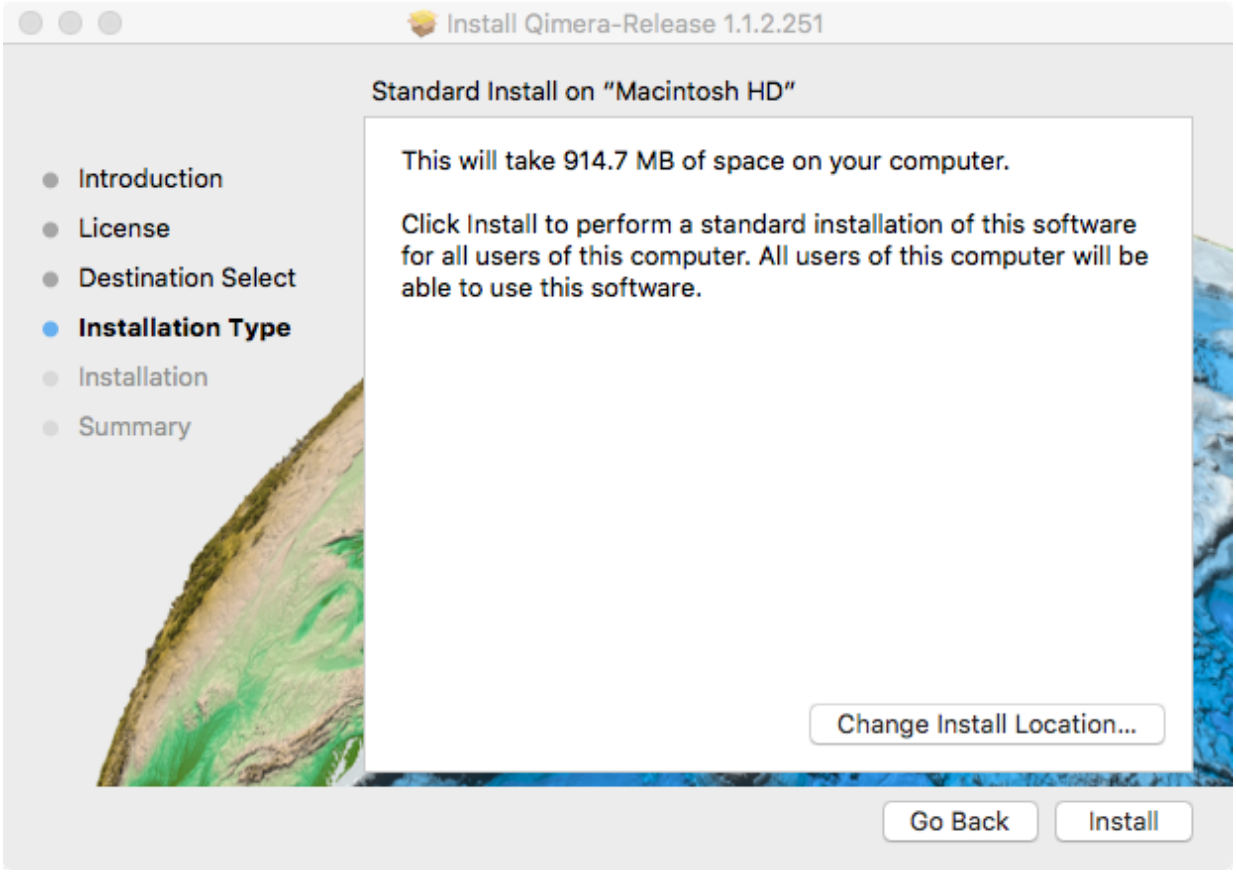
4. If you agree to the terms of the license agreement, click Agree



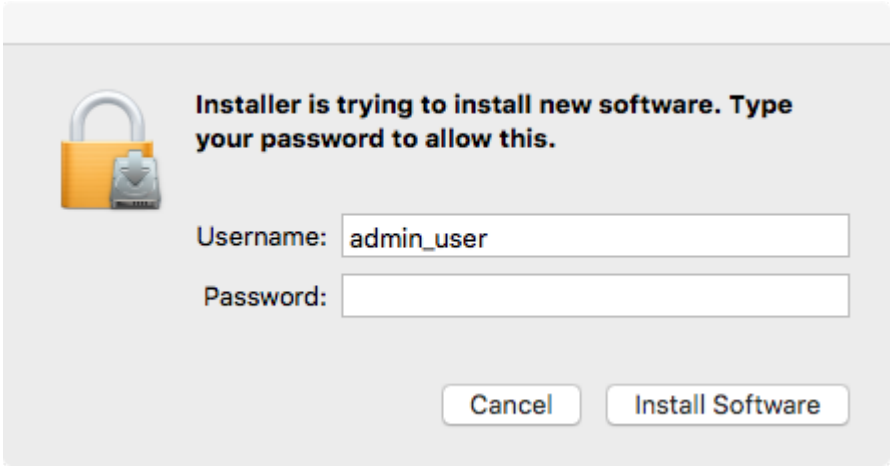
5. Select a volume where you wish to install the software. Click Continue.



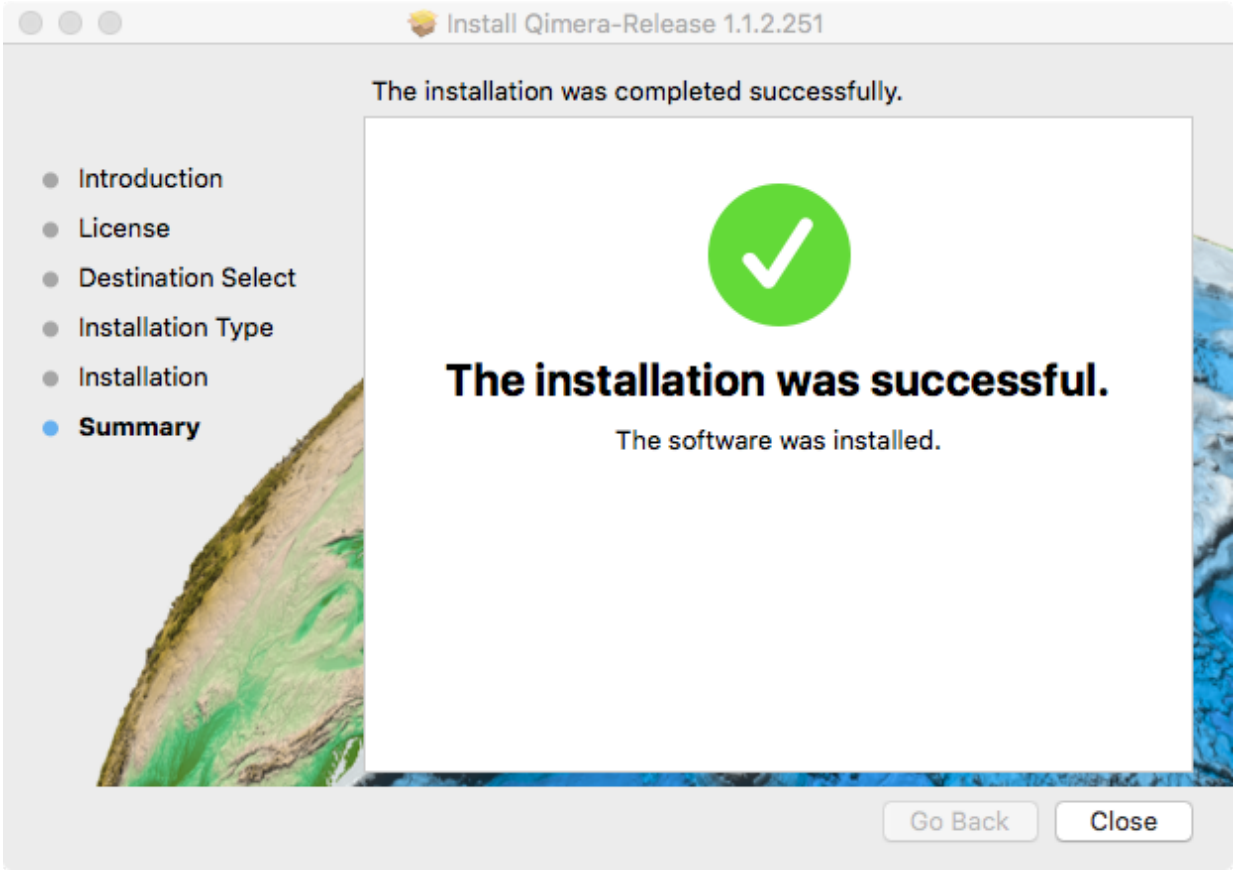
6. The software is now ready for installation. Click Install.



7. If you are prompted for authentication please provide a user account with sufficient privileges to install the software and click OK.



8. Installation is now complete. Click Close.



9. **HASP Dongle Drivers Install**

   If the purple Sentinel HASP dongle is to be used for licensing, a driver must be separately installed before the license can be activated.
   Note that while Fledermaus requires a license file to be used in conjunction with the HASP dongle, Qimera does not.
   The driver can be downloaded from the Gemalto portal for Sentinal customers.
   Choose the following options to search for and download the driver for your machine.
   You only require one of the driver packages.

Category	Option
User Category	End User
Product	HASP HL
Operating System	Mac

Category	Option
Type	Run Time and Device Driver
Language	All

Click here for download page:

Sentinel HASP Run Time Driver Download from Gemalto

Once downloaded, open the dmg of your choice and click the installer.

Installing Qimera on Linux

The Linux version of Qimera includes both a graphical installation program and a command line installer. General users are encouraged to use the graphical program. The command line installer is also easy to use and can help facilitate installing Qimera rapidly without manual intervention, if required.
This makes it easier for some clients to repackage Qimera along with other tools as part of a group package.

It may be necessary to move some library files to get Qimera to start correctly (it may crash on startup). This should not be necessary for versions 2.1.1 and newer.

If you run Qimera from the command line and see errors stating something like this:

```
libGL error: failed to load driver: ...
```

Then it's possible that the culprit is some of the library files that are installed with Qimera. The fact that the errors seem to be pointing to graphics drivers is misleading.

Go into the Qimera install directory, find the lib folder and move 'libstdc++.so*' into a different folder (make a new sub-folder for example). This will hide those library files from Qimera and the correct system library files will instead be used.

System Requirements

- Qimera Platform Requirements

- Qimera System Requirements

Graphical Install

To run the graphical installer, run the **setup** program from the software distribution. This will take you through a step-by-step installation of Qimera that is similar to a Windows-based installation. To start the installation, type:

```
./setup
```

You will be presented with an installation window. (The "0.0.0" will be replaced with an actual version number, of course.) Follow the wizard to install Qimera on your system.

Command Line Install

For the alternative command-line tool, run **quick-install**. To run quick install without manual intervention, specify the install path and your acceptance of the license agreement on the command line:

```
./quick-install /opt/QPS/Qimera yes
```

You will see Fledermaus being installed on your system. After the install has completed you will be run Fledermaus.



Before Qimera can be run, a valid license must be installed.

See How-to License Installation (Qimera 1.5.7 or older) for MAC Address (node lock) and network licenses. See below for a link to the driver for a QPS HASP.

HASP Dongle Drivers Install

If the purple Sentinel HASP dongle is to be used for licensing, a driver must be separately installed before the license can be activated.
Note that while Fledermaus requires a license file to be used in conjunction with the HASP dongle, Qimera does not.
The driver can be downloaded from the Gemalto portal for Sentinal customers.
Choose the following options to search for and download the appropriate driver for your machine:

Category	Option
User Category	End User
Product	HASP HL
Operating System	Linux
Type	Run Time and Device Driver
Language	All

Click here for download page:

Sentinel HASP Run Time Driver Download from Gemalto

Once downloaded, unzip the package of your choice and follow the instructions packaged with the driver (usually found in readme.html).

How-to License Installation (Qimera 1.5.7 or older)

This How-to explains the type of licensing available for Qimera, how to install the license file, find the license file if installed and how to find your hardware ID.

On this page:

- Setting up Qimera Licenses
  - Qimera License Types
- Automatic License Installation
  - License Status
  - Install a License File
  - System Details
  - Support Details
- Activating or Upgrading a HASP License (Windows Only)
- Manual License Installation
- Node-Locked License Details
- Obtaining Hardware IDs
  - Manually Obtaining the Ethernet ID on Windows

Setting up Qimera Licenses

In order to run Qimera software a valid license must be available for the software. Your license file will be named something like this: "20141125-2154_28b2bd9078ab.*lic*".

A Qimera license can contain one or more 'features'. There is the foundation Qimera product called Qimera Core. Built on this 'foundation' are three other products - Qimera QINSy DB, Qimera Raw Formats and lastly Qimera SISQA.

For more information on Qimera product - Qimera Product document briefly outlines the different Qimera product and the available functionality in each.



Qimera SISQA is only available on Windows and only in combination with Qimera Raw Formats.

Qimera License Types

A Qimera license can be licensed by node locked license or added to a Fledermaus dongle or a QPS HASP dongle.

Node-Locked License – A node locked license is for a particular machine and that machine only. To generate a node-locked license, a unique id number that identifies a computer must be sent to QPS before the license can be generated. See Node Locked License Details for more information on setting up a node-locked license.

Fledermaus dongle is Blue

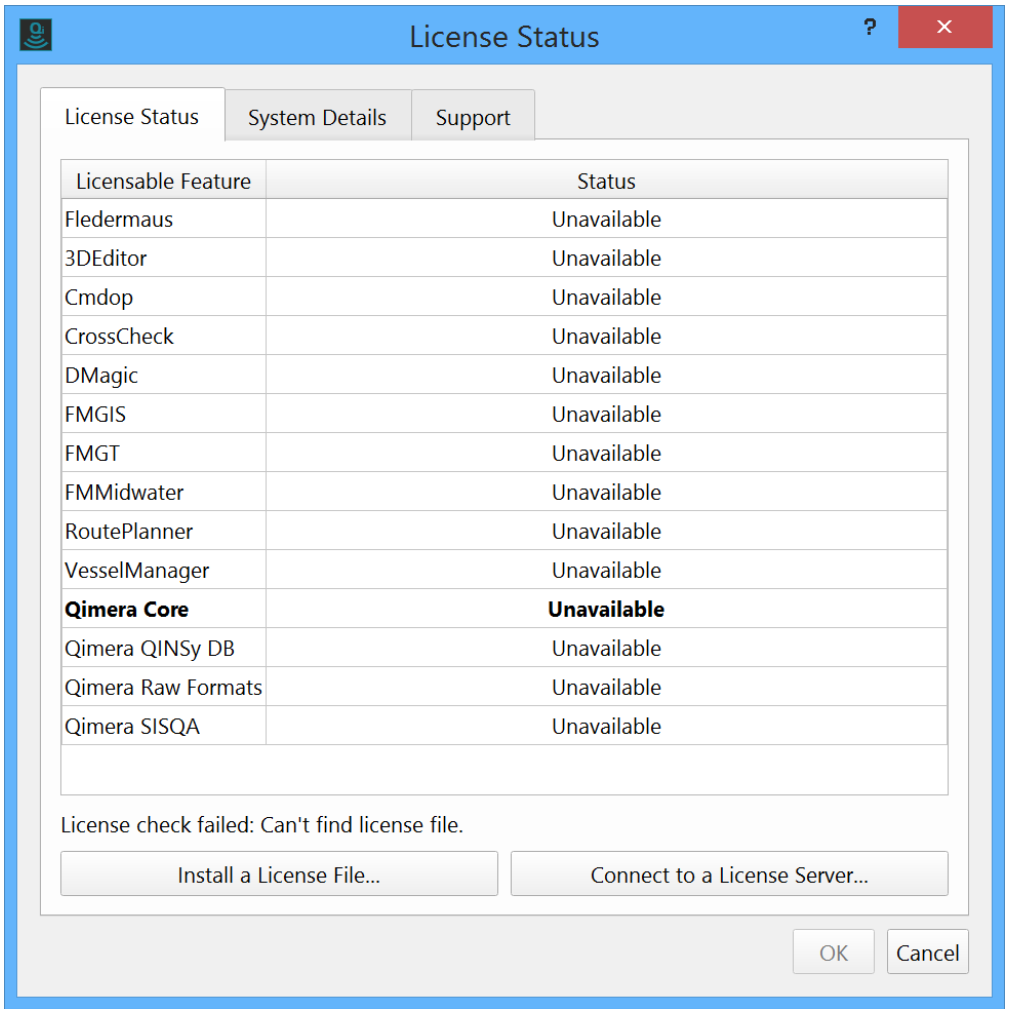
QPS HASP dongle is Purple

Automatic License Installation

The first time that you run Qimera you will see a *License Status* window.

License Status

The License Status screen allows you to quickly see what licenses are available for your system. This window gives you an overview of your system and allows you to easily install a license file. Along the top you have *License Status, System Details,* and *Support.*

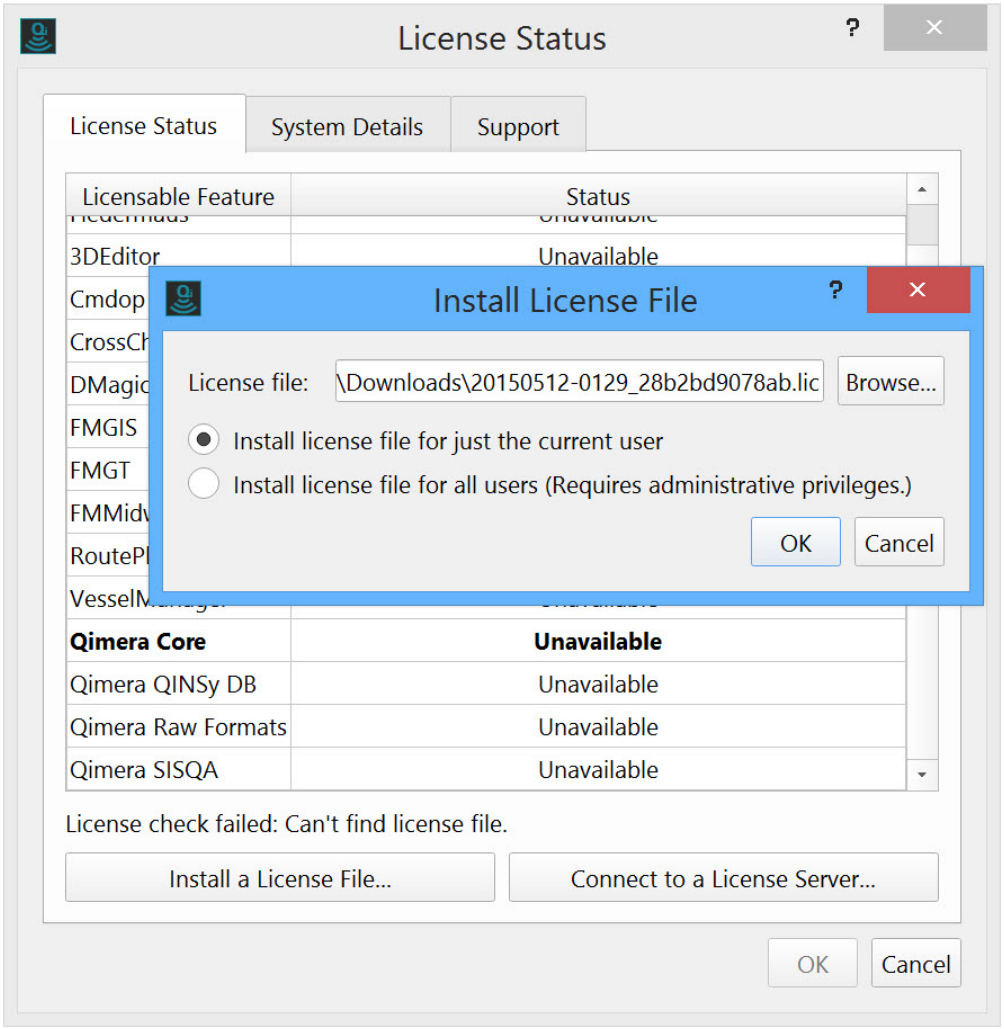


Note : *If you had an earlier beta version of Qimera on your computer during a workshop, you need to use the Windows Uninstall to remove that version and delete any previous Qimera projects.*

Install a License File

1. Within the License Status tab at the bottom you will see the *Install a License File...* button. Clicking on this will present you with the following window.

2. Click on Browse, and find the location where you have saved your license file. Once you have selected the license file click OK.



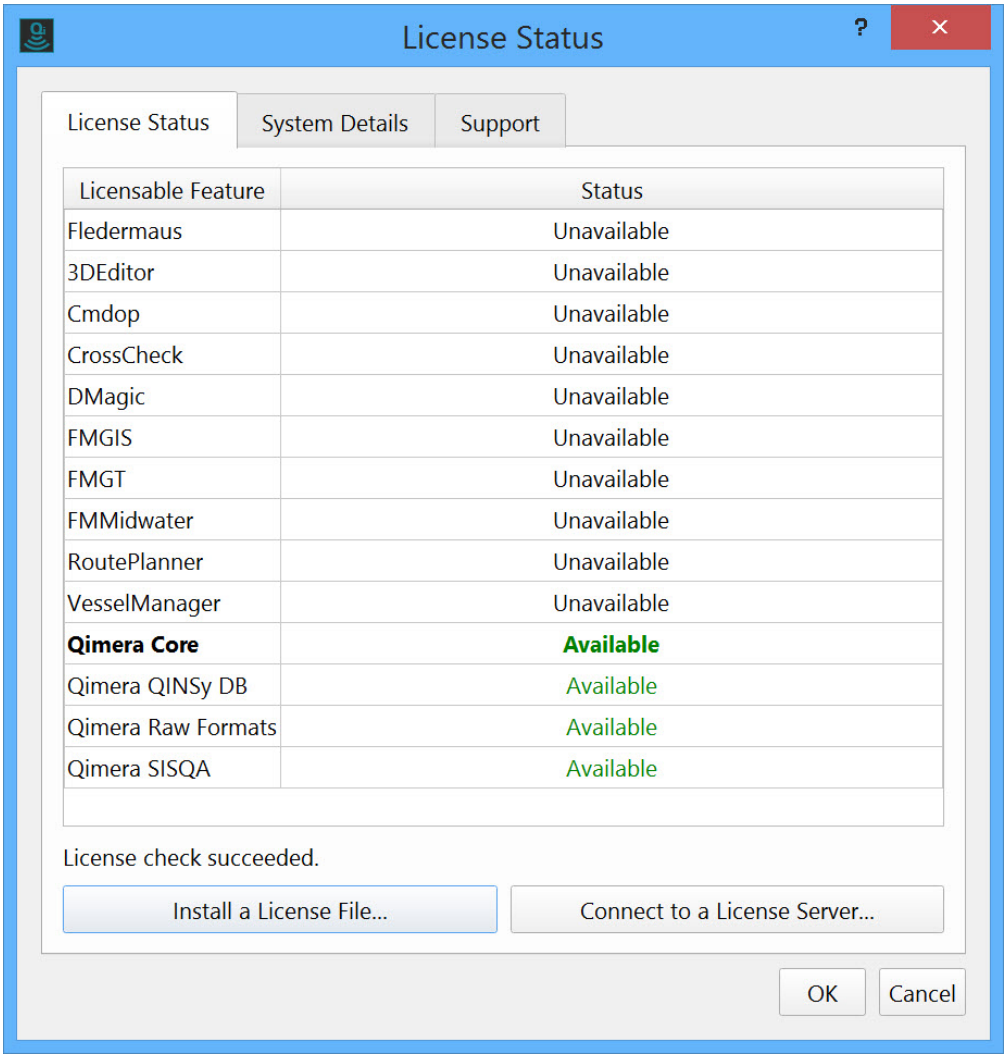
3. Choose whether to install the license for just the current users or all users. Installing for all users is only necessary if you share a computer with other users and wish to use a common license file. Installing for all users requires administrator privileges if Qimera was installed in a non-user-writable path, such as "C:\Program Files".

	Shared Among Users	**Shared Among Installations**	**Windows License Path**	**Mac OS X License Path**
Current User	No	Yes	C:\Users**YourUserName**\AppData\Local\QPS\Fledermaus\licenses	/Users/**YourUserName**/Library/Preferences/QPS/licenses
All Users	Yes	No	**C:\Program Files\QPS**\Qimera\licenses †	/Library/Application Support/nl.qps/Qimera/licenses

† "C:\Program Files\QPS\Qimera" is Qimera's default install path on Windows. If you installed the application elsewhere, the license file must be placed there instead.

4. Once you have chosen the option that is applicable or best suited to your work environment (ie. which users will be able to use the license file) click OK.

5. You will see the License Status screen again and it will run through the list of *Licensable Features* and the status will show Available in *green*.

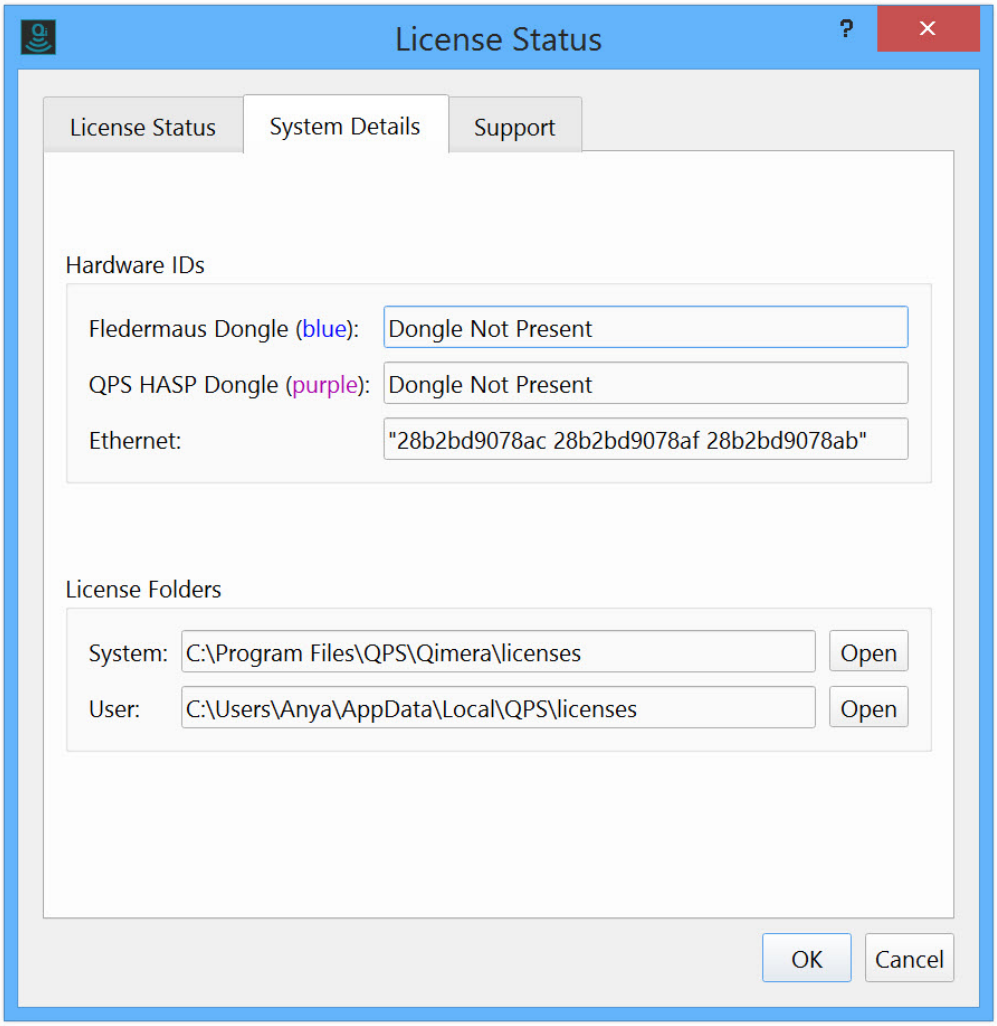


6. You can click OK and Qimera will open. You have now successfully installed your Qimera license and you are ready to start using the software.

System Details

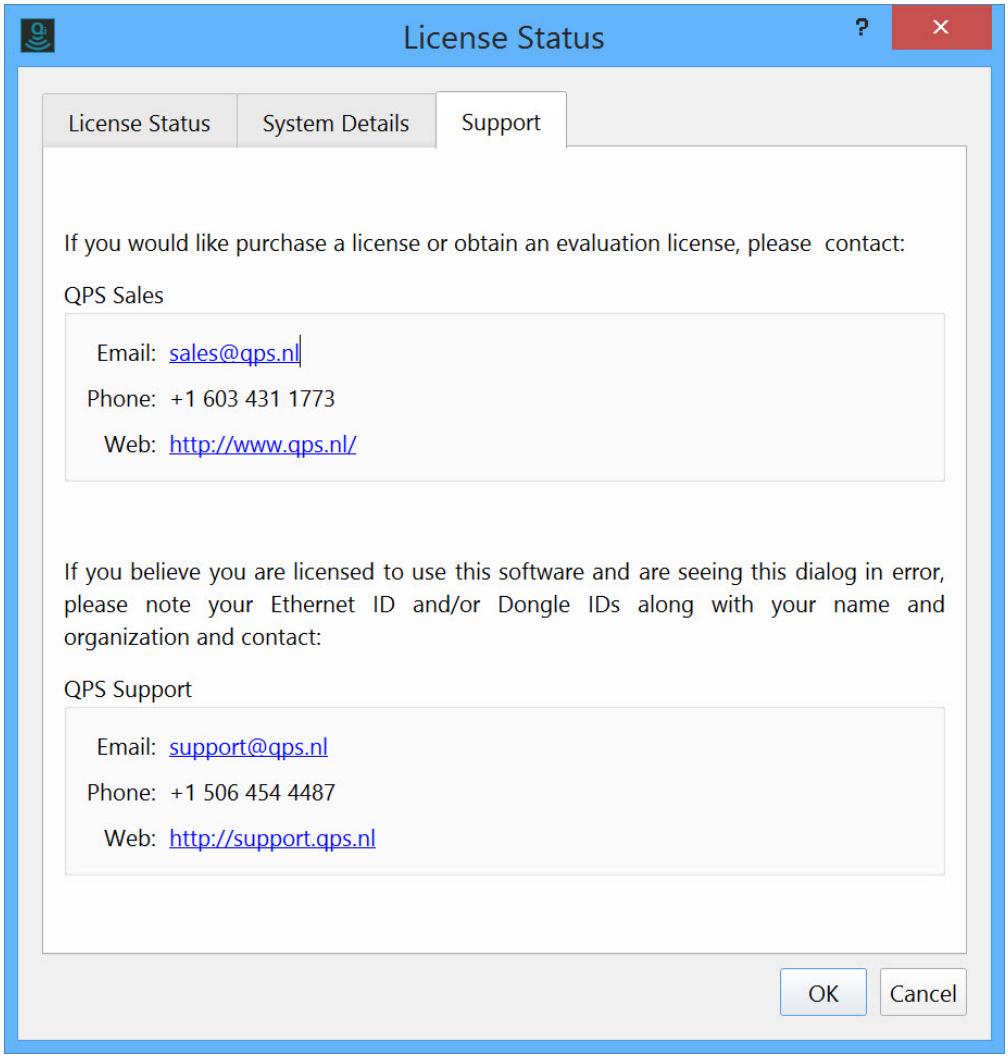
The License Status Wizard also contains two other tabs which contain useful information.

The second tab is System Details which provides Hardware ID's available to be licensed and also lists the License Folders locations, both for the System and the User.



Support Details

The final tab is Support. This provides Contact information for QPS Sales and Technical Support.



Activating or Upgrading a HASP License (Windows Only)

Please see the page here for more information on the HASP Loader and upgrading the HASP License:

QINSy Quick Start - HASP Loader

The HASP Loader program is installed with both QINSy and Qimera. To start it, go to the Windows Start screen and type HASP, then start the HASP Loader. It can also be run from this location: C:\Program Files (x86)\Common Files\QPS\HaspLoader\3.1

Manual License Installation

To manually install a license file, copy the file into one of the two license folders as described in the table above.

Node-Locked License Details

Node Locked licenses are based on a host platform ID, sometimes called a Host ID, MAC address, or Ethernet address. It is a unique number that identifies a computer. Usually this Host ID is obtained from the Ethernet card in a computer.

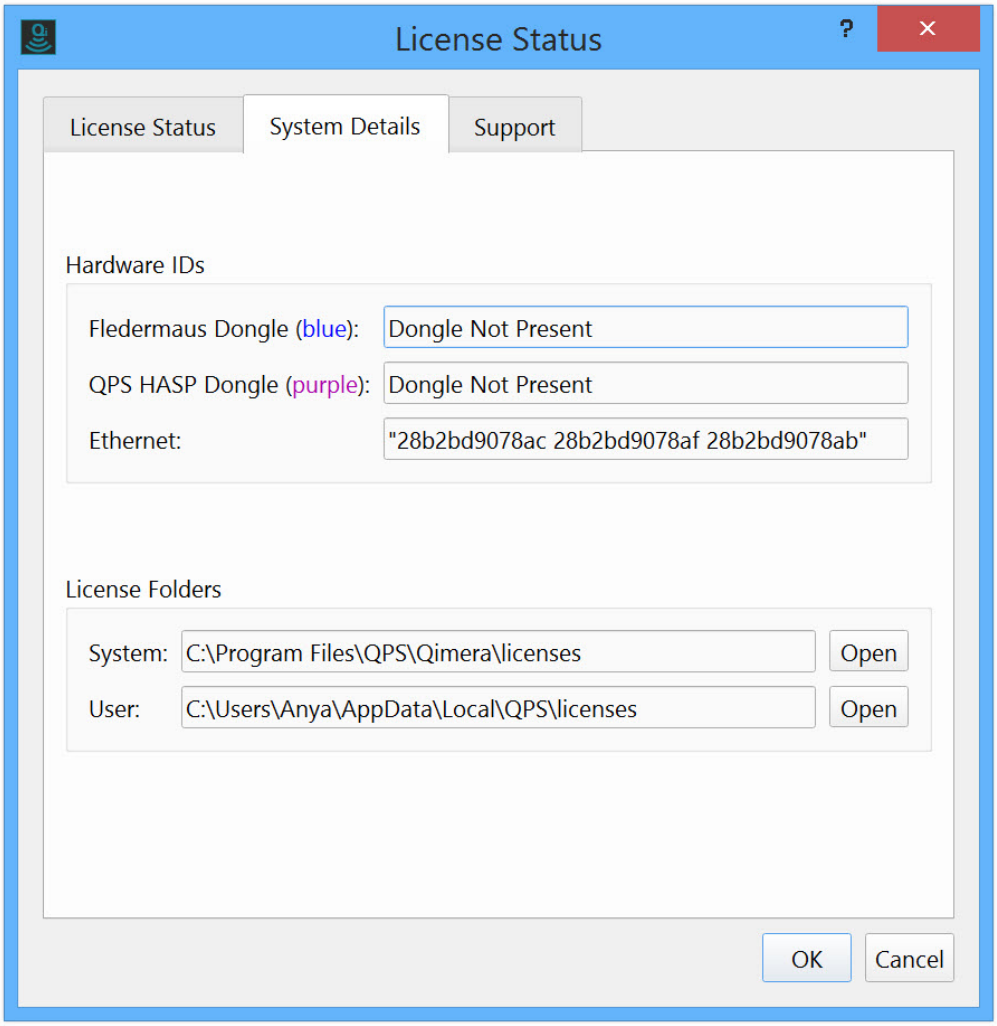
Once you have the host ID it needs to be sent to QPS to have the official license file generated. Email the Host ID to support@qps.nl or call us directly. Upon receipt of the ID, QPS will generate the necessary license file required to run the software.

The license file you receive will look something like the one below. It may contain other lines of text depending upon which products and features you have licensed.

```
Product(s): QimeraPro
FEATURE qmcore ivs 7.2 31-dec-2030 uncounted HOSTID=28b2bd9078ab \
 SIGN="08E9 5F8B 78FB 0826 9E35 2EE0 9B21 B327 1372 8F24 4CC2 \
 CA7C D782 F1D1 1EE4 016A 7EAF 29B0 22AB A993 B2B6 C001 E975 \
 835A 70B1 34DE 7D8E 4F32 F105 CAC5"
FEATURE qmqinsy ivs 7.2 31-dec-2030 uncounted HOSTID=28b2bd9078ab \
 SIGN="0976 CEDD 94FF 380E EBBB 33C0 34A4 817D 32A2 2AE2 E9EC \
 C7A9 DC21 1C52 06D3 0B01 592A 551D CDA1 806D 5776 C3C1 3659 \
 ADC3 A2D8 E462 3C5F 93C3 B970 38E2"
FEATURE qmrawformats ivs 7.2 31-dec-2030 uncounted \
 HOSTID=28b2bd9078ab SIGN="0E57 353E CDD7 75C2 0E05 61A9 90CB \
 3DC9 F9BB 511B 50EF F9A7 15B2 85CA B936 03E9 DAE7 60A7 4B14 \
 C652 487C E1DF 477A 3B9D 228D 267C 1B64 BC18 E8A7 C75E"
FEATURE qmsisqa ivs 7.2 31-dec-2030 uncounted HOSTID=28b2bd9078ab \
 SIGN="1166 A5A1 5C17 A92E 7ECB 61AC DD14 CBED 4E51 84A8 C46E \
 1888 1D5F 501F F6B4 0315 C287 634E 994B 990D E96C 97DA 9D1F \
 89A7 04BA E16D 4C0F AB17 2301 B479"
FEATURE qmbackscatter ivs 7.2 31-dec-2030 uncounted \
 HOSTID=28b2bd9078ab SIGN="04EC 6927 3899 190E 864F 85E4 6796 \
 4657 9505 C443 36C0 B7A6 C40D 0654 9308 1DA6 300A 9393 5B43 \
 30E2 52FC 87FC 7DFC A499 A557 69D0 2F88 6A8C 7C35 D2FB"
```

Obtaining Hardware IDs

The easiest way to obtain hardware IDs is to attempt to run the Qimera application. If no valid license is found, the license status dialog will be displayed. If a valid license is found, the dialog can be shown via *Help > View License Status...* in the menu. In either case, the host IDs can be seen on the System Details tab. This tab displays all three potential host IDs. Please include all three when contacting QPS regarding licensing.



Manually Obtaining the Ethernet ID on Windows

Alternately, the Ethernet Address can be located in the Windows Command Prompt by typing "`ipconfig /all`" and pressing Enter. The Ethernet Address is displayed in the field "Physical Address" and will look similar to this "`00-0E-0C-22-09-25`".

How-to License Manager (Qimera 1.6.0 or newer)

This article help you use the License Manager utility.

On this page:

- How to Start
- What it Does
- How-to Articles
- General Description
  - License status
    - License Information
    - Product
    - Add-Ons
  - Copy License ID
  - Upgrade Dongle
  - Add Activation Code
  - Update Softlocks
  - Offline Activation
  - Connect to Server
  - Disconnect from server
  - SET CUSTOM Proxy
  - COMMANDLINE ACTIVATION
  - Help

This is a copy of the page found here:
License Manager Reference

How to Start

1. Launch the standalone license-manager.exe located in C:\Program Files\Common Files\QPS\License-Manager OR
2. Launch the License Manager from each QPS Application

a. Window/Linux - View License Status... under Help Menu in the Menu Bar
b. macOS - View License Status... under the Application Name in the Menu Bar

What it Does

This dialog manages QPS product licenses across its entire software suite.

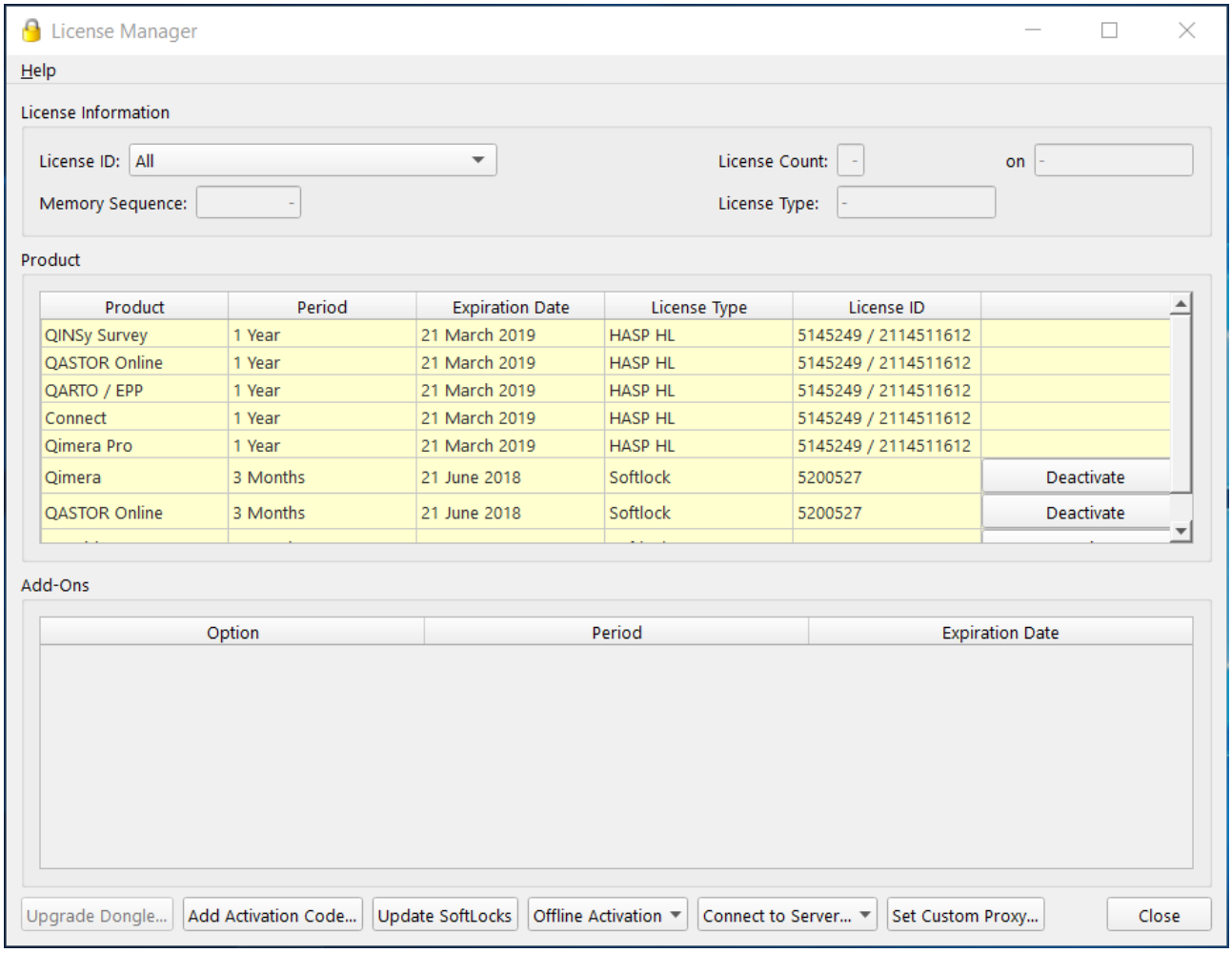
How-to Articles

How-to Softlock Licenses Technical

General Description

In order to run any software in the QPS Suite, a valid license must be available for the software application.
QPS applications currently support Softlock and HASP Dongle licenses that are fully integrated into the License Status Dialog.
When you purchase a QPS software application you will be provided with licenses of your choosing.

License status



License Information

The *License Information* group contains information for the currently selected license in *License ID* combo box.
Selecting a License in in the *License ID* combo box will filter the *Product* table to only contain that license.

Product

The *Product* table contains information for all HASP and Softlock product licenses attached to the device.
If a Softlock license is no longer needed on the device it can be deactivated using the *Deactivate* combo box cell and selecting online or offline deactivation.

Add-Ons

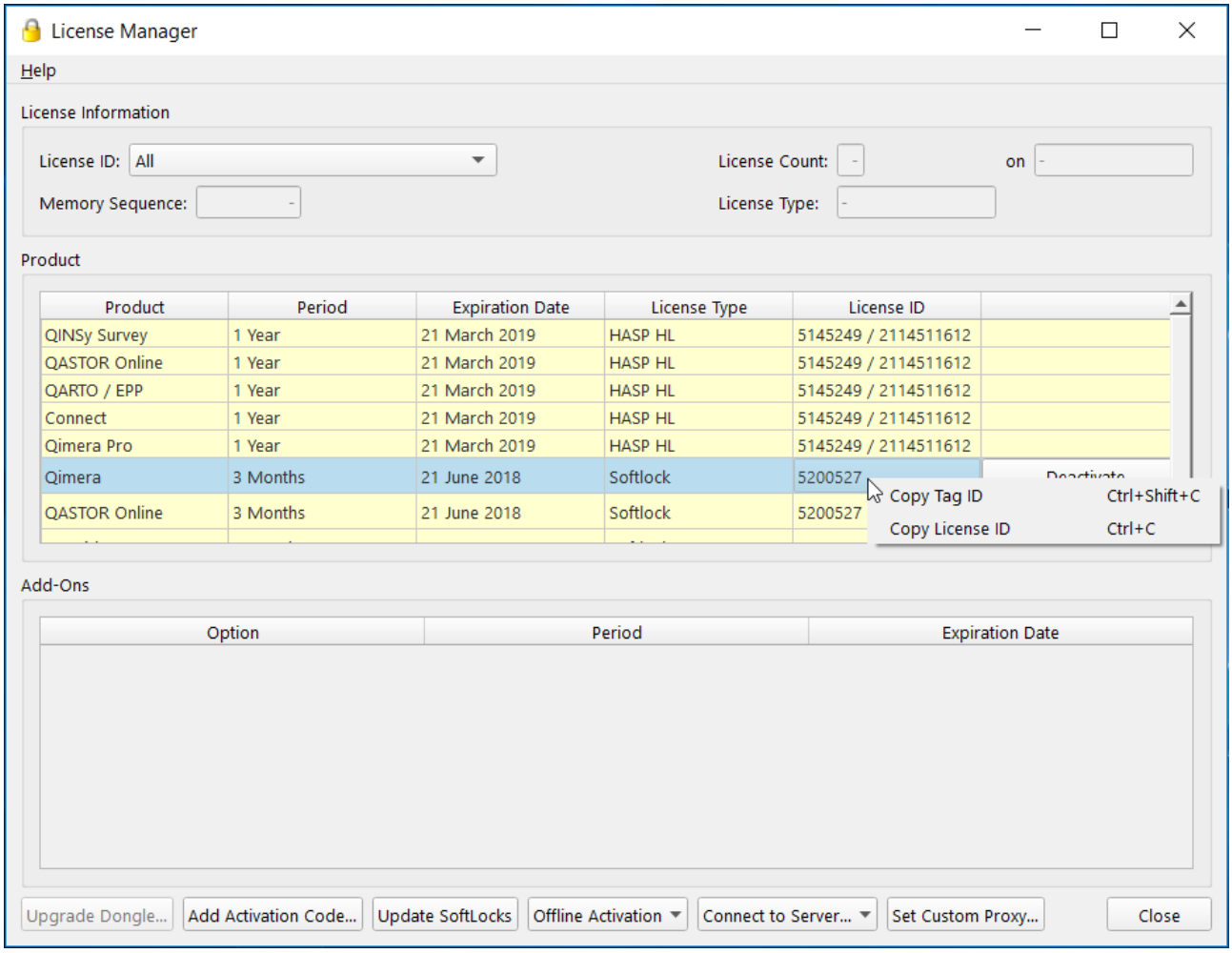
The *Add-Ons* table displays any additional functionality your License may offer for a particular product line.
Selecting a License in the *Product* table will filter the *Add-Ons* for the selected License.

Copy License ID

In the case that a license ID needs to be conveniently copied from the License Manager, simply right click (click with the right mouse button) on the product for which the license ID is to be copied, then select one of Copy License ID or Copy Tag ID. The option to select depends on what is to be copied. The Tag ID is one of the following: for dongles, it is the number that appears on the printed tag attached to the physical dongle, for softlocks, it is the 7 digit number like a virtual tag ID starting with the digits 520, for servers, this is the same as the license ID. The license ID is one of the following: for dongles, it is the number electronically associated with a dongle, shown in tandem with the tag ID in the display separated by a slash; for softlocks, it is the 28 character activation code separated with dashes, not including the product number or name' for server licenses, this is the location of the server for that product.

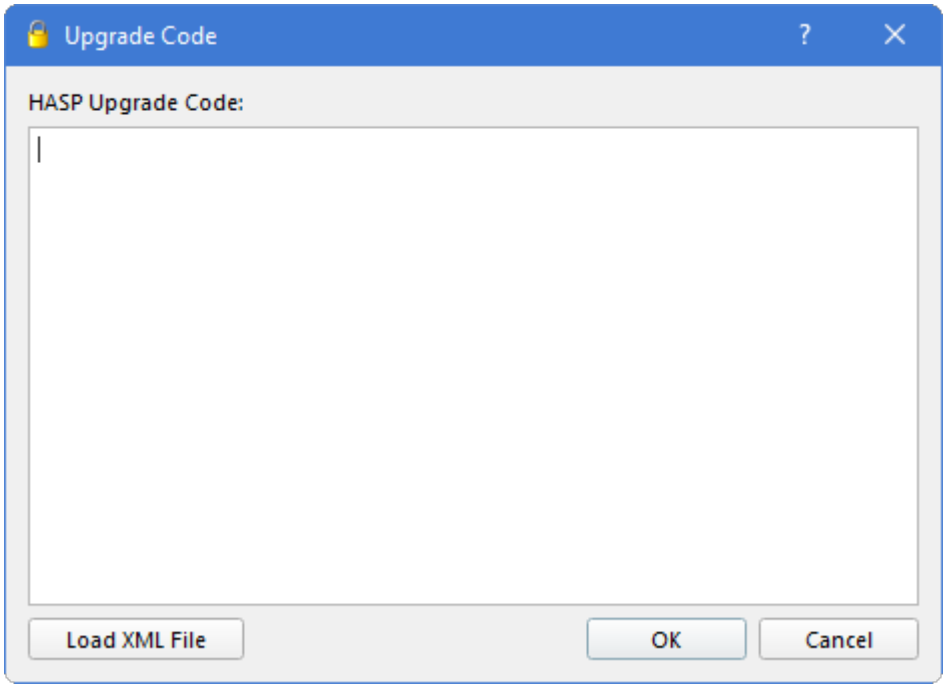
Shortcut keys are available. It is sufficient to click on the product row, then press the control, shift and C keys together (Ctrl+Shift+C) to copy the tag ID. The license ID may be copied as before in v1.2 by pressing Ctrl+C.

See an example of the right click menu in the following.



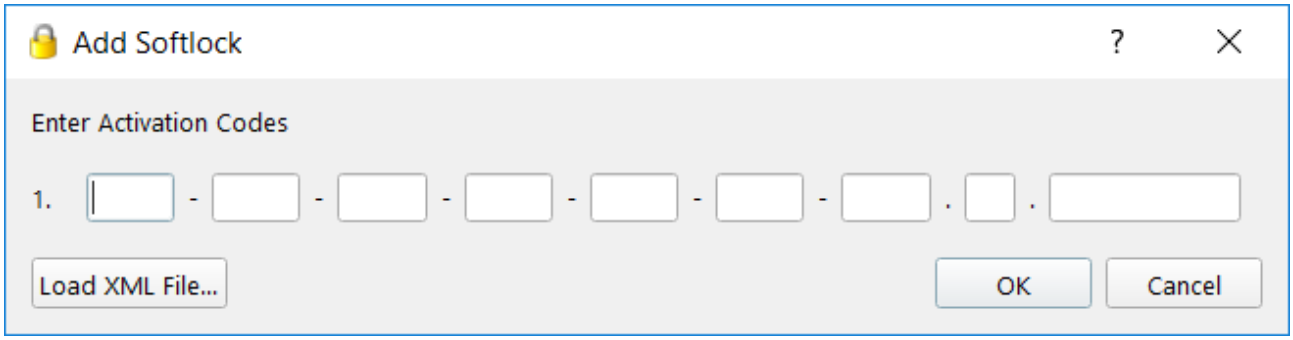
Upgrade Dongle

Selecting a HASP dongle from the License ID combo box will enable the button to *Upgrade Dongle*.
QPS will provide a HASP Upgrade code that will have to be entered or loaded into the Upgrade Code Dialog Window.



Press *Load XML File* to browse for the file. When you open it, the code will automatically be loaded into this window.
After pressing *OK* the dongle will be upgraded and will be ready for use.

Add Activation Code



Selecting the *Add Activation Code...* button launches a new dialog to add a new Softlock License obtained through QPS.
The Softlock license key can be entered manually, pasted into the first text field, or loaded with an appropriate XML file using the *Load XML File* button.
Clicking *OK* will apply the new Softlock License for use.

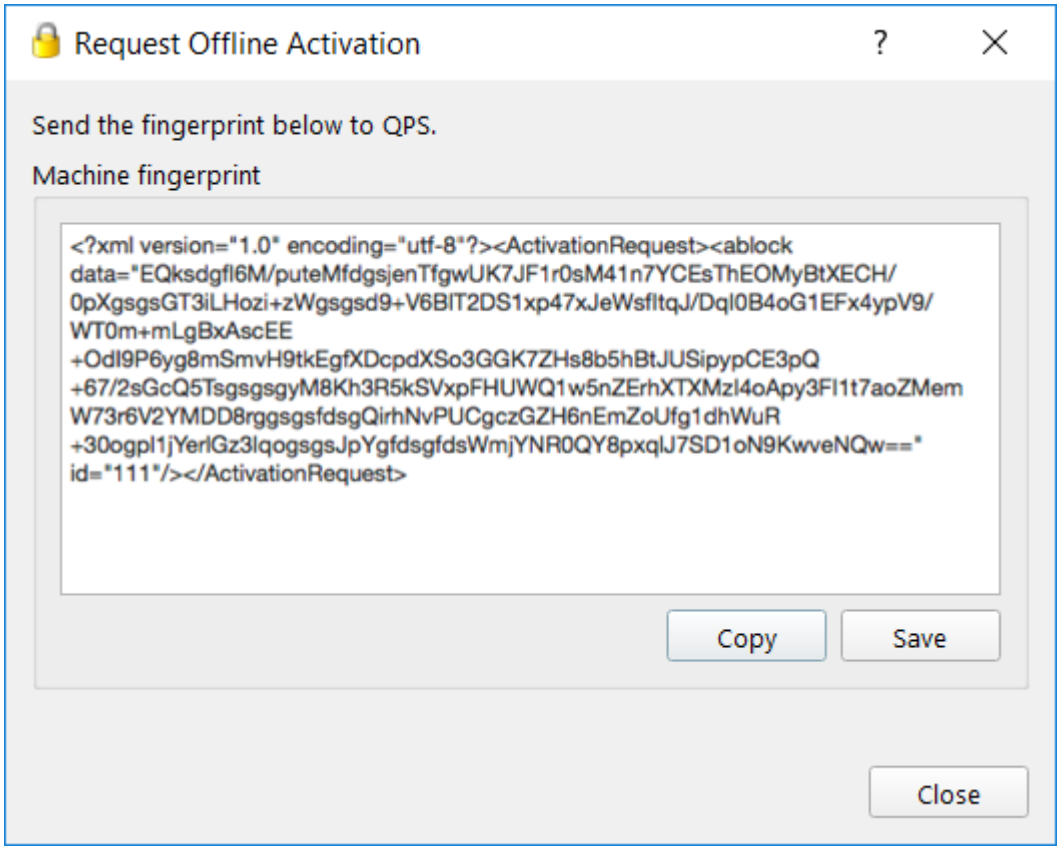
Update Softlocks

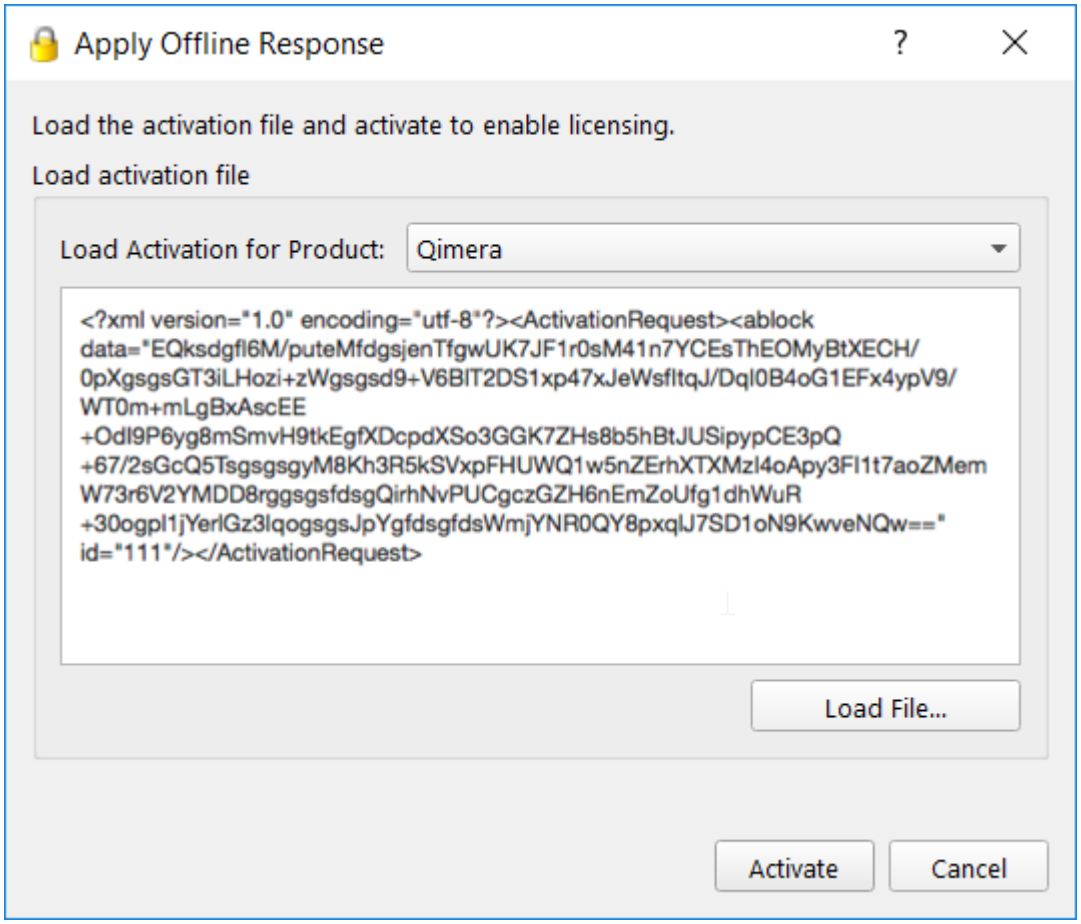
If changes have been made to a Softlock License, for example new Add-Ons requested, the local Softlock License will have to be updated.
This can be done manually using the *Update Softlocks...* button.

Softlocks are automatically updated on a regular basis during the routine softlock check or a restart of the licensed application.

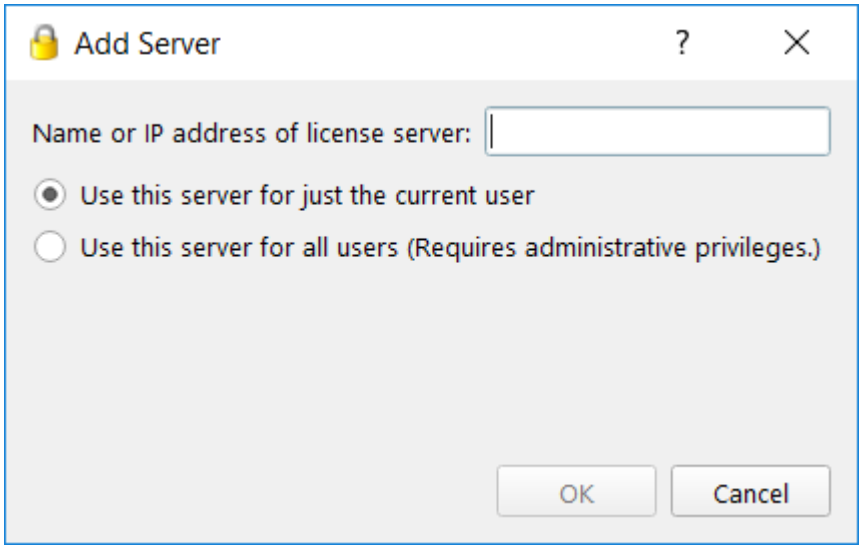
Offline Activation

In the event of limited internet connectivity *Offline Activation* can be performed by clicking the *Offline Activation* button.
After selecting *Generate Request...* you will be required to enter your QPS supplied Softlock Product Key which will generate an XML formatted machine fingerprint that must be provided to QPS.
QPS will then provide an XML formatted activation string that can be applied using the *Apply Response...* option of the *Offline Activation* button.


Request Offline Activation
?
Send the fingerprint below to QPS.
Machine fingerprint
<?xml version="1.0" encoding="utf-8"?><ActivationRequest><ablock
data="EQksdgfl6M/puteMfdgsjenTfgwUK7JF1r0sM41n7YCEsThEOMyBtXECH/
0pXgsgsGT3iLHozi+zWgsgsd9+V6BIT2DS1xp47xJeWsfltqJ/Dql0B4oG1EFx4ypV9/
WT0m+mLgBxAscEE
+OdI9P6yg8mSmvH9tkEgfXDcpdXSo3GGK7ZHs8b5hBtJUSipypCE3pQ
+67/2sGcQ5TsgsgsgyM8Kh3R5kSVxpFHUWQ1w5nZErhXTXMzl4oApy3FI1t7aoZMem
W73r6V2YMDD8rggsgsfdsgQirhNvPUCgczGZH6nEmZoUfg1dhWuR
+30ogpl1jYerlGz3lqogsgsJpYgfdsgfdsWmjYNR0QY8pxqlJ7SD1oN9KwveNQw=="
id="111"/></ActivationRequest>
Copy
Save
Close



Connect to Server



If a license server has been configured it can be used to distribute licenses over a network. Enter the IP address of the license server and select the appropriate user option and select *OK*.

Disconnect from server

If a license server has been connected to in the past this option will become available even if the server is offline.
Disconnecting from a server will prompt the user to confirm the requested disconnect. It should be noted that the licenses will remain active until the application is closed.

SET CUSTOM Proxy

By default, License Manager uses whatever proxies your users have set for their system. Where License Manager reads these proxy settings from differs between operating systems:

- Windows: The proxy settings are read from Internet Explorer.
- Mac OS X: The proxy settings are read from the system internet settings.
- Linux: The proxy settings are read from the environment variables `http_proxy` or `all_proxy`.

You can overwrite the default system proxy settings by specifying a proxy server address. When using custom proxies they must be in the form Proxy in the form: `http://username:password@host:port/`

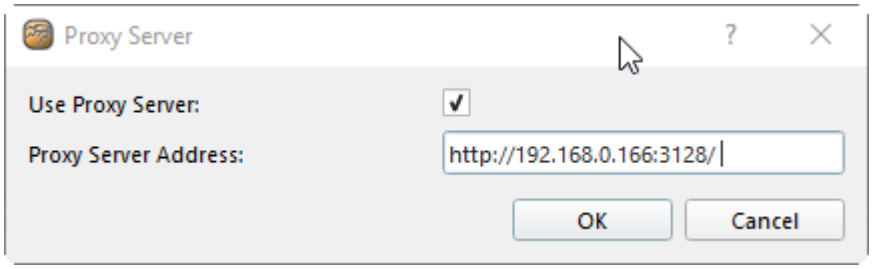
- Example 1 (just a host): `http://127.0.0.1/`
- Example 2 (host and port): `http://127.0.0.1:8080/`
- Example 3 (all 3): `http://user:pass@127.0.0.1:8080/`

Note: If the port is not specified, License Manager will default to using port 1080 for proxies.

- To set a custom proxy simply check 'Use Proxy Server' and specify a proxy server address and press OK.
- To clear a previously set custom proxy simply uncheck 'Use Proxy Server' and press OK.

License Manager also support NTLM proxies on Windows. To use NTLM proxies you must also specify the domain. For example:

http://DOMAIN\username:password@host:port/



COMMANDLINE ACTIVATION

The commandline can be used to activate a softlock license in an automated manner. The -silent option in conjunction with the -activate option can be used to activate a single activation code. It is an error to specify either of these options without the other.

Usage is: license-manager
[-silent]
[-activate <activation-code>]

- "-silent" tells the LicenseManager not to show the GUI.
- "-activate <activation-code>" tells the LicenseManager to activate the specified code.
- "-h" displays the usage information.
- "-ver" displays the version information.
- The exit code indicates if the activation was successful or not.

Help

Clicking the *Help* menu item will give you online and offline options for viewing *'How-to'* manuals for the License Manager and HASP Dongles.

How-to Make Qinsy Vertical Datum resources available to Qimera

This How-to describes the process for setting up Qinsy installation vertical datum resources that are not available to Qimera.

On this page:

- 1) A geoid that was set up on a different PC
- 2) You have created or imported a new geoid file into the Qinsy workspace
- Additional Notes

Since Qimera 1.4.0, the QPS geodetics are no longer part of the Qimera Installer and must be installed separately. Please download the latest version of the installer from the Qimera download page.

QPS Geodetic Package	2.0.3	2018-01-31	QINSy 8.16.0 and up (includesnewqgfvom)	Windows	QPS-Geodetics-2.0.3-Windows-Installer.msi	333 MB
				Mac OS X	QPS-Geodetics-2.0.3-Mac-Installer.pkg	331 MB
				Linux	QPS-Geodetics-2.0.3-Linux-Installer.zip	330 MB

There are currently two cases for enabling Qimera support for a Qinsy geoid that is not already bundled with the QPS Geodetics Installer

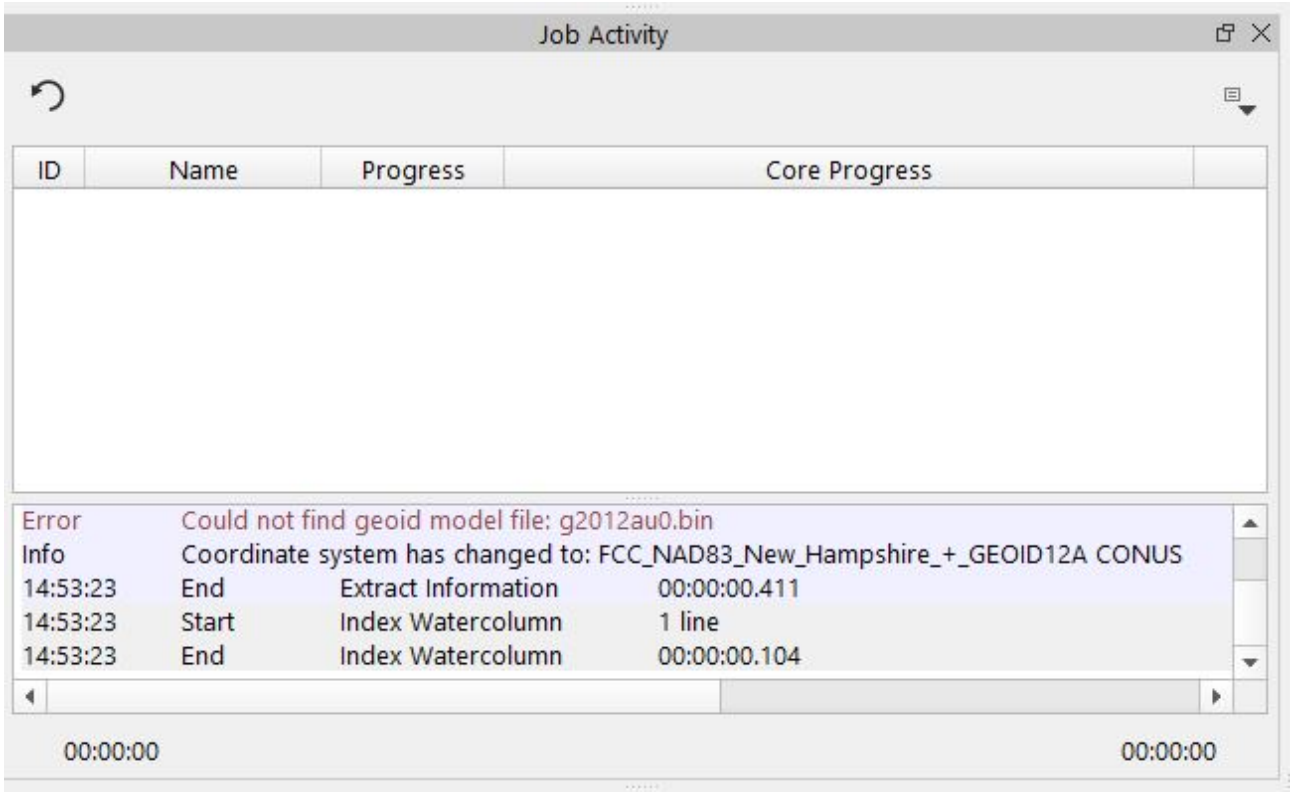
1) A geoid that was set up on a different PC

This means that this geoid is not on the local machine. Please see the following steps:

If a geoid file is specified in the Qinsy database, but it cannot be found in the appropriate folder, an error will be displayed in the Job Activity window. The error will follow this format:

"Could not find geoid model file: <GeoidModel>.BIN"

Here is an example:



The error will also be recorded in the project's log file (located in the project folder's LogFiles directory), job-activity.log:

```
14:53:22 Start Extract Information 1 line
Error Could not find geoid model file: g2012au0.bin
Info Coordinate system has changed to: FCC_NAD83_New_Hampshire_+_GEOID12A
CONUS
14:53:23 End Extract Information 00:00:00.411
14:53:23 Start Index Watercolumn 1 line
14:53:23 End Index Watercolumn 00:00:00.104
```

To make the geoid available in Qimera, follow these steps:

1. Copy the <GeoidModel>.bin to: C:\Program Files (x86)\Common Files\QPS\Geo\Geoid
2. Restart Qimera if you have it open.
3. You will need to reprocess files within Qimera or possibly even create a new project (or reset the current Qinsy project) if the changes aren't applied.

2) You have created or imported a new geoid file into the Qinsy workspace

Early versions of Qimera used a separate geoid model folder. It now uses the same default and secondary folders as Qinsy. If a new model has been added for Qinsy, it will also be available to Qimera on the same machine.

Additional Notes

The following table is a growing list of known not previously supported Vertical Datum Geoid models. Please, if you have issues applying this workaround, contact Support via Support Ticket

Geoid Model	Supported	Not supported	Action
EGM2008	Qimera v1.1 or higher	Qimera v1.0.7 and previous	How-to EGM2008 Geoid

How-to Sentinel NetHASP and HASP

This How-to explains how to set up the Sentinel NetHASP (or Net Hasp) as either a server or client. This also applies to a normal (not Net) HASP key.

On this page:

- Windows
  - Install Driver (If Qimera or Fledermaus are already installed)
  - Download Driver separately
- Mac
  - Download Run Time installer
  - Install the package
- Linux
  - Download Run Time installer
  - Install the package
  - Confirm NetHasp is working and visible
- Updating the NetHasp
- Troubleshooting
  - Input Host IP Address on Client Machines (not normally necessary)
  - Allow Remote Access to ACC and Admin API (not normally necessary)
  - Additional Information

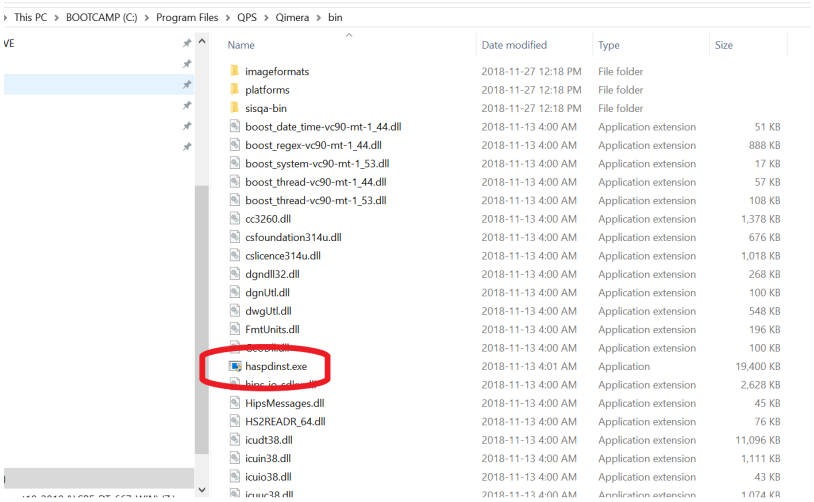


If you have installed Qinsy on your Windows machine, this driver is already installed and no further work should be required to get the NetHASP working as either a server or client.

Windows

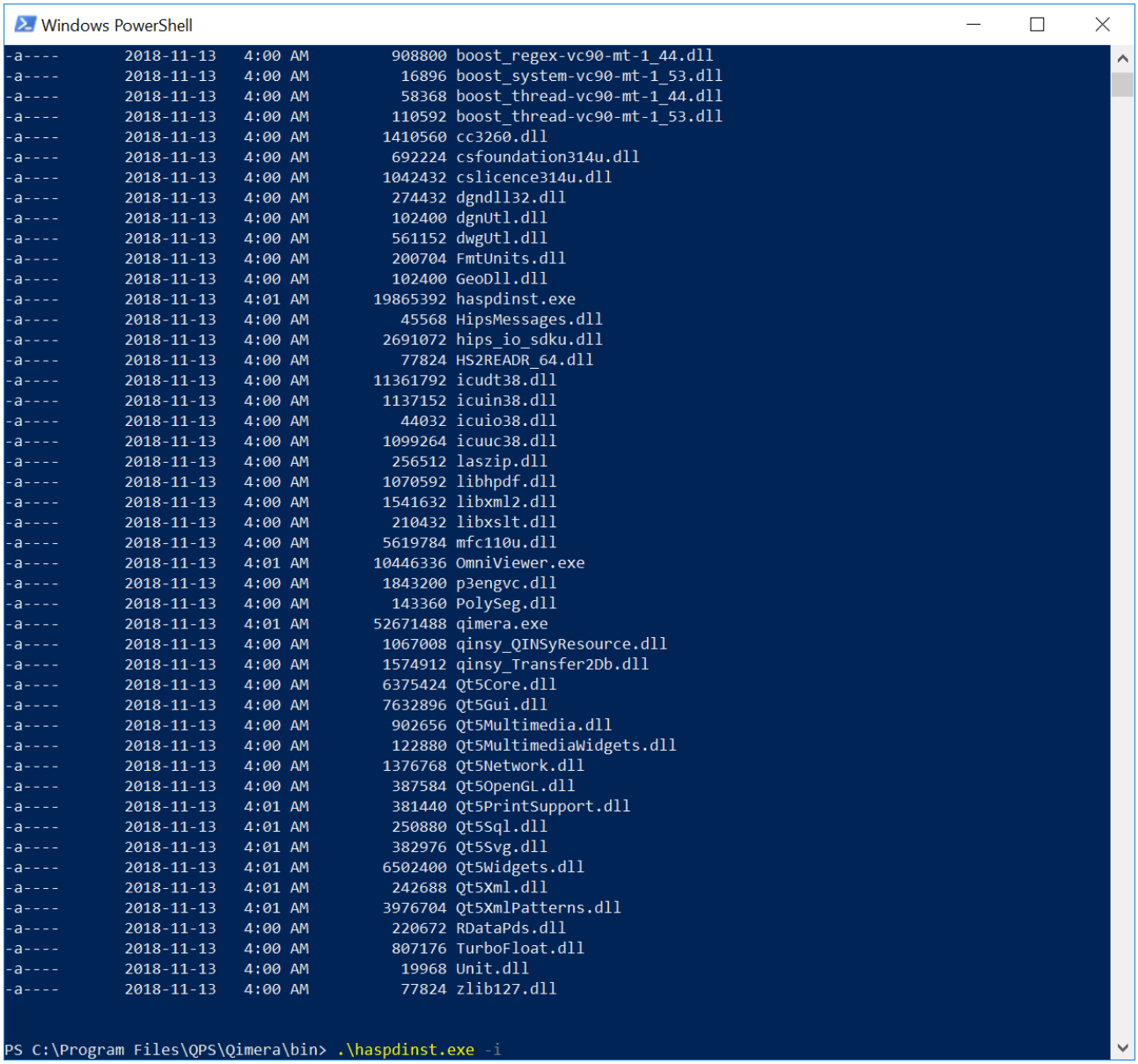
Install Driver (If Qimera or Fledermaus are already installed)

In the bin folder where Qimera or Fledermaus is installed, there is a file called haspdinst.exe. The default location for this is C:/Program Files/QPS/Qimera (or Fledermaus)/bin.



Go to that folder with either Windows Command Prompt or Powershell (run with Administrator privileges) and run the following command:

haspdinst.exe -i



This will install the Hasp drivers which includes the runtime drivers to enable both the Host and Client Net Hasp capabilities.

Download Driver separately

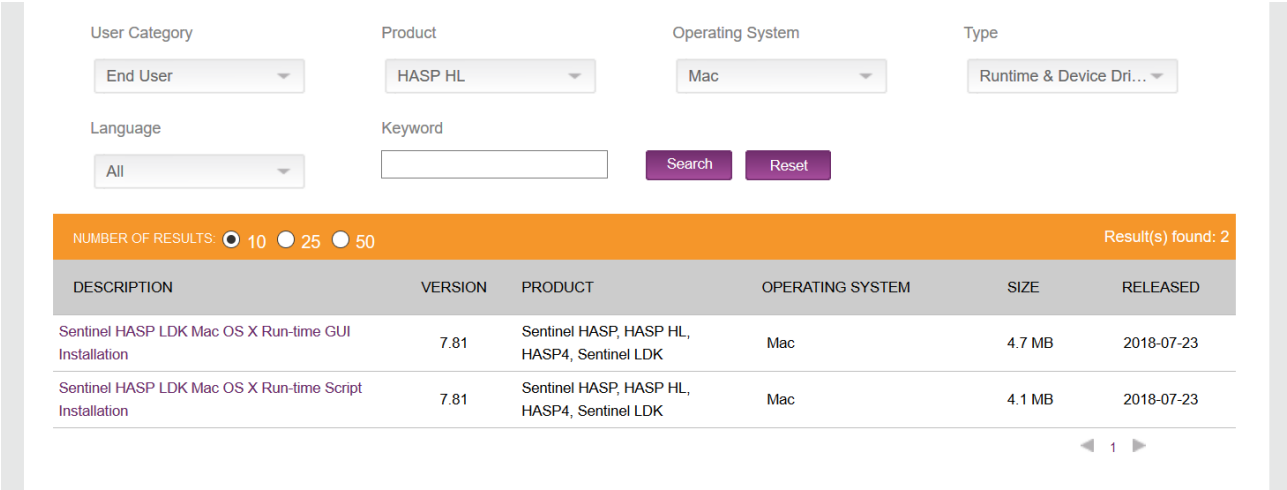
A driver is also available at the bottom of the Qinsy, Qimera, and Fledermaus download web pages.

QPS Downloads

Mac

Download Run Time installer

First, download the appropriate Mac OS package from here: Sentinel Mac OS Downloads



Normally, the Run-Time GUI Installation package would be chosen.

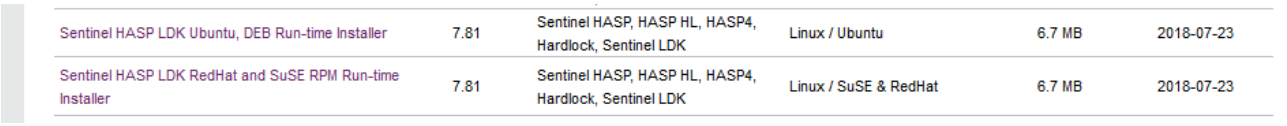
Install the package

Both of the packages shown above are DMG files and can be installed directly.

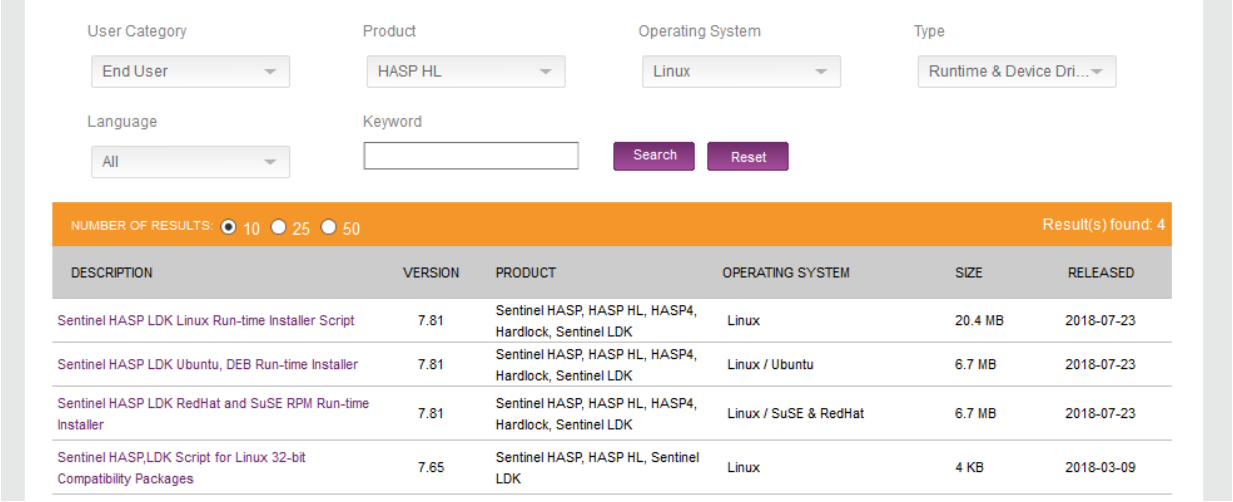
Linux

Download Run Time installer

First, download the appropriate linux package from here: Sentinel Linux Downloads



If the link doesn't work, search for "sentinel linux hasp driver". One of the links should be more specific than the general Sentinel download page. If the general sentinel page: https://sentinelcustomer.gemalto.com/sentineldownloads/ is all that's available, change the search parameters as follows:



DESCRIPTION	VERSION	PRODUCT	OPERATING SYSTEM	SIZE	RELEASED
Sentinel HASP LDK Linux Run-time Installer Script	7.81	Sentinel HASP, HASP HL, HASP4, Hardlock, Sentinel LDK	Linux	20.4 MB	2018-07-23
Sentinel HASP LDK Ubuntu, DEB Run-time Installer	7.81	Sentinel HASP, HASP HL, HASP4, Hardlock, Sentinel LDK	Linux / Ubuntu	6.7 MB	2018-07-23
Sentinel HASP LDK RedHat and SuSE RPM Run-time Installer	7.81	Sentinel HASP, HASP HL, HASP4, Hardlock, Sentinel LDK	Linux / SuSE & RedHat	6.7 MB	2018-07-23
Sentinel HASP,LDK Script for Linux 32-bit Compatibility Packages	7.65	Sentinel HASP, HASP HL, Sentinel LDK	Linux	4 KB	2018-03-09

The Run-Time Installer Script will be required for non Ubuntu / Redhat type Linux distributions.

Install the package

Unzip the downloaded file.

In Ubuntu / Mint / etc run:

```
sudo dpkg -i aksusbd_7.81-1_amd64.deb
```

or install it with the GUI package manager.

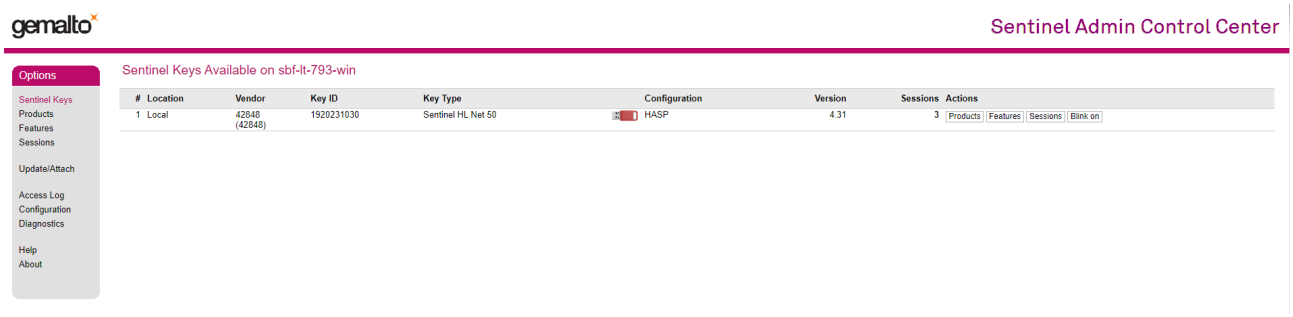
In Redhat / CentOS / SuSE, use the 'rpm -i' command (or use the GUI package installer):

```
As root:
rpm -i aksusbd-7.81-1.x86_64.rpm
```

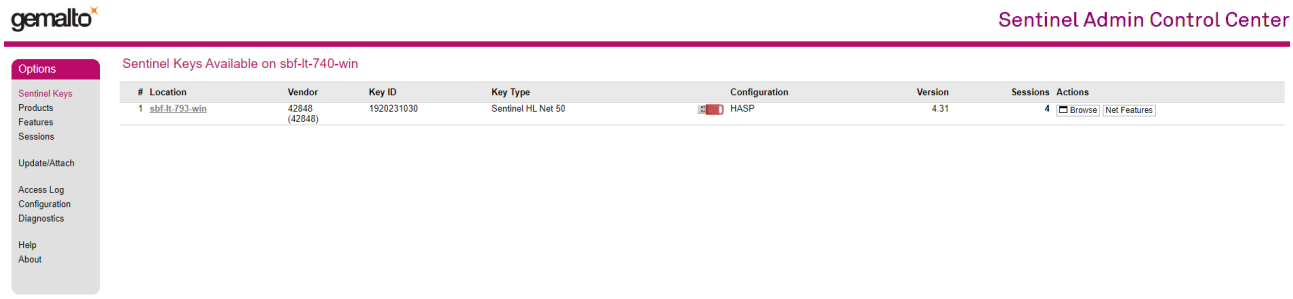
Confirm NetHasp is working and visible

When the driver is installed, it is wise to ensure the dongle is visible on the network. This can be checked by navigating to http://localhost:1947/

First, you can check on the PC that the dongle is inserted. The dongle should be visible under the 'Sentinal Keys' tab with it's location showing 'local':



Next, navigate to the same website (http://localhost:1947/) on the PC's that will be acting as clients. Again, under 'Sentinal Keys', the dongle should be visible with its location showing the host PC:



Updating the NetHasp

The QPS License Manager, found in Qimera 1.6 and newer, Qinsy 8.18 and newer, and Fledermaus 7.8 and newer, should be used to update the NetHasp.

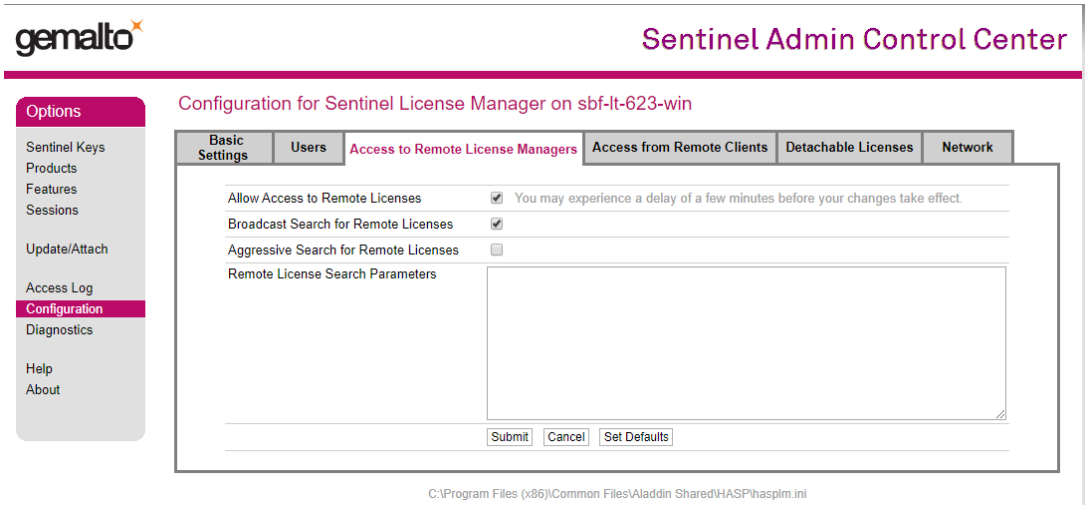
Troubleshooting

Input Host IP Address on Client Machines (not normally necessary)

If the client machine is still not seeing the server, it may be required to point the client machine to the IP address or hostname of the server.

This can be done by:

1. Navigate to http://localhost:1947/
2. Options: Configuration → Access to Remote License Managers



3. Under Remote License Search Parameters, enter the IP address or hostname of machine that holds the key.

4. Submit and exit.

> ⚠ The above steps may need to be repeated on each client machine that is trying to connect to the host machine.

Allow Remote Access to ACC and Admin API (not normally necessary)

By changing the Basic Settings from the host machine, the client machines will be able to remotely access the Admin Control Center (ACC) and Admin API to change the settings.

This can be done by:

1. Navigate to http://localhost:1947/
2. Options: Configuration → Basic Settings



3. Click the checkbox for 'Allow Remote Access to ACC' & 'Allow Remote Access to Admin API'.

4. Submit and exit.

Additional Information

See the following pages for additional information:

How-to NetHASP dongles

Network HASP dongles

How-to Set up a Project and Geodetic Settings

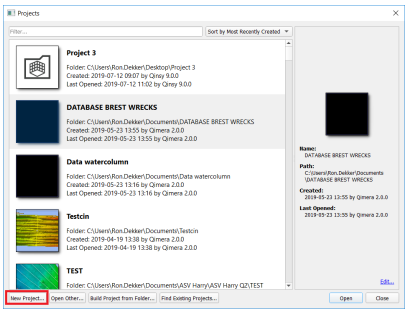
This article will help you set up a new project.

On this page:

- Set up Geodetics in a new project
  - 1. Automatic
  - 2. WKT File
  - 3. Set up Project Coordinate System

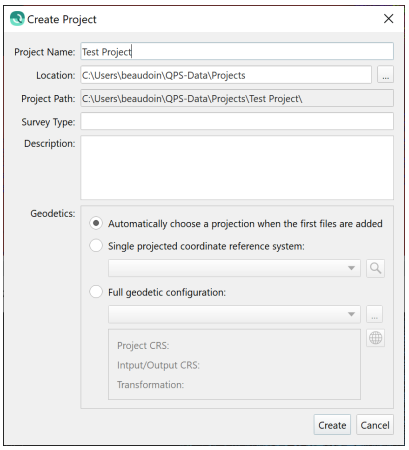
Set up Geodetics in a new project

Go to Project Browser and create a new project



From this point on there are three ways to set up a new project:

1. Allow it to automatically choose the projection when files are added, which
   - Chooses UTM zone automatically for first file for non-Qinsy data
   - Extracts projection from Qinsy file, if .db/.qpd files are provided



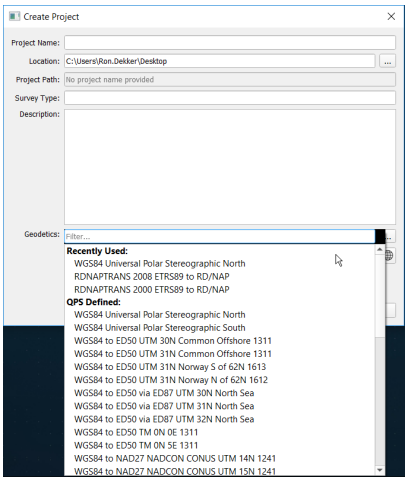
2. Specify a projected coordinate reference system
3. Set up your CRS from scratch using the Full geodetic configuration

1. Automatic

For a predefined setup click on the drop down menu.

Here you will find:

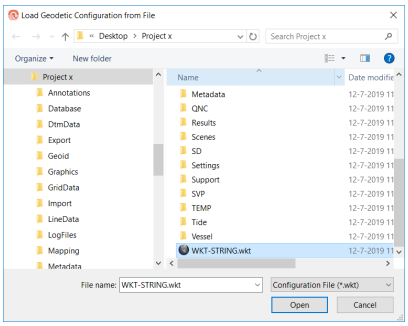
1. Recently Used geodetic setups if you have done it before and/or saved a custom created one
2. QPS Defined, which are the Qinsy predefined datums

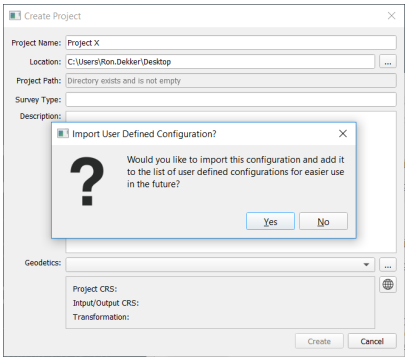


2. WKT File

If you have a WKT file (can be saved via the SETUP CRS option below).

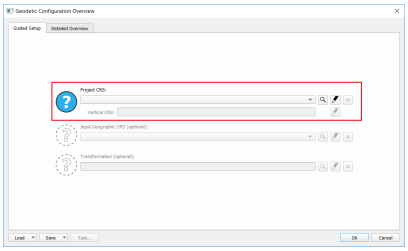
1. You are able to select the WKT file which will populate the Datum for this project



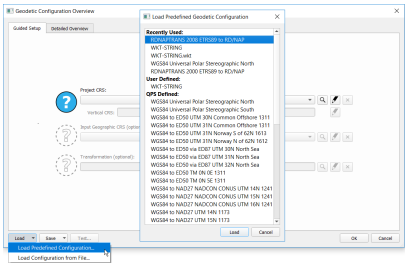


3. Set up Project Coordinate System

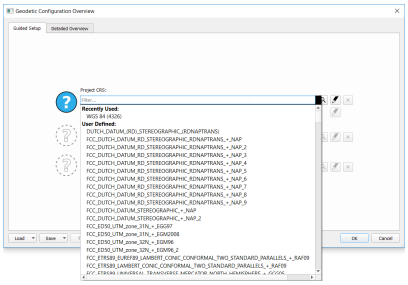
For a CRS setup from scratch you now have to set up the Project CRS:

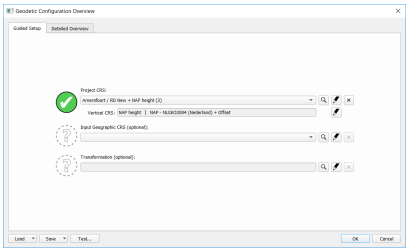


1. The project CRS is the Target datum.



1. This can <u>either</u> be set up by loading a complete predefined datum transformation,
2. <u>Or</u> by loading a WKT file.





1. You can load a specific existing ellipsoidal datum (e.g. WGS84, ETRS89, different local datum, etc.)
    a. In case you still want to do a datum transformation you will have to do it manually, please keep reading.
2. If set up correctly you will see a green check-mark

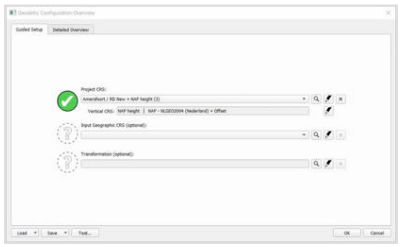
1. Set up Target datum by using the magnifying glass.
2. If set up correctly you will see a green check-mark.



If you still want to set up the datum transformation, you can do it in two ways:

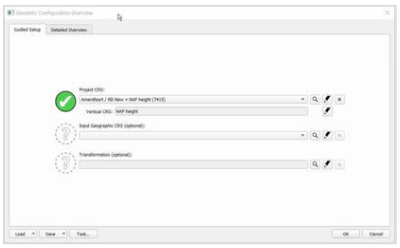
1 Select Input geographics first, once target datum is selected:

1. Set up Source Datum
2. Set up correct Transformation
3. If set up correctly you will see a green check-mark



2 **Select transformation first:**

1. A list with existing related transformations is available
2. Once selected the Source datum will be auto-populated
3. If set up correctly you will see a green check-mark



How-to Work with Qinsy and Qimera Live

This article will help you make the connection between Qinsy and Qimera Live.

On this page:

- Introduction
- How to work with Qinsy and Qimera Live
  - Step 1
  - Step 2
  - Step 3
  - Step 4

Introduction

Qimera Live allows Qimera to automatically monitor a data directory for new files. When new files arrive and are safe to read, it will import them into your project, process them and then add them to a Dynamic Surface. Since Qinsy and Qimera share a common directory structure, there are special precautions that should be considered to set up Qinsy and Qimera in an optimal manner that won't interfere with online acquisition. These considerations do not necessarily apply to other acquisition systems, however, it is generally advisable that you configure your acquisition system to copy raw data files at the end of line to another location for Qimera to monitor, if at all possible.



Qinsy

Qimera can open Qinsy projects directly, however, we **strongly** advise against doing this while acquisition is occurring with Qinsy, especially with the new Qimera Live capability. It is our recommendation to configure Qinsy to copy the database files to another location and then to have Qimera monitor that remote location. Qimera will specifically disallow setting a Qinsy project directory as the monitor directory in a Qimera Live configuration.

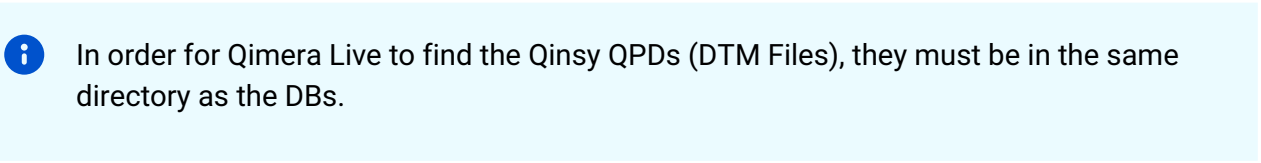
How to work with Qinsy and Qimera Live

Step 1

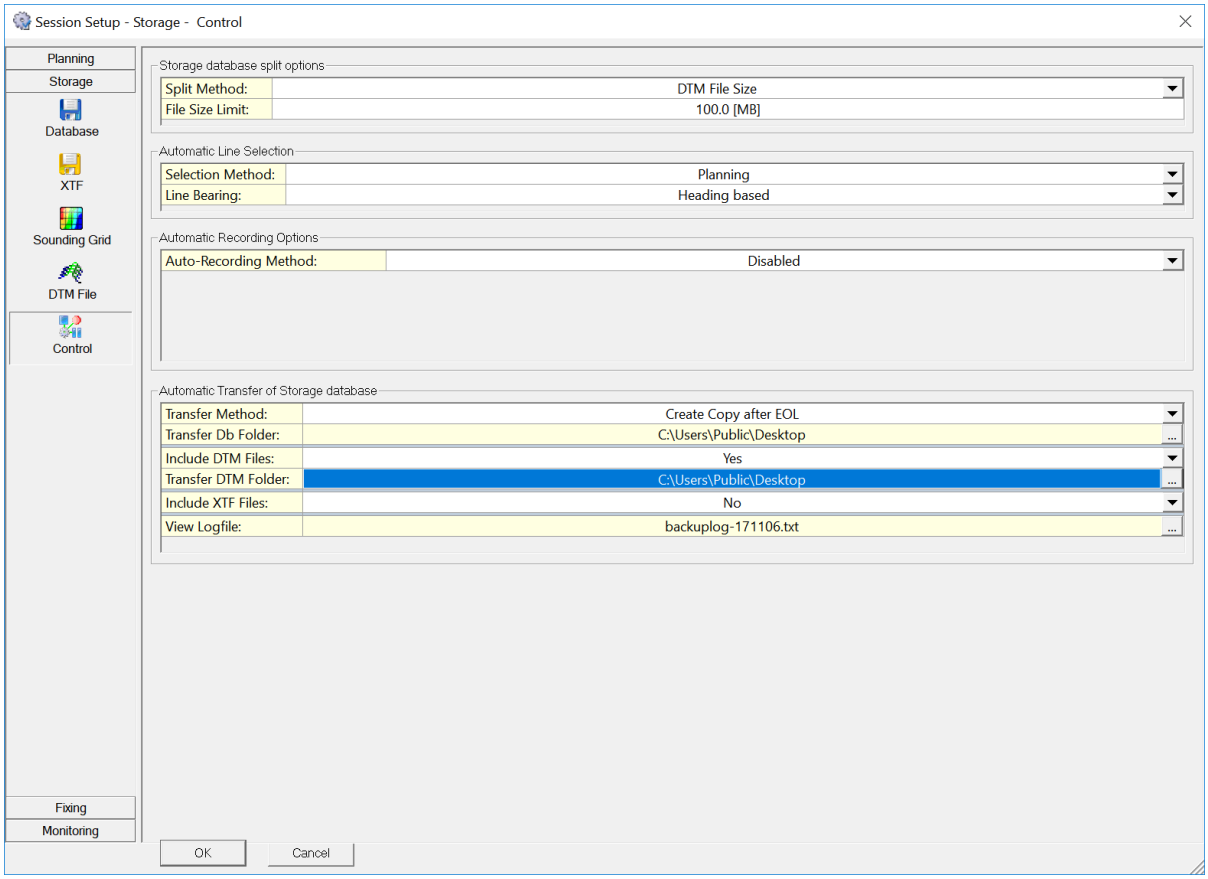
Prepare your Qinsy project, then go Online.

Step 2

In the Qinsy Controller window go to the Settings menu, choose Session Setup and go to the Storage configuration panel on the left side of the dialog. In the Automatic Transfer of Storage database section of the "Control" configuration, set the Transfer Method to 'Create Copy after EOL', and also specify the directory in which you'd like the copy to be made. This directory should be remembered, as it will be the directory in which Qimera will look for new data.



In order for Qimera Live to find the Qinsy QPDs (DTM Files), they must be in the same directory as the DBs.



Step 3

Once you have logged at least one file with Qinsy, run Qimera and create a new project. Manually add the first file that is transferred by Qinsy into the monitoring directory

specified in Step 2. Process this file in Qimera and create a Dynamic Surface. If you haven't done this before, please consult the Quick Start Guide.

Step 4

Once you have a Dynamic Surface created, start Qimera Live using the Automatic Import instructions.

Qimera Live may also be used in the office for "scheduling" processing tasks. For example when extracting Qinsy db files from a zip folder, the folder can be actively monitored and files will be processed and added to the Dynamic Surface.

2. Basic Processing

- How-to Work with Additional Soundings
- How-to Apply Tides
- How-to Dynamic Surfaces
- How-to Process a Patch Test
- How-to Process Sound Speed
- How-to Structure from Motion (SfM)
- How-to Tide Strategy
- How-to Tips and Tricks
- How-to Vertical Referencing
- How-to Water Column Sounding Extraction

How-to Work with Additional Soundings

There are scenarios where multiple returns could conceivably be measured by a particular beam.

On this page:

- Introduction
- How to work with Additional Soundings
  - Step 1
  - Step 2
  - Step 3
  - Step 4

Introduction

The following documentation will introduce users to additional tips, tricks, and information specific to working with Additional Soundings. Additional Soundings are a relatively new capability offered by some multibeam echosounder hardware manufacturers. Traditional multibeam echosounder systems provided a single bottom return per beam. In many instances, for example over a wreck, there are scenarios where multiple returns could conceivably be measured by a particular beam. This new capability allows for this. Currently, Qimera supports this functionality for Kongsberg and Teledyne-Reson. Kongsberg manuals and marketing material refers to these types of soundings as "Extra Detections" whereas Teledyne-Reson uses the term "Multi-Detect". We use the general term Additional Sounding in Qimera.

How to work with Additional Soundings

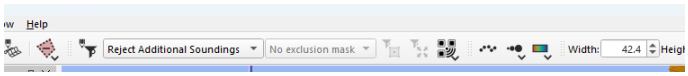
Step 1

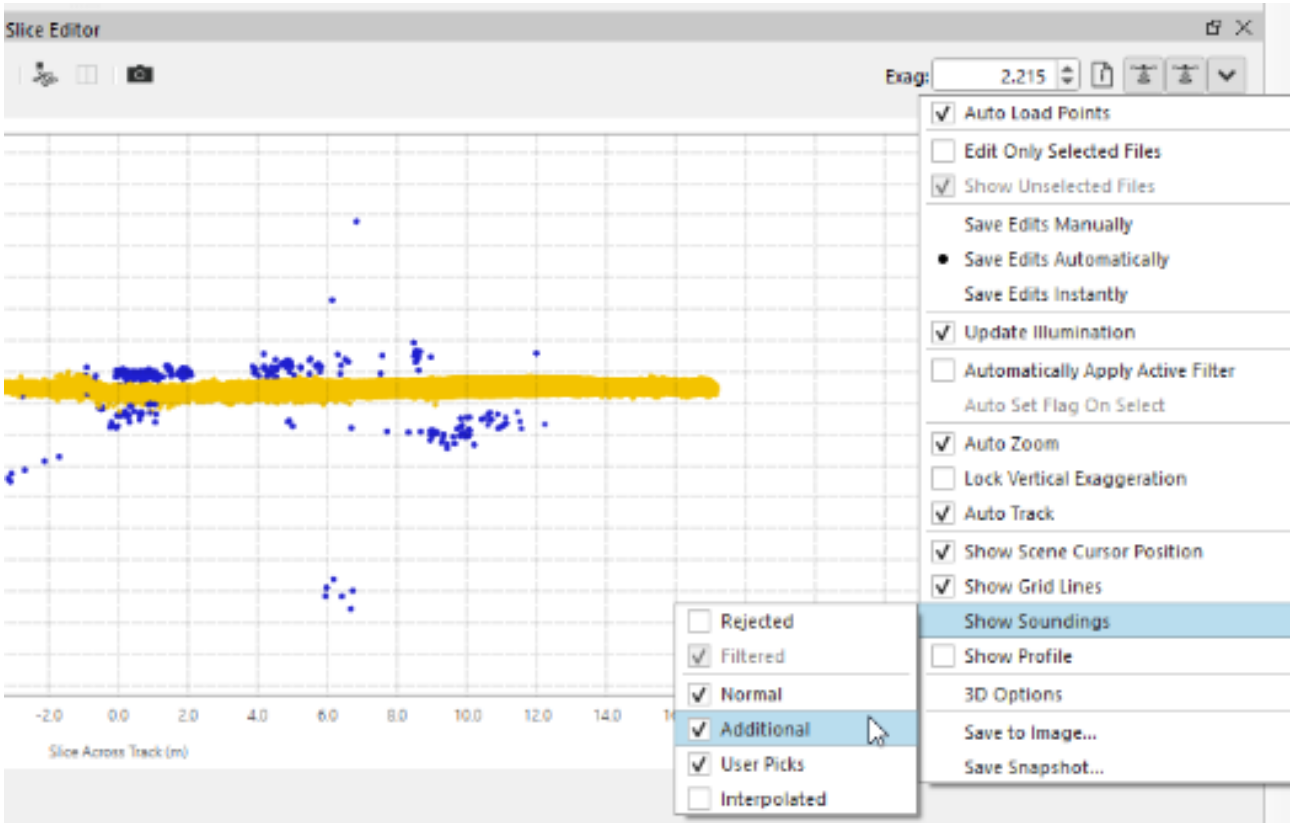
Load raw sonar files into your project and create a grid. See Getting Started for more information on how to do this.

Step 2

Additional soundings are included automatically. This would mean that when importing the DB file it would automatically be shown. However it could be that sometimes you need to trigger the software to show them by using a specific filter that will accept all the additional sounding. Resulting in the soundings being showed in your slice editor. Also you

should then check if the soundings are actually included in the slice editor by going over the shown soundings.





There are differences on how data is flagged during processing. Teledyne-Reson multi-detect data are all flagged as accepted during processing, regardless of the priority. Kongsberg documents specifically indicate that Extra Soundings of Class 8 should only to be used for engineering and troubleshooting as they contain very noisy detections. Qimera flags these particular soundings as rejected during processing. The remaining sounding Classes are flagged as rejected if their visibility status was disabled in Kongsberg SIS during acquisition.

Step 3

Now that all of the Additional Soundings have been enabled, you may wish to globally reject some of the Additional Soundings in particular files that do not provide any benefit. For example, if surveying in the vicinity of a wreck, you may only wish to use the additional soundings for those lines that pass over the wreck. With Additional Soundings, comes additional potentially noisy data that must be cleaned. Rejecting the Additional Soundings for survey lines that do not pass over the target of interest may be desirable. This is quickly done by selecting the files for which you wish to disable the Additional Soundings and then accessing the Disable Additional Soundings under the Simple Filters section of the Tools Menu. Once you trigger this action, the Dynamic Surface will update at the end of the line processing.

The same sub-menu offers the capability to re-enable Additional Soundings. Note that neither of these actions triggers intensive re-processing; the procedure that is triggered simply sets the sounding flags in the line selection to accept or reject in a light-weight and quick pass over the QPD files.

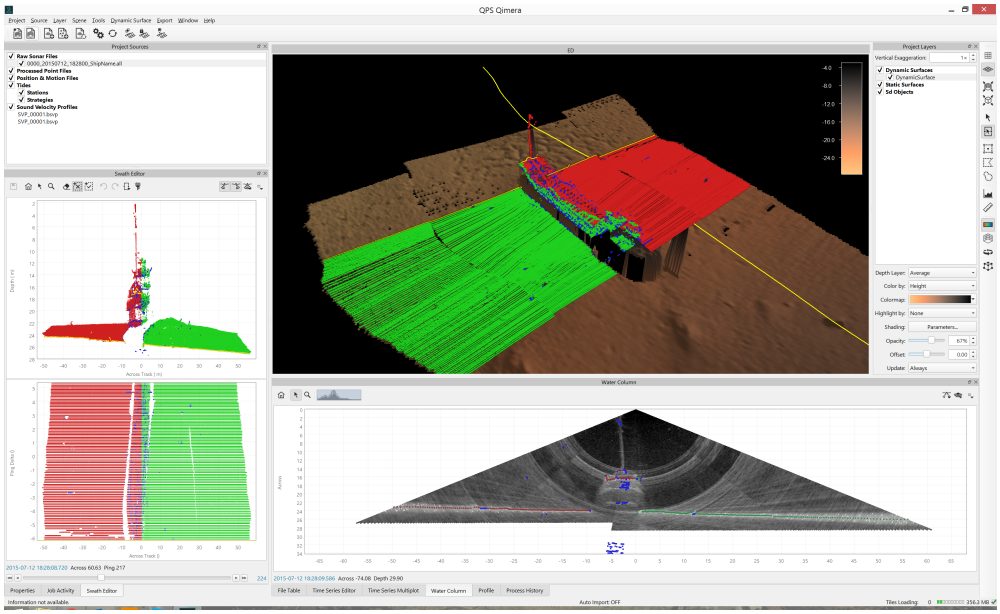
Step 4

You can now focus on the job of verifying that the Additional Soundings gave you the additional mapping detail that you desire. You can also reject any noisy Additional Soundings that are creating artifacts in the Dynamic Surface. There are two workflows supported for this: Swath Editing and 3D Editing. Both are explored below.

Swath Editor, Water column Viewer and 4D Scene

The Swath Editor, water column view and the 4D Scene provide a powerful and intuitive working environment to assess which of the Additional Soundings are necessary to best capture the size and shape of the mapping target of interest. The image below gives an example of the suggested layout and visualization. When examining a particular file using the Swath Editor, you can enable a number of visualization options to help you understand which of your soundings are additional detections and which have been rejected and/or accepted by default. Refer to the Swath Editor documentation for more information on how to control the visibility in the Swath Editor and the 4D Scene. The Water Column documentation also provides information how to control visibility in this particular display. It is recommended that you review both of the reference materials for both of these tools to best decide what visibility options suit your workflow and the task at hand.

The image below shows the Additional Soundings drawn in blue, it is clear from these images that the Additional Soundings are providing extra resolving capability of the deck structure. Note that soundings can only be edited (marked as accepted or rejected) in the Swath Editor window.

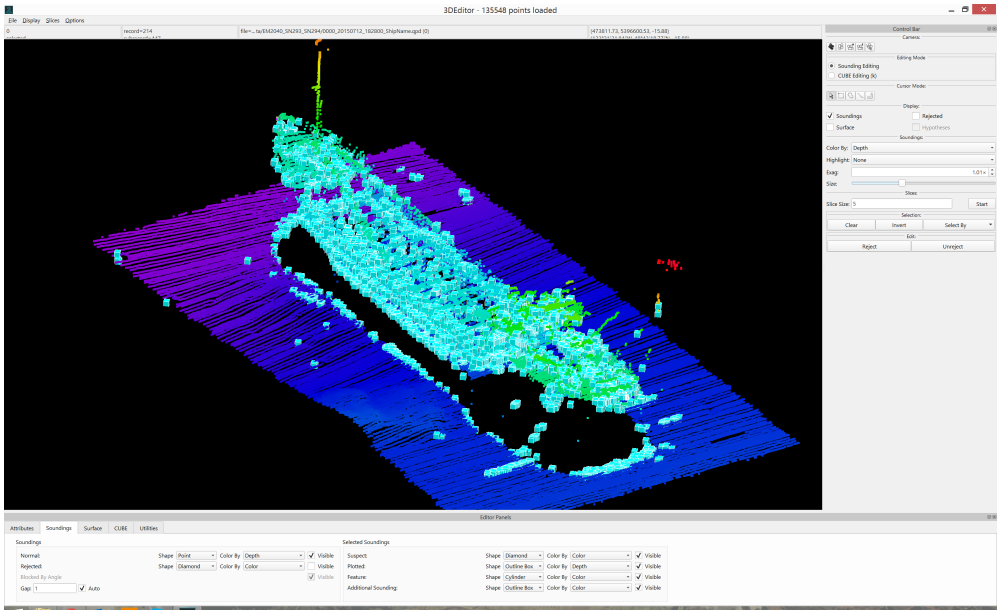


3D Editor

Additional Soundings can be viewed in the 3D Editor as well, as shown in the image below where the Additional Soundings are displayed as teal spheres. The area based editing approach has the benefit of being able to visualize soundings from multiple survey line passes at the same time. The documentation for the 3D Editor describes how to adjust the visibility and display options for Additional Soundings. Examples of typical display and selection options that you can use are:

- You can change how Additional Soundings are displayed under the *Soundings Group* at the bottom of the 3D Editor. The default is to display them as teal spheres. Even if the Additional Soundings are rejected, they will be displayed as a teal sphere.
- If the Rejected tickbox on Control Bar on the right side of the 3D Editor is ticked, then additional the rejected Additional Soundings will be shown. Otherwise, they are not shown.
- You can change your selection mode to only select Additional Soundings via the *Select By* dropdown menu on the Control Bar on the right side of the 3D Editor.

The Quick Start Guide describes how to use the 3D Editor in a typical area based editing exercise and it should be consulted further for information on how to visualize, select, accept and reject soundings based on a variety of selection criteria.


3DEditor - 135548 points loaded
File Display Slices Options
Control Bar
Camera
Editing Mode
Sounding Editing
CUBE Editing (k)
Cursor Mode
Display
Soundings
Rejected
Surface
Hypotheses
Soundings
Color By: Depth
Highlight: None
Exag:
Size:
Slices
Slice Size: 5
Start
Selection
Clear
Invert
Select By
Edit
Reject
Unreject
Editor Panels
Attributes
Soundings
Surface
CUBE
Utilities
Soundings
Normal
Shape Point
Color By Depth
Visible
Rejected
Shape Diamond
Color By Color
Visible
Blocked By Angle
Visible
Gap: 1
Auto
Selected Soundings
Suspect
Shape Diamond
Color By Color
Visible
Plotted
Shape Outline Box
Color By Depth
Visible
Feature:
Shape Cylinder
Color By Color
Visible
Additional Sounding
Shape Outline Box
Color By Color
Visible

How-to Apply Tides

This How-to describes the work flow for applying tides in Qimera.

On this page:

- Import supported tide data
- User-defined import of tide data (ASCII)
- Confirm Tide Data Import
  - Visual Confirmation
  - Data Overlap

Import supported tide data

If your file is one of the following formats then you can import it directly into Qimera:

- Qinsy Tide Data (*.qtd)
- Qinsy Regular Tide File (ex: 24/10/2009 10:10 1.24)
- UK Tide Gauge Network, BODC Tide format
- NOAA CO-OPs OPeNDAP
- Caris (*.tid) (ex: 2000/11/01 00:00 0.522)
- Swedish Maritime Authority (*.niv) (ex: 20040819,1240, -0.0)
- ARGOSS - Fixed Format
- COWLIS - Canadian Hydrographic Service
- MSQ Dialmace
- PREDUCT - Dutch Navy (*.qtr)
- RIKZ - Dutch Public Works
- HMS - Fixed Format (*.log)
- DMY HMS - Fixed Format (ex: 15/09/00 08:30 -2.02)
- YMD HMS - Fixed Format (ex: 20000808 0000 -12)
- Finnish Maritime Administration
- SHOM

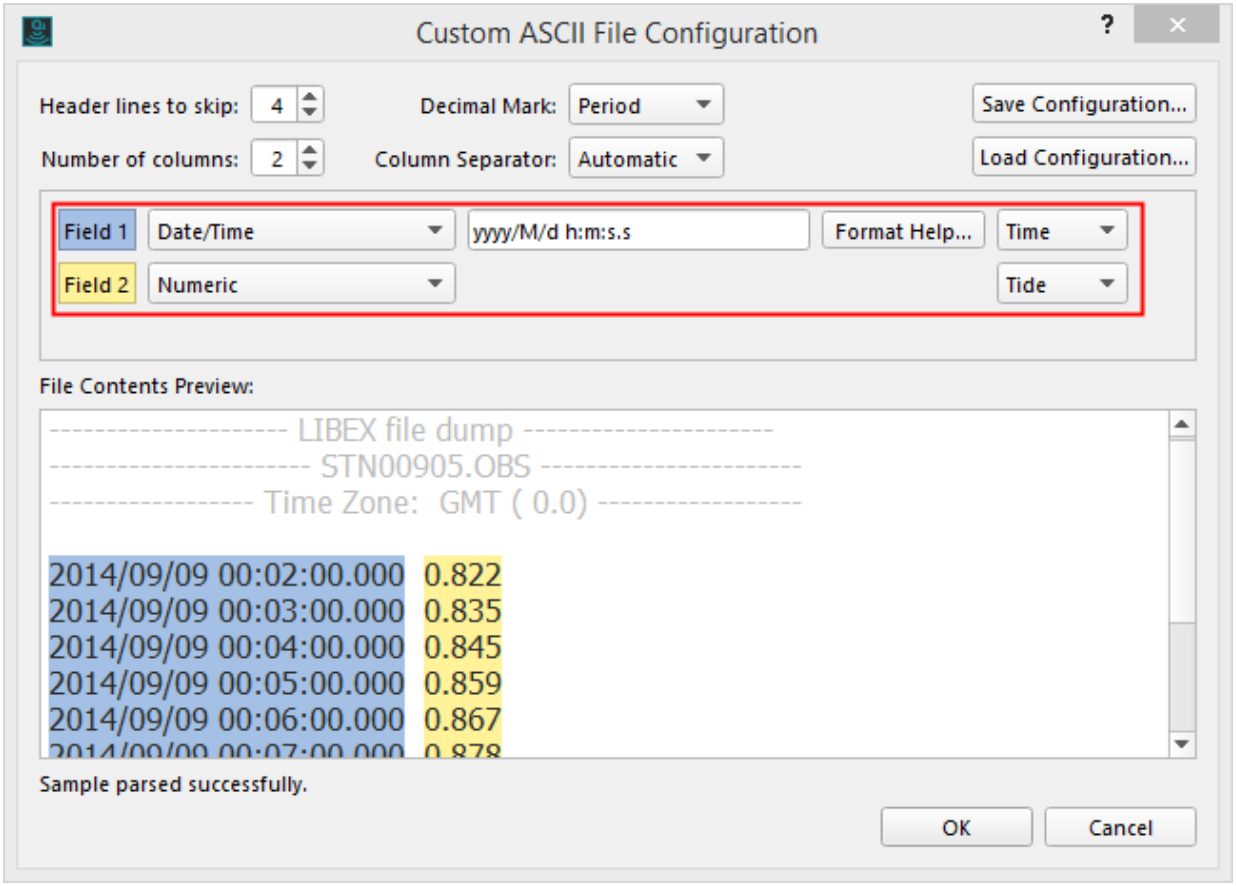
1. From the 'Source' pull-down menu at the top of the Qimera window, hover over 'Import' and select 'Supported Tides'
2. Navigate to the location of the your tide file and open it.

User-defined import of tide data (ASCII)

Qimera allows detailed parsing of an ASCII file containing tide data.

1. From the 'Source' pull-down menu at the top of the Qimera window, select 'Add Tide Files...'

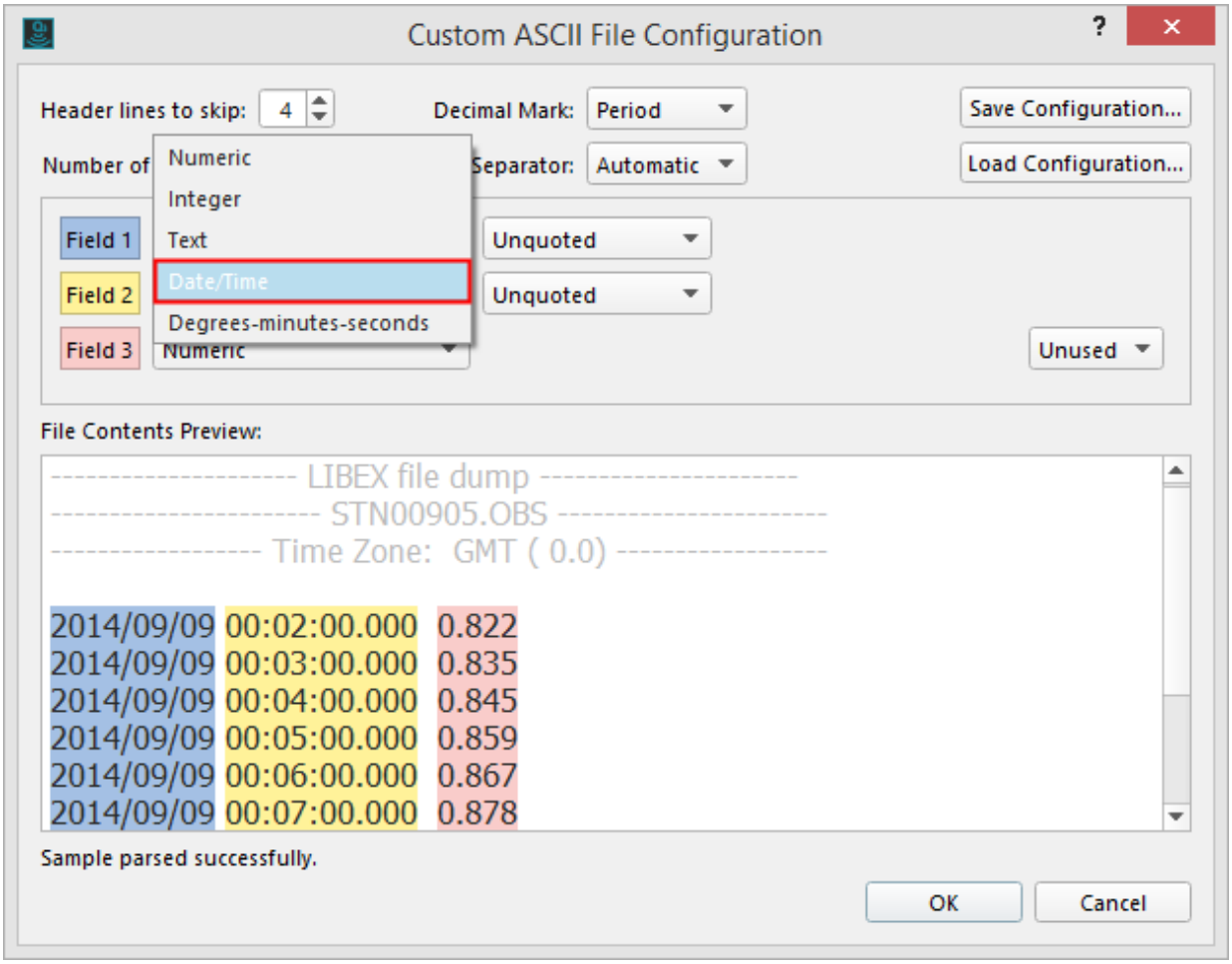
2. Select your ASCII file and open. The ASCII configuration window will then launch.
3. The tool will try to auto-detect the number of header lines. If this number is correct, the header lines should be greyed out.
4. Scroll down the File Contents Preview (if necessary) and view the data fields.



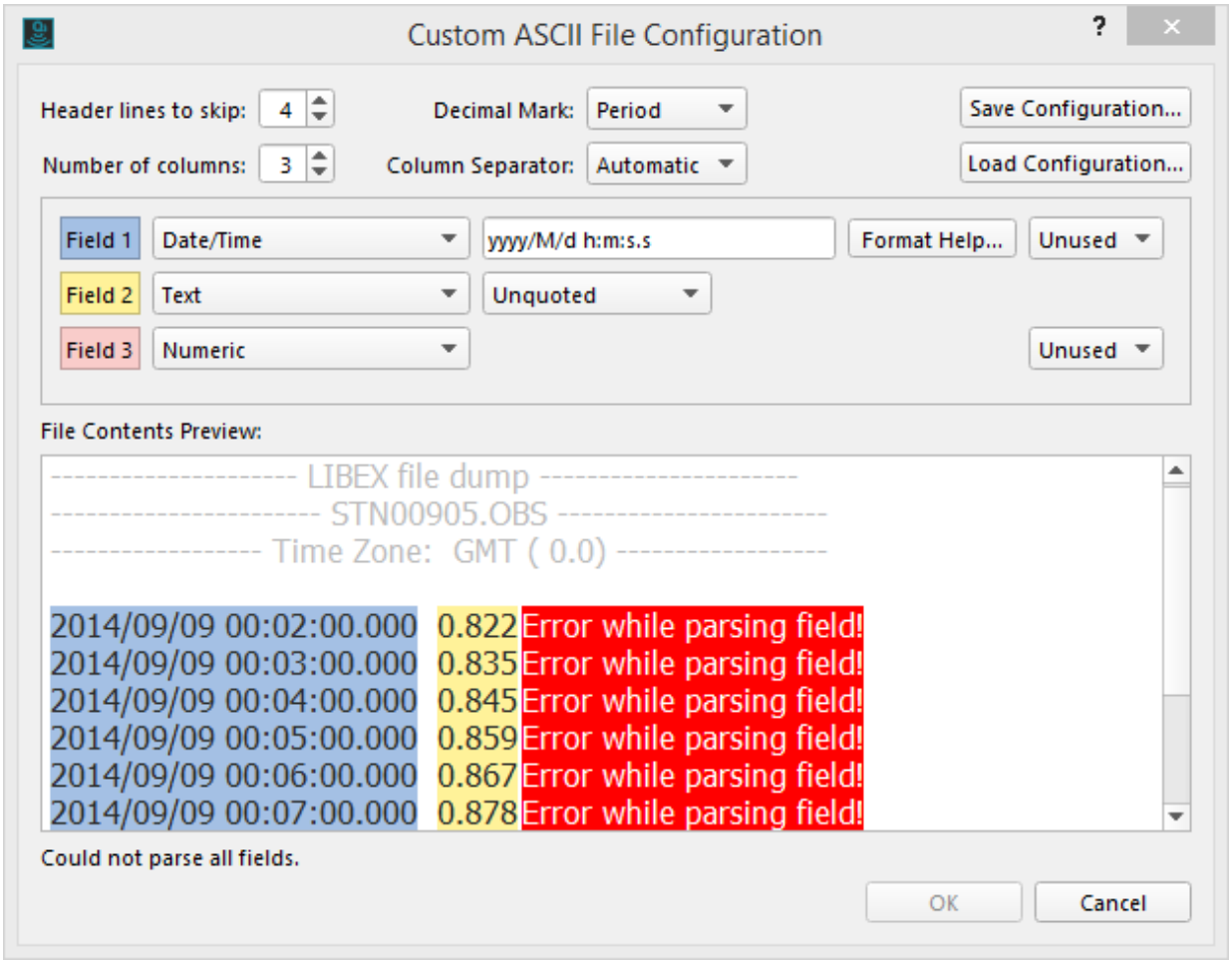
In this case, the date/time field has been correctly detected, the tide and time have also been set.

If your file has been incorrectly parsed follow the steps below, otherwise skip to step 10.

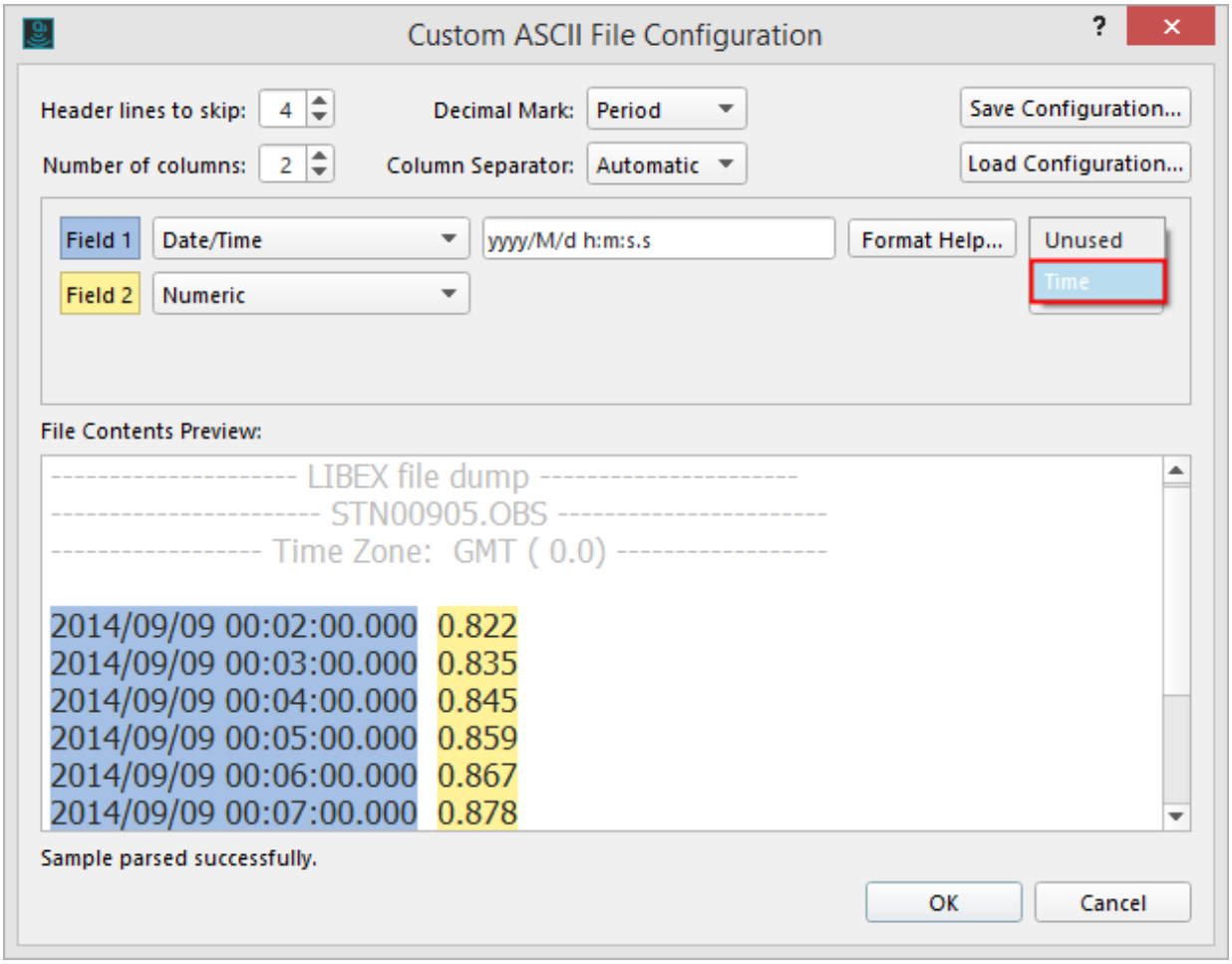
5. Each column of data needs to be associated with a data type. Use the field pull-down menus next to each field.



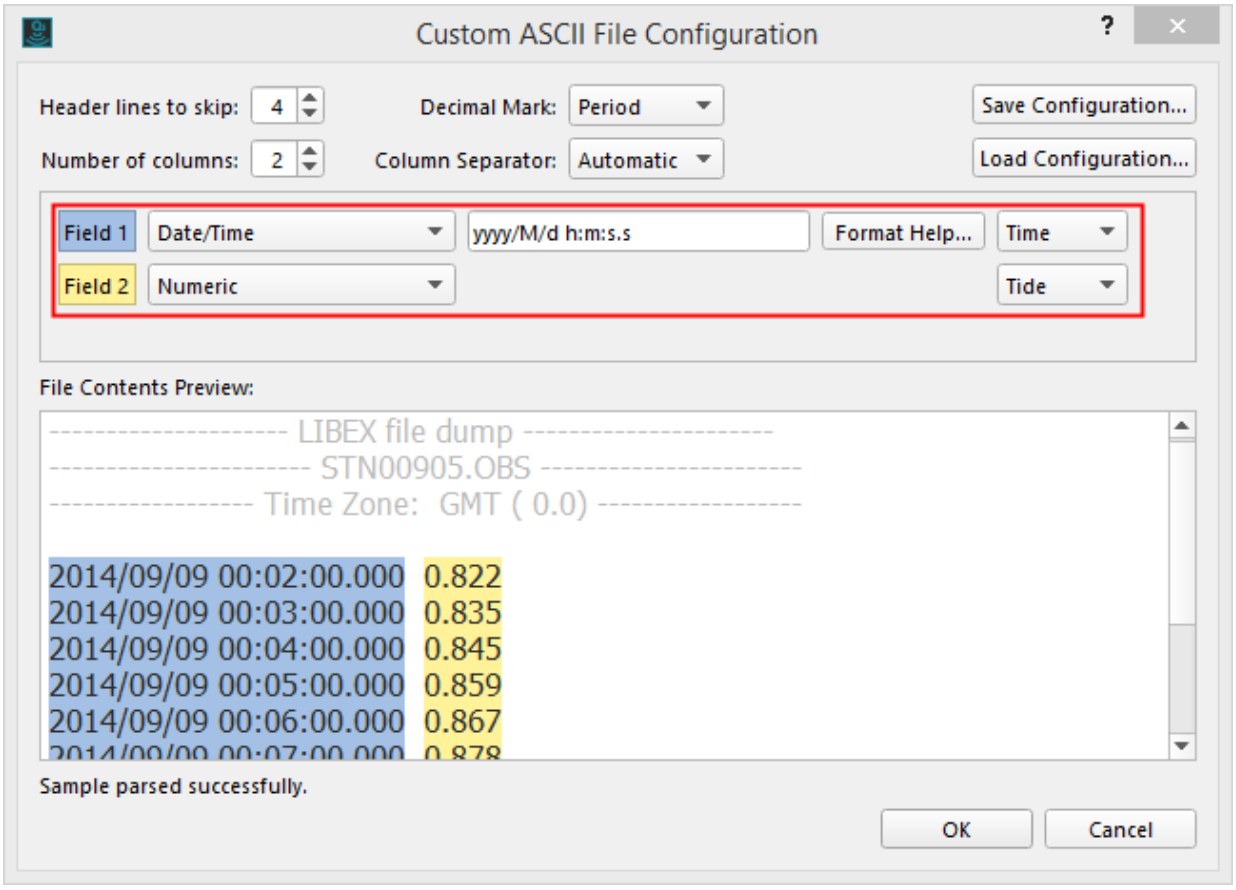
6. When the data type for field 1 is changed the default date/time may or may not work: The default format is editable. Changing it in this case to (yyyy/M/d h:m:s.s) solves the problem. It also leaves you with an extra field



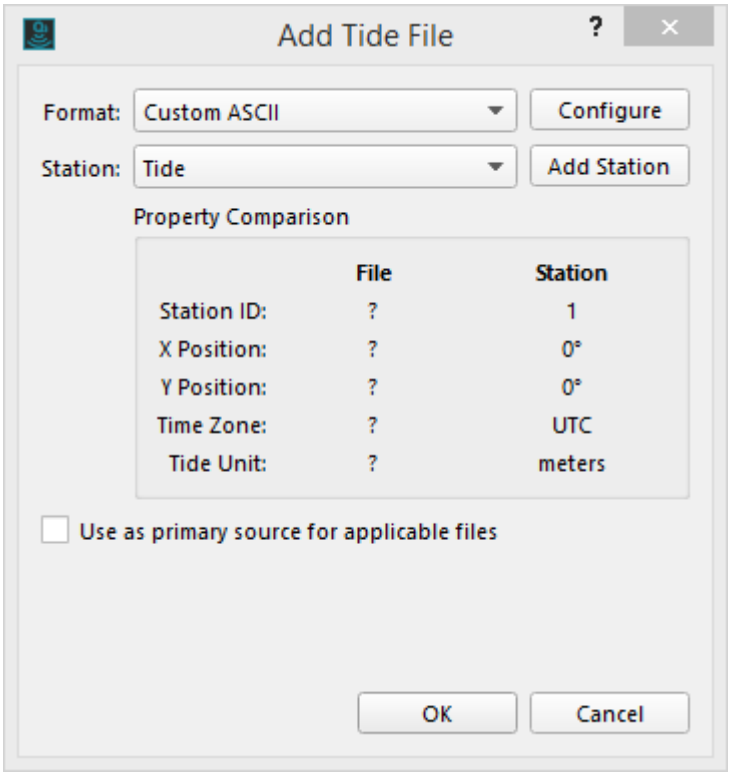
7. In the case above, the Field 2 data type needs to be changed to Numeric and the number of fields reduced to 2 (If you want to save this configuration for future imports, use the Save Configuration button near the top right corner of the window).
8. You now need to set the the Field Mappings, using the pull down menus at the end of each field to set the correct value



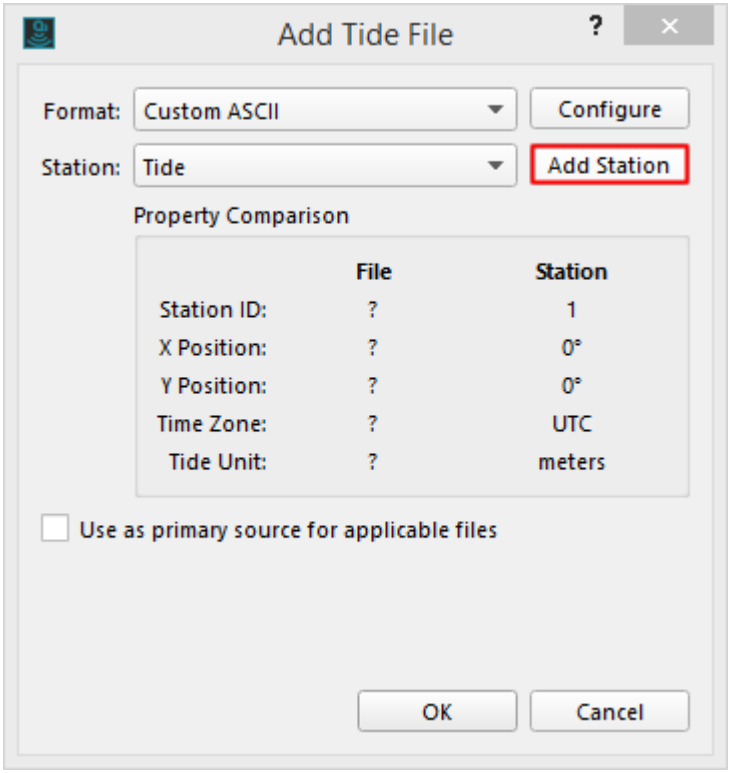
9. Once the sample has been parsed successfully (this will be stated below the Contents Preview window) you can click OK



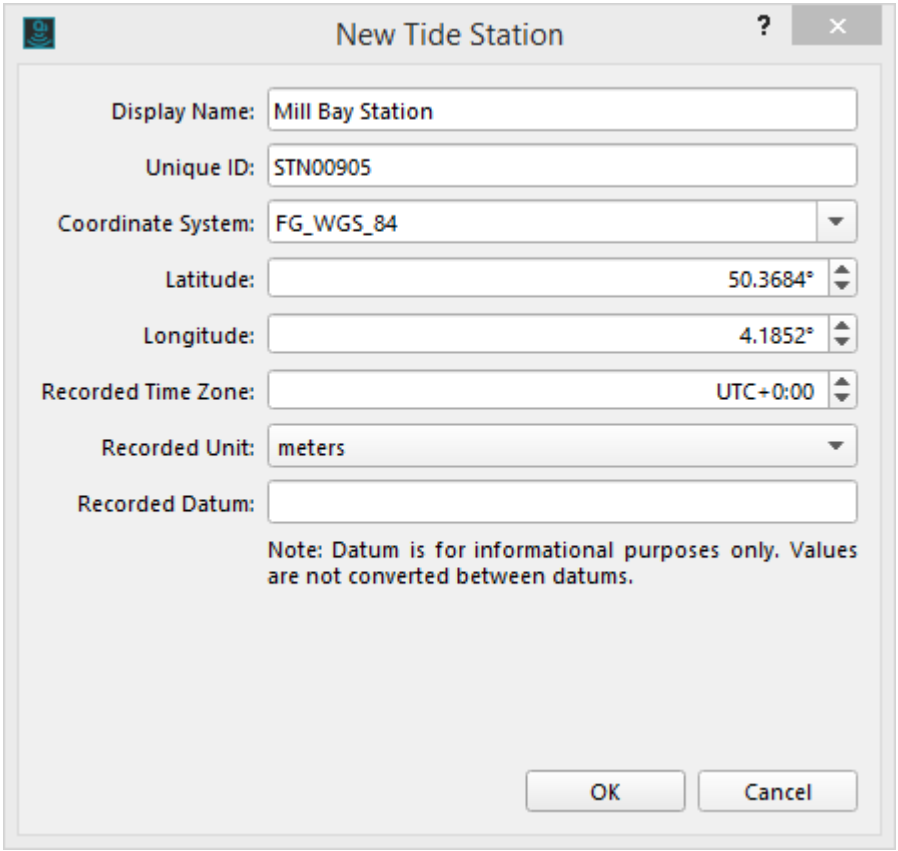
10. Now the tide station needs to be set.



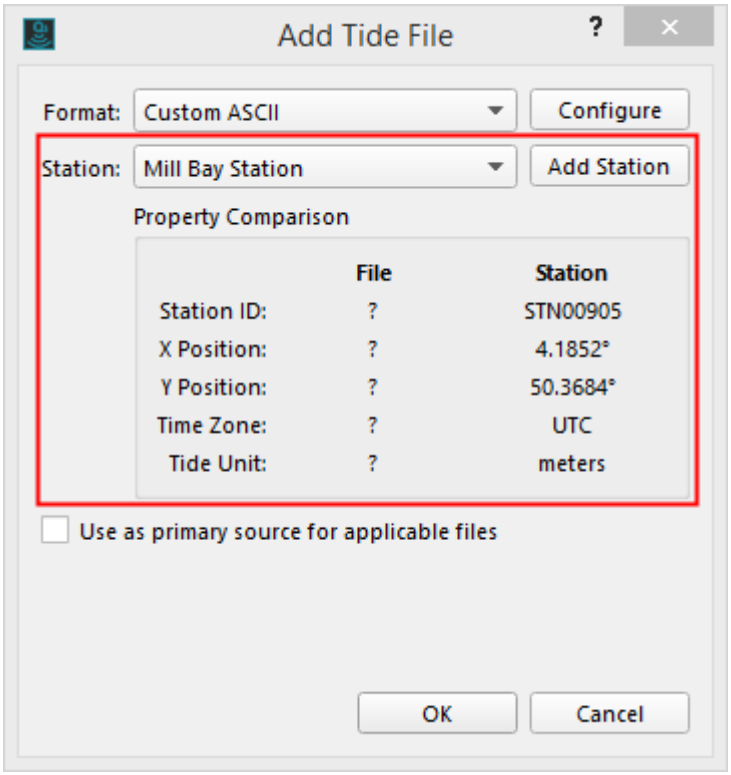
11. You can either use the station information given or click the 'Add Station' button.



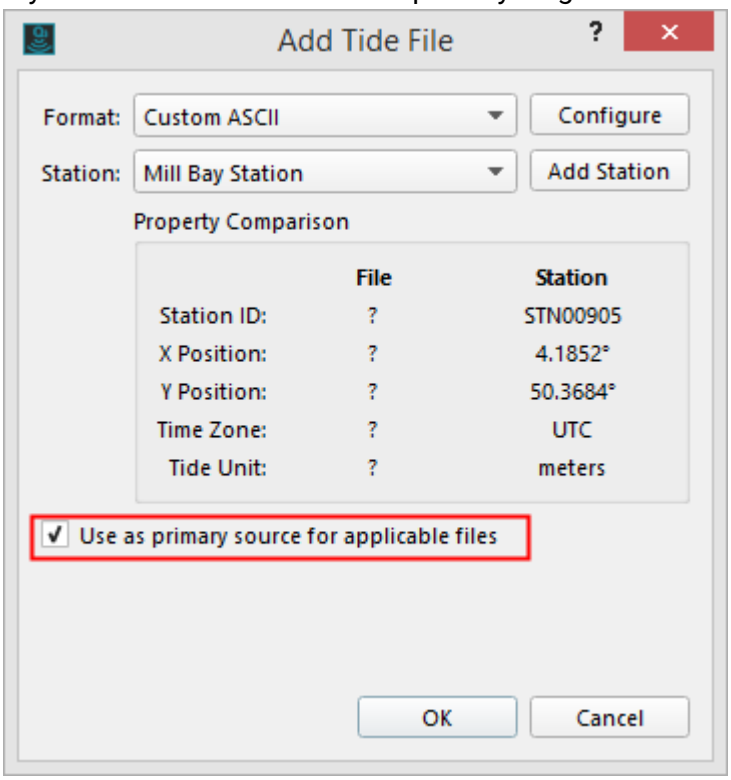
12. This will allow you to set a new tide station for your data. Make sure that you have a unique ID, the correct co-ordinate system.
13. It is important to have to correct position of the tide station and the correct recorded time zone or your tide will not be able to be applied.



14. Check the recorded unit and add the datum if you wish.
15. Click OK and you will return to the Import ASCII Tide Profile Window.
16. Make sure that all the information has been correctly updated



17. If you wish this to be set as the primary height source tick the box.

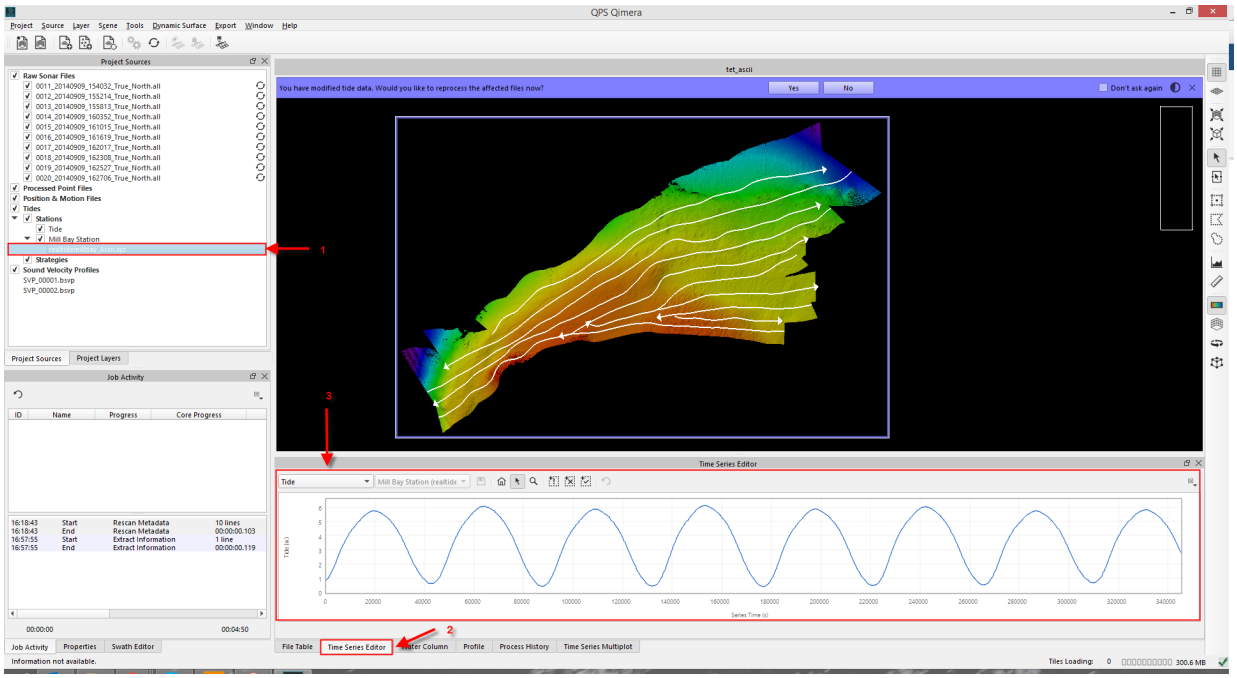


18. Be aware, if the files do not match up with the tide (either the time or the location) the tide file will not be applied.

Confirm Tide Data Import

Visual Confirmation

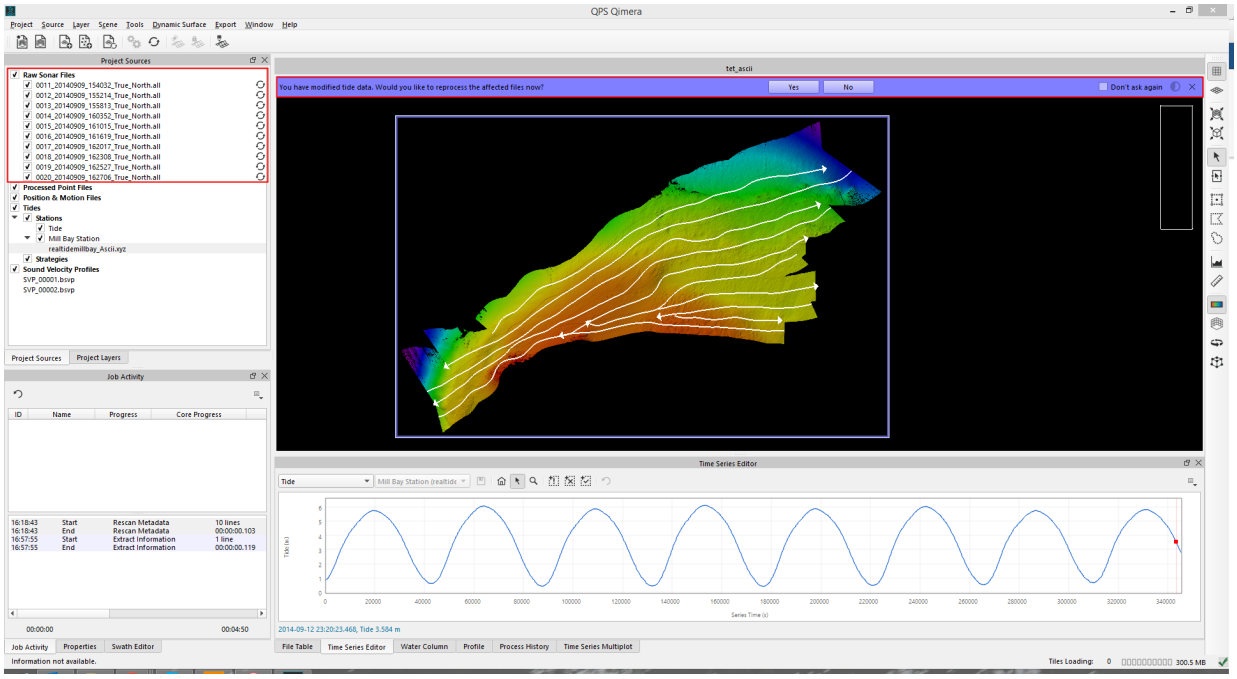
1. Select your tide file in the Project Sources box (1) in the main Qimera window. If it is not present, it can be enabled under the Window pull-down menu.



2. Click on the Time Series Plot tab (2) at the bottom of the screen. This box can be enabled under the Window pull-down menu if it is absent.
3. You will see the tide data in the Time Series Plot (3)

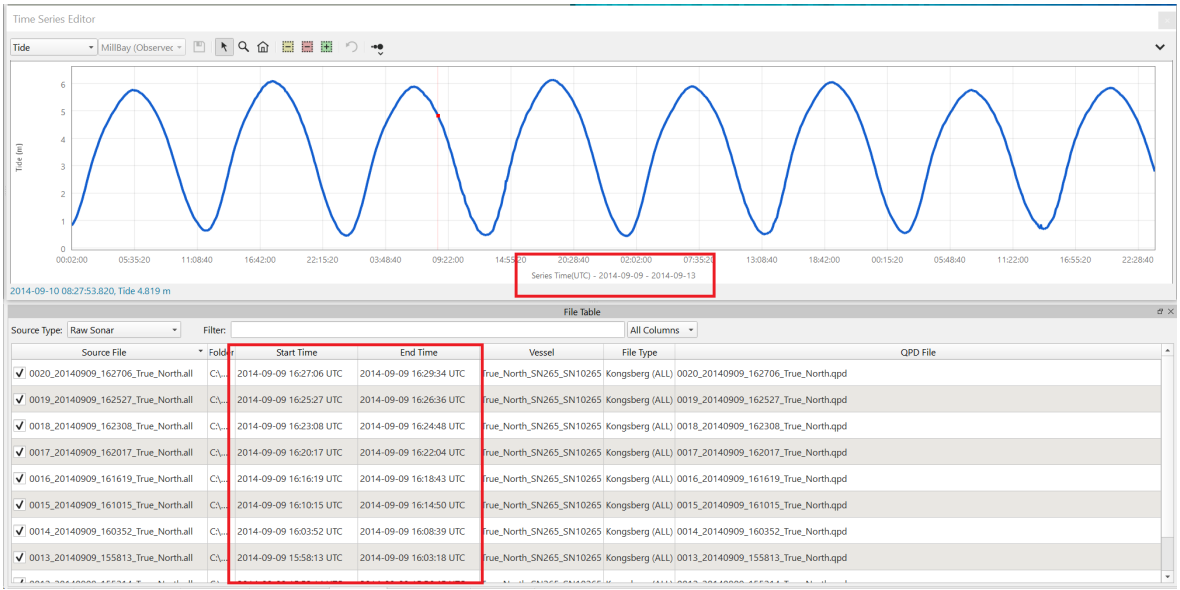
Data Overlap

1. You may see a dialog pop up at the top of geographic window asking if you want to reprocess files now. Before you click yes, you may want to confirm that all files have appropriate overlap with the tide data.





2. Additionally, you can confirm that your tide series beginning and end overlap with your data files:

a. 

3. Check the status of the multibeam files in the Project Sources window.
4. You should see the reprocess icons to the right of each line name. Hover your mouse over the icon, it should indicate that the line requires Z navigation reprocessing. This indicates that the

data from the tide file overlaps with the multibeam data and is waiting to be applied to that line.

5. To process the lines, select them and click on the Auto-Process button just under the menu at the top of the screen. Alternatively, each line can be reprocessed by double clicking the name.
6. The dynamic surface will automatically be updated when the reprocessing is complete.

How-to Dynamic Surfaces

This How-to briefly explains Qimera's Dynamic Surface, how to create a Dynamic Surface and how to utilize the surface in the processing workflow.

On this page:

- What is a Dynamic Surface
- Create a Dynamic Surface
- Create Dynamic Surface Dialog
- Project Layers - Dynamic Surface
- Using Dynamic Surface
- Dynamic Surface Main Menu

What is a Dynamic Surface

The Dynamic Surface is an integral part of Qimera's Dynamic Workflow™. Qimera's Dynamic Workflow engine works by taking advantage of the dependencies between raw measurements, processed soundings and derivative products. If a raw measurement is altered, or perhaps a processing configuration is changed, the engine can easily establish which set of processed soundings must be updated, it will establish exactly what type of re-processing must occur and also which derivative products must be updated. The Dynamic Surface is dynamically updated when re-processing occurs.

Qimera's Dynamic Workflow™ has two modes: an automatic processing and update workflow mode and a manual workflow mode. In the manual mode Qimera simply marks all source items needing reprocessing with an update icon in the Project Sources view. The user can trigger an update by clicking the Auto Process button in the main toolbar.

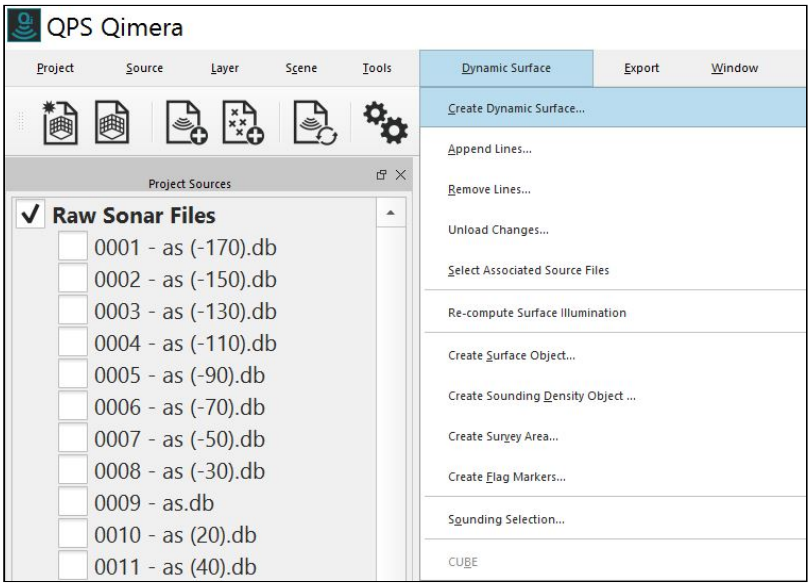
A Dynamic Workflow is established only when the user allows Qimera to perform all necessary updates automatically after a user makes a change to any of the items for which other items may depend upon. The mechanism for this is "Do not ask me again" tickbox that is always shown in the prompted questions that are presented to the user after any major type of edit or reconfiguration operation. This is done slowly as the user gains more experience with Qimera and explicitly chooses to allow Qimera to remember desired outcomes when they perform an edit or change a configuration.

The user can revert to a manual mode of operation by clearing the remembered questions in the Project Preferences dialog, which is accessed under the Project menu.

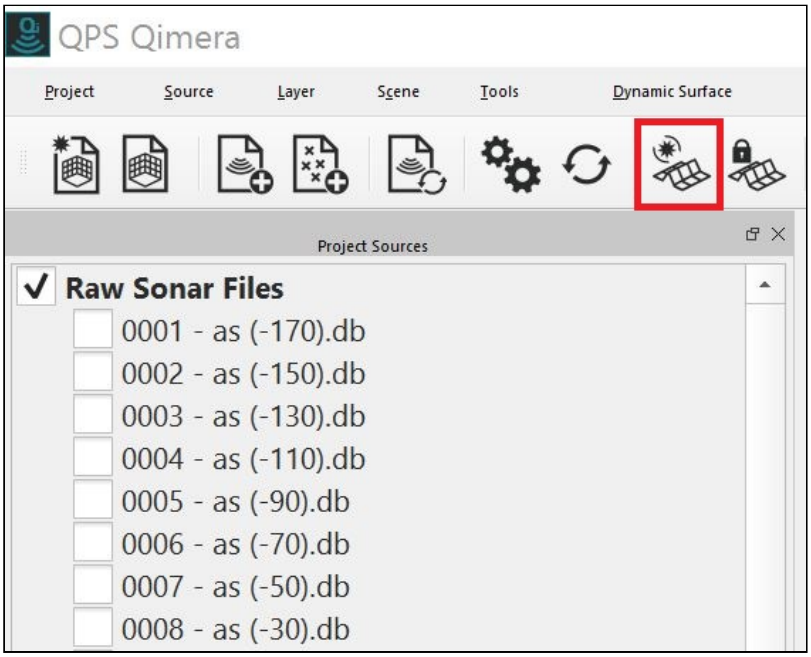
Create a Dynamic Surface

You can build the Dynamic Surface from two places:

1. From the Main Menu, select Dynamic Surface and then select Create Dynamic Surface.



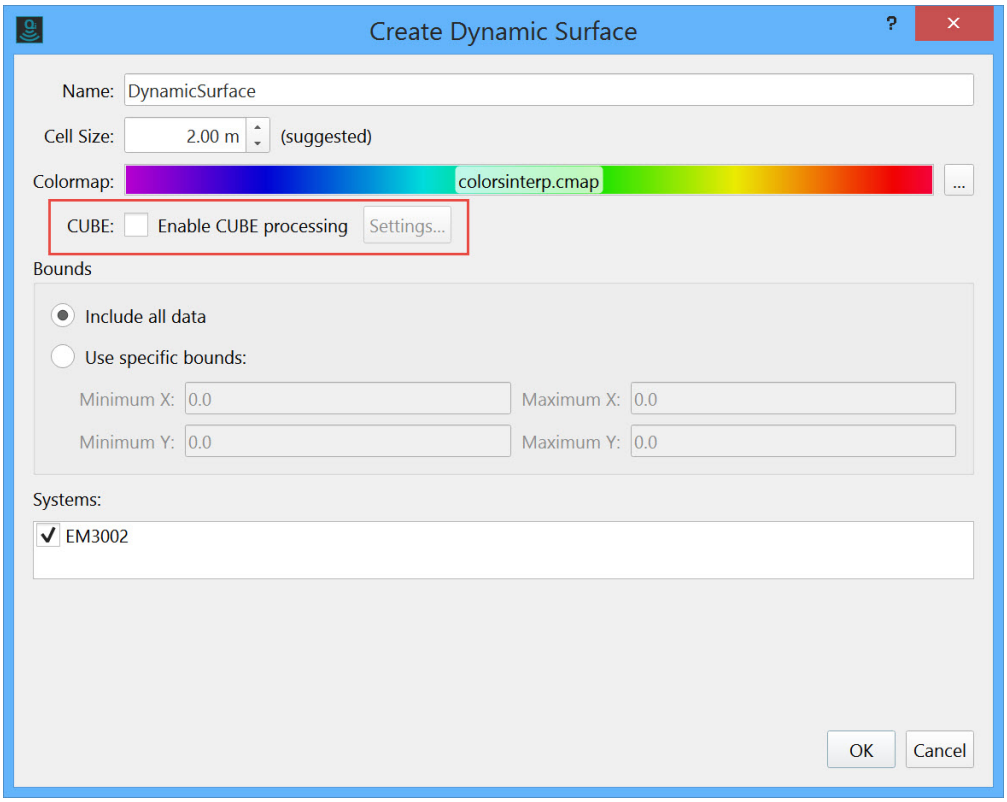
2. Or by using the Dynamiac Surface Button.



 Dynamic Surface Button. This will launch the **Create Dynamic Surface** dialog that will create a dynamic surface from the selected source data and optionally the currently selected rectangular area.

Create Dynamic Surface Dialog

1. Selecting Create Dynamic Surface opens up the Dynamic Surface Dialog



2. In this dialog you can Name the Dynamic Surface. Since you can create multiple Dynamic Surfaces this can be useful to distinguish Dynamic Surfaces produced for a specific area, survey day or processing stage.

3. Qimera suggests a suitable cell size for the grid to give the best surface that the data resolution will support.

4. Select the Colormap you wish to use with the Dynamic Surface.

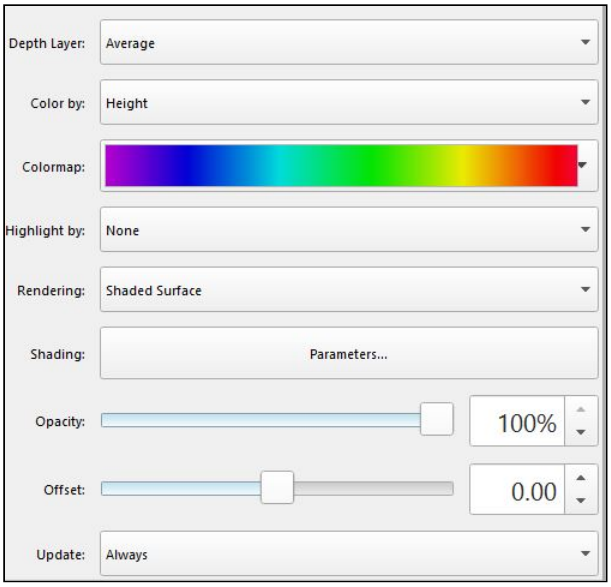
5. The dialog offers enabling of CUBE processing for 3DEditor. If this is not selected a standard Area Base Editing - sounding based Dynamic Surface will be produced for use in 3DEditor.

6. Specify using all the data or restricting by using specific bounds.

7. Finally, the dialog display the sonar Systems that are involved in the creation of the Dynamic Surface.

Project Layers - Dynamic Surface

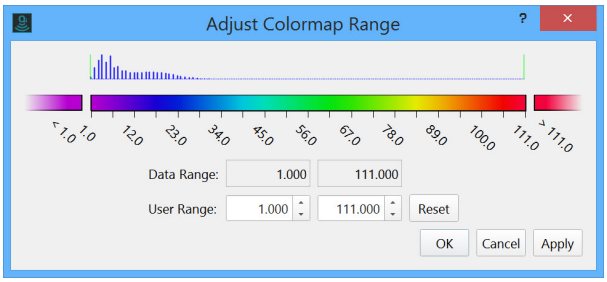
Once the Dynamic Surface has been created it will appear in the Project Layers tab under the Dynamic Surfaces in the Project Layers tree.

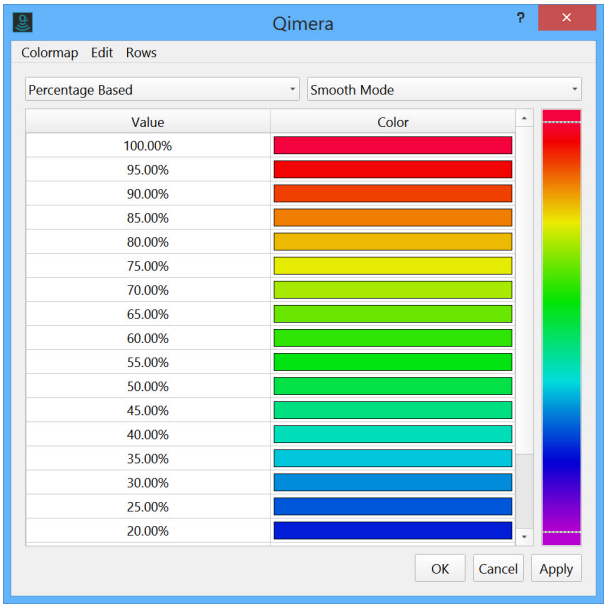


By highlighting a Dynamic Surface you are offered a menu that enables you to select what layer is visible, what color map is used, shading and opacity parameters and also vertical exaggeration and offset.

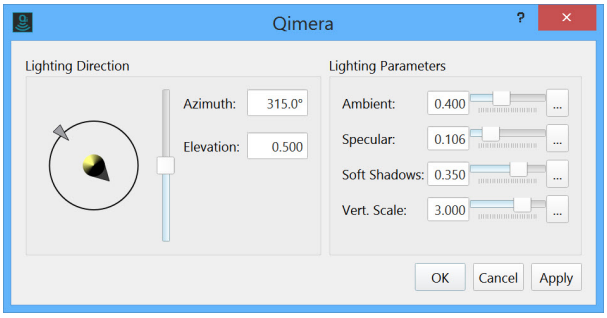
The visual changes offered are:

- **Vertical Exaggeration**
- **Depth Layer -** ***Shallow, Average, Deep***
- **Color by -** ***Height, Standard Deviation, Sounding Density, Checked Flag, Plotted Flag, Feature Flag***
- **Colormap -** ***Load colormap, Change Colormap Range, Edit Colormap***





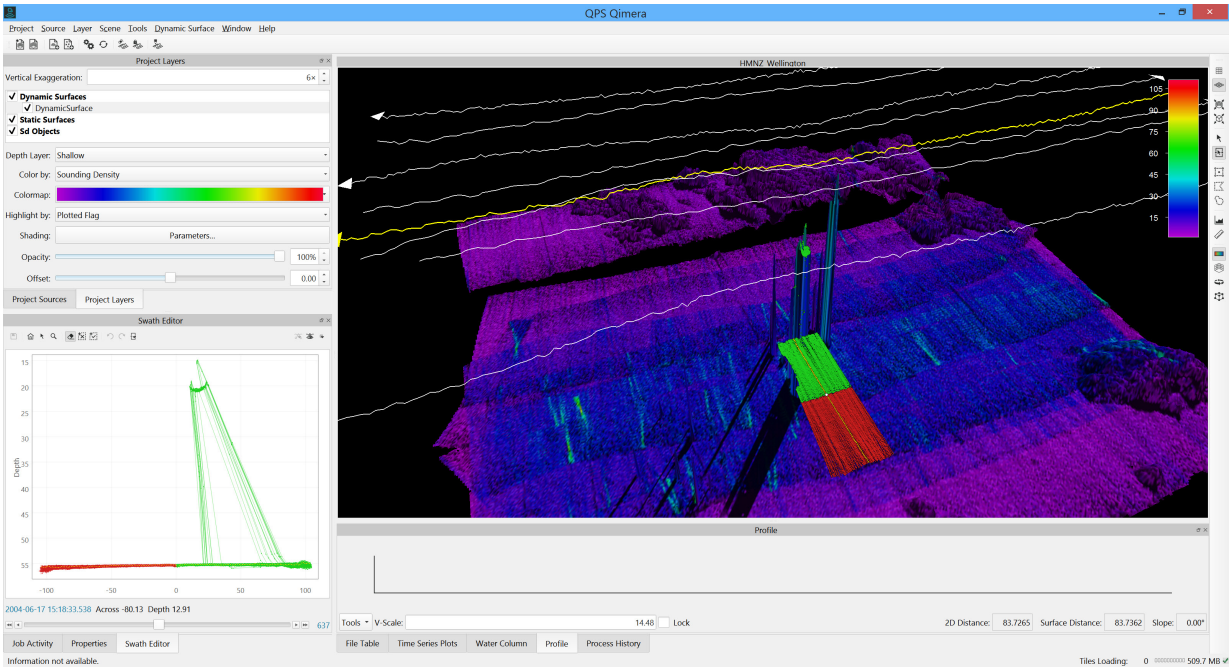
- **Highlight by - *None, Plotted Flag, Checked Flag, Feature Flag***
- **Shading Parameters**



- **Opacity**
- **Offset**

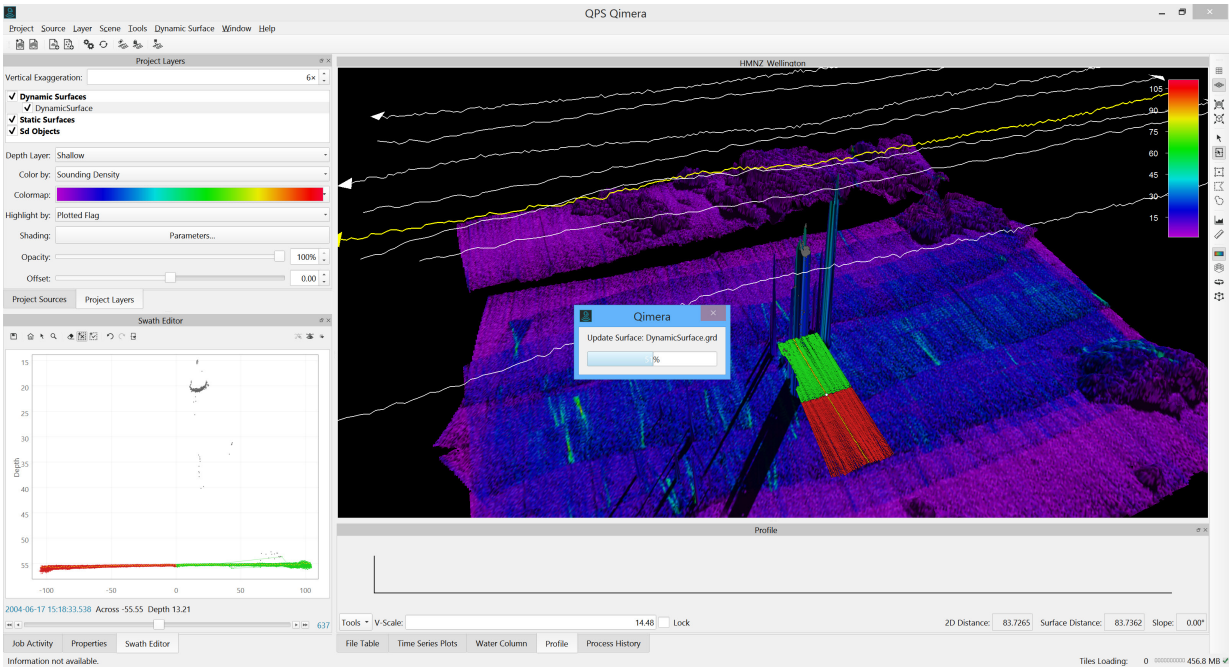
Using Dynamic Surface

1. With a Dynamic Surface selected you can combine this with the Swath Editor tool and clean and quality control the source data with the surface for reference.



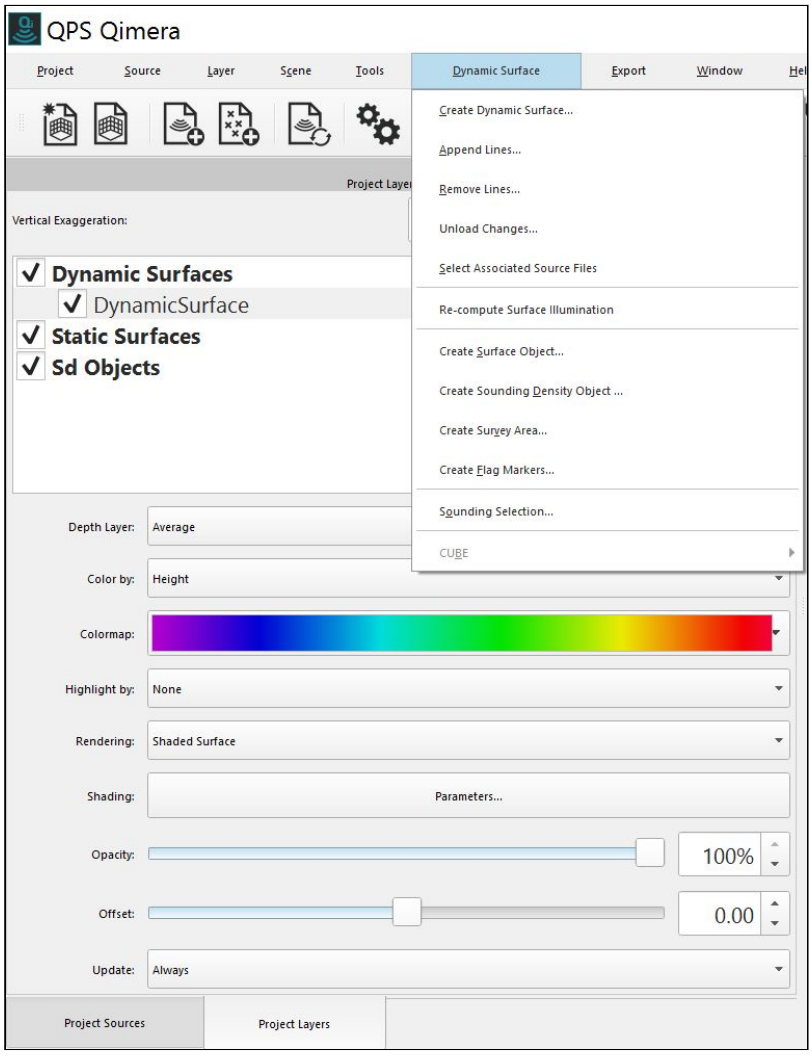
For and indepth guide to the use of the Swath Editor tool, please see this article - How-to Clean Data with the Swath Editor

2. Any editing done can be saved and dynamically processed and updated to the Dynamic Surface.



Dynamic Surface Main Menu

The Dynamic Surface Main Meun offers editing and additive options for the Dynamic Surface, such appending new source lines of data or applying a Spline Filter. It also offers Export and Product options such as creating a GRD file or Exporting the Soundings.



For information on Howto Apply a Spline Filter to a Dynamic Surface please see this article How-to Spline Filtering details

How-to Process a Patch Test

This How-to document describes how to perform a patch test in Qimera. The document applies to single-head multibeam echosunders as well as dual-head multibeam echosounders.

On this page:

- Patch Test Overview
- Step-by-step guide
  - Step 1 - Setting up the data and activating the patch test tool
  - Step 2 - Selecting lines and determining offsets
  - Step 3 - Applying patch test offsets
- Tips and Tricks

For information on multibeam Patch Test (calibration) theory, please see this Qinsy document: How-to Calibrate a Multibeam Echosounder (Patch Test).
This document also describes the sailing pattern for gaining the best patch test results, for both single-head and dual-head multibeam echosunders.

For a more in-depth explanation of the specific functions in the Patch Test tool, please visit our reference manual here: Qimera Patch Test

Warning

Qimera Patch Test Tool has been designed for calibrating both single-head and dual-head multibeam systems. The directions on this page assume you are using a single head multibeam system.
There is a section on the calibration of a dual head system at the bottom of this Qinsy document: How-to Calibrate a Multibeam Echosounder (Patch Test).
There is also information here: Kongsberg EM2040 Dual Head Calibration

Info

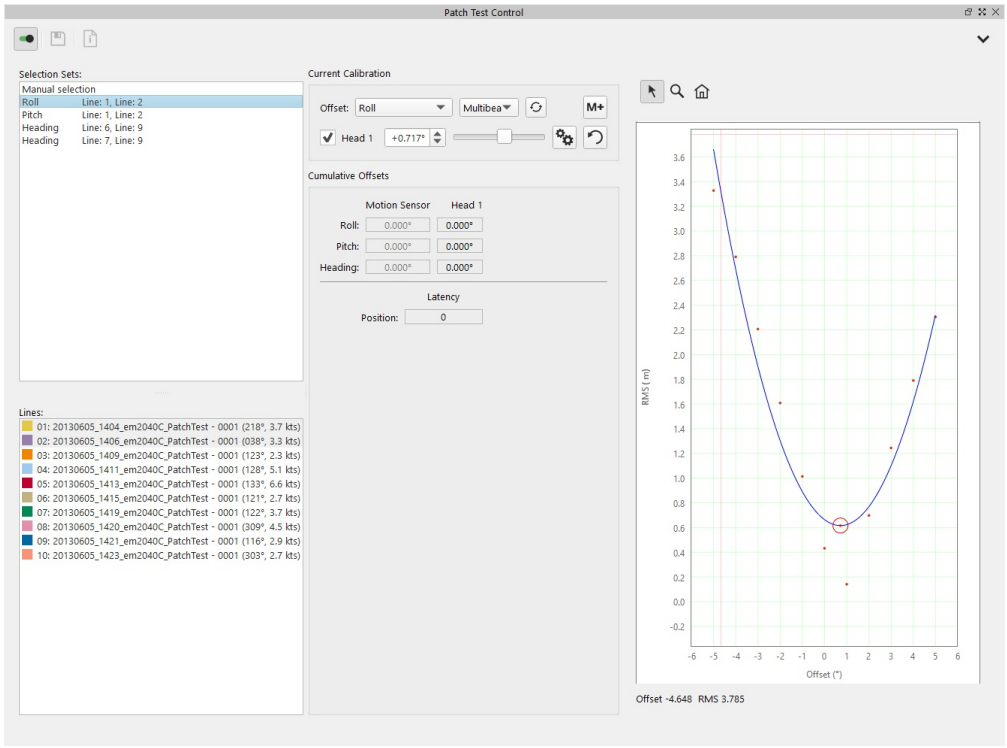
From the Qimera FAQ:

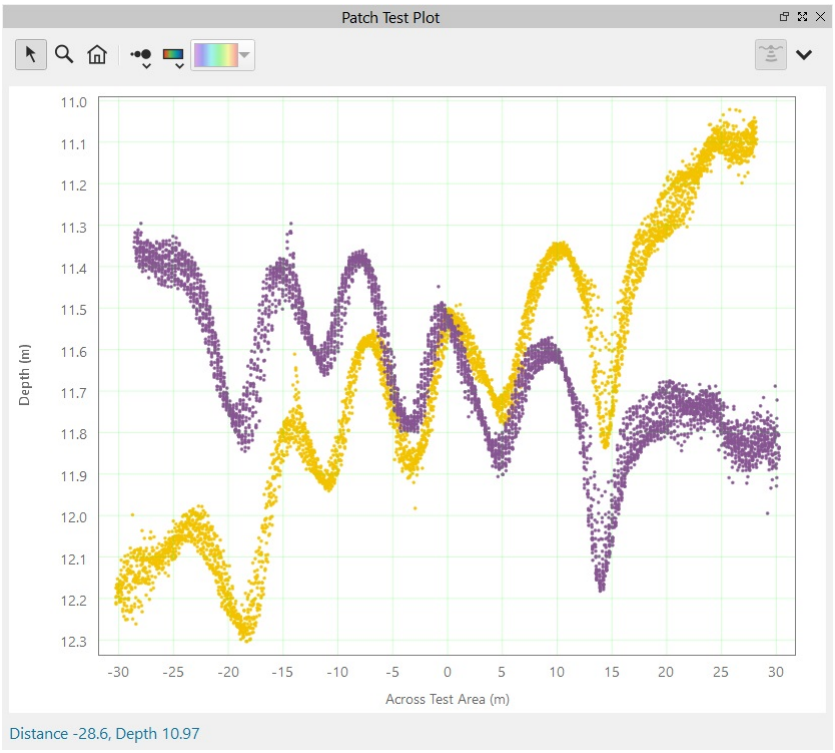
When I apply Patch Test results, the angular offsets are not entered the same for the Tx and Rx transducers in the Vessel Editor, why?

Qimera separates the two transducers in its vessel offsets.
The Patch Test Tool will apply the offset corrections to the transducer at which they will have an effect. Roll to Rx, Pitch and Heading to Tx.
The values from the Patch Test can also be applied to the motion sensor data instead of the mounting offsets of the transducers.

Patch Test Overview

The Patch Test Tool window consists of two hot dockable windows, which are the Patch Test Control Window and the Patch Test plot window.
The Patch test tool can be launched by using a hotkey, which can be configured by the user.



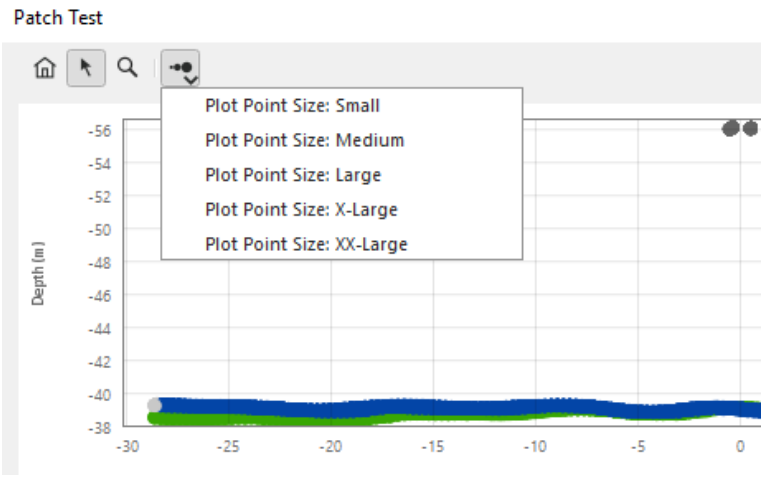


1.

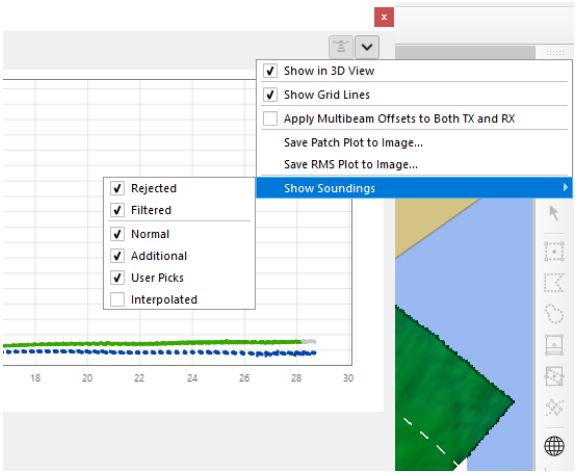
- The Patch Test Plot window contains tool buttons and a point cloud cross section displaying the soundings that are within the selection box.

- The Patch Test Control window (on the left) has 3 main areas: the Selection Sets (based on the lines listed below), the Calibration area and the Graphical representation.

The size of the dots in the point cloud graph can be adjusted using the Plot Size button by using either the drop down menu, or the toggle functionality.
Points which have the rejected status can be turned off by using keyboard combo Ctrl+R.



An options drop down tab allows you to select what types of points to view, and gives the options of showing in 3D view, showing the grid lines, and applying multibeam offsets to both TX and RX.
Additionally there are options to save the patch plot and the RMS plot to images.



For a more in depth explanation of the specific functions in the Patch Test tool, please visit our reference manual here: Qimera Patch Test

Step-by-step guide

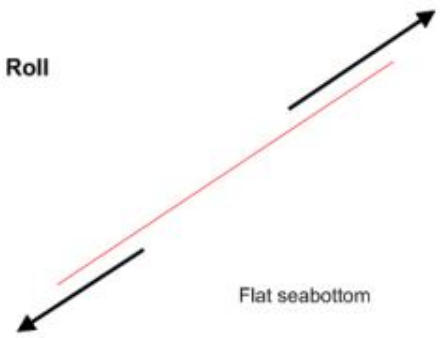
Step 1 - Setting up the data and activating the patch test tool

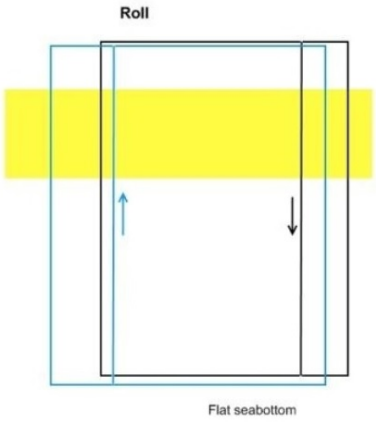
- Ensure you have loaded Raw Sonar Files into your project. These can be added using the 'Source' pull-down menu at the top of the main window.
- It's best to build a dynamic surface. Select one or more of the sonar files from within the Project Sources window. This window can be toggled in the 'Window' pull-down menu. Choose the same lines that will be used in the patch test. Select 'Create Dynamic Surface' from the 'Dynamic Surface' pull-down menu or click the 'Create Dynamic Surface' Icon.
- Select the lines to be loaded into the patch test tool from within the Project Sources window. Choose all the relevant lines to test for roll, pitch, heading, and latency.
- Click on 'Patch Test' in the 'Tools' pull-down menu at the top of the Qimera Window. This will bring up the Patch Test window with your selected lines loaded.

Step 2 - Selecting lines and determining offsets

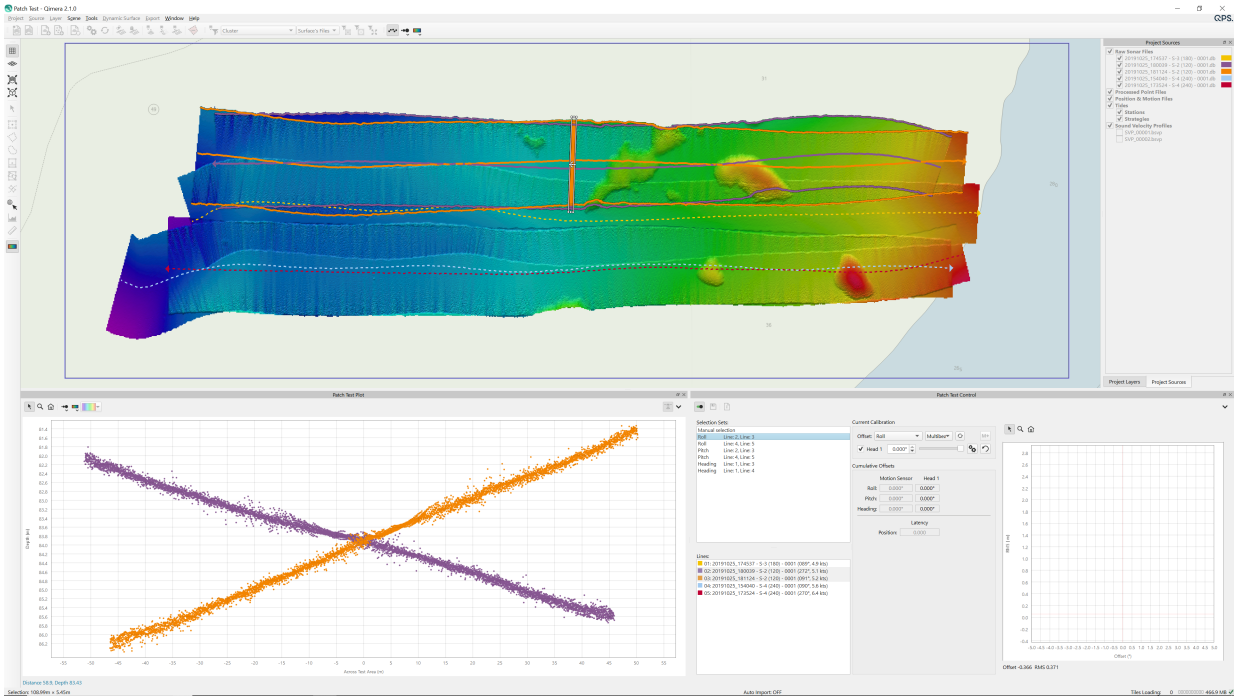
Roll Offset

The roll test uses two lines of data, run in opposite directions with the same vessel speed over the same ground (need to overlap as much as possible). An area of flat seabed is best for this test. From Howto Calibrate a Multibeam Echosounder .
The first graph shown below shows a line pair suitable for the roll calibration of a single-head multibeam echosounder . The second graph shows a line pair that is suitable for a roll calibration of a dual-head system

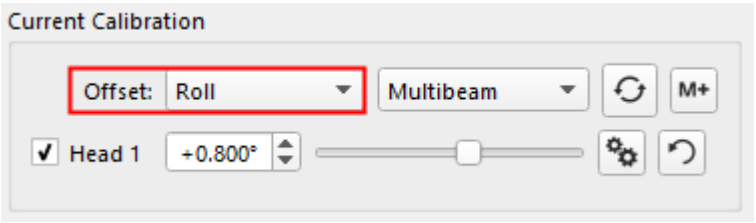




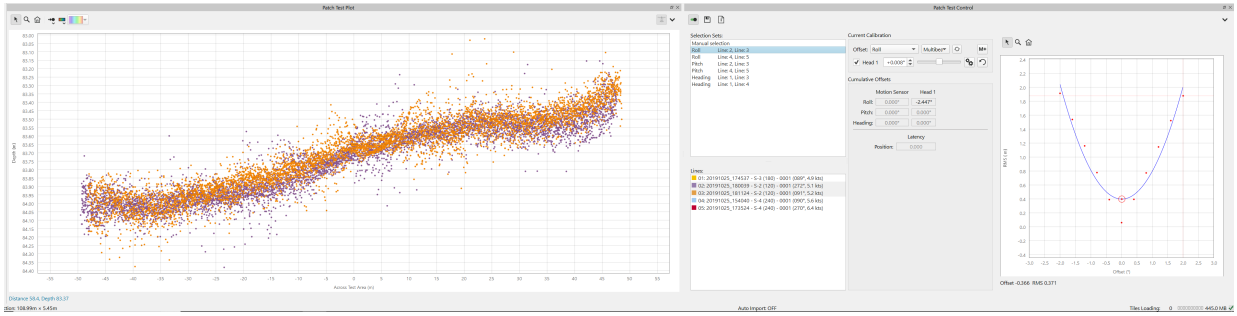
1. With the patch test tool open and relevant lines loaded, click on the pre-selected pair of lines in the line selection box. Alternatively, select your own lines. The pre-selection is done based on the auto-pairing algorithm.
2. Adjust the location of the selection box in the geographic window. It should be oriented at 90 degrees to the lines.



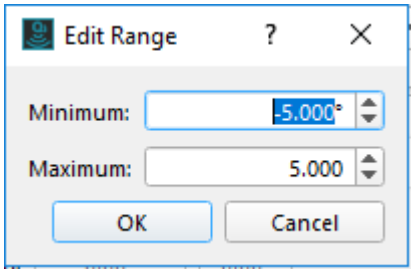
3. Ensure that 'Roll' is selected in motion pull-down menu box.



4. Now you can determine the offset manually by dragging the slider, or automatically by using the Auto Solve button  The two sounding cross sections should be aligned as closely possible.
   In order to enable the Auto Solve for a dual-head system, you will need to disable one of the two heads, both heads should be calibrated separately.



5. If the angular change is too coarse, adjust the scale using the 'Edit Range' button at the right end of the slider.



In this case, the Starting and Ending Values can be changed to something like -1 and 1

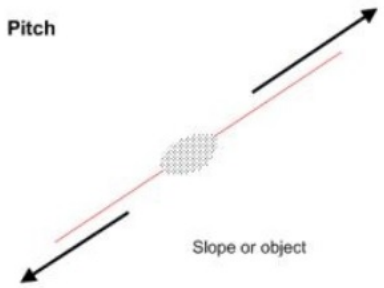
It may be necessary to increase or decrease the width of the selection box in the geographical window. A very narrow box will decrease the number of points that are in the cross sections.
This may be necessary in areas where the seabed is not as flat as it could be. The selection box can be resized, rotated, or redrawn at any time.

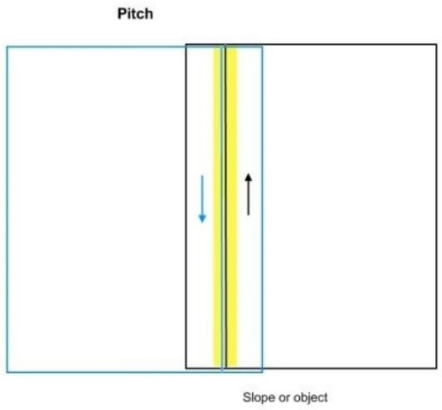
6. If you are using the auto-solve check that the parabola makes sense before applying. Once the cross sections are matched, the offset value needs to be saved. Do this by clicking the 'Add Calibration' button M+

Pitch Offset

To be able to determine the C-O for pitch, the patch test uses two lines of data in opposite directions with the same vessel speed over the ground.
A seabed with defined targets or is sloped (along track) is best for this test. From How-to Calibrate a Multibeam Echosounder.

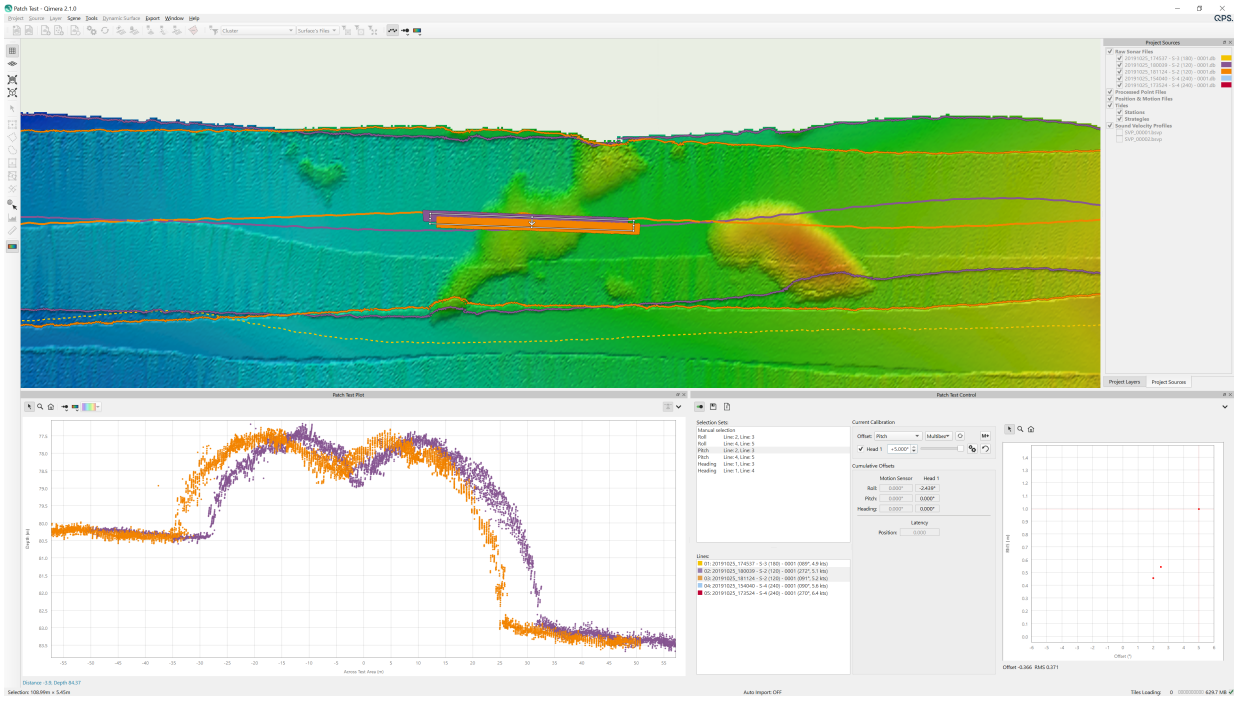
The first graph shown below shows a line pair suitable for the pitch calibration of a single-head multibeam echosounder . The second graph shows a line pair that is suitable for a pitch calibration of a dual-head system.





The patch test for determining the pitch offset, is conducted much the same as the roll test above, with 2 critical differences:

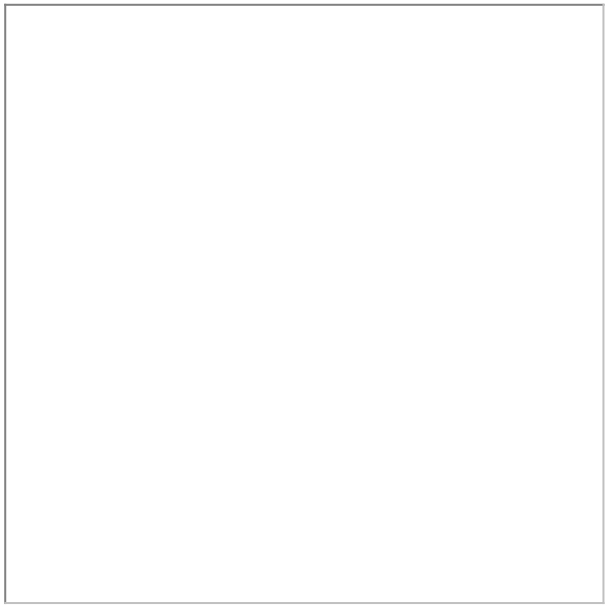
1. The selection box in the geographic window must be aligned to be parallel the the direction of travel and placed on top of the centre.
2. Move the box to a slope or object on the seafloor.
3. Pitch must be selected in the motion pull-down menu or select pitch in the selection sets:

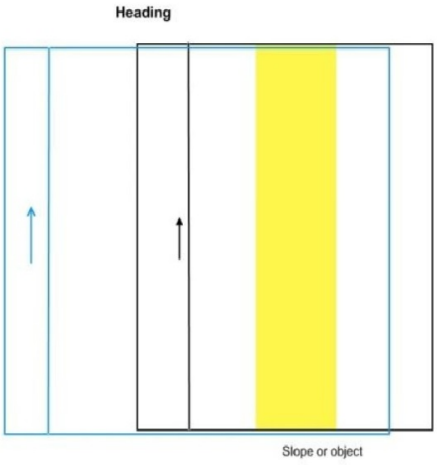


4. From here, follow steps 4-6 in the Roll Offset section to conduct a pitch calibration and add it to the MBES offsets.

Heading Offset

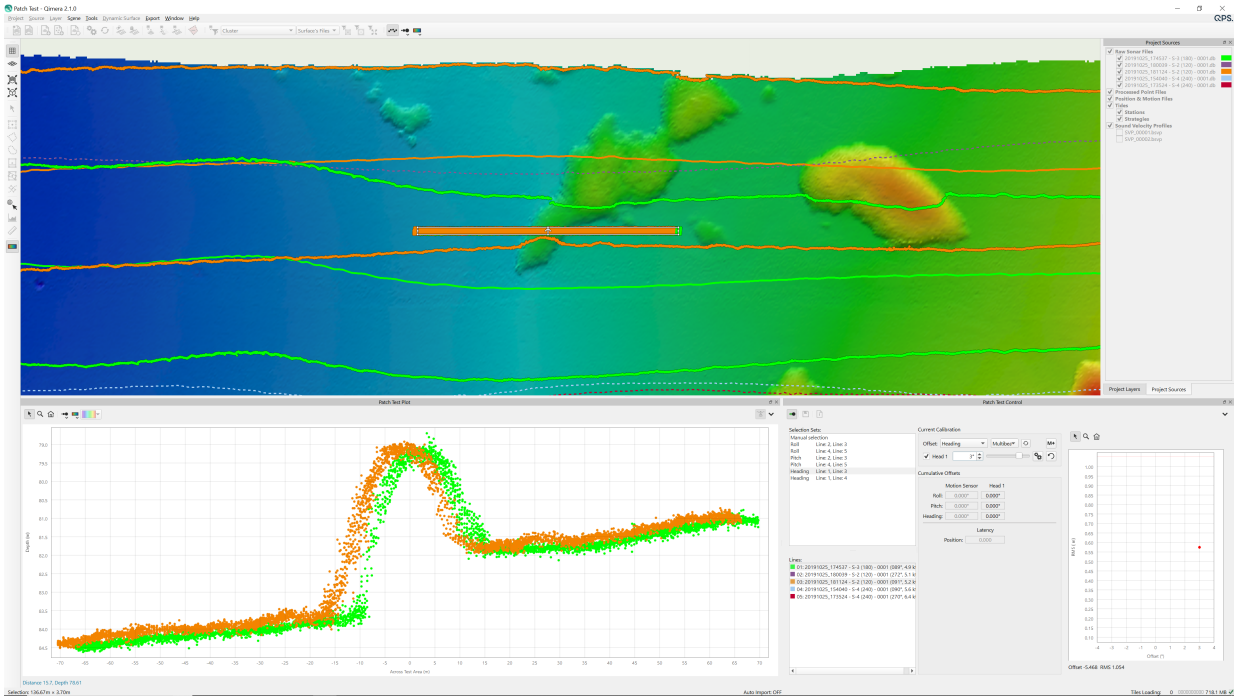
The heading test uses two parallel lines of data that were run in the same direction with the same vessel speed. These lines are spaced apart by about half a swath width or a little less.
There must be an area with slope (along track) or a defined target in the area of overlap.
From How-to Calibrate a Multibeam Echosounder.
The first graph shown below shows a line pair suitable for the heading calibration of a single-head multibeam echosounder . The second graph shows a line pair that is suitable for a heading calibration of a dual-head system.





The patch test for determining the heading offset is conducted much the same as the roll test above, with 2 critical differences:

1. The selection box is oriented parallel to the lines, between them, in the area of overlap. There should be a discernible slope or target within the box. In the following graphic, the two lines being used are highlighted in green and orange
   The selection box is positioned between them in the outer beams.
2. Heading must be selected in the motion pull-down menu, or select heading in the selection sets:



From here, follow steps 4-6 in the Roll Offset section to conduct a heading calibration and add it to the MBES offsets.

Position Latency

The position latency calibration tool uses two lines of data, run in the same direction with different vessel speeds over the same ground (overlapping as much as possible). There must be an area of slope (along track) or a defined object below the vessel.

> **Info**
>
> The larger the difference in speed between the two lines, the more evident the position latency will be. It is also beneficial if the data is collected in an area that is reasonably shallow, this will increase the resolution of the slope or targets.
>
> Check out this document for more information on system timing: .How-to Timing in Qinsy v9.0.

The latency test is conducted much the same as the roll test above, with 2 critical differences:

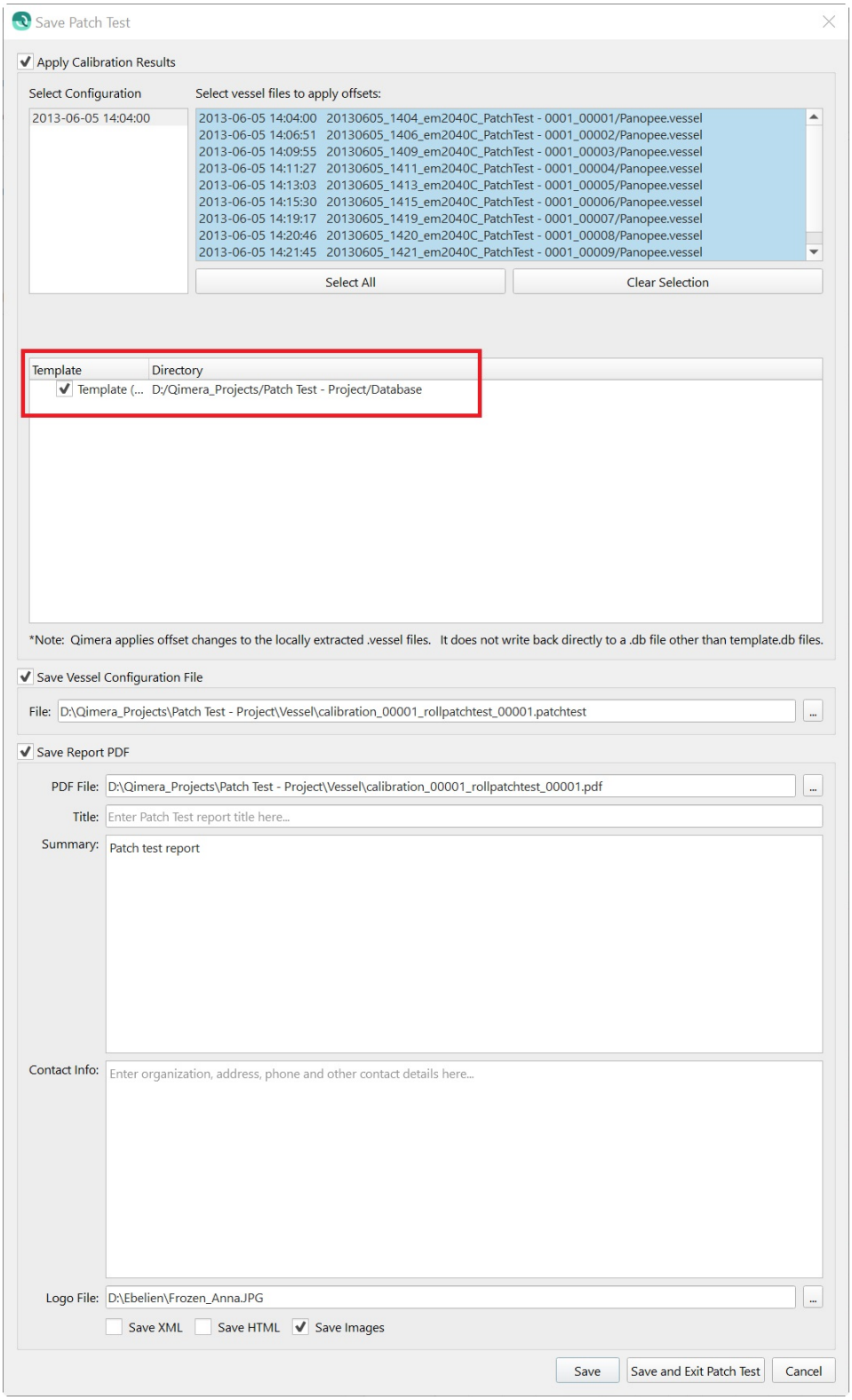
1. The selection box in the geographic window must be aligned to be parallel the the direction of travel and placed on top of the center of the lines.

2. Position Latency must be selected in the motion pull-down menu.

Step 3 - Applying patch test offsets

1. Once you have finished the patch test click Save and Apply in the Patch Test window.

2. Give the patch test a title and click Save.
3. You are then given the option which configuration (if you have multiple ones) and which lines you would like to apply the patch test values to.
4. Click OK to apply the configuration to your lines. They will then need re-processing. In this GUI you will also need to define the settings for the Patch test Report.
Apply patch test C-O values to the Qinsy *.db file in case you will need to update the template for data collection, this is highly recommended: the check box to apply C-O to template db file is checked by default.



5. Once complete you will find the Patch Test report, with images of the areas used in the Vessel folder of your project.

6. For completeness: you may want to check if C-O values have made it to the vessel configuration, by checking the vessel config for the appropriate lines in Qimera.

For Qinsy users, who are not using Qimera for processing: it is recommended to double check whether C-O values have made it to Qinsy template Database Setup, before data collection. Please note C-O values will not be applied to the recorded Qinsy db files.
In case you will need C-O values applied to recorded Qinsy db files after the fact, you will have to clone the C-O values from template db files to recorded db files and then Replay if needed.
For Qimera users: files will be processed after C-O have applied.

Tips and Tricks

- If you are not getting a nice parabola as shown in the Patch test Control Window (see first image in this document) but still receive an indication that Auto solve is complete, then it is strongly advised to manually calibrate.
- When Auto solve can't find a good solution for the misalignment calculation, you will have to manually select lines or re-position the selection box and try the Auto solve again.

How-to Process Sound Speed

This How-to describes the workflow for sound speed processing in Qimera.

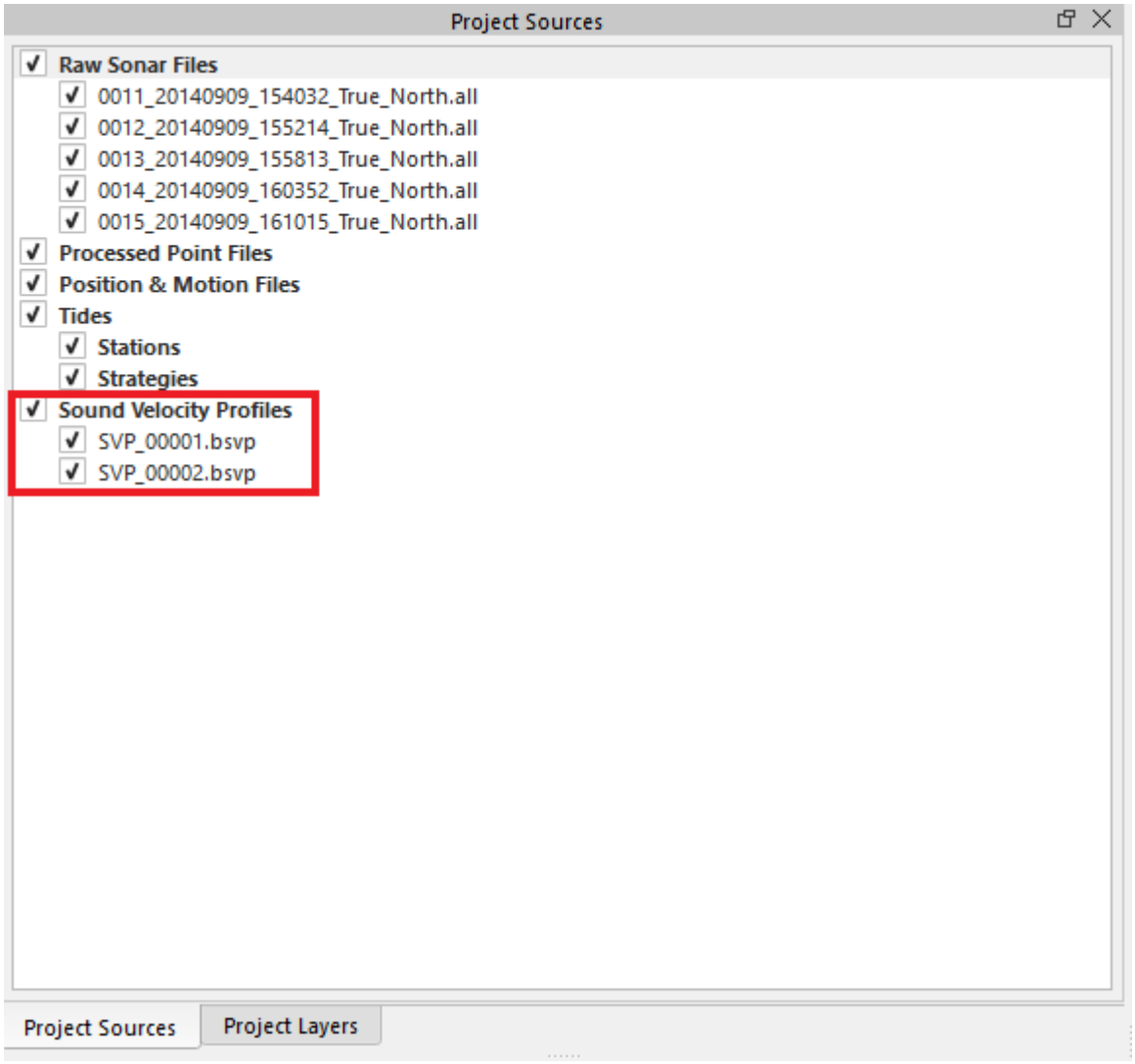
On this page:

- Importing SVPs
  - SVPS imported with raw sonar files
  - Importing ASCII SVPs
- Editing SVPs
- Applying changes

Importing SVPs

SVPS imported with raw sonar files

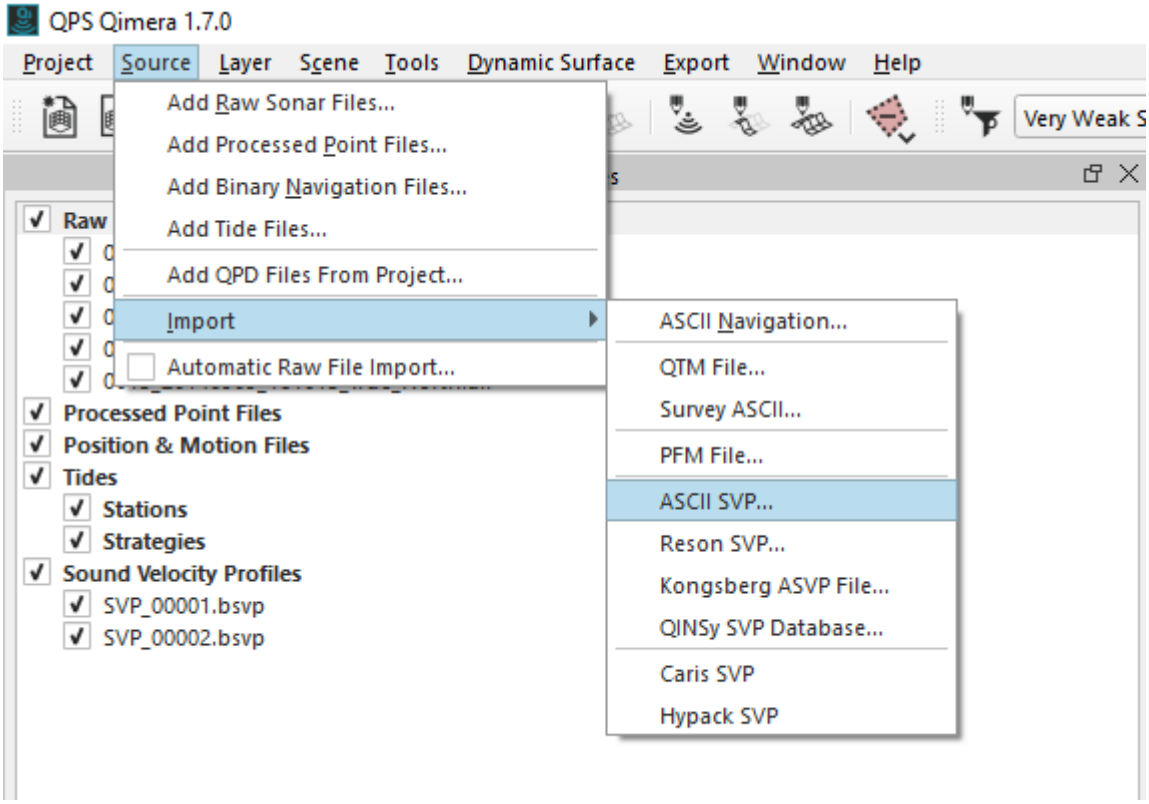
Depending on the Raw Sonar File type, the profile that was logged in the file will be extracted and will be available for use and editing in Qimera.
To view what SVPs were brought in by default, scroll down in the Project Sources window:



Importing ASCII SVPs

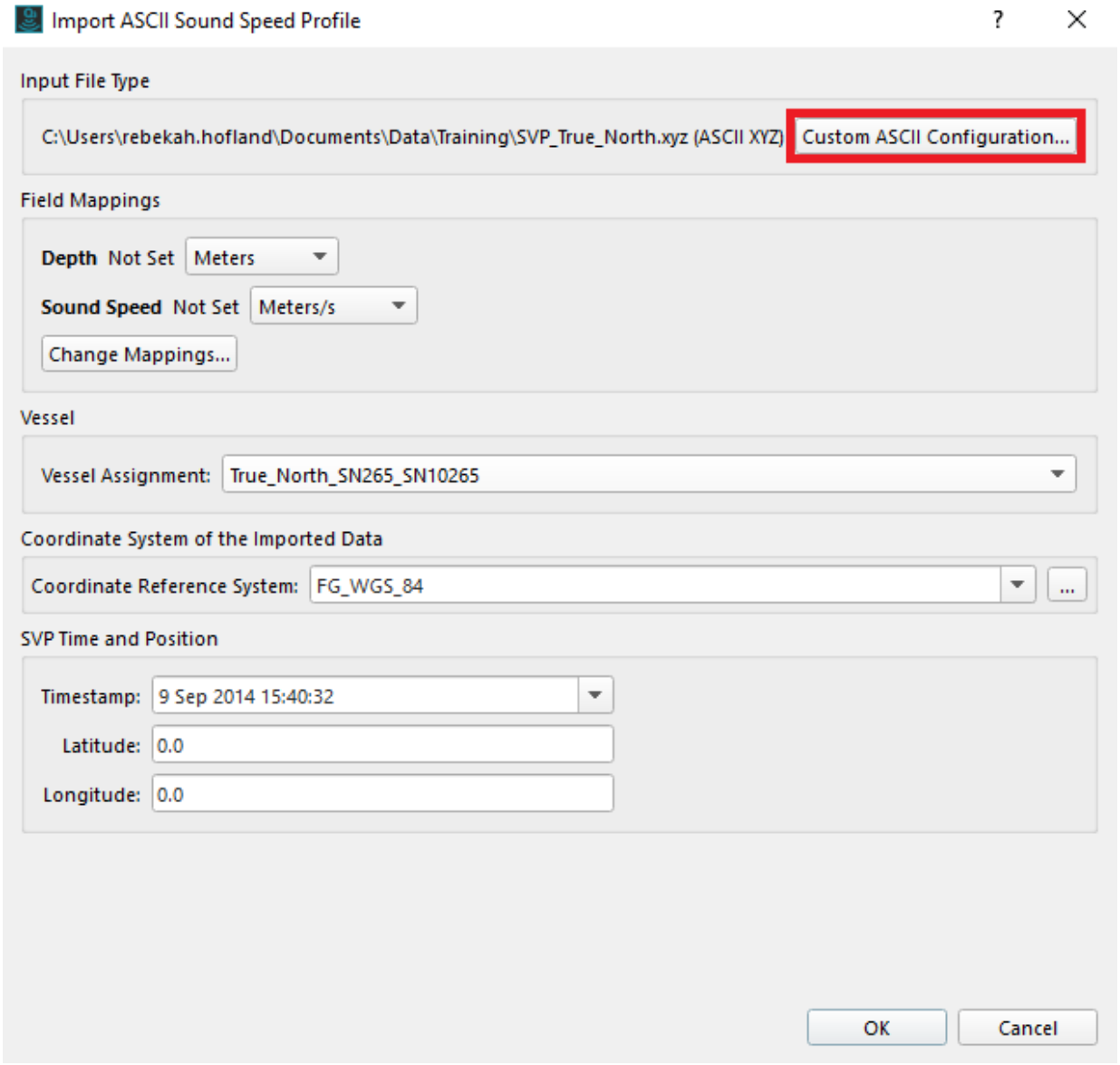
ASCII SVPs can be imported via the ASCII importer.

1. Load an ASCII SVP file by clicking on the 'Source' pull-down menu, then navigating to 'Import', then click on 'ASCII SVP'

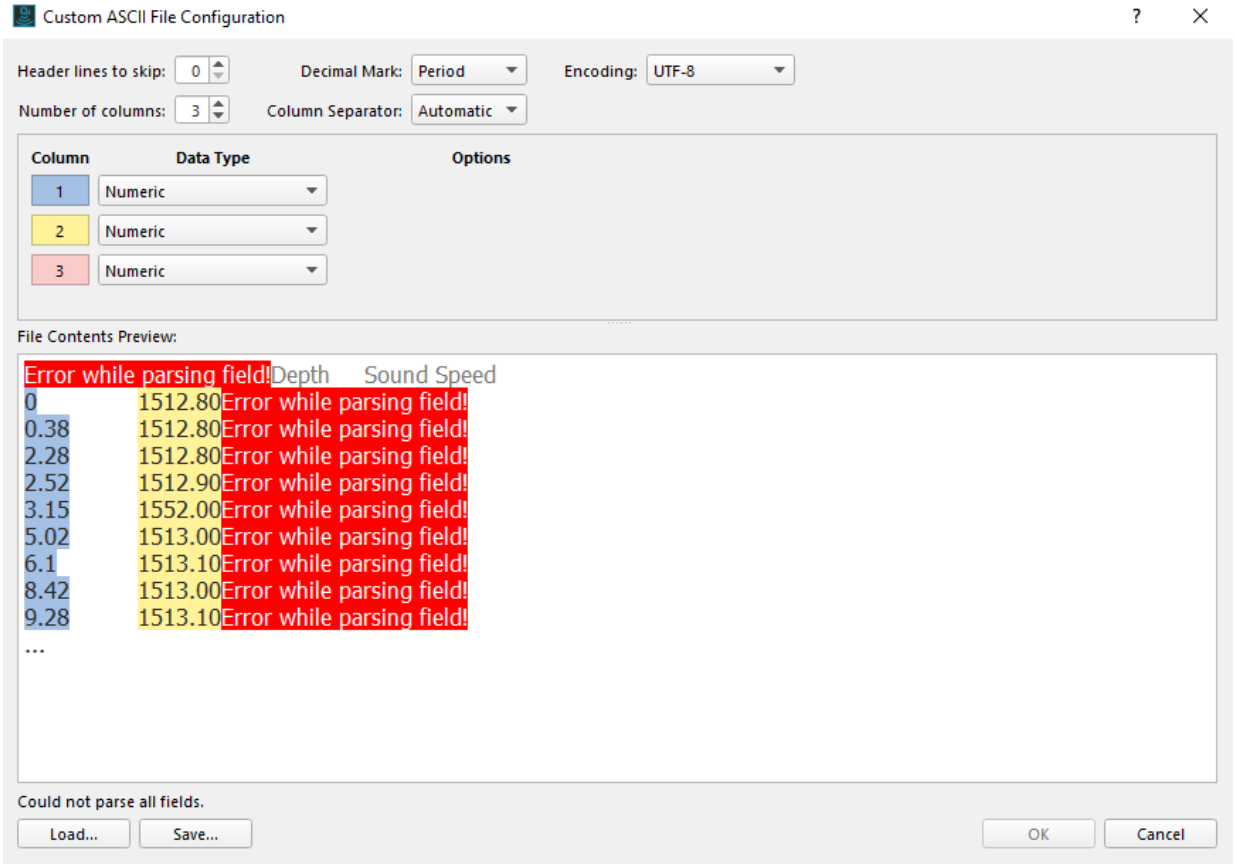


2. This will bring up the Import ASCII Sound Speed Profile window. Your SVP file type may or may not be detected automatically, depending on its type. If you see the button highlighted below,

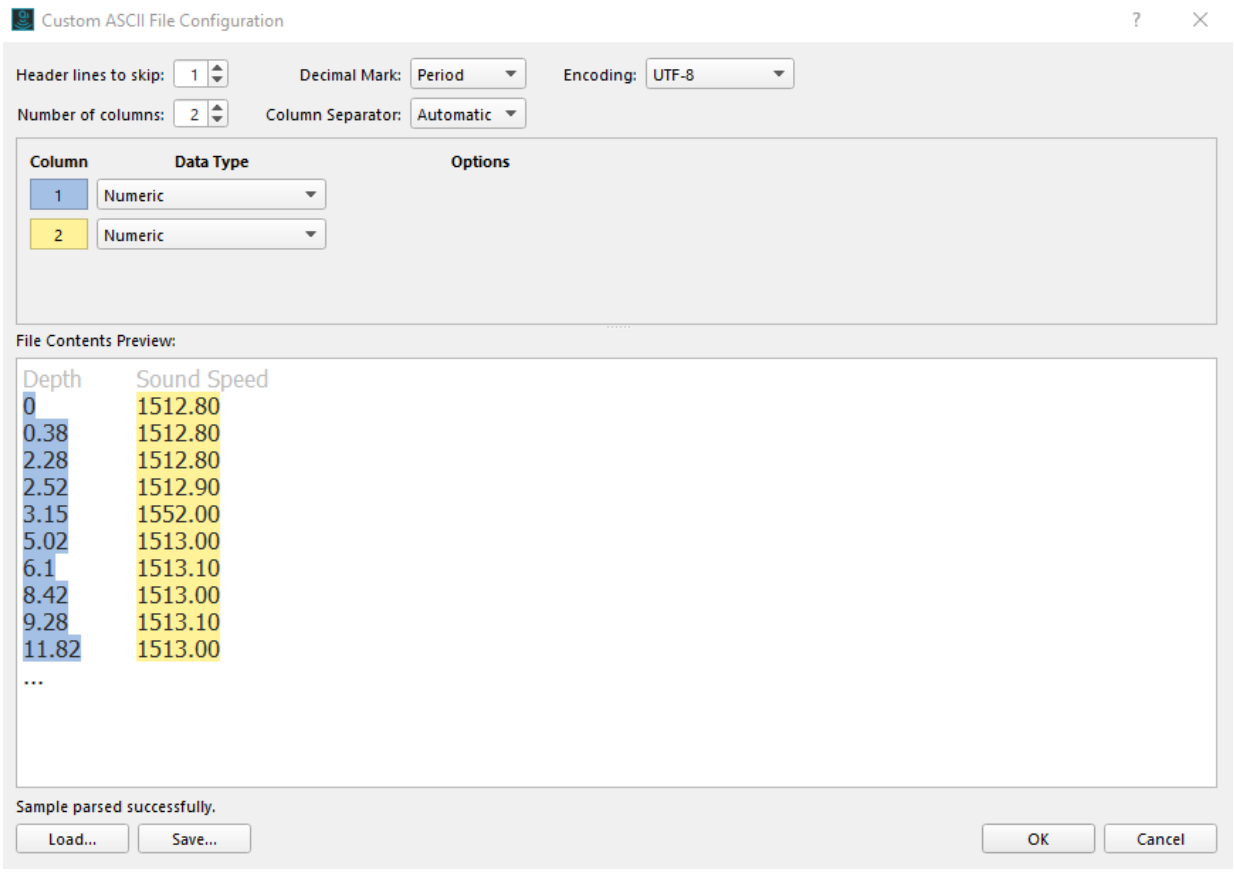
click on it to enter the Custom ASCII Configuration dialog:



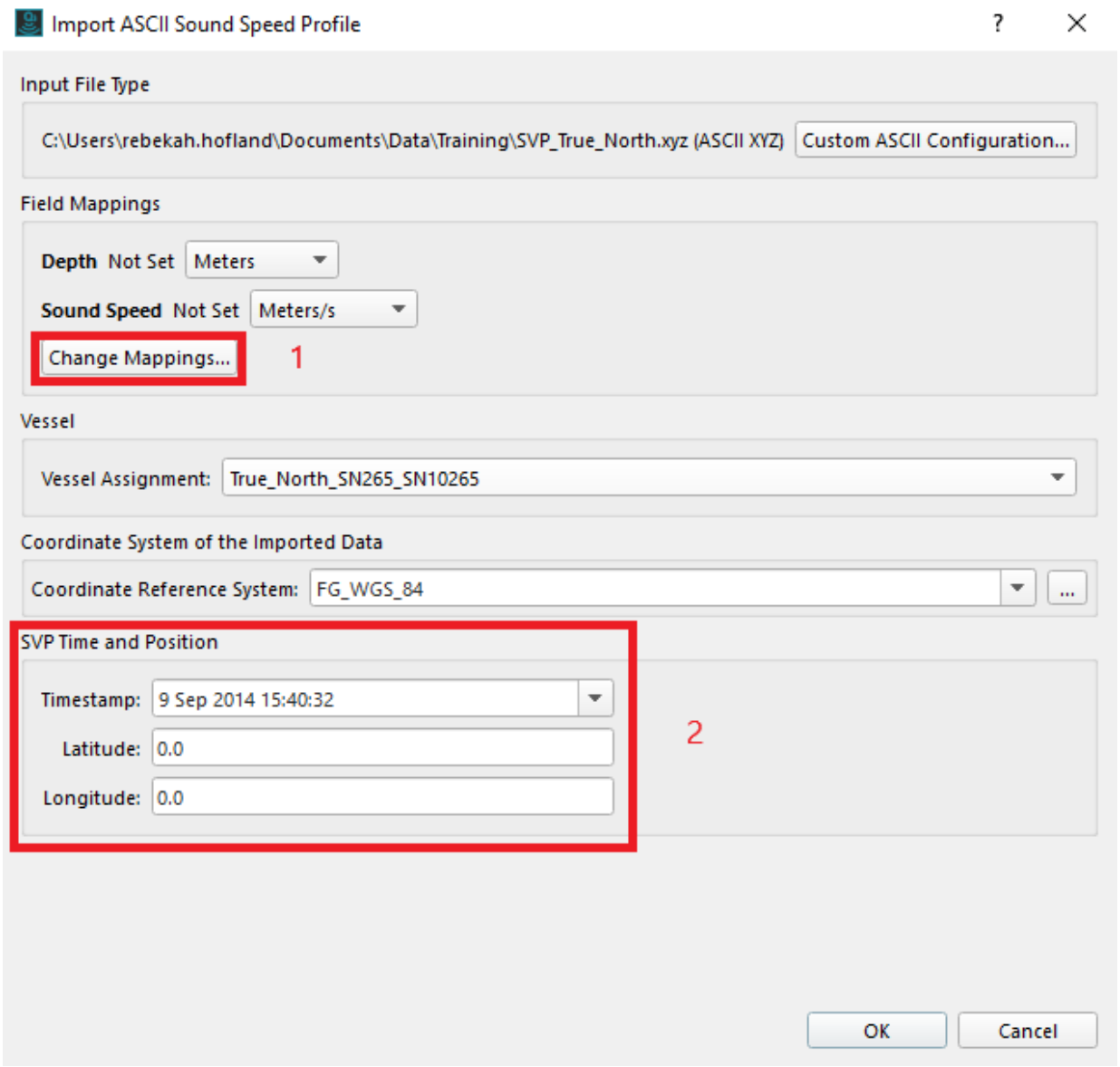
3. Within this window, the settings can be adjusted so that Qimera can bring the file in properly. As seen below, when settings need to be changed the file preview will show an error.

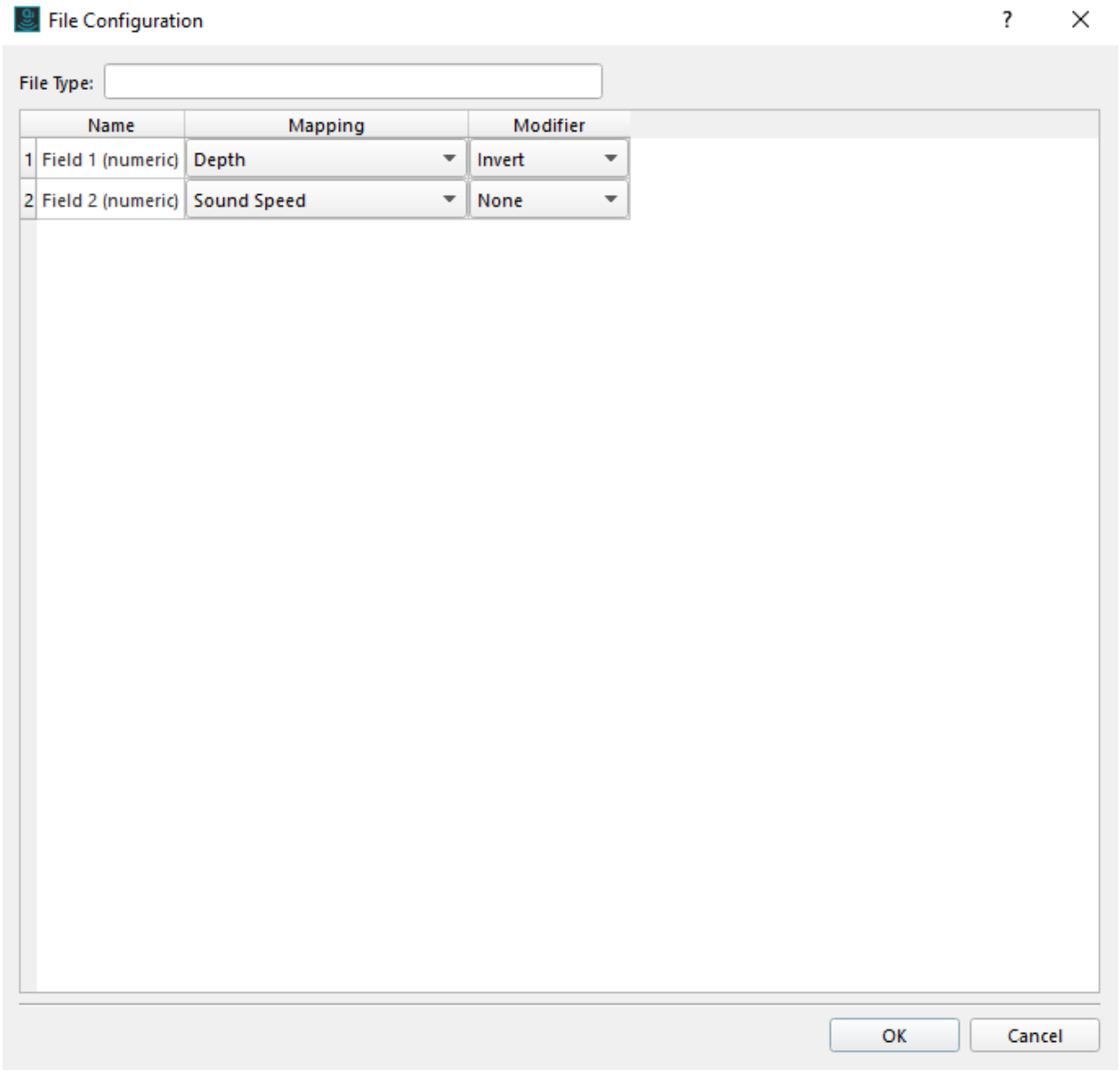


4. To fix these errors, header lines to skip and number of columns were changed. Each file is usually different however, as sometimes the type of data in a field needs to be changed.



5. For a more detailed walk through of the parser and Field Mappings, please refer to the How-to Apply Tides documentation and take a look at the 'Import Non-supported tide data' section there.
6. Once you have the data parsed successfully, click OK and configure the Field Mappings (1) in the Import ASCII Sound Speed Profile window.


Import ASCII Sound Speed Profile
Input File Type
C:\Users\rebekah.hofland\Documents\Data\Training\SVP_True_North.xyz (ASCII XYZ)
Custom ASCII Configuration...
Field Mappings
Depth Not Set
Meters
Sound Speed Not Set
Meters/s
Change Mappings...
1
Vessel
Vessel Assignment:
True_North_SN265_SN10265
Coordinate System of the Imported Data
Coordinate Reference System:
FG_WGS_84
SVP Time and Position
Timestamp:
9 Sep 2014 15:40:32
Latitude:
0.0
Longitude:
0.0
2
OK
Cancel

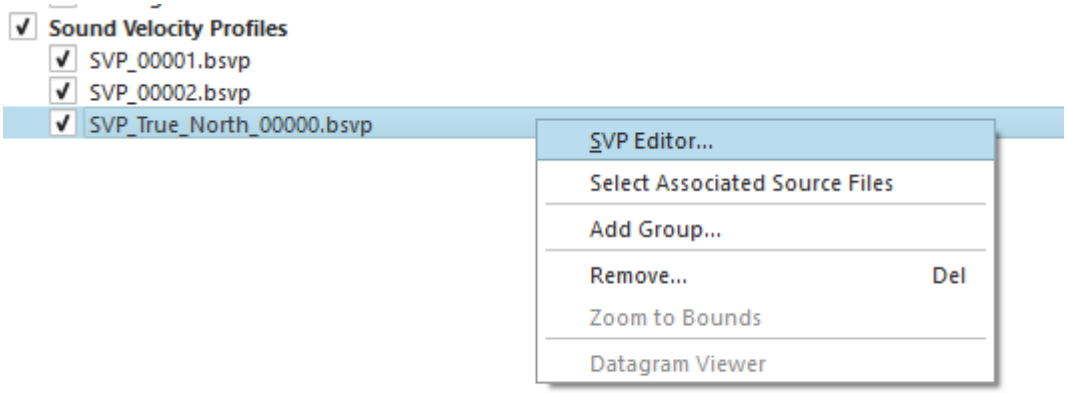


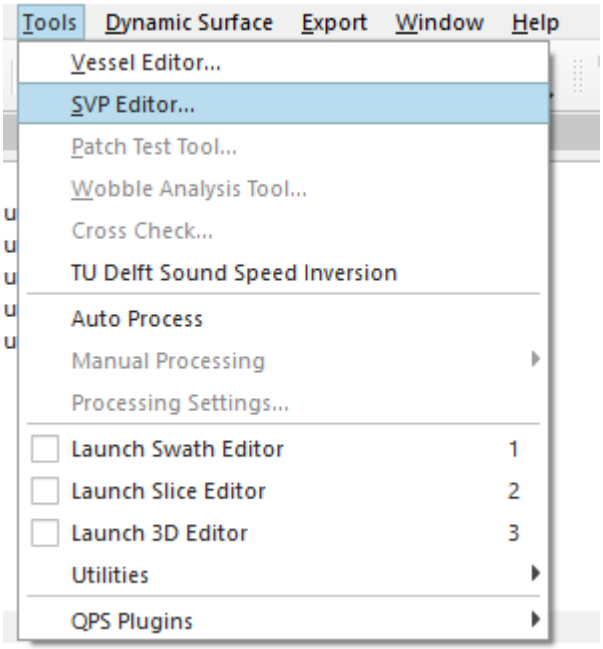
7. If you are planning to apply position or time based rules to your sound speed processing, ensure that the Time & Position information (2) is correct. This can also be completed later using the SVP Editor.

Editing SVPs

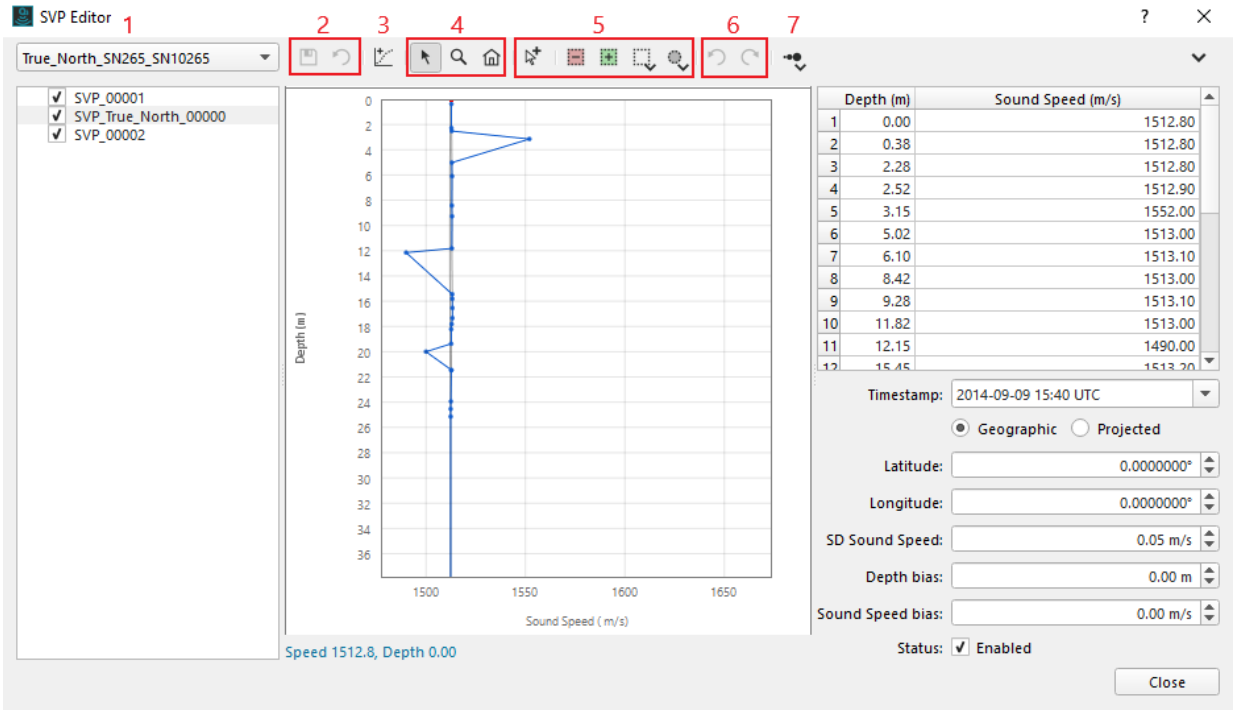
Qimera features a tool for graphically editing SVPs

1. To edit individual SVPs, right click on the filename in the Project Sources window (left image) and select 'Edit SVP'. You can also select 'Edit SVP' in the 'Tools' pull-down menu (right image).


Sound Velocity Profiles
SVP_00001.bsvp
SVP_00002.bsvp
SVP_True_North_00000.bsvp
SVP Editor...
Select Associated Source Files
Add Group...
Remove... Del
Zoom to Bounds
Datagram Viewer


Tools
Dynamic Surface
Export
Window
Help
Vessel Editor...
SVP Editor...
Patch Test Tool...
Wobble Analysis Tool...
Cross Check...
TU Delft Sound Speed Inversion
Auto Process
Manual Processing
Processing Settings...
Launch Swath Editor 1
Launch Slice Editor 2
Launch 3D Editor 3
Utilities
QPS Plugins

2. You should now see the SVP Editor window:



Along the top of the window are the following (from left to right):

- Sounder Selector (1)
- Save Changes, Revert (2)
- New SVP (3)
- Explore, Zoom, Zoom Home (4)
- Add Entry, Reject Selection, Accept Selection, Selection Shape (Rectangle, polygon, free, erase), Select inside or outside (5)
- Undo, Redo (6)
- Point Size (7)

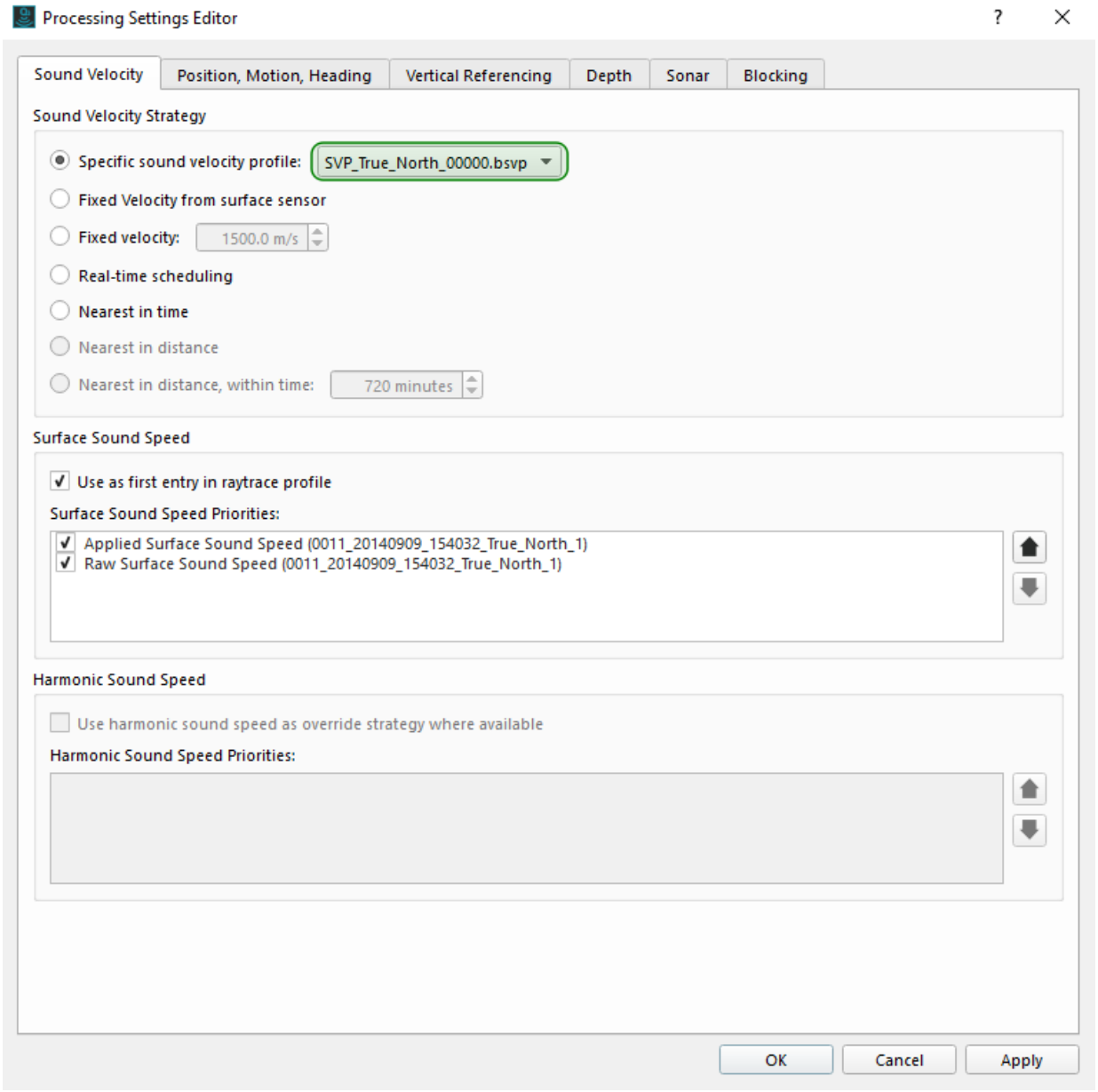
Use the mouse scroll wheel while hovering over the graph, it will zoom the y-axis. (The explore button must be active for this to work)

3. Points can be graphically added, flagged as invalid or valid.
4. Double clicking in the depth / sound speed table at the right allows for values to be edited.
5. Each time an SVP is edited, changes can be saved. This will create a revised SVP which will be visible under its filename, and the SVP can be reverted back to the original by right clicking the revision, and selecting revert.

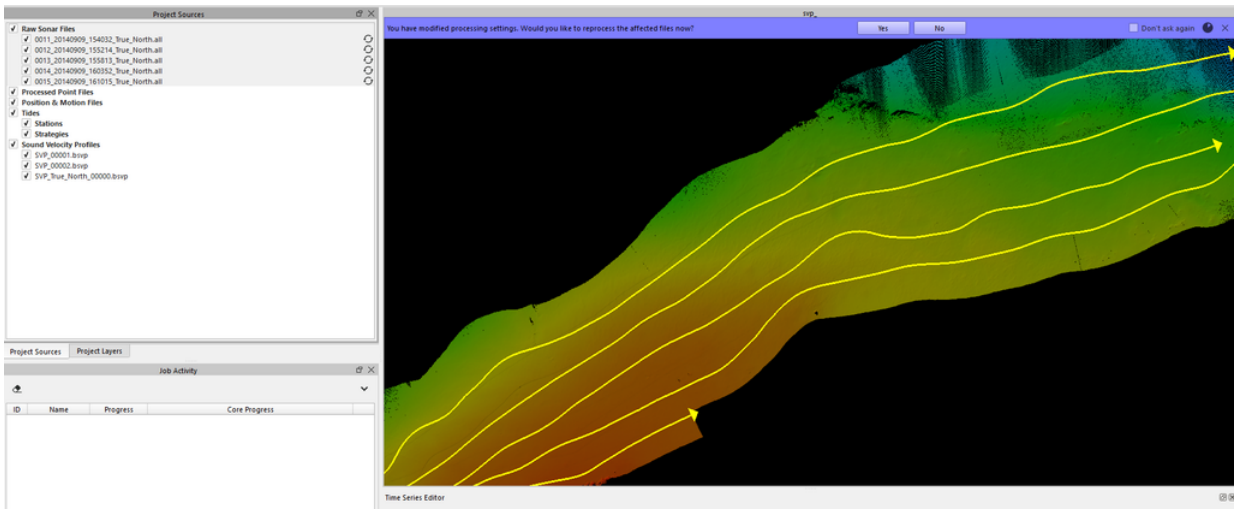
6. A new SVP can be created from scratch. Click the 'New SVP' button and enter a filename and time.
   a. Points can be created graphically after clicking on the 'Add Entry' button
   b. Points can also be created by right clicking in the table and adding a row before or after an existing entry.

Applying changes

1. Click on the 'Processing Settings' button  at the top of the Qimera Window. This will bring up the Processing Settings Editor.



2. In the Processing Settings Editor you will see options that dictate how the sound speed information is applied to the data.
3. Once you apply processing settings, a blue bar will appear at the top of the geographic window prompting you to 'reprocess the affected files'. You can click on this or move your attention to the Project Sources window.



4. Next to an affected file, you will see the reprocess icon, two circular arrows. If you hover your mouse over this icon it will reveal which reprocessing steps are required. In this case the file(s) 'Require Full Raytrace Processing'
5. The reprocessing can be carried out by double clicking on individual lines or clicking on the 'Auto Process' button at the top of the Qimera window. Auto Process will reprocess all lines that require update.
6. After one or more lines are reprocessed, all dynamic surfaces will be updated.

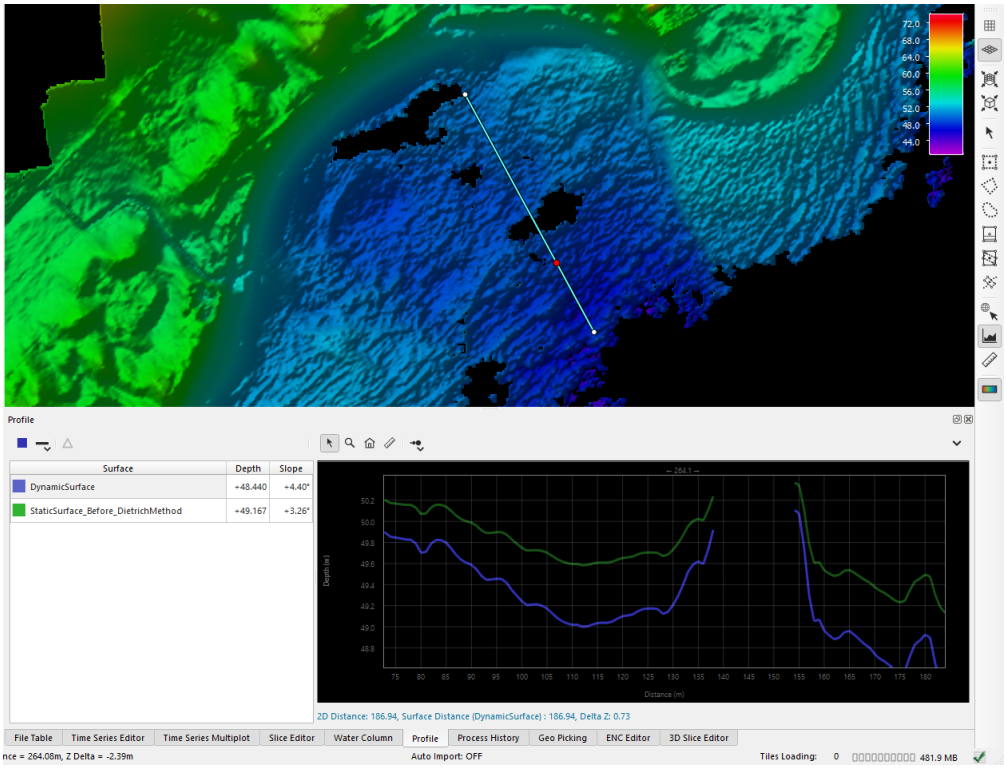
How-to Structure from Motion (SfM)

This How-to briefly explains how Qimera's Structure from Motion (SfM) Bathymetry tool works.

On this page:

- Introduction
- Structure from Motion (SfM) Bathymetry Dialog
  - How to Start
  - What it Does
  - General Description
    - Method
    - Water Surface
      - Water Height
      - Refractive Index
    - Camera
    - Image Position/Orientation
      - File
      - Coordinate Reference System
- Starting from AgiSoft
  - Camera Properties
  - Camera Position & Orientation
- Starting from Pix4d
  - Camera Properties
  - Camera Position & Orientation
- Example: Small Angle Method
- Example: Dietrich Method

Introduction



The Structure from Motion (SfM) can be used to correct for refraction errors in submerged data acquired from airborne photogrammetry.

Because of the large density difference between air and water, light reflected off submerged objects and observed from the air will be significantly refracted. From an airborne camera's perspective the submerged objects will appear shoaler than they are in reality.

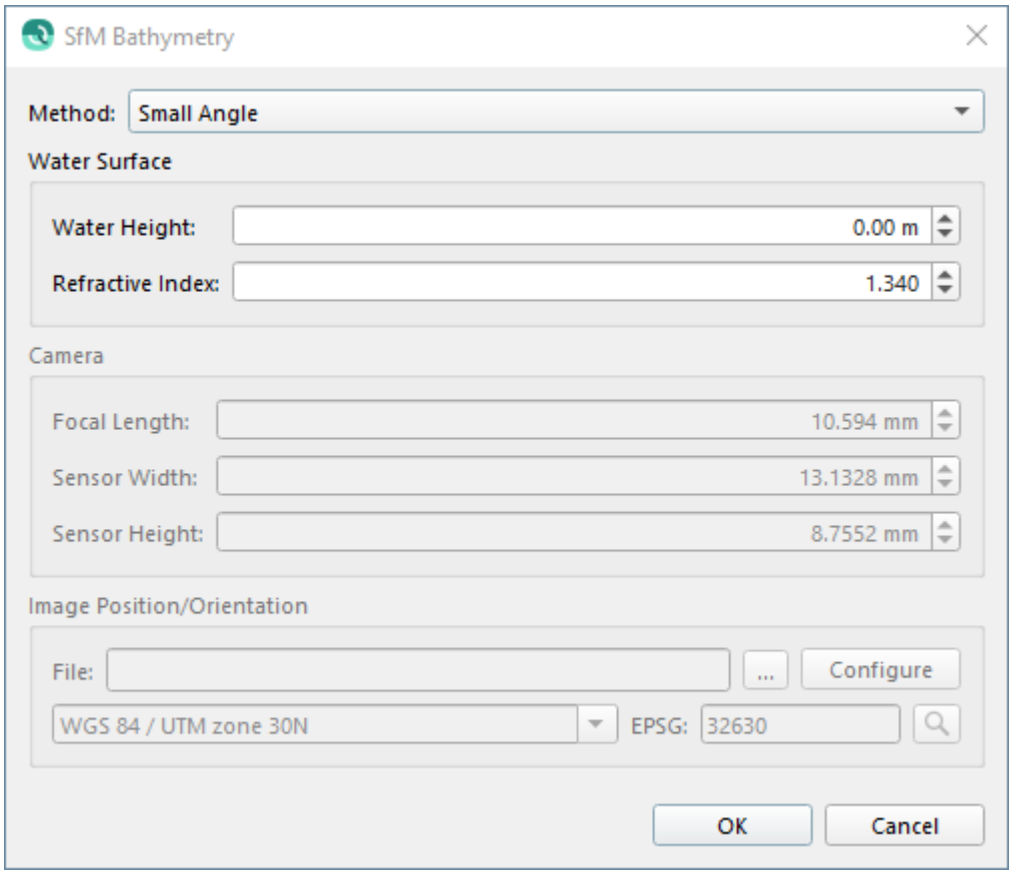
While the refraction correction is dependent on the angle of incidence with the water, with photogrammetry the exact angle of incidence of any given point is unknown because it is the combination of multiple camera positions.

There are two methods available to estimate a correction:

1. The Dietrich Method - tries to find all the camera positions or images that may have contributed to a point and averages the correction.
2. The Small Angle Method - does not remove all refraction errors, but removes a large error which is easy to model and correct for even with an unknown incidence angle.

The Small Angle Method only requires the Water Height & Refractive Index. It can be used if you do not have access to the original project with information on camera parameters and position/ orientation.

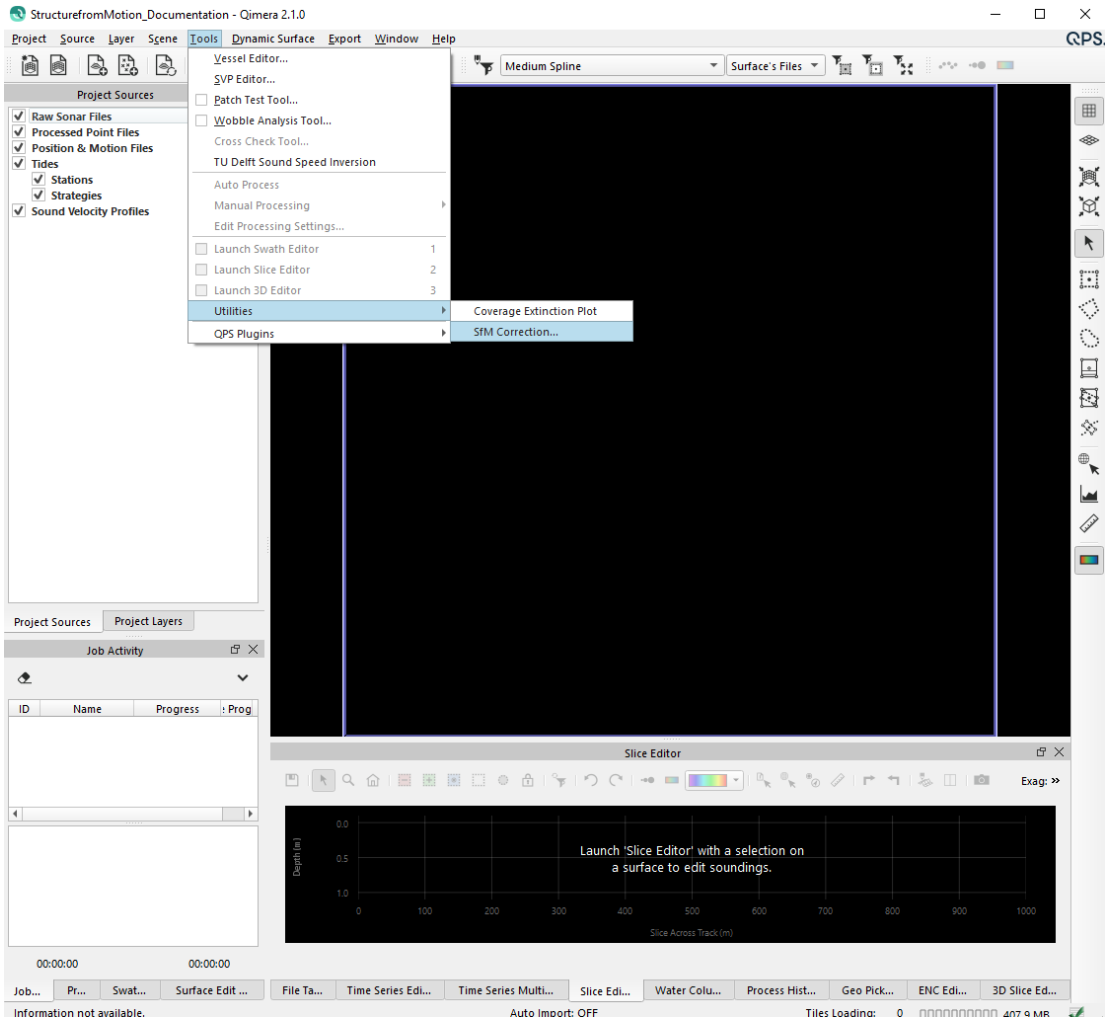
Structure from Motion (SfM) Bathymetry Dialog



Structure from Motion (SfM) Dialog

How to Start

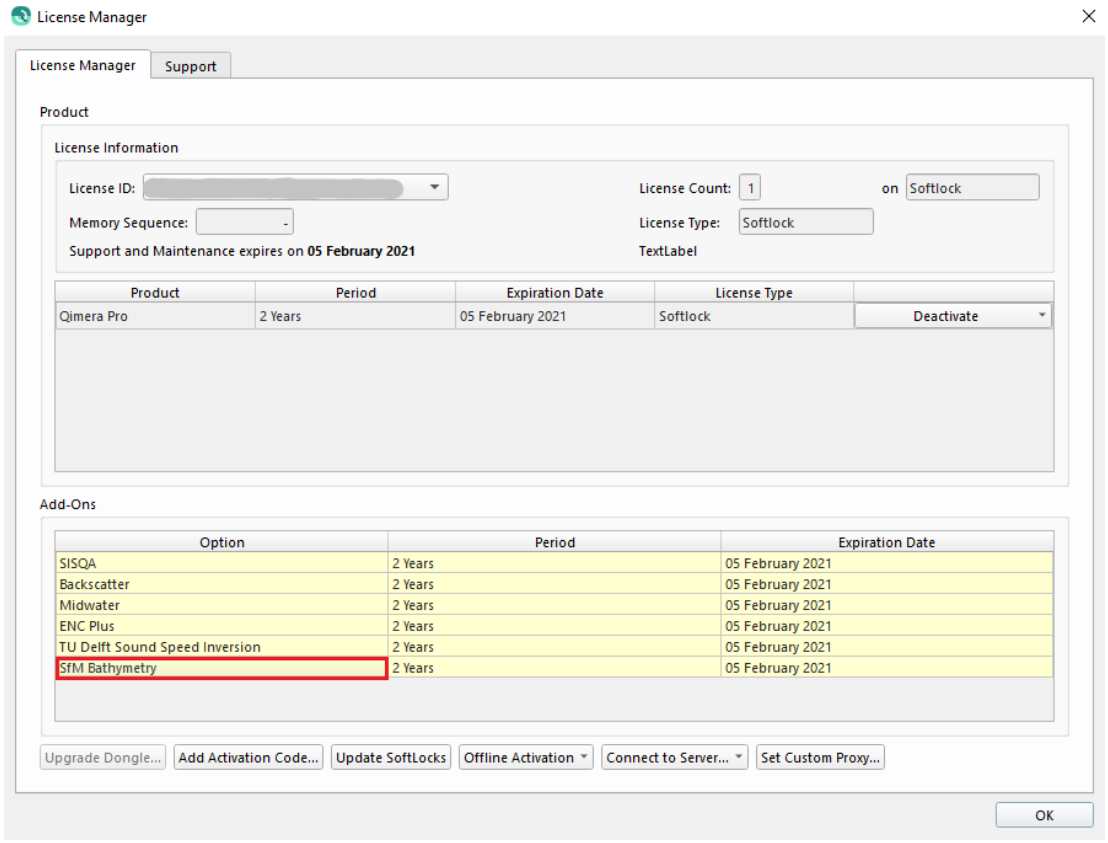
- Make a selection of Sonar Files → Tools → Utilities → SfM Correction...



SfM Correction from Tools Menu

License

To run the Structure from Motion tool, Qimera requires a valid and activated SfM Bathymetry Add-on to the license.



License Manager - SfM Bathymetry Add-on

What it Does

The Structure from Motion (SfM) can be used to correct for refraction errors in submerged data acquired from airborne photogrammetry, commonly referred to as "Structure from Motion", or SfM.

This can be applied to Processed Point Files.

> ⚠ This should not be used in conjunction with the Z-Shift Data filter (see Manage Filter Profiles), as it will remove any previously applied shifts.

General Description

The various settings for Structure from Motion (SfM) Tool are described below...

Method

Method	Description
Dietrich	Camera properties are used to compute the field of view of each image. A point is refraction corrected for the incidence angle of each image for which it falls within the field of view. The final correction to a point is the average of all corrections. **This is the preferred and default method.**
SmallAngle	This method makes the assumption that all incidence angles are at or near perpendicular with the water surface, or in other words that they are small angles of incidence. For a downward facing camera with a horizontal field of view of 70 degrees the error due to refraction is between 25% and 32% of water depth. The default setting of 1.34 for the refractive index of water will account for between 100% of the refraction error at nadir (near the camera track) to 70% at the outer extents of the field of view (away from the camera track). This will account for the majority of the refraction error but will leave some of the data in the outer extents of the field of view shoal biased at a maximum of 10% of water depth. For the same camera configuration a scale factor of 1.48 will over-correct with 140% of the refraction error at nadir to 100% at the outer extents of the field of view. This will deep bias the data near the camera track up to 10% of water depth, but in some cases may be preferable for matching data at the edge of the aerial survey with acoustic derived bathymetry in deeper waters. **This method should be used if you do not have access to camera positions and orientations.**

Water Surface

This group of settings relates to describing the water surface and it's properties.

Water Height

This is the height of the water in your vertical datum used during data acquisition.

Example: If your data is referenced to mean sea level (MSL) and the tide was 1.0 meters below MSL during data acquisition then the water height should be entered as -1.0 meters.

Refractive Index

This is the refractive index for water with respect to air.

This should generally not be modified unless you are using the Small Angle method and can accept some deep biasing of the data.

Camera

These settings are only applicable to the Dietrich method, and required.

Focal Length, *Sensor Width*, and *Sensor Height* should be provided by the camera manufacturer or accessible within your SfM processing software. All values should be in millimeters.

These are used to compute the field of view of the camera.

Image Position/Orientation

These settings are only applicable to the Dietrich method, and required.

File

This is the "Omega Phi Kappa" file export from you SfM software describing the image, or camera positions and orientations.

You will have to configure the ASCII parser for the 6 required fields: X, Y, Z, Omega, Phi, and Kappa:

- X, Y, and Z are Easting, Northing, and Height, or Longitude, Latitude, and Height respectively
- Omega, Phi, and Kappa are the rotations about the X, Y, and Z axes respectively

This is a photogrammetry specific convention and is different from our standard rotation conventions.



More information from Pix4d on how Omega, Phi, Kappa are defined can be found here: https://support.pix4d.com/hc/en-us/articles/202558969-How-are-omega-phi-kappa-defined

Coordinate Reference System

This should be the coordinate reference system (CRS) of the positions in the file. This is required in order to relate the image positions with the project data.

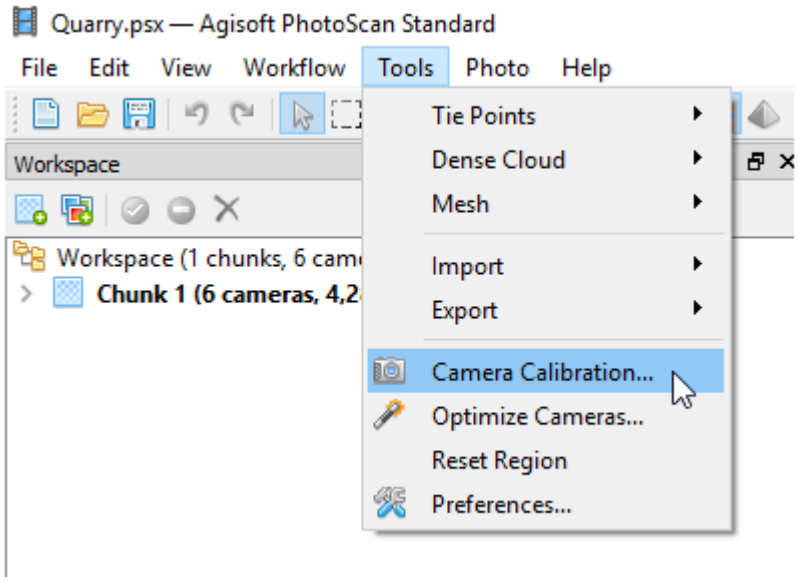
The default is the project CRS, which assumes there is no transformation required.

Starting from AgiSoft

Camera Properties

The camera properties can be found in Agisoft by:

1. Tools Menu → Camera Calibration...



2. The focal length and the pixel size are shown below.

3. To get the sensor width and height, multiply the resolution by the pixel size.

Example:

Sensor Width/Height

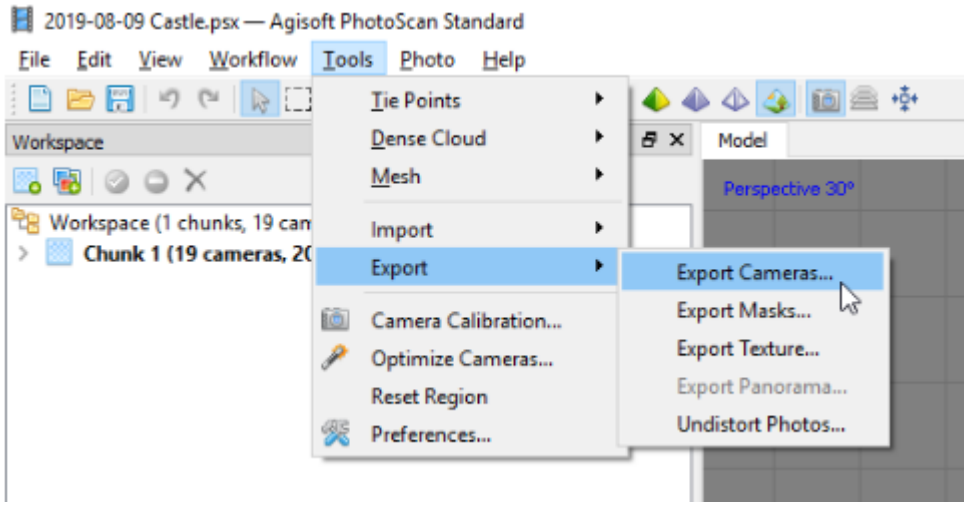
5472 x 0.00239981 mm = 13.132 mm

3648 x 0.00239981 mm = 8.755 mm

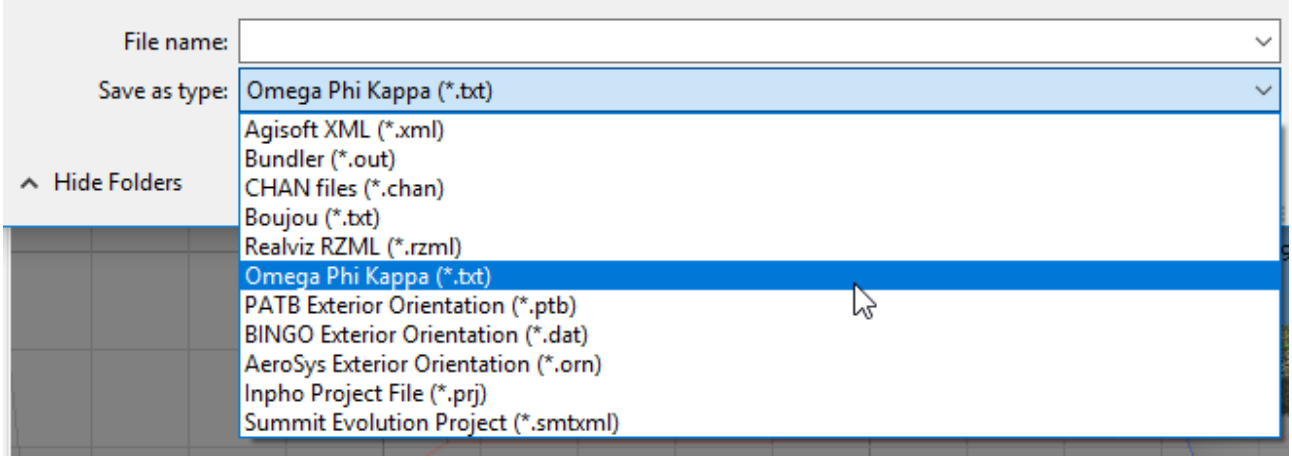
Camera Position & Orientation

The camera position & orientation can be found in Agisoft by:

1. Tools → Export → Export Cameras...



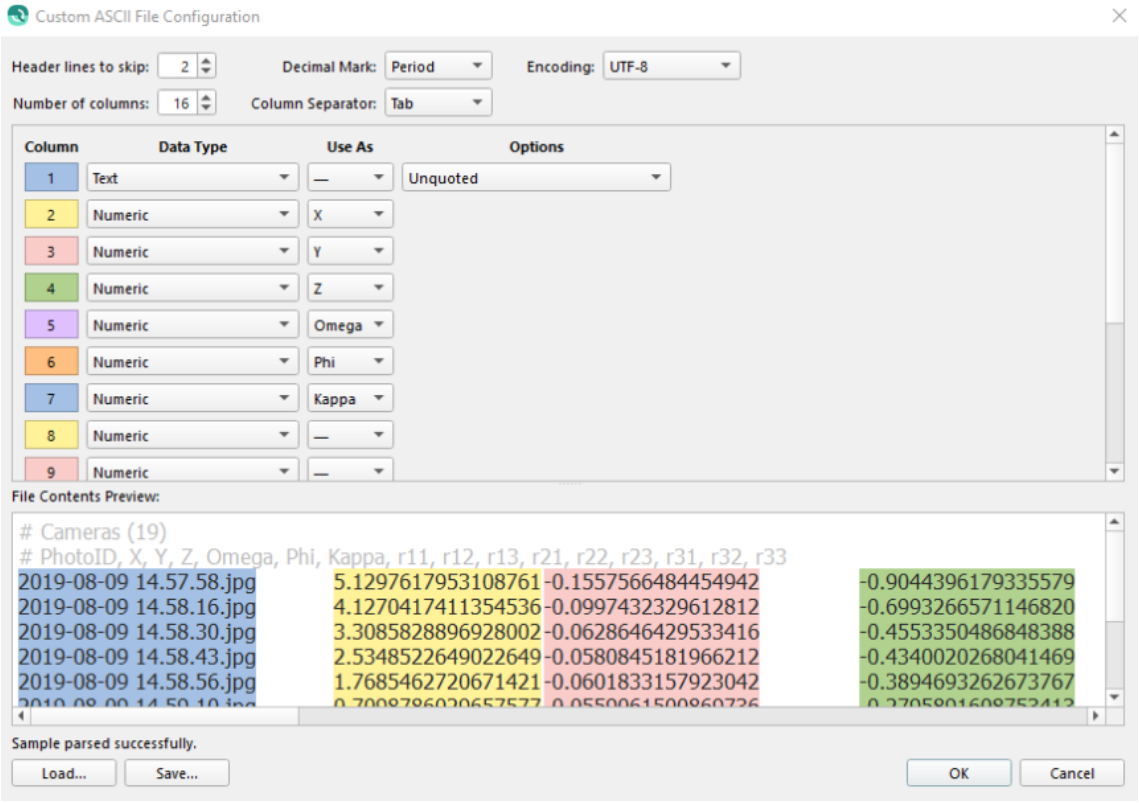
2. For "Save as type:" select "Omega Phi Kappa (*.txt)"



The Omega Phi Kappa (.txt) File Format must be configured to the correct ASCII Format, shown below.

Use As: --, X, Y, Z, Omega, Phi, Kappa

After the first import, Qimera should remember the previously used ASCII Format.



Starting from Pix4d

Camera Properties

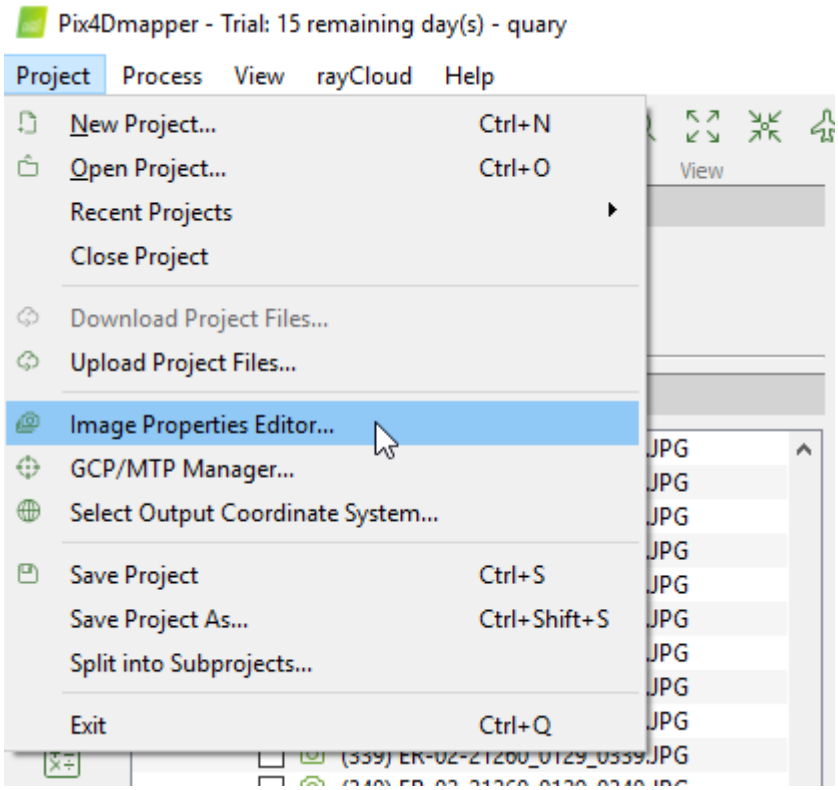
The camera properties can be found in the project params file here:

```
<project folder>\1_initial\params\<project name>_pix4d_calibrated_internal_camera_parameters.cam
```

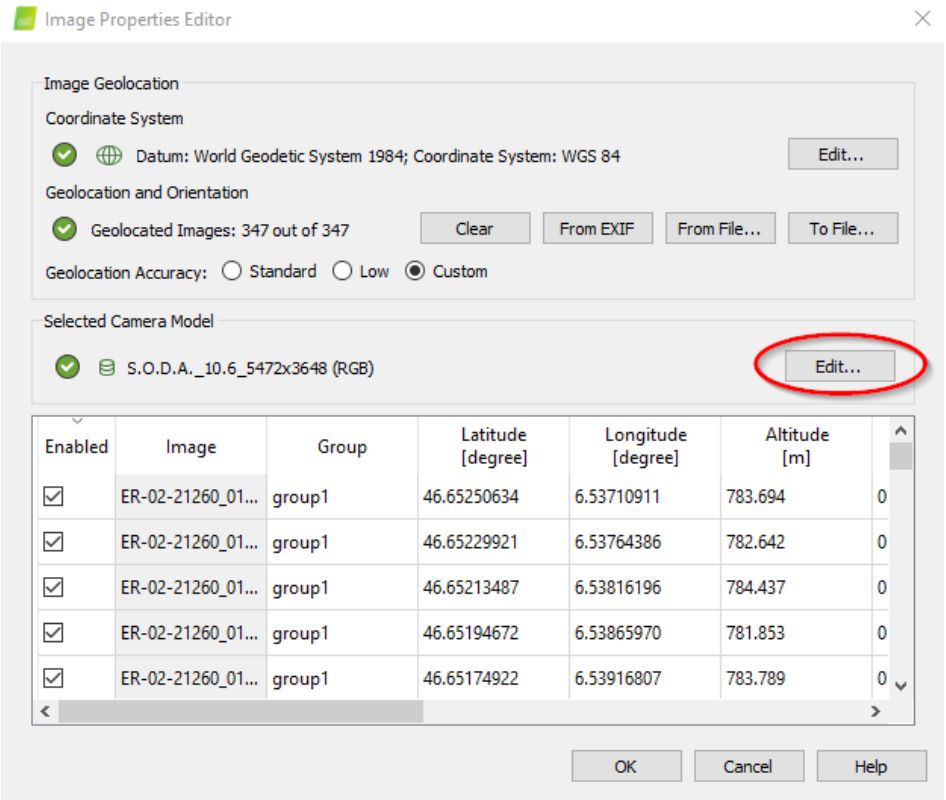
OR

1. In the Pix4D application, the camera properties can be found by:

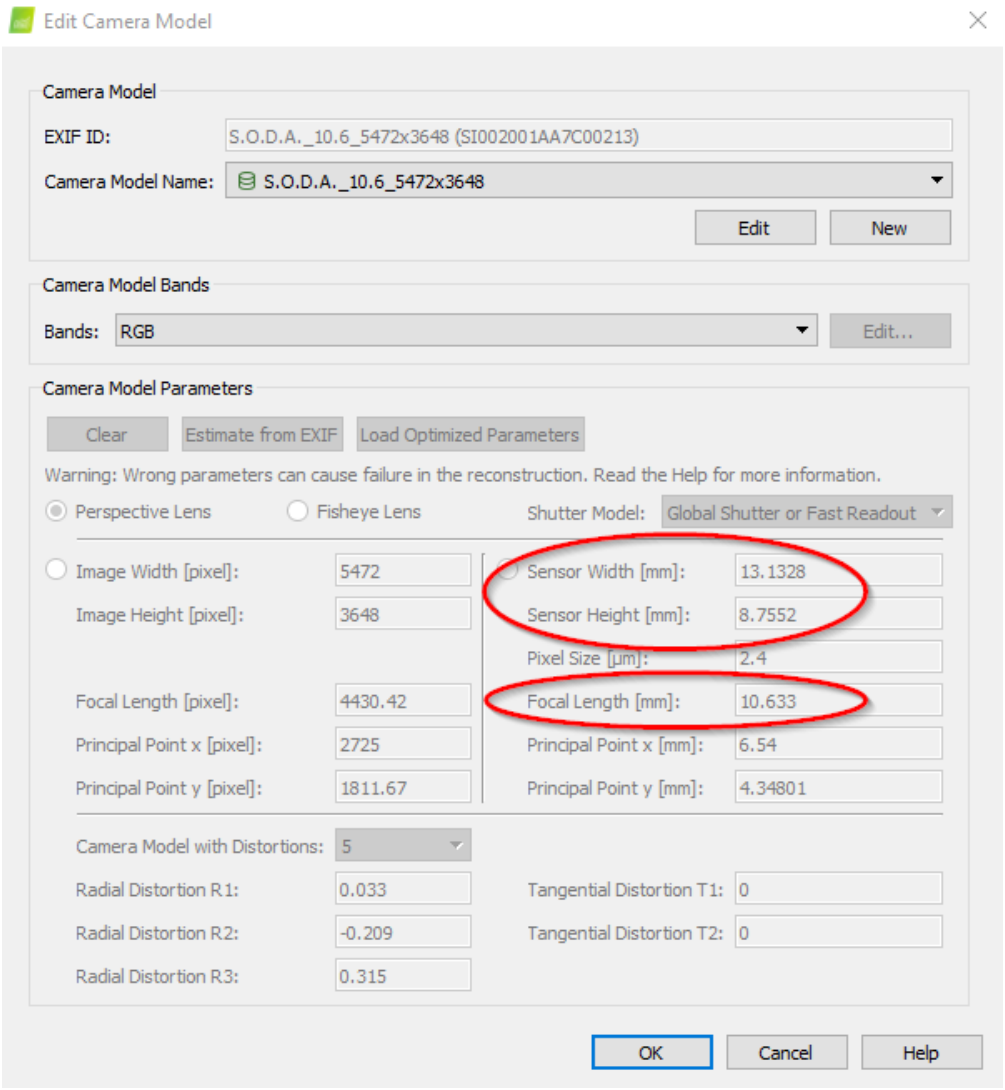
Project → Image Properties Editor..



2. Selected Camera Model → Edit...



3. The sensor width/height, and focal length are shown below.



Camera Position & Orientation

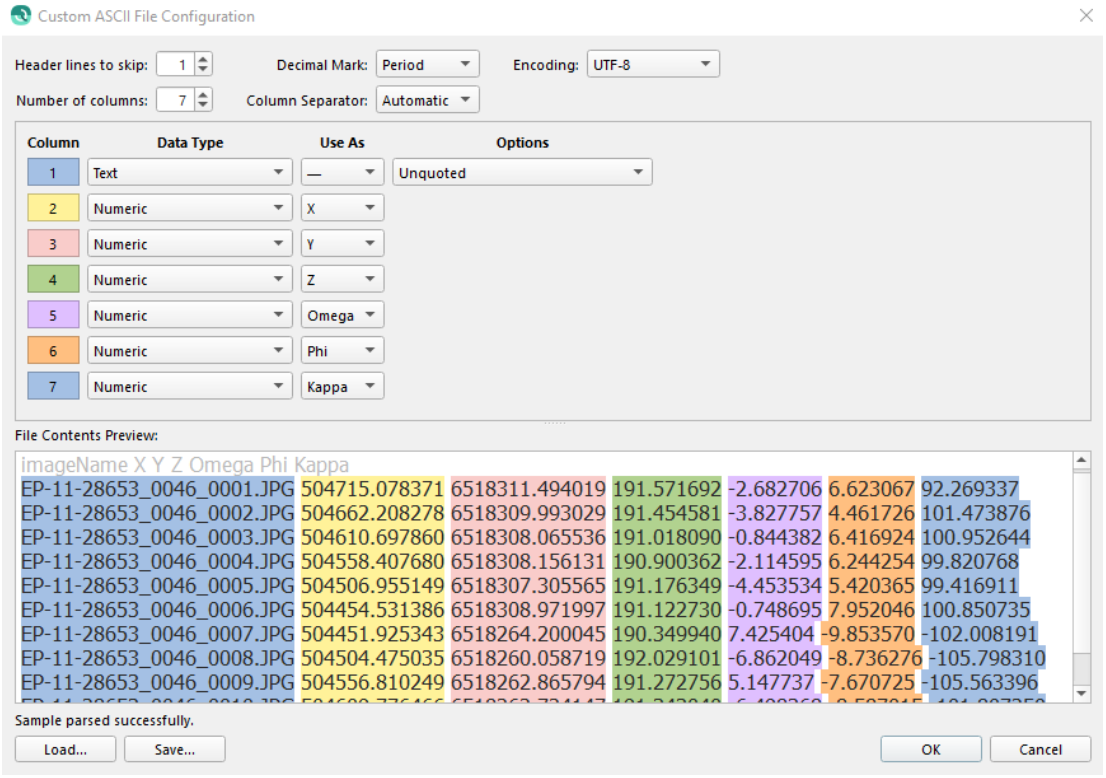
The camera position & orientation can be found in the project params file here:

```
<project folder>\1_initial\params\<project name>_calibrated_external_camera_parameters.txt
```

The calibrated_external_camera_parameters (.txt) File Format must be configured to the correct ASCII Format, shown below.

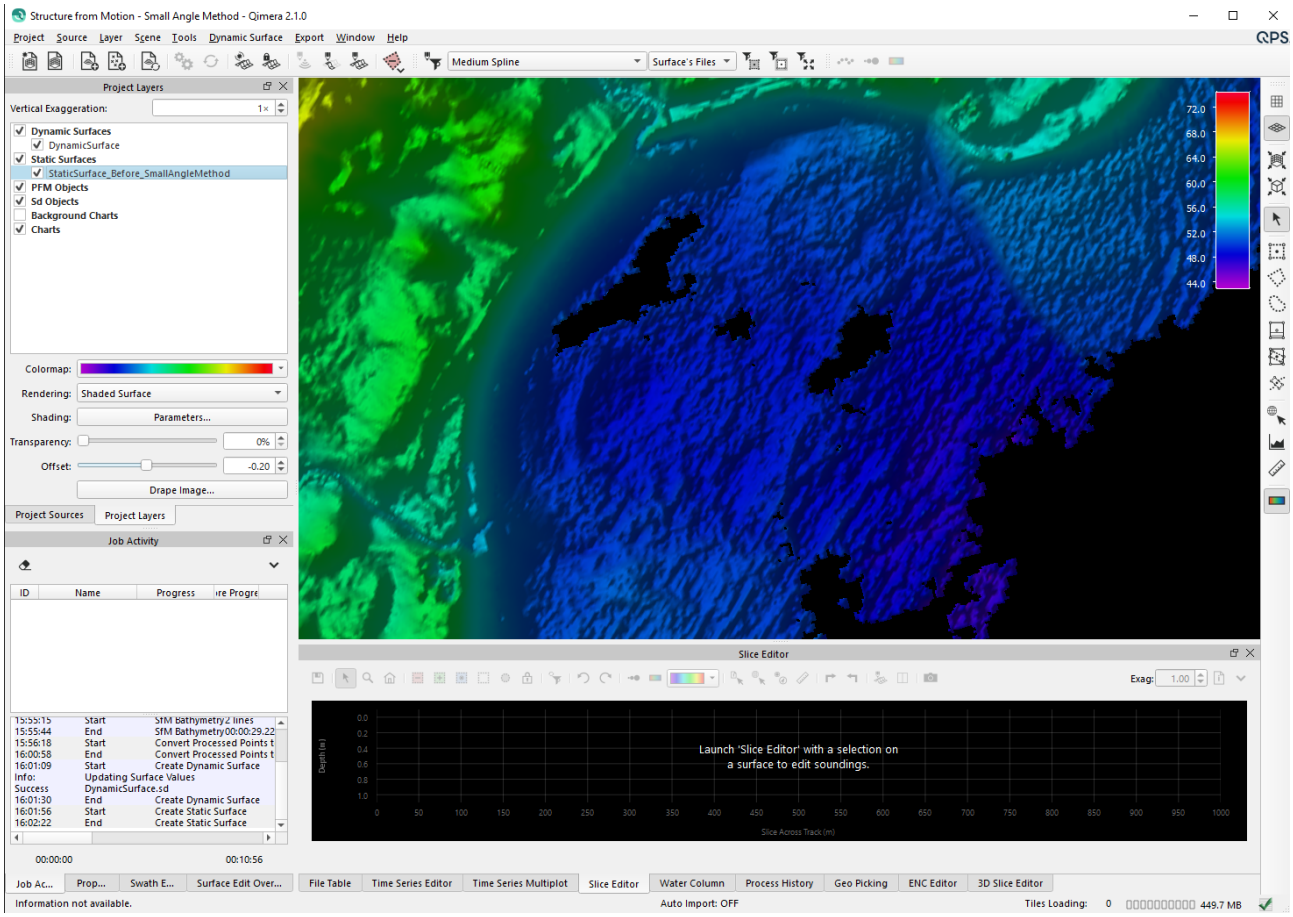
Use As: --, X, Y, Z, Omega, Phi, Kappa

After the first import, Qimera should remember the previously used ASCII Format.



Example: Small Angle Method

1. Import Processed Point Files
2. Create Dynamic Surface
3. Optional: Create a Static Surface to be used for comparison after the correction

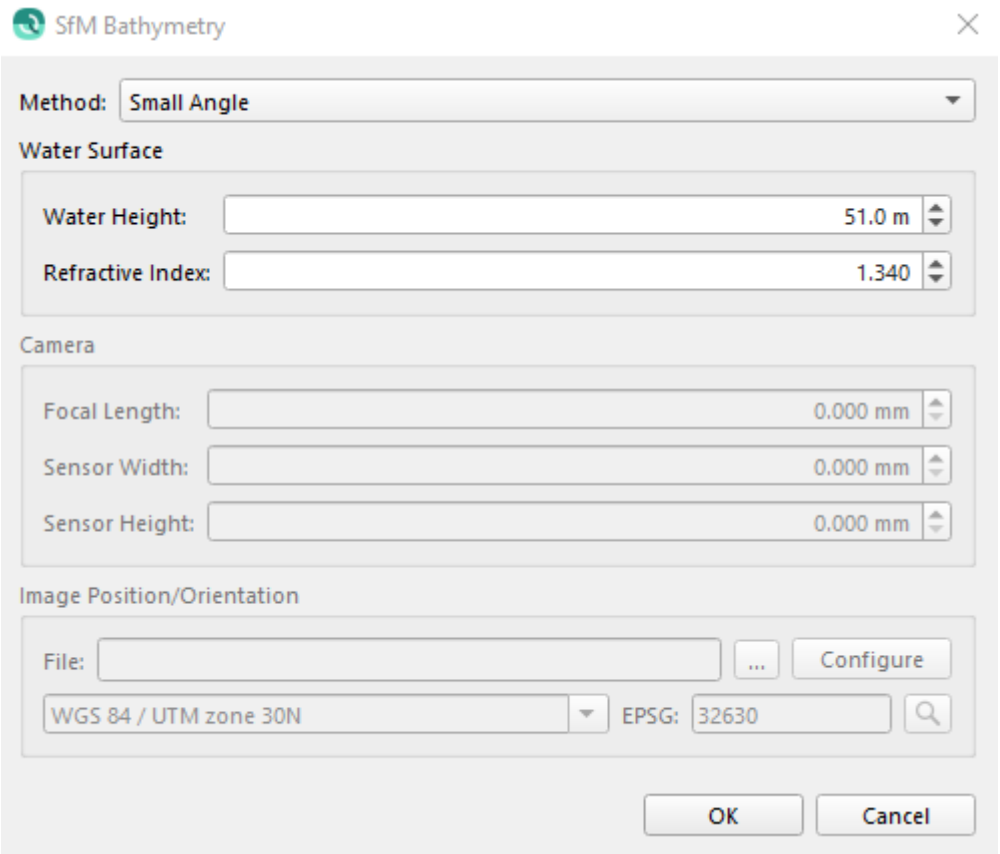


4. Select the Processed Point Files you want to run the Structure from Motion (SfM) Bathymetry Correction on

5. Tools Menu → Utilities → SfM Correction...

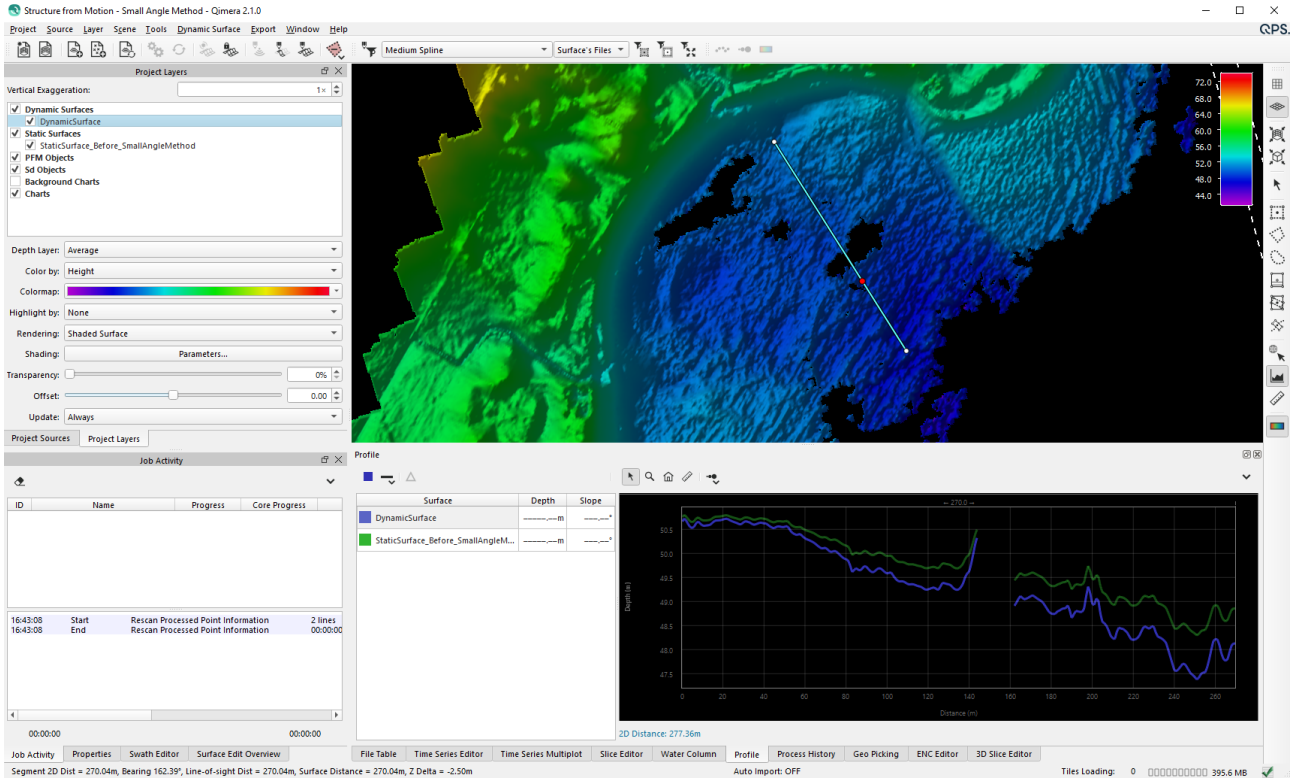
6. Enter in Water Height & Refractive Index

7. Click OK



8. Processed Point Files & Dynamic Surface will update

9. Optional: Compare the differences by creating a profile on the updated Dynamic Surface & original Static Surface

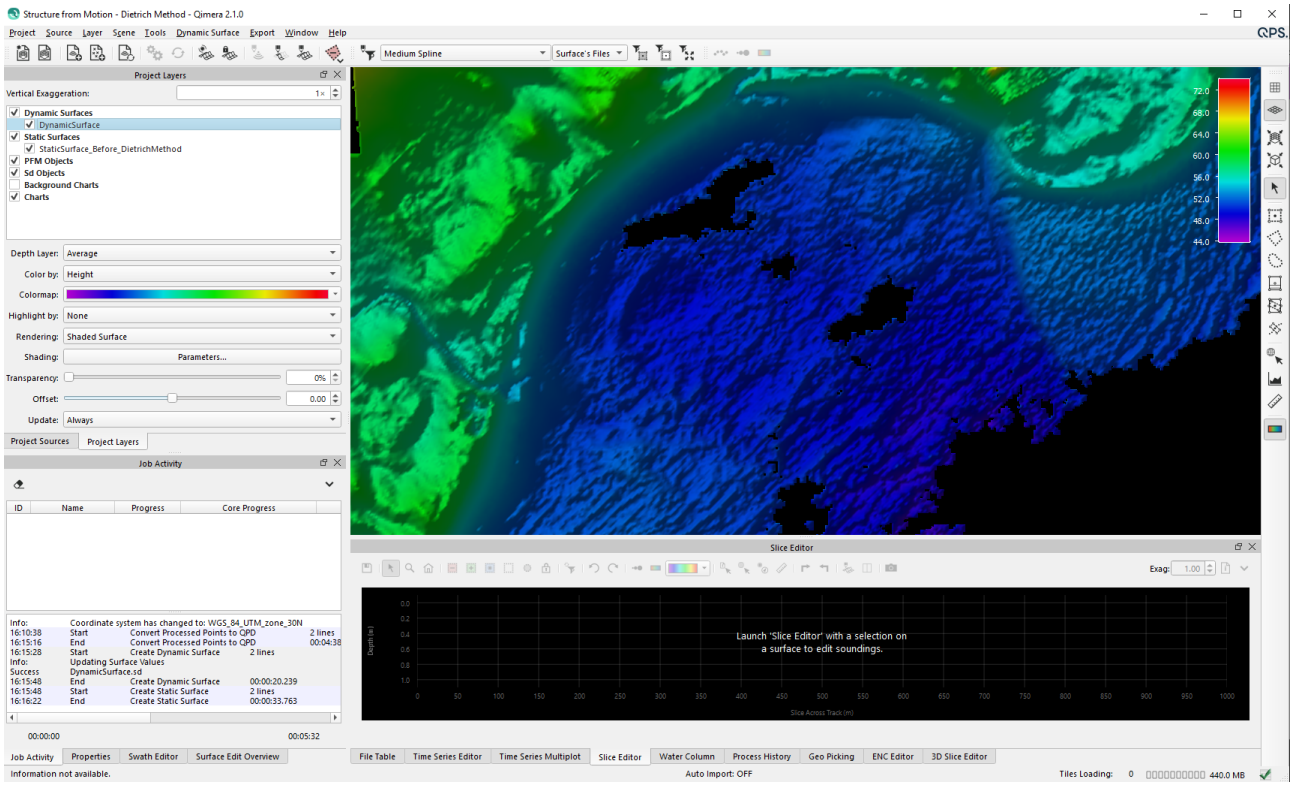


In this example, the Blue line is the updated Dynamic Surface and the Green line is the original Static Surface.

After running the Structure from Motion (SfM) tool, the surface is corrected and shifted, shown above in the Profile Dock.

Example: Dietrich Method

1. Import Processed Point Files
2. Create Dynamic Surface
3. Optional: Create a Static Surface to be used for comparison after the correction



4. Select the Processed Point Files you want to run the Structure from Motion (SfM) Bathymetry Correction on

5. Tools Menu → Utilities → SfM Correction...

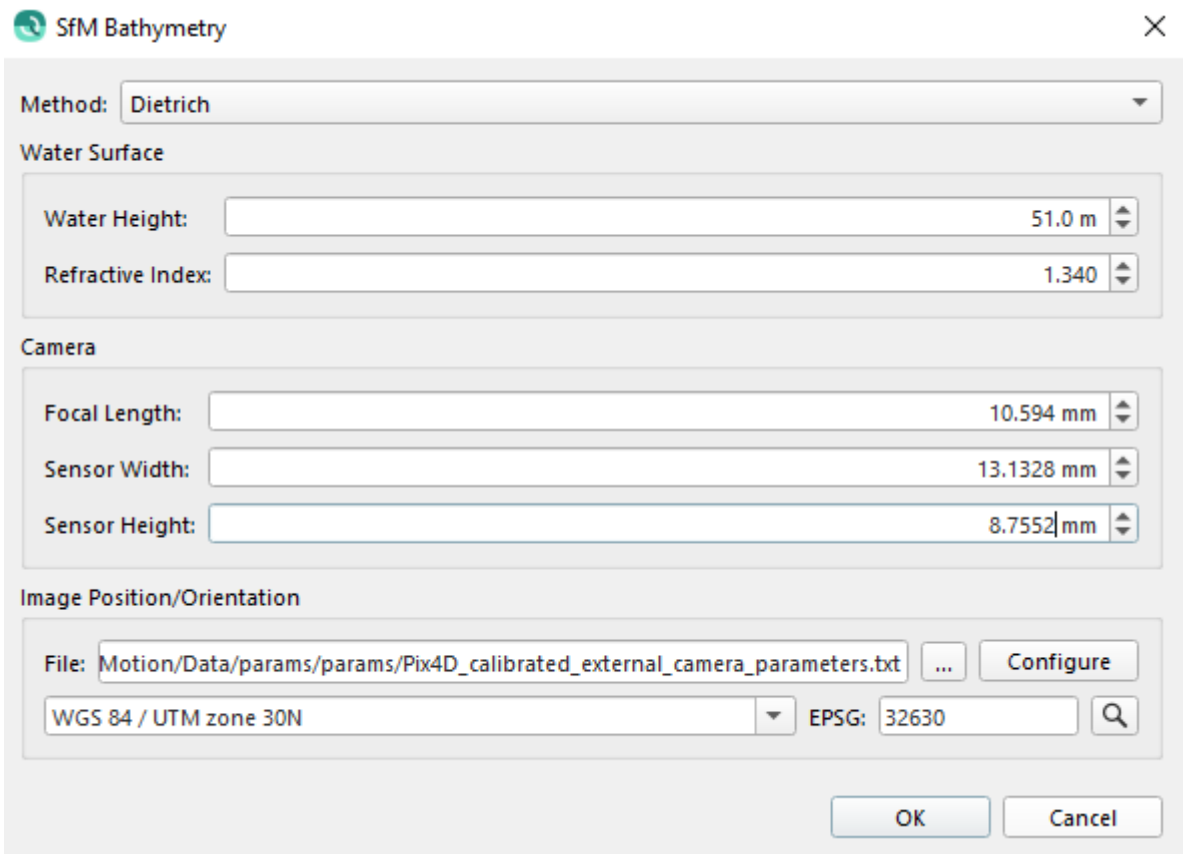
6. Enter in Water Height, Refractive Index, Camera Parameters (Accessible in SfM processing software)

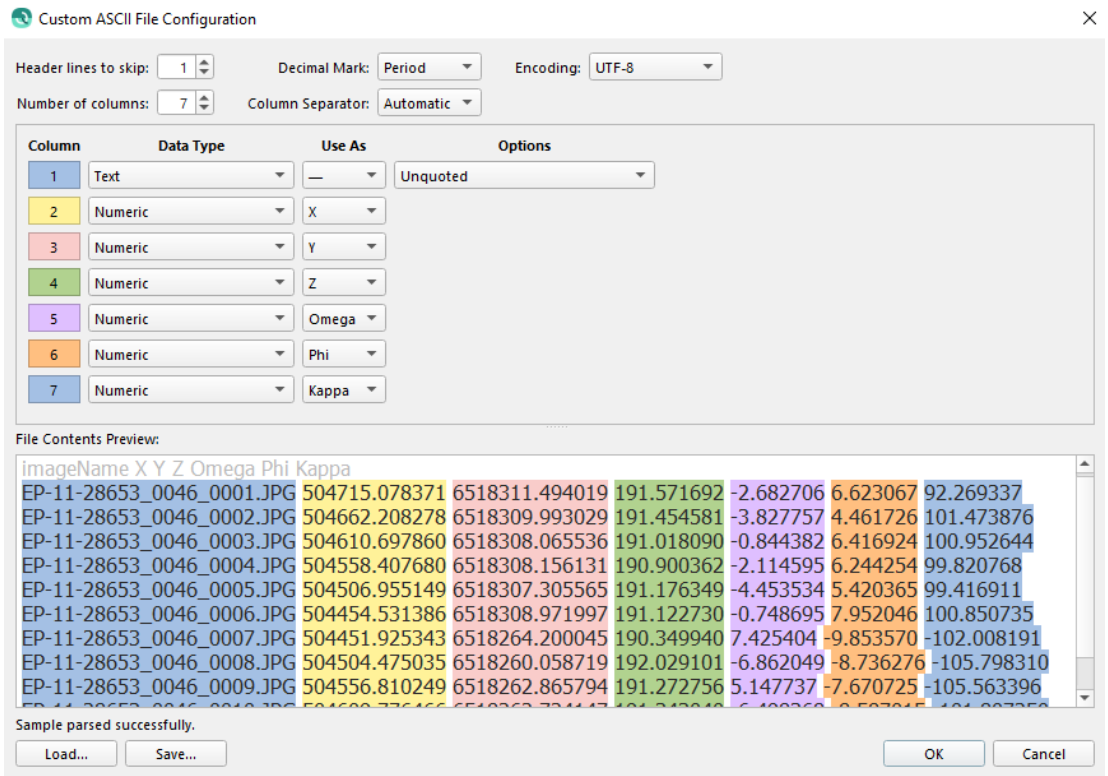
7. Import the Image Position/Orientation .txt file exported from the SfM processing software

8. Click Configure to check that the correct ASCII File Configuration is selected (–, X, Y, Z, Omega, Phi, Kappa)

9. Check to ensure the Geodetics are correct

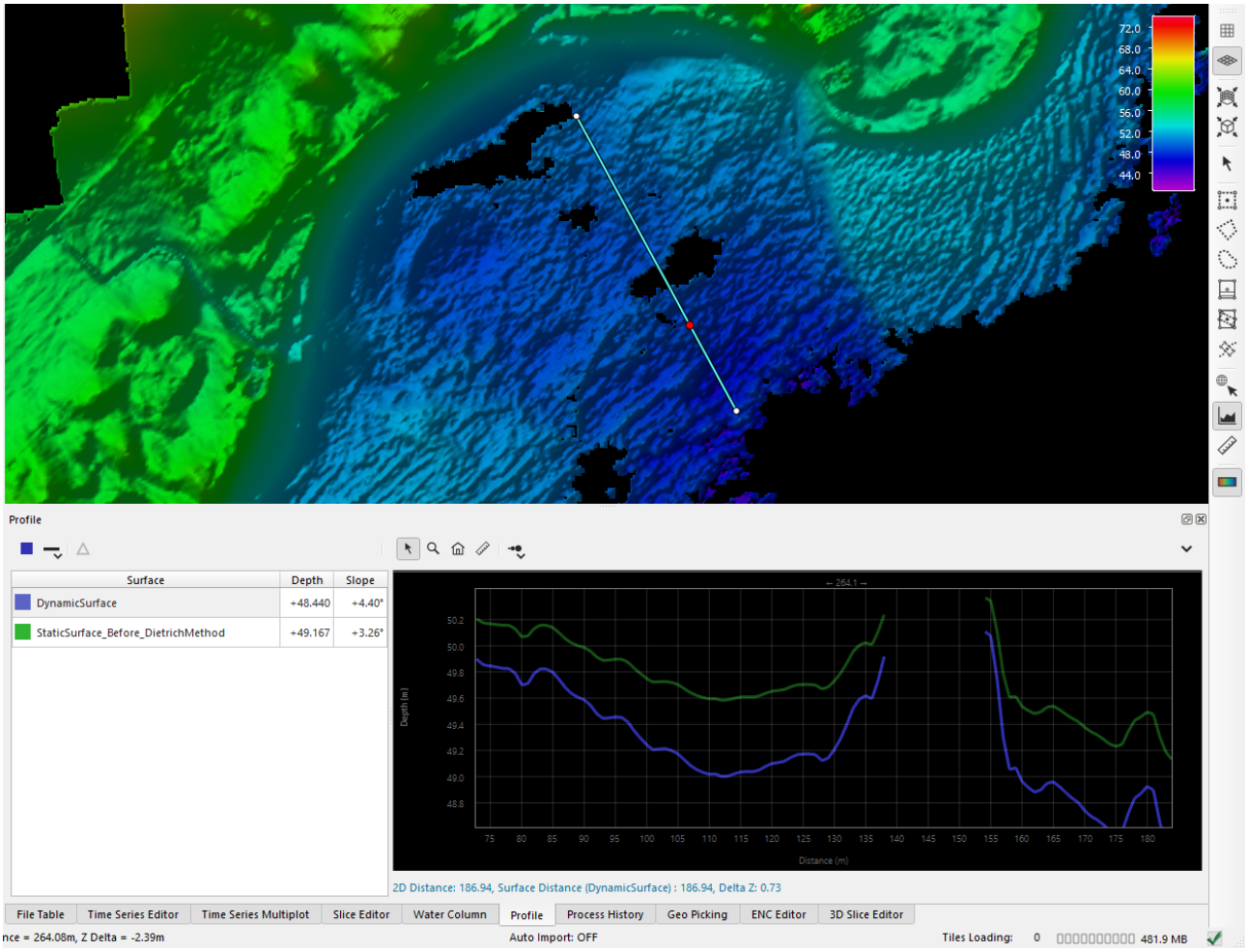
10. Click OK


SfM Bathymetry
Method: Dietrich
Water Surface
Water Height: 51.0 m
Refractive Index: 1.340
Camera
Focal Length: 10.594 mm
Sensor Width: 13.1328 mm
Sensor Height: 8.7552 mm
Image Position/Orientation
File: Motion/Data/params/params/Pix4D_calibrated_external_camera_parameters.txt
...
Configure
WGS 84 / UTM zone 30N
EPSG: 32630
OK
Cancel


Custom ASCII File Configuration
Header lines to skip: 1
Decimal Mark: Period
Encoding: UTF-8
Number of columns: 7
Column Separator: Automatic
Column
Data Type
Use As
Options
1 Text — Unquoted
2 Numeric X
3 Numeric Y
4 Numeric Z
5 Numeric Omega
6 Numeric Phi
7 Numeric Kappa
File Contents Preview:
imageName X Y Z Omega Phi Kappa
EP-11-28653_0046_0001.JPG 504715.078371 6518311.494019 191.571692 -2.682706 6.623067 92.269337
EP-11-28653_0046_0002.JPG 504662.208278 6518309.993029 191.454581 -3.827757 4.461726 101.473876
EP-11-28653_0046_0003.JPG 504610.697860 6518308.065536 191.018090 -0.844382 6.416924 100.952644
EP-11-28653_0046_0004.JPG 504558.407680 6518308.156131 190.900362 -2.114595 6.244254 99.820768
EP-11-28653_0046_0005.JPG 504506.955149 6518307.305565 191.176349 -4.453534 5.420365 99.416911
EP-11-28653_0046_0006.JPG 504454.531386 6518308.971997 191.122730 -0.748695 7.952046 100.850735
EP-11-28653_0046_0007.JPG 504451.925343 6518264.200045 190.349940 7.425404 -9.853570 -102.008191
EP-11-28653_0046_0008.JPG 504504.475035 6518260.058719 192.029101 -6.862049 -8.736276 -105.798310
EP-11-28653_0046_0009.JPG 504556.810249 6518262.865794 191.272756 5.147737 -7.670725 -105.563396
Sample parsed successfully.
Load...
Save...
OK
Cancel

11. Processed Point Files & Dynamic Surface will update

12. Optional: Compare the differences by creating a profile on the updated Dynamic Surface & original Static Surface



In this example, the Blue line is the updated Dynamic Surface and the Green line is the original Static Surface.

After running the Structure from Motion (SfM) tool, the surface is corrected and shifted, shown above in the Profile Dock.

How-to Tide Strategy

This how-to documentation will help users to implement a Tide strategy. A Tide Strategy can be used as a tide source for vertical referencing.
These steps assume that you have a Qimera working project open with data files loaded.

On this page:

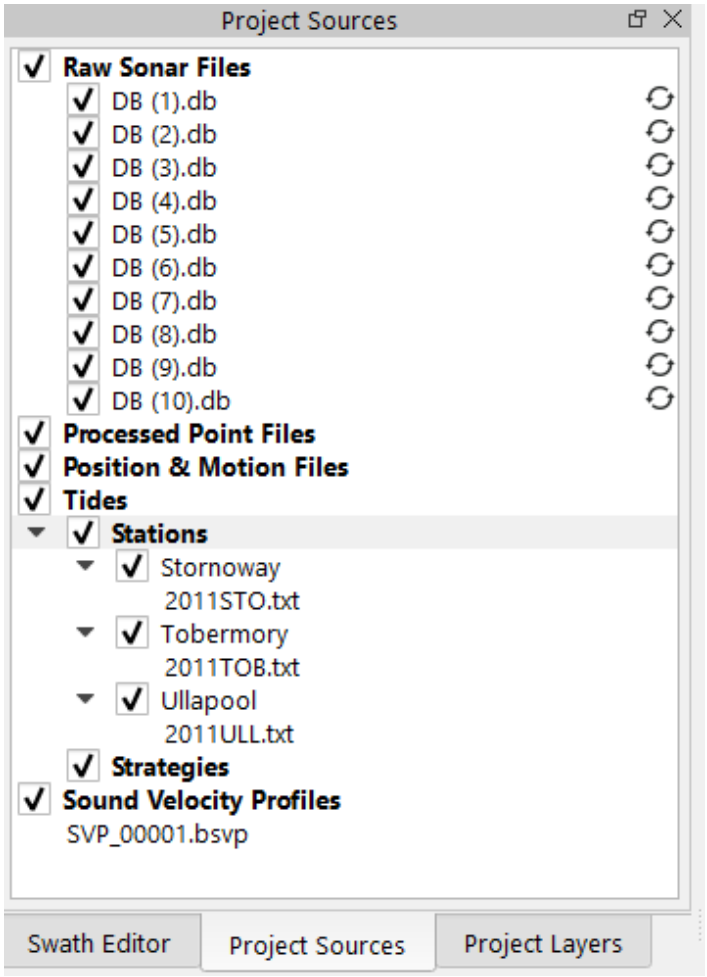
- Step 1 - Import the tide files
- Step 2 - Create Tide Strategy
- Step 3 - Apply Tide Strategy
- Step 4 - Review Tides in Times series and Time Series Multiplot
- Step 5 - Review Tides comparing Static Surfaces
- Related articles

Before you start, create a Dynamic Surface and a Static Surface, you will use the last one to review on the last step.

Step 1 - Import the tide files

Import your tide files, go to the Source Menu and select: 'Add tide files'. Navigate to the Tide file. For each file you will add a station.
Note that you will not add the tide files in batch, to add files in batch the files need to belong to the same station.
For detail information about import of Tide files, please see How-to Apply Tides

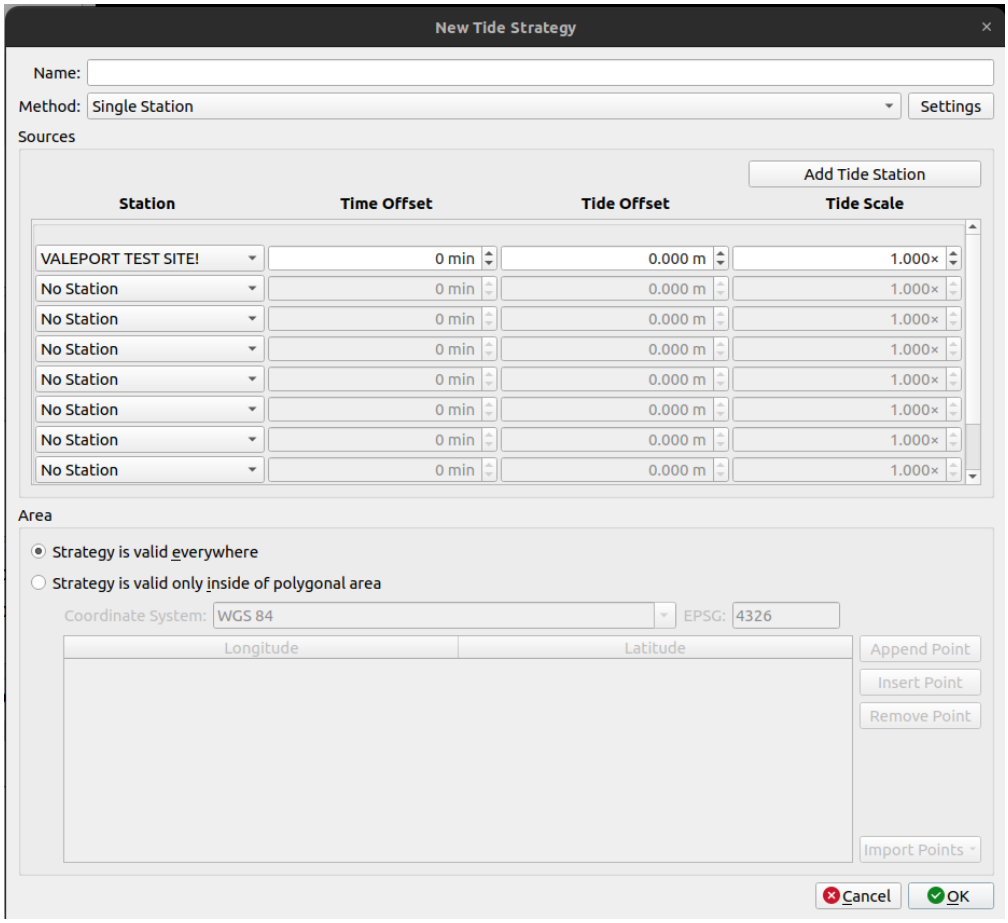
In this example, there are 3 tide files imported:



Project Source Files Window with tide files already imported and Raw sonar files marked dirty

Step 2 - Create Tide Strategy

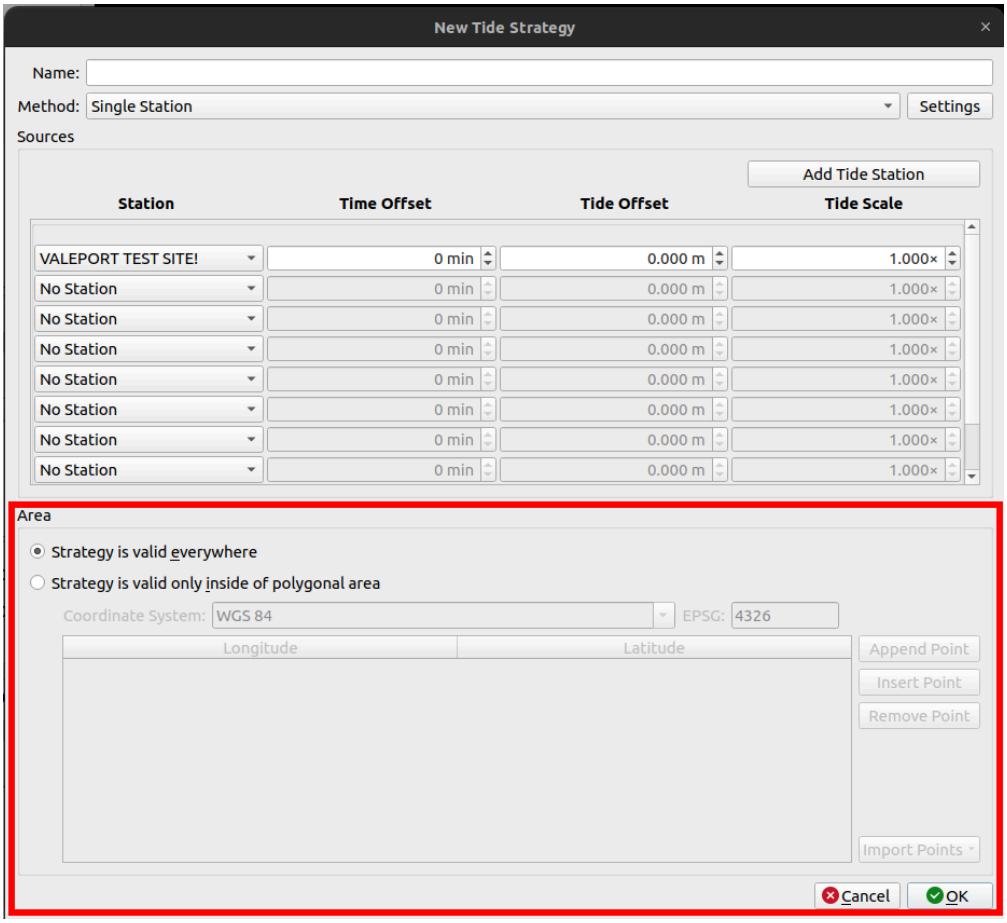
Right-click Tides or Strategy on the Project Sources Window, and select 'Create Tide Strategy'.



Tide Strategy dialog

To add more Tide-Stations, click the Add Tide Station button. This will create new rows in the scrollable window.

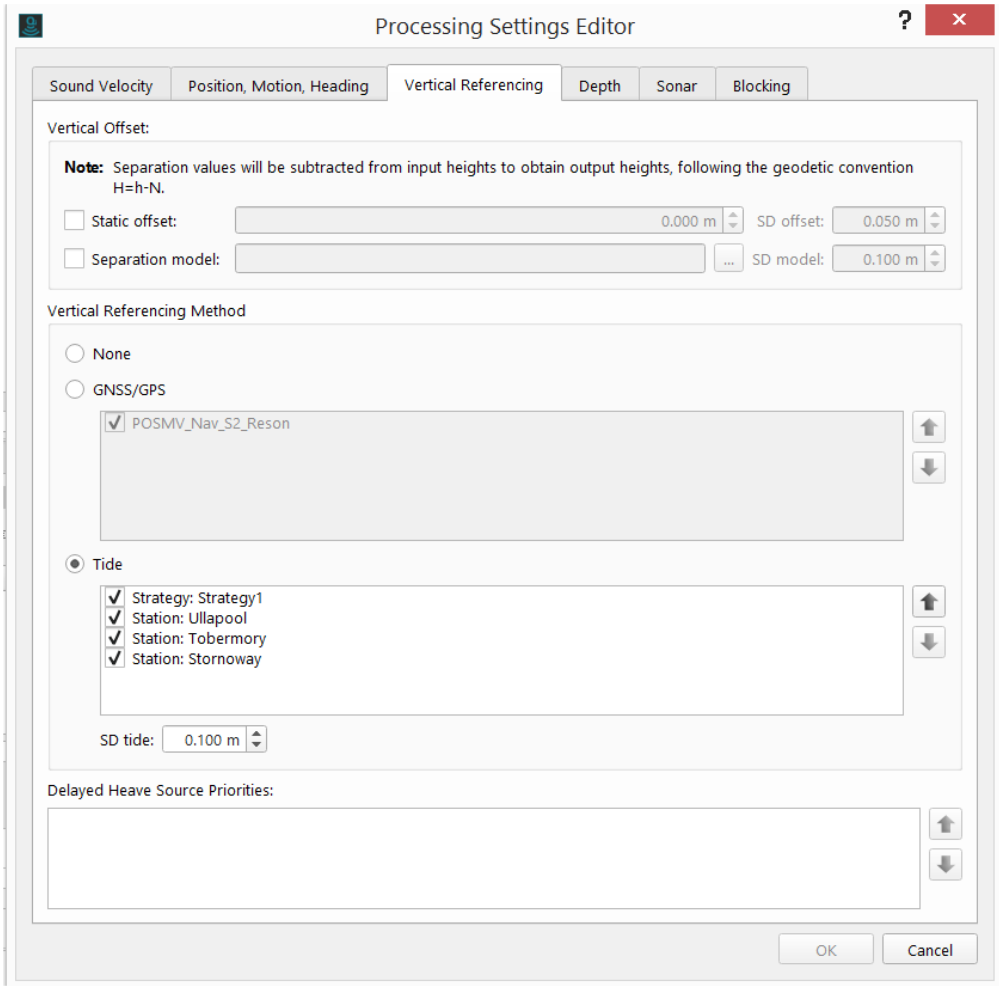
Select a name, for display purposes and also select the method. When selecting the method, Qimera will populate the sources options for your strategy method. You can find more information about the Methods in Qimera Tide Strategy Dialog. You are also able to adjust your sources and set the area. You could set the strategy valid for a limited area of the survey.



Tide Strategy dialog - Area

Step 3 - Apply Tide Strategy

On the project sources window, right-click on Raw Sonar files, selecting all data files, and go to the Processing Parameters to the Vertical Reference tab. On the Vertical referencing tab, ensure Tide is selected and Strategy is set as the top priority.

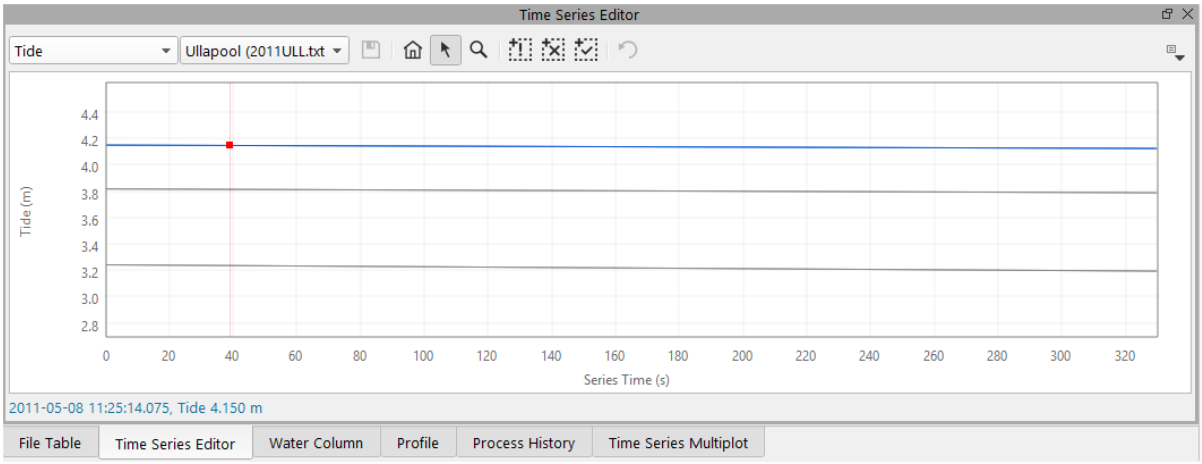


Processing Parameter dialog Vertical Referencing Tab

You should now reprocess, click the Auto Process icon .

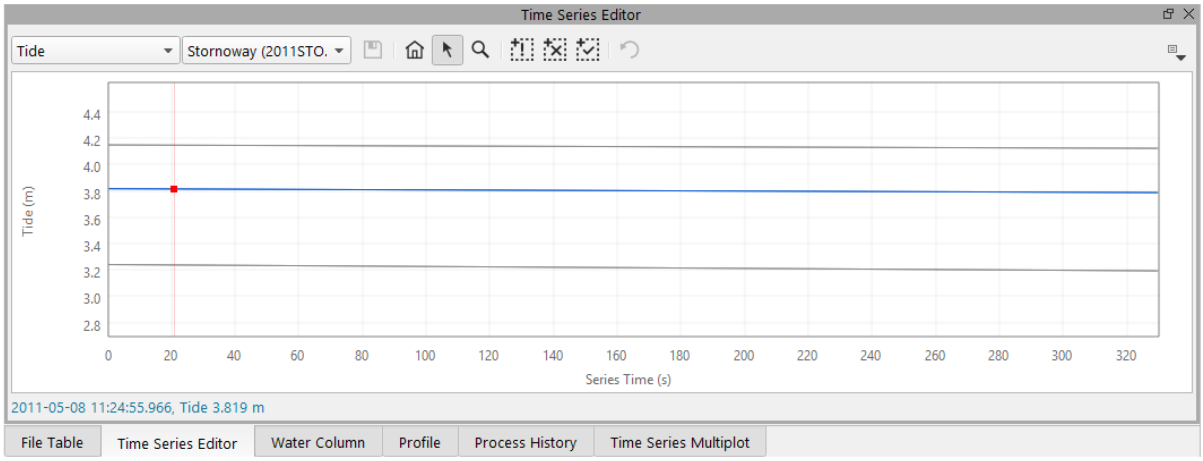
Step 4 - Review Tides in Times series and Time Series Multiplot

You can review your tide files and tide strategy. Select a raw sonar file, and hover to the Time Series Editor window, and select Tide and one of the Stations.



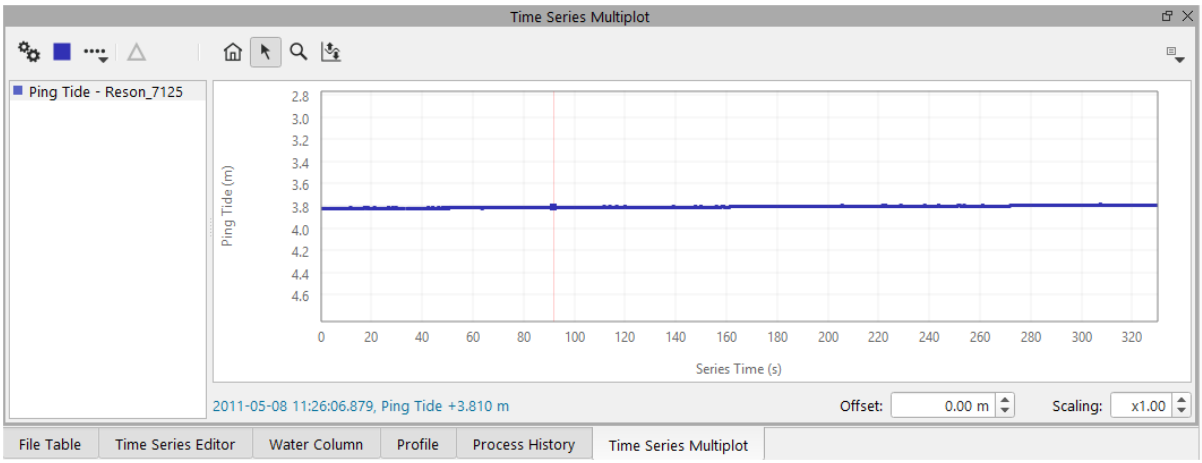
Time Series Editor window with tide station selected

You are able to see all three tides values for the Time Series of that particular file. Depending on the interpolation and methods used the Strategy should be a sensible value between the tides used.



Time Series Editor window with another tide station selected

To review the outcome value of the Tide Strategy, select the Time Series Multiplot and configure it to load the Ping Tide. The tide strategy is area dependent, so the value will be interpolated between the 3 stations. See the How-to Time Series Multiplot for steps on how to configure the Multiplot to show the Ping Tide.



In this case, the values of the Tide Strategy are close to the Stornoway tide station values. You have now successfully applied a Tide Strategy.

Step 5 - Review Tides comparing Static Surfaces

Create a new static Surface. You will now be able to compare both surfaces. In this case a surface difference.

Related articles

New Features for Managing and Applying Tides in Qimera

How-to Apply Tides

How-to Custom ASCII File Import

How-to Time Series Multiplot

How-to Tips and Tricks

Common tips and tricks for using Qimera.

On this page:

- Navigation and Exploration
  - Shift + Left Click in 2D / 4D window
  - Mouse Wheel
- Shortcuts
  - Selection Shortcuts
  - Filtering and Editing
  - Moving a Selection or Slice box
  - View Shortcuts
  - File Shortcuts
- Other Tips
  - Point Size and Color By selection

Navigation and Exploration

Shift + Left Click in 2D / 4D window

In order to avoid exiting a measure or selection mode, or the redrawing of a selection box, you can Shift + Left Click on the 2D / 4D window to move or rotate.

Mouse Wheel

The mouse scroll wheel can be used to zoom in and out of many plots and displays. Combined with the zoom button, this can be very useful for adjusting plot dimensions or aspect ratio.

Shortcuts

Selection Shortcuts

- (R)ectangular Select
- (P)olygon Select
- (F)reehand Select
- (C) Fixed Slice Select

- (Shift + C) Free Slice Select
- (Shift + L) Scroll Select

Filtering and Editing

- (1) Open selected lines in Swath Editor
- (2) Open selection in Slice Editor (Must have a Dynamic Surface selected)
- (3) Open selection in 3D Editor (Must have a Dynamic Surface selected)
- (U) Open CUBE Filtering Settings Dialog (Must have a CUBE dynamic surface selected)

Moving a Selection or Slice box

- W,A,S,D keys move ahead, back, left and right. This moves either the selection box or the slice, depending on which mode you are in.
- Shift + W,A,S,D moves the entire selection box while in Fixed and Free Slice Select modes.
- Q & E rotate the slice or selection boxes if it is possible.

View Shortcuts

- (T) Toggle between 2D and 3D view
- (Z)oom to selected object
- (Shift + Z)oom to scene

File Shortcuts

- (Ctrl + F) open project folder in File Explorer (Windows)
- (Ctrl + O)pen project

Other Tips

Point Size and Color By selection

The Point Size and Color By buttons () can be used in two ways.

a. Clicking on the icon will cycle through all the options.
b. 'Clicking and holding' will bring up a list of the options (see Figures 1a and b):

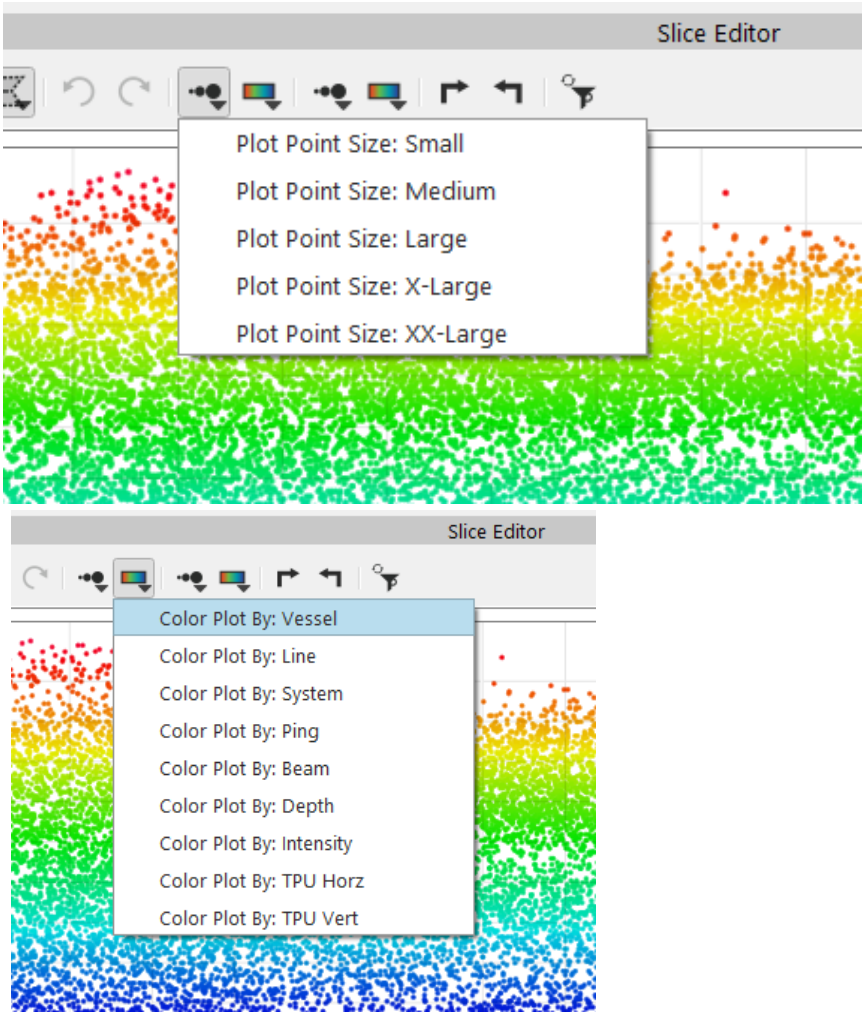


Figure 1a and b. *Holding down to view point size and plot color options.*

These cycle-through icons are located in the Slice and Swath Editors, Time Series tools, Wobble and Patch Test tools as well as the SVP Editor.

How-to Vertical Referencing

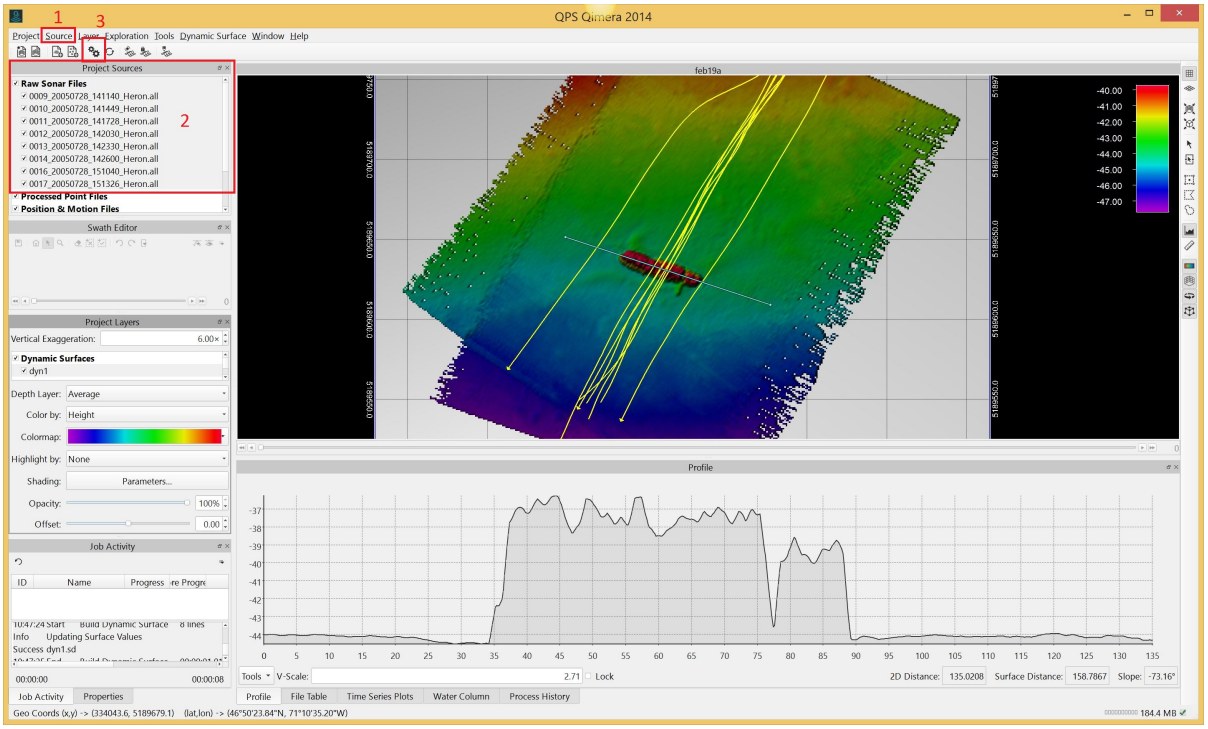
This How-to describes the process for setting and adjusting the vertical referencing of data.

On this page:

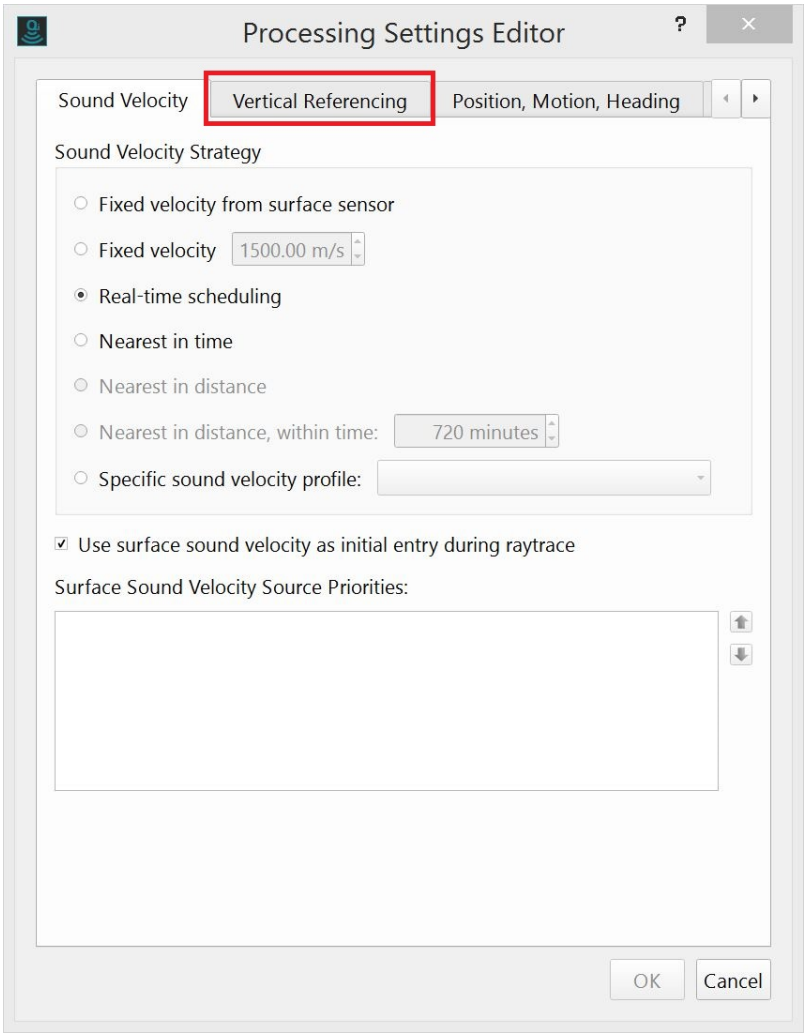
- Setup
- Vertical Referencing Options Overview
- Details

Setup

1. Ensure that the files you want to adjust are loaded into the project.
2. Load any tide, sbet, ASCII or binary nav files that are applicable. Use the 'Source' pull-down menu (1) for this.
3. Select the lines (files) that need vertical reference adjustment.
   You can highlight individual lines or click on 'Raw Sonar Files' in the Project Sources window (2) to highlight all files.
4. Click on the 'Processing Settings' button (3).

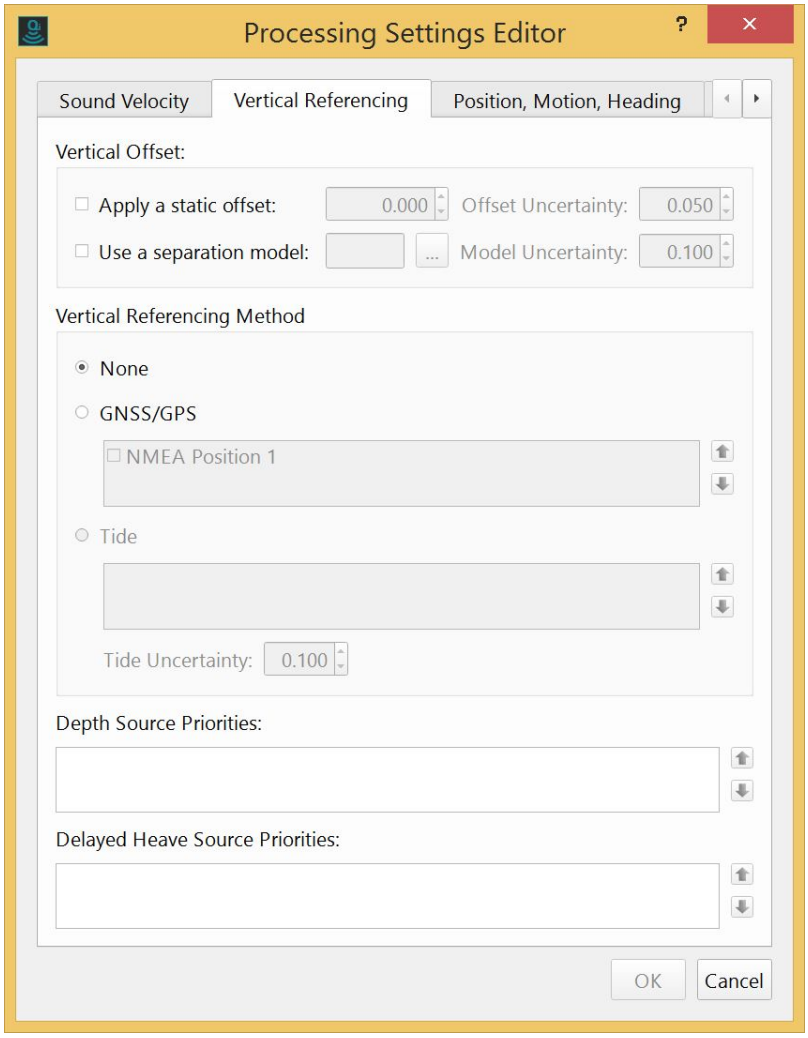


5. The Processing Settings Editor window will pop up.
   Click on the Vertical Referencing tab.



Vertical Referencing Options Overview

The Vertical Referencing options are laid out as seen below:



The Vertical Offset section allows setting static offsets and the use of a separation model. There is an adjustable uncertainty associated with each.

The Vertical Referencing Method section allows for the selection of either GNSS/GPS or Tides as your referencing source. The arrows at the right side of each box allow for the adjustment of the source priorities.

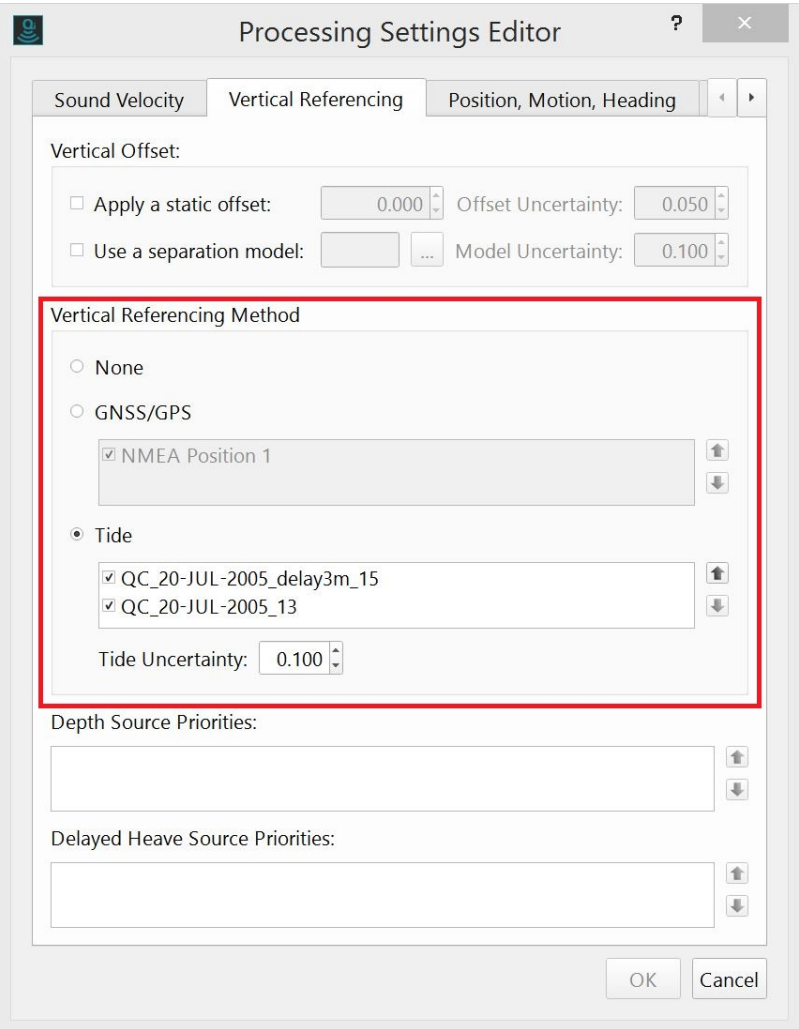
The Depth Sources Priorities box allows for prioritization of depth sources that are available. An example of this would be a depth sensor attached to an AUV/ROV.

> ⚠ If a depth source is available and applied, heave (from the motion sensor) and vessel squat are not applied.

The Delayed Heave Source Priorities box allows prioritization of any delayed heave sources that are available.

Details

Within the Vertical Referencing Method box shown below, there are two options for vertical referencing sources GNSS/GPS and Tide. Only one can be active at any time.



Within each of the methods there can be multiple sources. If the box beside each is ticked it will be applied to the MBES data. They are applied in order of their position in the list. If there is a gap or lack of overlap in the first, the second will be used, etc.

If the box is left unchecked, it will not be applied at all.

Once the OK button is pressed you will be prompted to reprocess affected files (at the top of the geographic window. This will apply the vertical referencing sources to the data and the dynamic surface (if you have one built) will be automatically regenerated.

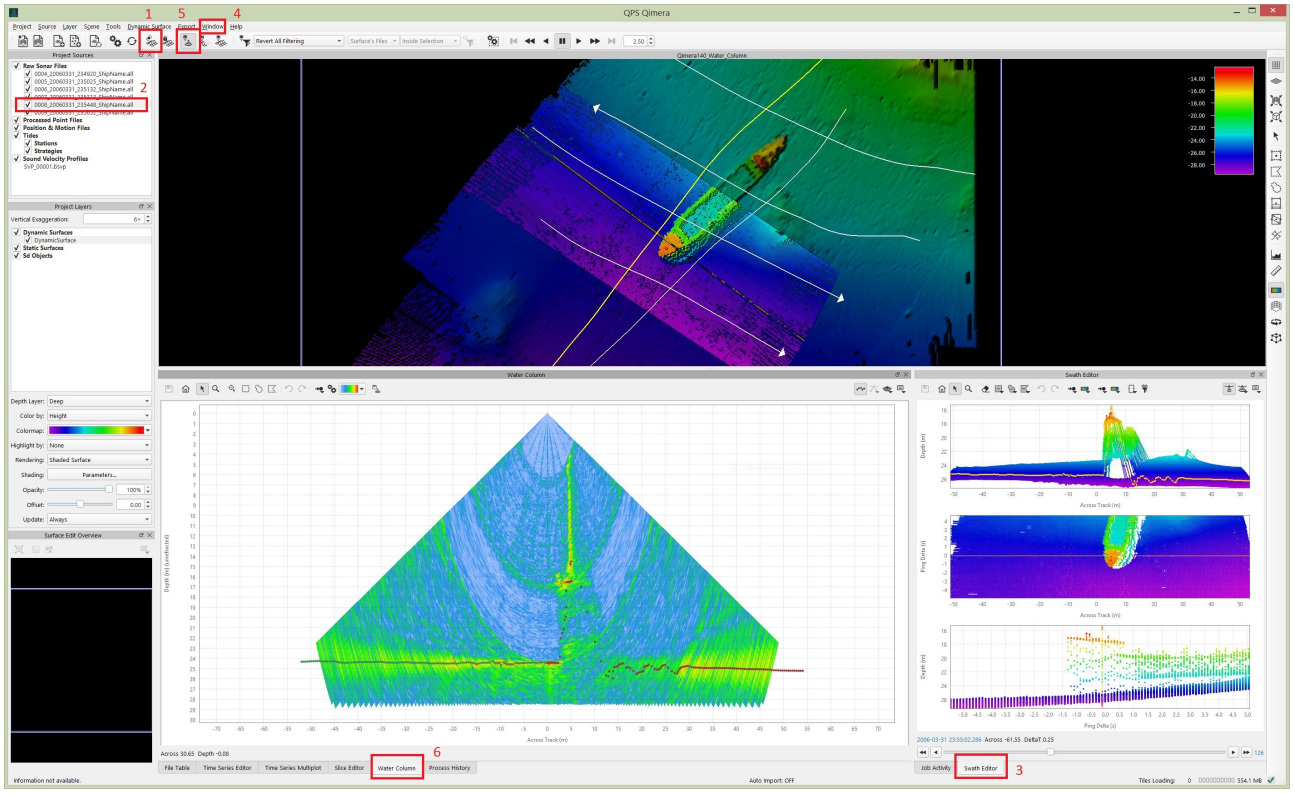
How-to Water Column Sounding Extraction

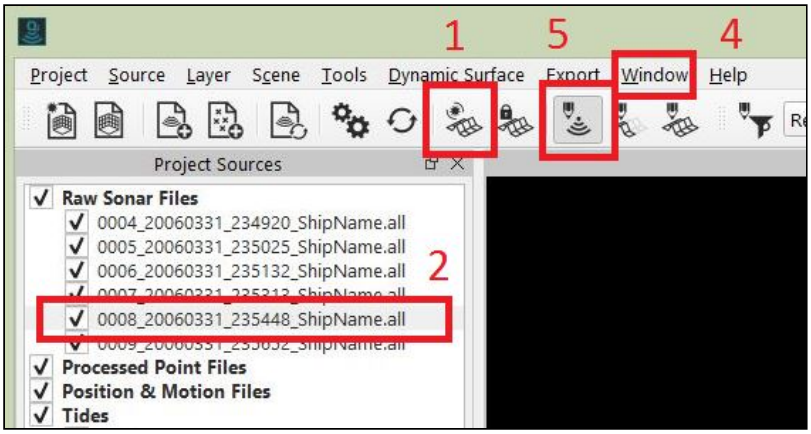
This page will help you view data using the water column.

On this page:

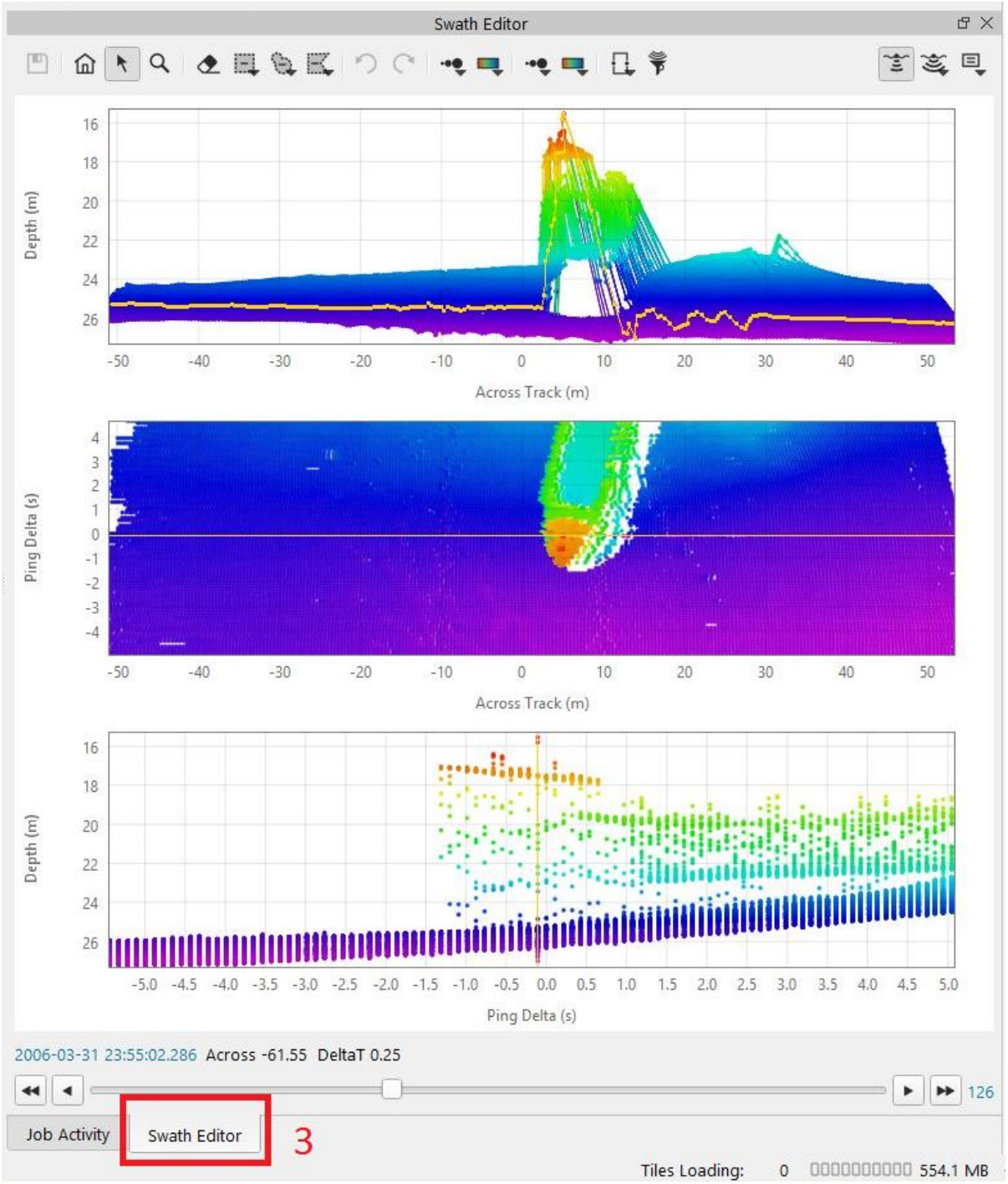
- Starting up the Water Column Tool
- Working with the Water Column Tool
  - Swath Editor Dock
  - Water Column Dock
  - Filter Settings
- Sounding Selection and Extraction
  - Creating single points
  - Sounding extraction by selection
- Additional Functionality
  - Saving snapshots
  - Exporting User Created Soundings
  - Deleting User Created Soundings

Starting up the Water Column Tool

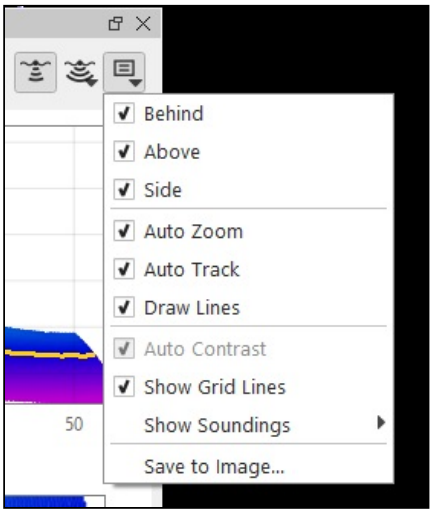




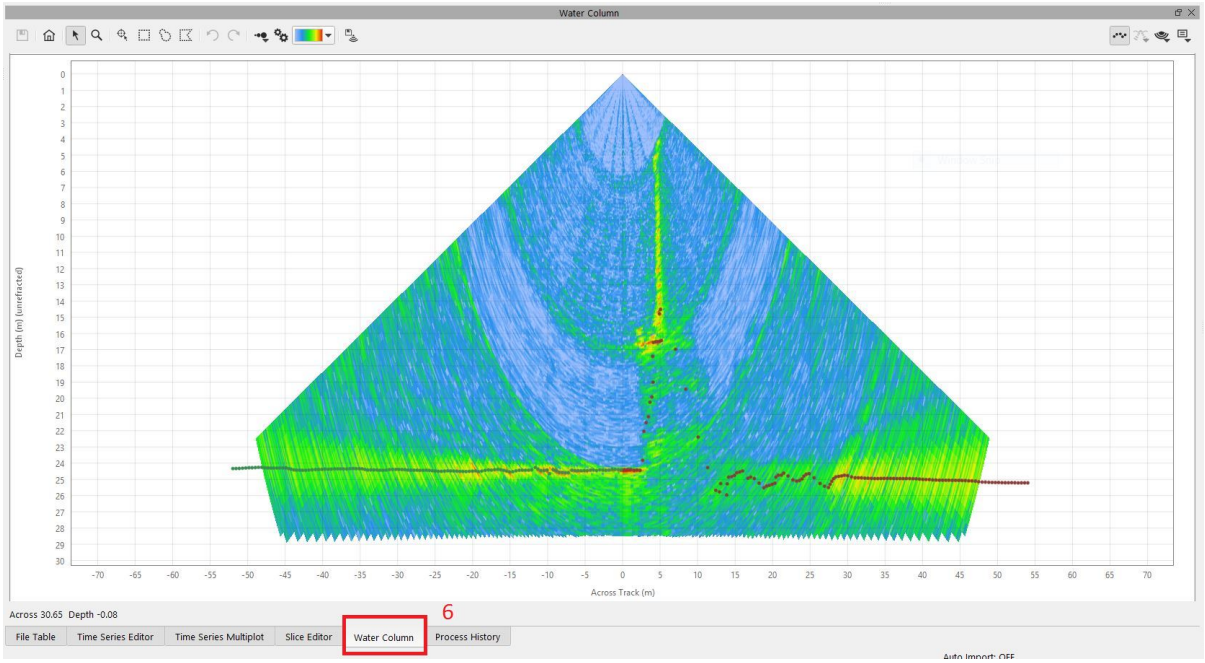
- 1) Create a Dynamic Surface if you haven't already. See the How-to Dynamic Surfaces page for more information.
- 2) Select a line in Project Sources dock. (only a single line can be viewed at a time).



- 3) Ensure that the Swath Editor Dock is turned on. If it can't be found in the dock tabs, turn it on via the Window drop down menu (4).



- 5) Start the Swath Editor with the dedicated button in the menu bar or the keyboard shortcut 1, adjust views as desired. Behind, Above, and Side views are available.
  For more information see the Qimera Swath Editor Window page in the Reference Manual.

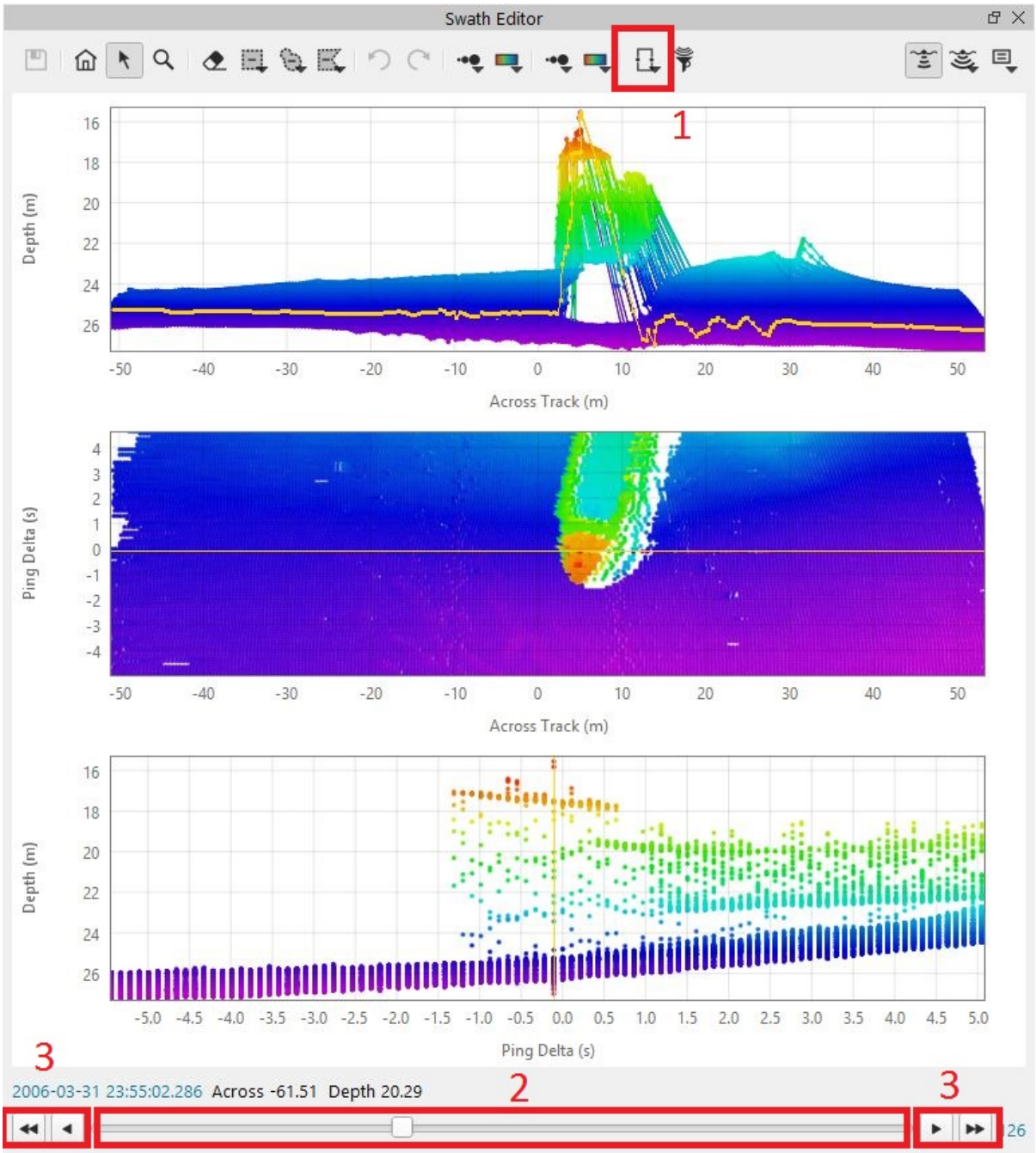


- 6) Turn on or raise the Water Column dock.

Working with the Water Column Tool

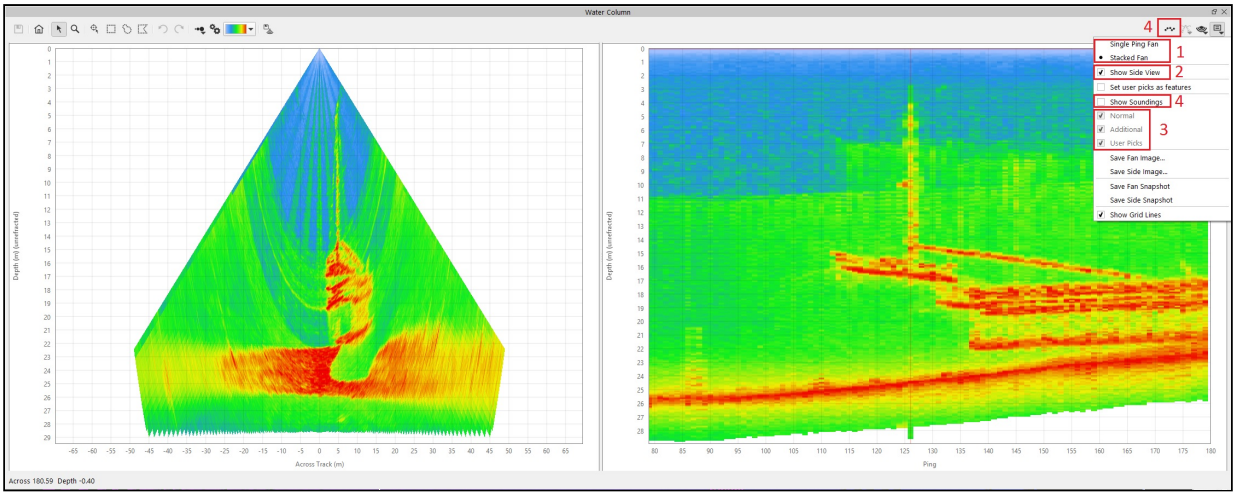
Using the Water Column Tool. See the Qimera Water Column Dock page for additional information.

Swath Editor Dock



- 1) Adjust the Swath Editor buffer size.
- 2) Use the Swath Editor slider to position buffer over area of interest.
- 3) Navigate along track by using the buttons on either side of the slider or the WSAD keys (A & D for single ping, W & S to move buffer).

Water Column Dock



- 1) Choose between Single Ping and Multi Ping (Stacked) fans.
- 2) Show side view if desired.
- 3) Toggle display of individual sounding types or use the Show Soundings button (4) to quickly toggle all types.

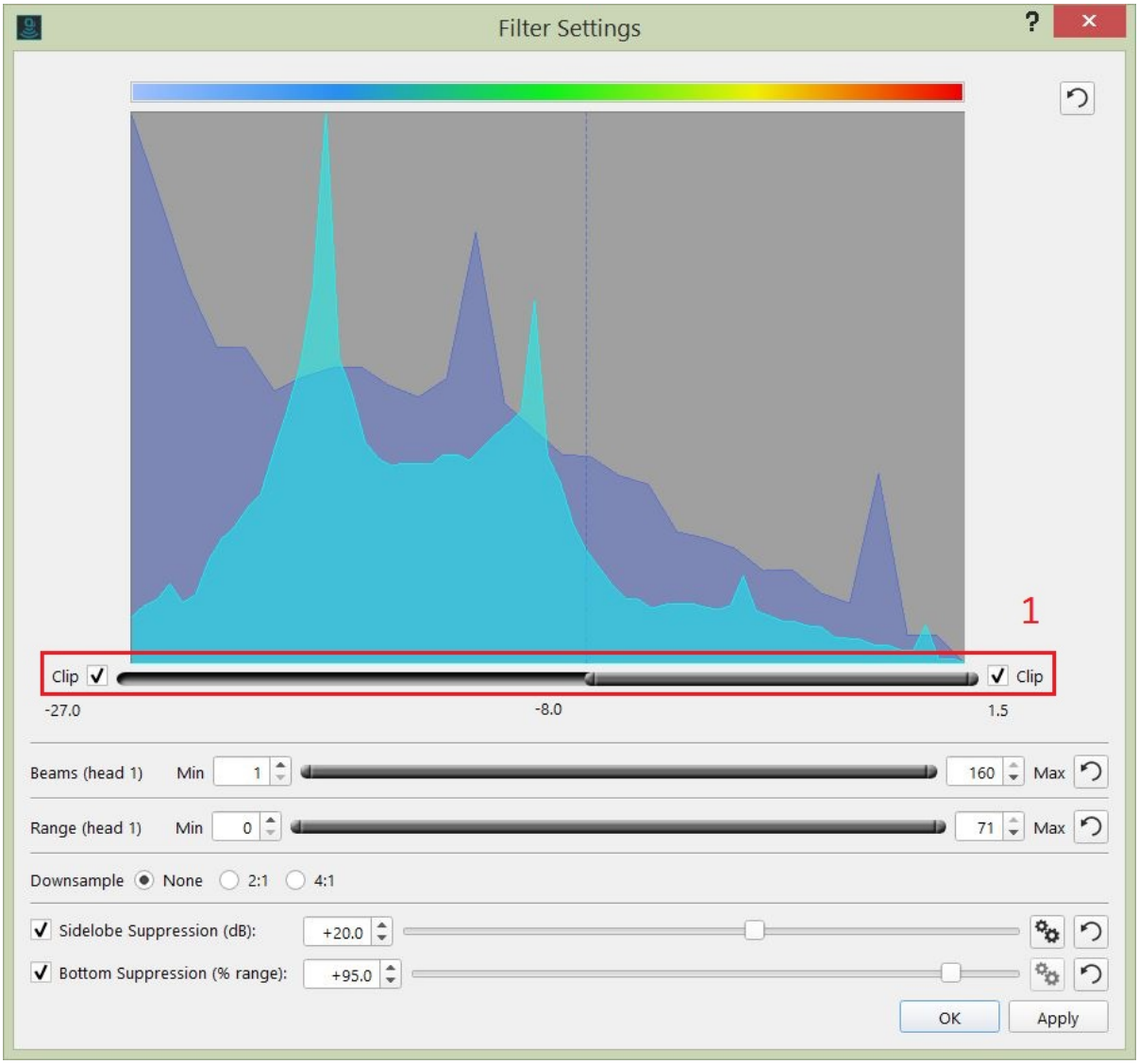
- Optionally, choose the Shallow depth layer of the Dynamic Surface to see the shoal surface. You may need to select the Deep layer to see the soundings projected in the 2D / 3D Window.
- Activate 'Set User Picks as Features' if you want to also flag new soundings as a feature.

Filter Settings

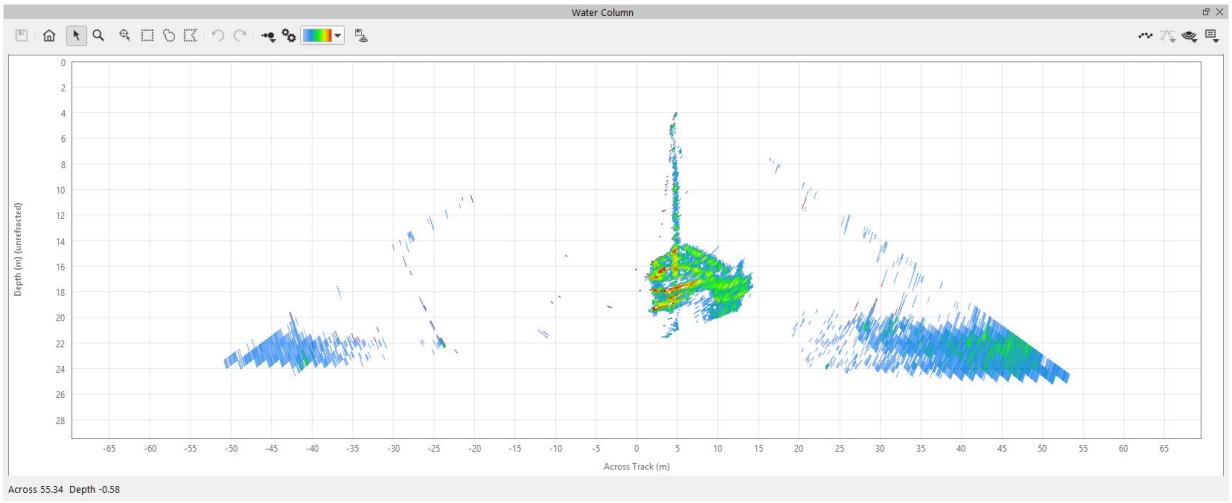
See the Filter Settings section of the Qimera Water Column Dock for additional information.



- Launch the Filter Settings dialog.



- 1) Adjust signal thresholds.
- Adjust other settings as required



Sounding Selection and Extraction

Creating single points

- Switch to single ping display mode (Single Points cannot be created in a stacked view).



- Click the Add Sounding button.
- Click on a feature in the Water Column plot (If nothing shows up, you may have your soundings turned off).
- Use the Undo and Redo buttons before saving. Once the User Picks have been saved they cannot be individually removed.

Sounding extraction by selection



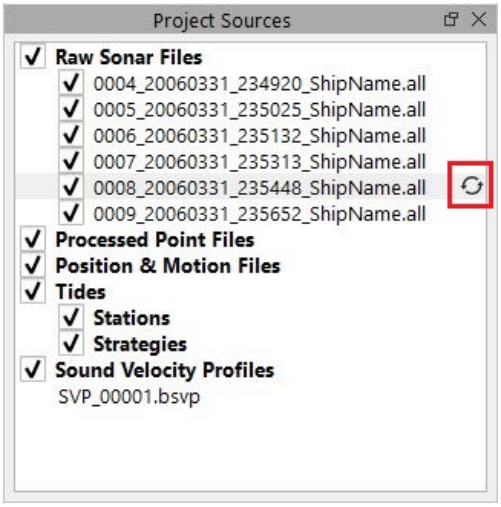
- Use a selection tool, ie Lasso to select area in water column to create soundings at location of pixels (this will project through all stacked pings if there are visible pixels).
  This can be used with single ping and stacked ping modes.

Finish Sounding Selection & Extraction and apply changes to Dynamic Surface

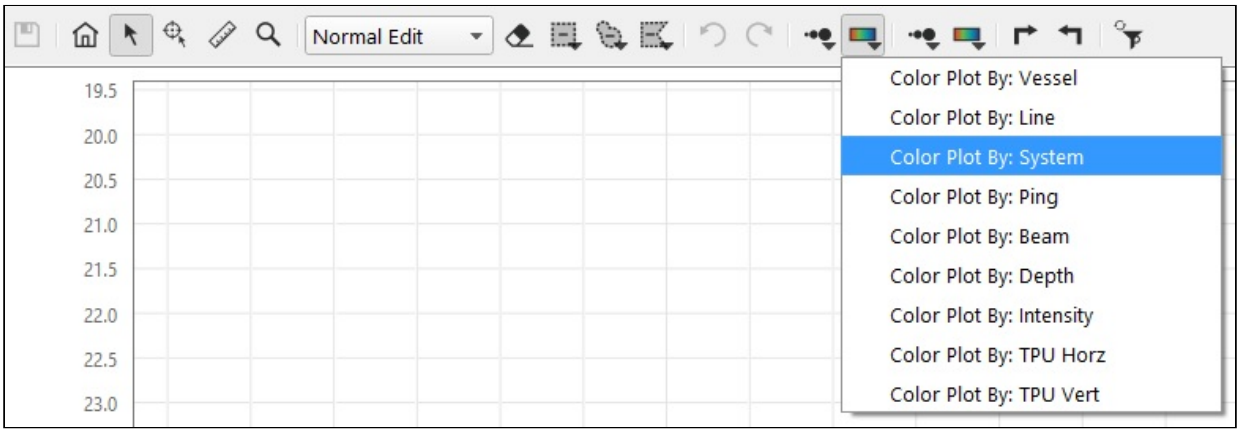
- Move along line and finish selecting features with the selection tools.



- Click the Save button when you are finished.
- Exit Swath Editor by clicking the Swath Editor button in Qimera's main toolbar or press 1



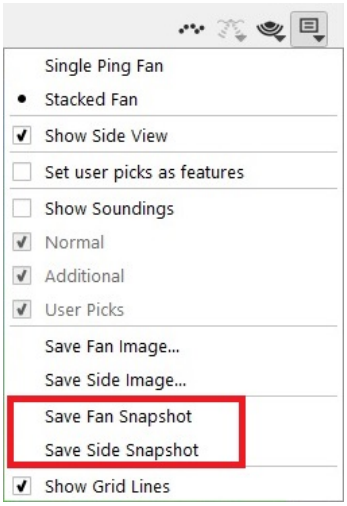
- Reprocess line(s) that have new soundings added. These will have the reprocess icon shown above.
- The Dynamic Surface will be updated automatically unless you have updating turned off.
- View and edit the new soundings in the Slice Editor or 3D Editor



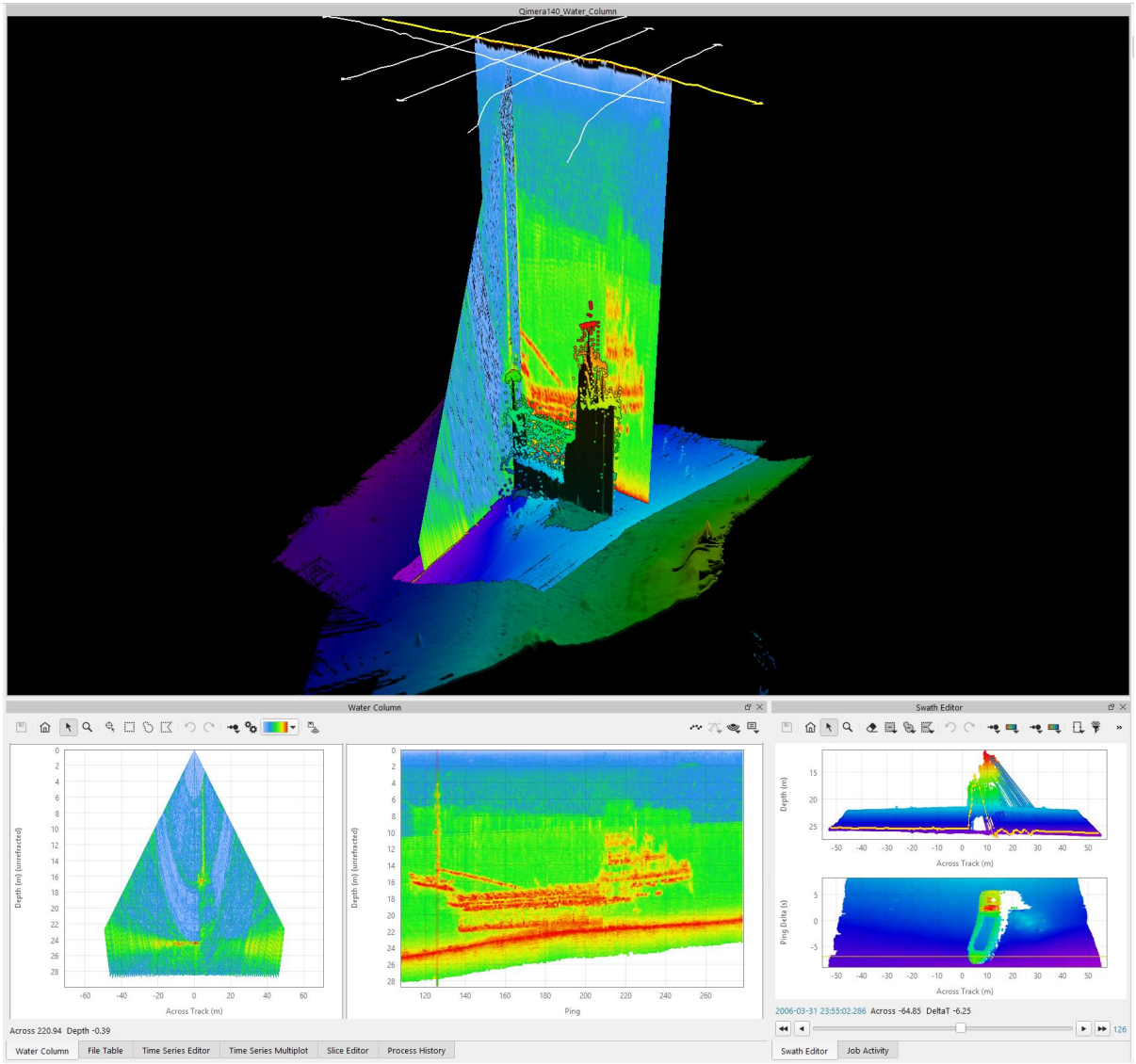
- To highlight the user created soundings in the Slice Editor, choose to color the points by system (click and hold the Color By button to activate the drop down menu).

Additional Functionality

Saving snapshots



- Save fan or side views as SD curtain snapshots

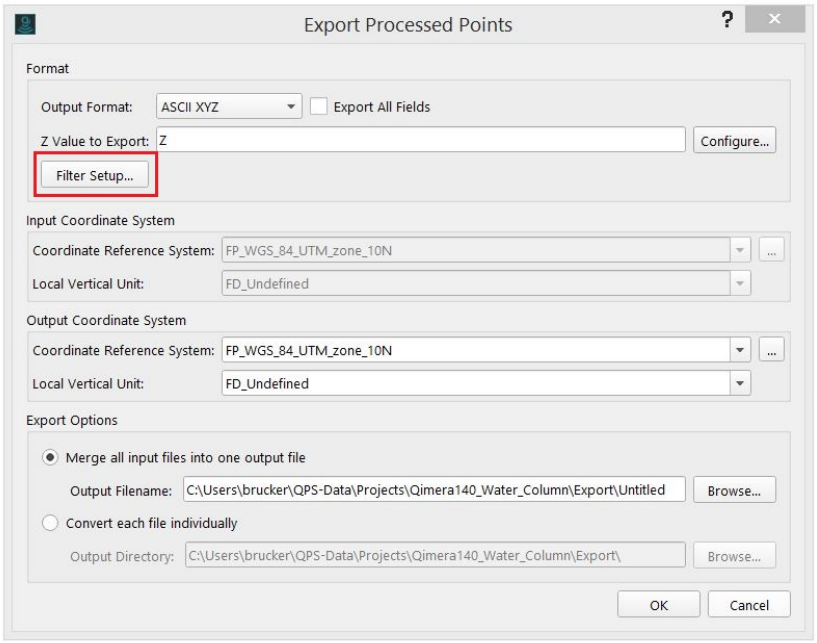


- View in 3D view mode

Exporting User Created Soundings

- Select line(s) in the Project Sources dock

- Go to Export -> Raw Sonar File -> to Processed Points





- Click Filter Setup
- Check the box next to 'Select User Additional Records'. This will now export only the manually created soundings.

Deleting User Created Soundings

- Individual user picks cannot be deleted. Once they have been created and saved they can be edited (flagged) in one of the editing tools (Swath, Slice, or 3D Editor).
- Removal of ALL user picks is possible. Under the main Tools dropdown menu select Manual Processing and Delete Water Column Picks (Tools -> Manual Processing -> Delete Water Column Picks).

3. Analysis and Troubleshooting

- How-to TU Delft Sound Speed Inversion
- How-to Cable/Pipe Detection and Editing
- How-to Coverage Extinction Plot
- How-to Flag Grid Cells
- How-to Line height matching tool
- How-to Screen Capture
- How-to Shift Time Series Observations
- How-to Static Horizontal Shift Tool
- How-to Static Vertical Shift
- How-to THU/TVU Layers
- How-to Time Series Multiplot
- How-to Use the Crosscheck Tool
- How-to Use the Wobble Analysis Tool
- How-to Varying Vertical Shift

How-to TU Delft Sound Speed Inversion

This How-to is a step-by-step description for using TU Delft Sound Speed Inversion tool, available from Qimera 1.6 and up. This tool fixes problems in bathymetric data caused by Sound Speed issues in areas where sound speed in water is challenging, like in estuaries where fresh water meets seawater or near factories where hot and cold water meet.

On this page:

- Introduction
- Step-by-Step Guide
  - Step 1 - Assess Your Data
  - Step 2 - Save a Before Image
  - Step 3 - Select The Data That Needs Repair
  - Step 4 - Run The Algorithm
    - Parameters
  - Step 5 - Assess Your Results
  - Step 6 - Make Adjustments if Necessary
- References

QPD files created in QINSy prior to 8.18, Qimera prior to 1.6, or with Direct to QPD will not have sufficient information to run the algorithm and will require sound velocity correction in Qimera prior to use. If needed a separate dialog will ask if you wish to reprocess the files to continue.

Since Qimera 1.6.1, this algorithm can be run on either QPDs only or QPDs linked to raw sonar files (.all, .s7k, etc). Along with this comes the ability to run this with only a Qimera Clean level of licensing. The TU Delft Sound Speed Inversion addon is still required however. See Qimera - License Levels for more information on addons.

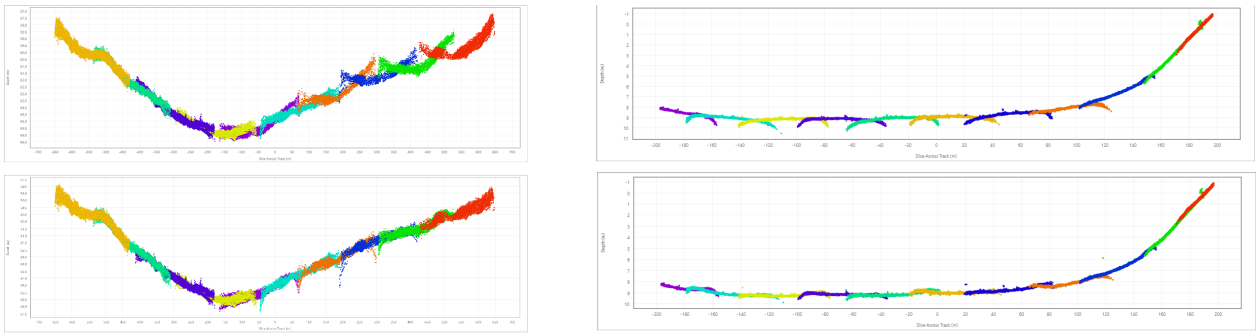
Introduction

QPS has worked together with the Technical University of Delft (TU Delft), The Netherlands to implement their sound speed inversion algorithm in QPS Qimera. The TU Delft algorithm allows for a completely automated refraction error correction.

This algorithm works by taking advantage of the overlap between survey lines, harnessing the power of redundancy of the multiple observations. For a given set of pings, the algorithm simultaneously estimates sound speed corrections for the chosen pings and their neighbors by computing a best-fit solution that minimizes the mismatch in the areas of overlap between lines. To do this the tool uses a simplified model of the water column in which the sound speed throughout the water column is constant from top to bottom (this is essentially the harmonic sound speed) and a refraction correction occurs only at the transducer face to allow for a ray bending correction. The data quality may significantly improve when applying this calculated harmonic Sound speed. For accountability, the algorithm also preserves the output of the inversion process for review, vetting, adjustment and reporting. This process is repeated across the entire spatial area, allowing for an adaptive solution that responds to changes in oceanographic conditions.

In general the more overlap the better the results of the tool are. However, based on the Academic paper in IEEE a 35% overlap is advised as a minimum. As shown in Table 2 of the paper a decrease in the overlap percentage increases the standard deviation. For overlap percentages decreasing from 70% to 35%, the standard deviation only slightly increases. For an overlap of less than 35%, a more rapid increase is found.

The collection of images below depict two examples of where the tool removed the effects of refraction from the data. The set of pictures on the left show where "Smileys" in the data were fixed, and the right pair show an example of "Frowns" being fixed. The top images show a slice of the data before corrections, and the bottom images are from after corrections.



(All images in Slice Editor view, colored by line)

Benefits of this method include:

1. Automated and objective: Overcomes the limitations of other solutions which require manual review and adjustment of the 'fudge factor' corrections that are inherently subjective and NOT repeatable. (even by the same operator!)

2. Physics-Based: Honors the physics of acoustic ray bending.

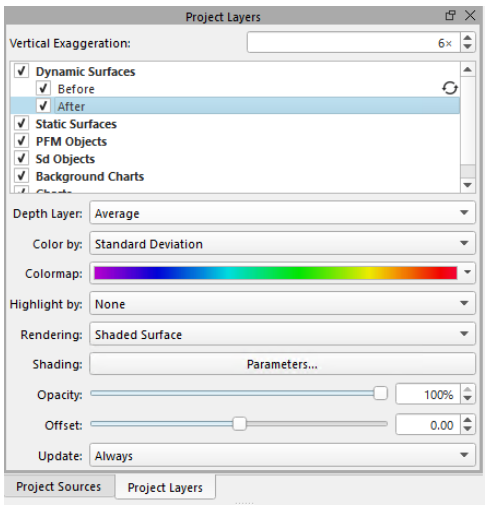
3. Accountable: Preserves the output of the inversion process for review, vetting, adjustment and reporting. If you don't like the result, you can easily disable it.

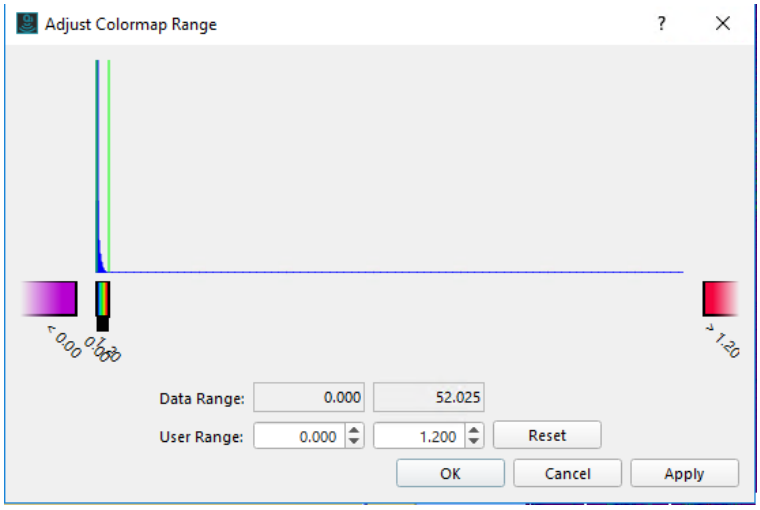
Step-by-Step Guide

> For the best results, we advise to run the algorithm on a pre-cleaned data set, especially when running the Quick Search algorithm. For spiky data the Full Search algorithm is most likely to do a better job than the Quick search algorithm, due to the nature of the algorithm using more data. But outliers / spikes in the data will influence the calculations

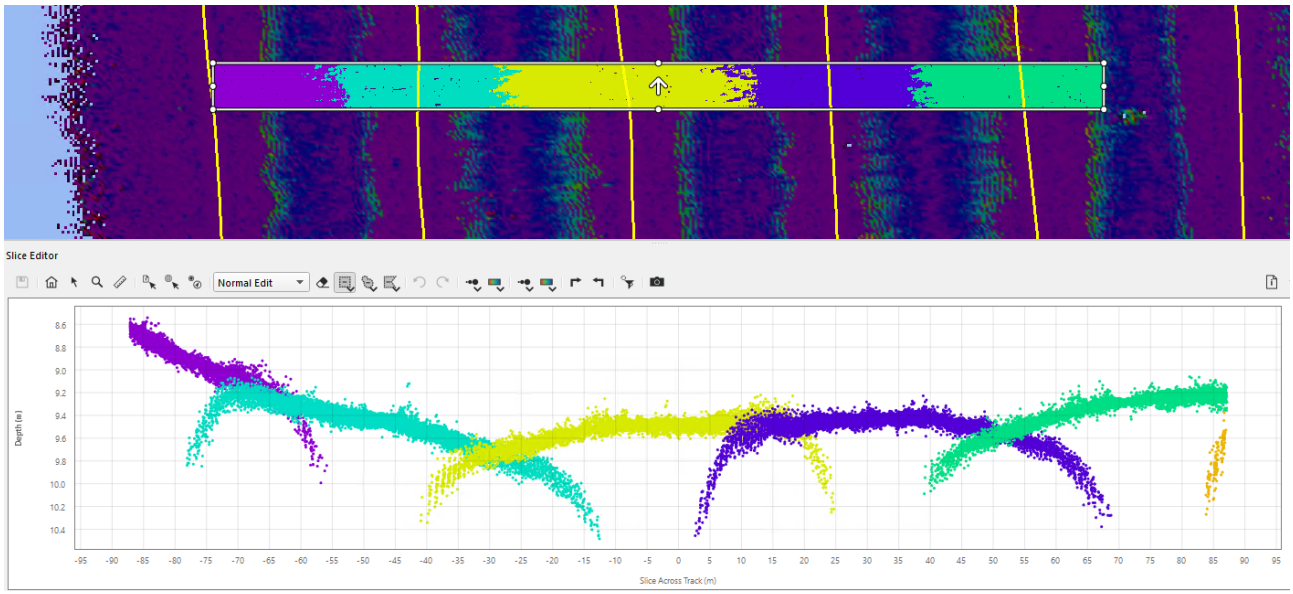
Step 1 - Assess Your Data

Determine the lines that require Sound Velocity improvement by assessing the data/ survey. A good way to visually spot refraction errors in your data is to set the Dynamic Surface attribute 'Color by' to Standard Deviation, and then adjust the colormap to emphasize outliers. The Adjust Colormap Range dialog will come up, you can left-click and right-click on either side of the histogram to adjust the range. You can also type in values in the text entry boxes below.

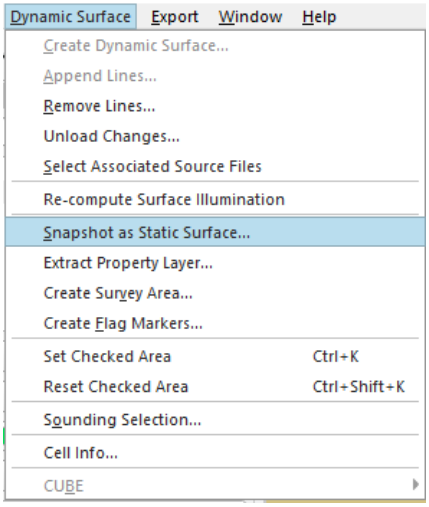


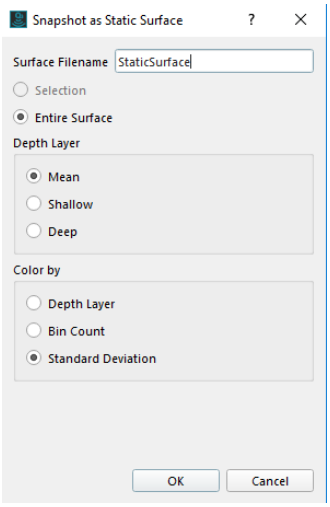


Next, using the Slice Editor (either 2D or 3D), you can zoom to problem areas and color the data by line to check the overlap of adjacent lines. In some cases, all survey lines must be adjusted. In other cases, only a few lines need to be adjusted. If your dataset is not pre-cleaned, cleaning of the data should occur here.



An additional step that can aid in assessing the results of the correction is to create two dynamic surfaces at the beginning of your project, one for before the corrections and one for after. This allows the user to easily see what changed in their data. Alternatively you could snapshot the dynamic surface as a static surface, a function accessed in the Dynamic Surface drop down menu.

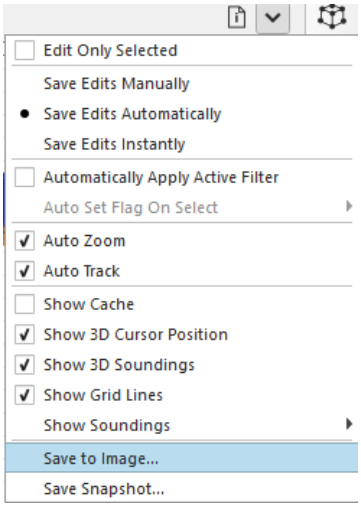




Step 2 - Save a Before Image

This second step is not strictly necessary, but is a suggested best practice to help you assess the results of the algorithm by capturing a snapshot of the results before application of the algorithm.

With the 2D slice editor open, and a slice of the data selected, select the "Save to image" option found under the drop down menu in the top right corner of the slice editor window. You will be prompted to give this image a name and location.

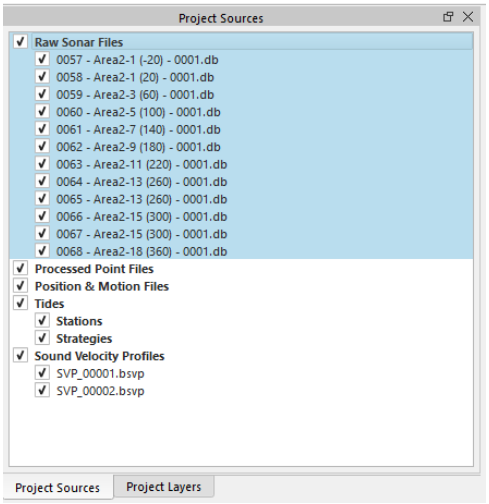


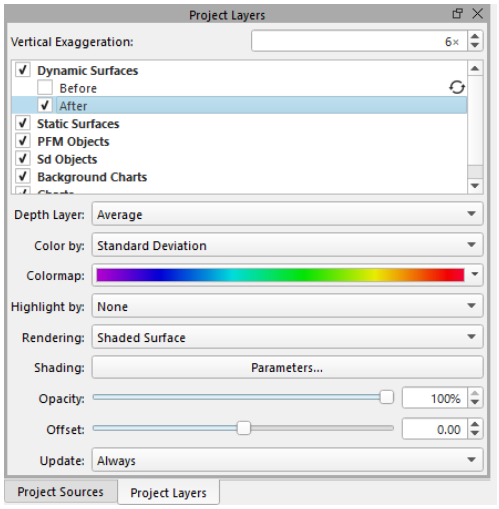
If you followed the optional step to create two dynamic surfaces, once the slice editor image is saved, set the before dynamic surface to never update, so that the refraction corrections are not applied to it. In this way you can compare the two surfaces once the tool has run.



Step 3 - Select The Data That Needs Repair

In the Project Sources Window, select the appropriate line(s) for which you'd like to compute a correction (the left image below). In the Project Layers window, select the Dynamic Surface you'd like to have improved (the right image below).

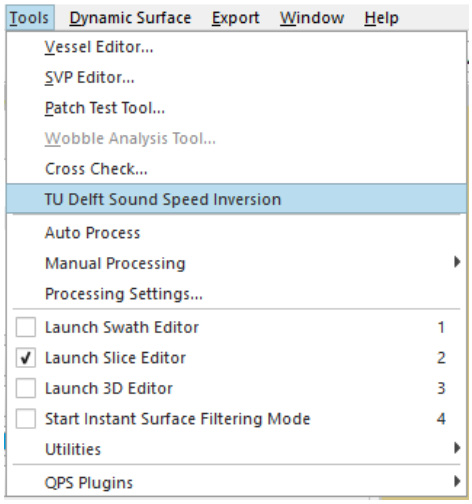


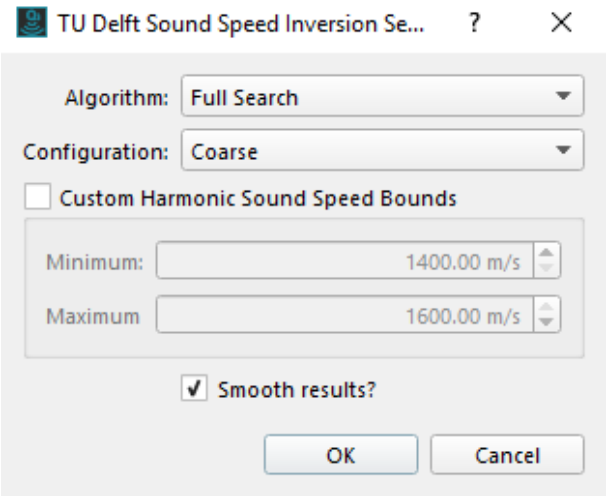


Why do you need to select lines and surfaces? The short answer is that the lines you select will be the lines that are corrected. The Dynamic Surface that you select helps the algorithm determine which neighboring survey lines can be used to assist the algorithm, even if those lines do not need to be corrected. You should only select the lines that you want to repair, the Dynamic Surface's spatial indexing will help the algorithm find the surrounding lines that will assist in the repair. The surrounding lines will NOT be adjusted by the algorithm.

Step 4 - Run The Algorithm

Select the TU Delft Sound Speed inversion tool, available on the Tools drop down menu.





Parameters

There are four parameters which can be set to the users preferences: Algorithm, Configuration, Custom Harmonic Sound Speed Bounds, and Smooth results.

"Algorithm" can be set to either Full Search or Quick Search. There are pros and cons to each method:

Algorithm	Optimization Method	Speed	Best used for	Other
Quick Search	Nonlinear Least Squares	Fast to Medium	• Relatively flat bathymetry • Minimal artifacts (aside from sound speed artifacts)	Easily distracted by noise and terrain
Full Search	Differential Evolution	Medium to slow	• Variable bathymetric relief • Some noise artifacts	Reliably finds best solution

"Configuration" can be set to Coarse, Fine, or Very Fine.

Generally the Coarse setting is sufficient in most cases, however there are a couple other factors to consider:

Configuration	% of Data used	Speed	Best used for
Coarse	25%	Fastest	Environments with gradual change in sound speed.
Fine	50%	Medium	Environments with less gradual, but not abrupt changes in sound speed.
Very Fine	100%	Slowest	Environments where very abrupt changes in sound speed are expected.

Enabling this option will make a weighted moving average of the resulting harmonic sound speed time series. This is most beneficial for the Quick Search which is more prone to poor estimates in noisy environments.

"Custom Harmonic Sound Speed Bounds" gives the option to limit the sound speeds used by the tool.

"Smooth results" can be toggled on and off. Enabling this option will make a weighted moving average of the resulting harmonic sound speed time series. This is most beneficial for the Quick Search which is more prone to poor estimates in noisy environments.

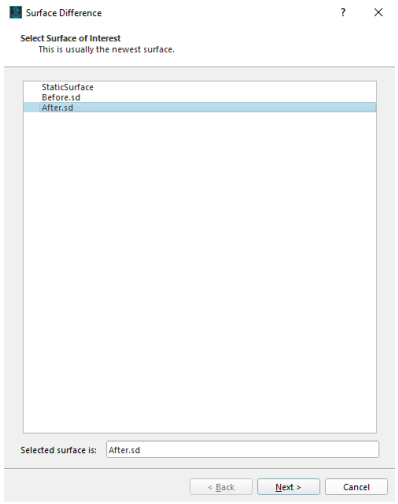
Step 5 - Assess Your Results

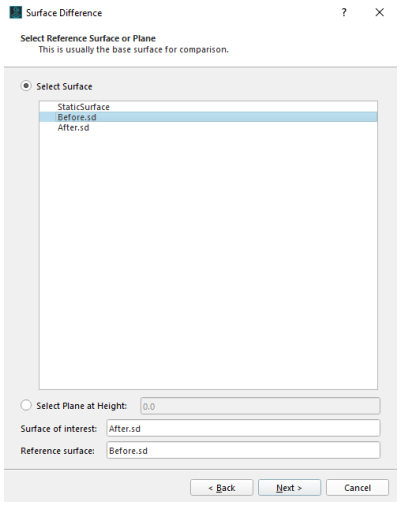
This step is not strictly necessary either, but it is a good practice to verify your results.

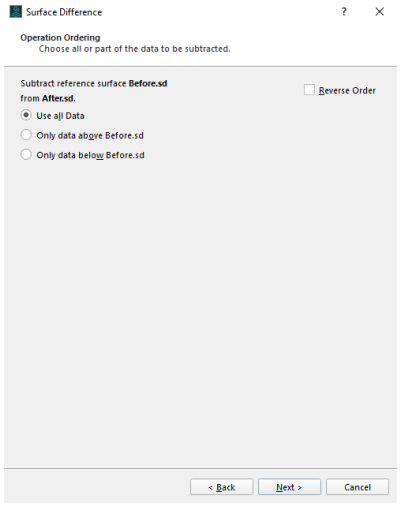
The reprocessing of the sounding results that occurs after completion of the algorithm run in Step 4 will trigger the automatic update of any Dynamic Surfaces that use the selected lines (unless set to never update). This is why it is helpful to have a Snapshot surface first, you can compare the results before and after the tool is run. You can check for the improvements of the Dynamic Surface by comparing to the 'Before' Dynamic Surface or Static surface snapshot taken from the Dynamic Surface at step 2. The most common way to do this is to compute a surface difference.

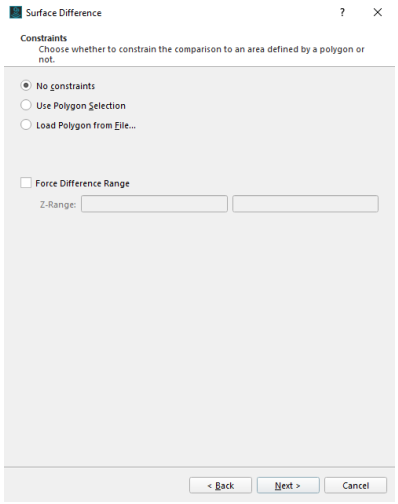
Select your 'Before' Dynamic Surface or Static Surface computed in Step 2, and also select your newly updated Dynamic Surface.

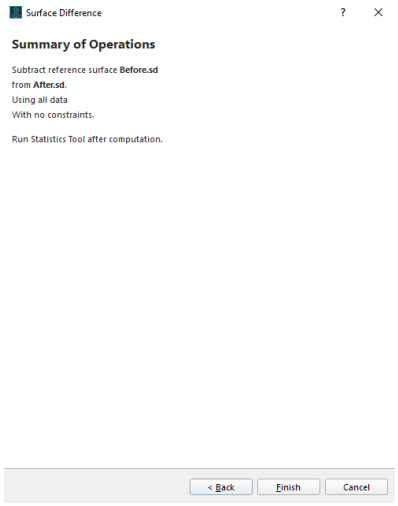
Under the Layers menu, choose the "*Surface Difference...*" option. This will launch a wizard that will walk you through the process of creating a surface difference. The first stage of the wizard is shown below, typically at this step you choose the Dynamic Surface since it is the "new" surface that you want to compare against the original surface. In the second step, you would typically choose the Static Surface that you created in Step 2.


Surface Difference
Select Surface of Interest
This is usually the newest surface.
StaticSurface
Before.sd
After.sd
Selected surface is:
After.sd
< Back
Next >
Cancel

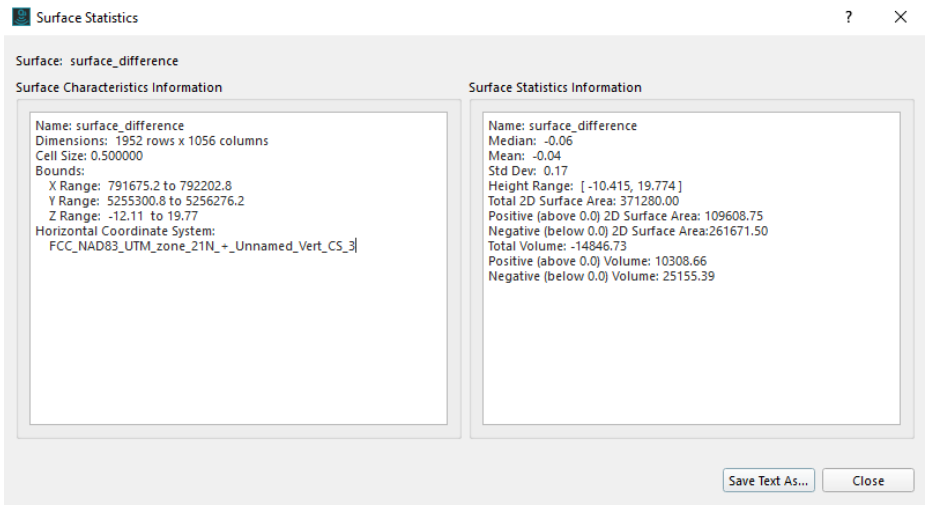

Surface Difference
Select Reference Surface or Plane
This is usually the base surface for comparison.
Select Surface
StaticSurface
Before.sd
After.sd
Select Plane at Height:
0.0
Surface of interest:
After.sd
Reference surface:
Before.sd
< Back
Next >
Cancel


Surface Difference
Operation Ordering
Choose all or part of the data to be subtracted.
Subtract reference surface Before.sd
from After.sd.
Reverse Order
Use all Data
Only data above Before.sd
Only data below Before.sd
< Back
Next >
Cancel

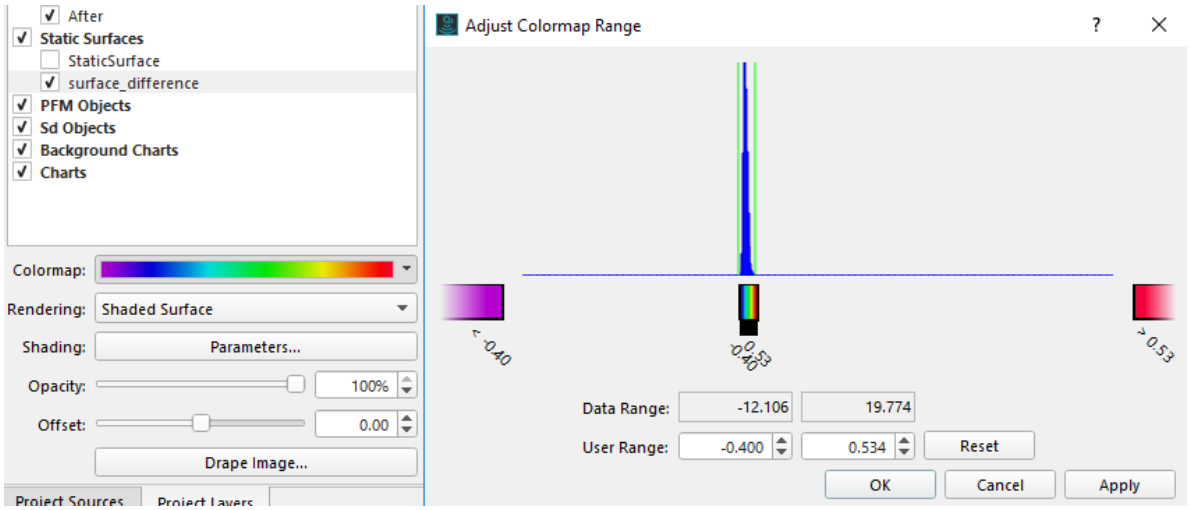




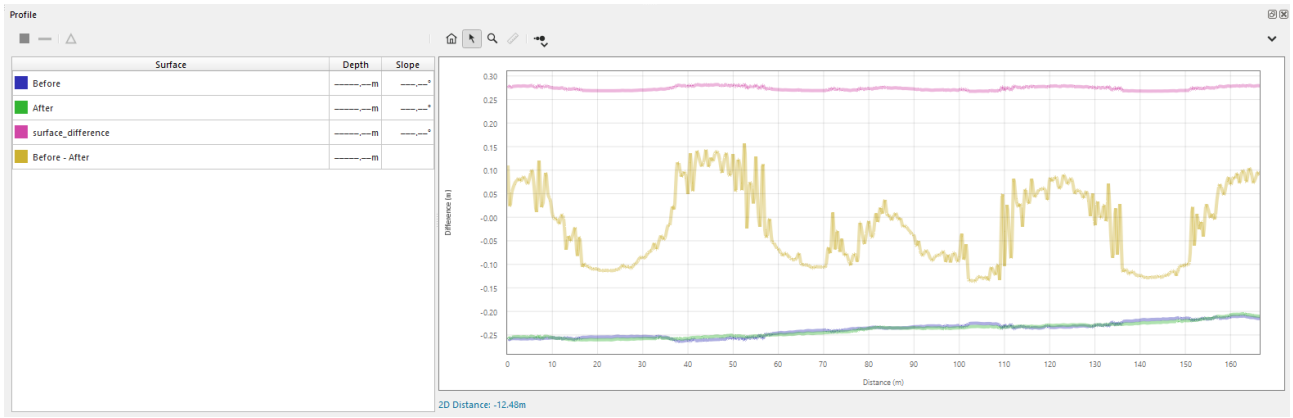
At the end of the process, it will give some statistical results which can be saved as a report, see below for an example.



You can review the surface difference map and assess the outcome by adjusting the histogram and colormap to help emphasize areas where there are large differences between the original data and the corrected data. Start by selecting the surface difference result from the Project Layers window, and then click on the Colormap below it and select "Adjust Colormap Range". The Adjust Colormap Range dialog will come up, you can left-click and right-click on either side of the histogram to adjust the range. You can also type in values in the text entry boxes below.



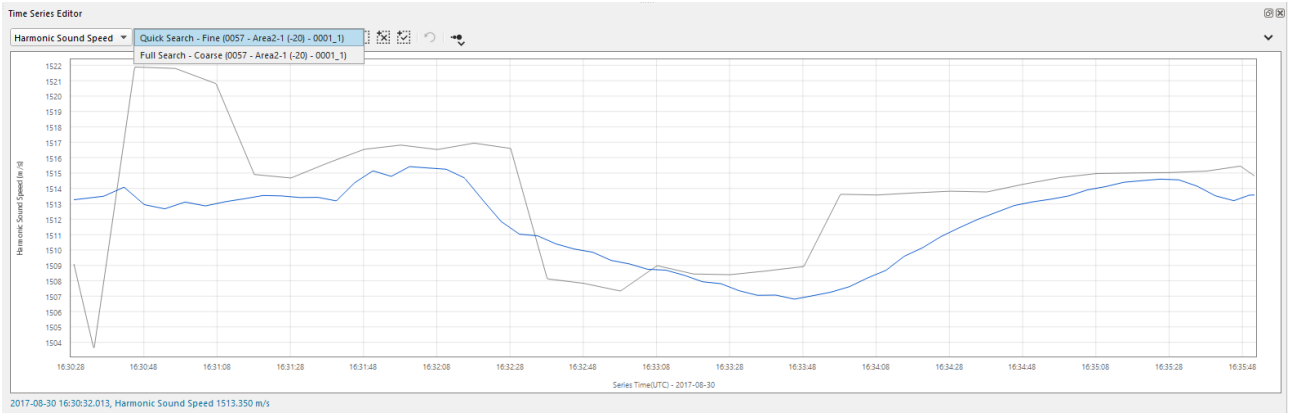
Now that you have improved the contrast of the surface difference result, you can profile in the surface for areas where large differences are seen to assess the magnitude of the difference. A profile can be done with a right-click and drag, or by switching to profiling mode. Additionally, a difference series can be computed in the profile view by selecting the two surfaces you wish to see the difference between, and then the tool is accessed by the triangle button in the top left of the profile window.



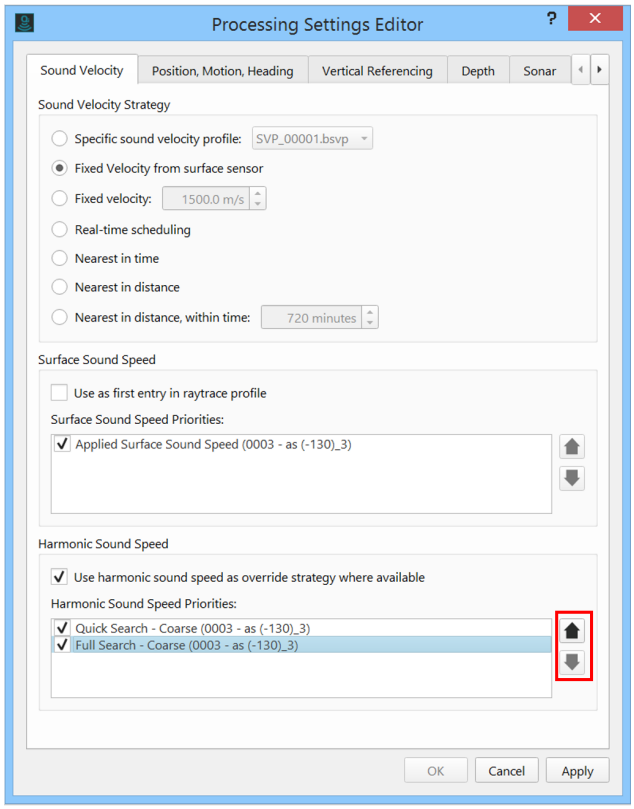
Step 6 - Make Adjustments if Necessary

You can review the algorithm's output of Harmonic Sound Speed in the in the Time Series Editor.

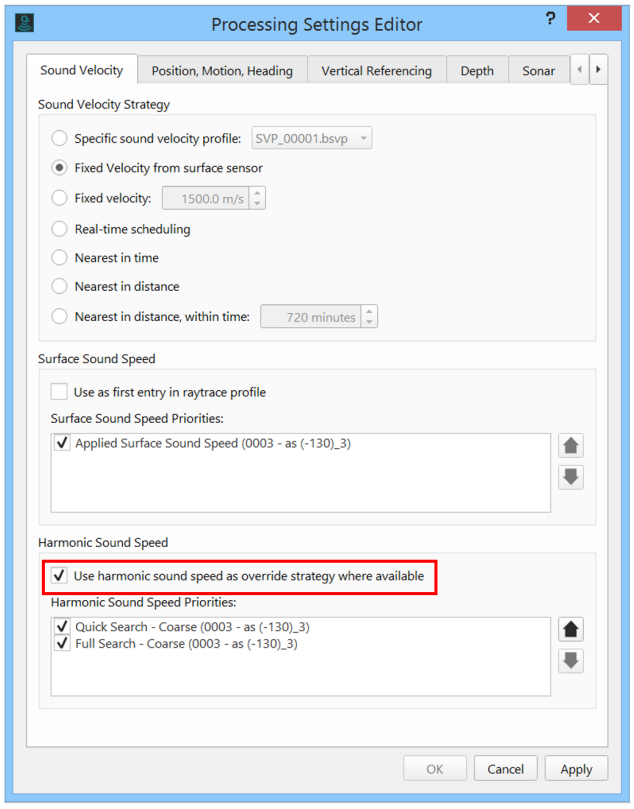
In case you're not sure about the improvement or if you wish to try the other algorithm settings for the sake of comparison, you can re-run the TU Delft Sound Speed Inversion tool GUI and choose different settings like Quick Search, etc. This calculates a new harmonic sound speed time-series result, which can be reviewed and compared to the harmonic sound speed previously calculated. You can view the different results this in Time Series Editor.



The results from the last run of the tool will be the one that is used in any follow up processing. If you want to adjust which result you want to use after your investigation, you can manage which results you prefer to use in the Processing Settings dialog under the Tools drop down. Select the time-series you prefer and move it to the top of the priority list and click Ok. The data will be reprocessed and the Dynamic Surface will update.



If you are not happy with the results or you need to disable their use, you can do this by unchecking the tick box over the Harmonic Sound Speed time-series items, as shown below.



For a more in depth explanation of specific options within this tool, visit our reference page: TU Delft Sound Speed Inversion Settings Dialog

References

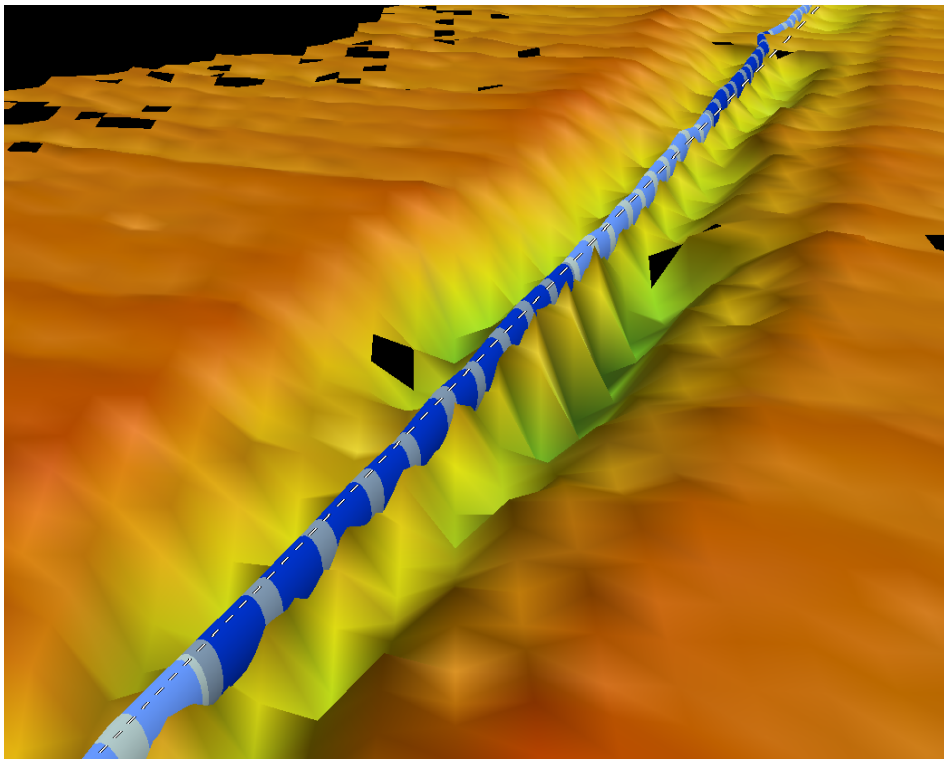
For the interested user, there are two publications that describe the underlying algorithm.

1. Shallow Survey 2018 paper and presentation.
2. Academic paper in IEEE.

How-to Cable/Pipe Detection and Editing

This How-to document describes how to detect and edit a cable or a pipe line from multibeam data.
There are also ways of detecting a pipe from a cable/pipe tracker system, for which we will add the information later on.

Part 1 of this article explains the cable/pipe detection. Part 2 explains the cable/pipe editing and smoothing.



Introduction

To use the TOP (Top of Product) tools, a Qimera Offshore License is required. The Qimera Offshore license will work with Qimera 2.4 and newer. Before getting started and using the tool, ensure you have the following information available in the Qimera project:

- Dynamic Surface built from the survey data, preferably built at a small bin size.
- Add shading to the surface for more context and you may want to do a visual inspection on where the cable/pipe is sitting.
  For the best results, you may want to be using a data set that is free of noise and spikes around the cable/pipe.
- A qgf line file or a CAD file of the design cable/pipe or the as-laid cable/pipe. The file should contain KP values. This file can be created in Qinsy Survey Manager if needed or by using the Profile and/or Measure tool in Qimera to draw a line along the cable/pipe and when finished, right click and select "Create Route from Current Selection". When the line is loaded into

Qimera you will need to promote it to a Project Route by right clicking on the SD line object and selecting "Use Line Object as Route".

For the cable/pipe detection, it helps if you know the cable/pipe diameter. When in doubt, you can use the measure tool in Qimera Slice Editor.

Part 1 - Cable/Pipe Detection

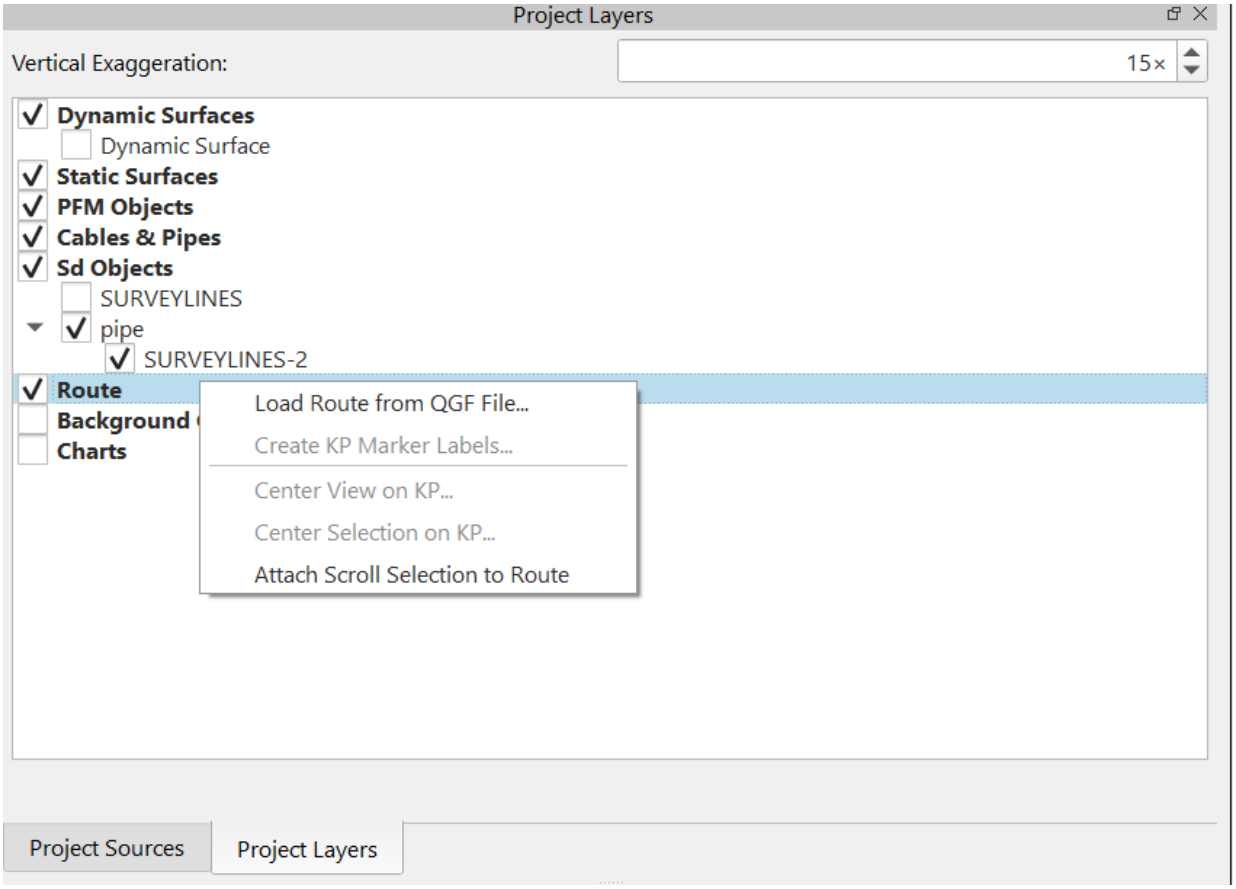
There are basically two ways of cable/pipe detection:

- Automatically - which processes the entire line or within a custom range.
- Manually - by doing single detections.

Both methods will be discussed in this article.
The first method, the automated cable/pipe detection on the entire line, works really well, if the survey data is of good quality. When the surface is free of spikes and noise, the automated cable/pipe detection will do the job.
The manual processing, method 2, can be done on the entire line, but it's time consuming. When the automated cable/pipe detection went well, you would only need to adjust the detected cable/pipe manually on some portions of the data.

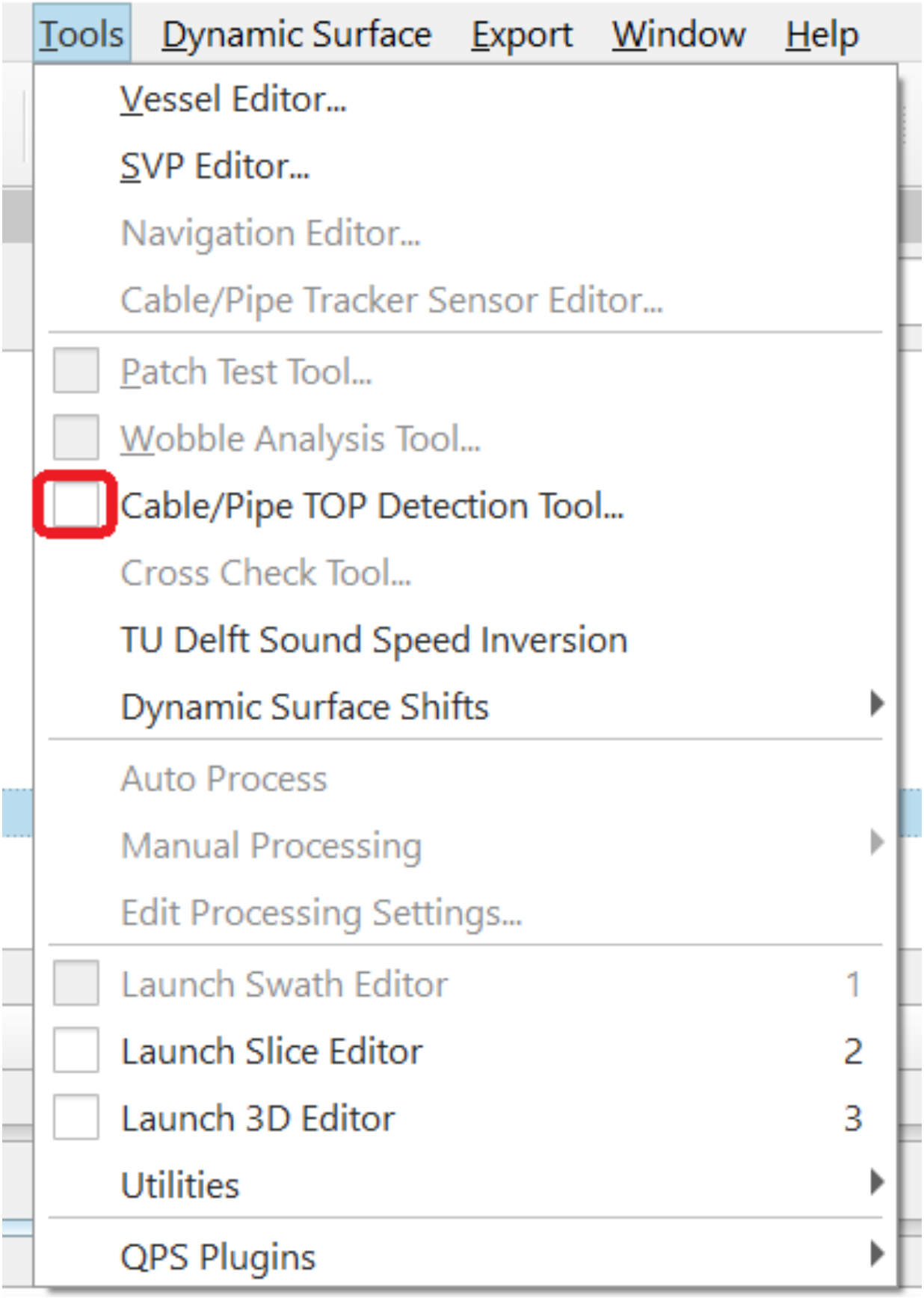
Method 1 - Automated Cable/Pipe Detection - Entire Line Processing

1. In the Project Layers dock, right click on Route, then choose to Load a Route from the QGF File. This step is needed in order to make the route available in the Qimera project.
   Another way of doing this, is to select the Sd file of the cable/pipe, which was brought in as CAD, right click, use Line object as route.

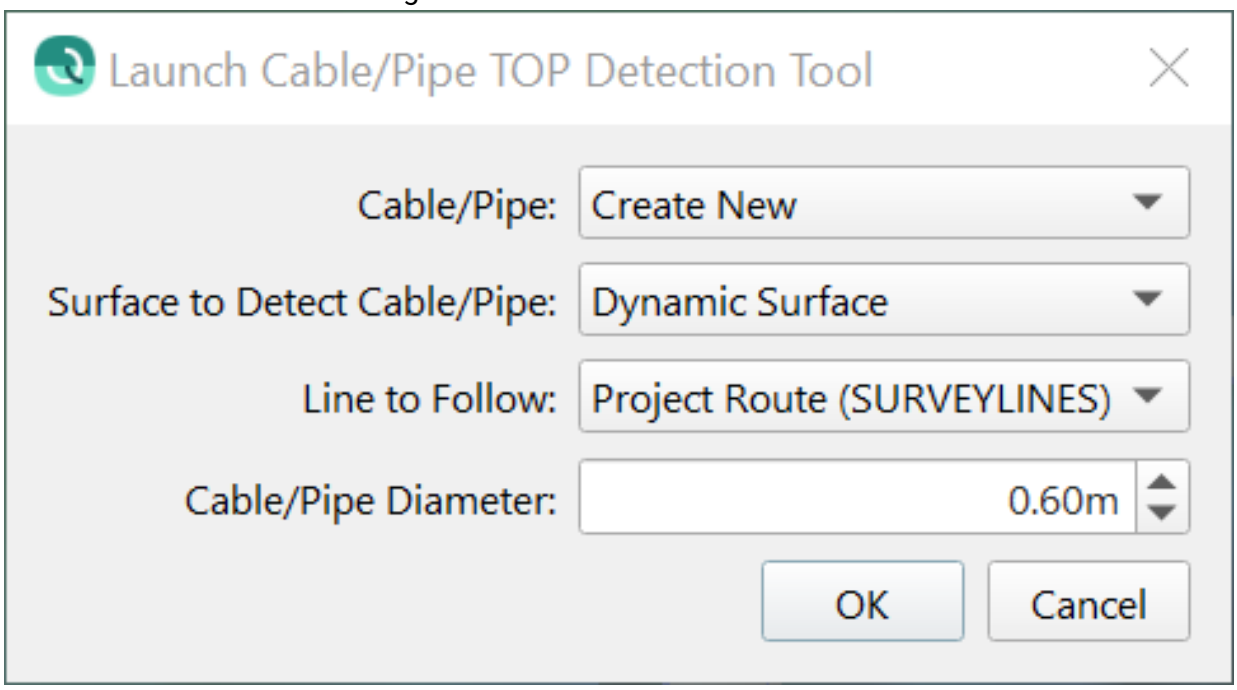


2. Ensure to have a Dynamic Surface available from where the cable/pipe needs to be detected from.
   The Cable/Pipe Detection tool won't run on a static surface.
   A dynamic surface can be built in different ways: it can be the surface built from processed data in the Qimera project. It may also well be built from an XYZ ASCII file that was brought in as processed points.
   Look here for more info.

3. From the Tools dropdown menu, select Cable/ TOP detection tool.


Tools
Dynamic Surface
Export
Window
Help
Vessel Editor...
SVP Editor...
Navigation Editor...
Cable/Pipe Tracker Sensor Editor...
Patch Test Tool...
Wobble Analysis Tool...
Cable/Pipe TOP Detection Tool...
Cross Check Tool...
TU Delft Sound Speed Inversion
Dynamic Surface Shifts
Auto Process
Manual Processing
Edit Processing Settings...
Launch Swath Editor 1
Launch Slice Editor 2
Launch 3D Editor 3
Utilities
QPS Plugins

This launches the GUI for Cable/Pipe TOP Detection tool.
Ensure to set the correct settings.

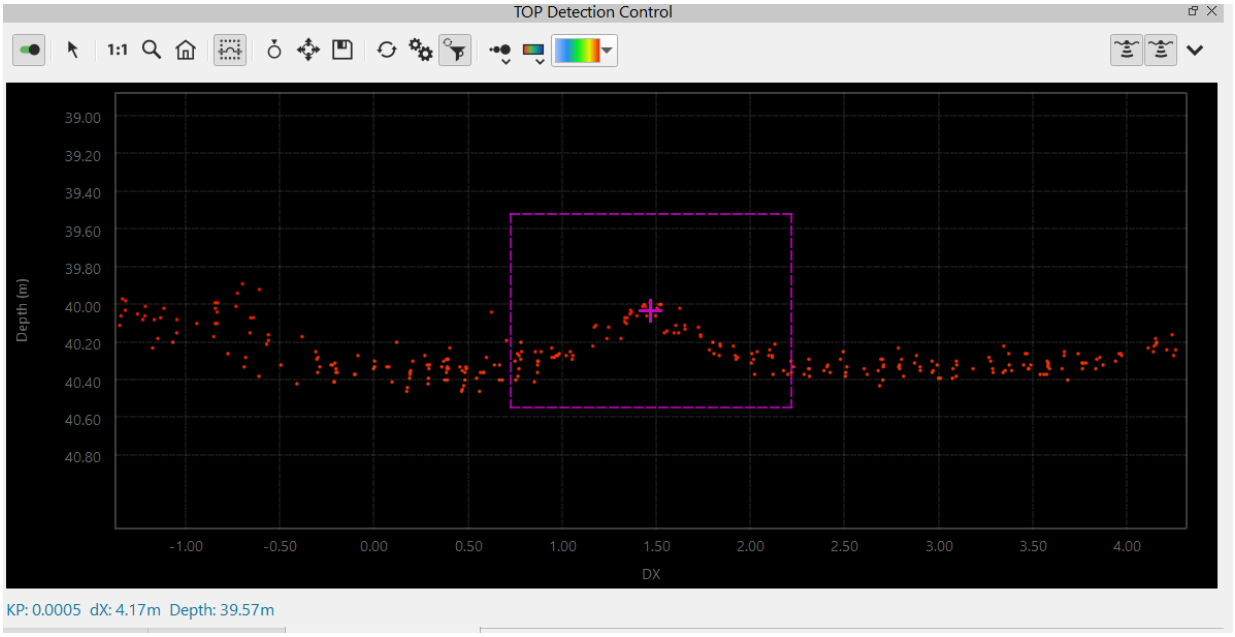


OK this.

4. Two hot dockable windows have now opened:
   1) the TOP Detection Control Window and
   2) The Top Detection Results Window.
   Also, on 4d main view, you will see the polyline used as scroll reference and a selection box drawn perpendicular to that scroll line.
   A cross section of the data selected inside the scroll box is shown in TOP Detection Control Window.
   This is what needs to be looked at first.
5. In the TOP Detection Control dock, in the cross section view, on the toolbar click on Select Tracking rectangle



   and draw a rectangle over the soundings that make up the cable/pipe:

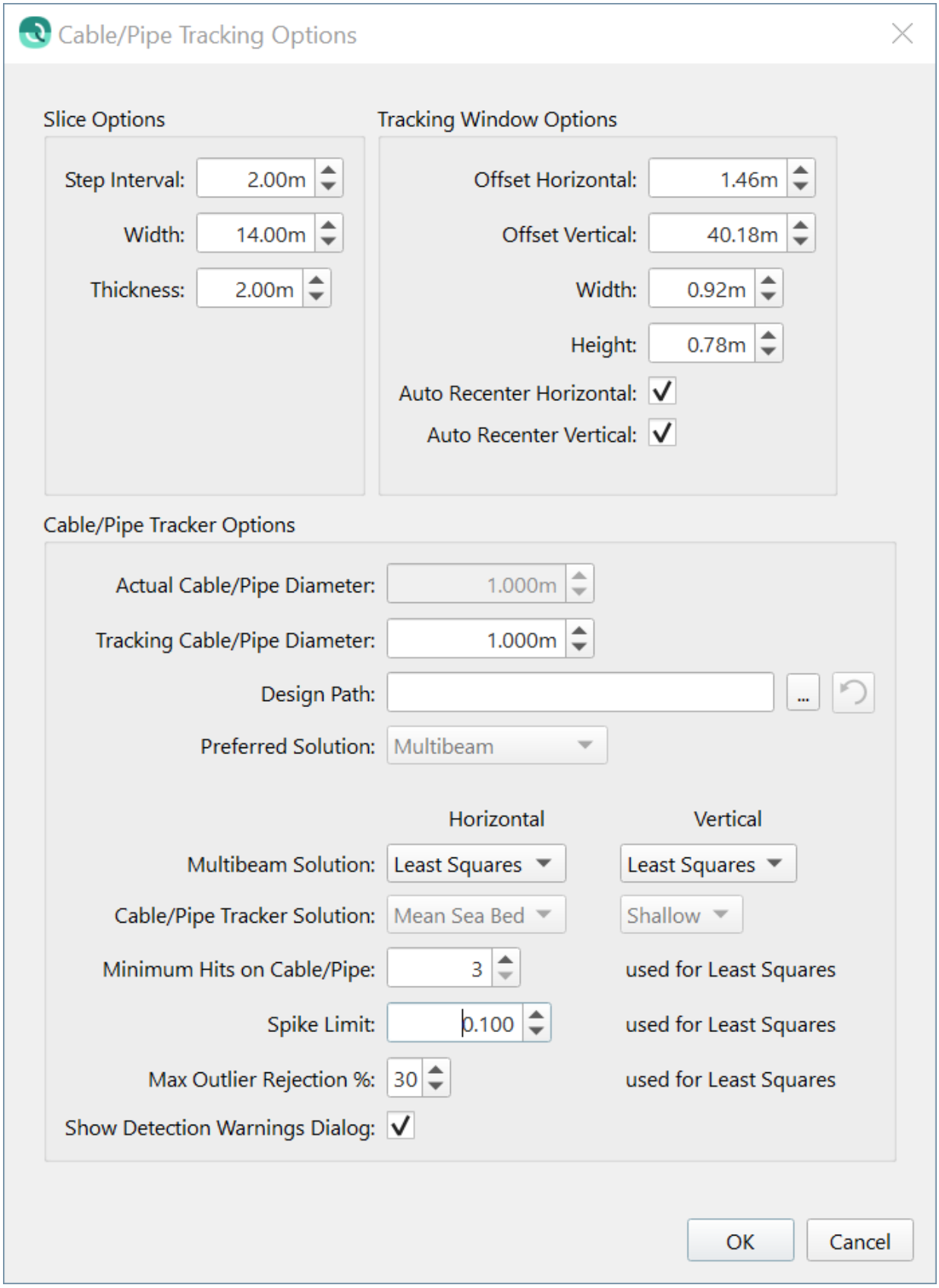


6. Click on the Settings button (double gears)



.

This opens the Tracking Options dialog:


Cable/Pipe Tracking Options
Slice Options
Step Interval: 2.00m
Width: 14.00m
Thickness: 2.00m
Tracking Window Options
Offset Horizontal: 1.46m
Offset Vertical: 40.18m
Width: 0.92m
Height: 0.78m
Auto Recenter Horizontal:
Auto Recenter Vertical:
Cable/Pipe Tracker Options
Actual Cable/Pipe Diameter: 1.000m
Tracking Cable/Pipe Diameter: 1.000m
Design Path:
...
Preferred Solution: Multibeam
Horizontal
Vertical
Multibeam Solution: Least Squares
Least Squares
Cable/Pipe Tracker Solution: Mean Sea Bed
Shallow
Minimum Hits on Cable/Pipe: 3
used for Least Squares
Spike Limit: 0.100
used for Least Squares
Max Outlier Rejection %: 30
used for Least Squares
Show Detection Warnings Dialog:
OK
Cancel

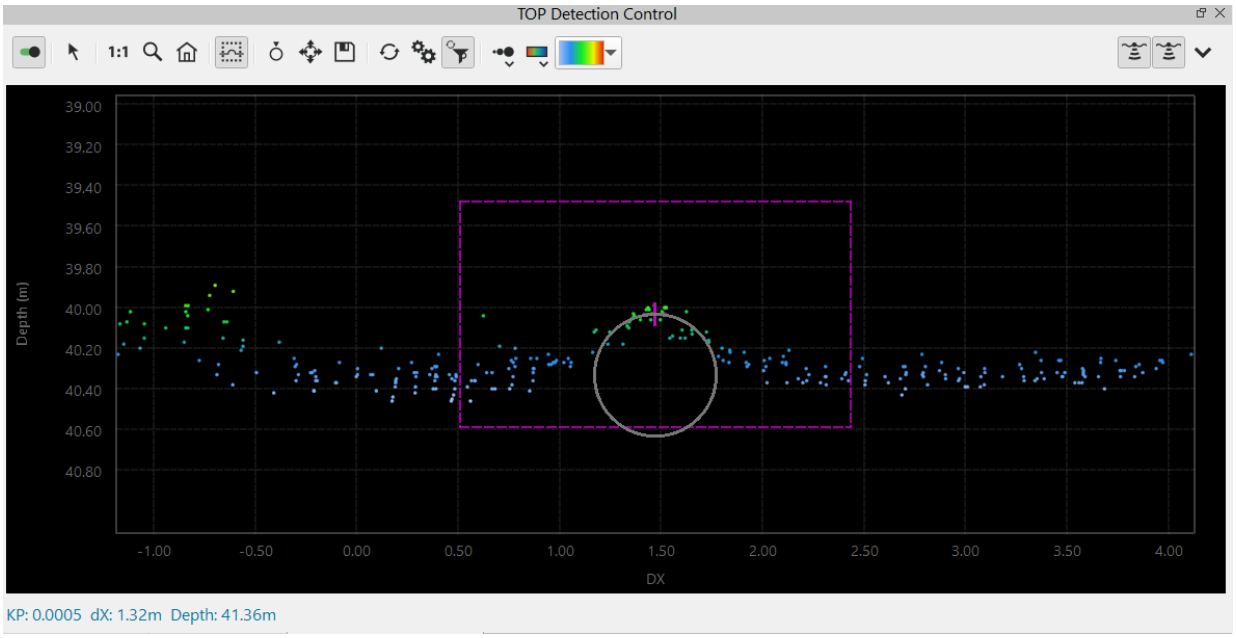
The Cable/Pipe Tracking options are explained Qimera TOP Detection Settings Dialog .

7. On the TOP Detection Control toolbar, click on Do Single Detection button



.
This is to check the first single detection, which is the current solution, in order to see if this detection goes well and to check if you have made the correct detection settings.
The first time you click on this button, the options dialog (mentioned in step 5) will open.

8. OK this and you should see the first detection made within the selection. The detection is shown as the circle:



9. If this looks promising, then proceed with next step.
If the cable/pipe is in the wrong place, then check the settings by clicking on the double gears button



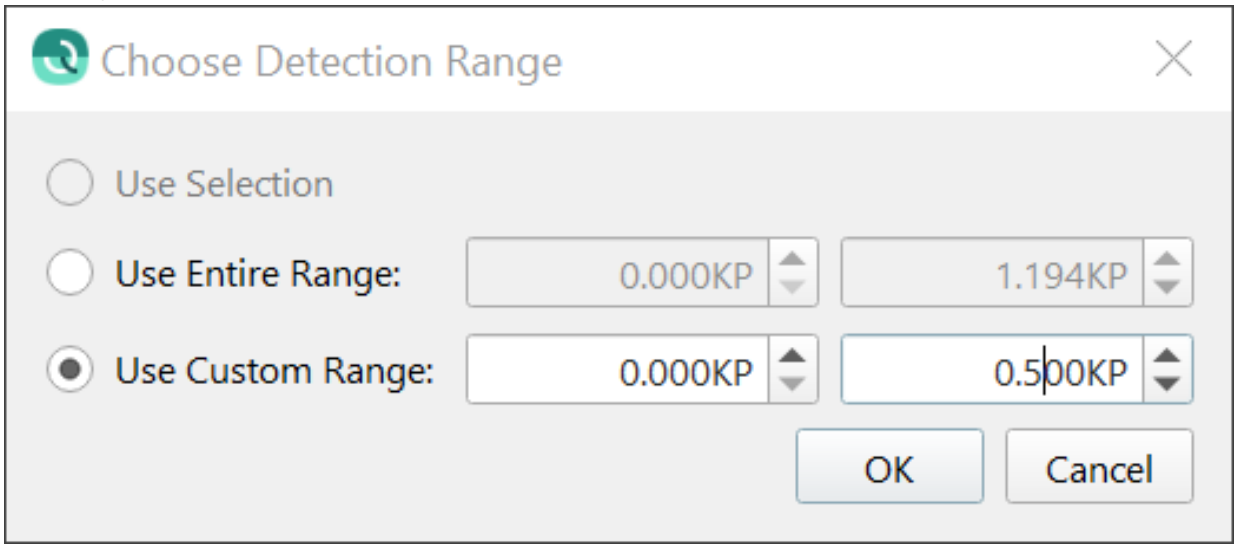
.

10. Click on Processing button

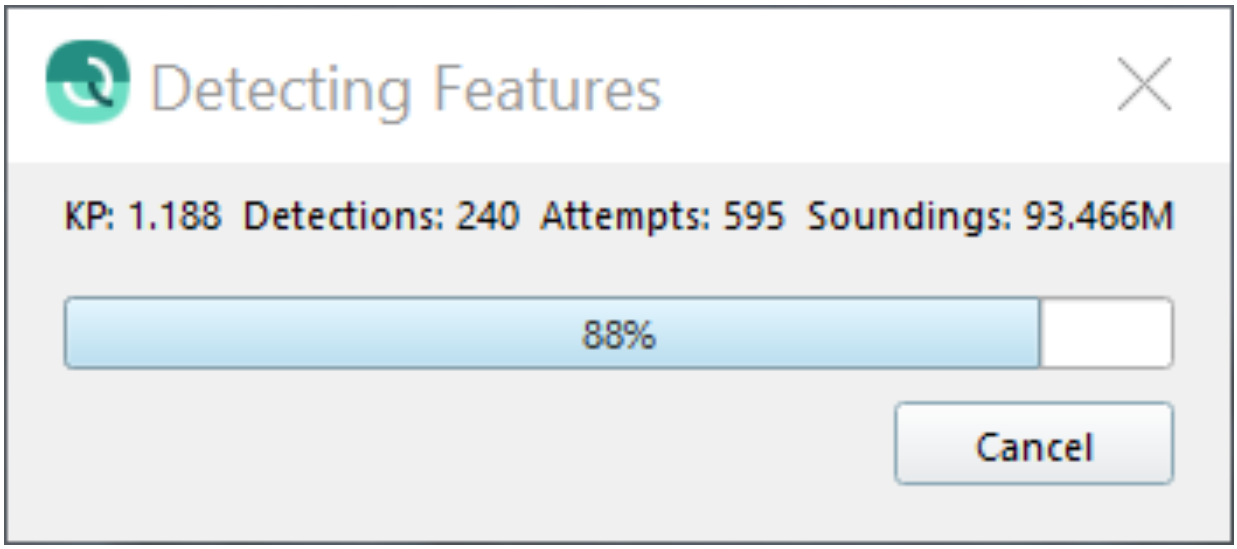


.
This opens the Detection Range dialog. Choose to detect the cable/pipe of the entire poly line

or a custom range.
You may first want to try the detection settings on a custom range, by setting the min and max KP value, just to see how it goes.
When you are happy with the results, you can run the automated detection on the entire line.
When it's a long cable or pipe line, the custom range pipe detection may be the preferred way of doing this.

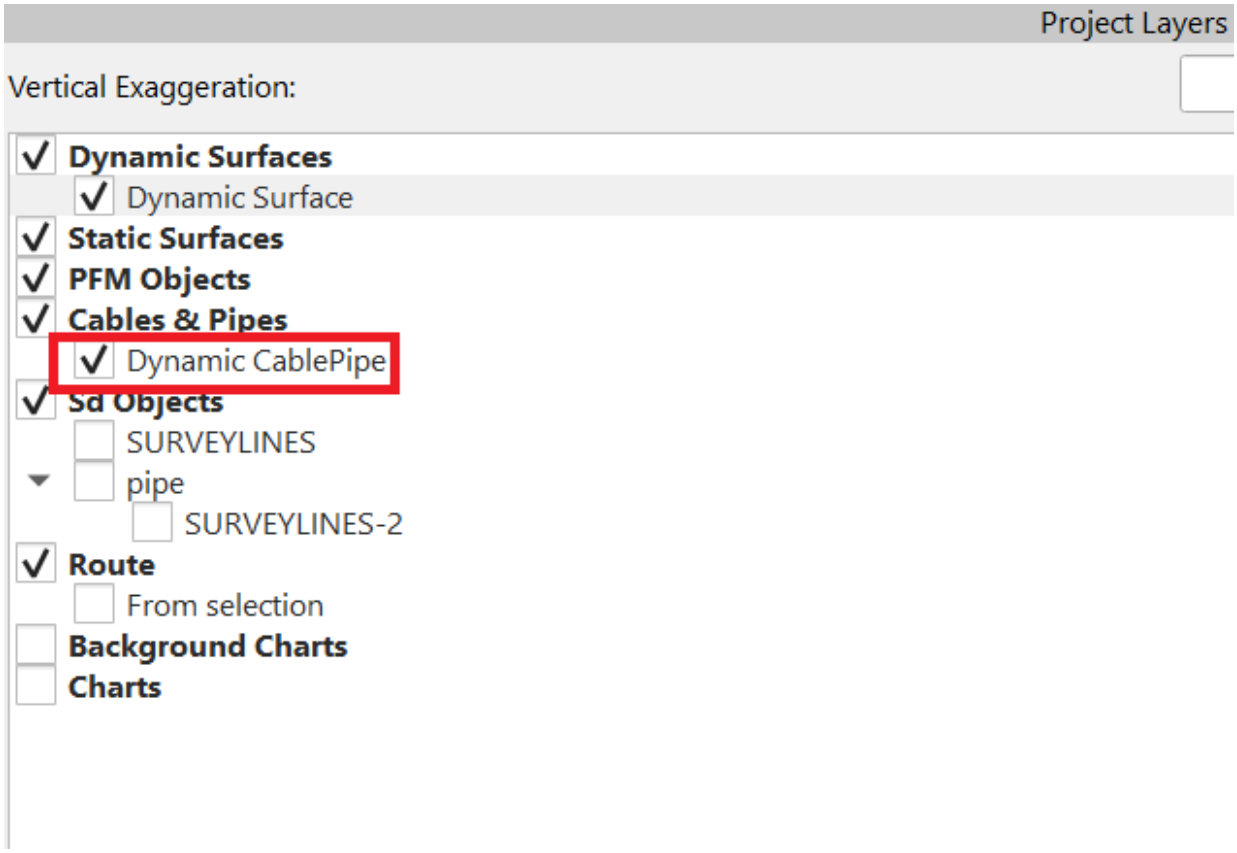


11. Click on OK to kick the detection tool.
You should see a message box showing the detection progress:

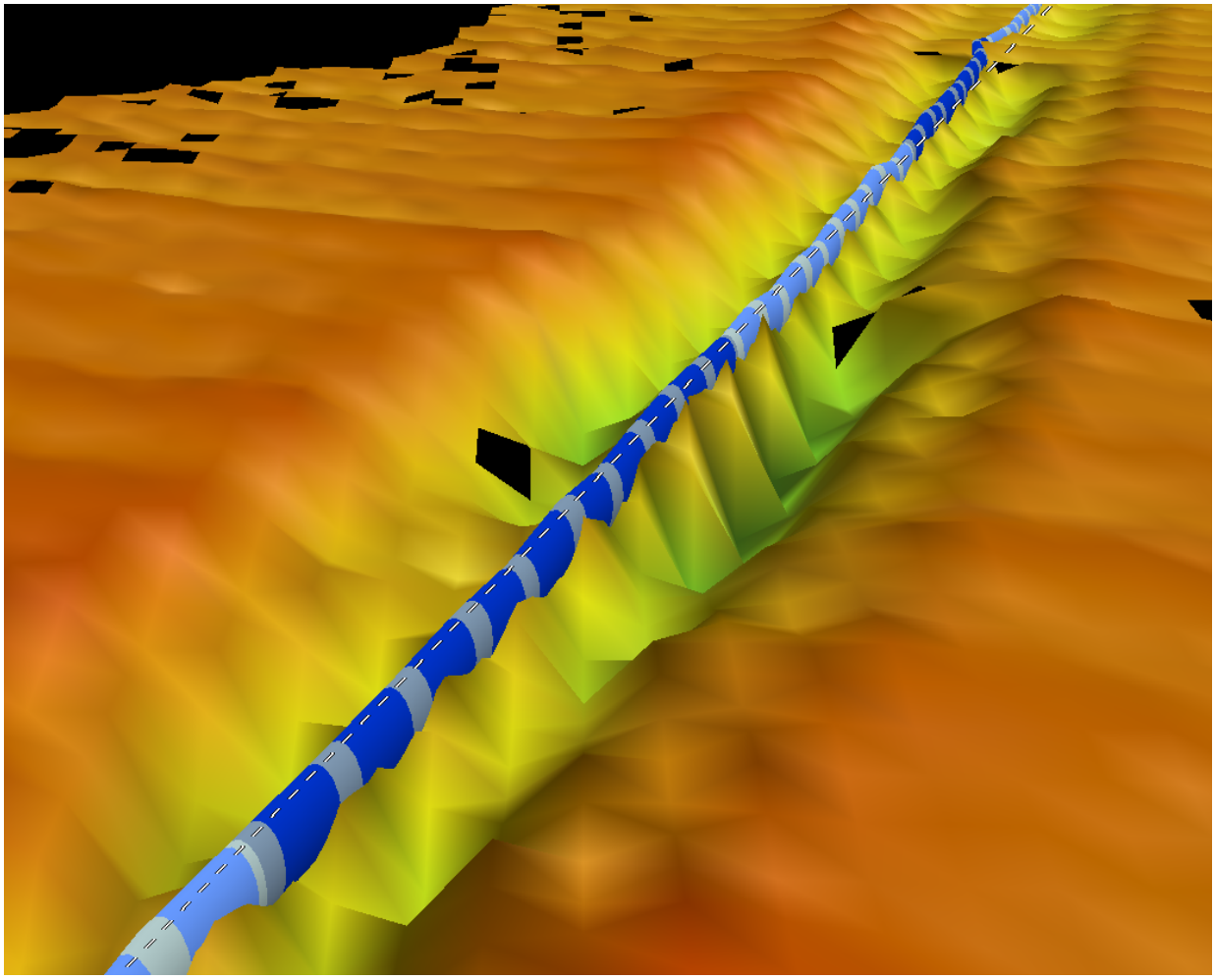


You may want to check the number of attempts against the number of detections.
When there are few detections and many attempts, you may want to cancel the process and double check the detection settings.
When the detection has finished, there may be warnings, these may be saved to a file.

OK the warnings dialog.

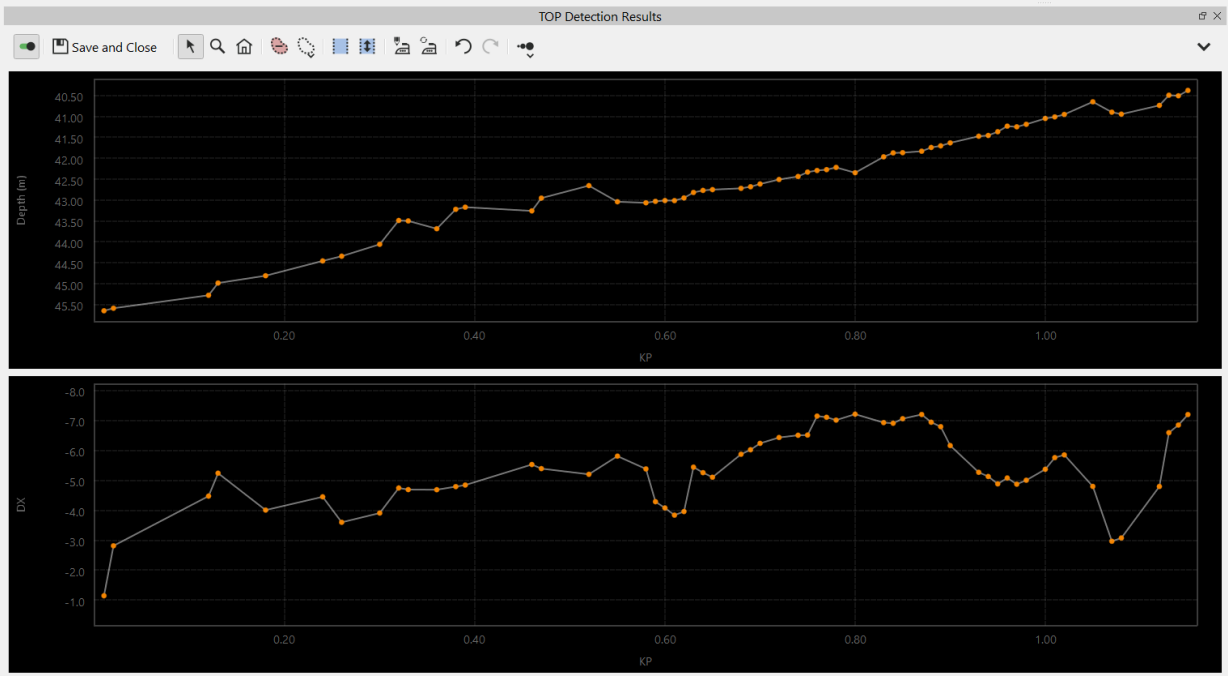
12. Ensure the cable/pipe is enabled under Cables & Pipes in Project Layers dock.
13. 

This way, you will find the detected cable/pipe shown on the 4D main display:



You can navigate/rotate on the surface by holding the shift key down and using the left mouse button to rotate, using the mouse scroll wheel to zoom in/out and using the middle mouse button click to re-center the view.

14. The detected cable/pipe is shown in the TOP Detection Results window.
    QC the detected cable/pipe results.



You can edit and smooth the detected cable/pipe in TOP Detection Results Dock.
How to smooth and edit a detected cable/pipe see Part 2 - Cable/Pipe Editing further down this page.

15. Use Cable/Pipe analysis tool to analyze the cable/pipe and to export the x-points listing.

Info

The automated detection tool may take some time to finish.

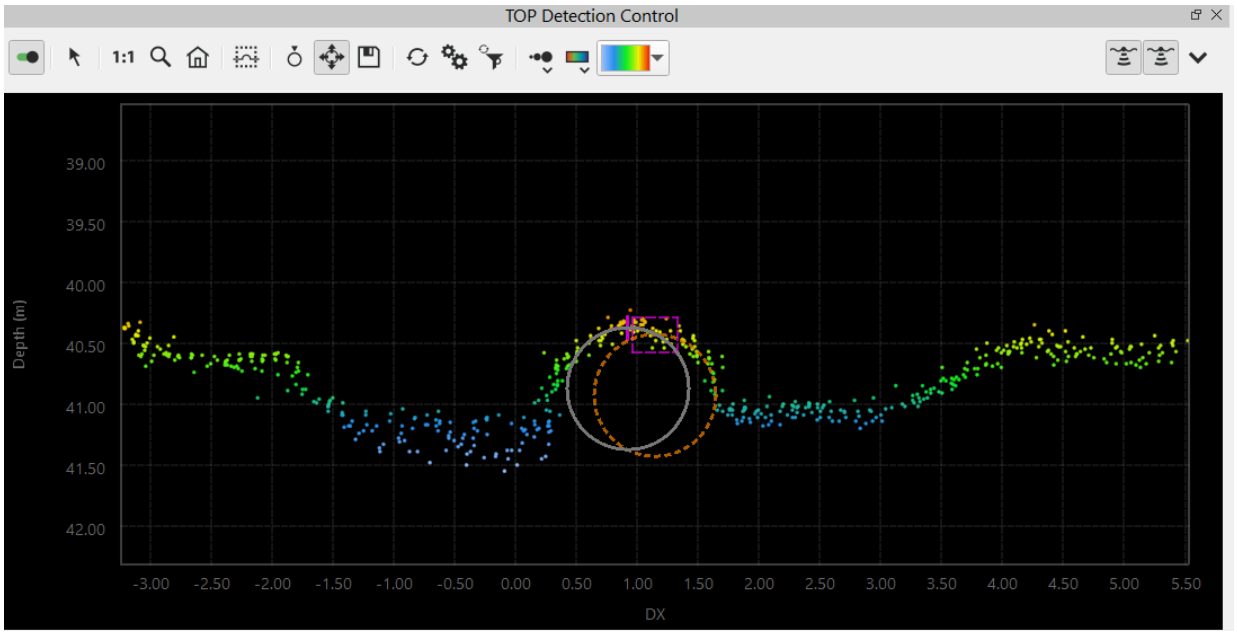
This is because the algorithm needs to make decisions and this just takes time.

It is quicker than the manual detection.

Method 2 - Manual Cable/Pipe Detection - Single Detection

This method can be used in addition to the automated cable/pipe detection (Method 1). This method can also be used to manually detect the entire cable or pipe line, in case the survey data is of poor quality and the automated detection has trouble finding the cable/pipe in the DTM.

1. The first steps are similar to the steps of Method 1 - automated processing, Step 1 - 8.

2. At step 8, when you find the cable/pipe is at the wrong location, you can manually move the cable/pipe to the correct location.
   Use the button Move Cable/Pipe Manually
   
   .
3. This allows for moving the portion of the cable/pipe selected within the slice to the desired location.
   Just hold the left mouse key on the circle and move the circle to the desired location.
   

   Then save.
4. You can move the selection forward by using the W key on the keyboard.
   To move the selection backwards, use the S key.
   Do another single detection by using the Do Single Detection button
   
   .
   If you are happy with the detection, then save.
   If you need to adjust the detection, manually adjust as explained in step 2 et cetera.
5. Repeat the single detections until you have finished the entire line.
6. From here continue at step 12 of Method 1 - Automated Cable/Pipe Detection

Info

You can apply an automated data cleaning filter to the soundings in order to reject spikes during cable/pipe detection.
This can be achieved by clicking on the "Run Filter profile during detection" button on the TOP Detection Control Window tool:
The filter to apply can be setup in the filter toolbar, look here for more information.

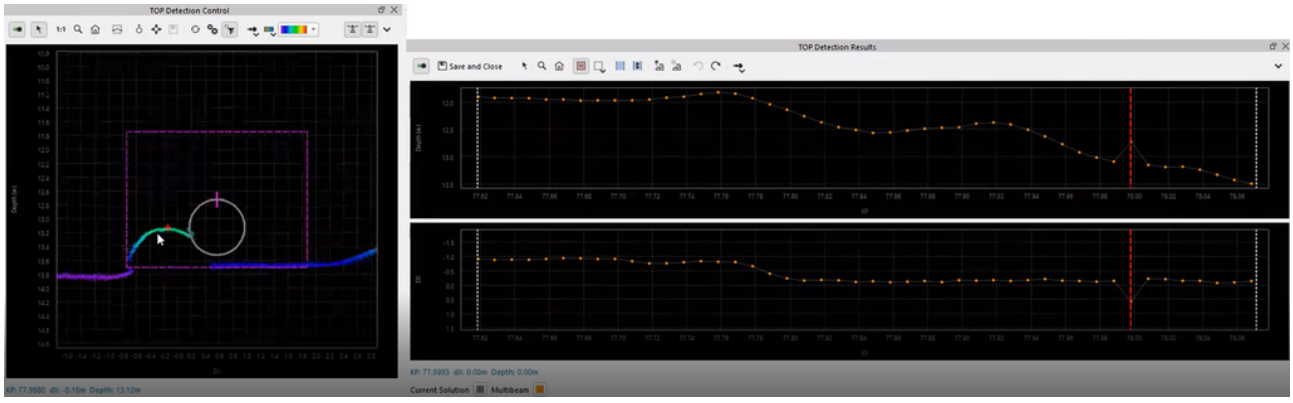
Info

Use the Cable/Pipe Tracking Options to change the slice dimensions if needed:
This is sometimes needed, when the single detection can't be done.
This may happen when the selection is too far away from the surface.
Drawing a new rectangle may also help.

Part 2 - Reviewing and Editing the Detected Cable/Pipe

Reviewing and Editing the Detected Cable/Pipe

Once the cable/pipe has been detected, the detections are displayed in TOP Detection Results dock.
The vertical red dotted line in the TOP Detection Results dock shows where the selection is at:



In this example, there is a spike in the detections, which also displays in TOP Detection Control dock as a wrong solution.

This can be solved in different ways: 1-2-3

1. In Top Detection Results dock, Ctrl+ click to the spike and delete the spike using the "delete detections" button on TOP Detection Control Toolbar

   This will delete the spike and the detections will be interpolated. Click Save and you will notice the cable/pipe has updated.
2. In TOP Detection Control it can be solved by redrawing the tracking rectangle constrained over a smaller area and do a single detection. Check if it is a good solution, then Save and you will notice the cable/pipe has updated.
3. In TOP Detection Control you have the option to use the Move key

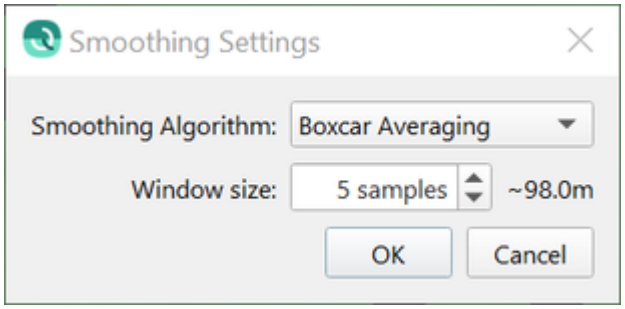
   (see Manual Cable/Pipe Detection on this page) and drag it to where you think there is a good solution.
   When you are happy, click Save and you will notice the cable/pipe has updated.

Cable/Pipe Smoothing

Cable/Pipe smoothing options are available in Top Detection Results dock.
Select the sample range you want to smooth by clicking on the Sample Range Selection button 

To undo the selection, use the Explore button 

A smoothing option can be chosen by clicking on the Edit Smoothing Settings button .
There are two methods available for smoothing: Boxcar Averaging and LOWESS



Look here for more information on the smoothing settings.

To smooth all detections, use the Smooth All 

To undo, use the Undo button 
Save when you are happy and the cable/pipe detections will update.

Do a visual inspection on the 4D main display.
To get to product deliverables, use Cable/Pipe analysis tool to analyze the cable/pipe and to export the x-points listing.

Related articles

- Qimera Reference Manual - Cable/cable/pipe TOP Detection Tool
- Qimera Reference Manual - Cable/cable/pipe Analysis Dock
- Qimera - Knowledge Base - How-to Dynamic Surface
- Qimera - Knowledge Base - How-to Filtering operations

How-to Coverage Extinction Plot

This page goes into how to use the plot and some advantages of using it.

On this page:

- What is it?
- How to use it?
  - How to access
  - Data Used and Advantages
  - Example

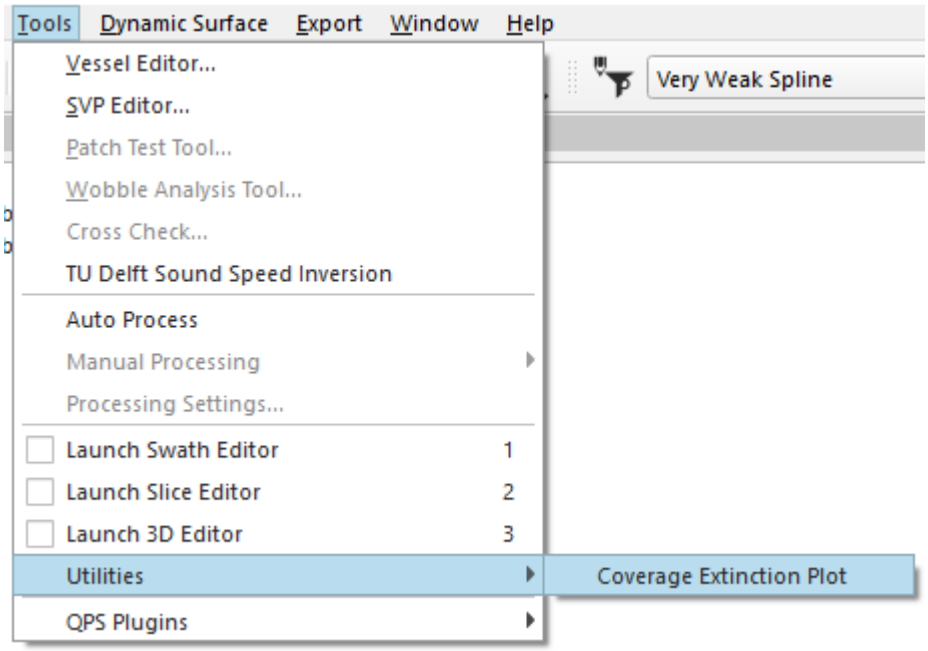
What is it?

The coverage extinction plot in Qimera is a tool that lets you assess the swath coverage capabilities of your multibeam system. This page goes into how to use the plot and some advantages of using it.

How to use it?

How to access

To start the tool, navigate to the *Coverage Extinction Plot* option from *Tools->Utilities* menu of Main Menu bar.



Data Used and Advantages

Data to effectively utilize this plot usually consists of a set of survey lines running from the shallowest to the deepest depth range of the system. This is not always necessary, however data as aforementioned allows the user to determine where the coverage decreases, and at what ranges the sonar is actually effective to.

Advantages to ensuring your data can be used in this tool include:

- the ability to determine the swath coverage of your system (relative to the manufacturer's claimed specifications)
- noise issues that arise due to interference (from mechanical, electrical, or acoustic sources) can be identified early on
- this plot can be used to assess and diagnose system health (examples of using this type of plot for this reason can be seen in the technical reports produced by the Multibeam Advisory Committee (MAC) on their website, http://mac.unols.org/reports)
- As with all Qimera plotting widgets, the graph can be saved as a report quality PNG file with full markup of axes, etc.

Example

Here is an image displaying an example of the type of plot you get from using this tool:



The image above repeats the analysis of a Kongsberg EM710 data set done by the MAC during a sea trial aboard the R/V Falkor (look for the 2014 Spring report on this at the link above, specifically page 18). Here are some key things to notice about this plot:

- The graph indicates that the EM710 achieved maximum swath width at a depth of about 500-600 m, which is within expectation.
- Full extinction occurred near 2,000 m, which was also expected.

For more information on this tool, please visit our reference manual: Qimera Coverage Extinction Plot

How-to Flag Grid Cells

This How-to document describes how to use the Flag Grid Cells tool and how the result can be visualized to aid in data control.

Introduction

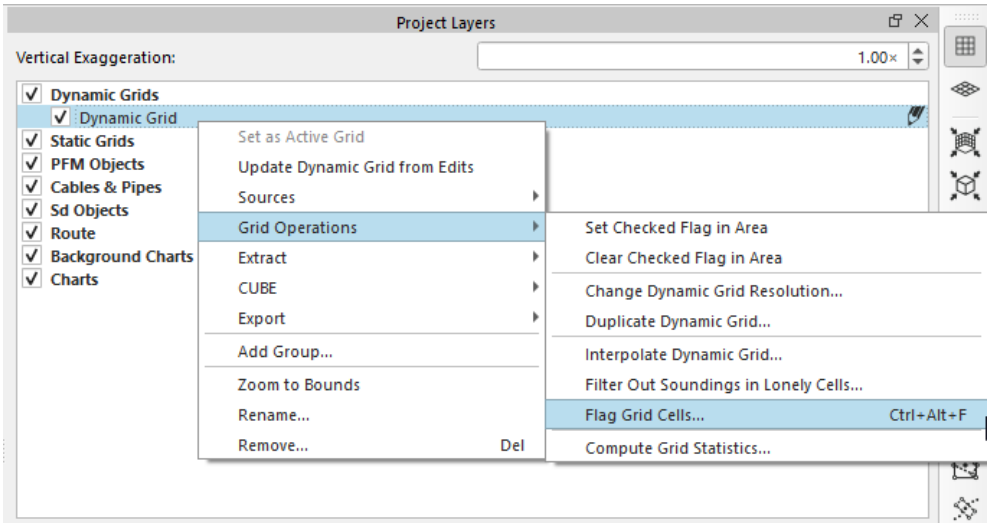
The Flag Grid Cells tool allows users to set indicators for which a grid cell will be flagged. The user does this by choosing a mode and then defining the indicators that the algorithm needs to use. An additional option is to populate a list for which cells are flagged which can be exported and visualized for rapid data verification.

After the tool has been run, the option to color your grid on “Cell of interest” allow to identify areas which are marked by the tool. When the slice editor is used the option color by “Cell of interest” will show the user which sounding contributed to the marked grid cell.

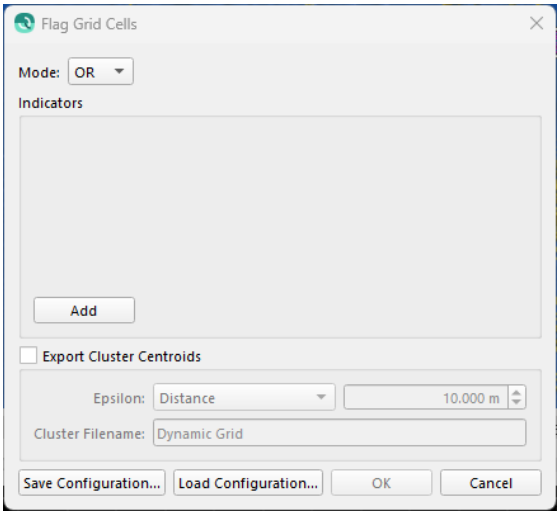
Step-by-step-guide

Step 1 - Start the Flag Grid Cell tool

Right-click on a Dynamic Grid, Grid Operation, and Flag Grid Cells. You can also use the shortcut ctrl + alt + f.



Step 2 - Run the tool



Mode

Set to AND if all indicators must be true for a cell to be flagged. Set to OR if just one of the indicators must be true for a cell to be flagged.

Indicators

Indicators are the conditions that must be satisfied for a cell to be flagged. To add a new indicator, click the add button and update the desired layer, algorithm and range. These can later be removed using the 'X'.

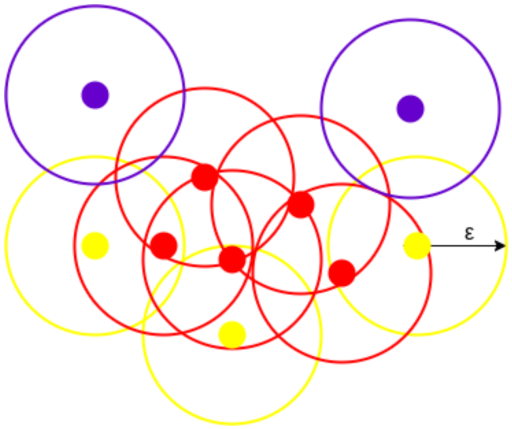
Settings	Option	Description
Layer	Cell Range Density Uncertainty(95%) Shallow Surface Mean Surface Deep Surface	Option to set a layer type to flag the grid cells that are true for that layer. For exmaple: *Set the option to Density - Less Than - 10* to flag all the cells that have a sounding density less than 10 in that cell.
Algorithm	Greater Than Less Than Inside Range Outside Range	Used to define an expression for which the algortihm should use the values set in the settings option.

Settings	Option	Description
Settings	Min or Max Value	Based on the set alogrithm the option to set a min and or max value is available.

Export Cluster Centroids

Checking export cluster centroids will perform a clustering algorithm and produce a points object that can be used to geolocate groups of flagged cells. The epsilon parameter can be used to define the maximum distance between two samples for them to be considered in the same group.

When multiple cells are within the same epsilon range they are considered 1 group. If points are outside of this group they are considered a different group.



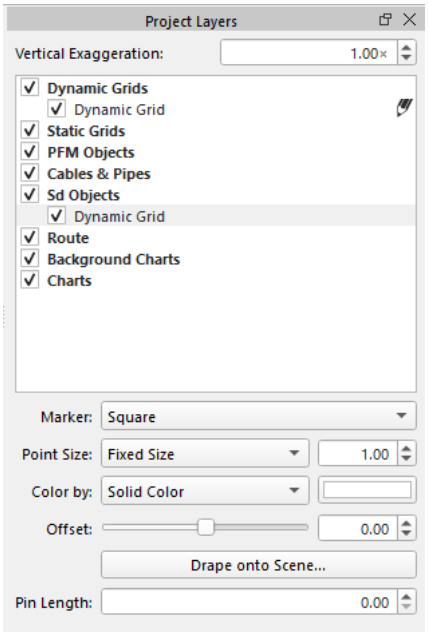
The file name defines the points object's name that will be automatically added to the project when the operation is complete.

Step 3 - Assess the flagged cells

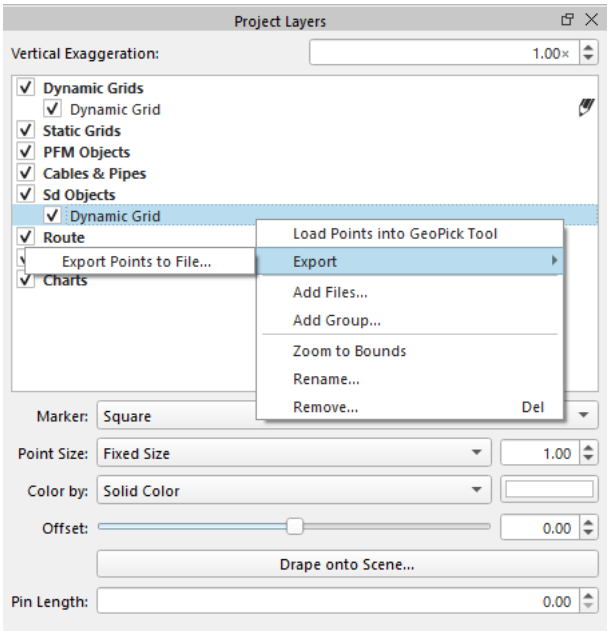
After the tool has been run there are multiple options to assess the flagged cells. Users can use the file populated by the Export Cluster Centroids for an overview and quick navigation option to go to the specific cells when it is loaded in the Geo Picking dock. This can then be used in combination with the option to color a grid by “Cell of interest”.

File list

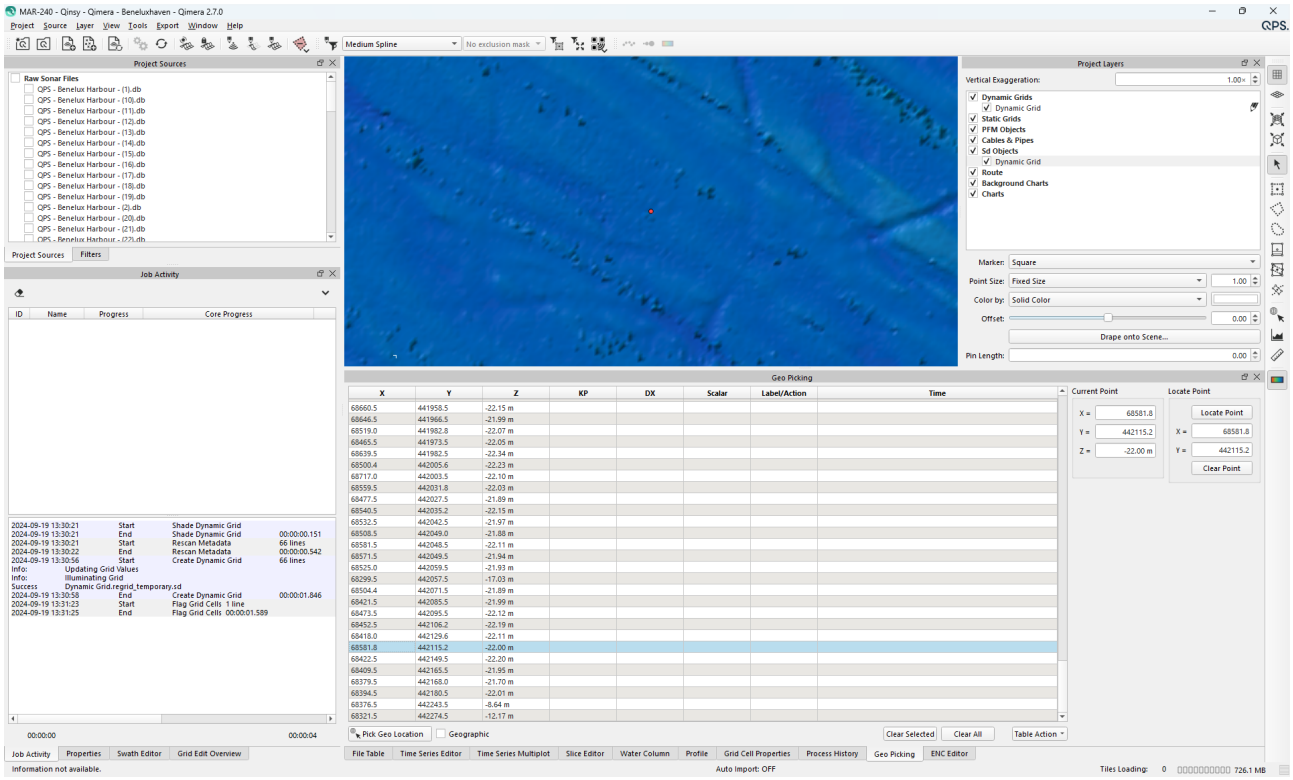
The list that is generated with the “Export Cluster Centroids” is automatically loaded in the “Project Layers” dock underneath the “Sd Objects”. Selecting this list gives user the option to adjust the markers, size and color for better visualization purposes if desired.



The entire list can be exported to an XYZ file and also be loaded in the Geopicking dock for overview and quick navigation to marked areas of interest.

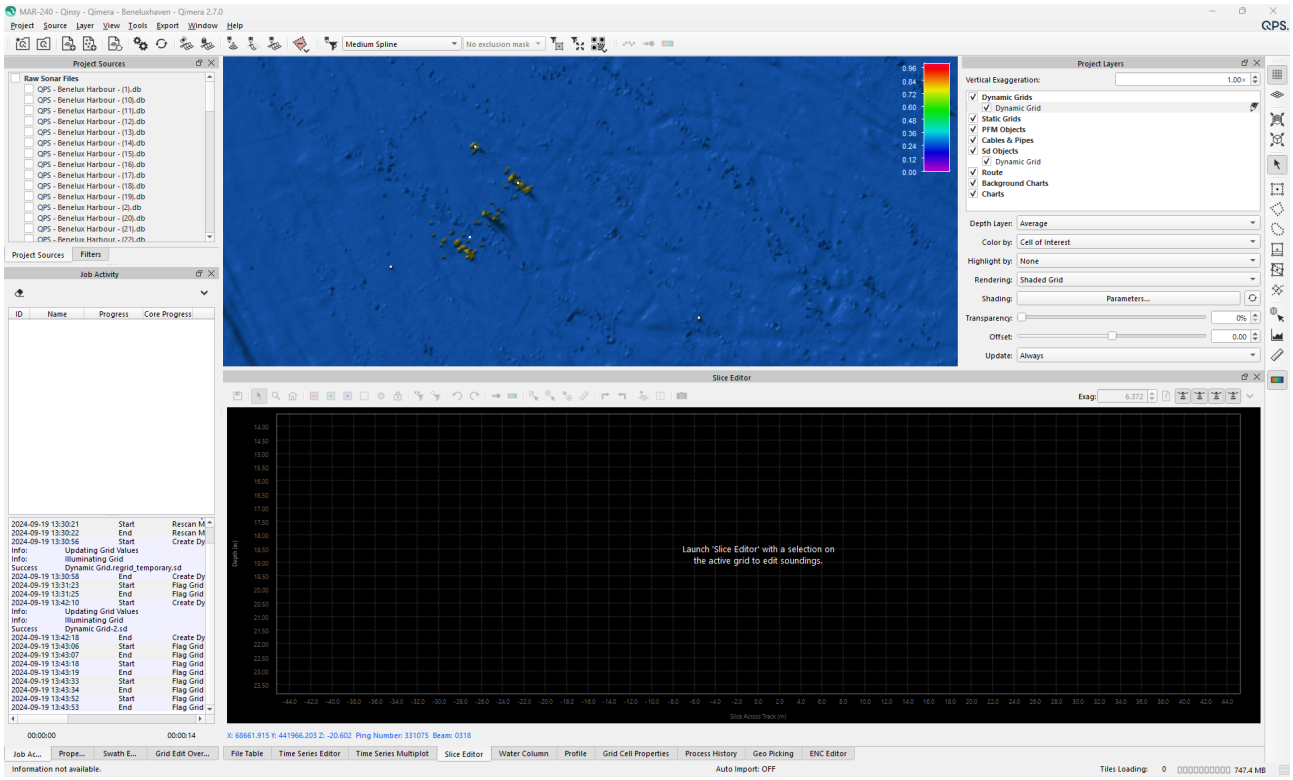


When the points are loaded in the Geopicking dock, users can select a point and use the “Locate Point” to move the general view to that point. This will help in finding areas of interest that are marked with the Flag Grid Cell tools on a larger data set.



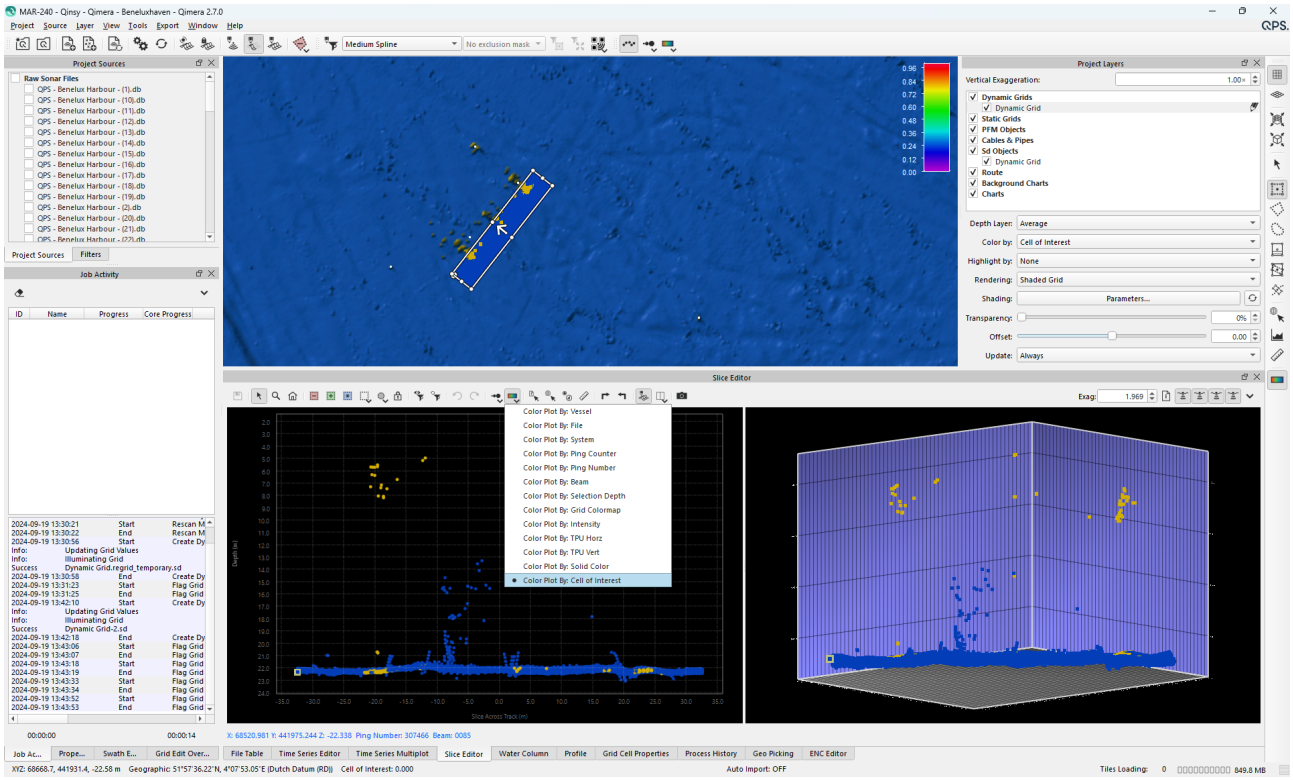
Dynamic Grid Color by

When the tool has been run the user can use the Color by “Cell of interest” option on the Dynamic Grid that was used. This will color the cells that are flagged “yellow” and the other cells blue for a distinguish color and easy identification of cells or interest.



Slice Editor Color by

When cells of interest are marked a user can decide to investigate further for example, if the cells are flagged with a high Uncertainty(95%) or outside of a Cell Range. When a selection is made on the area the slice editor can be launched. In the slice editor the Color by “Cell of interest” option to show which soundings contributed to the flagging of the grid cells and decide what actions needs to be done.


MAR-240 - Qinsy - Qimera - Beneluxhaven - Qimera 2.7.0
Project Sources
Job Activity
Project Layers
Slice Editor
Color Plot By: Vessel
Color Plot By: File
Color Plot By: System
Color Plot By: Ping Counter
Color Plot By: Ping Number
Color Plot By: Beam
Color Plot By: Selection Depth
Color Plot By: Grid Colormap
Color Plot By: Intensity
Color Plot By: TPU Horz
Color Plot By: TPU Vert
Color Plot By: Solid Color
Color Plot By: Cell of Interest

How-to Line height matching tool

This How-to is a step-by-step description for using the vertical shift tools on the dynamic surface , available from Qimera 2.3 and up.

On this page:

- Introduction
  - Step 1 - Assess Your Data
  - Step 2 - Save a Before Image
  - Step 3 - Start Static Vertical Shift Tool
  - Step 4 - Perform Line Height Matching
    - Continue processing
  - Step 5 - Assess Your Results
    - Revert to original

Introduction

There are three different vertical shift tools available in Qimera, where the last one is for adjusting already applied shifts

- Line height matching tool
- How-to Static Vertical Shift
- How-to Varying Vertical Shift

This guide will explain the Line height matching tool

The Line Height Matching Tool can work to vertically match unlocked lines, via an automated process, to neighboring lines that are either locked or have had an offset determined during the execution of the routine.
It will resolve the offsets of all unlocked items using a Least Squares optimization, until all unlocked lines have been shifted.
All locked lines will be considered, even if they are separated from each other geographically.
The offset value between lines is calculated via footprints from each file that fall into common comparison cells.

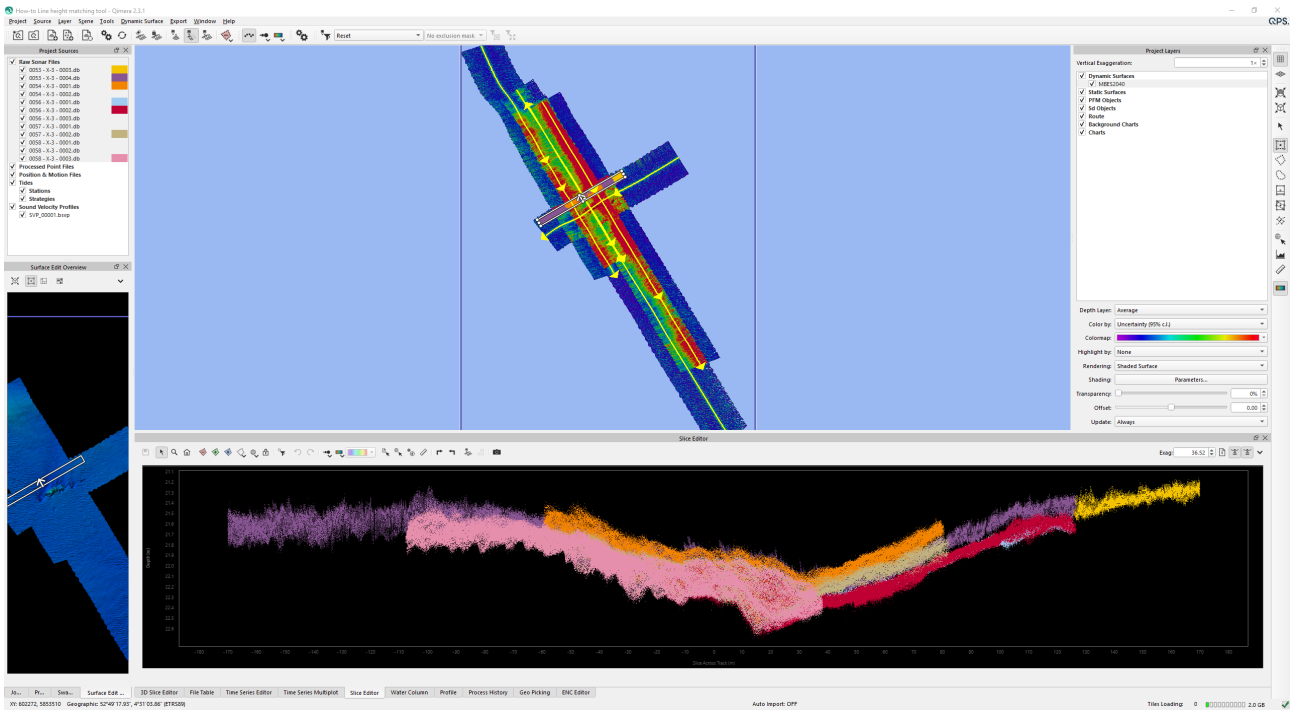
The tool can also be used manually where, after double clicking in the Offset column for an unlocked line, a shift can be manually entered or changed with the mouse wheel.

- Shift apply to the files, not to the dynamic surface only. If you have multiple dynamic surfaces, applying the shift will affect all surfaces.

Step 1 - Assess Your Data

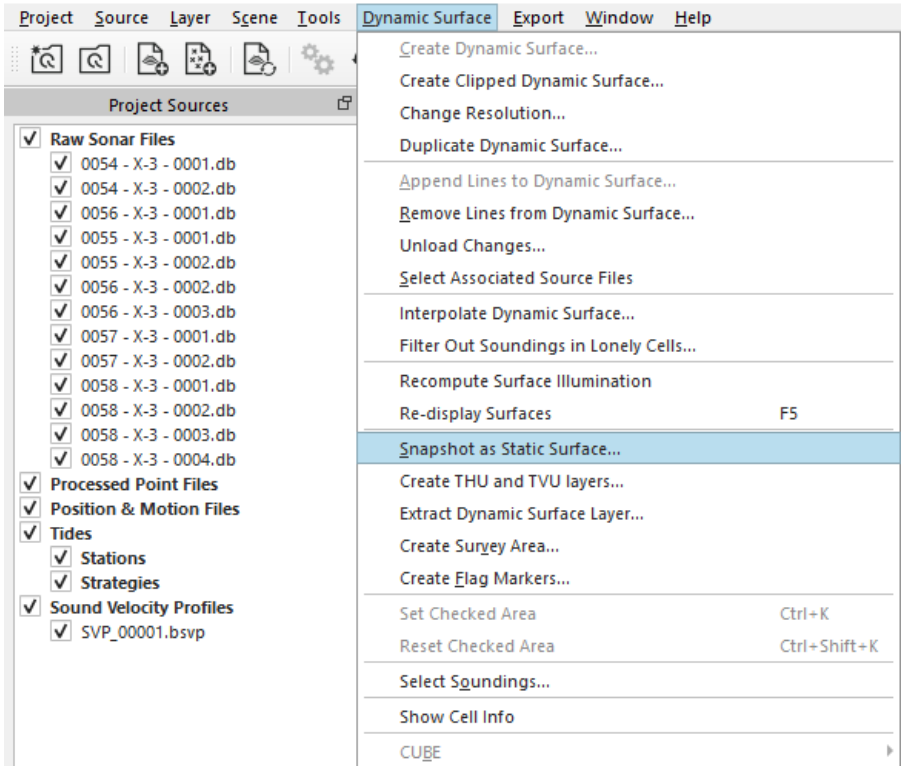
Determine which line(s) requires vertical correction and which line will be used as reference.

- The easiest way to assess this if there is an offset, is to color your grid by Uncertainty 95%
- Slice editor might also help to identify any problems



Step 2 - Save a Before Image

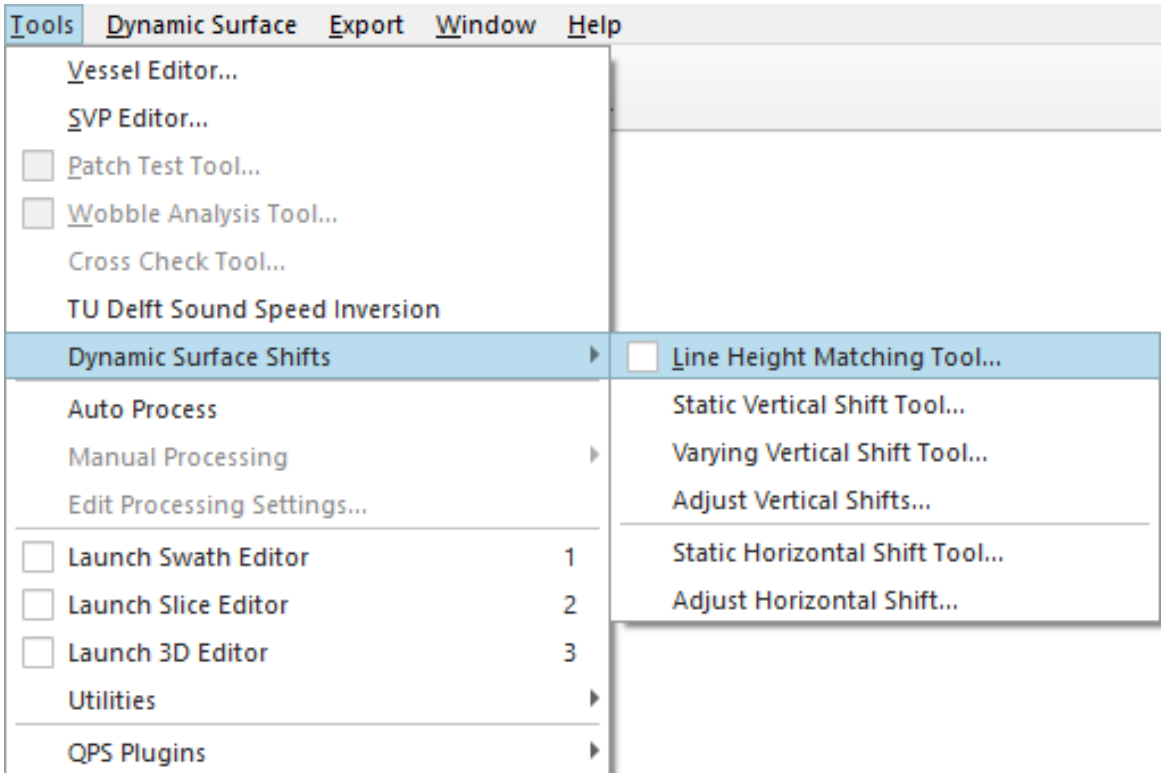
It is best practice to help you assess the results of the algorithm by capturing a snapshot of the results before any changes are done.
From the Dynamic Surface menu select 'Snapshot as Static Surface' so a Static Surface is generated. You will be prompted to define a name and attributes.



Step 3 - Start Static Vertical Shift Tool

Once you have assessed your data and determined which line to use as a reference:

- Raw Sonar Files which you want to apply the Line height matching to
- Go to Tools, Dynamic Surface Shifting, Line Height Matching Tool

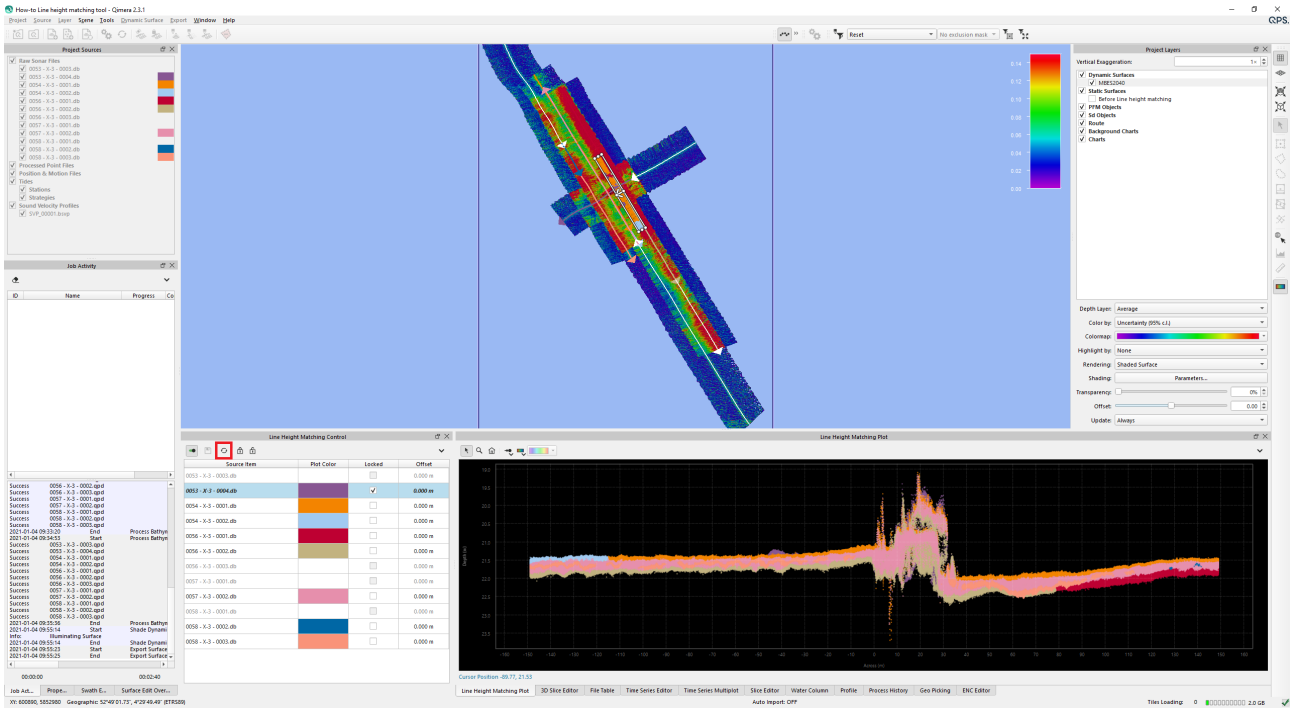


Step 4 - Perform Line Height Matching

In the Line Height Matching Tool, you will have a selection box which you can move around and change in size, similar to using the slice editor.
When you have made a selection:

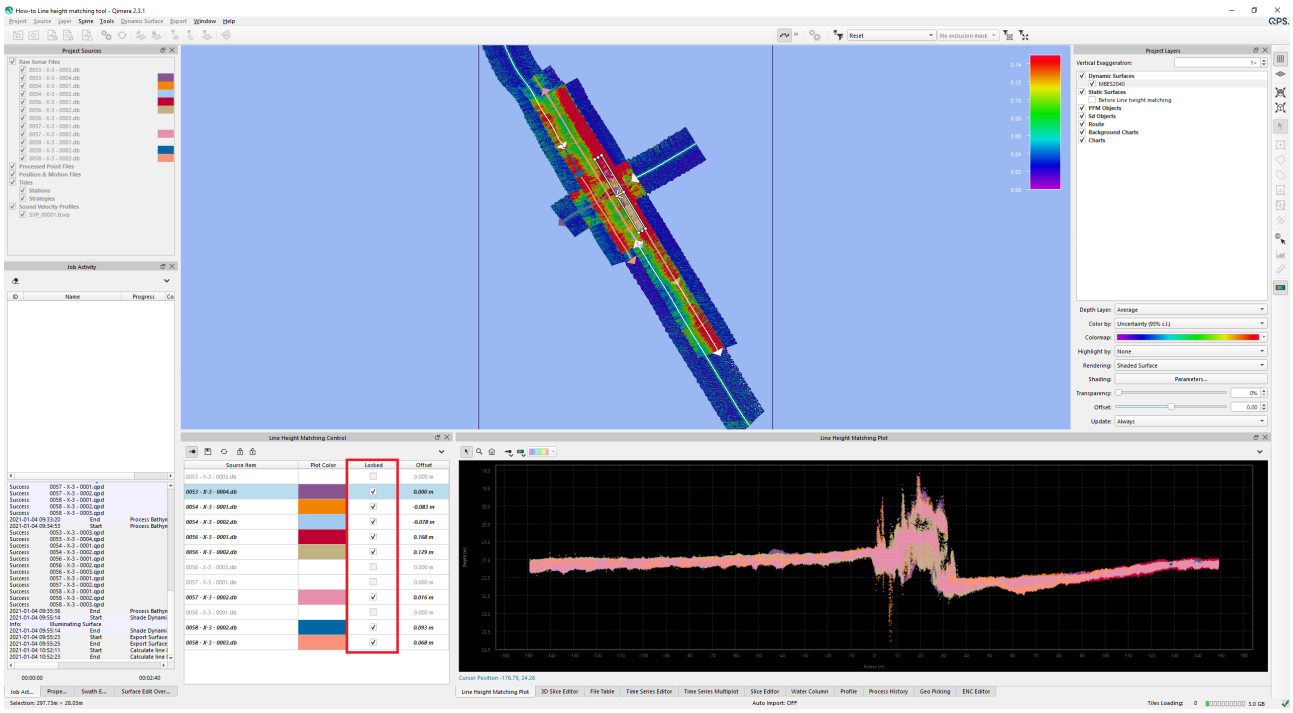
- Lines color accordingly and match the Project source, Source items in the Line Height Matching Control, plan view and Line Plot
- Line height Matching Plot displays similar to the Slice editor

Once started, determine which line or lines you would like to use as reference, these will have to be 'Locked'.
Once determined, you can start the 'Auto compute'



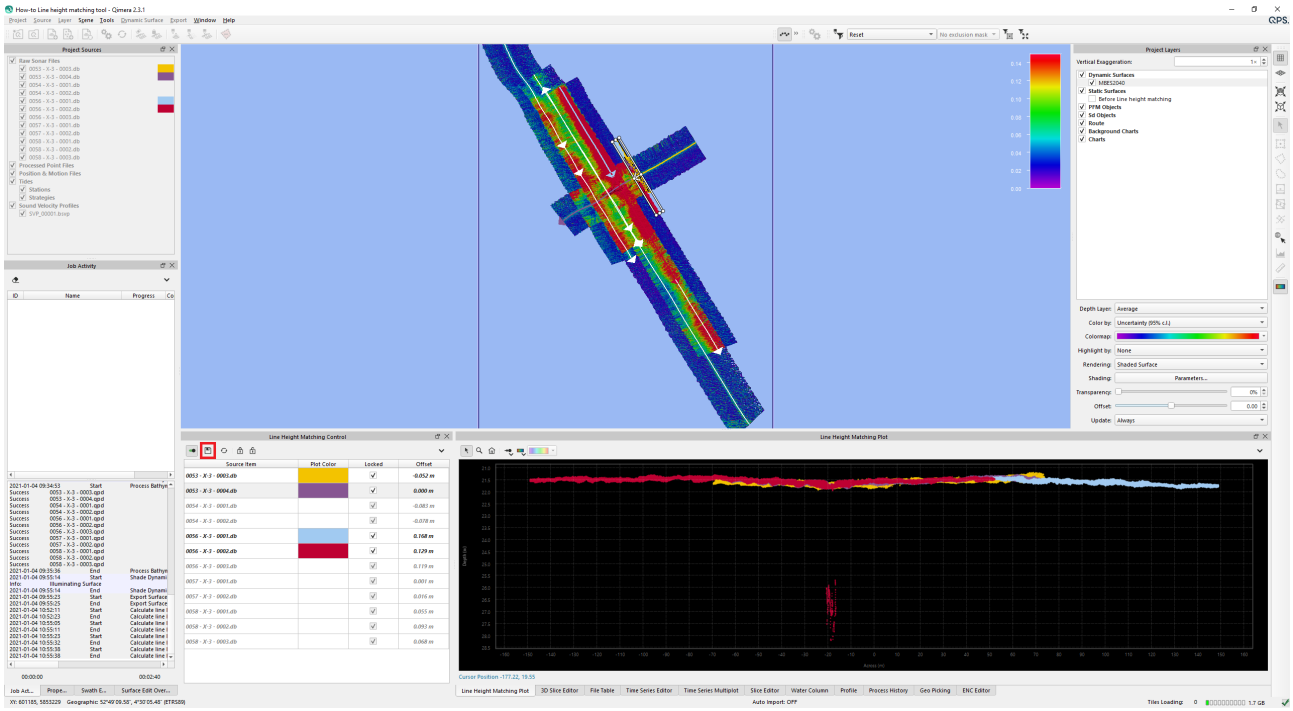
Continue processing

Once you have performed your first Line matching, the lines containing a suggested offset will now be locked as well.

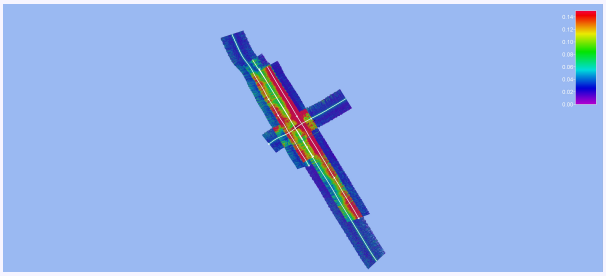
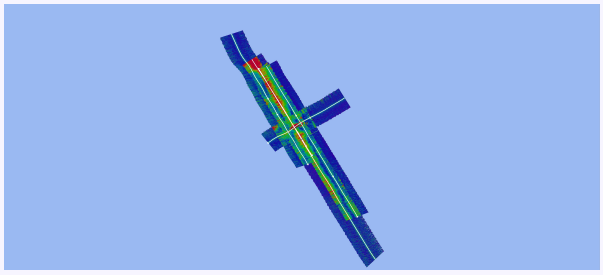
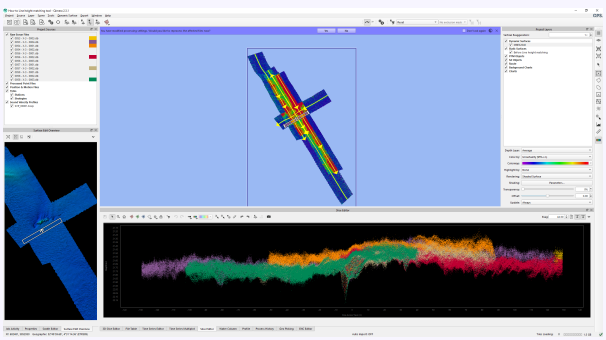
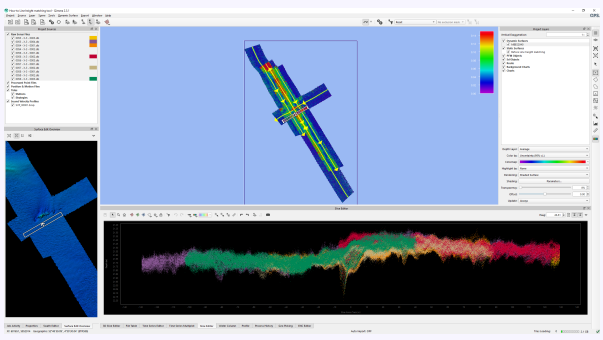


- Any new selection made will now use the locked lines as reference
- The box can still be moved around and allow you to move all other lines to the locked lines

- Once happy with the result, make sure to save the settings

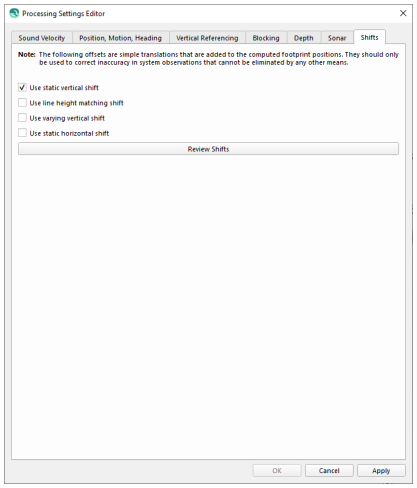


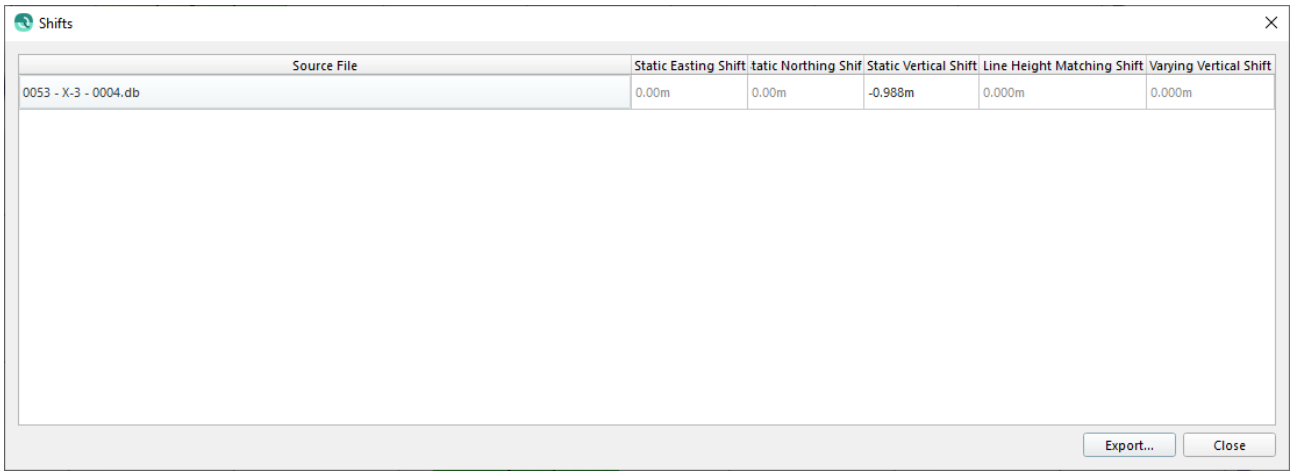
Step 5 - Assess Your Results

Before Line Matching Tool	After Line Matching Tool
	
	

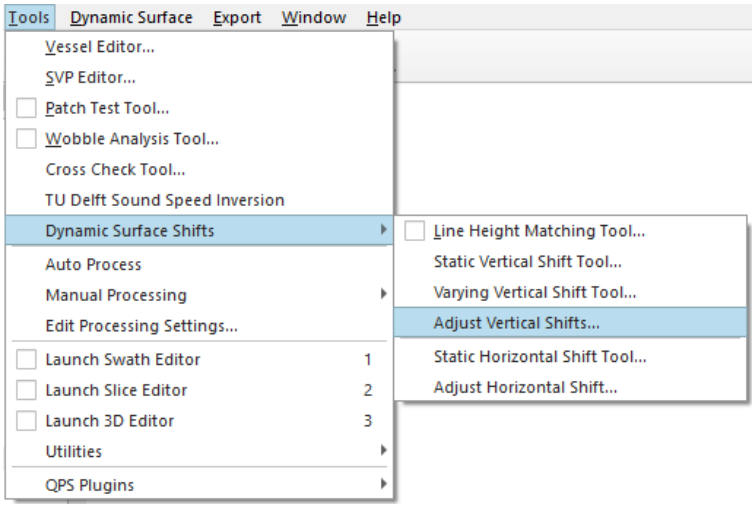
Revert to original

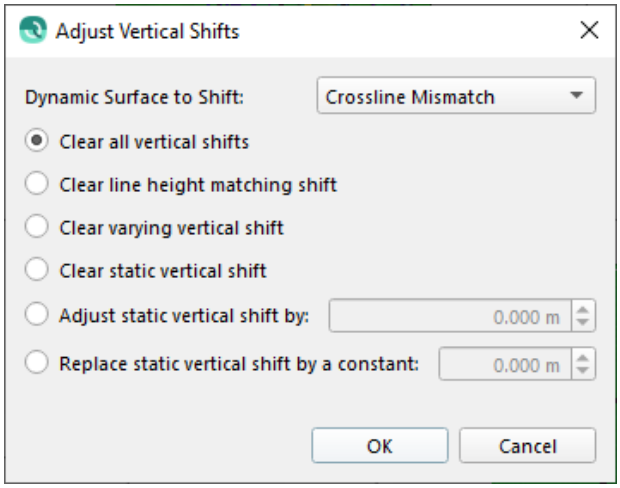
Notice that you are able to check and/or disable the Varying Vertical shift under the Processing Settings:





To clear generated shifts:





Option	Used for
Dynamic surface to Shift	Change the combo box to display the Dynamic Surface containing the raw sonar files that you wish to apply or clear the vertical shift. • All currently available Dynamic Surfaces will appear in this combo box. • You can also choose the *Selected Sonar Files* option in which case the files you selected in the Qimera Project Sources Dock will have the shift operation applied.
Clear all vertical shifts	Clear all shifts applied by any of the available tools.
Clear line height matching shift	This will clear the shift applied by the How-to Line height matching tool
Clear varying vertical shift	This will clear the shift applied by the How-to Varying Vertical Shift
Clear static vertical shift	This will clear the static vertical shift applied by this dialog or by the How-to Static Vertical Shift .
Adjust static vertical shift by	This option will apply the additional specified shift in an additive manner to the current static vertical shift.

Option	Used for
Replace static vertical shift by a constant	This option will replace the static vertical shift for the raw sonar files by an entered constant.

How-to Screen Capture

This How-to article briefly introduces the Screen Captures Tool in Qimera, and how to get the best resolution for the screen capture.

On this page:

- Introduction
  - Step-by-Step
    - Step 1: Starting the Screen Capture Dialog Box
    - Step 2: Screen Capture Dialog Box
  - Higher Resolution
- Additional Information

Introduction

Screen Captures (see Figure 1) are useful to quickly share a view of the data or to compare with clean data.

The Bathymetry Data used in this How-to article is from the Fisheries and Oceans Canada Non-Navigational Bathymetry Data, in the Murray Harbour and Murray River area of P.E.I., Canada.

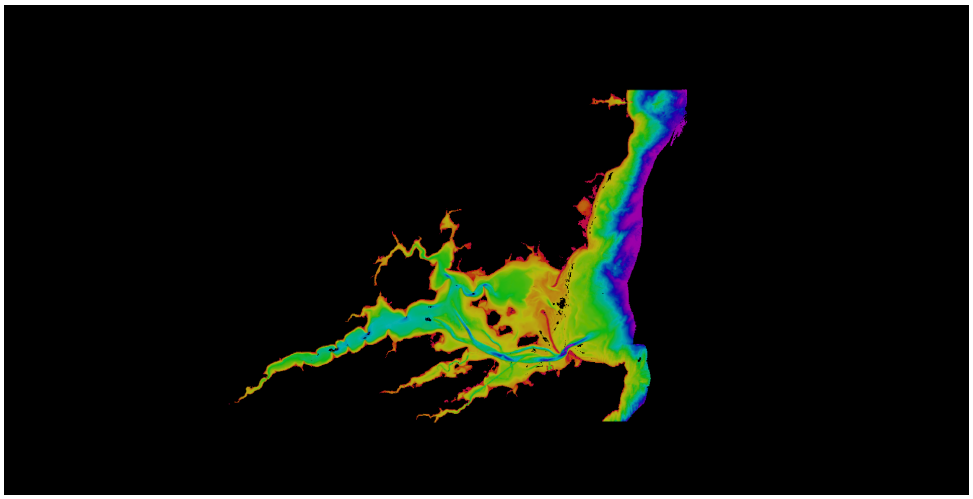


Figure 1. *An example Screen Capture taken in Figure 4..*

Step-by-Step

Step 1: Starting the Screen Capture Dialog Box

Open the Screen Capture dialog box by selecting "Export Screen Capture..." under "Export" in the menu bar (see Figure 2).

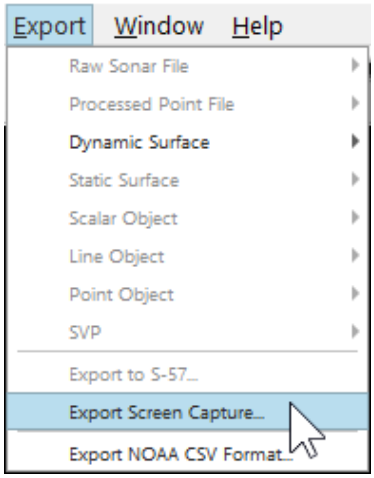


Figure 2. *How to start the Screen Capture tool.*

Step 2: Screen Capture Dialog Box

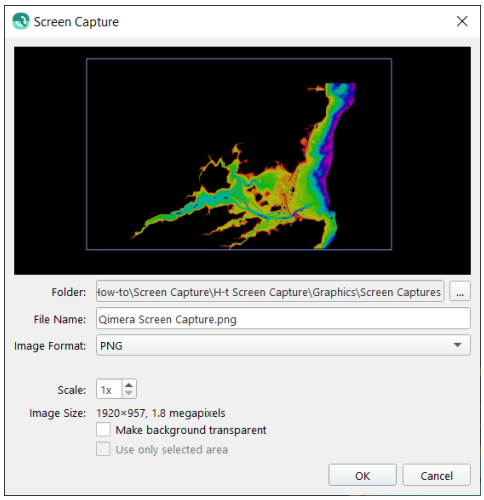


Figure 3. *The Screen Capture Tool Dialog Box.*

The Screen Capture Dialog Box (see Figure 3) allows you to choose where the screen capture is saved under the "Folder" by selecting the "..." button and choosing the desired folder.

You can also type a new name in the "File Name" box and choose the image format in the "Image Format" dropdown menu.

The Scale can also be changed in the "Scale" box.

The "Image Size" states the resolution size of the scene.

There are check boxes to decided if you want the background invisible or to only use a selected area.

Higher Resolution

To get higher resolution on your screen capture (see Figure 4) there are a few tips:

- Have the Height:Width Ratio of you Qimera window at 1:2
- Use a higher resolution Monitor
- Scale factor should be close to 1 to minimize distortion
- The less zoomed on the surface, the less distortion on the final screen capture
- The surface should be created with the smallest cell size possible
- Take away all the docks to make the view port is as large as possible

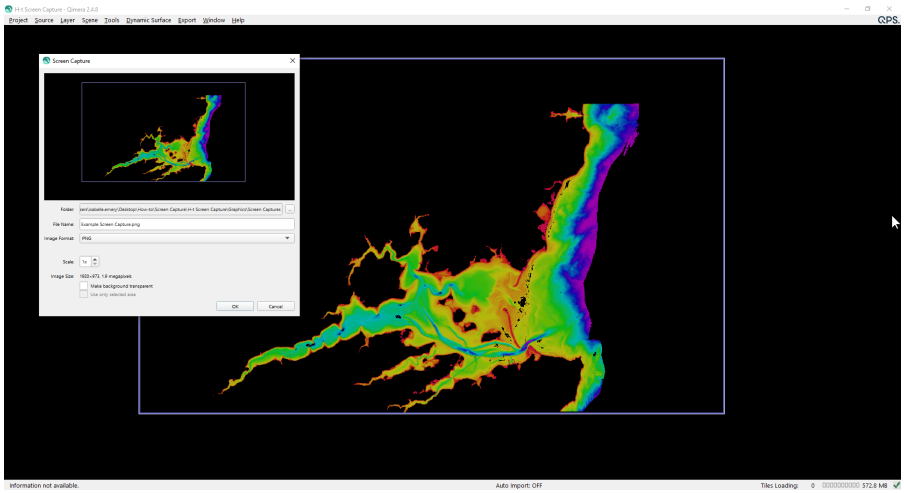


Figure 4. *An example of the best way to set up a Screen Capture.*

Additional Information

- Qimera Screen Capture Dialog
- (8.6) How-to Screen Capture

How-to Shift Time Series Observations

This How-to is a step-by-step description for using the shift tools in the Time Series Editor, available from Qimera 2.3 and up.
This tool can fix time series observations problems, e.g. height jumps.

On this page:

- Introduction
- Step-by-Step guide
  - Step 1 - Assess Your Data
  - Step 2 - Save a Before Image
  - Step 3 - Select the Data that needs Shifting
  - Step 4 - Use the Tools
  - Step 5 - Assess your Results

Introduction

Time Series Editor is used in addition to other Qimera tools to QC and trouble shoot data. The Time Series Editor is a graphical view of the time series (extracted from raw sensor data). The tool plots the measurements from all sensors associated with the particular source item. For example, if you have a source file with two motion sensors, the data from both sensors will be displayed simultaneously. More info can be found in:Qimera Time Series Editor Dock.

There are two ways of shifting time series observations, there is the insert option which allows you to enter a sample data before the start of the series or at the end of the series. It will also allow you to replace an observation which has been interpolated or marked as invalid. Next to that there is the shift option which allows the you to shift a selection of time series to a new desired location.

Good to know

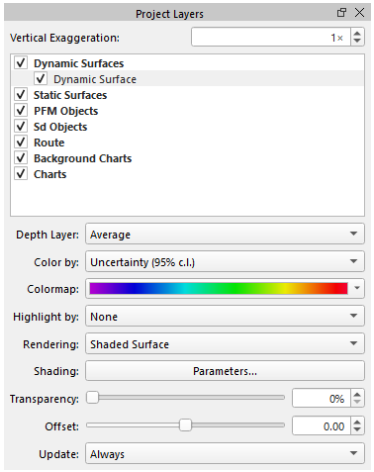
It is not possible to insert new observations in the time series, it is only possible to enter a sample data at the start and at the end of the series, or replace an existing one.

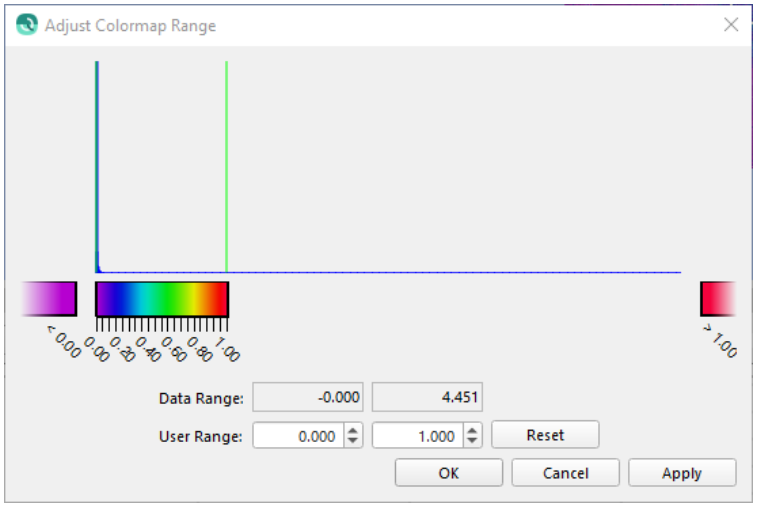
Step-by-Step guide

Step 1 - Assess Your Data

Determine the line that requires Time Series improvement by assessing the data/survey. A good way to visualize any errors in your data is to set the Dynamic Surface attribute to 'Color by' Uncertainty (95% c.l.), and then adjust the colormap to emphasize outliers. The

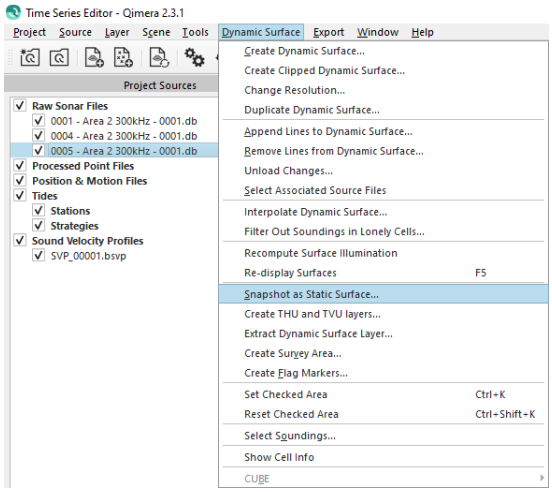
Adjust Colormap Range dialog will come up, you can left-click and right-click on either side of the histogram to adjust the range.

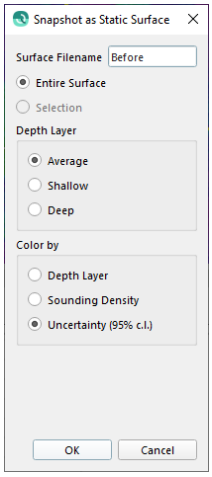




Step 2 - Save a Before Image

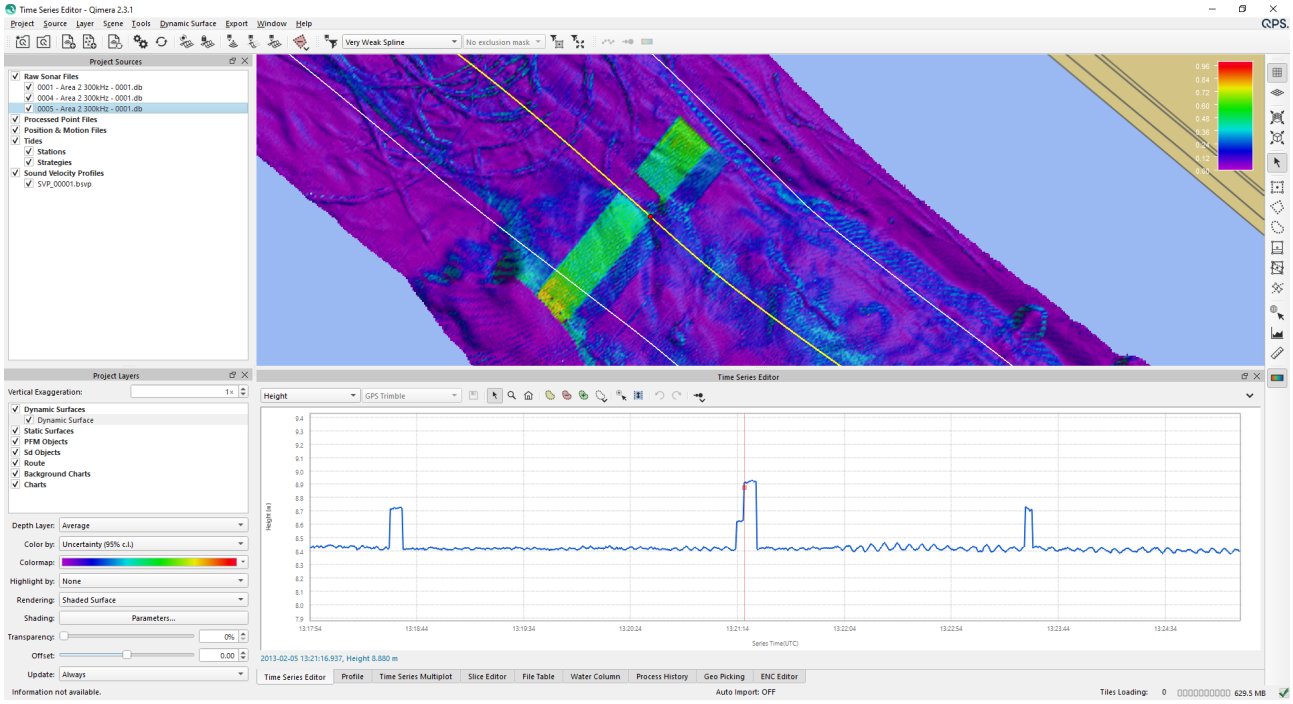
It is a suggested best practice to help you assess the results of the algorithm by capturing a snapshot of the results before any changes are done.
From the Dynamic Surface menu select 'Snapshot as Static Surface' so a Static Surface is generated. You will be prompted to define a name and attributes.





Step 3 - Select the Data that needs Shifting

When a problem area is detected, the file (reflecting the area) needs to be selected and the Time Series Editor dock opened so the time series can be adjusted. With the combo Boxes the attribute that is causing the problem can selected.



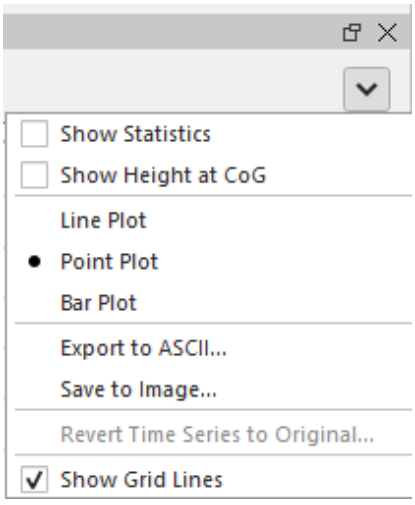
Step 4 - Use the Tools

There are two ways to edit the time series observations to a new location.

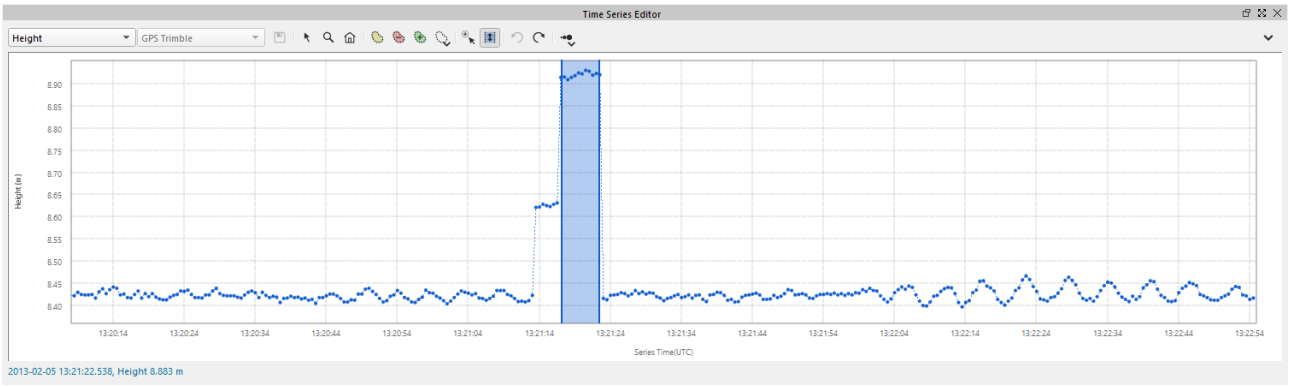
1. Sample range shift
2. Insert sample

Sample range shift

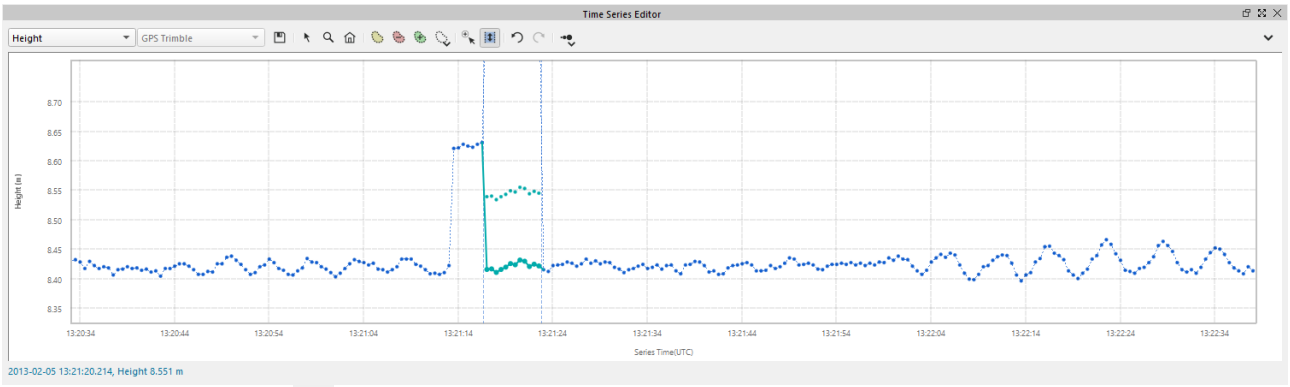
To make the observations more visible the plot can be changed from lines to points, this can be found under the drop down menu in the top right corner of the Time Series editor window.



Select the 'Select sample range to shift'  from the Time Series Editor toolbar, from here drag a selection in the time series you want to change.



After the selection the observations which are selected by the Sample range shift tool are marked cyan. From here the observations can be moved to the new location. The original observations are marked with a blue dotted line.

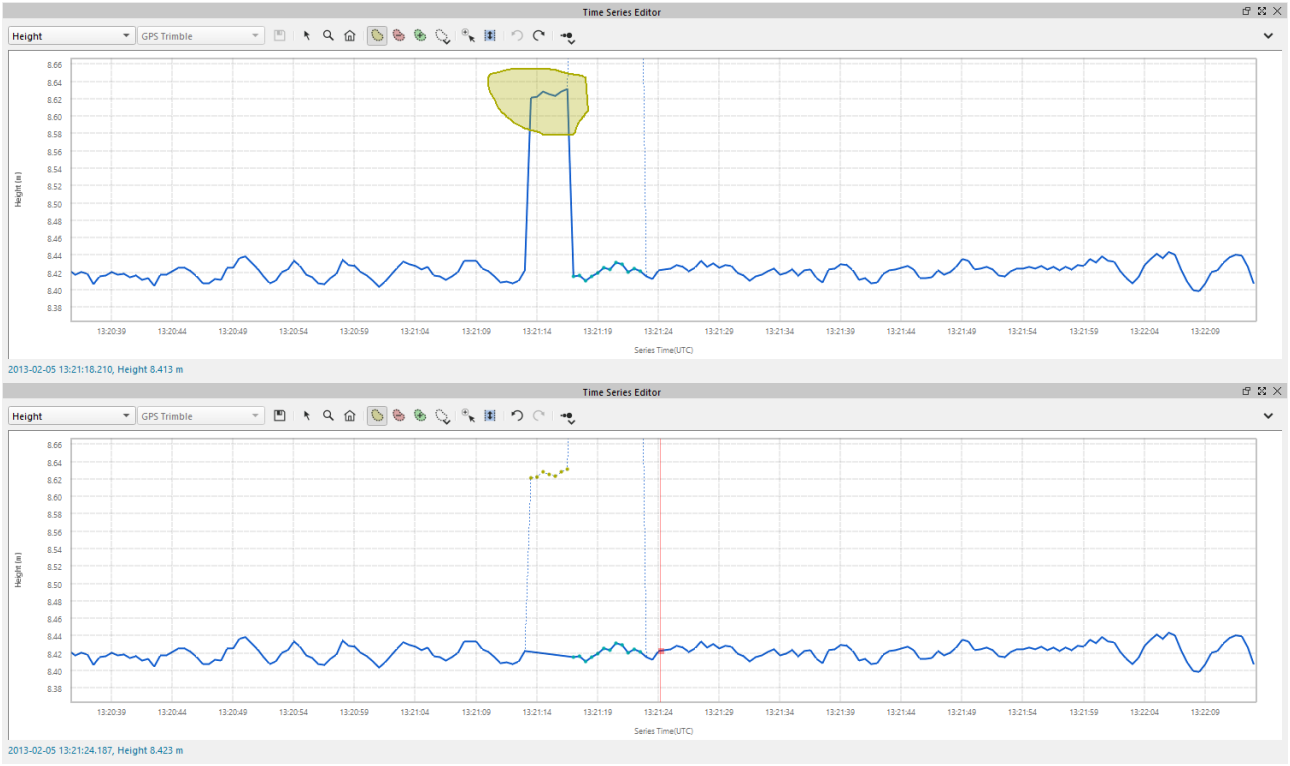


Select the save icon  to save the edits, this will result in reprocessing of the selected file.

Insert sample

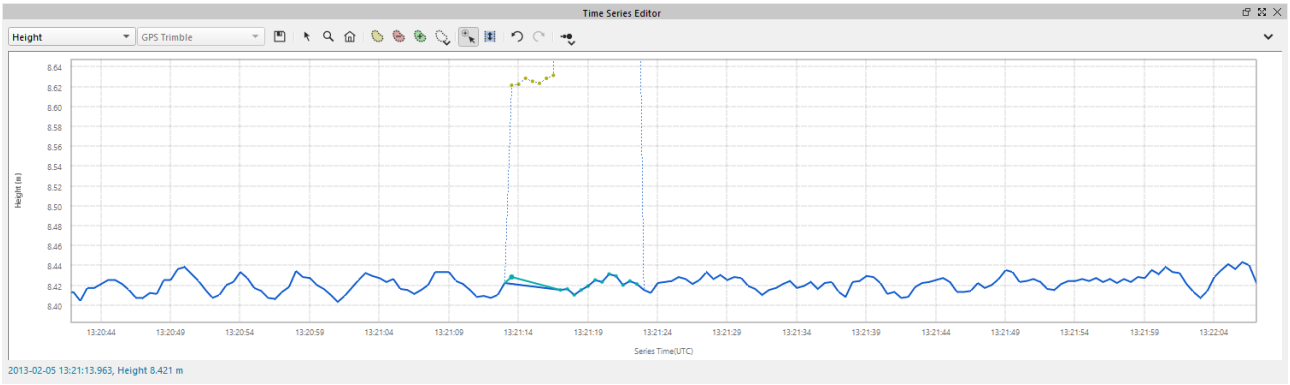
For this tool it could be easier to use the line plot.

To determine the new observation the original observation should be marked as invalid or ignored by de use of the selections tools in the Time Series editor toolbar. If marked invalid is used Qimera will then interpolated between the last and first valid observation.

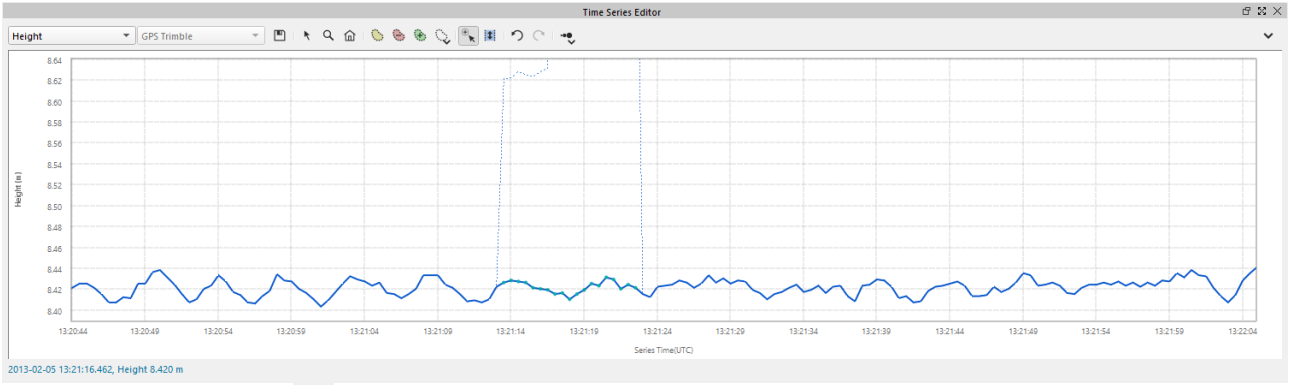


As can be noticed in the image above the interpolated will be one line, the user can use the 'Insert Sample' tool to overrule the interpolation with a new observation.

Select the 'Insert Sample' tool  from the Time Series Editor toolbar.



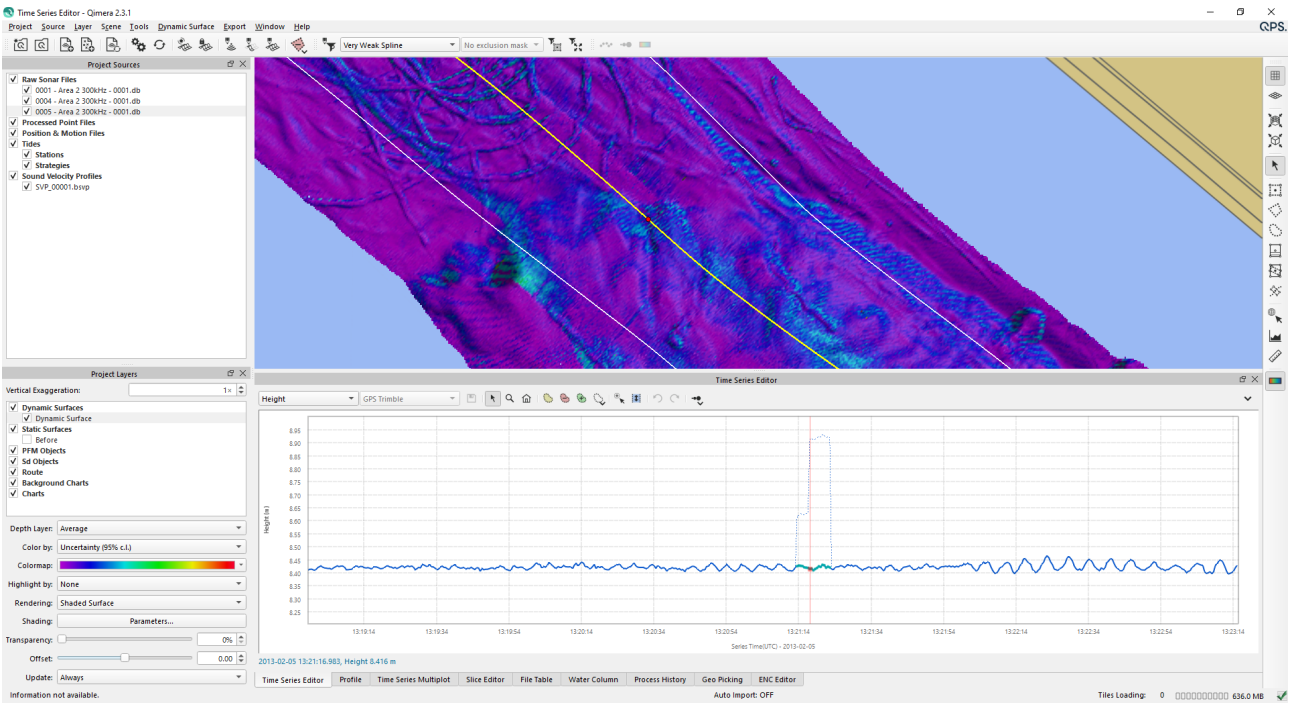
From here on the time of the original observation a new observation can be defined. The new observation will be marked cyan and the interpolation line to the next observation are drawn as well. The original observations are marked with a blue dotted line.



Select the save icon to save the edits, this will result in reprocessing of the selected file.

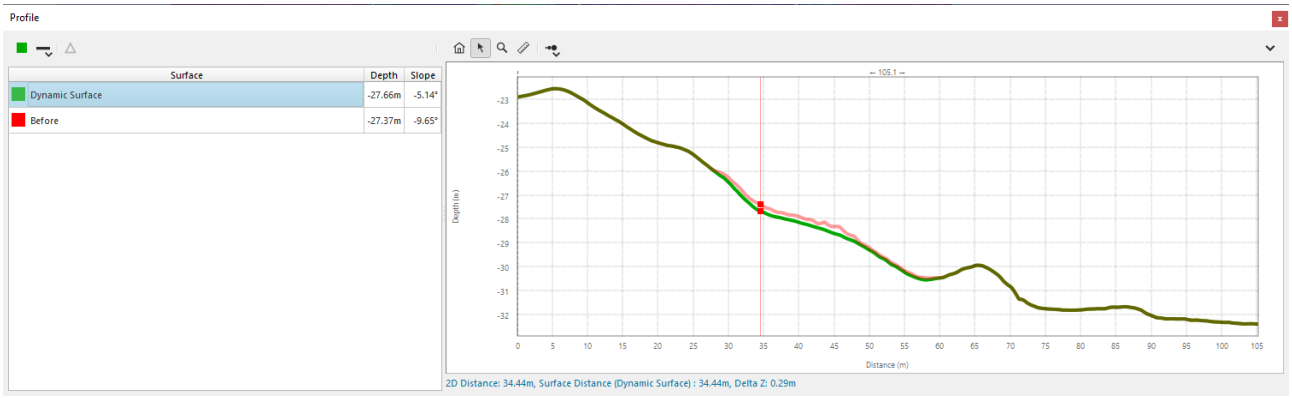
Step 5 - Assess your Results

The reprocessing of the sounding results that occurs after completion of the algorithm run in Step 4 will trigger the automatic update of any Dynamic Surfaces that use the selected lines. This is why it is helpful to have a Snapshot surface first, you can compare the results before and after the tool is run.
In the 4D scene you can review the latest result of the Dynamic Surface.



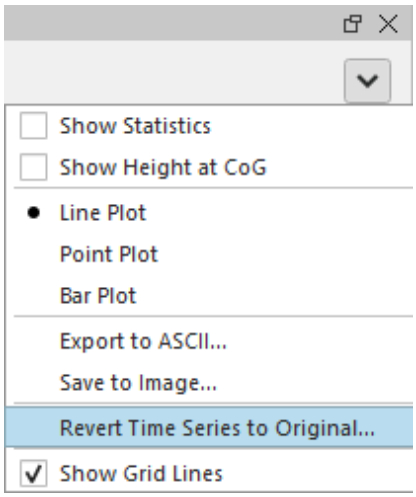
It is also possible to generate a profile to see the difference of the new surface compared to the original surface. To generate a profile right click and drag on the surface.

In order to show both surfaces in the profile dock, make sure both surfaces are enabled in the project layers.



Revert to original

Notice that you are always able to revert back to the original time series. This can be found under the drop down menu in the top right corner of the Time Series editor window. This will result in reprocessing of the selected file.



How-to Static Horizontal Shift Tool

This How-to is a step-by-step description for using the Horizontal Shift Tool on the Dynamic Surface, available from Qimera 2.3 and up.

On this page:

- Introduction
- Step-by-step-guide
  - Step 1 - Assess & Import your data
  - Step 2 - Start the Static Horizontal Shift Tool
  - Step 3 - Select Reference surface, Line object & Shading
  - Step 4 - Select Fiducial points
  - Step 4 - Assess results

Introduction

The Static Horizontal Shift Tool allows a user to align a Dynamic Surface from a survey to another reference surface that could be either a Dynamic or Static Surface. The user does this by selecting a number of corresponding matching point pairs on each surface, which are referred to as reference points. Qimera will then compute an average XY offset between all reference pairs that can then be applied to the raw sonar files of the Dynamic Surface the user desires to shift. Typically, the user picks corresponding features on the seabed or corresponding features of line objects such as contours to use as reference points. The user can pan or zoom around either surface view and the same corresponding geographic location will be at the center of the view when the views are "locked".

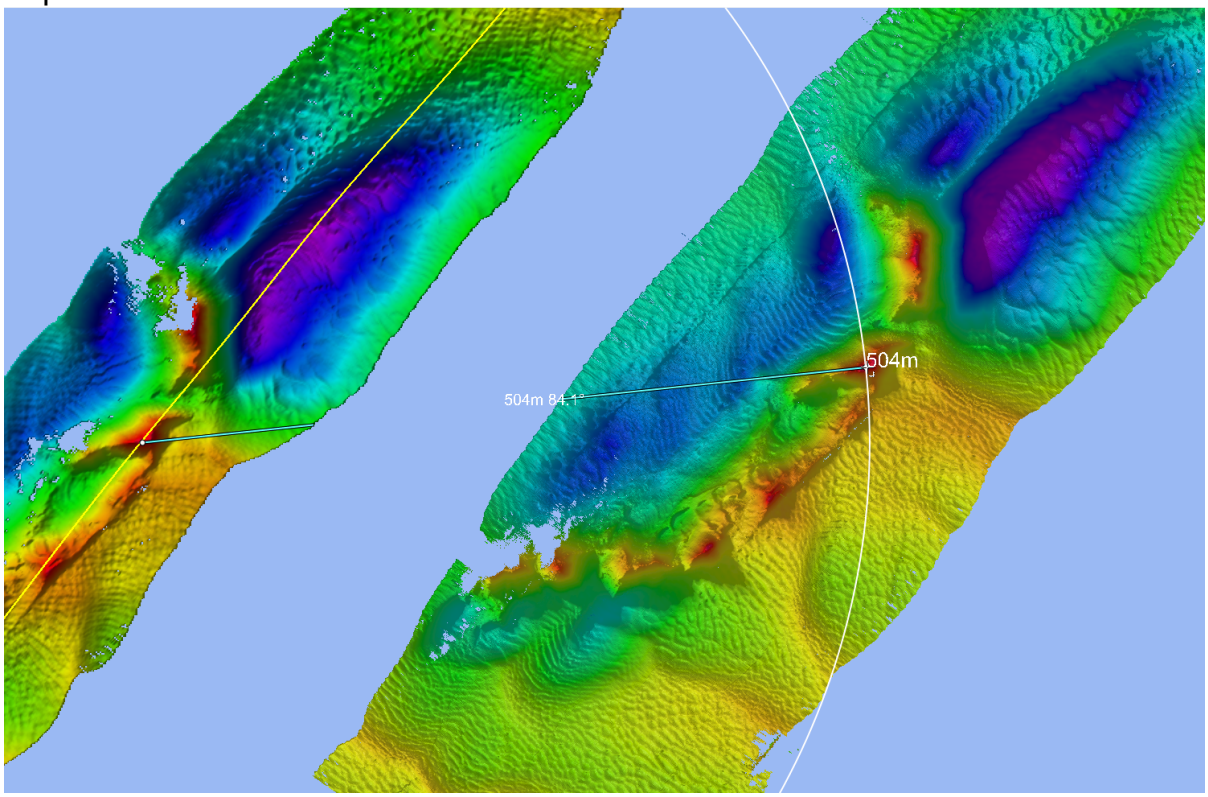
The average XY offset is computed by averaging the XY displacement of all reference pairs in the Point Table. As you register reference pairs by clicking on like features in each window, circular icons appear that represent the location of each pick. The color of the icon helps you see which pairs go together. Each icon also has a "tail" that extends to the corresponding Reference position in the opposite surface view. You can start a pick pair in either surface view. The panels below show how the icons appear as you start and finish your pick on a feature. In this example, the user chose a simple bump that appeared in both surfaces. As you pick, the points are also added to the Point Table.

Step-by-step-guide

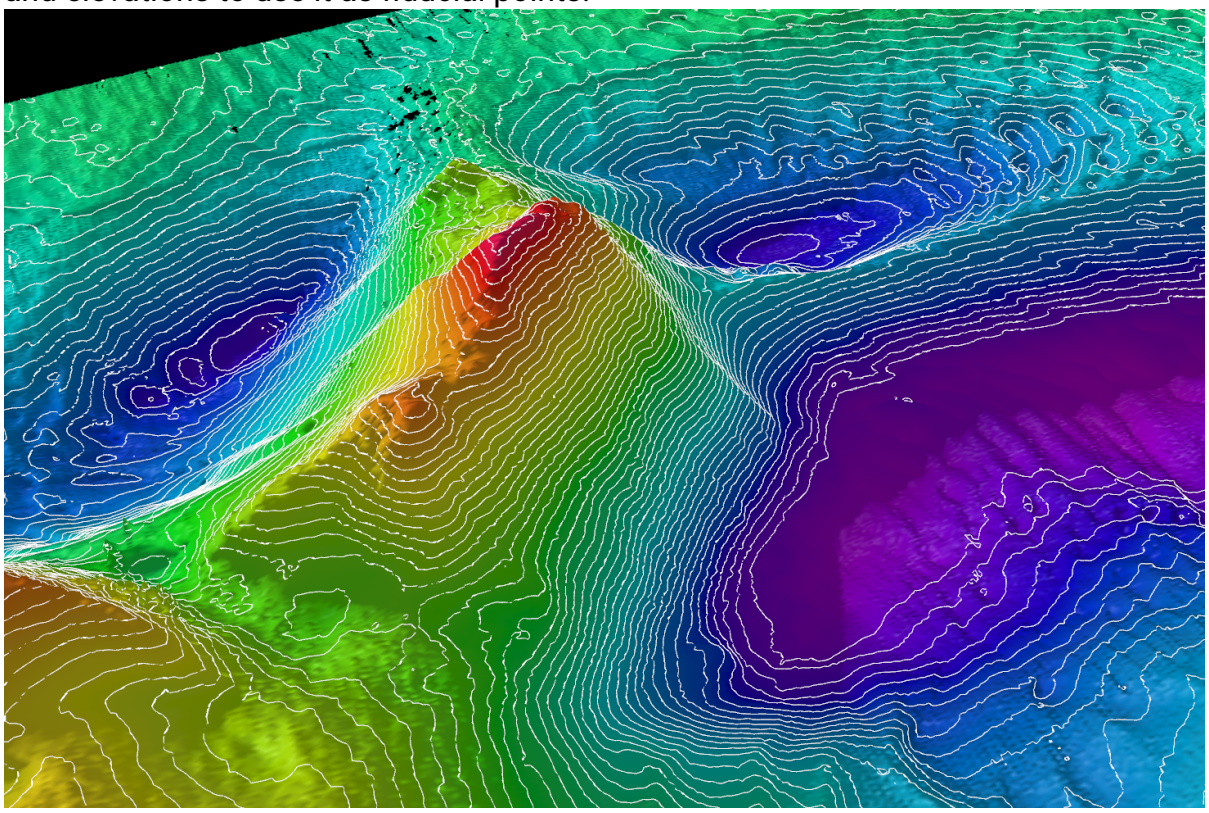
Step 1 - Assess & Import your data

In order to use the tool, two surfaces are required. The first surface will function as a reference surface while the second selected dynamic surface will be shifted based on the calculated fiducial points.

Use the profile and/or measure tool to get a rough assessment of the horizontal shift required.

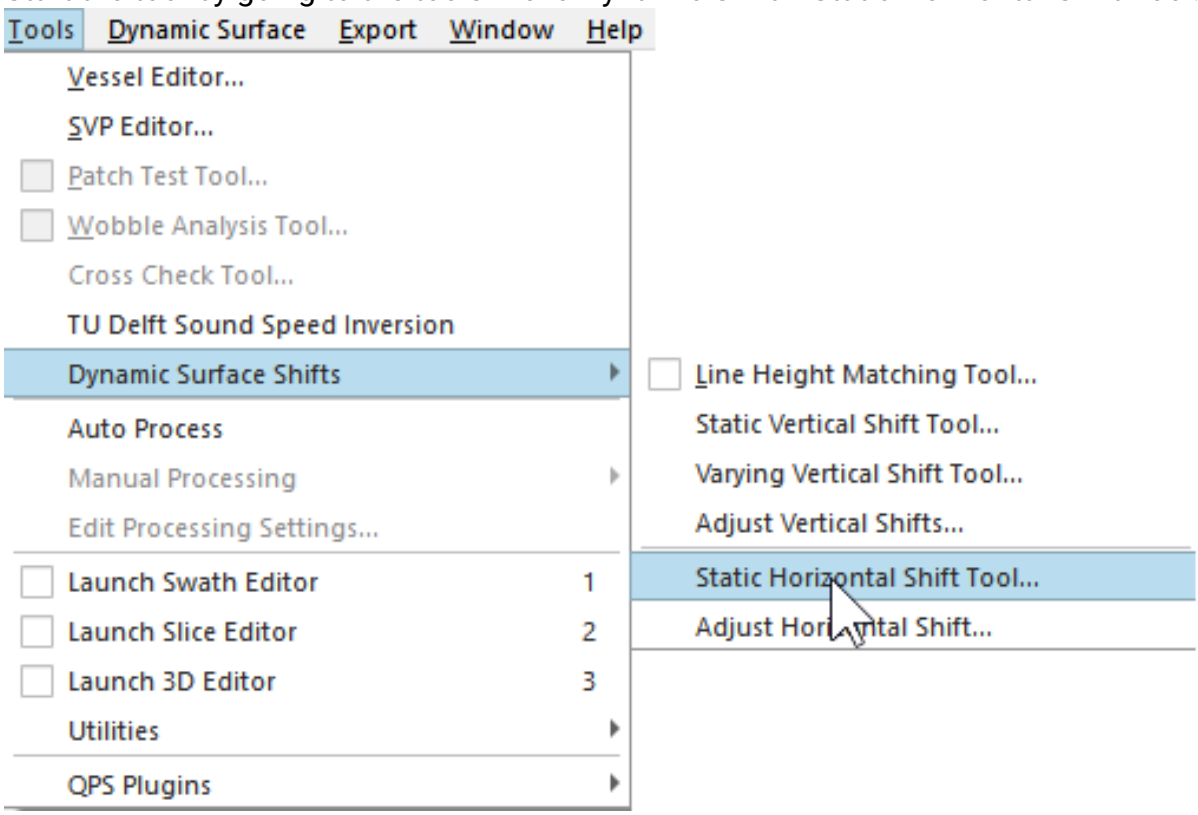


Use the contouring option to create contours, this makes it easier to distinguish features and elevations to use it as fiducial points.

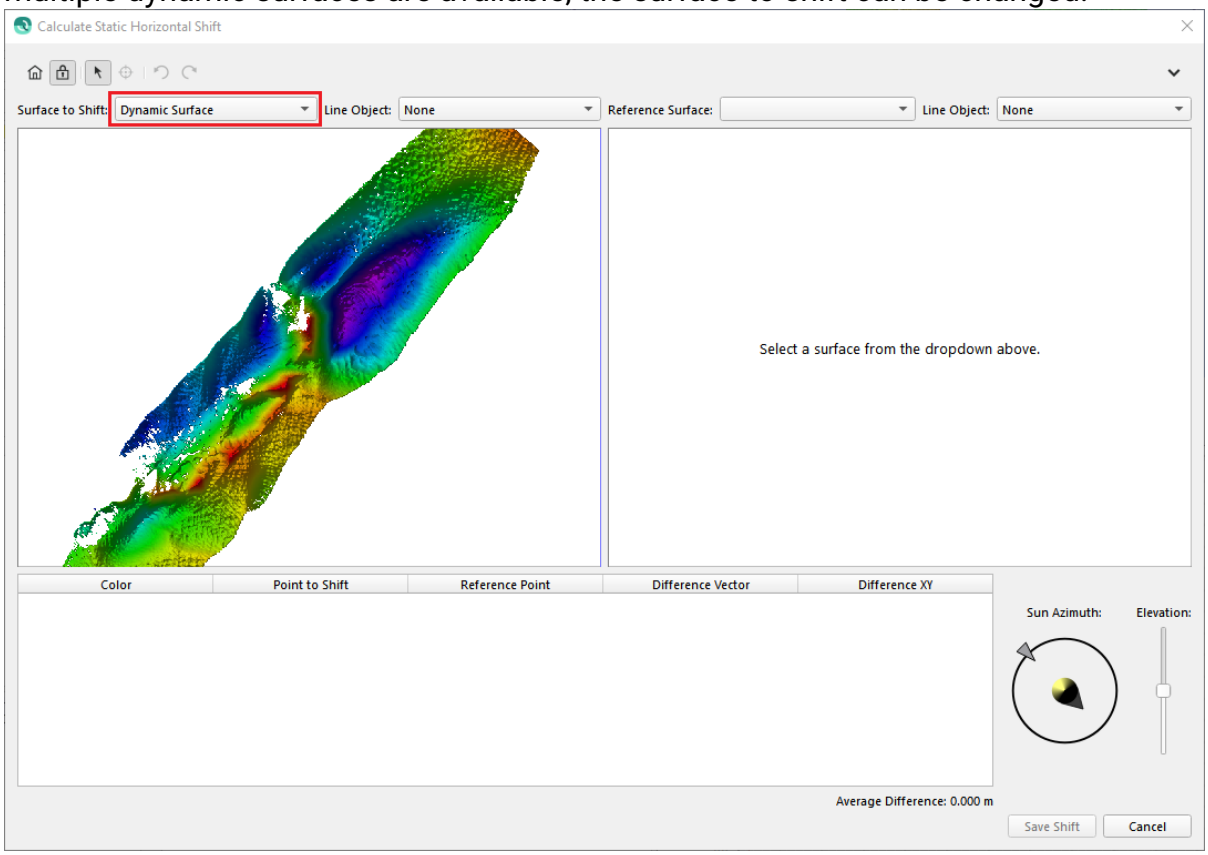


Step 2 - Start the Static Horizontal Shift Tool

Start the tool by going to the tools menu Dynamic Shift > Static Horizontal Shift Tool.



The tool will open. The tool selects the current dynamic surface as Surface to shift. When multiple dynamic surfaces are available, the surface to shift can be changed.

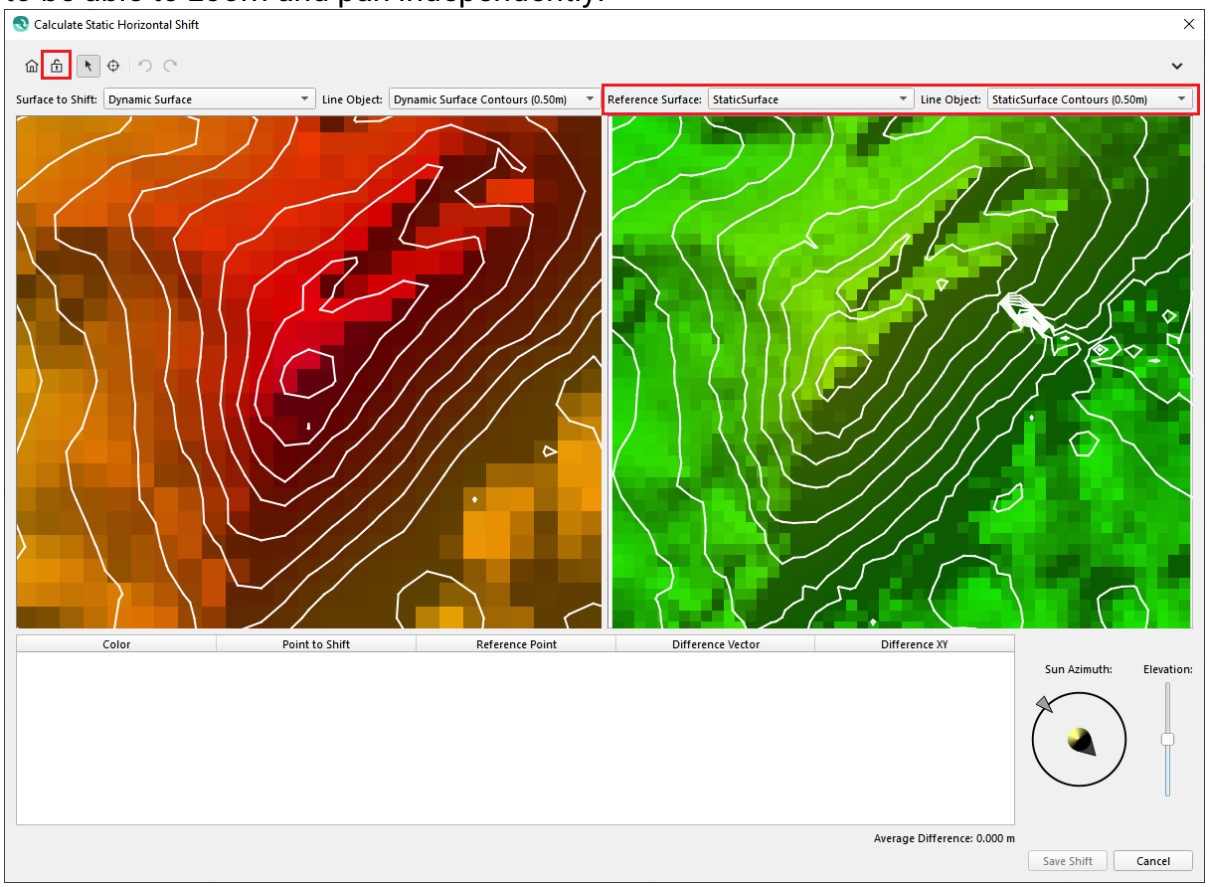


Step 3 - Select Reference surface, Line object & Shading

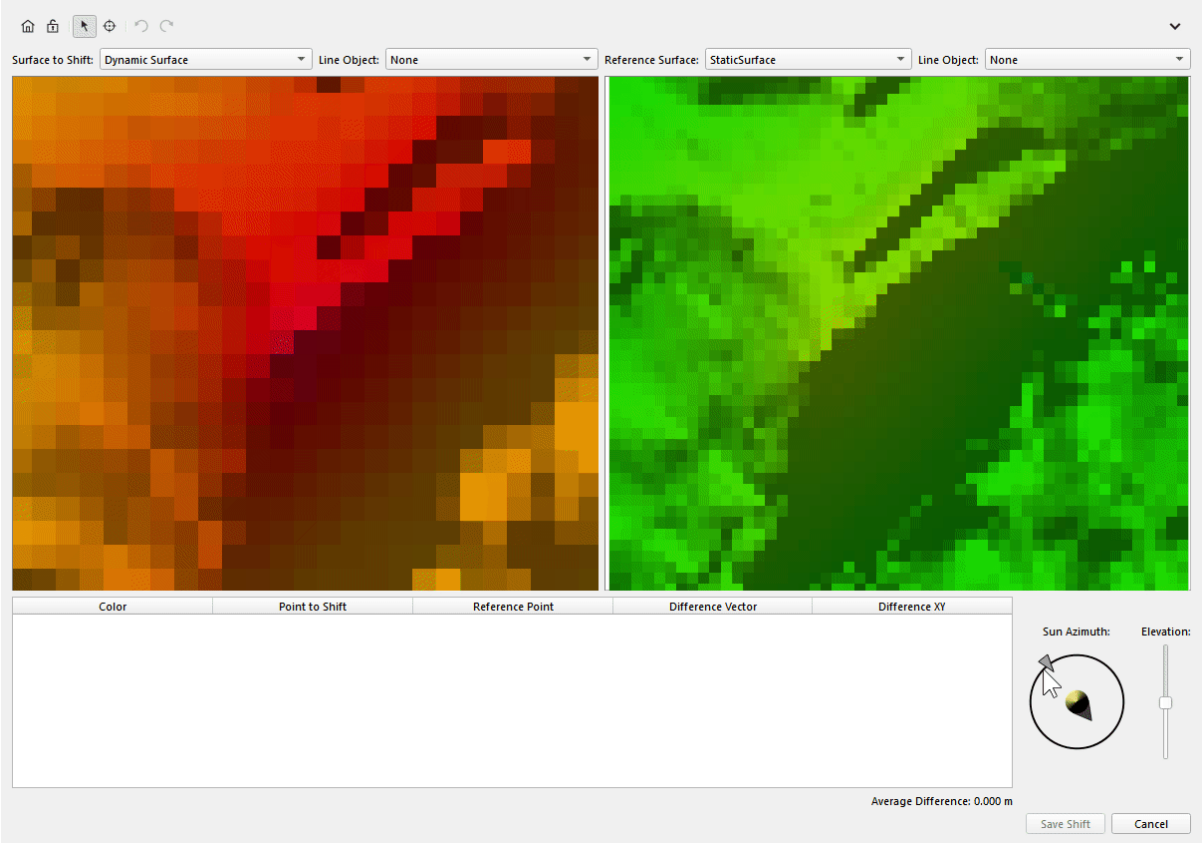
Use the reference surface drop down menu to select the surface you would like to shift towards to. This can be another dynamic surface or a static surface. If available, select the contours as line object. Having contours in the view panel makes it easier to link the same object.
Once the reference surface is selected you can zoom in and out on the surface. Note that the views are synchronized, so scale, zooming level and view point are equal.

When objects surface are far apart disable the view synchronization via the lock icon 

to be able to zoom and pan independently.

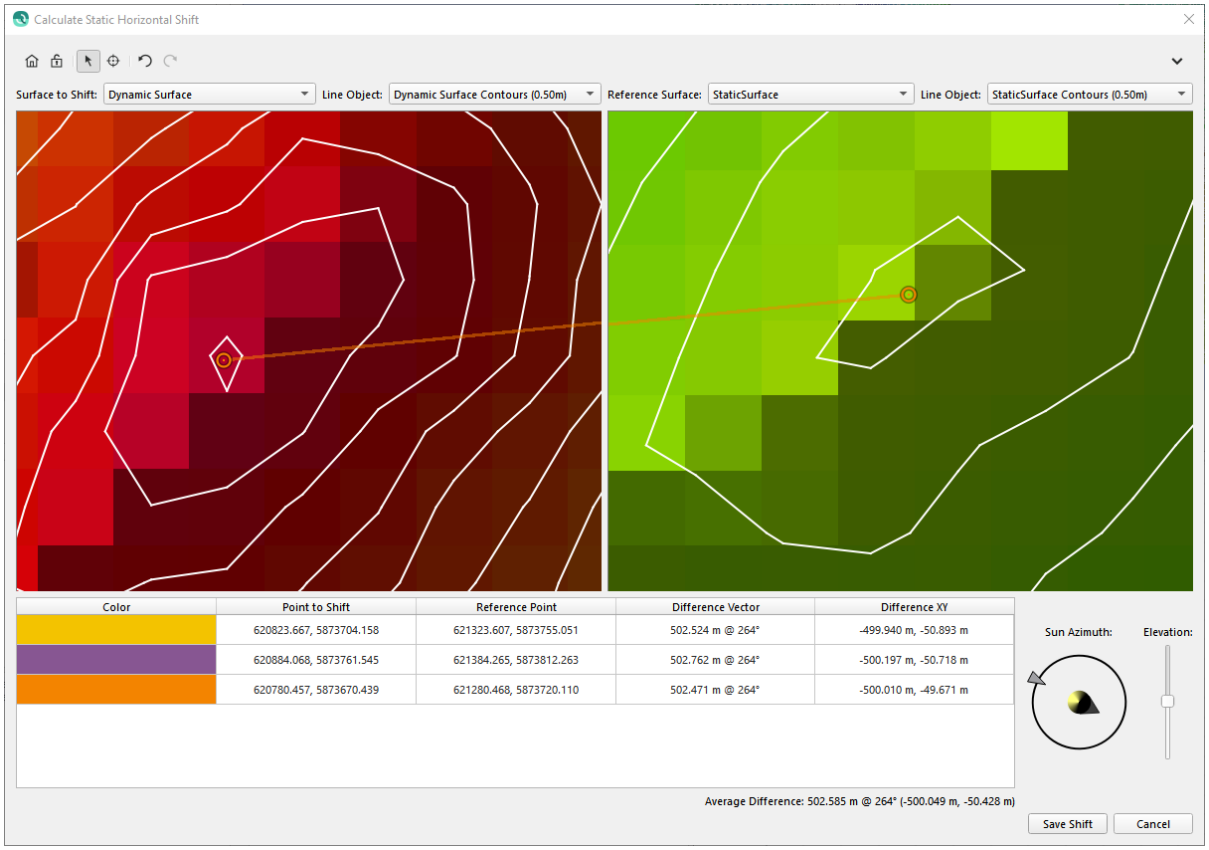


The shading can be adjusted and can help to distinguish particular features to use it as a reference point. Change the azimuth and elevation in the panel.

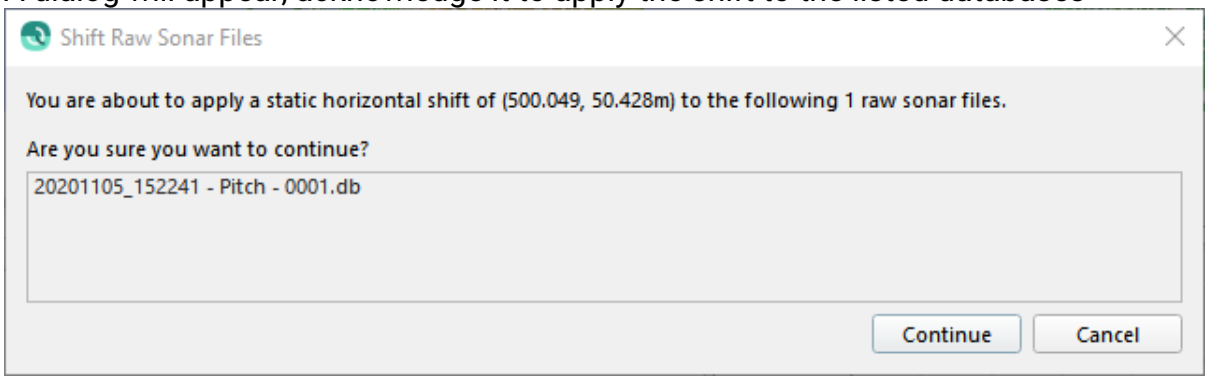


Step 4 - Select Fiducial points

To select fiducial points go into pick mode by selecting the pick icon . This will allow you to select a point in both plan views. Between the 2 points a vector will be calculated. Repeat the steps to add multiple fiducial points, this will increase the likeliness of the shift. Once finished select Save shift.

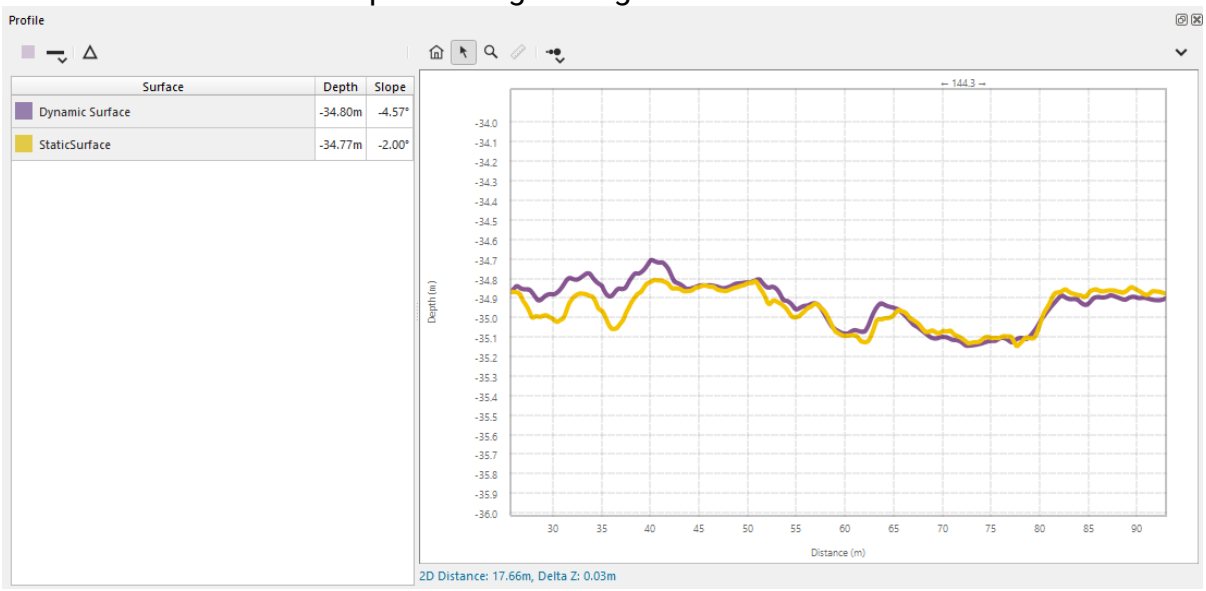


A dialog will appear, acknowledge it to apply the shift to the listed databases

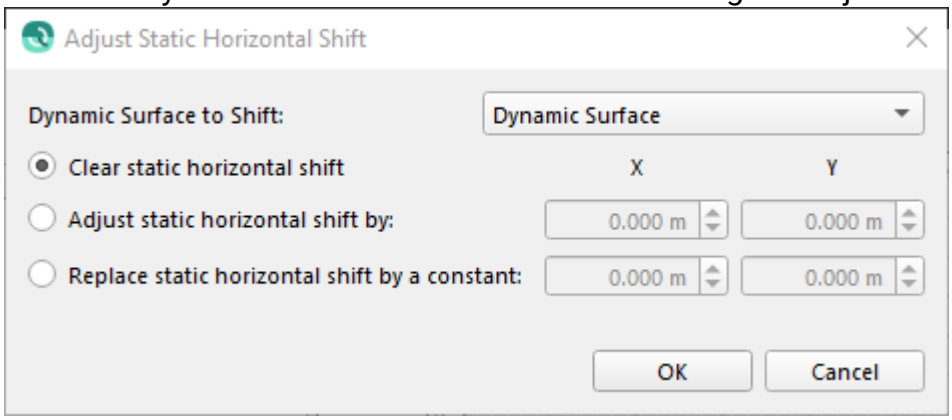


Step 4 - Assess results

After applying the results the profile display can indicate if the surfaces do overlap. The shift can be viewed in the processing settings



If necessary the shift can be cleared or altered using the Adjust horizontal shift tool.



How-to Static Vertical Shift

This How-to is a step-by-step description for using the Vertical Shift tools on the dynamic surface , available from Qimera 2.3 and up.

On this page:

- Introduction
- Step-by-Step guide Static Vertical Shift
  - Step 1 - Assess Your Data
  - Step 2 - Save a Before Image
  - Step 3 -Select The Data That Needs Shifting
  - Step 4 - Start Static Vertical Shift Tool
  - Step 5 - Assess Your Results

Introduction

There are three different vertical shift tools available in Qimera:

- Static vertical shift
- How-to Qimera - Line height matching tool
- How-to Qimera - Varying Vertical Shift

This how-to will discuss the Static Vertical shift vertical shift tool.

Benefits:

- Static vertical shift offsets due to:
  - Shift to design
  - Correct for vertical anomalies
    - Geodetics
    - Old and newer surveys
    - ROV survey overlap

This tool computes an average vertical offset between two surfaces using the statistical data generated by a traditional surface difference. For more information on the surface difference algorithm, please see the section on the Surface Difference Wizard. This type of tool is useful in situations where your survey data must be made to vertically align with a reference surface that has a constant vertical mismatch. This can occur when matching a ROV or AUV surface to one from a surface vessel. It could also be used to recover from an error in vertical referencing in either your new surface or in the reference surface. The shift is preserved in the Processing Settings for the contributing files and can be reviewed, reported and reverted with ease.

Good to know

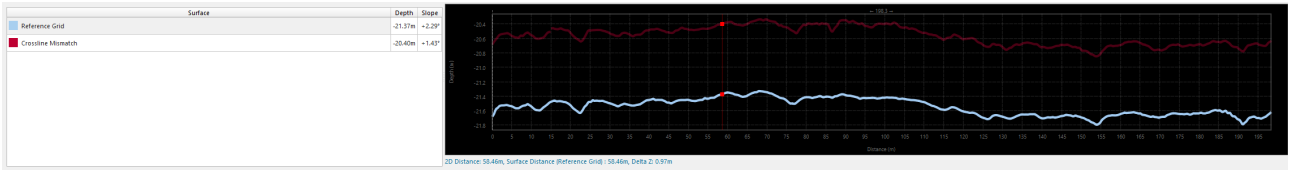
- Shift apply to the files not to the dynamic surface only, if you have multiple dynamic surfaces, applying the shift will affect all surfaces.

Step-by-Step guide Static Vertical Shift

Step 1 - Assess Your Data

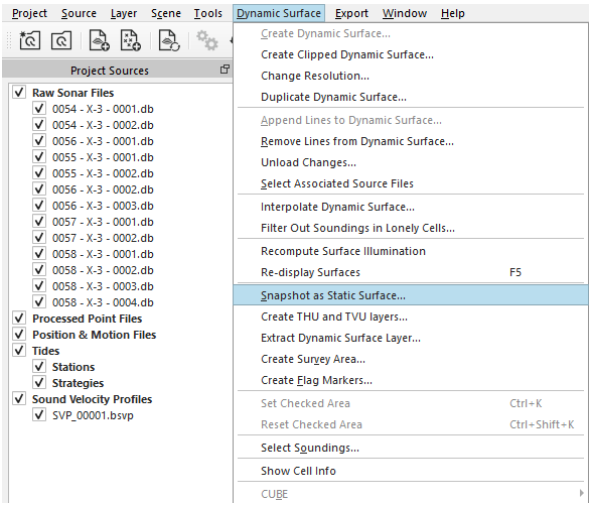
To asses your data, a reference grid or design is required, as this will be used to check if there are any height offsets at all. This type of tool is useful in situations where your survey data must be made to vertically align with a reference surface that has a constant vertical mismatch.

In the example below we see a constant mismatch of roughly 1 meter, we can correct for this.



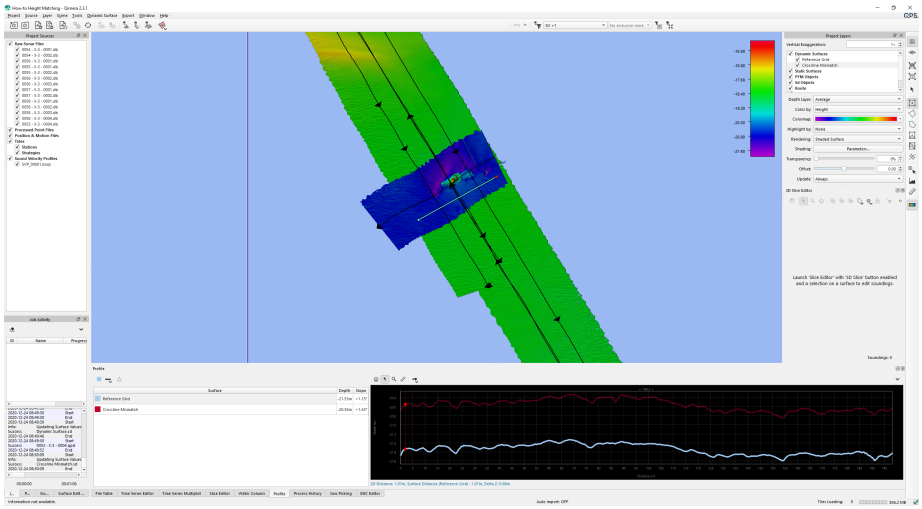
Step 2 - Save a Before Image

It is best practice to help you assess the results of the algorithm by capturing a snapshot of the results before any changes are done. From the Dynamic Surface menu select 'Snapshot as Static Surface' so a Static Surface is generated. You will be prompted to define a name and attributes.

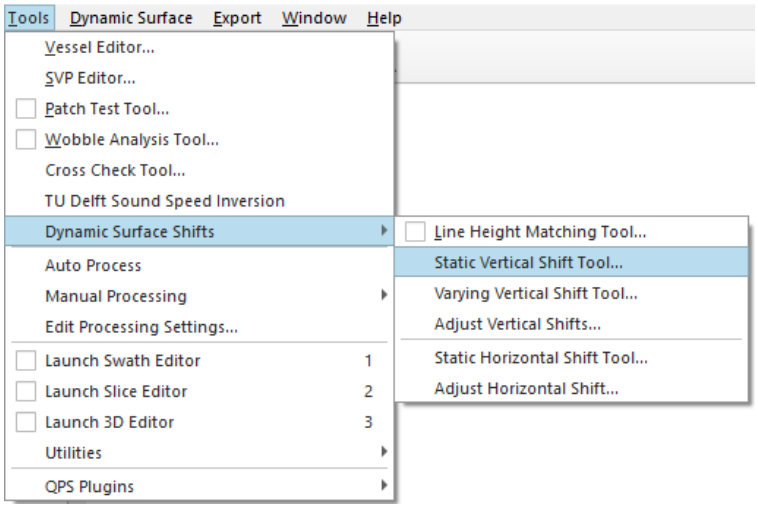


Step 3 -Select The Data That Needs Shifting

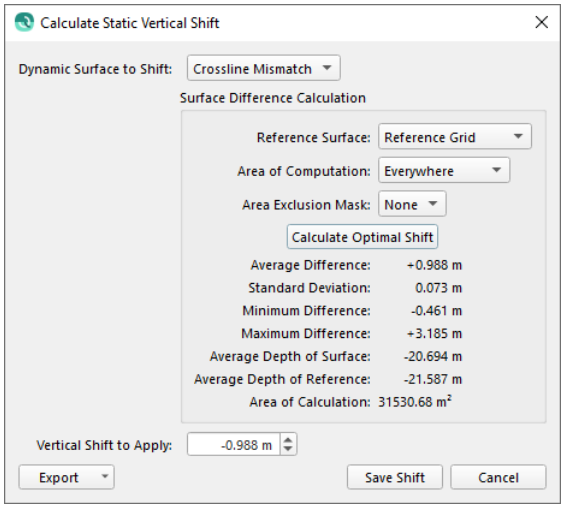
In the Project Sources Window, select the appropriate line(s) for which you'd like to compute a correction (the left image below).



Select the Static Vertical shift tool, available on the Tools drop down menu under Dynamic surface shift



Step 4 - Start Static Vertical Shift Tool



Parameters

There are four parameters which can be set to the users preferences: Dynamic Surface to shift, Reference Surface, Area of Computation, Area Exclusion Mask;

Option	Used for
Dynamic surface to Shift	Selection of Dynamic Surface which is to be shifted with a fixed offset to the Reference Surface
Reference Surface	Surface used for reference of the static shift
Area of Computation	You can constrain where the computation is made using a selection in the scene: For example, you could select a known relatively flat area of the seabed.

Option	Used for
Area Exclusion Mask	you can select a line object in the scene, this will *mask* out areas you don't want to be part of the statistical computation. For example, if the primary survey contains rock dumping and the reference surface does not, you can mask out the area of the rock dumping which allows the algorithm to compute more accurate statistics.

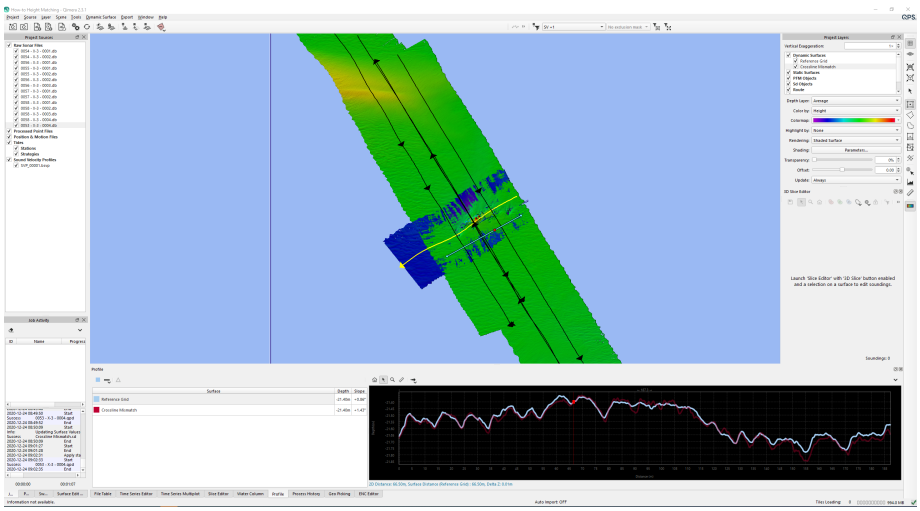
Apply data

Once you save the results using the *Save Shift* button, every raw sonar file that is part of the Dynamic Surface you are shifting will have a static vertical shift applied.

Qimera will then prompt you to update all Dynamic Surfaces containing the affected lines. The static shifts can be reviewed in the Processing Settings Dialog.

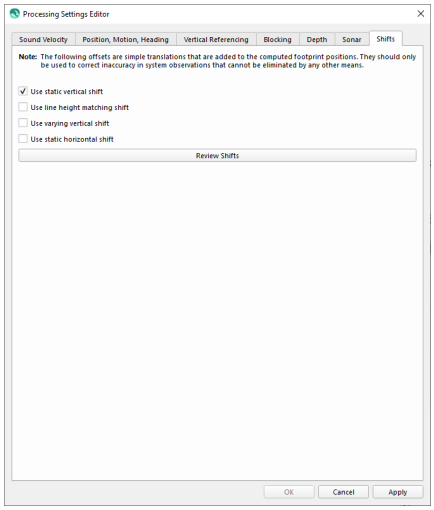
Step 5 - Assess Your Results

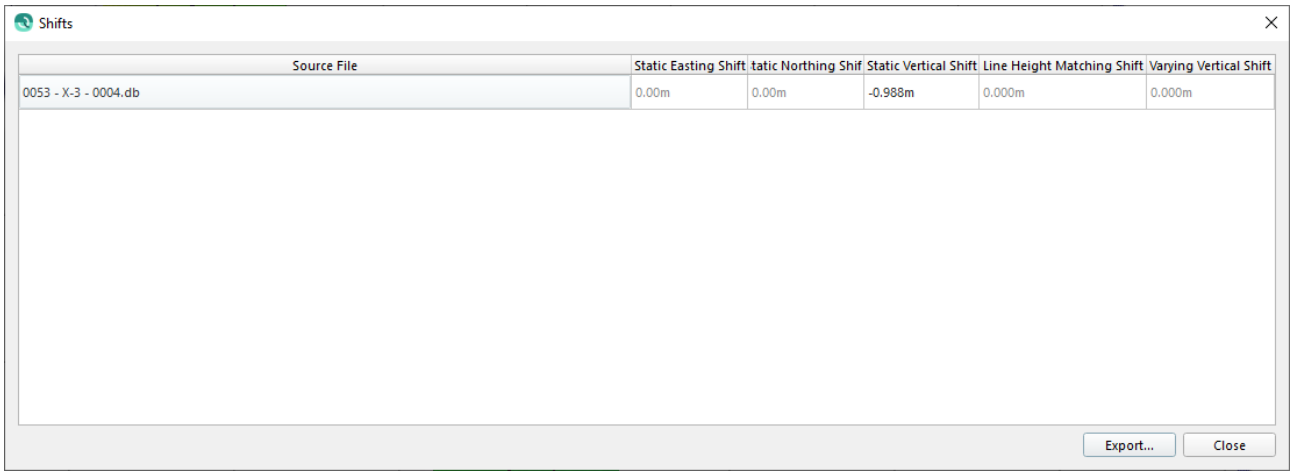
After applying the results the profile display can indicate if the lines do overlap.



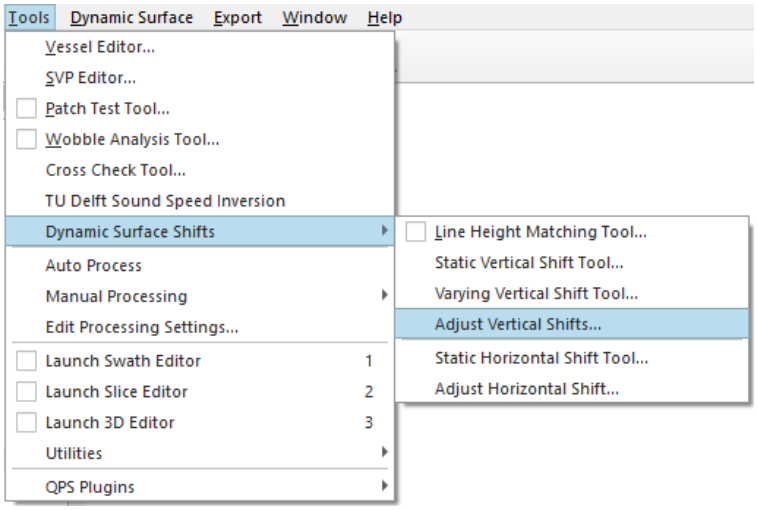
Revert to original

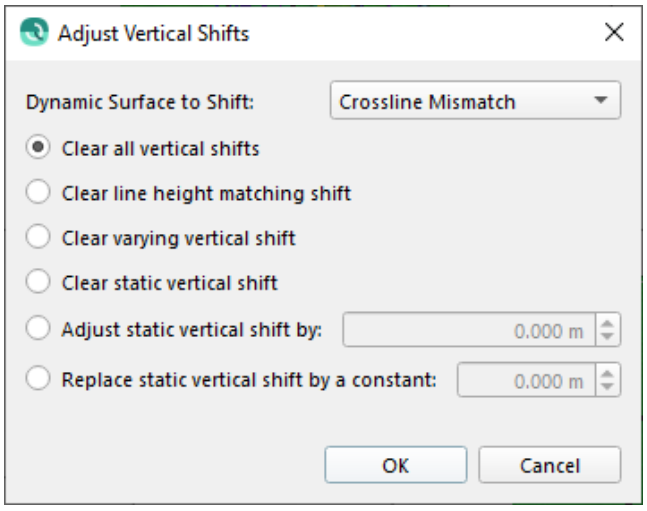
Notice that you are able to check and/or disable the Varying Vertical shift under the processing settings:





To clear generated shifts:





Option	Used for
Dynamic surface to Shift	Change the combo box to display the Dynamic Surface containing the raw sonar files that you wish to apply or clear the vertical shift. • All currently available Dynamic Surfaces will appear in this combo box. • You can also choose the *Selected Sonar Files* option in which case the files you selected in the Project Sources Dock will have the shift operation applied.
Clear all vertical shifts	Clear all shift applied by any of the available tools.
Clear line height matching shift	This will clear the shift applied by the Line Height Matching Tool.

Option	Used for
Clear varying vertical shift	This will clear the shift applied by the Varying Vertical Shift Tool.
Clear static vertical shift	This will clear the static vertical shift applied by this dialog or by the Static Vertical Shift Tool.
Adjust static vertical shift by	This option will apply the additional specified shift in an additive manner to the current static vertical shift.
Replace static vertical shift by a constant	This option will replace the static vertical shift for the raw sonar files by an entered constant.

How-to THU/TVU Layers

This page goes through how-to create THU/TVU layers for your survey, as well as whether the resulting values make sense.

- Step 1: Verify your SD values
  - Variable Values
  - Static Values
- Step 2: Create THU and TVU layers
- Step 3 - Check the results (Optional)
  - Total Vertical Uncertainty (TVU)
  - Total Horizontal Uncertainty (THU)
- Step 4 - Troubleshooting (Optional)

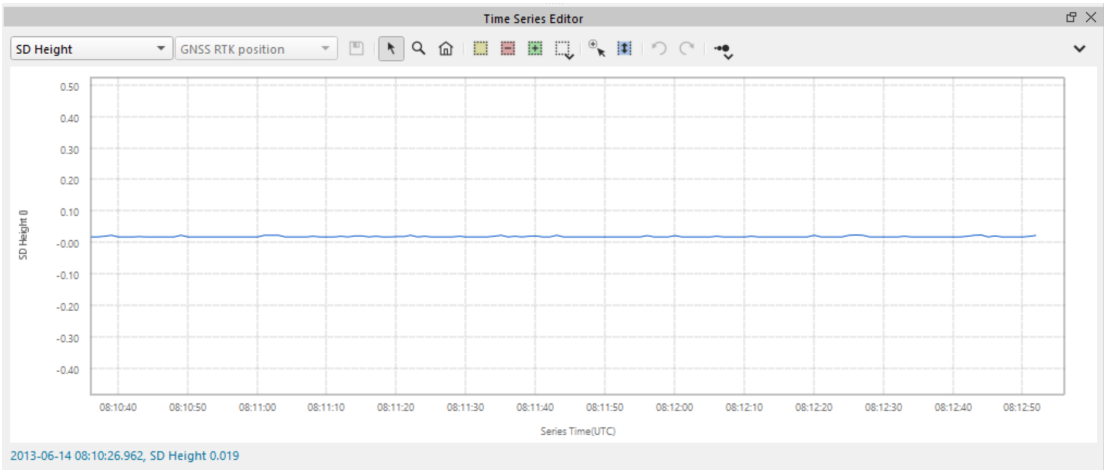
Step 1: Verify your SD values

The first thing to do is check your standard deviation (SD) values for each hardware system in your survey.

If neither specific static or variable SD values are entered or imported, Qimera will use default SD values of a 0.5m horizontal uncertainty and a 1m vertical uncertainty.

Variable Values

In some circumstances, a time series of your SD values can be imported and used by Qimera:



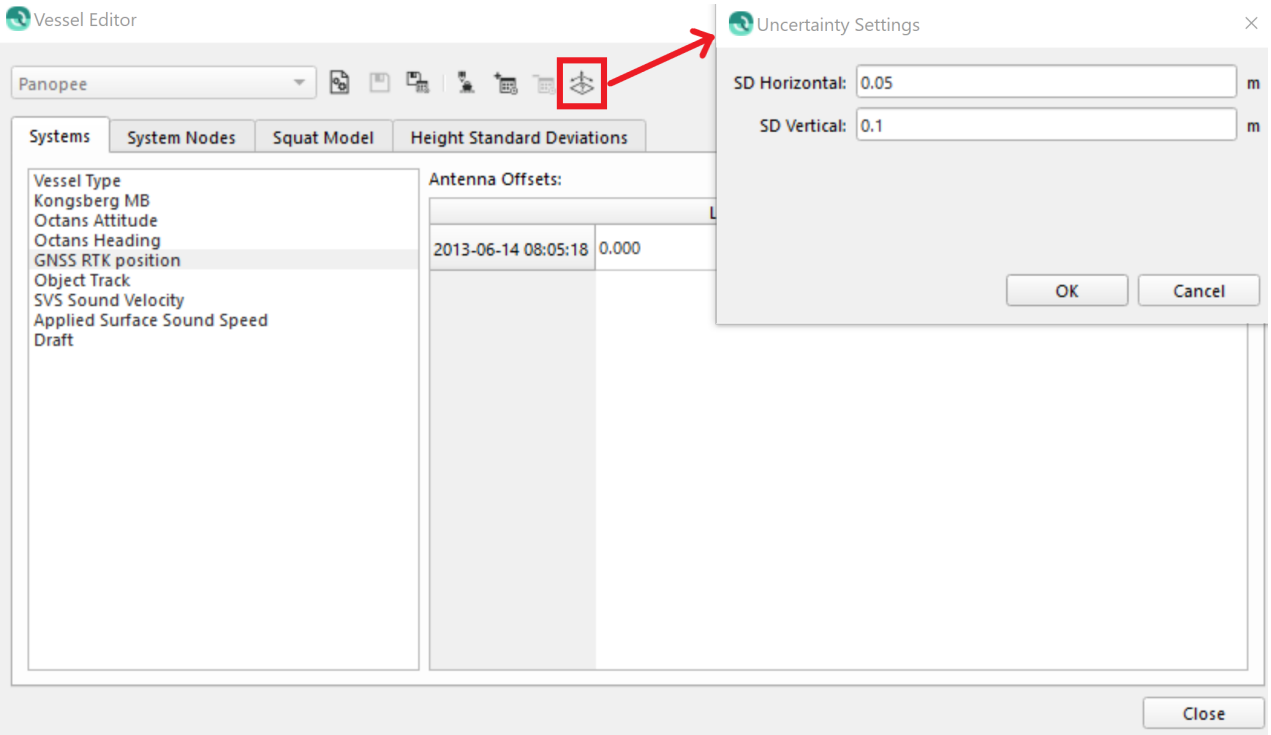
Where Qimera will use the time series of SD values from the raw file for the THU/TVU layer creation when available, which can be seen in the time series editor. These time series are given higher priority than the static values in the vessel editor.

There are two ways to bring this data into Qimera, either by importing raw source files or navigation files which contain the SD time series. For example if you are working with a

POSMV system, you may be importing your sbet/smrmsg file pair into your Qimera project, which would include the SD values in the smrmsg file. For more information on that import, please see the following how to: https://qpssoftware.scrollhelp.site/qimera/how-to-import-binary-navigation

Static Values

The SD values for your specific systems can be found in the manufacturers manuals that should have been received with your systems. Once found, you can enter them in the Vessel editor for each selected system by selecting the TPU option:

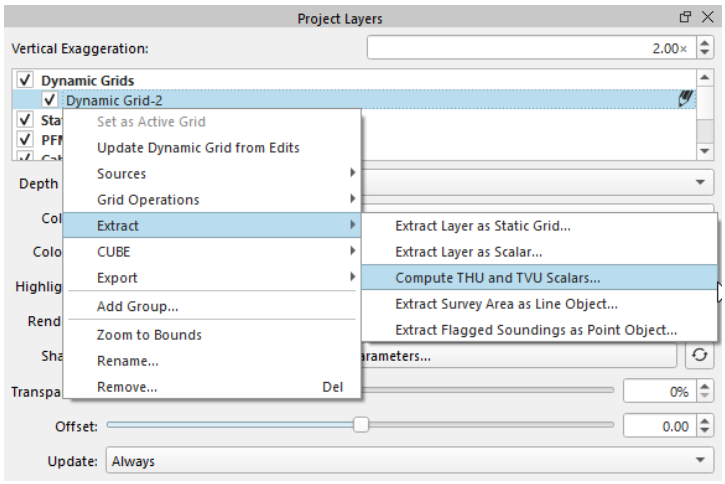


These may have been saved into the vessel configuration, if they were entered by the onboard survey team during data acquisition and you are working with a raw sonar file format which Qimera can read the SDs from. For more information on the SD values that would be setup in Qinsy by the survey team, please see the following how-to: https://qpssoftware.scrollhelp.site/qinsy/how-to-total-propagated-uncertainty-tpu

> ⚠ Whether the SD values are read from the raw file or not, we always recommend double checking the SD values in the vessel editor with the values from the manufacturer.

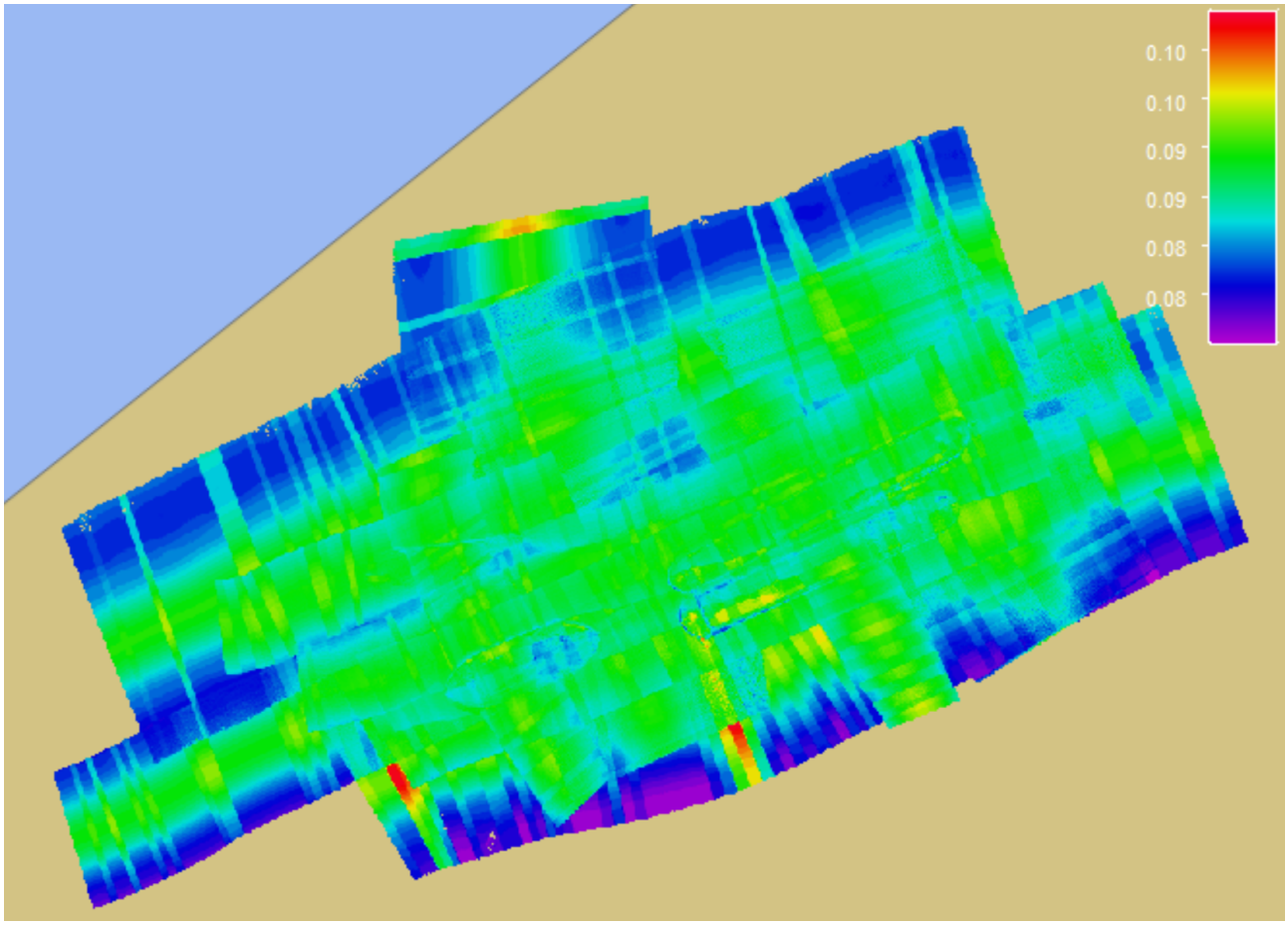
Step 2: Create THU and TVU layers

Now that the SDs are confirmed, you can have Qimera use them to create the THU/TVU layers. To do this, select a dynamic grid you would like to create the TPU layers for. Then right click on the Dynamic Grid and select Extract - Compute THU and TVU Scalars:



If you are working with a version of Qimera older than 2.7.0, you would instead select the ‘Create THU and TVU layers’ from the Dynamic Grid dropdown menu.

This will begin the process, and once the layers are created they will be automatically loaded into the project, and will be found under the SD Objects section in the Project Layers tab.



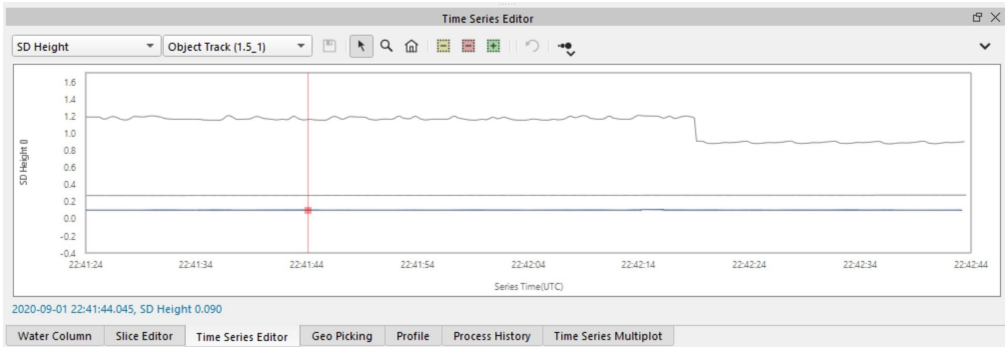
Step 3 - Check the results (Optional)

This step can technically be done before the creation of the TPU layers or not at all, but it can be handy to know whether the values you are getting from Qimera make sense with general uncertainty equations.

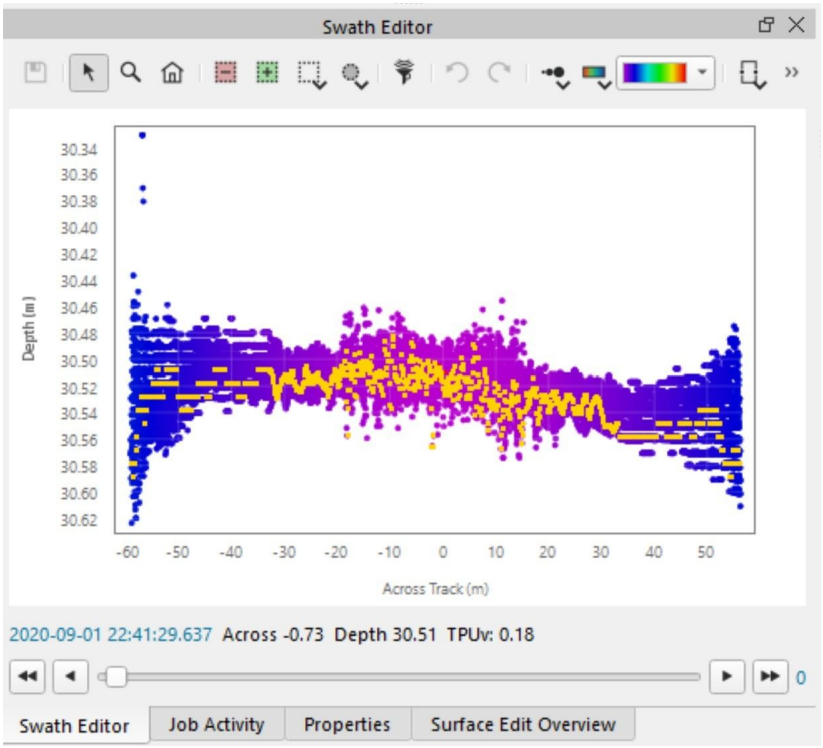
Please keep in mind that the following is a simplified outline, as we are only looking at the nadir values and not taking many factors into consideration.

Total Vertical Uncertainty (TVU)

Looking first at the TVU values, with the file selected and the time series editor dock open, we can see that the priority positioning (Which in this example is the object track source) SD Height values are pretty consistently about 9 to 10 centimeters (if this series is not available, Qimera will only have the SD in the vessel editor to go off of):



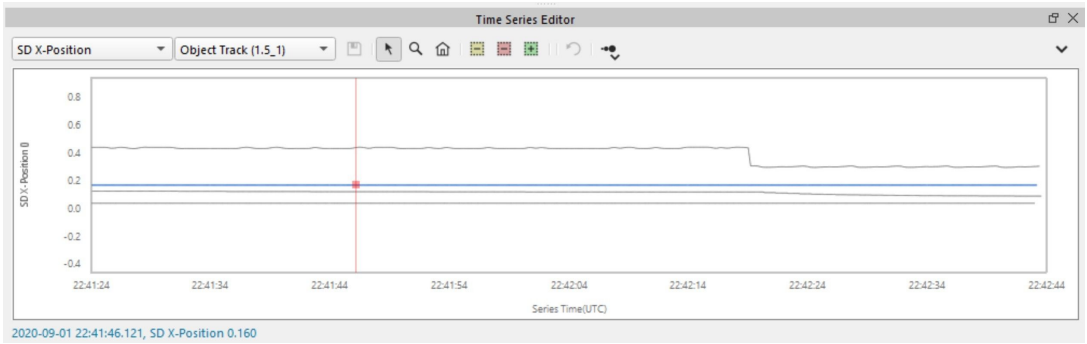
Then opening the swath editor and coloring by TVU, when you mouse over the nadir beams you find a value of about 18 cm:



Then thinking about the rough calculation that happens here just based on basic standard deviation math, you would be looking at a 95% confidence interval, so you would multiply the SD value by 1.96; this would get you to 0.176 m. You can see that this matches the reported 18cm TVU value computed by Qimera, with a small difference due to rounding.

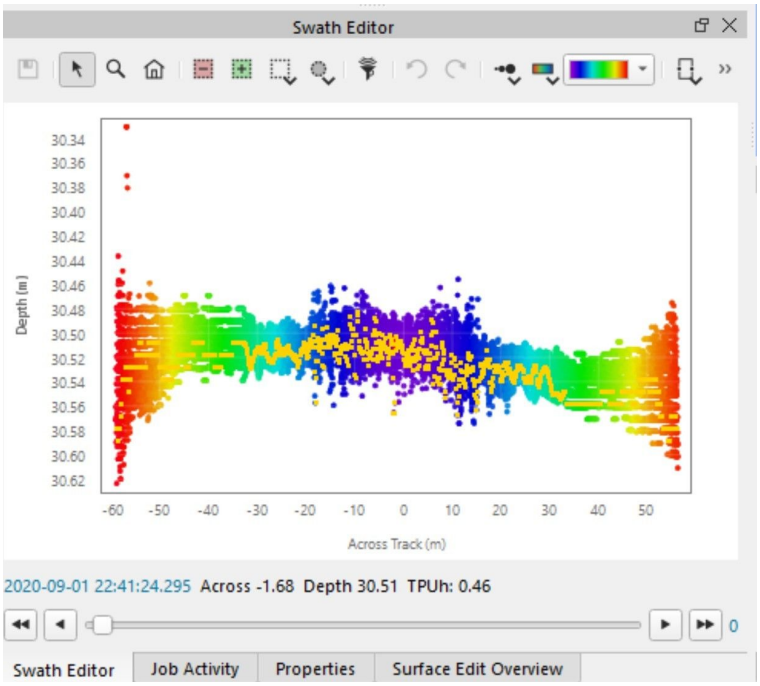
Total Horizontal Uncertainty (THU)

Now looking at the THU. The SD of the X position of the system used as priority gives 16 cm:



Since this is in a different dimension (2-sigma rather than the 1-sigma which the SD is reported in), we would multiply by 2.45, (result= 0.392), then set this value aside (will refer to it as value A).

Now looking at the beam footprint at nadir, based on beam width and depth (avg. across/ along track, convert to radians and multiply by depth), we get value B = 0.26612.
Then take the root mean squared for a result of 47 cm.
Which matches pretty closely what we see in the swath editor, colored by THU now and looking again at the nadir beams, which gives about 46 cm:



Step 4 - Troubleshooting (Optional)

If the TVU/THU values computed by Qimera are not what you expect, there are a couple troubleshooting options.

The first is of course double checking the SD values used (as described in step 1).

There is also a possibility that there are some outliers which are not indicative of the survey, but which raise the average TVU/THU values. If this is the case, you can utilize the

‘Reject Above Uncertainty Threshold’ filter, available in the Manage Filter Profiles Dialog window. More information on that filter can be found here: https://qpssoftware.scrollhelp.site/qimera/qimera-manage-filter-profiles-dialog#QimeraManageFilterProfilesDialog-RejectAboveUncertaintyThreshold and information on running filters on your data can be found here: https://qpssoftware.scrollhelp.site/qimera/how-to-filter-operations-and-filtering-profiles Once that is run, you can recreate the THU/TVU layers (see step 2), should the scalars be required.

How-to Time Series Multiplot

This how-to briefly covers how to use the Time Series Multiplot to view observed and computed parameters.

On this page:

- Introduction
  - How to work with the Time Series Multiplot
    - Step 1: Load Sonar Files and Open Time Series Multiplot
    - Step 2: Configure Series
    - STEP 3: View the Graphs
    - STEP 4: Adjust the View in the Time Series Multiplot Dock
- Additional Information

Introduction

Time Series multiplot is used in addition to other Qimera tools to Quality Control, QC, and trouble shoot data. The Time Series multiplot is a graphical view of the time series (extracted from raw sensor data) and computed data (QPD) available in a file, The tool enables to plot a correlation, for example GNSS height versus motion sensor heave versus nadir beam of the multibeam system. The tool is capable of overlaying observations from multiple systems in one plot.



Any editing required on raw observations needs to be done in Time Series editor and can't be done in multiplot.

How to work with the Time Series Multiplot

Step 1: Load Sonar Files and Open Time Series Multiplot

Create a new project and load raw sonar files into your project. See Getting Started for more information on how to do this. Enable the Time Series Multiplot dock in the Qimera Window Menu.

Observed parameters are available in Time Series multiplot once the raw sonar files have loaded. To enable computed parameters, you need to have the data processed.

Step 2: Configure Series

In Project Sources Window highlight the file you want to investigate in Time Series Multiplot, go to Time Series Multiplot Window, and click on Configure Series (see Figure 1).

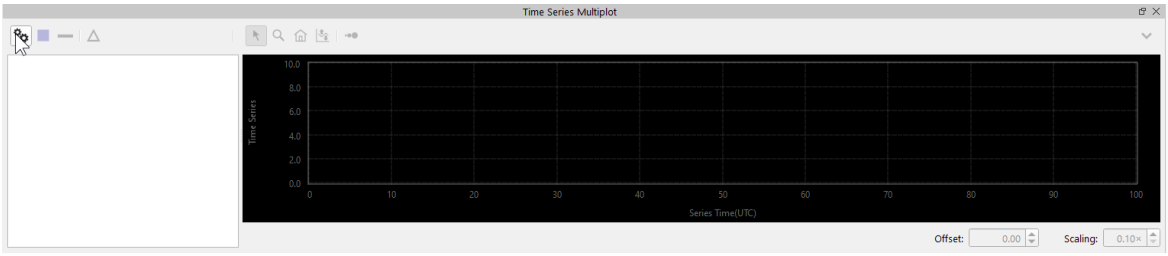


Figure 1. *Select Configure Series button in the Time Series multiplot .*

Select the Observed Parameters, taken from the raw files and Computed Parameters, taken from the QPD, you want to review. Select the right/forward arrow (see Figure 2a). The arrow is moving the selections to the right "Current Configuration". To remove a parameter from the current configuration, select it and select the left/back arrow. Select "OK" (see Figure 2b) to create the time series multiplot with the current configuration chosen.

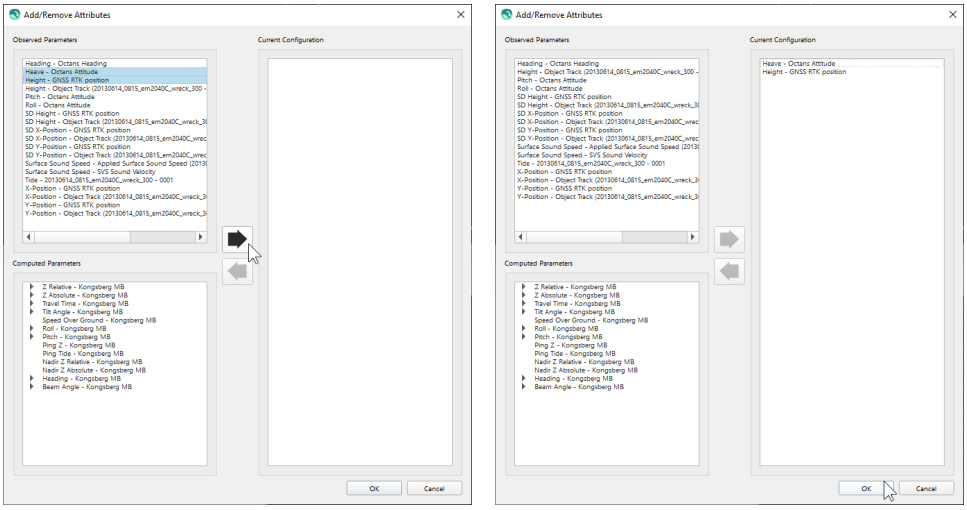


Figure 2a and b. *Select parameters required and select the right arrow to move to current configuration.*

STEP 3: View the Graphs

Time Series Multiplot has drawn two graphs, GNSS height versus motion sensor heave (see Figure 3). In the example below, you will find that GNSS height and Heave observations are out of sync. Heave sign convention seems to have been set correctly (heave is positive up).

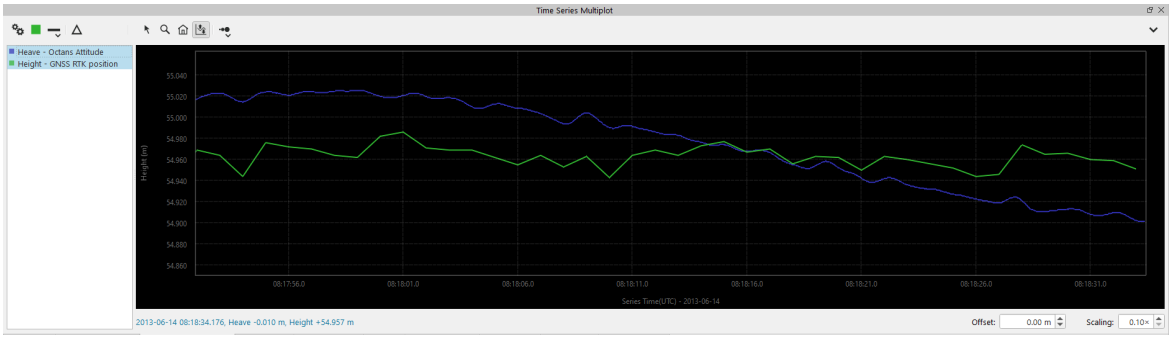


Figure 3. *Time series Multiplot GNSS height vs heave*

The Multiplot display will also show a scatter plot (cross correlation) between two selected parameters (see Figure 4). The scatter plot can be toggled on and off by using the Time Series Multiplot dropdown Menu .

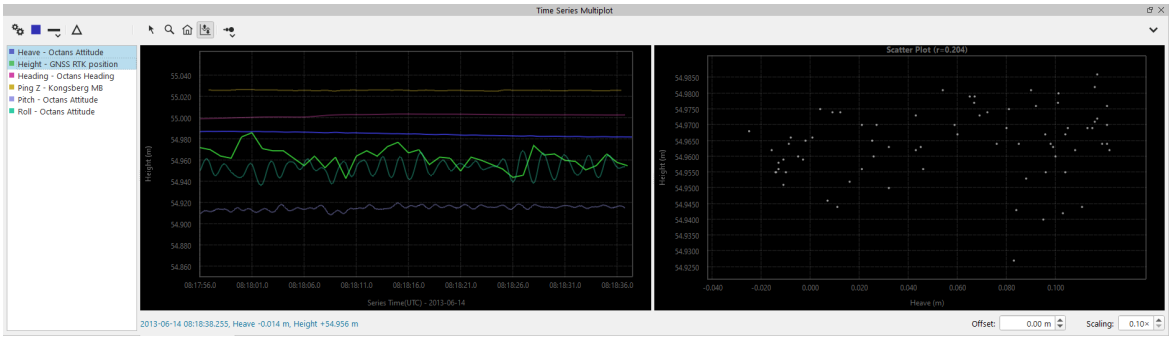


Figure 4. *The scatter plot between two selected parameters.*

STEP 4: Adjust the View in the Time Series Multiplot Dock

With the selected configuration and screen layout, you can easily step through the raw sonar files available in the project, by selecting a file in project Sources Window or by mouse clicking on the navigation in 4D scene. Change the graph color using the color button (see 1 in Figure 5) or change the line type of the graph using the line pattern button (see 2 in Figure 5). Change the plot scaling using scaling series mode button (see 3 in Figure 5) or key combination Ctrl+ scroll mouse wheel. The offsets and scaling can be adjusted in the toggle boxes at the bottom of the time series multiplot dock (see 4 in Figure 5).

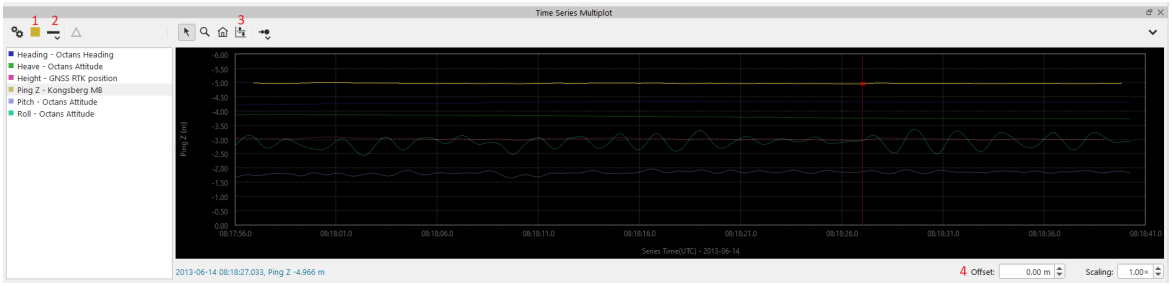


Figure 5. *The tools to adjust the view of the graph are numbered.*

Additional Information

- Qimera Time Series Multiplot Dock
- Time Series Multiplot

How-to Use the Crosscheck Tool

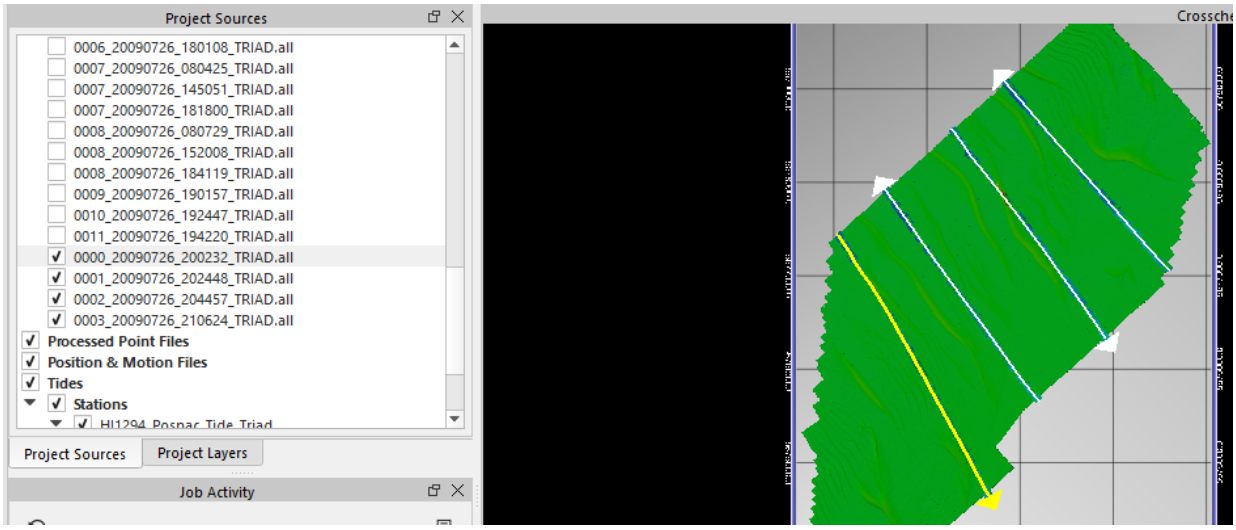
This article describes how to work with the new crossline comparison tool that has been released with version 1.2

On this page:

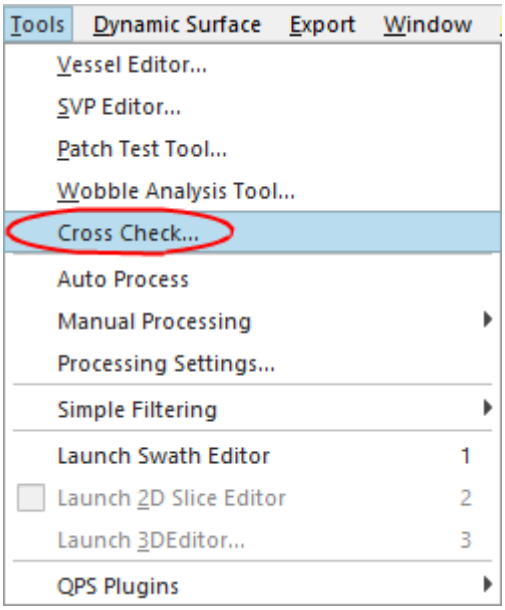
- Step-by-step guide

Step-by-step guide

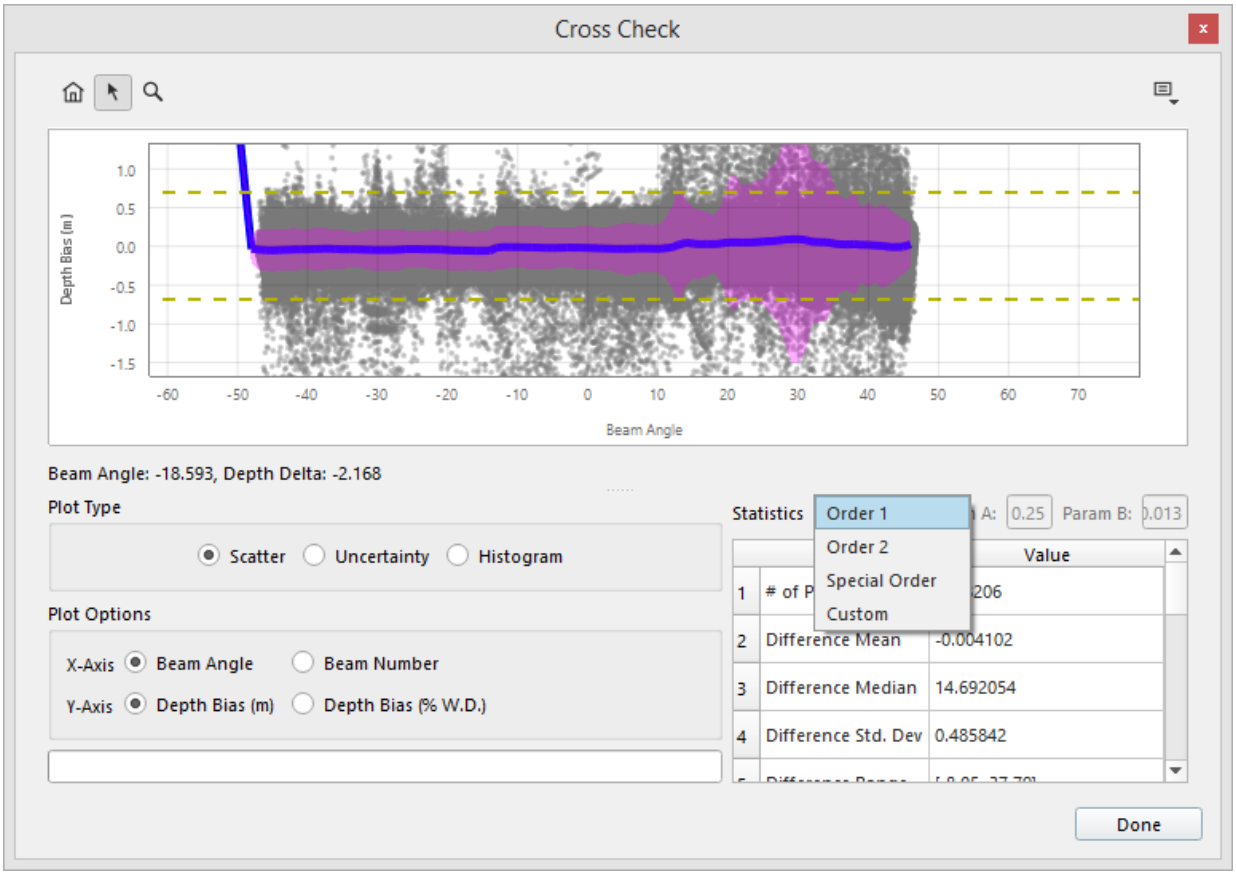
1. First ensure you have a cleaned Dynamic Surface that does not contain the cross lines.
2. Select the first cross line in the Project Sources window.



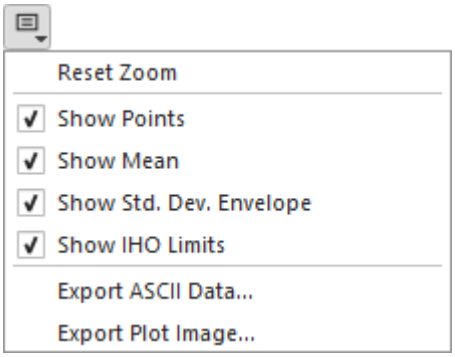
3. Go to the Tools drop down menu and select Cross check



4. Select from the Statistics drop down menu the required IHO Order or select the Custom option and input the required A&B parameters



5. Using the  icon you can turn on and off various visual functions which will allow you to set up your display with the views required for a report.
6. It is from here you can also export your information using the Export ASCII Data... and Export Plot Image... options



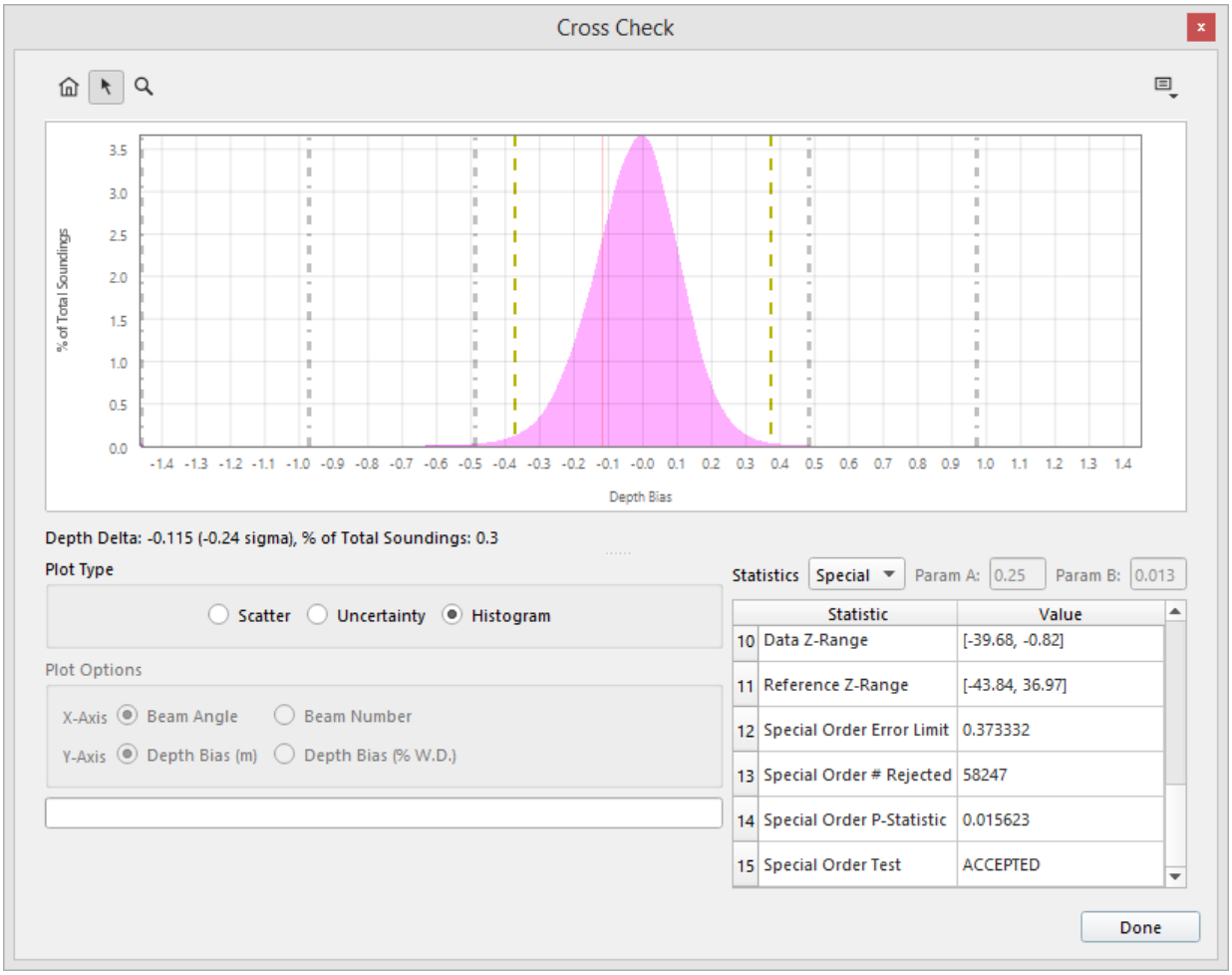
The yellow dotted lines depict the limits of your IHO order vertical tolerance.

The purple area is the 95% Confidence Interval (2 Standard Deviations) based on normal distribution (check the histogram)

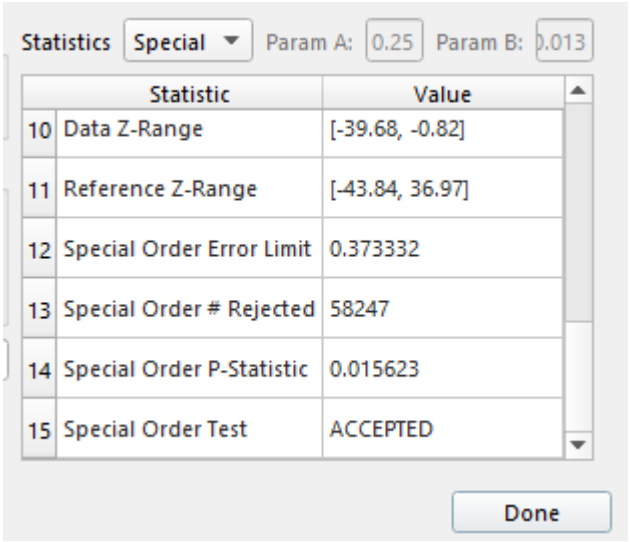
The blue line represents the Mean Value

Points indicate the difference in depth between the cross line and the surface. They can either be drawn based on beam angle or on Beam number.

7. Check the distribution of your data using the Histogram.



8. The text in the Statistics window will indicate whether the crossline had passed the parameters for your IHO order



9. Follow the above steps for your other cross lines.

If required, you can select multiple crosslines before launching the Cross Check window

How-to Use the Wobble Analysis Tool

This How-to describes the use of the Wobble Analysis Tool to test for and correct common motion and offset related problems

> ⚠ For more in-depth information on the effects that changes in this tool have on your data, please visit the Qimera Wobble Analysis section of the Qimera Reference Manual

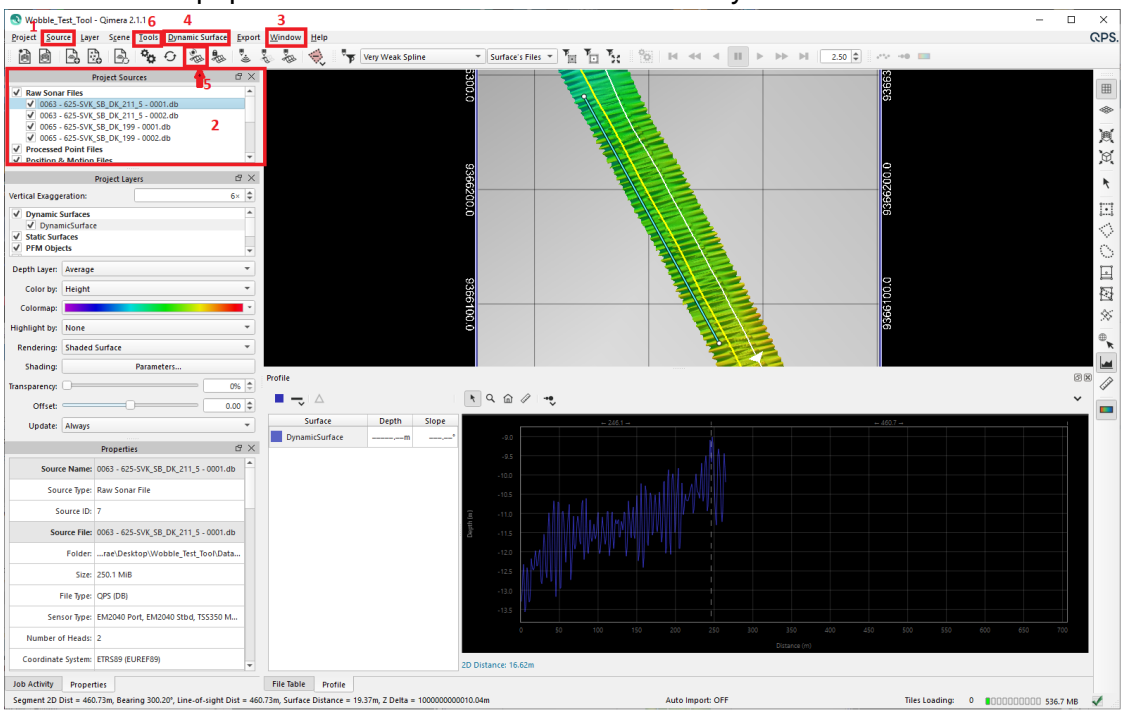
On this page:

- Setting up the data & activating the Wobble Analysis Tool
- Wobble Analysis Tool Dock Overview
- Using the Wobble Analysis Tool
- Saving and Applying Changes

Setting up the data & activating the Wobble Analysis Tool

1. Ensure you have loaded Raw Sonar Files into your project. These can be added using the 'Source' pull-down menu (1) at the top of the main window.
2. It's best to first build a dynamic surface from the line you intend to use the Wobble Analysis Tool on. Select the sonar file you will be using the Wobble Analysis Tool on from within the Project Sources window (2). This window can be toggled in the 'Window' pull-down menu (3). Select 'Create Dynamic Surface' from the 'Dynamic Surface' pull-down menu (4) or click the 'Create Dynamic Surface' Icon (5).
3. Select a single line to be loaded into the Wobble Test Tool from within the Project Sources window (2).

4. In the 'Tools' pull-down menu (6) at the top in the Main Menu bar, select 'Wobble Analysis Tool'. This will populate the Wobble Test Plot Dock with your selected line loaded.



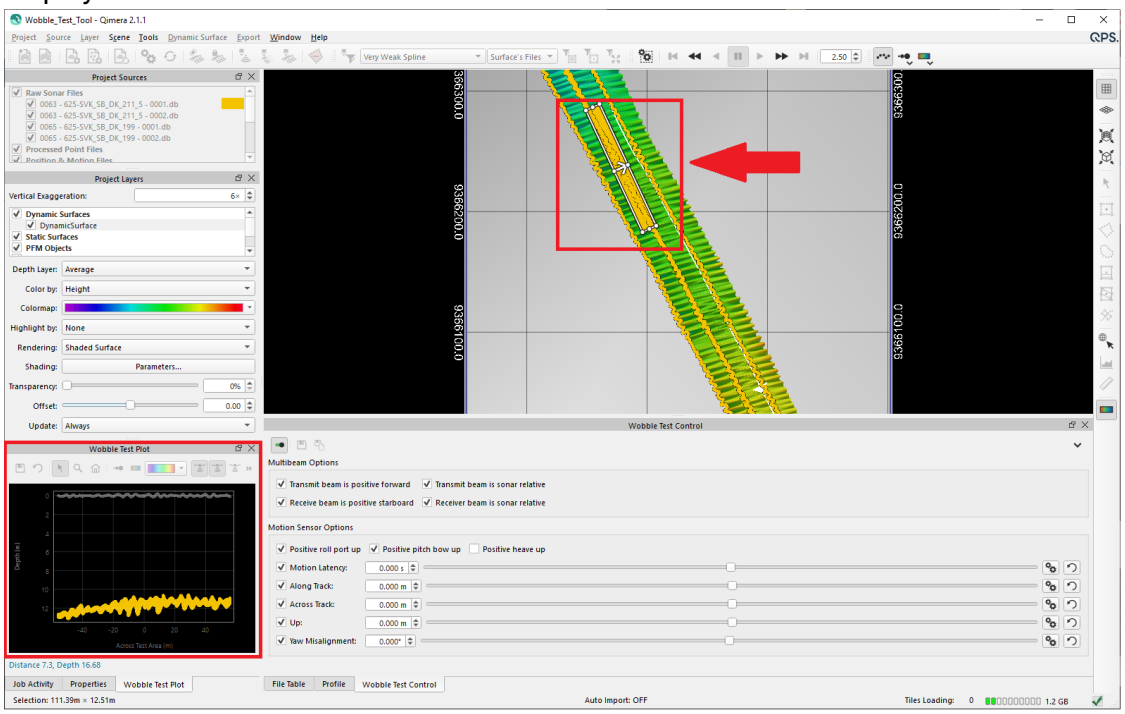
Wobble Analysis Tool Dock Overview

Once the Wobble Analysis Tool is selected, the Wobble Test Plot & Wobble Test Control docks will populate.

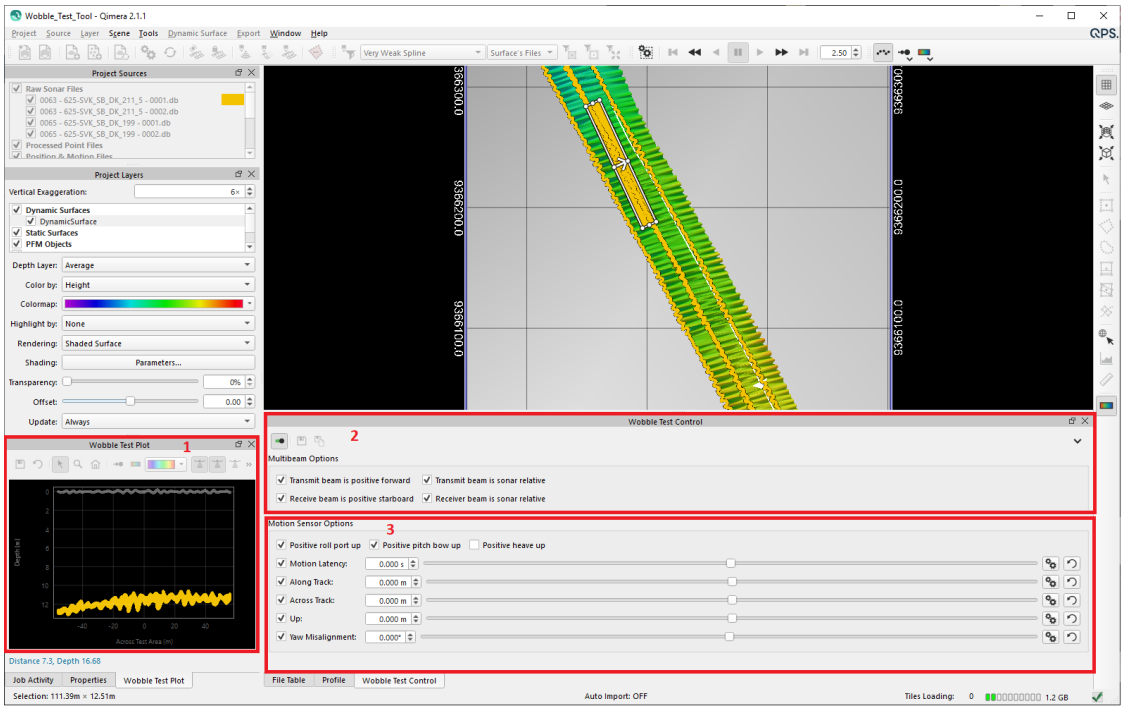
> Please note, the data displayed here has been exaggerated in order to easily illustrate the effects of the Wobble Analysis Tool.

1. When the Wobble Analysis Tool is open, a selection box will be placed over the data in the 4D Scene window. It can be moved, resized and rotated using the nodes on the selection box itself.
   The white arrow indicates which direction the soundings will be viewed in the point cloud

display within the Wobble Test Plot dock.



2. The Wobble Test window can be divided into 3 main areas:



(1) **Wobble Test Plot:** Cross sectional of the point cloud. This contains the soundings that fall inside the selection box that is located over the grid in the 4D Scene window. The points are viewed from the side of the direction of the white arrow in the selection box .

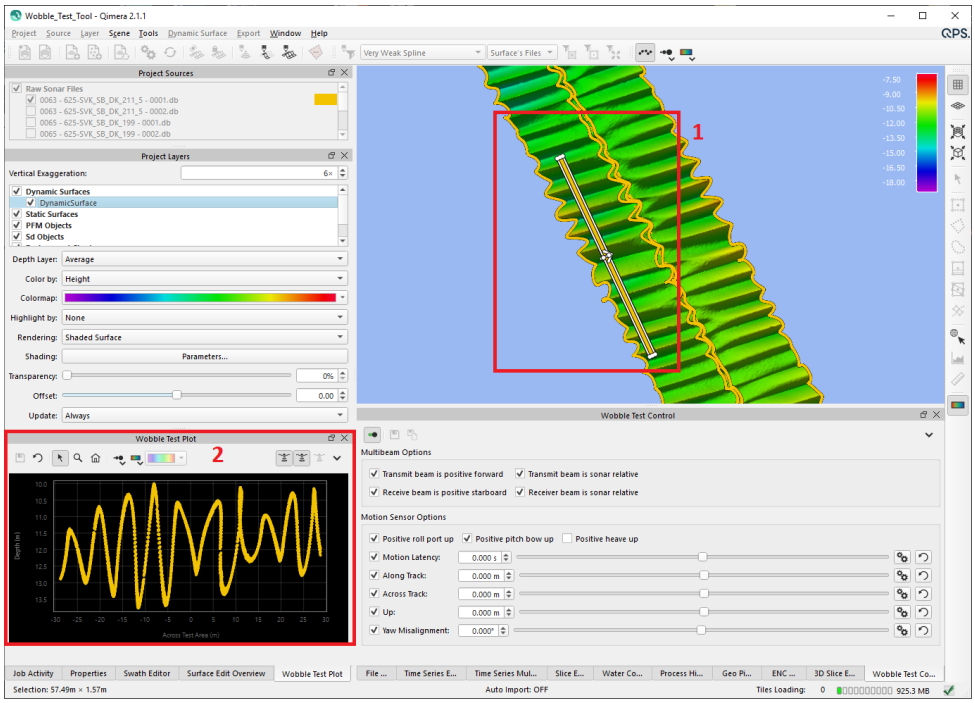
(2) **Multibeam Options:** Allows for toggling the reversal of common MBES setup options and relative directions.

(3) **Motion Sensor Options:** Allows for toggling the reversal of the direction in which Roll, Pitch, and Heave are applied. It also contains sliders allowing for adjustment of Motion Latency as well as Along Track, Across Track, Upward Positional and Yaw Misalignment offsets of the IMU relative to the vessel CoG.

Using the Wobble Analysis Tool

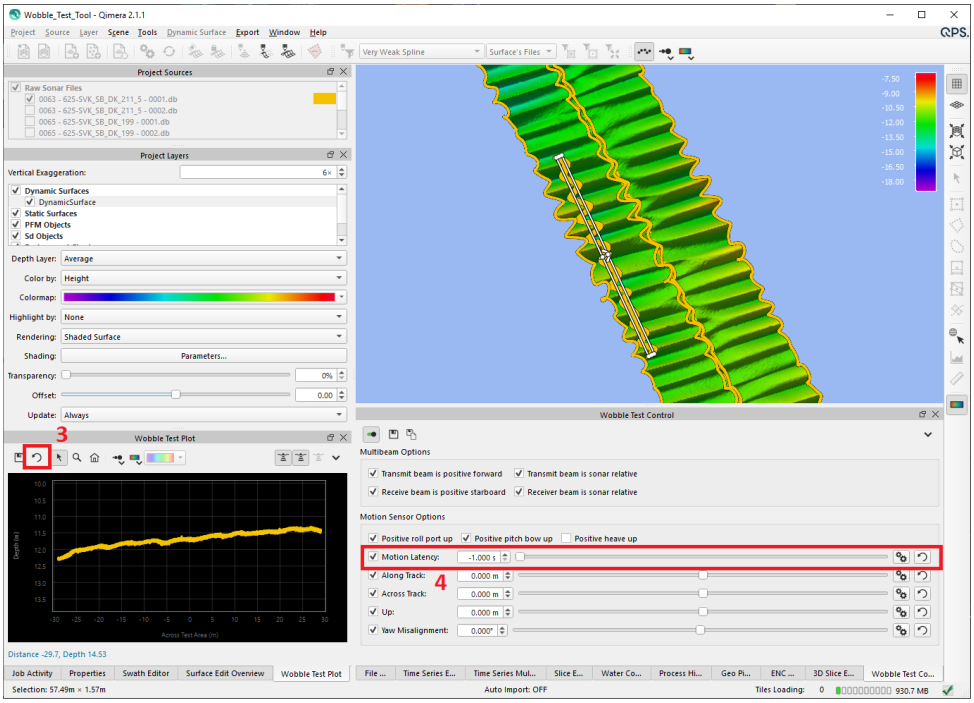
In the example used here, there is a wobble that doesn't exist at nadir and gets more pronounced towards the outer beams.

1. Move the selection box (1) towards the outer beams and ensure that it is aligned parallel to the ship track.



2. Note the change in the point cloud (2) in the Wobble Test dock. The point cloud will be adjusted in real-time as you toggle settings and move sliders in the Wobble Test Control dock.
3. As an exercise, you can cycle through the check boxes, toggling their application. If a certain setting doesn't improve the problem or makes it worse, return the setting to it's original.

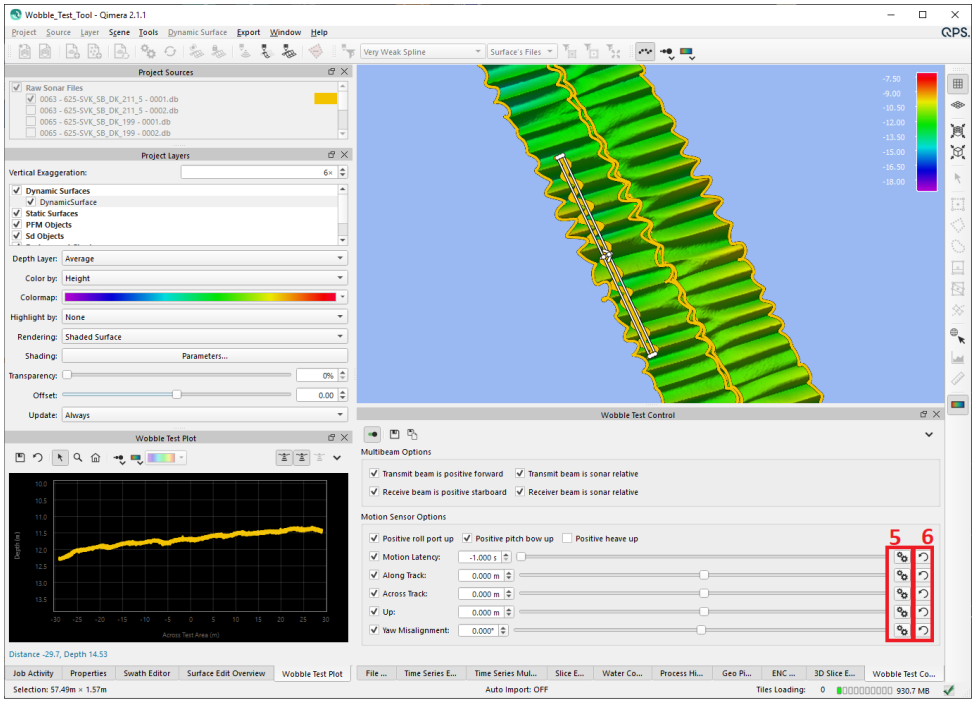
4. To reset all the settings, click the Reset button (3) at the top of the Wobble Test Plot dock.



5. In this example, the only change that improved the data was the adjustment of the motion latency. (4) By pressing SHIFT while moving the slider, you can observing the change occuring, and zero in on a setting that provides the best reduction of the motion artifact.

> ⚠ Certain situations may require a combination of adjustments.

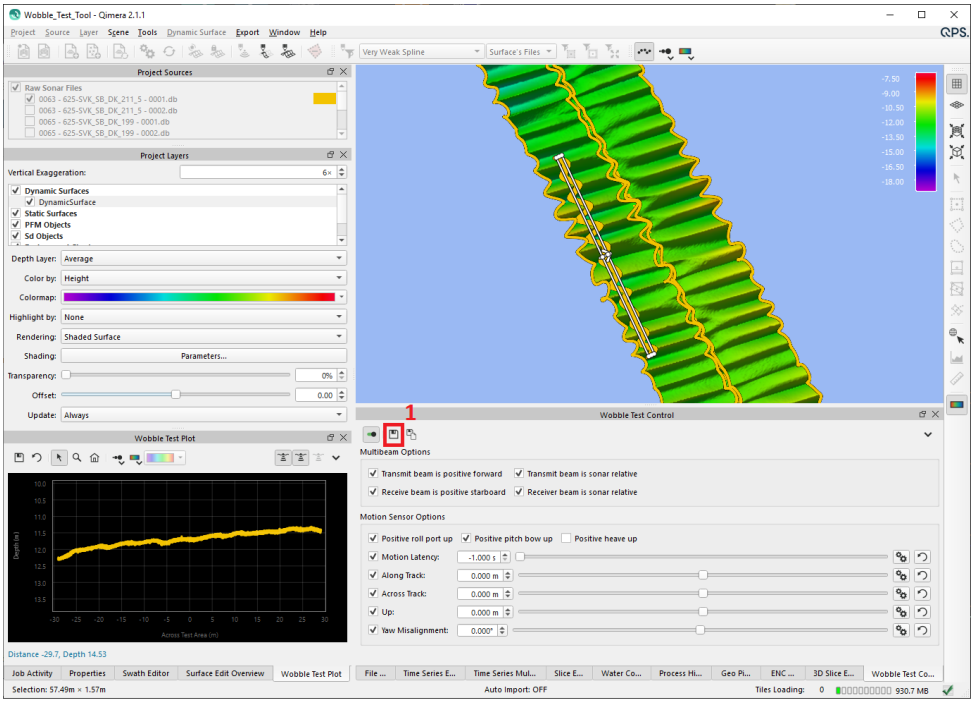
6. If the scale of the slider needs to be adjusted, it can be done by clicking on the Settings button (5) that is located to the right of each slider.
7. Each slider also has a Reset button (6)



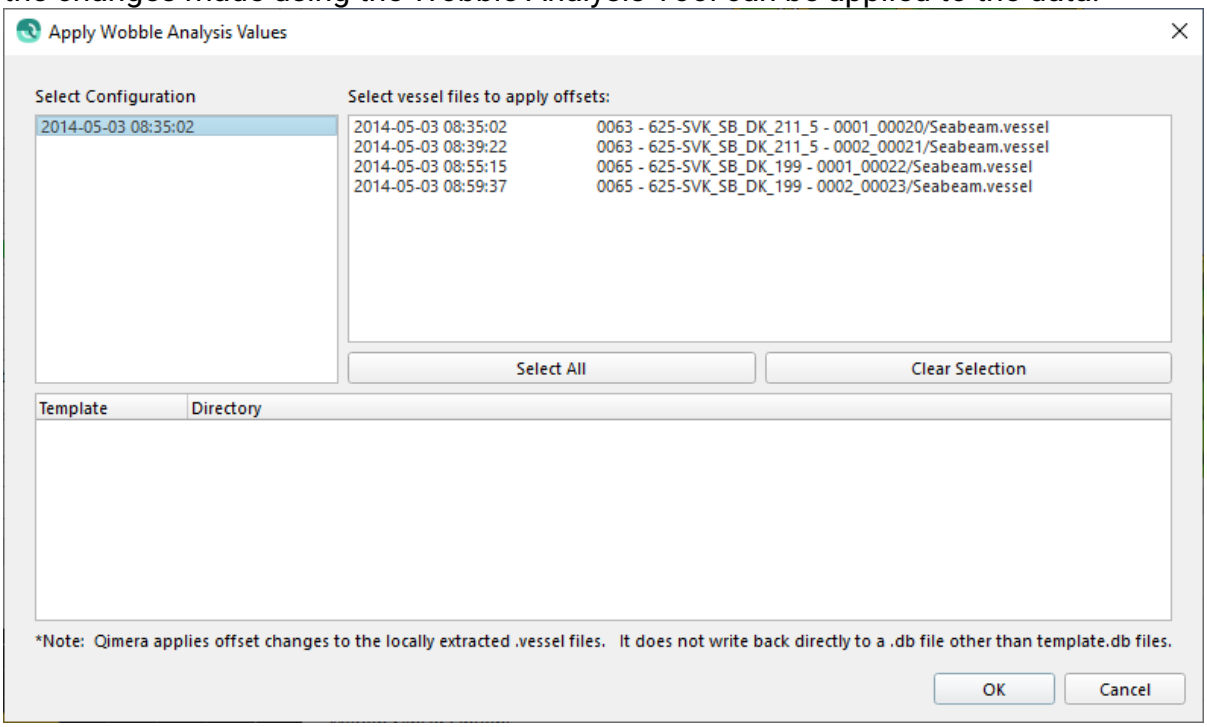
> For more in-depth information on the effects that changes in the this tool have on your data, please visit the Qimera Wobble Analysis section of the Qimera Reference Manual

Saving and Applying Changes

1. Once you are satisfied with your adjustments, click on the Save & Apply button (1) at the top of the Wobble Test Control dock. First, this will prompt you to save a wobble test file. Rename and save the file in your project. The default location of this file will be *Project/Vessel/Filename.wobbleanalysis*.



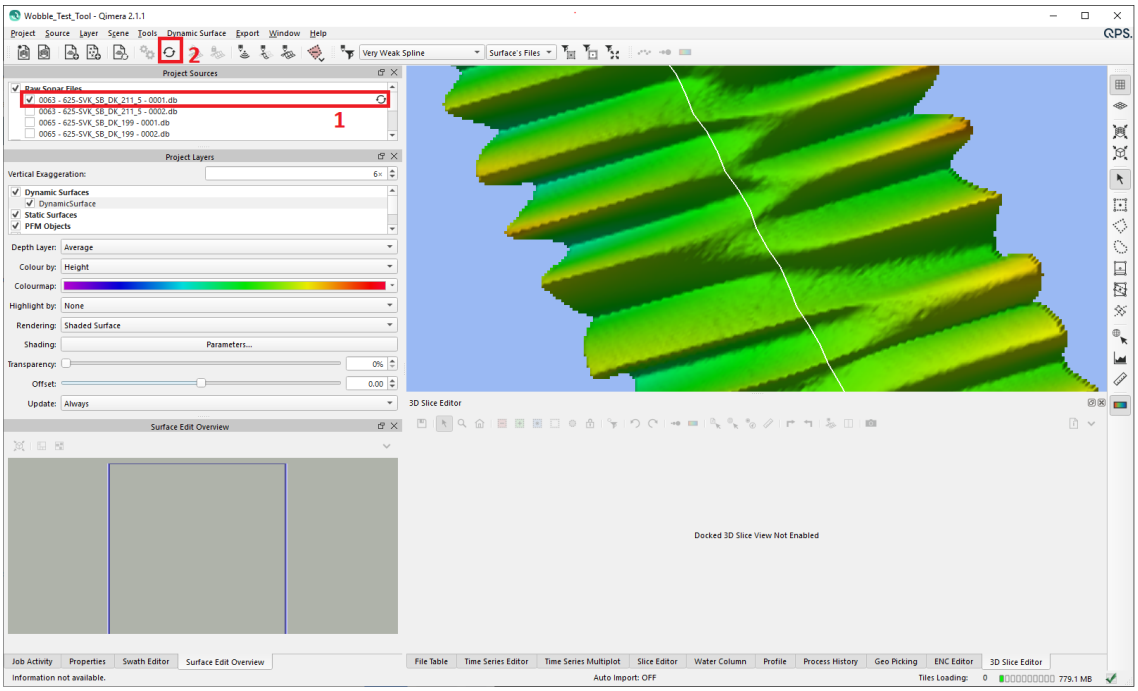
2. Once the edits have been saved, a dialog box will then prompt with the files where the changes made using the Wobble Analysis Tool can be applied to the data.



3. Select the file(s) where the edits need to be applied and click OK.

4. Dynamic Workflow may appear at the top of the 4D Scene window (depending on the user settings) prompting you to reprocess the affected files. Ignore the box for

now or click no.



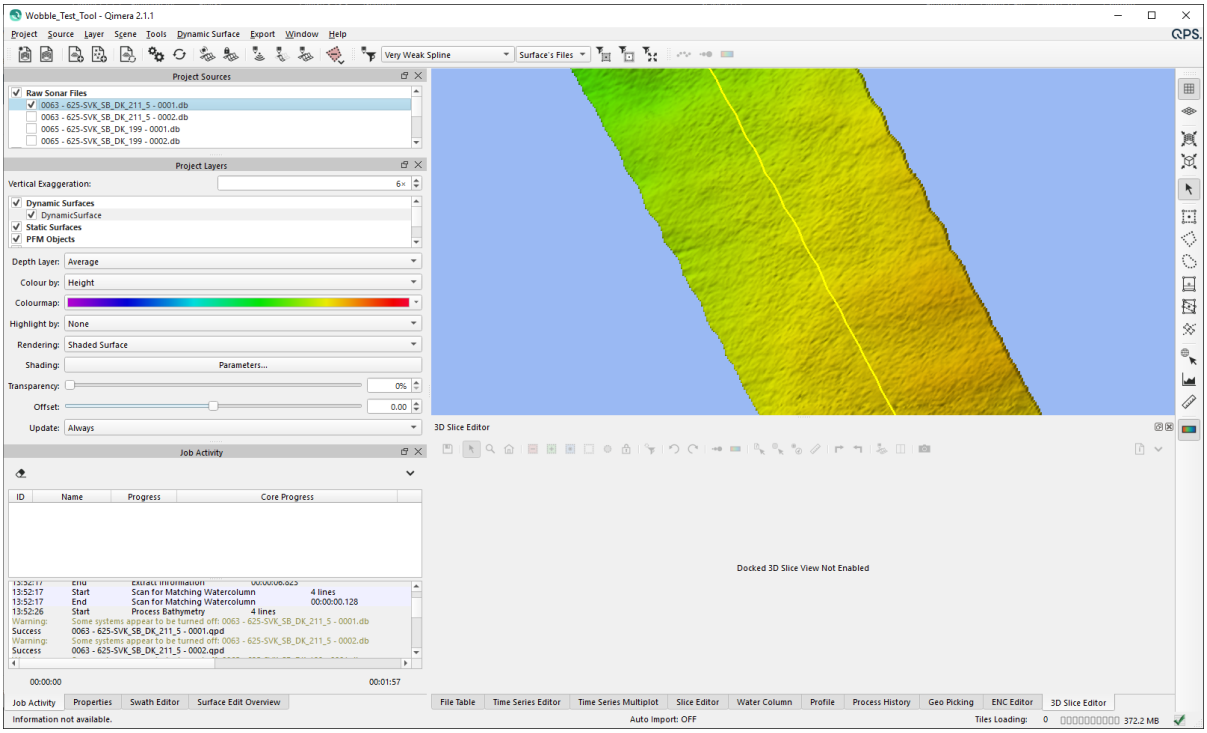
5. Notice that the reprocess icon (1) appeared next to one or more line names in the Project Sources box.

6. If you hold your mouse over this icon it will describe what reprocessing steps will be carried out.

7. A single line can be reprocessed by double clicking on its file name in the Project Sources box (1).

8. To reprocess all lines that require update, click on the Auto Process icon (2) near the top menu bar.

9. Once the reprocessing is complete, the Dynamic Surface(s) will be recomputed.


Wobble_Test_Tool - Qimera 2.1.1
Project Source Layer Scene Tools Dynamic Surface Export Window Help
Project Sources
Raw Sonar Files
0063 - 625-SVK_SB_DK_211_5 - 0001.db
0063 - 625-SVK_SB_DK_211_5 - 0002.db
0065 - 625-SVK_SB_DK_199 - 0001.db
0065 - 625-SVK_SB_DK_199 - 0002.db
Project Layers
Vertical Exaggeration:
Dynamic Surfaces
DynamicSurface
Static Surfaces
PFM Objects
Depth Layer:
Colour by:
Colourmap:
Highlight by:
Rendering:
Shading:
Transparency:
Offset:
Update:
Job Activity
ID
Name
Progress
Core Progress
3D Slice Editor
Docked 3D Slice View Not Enabled
Job Activity
Properties
Swath Editor
Surface Edit Overview
File Table
Time Series Editor
Time Series Multiplot
Slice Editor
Water Column
Profile
Process History
Geo Picking
ENC Editor
3D Slice Editor
Information not available.
Auto Import: OFF
Tiles Loading:

How-to Varying Vertical Shift

This How-to is a step-by-step description for using the Vertical Shift tools on the dynamic surface , available from Qimera 2.3 and up.

On this page:

- Introduction
- Step-by-Step guide
  - Step 1 - Assess Your Data
  - Step 2 - Save a Before Image
  - Step 3 - Select the data that requires shifting
  - Different surface
  - Step 4 - Start Varying Vertical Shift Tool
  - Step 5 - Varying Vertical Shift Tool Settings
    - Parameters
    - Calculate Varying Shift
  - Shifts
  - Step 5 - Assess Your Results
    - Revert to original

Introduction

There are three different vertical shift tools available in Qimera:

- How-to Qimera - Line height matching tool
- How-to Qimera - Static Vertical Shift
- Varying vertical shift

This guide will discuss the Varying Vertical Shift.

Benefits:

- Static vertical shift offsets due to:
  - Shift to design
  - Correct for vertical anomalies
    - Geodetics
    - Old and newer surveys

- ROV survey overlap

This tool computes a time-varying vertical offset between two surfaces using the statistical data generated by a traditional surface difference. The main advantage of this particular tool is that it examines the ping point cloud data in the Dynamic Surface that you wish to shift and uses this to determine the optimal shift along the navigation track, allowing the shift to thus vary along track. This can be used to correct for a number of dynamic errors such as tide drift, heave bandwidth, or just differences in vertical referencing in between successive surveys. The tool is designed to work optimally, for the moment, for long linear corridor surveys such as those running along a pipe or cable route where the survey must be matched against a previous survey to assess changes in seabed conditions in the vicinity of the pipe or cable. It can be used though to repair problems with height accuracy drop outs with post-processed navigation, for example, as shown in the four part sequence below where a single survey line with a poor SBET solution is repaired against a surface build from the neighboring lines.

Good to know

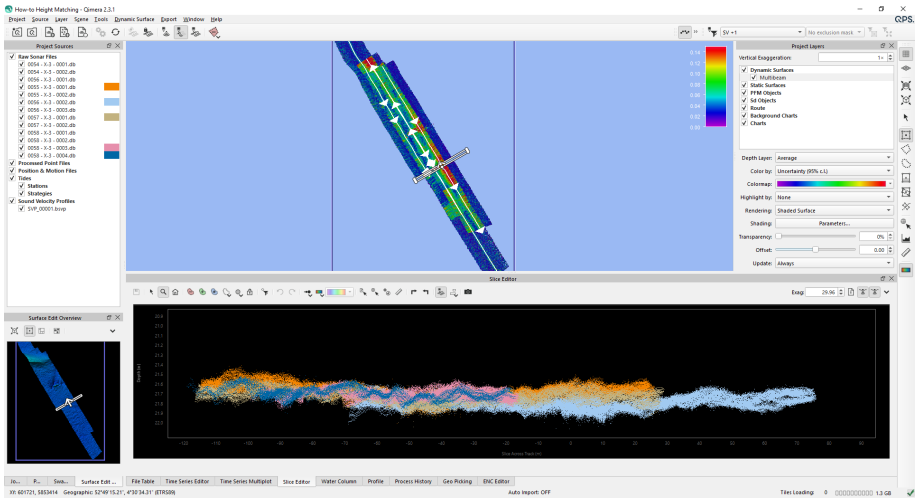
- Shift apply to the files not to the dynamic surface only, if you have multiple dynamic surfaces, applying the shift will affect all surfaces.

Step-by-Step guide

Step 1 - Assess Your Data

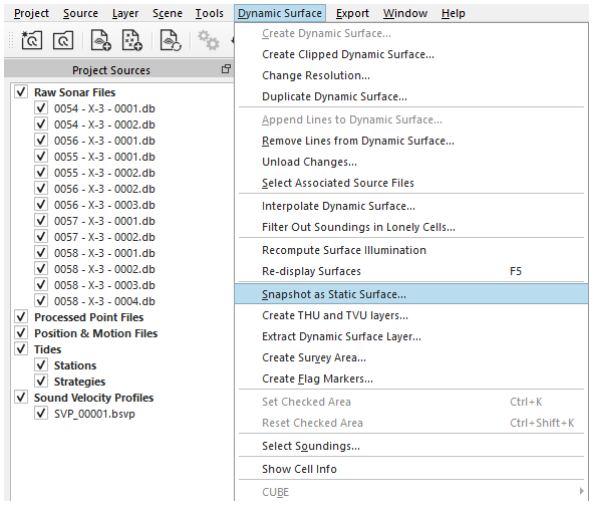
Determine which line(s) requires vertical correction, either due to a mismatch of a survey or a geodetic offset.

- Easiest way to asses if there is an offset is to color your grid by Uncertainty 95%
- Slice editor might also help to identify any problems



Step 2 - Save a Before Image

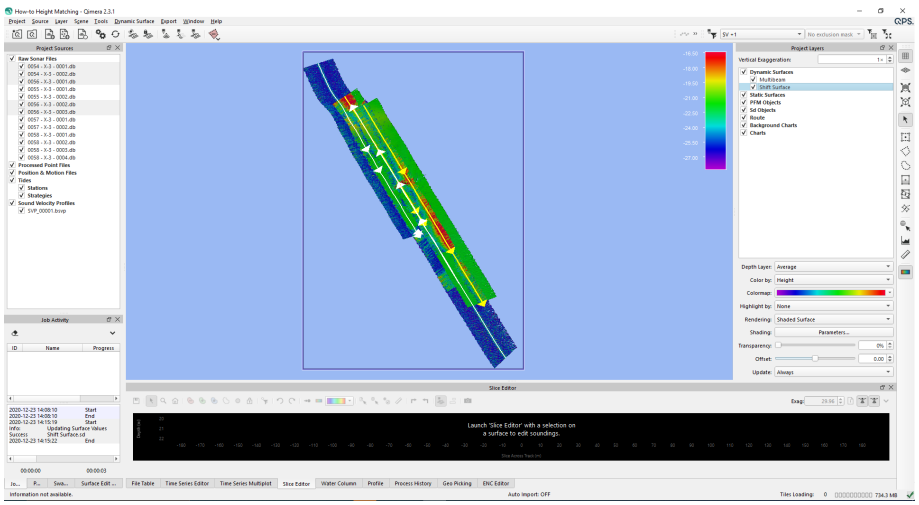
It is best practice to help you assess the results of the algorithm by capturing a snapshot of the results before any changes are done. From the Dynamic Surface menu select 'Snapshot as Static Surface' so a Static Surface is generated. You will be prompted to define a name and attributes.



Step 3 - Select the data that requires shifting

Once a problem or more problems are detected in the survey lines, first a new surface is to be generated where the lines with an offset are selected, we call it Shift Surface here.

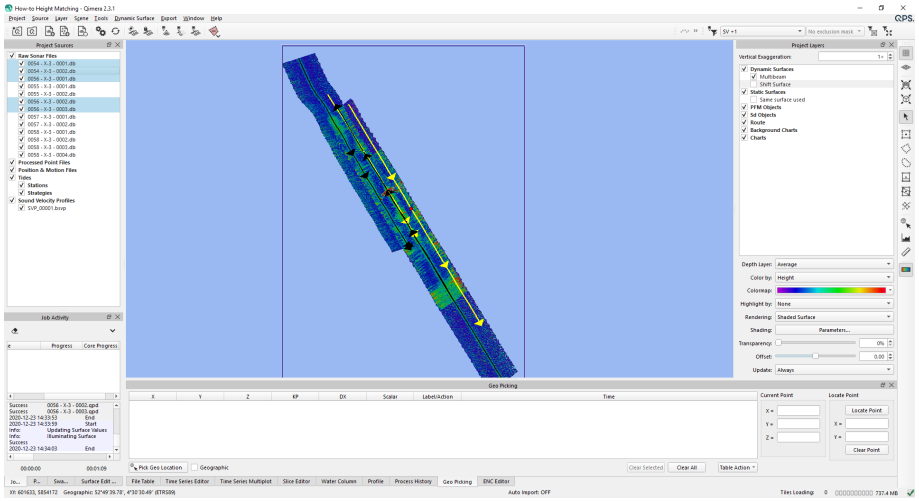
- In the Project Sources Window, select the appropriate line(s) for which you'd like to compute a correction (the left image below).



Different surface

Before we continue make sure to remove the selected lines from the Reference surface (in our case the surface named: 'Multibeam')

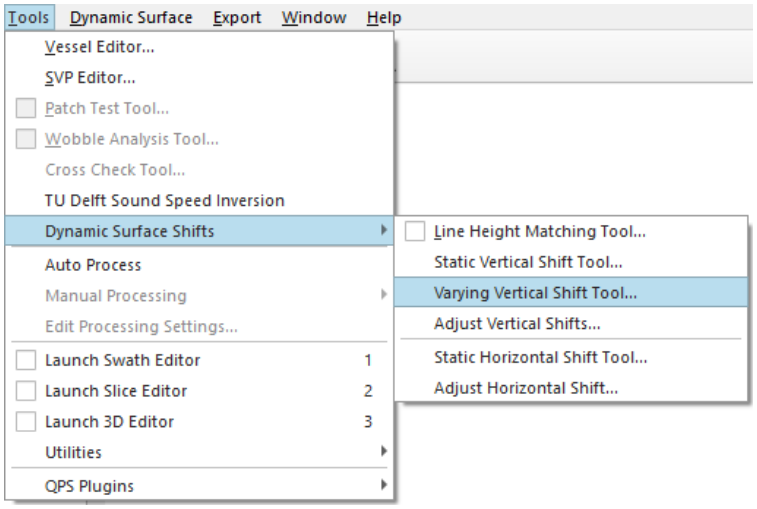
- This will make sure that we aren't comparing the to be shifted data to the Multibeam surface already containing the same data



Step 4 - Start Varying Vertical Shift Tool

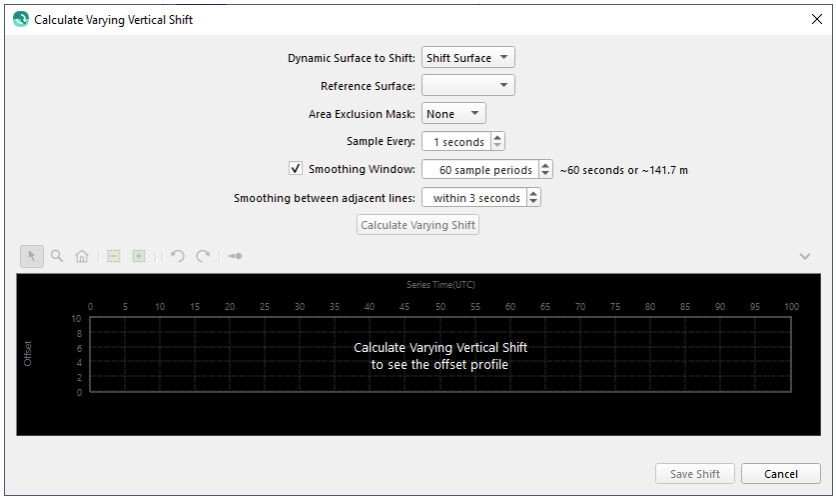
Select the Varying Vertical shift tool, available on the Tools drop down menu under Dynamic surface shift:

- Tools > Dynamic Surface Shifts > Varying Vertical Shift Tool



Step 5 - Varying Vertical Shift Tool Settings

Once the tool is started, there are a few parameters to be set:



Parameters

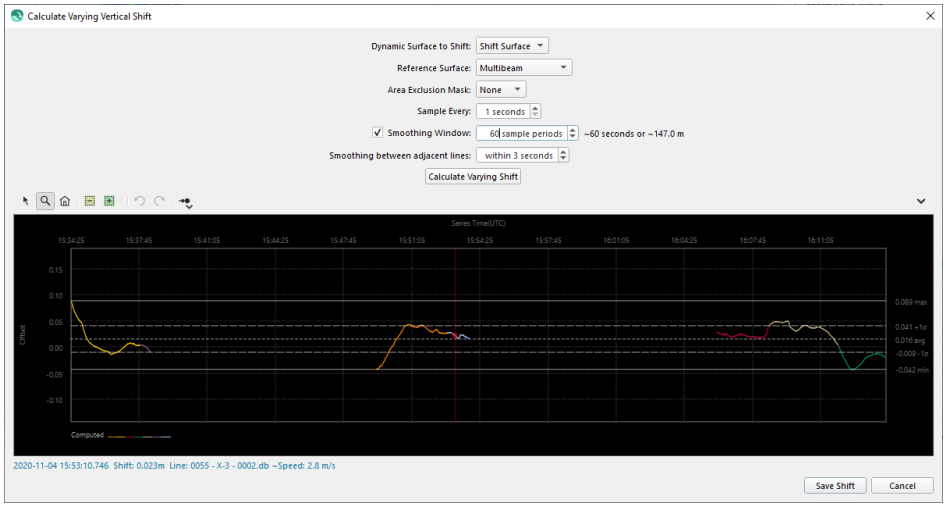
There are five parameters which can be set to the users preferences:

Option	Used for
Dynamic surface to Shift	Use this combo box to select the Dynamic Surface you wish to shift. It will set the Dynamic Surface you had selected in the Project Layers Dock when you launched the tool.
Reference Surface	Use this combo box to select the reference surface.
Area Exclusion Mask	Use this combo box to select a line object from the Project Layers Dock that can be used to mask out areas that you don't want used by the surface difference computation. For example, if the primary survey contains rock dumping and the reference surface does not, you can mask out the area of the rock dumping which allows the algorithm to compute more accurate statistics.

Option	Used for
Sample Every	Use this numeric entry field to specify the time interval over which a time-series shift should be computed. The default is 1-sec, meaning that the ping data will be traversed at 1-sec intervals and each ping that is found at this interval is then used to compare against the reference surface.
Smoothing Window	Use this numeric entry field and checkbox to enable smoothing of the raw vertical shift time-series. This is enabled by default to always give a smooth time-series of vertical shifts such that large jumps will not be observed. When you update the value in the box, the time-series graph will update. You may want to consider making image exports of the unfiltered time-series for reporting, as well as the smoothed time-series.

Calculate Varying Shift

Click this button to run the continuous shift computation,the result will visualized in the display below, changing the smoothing window will adjust what height will be applied to each section





Once you save the results using the *Save Shift* button, every raw sonar file that is part of the Dynamic Surface you are shifting will have a Varying vertical shift applied.

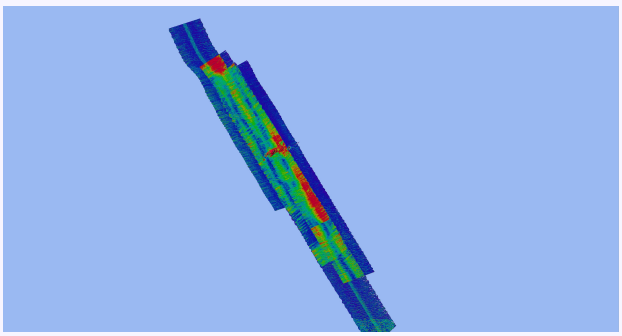
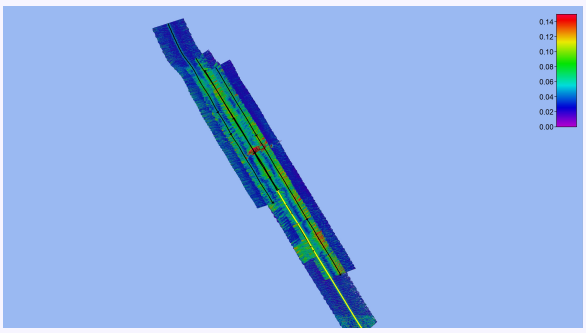
Qimera will then prompt you to update all Dynamic Surfaces containing the affected lines.

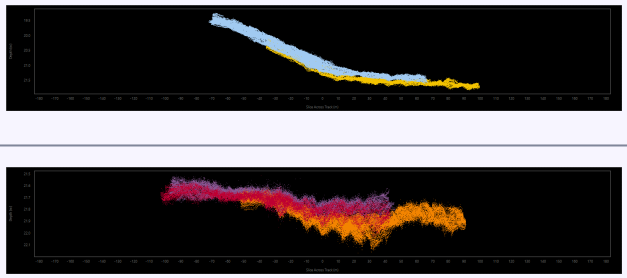
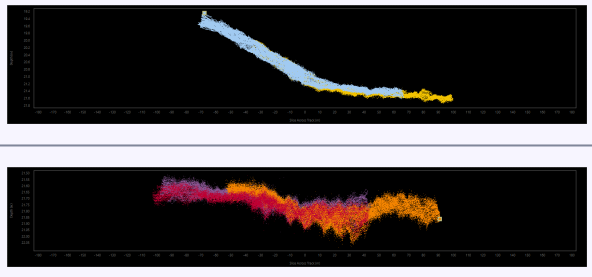
Shifts

Notice that you are able to disable the Varying Vertical shift as well:

Step 5 - Assess Your Results

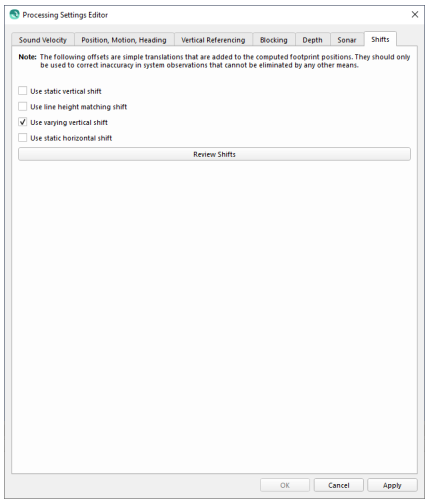
After this tool computes a time-varying vertical offset between two surfaces using the statistical data generated by a traditional surface difference, the difference can be seen by re-importing the shifted data in the original Surface and color by Uncertainty 95%

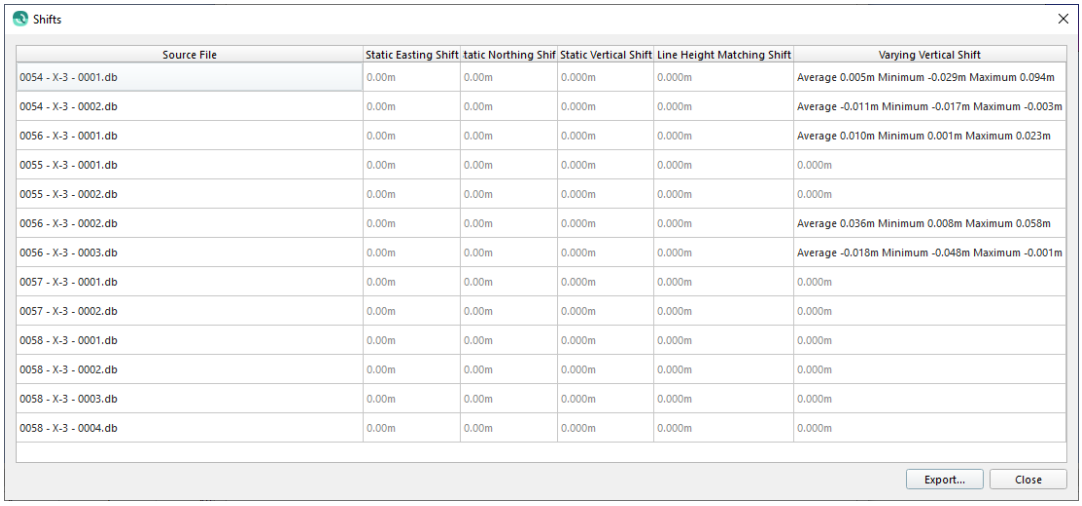
Before Varying Shift	After Varying Shift
	

Before Varying Shift	After Varying Shift
	

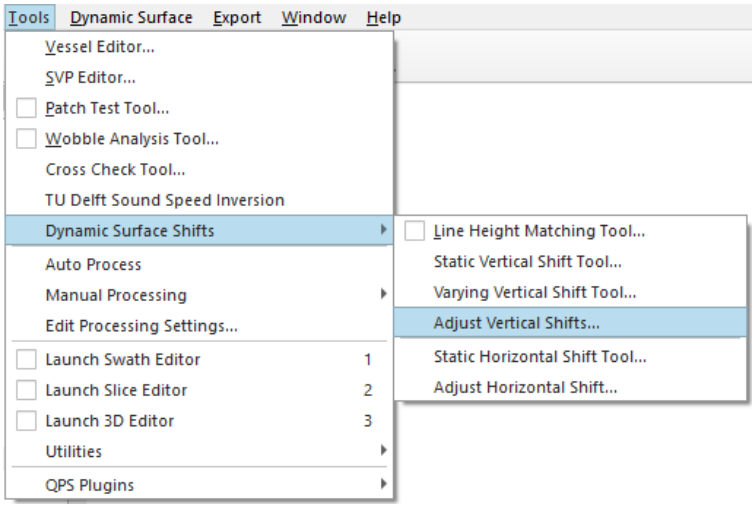
Revert to original

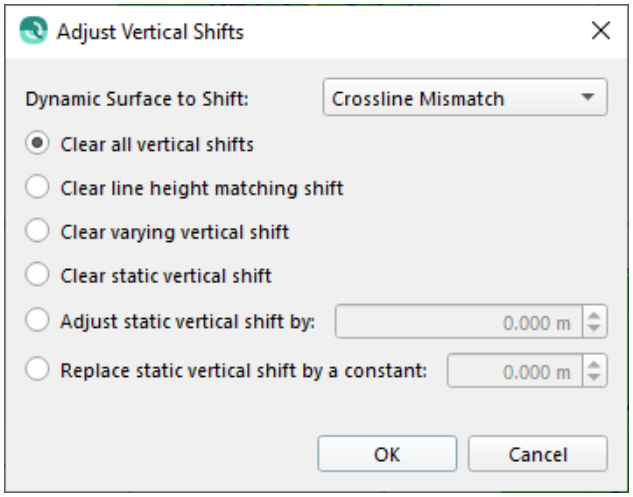
Notice that you are able to check and/or disable the Varying Vertical shift under the processing settings:





To clear generated shifts:





Option	Used for
Dynamic surface to Shift	Change the combo box to display the Dynamic Surface containing the raw sonar files that you wish to apply or clear the vertical shift. • All currently available Dynamic Surfaces will appear in this combo box. • You can also choose the *Selected Sonar Files* option in which case the files you selected in the Project Sources Dock will have the shift operation applied.
Clear all vertical shifts	Clear all shift applied by any of the available tools.
Clear line height matching shift	This will clear the shift applied by the Line Height Matching Tool.

Option	Used for
Clear varying vertical shift	This will clear the shift applied by the Varying Vertical Shift Tool.
Clear static vertical shift	This will clear the static vertical shift applied by this dialog or by the Static Vertical Shift Tool.
Adjust static vertical shift by	This option will apply the additional specified shift in an additive manner to the current static vertical shift.
Replace static vertical shift by a constant	This option will replace the static vertical shift for the raw sonar files by an entered constant.

4. Data Cleaning

- How-to Apply Spline Filtering
- How-to Clean Data with the Swath Editor
- How-to Cooperative Cleaning Workflow
- How-to Filter Operations and Filtering Profiles
- How-to Point Cleaning with a Qinsy Project
- How-to Production Line Processing Workflow
- How-to Scroll referencing
- How-to Spline Filtering details
- How-to Work with Slice Editor

How-to Apply Spline Filtering

Please see the following pages for more information:

- How-to Filter Operations and Filtering Profiles
- How-to Spline Filtering details
- Qimera Filter Operation Toolbar
- Qimera Manage Filter Profiles Dialog

How-to Clean Data with the Swath Editor

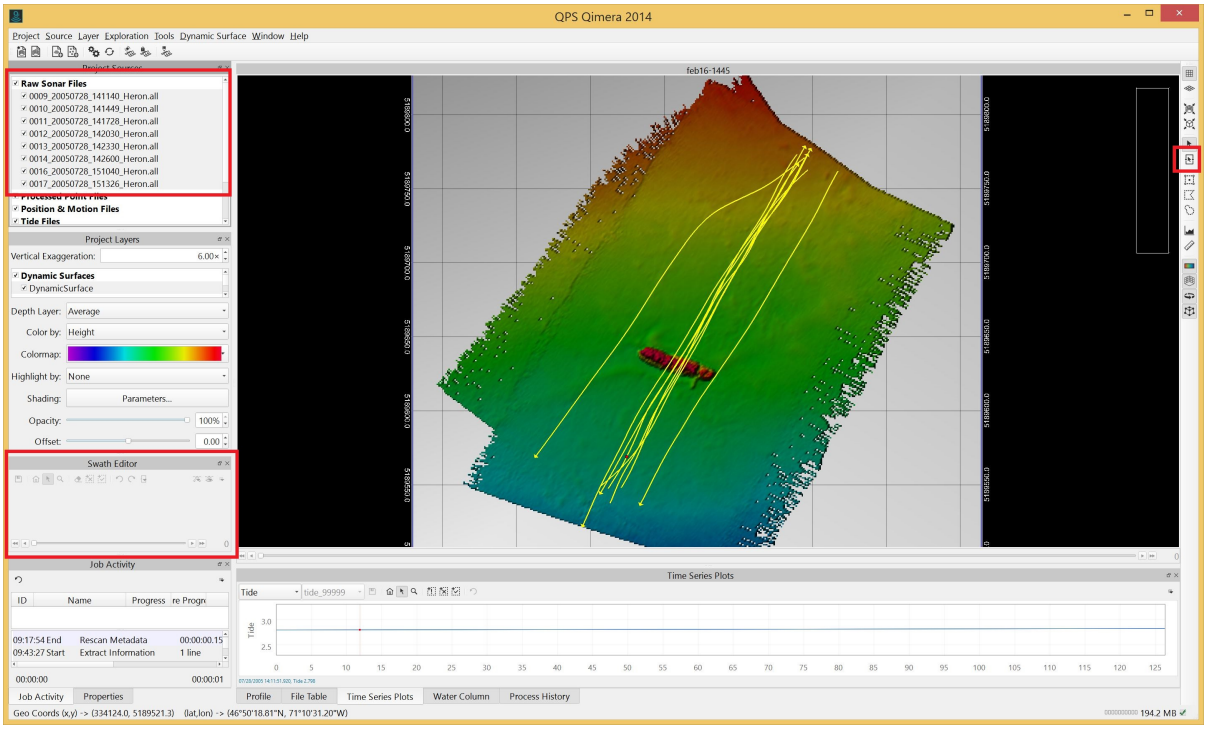
This How-to describes how to clean data with the Swath Editor tool.

On this page:

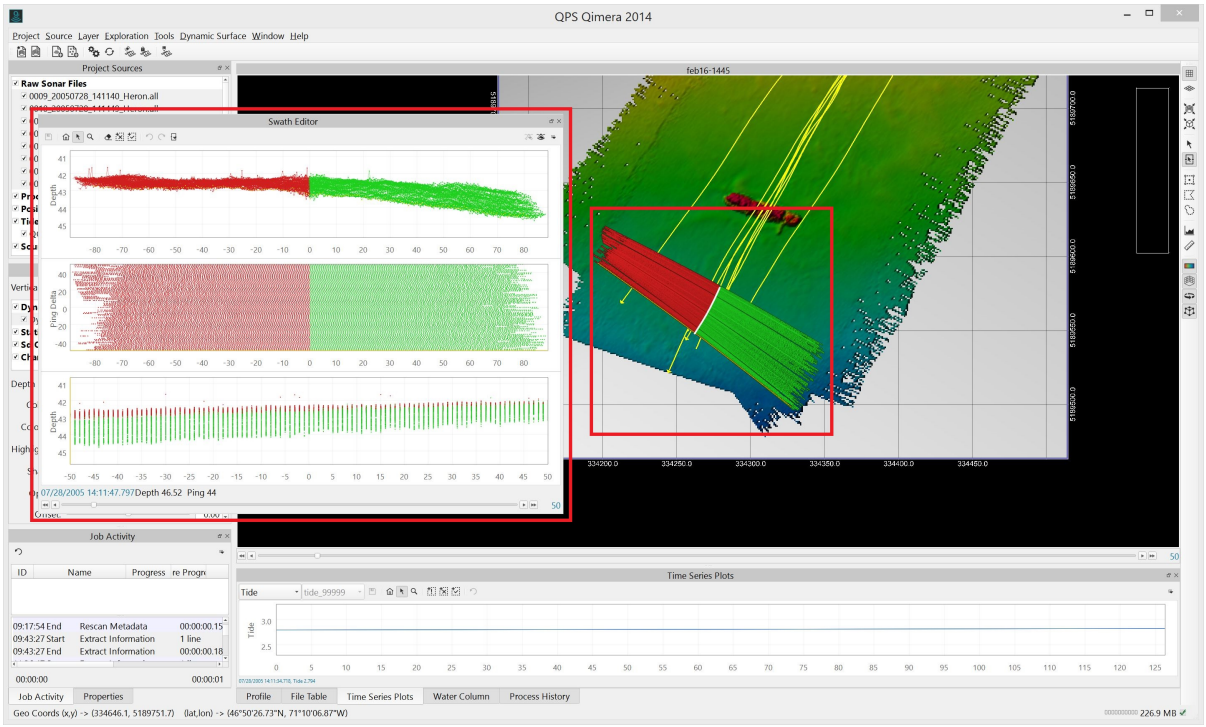
- Setting up the Swath Editor window
- Selecting lines and adjusting view settings
- Flagging points
- Saving work
- Short Instruction Video
- Related Articles

Setting up the Swath Editor window

1. Ensure you have loaded Raw Sonar Files into your project. These can be added using the 'Source' pull-down menu at the top of the main window.
2. You will need to build a dynamic surface. Select one or more of the sonar files from within the Project Sources window. This window can be toggled in the 'Window' pull-down menu.
3. Once your lines are selected (highlighted in grey), choose 'Create Dynamic Surface' from the 'Dynamic Surface' pull-down menu. Enter a name for the dynamic surface in the popup window.
4. Choose appropriate settings for the Dynamic Surface and Cube options or leave the defaults as is.
5. Create the dynamic surface.
6. Ensure that the Swath Editor window is visible. If it's not visible, enable it under the 'Window' pull-down menu.
7. Activate the Swath Editor's functionality by clicking the Swath Select button (R keyboard shortcut) on the toolbar at the far right side of the Qimera window.



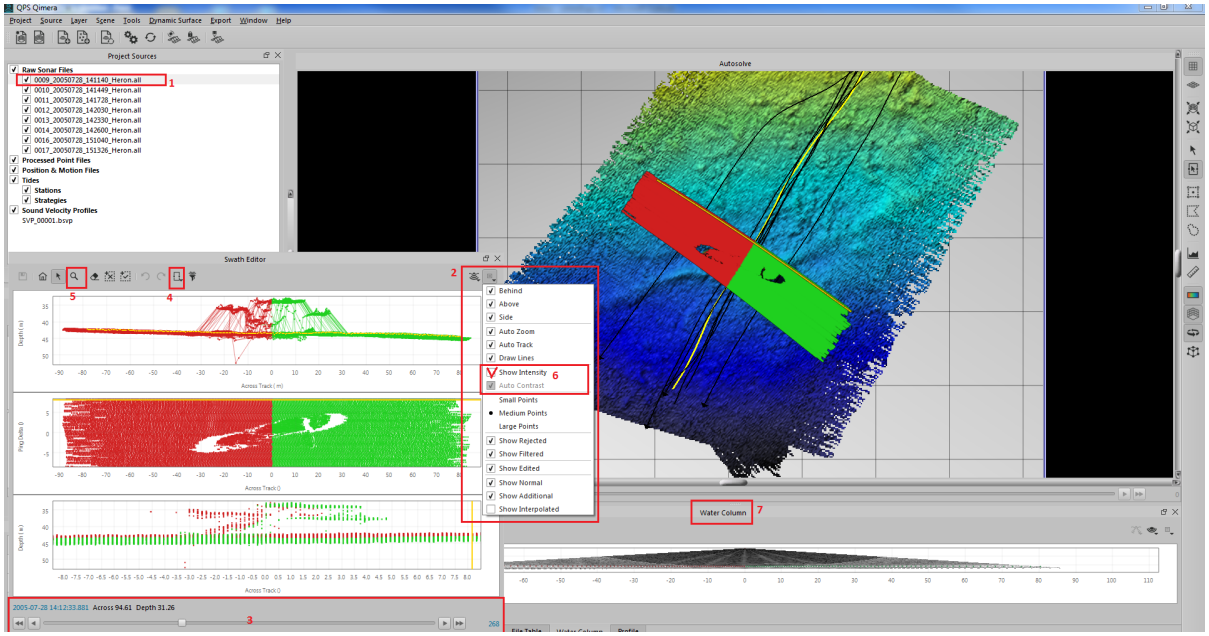
8. Drag the Swath Editor window out of its dock.
   You should now see the Swath Editor buffer in the geographic window and the Swath Editor window should be populated with points:



The geographical window can be set to either Plan View or Turntable View while using the Swath Editor.

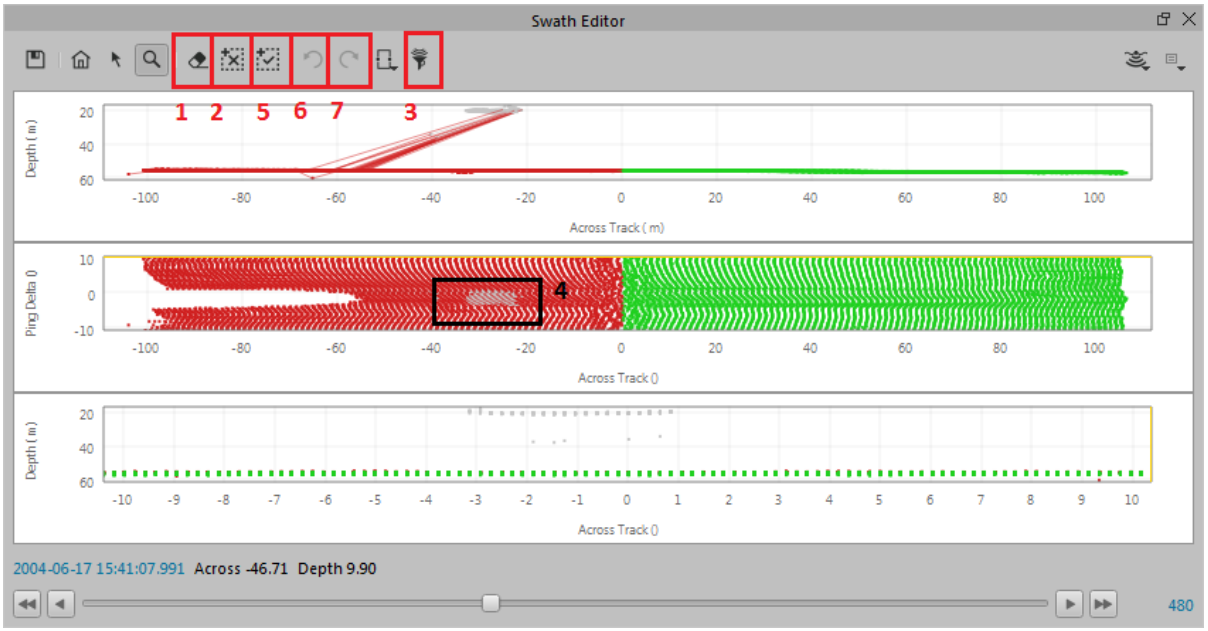
Selecting lines and adjusting view settings

1. Select the line to be edited by clicking on the line name in the Project Sources window (1) or by clicking on the line in the geographical window.
2. Additional views inside the Swath Editor window can be toggled with the pull-down menu at the right top corner of the Swath Editor window (2).
   Activate Behind, Above, and Side view if desired.
3. Select the portion of a line to be edited by clicking on it in the geographical window or dragging the red/green buffer down the line.
   The buffer can also be moved along a line by using the slider and buttons (3) at the bottom of the Swath Editor window.
4. The length of the buffer can be changed by using the pull-down slider button (4) at the top of the Swath Editor window.
5. Use the zoom button (5) at the top of the Swath Editor window to zoom into an area in the data.
6. Check Show Intensity check box to reveal per beam intensity information. Read more about Intensity Display here.
7. Activate Water Column display to display water column information if available.



Flagging points

1. To begin cleaning data, click the Erase Invalid (1) or Select Invalid (2) buttons at the top of the Swath Editor window.
2. If you choose the Select Invalid button, you can drag a box around soundings that you want to flag as unwanted.
   If you choose the Erase Invalid button, use your mouse like a paint brush. Click and drag through unwanted data to flag it.
   Move the cursor slowly because fast movements will cause the cursor to skip.
3. You may decide to apply a Blocking filter. The Blocking will be applied to the entire file selected for swath editing.
   Once you're happy with the filter results, you may want to apply the Blocking to other lines too, by applying the Blocking in "Processing".
   Read more about the Blocking here.
4. Once soundings are flagged their colour will be changed to grey. When "Show Intensity" is on, the flagged points will be displayed in colour.
5. Flagged soundings can be unflagged by clicking on the Select Valid button (5) and dragging a box around them.
6. The undo (6) and redo (7) buttons at the top of the Swath Editor window can be used to step backwards and forwards through previous flagging selections.



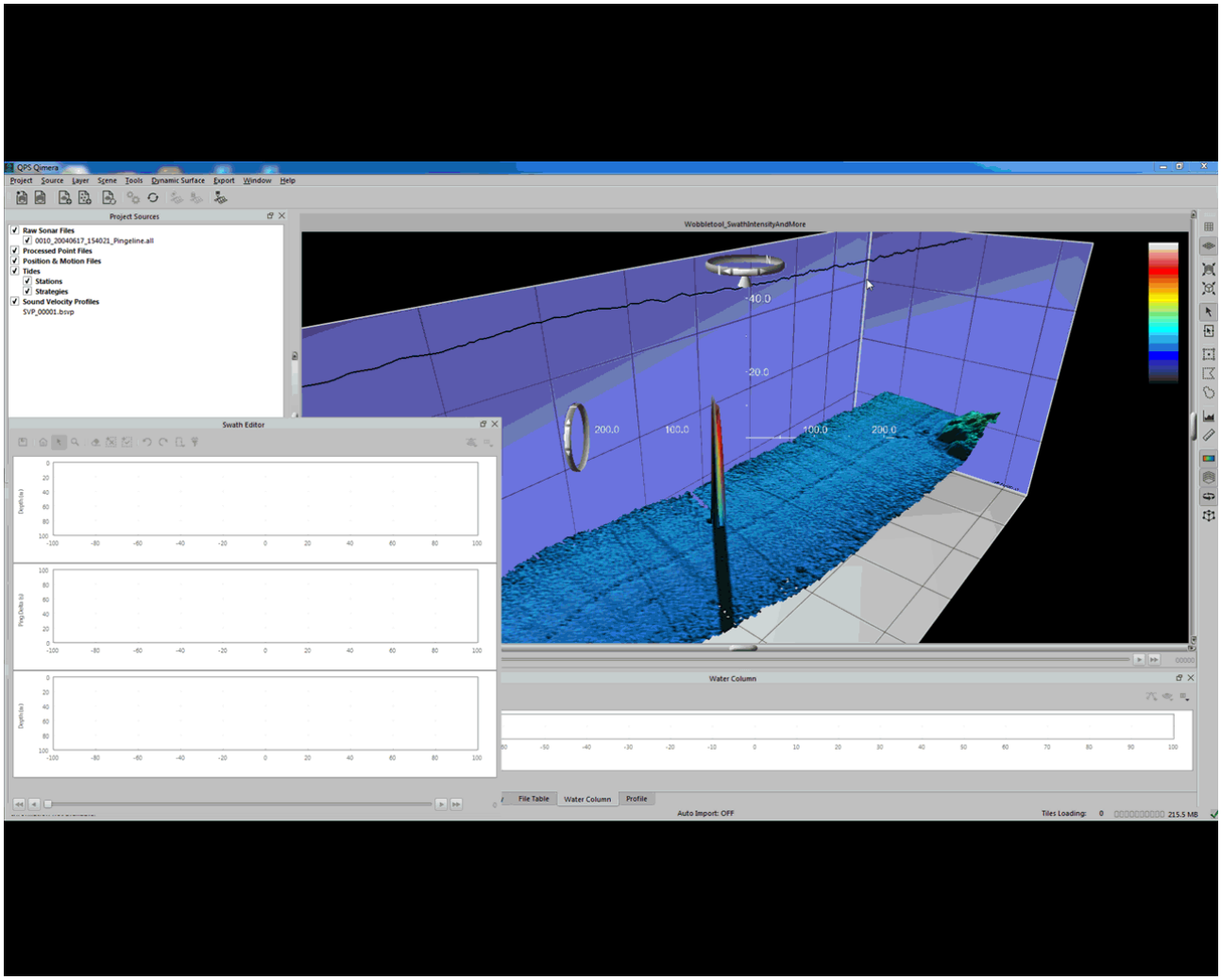
Saving work

1. When you want to finish a session, click the Save Edits button at the top of the Swath Editor window.



2. The surface will then be re-gridded.

Short Instruction Video



Related Articles

How-to Clean Data with the Swath Editor

Qimera Water Column Window

How-to Cooperative Cleaning Workflow

This How-to outlines how Qimera enables multiple users to work together to clean data. From a "Master" project stored on the network, you can easily create small cleaning projects to work on, on your local computer or on a USB drive to pass along to the office. Once you've finished your data cleaning on the cleaning project, the Master project can be updated with the edits done in the cleaning projects. This is part of our answer to "multi-user", and serves the purpose of cleaning larger areas.

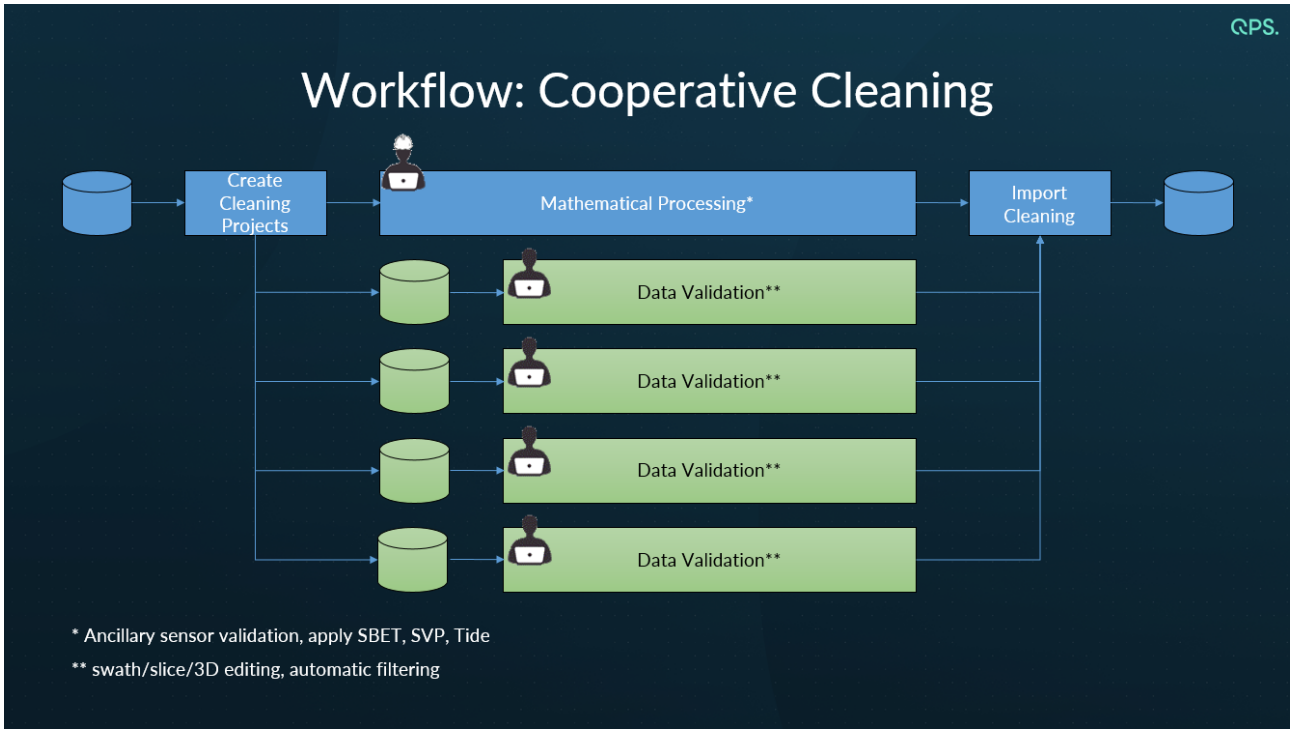
On this page:

- Step-by-Step Guide
  - Step 1: Create Cleaning Projects
  - Step 2: Open a Cleaning Project
  - Step 3: Apply Edits to Master Project
- Tips and Tricks
- Related articles

> ⚠ Operations that shift the heights of footprints (the TU Delft Sound Speed Inversion, Z Shift Data Filter, and Apply Refraction Correction Filter) should not be carried out between when a cleaning project is created and when the edits are merged back into the master project. Applying these shifts can have unexpected consequences such as shifts being reset to zero.

> ⚠ The intention of the cleaning projects is to NOT do any cleaning in the master project before creating cleaning projects.

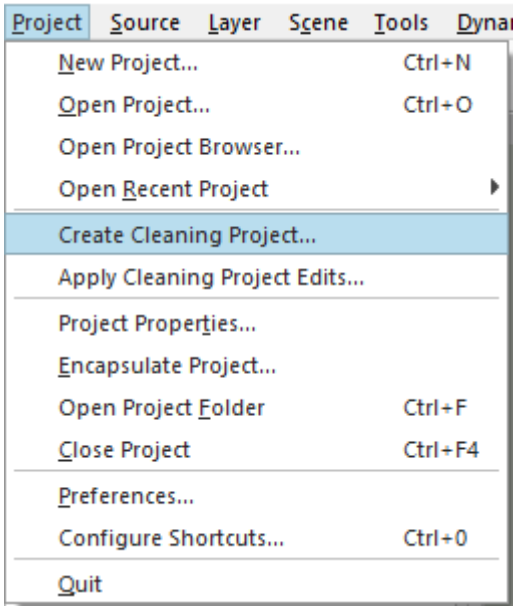
> ⚠ While working in a cleaning project, the user should not perform Grid Interpolations on the surface. Since grid interpolations exist only on the Surface and not within the associated QPD files, the grid interpolations will **NOT** carry over from a Cleaning Project to the Master Project.



Step-by-Step Guide

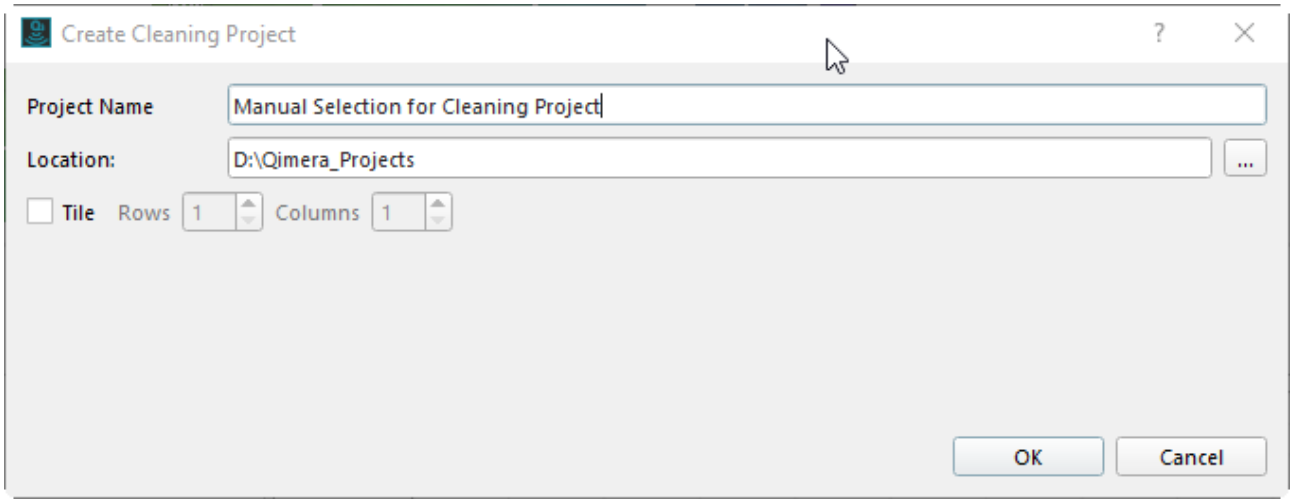
Step 1: Create Cleaning Projects

In the Master Project, if you don't select an area with the rectangular select (R) tool, Qimera will use the whole area of the project to create cleaning projects.
To do this, navigate to the 'Create Cleaning Project' option from the Project drop down menu:



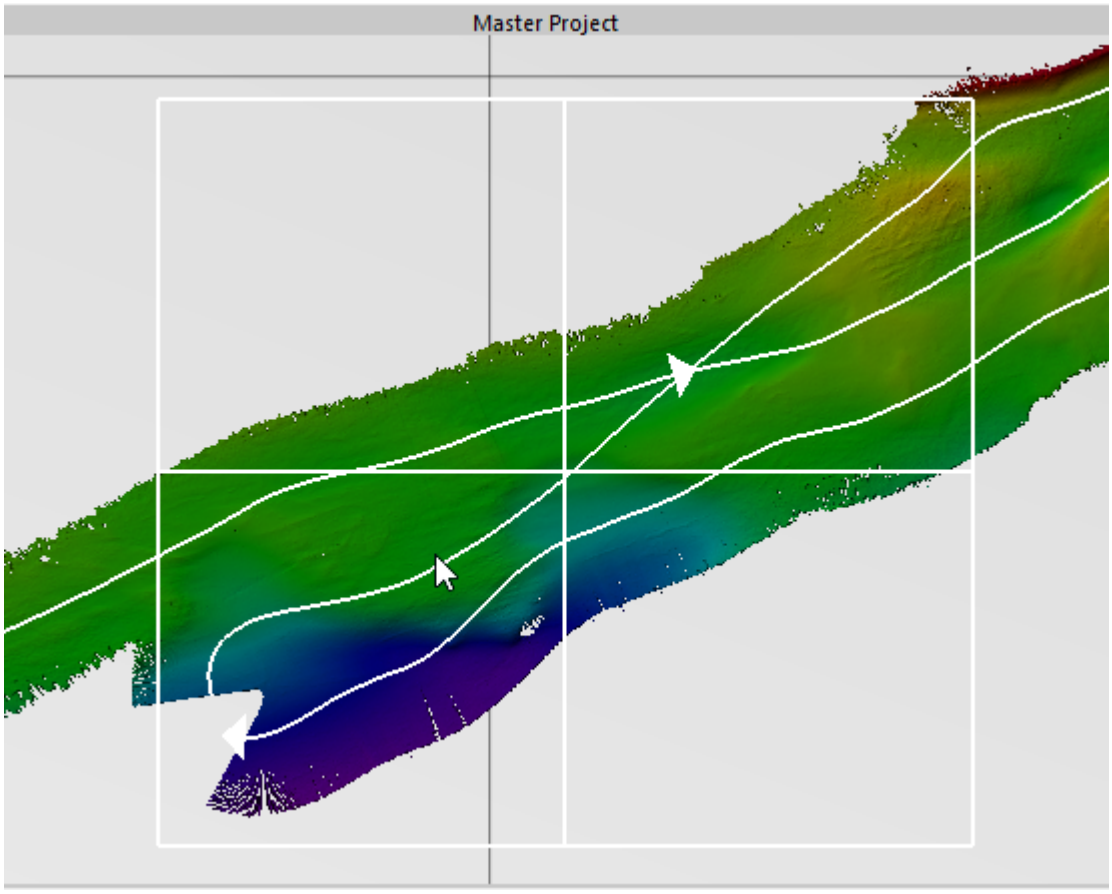
In the Create Cleaning Project GUI, you have three prompts:

- Project Name: This is the prefix of all cleaning projects to be made. For example when the prefix is "Cleaning" the 4 cleaning projects will be named "Cleaning" , "Cleaning1" Cleaning2" and "Cleaning3".
- Location: This is where the cleaning projects will be saved.
- Tile check box: This is an option which, when toggled on, will allow you to choose the number of rows and columns you will divide your survey into.
  Meanwhile, while toggled off, you have the option to create the cleaning projects manually.



Once you're done, click OK.

The area chosen will be divided accordingly, and the area of each is represented by an Sd Object, as seen in the image below.
They can be seen in the Project Layers window. These objects are also displayable in 4D scene.



Step 2: Open a Cleaning Project

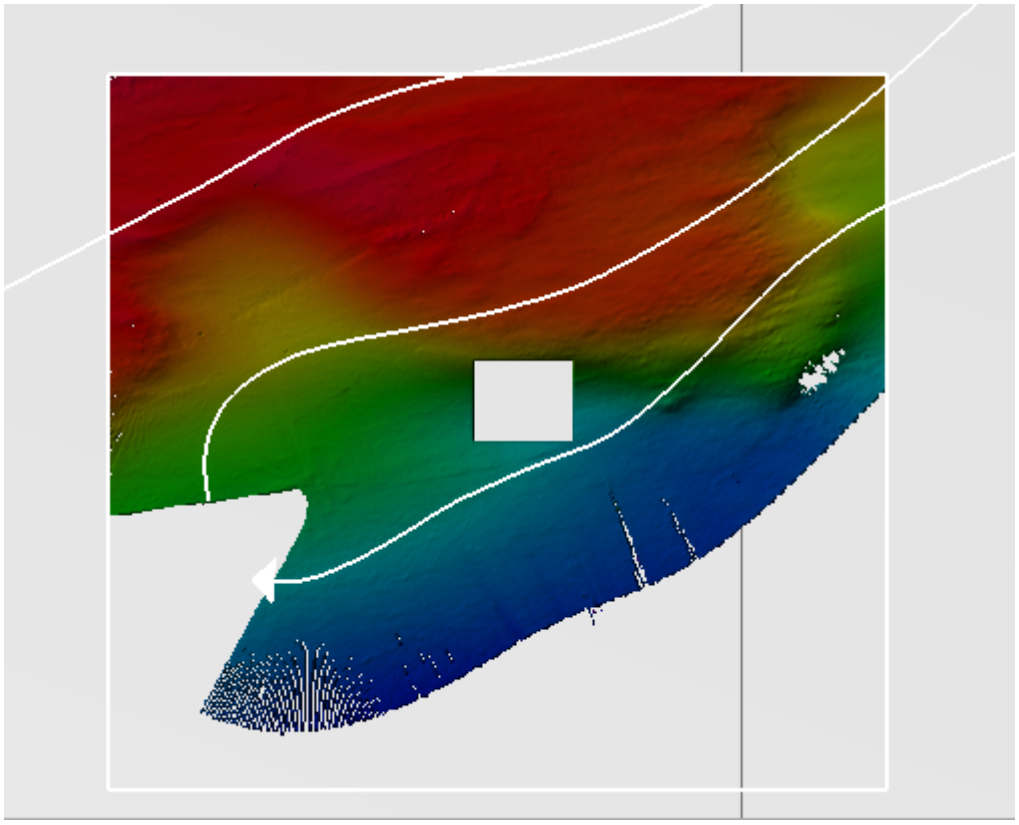
To open one of the cleaning projects, navigate to the 'Open Project' option in the Project drop down menu.

The cleaning project contains the dynamic surface and the QPD files associated with it.

It also contains 2 Sd Objects:

- Checkout: represents the bounds of the cleaning project
- Overview: represents the bounds of the entire Master project

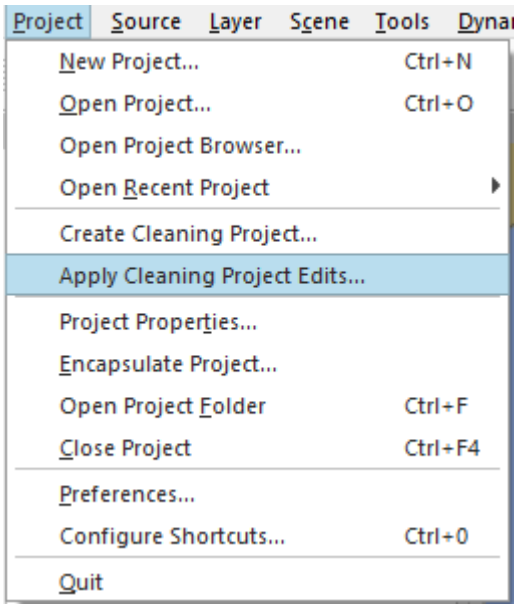
Complete any cleaning that you wish to do on the area. For this example we knocked a hole in the data.



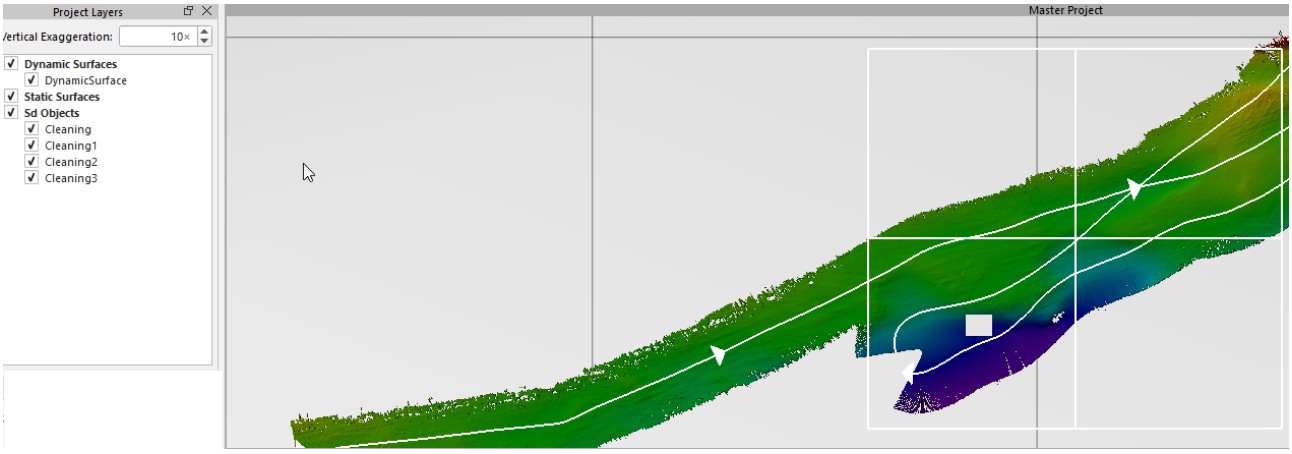
Once you've finished your cleaning, close the cleaning project.

Step 3: Apply Edits to Master Project

Open the Master project and from Project drop down menu choose to Apply Cleaning Project Edits (see below) then select the correct cleaning project.



See how the dynamic surface of the Master updates with the edits.



Ways to remove updates from cleaned section include the following filters: Accept All Soundings, Revert All Filters, Revert All Manual Edits

Tips and Tricks

- Once you have finished all the work and when you have confirmed to have updated the Master project with all the edits, you may want to delete the cleaning projects from the local PC.
- To keep track of the editing done in the cleaning projects, you can colour the Sd Object of the cleaning project rectangle in the Master project: In Project Layers window, right click on the Sd

Object of the cleaning project and change the color.
You can also create a subfolder in the Project Layers window. The Sd Objects that correspond with completed merges can be moved to a 'Done' subfolder for instance.

- In case you've started the cleaning in Just Point cleaning mode, and should there be any need to review Time Series associated with the QPD, you would have to load the Qinsy DB into the Master Project by using the " Load Associated DB File" option.

Related articles

Howto Qimera - Scroll referencing
How-to Qimera - Working with Slice Editor
How-to Qimera - Filter Operations and Filtering Profiles
How-to Qimera - Spline Filtering details
How-to Qimera - Cleaning Data with the Swath Editor
How-to Qimera - Production Line Processing Workflow

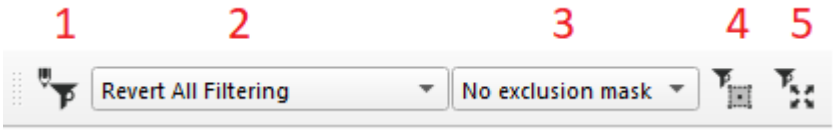
How-to Filter Operations and Filtering Profiles

This document describes how to set up a Filter profile and how to apply it.
The filtering profile is a scheme that allows for applying preconfigured or customized filters in a specified order.

On this page:

- Preconfigured Filters
- Custom Filter Profiles
  - Method 1: Defining a filter profile for a single filter
  - Method 2: Defining a filter profile for a series of filters that can be run in specified order

You will find the filter buttons on the Filter Operation toolbar, on the Bathymetry toolbar.



The filter buttons have the following meaning:

1. Define a new filter profile or edit a filter profile
2. Filter selection drop down
3. Selection of exclusion mask
4. Apply filter inside selection
5. Apply filter everywhere

When the Slice Editor is open, the last two drop down menus will be greyed out and inactive. To apply the filter while the Slice Editor is open, click on the Run Filter Profile button  in the Slice Editor action bar. Filters run in the Slice Editor will only affect data that is currently loaded in the Slice Editor window.

Preconfigured Filters

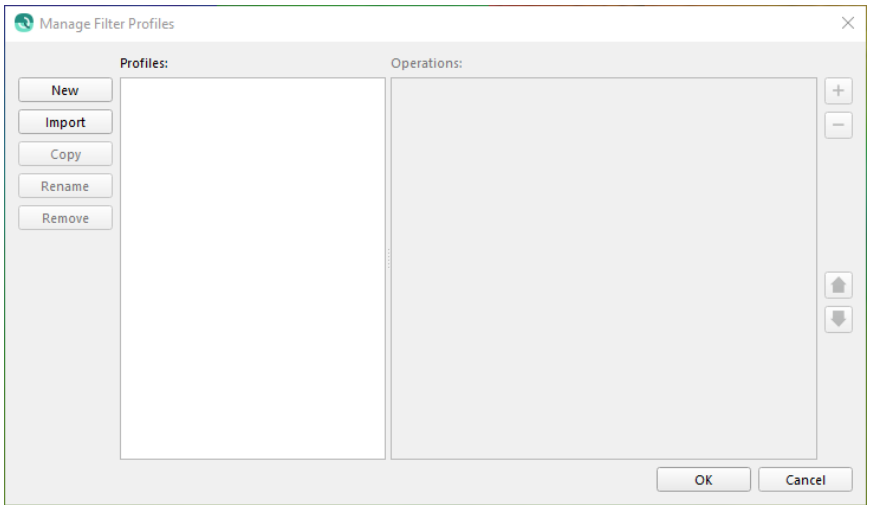
The first two sections of the filter drop down contain preconfigured spline filters and 'Other Operations'.
Information regarding these operations can be found in the Qimera Filter Operation Toolbar documentation.

Custom Filter Profiles

This article describes two methods:

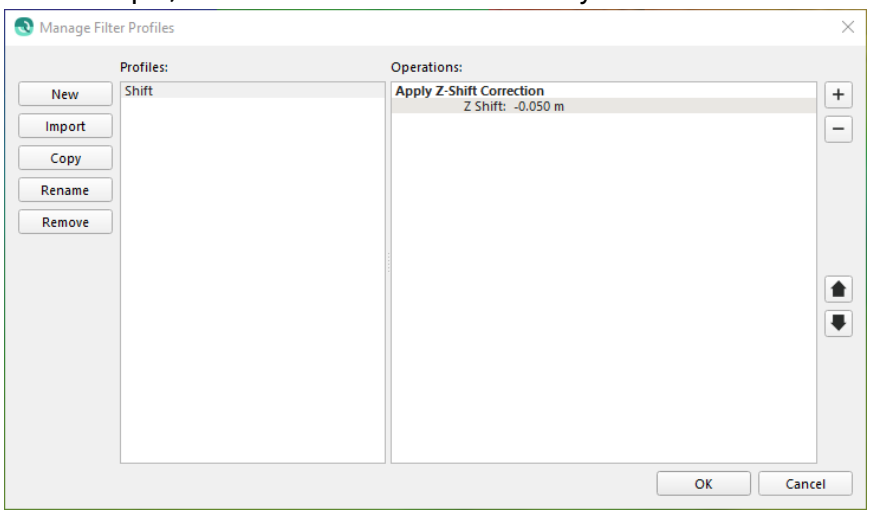
- Method 1: Defining a filter profile for a single filter
- Method 2: Defining a filter profile for a series of filters that can be run in the order specified by the user

Method 1: Defining a filter profile for a single filter

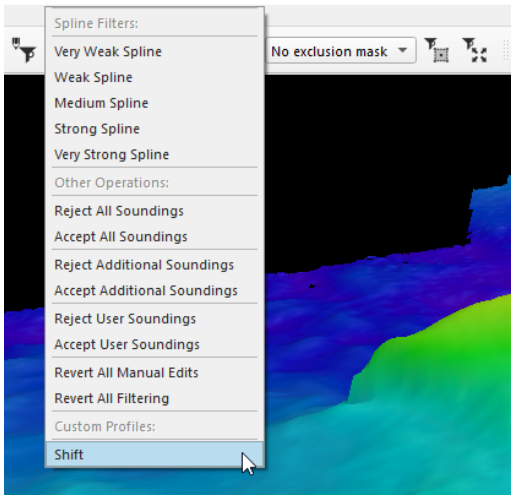
1. Click on Create new filter profile  This opens the Manage filter profiles dialog
2. 

3. Click New and give the filter profile a descriptive name so it's easily found in the filter drop down list

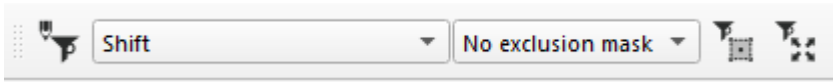
4. Then, on the right side in the dialog, click + and choose the action that belongs to this filter. In this example, the data will be shifted down by 20 meters. Click OK to close



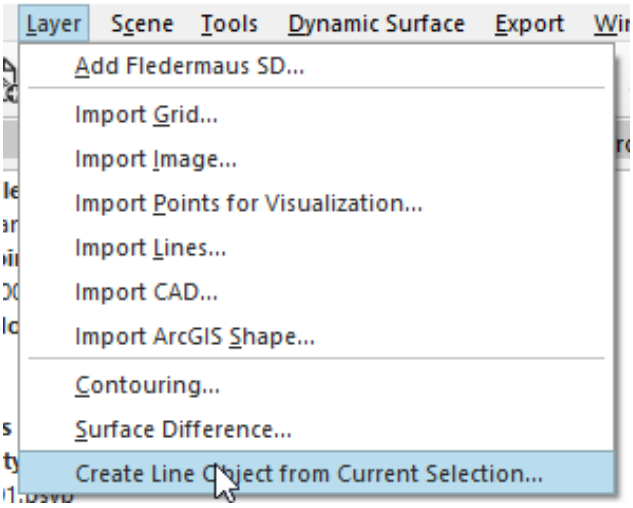
5. See how your filter is added to the filters drop down list



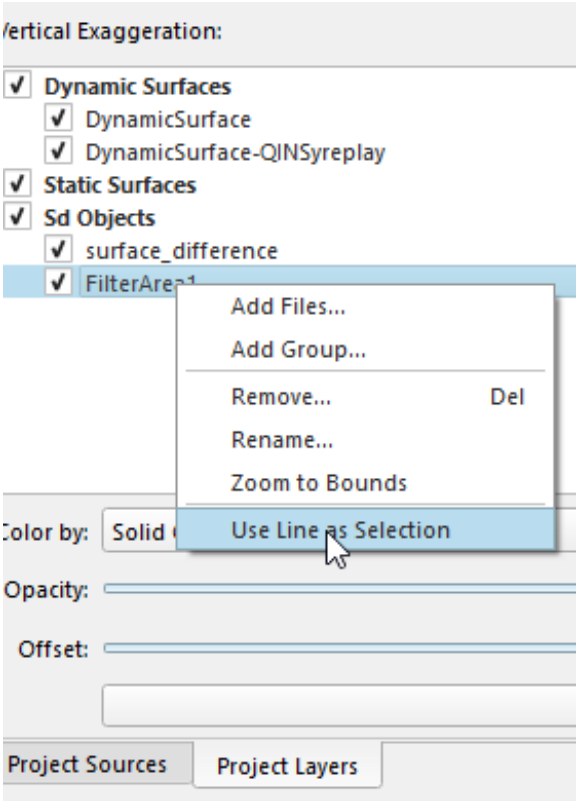
6. Confirm the newly created filter has become the active filter



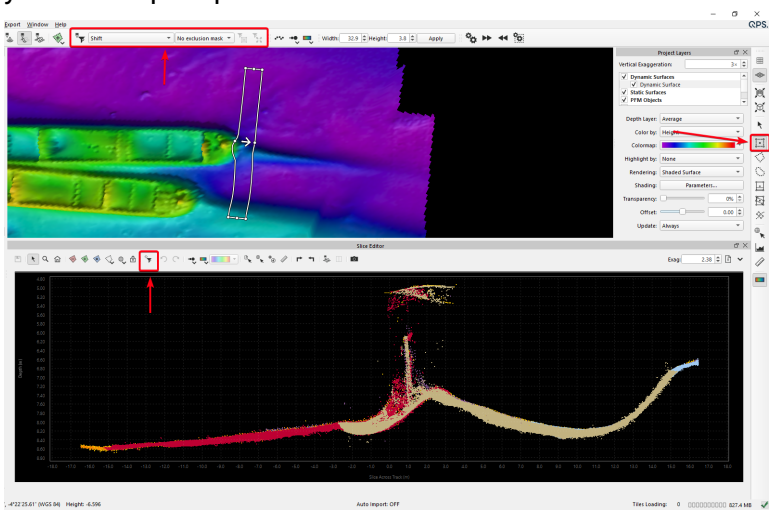
7. Choose the files or surface you want to apply the filter to by selecting them in either the Source file or Project Layers menu. For a start you can preview the results in Slice Editor, steps below explain how to do this.
   The advantage of previewing in the Slice Editor is that the filter application can be rolled back by clicking on the 'Undo' button.
8. Select an area using one of the selection tools in the Qimera 4D Scene Toolbar.
   a. If needed, save your polygon to have it available for future filtering. To do so, select Create Line Object From Current Selection from the layers drop down menu.



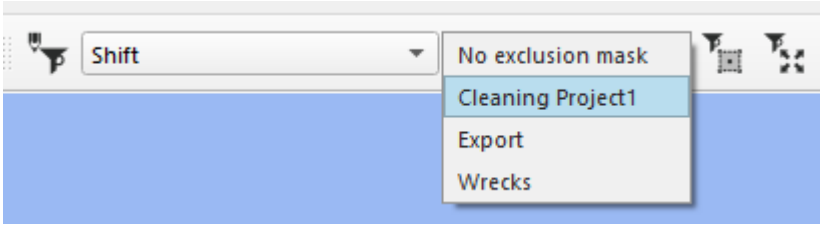
b. In order to make a newly saved or newly imported polygon the selection for the filtering, just right mouse click on the SD line object in Project layers dock and choose Use Line as Selection.



9. Launch the Slice Editor in order to preview the filtered data. When the preview is not needed, you can skip step 10-11



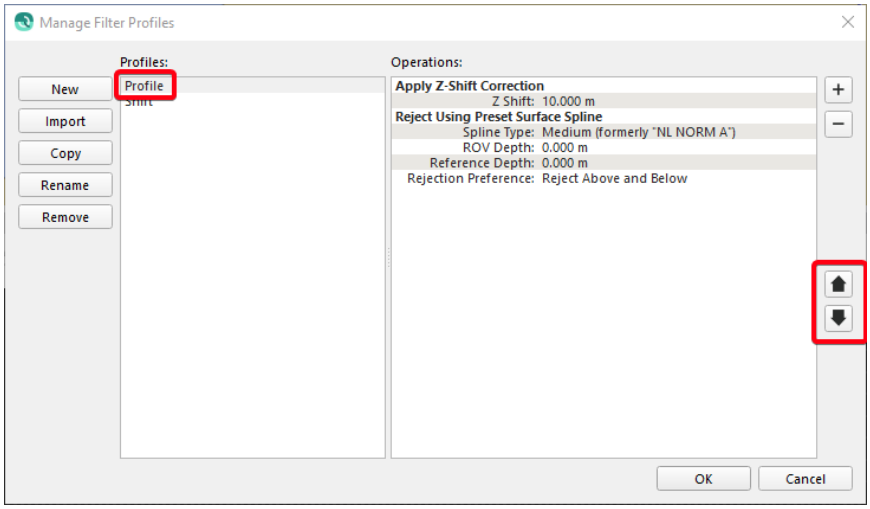
10. To preview the filter In Slice Editor, click on 
11. If you're happy with the result you can apply the filter while remaining in preview-mode by clicking on . You can also exit preview-mode before applying the filter, or you can also exit the Slice Editor and apply the filter to any files or surface files by selecting them in either the Source file or Project Layers menu. When you want to exclude an area you can select the exclusion mask. More info can be found here. If you're not happy with the results, click on the Undo button or Ctrl+Z hotkey to undo.



12. If you wish to run the filter without previewing click 
13. Choose whether the filter must be applied inside or outside the spatial selection or anywhere (entire survey, this may take a while for the filter to finish).

Method 2: Defining a filter profile for a series of filters that can be run in specified order

1. Follow steps 1 to 4, as explained above. Then add your second or third or n filter to the profile, and save.
2. You can change the order of the filters. Click OK when your filter profile is complete. It can always be modified later.



3. Repeat steps 5-13 of method described above (Method 1)

> If you're not certain what the effect of a filter is, then first try the single filter before running the filter profile. The filters defined in the profile will be run in the order as defined in the filter profile setup.

Related articles:

How-to Work with Slice Editor

Qimera Filter Operation Toolbar

How-to Point Cleaning with a Qinsy Project

This document discusses the basics of point cleaning of a Qinsy project in Qimera. The starting point for this document is a Qinsy project that has QPD files built during data acquisition with Qinsy.

On this page:

- Step by step guide
  - Step 1 Launching Qimera from Qinsy
  - Step 2 Preliminary Check
  - Step 3 Create a snapshot
  - Step 4 Quickly disable points in polygon
  - Step 5 Automatic Filtering
  - Step 6 Manual cleaning
  - Step 7 Final Quality Control
  - Step 8 Data Export

Version 1.6

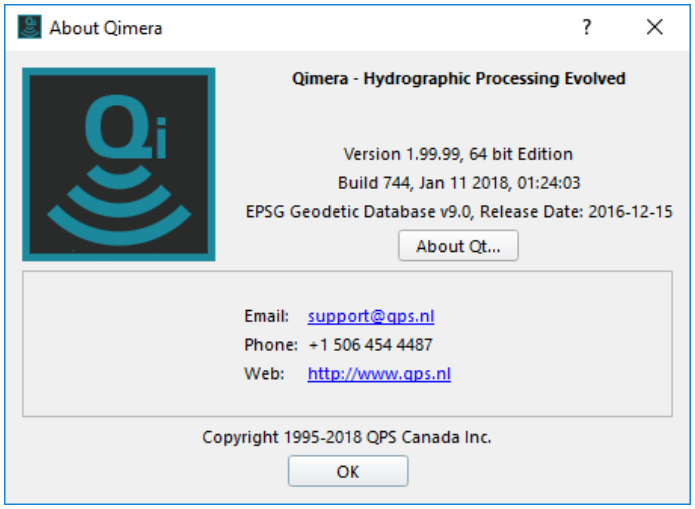
This How-to description is applicable to Qimera version 1.6.0 and higher.

This workflow is specifically designed for Qinsy clients who:

- Compute online QPDs and preferably a Dynamic Surface as well
- Are content with the quality of the online footprint calculations
- Might use blocking filters while online to remove outliers
- Are primarily interested in removing poor quality bottom detection points from their data sets, i.e. data editing or cleaning

Data re-processing is still possible within Qimera for the occasional line that requires a bit of re-processing.
For full sonar processing see Getting Started.

This How-to is created with the Qimera Nightly build 740.



Useful links

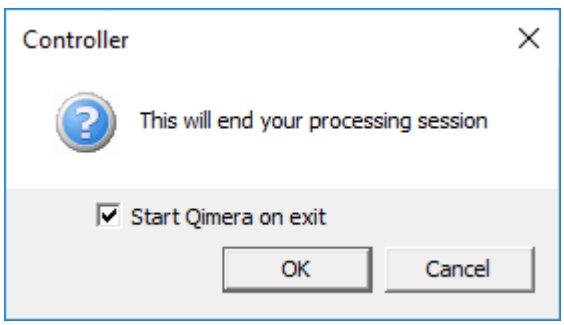
You may find more detailed step-by-step descriptions by following the links below:

- The "Qloud method": How-to Work with Slice Editor
- File based cleaning: How-to Clean Data with the Swath Editor
- Cleaning large data sets and multi-user data cleaning: How-to Cooperative Cleaning Workflow
- Applying automatic filtering: How-to Filter Operations and Filtering Profiles
- Technical description and how-to spline filtering: How-to Spline Filtering details

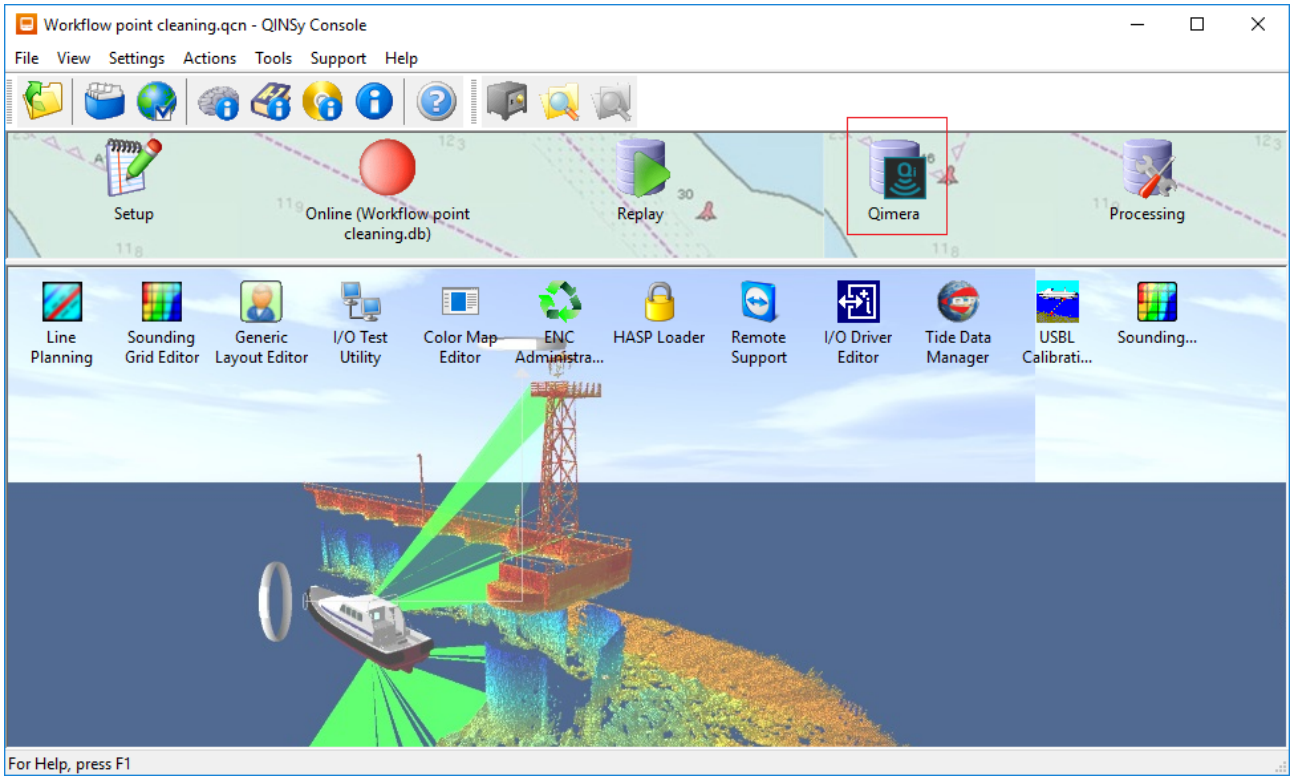
Step by step guide

Step 1 Launching Qimera from Qinsy

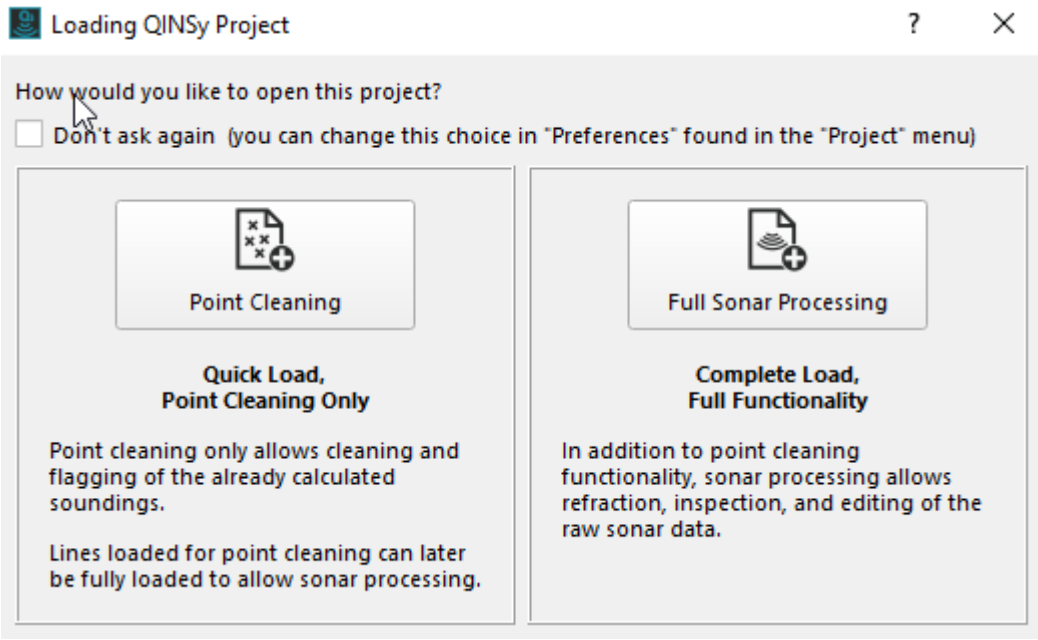
After the data collection in Qinsy and closing the Controller a pop-up appears whether you want to start Qimera:



When the tick box is selected Qimera will start immediately with the collected data of that project.
If it is not possible to clean the data right away for whatever reason, it is also possible to start Qimera from the Console at a later time:

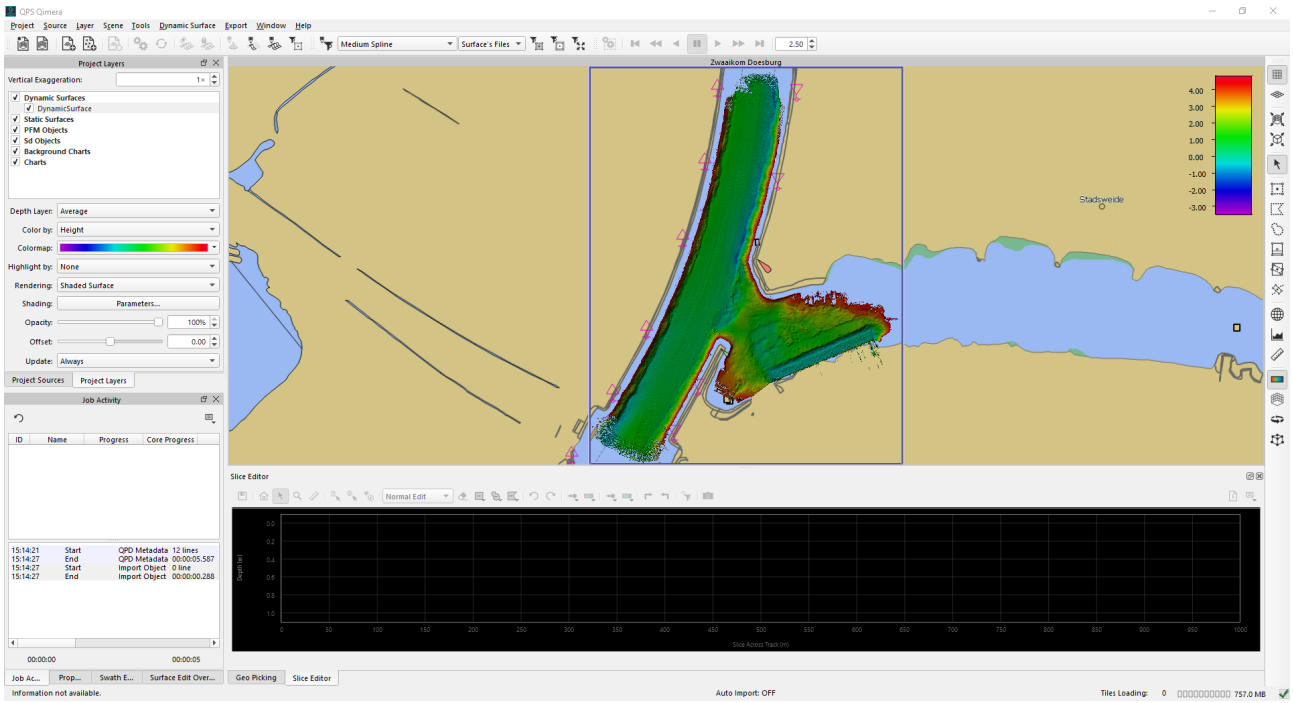


Once Qimera is started, a pop up appears with the question if you want "Point Cleaning" or "Full Sonar Processing".
In this How-to the focus is on just "Point Cleaning". You will not get this choice when you have "Qimera Core" programmed to your dongle (no full sonar processing) and you will be taken directly to a point cleaning start up experience.



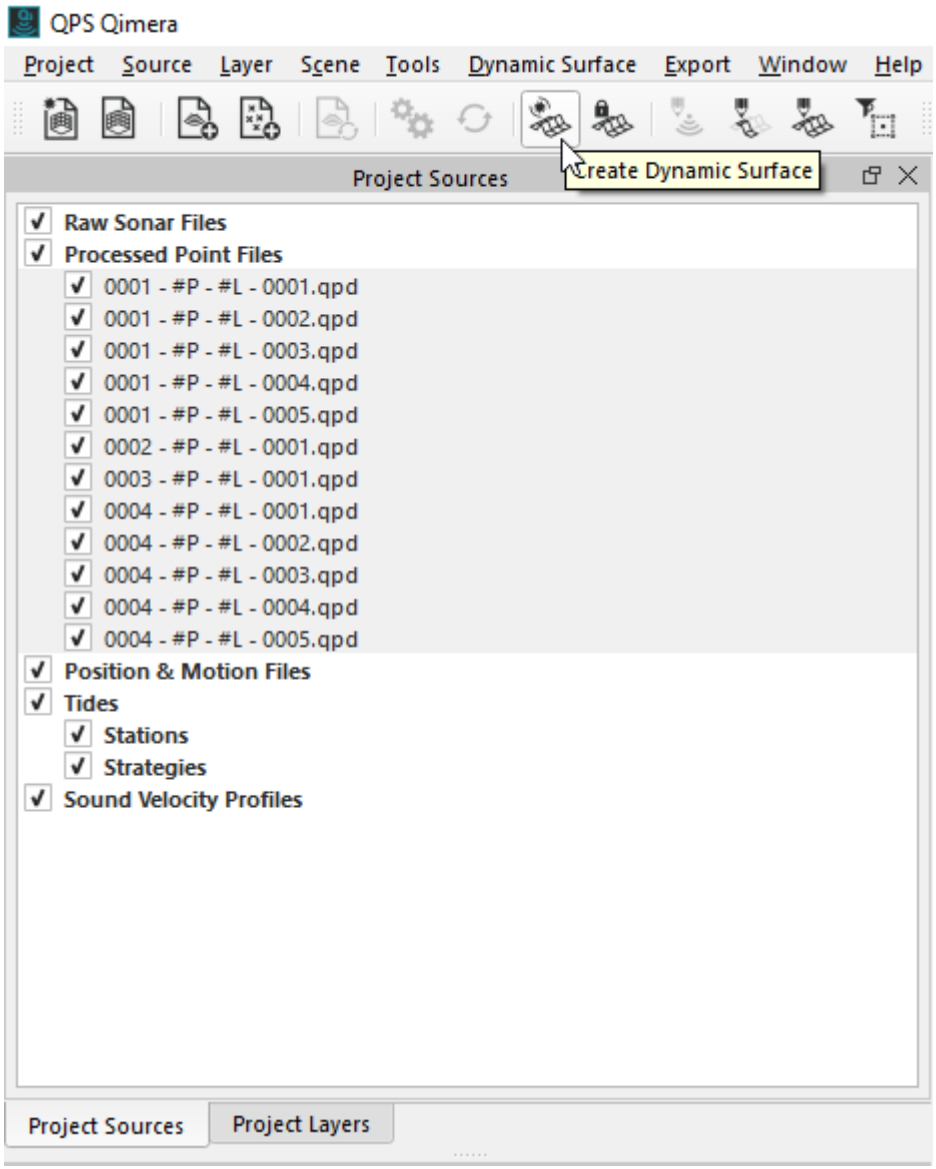
If the tick box "Don't ask again" is checked, Qimera will store this as the default value. You can change this in the Project Preferences - Remembered Prompts.

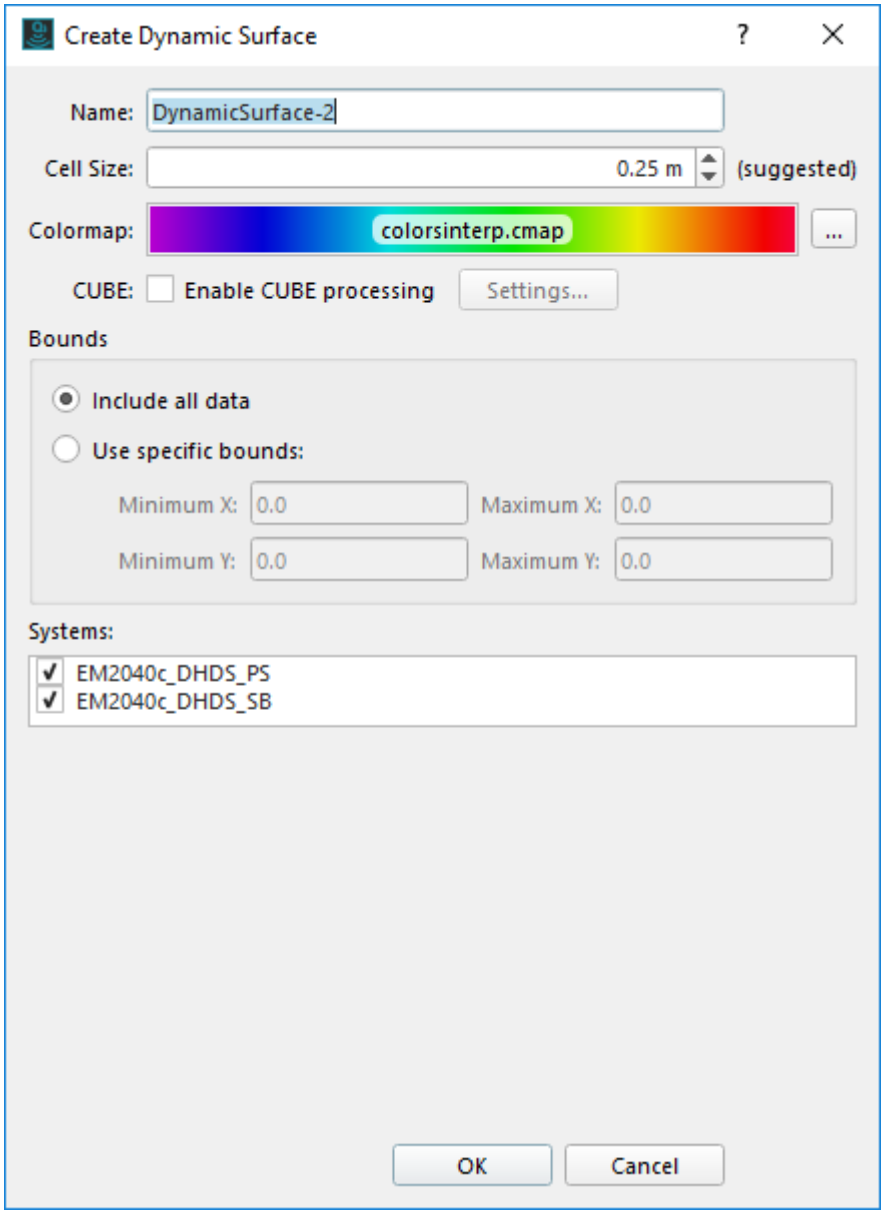
After "Point Cleaning" is selected, Qimera will automatically open the project in the chosen Qinsy folder and it will load the QPDs and Dynamic Surface if available.
Qimera also will open the Point cleaning workspace, which contain the appropriate docks and windows for the data cleaning.



If no Dynamic Surface was created during the survey, you can create one now. Select the *.qpd files and click on the "Create Dynamic Surface" icon .

Now you can define the name and set the cell size. A suggested cell size will be given to you based on the average water depth (from the QPDs) and the average beam angle of a modern mapping system.


QPS Qimera
Project Source Layer Scene Tools Dynamic Surface Export Window Help
Create Dynamic Surface
Project Sources
Raw Sonar Files
Processed Point Files
0001 - #P - #L - 0001.qpd
0001 - #P - #L - 0002.qpd
0001 - #P - #L - 0003.qpd
0001 - #P - #L - 0004.qpd
0001 - #P - #L - 0005.qpd
0002 - #P - #L - 0001.qpd
0003 - #P - #L - 0001.qpd
0004 - #P - #L - 0001.qpd
0004 - #P - #L - 0002.qpd
0004 - #P - #L - 0003.qpd
0004 - #P - #L - 0004.qpd
0004 - #P - #L - 0005.qpd
Position & Motion Files
Tides
Stations
Strategies
Sound Velocity Profiles
Project Sources
Project Layers

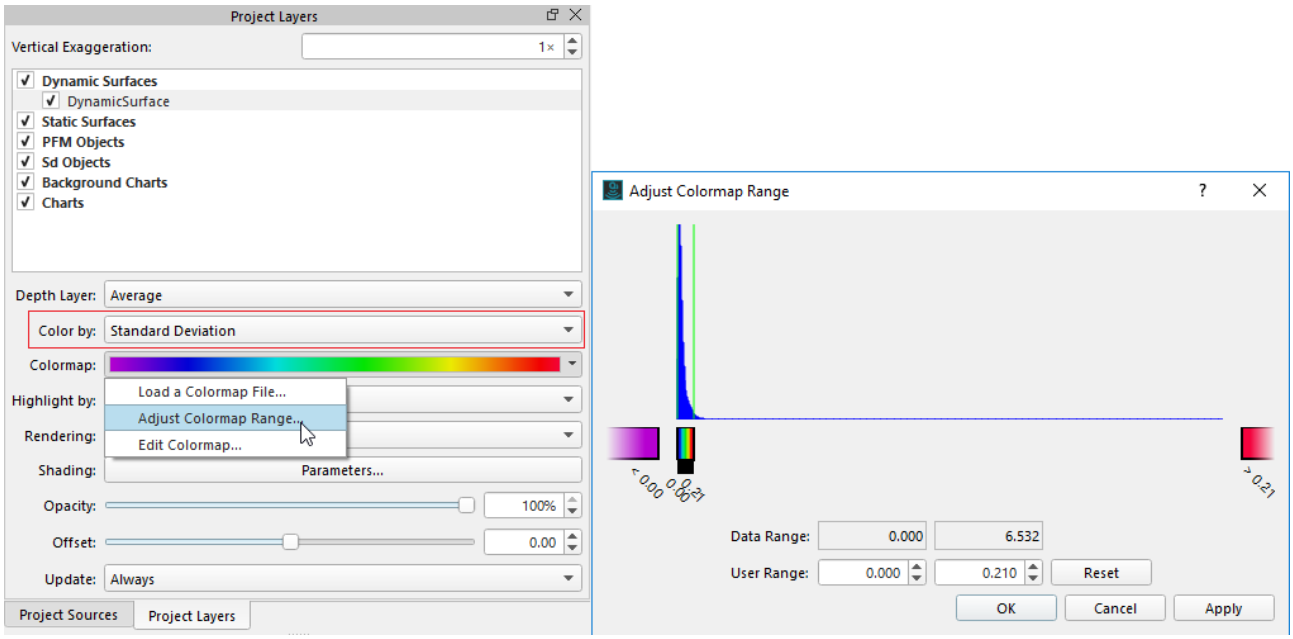


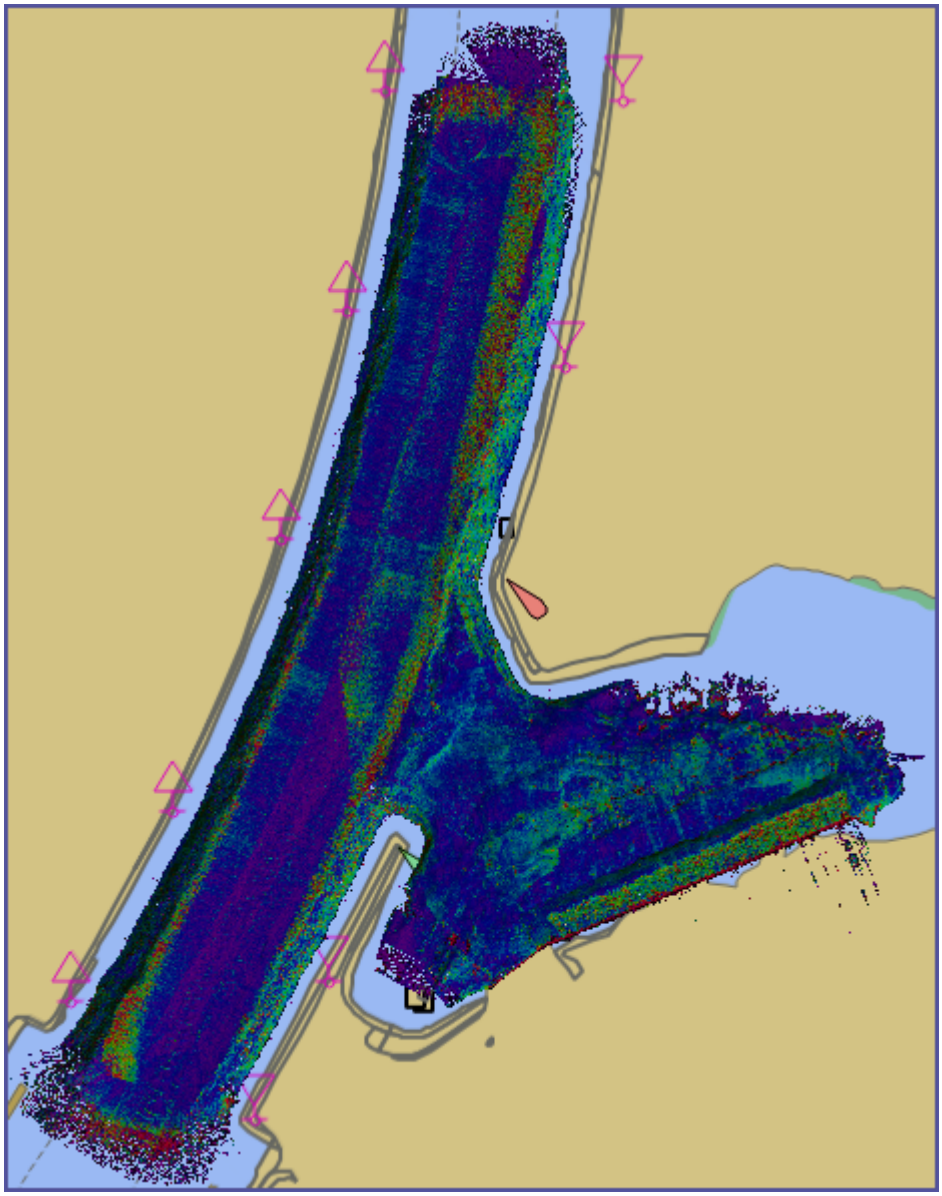
Step 2 Preliminary Check

Before you do any data cleaning, you may find it appropriate to do some quick quality control, to see where your data needs special attention regarding the cleaning. This can be easily done by setting the color coding of the Dynamic Surface to "Color by" : Standard Deviation.
In Project Layers Dock, mouse select the Dynamic Surface, then select "Color by" and select Standard Deviation.

If necessary, the color map can be adjusted to user defined minimum and maximum standard deviation (SD) values, which makes it easy to find large SD values.

Use the left mouse button to adjust the minimum value and the right mouse button to adjust the maximum value.



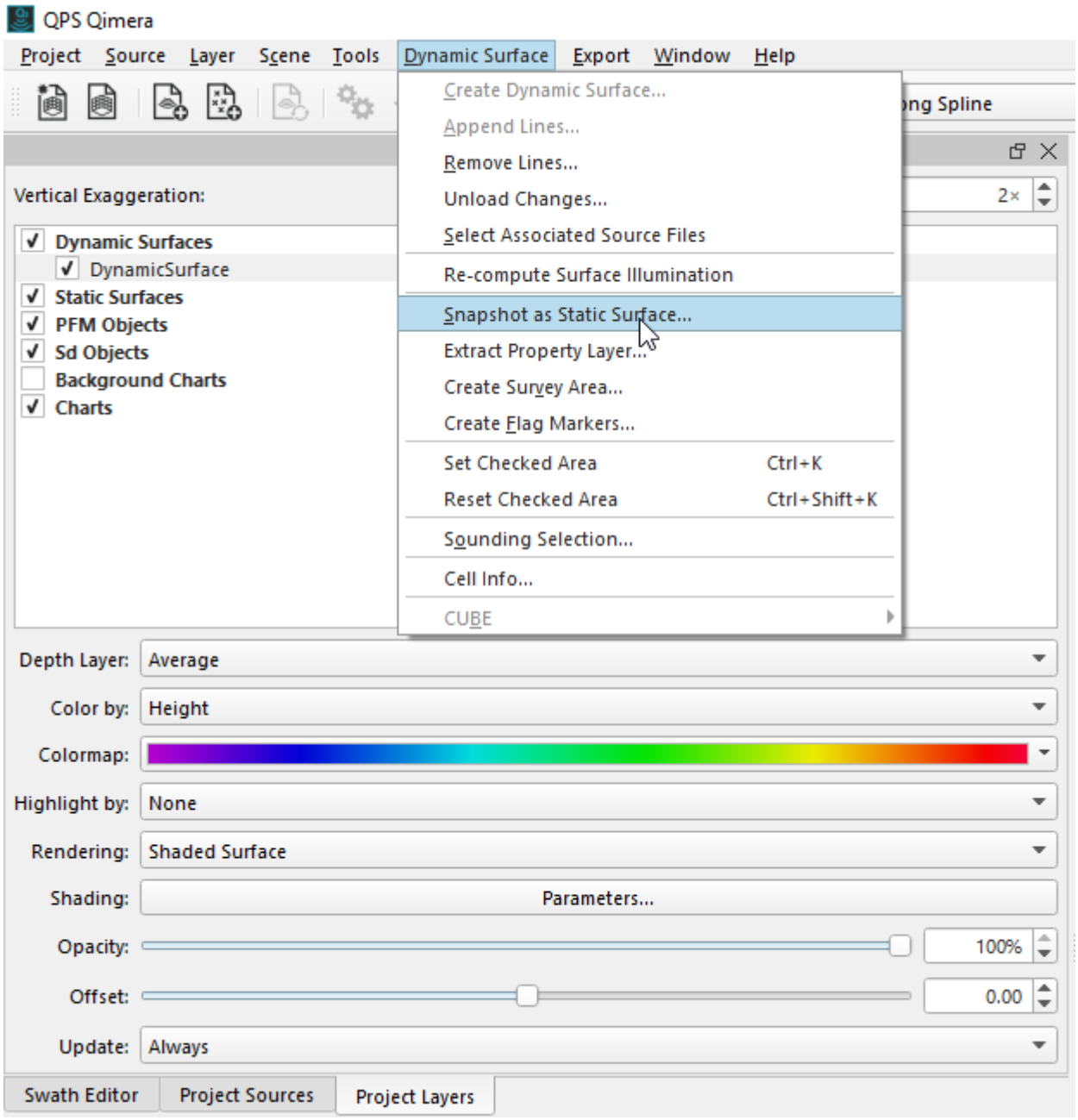


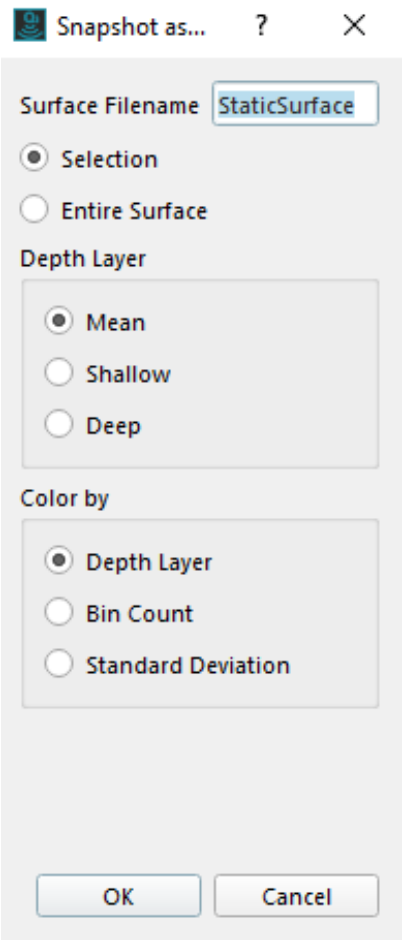
Dynamic Surface Colored by Standard Deviation

Step 3 Create a snapshot

Before filtering it is advised to create a snapshot of the Dynamic Surface. When the data cleaning is finished, you can compare the up to date Dynamic Surface to the surface you started with.

To use the snapshot function, select the Dynamic Surface, then select Snapshot as Static Surface from the Dynamic Surface dropdown menu in the Toolbar.
Choose the appropriate attribute for the Static Surface, you may want to create multiple Snapshots.

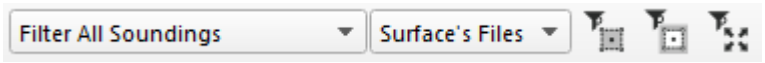

QPS Qimera
Project Source Layer Scene Tools Dynamic Surface Export Window Help
Create Dynamic Surface...
Append Lines...
Remove Lines...
Unload Changes...
Select Associated Source Files
Re-compute Surface Illumination
Snapshot as Static Surface...
Extract Property Layer...
Create Survey Area...
Create Flag Markers...
Set Checked Area Ctrl+K
Reset Checked Area Ctrl+Shift+K
Sounding Selection...
Cell Info...
CUBE
Vertical Exaggeration:
2×
Dynamic Surfaces
DynamicSurface
Static Surfaces
PFM Objects
Sd Objects
Background Charts
Charts
Depth Layer: Average
Color by: Height
Colormap:
Highlight by: None
Rendering: Shaded Surface
Shading: Parameters...
Opacity: 100%
Offset: 0.00
Update: Always
Swath Editor
Project Sources
Project Layers



Step 4 Quickly disable points in polygon

For outlying data it is now possible to use the quickly disable points in polygon. With this option the points inside the polygon will be filtered.

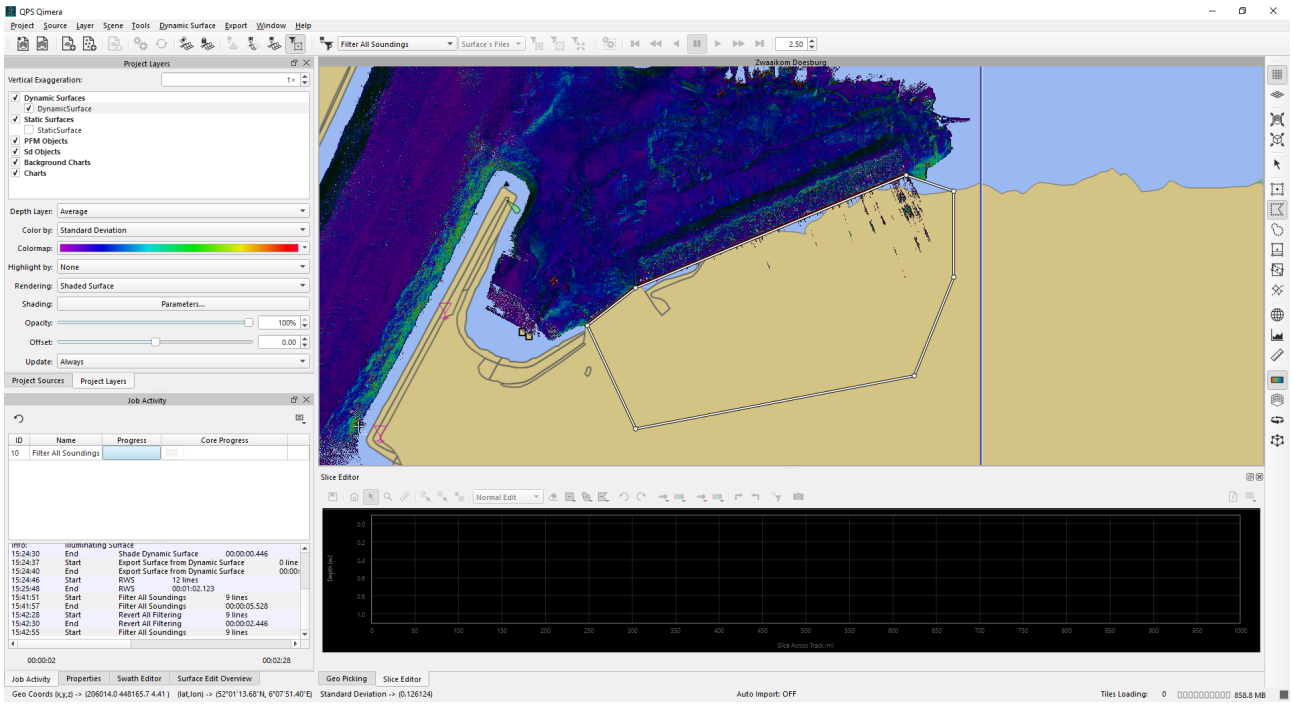
To use this function the following steps have to be taken:

- Select in the filter toolbar "Filter All Soundings" 

- Select the "Enable Surface Filter Editor"  (4)
- Use the Polygon Select  to create a polygon

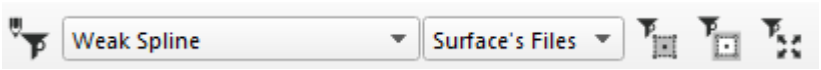
When a polygon is created on the screen the data inside the polygon will automatically be filtered. You can also use the keyboard shortcut Shift+R to apply the current filter in the area that is selected.

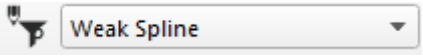
See example below:

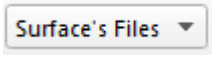


Step 5 Automatic Filtering

Before manual editing, a filter can be used to clean out the spikes. To filter the data the Filter Operation Toolbar can be used.
Below are the steps to filter the data:



- Select the Dynamic Surface in the project layer dock
- Select the preferred filter, for example: spline/rejected soundings/accept sounding or create a filter manually 

- Choose which files have to be filtered, for example: all files/surface's files/selected files 

- Run the filter Inside selection/Outside selection/Everywhere 
- Update Dynamic Surface (this happens automatically, typically) 

Step 6 Manual cleaning

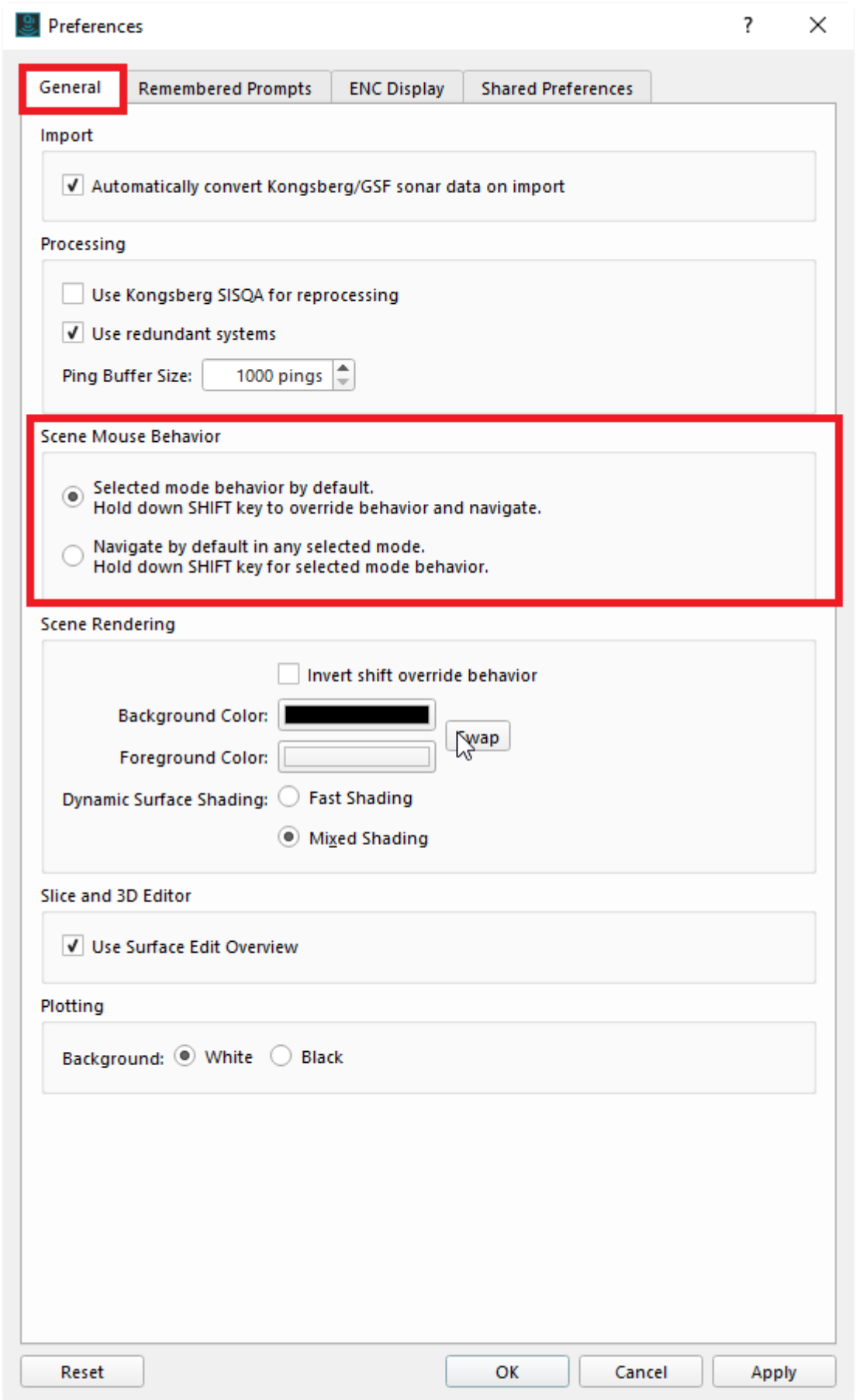
Tips Manual Editing

For working with the Slice Editor see: How-to Qimera - Working with Slice Editor.

> For Spike Hunting use the ALT key and left mouse button: make a spatial selection, click on the spike and 2D or 3D will "hop" to the spike.

Spikes that were missed by automatic filtering may need additional manual cleaning. This can be useful around objects etc. For manual editing a selection needs to be created, this can be done by selecting one of the following icons  and then making the appropriate selection on 4D view (scene).

To make a selection, use the left mouse button (default setting) or choose to use the combination to hold the SHIFT key and make the selection by left mouse. For the second suggested option, the mouse default behavior for the selection should be changed on General tab of Preferences available from the Project Drop down menu.

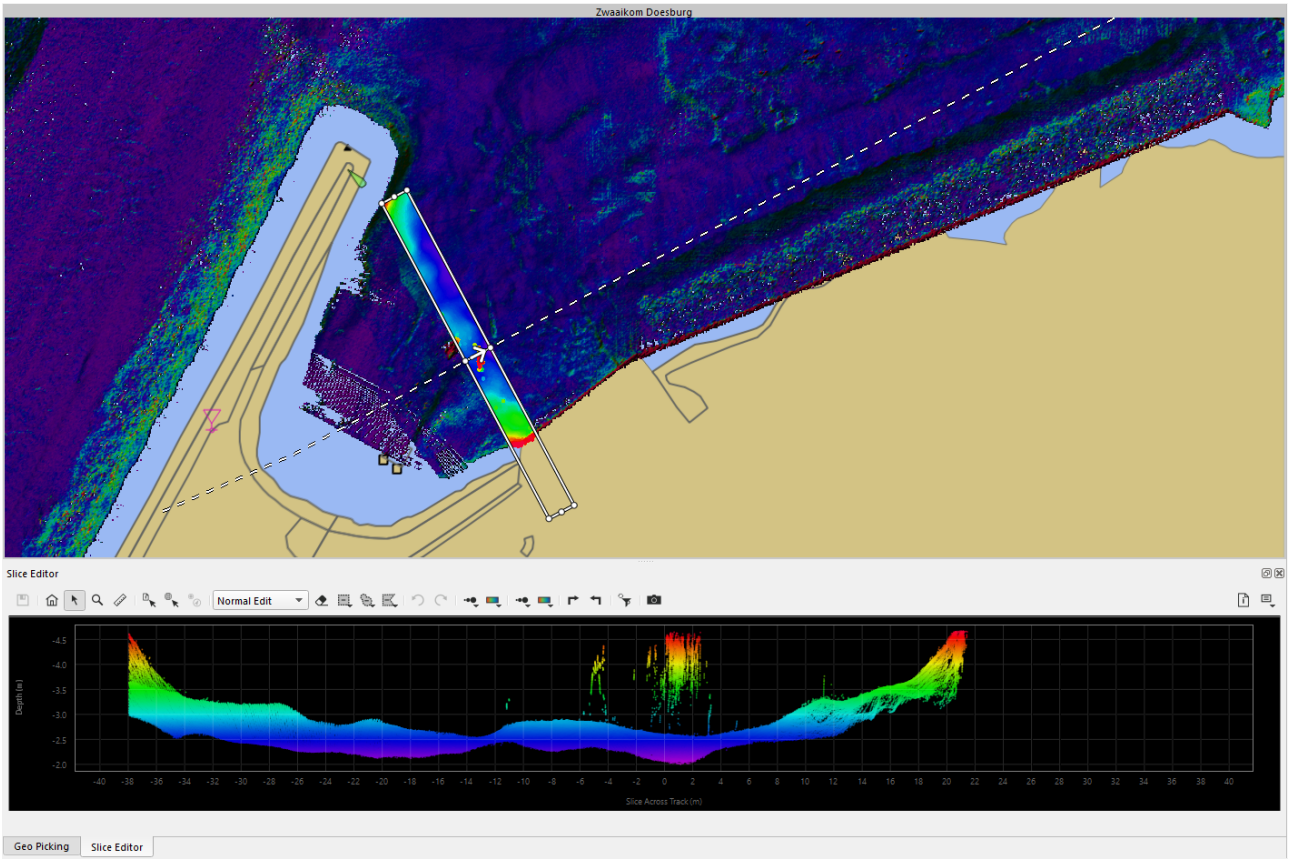

Preferences
General
Remembered Prompts
ENC Display
Shared Preferences
Import
Automatically convert Kongsberg/GSF sonar data on import
Processing
Use Kongsberg SISQA for reprocessing
Use redundant systems
Ping Buffer Size:
1000 pings
Scene Mouse Behavior
Selected mode behavior by default.
Hold down SHIFT key to override behavior and navigate.
Navigate by default in any selected mode.
Hold down SHIFT key for selected mode behavior.
Scene Rendering
Invert shift override behavior
Background Color:
Foreground Color:
Swap
Dynamic Surface Shading:
Fast Shading
Mixed Shading
Slice and 3D Editor
Use Surface Edit Overview
Plotting
Background:
White
Black
Reset
OK
Cancel
Apply

Settings for Secene Mouse Behavior

The advantage of this is that a selection can only be made when holding the shift key; you won't lose your selection when (accidentally) clicking on the 4D view.

For this How-to, the Scroll Slice Select is used . With this button the user can define a path that the selection walks along.
To move the selection, use the W&S buttons to move forward and backwards and the Q&E buttons to rotate the slice box.

To edit the soundings launch the Slice Editor  or press "2".

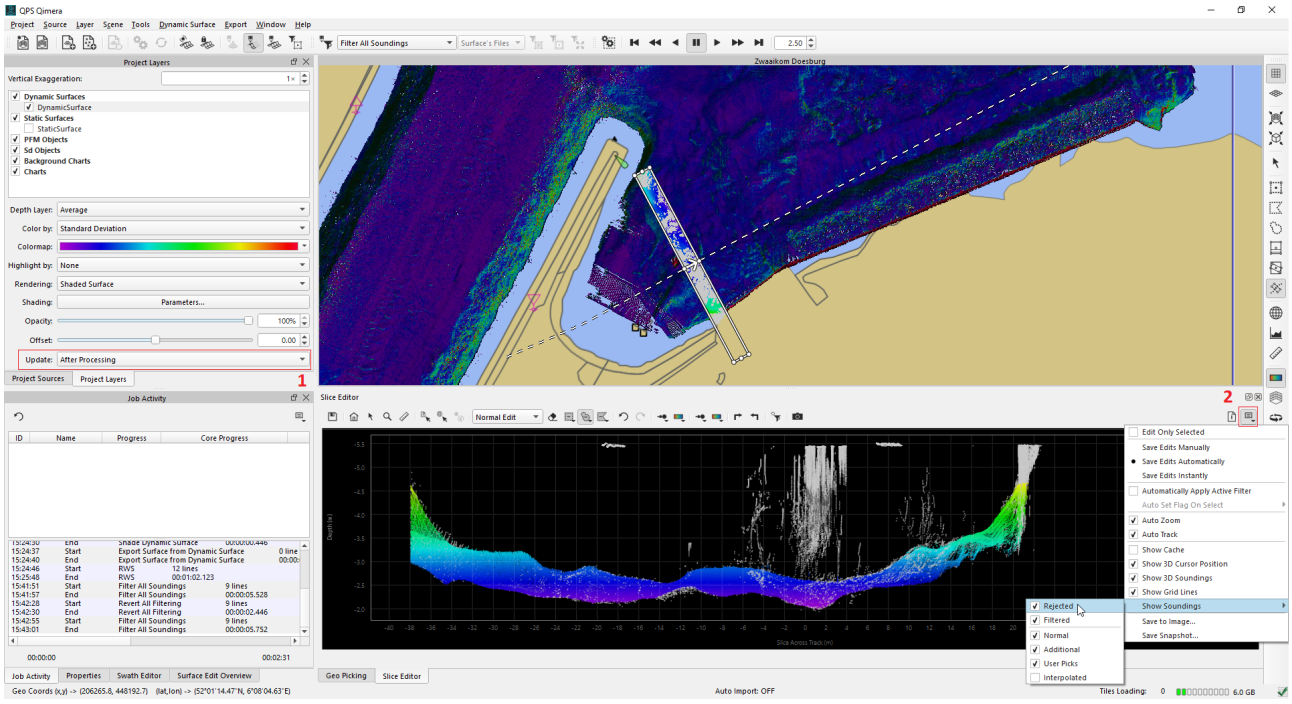


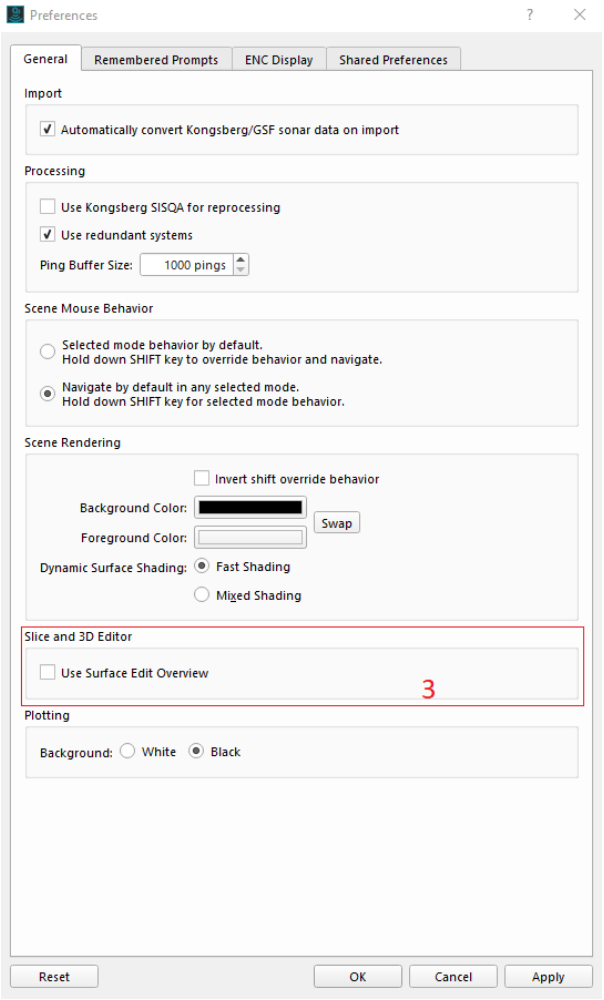
In the slice editor toolbar the user can define the settings for cleaning Reject inside/Reject outside/Color by system/Color by depth/etc.



For faster editing you can select the Dynamic Surface to update "After Processing"(1), the Slice Editor is not showing rejected soundings (2) (CTRL+R), and the "Use Surface Edit Overview" in the Preferences is un-ticked (3).
After cleaning, remember to change the Dynamic Surface update back to 'Always' or apply the edits (right click on the Dynamic Surface and select 'Update Dynamic Surface from

Edits').
This is only necessary if you have changed the update setting.

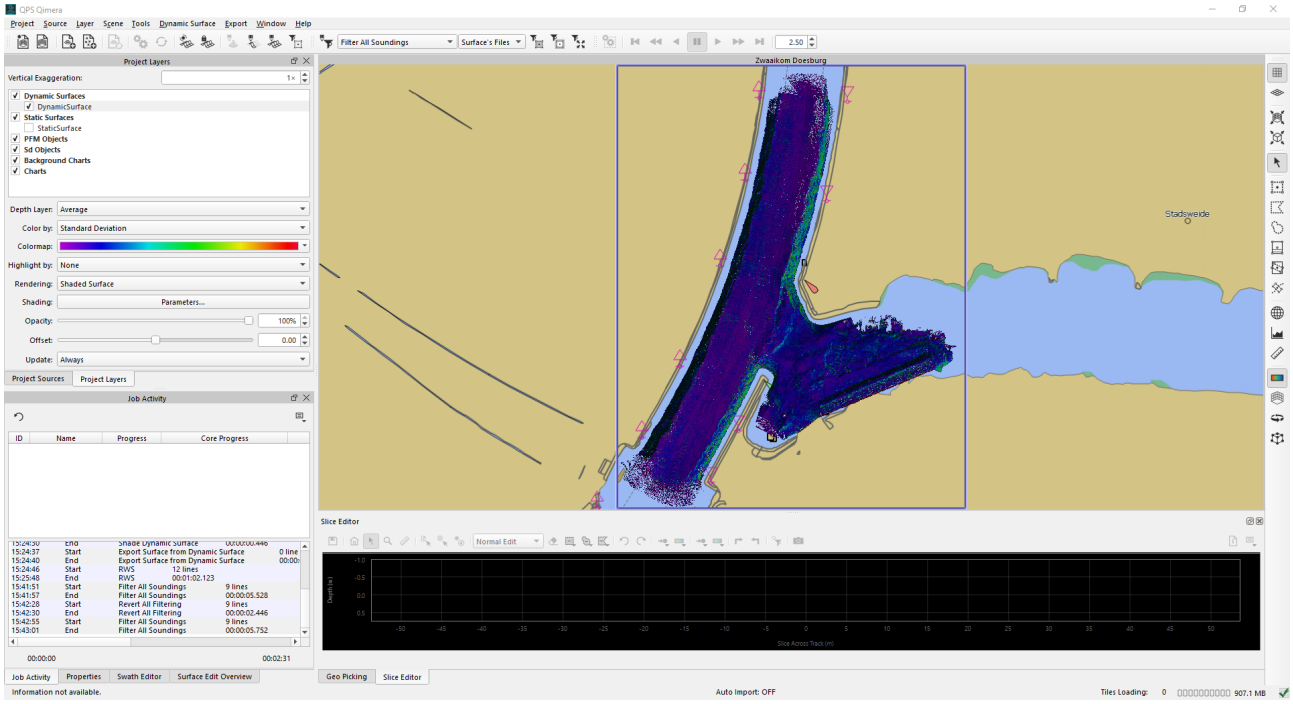

QPS Qimera
Project Source Layer Scene Tools Dynamic Surface Export Window Help
Project Layers
Vertical Exaggeration:
Dynamic Surfaces
DynamicSurface
Static Surfaces
StaticSurface
PFM Objects
Sd Objects
Background Charts
Charts
Depth Layer: Average
Color by: Standard Deviation
Colormap:
Highlight by: None
Rendering: Shaded Surface
Shading: Parameters...
Opacity: 100%
Offset: 0.00
Update: After Processing
Project Sources
Project Layers
1
Job Activity
ID Name Progress Core Progress
Job Activity
Properties
Swath Editor
Surface Edit Overview
Zwaaikom Doesburg
Slice Editor
Normal Edit
2
Edit Only Selected
Save Edits Manually
Save Edits Automatically
Save Edits Instantly
Automatically Apply Active Filter
Auto Set Flag On Select
Auto Zoom
Auto Track
Show Cache
Show 3D Cursor Position
Show 3D Soundings
Show Grid Lines
Show Soundings
Save to Image...
Save Snapshot...
Rejected
Filtered
Normal
Additional
User Picks
Interpolated
Geo Picking
Slice Editor
Auto Import: OFF
Tiles Loading:



Step 7 Final Quality Control

After manual cleaning, re-examine the Dynamic Surface by setting the color coding to "Color by: Standard Deviation" and confirm the dynamic surface (and the related QPD) look okay.

You can decide to activate 3D view  (or press 3) and use the color coding tools to examine data quality.


QPS Qimera
Project Source Layer Scene Tools Dynamic Surface Export Window Help
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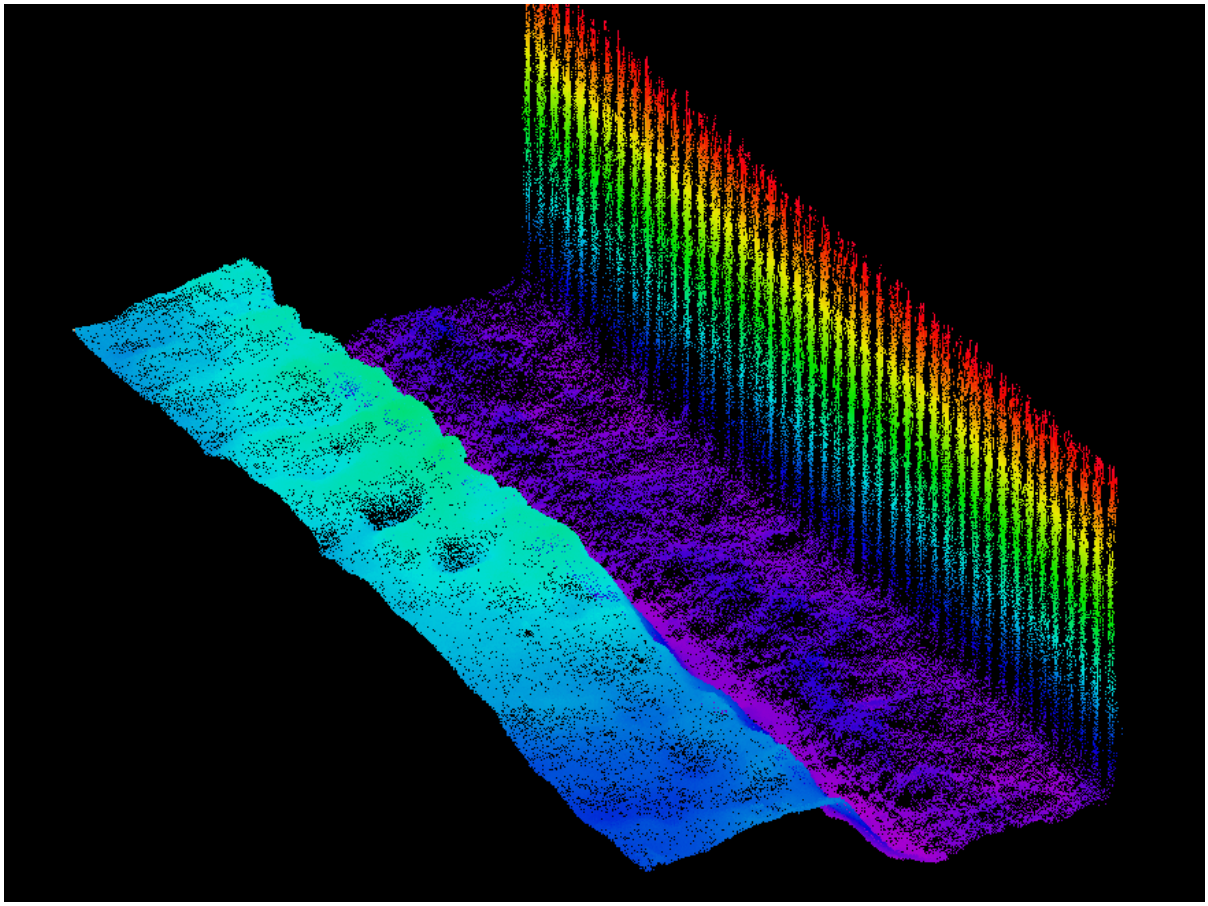
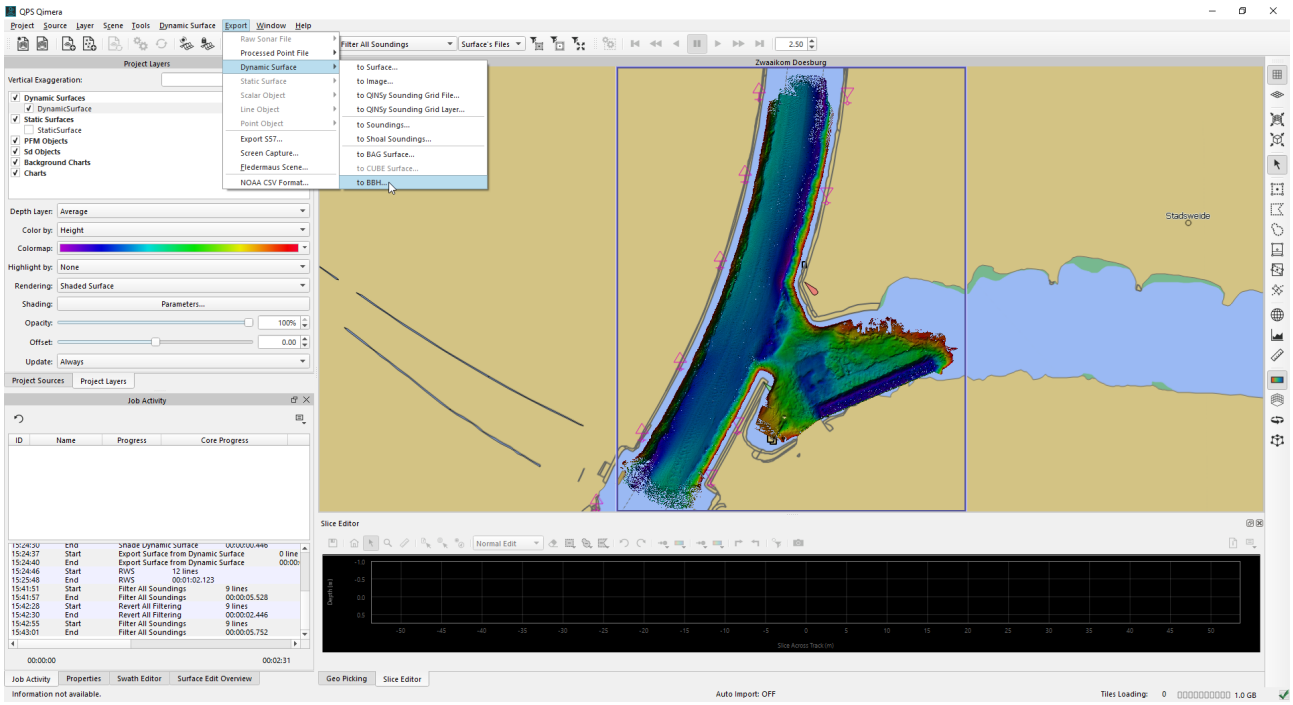
Vertical Exaggeration:
Dynamic Surfaces
DynamicSurface
Static Surfaces
StaticSurface
PFM Objects
Sd Objects
Background Charts
Charts
Depth Layer: Average
Color by: Standard Deviation
Colormap:
Highlight by: None
Rendering: Shaded Surface
Shading: Parameters...
Opacity: 100%
Offset: 0.00
Update: Always
Project Sources
Project Layers
Job Activity
ID Name Progress Core Progress
Zwaaikom Doesburg
Stadsweide
Slice Editor
Normal Edit
Job Activity
Properties
Swath Editor
Surface Edit Overview
Geo Picking
Slice Editor
Information not available.
Auto Import: OFF
Tiles Loading:

3D view:



Step 8 Data Export

Once you trust the data meets the requirements, you can proceed to the next step in your workflow, for example to export the clean surface to the desired ASCII file format.



How-to Production Line Processing Workflow

This How-to outlines in what way Qimera combines multiple processing projects into one Master cleaning project (or a final QC project). This workflow enables users to divide data processing work loads, it also enables one data processor to process data acquired during multiple days or by multiple vessels and add those to a master cleaning project. You can go back and forth in the processing and cleaning. This way you can keep the mathematical processing in small processing projects and the cleaning in one big master project. This is part of our answer to "multi-user".

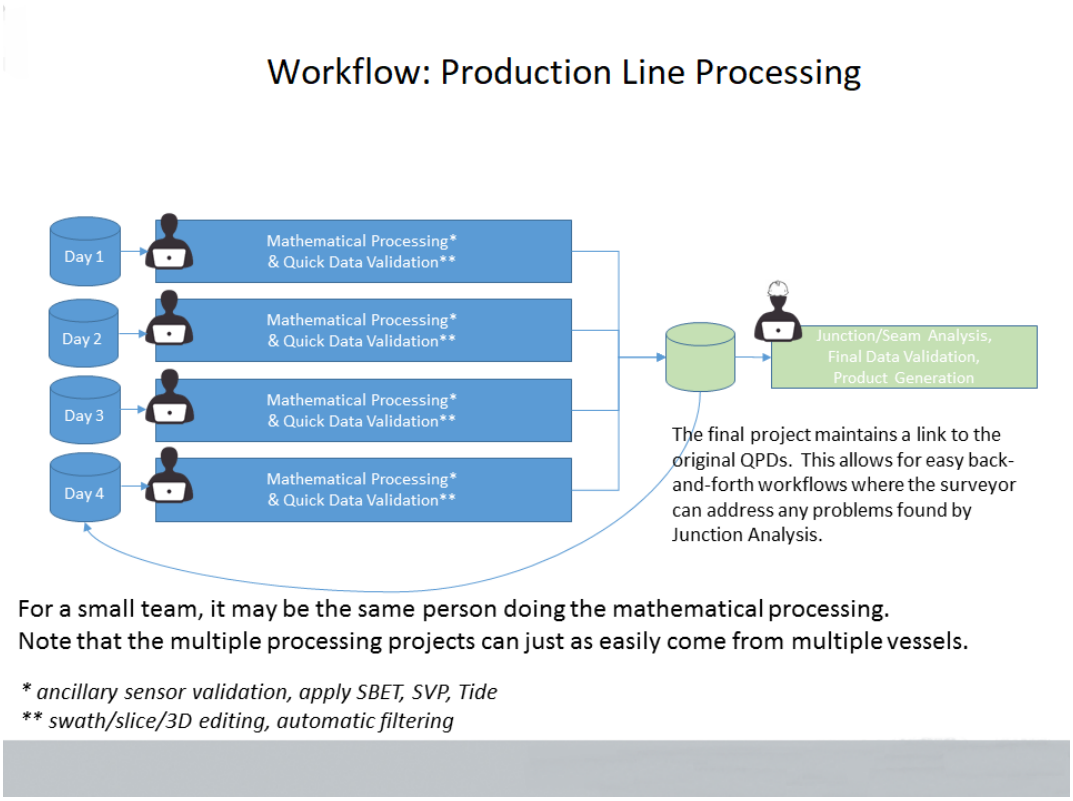
On this page:

- Step-by-step guide
- Related articles

The step-by step guide below discusses the example of two data processors on board the MV Quinny Load, each data processor will be processing a different set of files in their small (local) project and from there they will be building one Master cleaning Project from those two small processing projects.

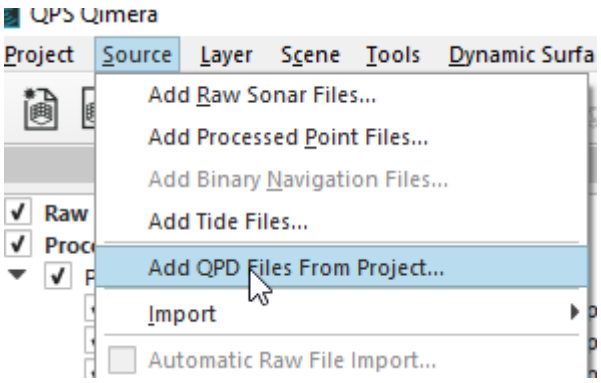


The QPDs reside in the original Processing Project. This is the only copy of these QPDs present for this workflow, so care must be taken to ensure that only a single Qimera project is writing to these files at a time. Either the Processing Project or the Master Project can be making changes to a given set of QPDs at a certain time, not both concurrently.



Step-by-step guide

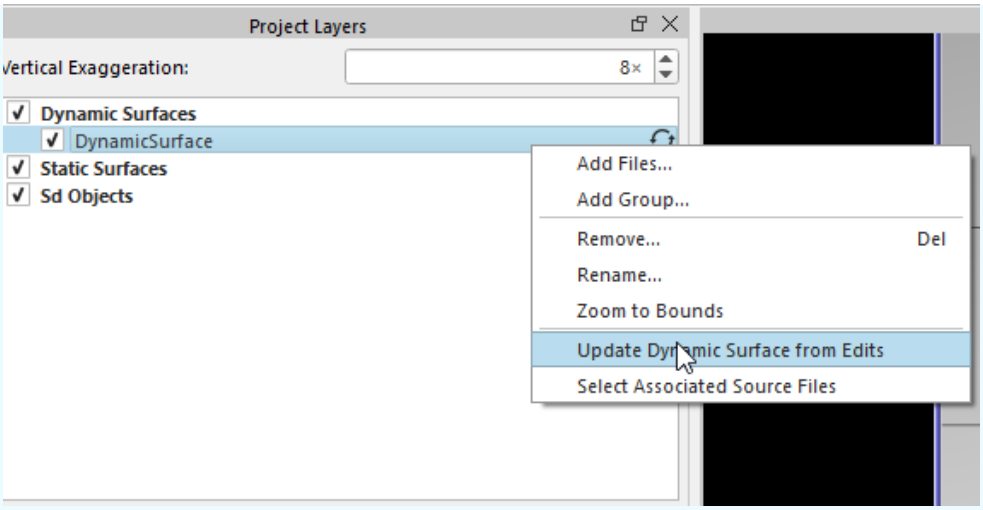
1. Data processor 1: creates a new Project "Processing Project 1" and imports Raw sonar files lines 1-100.
2. Qimera extracts the files, then the data processor sets the correct processing settings, and builds a dynamic surface.
3. Data Processor 2: creates a new project "Processing Project 2" and imports raw sonar files 101-200 . Then step 2 (above).
4. Both data processors do the processing and cleaning jobs they are used to doing and they are QC-ing the data here after.
5. Then create the master Project called Assembly project. Don't load any Raw sonar or Processed Points files.
6. Under the Source drop down menu, 'Add QPD Files From Project', browse to the Processing Project 1 and select OK.
   This brings in the QPDs from the Processing Project. (From here you can't do any mathematical processing anymore, just point cleaning).



7. Import Processing Project 2. Repeat step 6 until all processing projects have been imported.
8. Make a Dynamic Surface based on the imported projects (QPD). The QPD files live in the project in which they were originally created. Just right mouse click on the QPD and open the Containing Folder for the File Path.
   (So if you would notice a problem in the QPD, you could tell the processor to have another look at the data he has worked on).
9. Continue the cleaning and filtering in the Master Project if necessary.

For any mathematical re-processing of the data, you would need to revert to the appropriate Processing project.

The Processing Project would notice the Dynamic surface is out of date, when any additional cleaning/filtering was done in the Master Project and vice versa.
Just right click on the Dynamic Surface in the project, then choose to 'Update the Dynamic Surface from Edits' to bring the Dynamic Surface up to date.



Related articles

Howto Qimera - Scroll referencing

How-to Work with Slice Editor

How-to Filter Operations and Filtering Profiles

How-to Spline Filtering details

How-to Clean Data with the Swath Editor

How-to Cooperative Cleaning Workflow

How-to Scroll referencing

This article explains the scroll referencing for the 3D editor and Slice Editor selection box. There are two methods of scroll referencing, both methods are explained in this article.

On this page:

- Step-by-step guide
  - Method 1: Scroll selection box is drawn perpendicular to scroll reference line
  - Method 2: Use navigation as scroll referencing
- Related articles

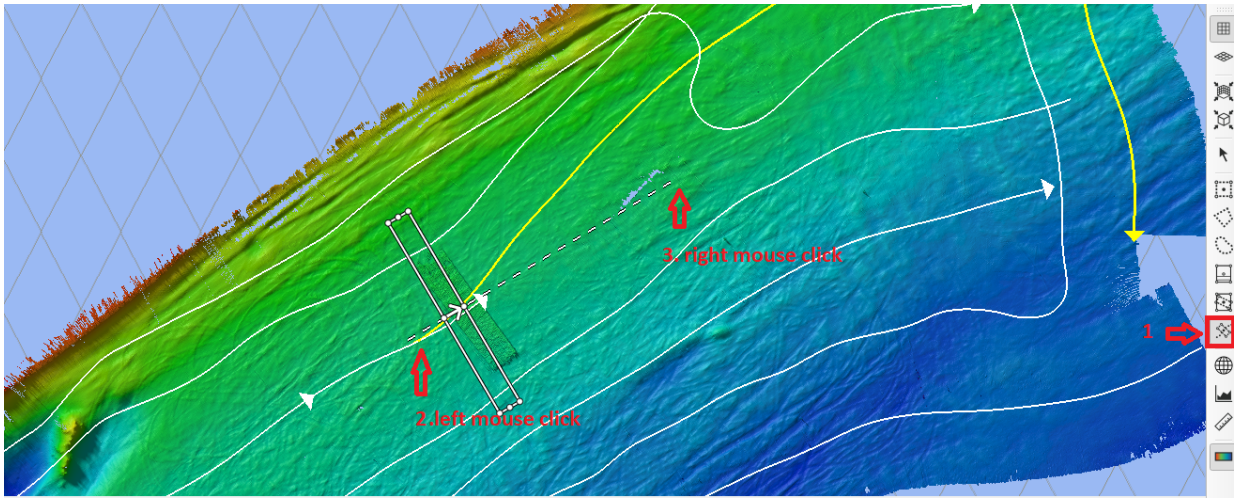
We have implemented an option to change default left mouse button behavior based on workshop feedback with former Qloud users. The default left mouse button will remain the same in you need to hold down the Shift key to adjust the view in the Scene when you are in another mode such as polygon selection. The new optional mode leaves the left mouse button always in navigation mode and you hold down shift to activate the secondary mode, such as to draw a polygon. Many Qloud users have found this second mode more intuitive in that you can draw a selection and then it remains where you drew it when you attempt to adjust the 3D view. This setting is available in the 'General' tab of the Qimera Preferences.

Having this new option active would mean that a 'Ctrl + left mouse click' would become 'Ctrl + Shift + left mouse click' for activating the scroll referencing.

Step-by-step guide

Method 1: Scroll selection box is drawn perpendicular to scroll reference line

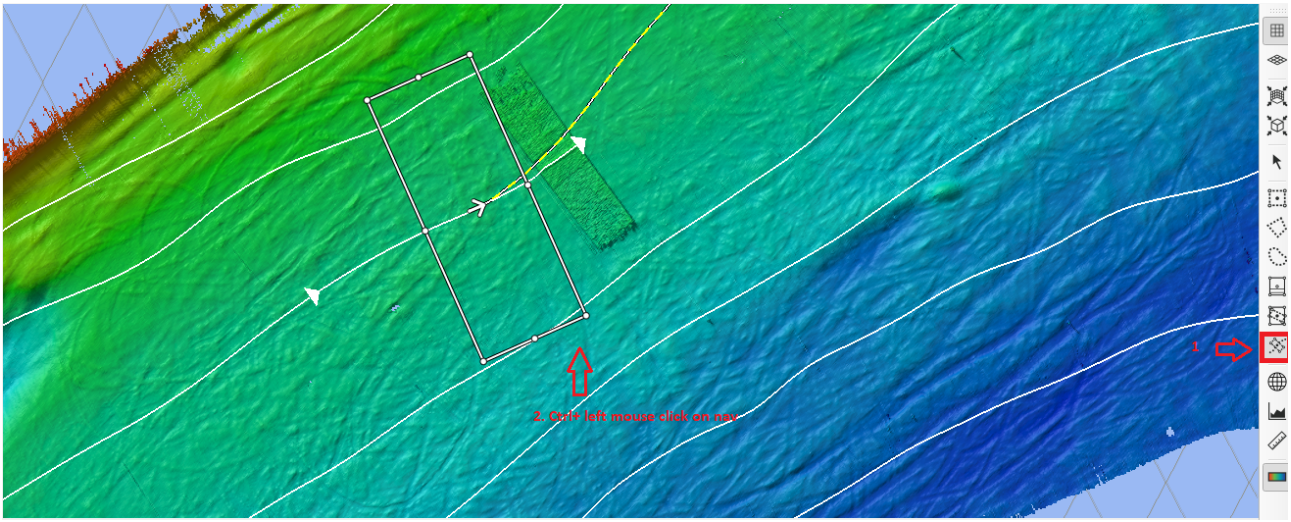
1. Make a selection for Slice Editor or 3D editor by using the scroll select tool on the 4D scene.
2. In main scene draw the scroll reference line by left mouse clicking to start drawing the scroll reference line (this can be multi-segment by again clicking left), a scroll selection box will be drawn perpendicular to this automatically
3. Click right to close the scroll reference line line
4. Launch 3D editor or Slice Editor to clean soundings
5. The scroll box can be moved up and down along the scroll reference line by using the hotkeys WASD or the key combinations Ctrl+ → and Ctrl+ ↓ on your keyboard to move the box up and down



Scroll selection

Method 2: Use navigation as scroll referencing

1. Draw the scroll reference line as described in method 1, steps 1-3
2. Now hold the Ctrl key and left click on the navigation. The scroll box is now linked to the navigation, the scroll box is drawn perpendicular to the navigation at the start of the line, the navigation can be used as the scroll referencing for 3D editor or Slice Editor
3. Launch 3D editor or Slice Editor to clean soundings
4. The scroll box can be moved up and down along the navigation by using the hotkeys WASD or the key combinations Ctrl+ → and Ctrl+ ↓ on your keyboard to move the box up and down



Scroll selection and linking the scroll box to the navigation by using Ctrl+ left mouse click

Related articles

How-to Work with Slice Editor

How-to Spline Filtering details

This documents explains the QPS Spline Filter. It also provides an example of how to apply the Spline filter in Qimera.

On this page:

- Introduction to Spline
  - The First Pass
  - The Second Pass
- How to select and apply the spline filter
- Spline Technical Information
- Creation of Custom Spline Filter
- Additional Information

In Qimera 1.3 the predefined spline filters were renamed:

Qloud filter name	Qimera filter name
Extremely High Detail	Very weak
NL Norm A	Weak (NL Norm A)
SMA Exclusive Order	Weak
NL Norm B	Weak (NL Norm B)
IHO Special Order	Medium
IHO First Order	Strong
IHO Second Order	Very strong

Introduction to Spline

The QPS Surface Spline Filter was developed in 2002 for use in Qloud.

The underlying principle of this filter is that it attempts to fit a surface through noisy multibeam echosounder data and clip all footprints that lie too far from this surface.

The QPS Surface Spline Filter does more or less the same as a data processor would do manually, i.e. it attempts to determine what the bottom, or a feature on the bottom, is by fitting a surface spline through the noisy footprint data and filter out any footprints that lie far away from this surface.

The filtering is done in two passes:

a. The first pass will create a spline and identify large blunders.
b. A second pass will create a refined spline used to flag soundings.



The surface spline used in this algorithm is known in literature as a Thin Plate Spline. Please see Additional Information at the end of this How-to for articles by Bookstein and Belongie on the thin plate spline and its application.

The First Pass

A surface spline will be deformed if large spikes are present. In other words, blunders (large spikes in the data) have an effect on the fitted surface. These spikes need to be removed to achieve a surface that fits ‘nicely’.

A surface spline is considered a nice fit, if the Root Mean Square of all differences between the surface and the actual points is smaller than the set threshold. This value will be called the deviation.

The threshold is the first filter parameter and is expressed as a percentage (default 0.5%) of the depth.

As the surface is calculated if the deviation is larger than the threshold, four points are removed from the spline dataset:

a. the footprint with the maximum height
b. the footprint with the minimum height
c. the footprint with the largest positive difference with the surface
d. the footprint with the largest negative difference with the surface

The surface is then recalculated and if the deviation is now below the threshold, the surface is determined to be a 'nice' fit. If the deviation is still above the threshold, four points are removed again, as described above and a surface is fitted again. This process iterates until either the deviation target is reached, or more than half of the initial points are discarded.

As soon as a surface that fits nicely is available, all points that have a larger difference are filtered out. The parameter is the first-pass SD factor.

The Second Pass

Once the largest errors are filtered, all remaining points are used to create a new spline surface. This second pass is then used to filter out all the soundings that lie farther than the calculated distance from the new spline surface. The parameter used here is the second-pass SD factor.

Note that points that were filtered in the first pass can be unfiltered in this pass. This is needed since the surface that was determined in the first pass was calculated with a reduced data set.

How to select and apply the spline filter

The Spline filter can be applied via the Filter Profile Operation Toolbar or the Slice Editor. Please see these pages for more information:

How-to Filter Operations and Filtering Profiles

How-to Work with Slice Editor

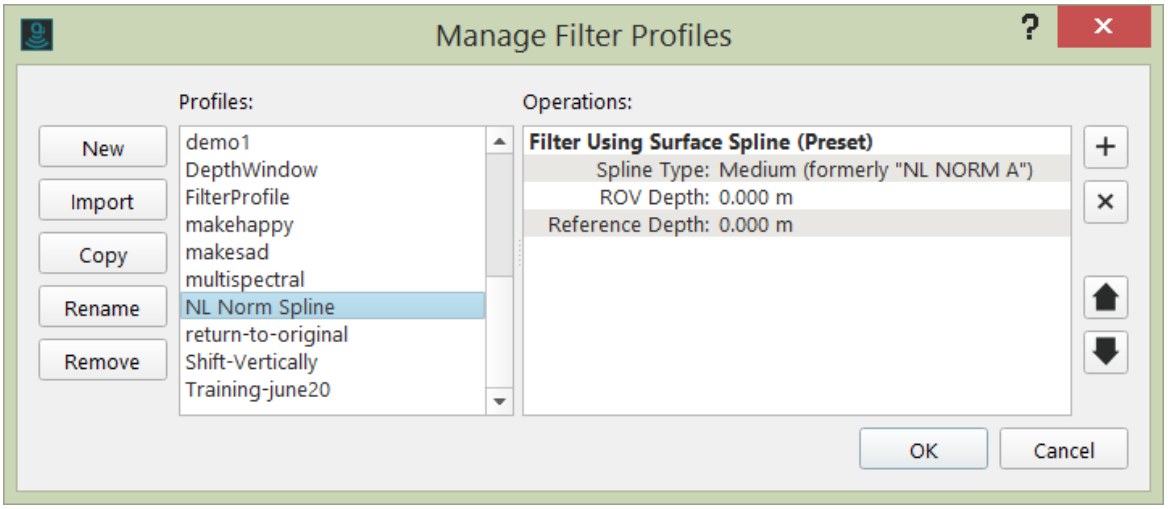
Spline Technical Information

Approximations for the IHO specifications below have been pre-configured and are available as preset spline filters in Qimera.

IHO S44	Depth Range(m)	a	b
Very Weak (Extremely High Detail)	0 - 10	0.05	0.00020
Weak (Exclusive Order)	0 - 20	0.15	0.0040
Medium (Special Order)	0 - 20	0.25	0.0075

IHO S44	Depth Range(m)	a	b
Strong (First Order)	20 - 50	0.50	0.0130
Very Strong (Second Order)	50 - 100	1.00	0.0230

NLNORMA and NLNORMB - The NL Norm A and NL Norm B filters have been determined by the Dutch Government to comply with RTK fixed surveys in shallow waters. These filter presets are only available when creating a new filter profile.



Creation of Custom Spline Filter

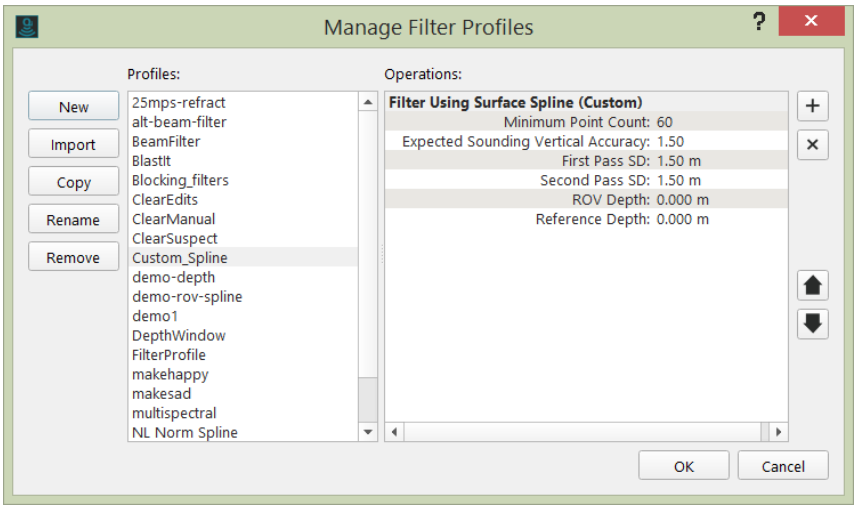
The Filter Operation Toolbar allows for the creation and application of custom filters.

Here is a brief summary of the Spline Filter parameters:

1. Number of points - The number of points processed at once. If this number is reduced, the filter takes significantly less computation time, but accuracy is affected. Intuitively, one can understand that if not enough points are considered, a local cluster of blunders may be considered as a valid surface. The number of points should be set as high as possible, while a reasonable filter speed is maintained. A higher number of data points will allow the filter to more accurately follow the surveyed terrain.
2. Sensor Level:
3. Reference Level:
4. The first-pass Standard Deviation factor. Recommended range: [1.0 … 4.0], where 1.0 is a strong filter action and 4.0 a weak one. It is important that this factor is set to such a value that large blunders are eliminated, so it should not be too high. Since the surface spline

determined in the first pass is not as accurate as the spline of the second pass, this factor should also not be set too low, to prevent the accidental filtering of valid data points. A good starting point seems to be: 2.0.

5. The second-pass Standard Deviation factor. Recommended range: [1.0 … 4.0]. This is the most important parameter in my opinion. Once a surface with a certain difference to the original data points has been determined, this parameter determines if a point is filtered or not.
6. Approximation factor, expressed in a percentage of the depth. This is similar to the IHO orders that specify a minimal vertical Total Propagated Uncertainty to be achieved when surveying. One can say that the expected accuracy of the survey must be used as this parameter.



It's the QPD's that are filtered by the Spline Filter. DS-es built from Spline Filtered QPD's will update accordingly. This might implicate a re-build for multiple DS-as after spline filter application and this might clarify cases of all DS-es being rebuilt after Spline filer application.

For a start, run the Spline Filter on a small area for testing with the Slice Editor. When you're happy with the results, run the filter on the entire survey. Please note this suggestion only applies to an area with little seafloor variation.

To un-reject soundings rejected by the Spline filter, use the Revert All Filtering function, which is available from the Filter Operation Toolbar

Additional Information

Papers on thin-plate spline filters and their applications:

"Principal warps: Thin-plate splines and the decomposition of deformations" - Bookstein, F.L.- IEEE Transactions on pattern analysis and machine ...*IEEE Transactions on Pattern Analysis and Machine Intelligence, 11*(6), 567-585., 1989. Retrieved from http://user.engineering.uiowa.edu/~aip/papers/bookstein-89.pdf.

"Approximate thin plate spline mappings" - Donato,G., Belongie, S. - Computer Vision—ECCV 2002, 2002 - Springer. Retrieved from http://vision.ucsd.edu/sites/default/files/fulltext(4).pdf.

"Shape matching and object recognition using shape contexts" - Belongie, S., Malik, J., Puzicha, J. - Pattern Analysis and Machine ..., 2002. Retrieved from http://staff.science.uva.nl/~rein/UvAwiki/uploads/HVisser/Shape_Matching_and_Object_Recognition_Using_Shape_Contexts_Belongie_Malik_Puzicha.pdf

Ebelien van der Velde [QPS] (Deactivated)
Dymphke van der Geer [QPS] (Deactivated) this is somewhere between a Technical Document and a How-to. I am moving it across because it is better to have something in the KB than nothing. But post release I would like to come back and create two documents based on this. Cheers A

Anya Duxfield (Deactivated) agreed

Ebelien van der Velde [QPS] (Deactivated) I have removed your citation numbers. For 1 since we are citing a QPS document in a QPS document (that we are not prepared to share outside of organisation) citation is not valid. For the acronymns 2 and 3 I replaced with full terminology (for people like me who have to think hard to remember what RMA and TPU stand for so we do not have to follow a link to be reminded 🙂)

The document linked below is for QPS Staff Eyes Only and is linked here to assist in understanding.

How-to Work with Slice Editor

This article describes how to manually delete spikes from your DTM. Slice Editor interacts with Surface Edit Over view.
This article will explain different ways of additional manual cleaning, assuming filtering has been done, the data set is almost clean and is almost good to go for final delivery.

On this page:

- Step-by-step guide
  - Method 1 Using Free Slice Select or Fixed Slice Select on areas of interest based on grid SDs
  - Method 2 Using partitions when in Fixed Slice Select mode
  - Method 3 Linked line method, Start slicing by "marching along the line"
- Applying a filter profile in the Slice Editor
- Related articles

Before you start, please take note of the following: Soundings rejected in Slice Editor, are being marked invalid in the QPD (Processed data file) that corresponds with the raw sonar file. Raw sonar files themselves are not affected by edits done in Slice Editor. The Qimera Dynamic Surface reflects the edits.

We have implemented an option to change default left mouse button behavior based on workshop feedback with former Qloud users. The default left mouse button will remain the same in you need to hold down the Shift key to adjust the view in the Scene when you are in another mode such as polygon selection. The new optional mode leaves the left mouse button always in navigation mode and you hold down shift to activate the secondary mode, such as to draw a polygon. Many Qloud users have found this second mode more intuitive in that you can draw a selection and then it remains where you drew it when you attempt to adjust the 3D view. This setting is available in the 'General' tab of the Qimera Preferences.

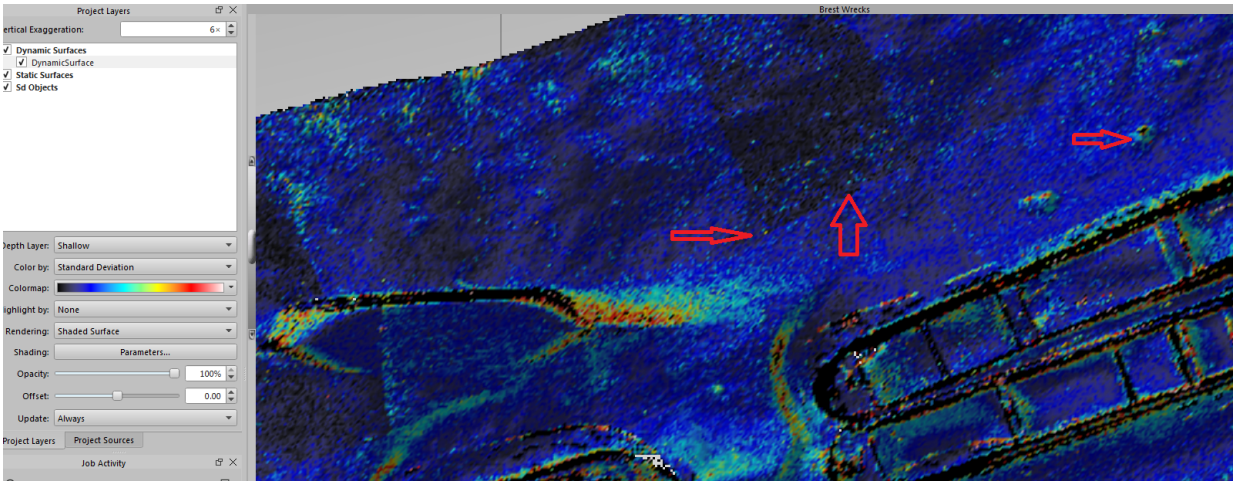
Step-by-step guide

Of course there are different ways of getting to an end result that would be acceptable. Below we will explain 3 methods.
There are possibly more good methods. Iif you feel like sharing them with us, please e-mail to support@qps.nl

Method 1 Using Free Slice Select or Fixed Slice Select on areas of interest based on grid SDs

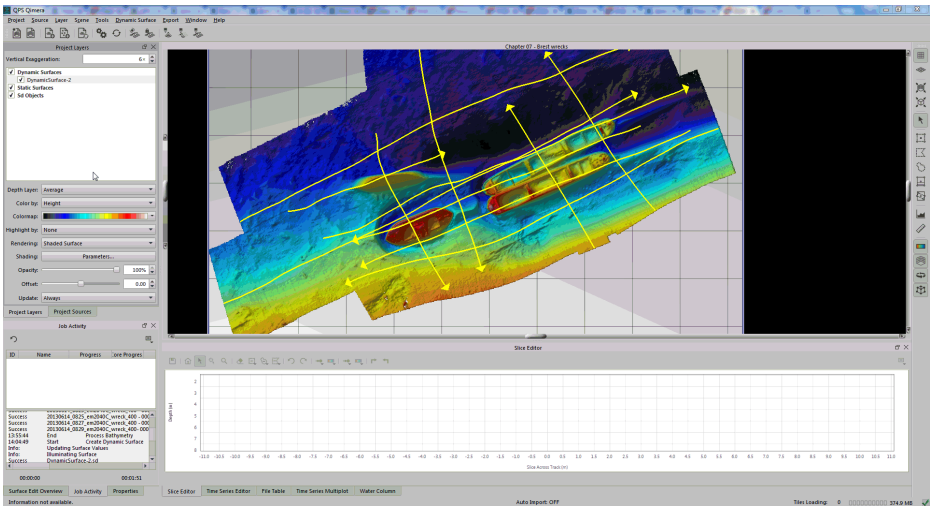
This method is an efficient way of cleaning large surveys

1. Ensure to have all required processing applied, like SVP, heights, blocking settings, filtering et cetera. Also see Qimera Processing Settings Dialog Slice editor is an area based editing tool, capable of slicing and allowing to check overlaps between files and to check how overlapping lines correlate. Slice editing is point editing and it's basically meant to be the final step in the data processing and cleaning work flow before exporting to final products
2. Ensure to have the Dynamic Surface built. Choose to when to update the Dynamic Surface: Always, After Processing, or Manual. For this typical use we suggest to set it to " Always". Set the Dynamic Surface Shallow Surface depth layer attribute to Standard Deviation. Check the color map range to see if the majority of the soundings is within the color map range, else you may need to edit the color map range. For more information on color map settings: Qimera Colormap Editor Dialog and Qimera Colormap Range Adjustment Dialog
3. Look for areas of interest, by means of looking for high sd values that can't be explained by natural artifacts, see screenshot below.



4. On 4D scene toolbar choose Free Slice Select  or use magic hotkey combination Shift + C hold your left mouse and draw the selection over an area of interest on 2D view in 4D scene. You can also choose to use Fixed Slice Select (hotkey C) . In the fixed slice select method, the smaller inner selection is locked to the larger outside selection box. The free slice select lets you rotate the smaller inner selection box independently.
Notice how the selection is made for you and how the Slice Editor window is populated with soundings including the spikes that you want removed.

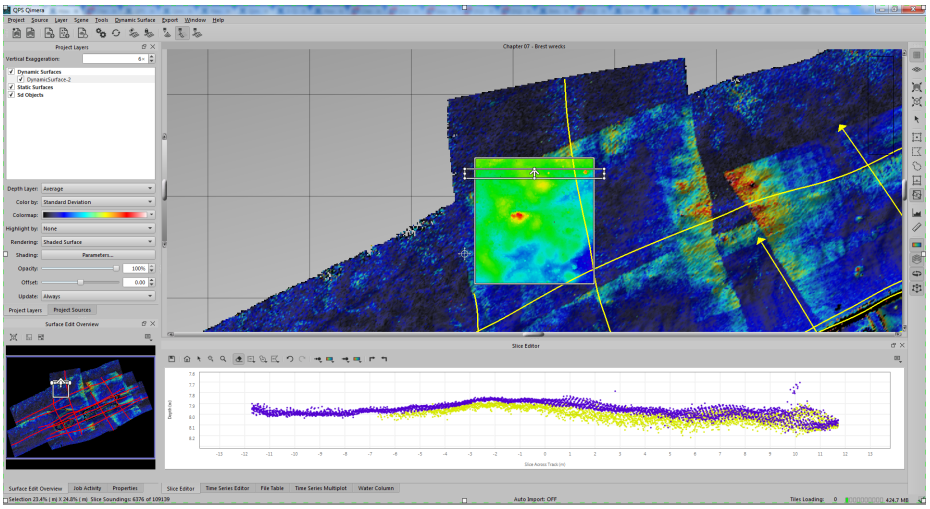
Also see short instruction video here below:



5. Set the Dynamic Surface layer to "Shallow"
6. Use s and w keys on the keyboard to move the slice box up and down within the area selected.
7. Now on 4D scene, on 2D view, hold your left mouse and draw the selection over an area of interest and hit the "2" key on your keyboard or click on Launch Slice Editor button on the main toolbar. Notice how the selection is made for you and how the Slice Editor window is populated with soundings including the spikes that you want removed.

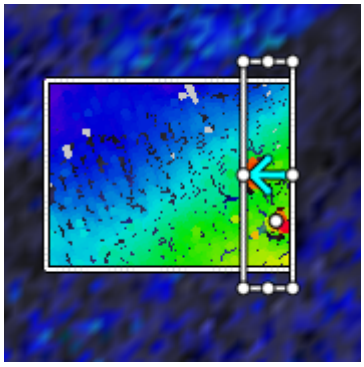


8. Also notice the Surface Edit Overview window is now also enabled (bottom left window). The 3 windows that are key to point editing are 1) 4D scene 2) Surface Edit Overview and 3) Slice Editor with or without having 3D view enabled



9. The selected slice can be rotated to your preference by using the rotation widget that is positioned right on top of the light blue arrow inside the slice selection box. Or use hotkey "q"

to rotate counter clockwise or use "e" to rotate clockwise. The inner slice box height can be changed by using + or - key on the keyboard. For more hotkey combinations for selections look in the "Configure Shortcuts" from the Project drop down menu. You may also want to take a look here for instructions on how to change the default shortcuts: Qimera Configure Shortcuts Dialog

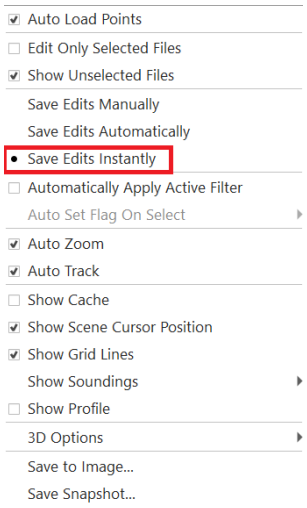


10. In Slice Editor Interface set the color map for the Plot to your preferences, allowing for QC-ing the soundings in the overlaps.
    For example use "color by line" by holding the left mouse key on the Color Plot By button and select " color by line" from the drop down menu.
    This is just an example, please also check out the other color coding options.



11. On the top right in Slice Editor dock, you will find a settings button 

Just click on the down arrow (carrot) key and then choose to "save edits instantly", as demonstrated in the following screenshot.



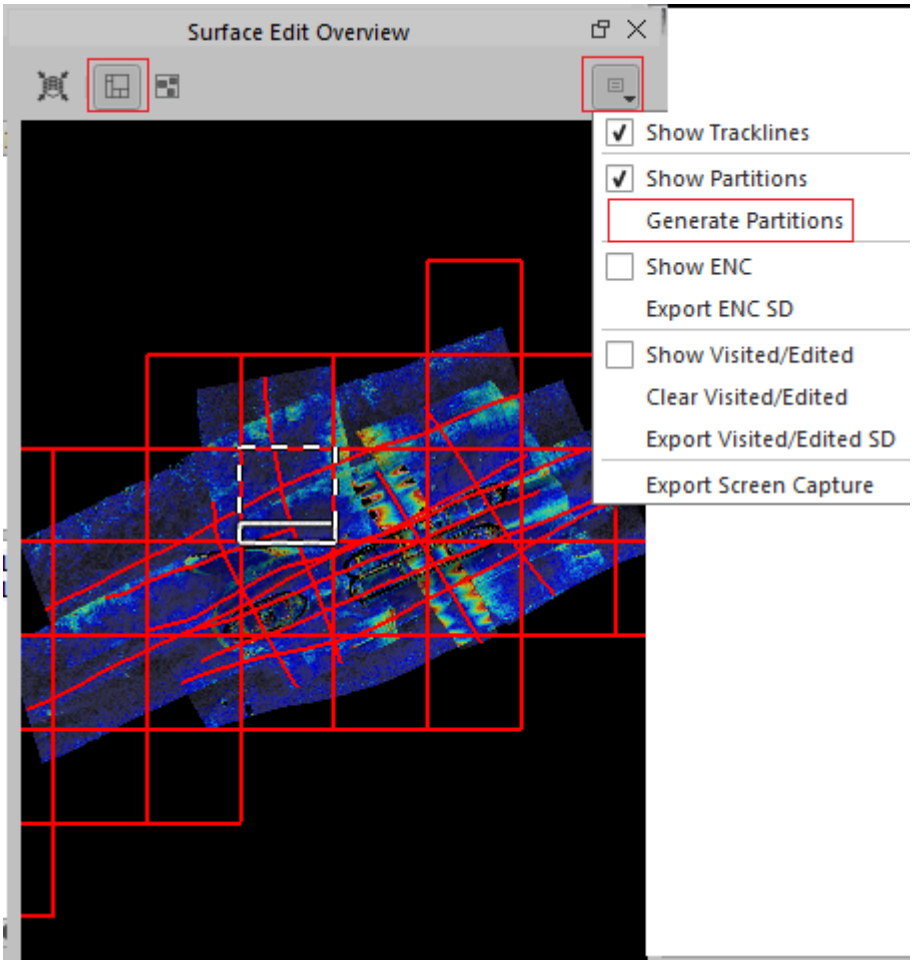
12. In Slice Editor check for outliers. Use the eraser tool or the Reject Inside/Outside rectangle, Inside/Outside Lasso or Inside/outside polygon tools to manually delete points. Use key combination Ctrl+R to show or hide rejected soundings.
13. When the edits are instantly saved, rejected points may be un-rejected by using the "Accept selection" key . If you want to undo last action, just use the undo button. (The undo is only possible, when you have selected to save the edits manually.
14. Next move the slice forward or backward by using the s and w keys on your keyboard, repeating the QC and the dot killing.
15. Save the edits using the save button. If you set the Dynamic Surface to update " Always" your dynamic surface will now automatically update with the edits.
    If the Dynamic Surface set is to "never" update, then you can continue the point editing in Slice Editor and save the edits. You can also make new selections, edit points and save.
    Once you've finished the point cleaning you can save all the edits at once by setting the Dynamic Surface to update " Always" .
16. Once finished the point editing, you can make a new selection for editing based on above descriptions.
17. Check the results on the area selected for the slice editing, using the desired point color coding for the scene. You could also QC the dynamic surface, using the SD attribute.
18. If required, in Surface Edit Overview window check for visited/edited areas

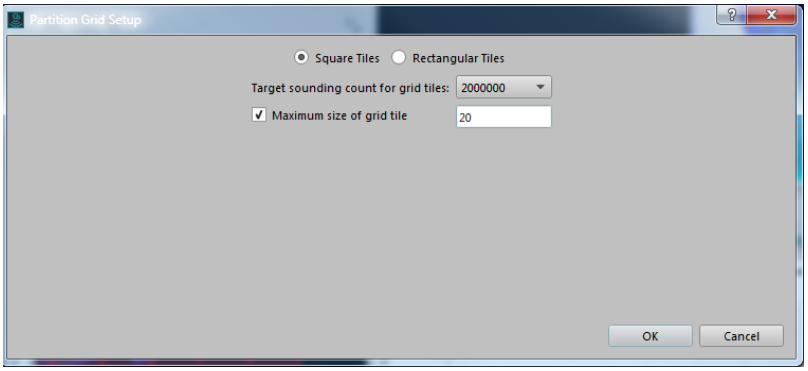
If you don't want the Dynamic Surface to update after each editing done in Slice Editor: just set the Dynamic Surface to update " Manual". When you finished the slice editing, set the Dynamic Surface Update back to "Always" and the Dynamic surface will update with edits made in Slice Editor.

Method 2 Using partitions when in Fixed Slice Select mode

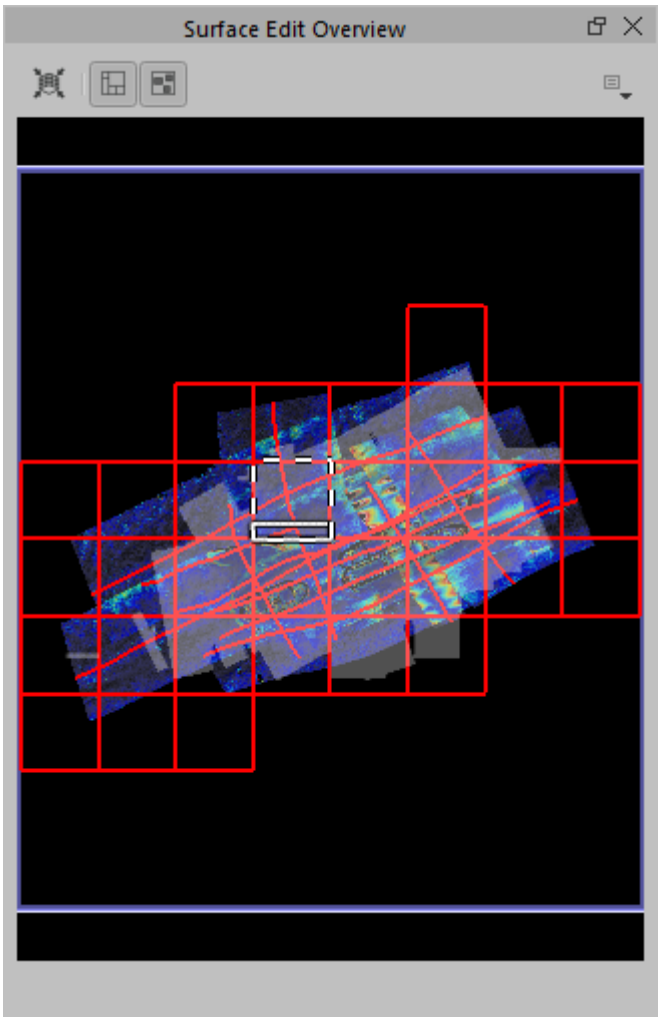
This method is probably less efficient when working with large surveys to process, but when using this method of systematically stepping through the soundings, it's almost impossible to overlook any outliers in the data.

1. On 4D toolbar, click on Fixed Slice select  , Free Slice Select  or Rectangle Select .
2. In Surface Edit Overview, Generate Partitions. This is where you define the size of the partitions, based on the number of selected soundings.





3. In Surface Edit Overview window, ensure to have partitions enabled, by clicking on Show Partitions button 

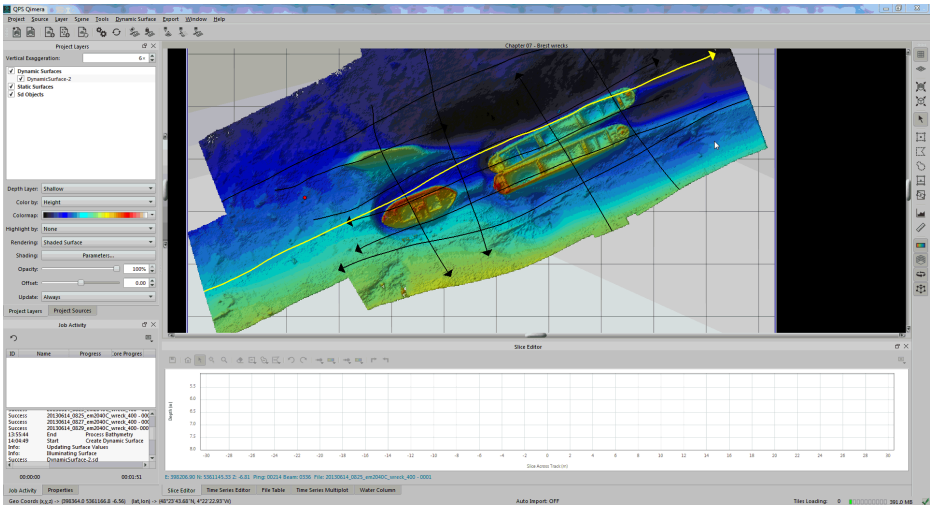


4. Left mouse click on one of the partitions of interest (see step 3 explained in method 1 above) or just select the upper left partition for a start and work through partitions in a preferred order.
5. Notice how the partition reflects the selected slice and notice how Slice Editor is populated with soundings and notice the slice selection made on 4D scene.
6. use w of s keys on your keyboard to start slicing.
7. Repeat steps 7- 18 of method 1, as explained above.

Method 3 Linked line method, Start slicing by "marching along the line"

1. On 4D scene toolbar select the Scroll Select button  or use Shift + L keyboard combination; this draws a scroll ref line and a scroll selection box perpendicular to this line on 4D scene
2. Use key combination Ctrl+ left mouse key to link the selection to the navigation

3. Press " 2" on your keyboard or press Launch 2D slice editor key on the main toolbar 
4. Re-size the box and re-position by moving it over the line using w and s keyboard keys and notice how Slice Editor window is populated with soundings
5. Repeat steps 8-14 of method 1, as explained above.
6. Once you've finished marching along the line with Slice Editor, then just Ctrl+left click again to link the Slice box to the next line and repeat the steps as per described above.
   Also see short instruction video here below.



QC your data by using the DS color attributes and the Slice Editor " Color By" selections. There are different approaches of cleaning data. First method described in this article explains an efficient way of multibeam data cleaning of large surveys by checking for high SD's in the Dynamic Surface. Second method would be less efficient when working with large surveys to process, but when using this method of systematically stepping through the soundings, it's almost impossible to overlook any outliers in the data. The third method is more or less just slicing through the DTM, with the overlapping tracks available to QC your data.

Applying a filter profile in the Slice Editor

It is possible to execute your filter profile in the Slice Editor. Please see How-to Filter Operations and Filtering Profiles for more information.

Related articles

Qimera Slice Editor Dock

Howto Qimera - Scroll referencing

5. File type and Workflow

- How-to Migrate a Qimera Project to FMGT
- How-to ENC Editor
- How-to Work with Hypack HSX Data
- How-to Work with Kongsberg ALL Data
- How-to Work with Large Data
- How-to Work with Qinsy Data
- How-to Work with Reson S7K Data

How-to Migrate a Qimera Project to FMGT

Qimera at present has a unique directory structure, which is not shared by QPS DMagic or FMGT.
Therefore, if you wish to continue working on data or a Project you created in Qimera you need to export gsf files at the end of your Qimera Project.

On this page:

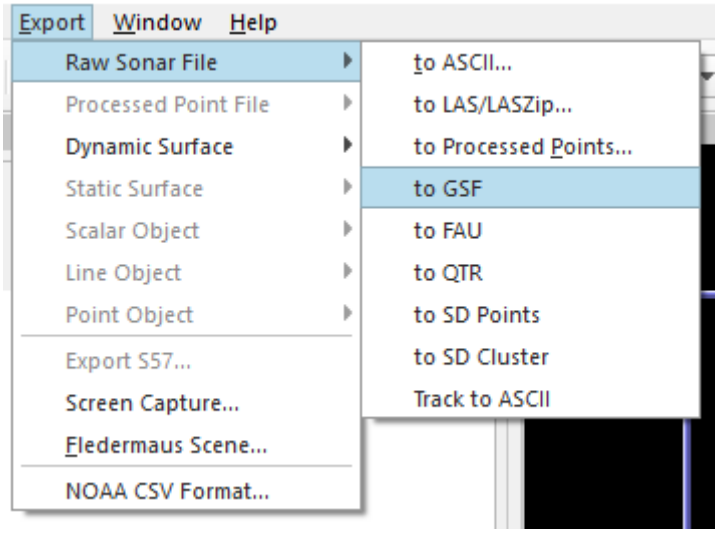
- Exporting Bathymetry for use in FMGT
- Loading Qimera exported GSF to FMGT
- Export a Reference Grid for use in FMGT

Exporting Bathymetry for use in FMGT

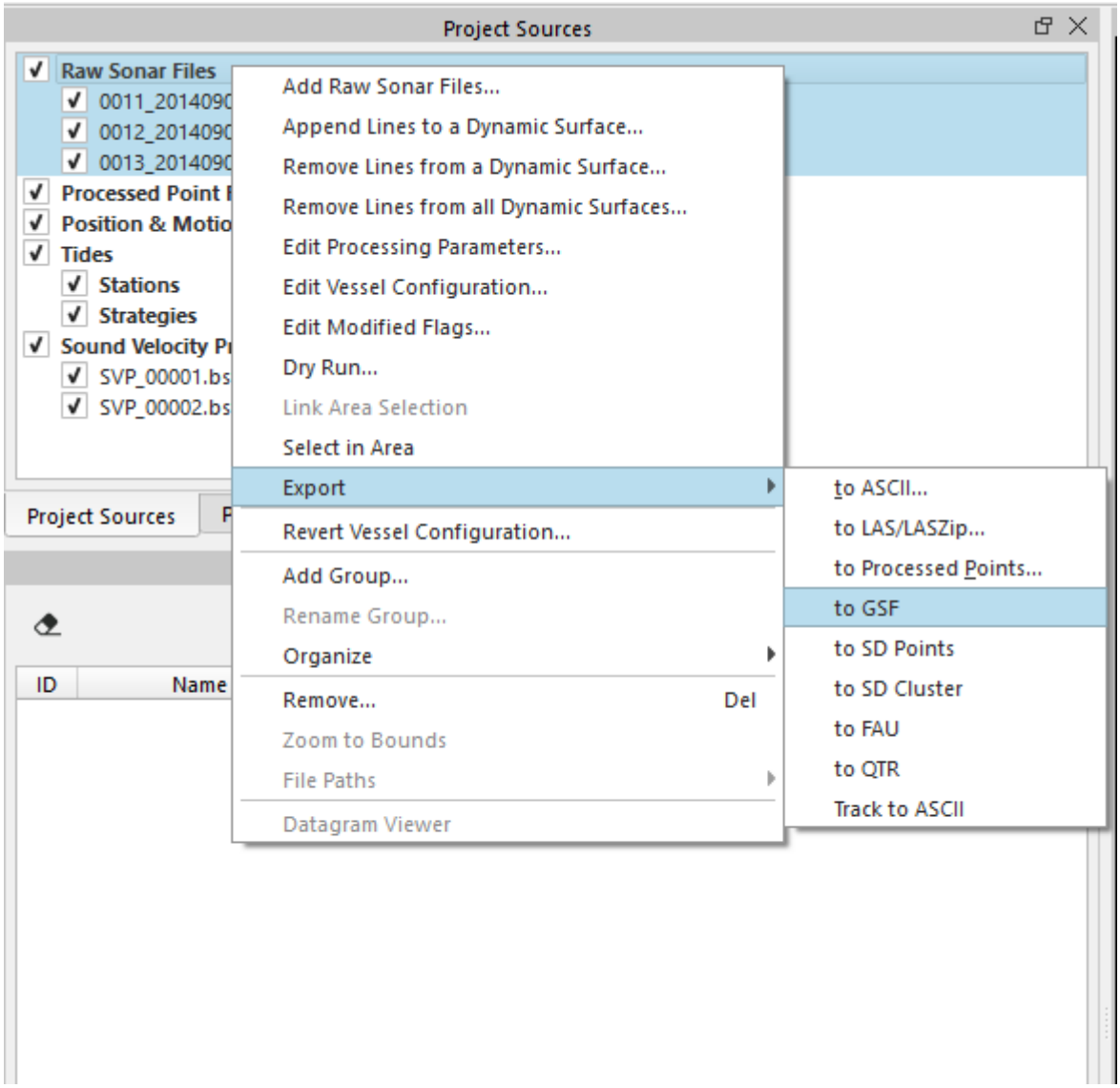
Currently, FMGT does not read the Qimera project. However, there is a simple and straight forward way to migrate your bathymetry edits form Qimera to FMGT:

1. Create Qimera Project and load source data
2. Process and edit bathymetry
3. Export the fully populated GSF files from Qimera. There are two ways to do this:

Option 1: Selecting from the top Menu bar Export > Raw Sonar File and then to GSF:



Option 2: Or highlight Raw Sonar Files under the Project Source list and right mouse click to obtain the drop down Export GSF:



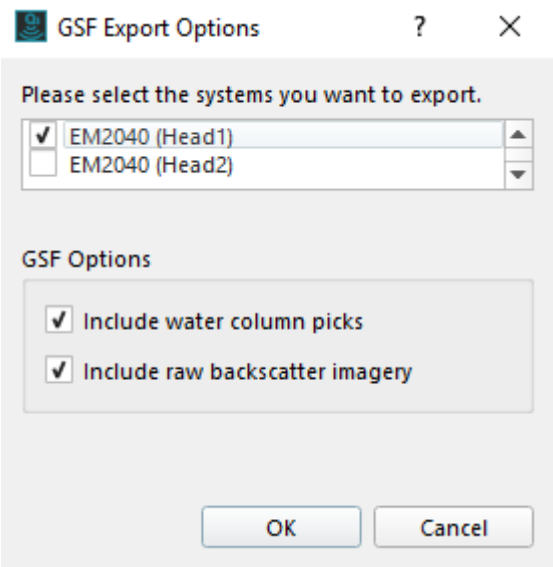
Both of these methods to Export a GSF will cause Qimera to access the QPD files that are created at import of Source files.

Export products are saved to Username\QPS-Data\Projects\QIMERA_Project_Name\Export

These files contain all edits and processing that has occurred and saved in Qimera; for example application of a new SVP profile or CUBE using 3DEditor.

All these changes were reflected in the Dynamic Surface and saved to the QPD.

4. Upon selecting Export GSF Qimera allows the user a few options for what they would like to include in the resulting GSF's:



The first option is relevant for users with data that was collected with a dual head system, where you can select one or both of the systems used to be exported into the resulting gsf's.

The next two allow you to include water column and raw backscatter imagery.

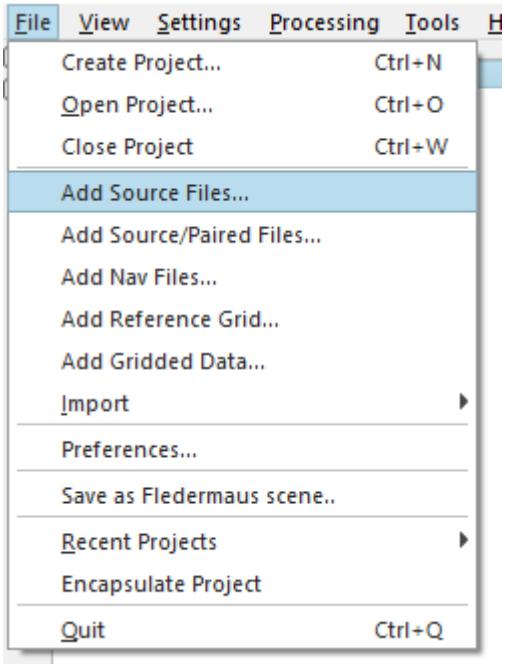
This might seem complicated at first, but it should be noted that we convert (and sometimes pair files) from the source data to GSF in FMGT.
Therefore what is happening with the export from Qimera is that conversion is being done in Qimera rather than in FMGT.
The GSF files will still need to be indexed in FMGT but after that they're ready for further processing.

Loading Qimera exported GSF to FMGT

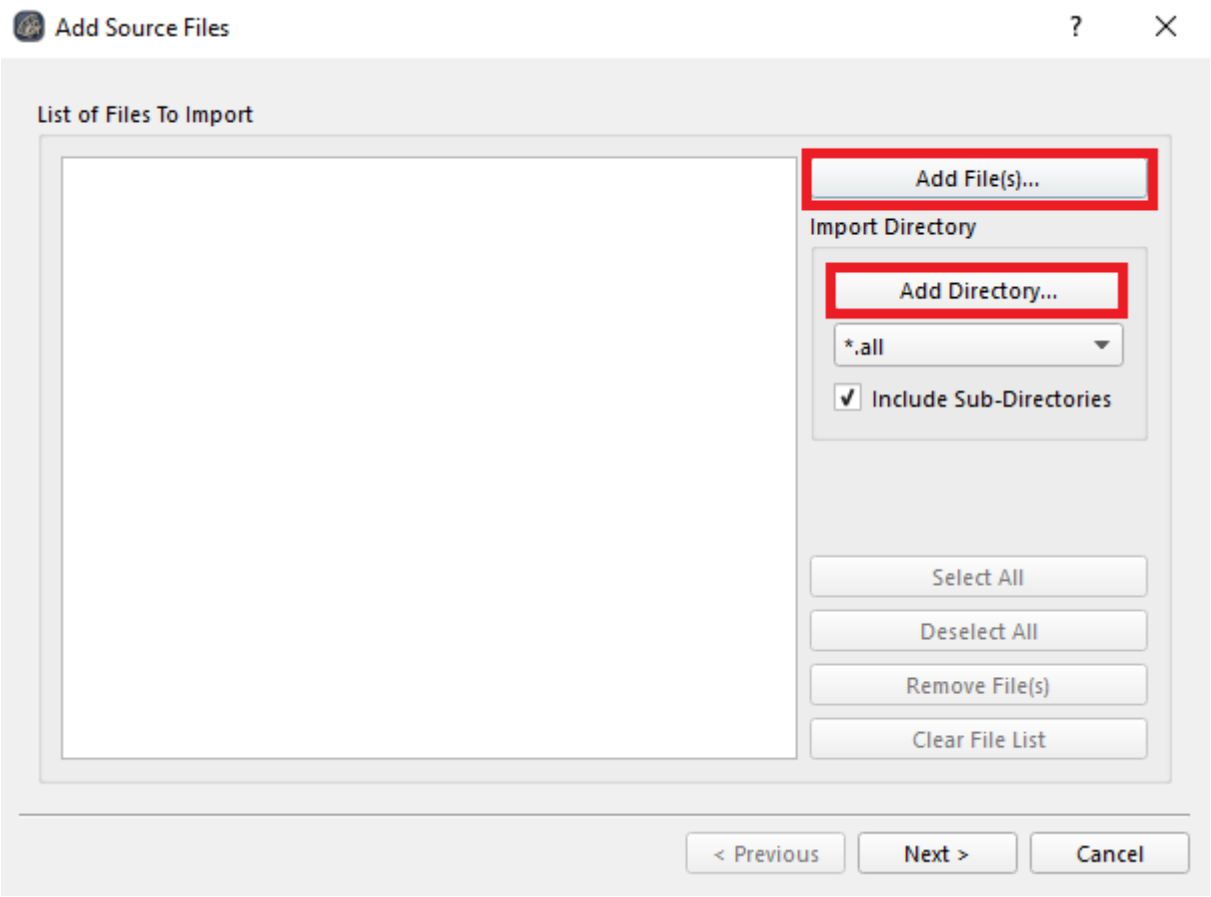
1. Open FMGT and Create a new Project.
2. Select Add Source Files from the the top Menu bar File drop down menu.

Please note that users should be careful when selecting the coordinate systems of the data and the projects in the workflow outlined on this page.

The GSF files we create use geographic coordinates, referenced to the datum of the Qimera project, so the exported GSF's will be in the same geographic coordinate system as the Qimera project.
For example, if the Qimera project coordinate system was set to WGS_1984_UTM_Zone_30N, then the GSF's would be in WGS_1984, and should be brought into FMGT as such, rather than the projected coordinate system that the project can be set to.



3. Then either select Add Files or Add Directory



4. Browse to the Qimera Project you wish to migrate to FMGT.

   Export products from Qimera are saved to Username\QPS-Data\Projects\QIMERA_Project_Name\Export

5. Select the GSF line files that you wish to process in FMGT.

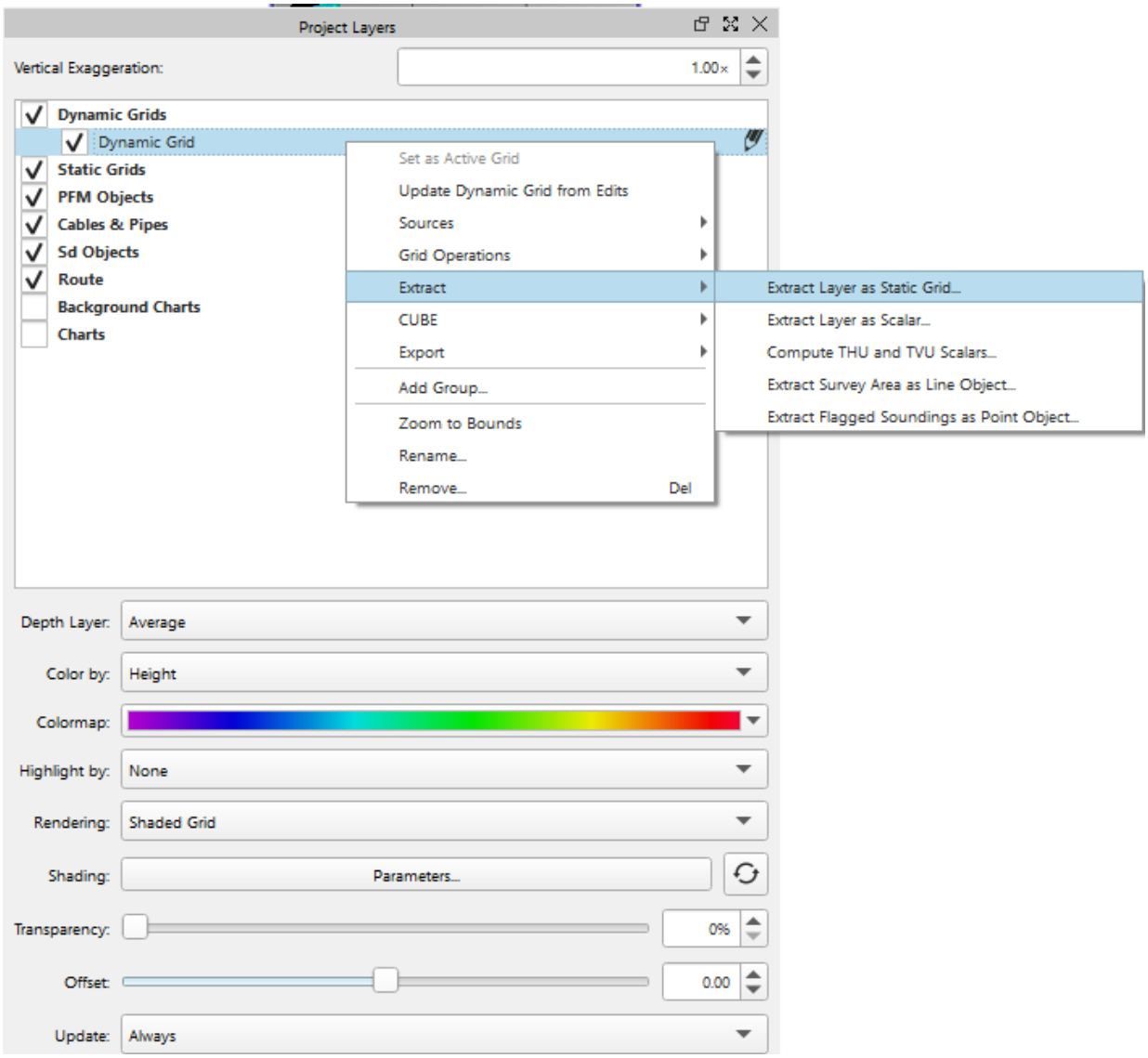
> **Tip:**
> If you have many files to bring in, using the Import Directory option can save you some time

6. Once imported you can proceed to process the files in FMGT.

Export a Reference Grid for use in FMGT

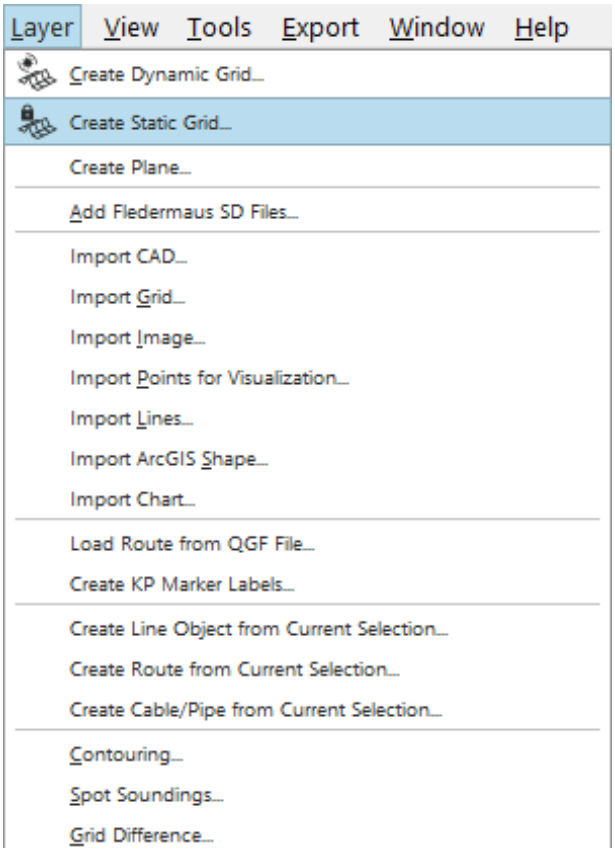
1. Create Qimera Project and load source data.
2. Process and edit bathymetry.

3. Select your Dynamic Grid in Project Layers > Extract Layer as Static Grid



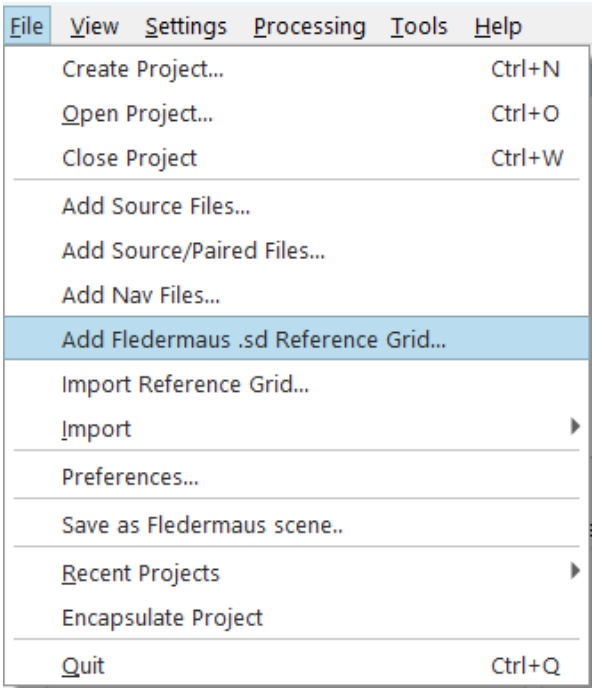
Extract Layer as Static Grid

Or Layer > Create Static Grid



Create Static Grid via the Layer Menu

4. The created Static Gridwill, unless otherwise specified, be located in the Default Projects Folder: Username\QPS-Data\Projects\QIMERA_Project_Name\SD\StaticGrid.sd
5. In FMGT, add this surface as a reference grid by selecting 'Add Reference Grid' in the File drop down menu:



Add Fledermaus .sd Reference Grid

How-to ENC Editor

This How-to outlines the features and functionality of the ENC Editor, released with Qimera 1.6.0.

On this page:

- ENC Layers
  - Create a New Layer
  - Import Existing Layer
- ENC Objects
  - Creating an object
    - Creating an ENC Object in the ENC Editor
    - Creating an ENC Point Object in the Swath Editor
    - Creating an ENC Point Object in the Water Column Viewer
    - Creating an ENC Point Object in the Slice Editor
    - Creating an ENC Point Object in the 3D Editor
  - Configuring an object
- Working with the ENC Editor Dock
  - Selecting Objects
    - Clicking in Main Window
    - Selecting Objects in the ENC Editor Table
    - Selecting Objects Geographically
    - Selecting Objects with Filters
  - Editing single objects
  - Editing multiple objects
  - Working with Filters
    - Creating a New Filter
    - Applying a Filter
    - Editing Filters
    - Importing and Exporting Filters
  - Querying a chart
  - ENC Editor drop-down menu
    - Edit Feature

- Configure Columns
- Export and Import Filters
- ENC Editor Feature Table
- Right Click Functions
- Exporting an ENC

- To display your ENC on top of other layers, right click on 'Charts' in the Project Layers dock and check the box next to 'Charts on Top'
  - Toggle the same setting for individual chart objects if need be.
- To zoom to an ENC Object, right click on it in the ENC Editor table and choose 'Center On'.

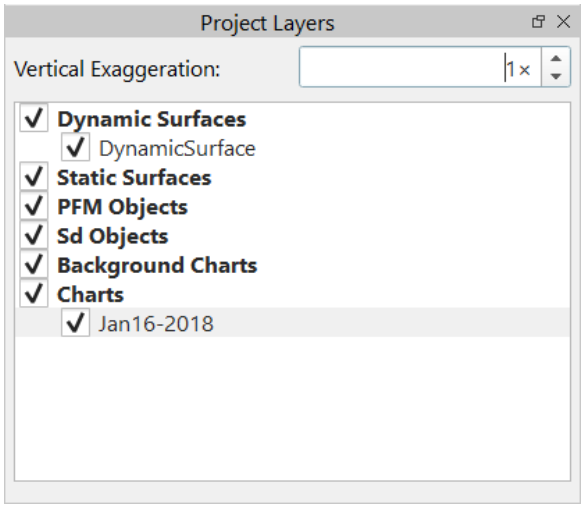
The ENC Editor, released as part of Qimera 1.6.0, allows for the creation of ENC Features. These features are stored in a QPS proprietary format file, a .QNC. The Qimera created QNCs can be exported to S57 .000 files. Features can be linked to soundings or a fixed position from a grid layer (i.e., shallow, deep, average, CUBE). Features linked to a sounding will reflect any changes to that sounding's location or depth. Features linked to a grid layer will reflect any changes to that grid layer's depth.

ENC Layers

Create a New Layer

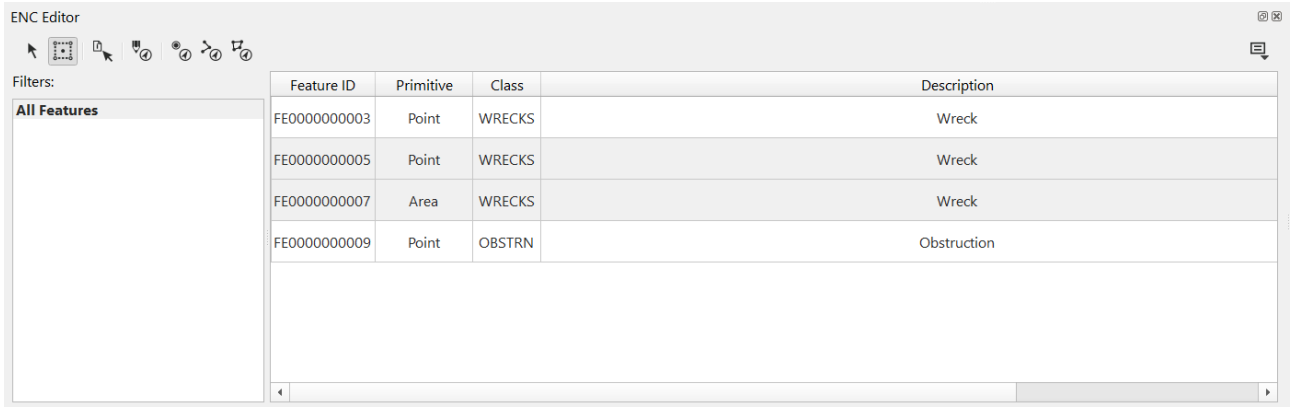
Option 1:

Right click on 'Charts' in the Project Layers dock and select 'Create New Chart'.



Option 2:

Go to the the ENC Editor dock and click on one of the 'Create ENC .... Object' buttons and select a location or sounding in one of the views. If no layer has been created, a prompt to create a new layer will appear.



Import Existing Layer

Right click on 'Charts' in the Project Layers dock and select 'Add Files' or 'Import Files'. Add files is used for bringing in existing QNCs, Import Files is used to import a .00* or QNC.

ENC Objects

Creating an object

Creating an ENC Object in the ENC Editor

The ENC Editor supports creating Point, Line, and Area ENC objects.

Point Object Creation

Click on the 'Create ENC Point Object' button in the ENC Editor dock menu bar, then click on the surface.

A point will be created at the depth of the node closest to the cursor.

Line Object Creation

Click on the 'Create ENC Line Object' button in the ENC Editor dock menu bar, then click on the surface to create the line.

Area Object Creation

Click on the 'Create ENC Area Object' button in the ENC Editor dock menu bar, then click on the surface to create the line. Close the area by clicking on the first point.

Creating an ENC Point Object in the Swath Editor

Only Point Objects can be created from the Swath Editor. These objects will be associated with the selected sounding, typically the shallowest one.

1) Create a selection of any type and start the Swath Editor.

2) Click on the 'Create ENC Point Object' button in the Swath Editor menu bar.

3) Select a sounding in the Swath Editor plot window.

Creating an ENC Point Object in the Water Column Viewer

Only Point Objects can be created from the Water Column Viewer. These objects will be associated with the selected sounding, typically the shallowest one.

1) Create a selection of any type and start the Swath Editor.

2) Go to the Water Column dock, isolate the pings of interest where the object can be seen.

3) Click on the 'Create ENC Point Object' button in the Water Column menu bar.

4) Click on the desired point in the Water Column fan view Swath Editor plot window. This will create an ENC feature object and it will create a "user additional" sounding in the sounding set. Be sure to click Save prior to exiting the Swath Editor.

Creating an ENC Point Object in the Slice Editor

Only Point Objects can be created from the Slice Editor. These objects will be associated with the selected sounding, typically the shallowest one.

1) Create a selection of any type and start the Slice Editor.

2) Click on the 'Create ENC Point Object' button in the Slice Editor menu bar.

3) Select a sounding in the Slice Editor plot window.

Creating an ENC Point Object in the 3D Editor

Only Point Objects can be created from the 3D Editor. These objects will be associated with the selected sounding, typically the shallowest one.

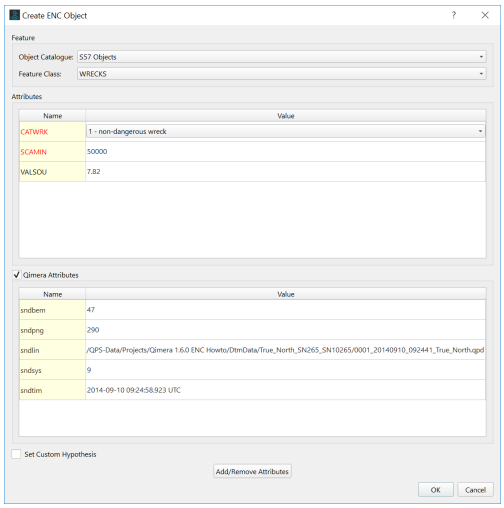
1) Create a selection of any type and start the 3D Editor.

2) Click on the 'Create ENC Point Object' button in the 3D Editor Control Bar.

3) Select a sounding in the 3D Editor plot window.

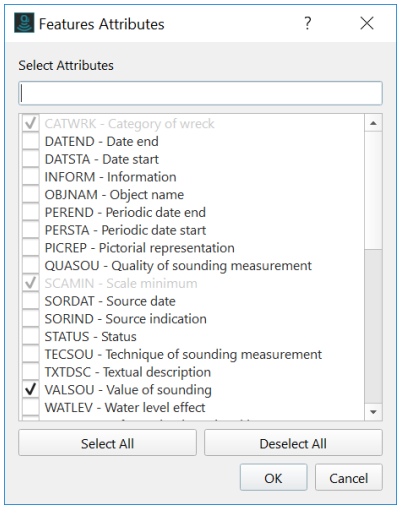
Configuring an object

Once the Point, Line, or Area has been selected, a dialog will appear that allows for the object and its attributes to be configured:



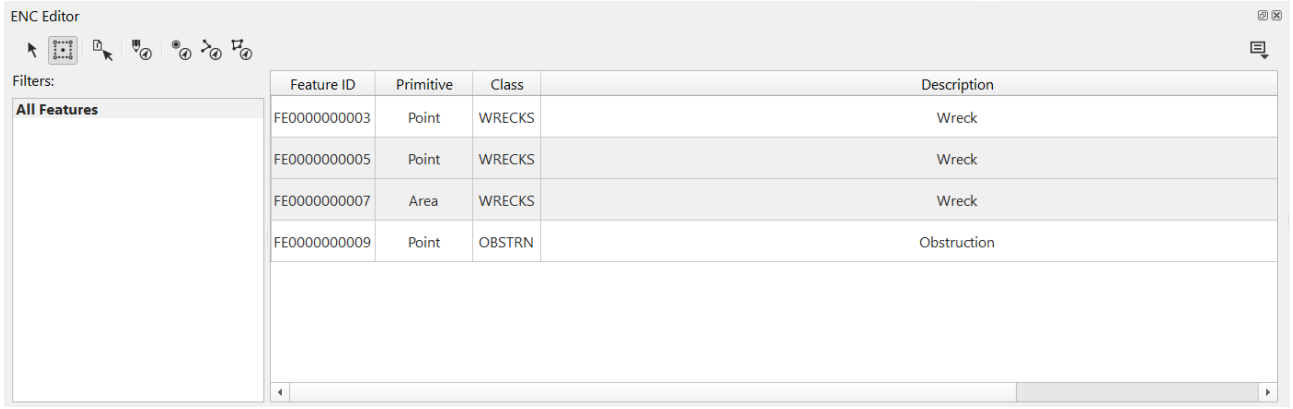
Choose the appropriate values from the 'Object Catalogue' and 'Feature Class'. Attributes can be added or removed via the 'Add / Remove Attributes' button near the bottom.

Toggle attributes on or off (some are mandatory and cannot be turned off):



Working with the ENC Editor Dock

Once ENC objects are created, you will see the table in the ENC Editor Dock populated with those objects.



Selecting Objects

Clicking in Main Window

Click on the 'Pick ENC Object' in the ENC Editor toolbar. Click on an object in the main view to highlight it in the table. This is best done after highlighting objects via another method.

Selecting Objects in the ENC Editor Table

Use the shift or control keyboard keys and the mouse to select one or more objects in the table. Once highlighted there, they will become visible in the main window.

Selecting Objects Geographically

Click on the 'Select ENC Objects' button in the ENC Editor toolbar. Draw a selection in the main window. All objects that fall in that selection will be displayed in the main window and will be highlighted in the ENC Editor table.

Selecting Objects with Filters

See the section below for more information on filtering objects.

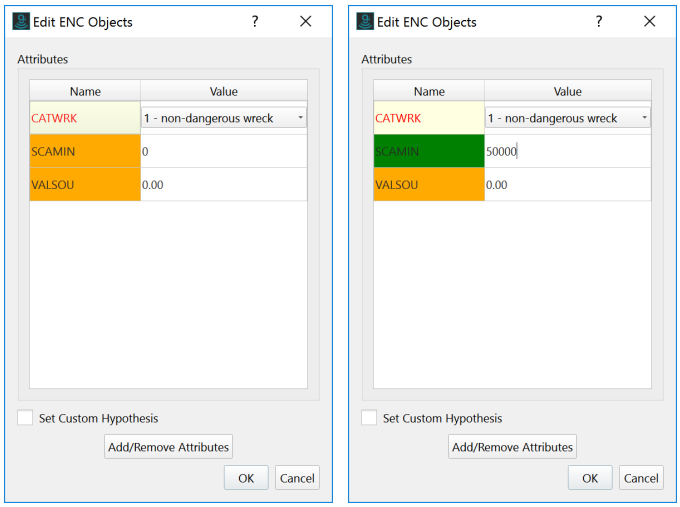
Editing single objects

Double click on an object in the table, or select it, then click on the 'Edit Feature' button in the ENC Editor dock.

Editing multiple objects

If several objects are selected, either via geographic selection, a filter, or highlighting several objects in the ENC Editor dock, they can be edited as a group. Right click on one of the selected objects in the ENC Editor dock and choose 'Edit'. You can also click on the 'Edit Feature' button in the dock. This will bring up the Edit ENC Object dialog and applicable attributes can be added, removed, or edited.

Any attributes that differ between the selected attributes will be displayed in orange, indicating that all objects do not have the same value for that attribute. If you make not edits for an attribute, no values will be overwritten. If you make edits to an attribute that differs, the label display color will change to green indicating that all objects will now have to same value for the edited attribute.

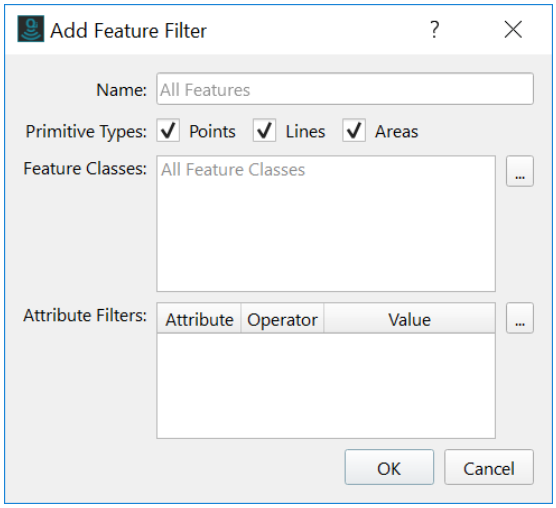


Working with Filters

Creating a New Filter

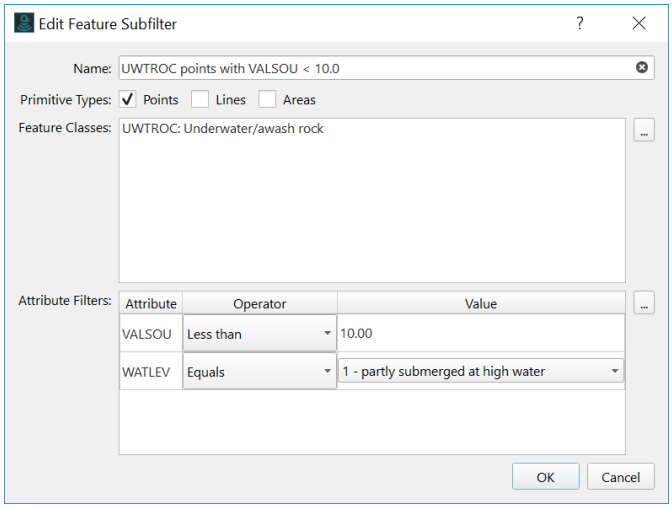
To create a new ENC filter, right click on 'All Features' in the Filter section of the ENC Editor dock. Choose 'Add Filter'.

The Add Feature Filter dialog will appear:



Enter a name and select which object types you want the filter to include. Select which feature classes you want to include in the filter. Attributes can be filtered as well with simple Boolean and Relational operators. If you do not enter a name for your filter, the name will be updated automatically to describe the filter contents.

The following filter shows objects that are points, of class UWTROC, and have a VALSOU of less than 10.0 (m) and WATLEV attribute equal to 'partly submerged at high water'.



Filters can be nested within other filters to improve organization and simplicity of individual filters. These are called subfilters. To create a subfilter, right click on an existing filter and select 'Add Subfilter'.

Applying a Filter

Using a filter is as simple as clicking on it. The filter results will be shown in the table.

Editing Filters

Right click on a filter to edit, duplicate or remove it. You can also add a new sub-filter with the same action.

Importing and Exporting Filters

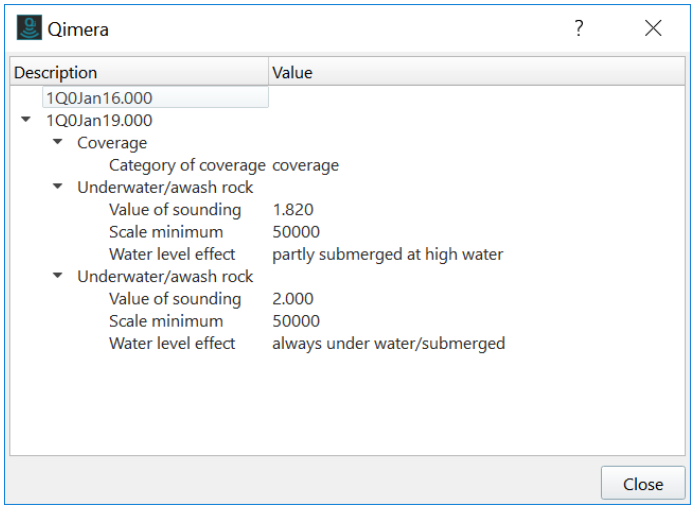
Filters can be exported and imported. Use the ENC Editor drop-down menu (at the top right of the dock) to access this functionality.

Querying a chart

It is possible to query chart elements. Click on the 'Query Chart' button in the ENC Editor dock and then click on the scene.

This tool can be used to query both user created objects, and elements in an imported chart or a background chart.

After clicking on an ENC object or feature, a window will appear showing all the objects that overlap the point clicked:



ENC Editor drop-down menu

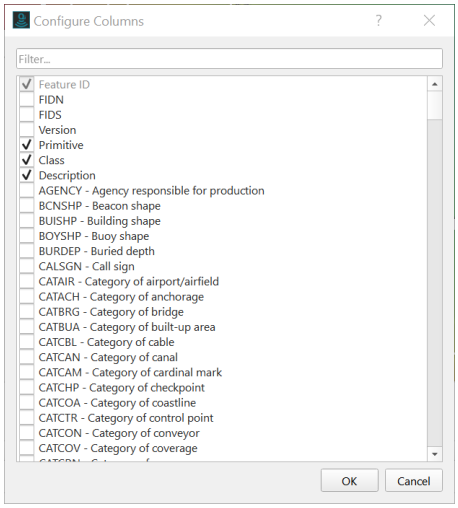
At the top right of the ENC Editor dock is the dock drop-down menu.
This menu contains the following functions.

Edit Feature

This is the same as double clicking or right clicking on a feature in the table.

Configure Columns

This is used to configure the visible columns in the ENC Editor table:



Export and Import Filters

This starts a file dialog used to either load or save a filter.

ENC Editor Feature Table

The table displays all features that result from the active filter (or all, as default, if 'All Features' is active).

The columns of the table are configurable via the ENC Editor drop-down menu.

Right Click Functions

Copy To & Move To

This allows features to be copied or moved to another chart.

Edit

Edit a feature. The same as double clicking on a feature.

Center On

Center the scene on the selected feature.

Delete

Delete a feature from a chart.

Exporting an ENC

An ENC Chart created in Qimera can be exported to an S57 (.000) file. To do this, highlight a chart in the Project Layers dock and go to the Export drop-down menu at the top of the Qimera Window. Choose 'Export S57' and provide a file name and location.

How-to Work with Hypack HSX Data

This How-to describes how to add and work with Hypack HSX data in Qimera (Versions 2.0.0 and up).

On this page:

- About Hypack HSX Data
- How-to Bring Hypack HSX Data Into Qimera
- Visualizing a File in Qimera
- Selecting a File in Qimera

For additional information, see our Getting Started guide.

Data

The data used for this How-to is single head Reson 8125 data logged using Hypack. The data was provided by the Port of London Authority.

About Hypack HSX Data

The supported Raw Sonar Files for Hypack is a HSX file. These files are logged using HYSWEEP. HSX files are in an ASCII format and can be loaded into a text editor when troubleshooting.

HSX files are always in a projected Coordinate Reference System (CRS). The CRS of the files should be considered when being added to a project. It is important to note that the projected CRS information (which CRS was used during acquisition) is not stored in the HSX file directly and must be known and supplied by the user.

HS2 and HS2X format files are Hypack files that have had some level of processing applied to them. They are binary files and can be loaded in Qimera as Processed Point Files using the *Add Processed Point Files Dialog*.

Useful information about what is read from HSX files on import can be found on the Qimera Supported Data Formats page, the Add Raw Sonar Files Dialog page and the Sonar Source Data Import Capabilities page.

Licensing

> The import and processing of raw data formats is dependent on licensing. To view your license coverage in Qimera, go to the *Help Menu* and choose Show License Manager.

How-to Bring Hypack HSX Data Into Qimera

1) After you open Qimera, the Projects Dialog will launch. Select *New Project...* to open the *Create Project Dialog*.

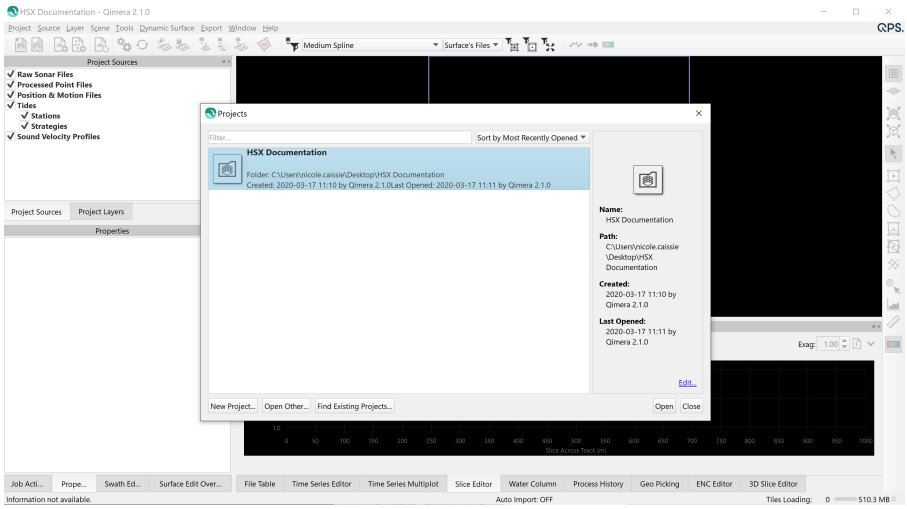


Figure 1: Qimera's Projects Dialog

Alternatively, you can create a project by clicking the *Create Project Button*  on Qimera's Bathymetry Toolbar, or by going to the Project *Menu* and choosing *New Project...*

2) Fill in Project Details:

1. Add a project name.
2. By default, the folder for your project will be in the 'C:\Users\username\QPS-Data\' directory, though you can choose another location.
3. The Survey Type and Description boxes can be used to add additional notes about the project.
4. Set the Project Coordinate System (CRS):
   a. *Single Projected* - If you would like to manually set the CRS from a list of pre-defined systems using the *Search Coordinate System Dialog*.
   b. Full Geodetic Configuration - If you would like your project be in a projection that is not included in the list of pre-defined CRS, you can manually enter the geodetic configuration

parameters. A Geodetic Configuration consists of, at minimum, a Project CRS. Additionally, it can contain an Input Geographic CRS and a Transformation between the Project CRS and the Input Geographic CRS. You can also optionally have a Vertical CRS. This is done using the *Geodetic Configuration Overview Dialog*.

Coordinate Reference System

The *Automatic CRS Projection* is not the recommended option when importing HSX files.

Automatic CRS Projection is an option when creating a new project, however, if chosen, the CRS of the imported data will have to be entered in the Add Raw Sonar Files dialog when importing HSX files. The CRS entered during import will then become the Project CRS.

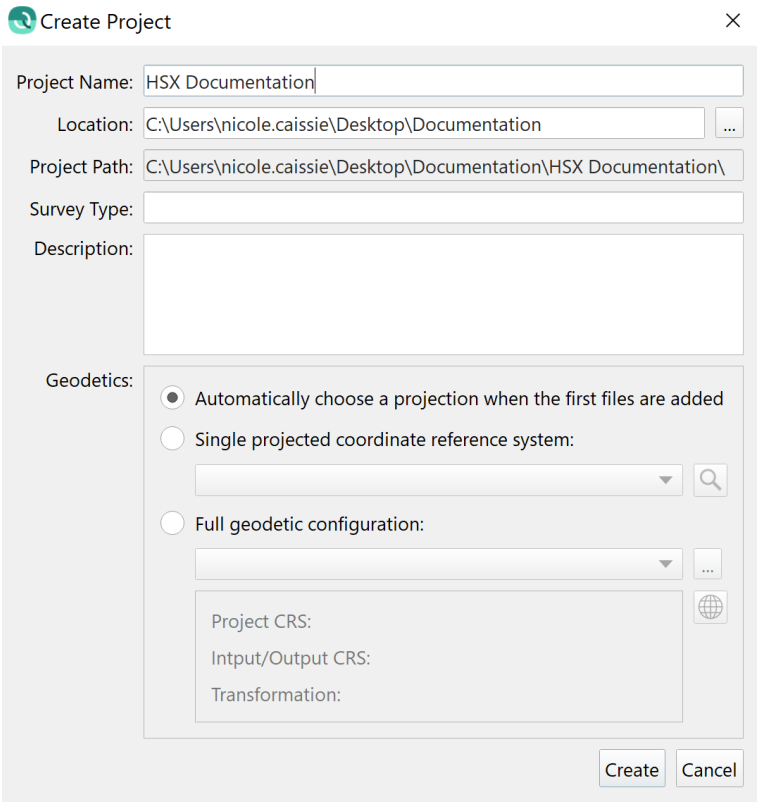


Figure 2: Create Project Dialog

3) Once the Project CRS is set, click OK to create the project. Once created, the *Project Folder* will contain sub-folders for storing bathymetry files in QPD format, internal metadata, extracted external source data, and products.

4) You will be prompted to add source files to your new project. Choose Add Raw Sonar Files.

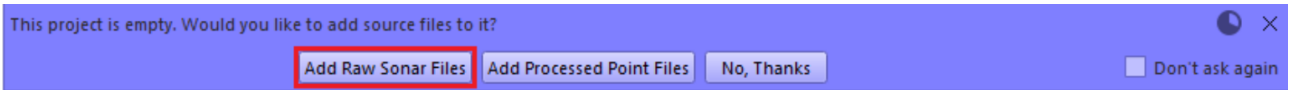


Figure 3: Add Raw Sonar Files Prompt

Alternatively, you can add Raw Sonar Source Files by clicking the *Add Raw Sonar File Button*  on Qimera's Bathymetry Toolbar, or by going to the Source *Menu* and choosing *Add Raw Sonar Files...*

5) Use the *Add Files...* Button to navigate to and select your HSX files.

1. If a Vessel Name is not found in the first HSX file, a *Create New Vessel Dialog* will launch. Add a Vessel Name and click OK to continue. A Vessel Assignment section will be added to the *Add Raw Sonar Files Dialog* and the Vessel Name will be automatically listed under Vessel Assignment. Qimera will create a vessel file with this name in your project. If you import data without vessel information at a later stage, you must choose the correct vessel to associate the data with since Qimera cannot determine this on its own. The sample data used in this how-to contains the vessel name information, so this step is not necessary.
2. Set the Time Reference to the time zone used during acquisition.
3. Set the Coordinate Reference System of the Imported Data.
4. Click OK to load the files.

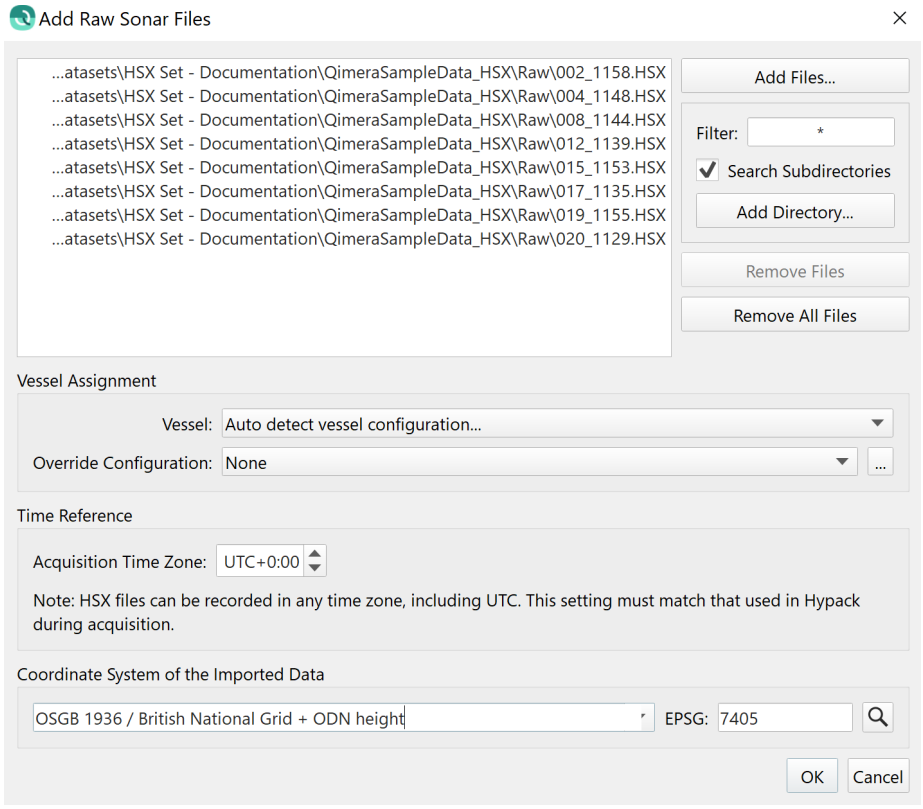


Figure 4: Add Raw Sonar Files Dialog

HSX files are always projected, however the coordinate system information of the imported data **cannot** be read from the file directly. Therefore, the default coordinate system in the Import Dialog (WGS 84) will never be correct and must be changed by the user. This is a design choice to prevent the user from assuming that Qimera is reading the information from the HSX files. If the user leaves the default of WGS 84, they will be warned and forced to change to a projected coordinate system.

6) Qimera will load the HSX files to the project, scanning for and extracting any available information.

Shown below are:

1. Indicators showing the loading progress of each individual file in the Project Sources Dock.
2. The loaded tracklines visualized in the 4D Scene.
3. The overall progress of data extraction in the Job Activity Dock.

4. Any warnings or errors shown in the Job Activity Dock.

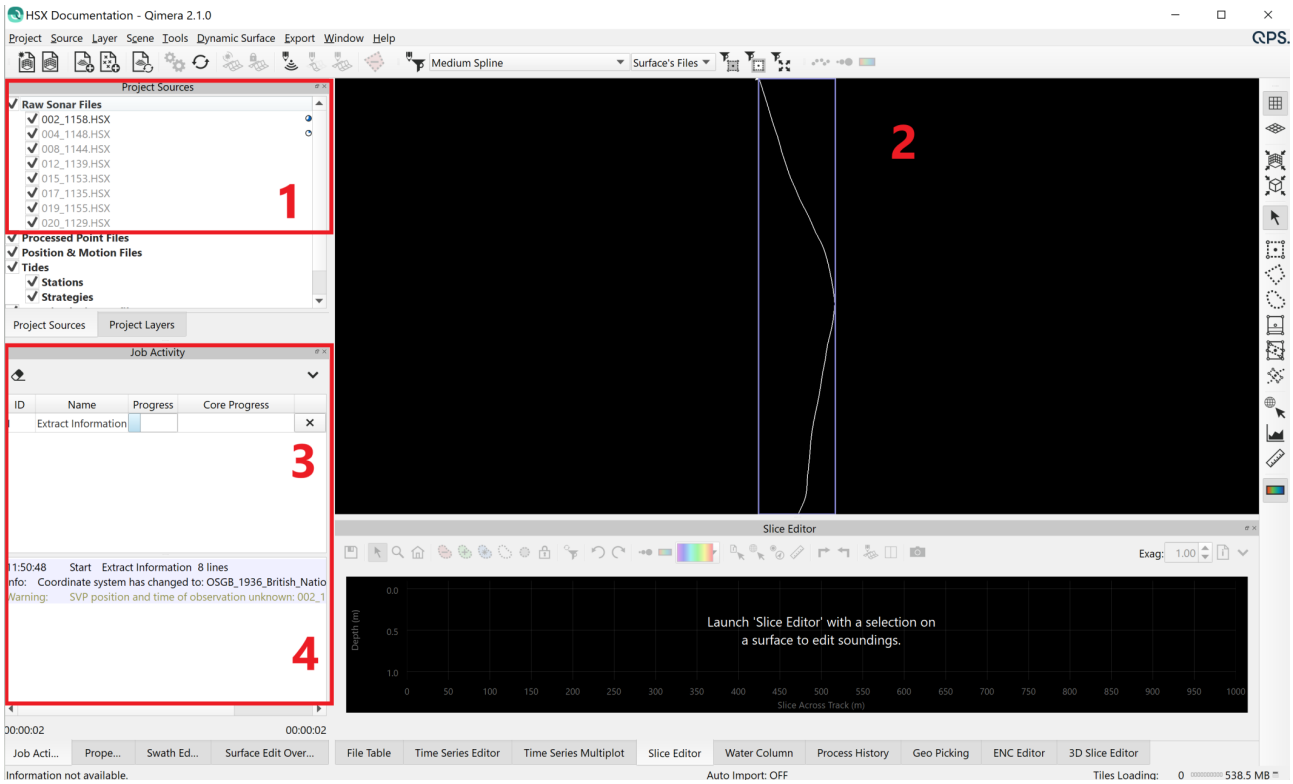


Figure 5: Information Being Extracted from the HSX Data During Load

7) As the information from the HSX files is extracted, you will see the extracted vessel information in the File Table Dock. You can review the Properties Dock to see what information was extracted for each file (make sure that you have a file selected).

Shown below are:

1. Properties Dock
2. File Table Dock

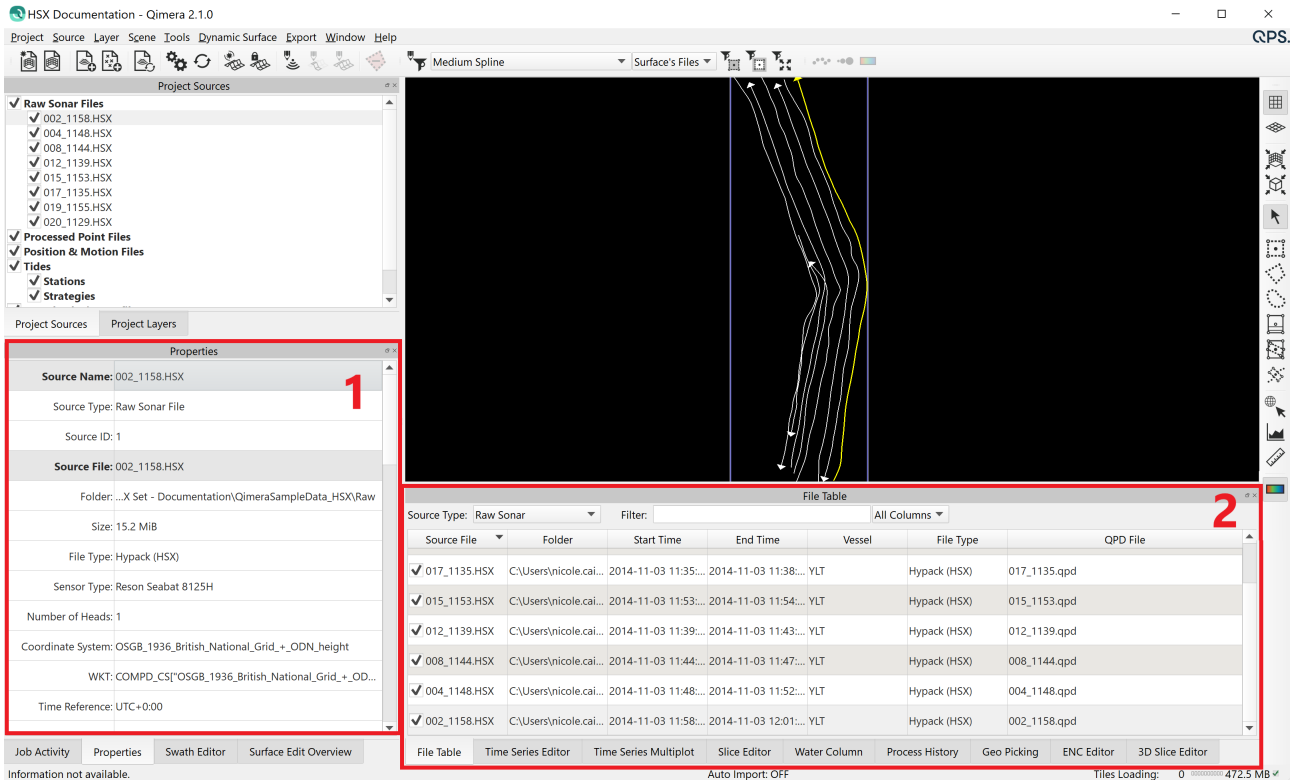


Figure 6: Imported Data Populating the Properties Dock and File Table Dock

8) For this example dataset, the *Job Activity Dock* displays a warning about SVP position and time. This just means that the SVP position and time were not available in the file, so Sound Velocity Processing Strategies based on location or time won't be available unless you provide this information in the SVP Editor.

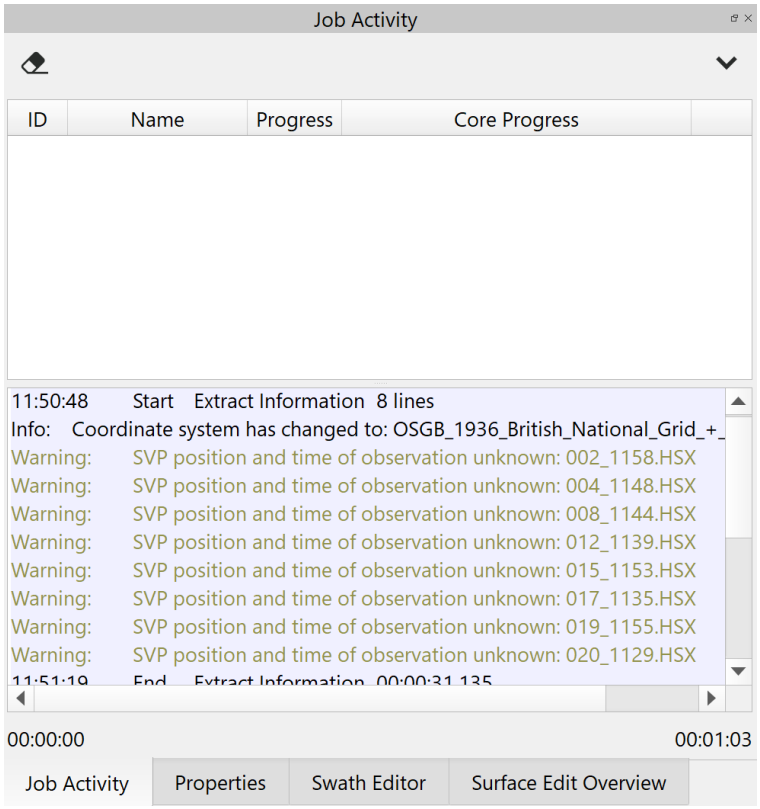


Figure 7: Job Activity Dock

Extracted information for HSX data may include:

- Raw multibeam
- Vessel configuration
- SVP
- Surface sound speed
- Orientation
- Position
- Tide

* The tide record in HSX files can contain tide values, GPS height, or both. If the record is populated the information will be extracted by Qimera and made available for use in vertical referencing – however there is no way for Qimera to know which value (tide, GPS height, combination) was used.

For a full list of what is extracted from each supported format, click here.

In the *Properties Dock*, you can see that Vessel Configuration, Position, Motion and Tide were all extracted from the file, but that there was no water column information or Beam Time Series information.

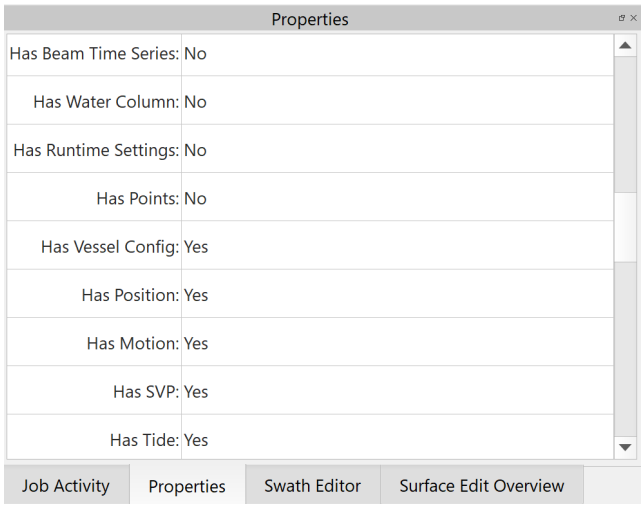


Figure 8: Properties Dock

9) As information is extracted from the HSX files, the folders in the Qimera project get populated with the information.

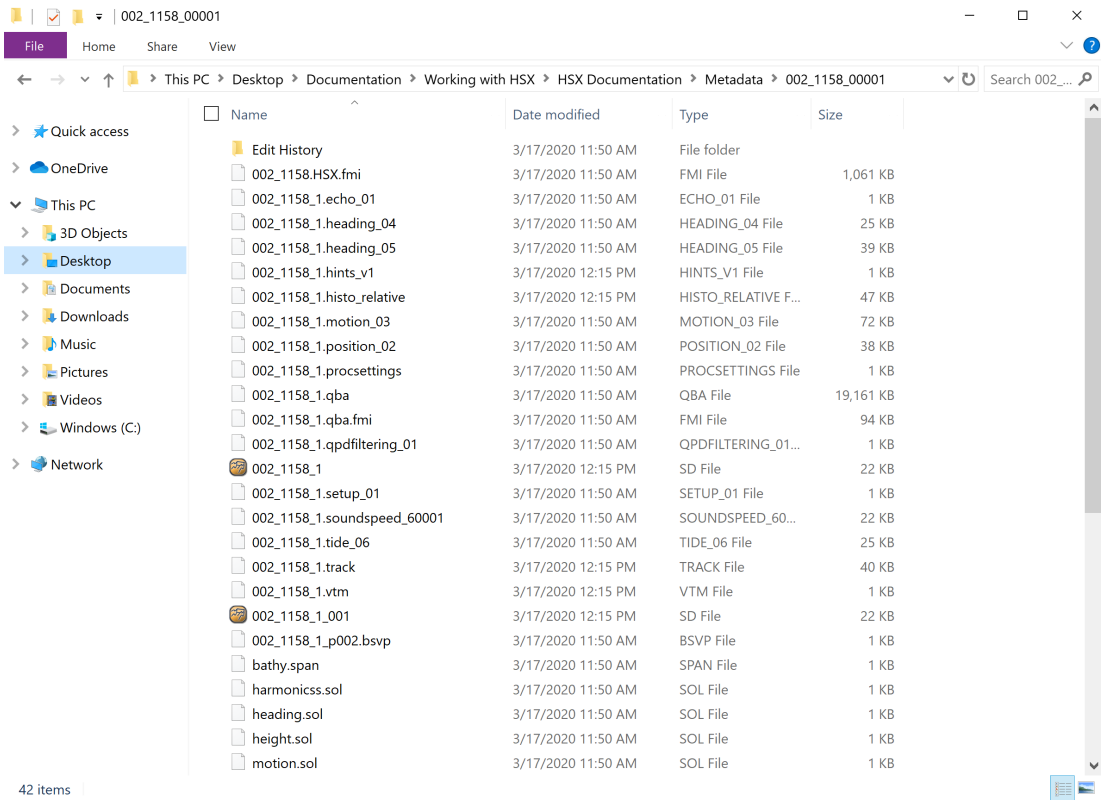


Figure 9: Extracted Information for Line 002 in the Metadata Folder

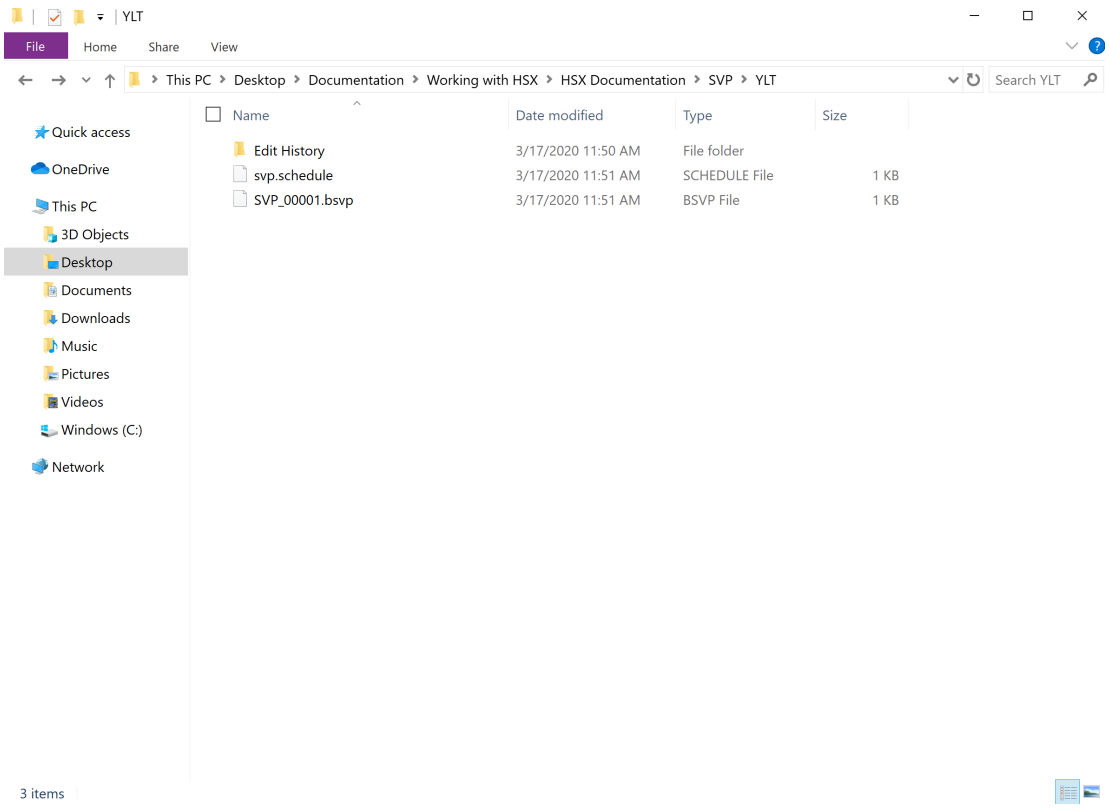


Figure 10: Extracted SVP Information in the SVP Folder

Visualizing a File in Qimera

Checking a file ON or OFF in the Project Sources Dock controls the visibility of the trackline.

Checking a file ON or OFF does not effect which files are used in surface creation and processing routines.

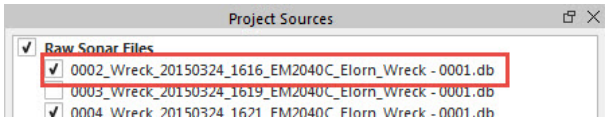


Figure 11: File Checked ON in Project Sources Dock

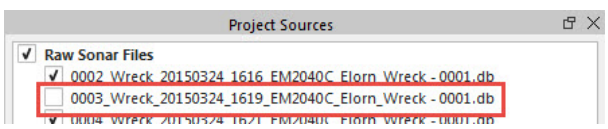


Figure 12: File Checked OFF in Project Sources Dock

Selecting a File in Qimera

For files to be used in a processing routine (such as Surface Creation), they can be checked ON or OFF, but they must also be selected.

Files can be selected by clicking on the file name or trackline with the mouse (use *SHIFT-click* or *CTRL-click* to select multiple files), or by selecting the parent directory above the files in the Project Sources Dock. The parent directory in *Figure 13* is "Raw Sonar Files."

In this example, only lines 0002 & 0003 are selected.

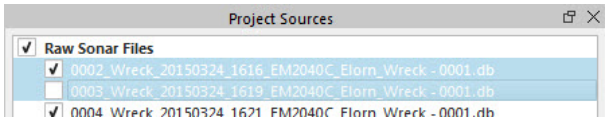


Figure 13: Files Selected in Project Sources Dock

This is a key part of Qimera's workflow. For an overview of the Qimera user interface, click here.

Note: When lines have just been added to your project and you are prompted to do a process, all of the lines that were added will automatically be included in that process.

How-to Work with Kongsberg ALL Data

This How-to describes how to add and work with Kongsberg ALL data in Qimera (Versions 2.0.0 and up).

On this page:

- About Kongsberg ALL Data
- How-to Bring Kongsberg ALL Data Into Qimera
- Vessel Offsets Equal Zero
- Visualizing a File in Qimera
- Selecting a File in Qimera

For additional information, see our Getting Started guide.

Data

The data used for this How-to is EM2040 data provided by Canadian Hydrographic Service.

About Kongsberg ALL Data

By default, Kongsberg ALL files are converted to QPD format on import. The QPD format is used to store computed footprints and is the QPS format for *processed point data*. The newer format KMALL will not be automatically converted to a QPD.

Licensing

The import and processing of raw data formats is dependent on licensing. To view your license coverage in Qimera, go to the *Help Menu* and choose *Show License Manager.*

How-to Bring Kongsberg ALL Data Into Qimera

1) After you open Qimera, the Projects Dialog will launch. Select *New Project...* to open the Create Project Dialog.

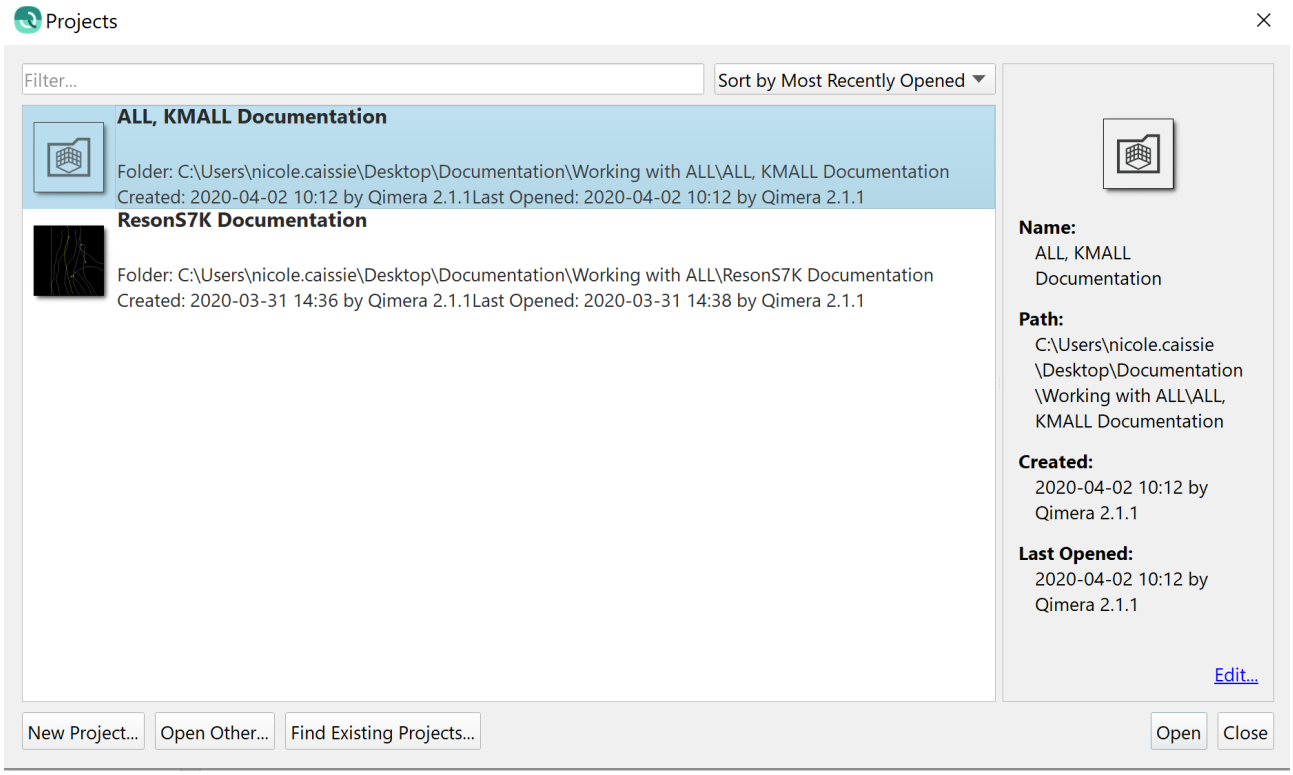


Figure 1: Qimera's Projects Dialog

Alternatively, you can create a project by clicking the *Create Project Button*  on Qimera's Bathymetry Toolbar, or by going to the Project *Menu* and choosing *New Project...*

2) Fill in Project Details:

1. Add a project name.
2. By default, the folder for your project will be in the 'C:\Users\username\QPS-Data\' directory, though you can choose another location.
3. The Survey Type and Description boxes can be used to add additional notes about the project.
4. Set the Project Coordinate System (CRS):
    a. *Automatic* - Qimera will automatically extract the project coordinate system from source files or choose an appropriate UTM zone when loading Kongsberg ALL files by looking at the geographic navigation extents.
    b. *Single Projected* - If you would like your Qimera products (QPDs, surfaces, etc.) to be in a projection that differs from your source files, you can manually set the CRS from a list of pre-defined CRS using the *Search Coordinate System Dialog.*

c. *Full Geodetic Configuration* - If you would like your Qimera products (QPDs, surfaces, etc.) to be in a projection that differs from your source files and is not included in the list of pre-defined CRS, you can manually enter the geodetic configuration parameters. A Geodetic Configuration consists of, at minimum, a Project CRS. Additionally, it can contain an Input Geographic CRS and a Transformation between the Project CRS and the Input Geographic CRS. You can also optionally have a Vertical CRS. This is done using the *Geodetic Configuration Overview Dialog*.

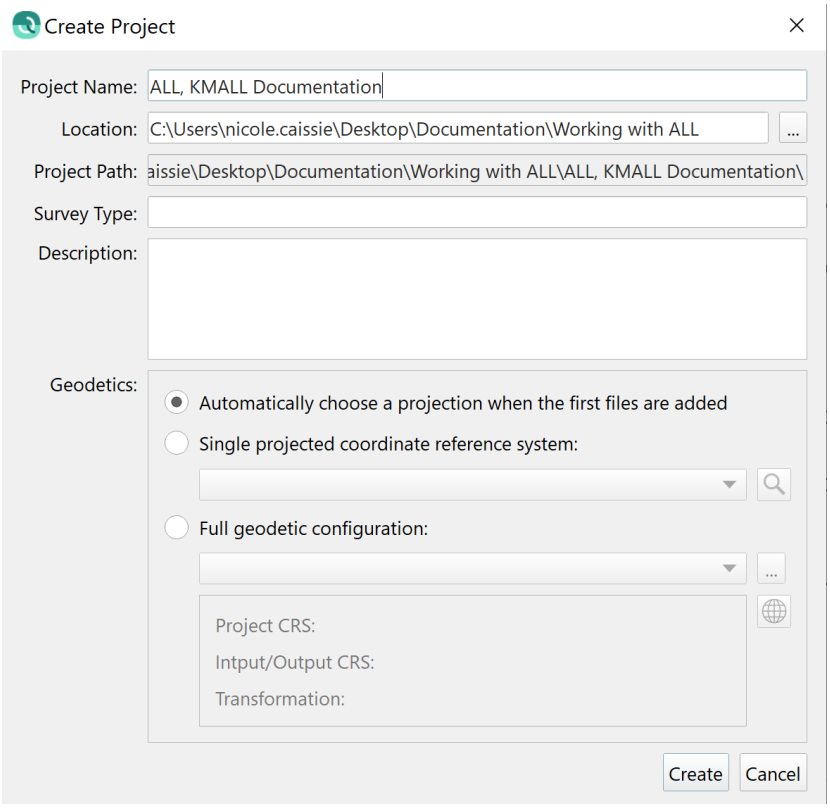


Figure 2: Create Project Dialog

3) Once the Project CRS is set, click OK to create the project. Once created, the *Project Folder* will contain sub-folders for storing bathymetry files in QPD format, internal metadata, extracted external source data, and products.

4) You will be prompted to add source files to your new project. Choose Add Raw Sonar Files.

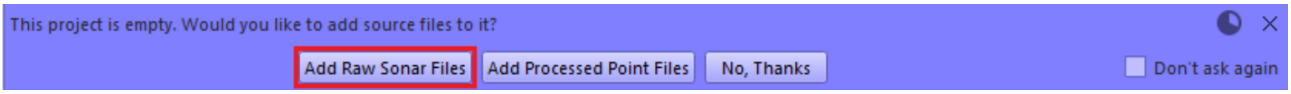


Figure 3: Add Raw Source Files Prompt
Alternatively, you can add Raw Sonar Source Files by clicking the *Add Raw Sonar File*

Button  on Qimera's Bathymetry Toolbar, or by going to the Source *Menu* and choosing *Add Raw Sonar Files...*

5) The ALL and KMALL files provide most of the information required by Qimera. The only information that must be input manually is the Coordinate Reference System (CRS).

Use the *Add Files... Button* to navigate to and select your ALL or KMALL files.

1. The vessel offsets for all sensors are stored in the ALL and KMALL files. Qimera reads these and uses them appropriately during all processing so no further vessel configuration is required.
2. Set the Coordinate Reference System of the Imported Data. The default CRS is WGS_84 which is normally correct.
3. Click OK to load the files.

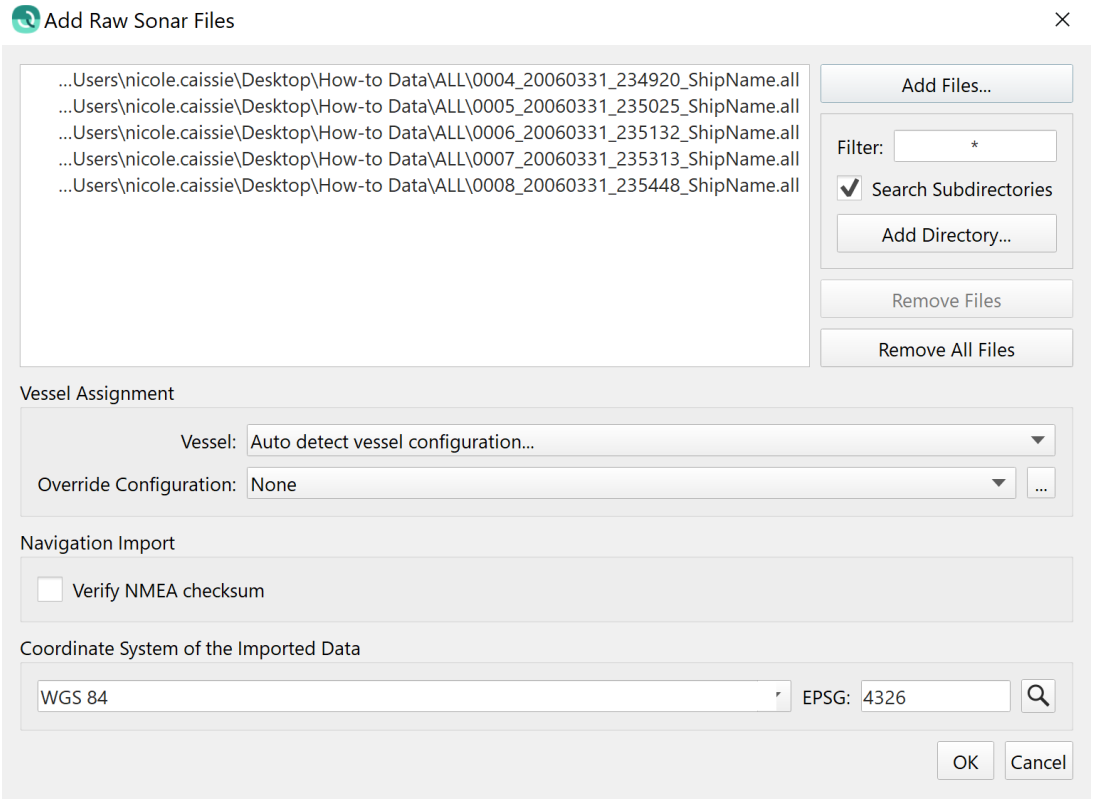


Figure 4: Add Raw Sonar Files Dialog

The vessel name for ALL files is sometimes shown here, if it has been setup in SIS. If it has not been setup, then Qimera will combine the sonar model number and the serial number to create a unique name as the vessel name.
For KMALL files, the vessel name is not stored as it is in ALL format. The sonar model number and serial number will be used as described above.

Full-Sonar Processing is not currently supported for some of the older Kongsberg systems. The systems that fall into this category are: EM1002, EM3000, EM300, and EM120. Data from these systems can be imported in Qimera using the *Add Raw Sonar Files Dialog* but processing is limited to applying SBETs, Navigation, and Tides. Point cleaning, including use of the Swath Editor, and creation of surfaces is all possible.

6) Qimera will load the ALL or KMALL files to the project, scanning for and extracting any available information and writing it to the Qimera project.

Shown below are:

1. Indicators showing the loading progress of each individual file in the Project Sources Dock.
2. The loaded tracklines visualized in the 4D Scene.
3. The overall progress of data extraction in the Job Activity Dock.
4. Any warnings or errors shown in the Job Activity Dock.

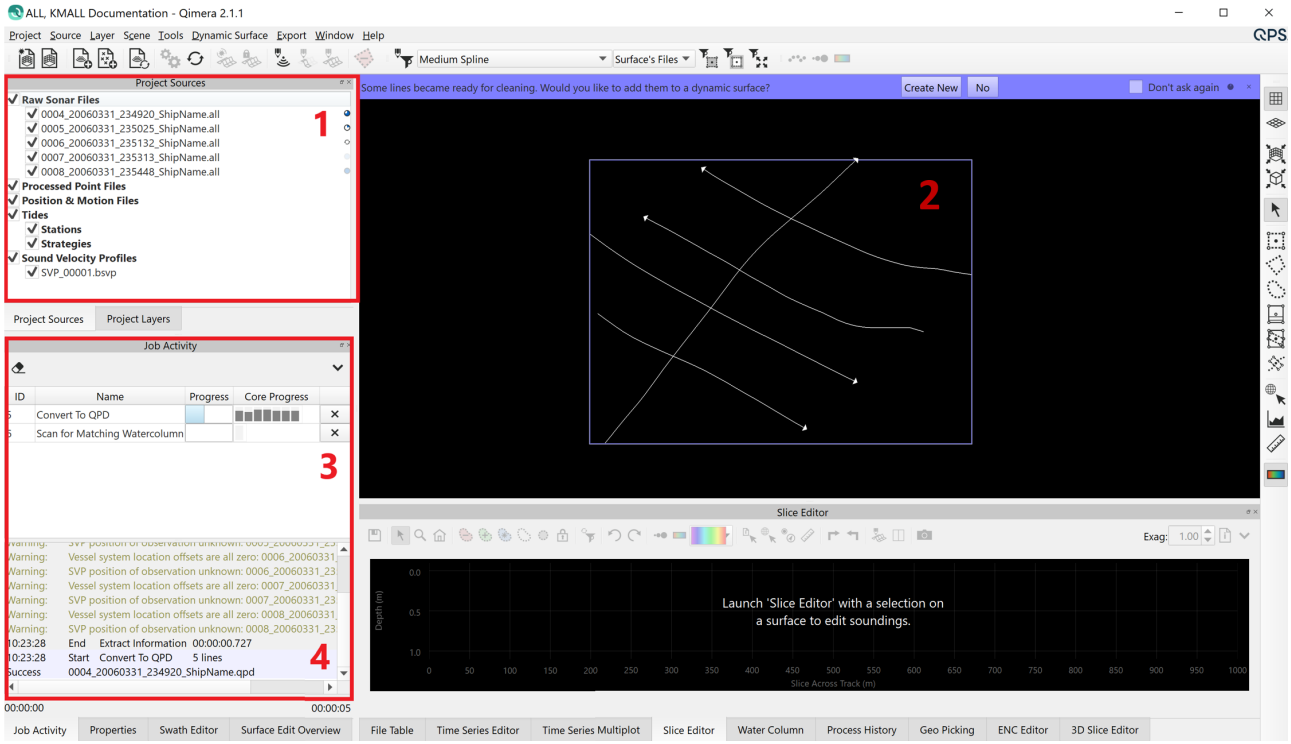


Figure 5: Information Being Extracted from the ALL Data During Load

7) As the information from the ALL files is extracted, you will see the extracted sonar information in the File Table Dock. You can review the Properties Dock to see what information was extracted for each file (make sure that you have a file selected).

Shown below are:

1. Properties Dock
2. File Table Dock

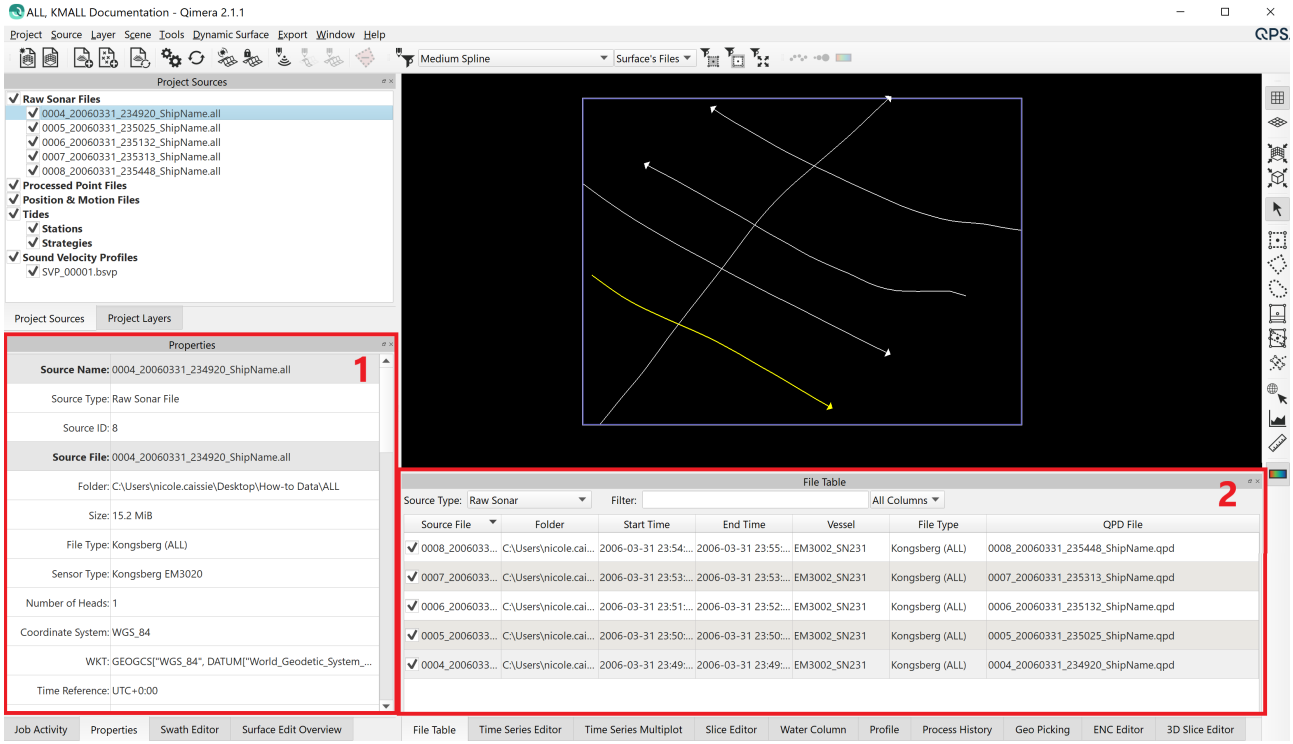


Figure 6: Imported Data Populating the Properties Dock and File Table Dock

8) For this example dataset, the *Job Activity Dock* displays a warning about vessel system location offsets, and SVP position. This just means that:

- All of the vessel system offsets are equal to zero. This can be changed in the Vessel Editor Dialog. More information on this warning can be found below, under the *Vessel Offsets Equal Zero* section,
- The SVP position was not available in the file, so Sound Velocity Processing Strategies based on location won't be available unless you provide this information in the SVP Editor.

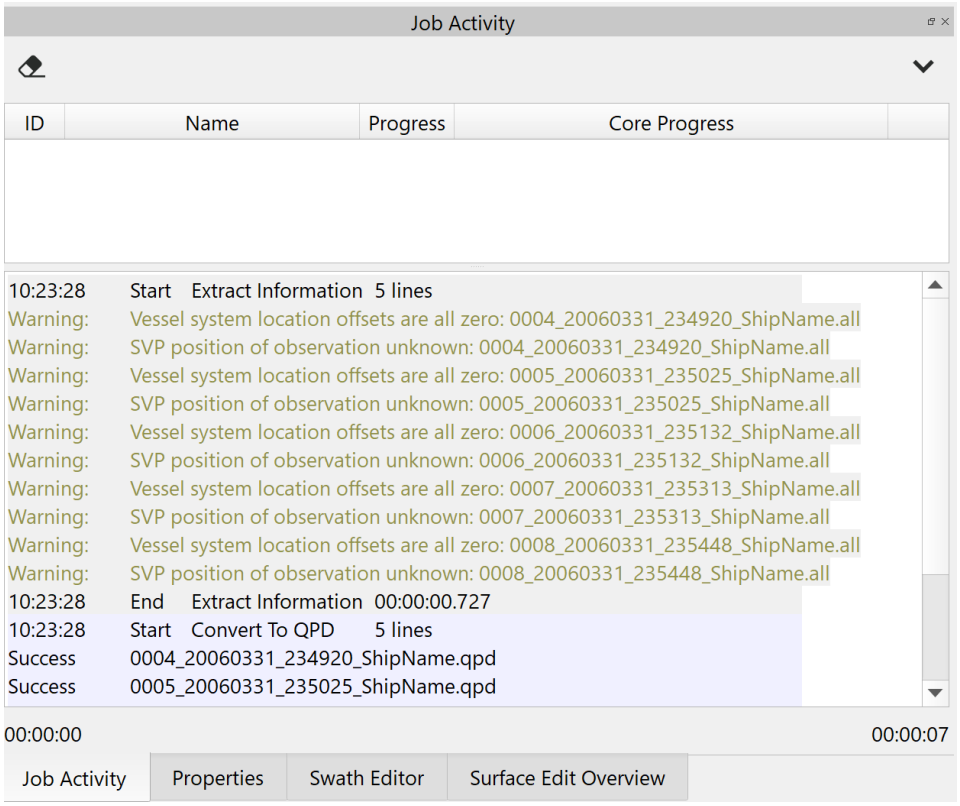


Figure 7: Warnings in the Job Activity Dock

Extracted information for ALL data may include:

- Processed multibeam if direct to QPD files is enabled
- Raw multibeam
- Water column
- Vessel configuration
- SVP
- Surface sound speed
- Orientation
- Position
- Height
- Pressure

For a full list of what is extracted from each supported format, click here.

In the *Properties Dock*, you can see that Beam Time Series, Water Column, Vessel Configuration, Position, Motion and SVP were all extracted from the file, but that there was no Tide.

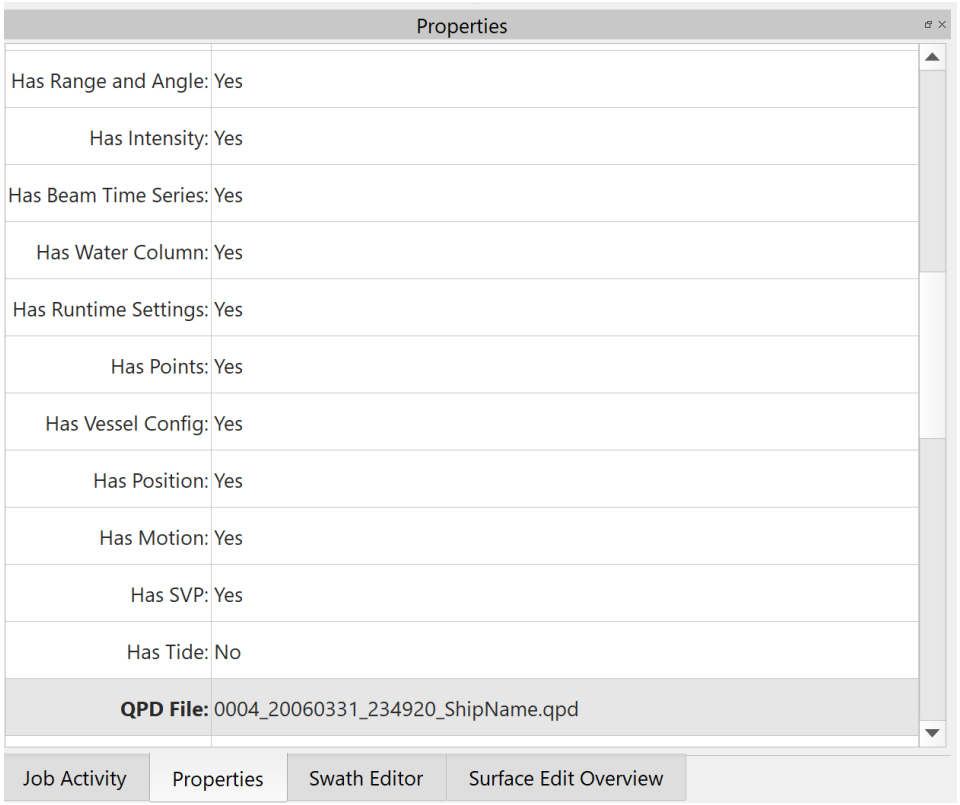


Figure 8: Properties Dock

9) As information is extracted from the ALL files, the folders in the Qimera project get populated with the information.

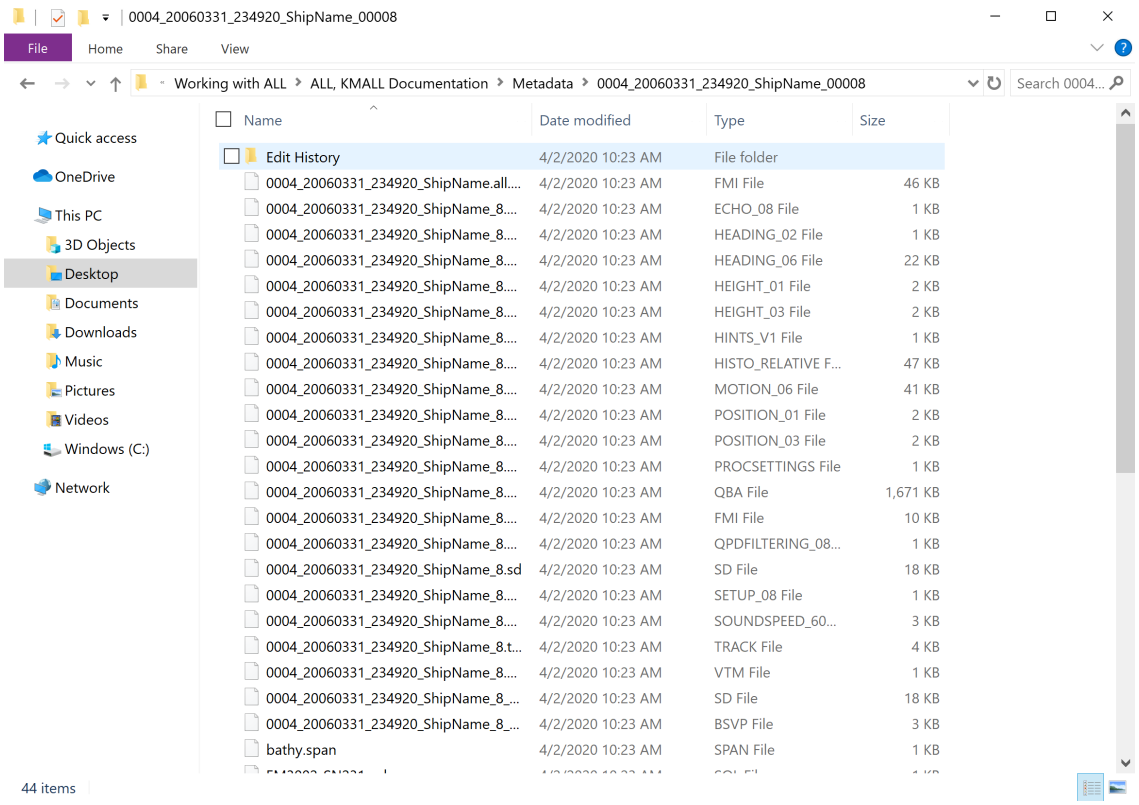


Figure 9: Extracted Information for Line 0004 in the Metadata Folder

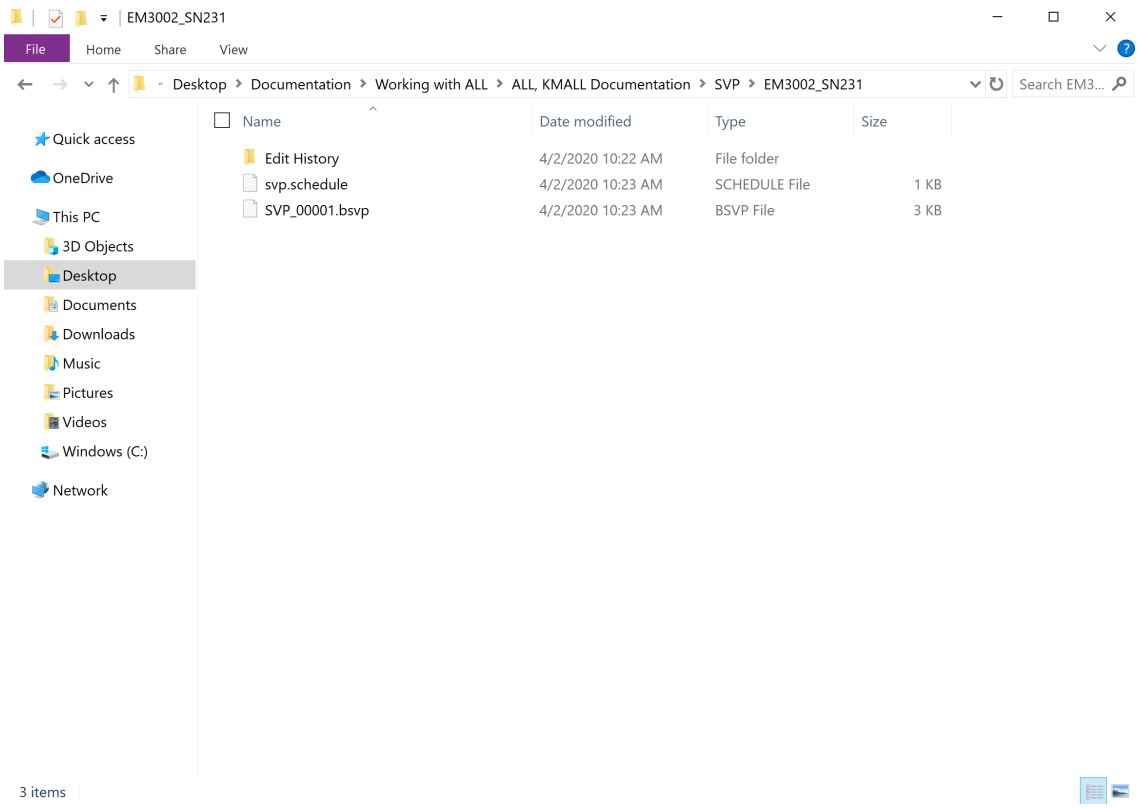


Figure 10: Extracted SVP Information in the SVP Folder

Vessel Offsets Equal Zero

In this example dataset, the Job Activity Dock displays a warning that the "*Vessel system location offsets are all zero*", as well as a prompt noting that "*Your vessel offsets are all zero. Would you like to edit your vessel settings now?*"

Click *Yes* at the prompt to open the *Vessel Editor* (or *Tools Menu -> Vessel Editor*).

A review of the settings in the *Vessel Editor* will show that the Roll, Pitch, Heading, Starboard, Forward, and Up Transducer Offsets are all set to zero.

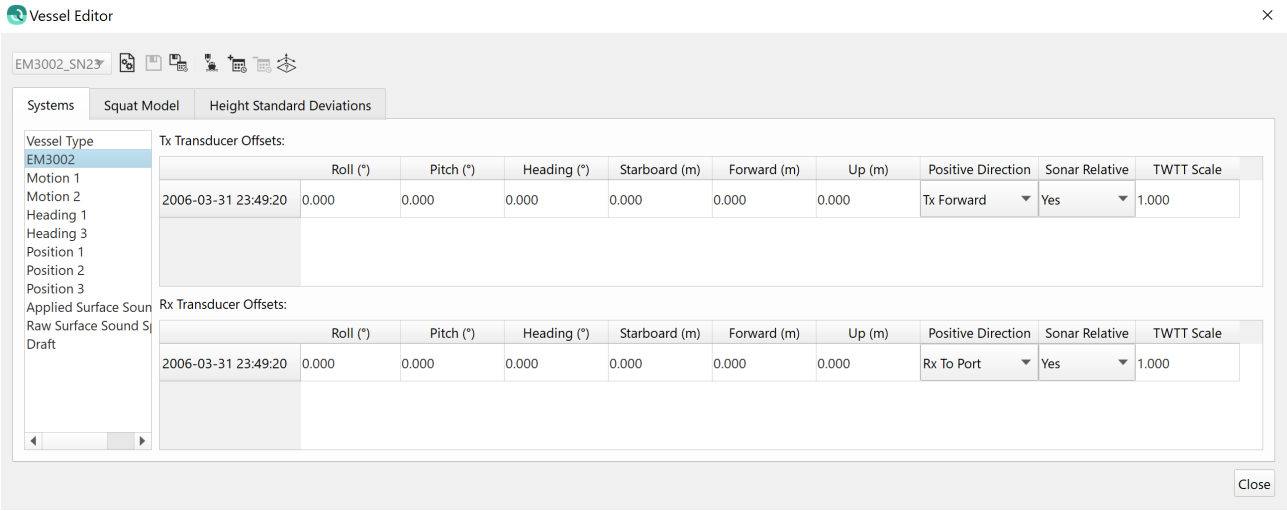


Figure 11: Vessel Offsets Set to Zero in the Vessel Editor

This vessel was equipped with a POSMV, and all referencing was done to the POS rather than in Qinsy. This is a typical warning for this set-up and is not a cause for concern, therefore no action is necessary in this particular case.

Visualizing a File in Qimera

Checking a file ON or OFF in the Project Sources Dock controls the visibility of the trackline.

Checking a file ON or OFF does not effect which files are used in surface creation and processing routines.

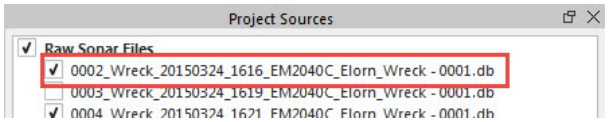


Figure 12: File Checked ON in Project Sources Dock

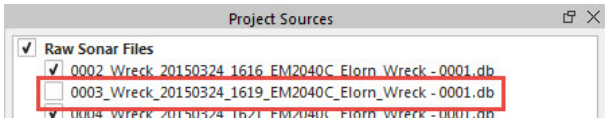


Figure 13: File Checked OFF in Project Sources Dock

Selecting a File in Qimera

For files to be used in a processing routine (such as Surface Creation), they can be checked ON or OFF, but they must also be selected.

Files can be selected by clicking on the file name or trackline with the mouse (use *SHIFT-click* or *CTRL-click* to select multiple files), or by selecting the parent directory above the files in the Project Sources Dock. The parent directory in *Figure 14* is "Raw Sonar Files."

In this example, only lines 0002 & 0003 are selected.

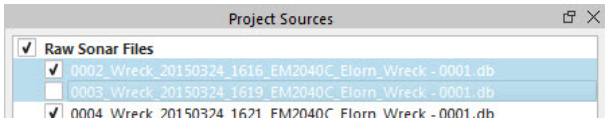


Figure 14: Files Selected in Project Sources Dock

This is a key part of Qimera's workflow. For an overview of the Qimera user interface, click here.

Note: When lines have just been added to your project and you are prompted to do a process, all of the lines that were added will automatically be included in that process.

How-to Work with Large Data

This document will help you to deal with large data sets.

On this page:

- Introduction
  - Step 1. Data Storage
  - Step 2. Project Creation
  - Step 3. Computing Power & Preparing for Processing
  - Step 4. Filtering & Editing a Surface
  - Step 5. Reprocessing the Source Files
  - Step 6. Exports

Introduction

The following information is a descriptive document of how to deal with large datasets with Qimera as a guideline of the considerations in the steps that apply to process large datasets.

Step 1. Data Storage

- It is recommended to have the project saved to your local hard drive (i.e. C: drive of your PC) of your unit. Especially with large datasets, having the project saved on an external hard drive, or working over a network can cause loading times to increase significantly. Any changes to the data will be saved back to the project, which will be fastest if the project is easily accessible (local) to Qimera.
- It is also recommended to work with the raw source files directly on the local hard drive (i.e. C: drive of your PC) of your unit. Especially with large datasets, having the raw source files saved on an external hard drive, or working over a network can cause initial loading and processing times to increase significantly.
- If the project is located locally on your PC, but the raw source files are not, the initial loading and processing will be much slower than if the raw source files were also local. After the files are processed, the loading times will be similar to if the raw source files were local. After the files are processed, the load times are similar whether they are located locally or not because during the processing of the files, QPD files are made for each of the raw source files. These QPD's will be saved to the project in the DtmData folder, and will be used in replace of the raw source files. Any changes in the project will be saved to the QPD's, and not to the raw source files.

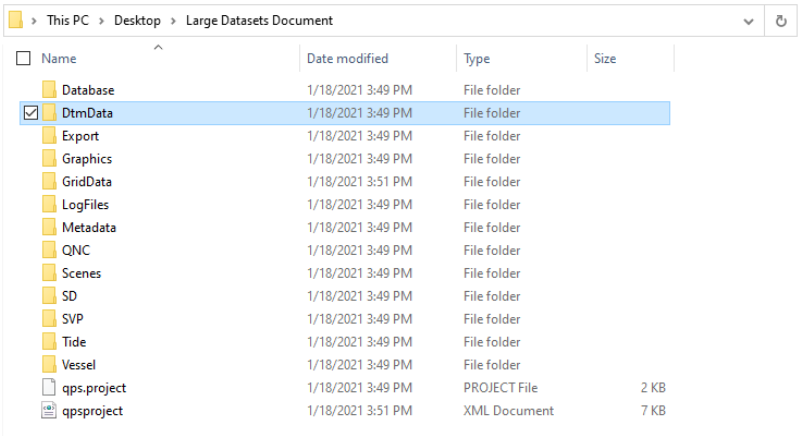


Figure 1. *Qimera Project Folder Structure - DtmData*

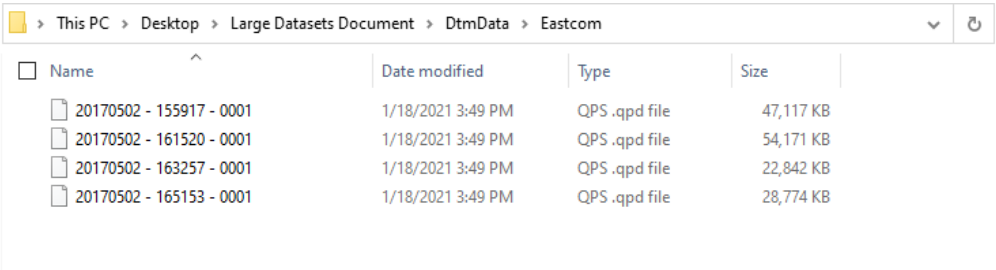


Figure 2. *QPS .qpd files in DtmData Folder*

- If the project and raw source files must be accessed by a network, it is recommended to have the project and raw source files located on the same disk drive. This will allow Qimera to read & write to only 1 location, versus 2. This can speed up the process a bit compared to using 2 different disk drives.
- If you are only cleaning data in the project, you only need access to the QPD's. If you do not need to reprocess the files, you technically do not need access to the raw source files at all. The raw source files could be moved to a different location if needed to clear disk space. It is always recommended to keep a copy of the raw source files somewhere in case they are needed in the future.

Step 2. Project Creation

- Once the raw source files are processed and the QPD's are created, the QPD's can be loaded into a new project if desired. The QPD's will load significantly faster than loading the raw source files.
  In a test project, with approximately 2500 raw source files (.db's), it took around 95 minutes to load the .db's into the project, versus only 20 minutes for the corresponding QPD's.
- With very large project, especially projects with data from multiple vessels and/or spanning over multiple days, it is recommended to organize the project source files by vessel and day,

etc. This can be done by right-clicking on the Raw Sonar Files section in the Project Sources → Organize → Regroup by ...

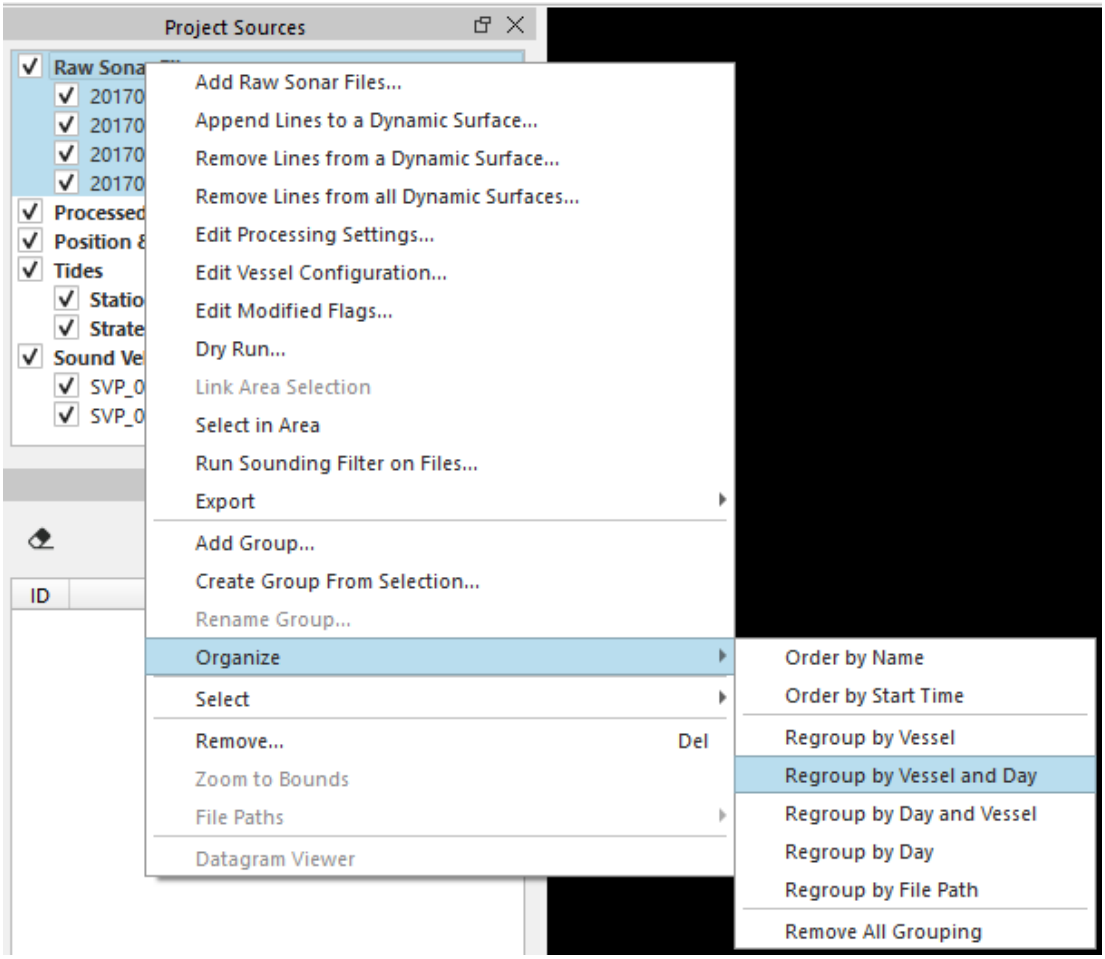


Figure 3. *Raw Sonar Files - Organize - Regroup by Vessel and Day*

- If a project spans over a very large area, it is recommended to organize the project by blocks or sections. This can be done by selecting a group of Raw Sonar Files, right-clicking → Create Group From Selection... This will group together the source files, which can then be organized by vessel and day, etc., if preferred.

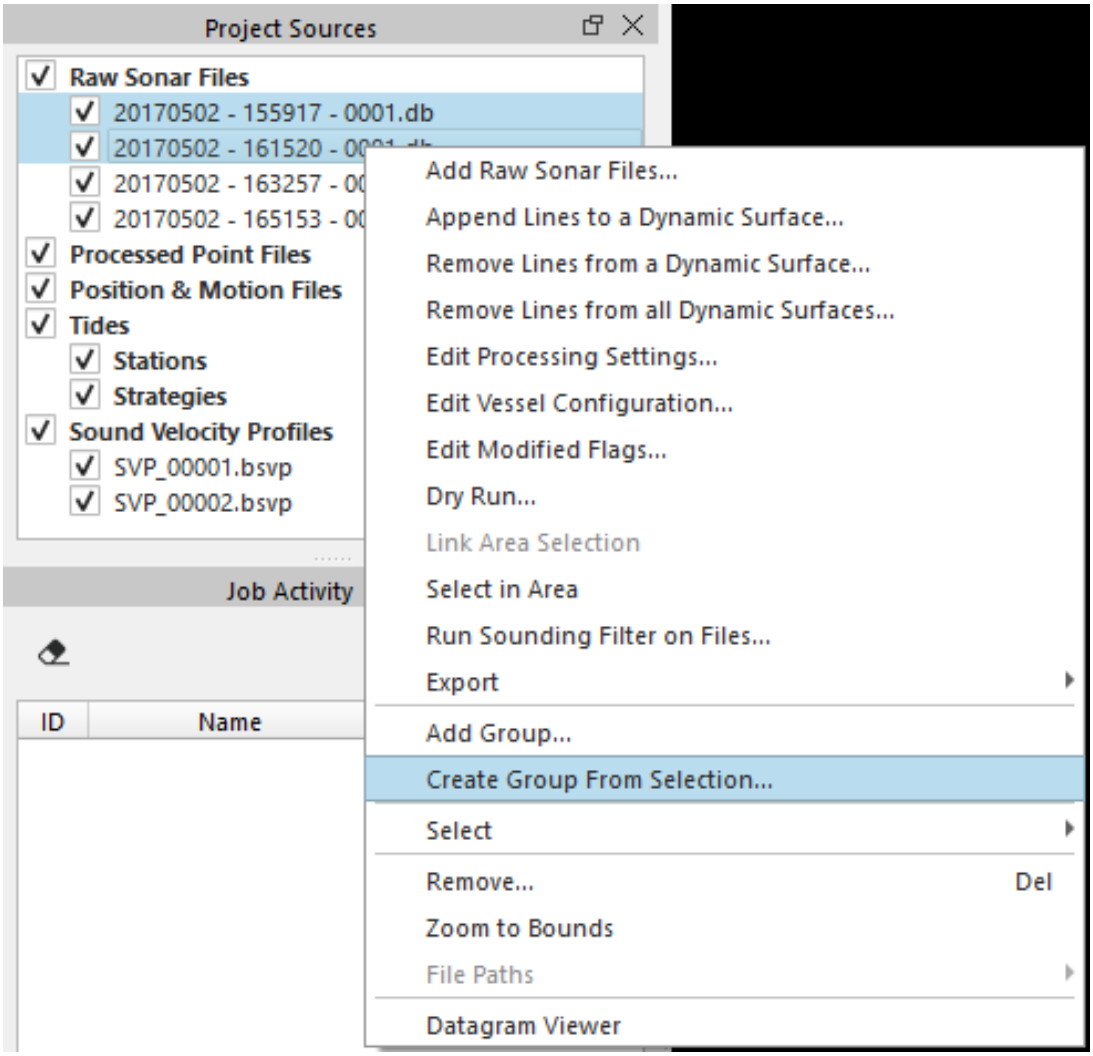


Figure 4. *Raw Sonar Files - Create Group From Selection*

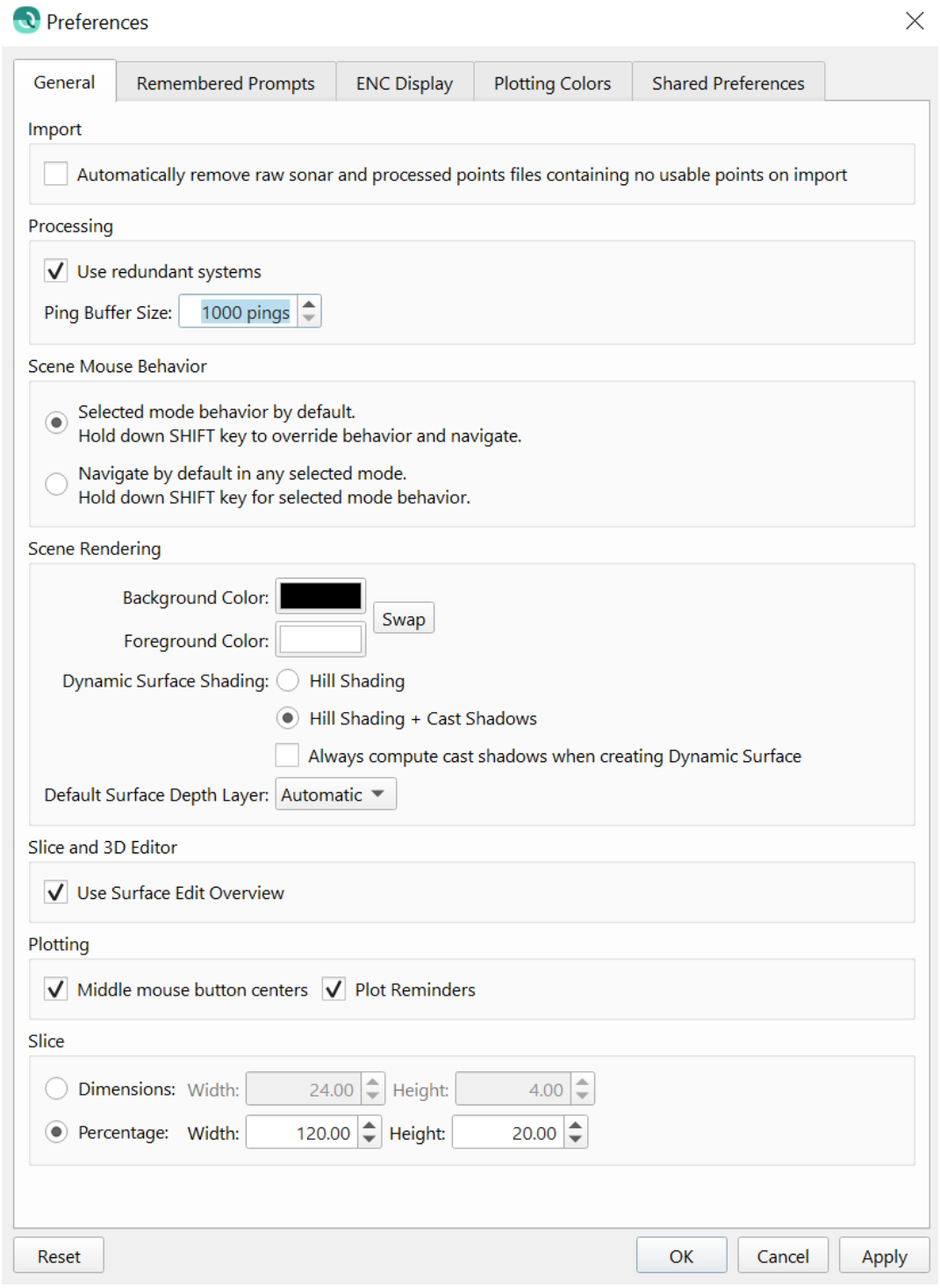
- If CUBE is not required, it is recommended to not include it when creating a large surface. Adding in a CUBE layer can increase the time needed for the surface to update, which increases significantly more as the surface size increases. Each time the surface is updated, the CUBE has to be recalculated. If Qinsy is set up correctly during acquisition, CUBE should not be necessary, which will save some time.
- When creating large dynamic surfaces in Qimera, it is suggested to keep an eye on the size of the surface. It is not recommended for the surface to exceed a size of around 50Gb. If the surface will exceed 50Gb, it is recommended to perform cooperative cleaning. You can learn more about cooperative cleaning in Step 4. Filtering & Editing a Surface.

Step 3. Computing Power & Preparing for Processing

- It is recommended to check that the hardware specifications of the machine meets the requirements for Qimera to run. Qimera will run as long as the minimum hardware

requirements are met, however Qimera will perform best if the recommended hardware requirements are met, especially when dealing with large datasets.
For more information, click here: Qimera System Requirements

- There is the option to change the Ping Buffer Memory Size used during sound velocity correction in Qimera. During sound velocity correction, Qimera will buffer the processed pings into memory and write them at all at once. The size of this buffer determines how many are stored before writes to disk. The large this buffer, the more efficient your processing will be. The Ping Buffer Size can be assigned in the Preferences Dialog within Qimera. This dialog can be opened from the Project menu → Preferences.



- There is also the option to allow Qimera access to more computing power generated by the PC than is allocated by default. The Maximum Number of Processing Threads can be assigned in the Preferences Dialog within Qimera. This dialog can be opened from the Project menu → Preferences.
  It should be noted that as you increase the number of thread being used, the PC may become

less responsive, so it is recommended to only do this if the PC is being used for only processing.

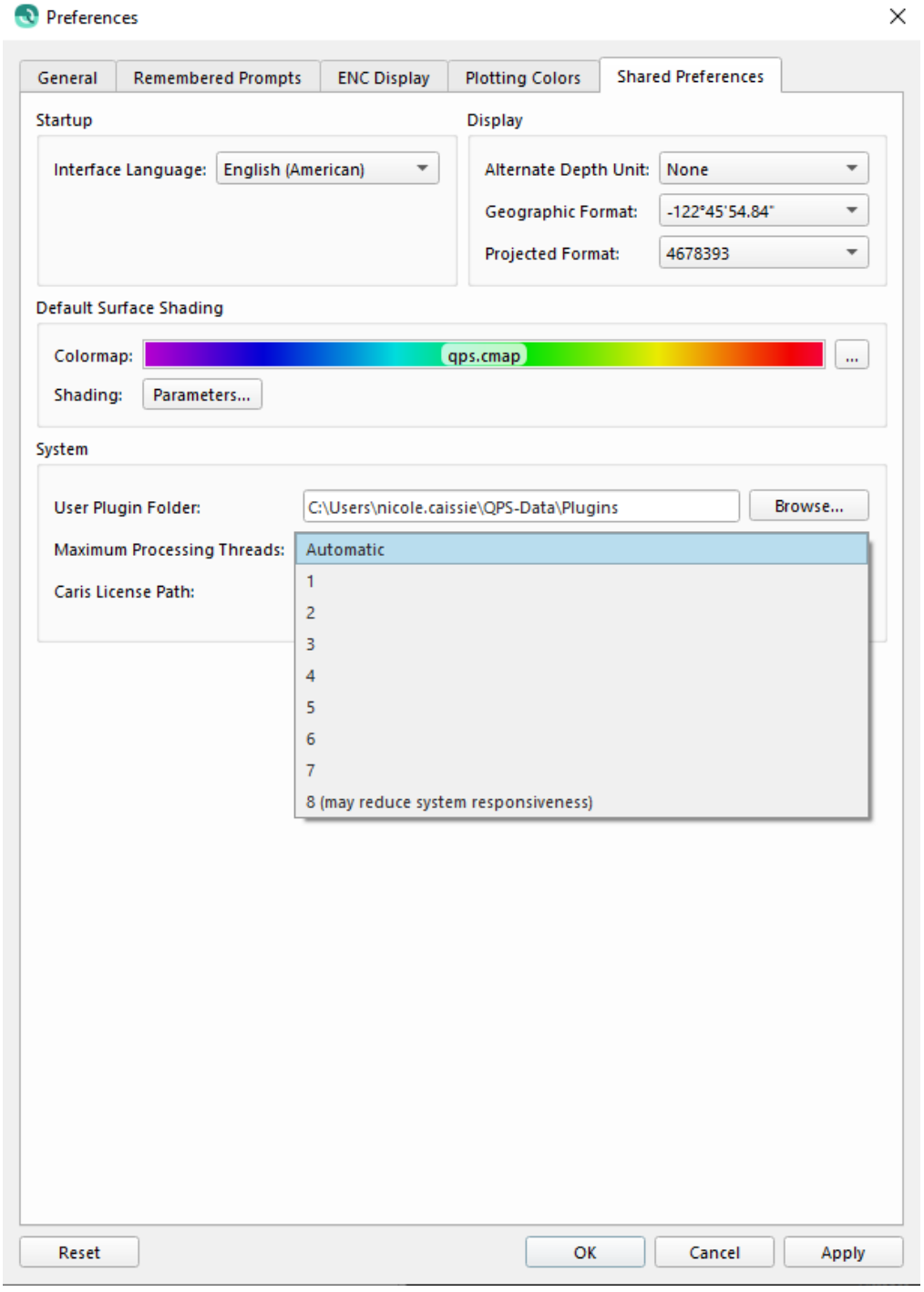


Figure 5. *Maximum Processing Threads Settings*

Step 4. Filtering & Editing a Surface

- When working with large datasets and surfaces, it is important to know the different options for updating the surfaces. Especially if you are manual rejecting and accepting soundings in an editor, it is recommended to set the surface to update manually. This will save you from needing to wait for the surfaces to update each time an edit is saved. Once all of the desired changes are made, you can force the surfaces to update by selecting the surfaces → right click → Update Dynamic Surface from Edits. If you can wait until the end of the day to update all of the surfaces, that is encouraged to reduce the downtime needed to update. Depending on the size of the surfaces and the quantity, these updates can take a long time to complete.

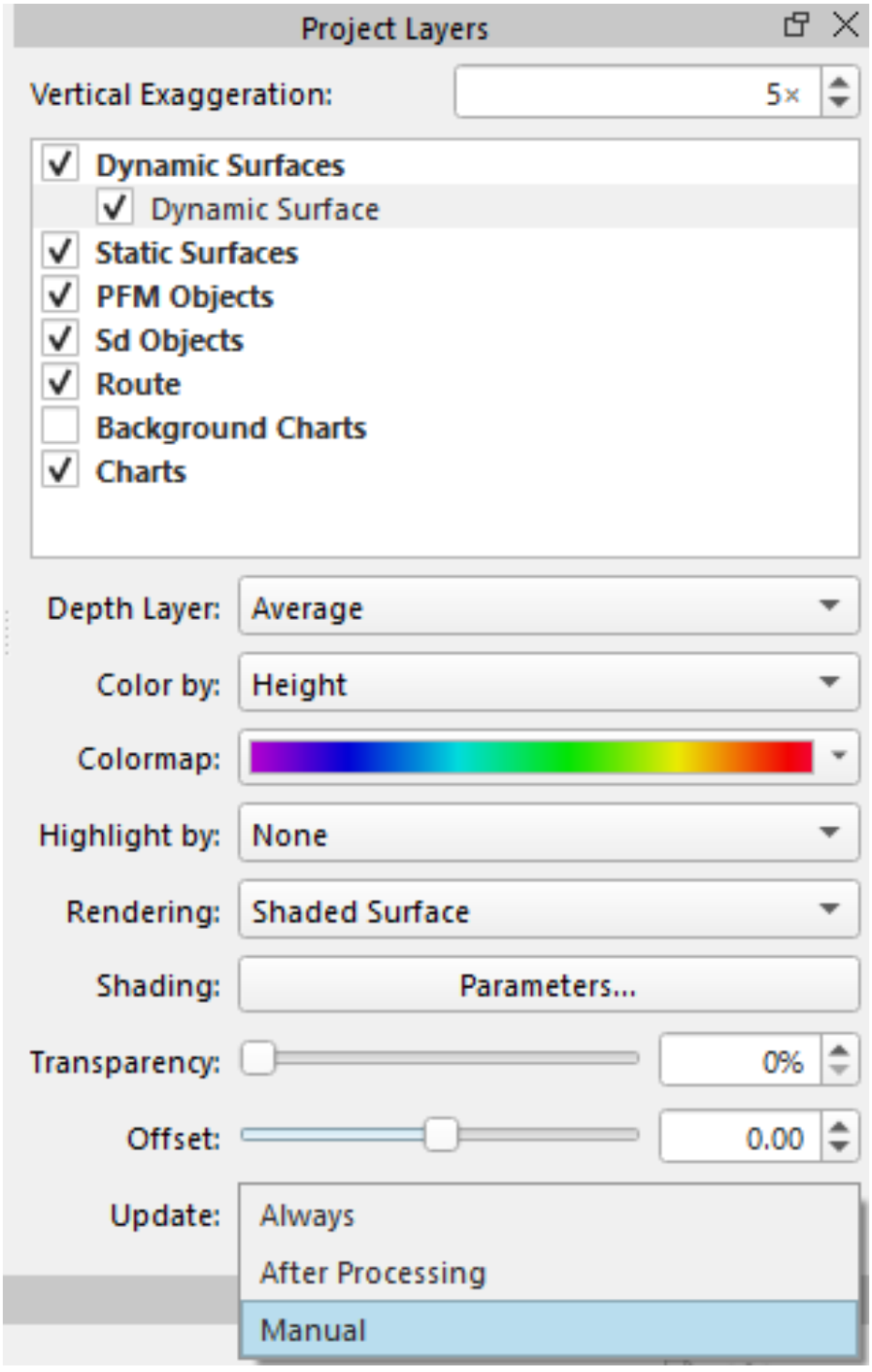


Figure 6. *Update Surface Options*

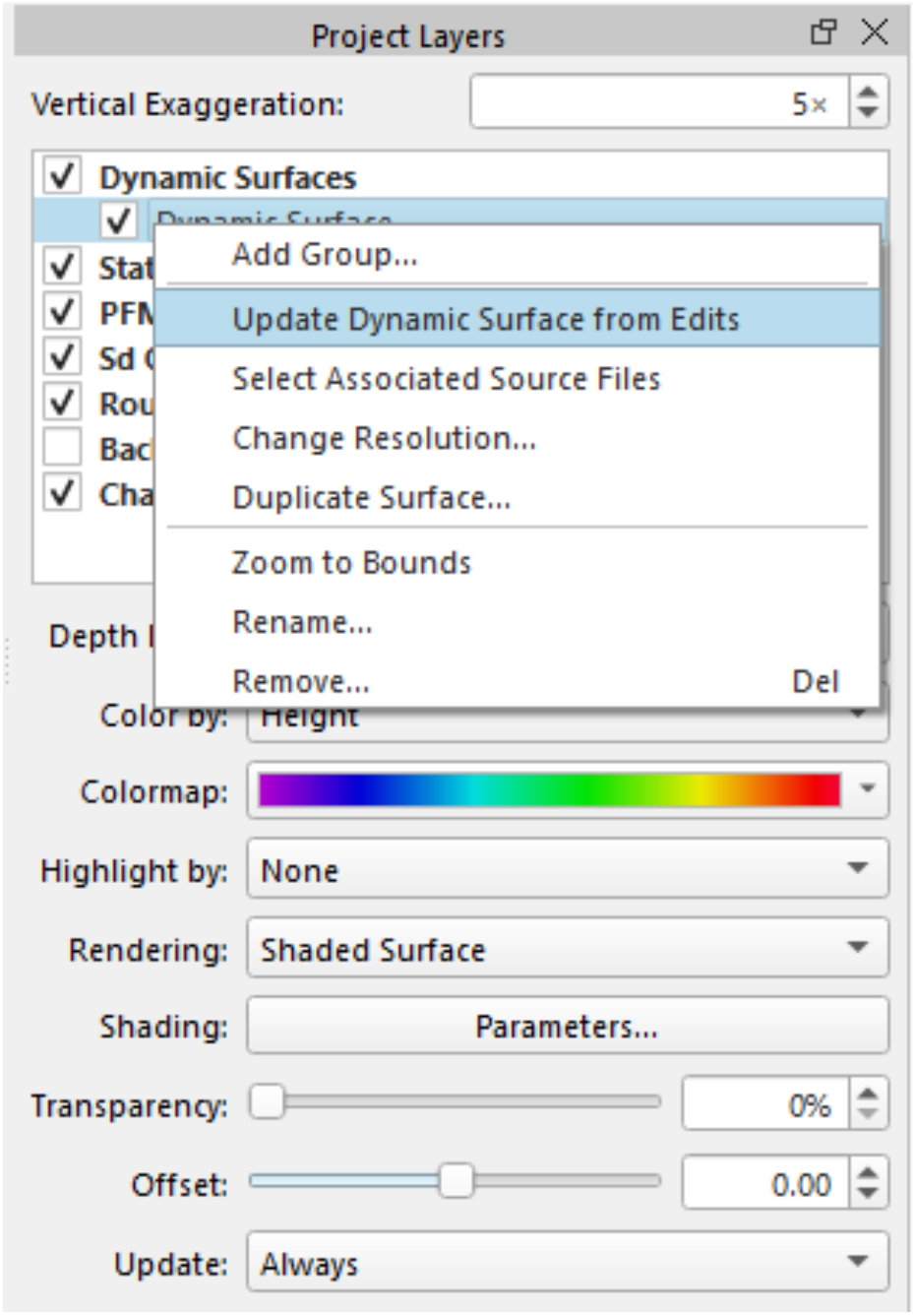


Figure 7. *Update Dynamic Surface from Edits*

Update Policy	Behavior
Always	The dynamic surface will automatically update whenever changes are made to the underlying point data.
After Processing	The dynamic surface will automatically update whenever a processing job modifies the underlying point data. Running any filters or manualy cleaning in the 3D editor, swath editor or slice editor will not automatically cause an update, but will instead cause the surface to marked as needing an update. This allows one to do quick manual cleaning without having to wait for the surface to update after each edit. When edits are complete, the surface can be updated via its context menu, or by pressing the Auto Process button.
Never	The dynamic surface is completely disconnected from the changes to the underlying point data. The 3D editor cannot be launched on the surface. Neither processing jobs, filters, or the swath editor will cause the surface to update. Note that switching from Never to a different update policy will require a full surface update, which can be quite slow for large surfaces.

Figure 8. *Update Surface Options Details*

- For filtering on large surfaces, the Selection Movement Toolbar can be used to automatically jump you through the data to inspect or manually apply a chosen filter to the selection area. The step interval can be changed to the amount of seconds you want the selection box to play forward or in reverse.



Figure 9. *Selection Movement Toolbar*

If you want a filter to apply automatically as the selection box moves through the selection area, you can set this up in Slice Editor. You can do this by choosing the filter from the Filter Operation Toolbar → Open Slice Editor → Slice Editor Drop Down Menu → Automatically Apply Active Filter. Turning on this check box will automatically apply whatever filter you have chosen to the area being displayed within the Slice. If this method is followed, it is important to change the Save Edits option according. If Qimera is set to walk through an area with limited interaction from the user, you should have the Save Edits set to automatic or instantly to reduce the need for the processor to manually save the changes.

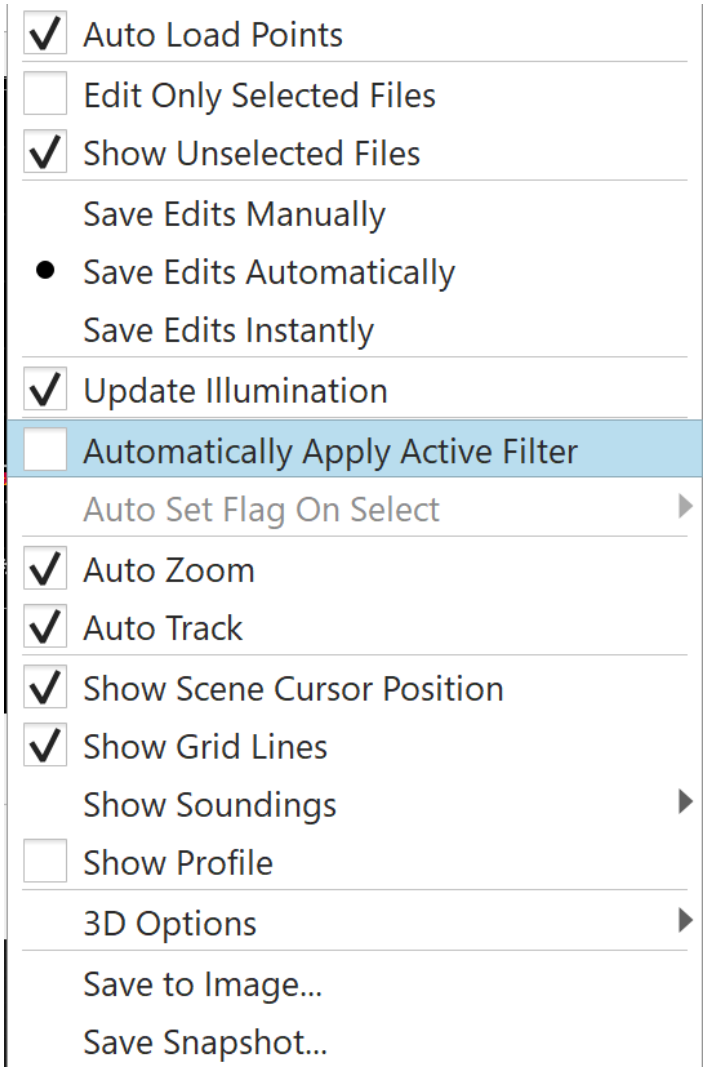


Figure 10. *Automatically Apply Active Filter in Slice Editor*

- The procedure in which you should follow to perform cleaning on your surface will depend on the focus of the project. Most contracts generally stipulate Total Propagated Uncertainty (TPU), and Sounding Density requirements. This should be reviewed as early as possible to ensure the data is within specifications. Especially with very large surfaces, it is not always possible to manually inspect the full surface. Because of this, spot cleaning with the help of the Color Surface By: option and custom colormaps can be very useful for large surfaces.

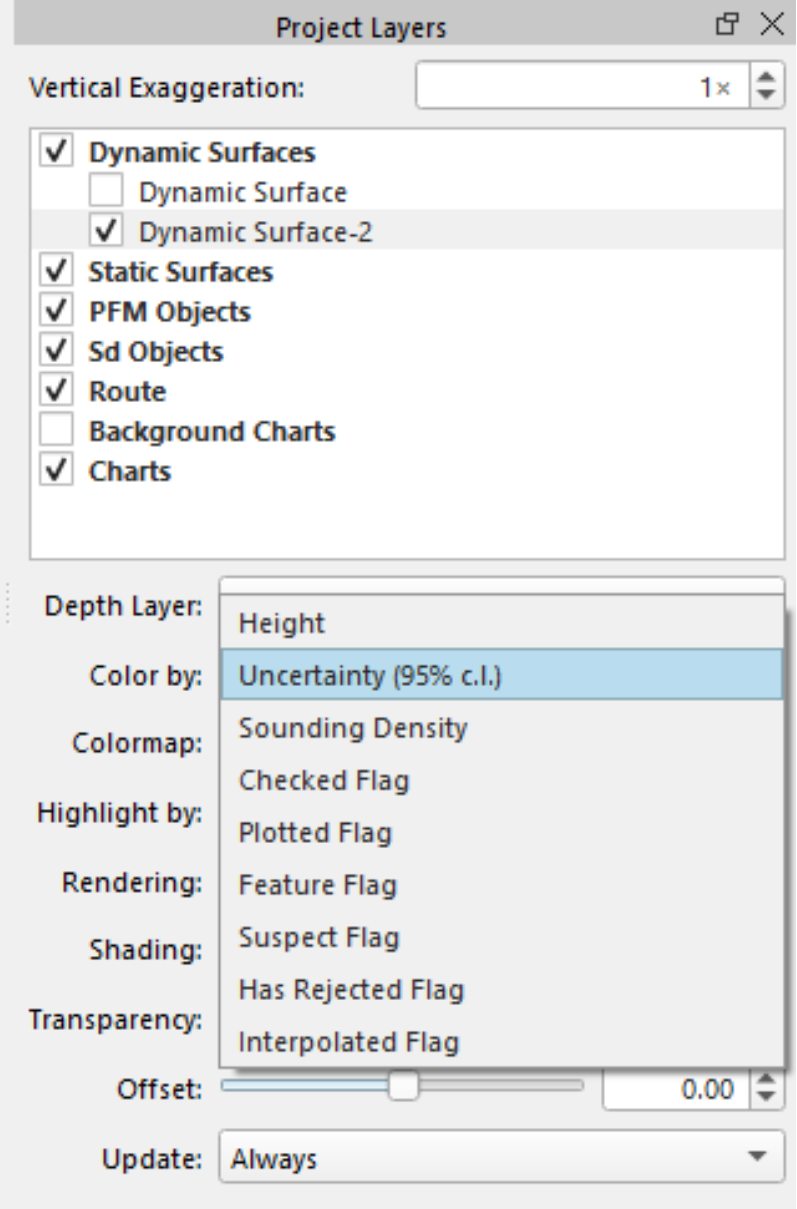


Figure 11. *Color By Uncertainty (95% c.l.)*

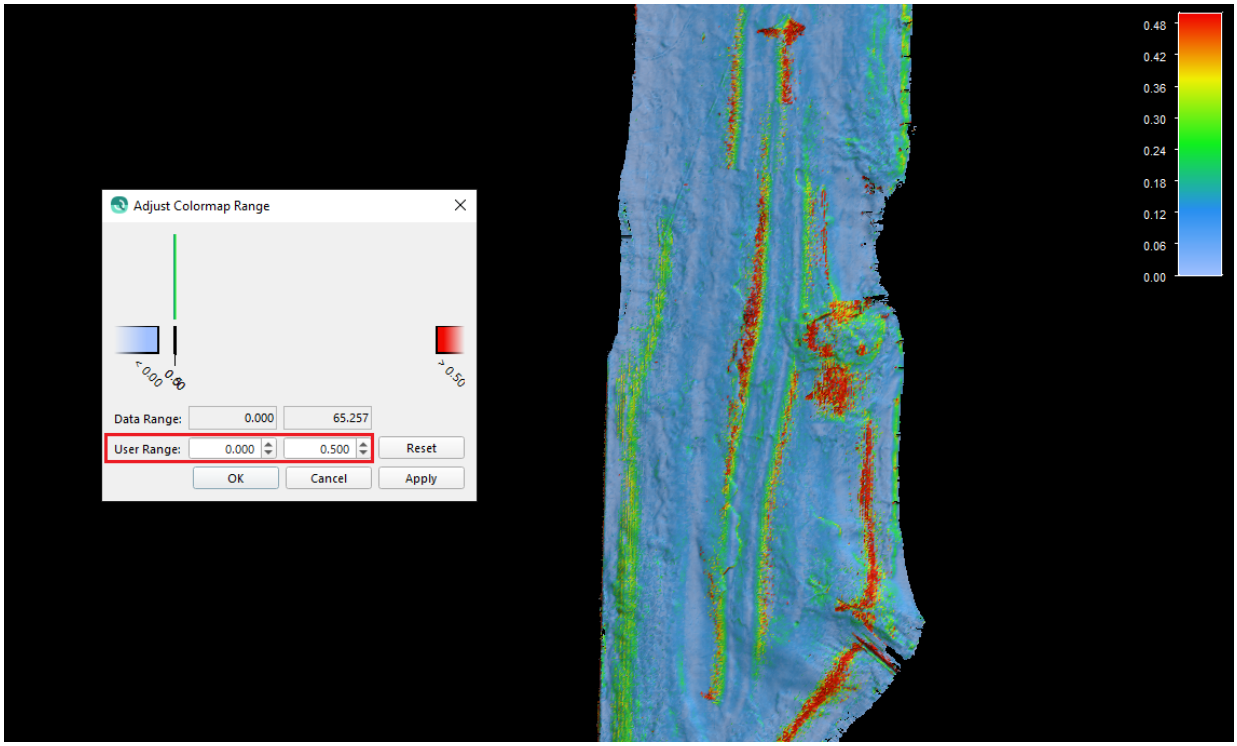


Figure 12. *User Defined Colormap Range*

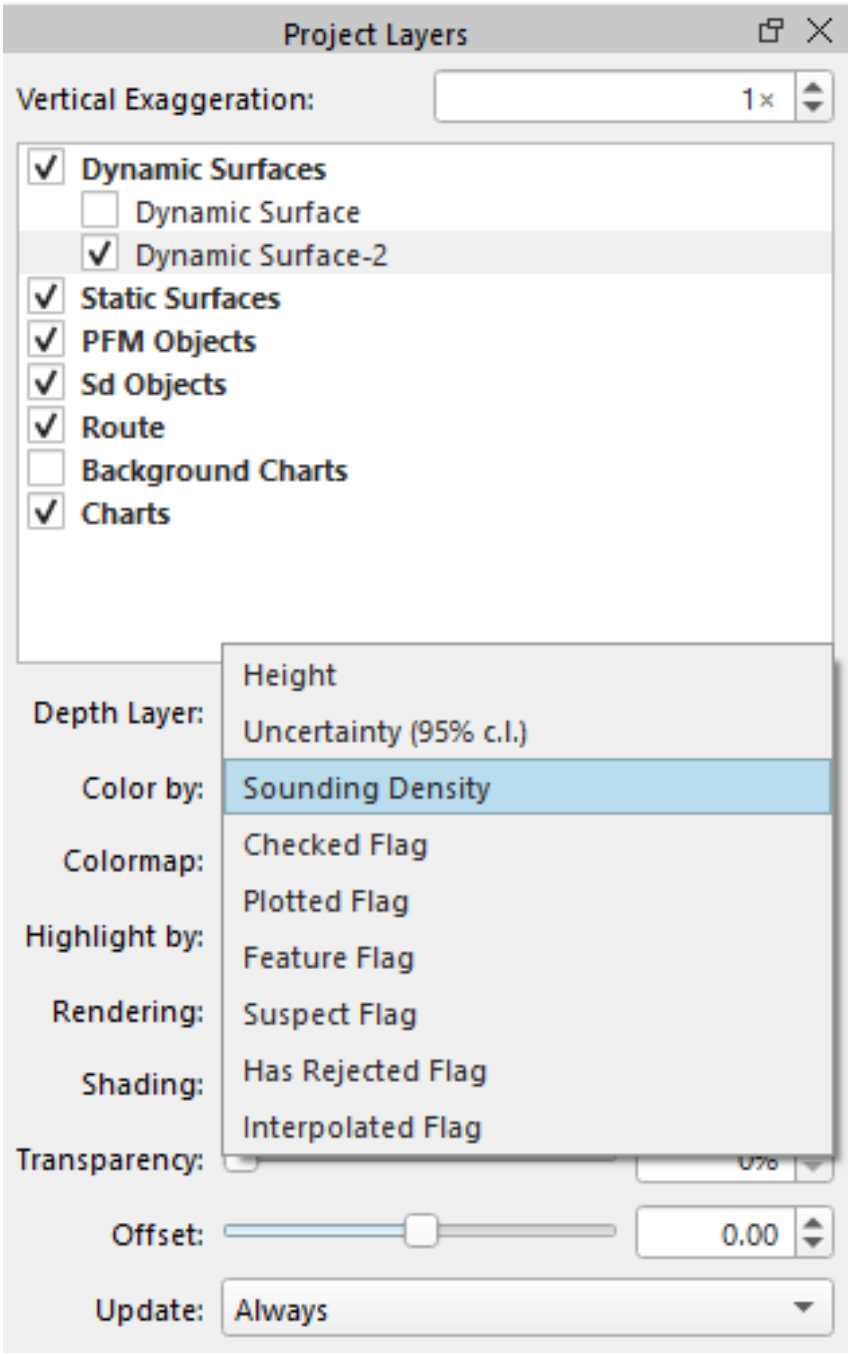


Figure 13. *Color By Sounding Density*

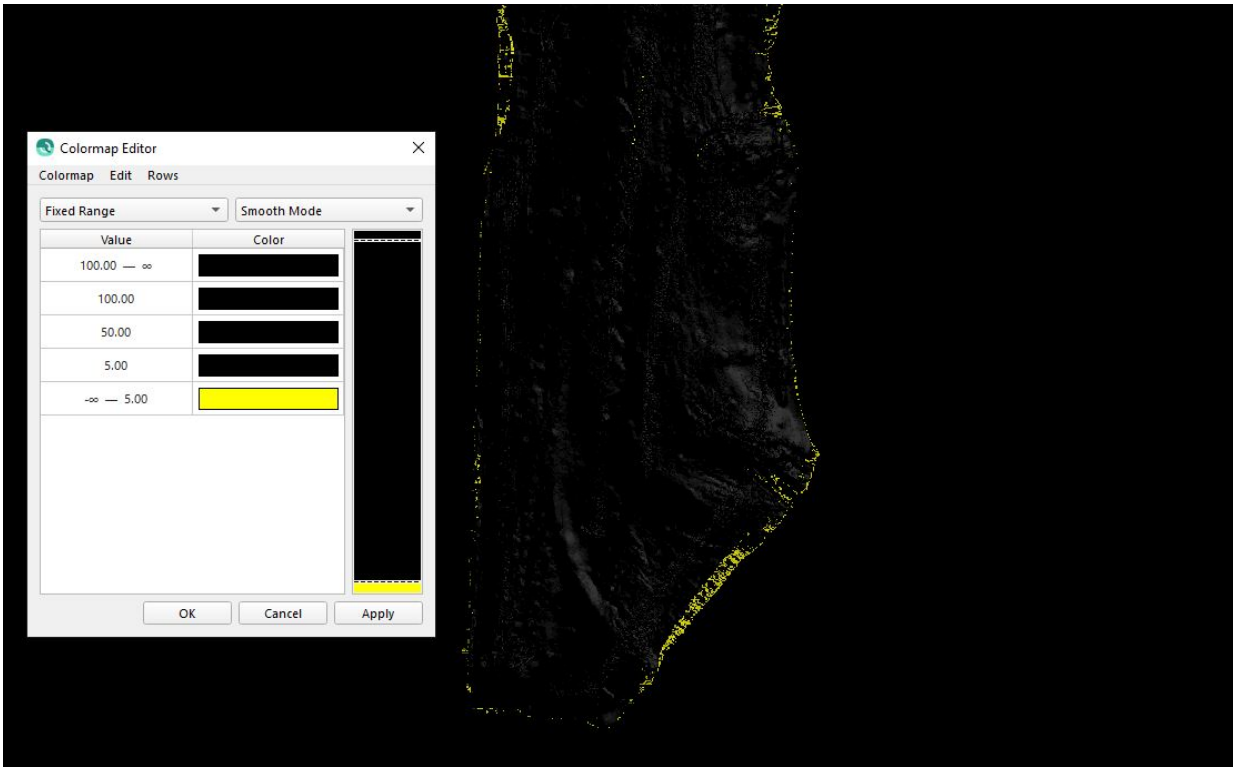


Figure 14. *User Defined Colormap Range*

By using the Color by: option paired with the customized colormaps, you can easily see the areas that need to be inspected more closely. This can save a lot of time for very large surfaces, and will update as the surface updates.

- Cooperative Cleaning can be a very useful tool when working with very large projects and surfaces. Cooperative cleaning allows you to break up a "master" project into multiple small cleaning projects to work on individually. Once you've finished the manual cleaning, the master project can be updated with the edits done in each of the cleaning projects. This can also be used by a single processor to break up a large project on their computer for the sole purpose of breaking up the size, which will prevent long updates of the surface.
  More information on Cooperative Cleaning can be found here: Cooperative Cleaning in Qimera

Step 5. Reprocessing the Source Files

- As mentioned above in Step 1. Data Storage, the raw source files must be accessible to reprocess the source files. Reprocessing of the source files is required for any files that are affected when any changes are made in the Processing Settings, Time Series Editor, SVP Editor, or Vessel Editor. It is recommended to make all of the changes required in the previously listed editors before reprocessing. When all of the changes are complete, you can then reprocess all of the Raw Sonar Files at once. Reprocessing all of the files at the same time will take a significant amount of time, but overall to will save time in the end. Most

operations in Qimera are still available while files are reprocessing, although you will not be able to launch the Swath, or Slice Editor until after the files are finished reprocessing. If you make changes in the Processing Settings then reprocess the files, and move on to make changes in the Time Series Editor, you will then have to reprocess the files all over again. Leaving all of the reprocessing to run at once will take a long time to apply all of the changes, but will save you from reprocessing all of the files multiple times.

- If possible, to increase efficiency, it is recommended to make all of the changes to the files and then leave Qimera to reprocess all of the files overnight. This is not always possible, especially when working shifts, but if possible, it can save a lot of downtime.

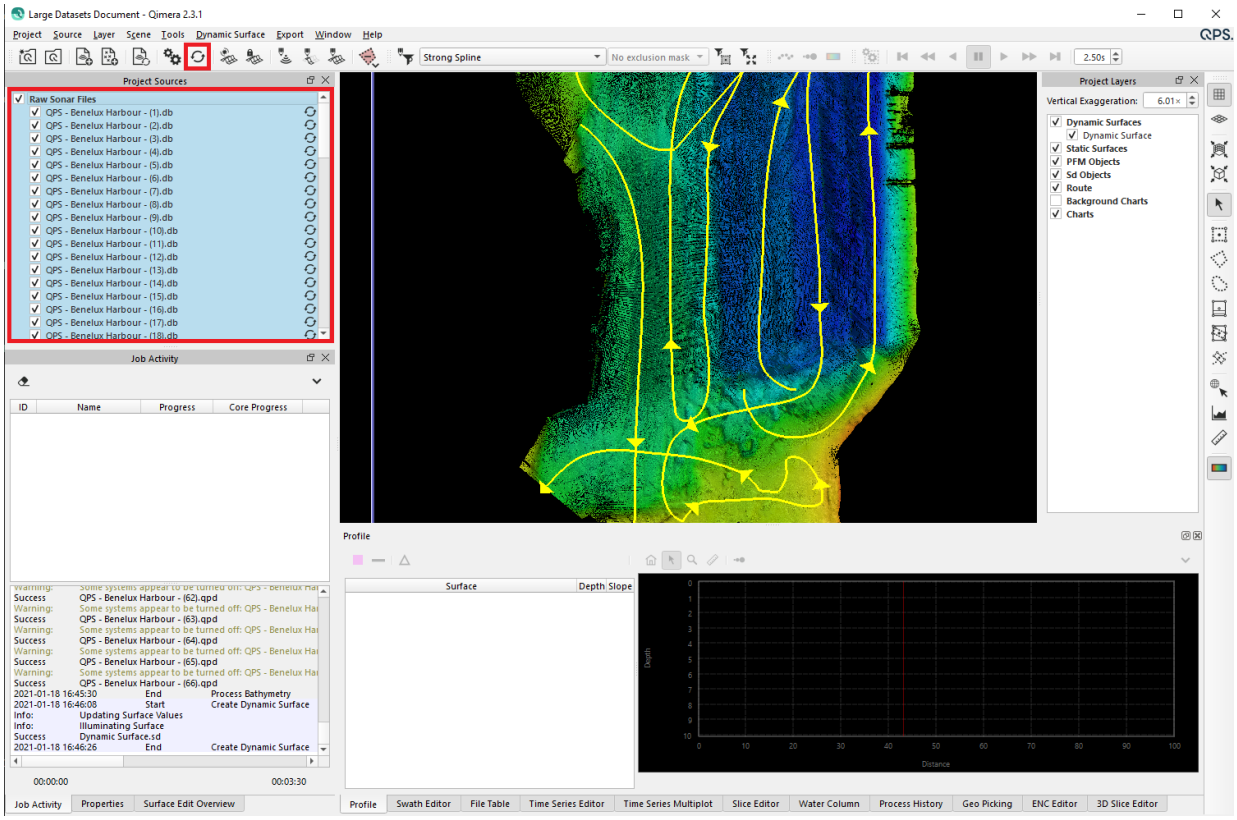


Figure 15. *Reprocess All Raw Sonar Files*

Step 6. Exports

- If you are required to produce a single dynamic surface that is very large, it is recommended to build the dynamic surfaces into Fledermaus from the cleaned QPS in the project(s) space. From within Fledermaus, you can export the full combined surface. Currently, Fledermaus 8 is able to handle a very large grid as it supports the latest grid versions. It makes it a useful tool when it is required to deliver one large surface. Fledermaus can also handle multi projects connection, and loads from those.
- Command Line Scripting has been added in the Qimera 2.2.0 release. At the moment, only basic functionality is supported: project creation, import of .all files, convert to QPD, creation of

a new Dynamic Surface, append to an existing Dynamic Surface and application of a filter profile from the Filter Toolbar. More information about scripting in Qimera can be found here: Qimera "qimera-command"

How-to Work with Qinsy Data

This How-to describes how to add and work with Qinsy data in Qimera (Versions 2.0.0 and up).

On this page:

- About Qinsy Data
- How Qimera Establishes the Coordinate Reference System
- How-to Bring Qinsy Data Into Qimera
  - Option 1: Open Qimera from the Qinsy Console
  - Option 2: Opening an Existing Qinsy Project
  - Option 3: Creating a New Project & Adding Raw Sonar Data
- No QPD's in Project
- Older QPD's in Project
- Vessel Offsets Equal Zero
- Visualizing a File in Qimera
- Selecting a File in Qimera
- Auto-Import of QGF from Qinsy projects

For additional information, see our Getting Started guide.

Data

The data used for this How-to is single head EM2040C data from Brest, France, that was acquired using Qinsy and was provided by Université de Brest.

About Qinsy Data

The supported Raw Sonar format for Qinsy data is a DB file. These files are logged by Qinsy during online acquisition.

If Qinsy QPD files are available, they will be used in Qimera; otherwise, Qimera will generate new QPD files from the added DB files.

Qinsy QPD files can be added manually as *Processed Point files*, and *Qinsy GRD grid files* can be added using the Import Grid option in the *Layer Menu*.

Licensing

The import and processing of raw data formats is dependent on licensing. To view your license coverage in Qimera, go to the *Help Menu* and choose *Show License Manager*.

How Qimera Establishes the Coordinate Reference System

Qimera can use logged DBs, template DBs, or QPDs to establish the Project Coordinate Reference System (CRS).

This is the order that Qimera will use to establish the project CRS:

1) If Qimera is started directly from the Qinsy Console, the same CRS used in Qinsy will be used in Qimera.

2) If a DB is present, it will be used to establish the project CRS. This will work when opening a project for either *Point Cleaning* OR *Full Sonar Processing*. This is also the case when a DB is imported into a new Qimera project.

3) If a Qinsy project is opened and there is no logged DB present, the template DB (if present) will be used to set the Project CRS.

4) If there are no logged DBs or template DBs present, the QPDs will be used to set the Project CRS.

In all cases, the first valid source of a CRS definition will be used. If you have several CRS's defined across multiple DB's, templates, or QPD's, extra care must be taken that the correct CRS is set.

⚠ Once the CRS is set, it cannot be changed for a project.

How-to Bring Qinsy Data Into Qimera

You can choose to:

1) Open Qimera directly from the Qinsy console, which will automatically bring in all files into Qimera

2) Open an existing Qinsy project in Qimera, which will load the existing DB and QPD files (if the QPD files exist)

3) Or, create a New Project in Qimera and add the DB files as source files (QPDs can also be used to create a Qimera project if desired)

These options are reviewed below.

Option 1: Open Qimera from the Qinsy Console

1) From the Qinsy Console, click the Qimera button to launch Qimera.

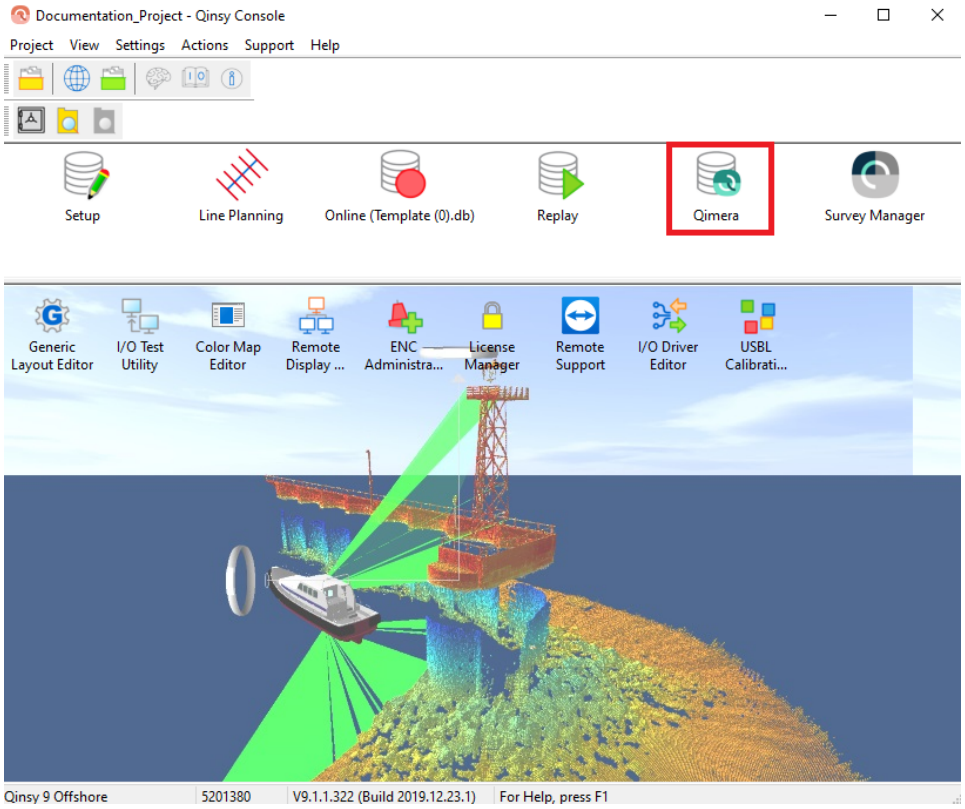


Figure 1: Opening Qimera from Qinsy Console

2) If your project contains both QPD's and DB files, a prompt dialog will appear asking how you want to open your project:

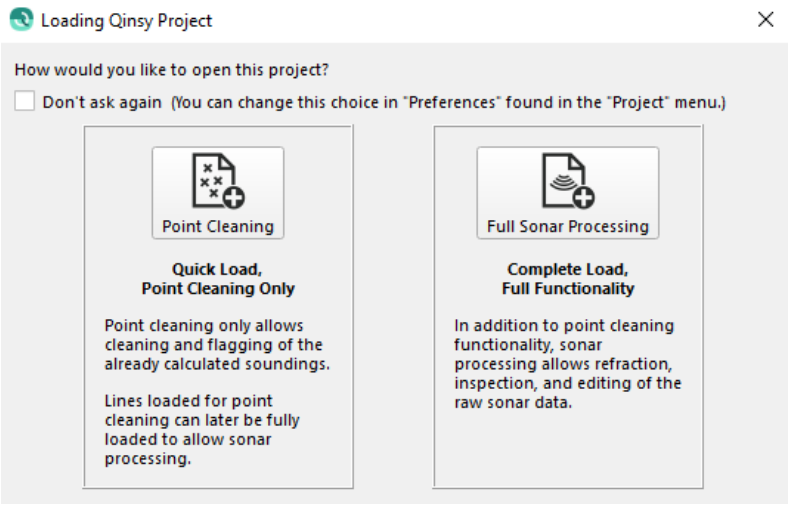


Figure 2: Qimera's Loading Qinsy Project Dialog, Point Cleaning or Full Sonar Processing

> ⚠ The option to choose *Point Cleaning* or *Full Sonar Processing* is license dependant. To view your license coverage in Qimera, go to the *Help Menu* and choose *Show License Manager.*

3) If you select *Point Cleaning*, Qimera will only load the QPD files from the *DtmData Folder* in the Qinsy project directory. The QPDs will be listed in the *Project Sources* under *Processed Point Files*. The project can be 'upgraded' to *Full Sonar Processing* by right-clicking on a QPD and selecting *Load Associated DB File.*

Qimera will automatically create new folders and files inside of the existing Qinsy project. These additional folders and files are used to maintain metadata, hold extracted information, and provide locations for newly created files.

Click *here* for an overview of the Qimera Project Structure and what is stored in each folder.

4) If you select *Full Sonar Processing*, Qimera will load the Qinsy project, scanning for and extracting any available information as it opens the project.

Click here for a full list of what is extracted from each supported format.

Extracted information for Qinsy projects can include:

- Processed multibeam if QPD files available
- Raw multibeam
- Water column imagery
- Vessel configuration
- SVP
- Surface sound speed
- Orientation
- Position
- Height
- Tide
- Pressure
- Sonar Settings
- Other (i.e. Snippets)

As the project opens, DB files will be listed in the Project Sources Dock under *Raw Sonar* Files. In *Figure 3* you can see:

1. Indicators showing the loading progress of each individual file in the Project Sources Dock,
2. The loaded tracklines visualized in the 4D Scene,
3. The overall progress of data extraction in the Job Activity Dock,
4. Any warnings or errors shown in the Job Activity Dock.

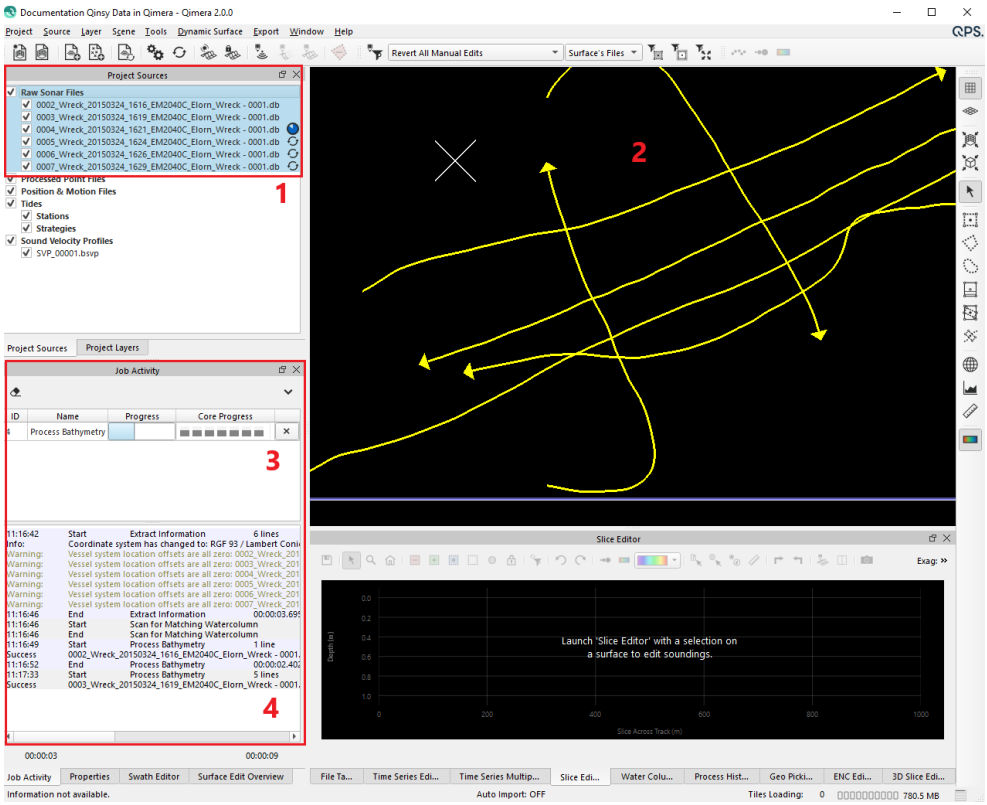


Figure 3: Information being extracted from the Qinsy Project During Load

5) Once the project data extraction is complete, you can review:

1. All of the DB files from the project will be shown in the Project Sources Dock under *Raw Sonar Files*,
2. And any encountered errors in the Job Activity Dock.

In this example dataset, the Job Activity Dock displays a warning that the "*Vessel system location offsets are all zero*".

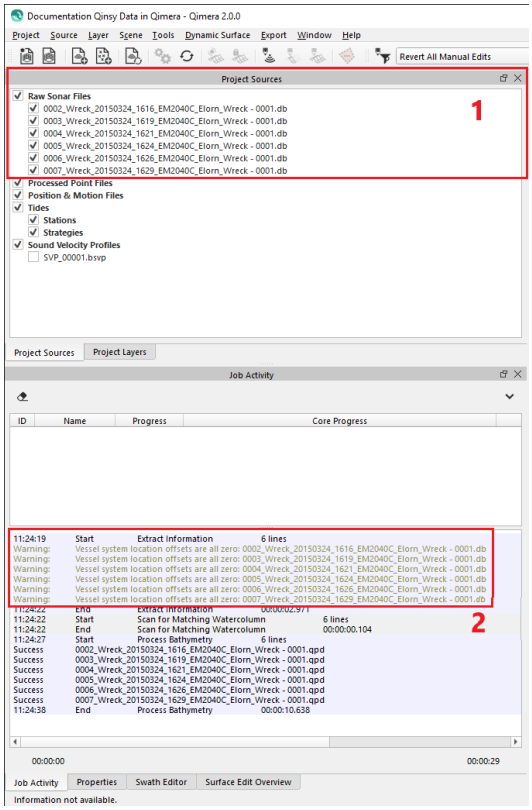


Figure 4: Data Extraction Complete

6) As information is extracted from the Qinsy files, the additional folders that Qimera created in the project get populated with the information.

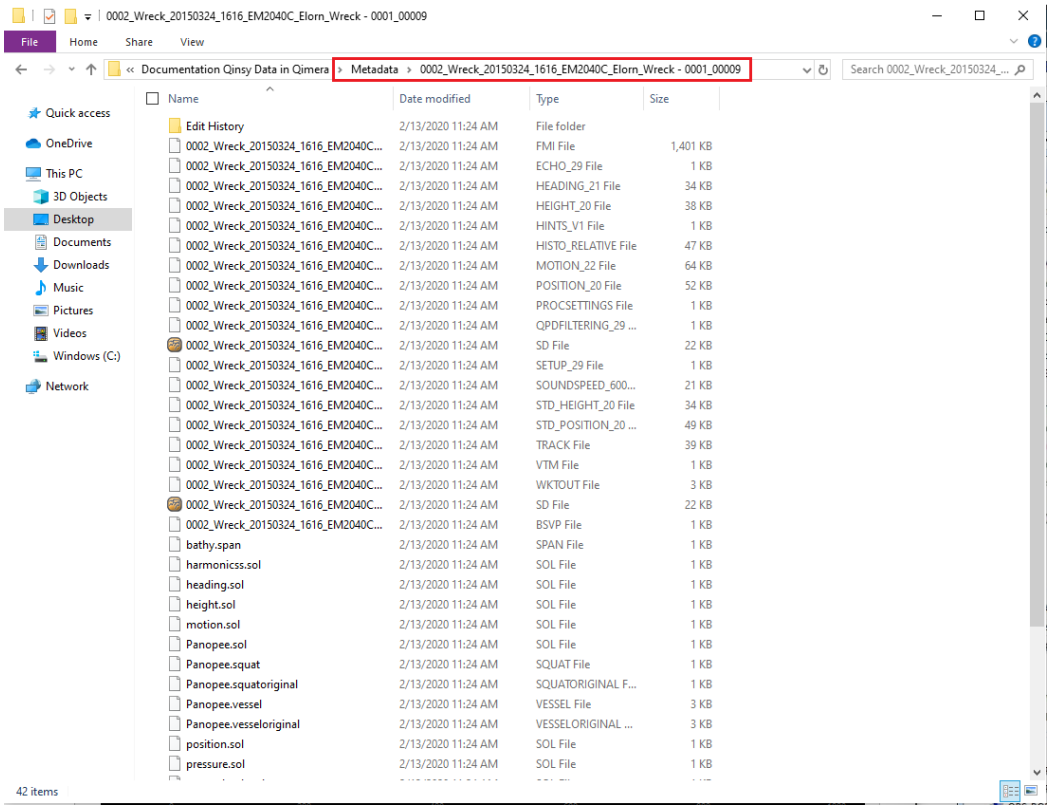


Figure 5: Extracted Information for Line 0002 in the Metadata Folder

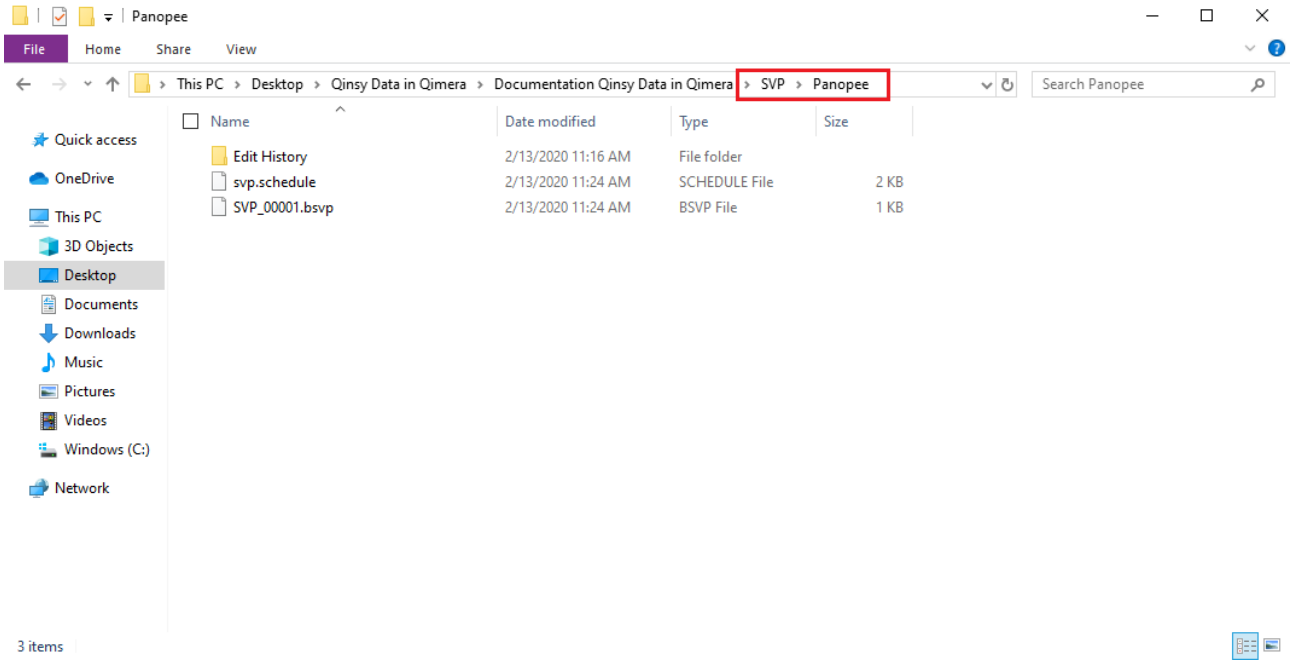


Figure 6: Extracted SVP Information in the SVP Folder

Dynamic Surface Created in Qinsy

If there are any Dynamic Surfaces that were built by Qinsy while Online or in the Processing Manager, these will be detected by Qimera and loaded automatically.

Option 2: Opening an Existing Qinsy Project

1) After you open Qimera, the Projects Dialog will launch. Select *Open Other...* to open the *File Explorer*.

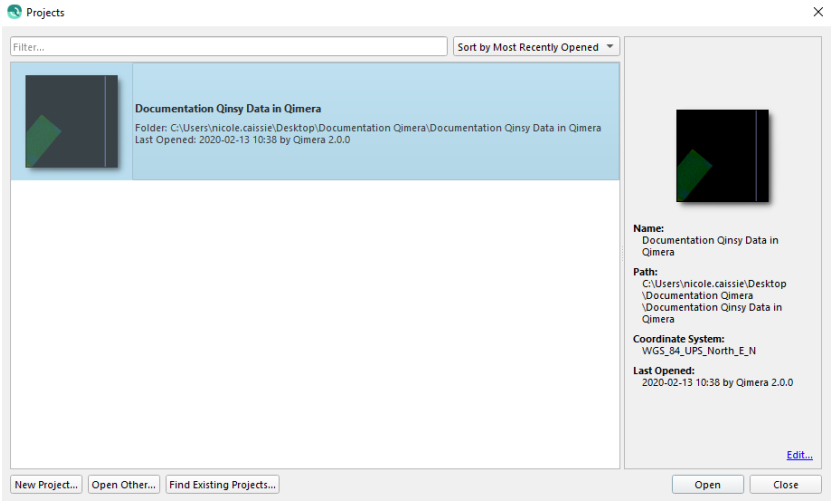


Figure 7: Qimera's Projects Dialog, Open Other... option

Alternatively, you can open a project by clicking the *Open Project Button*  on Qimera's Bathymetry Toolbar, or by going to the *Project Menu* and choosing *Open Project...*

2) Navigate to and select the parent folder of your Qinsy project.

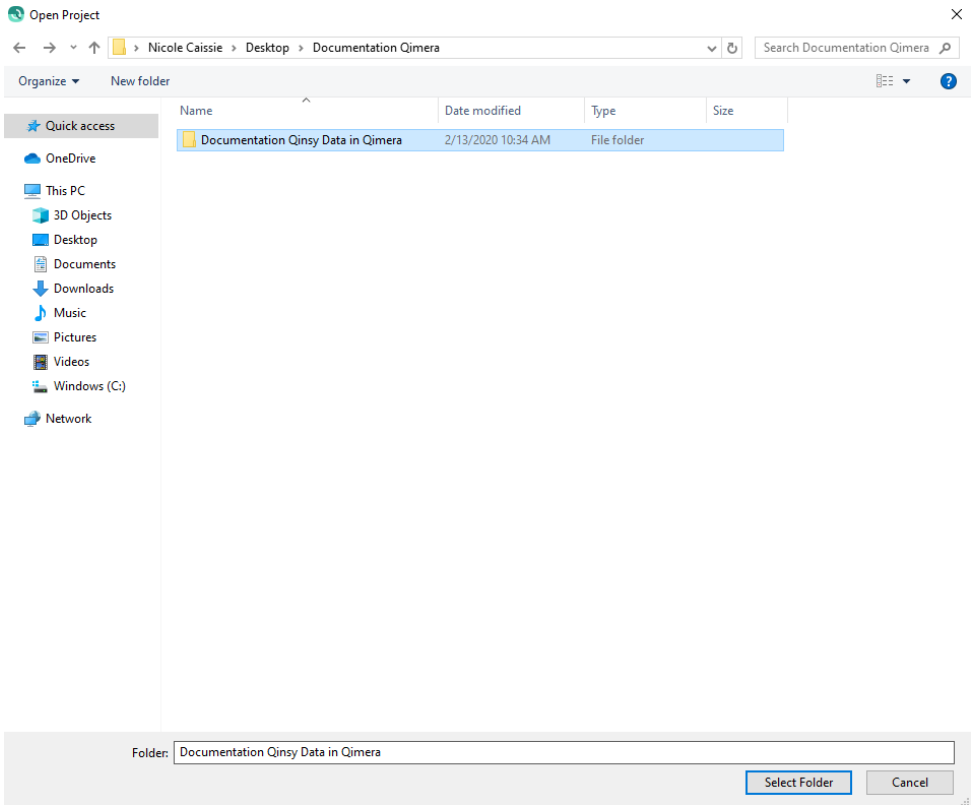
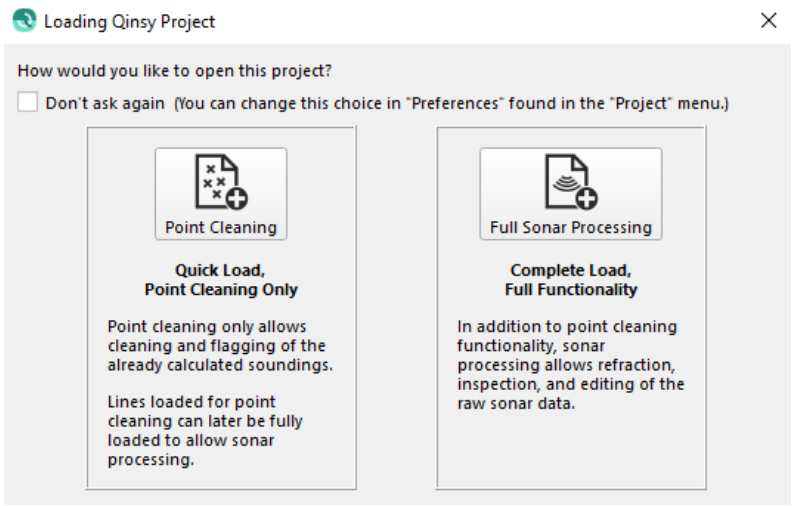


Figure 8: File Explorer, Selecting the Qinsy Project Directory

3) If your project contains both QPD's and DB files, a prompt dialog will appear asking how you want to open your project:



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As the project opens, DB files will be listed in the Project Sources Dock under *Raw Sonar* Files. In *Figure 10* you can see:

1. Indicators showing the loading progress of each individual file in the Project Sources Dock,
2. The loaded tracklines visualized in the 4D Scene,
3. The overall progress of data extraction in the Job Activity Dock,

4. Any warnings or errors shown in the Job Activity Dock.

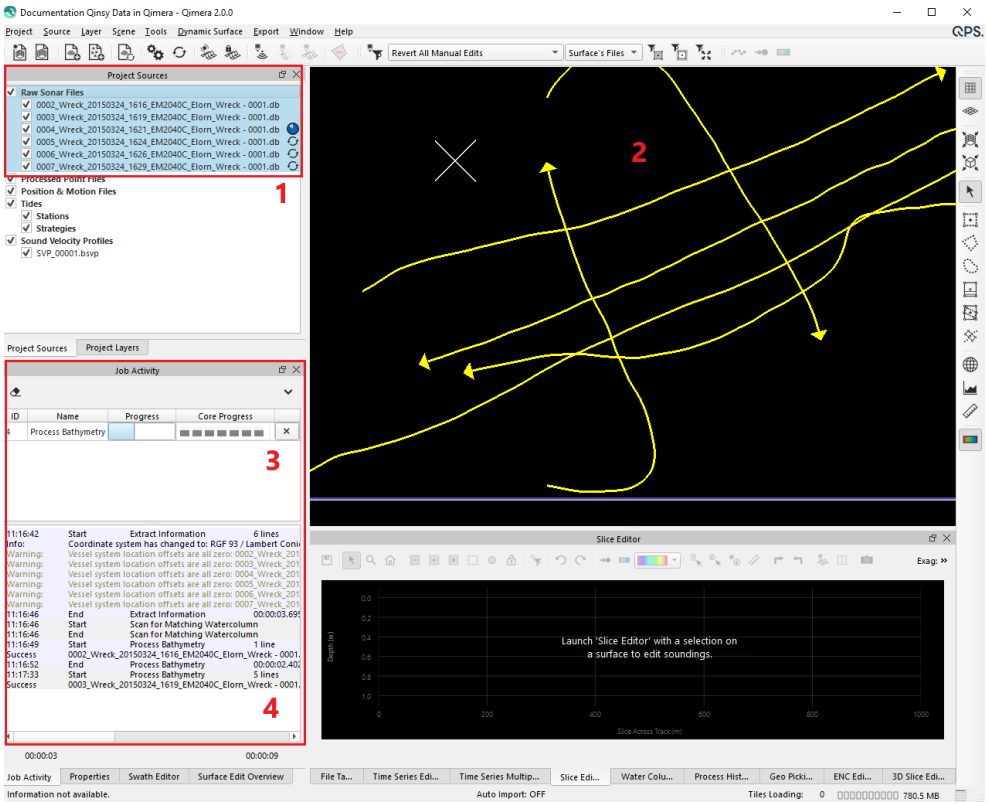

Figure 10: Information being extracted from the Qinsy Project During Load

6) Once the project data extraction is complete, you can review:

1. All of the DB files from the project will be shown in the Project Sources Dock under *Raw Sonar Files,*
2. And any encountered errors in the Job Activity Dock.

In this example dataset, the Job Activity Dock displays a warning that the "*Vessel system location offsets are all zero*".

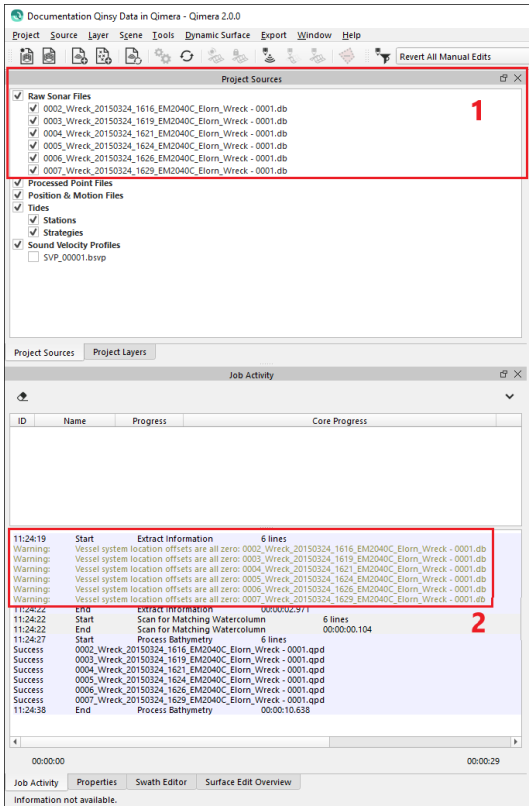

Figure 11: Data Extraction Complete

7) As information is extracted from the Qinsy files, the additional folders that Qimera created in the project get populated with the information.

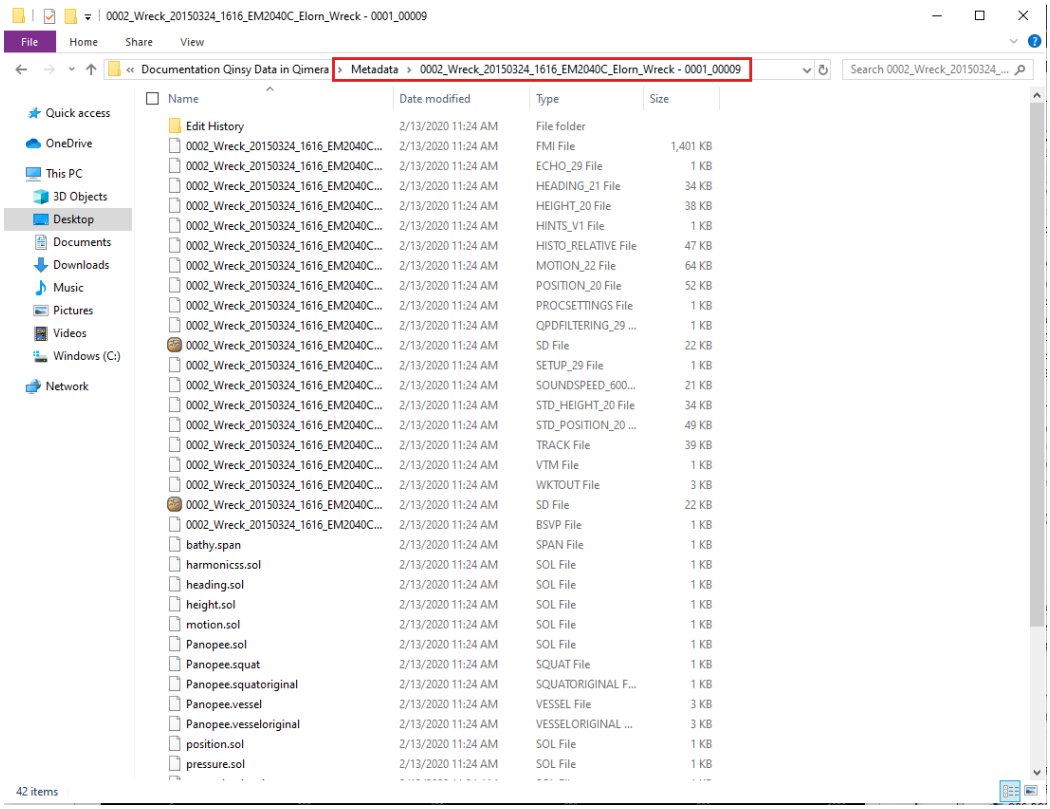

Figure 12: Extracted Information for Line 0002 in the Metadata Folder

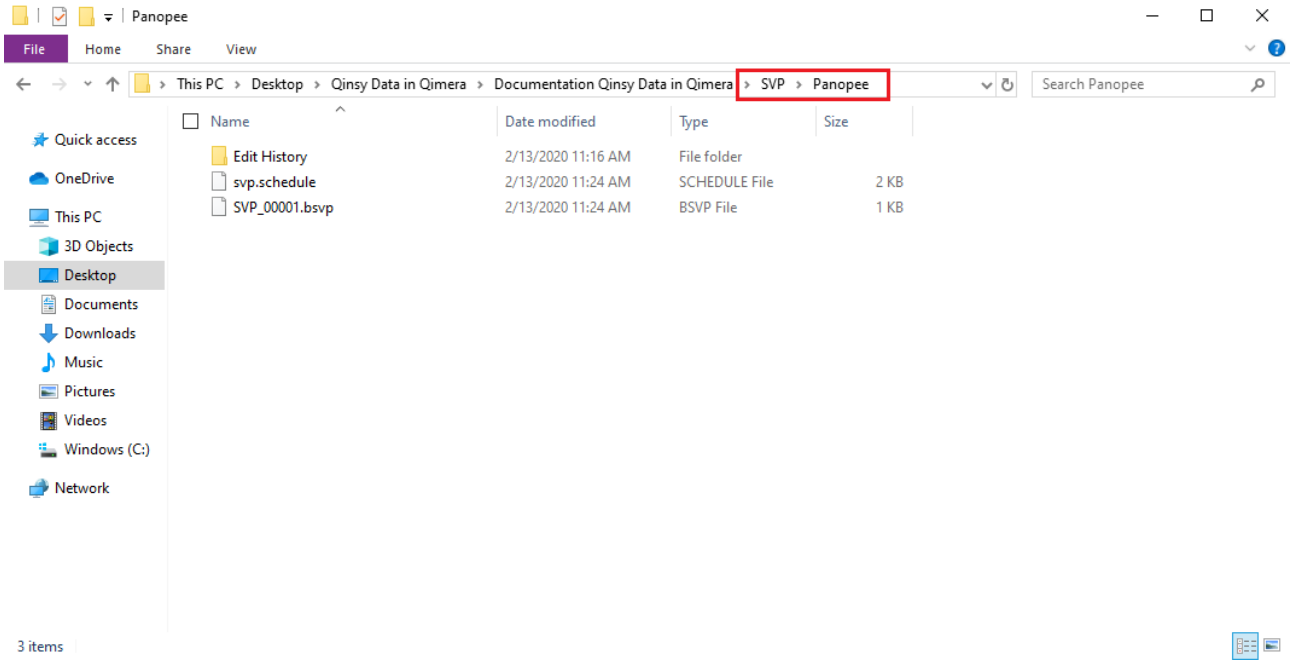

Figure 13: Extracted SVP Information in the SVP Folder

Dynamic Surface Created in Qinsy

If there are any Dynamic Surfaces that were built by Qinsy while Online or in the Processing Manager, these will be detected by Qimera and loaded automatically.

Option 3: Creating a New Project & Adding Raw Sonar Data

1) After you open Qimera, the Projects Dialog will launch. Select *New Project...* to open the *Create Project Dialog.*

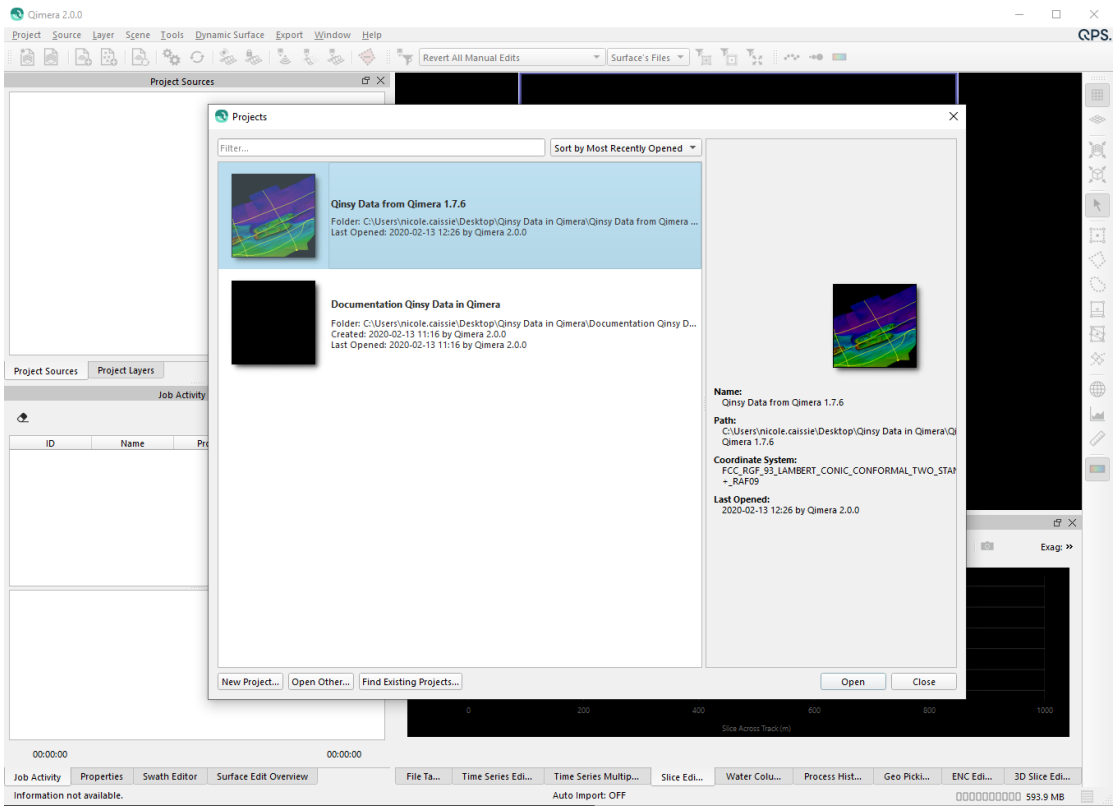

Figure 14: Qimera's Projects Dialog, New Project... Option

Alternatively, you can create a project by clicking the *Create Project Button*  on Qimera's Bathymetry Toolbar, or by going to the *Project Menu* and choosing *New Project...*

2) Fill in Project Details:

1. Add a project name.

2. By default, the folder for your project will be in the 'C:\Users\username\QPS-Data\' directory, though you can choose another location.
3. The Survey Type and Description boxes can be used to add additional notes about the project.
4. Set the Project Coordinate System (CRS):
    a. *Automatic* - Qimera will automatically extract the project coordinate system from Qinsy DB files. Qimera will choose an appropriate UTM zone when loading data from Reson (.s7k) or Kongsberg (.all) files by looking at the geographic navigation extents. If you are loading Hypack (.hsx) files, the *Automatic* option will not work. It is required to choose *Single Projected,* or *Full Geodetic Configuration,*
    b. *Single Projected* - If you would like your Qimera products (QPDs, surfaces, etc.) to be in a projection that differs from your source files, you can manually set the CRS from a list of pre-defined CRS using the *Search Coordinate System Dialog.*
    c. *Full Geodetic Configuration* - If you would like your Qimera products (QPDs, surfaces, etc.) to be in a projection that differs from your source files and is not included in the list of pre-defined CRS, you can manually enter the geodetic configuration parameters. A Geodetic Configuration consists of, at minimum, a Project CRS. Additionally, it can contain an Input Geographic CRS and optionally a Transformation between the Project CRS and the Input Geographic CRS. You can also optionally have a Vertical CRS. This is done using the *Geodetic Configuration Overview Dialog.*

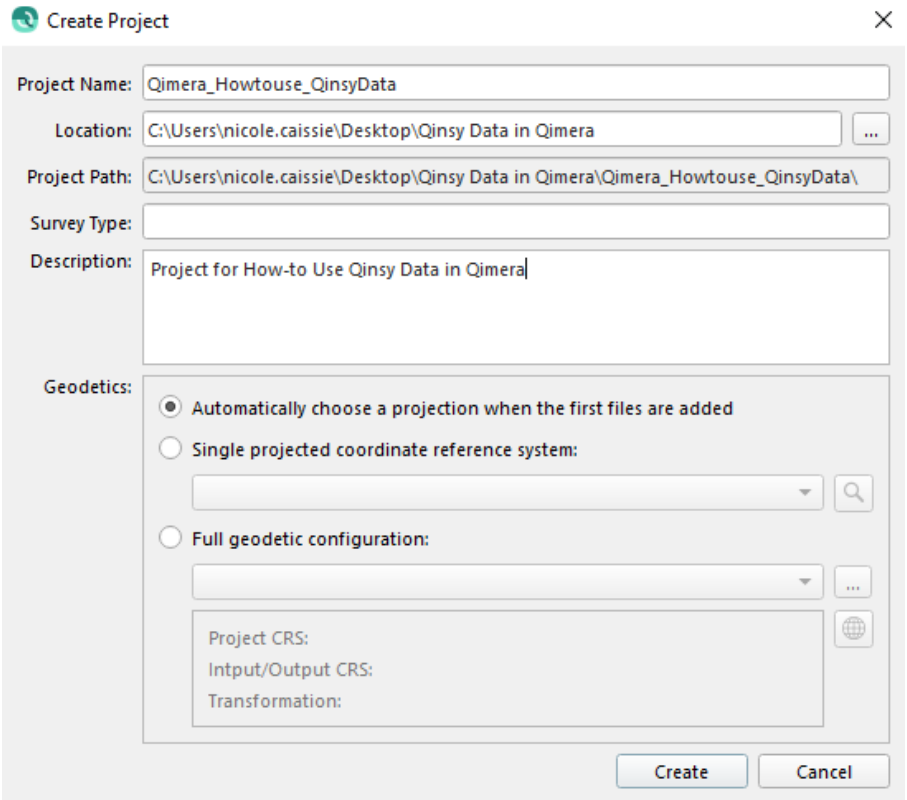

Figure 15: Create Project Dialog

3) Once the Project CRS is set, click OK to create the project. Once created, the *Project Folder* will contain sub-folders for storing bathymetry files in QPD format, internal metadata, extracted external source data, and products.

4) You will be prompted to add source files to your new project. Choose *Add Raw Sonar Files*.

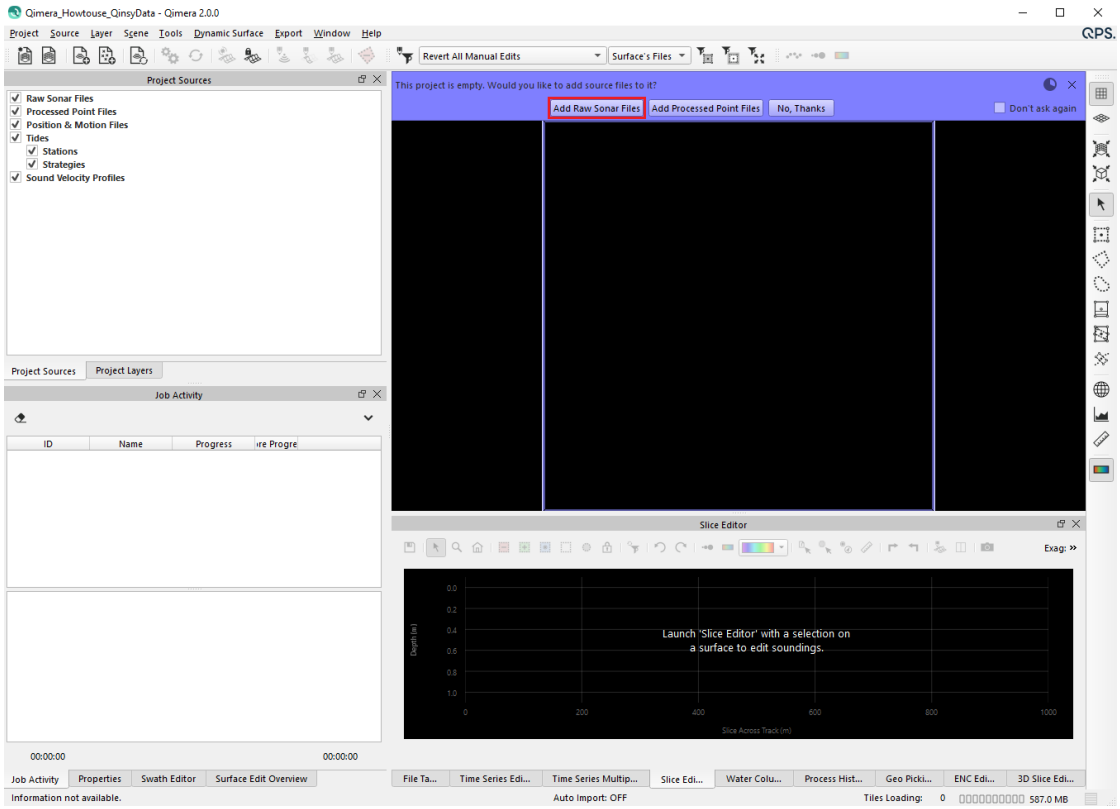

Figure 16: Add Raw Sonar Files Prompt

Alternatively, you can add Raw Sonar Source Files by clicking the *Add Raw Sonar File Button*  on Qimera's Bathymetry Toolbar, or by going to the *Source Menu* and choosing *Add Raw Sonar Files...*

5) Use the *Add Files... Button* to navigate to and select the DB files from the Database folder of your Qinsy project. Click OK to load the files.

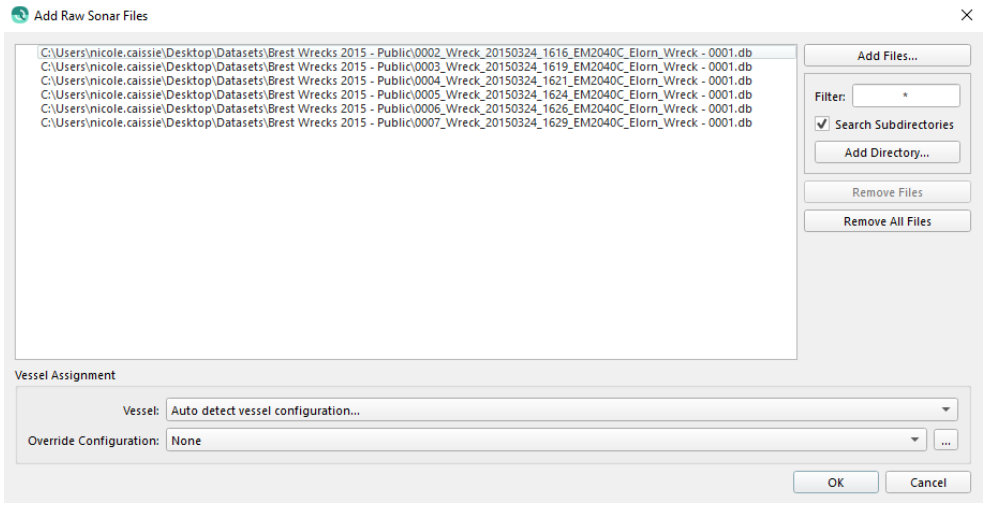

Figure 17: Add Raw Sonar Files Wizard

Coordinate System information can be read directly from the DB files, so setting this information in the import wizard is not an option.

6) Qimera will load the Qinsy DB files, scanning for and extracting any available information and writing it to the Qimera project.

For a full list of what is extracted from each supported format, click *here*.

DB files will be listed in the *Project Sources Dock* under the *Raw Sonar Files*.

Extracted information for Qinsy data can include:

- Processed multibeam if QPD files available
- Raw multibeam
- Water column imagery
- Vessel configuration
- SVP
- Surface sound speed
- Orientation
- Position

- Height
- Tide
- Pressure
- Sonar Settings
- Other (i.e. Snippets)

Shown below are:

1. Indicators showing the loading progress of each individual file in the Project Sources Dock.
2. The loaded tracklines visualized in the 4D Scene.
3. The overall progress of data extraction in the Job Activity Dock.
4. Any warnings or errors shown in the Job Activity Dock.

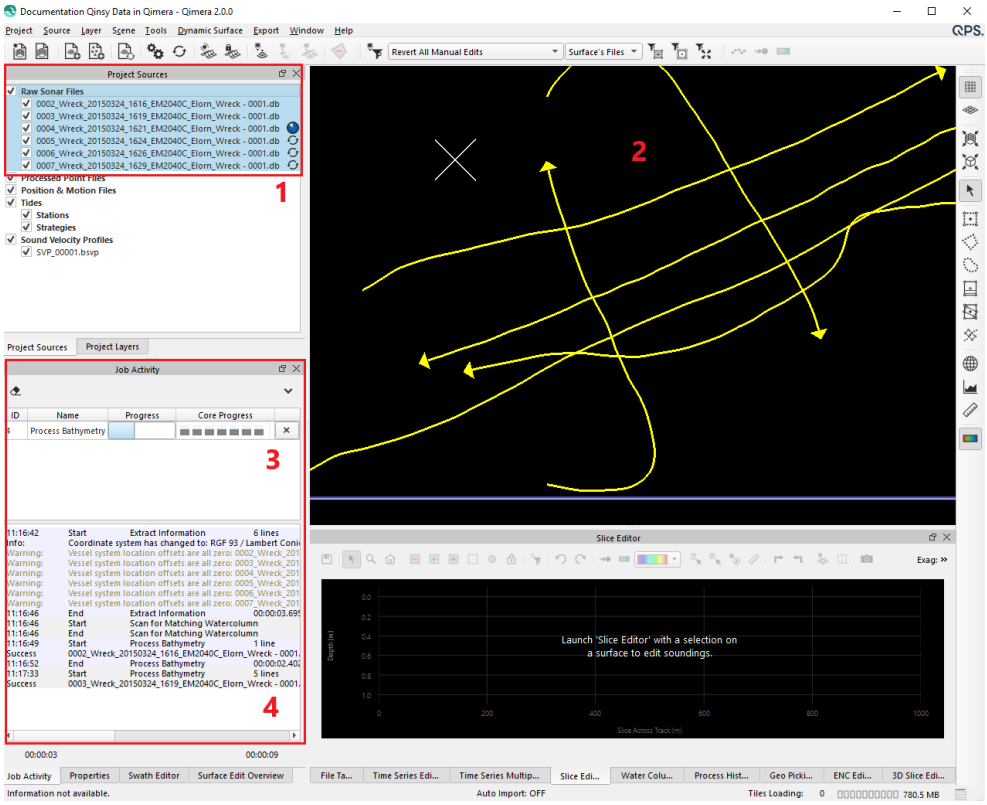

Figure 18: Information Being Extracted from the Qinsy Project During Load

7) As the data loads, QPD files will be generated and written to the Qimera project. Once the data is loaded, ancillary data extraction, and the QPD write is complete.

You will see:

1. All of the DB files from the project will be shown in the Project Sources Dock under *Raw Sonar Files*.
2. The loaded tracklines visualized in the 4D Scene.
3. Any encountered errors in the Job Activity Dock.
4. And the extracted QPD information in the *File Table Dock*.

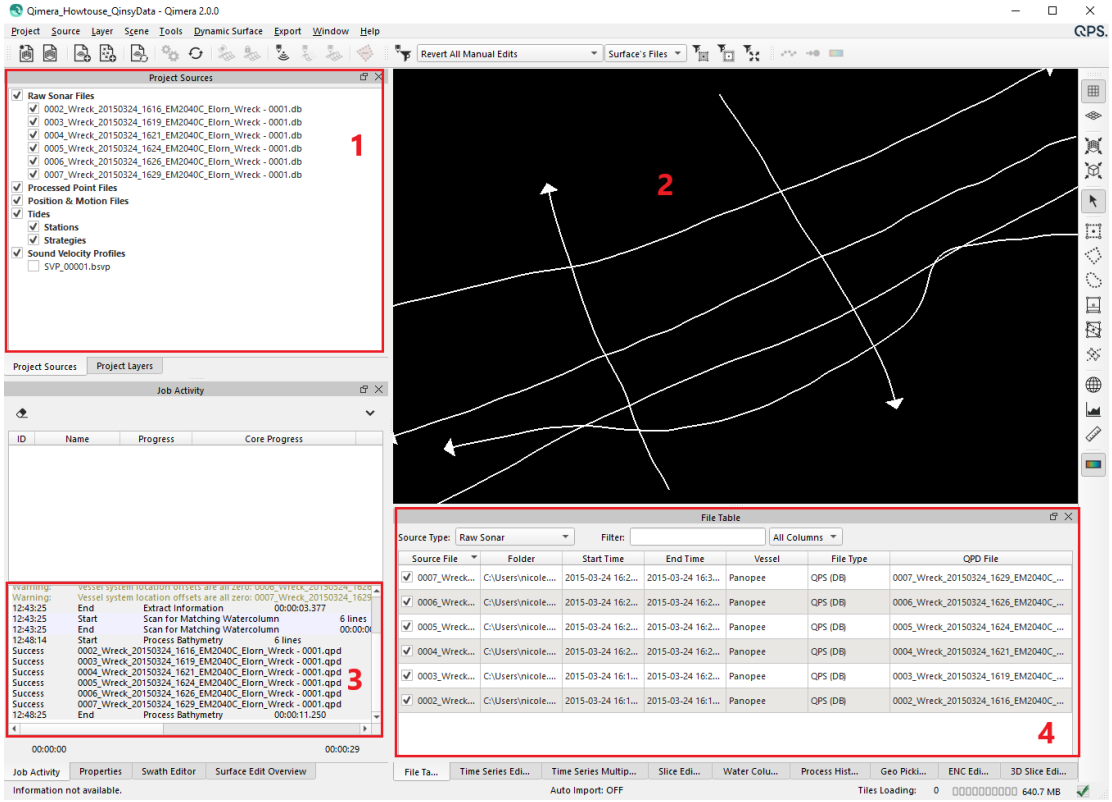

Figure 19: File Table Populated with Information and Errors/Issues Encountered in Job Activity Dock

8) As information is extracted from the Qinsy files, the folders in the Qimera project get populated with the information.

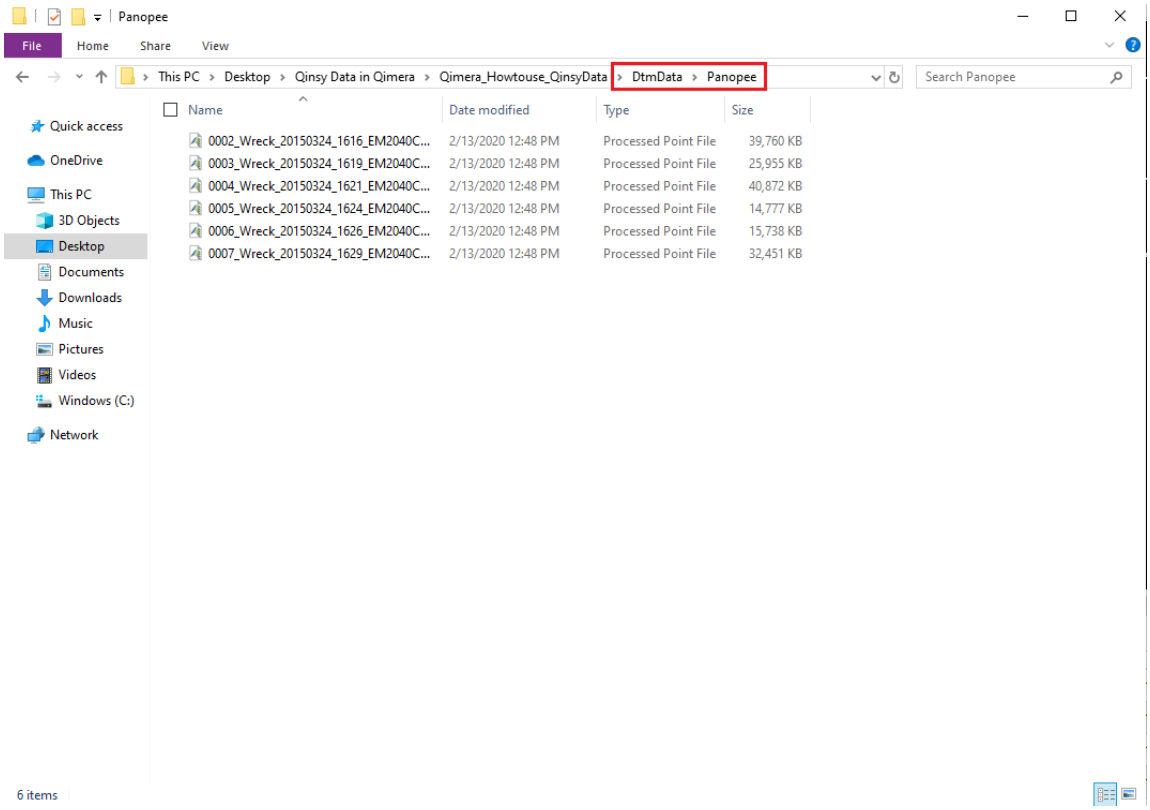

Figure 20: Newly Generated QPDs in the Qimera Project DtmData Folder

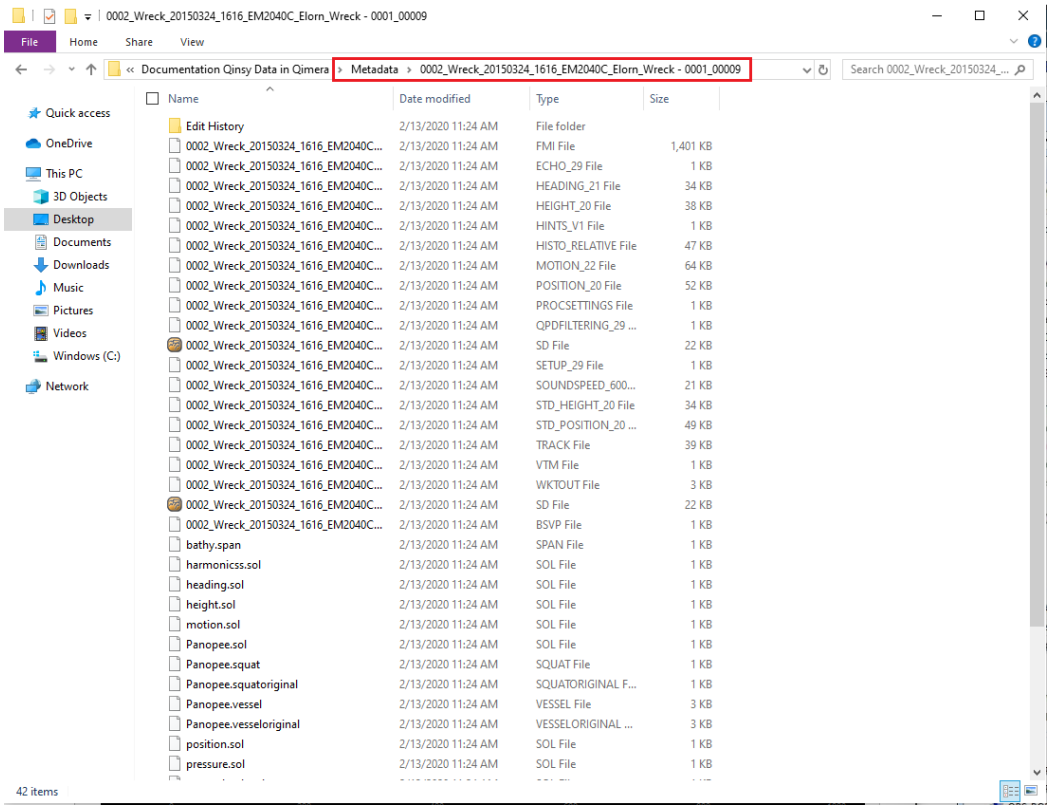

Figure 21: Extracted Information for Line 0002 in the Metadata Folder

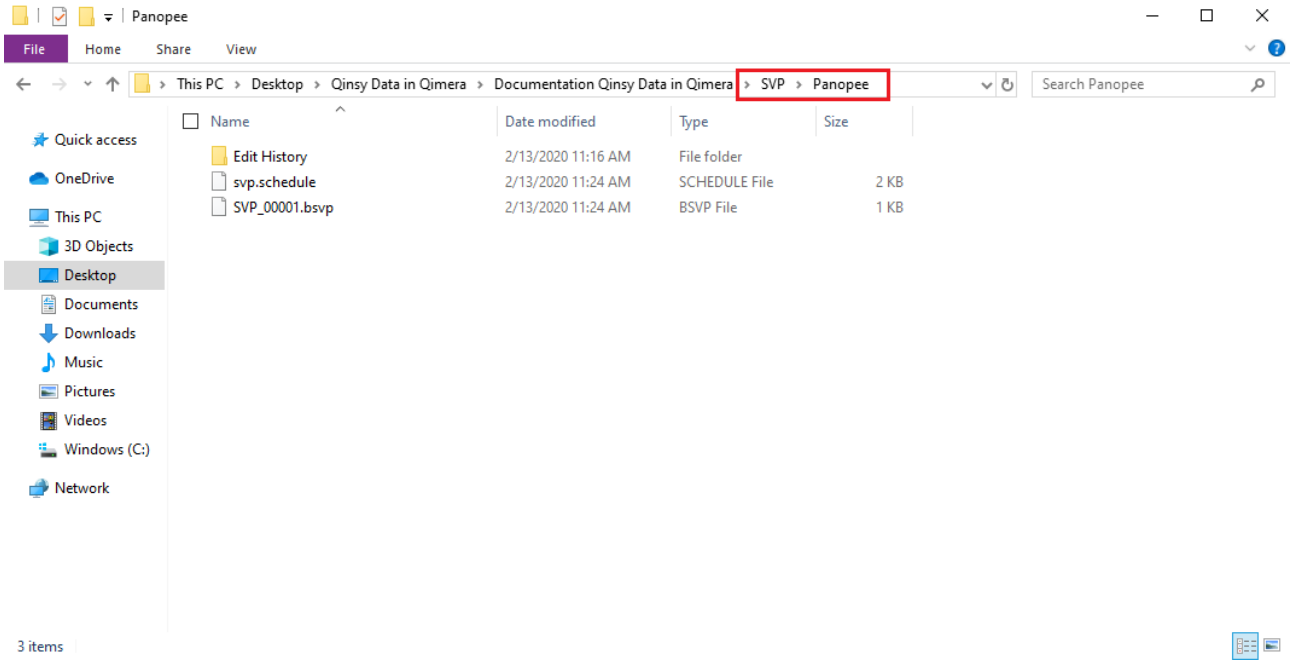

Figure 22: Extracted SVP Information in the SVP Folder

No QPD's in Project

When a project doesn't contain QPD files, the DB files in the Project Sources Dock will be followed by the symbol, indicating that they still require processing. Clicking the *Auto Process Button* or building a *Static* or *Dynamic Surface* will trigger the files to be processed and QPD files to be generated.

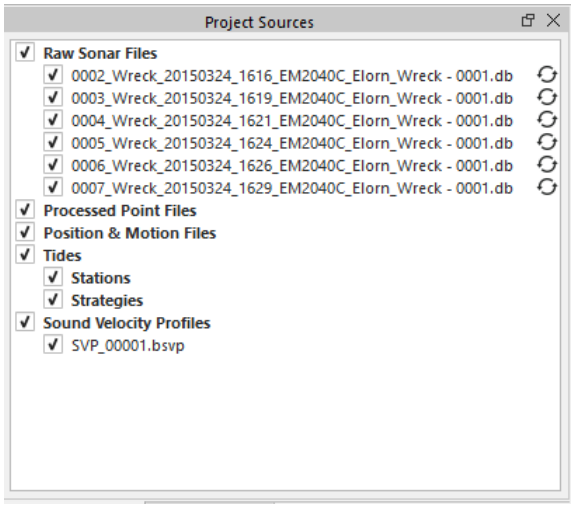

Figure 23: DB Files with Indication that Reprocessing is Required

Older QPD's in Project

When a project containing older QPD1 files (Qimera 1.0) is loaded into a newer version of Qimera (1.1 to 1.7, and 2.x), a popup warning will appear stating that the QPDs require updating.

Qimera will automatically regenerate the files in the upgraded QPD2 format and write the new files to the Qinsy project. The process will be noted in the Job Activity Dock shown below.

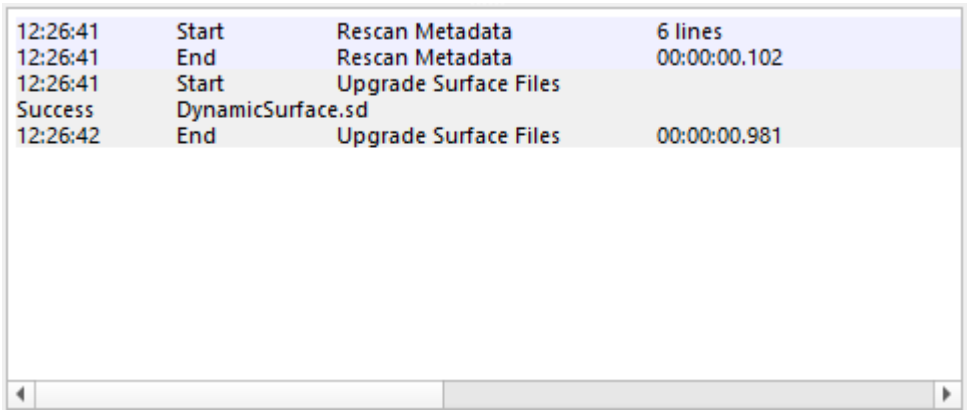

Figure 24: Upgraded Files in the Job Activity Dock

After you upgrade the project, it will not be supported in older versions of QPS software (Qimera 1.0 and Qinsy 8.10 or previous).

Vessel Offsets Equal Zero

In this example dataset, the Job Activity Dock displays a warning that the "*Vessel system location offsets are all zero*", as well as a prompt noting that "*Your vessel offsets are all zero. Would you like to edit your vessel settings now?*"

Click *Yes* at the prompt to open the *Vessel Editor* (or *Tools Menu -> Vessel Editor*).

A review of the settings in the *Vessel Editor* will show that the Starboard, Forward, and Up Transducer Offsets are all set to zero.

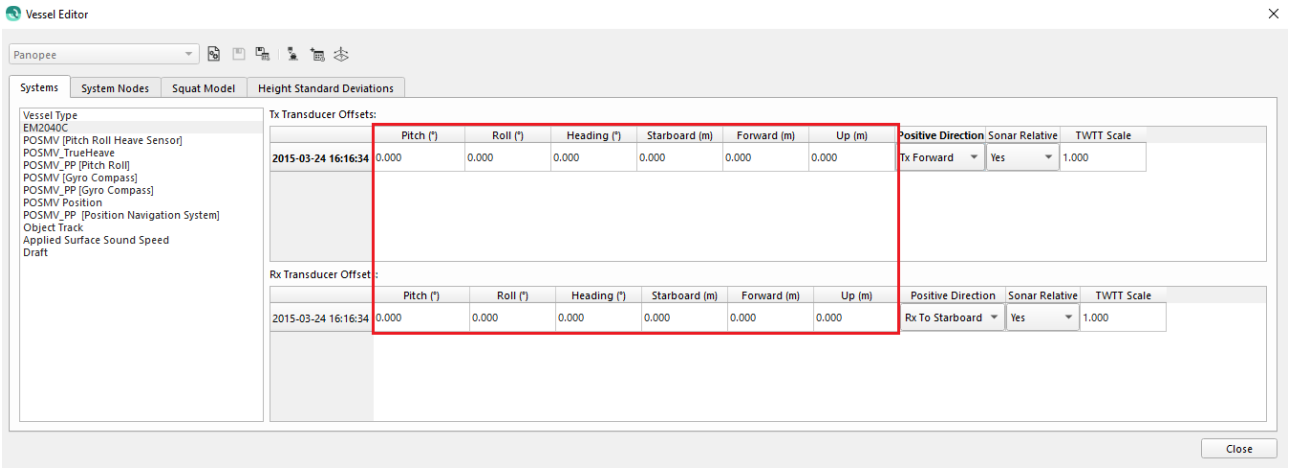

Figure 25: Vessel Offsets Set to Zero in the Vessel Editor

This vessel was equipped with a POSMV, and all referencing was done to the POS rather than in Qinsy. This is a typical warning for this set-up and is not a cause for concern, therefore no action is necessary in this particular case.

Visualizing a File in Qimera

Checking a file ON or OFF in the Project Sources Dock controls the visibility of the trackline.

Checking a file ON or OFF does not effect which files are used in surface creation and processing routines.

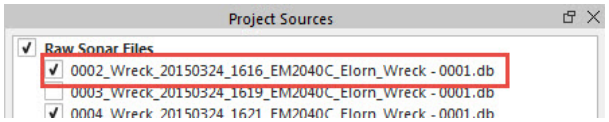

Figure 26: File Checked ON in Project Sources Dock

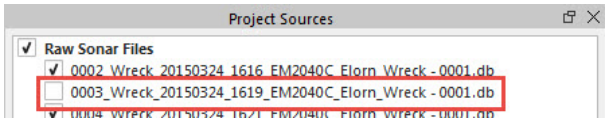

Figure 27: File Checked OFF in Project Sources Dock

Selecting a File in Qimera

For files to be used in a processing routine (such as Surface Creation), they can be checked ON or OFF, but they must also be selected.

Files can be selected by clicking on the file name or trackline with the mouse (use *SHIFT-click* or *CTRL-click* to select multiple files), or by selecting the parent directory above the files in the Project Sources Dock. The parent directory in *Figure 28* is "Raw Sonar Files."

In this example, only lines 0002 & 0003 are selected.

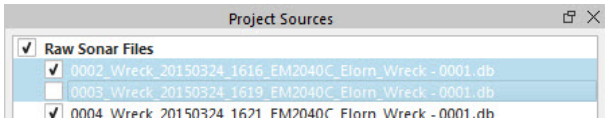

Figure 28: Files Selected in Project Sources Dock

This is a key part of Qimera's workflow. For an overview of the Qimera user interface, click here.

Note: When lines have just been added to your project and you are prompted to do a process, all of the lines that were added will automatically be included in that process.

Auto-Import of QGF from Qinsy projects

1. When opening a Qinsy project for the first time, any QGF Survey Line files (.qgfline and .qgfback) will be found and converted to .sd format and added to the Project Layers
2. Since .sd objects can only contain one object type per file (e.g. points in one file, lines in another), a QGF is "exploded" into a points and a lines .sd files. And the objects are named the same as the layer they belonged to. These are added under a single group with the group name coming from the QGF. Visibility can be controlled separately for points and lines as well using the normal mechanisms.

How-to Work with Reson S7K Data

This How-to describes how to add and work with Reson S7K data in Qimera (Versions 2.0.0 and up).

On this page:

- Data
- About Reson S7K Data
  - Licensing
- How-to Bring Reson S7K Data Into Qimera
- Visualizing a File in Qimera
- Selecting a File in Qimera

For additional information on using Qimera please see our Getting Started guide.

Data

The data used for this How-to is Reson 7125 data.

About Reson S7K Data

By default, Reson S7K files are converted to QPD format on import. The QPD format is used to store computed footprints and is the QPS format for *processed point data*.

Licensing

The import and processing of raw data formats is dependent on licensing. To view your license coverage in Qimera, go to the *Help Menu* and choose *Show License Manager.*

How-to Bring Reson S7K Data Into Qimera

1) After you open Qimera, the *Projects Dialog* will launch. Select *New Project...* to open the *Create Project Dialog*.

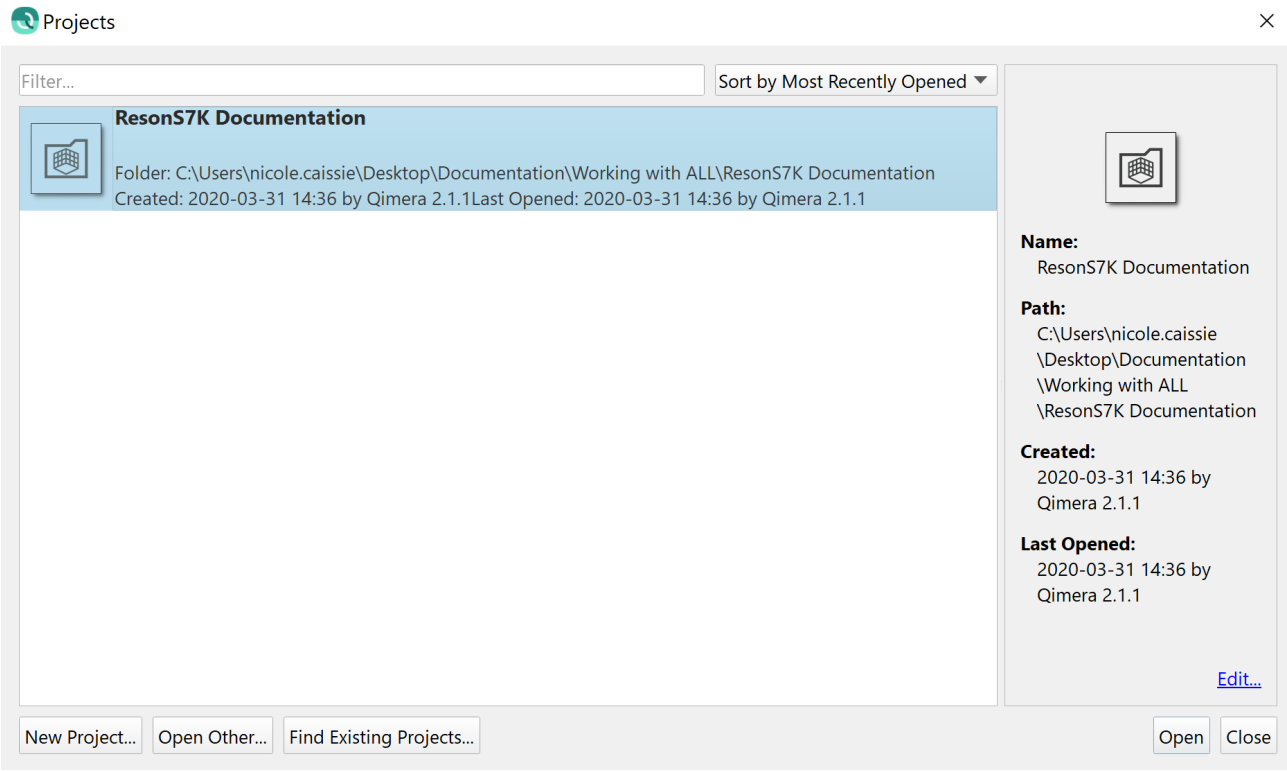

Figure 1: Qimera's Projects Dialog

Alternatively, you can create a project by clicking the *Create Project Button*  on *Qimera's Bathymetry Toolbar*, or by going to the *Project Menu* and choosing *New Project...*

2) Fill in Project Details:

1. Add a project name.
2. By default, the folder for your project will be in the 'C:\Users\username\QPS-Data\' directory, though you can choose another location.
3. The Survey Type and Description boxes can be used to add additional notes about the project.
4. Set the Project Geodetics:
    a. *Automatic* - Qimera will automatically extract the project coordinate system from source files or choose an appropriate UTM zone when loading Reson S7K files by looking at the geographic navigation extents.
    b. *Single Projected* - If you would like your Qimera products (QPDs, surfaces, etc.) to be in a projection that differs from your source files, you can manually set the CRS from a list of pre-defined CRS using the *Search Coordinate System Dialog.*
    c. *Full Geodetic Configuration* - If you would like your Qimera products (QPDs, surfaces, etc.) to be in a projection that differs from your source files and is not included in the list of pre-defined CRS, you can manually enter the geodetic configuration parameters. A Geodetic

Configuration consists of, at minimum, a Project CRS. Additionally, it can contain an Input Geographic CRS and a Transformation between the Project CRS and the input Geographic CRS. You can also optionally have a Vertical CRS. This is done using the *Geodetic Configuration Overview Dialog*.

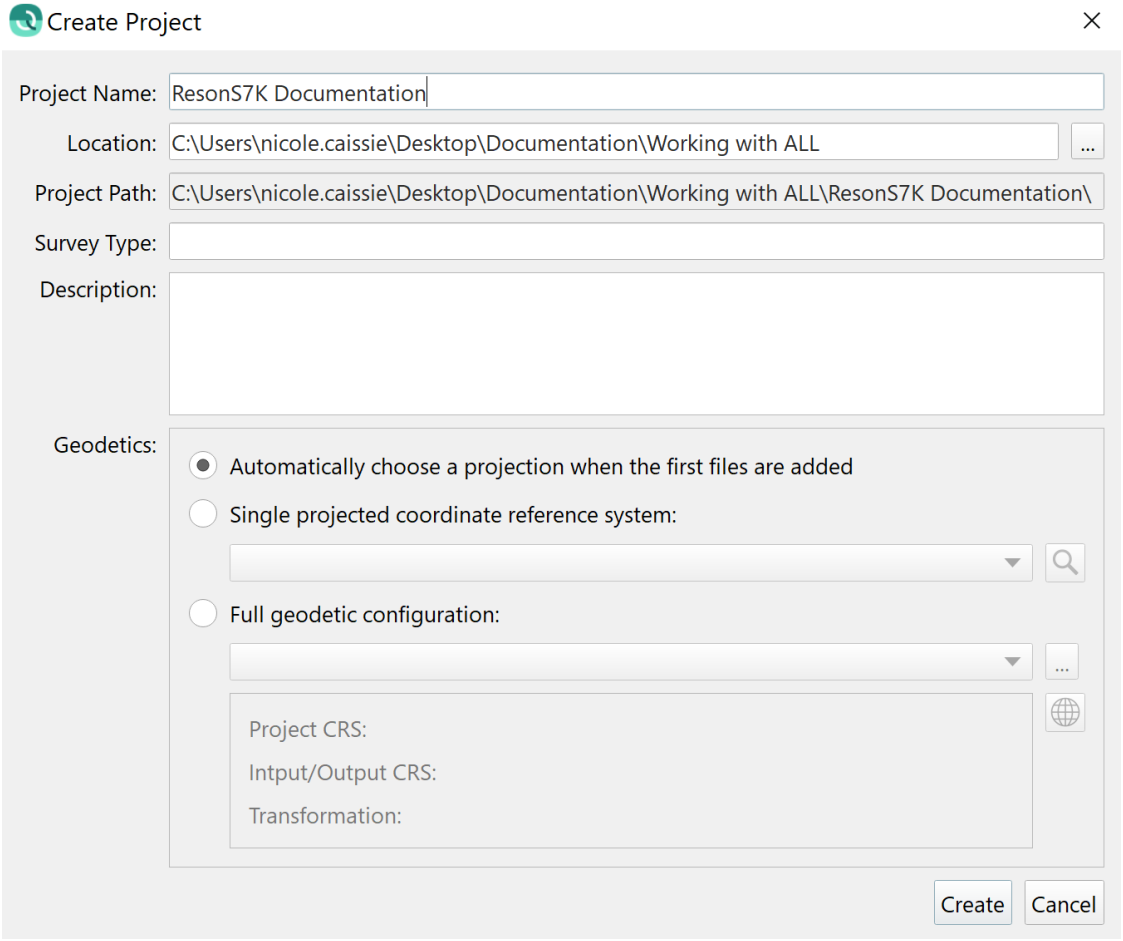

Figure 2: Create Project Dialog

3) Once the Project Geodetics are set, click CREATE to create the project. Once created, the *Project Folder* will contain sub-folders for storing bathymetry files in QPD format, internal metadata, extracted external source data, and products.
4) You will be prompted to add source files to your new project. Choose *Add Raw Sonar Files*.

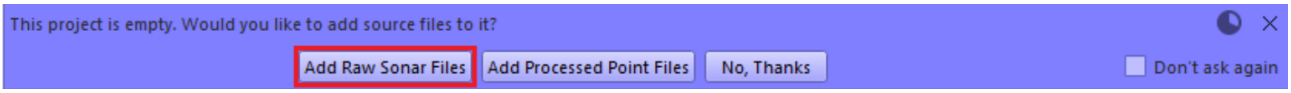

Figure 3: Add Raw Sonar Files Prompt
Alternatively, you can add Raw Sonar Source Files by clicking the *Add Raw Sonar File Button*  on *Qimera's Bathymetry Toolbar*, or by going to the *Source Menu* and choosing *Add Raw Sonar Files...*

5) Use the *Add Files... Button* to navigate to and select your S7K files.

1. If a Vessel Name is not found in the first S7K file, a *Create New Vessel Dialog* will launch. Add a Vessel Name and click OK to continue. A Vessel Assignment section will be added to the *Add Raw Sonar Files Dialog* and the Vessel Name will be automatically listed under Vessel Assignment. Qimera will create a vessel file with this name in your project.
   NOTE: If you import data without vessel information at a later stage, you must choose the correct vessel to associate the data with since Qimera cannot determine this on its own.

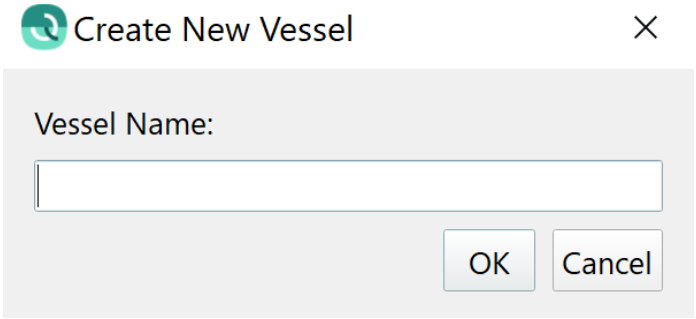

Figure 4: Create New Vessel Dialog

2. Set the Coordinate Reference System of the Imported Data.
3. Click OK to load the files.

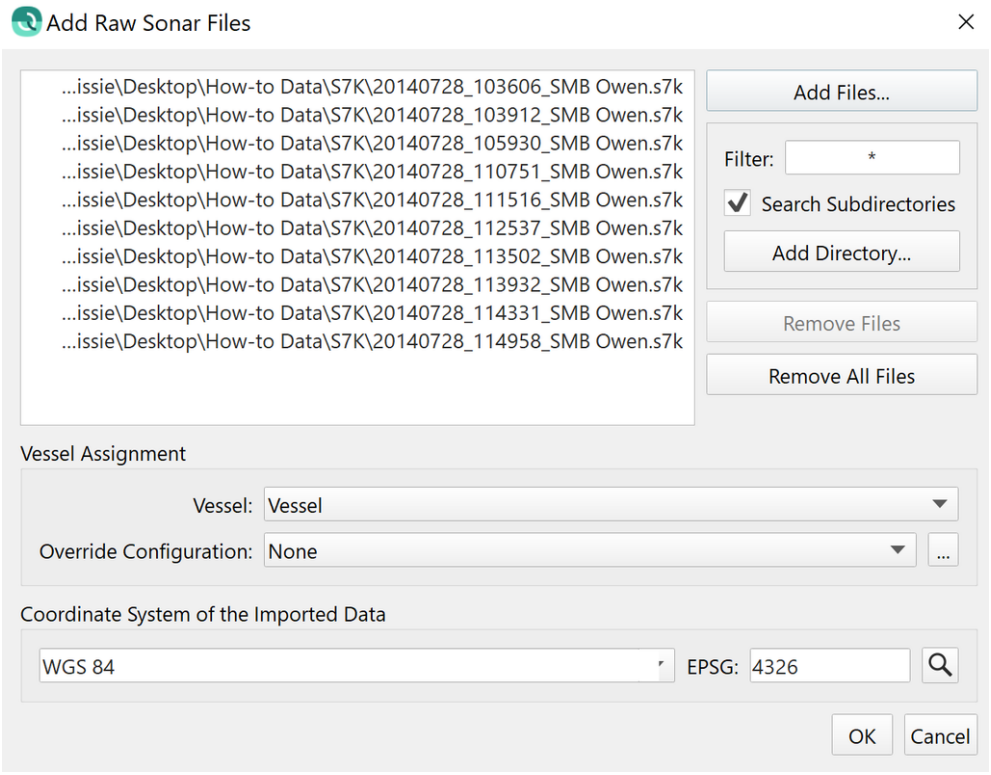

Figure 5: Add Raw Sonar Files Dialog

6) Qimera will load the S7K files to the project, scanning for and extracting any available information and writing it to the Qimera project.

Shown below are:

1. A list with indicators showing the loading progress of each individual file in the *Project Sources Dock*.
2. The loaded tracklines visualized in the *4D Scene*.
3. The overall progress of data extraction in the *Job Activity Dock*.
4. Any warnings or errors shown in the *Job Activity Dock*.

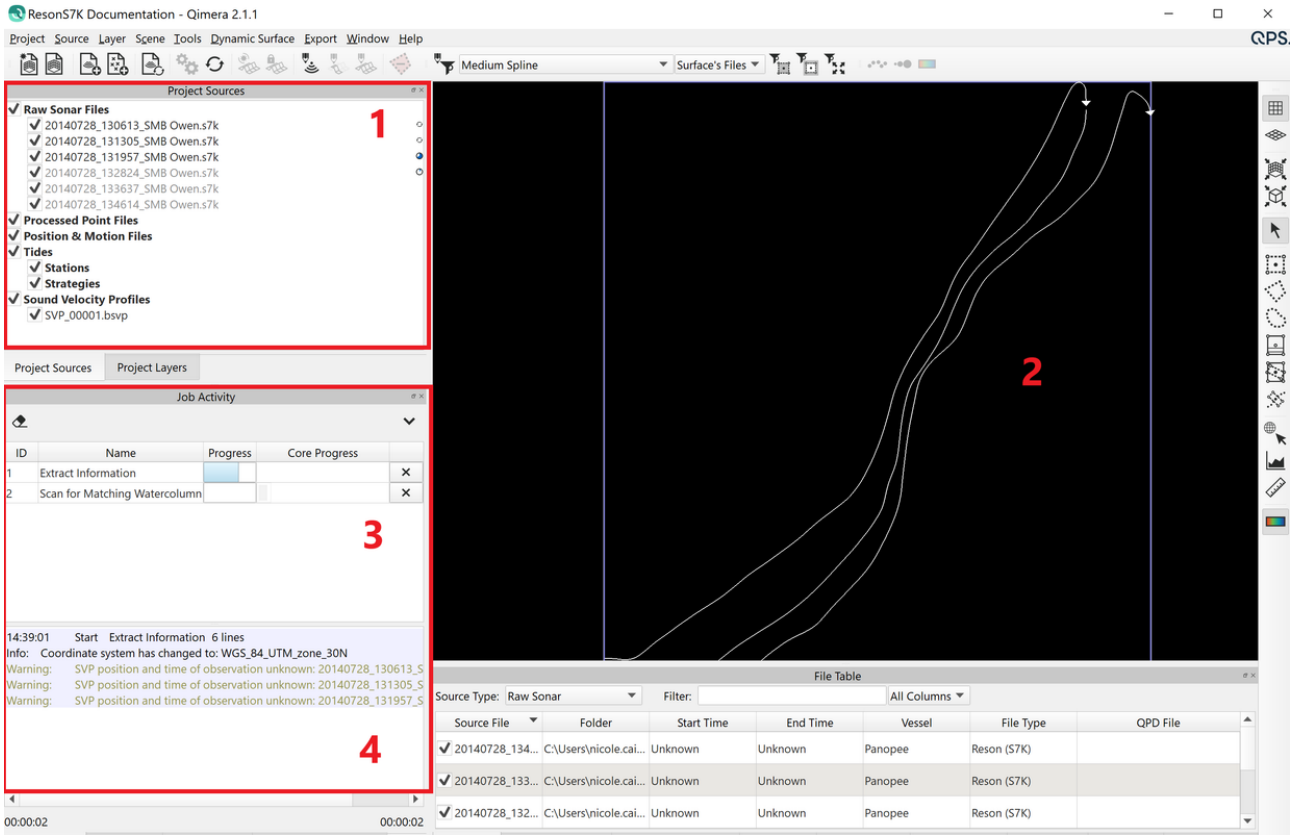

Figure 6: Information Being Extracted from the S7K Data During Load

7) As the information from the S7K files is extracted, you will see the extracted sonar information in the *File Table Dock*. You can review the *Properties Dock* to see what information was extracted for each file (make sure that you have a file selected).

Shown below are:

1. *Properties Dock*
2. *File Table Dock*

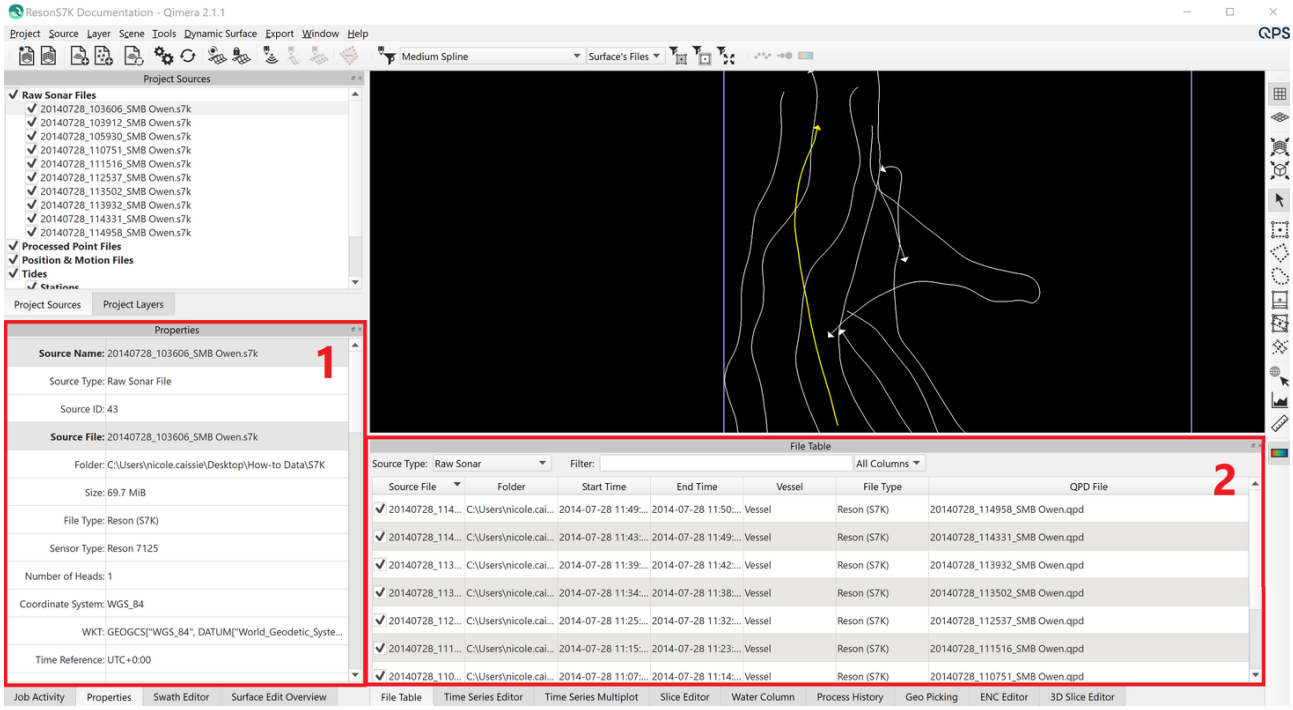

Figure 7: Imported Data Populating the Properties Dock and File Table Dock

8) For this example dataset, the *Job Activity Dock* displays a warning about SVP position and time. This just means that the SVP position and time were not available in the file or could not be read, so Sound Velocity Processing Strategies based on location or time won't be available unless you provide this information in the *SVP Editor*.

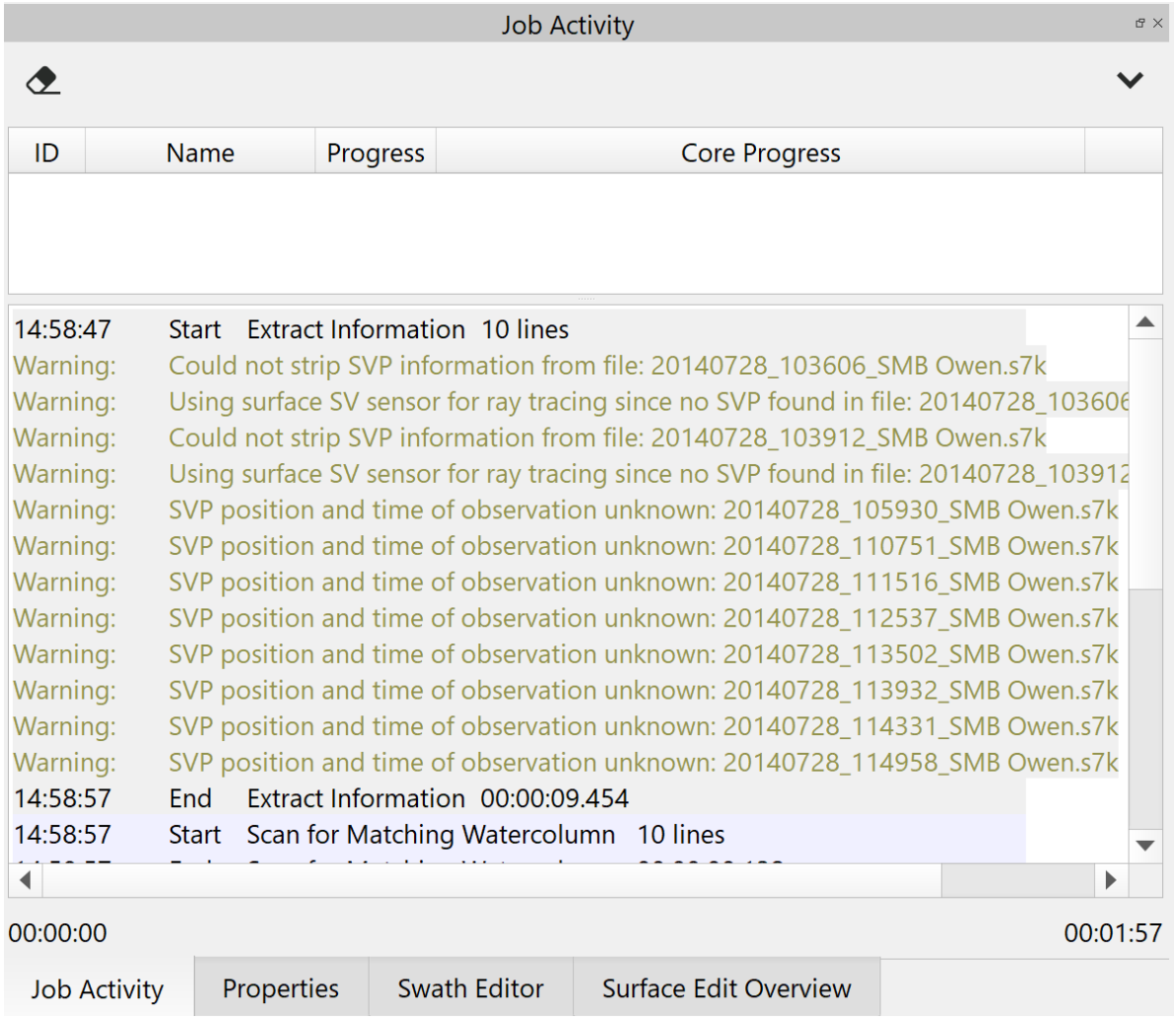

Figure 8: Warnings in the Job Activity Dock

Extracted information for S7K data may include:

- Raw MB
- Water column imagery
- Vessel configuration
- SVP
- Surface sound speed
- Orientation
- Position
- Height
- Pressure
- Sonar Settings
- Other (i.e. Snippets, etc.)

For a full list of what is extracted from each supported format, click *here*.

In this example of the *Properties Dock*, you can see that Beam Time Series, Vessel Configuration, Position, and Motion were all extracted from the file, but that there was no Water Column, SVP or Tide.

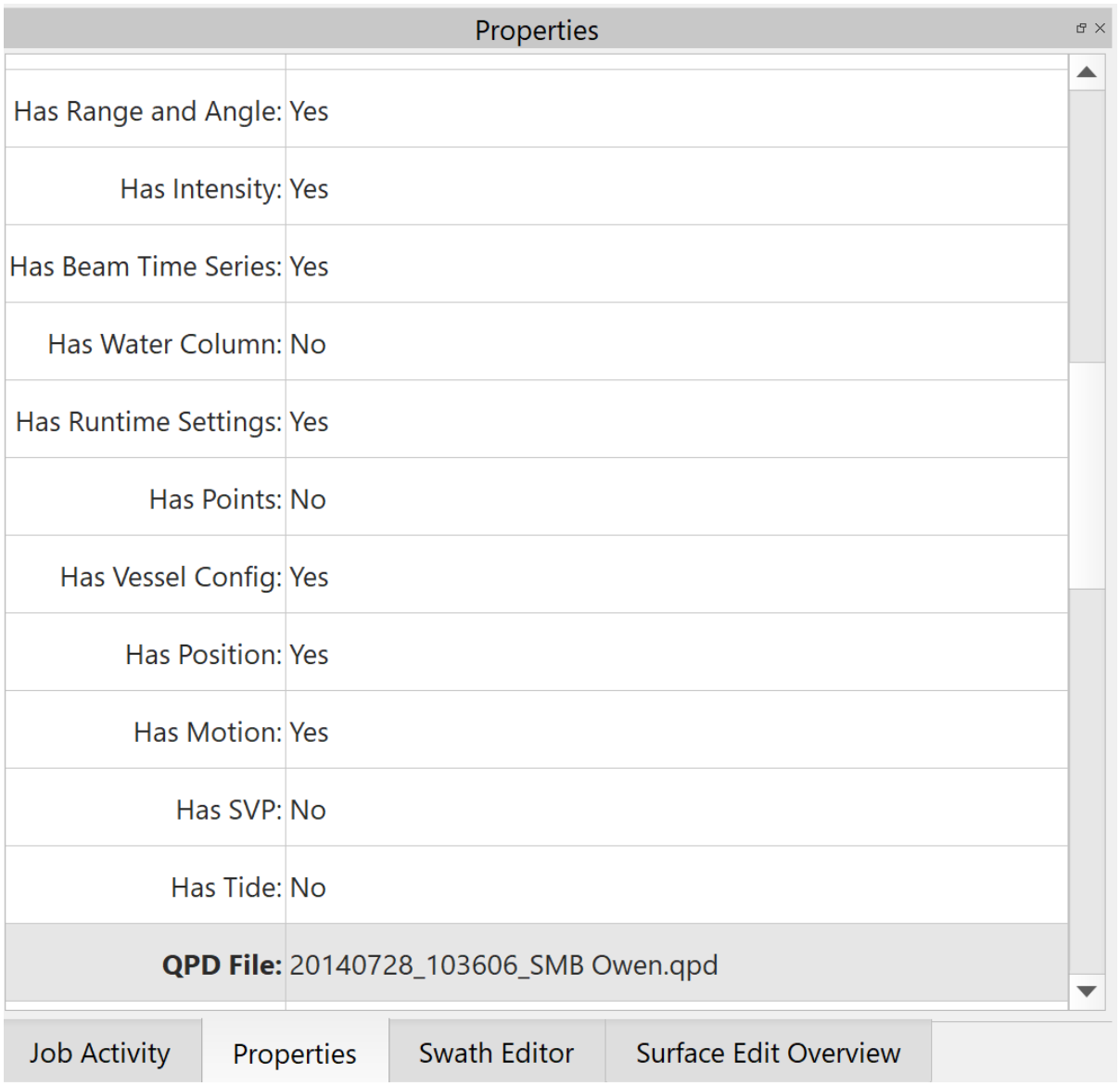

Figure 9: Properties Dock

9) As information is extracted from the S7K files, the folders in the Qimera project get populated with the information.

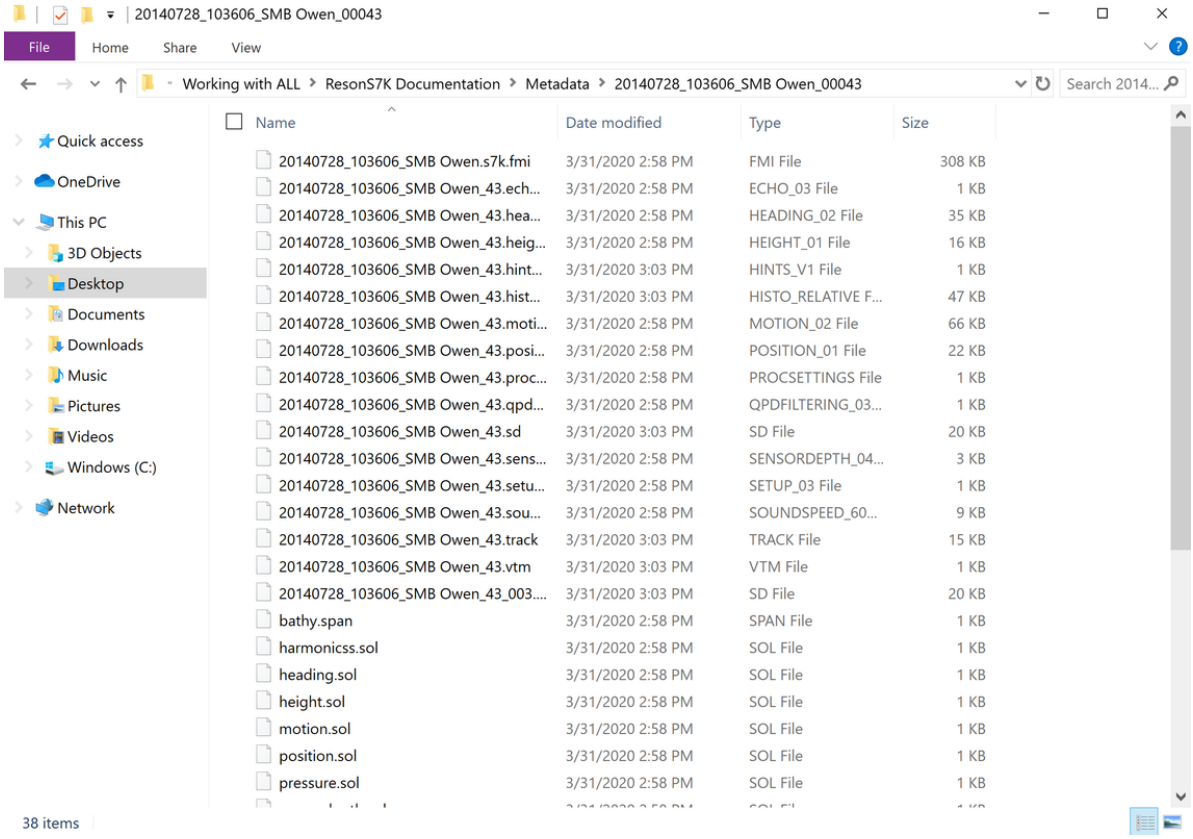

Figure 10: Extracted Information for Line 00043 in the Metadata Folder

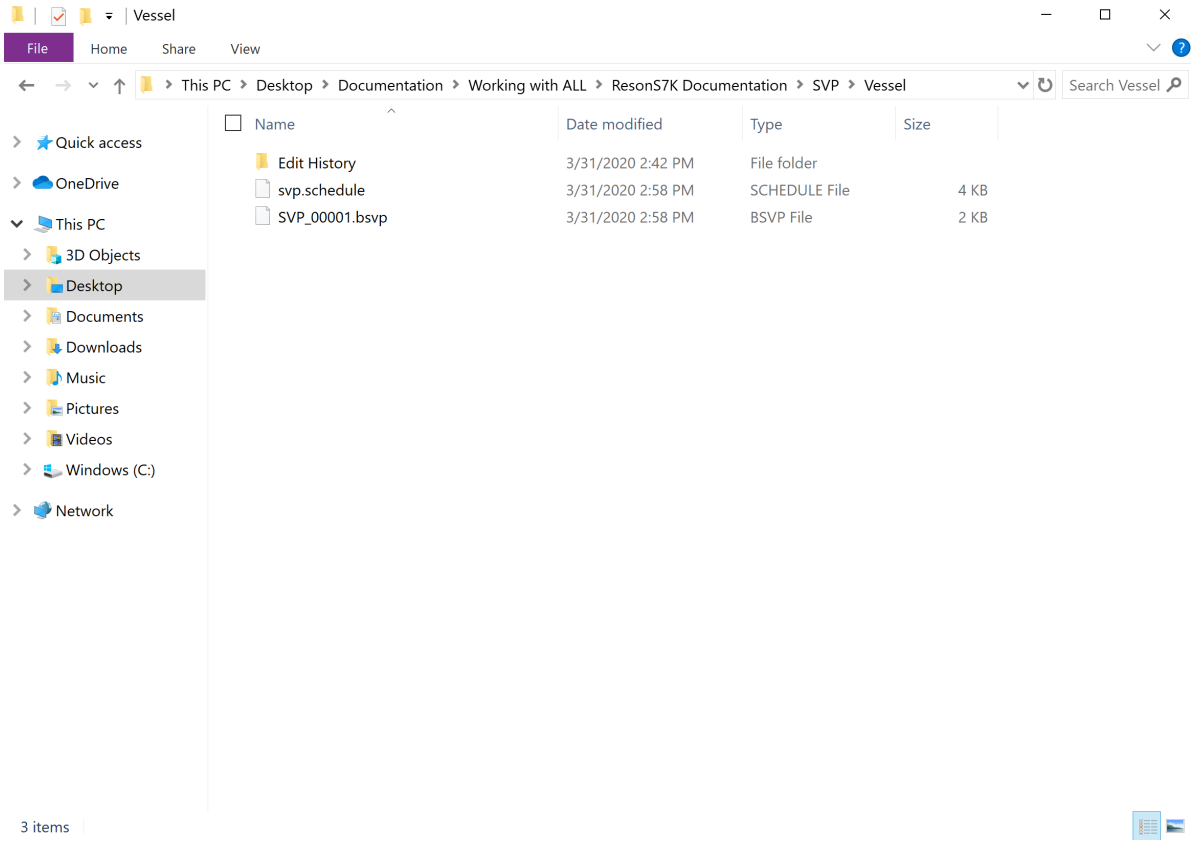

Figure 11: Extracted SVP Information in the SVP Folder

Visualizing a File in Qimera

Checking a file ON or OFF in the *Project Sources Dock* controls the visibility of the trackline. Checking a file ON or OFF does not effect which files are used in surface creation and processing routines.

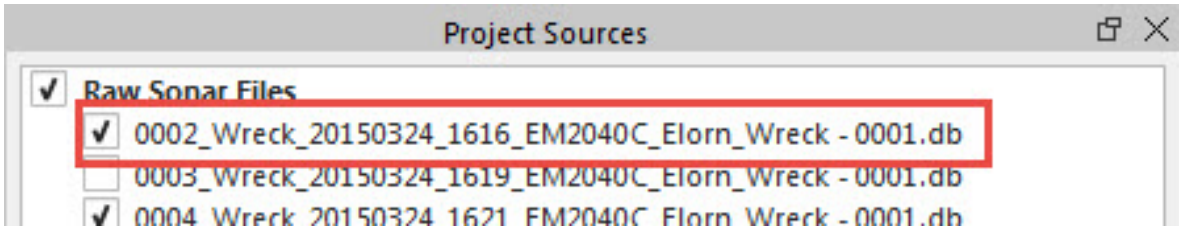

Figure 12: File Checked ON in Project Sources Dock

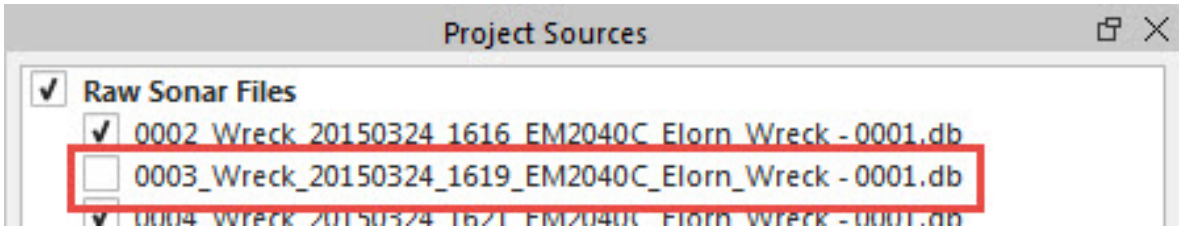

Figure 13: File Checked OFF in Project Sources Dock

Selecting a File in Qimera

For files to be used in a processing routine (such as Surface Creation), they can be checked ON or OFF, but they must also be selected.
Files can be selected by clicking on the file name or trackline with the mouse (use *SHIFT-click* or *CTRL-click* to select multiple files), or by selecting the parent directory above the files in the *Project Sources Dock*. The parent directory in *Figure 14* is "Raw Sonar Files."

In this example, only lines 0002 & 0003 are selected.

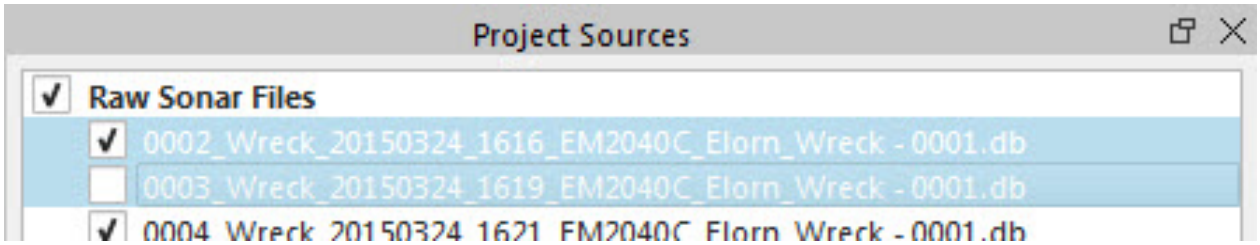

Figure 14: Files Selected in Project Sources Dock

This is a key part of Qimera's workflow. For an overview of the Qimera user interface, click *here*.
Note: When lines have just been added to your project and you are prompted to do a process, all of the lines that were added will automatically be included in that process.

Qimera Reference Manual



- Qimera Production Workflows
  - Qimera Cooperative Cleaning
  - Qimera Production Line Processing
- Qimera Appendices
  - Qimera ENCs
  - Qimera Glossary
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- Qimera Utility Applications
  - Qimera Command
  - Qimera OmniViewer
- Qimera Dynamic Workflow
  - Qimera Direct to QPD Process
  - Qimera Clear All Flags Process
  - Qimera Match QPD Process
  - Qimera Match Water Column Process

Introduction to Qimera

With currently available software, hydrographic data processing can be challenging even for the most experienced users. While software generally advances alongside hardware and processing methods, frustrations remain due to the fact the onus to arrive at a successful solution still relies mainly on the human operator. Namely, they must connect many, if not all pieces together to arrive at the final processing solution. Issues arise most often with the latter as the culprit. Humans can make simple errors when transcribing vessel configurations, or moving from one coordinate frame convention to another, while moving among or between software applications in their workflow. Human error can also arise when importing ancillary data, yet failing to associate it with the correct data files. Altering processing configurations and failing to trigger the appropriate reprocessing for all, or select files is also a common error. Simply put, any error in the process, albeit minor can lead to poor results in the final product; time allocated to troubleshooting the source of the problem results in project delays and reduced efficiency.

Paradigm Shift

A paradigm shift is a fundamental change in approach or underlying assumptions. With the release of QPS Qimera, we are striving for a paradigm shift by automating mundane and error prone tasks for which computers are ideally suited in order to allocate the energies of the user wisely. For instance, data transcription, processing state management and job scheduling are now automated. Conversely, Qimera isolates the stages of processing in which a human brings value to the process, such as processing configuration management, data validation and review.

Easy

Qimera is an easy to use and powerful sonar data processing application, designed to process, analyze and visualize multibeam echosounder data. Built using core QPS technologies, Qimera naturally supports the QINSy data logging format in addition to sonar file formats from other hardware and software manufacturers. Qimera intelligently and interactively guides the operator through the typical data processing stages; simplifying what traditionally has been a complicated convoluted process. Qimera's *Dynamic Workflow™* greatly improves the operator experience when processing hydrographic data by allowing users to configure the application to respond immediately to their actions; all data products and intermediate files are automatically updated after each action. If the user edits data or modifies a processing configuration, Qimera can queue the appropriate reprocessing steps and update all derivative products. Qimera uniquely remembers what actions and settings have been applied to the project data, and will highlight files that need further processing actions in order to complete the workflow.

Efficient

Qimera extracts as much information as possible from incoming data files, including all ancillary data and survey vessel information, such that users who configure this information correctly during acquisition can immediately begin processing without the hassle of configuring a project. Users who come to Qimera with data that is fully populated with ancillary data and vessel information can create map products and review their data within minutes.

Powerful

- Qimera Metadata Extraction Process
- Qimera Re-Nav XY Process
- Qimera Re-Nav XYZ Process
- Qimera Re-Nav Z Process
- Qimera Sound Velocity Correction Process
- Qimera Update Spatial Index Process

- Qimera Interface
  - Qimera Toolbars
    - Qimera Custom Toolbar
    - Qimera Selection Dimensions Toolbar
    - Qimera 4D View Toolbar
    - Qimera Selection Movement Toolbar
    - Qimera Bathymetry Toolbar

Qimera offers the typical complement of multibeam data review and editing tools such as a Time-Series Editor, Sound Velocity Profile Editor, a Patch Test Calibration Tool as well as advanced tools such as the Wobble Diagnosis Toolkit for troubleshooting common sensor installation/integration issues. Using the latest computing technologies, the unique I/O Balanced Multi-Core engine in Qimera is specifically designed to process sonar data as rapidly as possible. All processing is done as a background task which allows the user to continue to interact with the project.

- Qimera Filter Operation Toolbar
- Qimera Scene Editor Toolbar
- Qimera Specialized Tools
  - Qimera 3D Editor
  - Qimera Cable/Pipe TOP Detection Tool
    - Qimera TOP Detection Settings Dialog
  - Qimera Coverage Extinction Plot
  - Qimera Cross Check
  - Qimera Dynamic Grid Shifting Tools
    - Qimera Adjust Static

Horizontal Shift Tool

- Qimera Adjust Vertical Shifts Tool
- Qimera Heave/Swell Removal Tool
- Qimera Line Height Matching Tool
- Qimera Static Horizontal Shift Tool
- Qimera Static Vertical

Shift Tool
- Qimera Varying Vertical Shift Tool
- Qimera Instant Grid Filter
- Qimera Navigation Editor
- Qimera Patch Test
- Qimera SVP Editor
- Qimera Vessel Editor
- Qimera Wobble Analysis

- Qimera Dock Windows
  - Qimera Cable/Pipe Analysis Dock
  - Qimera ENC Editor Dock
  - Qimera File Table Dock

- Qimera Filter Profile Dock
- Qimera Grid Cell Properties Dock
- Qimera Geo Pick Dock
- Qimera Grid Edit Overview Dock
- Qimera Job Activity Dock
- Qimera PFM Dock
- Qimera Process History Dock
- Qimera Profile Dock
- Qimera Project Layers Dock
- Qimera Project Sources Dock
- Qimera Properties Dock
- Qimera Slice Editor Dock
- Qimera Swath Editor Dock

- Qimera Time Series Editor Dock
- Qimera Time Series Multiplot Dock
- Qimera Water Column Dock
- Qimera 4D Scene
- Qimera Main Menu Bar
  - Qimera Dynamic Grid Menu
  - Qimera Export Menu
  - Qimera Help Menu
  - Qimera Layer Menu
  - Qimera Project Menu
  - Qimera View Menu
  - Qimera Source Menu
  - Qimera Tools Menu
  - Qimera Window Menu

- Qimera Status Bar
- Qimera Wizards and Dialogs
  - Qimera About Dialog
  - Qimera Add Processed Point Files Dialog
  - Qimera Add Raw Sonar Files Dialog
  - Qimera Add Tide Definition File Dialog
  - Qimera Add Tide File Dialog
  - Qimera Application Preferences Dialog
  - Qimera Automatic Import Dialog
  - Qimera Cable/Pipe Tracker Sensor Editor Dialog
  - Qimera Calculate Contours Dialog

- Qimera Calculate Spot Soundings
- Qimera Colormap Editor Dialog
- Qimera Colormap Range Adjustment Dialog
- Qimera Configure Custom Toolbar Dialog
- Qimera Configure Shortcuts Dialog
- Qimera Create Cleaning Project Dialog
- Qimera Create Plane Dialog
- Qimera Create Project Dialog
- Qimera Create Static Grid Dialog

- Qimera Custom ASCII File Configuration Dialog
- Qimera Datagram Viewer Dialog
- Qimera Drape Image Dialog
- Qimera Dry Run Dialog
- Qimera Dynamic Grid Dialogs
    - Qimera Snapshot as Static Grid
    - Qimera Extract Dynamic Grid Layer
    - Qimera Append to Dyna

mic Grid Dialog

- Qimera Cell Info Dialog
- Qimera Change Resolution Dialog
- Qimera Create Clipped Grid
- Qimera Create Dynamic Grid Dialog
- Qimera Create Flag Markers Dialog
- Qimera Create

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- Qimera CUBE Dialogs

- Qimera Duplicate Dynamic Grid Dialog
- Qimera Export Grid to Soundings
- Qimera Export Shoal Soundings Dialog
- Qimera Export Static Grid Layer Dialog
- Qimera Filter Out Soundings in Lonely

Cells Dialog
- Qimera Interpolate Dynamic Grid Dialog
- Qimera Remove Lines Dialog
- Qimera Sounding Selection Dialog

- Qimera Edit Modified Flags Dialog
- Qimera Export BAG Grid Wizard
- Qimera Export Grid as Image Dialog
- Qimera Export Grid Dialog

- Qimera Export Grid To KML Dialog
- Qimera Export Line to XYZ Dialog
- Qimera Export Processed Points Dialog
- Qimera Export S-57 Dialog
- Qimera Export Soundings to ASCII Dialog
- Qimera Export Soundings to LAS/LASzip Dialog
- Qimera Export to FAU Dialog
- Qimera Export to GSF Dialog
- Qimera Export Track To ASCII Dialog
- Qimera Filter Below Dynamic

Cable/Pipe Dialog
- Qimera Flag Grid Cells
- Qimera Generate/ Edit X-Point Listings Dialog
- Qimera Generate Overlap Report
- Qimera Geodetic Configuration Overview
- Qimera Geodetic Search Dialog
- Qimera Grid Difference Wizard
- Qimera Grid Statistics Dialog
- Qimera Import ASCII Navigation Dialog
- Qimera Import CAD Dialog

- Qimera Import ESRI Shape Dialog
- Qimera Import Gridded Data Wizard
- Qimera Import Image Dialog
- Qimera Import Lines Dialog
- Qimera Import Navigation Configuration Dialog
- Qimera Import Points Dialog
- Qimera Import Sound Velocity Profiles Dialog
- Qimera License Status Dialog
- Qimera Manage Filter Profiles Dialog
- Qimera Merge Dynamic

Cable/Pipes Dialog
- Qimera New System Dialog
- Qimera PFM Unload Wizard
- Qimera Processed Point File Configuration Dialog
- Qimera Processed Point File TPU Calculation Dialog
- Qimera Processing Settings Dialog
- Qimera Project Browser Dialog
- Qimera Project Properties Dialog
- Qimera Projects Dialog
- Qimera Screen

Capture Dialog

- Qimera Select Colormap Dialog
- Qimera Select Coordinate System Dialog
- Qimera Set LAS Classification
- Qimera Shading Parameters Dialog
- Qimera Structure from Motion (SfM) Bathymetry Dialog
- Qimera Tide Station Dialog
- Qimera Tide Strategy Dialog
- Qimera TU Delft Sound Speed Inversion Settings Dialog

- Qimera Unload Processed Point File Dialog
- Qimera Workspace Creation Dialog

Qimera Production Workflows

The following pages detail some of the new workflows that Qimera provides.

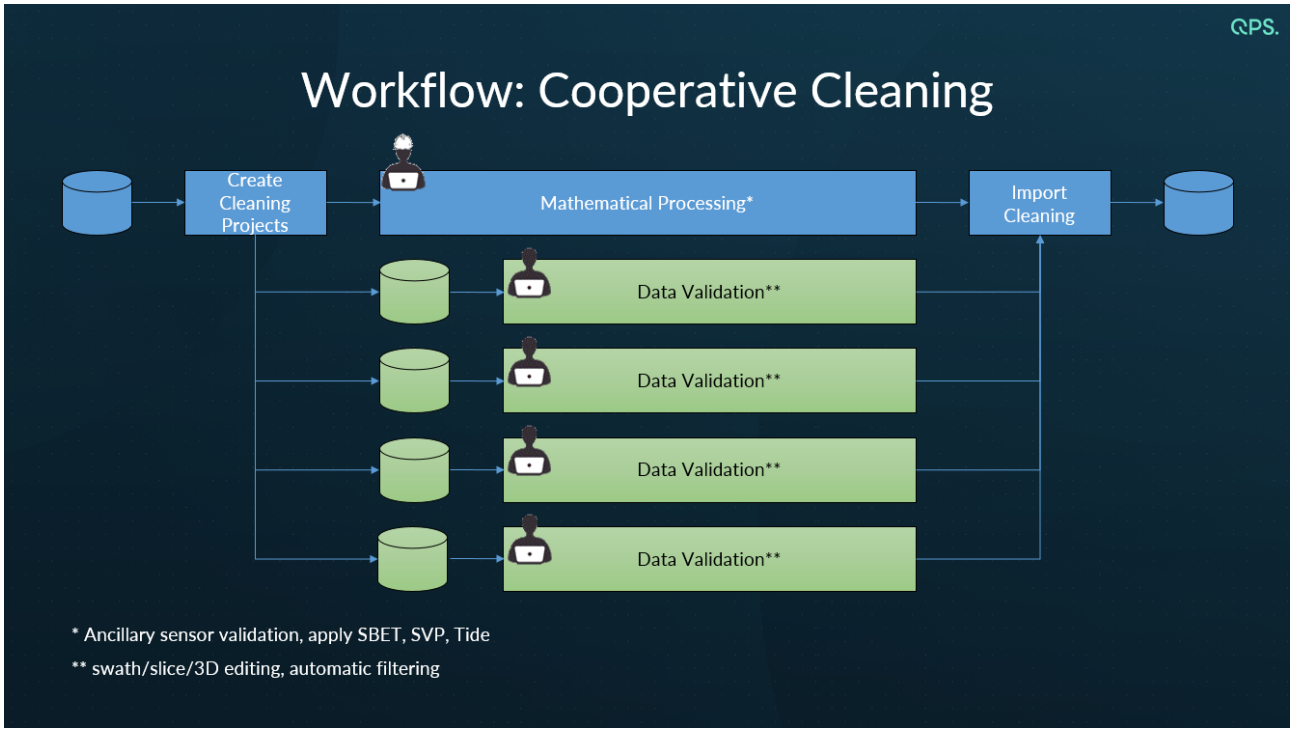
Qimera Cooperative Cleaning

Qimera Production Line Processing

Qimera Cooperative Cleaning

This method allows the lead data processor or surveyor-in-charge to maintain full control of the sensor and geodetic information while farming out the data cleaning to other and/or multiple data processors.
This is done by creating sub projects from the main project, and these these sub projects have their own Dynamic Surface and QPDs to work on; there is no resource conflict between the main project and the sub projects.
Once cleaning is done in the sub projects, Qimera then seamlessly re-integrates the data back to the master project for final quality control and product creation by the lead surveyor.

The graphic below explains the basic workflow concepts.

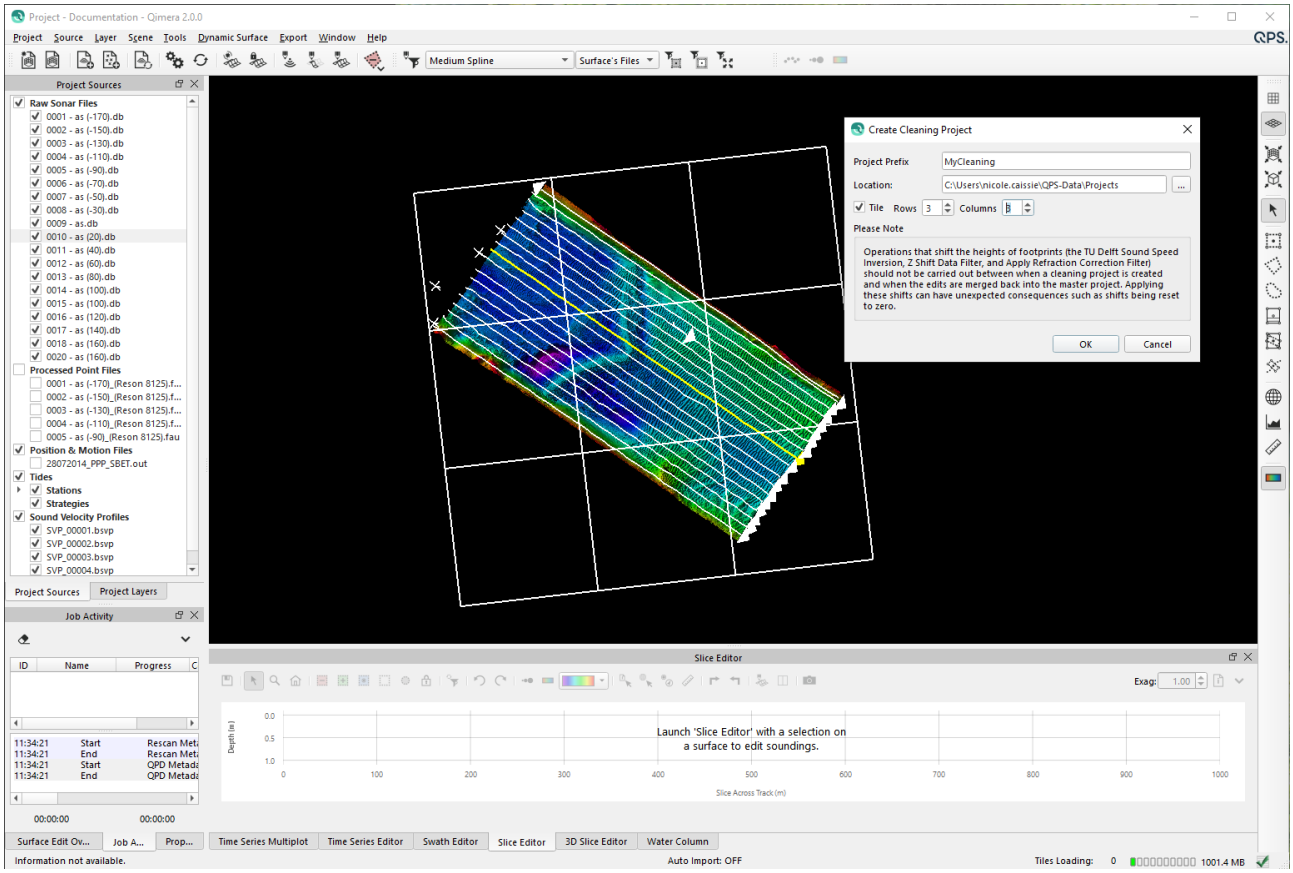


Benefits of Cooperative Cleaning:

- Multiple users can be tasked with working on the main bottleneck of multibeam sonar processing which is data cleaning, thereby rapidly reducing the time it takes to clean and validate multibeam survey data.
- All creation and re-integration of sub-projects is controlled by Qimera. There are no manual copy and paste operations, thus minimizing the effects of human error.
- Allows focused cleaning of large area surveys by multiple users while maintaining control by the lead data processor.

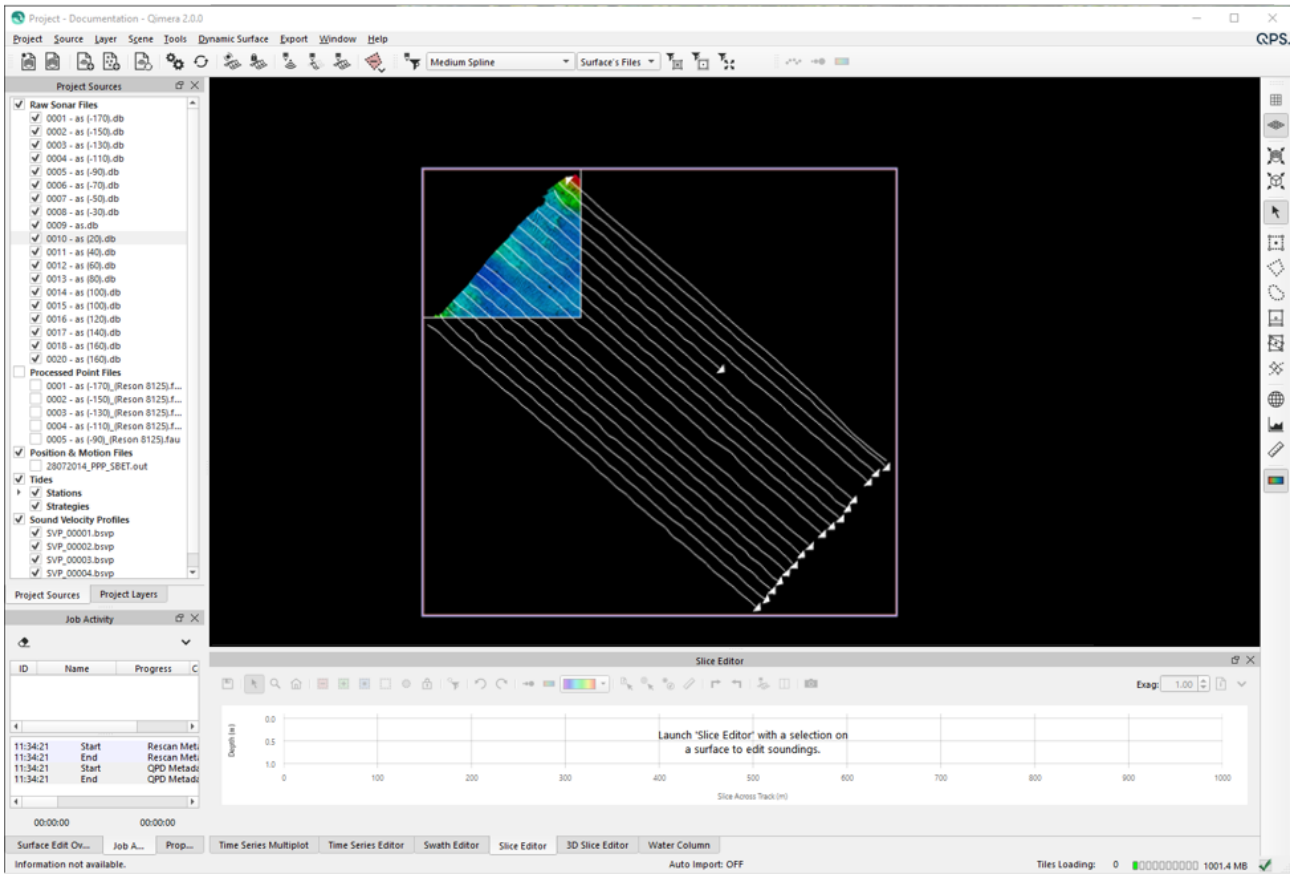
- Sub projects only require a Qimera Clean license and therefore will reduce the total cost of ownership of the software for a data processing team.
- Data cleaning can be performed by less experienced personnel, again reducing project costs.
- Sub projects contain QPD files only and are thus limited to cleaning only. This reduces the risk of less experienced personnel accidentally applying correctors or making configuration changes.
- Sub projects can be moved off the network to a local machine to overcome slow network bandwidth, while maintaining the integrity of the data by keeping the master copy.

The image below shows the main project being cut into a series of nine sub-projects with the new "Create Cleaning Projects" dialog.
The user specifies the cleaning project base name, location for output and the number of rows and tiles to cut the project into.
Alternately, the lead project surveyor can also designate a particular area for a cleaning project using the rectangular selection tool. The dialog to create a cleaning project will use this area instead.



The image below shows the data from the point of view of the person cleaning one of the sub projects.
They see the QPDs from the main project that overlap their work area and they see the outline of the entire project as well as the outline of their sub area.

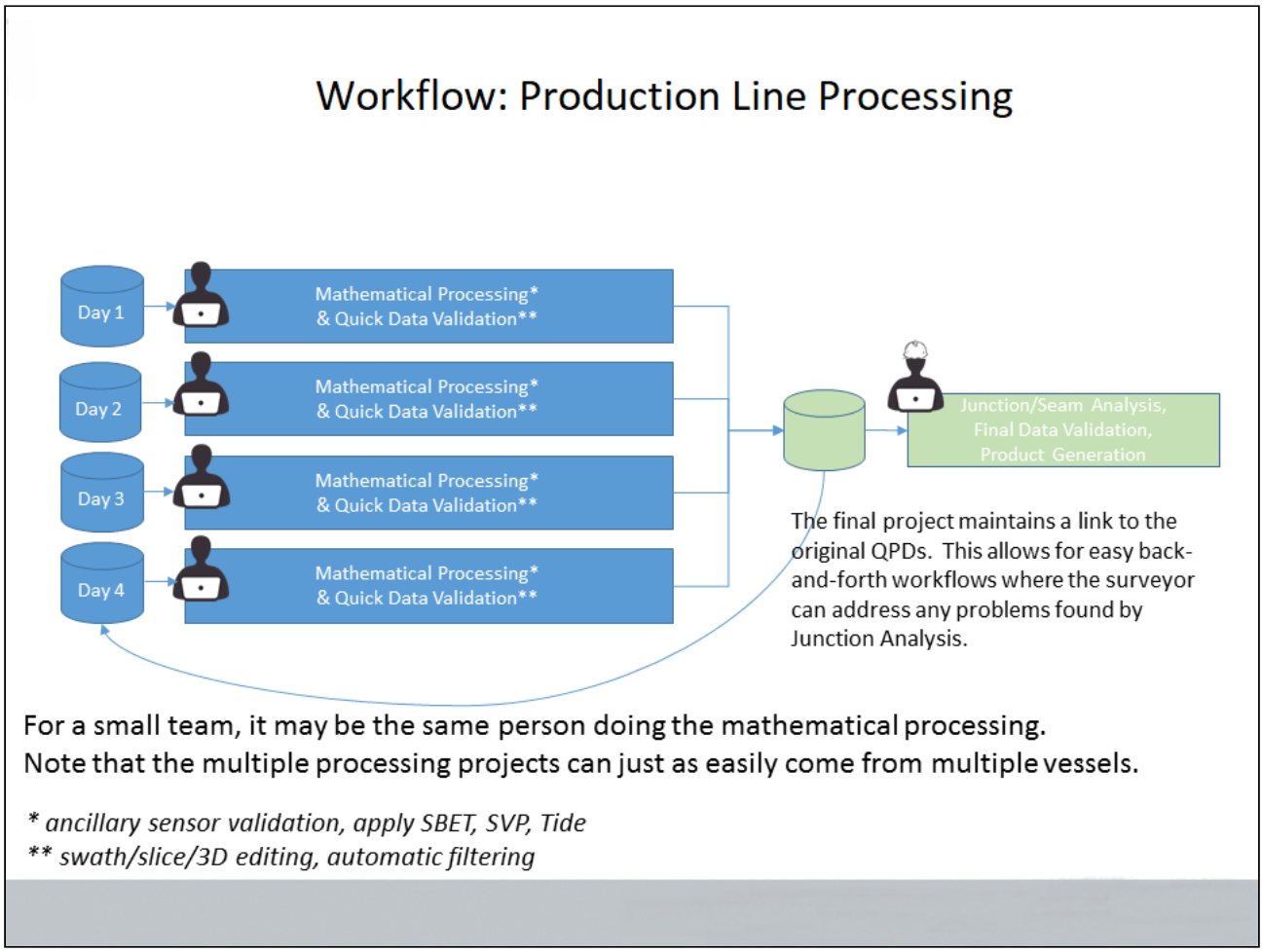
Since it is only QPDs that are brought into a cleaning project, the only actions that are permissible are data cleaning.
Compartmentalizing the data into cleaning projects limits the risk of accidental re-processing by inexperienced or curious data processors who like to explore what all the buttons do.



Once the data cleaner's work is done, the main project is opened up by the lead surveyor and they can import the cleaning from the cleaning project.
Only the editing that was done inside the cleaning area limit rectangle is brought back into the main project, further protecting the main project from overzealous cleaning that may have been done beyond the data cleaner's work area.

Qimera Production Line Processing

This method is used where full processing capability is required for multiple users but the final result needs to be checked and final products created from it. Production line cleaning merges multiple Qimera projects into one single project where data cleaning and QC can be performed. This is done by importing the QPD results from the processing projects into a new and final project where the results are staged for delivery. The graphic below explains the basic workflow concepts.

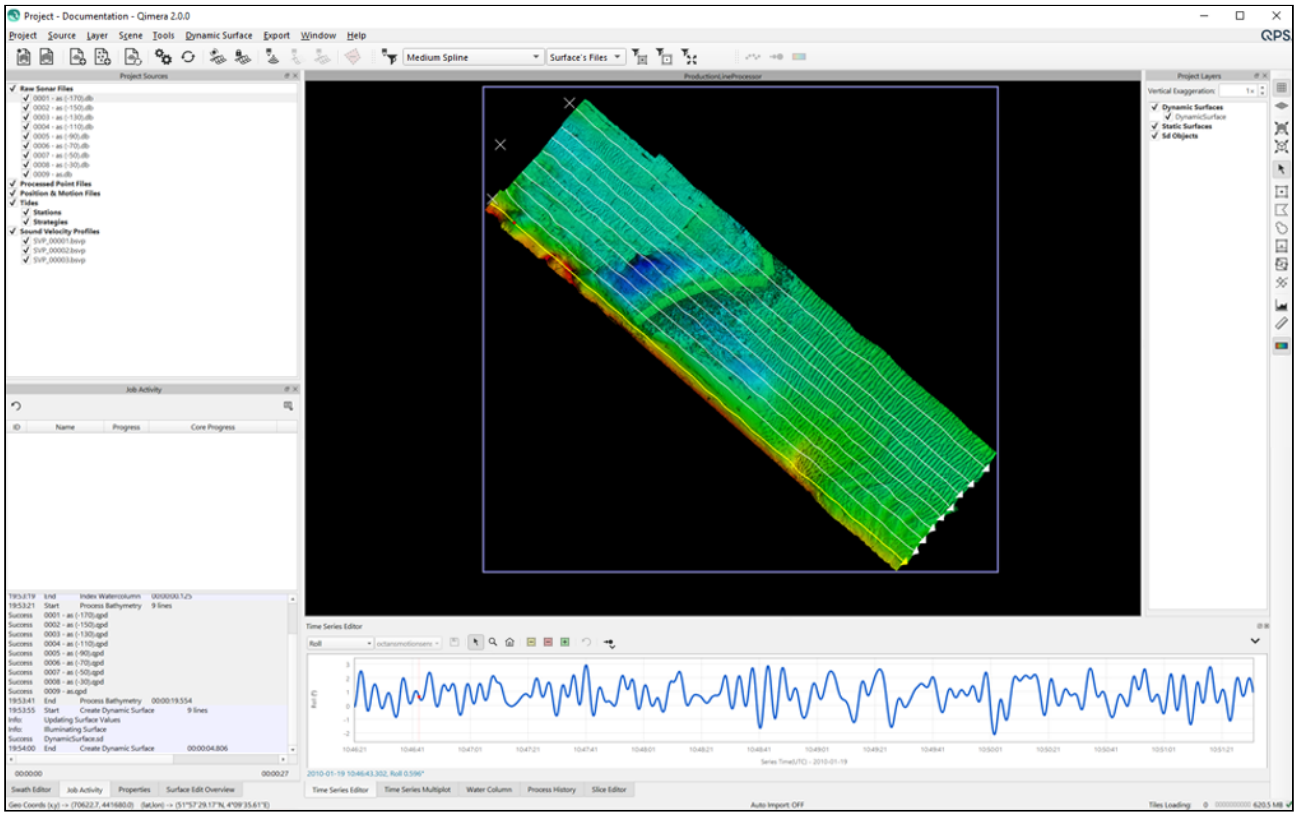


Benefits of Production Line Processing:

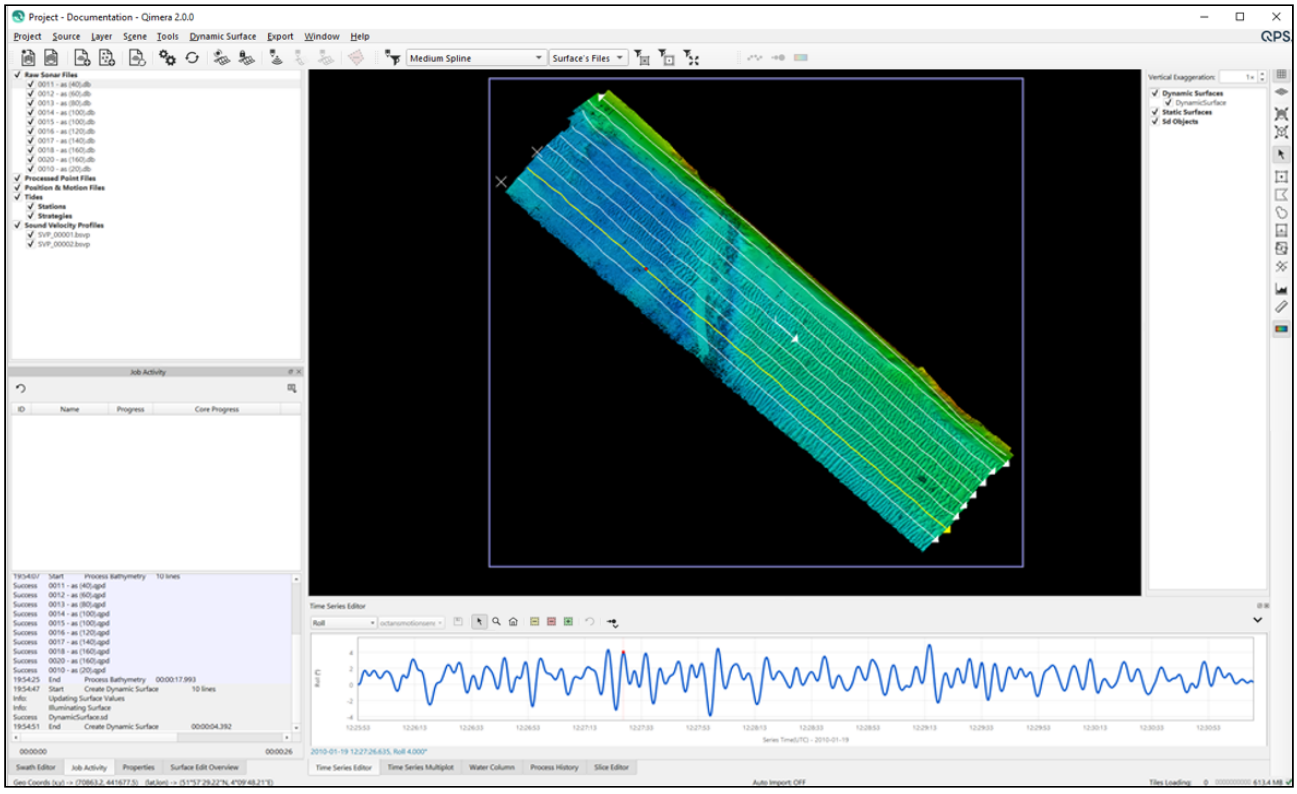
- For a Hydrographic office, a hydrographic survey can be portioned up among the bathymetry appraisal team for full validation by each person, and then pulled together following collective validation for final QC and chart production requirements.
- For Pipeline and cable surveys where the data can be divided into an alignment sheet per data processor. All of the separate projects can be brought together into one for the senior data processor to QC the data and create the final product.

- Processing can be divided offshore into one processor per day. The mathematical processing is done in the daily project, and is limited to the data and ancillary information for that single day only. This reduces the complexity of managing several tens or hundreds of additional ancillary files that can accrue over the span of a project. The daily processing project only needs the ancillary data for that day, making this experience far less prone to error.
- All merging operations are performed by the software, as opposed to manually by humans, therein eliminating error.

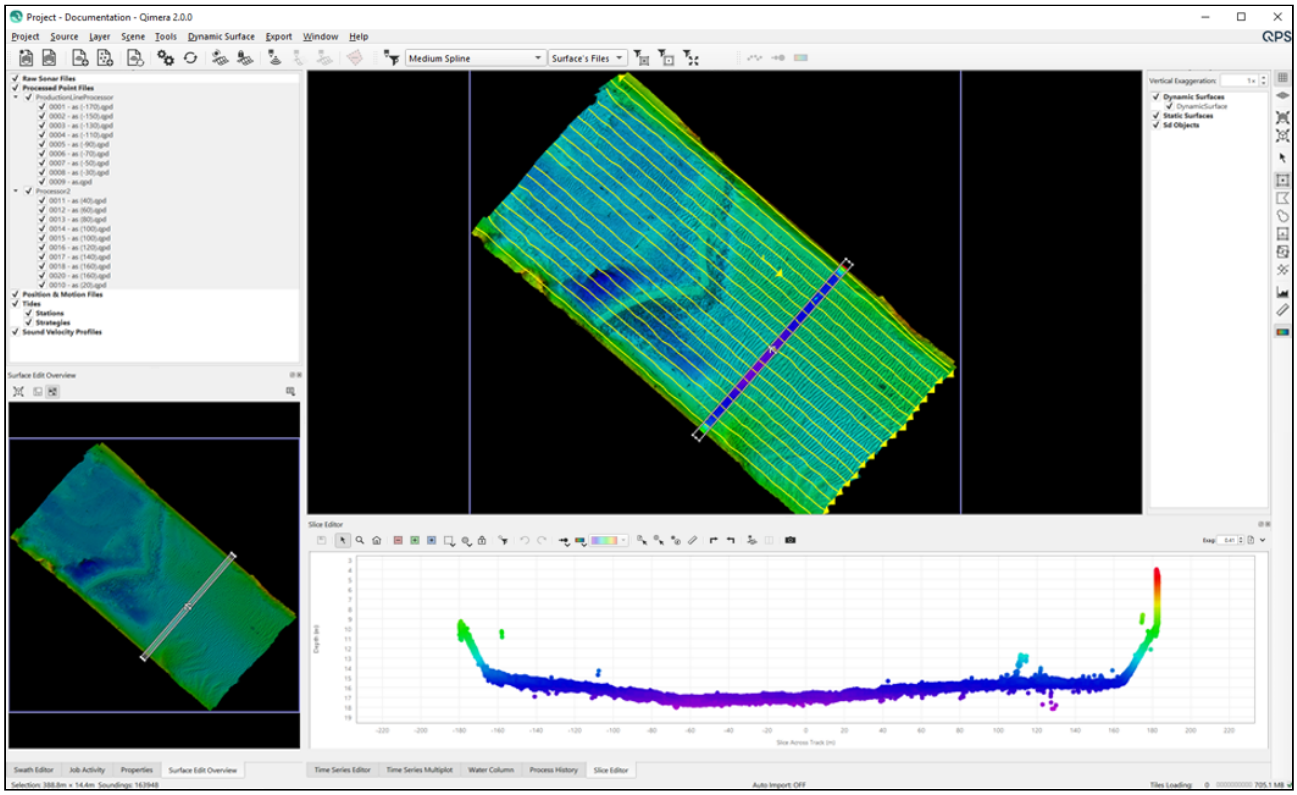
The series of images below show two separate sets of data being processed to get from raw sensor data to georeferenced soundings. The third image shows the QPD results from the first two small projects being merged into an assembly project, with the Slice Editor being used to verify the line up between the two different data sets. *It's important to note that the QPDs are shared between the processing project and the main project; it is up to the user to ensure that you do not attempt to write to QPDs at the same time.* The workflows for which this is meant to be used largely protect against this since data should not be submitted for inclusion in the master project until the mathematical processing is done. Specifically, when the mathematical processing project is done and is closed. The main processor then pulls the data into the main project with the understanding that the mathematical processing project will *not* be re-opened unless the surveyor is directed to do so, which would only be necessary should problems arise. Human coordination is essential in orchestrating this process, and avoids complex resource locking schemes in other software packages which will sometimes lock users out of their data. Humans are superior to machines in coordinating, and the functionality of this process performs optimally via human coordination and working together.



Bathymetry validation segment #1



Bathymetry validation segment #2



Combined segments for QC and chart producti
on requirements

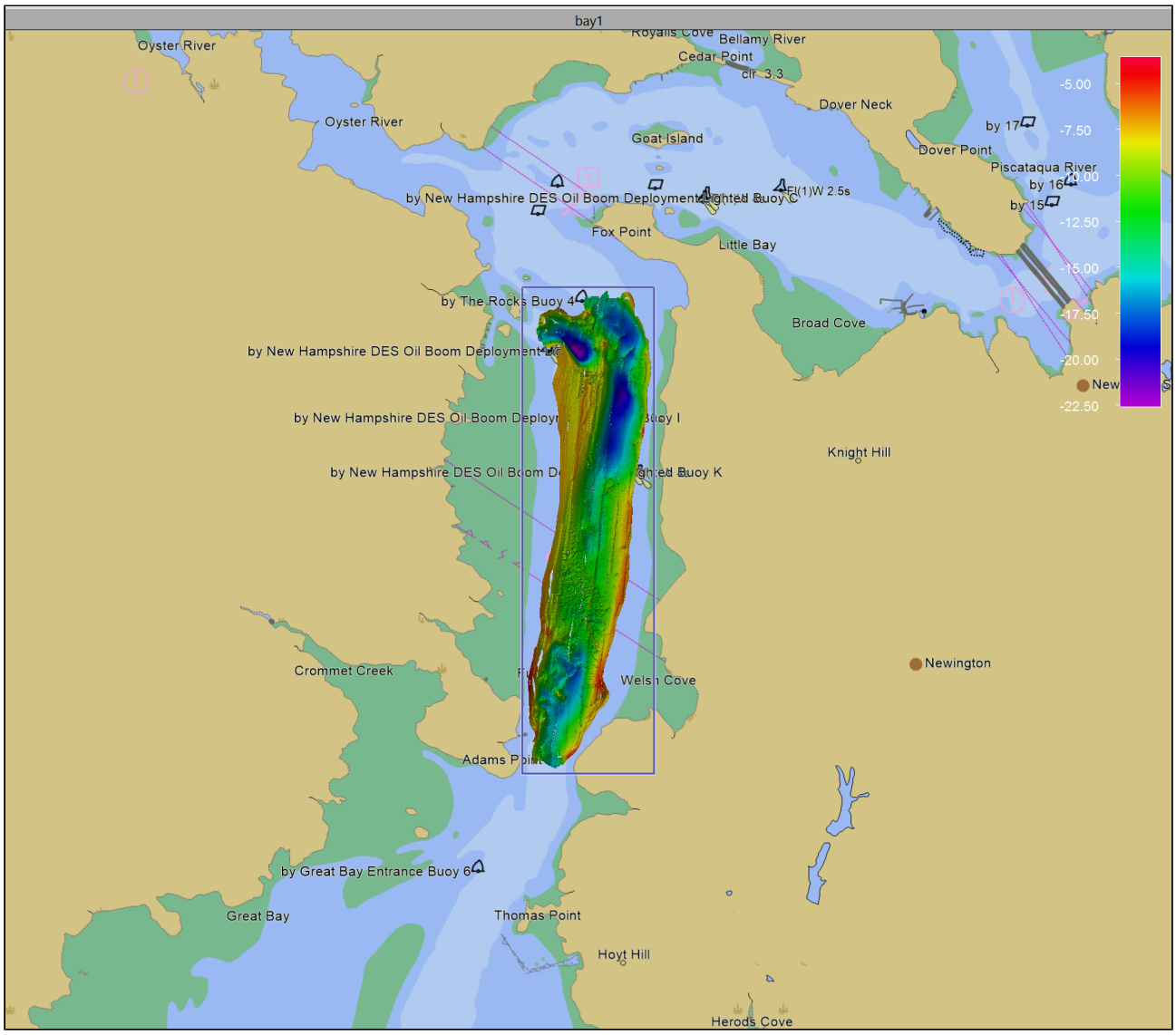
Qimera Appendices

- Qimera ENCs
- Qimera Glossary
- Qimera Plotting Grids
- Qimera Project Structure

This section is not complete. Please see the QPS Support Website for the latest documentation.

Return to: *Qimera Table of Contents*

Qimera ENCs



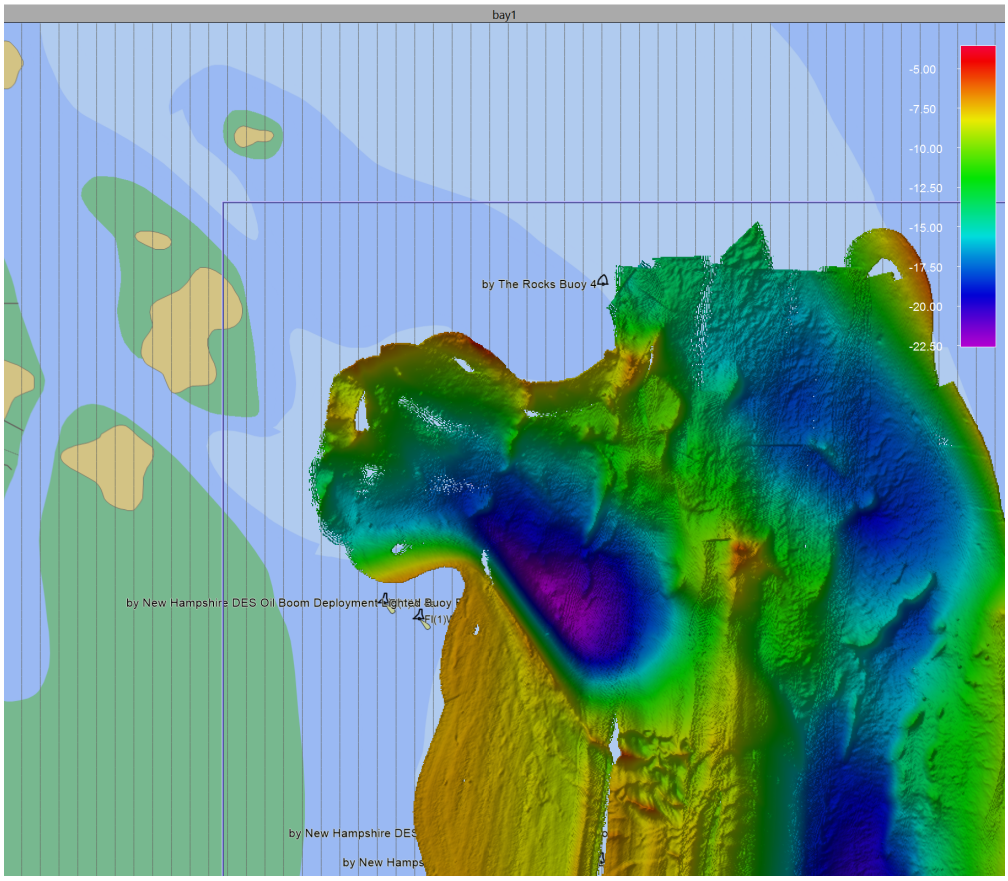
Use the Qimera Preferences Dialog to change the render attributes of the ENCs. To turn on the display of the ENCs, see the Qimera Grid Edit Overview Dock or Qimera View Menu documentation.

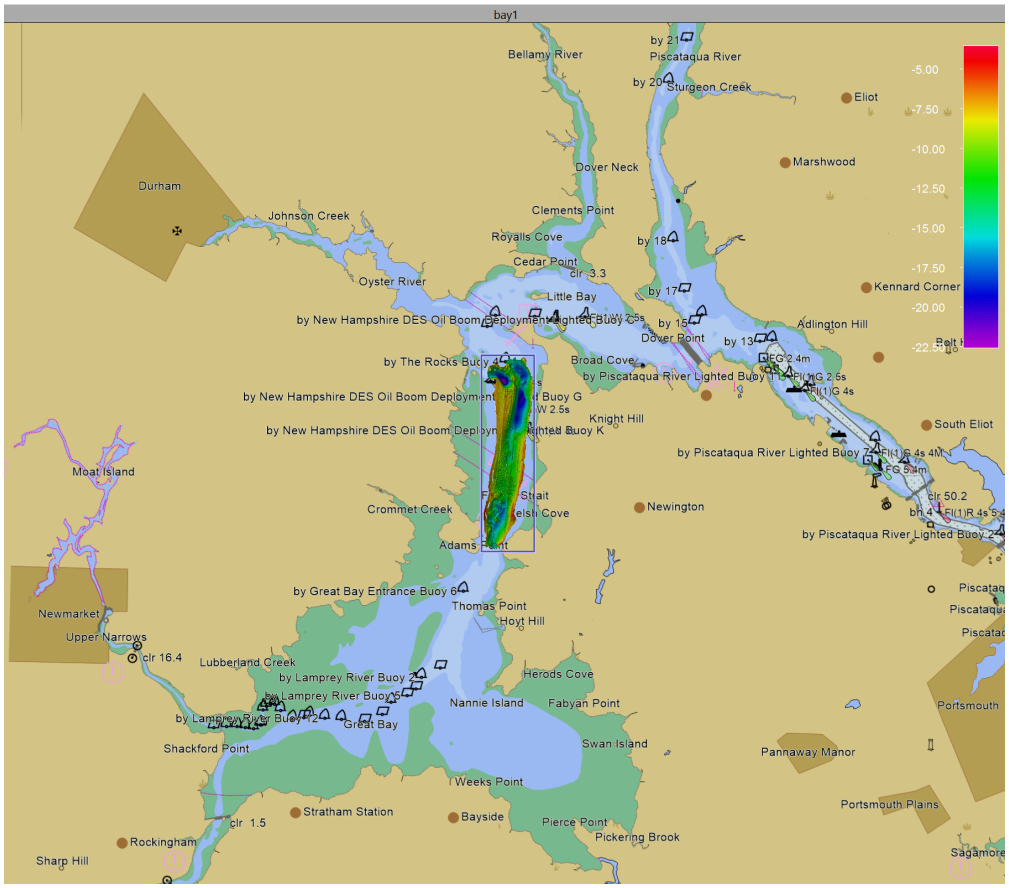
Qimera displays a processed version of ENC with the extension .QNC. QNCs are generated using the QPS ENC Administrator tool. See the documentation on the ENC Administrator Tool for more information. When Qimera is installed, a default set of world overview maps are added to the following location:

C:\Users\Public\Documents\QPS\Shared\Charts\World Overview

If you add additional ENCs using the ENC Administrator, simply create a folder inside the above folder when doing the conversion. These maps will be automatically used by Qimera projects. ENCs are used in Qimera for contextual information only and are not

intended for navigation purposes. They can be display in the Surface Edit Overview window as well as the main 4D Scene when in 2D mode. As you zoom in or out of the scene, the detail level will automatically change as shown in the images below.


bay1
-5.00
-7.50
-10.00
-12.50
-15.00
-17.50
-20.00
-22.50
by The Rocks Buoy 4
by New Hampshire DES Oil Boom Deployment Lighted Buoy F
Fl(1)W
by New Hampshire DES
by New Hamps


bay1
Bellamy River
Piscataqua River
Sturgeon Creek
Eliot
Marshwood
Dover Neck
Durham
Johnson Creek
Clements Point
Royalls Cove
Cedar Point
Oyster River
Little Bay
Kennard Corner
Adlington Hill
Dover Point
Broad Cove
Knight Hill
South Eliot
Moat Island
Crommet Creek
Newington
Newmarket
Upper Narrows
Lubberland Creek
Herods Cove
Nannie Island
Fabyan Point
Great Bay
Shackford Point
Swan Island
Pannaway Manor
Portsmouth
Weeks Point
Portsmouth Plains
Stratham Station
Bayside
Pierce Point
Pickering Brook
Rockingham
Sharp Hill
Sagamore
Thomas Point
Hoyt Hill
-5.00
-7.50
-10.00
-12.50
-15.00
-17.50
-20.00

Qimera Glossary

- A
  - Active Dynamic Grid
- B
- C
  - CCOM
  - Chimera
  - CUBE
- D
  - Data Validation
  - DTM
  - Dynamic Grid (GRD)
  - Dynamic Workflow
- E
  - EPSG
- F
- G
- H
- I
  - IMU
- J
- K
- L
- M
  - Multibeam Echosounder
  - MRU
- N
  - NADIR
- O
  - OMG
- P
  - Processed Point File
- Q
  - Qimera
  - QPD File

- R
- S
  - SBET
  - SBTC / SBIC
  - SD
  - SD
  - Sound Velocity
  - Sound Velocity Correction
  - Static Grid
- T
  - TPU (Total Propagated Uncertainty)
- U
  - USGS
- V
- W
  - Water column
  - Widget
  - WKT
- X
- Y
- Z

A

Active Dynamic Grid

Most dynamic grid operations in Qimera operate on the *active dynamic grid*. The active dynamic grid is either the currently selected dynamic grid, or if no dynamic grid is selected, the only visible dynamic grid.

B

C

CCOM

Center for Coastal and Ocean Mapping at the University of New Hampshire in Durham, NH, USA.

Chimera

A monstrous mythological fire-breathing creature composed of the parts of multiple animals. These animals depicted are typically lion, goat, dragon, and snake. This was the origin of *Qimera* in that we have taken technologies from across QPS and created a powerful (fire breathing) bathymetric processing tool.

CUBE

CUBE (Combined Uncertainty and Bathymetric Estimator) is an algorithm that takes advantage of statistical redundancy in a dense collection of soundings. Tracking the uncertainty associated with these soundings, CUBE can make estimates of the true depth of water across a survey area.

D

Data Validation

Dot killing, getting rid of outliers, data cleaning

DTM

Digital Terrain Model. In the QPS software suite, the abbreviation DTM is used in different ways. In QINSy, the DtmData folder stores the QPD files used for generating a DTM. In Fledermaus, DTM SD files are Fledermaus-format files of gridded bathymetric or topographic grids. The Qimera Create Grid Object option creates a DTM SD, which is equivalent to the Static Grid.

Dynamic Grid (GRD)

The Dynamic Grid will allow you to see a grid representation of the soundings you are working with. It is created by raw sonar data that has been sound velocity corrected or created by imported processed point files. This grid allows direct edit capability on the underlying sounding data and will automatically update when updates are complete.

Dynamic Workflow

Dynamic Workflow is an automated state machine based process that guides you through bathymetric processing steps, attempts to complete some steps (such as vessel extraction) automatically and determines the tasks that need to be accomplished next.

E

EPSG

European Petroleum Survey Group format for storing coordinate system information. Wikipedia Reference

F

G

H

I

IMU

Inertial Measurement Unit, often used interchangeably with MRU Wikipedia Reference

J

K

L

M

Multibeam Echosounder

Echosounder that forms a triangular fan of multiple beams that provides several sounding solutions across the ship track with a single ping emission. A single beam echosounder provides a sounding directly below the sounder only.

MRU

Motion Reference Unit, often used interchangeably with IMU.

N

NADIR

The point on the sea floor that lies directly below the sonar during a survey.

O

OMG

Ocean Mapping Group at the University of New Brunswick, in Fredericton, NB, Canada.

P

Processed Point File

These are files that contain processed soundings/footprints with a minimum XYZ attribute for each sounding. Supported file formats can range from simple ASCII to GSF. Refer to this list of supported file formats.

Q

Qimera

See *Chimera*.

QPD File

This is the processed format of all sonar data imported into Qimera.

Quality Positioning or Precision or Precision Data. This is the QPS proprietary format for processed raw data, and it is the processed format of all data imported into Qimera.
(leave 'sonar' out and there is more coming... in future).

R

S

SBET

Smoothed Best Estimate of Trajectory. An Applanix file format that contains the post processed inertial data from a POS MV. The data can include position, GNSS height, heading, and motion data (but not heave). Qimera requires the name "SBET" to to be in the name of the file to make it automatically detected. eg: SBET_11062015.out

SBTC / SBIC

Smoothed and combined (forward and reverse) tightly / loosely coupled trajectory. A NovAtel file format produced by their Inertial Explorer Software. The data can include position, GNSS height, heading, motion (including heave) and their standard deviations.

SD

Scientific Data Object. This is the storage format for Fledermaus visual objects.

SD

Standard deviation. A statistical parameter that describes the spread of measurements about their average. With a normal distribution, the SD gives the expected uncertainty level for any given measurement.

Sound Velocity

The speed that sound travels through a medium. This quantity is fundamental to echosounding since echosounders measure the travel-time of an acoustic pulse and the speed of sound is used to convert this into a range in linear units such as meters. Sound speed is the technically correct term, however, sound velocity is used throughout the marine geomatics industry and we have followed suit.

Sound Velocity Correction

The mathematical process which converts an observed two-way travel time measurement and launch angle relative to the horizontal to the depth and distance traveled by the acoustic pulse relative to its source.

Static Grid

The static Grid is data gridded from the processed (QPD) files. it's a static grid which won't change when editing (QPD) data.

T

TPU (Total Propagated Uncertainty)

The TPU of a point is a measure for the accuracy to be expected for such a point, when all relevant error / uncertainty sources are taken into account.

U

USGS

United States Geological Survey

V

W

Water column

Acoustic backscatter returns between the water surface and the seafloor interface; this information has many uses, but in Qimera its intended use is to help you determine the validity of bathymetric targets. If water column data is acquired and stored with the bathymetry data, Qimera will scan it on on data load and make it available for viewing in the Water Column Window.

Widget

The pick and zoom interface object that appears in the 4D scene that provides navigation through direct interaction with the data space.

WKT

Well Known Text format for storing coordinate system information. *Wikipedia Reference*

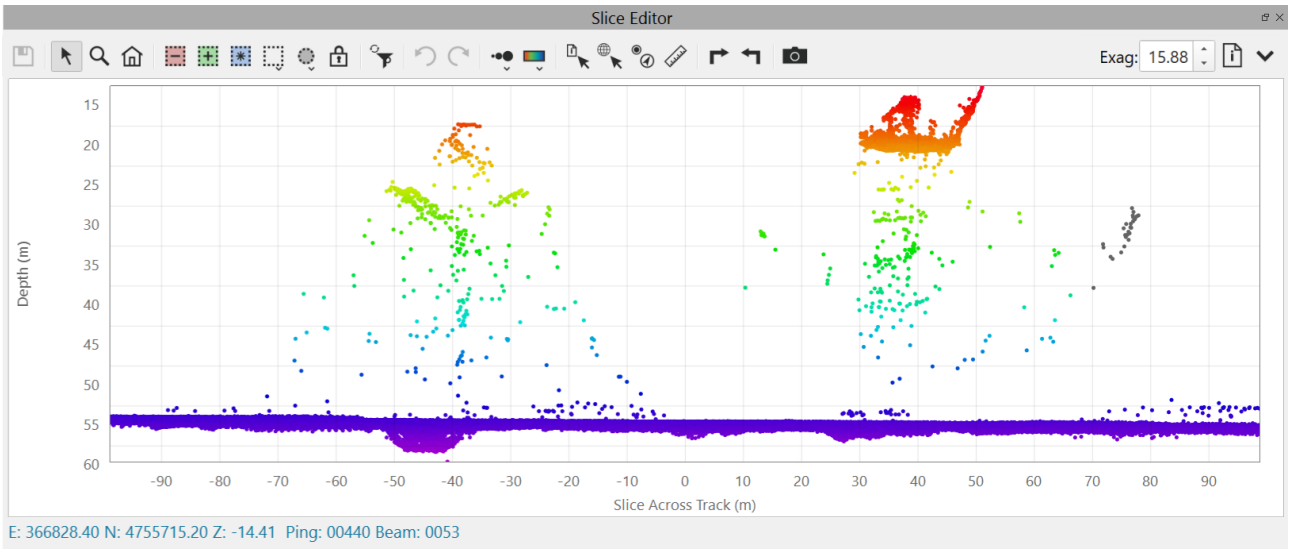
X

Y

Z

Return to: *Qimera Appendices*
Return to: *Qimera Table of Contents*

Qimera Plotting Grids



- Plotting Grids
  - Navigation
    - Explore Mode
    - Zoom Mode
    - Reset Zoom
    - Mouse/Keyboard Combinations
      - Mouse Wheel
      - Left Mouse Click-Drag
      - Middle Mouse Click
      - Middle Mouse Click-Drag
  - Plot Editing
    - Reject Selection
    - Accept Selection
    - Selection Style
    - Selection Area
  - Plot Editing Styles
    - Rectangle Editing
      - Inside Rectangle
      - Outside Rectangle

- Lasso Editing
    - Inside Lasso
    - Outside Lasso
- Polygon Editing
    - Inside Polygon
    - Outside Polygon
- Eraser Editing

Plotting Grids

Plotting grids are used in Qimera for a number of different tools. These include the *Time Series Editor, Time Series Multiplot, Swath Editor, SVP Editor, Slice Editor, Water Column View, Wobble Tool, Cross Check Tool, 3D Editor Tool* and *Patch Test Tool*. All of these widgets have some common features for both navigation and where applicable, editing.

The plot grid contains a horizontal and vertical axis that indicate the plotting contents range. Plots can be points, lines or stippled lines based on the widget capabilities. Some plots can have more than once source of input data such as the Time Series Editor. The lower left corner of the plot window will display the current cursor location value as well as any potential attribute information.

Navigation

Navigation of a plot grid can be accomplished using some common buttons from the widget toolbar as well as mouse buttons and mouse button/keyboard button combinations.



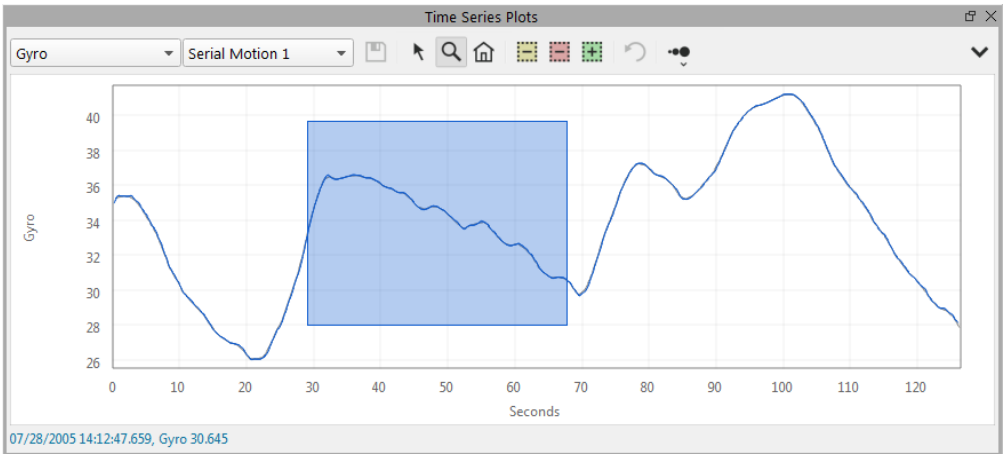
Explore Mode

This is the default mode for a plot widget. If you **left-click-drag**, you will pan the plot. When in any other cursor mode, **shift-left-click-drag** to pan the plot. The **Shift** key during **left-click-drag** reverts to the primary navigation mode of panning.

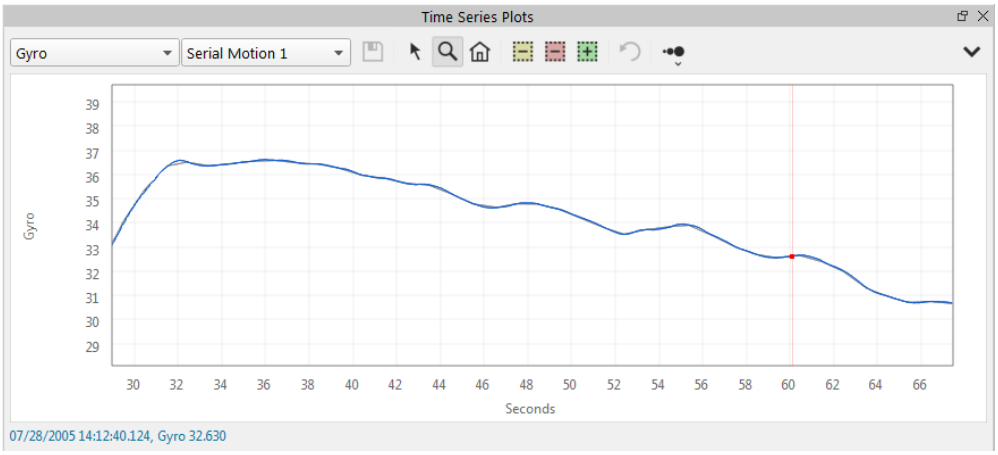


Zoom Mode

This option sets the cursor into zoom selection mode. Simply **left-click-drag** a rectangle on the plot. When you release the mouse, the plot will zoom in to this area. Click the *Reset Zoom* button to return to the full extents of the data. At any time, you can **shift-left-click-drag** to pan the plot to a new location. This is especially useful when you are zoomed in. An example of using the *Zoom* mode is shown below.



Zoom Mode Rectangle Selection



Zoom Mode Rectangle Selection Result



Reset Zoom

Zooms out to the extents of the plot data.

Mouse/Keyboard Combinations

Mouse Wheel

The mouse wheel allows you to easily zoom in/out of your plot. Depending on the widget, it may require the addition of the **Shift** key if you are in a cursor mode that also uses the mouse wheel. An example of this is the *Time Series Multiplot* vertical exaggeration.

Using the **Ctrl** key while using the mouse wheel will exaggerate the vertical scale of your plot.

Left Mouse Click-Drag

This mouse action is used primarily for panning your plot during **left-click-drag**. When not in *Explore* mode, it will require the addition of the **Shift** key. This action mimics the same mouse behavior as the 4D Scene

Middle Mouse Click

This mouse action will re-center the plot on the location that you click. This action mimics the same mouse behavior as the 4D Scene

Middle Mouse Click-Drag

This mouse action will zoom in/out of your plot as you drag left/right and up/down. This action mimics the same mouse behavior as the 4D Scene.

Plot Editing

The *SVP Editor, Swath Editor* and *Slice Editor* share similar toolbar components for selecting data points on the plot to either *Reject/Accept* or *Delete/Undelete* a sample. The basic behavior of these modes is described below using the *Swath Editor* as an example.

 Reject Selection

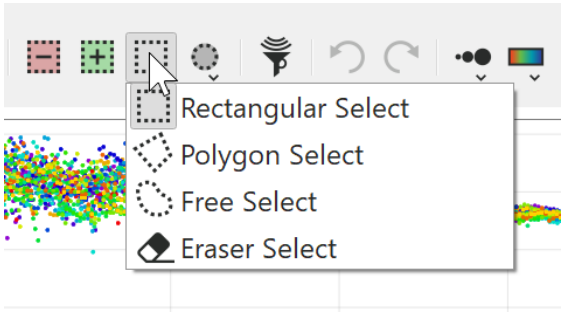
This button places the cursor in *Reject/Delete Selection* mode. Holding down the CTRL key will invert the mode between *Reject* and *Accept*. Use the selection style and selection area drop down buttons to modify the selection style.

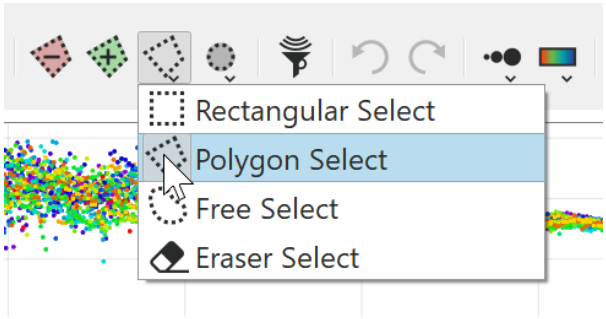
 Accept Selection

This button places the cursor in *Reject Selection* mode. Holding down the CTRL key will invert the mode between *Reject* and *Accept*. Use the selection style and selection area drop down buttons to modify the selection style.

 Selection Style

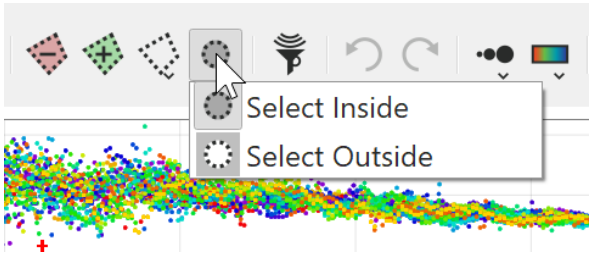
This button changes the selection style of both the *Reject* and *Accept* buttons. Clicking this will rotate through each of the styles, or long pressing will give you a drop down menu to select the style.

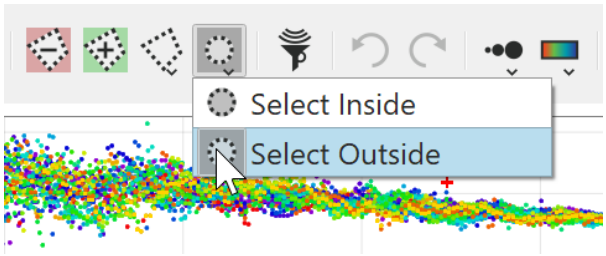




 Selection Area

This button changes the selection area of both the *Reject* and *Accept* buttons. Clicking this will rotate through each of the areas, or long pressing will give you a drop down menu to select the area.

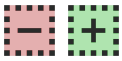




Plot Editing Styles

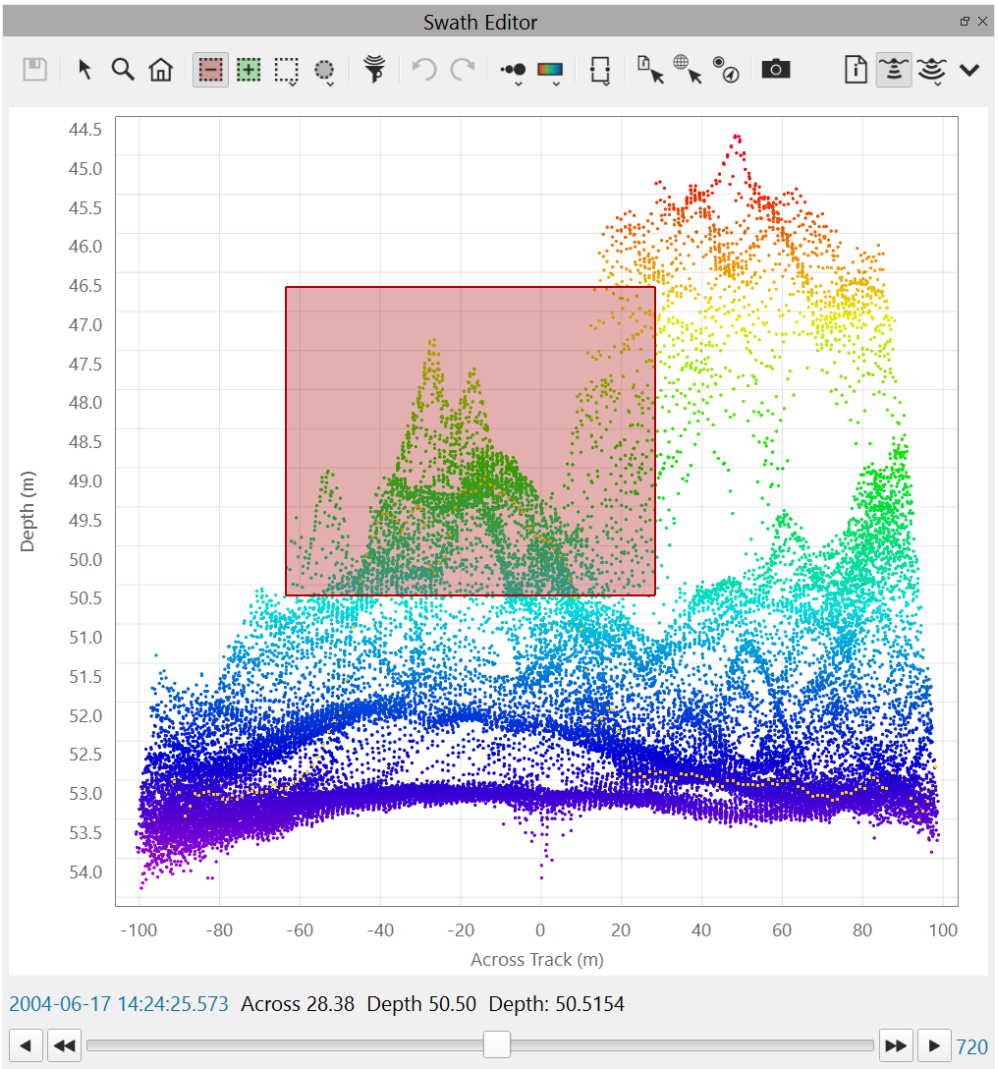
The Selection Style and Selection Area buttons modify the Reject/Accept buttons behavior, below are descriptions of all the various editing styles available.

 Rectangle Editing

 **Inside Rectangle**

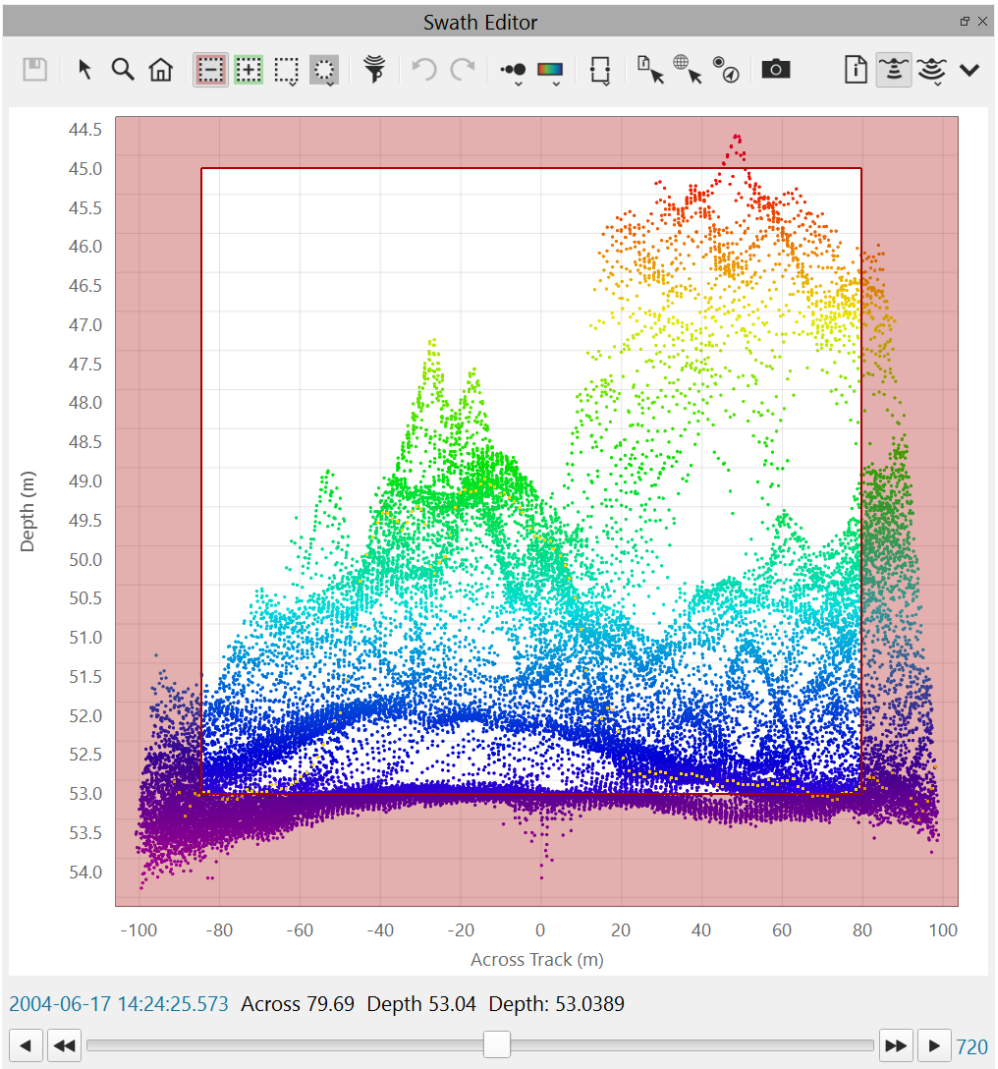
Simply **left-click-drag** over the plot to create a rectangular selection to reject/delete samples. When you **left-click-drag**, the selection is red to indicate the "Active" mode is *Reject* or *Delete*. If you hold down the **CTRL** key while doing a **left-click-drag,** the selection changes to blue indicating the "Active" mode is *Accept* or *Undelete*. When you release the mouse button, the active action will take place. If you wish to undo this action, simply use the *Undo* key. To *Redo* the action, click the *Redo* button. If you are in the middle of an edit action and have not yet released the mouse button, you can hit the **ESC** key to cancel the last edit.

The inverse of this mode can be activated while using the **CTRL** key or choosing the explicit accept mode with the  button.



Outside Rectangle

This behaves the same as the above mode except that it rejects soundings **outside** the selection. The inverse of this mode can be activated while using the **CTRL** key or choosing the explicit accept mode with the button.

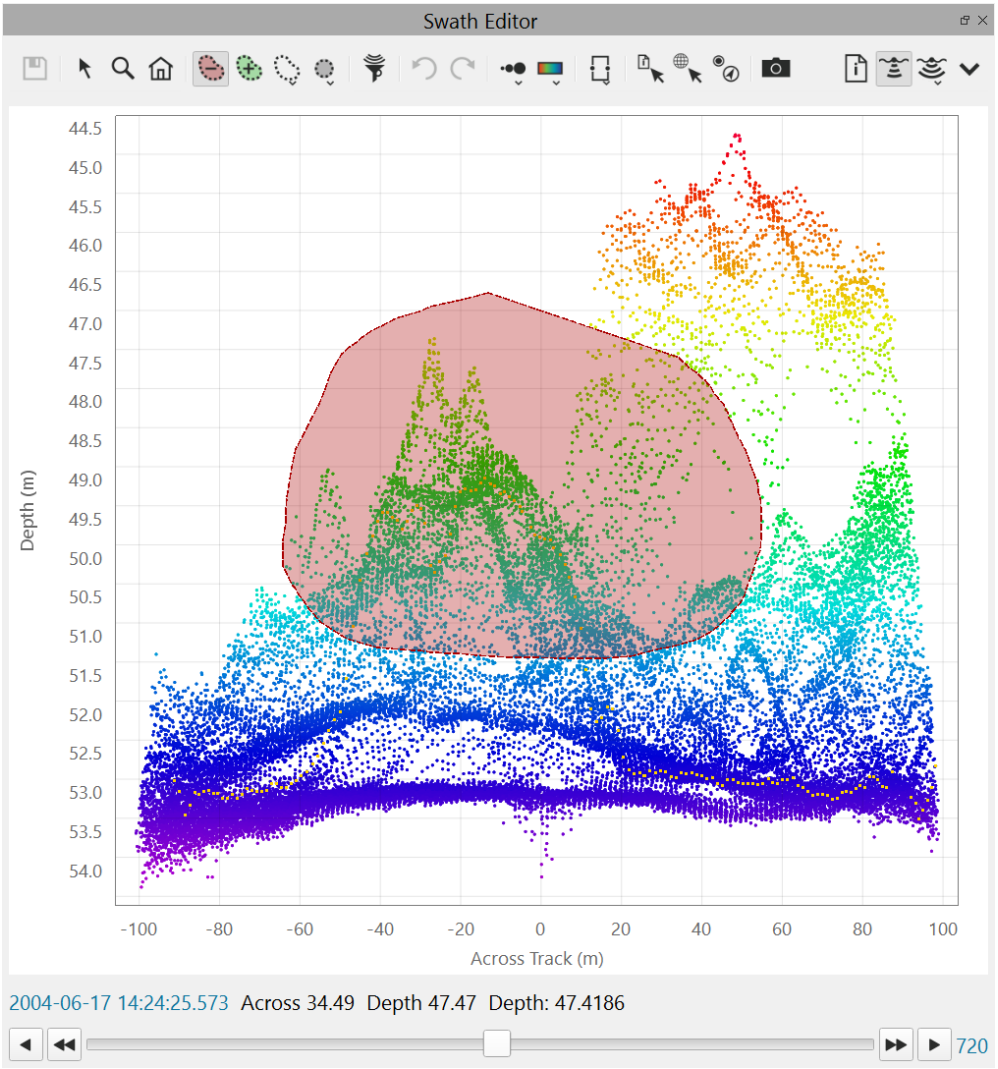


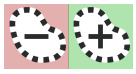
Lasso Editing

Inside Lasso

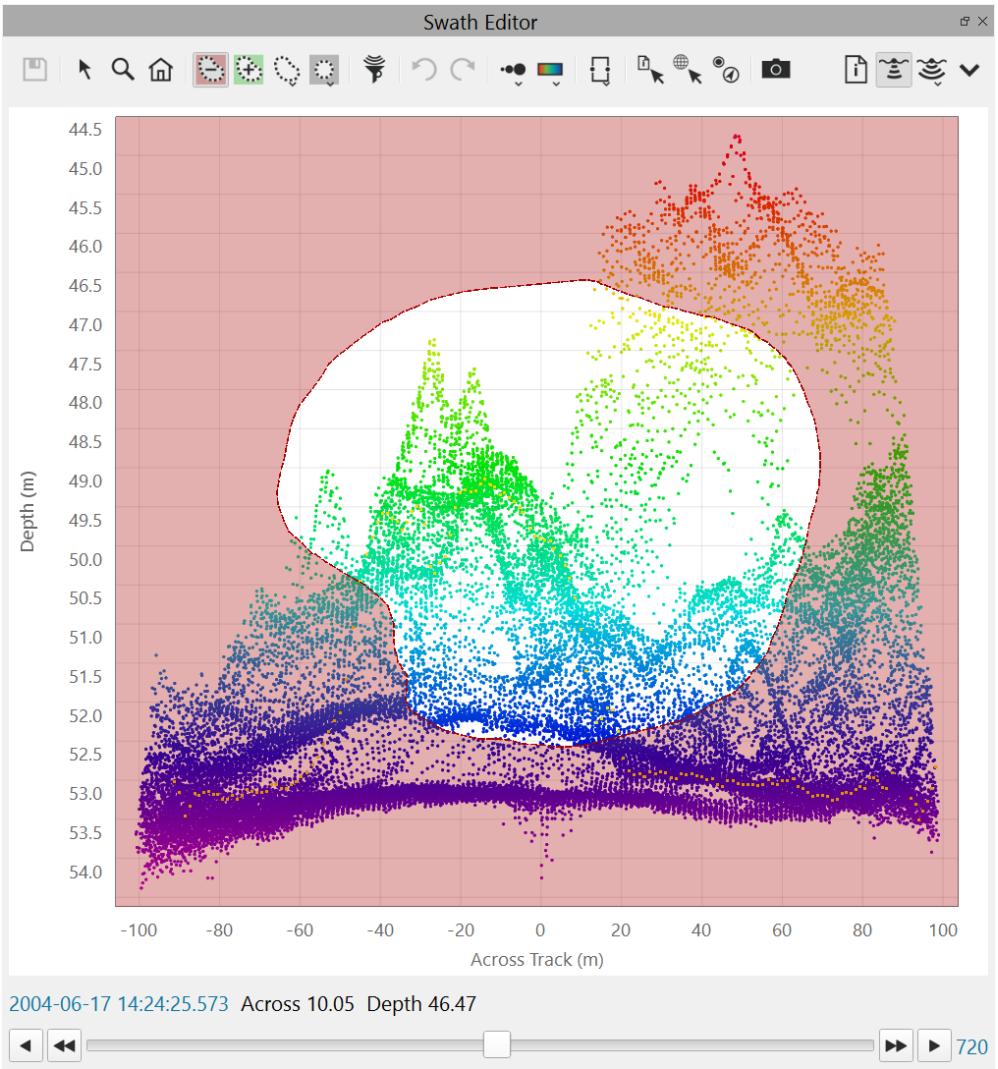
Simply **left-click-drag** over the plot to create a lasso selection to reject/delete samples. When you **left-click-drag**, the selection is red to indicate the "Active" mode is *Reject* or *Delete*. If you hold down the **CTRL** key while doing a **left-click-drag,** the selection changes to blue indicating the "Active" mode is *Accept* or *Undelete*. When you release the mouse button, the active action will take place. If you wish to undo this action, simply use the *Undo* key. To *Redo* the action, click the *Redo* button. If you are in the middle of an edit action and have not yet released the mouse button, you can hit the **ESC** key to cancel the last edit.

The inverse of this mode can be activated while using the **CTRL** key or choosing the explicit accept mode with the  button.

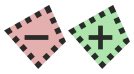


 **Outside Lasso**

This behaves the same as the above mode except that it rejects soundings **outside** the selection. The inverse of this mode can be activated while using the **CTRL** key or choosing the explicit accept mode with the  button.

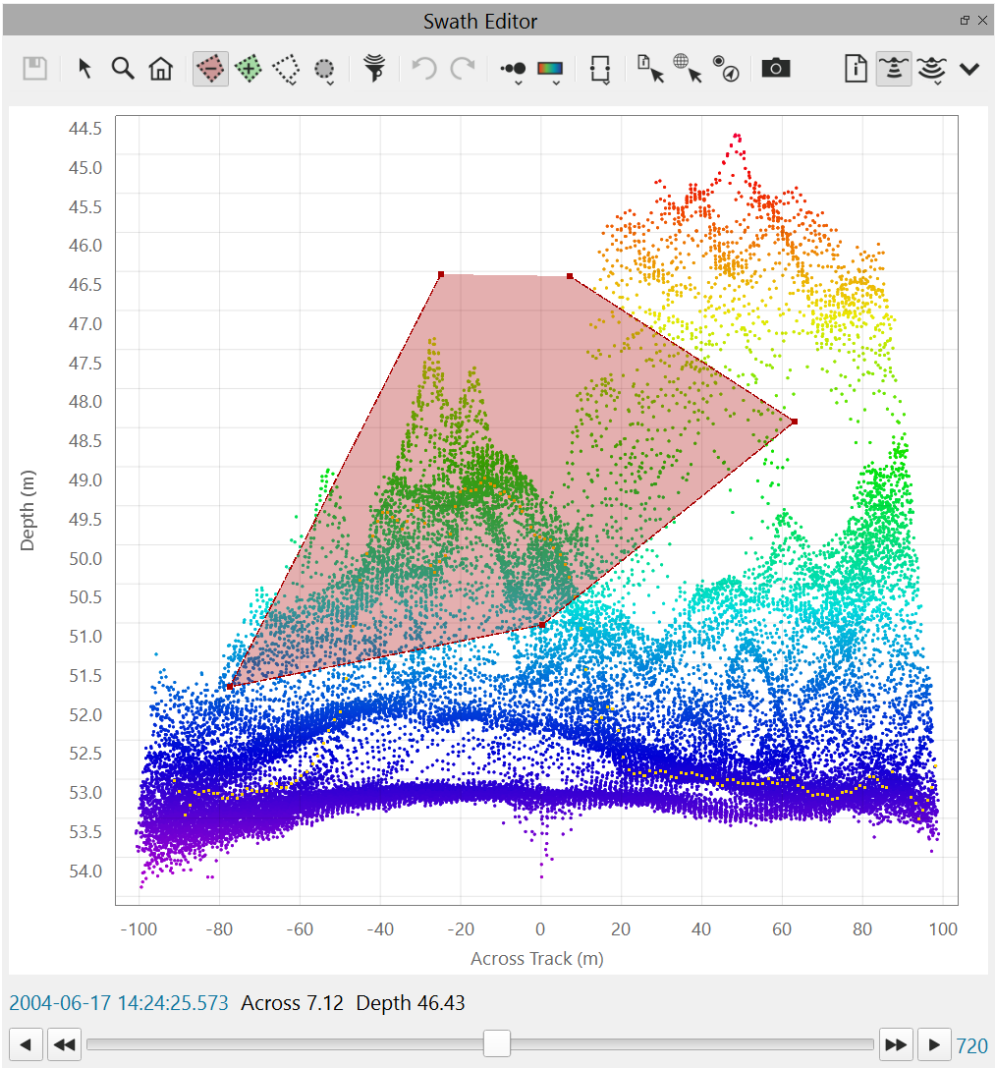



Polygon Editing


Inside Polygon

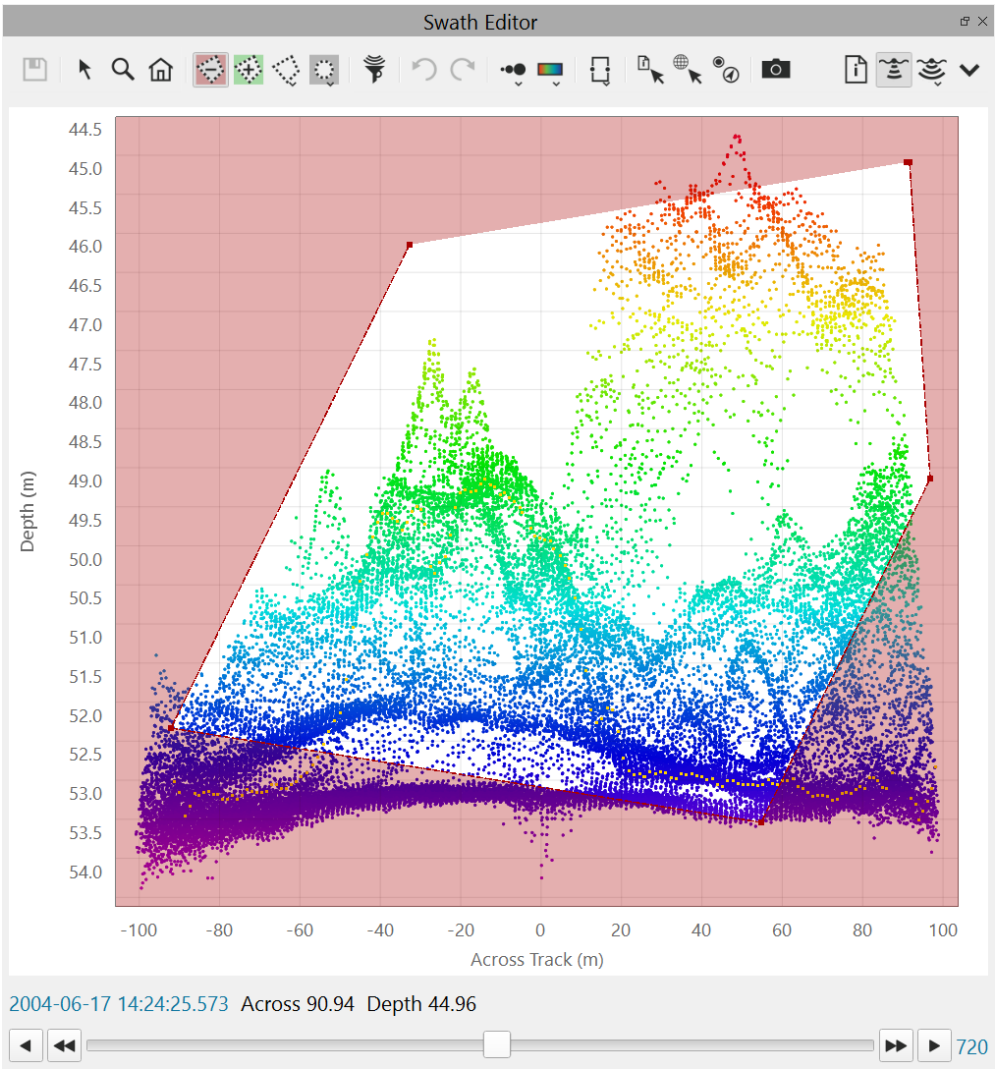
Simply **left-click** to define the vertex locations for the polygon selection . Click back on the first vertex to close or simply **right-click** to close. By default the selection is red to indicate the "Active" mode is *Reject* or *Delete*. If you hold down the **CTRL** key while building the polygon, the selection changes to blue indicating the "Active" mode is *Accept* or *Undelete*. When you complete the polygon, the active action will take place. If you wish to undo this action, simply use the *Undo* key. To *Redo* the action, click the *Redo* button. If you are in the middle of an edit action and have not yet closed the polygon, you can hit the **ESC** key to cancel the last placed polygon vertex. Continue to hit **ESC** to completely cancel the selection.

The inverse of this mode can be activated while using the **CTRL** key or choosing the explicit accept mode with the  button.



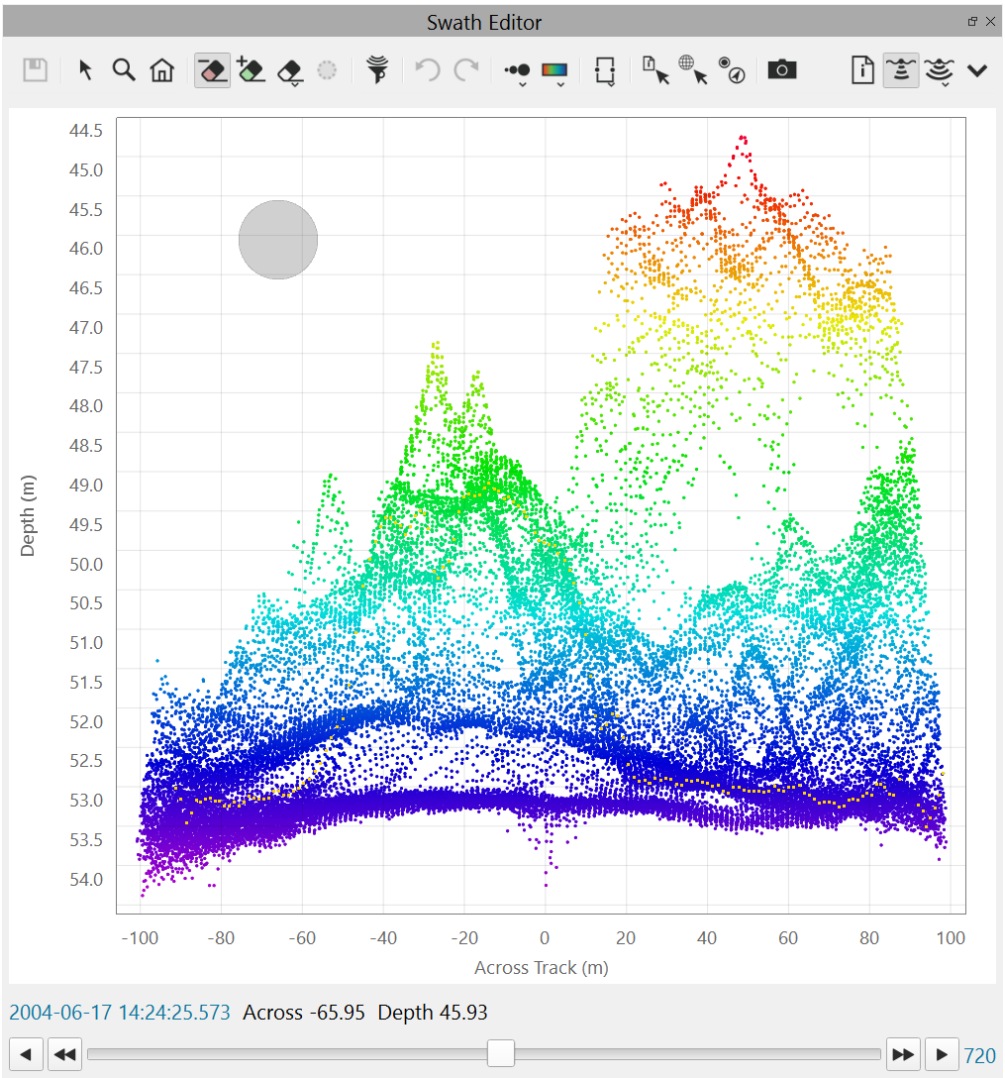
 **Outside Polygon**

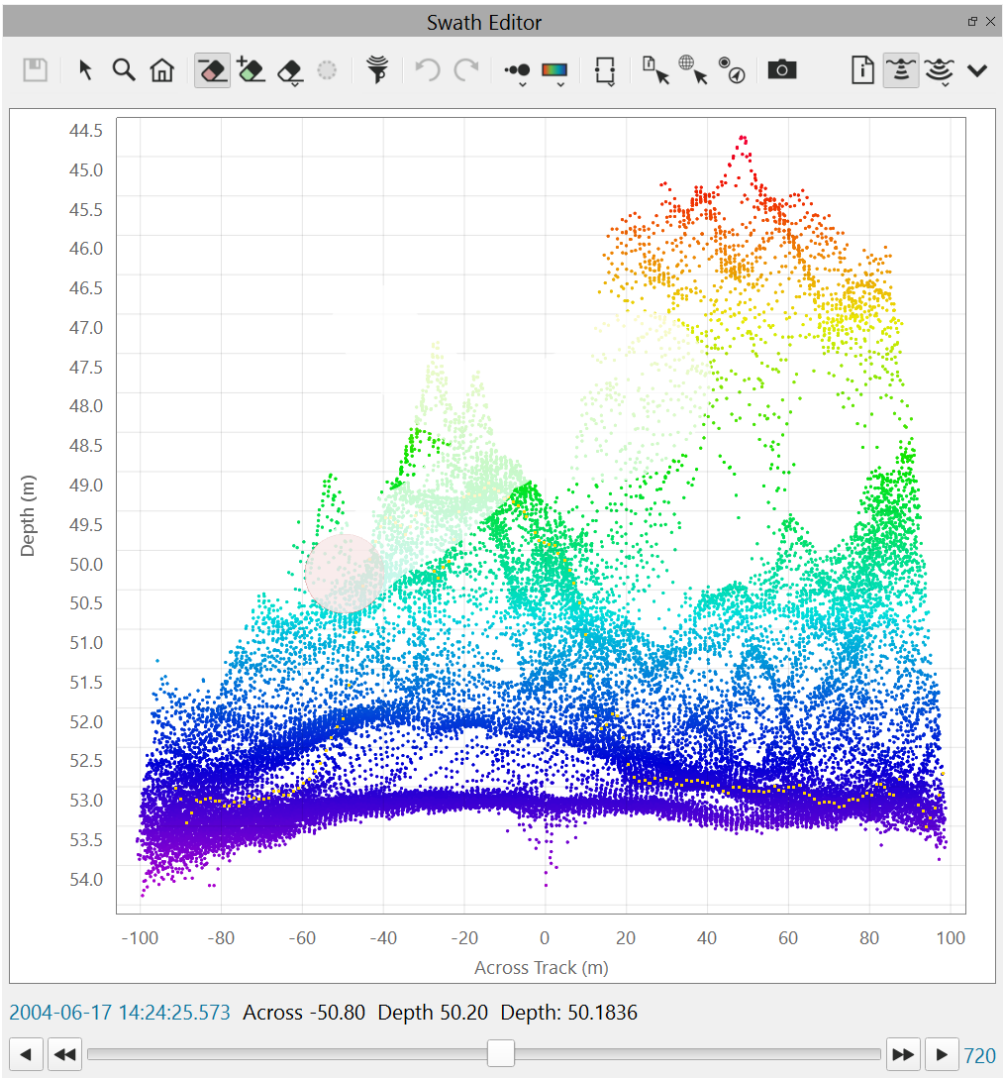
This behaves the same as the above mode except that it rejects samples **outside** the selection. The inverse of this mode can be activated while using the **CTRL** key or choosing the explicit accept mode with the  button.



Eraser Editing

Simply **left-click-drag** over the plot to reject/delete samples with the button. Moving the mouse wheel changes the size of the eraser. As you move over the plot, the eraser is gray. When you **left-click-drag**, the selection changes to red to indicate the "Active" mode is *Reject* or *Delete*. If you hold down the **CTRL** key while doing a **left-click-drag**, or choosing the explicit accept mode with the button, the selection changes to green indicating the "Active" mode is *Accept* or *Undelete*. When you release the mouse button, the active action will take place. If you wish to undo this action, simply use the *Undo* key. To *Redo* the action, click the *Redo* button. If you are in the middle of an edit action and have not yet released the mouse button, you can hit the **ESC** key to cancel the last edit.


Swath Editor
44.5
45.0
45.5
46.0
46.5
47.0
47.5
48.0
48.5
49.0
49.5
50.0
50.5
51.0
51.5
52.0
52.5
53.0
53.5
54.0
Depth (m)
-100
-80
-60
-40
-20
0
20
40
60
80
100
Across Track (m)
2004-06-17 14:24:25.573 Across -65.95 Depth 45.93
720



Return to: *Qimera Table of Contents*

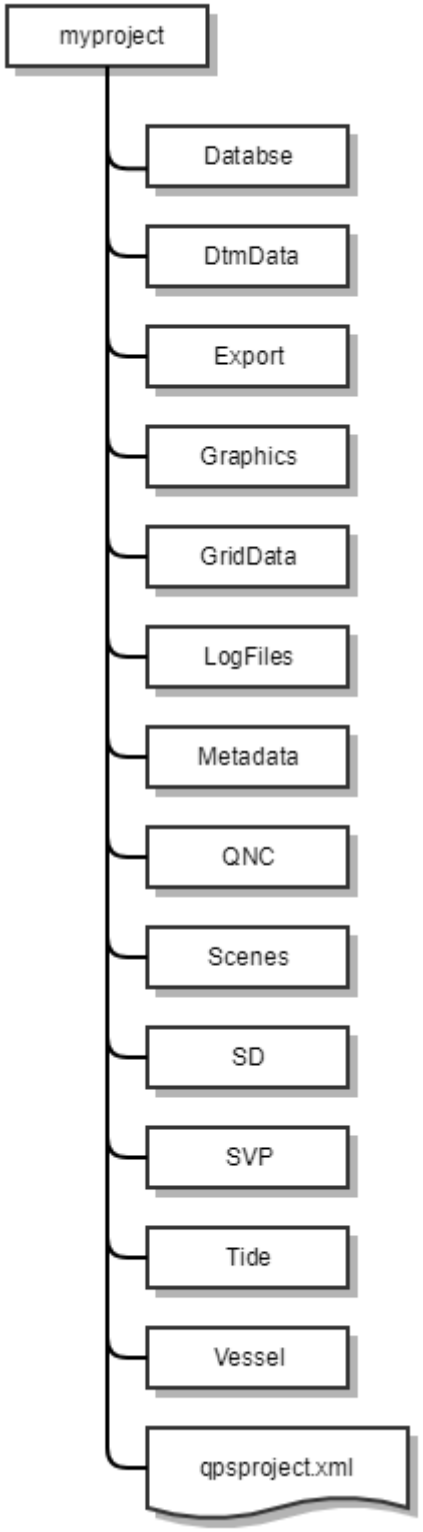
Qimera Project Structure

Top Level Layout

When you create a project, the project is actually a folder containing a specific set of sub-folders that will be the target of some data generated by or exported from Qimera. If you load an existing QINSy project, Qimera will add any additional folders that it needs. The top level also contains the *qpsproject.xml* file which contains all of the information required to persist key data within your project.

Project XML File

Manual editing of the *qpsproject.xml* file is not recommended as it determines what is loaded and viewable in the project.


myproject
Databse
DtmData
Export
Graphics
GridData
LogFiles
Metadata
QNC
Scenes
SD
SVP
Tide
Vessel
qpsproject.xml

Database

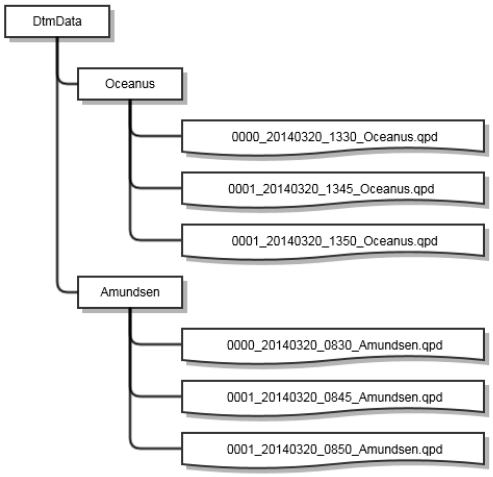
The database folder is where template and recorded database files are stored from a Qinsy project. Therefor, this folder will only be populated if you open a existing Qinsy project. For more information on database files, visit this link.

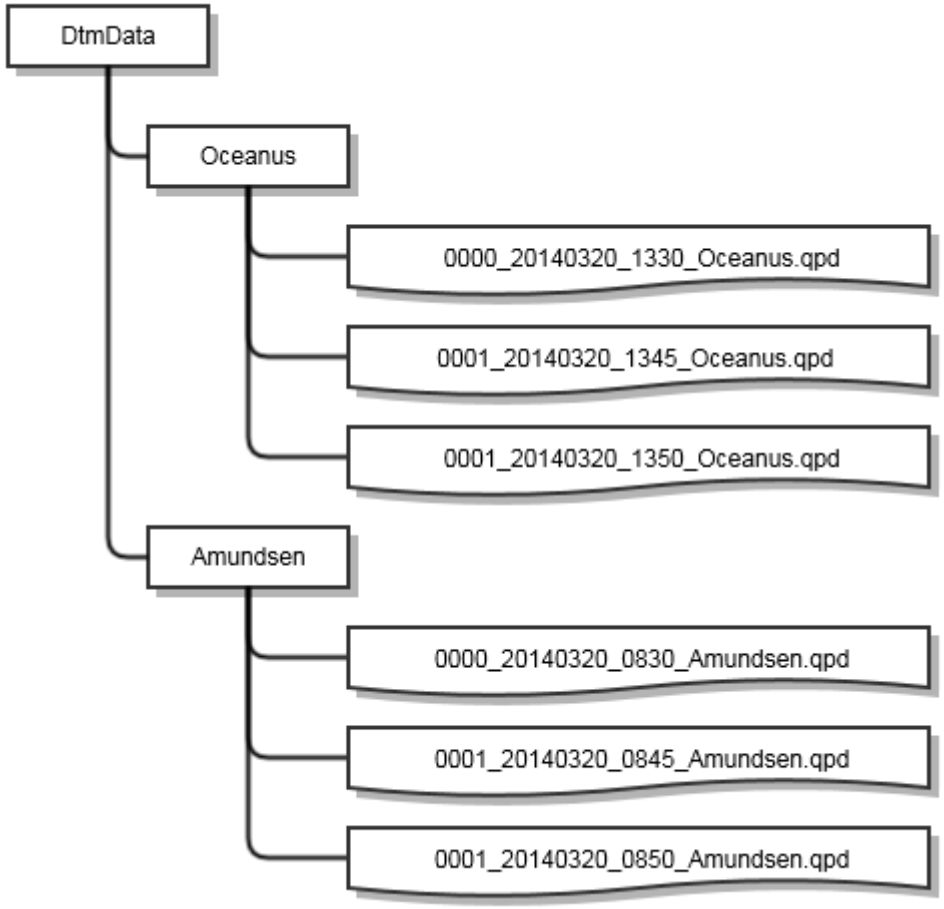
DtmData Folder

This folder contains all of the QPD files created by Qimera, or copied into Qimera during a QINSy project data import operation. The QPDs are grouped into sub-folders by vessel name. In the case of using Processed Point Files they are grouped in a sub-folder labeled PointFiles.

QPD Files

Do not delete or move QPD files in these folders. Doing this causes the project state to become unstable and can have negative consequences (crashes). Qimera maintains internal linkage between the QPD files, their raw source data and any Dynamic Surfaces that are built by them.





Export Folder

This folder is the default location for any export operations that Qimera performs. Examples are ASCII navigation exports, GSF exports, etc. Feel free to move or delete files in this folder.

Graphics

This folder contains the project thumbnail image. The filename is always *project-thumbnail.png*. Deleting this file will remove it's ability to show up in the Welcome screen but will be re-created the next time you open the project.

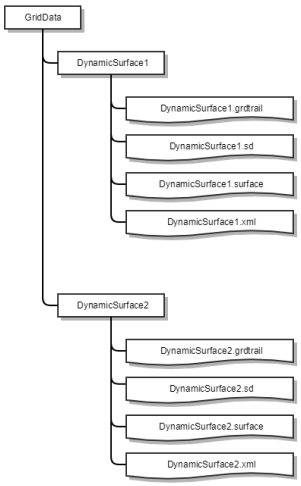
GridData

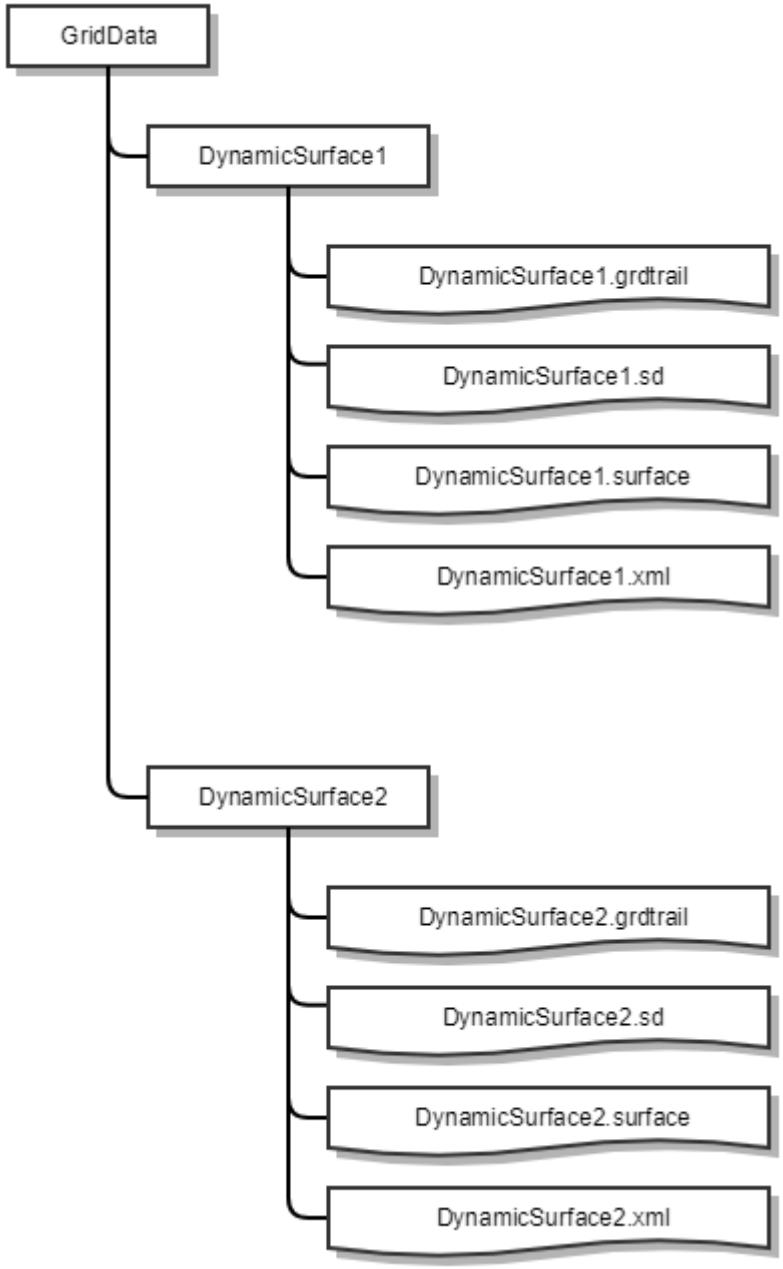
This folder contains any Dynamic Surface objects. Each surface has it's own sub-folder containing all the surface components. The *.grdx* file contains the CUBE data, and is created when CUBE processing is enabled during the Create Dynamic Surface process. The *.sd* file is the Fledermaus visual object for a surface. The *.surface* file contains the bathymetric layers and the shading illumination information. The *.xml* file contains the

internal surface metadata. Upon editing a surface with Slice or 3D editor, a .grdtrail file will be created which stores surface edit over information.

GridData Folder

Do not edit more or move any files within a Dynamic Surface folder unless you have **removed** that surface from your project. Doing this causes the project state to become unstable and can have negative consequences (crashes).



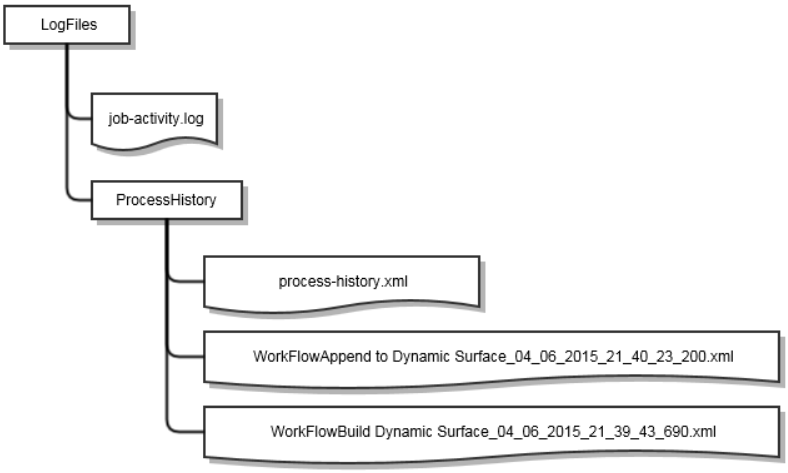


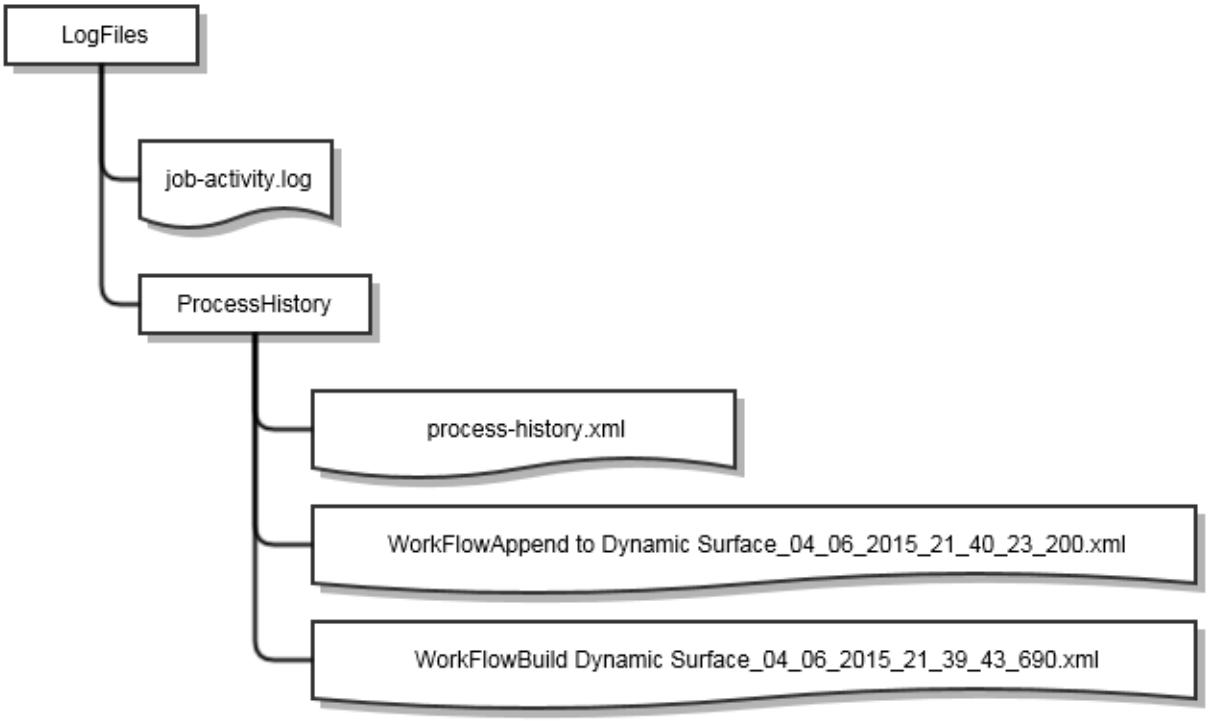
LogFiles

This folder contains the *job-activity.log* file which is a copy of the information that appears in the Job Activity Window. It also contains a sub-folder of the *Process History* XML files which contains the *process-history.xml* file and the *WorkFlowNNN* files that are used to show processing metadata information in the Process History window.

LogFiles Folder

If you delete the process history folder, you will lose all record of the processing performed on your data.





Metadata

This folder contains all of the metadata information stripped from the imported files. See the section on Metadata Extraction for more information. The contents of this folder are described below:

Metadata Folder

Do not edit or move any files in this folder. Doing this causes the project state to become unstable and can have negative consequences (crashes). If you need to delete a file, remove it from the appropriate node of the Project Sources window.

Visual Components

- Trackline (.sd)

Vessel Files

- Sensor and System Setup (.vessel)
- Squat Table (.squat)

Processing Control Files

- File Index (.fmi)
- Processing Dirty Flags (.hints_v1)
- Processing Settings (.procsettings)
- Echosounder Settings (.echo)
- Prioritized Time Series Solutions (.sol)
- Bathymetric Histogram (.histo_relative)

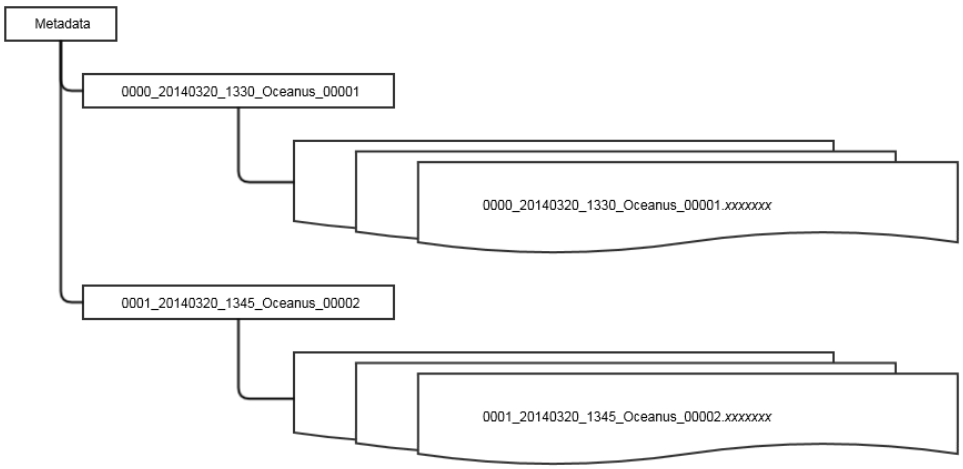
Time Series Data

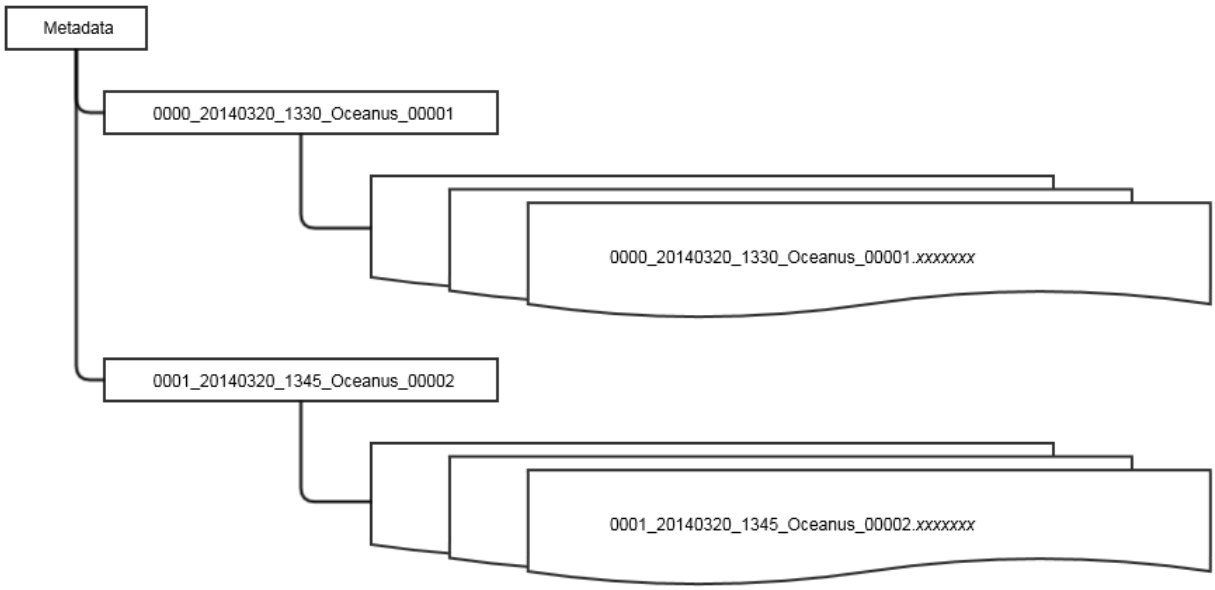
- Position (.position_##)
- Position Standard Deviation (.positionsd_##)
- Motion (.motion_##)
- Motion Standard Deviation (.motionsd_##)
- Heading (.heading_##)
- Heading Standard Deviation (.headingsd_##)
- Height (.height_##)

- Height Standard Deviation (.heightsd_##)
- Surface Sound Speed (.soundspeed_##)
- Pressure (.pressure_##)
- Depth (.depth_##)
- Tide (.tide_##)
- Dynamic Squat (.squat_##)
- SVP (.bsvp)

Processed Point Files

- Metadata collected from the processed point file (.xml)
- Center line (.sd)
- Offsets for each sounding needed for specific formats (.unload)





QNC

Imported an ENC chart files (.00*) will be converted to a Qimera QNC file and added the the project QNC folder.

Scenes

This folder will contain exported Fledermaus files. More information to come.

SD

This folder contains any Fledermaus SD layers that are create through an import or export process as well as any Static Surface SD objects.

SD Folder

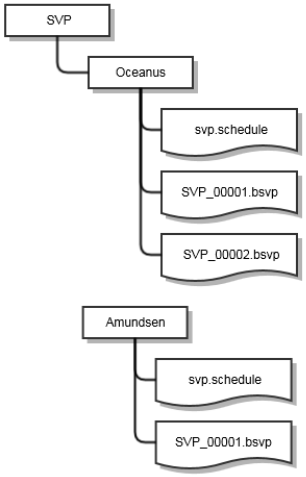
Do not delete any SD files in this folder unless they have been removed from the project. Doing this causes the project state to become unstable and can have negative consequences (crashes).

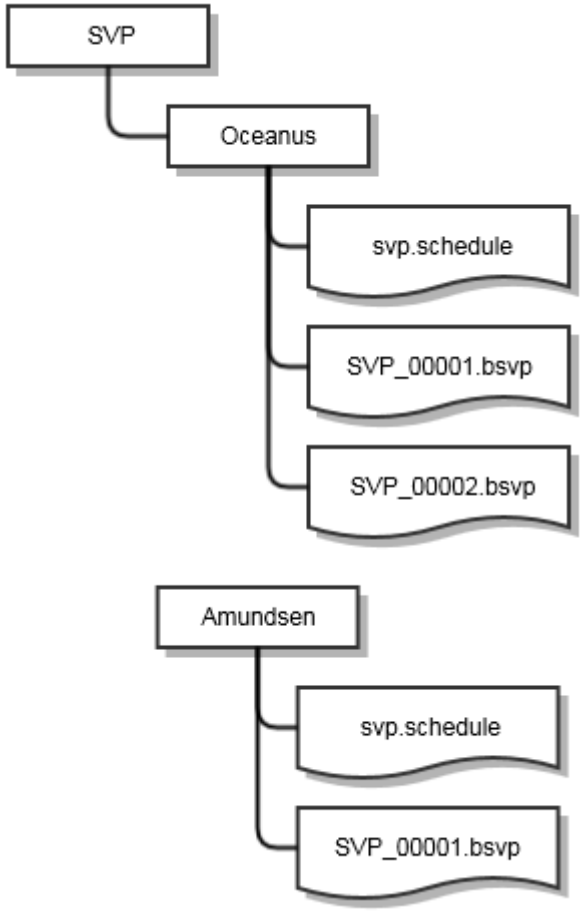
SVP

This folder contains the unique SVPs imported into Qimera or stripped from raw sonar files by the Metadata Extraction process. The SVPs are grouped into sub-folders by vessel name. Each vessel folder also contains a *svp.schedule* file that contains the extraction SVP intended scheduling from the raw sonar files.

SVP Folder

Do not delete any of these sub-folders or files. If you do, they will not be usable by Qimera for processing and the application state could become unstable. If you need to delete a file, remove it from the *SVP* node of the Project Sources window.





SVP Folder

Do not delete any SVP files in the sub-folders. Doing this causes the project state to become unstable and can have negative consequences (crashes).

Tide

This folder contains tide data used in the project.

Vessel

This folder is the default location for any Patch Test or Wobble Test sessions that are saved. If you delete them, they just become unusable by future sessions.

Patch Test

- Main patch test file (.patchtest)

- Patch test report (.pdf)

Wobble Test

- Main wobble test file (.wobbletest)

Return to: *Qimera Appendices*

Qimera Utility Applications

The following utilities are packaged alongside Qimera as stand-alone executables.

- Qimera Command
- Qimera OmniViewer

Qimera Command

- Overview
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  - List Systems
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Overview

`qimera-command` is a utility that exposes a simplified subset of Qimera's processing abilities via a command line interface for the purposes of scripting. While the full, graphical version of Qimera will always provide a richer processing experience, scripting parts of their processing workflow may make sense for organisations with very formalised and/or repetitive procedures. In most cases, `qimera-command` will be used to automate the preparation of a project to do as much of the busy work as possible before a human operator takes over processing, inspection and cleaning in the graphical Qimera interface.

`qimera-command` provides a subset of Qimera's features. While this feature set will likely grow in later releases, not all of Qimera's abilities are capable of being exposed in `qimera-command`. There are two ways to invoke `qimera-command` to execute jobs: Single command mode or configuration mode.

In single command mode, a single processing job will be executed and more complex processing workflows can then be built up by executing several jobs in series via a sequence of `qimera-command` commands.

In configuration mode, a JSON configuration is provided to `qimera-command` and each job specified will be executed, with shared parameters available such as the project.

Note that `qimera-command` was designed with scripting in mind, not to be a interactive command line interface for human operators. As a result, its command syntax can feel quite verbose and very particular. This is intentional as `qimera-command` wants to be 100% sure it understands what it is being told to do and avoids guessing or assuming user intention.

As it is a command line utility, `qimera-command` has no desktop or start menu shortcut. To launch it, open a terminal, navigate to the {{bin}} directory of your Qimera installation and run `qimera-command.exe` or `./qimera-command` depending on the conventions of your operating system. Users can also add this path to their environment variables and then run the commands from any directory. Then they can navigate to the project folder and not have to pass the --project folder argument for most jobs. For the remainder of this document we will use Windows syntax.

`qimera-command` aims to be largely self documenting via its command line help. To begin, run `qimera-command.exe --help`. In addition to explaining some general command line flags, this will list all the job types that can be passed to the `--job` flag. To learn about the behaviour and input to a particular job, run `qimera-command.exe --`

`job=<job-name> --help`. Each job type takes a specific set of flags, although many flags are common to multiple jobs.

Flags must be introduced with a double hyphen (dash). For flags that take a value, that value may be specified using an equal sign (`--flag=somevalue`) or a space (`--flag somevalue`). The order of flags on the command line is typically not important. Some jobs can also take a list of position arguments at the end of the command line, which are not introduced by flags. Special characters (spaces, new lines, asterisks, etc.) must be properly quoted or escaped according to the rules of your shell or scripting language. For example: `--project-folder="E:\My Projects\Initial Survey" --file=My\ File\ with\ Spaces.txt --note="***Uncorrected Values***"`

While running the given job, `qimera-command` may print relevant information to the command line. When the job is finished successfully, `qimera-command` will complete with an exit code of 0. All other exit codes indicate a failure of some kind, with an explanatory message printed to the command line.

`qimera-command` requires a `qimera-command` add-on with your Qimera or Qimera Offshore license to use.

Running in Single Command Mode

In single command mode, the `--job` flag is used to denote which job to run

```
# EXAMPLE - Running a generic job-name with a project-folder and other-arguments.
"C:\Path\To\bin\qimera-command.exe" --job job-name ^
--project-folder "C:\Users\username\QPS-Data\Projects\test" ^
--other-arguments
```

Running in Configuration Mode

In configuration mode, the `--config` flag is used to specify a path to a JSON file that contains a list of jobs to be run along with arguments. Instead of being command line arguments, instead these arguments become members of the job objects.

```
# EXAMPLE - Running a config of multiple jobs in a JSON file
"C:\Path\To\bin\qimera-command.exe" ^
--config="C:\\Path\\To\\config.json"
```

```
# EXAMPLE - JSON Config to run a collection of jobs that will create a project, add
all the files in a specific folder, and create a dynamic grid
```

```
{
  "project-folder": "C:\\Users\\username\\QPS-Data\\Projects\\test",
  "jobs": [
    {
      "job": "create-project",
      "epsg-code": 32610
    },
    {
      "job": "add-raw-sonar-files-db",
      "folder-path": "C:\\Users\\username\\Documents\\sonarfiles"
    },
    "auto-process",
    {
      "job": "create-dynamic-grid",
      "name": "Dynamic Grid",
      "cell-size": 0.25
    }
  ]
}
```

Jobs

Below is a list of jobs and their arguments, with examples formatted for command line usage. When using these for JSON configs, the arguments instead become objects.

Create Project

This job creates an empty project.

```
# EXAMPLE - Create a new project called "test" in EPSG 32630
"C:\Path\To\bin\qimera-command.exe" --job create-project ^
--project-folder "C:\Users\username\QPS-Data\Projects\test" ^
--epsg-code 32630
```

create-project	Arguments
--project-folder <path>	The project folder to create. Must not exist.
--survey-type <text>	Optional argument to set the survey type. Pass in quotations if contains spaces.

create-project	Arguments
--description <text>	Optional argument to set the description of the project. Pass in quotations if contains spaces.
--epsg-code <number>	The EPSG code specifying the projected project coordinate system.
--wkt-file <file-path>	The path to a file containing WKT (text file with wkt extension, Qinsy Database, or QPD) specifying the projected project coordinate system.

Add Raw Sonar Files DB

This job adds ".db" raw sonar files to a Qimera project.

```
# EXAMPLE - Add 3 specific DB files to the "test" project in EPSG 32630
"C:\Path\To\bin\qimera-command.exe" --job add-raw-sonar-files-db ^
--project-folder "C:\Users\username\QPS-Data\Projects\test" ^
"C:\Users\username\Downloads\datasets\Brest-Wrecks\20130614_0801_em2040C_wreck_300 -
0001.db" ^
"C:\Users\username\Downloads\datasets\Brest-Wrecks\20130614_0807_em2040C_wreck_300 -
0001.db" ^
"C:\Users\username\Downloads\datasets\Brest-Wrecks\20130614_0809_em2040C_wreck_300 -
0001.db" ^
--print-progress
```

add-raw-sonar-files-db	Arguments
--project-folder <path>	The project folder.
--folder-path <path>	A folder containing the files you wish to add to the project.
--print-progress	Print job progress to the command line.
Arguments: Files	To specify the files to add to the project you can use the --folder-path flag or you can pass a series of single file paths to raw files as positional arguments.

Add Raw Sonar Files All

This job adds ".all" raw sonar files to a Qimera project.

```
# EXAMPLE: Add 3 specific ".all" files to the "test" project in EPSG 32630. Delay
processing these files until explicitly instructed to process them.
"C:\Path\To\bin\qimera-command.exe" --job add-raw-sonar-files-all ^
--epsg-code 32630 ^
--project-folder "C:\Users\username\QPS-Data\Projects\test" ^
--delay-convert-to-qpd ^
"C:\Users\username\Downloads\datasets\Panopee-Brest-
Wrecks\0001_20150324_161631_Panopee.all" ^
"C:\Users\username\Downloads\datasets\Panopee-Brest-
Wrecks\0002_20150324_161913_Panopee.all" ^
"C:\Users\username\Downloads\datasets\Panopee-Brest-
Wrecks\0003_20150324_162143_Panopee.all" ^
--print-progress
```

add-raw-sonar-files-all	Arguments
--project-folder <path>	The project folder.
--folder-path <path>	A folder containing the files you wish to add to the project.
--epsg-code <number>	The input epsg code for the file(s) you wish to import.
--delay-convert-to-qpd	An optional argument to delay the conversion from raw file to QPD. By default all imported files are converted directly to QPD. If delay is selected the auto-process job can be run to convert outstanding files at a later time.
--wkt-file <path>	The input wkt for the file(s) you wish to import.
--print-progress	Print job progress to the command line.

add-raw-sonar-files-all	Arguments
Arguments: Files	To specify the files to add to the project you can use the --folder-path flag or you can pass a series of single file paths to raw files as positional arguments.

Add Raw Sonar Files KMALL

This job adds ".kmall" raw sonar files to a Qimera project.

```
# EXAMPLE: Add 1 specific ".kmall" file to the "test" project in EPSG 32630. Process
them immediately upon importing.
"C:\Path\To\bin\qimera-command.exe" --job add-raw-sonar-files-kmall ^
--epsg-code 32630 ^
--project-folder "C:\Users\username\QPS-Data\Projects\test" ^
"C:\Users\username\Downloads\datasets\0384_20250125_152045_SD-3003-0005-304.kmall" ^
--print-progress
```

add-raw-sonar-files-kmall	Arguments
--project-folder <path>	The project folder.
--folder-path <path>	A folder containing the files you wish to add to the project.
--epsg-code <number>	The input epsg code for the file(s) you wish to import.
--delay-convert-to-qpd	An optional argument to delay the conversion from raw file to QPD. By default all imported files are converted directly to QPD. If delay is selected the auto-process job can be run to convert outstanding files at a later time.
--wkt-file <path>	The input wkt for the file(s) you wish to import.
--print-progress	Print job progress to the command line.

add-raw-sonar-files-kmall	Arguments
Arguments: Files	To specify the files to add to the project you can use the --folder-path flag or you can pass a series of single file paths to raw files as positional arguments.

Add Raw Sonar Files S7K

This job adds ".s7k" raw sonar files to a Qimera project.

```
# EXAMPLE: Add all ".s7k" files from a specified directory to the "test" project in
EPSG 32630.
"C:\Path\To\bin\qimera-command.exe" --job add-raw-sonar-files-s7k ^
--epsg-code 32630 ^
--project-folder "C:\Users\username\QPS-Data\Projects\test" ^
--folder-path "C:\Users\username\QPS-Data\sample-s7k-data" ^
--vessel-name "new-vessel" ^
--print-progress
```

add-raw-sonar-files-s7k	Arguments
--project-folder <path>	The project folder.
--folder-path <path>	A folder containing the files you wish to add to the project.
--epsg-code <number>	The input epsg code for the file(s) you wish to import.
--wkt-file <path>	The input wkt for the file(s) you wish to import.
--vessel-name <name>	Name for the vessel the imported .s7k(s) will be associated with. Creates a new vessel if the name does not match an existing vessel in the specified project.
--print-progress	Print job progress to the command line.

add-raw-sonar-files-s7k	Arguments
Arguments: Files	To specify the files to add to the project you can use the --folder-path flag or you can pass a series of single file paths to raw files as positional arguments.

Create Dynamic Grid

This job creates a dynamic grid using all raw sonar files loaded in the provided project.

```
# EXAMPLE: Grid all the lines in the "test" project and name the grid
"Dynamic_Grid_3". Use the default cell-size.
"C:\Path\To\bin\qimera-command.exe" --job create-dynamic-grid ^
--project-folder "C:\Users\username\QPS-Data\Projects\test" ^
--name "Dynamic_Grid_3" ^
--print-progress
```

create-dynamic-grid	Arguments
--project-folder <path>	The project folder.
--name <text>	The name of the dynamic grid you would like to create.
--cell-size <number>	Optional argument that lets you choose the cell size of the dynamic grid in the project's survey units.

create-dynamic-grid	Arguments
--cube-config <text>	Optional argument that lets you specify the configuration to use when creating a CUBE grid. Config Options: • Default • Deep • Shallow • Custom • NOAA_0.5m • NOAA_1m • NOAA_2m • NOAA_4m • NOAA_8m • NOAA_16m • NOAA_32m
--print-progress	Print job progress to the command line.

Append to Grid

For each dynamic grid in the provided project this job appends all raw sonar files that are not already contained in that dynamic grid.

```
# EXAMPLE:
"C:\Path\To\bin\qimera-command.exe" --job append-to-grid ^
--project-folder "C:\Users\username\QPS-Data\Projects\test" ^
--print-progress
```

append-to-grid	Arguments
--project-folder <path>	The project folder.

Remove from Grid

Remove the specified source files from the specified grid.

```
# EXAMPLE: Remove two source files from a grid
```

```
"C:\Path\To\bin\qimera-command.exe" --job remove-from-grid ^
--project-folder "C:\Users\username\QPS-Data\Projects\test" ^
--grid-name "mygrid" ^
"C:\Users\username\Downloads\datasets\Panopee-Brest-
Wrecks\0001_20150324_161631_Panopee.all" ^
"C:\Users\username\Downloads\datasets\Panopee-Brest-
Wrecks\0002_20150324_161913_Panopee.all"
```

remove-from-grid	Arguments
--project-folder <path>	The project folder.
--grid-name <grid-name>	The grid to remove source files from. If omitted, source files will be removed from all grids.
Arguments: Files	List of source files to remove from the grid as positional arguments.

Remove from Project

Remove the specified files from the project

```
# EXAMPLE: Remove two files from a project
"C:\Path\To\bin\qimera-command.exe" --job remove-from-project ^
--project-folder "C:\Users\username\QPS-Data\Projects\test" ^
"C:\Users\username\Downloads\datasets\Panopee-Brest-
Wrecks\0001_20150324_161631_Panopee.all" ^
"C:\Users\username\Downloads\datasets\Panopee-Brest-
Wrecks\0002_20150324_161913_Panopee.all"
```

remove-from-project	Arguments
--project-folder <path>	The project folder.
Arguments: Files	List of files to remove from the project as positional arguments.

Auto Process

Will process all the data present in the project folder

```
# EXAMPLE: Process all the lines in the "test" project
"C:\Path\To\bin\qimera-command.exe" --job auto-process ^
--project-folder "C:\Users\username\QPS-Data\Projects\test" ^
--print-progress
```

auto-process	Arguments
--project-folder <path>	The project folder
--print-progress	Print job progress to the command line.

Configure Grid

Configure the Specified Grid

```
# EXAMPLE: Change the colormap and colormap range of a grid
"C:\Path\To\bin\qimera-command.exe" --job configure-grid ^
--project-folder "C:\Users\username\QPS-Data\Projects\test" ^
--grid-name "mygrid" ^
--colormap-filename "relief.cmap" ^
--lower-bound "-45.5" ^
--upper-bound "-35.5"
```

configure-grid	Arguments
--project-folder <path>	The project folder.
--grid <grid-name>	The grid to edit.
--colormap-filename <cmap-filename>	Colormap file name, including extension (from user or system colormap directories, listed using list-colormaps job).
--colormap-filepath <cmap-filepath>	Path to valid Colormap file.

configure-grid	Arguments
--lower-bound <lower-bound>	Colormap range lower bound (Positive Up). Requires accompanying upper-bound.
--upper-bound <upper-bound>	Colormap range upper bound (Positive Up). Requires accompanying lower-bound.

Run Filter Profile

This job runs the specified filter on all/specific raw sonar files in the provided project.

Note: when `-h` is used it will provide a overview of “User defined” filters present

```
# EXAMPLE: Apply the "Strong Spline" filter on 3 specific lines in the "test" project
"C:\Path\To\qimera-command.exe" --job run-filter-profile ^
--project-folder "C:\Users\username\QPS-Data\Projects\test" ^
--filter "Strong Spline" ^
"0001_20150324_161631_Panopee.all" ^
"0002_20150324_161913_Panopee.all" ^
"0003_20150324_162143_Panopee.all"
```

run-filter-profile	Arguments
--project-folder <path>	The project folder.
--filter <filter-name>	The name of the filter to run. Must be one of the following. Filter names containing spaces must be quoted.
--print-progress	Print job progress to the command line.
Arguments: Source File Names	Starting with **Qimera v2.7.4**, `Qimera-Command` can apply filters on specific lines of the project. The list of files must be specified as a space-separated string. **Note:** positional argument. So no need to add any flags. Just add the list of source file names to the end of the command

Export Grid ASCII XYZ

Export the data into an ASCII XYZ file

```
# EXAMPLE: Export 2 sections of "Dynamic_Grid_1" each constrained to the SD-polygons
"poly1" and "poly2". Export to a custom directory
"C:\Path\To\bin\qimera-command.exe" --job export-grid-ascii ^
--project-folder "C:\Users\username\QPS-Data\Projects\test" ^
--export-folder "C:\Users\username\Downloads\GridExports\" ^
--depth-layer "shallow" ^
--z-precision 4 ^
--column-separator "\t" ^
--bounds "poly1" ^
--bounds "poly2" ^
"Dynamic_Grid_1"
```

export-grid-ascii	Arguments
--project-folder <path>	The project folder.
--bounds	Optional argument. The names of SD objects for settings bounds. Multiple bounds can be specified by inputting the `--bounds` option multiple times.
--export-folder <Export/>	The folder to write the export to. This defaults to the project export folder.
--depth-layer <average>	The depth layer. (Shallow, Average, Deep or Cube)
--z-precision <2>	The decimal precision for Z values.
--column-separator <,>	The character to be used as a column-separator.
Arguments: grid-names	The list of the grid file names. **Note:** positional argument. So no need to add any flags. Just add the list of grid names to the end of the command

Export Lines to NOAA CSV

Export the data into a NOAA CSV file, all the data present will be exported in a single csv file.

```
# EXAMPLE: Export all data from the "test" project to the project's "Export\"
directory as NOAA CSV
"C:\Path\To\bin\qimera-command.exe" --job export-noaa-csv ^
--project-folder "C:\Users\username\QPS-Data\Projects\test" ^
--output-filename "brest-wrecks.csv"
```

export-noaa-csv	Arguments
--project-folder <path>	The project folder.
--output-filename <filename>	The name of the exported NOAA csv file.

Export Grid GeoTIFF

Export specified grid to a GeoTIFF file.

```
# EXAMPLE: Export a grid to a GeoTIFF file
"C:\Path\To\bin\qimera-command.exe" --job export-geotiff ^
--project-folder "C:\Users\username\QPS-Data\Projects\test" ^
--grid-name "mygrid" ^
--export-filename "new_geotiff.tif" ^
--depth-layer "shallow" ^
--export-world-file
```

export-geotiff	Arguments
--project-folder <path>	The project folder.
--grid-name <string>	Name of grid to export.
--export-filename <string>	Name for resulting exported GeoTIFF file, saved to project “Export” folder (exclusive with export-filepath).

export-geotiff	Arguments
--export-filepath <path>	File path to resulting exported GeoTIFF file (exclusive with export-filename).
--depth-layer <average>	The depth layer. (Shallow, Average, Deep or Cube).
--export-world-file	Export the TIFF world file?
--origin <lower-left>	Origin of the GeoTIFF world file. (lower-left or upper-left).

Export Grid Floating Point GeoTIFF

Export specified grid to a Floating Point GeoTIFF file.

```
# EXAMPLE: Export a grid to a Floating Point GeoTIFF file
"C:\Path\To\bin\qimera-command.exe" --job export-grid-floating-point-geotiff ^
--project-folder "C:\Users\username\QPS-Data\Projects\test" ^
--grid-name "mygrid" ^
--export-filename "new_geotiff.tif" ^
--depth-layer "shallow" ^
--no-data-value "NAN"
```

export-floating-point-geotiff	Arguments
--project-folder <path>	The project folder.
--grid-name <string>	Name of grid to export.
--export-filename <string>	Name for resulting exported ASCII GeoTIFF file, saved to project “Export” folder (exclusive with export-filepath).
--export-filepath <path>	File path to resulting exported ASCII GeoTIFF file (exclusive with export-filename).

export-floating-point-geotiff	Arguments
--depth-layer <average>	The depth layer. (Shallow, Average, Deep or Cube).
--no-data-value <no-data-value>	The No Data value for missing data (NaN or a custom number).

Generate Grid Uncertainty Layers

Create THU and TVU scalars for a given grid.

```
# EXAMPLE:
"C:\Path\To\bin\qimera-command.exe" --job generate-thu-tvu-layers ^
--project-folder "C:\Users\username\QPS-Data\Projects\test" ^
--grid-name "Dynamic_Grid_1"
```

generate-thu-tvu-layers	Arguments
--project-folder <path>	The project folder.
--grid-name	The name of the dynamic grid.

Export Grid to BAG

This job exports a BAG file for a dynamic grid

```
# EXAMPLE: Export the "Dynamic_Grid_1" as bag.
"C:\Path\To\bin\qimera-command.exe" --job export-bag ^
--project-folder "C:\Users\username\QPS-Data\Projects\test" ^
--grid-name "Dynamic_Grid_1" ^
--version 15 ^
--output "compute-tvu" ^
--xml-date ^
--bag-xml-metadata "C:\Users\username\QPS-Data\Projects\test\Export\Bag_Config.xml" ^
--compression 3 ^
--depth-layer "shallow"
```

export-bag	Arguments
--project-folder <path>	The project folder.
--grid-name <grid-name>	The dynamic grid to export.
--version <15>	Choose to export to a version 14 or 15 file.
--output <compute-tvu>	stddev, attached-scalar, cube-uncertainty, compute-slope-corrected-uncertainty, compute-tvu, loaded-scalar
--scalar-path <path>	Set this to the path of the scalar file if uncertainty is set to loaded-scalar.
--date <2024-08-09>	Directly specify a date for the export. Use the format: yyyy-MM-dd
--xml-date	Use the date in the bag-metadata-xml file.
--compression <0>	Compression value for the BAG file. Select a number between 0 and 5.
--bag-xml-metadata <filename>	The BAG XML metadata file. These files can be generated here: Export to BAG Surface Wizard
--depth-layer <average>	The depth layer of the grid to be exported. (Shallow, Average, Deep or Cube)

Export GSF

This job exports GSF files from the sonar files.

```
# EXAMPLE: Export 3 specific lines. Export each system separately. Do not flag
filtered-soundings as manually-editted.
# Export to a custom folder and use the vessel-name, file-name, and system-name for
each output file.
```

```
"C:\Path\To\bin\qimera-command.exe" --job export-gsf ^
--project-folder "C:\Users\username\QPS-Data\Projects\test" ^
--export-folder "C:\Users\username\Downloads\GridExports\" ^
--filename-pattern "%v\%f\%s" ^
--replace-whitespace ^
--export-systems-individually ^
--do-not-flag-filtered-as-manual-edits ^
"0001_20150324_161631_Panopee.all" ^
"0002_20150324_161913_Panopee.all" ^
"0003_20150324_162143_Panopee.all"
```

export-gsf	Arguments
--project-folder <path>	The project folder.
--export-folder <path>	The folder to export the GSF files to.
--filename-pattern <%v\%f>	The pattern of the exported filenames. %f: Source file name. %v: vessel name. %s: system name
--replace-whitespace	Replace whitespace with underscores in the exported filename
--export-systems-individually	Export each system to their own file.
--specific-system <1>	Export a specific system by index.
--exclude-user-additional-soundings	Exclude user additional soundings in the GSF export.
--exclude-raw-backscatter-imagery	Exclude raw backscatter imagery in the GSF export.
--do-not-flag-filtered-as-manual-edits	Do not flag filtered soundings as manual edits in the GSF export.
--flag-all-interpolated-soundings-as-accepted	Flag all interpolated soundings as accepted in the GSF export.

export-gsf	Arguments
Arguments: Source file names	The list of source file names to export. **Note:** positional argument. So no need to add any flags. Just add the list of source file names to the end of the command

List Colormaps

List user and system colormaps.

```
# EXAMPLE: List all user and system colormaps
"C:\Path\To\bin\qimera-command.exe" --job list-colormaps
```

Note: This job requires no arguments.

List Source Files

List Source Files in Project.

```
# EXAMPLE: List all source files in a project
"C:\Path\To\bin\qimera-command.exe" --job list-source-files ^
--project-folder "C:\Users\username\QPS-Data\Projects\test" ^
```

list-source-files	Arguments
--project-folder <path>	The project folder.

List Grids

List Static and Dynamic Grids in a project.

```
# EXAMPLE: List all grids in a project
"C:\Path\To\bin\qimera-command.exe" --job list-grids ^
--project-folder "C:\Users\username\QPS-Data\Projects\test" ^
```

list-grids	Arguments
--project-folder <path>	The project folder.

List SD Objects

List all SD Objects in a project.

```
# EXAMPLE: List all SD Objects in a project
"C:\Path\To\bin\qimera-command.exe" --job list-sd-objects ^
--project-folder "C:\Users\username\QPS-Data\Projects\test" ^
```

list-sd-objects	Arguments
--project-folder <path>	The project folder.

List Systems

This job will list the systems in the project

```
# EXAMPLE:
"C:\Path\To\bin\qimera-command.exe" --job list-systems ^
--project-folder "C:\Users\username\QPS-Data\Projects\test"
```

list-systems	Arguments
--project-folder <path>	The project folder.

List Vessels

List all Vessels in a project.

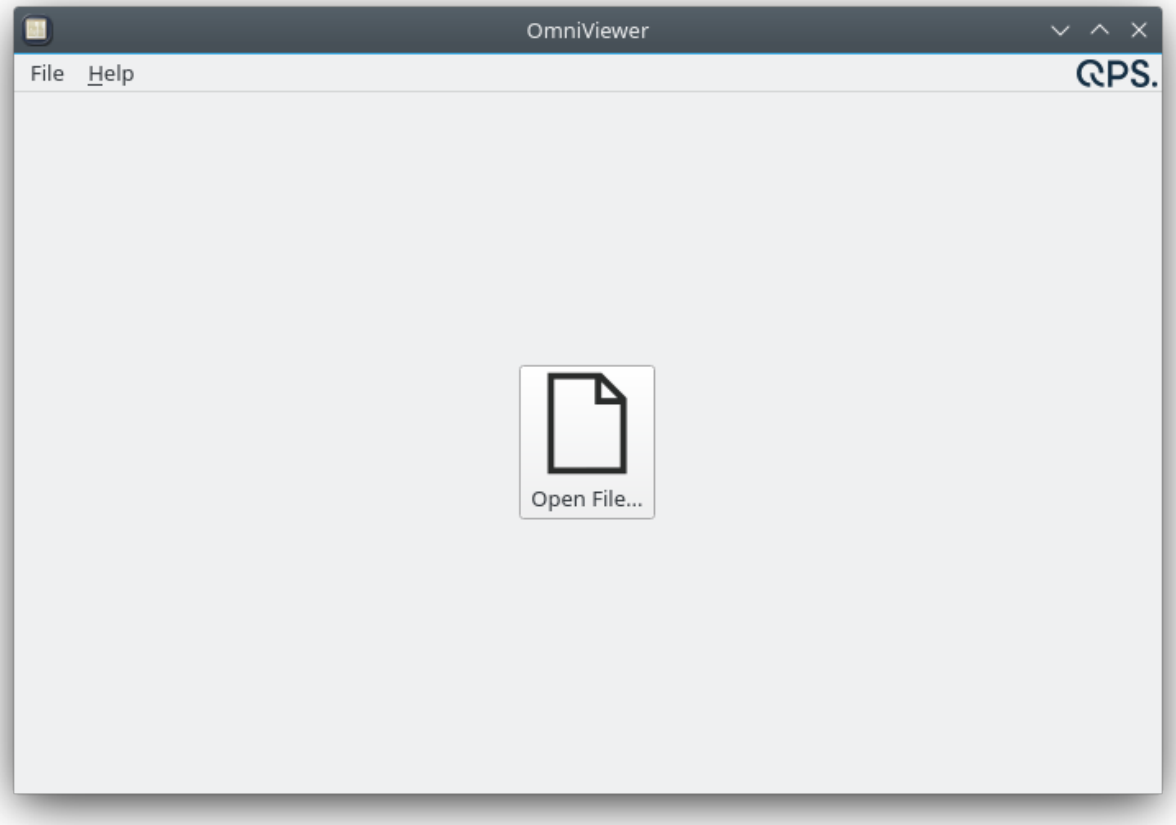
```
# EXAMPLE: List all Vessels in a project
"C:\Path\To\bin\qimera-command.exe" --job list-vessels ^
--project-folder "C:\Users\username\QPS-Data\Projects\test"
```

list-vessels	Arguments
--project-folder <path>	The project folder.

Qimera OmniViewer

OmniViewer is simple tool to inspect the contents of various binary file formats. This can be an extremely useful tool to confirm that binary files actually contain the data one expects, or to spot potential problems in that data. OmniViewer supports processed point files, raw sonar files and binary navigation files.

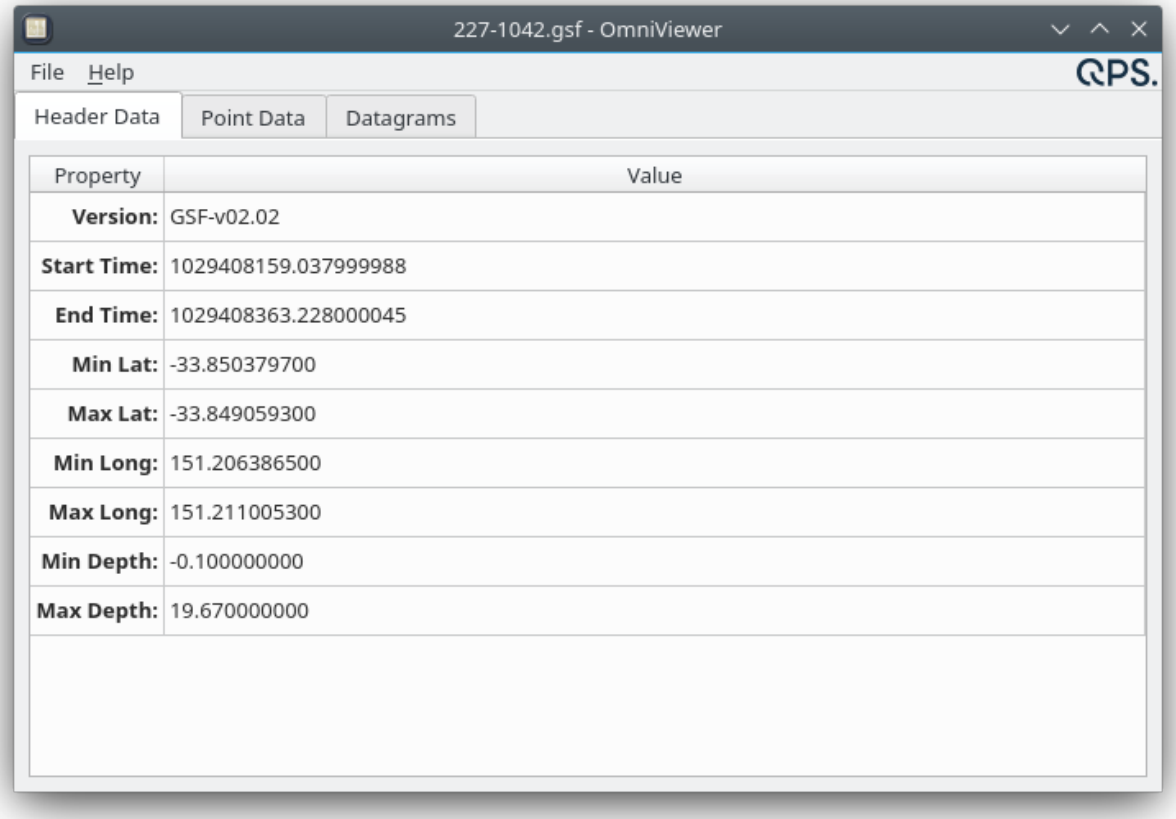
OmniViewer User Interface



When started, OmniViewer offers a single button to open a file. Clicking the button and choosing a file will cause up to three tabs to be displayed, depending on what information OmniViewer was able to extract from the file.

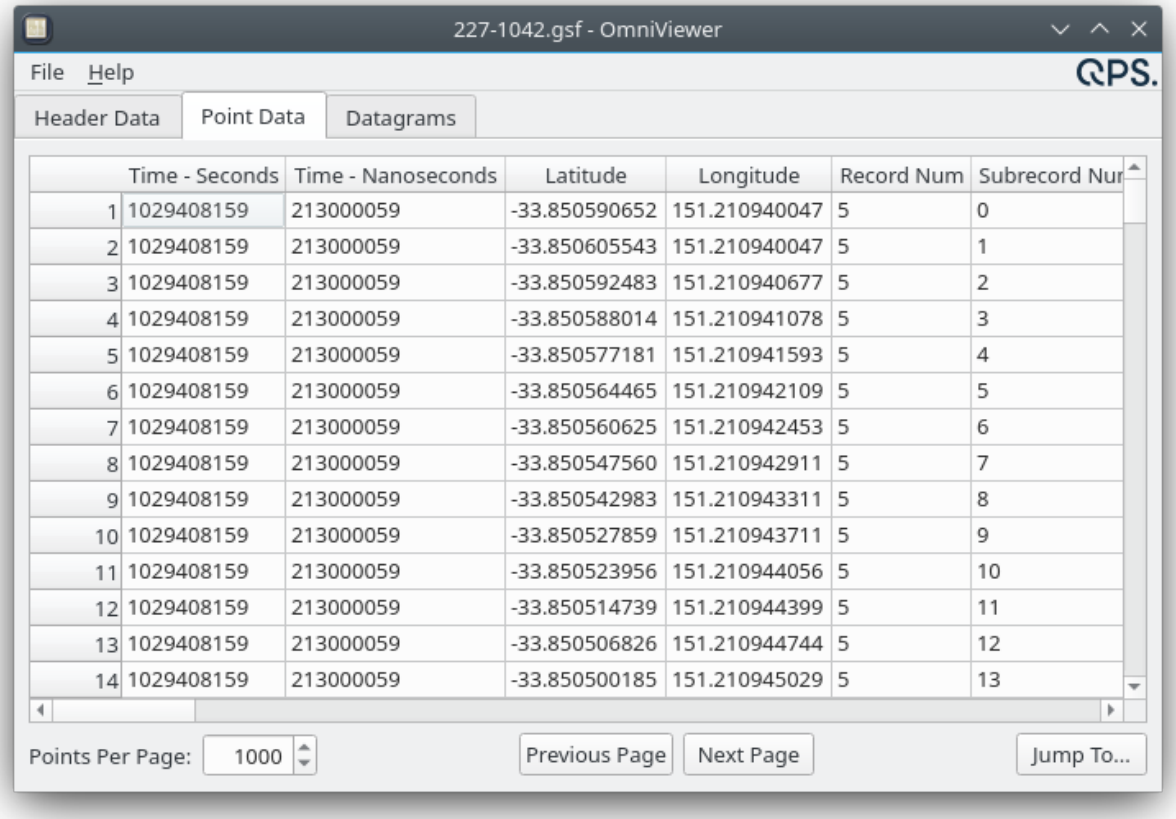
After finishing with one file, another may be opened via the *File* > *Open File...* menu entry.

Header Data Tab



This tab contains a simple table of file properties that were read from the file's header block. The actual contents will vary from file format to file format. Note that not all file formats contain a header block.

Point Data Tab

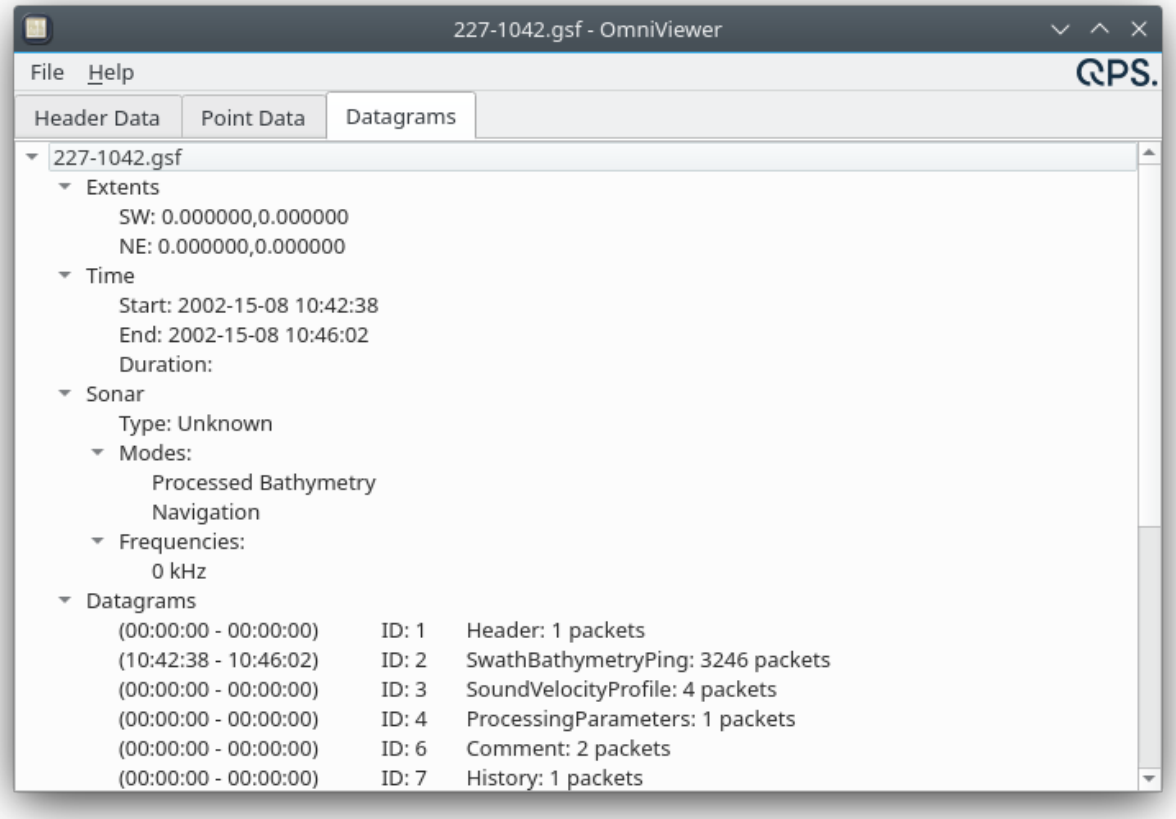


	Time - Seconds	Time - Nanoseconds	Latitude	Longitude	Record Num	Subrecord Nur
1	1029408159	213000059	-33.850590652	151.210940047	5	0
2	1029408159	213000059	-33.850605543	151.210940047	5	1
3	1029408159	213000059	-33.850592483	151.210940677	5	2
4	1029408159	213000059	-33.850588014	151.210941078	5	3
5	1029408159	213000059	-33.850577181	151.210941593	5	4
6	1029408159	213000059	-33.850564465	151.210942109	5	5
7	1029408159	213000059	-33.850560625	151.210942453	5	6
8	1029408159	213000059	-33.850547560	151.210942911	5	7
9	1029408159	213000059	-33.850542983	151.210943311	5	8
10	1029408159	213000059	-33.850527859	151.210943711	5	9
11	1029408159	213000059	-33.850523956	151.210944056	5	10
12	1029408159	213000059	-33.850514739	151.210944399	5	11
13	1029408159	213000059	-33.850506826	151.210944744	5	12
14	1029408159	213000059	-33.850500185	151.210945029	5	13

This tab displays a table of the processed point data contained in the file, if any. Each point is displayed on its own numbered row. Each column holds a single property or flag. The set of columns is specific to the particular file format.

Instead of loading the entire file all at once, the points are loaded in *pages*, both to improve performance and to ease navigation. The number of *Points Per Page* can be adjusted via the spin box at the bottom of the tab. The *Previous Page* and *Next Page* buttons can be used to navigate forward and backward through the file. The *Jump To...* button allows jumping to a particular location in the file by specifying by the *Record* and *Subrecord* numbers. The exact meanings of record and subrecord vary between file formats, but typically a record number indicates a ping number and a subrecord number indicated a beam number within that ping.

Datagrams Tab

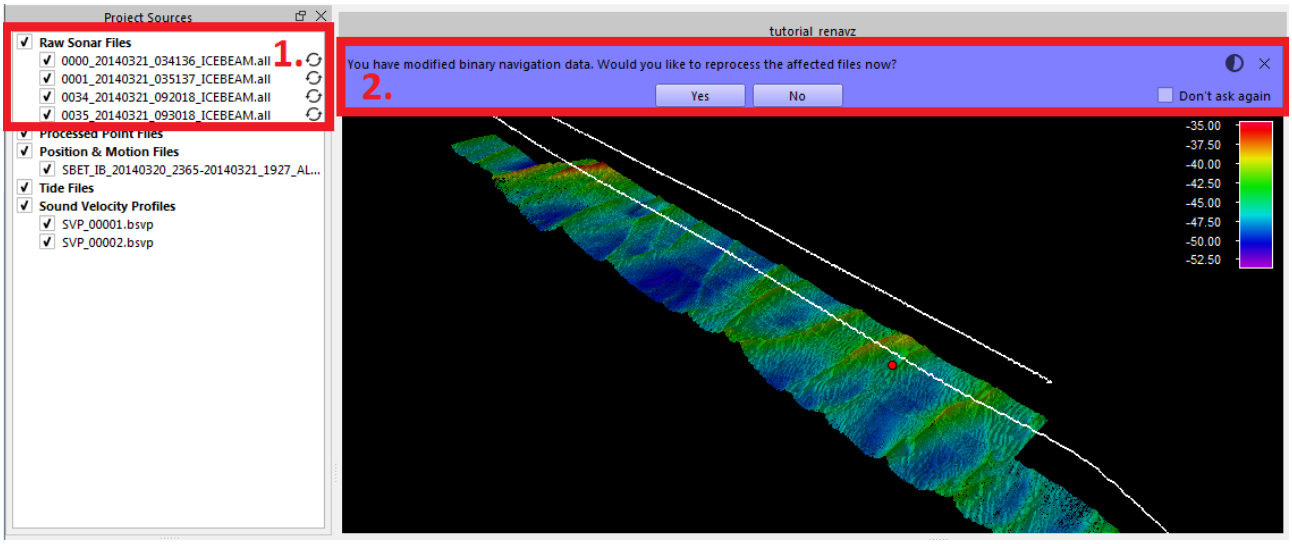


This tab displays a tree of metadata about the type of data and the various datagrams found in the file. Note that it does not display all the individual datagrams themselves. The exact contents will depend on the specific format, but the last section will show a summary of all the different datagram types found, including: the time range within which that datagram type appeared, the numeric ID of the datagram type, the textual name of the datagram type and the total number of occurrences.

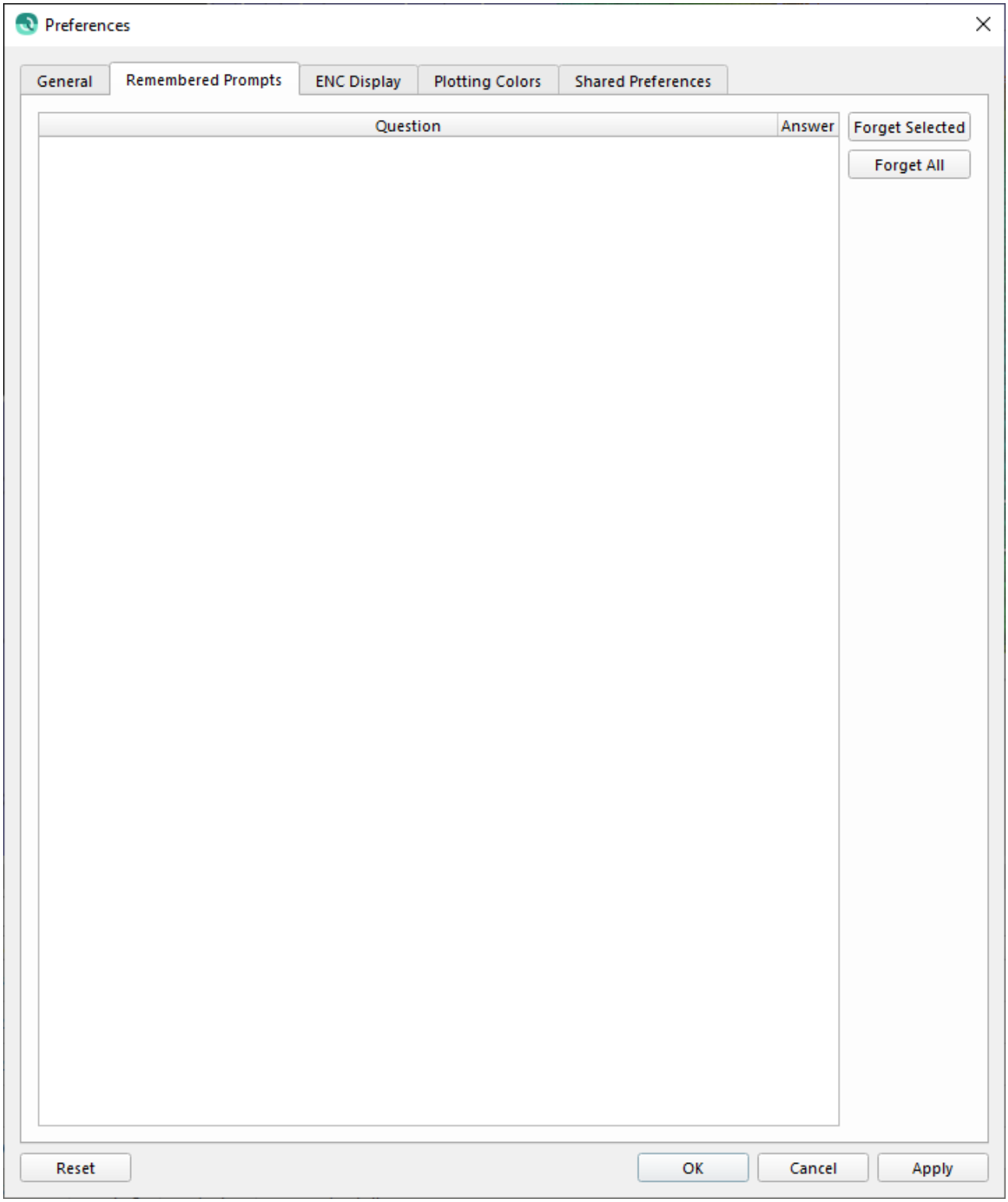
Qimera Dynamic Workflow

Qimera's Dynamic Workflow engine works by taking advantage of the dependencies between raw measurements, processed soundings and derivative products. If a raw measurement is altered, or a processing configuration is changed, the engine will establish which set of processed soundings must be updated. It will determine what type of re-processing must occur and which derivative products must be updated. While in manual workflow mode, Qimera will mark all source items that require reprocessing with an update icon :reprocess: in the Project Sources view panel (1). The user can also manually trigger an update by clicking the Auto Process button in the main toolbar.

In order to establish A Dynamic Workflow, the user must allow Qimera to perform all necessary updates automatically when a user alters items in which dependencies may exist. The activation of the automatic update mechanism occurs when the*"Do not ask me again"* tick-box (2) is selected following major edits or reconfiguration operations. The Qimera Dynamic Workflow builds slowly over the course of the unique user experience in Qimera. As the user gains more experience with Qimera, they decide when to allow Qimera to remember desired outcomes when editing or making changes in configuration.



The user can revert to manual workflow mode by clearing all or selected prompts in the *Remembered Prompts tab* in *Project → Preferences → Remembered Prompts.*



- Qimera Direct to QPD Process
- Qimera Clear All Flags Process

- Qimera Match QPD Process
- Qimera Match Water Column Process
- Qimera Metadata Extraction Process
- Qimera Re-Nav XY Process
- Qimera Re-Nav XYZ Process
- Qimera Re-Nav Z Process
- Qimera Sound Velocity Correction Process
- Qimera Update Spatial Index Process

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Qimera Direct to QPD Process

During initial import of raw sonar files, a Metadata Extraction job is launched. During this job, Kongsberg files will be automatically converted to QPD files. This allows for immediate use of Kongsberg files in Surface Generation and editing operations. Qimera will use the Kongsberg sounding solutions, as computed by the Kongsberg software during acquisition, in the creation of the QPDs. This entails transforming the sonar-relative beam footprint solutions provided by Kongsberg into QPD format using the primary positioning and heading source as configured in real-time. Due to the design of the QPD format, some minor mathematical transformations are done to re-reference the soundings to the transmitter transducer in the event that it is not the reference point used in the Kongsberg configuration. This allows for direct use of re-navigation capabilities in Qimera without having to re-raytrace. This operation does not involve a ray tracing correction since one is already applied by the Kongsberg software in real-time during acquisition. This option is recommended if you have data with a reasonably good ray tracing correction that was applied during acquisition and you are confident in the sonar, positioning sensor and motion sensor installation locations, and angles as configured in the Kongsberg software.

In addition to *Kongsberg .ALL Direct to QPD* operations, Qimera also supports .*GSF Direct to QPD*.

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Qimera Clear All Flags Process

Qimera - Clear All Flags Process

This process will clear all manual editing, blocking and filtering flags from the QPD. It launches a job to run on the currently selected raw sonar files. Once the job is complete, any associated Dynamic Surfaces will be updated.

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Qimera Match QPD Process

Qimera - Match QPD Process

This process is only done on QINSy (.db) files. During metadata extraction of the Qinsy raw sonar file, Qimera will attempt to find the associated QPD file for the line. Every QPD in a Qimera project will ultimately appear in the project *~/DtmData/VesselName* folder where *VesselName* is the name of the vessel for the specific loaded raw sonar file. In order to successfully match a line with it's associated QPD, the base name, (the part of the filename after the directory declaration and before the extension) -must be the same as the raw sonar file base name.

Opening Qinsy Projects

Qimera will first look in the *~/DtmData/VesselName* folder of that project for the QPD. If a match is found, the matching process stores the value in the project XML and exits. If the match is not found, Qimera will then look in the root project *~/DtmData* folder. When a match is found, the file will be **moved** to the *~/DtmData/VesselName* folder for that project. The path is then stored in the XML and the matching process will exit. When a match is not found, the raw sonar file will display as requiring processing in the tree view by the ↻ icon.

Importing Qinsy DB Files

If you have created a new project and are importing .db files into your project from another folder, Qimera will look in the Qinsy project's *~/DtmData/VesselName* folder for a matching QPD. If a match is found in the *~/DtmData/VesselName* folder, the file is **copied** to the local project *~/DtmData/VesselName* folder. If a match is not found, Qimera will look in the root folder *~/DtmData* of the QINSy project. If the match is found in the root folder *~/DtmData* of the QINSy project, the file will be **copied** to the local project folder *~/DtmData/VesselName*. In either scenario, the path is then stored in the XML and the matching process will exit.

Note, if the output coordinate system of an imported QINSy file is not the same as the Qimera project, Qimera will deem this a match failure. If a match is not found due to differing coordinate systems, the raw sonar file will display as requiring processing in the tree view by the ↻ icon.

Multi-Vessel DB files

If a DB / QPD pair contains data from more than one supported vessel (also called objects or vehicles), the following steps will take place:

1) When the file is imported, the source files will be split so each vessel has its own source file in the Project Sources dock.

2) For each vessel that has supported systems, a subfolder in the DtmData directory will be created.

3) If a QPD is matched, as in the *Importing Qinsy DB Files* section above, it will be copied into the appropriate DtmData subfolders. Vessels that do not contain supported systems will not have a QPD copied into the vessel's subfolder.

4) Each copy of the QPD will be compared to the vessel it is linked to. If the QPD contains griddable systems (MBES, Singlebeam, Laser, Pipetracker) that are not associated with its vessel, those systems will be removed. This results in the QPD only containing griddable systems that are associated with the linked vessel.

5) If systems are removed from a QPD, a backup is created first.

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Qimera Match Water Column Process

Qimera - Match Water Column Process

This process is only done on Kongsberg (.all) files. During metadata extraction of the Kongsberg file, Qimera will attempt to find the associated water column (.wcd) file for the line. Qimera will look in the folder where the line was loaded from. If a match is found, the water column path is stored in the project XML file. If not, you can later use the raw sonar file context menu to *Find* the associated water column file. If found, the data is displayed in the Water Column window during Swath Editing.

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Qimera Metadata Extraction Process

Qimera - Metadata Extraction Process

When data is loaded into Qimera, a metadata extraction process runs to intelligently strip information out of the file to optimize the Dynamic Workflow engine of Qimera, thus reducing the amount of work you have to do to process your data. The metadata extraction has some variability based on the file type and the basics are listed below.

When a file is loaded into Qimera, it is given a unique identifier and the filename and identifier are used to create a specific folder inside the project *~/Metadata* folder. For example, if the first file loaded is named *0000_20140321_034136_ICEBEAM.all*, the associated folder will be named *0000_20140321_034136_ICEBEAM_00001*. If the next line is named *0001_20140321_035137_ICEBEAM.all*, its folder will be named *0001_20140321_035137_ICEBEAM_00002* and so on. **WARNING**: **The contents of these folders are not meant to be edited by the user and could have unintended consequences!** So please don't move, delete, rename or otherwise edit any of these files.

Raw Sonar Files

The following are the tasks performed on raw sonar files during the metadata extraction process.

File Indexing

All raw sonar files supported by Qimera are packetized in nature and proceed linearly in time. Qimera creates an index file that allows for fast non-linear access to every distinct packet type inside the file. Qimera's optimized I/O engine maximizes the read performance of raw sonar files on all platforms (Windows, Mac, Linux).

Coordinate System Extraction

When loading QINSy (.db) files, the intended project coordinate system will be extracted and if the file is the first in the project and *Auto* was selected during project creation, Qimera will set the project coordinate system to this coordinate system. Qimera will also select the input navigation datum information to construct the coordinate system of the incoming navigation. For other file formats, if the *Auto* option was selected, Qimera will choose the nearest UTM zone as the project coordinate system upon import of the first raw sonar file into the project. This data is persisted in the *project.xml* file.

Vessel Information Extraction

Vessel file information such as sensor, linear and angular offsets is extracted and stored as *.vessel* files in the line metadata folder. If the vessel name is new, it will be added to the overall vessel list in the Qimera project.

Computation Settings Extraction

Certain raw sonar file types may have redundant time series data streams. The computation settings stores the choices made by the acquisition system as to which of these are the primary, secondary, etc. sources to use during processing. These file types are stored as.echo_##files in the line metadata folder. The "##" in the file name is the system id.

Bathymetry Start/End Time Extraction

Qimera stores the bathymetry's first and last packet times in the *project.xml* file.

Sound Velocity Profile Extraction

Qimera extracts and stores all sound velocity profiles in a generic binary format with the *.bsvp_##* extension in the line metadata folder. The "##" is the SVP number in the file.

Time Series Data Extraction

Qimera extracts the following time series data to the listed file extensions when available. This data is extracted and stored at full resolution in the line metadata folder. The "##" in each file name is the system id.

- Position (.position_##)
- Position Standard Deviation (.positionsd_##)
- Motion (.motion_##)
- Motion Standard Deviation (.motionsd_##)
- Heading (.heading_##)
- Heading Standard Deviation (.headingsd_##)
- Height (.height_##)
- Height Standard Deviation (.heightsd_##)
- Surface Sound Speed (.soundspeed_##)
- Pressure (.pressure_##)
- Depth (.depth_##)
- Tide (.tide_##)
- Dynamic Squat (.squat_##)

Processing Settings Extraction

This file will maintain all the processing settings that the user selects when for the file using the Processing Settings dialog. It is created during metadata extraction and intelligent options are made based on the metadata extracted from the file.

Time Series Solution Creation

Since Qimera supports multiply redundant sources of data for the same time series attribute, the solution files (timeseries*name.sol)* maintains the priority order of the particular attributes.

QPD Matching

A description of this process can be found here.

WCD Matching

A description of this process can be found here.

Track Line Creation

If Qimera was able to match a QPD file to the raw sonar file (.db), it will create a track line based on the port-side sonar transducer location. If a QPD does not exist, the track line is created from the primary position data time series. The track line object is in the Fledermaus SD (.sd) format.

Binary Bathymetry Conversion

When Qimera loads raw sonar data in ASCII format such as that found in Hypack (.hsx) files, it will automatically convert the bathymetry data to an internal binary format for faster multi-core processing during sound velocity correction.

Processed Point Files

Processed Point Files extract a *.metadata.xml* file which contains information required by Qimera to work with the file. Qimera will also create a track line or extents object in the Fledermaus SD (.sd) format.

Navigation Files

Navigation files follow a similar process as raw sonar files. The following steps are performed and described above.

- File Indexing
- Time Series Data Extraction
- Track Line Creation

Tide Files

Tide files have the *Time Series Data Extraction* step described above performed on their data.

SVP Files

SVP Files are imported and automatically converted to the Qimera *.bsvp* format.

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Qimera Re-Nav XY Process

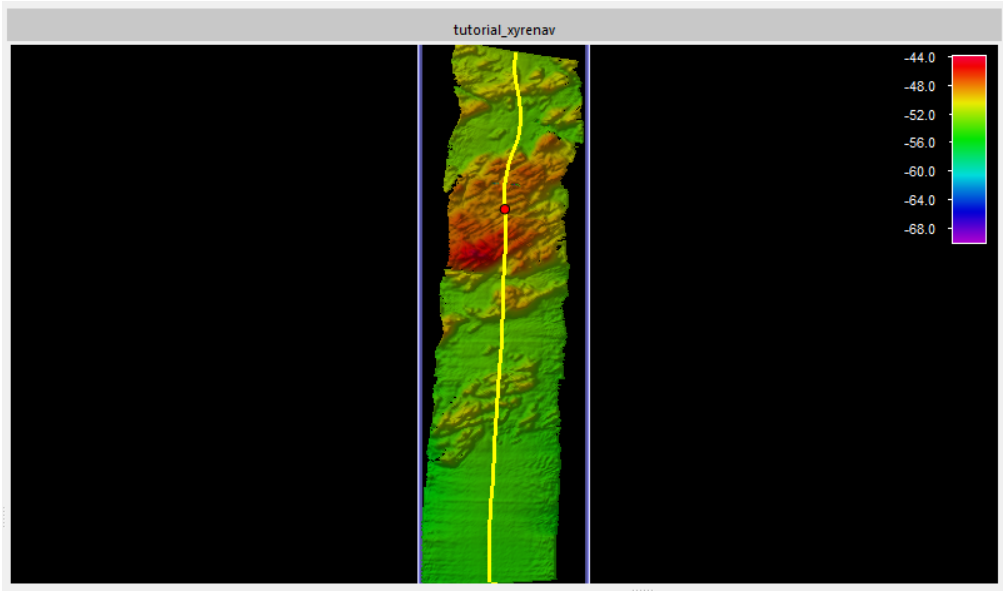
Qimera - Re-Nav XY

This process will be initiated automatically by the Dynamic Workflow engine whenever the primary source of position information has been changed via one of the following methods:

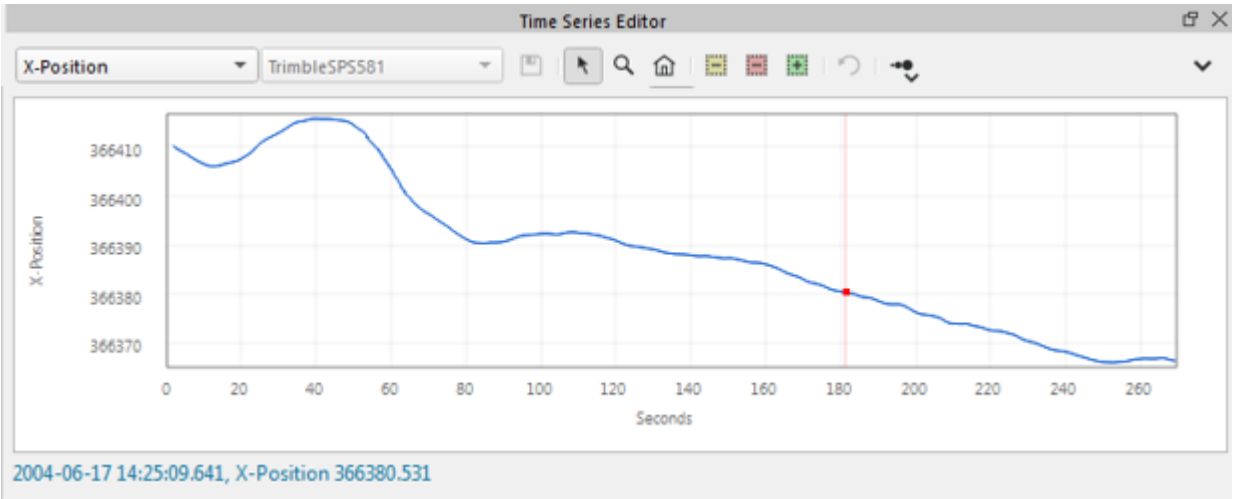
- Position time series editing - here
- Position time series import (i.e. POSPac, NavLab or SBTC) - here or here
- Position time series source re-prioritization - here

This can easily be demonstrated by the following example. Using a single line with an obvious course deviation, if we edit out the deviation and save the edits, Qimera will *Re-Nav* the line and update the dynamic surface.

Original Line

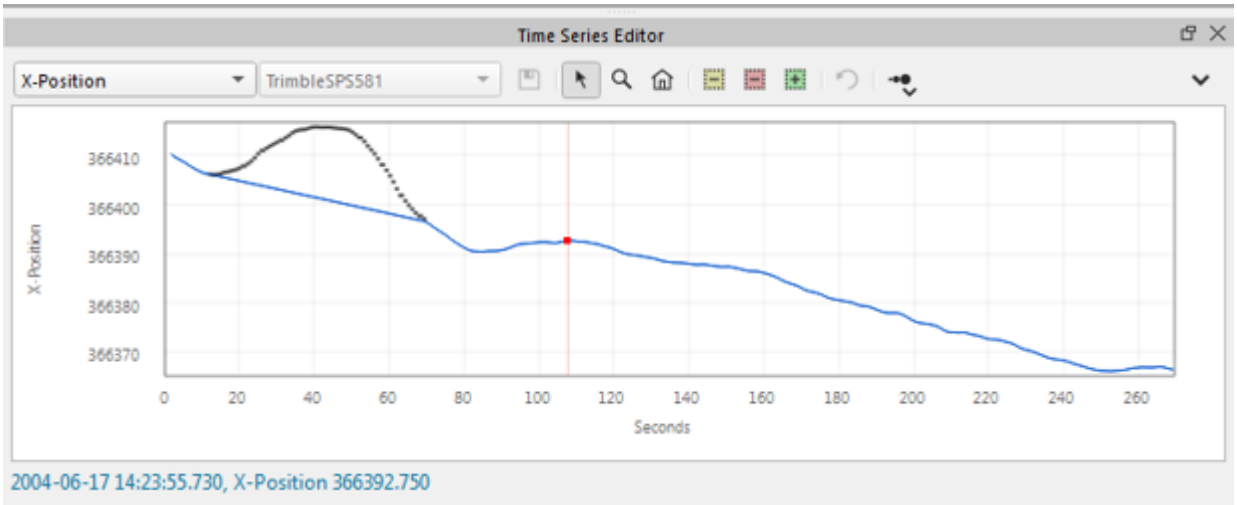


Original X Position



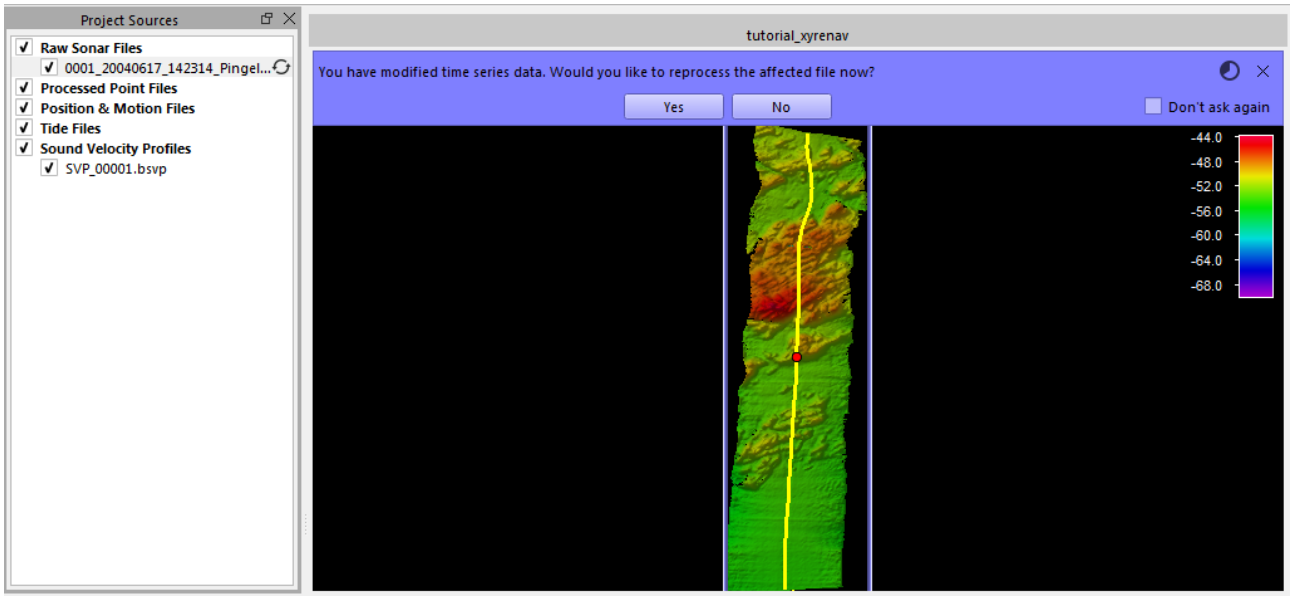
Edited X Position

For more information, see the section on editing time series data found here.



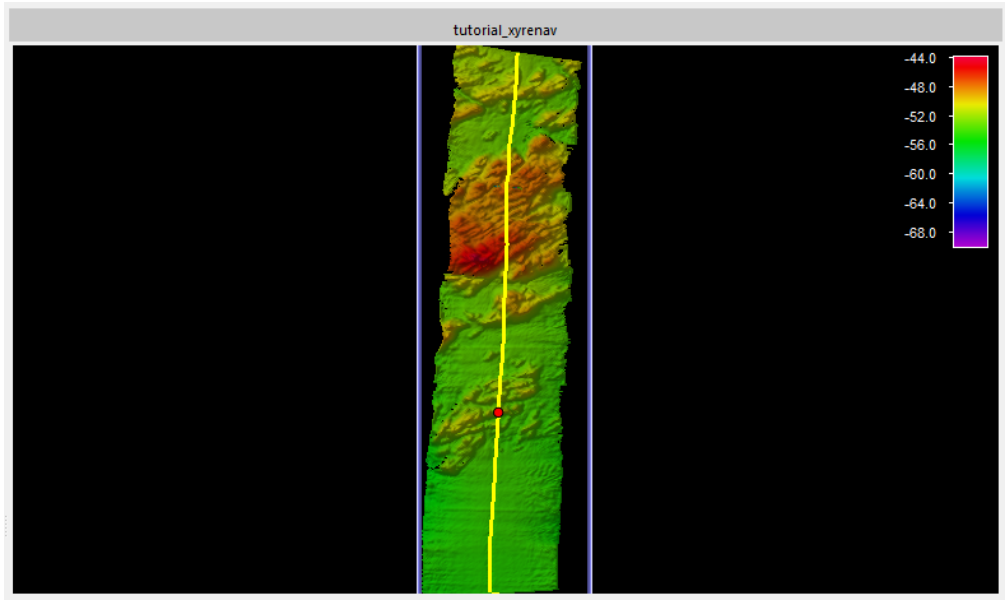
Dynamic Workflow Prompt

Once the edits are saved, Qimera's Dynamic Workflow engine prompts the user what needs to be done. If you check *Don't Ask Again* before clicking on Yes, Qimera will automatically perform this task in the future. Once you click *Yes*, the Job Activity window will display the running task. If you click *No*, Qimera will wait for you to later click on the *Auto Solve* button. You don't have to remember what type of operation needs to be performed on the file. The operations all have a precedence. So if you change something for this line that requires full sound velocity correction, this job will not be doubly performed. The Dynamic Workflow engine takes care of this for you.



Update Dynamic Surface

Once the Re-Nav XY process is complete, the Dynamic Surface is automatically updated. No further action is required. The updated surface is shown below.



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Qimera Re-Nav XYZ Process

Qimera - Re-Nav XYZ

This process is a combination of the Re-Nav XY and Re-Nav Z processes. It will be initiated automatically by the Dynamic Workflow engine whenever a combination of the following occurs:

- Position time series editing - here
- Position time series import (i.e. POSPac) - here or here
- Position time series source re-prioritization - here
- Height time series editing - here
- Height time series import (i.e. POSPac or tide) - here or here
- Height time series source re-prioritization or height configuration - here

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Qimera Re-Nav Z Process

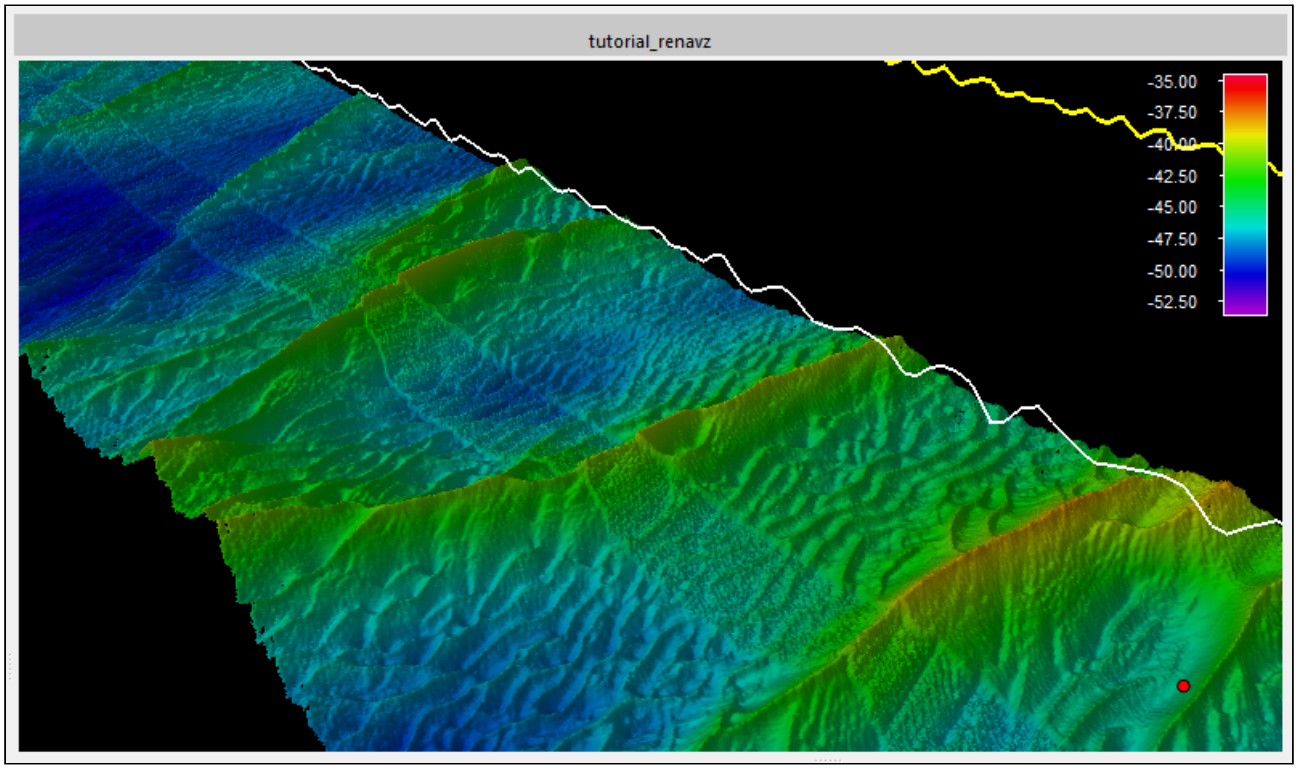
Qimera - Re-Nav Z

This process will be initiated automatically by the Dynamic Workflow engine whenever the primary source of height information has been changed via one of the following methods:

- Height time series editing - here
- Height time series import (i.e. POSPac, SBTC, or tide) - here or here
- Height time series source re-prioritization or height configuration - here

This can easily be demonstrated by the following example, referenced to the image below. Using 4 lines, (2 outbound and 2 inbound that have a time separation of ~5 hours) you can see an obvious tide bust where they overlap (see below). If we import just the GNSS height component of a POSPac file, Qimera will *Re-Nav* the lines and update the dynamic surface.

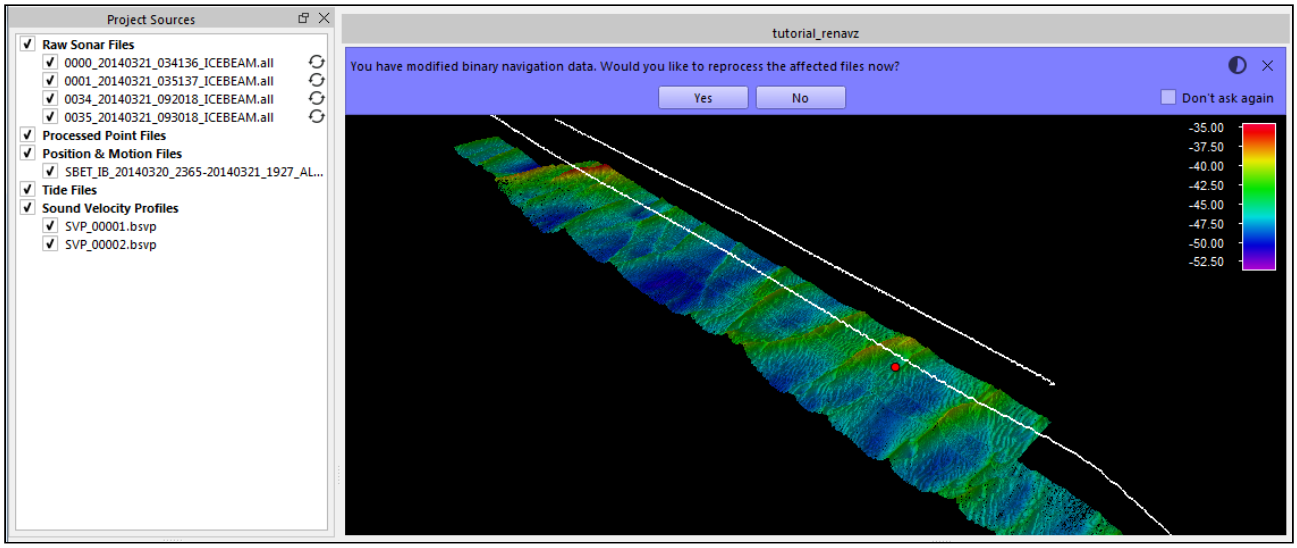
Original Lines



Dynamic Workflow Prompt

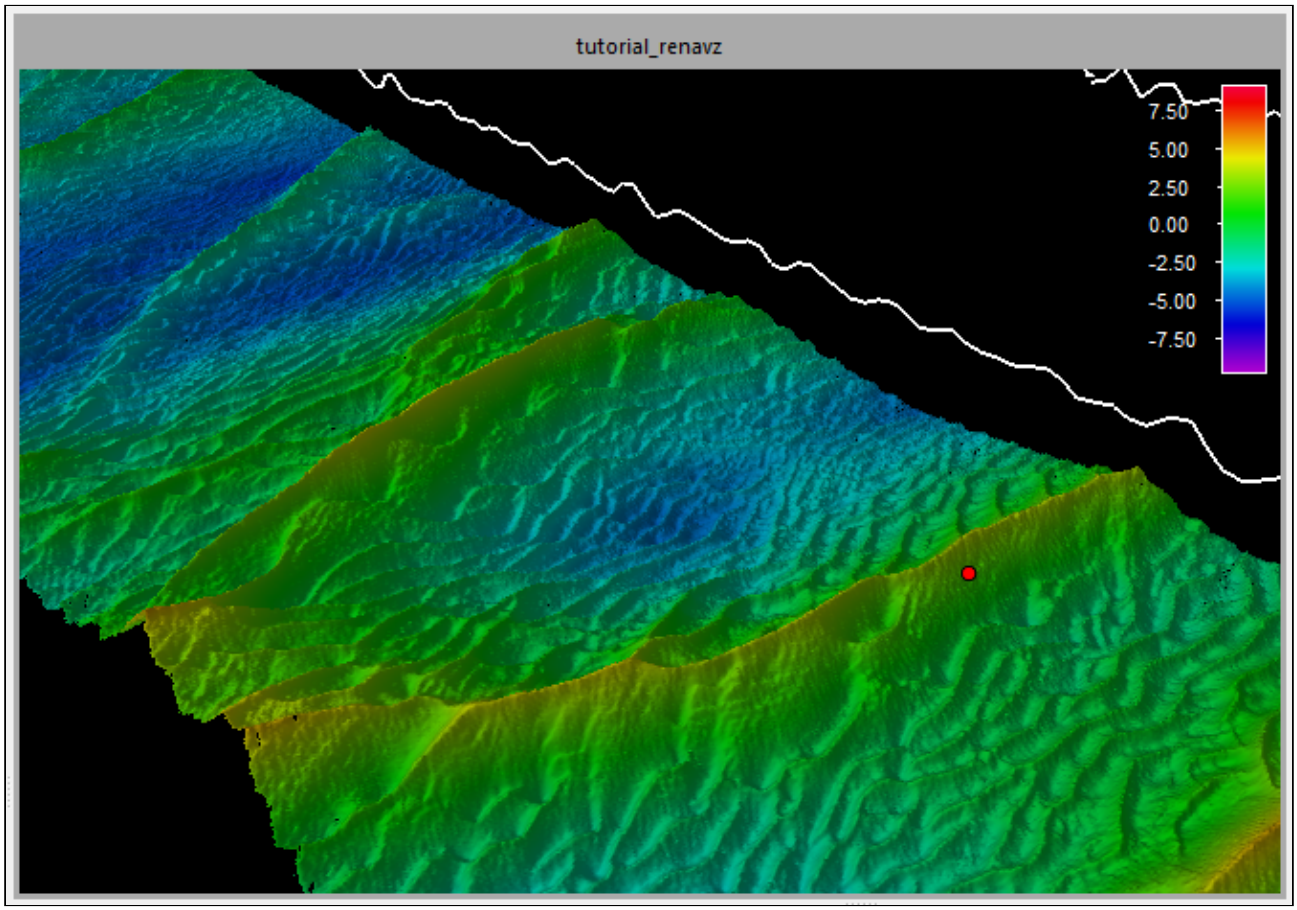
Once the GNSS height data is imported, Qimera's Dynamic Workflow engine prompts the user what needs to be done. If you check *Don't Ask Again* before clicking on Yes, Qimera

will automatically perform this task in the future. Once you click *Yes*, the Job Activity window will display the running task. If you click *No*, Qimera will wait for you to later click on the *Auto Solve* button. You don't have to remember which type of operation needs to be performed on the file, because the operations all have a precedence. So if you change something for this line that requires full sound velocity correction, this job will not be doubly performed. The Dynamic Workflow engine takes care of this for you.



Update Dynamic Surface

Once the Re-Nav Z process is complete, the Dynamic Surface is automatically updated. No further action is required. The updated surface is shown below.



Return to: Dynamic Workflow
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Qimera Sound Velocity Correction Process

This process will be initiated automatically by the Dynamic Workflow engine whenever the following occurs:

- SVP files are edited - here
- SVP selection strategies or processing configuration settings are modified - here
- Vessel configuration is edited, either manually or through application of patch test or wobble analysis results, including changes to TPU parameters - here
- Motion sensor, surface sound speed or depth/pressure (AUV only) data is edited - here
- Motion sensor, surface sound speed or depth/pressure (AUV only) data is re-prioritized - here
- Blocking parameters are changed - here

When this occurs, the multibeam observations of range and angle are re-integrated with all the supporting ancillary information, including the SVP, to re-compute the sonar relative sounding footprint location. The position of the CoG is also re-navigated in 3D using the specified vertical referencing method. If edits to the surface sound speed data are done, the multibeam beam angles are re-computed prior to the ray trace using the new surface sound speed.

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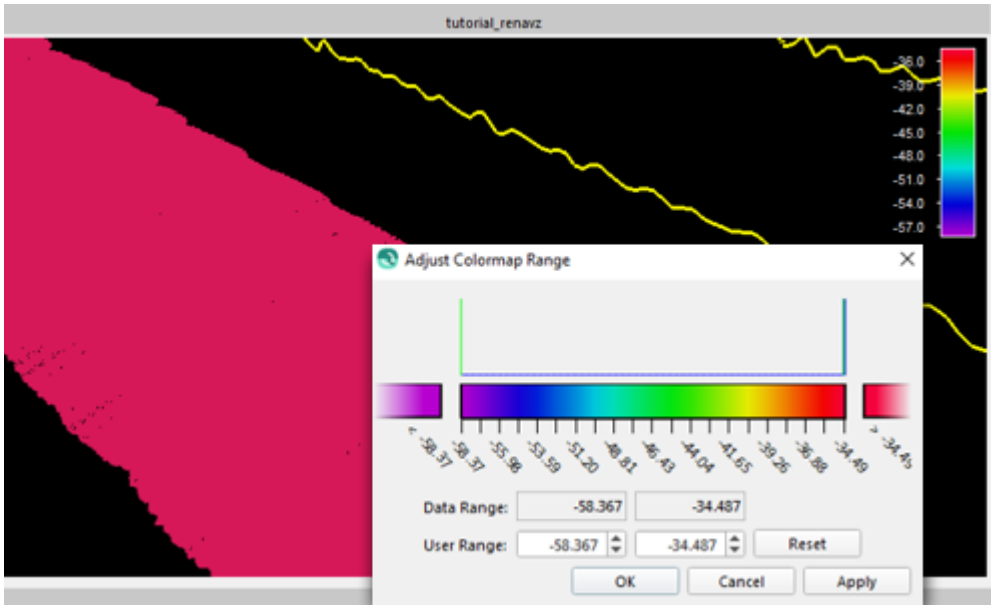
Qimera Update Spatial Index Process

Qimera - Update Spatial Index Process

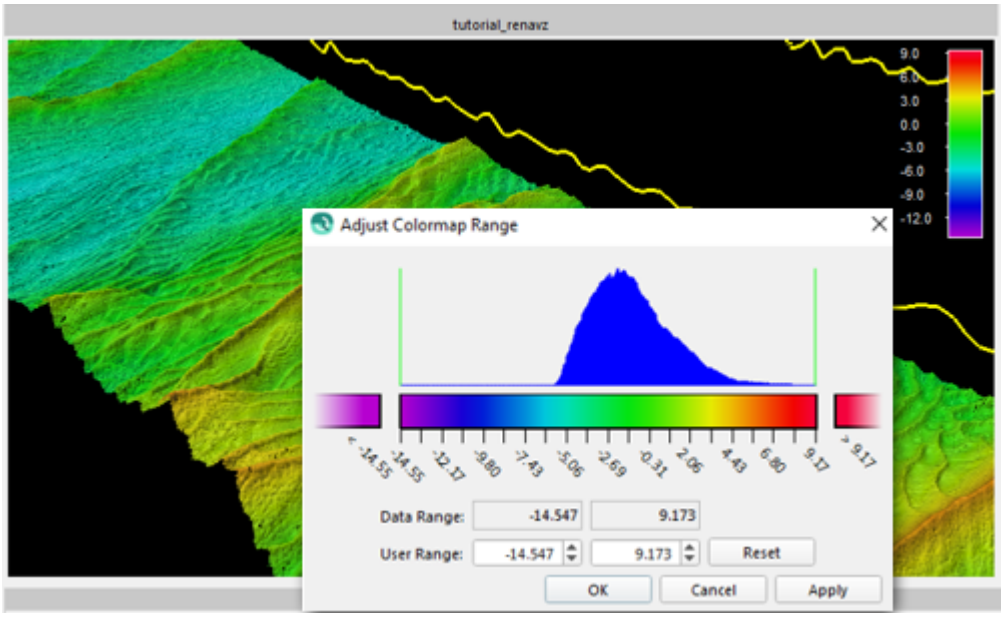
This is a utility function used to update the spatial extents of QPDs. If the spatial extents are somehow wrong, the mechanism in Qimera will activate when you try to create a Static Surface; you will get an error indicating that the bounds could not be determined or that your surface Z extents are invalid as shown below.

Bad Surface



To correct the problem, select the lines that were part of the surface, run the *Update Spatial Index* tool, then rebuild the static surface. The new surface is shown below.

New Surface



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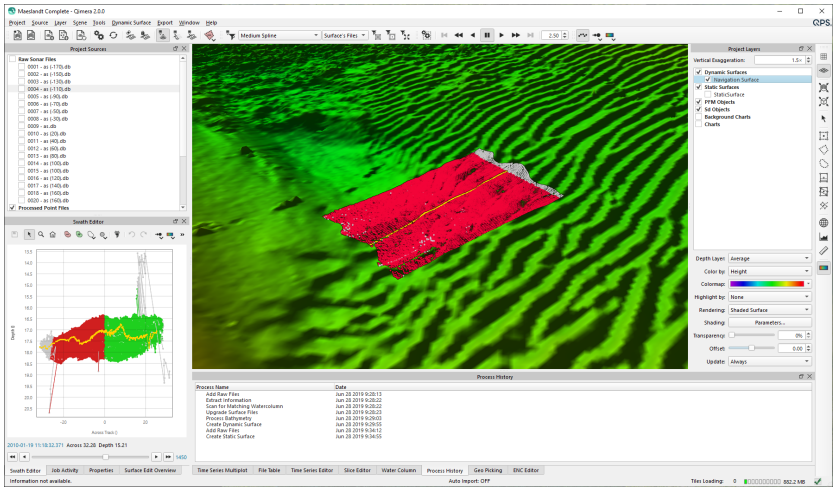
Qimera Interface



The following sections describe the Qimera interface in detail.

- Qimera Toolbars
  - Qimera Custom Toolbar
  - Qimera Selection Dimensions Toolbar
  - Qimera 4D View Toolbar
  - Qimera Selection Movement Toolbar
  - Qimera Bathymetry Toolbar
  - Qimera Filter Operation Toolbar
  - Qimera Scene Editor Toolbar
- Qimera Specialized Tools
  - Qimera 3D Editor
  - Qimera Cable/Pipe TOP Detection Tool
    - Qimera TOP Detection Settings Dialog
  - Qimera Coverage Extinction Plot
  - Qimera Cross Check
  - Qimera Dynamic Grid Shifting Tools
    - Qimera Adjust Static Horizontal Shift Tool
    - Qimera Adjust Vertical Shifts Tool
    - Qimera Heave/Swell Removal Tool
    - Qimera Line Height Matching Tool

        - Qimera Static Horizontal Shift Tool
        - Qimera Static Vertical Shift Tool
        - Qimera Varying Vertical Shift Tool
    - Qimera Instant Grid Filter
    - Qimera Navigation Editor
    - Qimera Patch Test
    - Qimera SVP Editor
    - Qimera Vessel Editor
    - Qimera Wobble Analysis
- Qimera Dock Windows
    - Qimera Cable/Pipe Analysis Dock
    - Qimera ENC Editor Dock
    - Qimera File Table Dock
    - Qimera Filter Profile Dock
    - Qimera Grid Cell Properties Dock
    - Qimera Geo Pick Dock
    - Qimera Grid Edit Overview Dock
    - Qimera Job Activity Dock
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    - Qimera Process History Dock
    - Qimera Profile Dock
    - Qimera Project Layers Dock
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    - Qimera Help Menu
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    - Qimera Add Tide Definition File Dialog
    - Qimera Add Tide File Dialog
    - Qimera Application Preferences Dialog
    - Qimera Automatic Import Dialog
    - Qimera Cable/Pipe Tracker Sensor Editor Dialog
    - Qimera Calculate Contours Dialog
    - Qimera Calculate Spot Soundings
    - Qimera Colormap Editor Dialog
    - Qimera Colormap Range Adjustment Dialog
    - Qimera Configure Custom Toolbar Dialog
    - Qimera Configure Shortcuts Dialog
    - Qimera Create Cleaning Project Dialog
    - Qimera Create Plane Dialog
    - Qimera Create Project Dialog
    - Qimera Create Static Grid Dialog
    - Qimera Custom ASCII File Configuration Dialog
    - Qimera Datagram Viewer Dialog
    - Qimera Drape Image Dialog
    - Qimera Dry Run Dialog
    - Qimera Dynamic Grid Dialogs
        - Qimera Snapshot as Static Grid

- Qimera Extract Dynamic Grid Layer
- Qimera Append to Dynamic Grid Dialog
- Qimera Cell Info Dialog
- Qimera Change Resolution Dialog
- Qimera Create Clipped Grid
- Qimera Create Dynamic Grid Dialog
- Qimera Create Flag Markers Dialog
- Qimera Create GRD Dialog
- Qimera CUBE Dialogs
    - Qimera Create Custom Hypothesis from Features Dialog
    - Qimera CUBE Filter Soundings Dialog
    - Qimera CUBE Output Grid Dialog
    - Qimera CUBE Settings Dialog
    - Qimera Re-Cube Area Dialog
- Qimera Duplicate Dynamic Grid Dialog
- Qimera Export Grid to Soundings
- Qimera Export Shoal Soundings Dialog
- Qimera Export Static Grid Layer Dialog
- Qimera Filter Out Soundings in Lonely Cells Dialog
- Qimera Interpolate Dynamic Grid Dialog
- Qimera Remove Lines Dialog
- Qimera Sounding Selection Dialog
- Qimera Edit Modified Flags Dialog
- Qimera Export BAG Grid Wizard
- Qimera Export Grid as Image Dialog
- Qimera Export Grid Dialog
- Qimera Export Grid To KML Dialog
- Qimera Export Line to XYZ Dialog
- Qimera Export Processed Points Dialog
- Qimera Export S-57 Dialog

- Qimera Export Soundings to ASCII Dialog
- Qimera Export Soundings to LAS/LASzip Dialog
- Qimera Export to FAU Dialog
- Qimera Export to GSF Dialog
- Qimera Export Track To ASCII Dialog
- Qimera Filter Below Dynamic Cable/Pipe Dialog
- Qimera Flag Grid Cells
- Qimera Generate/Edit X-Point Listings Dialog
- Qimera Generate Overlap Report
- Qimera Geodetic Configuration Overview
- Qimera Geodetic Search Dialog
- Qimera Grid Difference Wizard
- Qimera Grid Statistics Dialog
- Qimera Import ASCII Navigation Dialog
- Qimera Import CAD Dialog
- Qimera Import ESRI Shape Dialog
- Qimera Import Gridded Data Wizard
- Qimera Import Image Dialog
- Qimera Import Lines Dialog
- Qimera Import Navigation Configuration Dialog
- Qimera Import Points Dialog
- Qimera Import Sound Velocity Profiles Dialog
- Qimera License Status Dialog
- Qimera Manage Filter Profiles Dialog
- Qimera Merge Dynamic Cable/Pipes Dialog
- Qimera New System Dialog
- Qimera PFM Unload Wizard
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- Qimera Select Coordinate System Dialog
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- Qimera Tide Strategy Dialog
- Qimera TU Delft Sound Speed Inversion Settings Dialog
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Qimera Toolbars

Qimera has only a few primary toolbars, as Qimera adds capabilities, the number of toolbars may increase. However, the Qimera architecture leverages Dynamic Workflow to reduce the number of operations that must be displayed in a toolbar thus minimizing user interface complexity.

- Qimera Custom Toolbar
- Qimera Selection Dimensions Toolbar
- Qimera 4D View Toolbar
- Qimera Selection Movement Toolbar
- Qimera Bathymetry Toolbar
- Qimera Filter Operation Toolbar
- Qimera Scene Editor Toolbar

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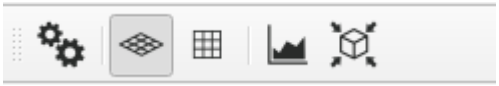
Qimera Custom Toolbar



- Qimera Custom Toolbar
  - Customization

Qimera Custom Toolbar

The Custom Toolbar is a user customizable interface allowing pre-determined actions, in the form of buttons, to be placed for quick access. Actions can be added in any order and can be separated using a separator. The Custom Toolbar can be shown or hidden using the Custom Toolbar option of the Window menu of the Main Menu Toolbar.

Customization

Customization of the Custom Toolbar is accomplished using the Configure Custom Toolbar Dialog.

This dialog can be shown by:

1. Selecting Configure Custom Toolbar... option of the Project menu in the Main Menu Toolbar.
2. Selecting the Configure Custom Toolbar... action icon in the Custom Toolbar if it has already been added 

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Qimera Selection Dimensions Toolbar

- Qimera Selection Dimension Toolbar
  - Width
  - Height
  - Apply

Qimera Selection Dimension Toolbar

The Selection Dimensions Toolbar provides controls for updating the overall width and height components of a selection in the work area. The toolbar will only be enabled when one of the supported selection modes is used:

1. Rectangular Selection
2. Fixed Slice Select
3. Free Slice Select
4. Scroll Slice Select

To show or hide the Selection Dimensions Toolbar, select the Selection Dimensions Toolbar option of the Window menu in the Main Menu Toolbar.

Width

The Width spin box can be used to update the overall width of the selection area.

Height

The Height spin box can be used to update the overall height of the selection area.

Apply

Clicking Apply will update the extents of the selection area and update any additional point editor selections you have open.

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Qimera 4D View Toolbar



- Qimera - 4D View Toolbar
  - View Buttons
    - 2D View
    - 3D View
  - Zoom Buttons
    - Zoom to View
    - Zoom to Object
  - Cursor Mode Buttons
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  - Navigation Override
  - Jump Selection To New Location
  - Selection Mode Hot Keys
    - Rectangular Select Mode
    - Polygon Select Mode
    - Freehand Select Mode
    - Fixed Slice Mode
    - Free Slice Mode
    - Scroll Select Mode
    - Geo Picking Mode
    - Profiling Mode
    - Measure Mode
  - Scene Component Buttons
    - Color Map

Qimera - 4D View Toolbar

This tool bar controls the main 4D view of Qimera. It controls how the cursor behaves in the window, visibility of certain scene components and quick ways to change view directions and the location in the scene.

View Buttons


2D View

This button places the scene into a plan view mode. You are viewing the scene from above and can zoom in/out or pan the view. **Left-Click** and drag will pan the scene. Moving the mouse-wheel will zoom in or out of the scene.


3D View

This button places the scene into a turntable view mode. You are viewing the scene as if it were on a rotatable table in front of you. **Left-Click** and drag in the horizontal direction will rotate the scene around the current center point. **Left-Click** and drag in the vertical direction will tilt the scene. **Middle-Click** on a point in the scene will change the center of rotation to that point.

Zoom Buttons


Zoom to View

This button will zoom out the current view so that all objects within the scene are viewable.


Zoom to Object

This button will zoom the scene such that the selected objects fits the viewable area of the window.

Cursor Mode Buttons



Explore Mode

This is the primary navigation mode of the 4D scene. If you are in any other cursor mode, simply hold down the **Shift** key to allow standard explore mode navigation behavior. When in explore mode, status information about the objects under the cursor will be displayed in the **Status Bar**. If you are in Plan View, use a L**eft-Click-Drag** to pan around the scene. Use the mouse wheel to zoom in and out of the scene. Alternatively, you can **Center-Click-Drag** to zoom in and out of the scene. If you are in Turntable View, a **Left-Click-Drag** horizontally will spin the scene about a central point as if the scene was on, you guessed it, a turntable. If you drag vertically, it will tilt the table toward or away from your viewpoint. To change the center of rotation, **Center-Click** a different location in the scene. This also works when in Plan View.

Navigation Override

To navigate in the scene in **any** cursor mode, hold down the **Shift** key and follow the navigation actions listed above.

Jump Selection To New Location

An action common to every selection mode below is the ability to **Jump** the selection to a new location in the scene. After you have an active selection, use **ALT-Left-Click** to select a new location in the scene. Your selection center will jump to that new location and if you were doing 3D or Slice editing, the appropriate soundings will be loaded to the editor.

Selection Mode Hot Keys

The Rectangle, Free Slice, Fixed Slice and Scroll Line selection modes all share use of a set of hot keys that will be described below. They are modeled after game controls and a future revision will allow customized remapping (for you lefties). The key pattern is **W**, **S**, **A**, **D**, **Q**, **E,** where Forward/Back motion= **W**/**S**, Left/Right motion= **A**/**D,** and Left/Right

rotation= **Q**/**E**. The addition of the **SHIFT** key is also used for selections modes that have an Overview area such as Free and Fixed Slice selection mode. See the individual mode descriptions below for more information on exactly which hot keys they support.



Rectangular Select Mode

This mode allows for rectangular area selections within the scene on a grid. This selection mode can be used by the Qimera Slice Editor and Qimera 3D Editor.

The selection can be drawn with two different methods: click and drag or three click.

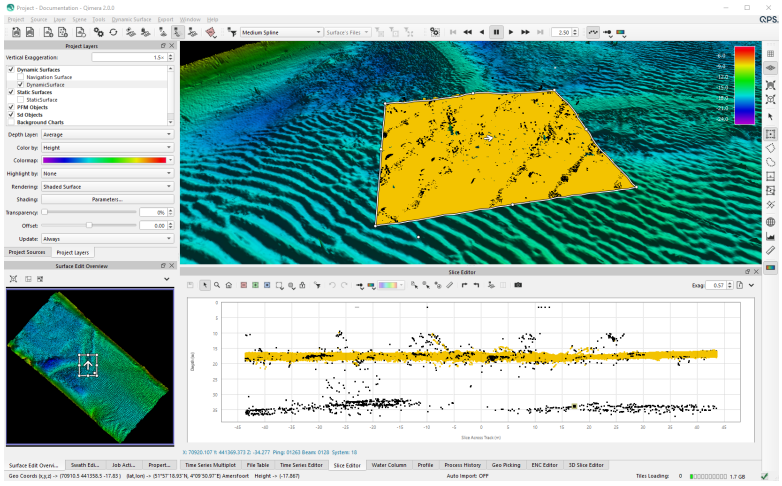
- **Click and Drag:** This draw method allows for drawing the selection with a single mouse gesture, but limits the orientation of the initial selection to match your current scene view. To draw **Left-Click** and drag anywhere on the grid. While drawing with this method, holding the **Ctrl** key will make the selection match the grid grid cell orientation.
- **Three Click**: This draw method allows for careful control of the height, width, and orientation of the rectangle. To draw, **Left-Click** without dragging, this will define the upper left corner of the selection. A line will be shown connecting the cursor to the first point, adjust your cursor for the desired orientation and width and **Left-Click** a second time to define the top edge of your selection. Further adjust your cursor for the desired height and **Left-Click** a third time to finalize the selection. While drawing the top edge with this method, holding the **Ctrl** key will make the edge match the grid grid cell orientation.

Once the rectangle has been drawn on the grid, it can be rotated or reshaped using the drag handles that appear on all sides and corners of the widget.

- **Left-Click** and drag one of the corner handles, it will resize the rectangle width and height.
- **Left-Click** and drag on one of the side handles, it will resize the rectangle in the associated axis.
- **Left-Click** and drag on the center handle rotates the selection rectangle.
- **Ctrl + Left-Click** and drag on any handle rotates the selection rectangle. You can toggle this behavior while dragging by releasing or clicking the Ctrl key.
- **Left-Click** and drag inside the rectangle but not over one of the handles allows you to move the rectangle over a grid.

To easily move the Rectangular Selection, use the **W** and **S** keys to move forward and backwards along the direction of the arrow. Use the **A** and **D** keys to move left and right, perpendicular to the arrow. Use the **Q** and **E** keys to rotate the selection +/- 15 degrees.

An example of this selection mode while Slice Editing is shown below.

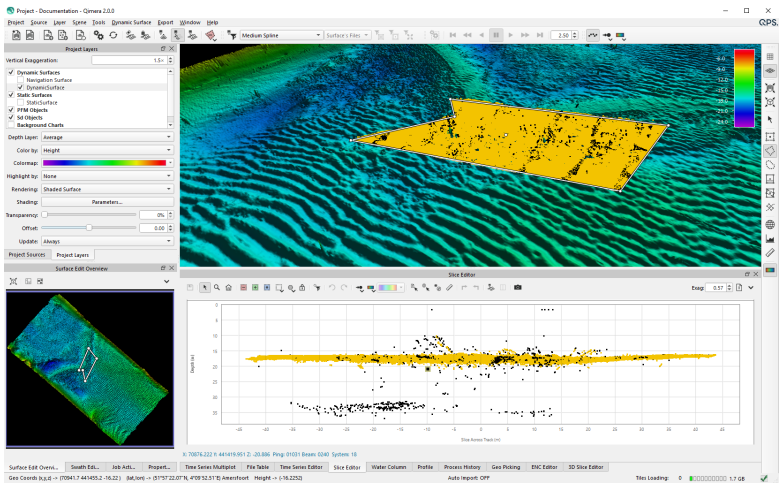




Polygon Select Mode

Left-Click a series of points on a series to define a selection polygon. You must select on the initial point to close the polygon. This selection mode can be used by the Qimera Slice Editor and Qimera 3D Editor. An example of this selection mode while Slice Editing is shown below.

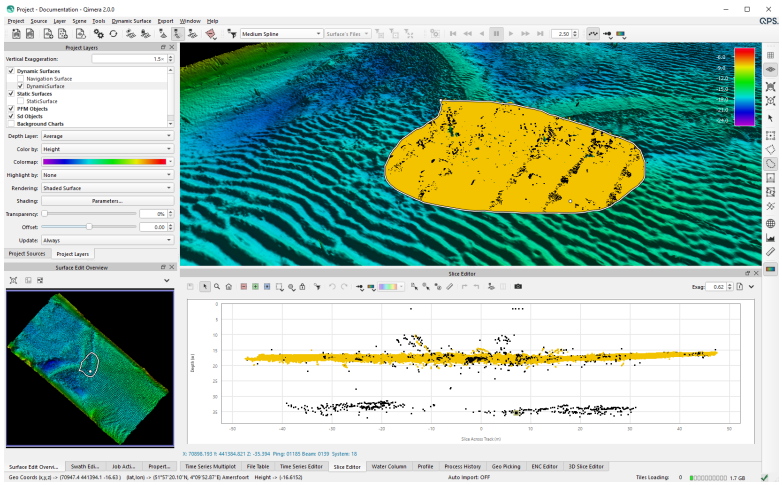
Hitting the **ESC** key at any point during polygon selection will remove the last polygon point created.





Freehand Select Mode

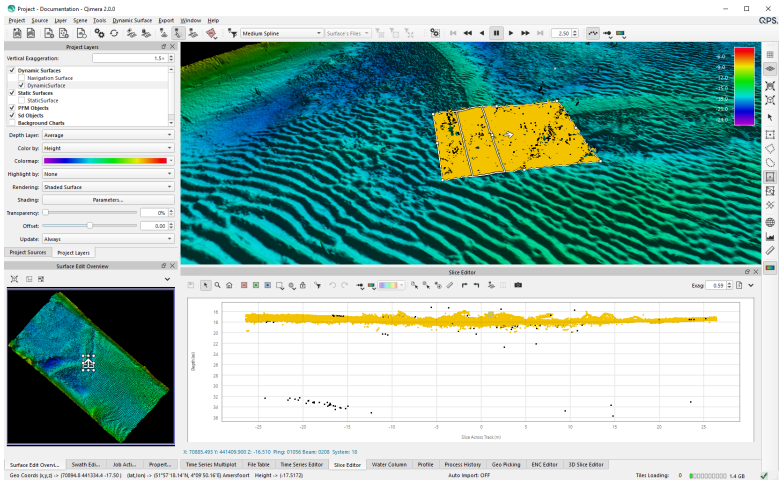
Left-Click and drag a shape to define a selection area. When you release the left mouse button, the selection area will be closed automatically. This selection mode can be used by the Qimera Slice Editor and Qimera 3D Editor. An example of this selection mode while Slice Editing is shown below.





Fixed Slice Mode

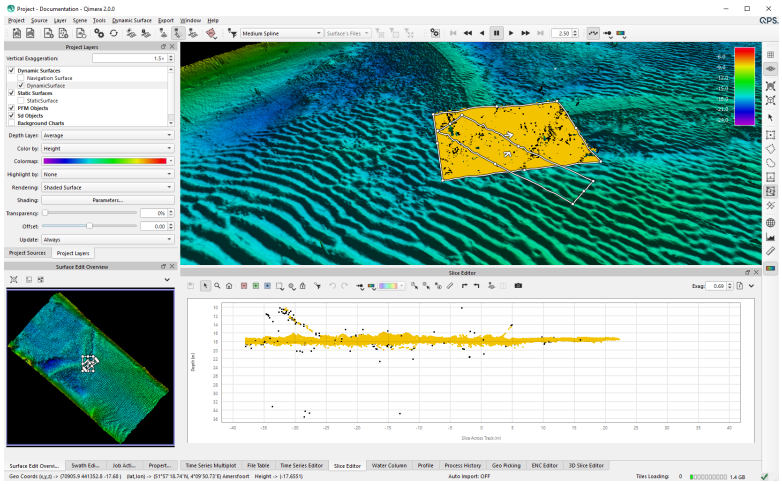
The selection is made up of an Overview area and a Slice area. The selection can be drawn with either the **Click and Drag** or the **Three Click** methods described in the Rectangular Select mode above. The handles of the Overview portion of this selection mode behave just like the Rectangular Select mode described above. The primary movement shortcut keys are mapped to the Slice for this selection mode. However, the slice can only be resized and move forward or backward within the overview. So only the **W**, **D**, **Q** and **E** keys have an effect. To move, resize or rotate the Overview of the selection using your keyboard, simply use the shortcut keys with the addition of the **SHIFT** key. This selection mode is used primarily by the Qimera Slice Editor but can be used by the Qimera 3D Editor. An example of this selection mode while Slice Editing is shown below.





Free Slice Mode

The selection is made up of an Overview area and a Slice area. The selection can be drawn with either the **Click and Drag** or the **Three Click** methods described in the Rectangular Select mode above. The handles of the Slice portion of this selection mode behave just like the Rectangular Select mode described above. The primary movement shortcut keys are mapped to the Slice for this selection mode. The center of the Slice will always stay within the Overview when moved. To move or resize the Overview of the selection using your keyboard, simply use the shortcut keys with the addition of the **SHIFT** key. This selection mode is used primarily by the Qimera Slice Editor but can be used by the Qimera 3D Editor. An example of this selection mode while Slice Editing is shown below. The inner selection can be rotated independently of the outer selection, which is the primary distinction between Free Slice and Fixed Slice modes.

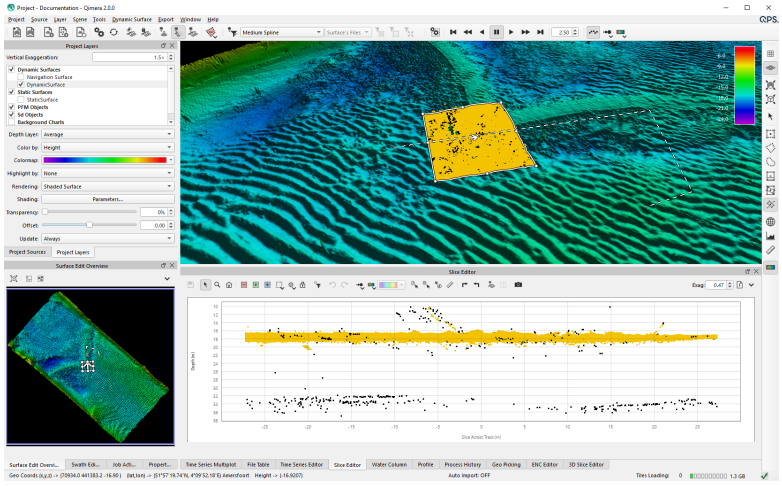




Scroll Select Mode

Left-Click and drag a shape to define a selection area. When using this mode, the selection area expands around your initial point. This is done so that you can begin your scroll selection at a particular point or feature in your survey. **Left-Click** to define all of the points in your line. Define the last point using a **Right-Click**. To start this mode, you can alternatively single **Left-Click** your starting location and Qimera will create a default selection area based on the size of your survey extents. If you have previously defined an area using this mode, Qimera will create a selection area with the same width and height. Similar to other selection modes, you can use the **W** and **S** keys to move forward and back along the scroll line. As you move, the selection area will point along the general direction of the scroll line. You can also use the **Q** and **E** keys to rotate the selection. This adds an angular bias to the scroll selection that will be maintained as you move along the scroll line. An example of this selection mode while Slice Editing is shown below.

Hitting the **ESC** key at any point during line creation will remove the last point created.





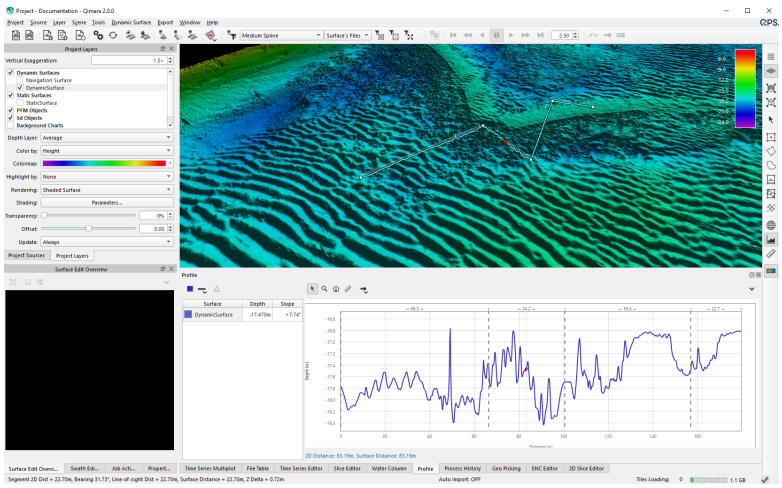
Geo Picking Mode

Left-Click a point on a Dynamic Grid to add a Geo location to the Qimera Geo Pick Dock.



Profiling Mode

Left-Click to create a series of line segments in order to see the depth profile in the Profile Window. **Right-Click** to end the profile. You can also use **Right-Click** and drag to define a single segment profile when in any of the standard cursor modes. With the scene in plan view mode (2D), clicks can be registered off-grid, while when the scene is in turntable view mode (3D), only clicks on a grid are considered valid. Hitting the **ESC** key at any point during profile creation will remove the last point created. An example of a multi-segment profile is shown below.

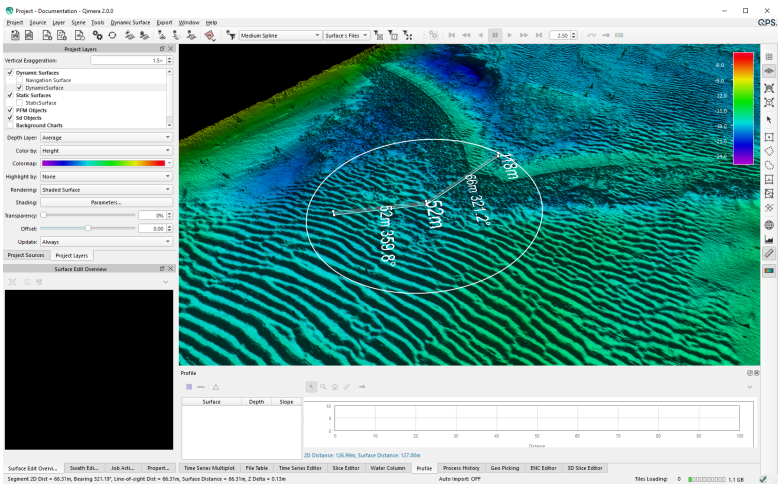




Measure Mode

Left-Click a series of line segments to see total distance, line segment distance and line segment bearing. You will see the last segment 2D distance, Bearing, Line-Of-Sight Distance, Grid Distance and Z Delta displayed in the Status Bar. As you move to a new location, a range circle will be drawn so that you can see all parts of the survey within the particular range. With the scene in plan view mode (2D), clicks can be registered off-grid, while when the scene is in turntable view mode (3D), only clicks on a grid are considered valid. An example of a completed multi-segment measurement is shown below.

Use the **=/+** key to increase the size of the text and the **-** key to reduce it. Hitting the **ESC** key at any point during line segment creation will remove the last point created.



Scene Component Buttons



Color Map

Show/Hide the color map overlay for the selected grid.

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Qimera Selection Movement Toolbar



- Qimera - Selection Movement Toolbar
  - Adjust Selection Geometry
  - Jump to Start
  - Step Backward
  - Play Backward
  - Pause
  - Play Forward
  - Step Forward
  - Jump to End
  - Step Interval

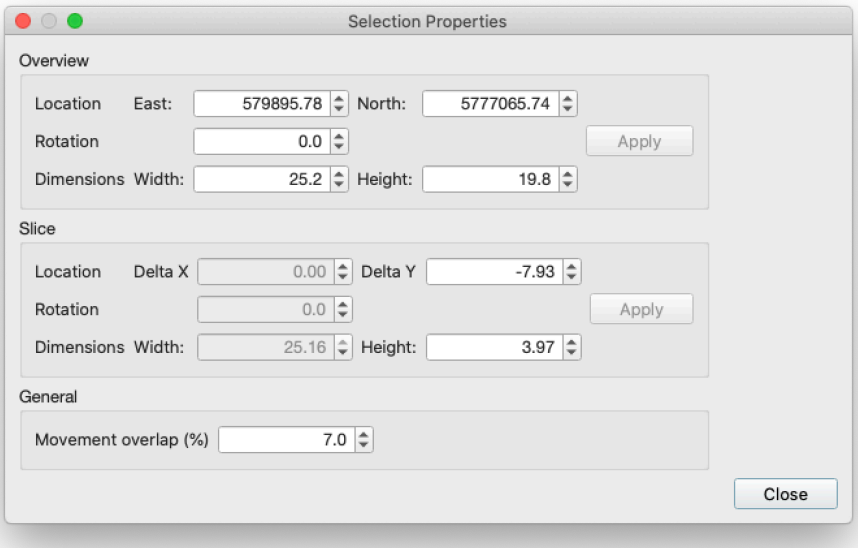
Qimera - Selection Movement Toolbar

This toolbar is used to control the properties of the different selection modes and to control movement of the selection in your scene. These actions work specifically with Rectangle, Free Slice, Fixed Slice and Scroll Line selection modes. See the page on the 4D Toolbar for more information on these selection modes.

 Adjust Selection Geometry

This button will show the Selection Properties Dialog shown below. This dialog allows you to manually configure the current selection properties. Depending on the selection type, different sections of this dialog will be enabled for user control. Remember that some selection modes consist of an Overview area in addition to a Slice area. The dialog below shows the properties of a Free Slice Selection. When you move the slice using the hot keys, the dialog will automatically update. To manually change any property, simply enter the new value and click the Apply button.

The *Movement overlap* setting changes the amount of overlap when advancing a selection using the movement keys. This temporarily overrides the movement overlap specified in the Qimera Preferences dialog. This setting is active until the current selection mode is turned off.




Jump to Start

This action is only available in Scroll Line selection mode. It will move the selection to the beginning of the scroll line.


Step Backward

This action is available for Rectangle, Scroll Line, Fixed Slice and Free Slice selection modes. It will move the selection or slice backward from the direction that it is facing. In any supported selection mode, the distance traveled is approximately 90% of the height of the selection or slice. If you are in Fixed Slice or Free Slice selection mode, the slice will be constrained by the overview area. If you are in Scroll Line selection mode, you will be constrained by the start of the line. You can also use the **S** hotkey to step backward.


Play Backward

This action is similar to Step Reverse above with the exception that it will step backward continually according to the time delay set in the Step Interval spin box. For Free Slice and Fixed Slice selection modes, it will be constrained by the selection overview. For Scroll Line selection mode, it will continue until it reaches the start of the line.

 Pause

This will pause Play Reverse and Play Forward actions.

 Play Forward

This action is similar to Step Forward below with the exception that it will step forward continually according to the time delay set in the Step Interval spin box. For Free Slice and Fixed Slice selection modes, it will be constrained by the selection overview. For Scroll Line selection mode, it will continue until it reaches the end of the line.

 Step Forward

This action is available for Rectangle, Scroll Line, Fixed Slice and Free Slice selection modes. It will move the selection or slice forward in the direction that it is facing. In any supported selection mode, the distance traveled is approximately 90% of the height of the selection or slice. If you are in Fixed Slice or Free Slice selection mode, the slice will be constrained by the overview area. If you are in Scroll Line selection mode, you will be constrained by the end of the line. You can also use the **W** hotkey to move forward.

 Jump to End

This action is only available in Scroll Line selection mode. It will move the selection to the end of the scroll line.

 Step Interval

Use this spin box to change the time delay for the Play Forward and Play Reverse modes.

Qimera Bathymetry Toolbar



- Qimera Bathymetry Toolbar
  - Project Management
    - New Project
    - Project Load
  - Data Management
    - Add Sonar Files
    - Add Points Files
    - Automatically Add Sonar Files
  - Processing and Settings
    - Processing Settings
    - Auto Process
  - Grid Creation
    - Dynamic Grid
    - Static Grid
  - Sounding Editing
    - Swath Editor
    - Slice Editor
    - 3D Editor
  - Instant Grid Tools
    - Instant Grid Reject
    - Instant Grid Accept
    - Instant Grid Filter

Qimera Bathymetry Toolbar

The Bathymetry Toolbar is the primary toolbar in Qimera that deals with Project Management, Data Management, Processing, Grid Creation and finally Sounding Editing.

Project Management


New Project

This will launch the Create Project Dialog for the creation of a new project.


Project Load

This will launch the Qimera Project Browser Dialog.

Data Management


Add Sonar Files

This will launch the Add Raw Sonar Files dialog, enabling the user to load supported sonar file formats to the project.


Add Points Files

This will launch the Add Processed Point Files dialog enabling the user to load supported processed point file formats to the project.


Automatically Add Sonar Files

This button will launch the Automatic Raw File Import dialog that allows Qimera to generate a Dynamic Grid during live acquisition operations.

Processing and Settings



Processing Settings

This will launch the Processing Settings dialog.



Auto Process

This will launch any required processing as determined by Qimera's Dynamic Workflow. See the section on Dynamic Workflow for more information on how Qimera determines whether files need to be processed or not. It will also update any dynamic grid with edits pending.

Grid Creation



Dynamic Grid

This will launch the Create Dynamic Grid dialog that will create a dynamic grid from the selected source data and optionally the selected rectangular area. A Dynamic Grid can be edited and reflects any changes to the underlying processed data.



Static Grid

This will launch the Create Static Grid dialog that will create a dynamic grid from the selected source data and optionally the selected rectangular area. A static grid cannot be edited.

Sounding Editing



Swath Editor

This will launch the Swath Editor on the selected line. If no line is selected, Qimera will select the first processed raw sonar file line.



Slice Editor

This will launch the Slice Editor on the selected Dynamic Grid using the current area selection. If no area is selected, Qimera will create a slice selection in the center of the selected Dynamic Grid.



3D Editor

This will launch the 3D Editor on the selected grid area.

Instant Grid Tools

This button offers one of three tools, Instant Grid Reject/Accept/Filter. These can be applied inside a polygon selection to the selected Dynamic Grid. Access to all tools are available from a menu shown with a long-click on the button.

The user should **be careful** as these tools can have unintended consequences. For example, if you make a large spatial selection in Instant Grid Reject mode on a Dynamic Grid, all soundings in the selection will be rejected instantly.



Instant Grid Reject

In the Instant Grid Reject mode all soundings within a polygon selection will instantly be rejected and the grid will be updated.



Instant Grid Accept

In the Instant Grid Accept mode all soundings within a polygon selection will instantly be accepted and the grid will be updated.

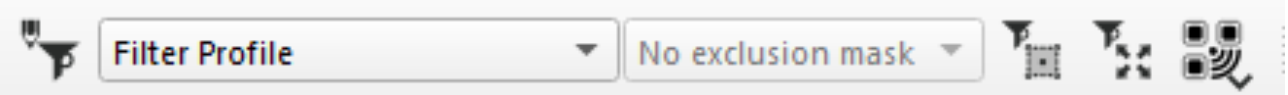


Instant Grid Filter

This will start the Instant Grid Filter mode which automatically applies the currently selected filter whenever the user makes a spatial selection.

Return to: Qimera Interface
Return to: Qimera Table of Contents

Qimera Filter Operation Toolbar



- Qimera - Filter Operation Toolbar
  - Manage Filter Profiles
  - Filter Profile to be Run
  - Exclusion Mask
    - Spline Filter Preset
    - Other Operations
    - Custom Profiles
  - Files to be Filtered
  - Run Filter Profile Buttons
    - Run Filter Profile Inside Selection
    - Run Filter Profile Everywhere
  - Filter By System

Qimera - Filter Operation Toolbar

This toolbar is the primary interface for interacting with Qimera's powerful filter operations. This is done by constructing, managing and choosing filter profiles, while specifying how each should be run. Filter profiles can be run in three different ways: directly from the toolbar, from within the slice editor, or from a selection of files in the Project Sources Dock. All files within the active dynamic grid are considered for filtering. The active dynamic grid is the currently selected dynamic grid, or if no dynamic grid is selected, the only visible dynamic grid. If you want to filter specific files, select those files in the Project Sources Dock and use the right-click context menu to bring up the Run Sounding Filter on Selected Files dialog.

 Manage Filter Profiles

This button launches the Manage Filter Profiles dialog. This dialog allows you to create, delete, and edit custom filter profiles.

Filter Profile to be Run

This drop down specifies which filter profile is active. This selection is used when filtering via both the toolbar and the slice editor.

It displays several commonly used filter profiles, as well as any custom filter profiles you may have created.

Exclusion Mask

This drop down will contain all of the SD scene objects that are closed lines. Use this drop down to prevent the selected filter from operating in an area. For example, let's say you have 2 wrecks that you want to protect from any filtering. You could create an exclusion mask using one of the area selection tools to select around one of the wrecks. Then with the right-click context menu of the scene, use the *Create Line Object From Current Selection* option and name it. The new line object will now appear in the *SD Objects* node of the Project Layers Dock. Now select an area around the second wreck. Then right-click the SD Object that you created and select *Add Selection to Line Object* from the context menu. You now have a "mask" that you can use during filtering that will protect both wrecks. Combining an Exclusion Mask with a specified selection is a powerful way to control where your filter will run on your data.

Spline Filter Preset

Qimera includes 5 preset spline filter profiles, ranging from very weak to very strong. These work by first fitting a 3D spline to a local set of soundings, and then rejecting points that lie too far from that spline. The Very Weak Spline preset is very conservative and rejects only significant outliers. The Very Strong Spline preset is much more aggressive in removing soundings. For more information on the spline filters, see the description of Filter Using Grid Spline (Preset).

Other Operations

These are a handful of common operations that users may wish to execute on their soundings.

- **Reject All Soundings**: Rejects all soundings within the selected area, regardless of their properties. This is useful primarily for cropping unwanted areas out of a survey.
- **Accept All Soundings**: "Unrejects" all soundings within the selected area. This clears any filtering, undoes any manual rejection and potentially ignores blocking. This does not affect additional soundings.
- **Reject Additional Soundings**: Rejects all "additional soundings" within the selected area. Additional soundings are soundings that some echosounders report above and beyond the usual numbers provided by their bottom detection algorithms. For Kongsberg Maritime

echosounders, these are called Extra Detection's. For Teledyne-Reson echosounders, these are called Multi-Detect.

- **Accept Additional Soundings**: Accepts all "additional soundings" within the selected area.
- **Revert All Manual Edits**: Clears the Manual Edit flag on all sounding within the selected area. This may cause manually accepted soundings to be rejected or manually rejected soundings to be accepted, depending on the state of other flags.
- **Revert All Filtering**: Clears the Filtered flag on all sounding within the selected area. This may cause soundings previously rejected by a Filter operation to be accepted, depending on the state of other flags.

Note that filters run from the Filter Toolbar will set the 'Filter' bit in the QPD when rejecting points. By doing so, we can differentiate these rejected soundings from soundings rejected via manual editing in the Swath, Slice and 3D Editors (these set the 'Manual Edit' flag). This allows you to apply and revert filters using the filter toolbar without being worried about losing any manual editing that may have been done.

Custom Profiles

These are the profiles which were created (or imported) via the Manage Filter Profiles dialog.

Files to be Filtered

All files within the active dynamic grid are considered for filtering. The active dynamic grid is the currently selected dynamic grid, or if no dynamic grid is selected, the only visible dynamic grid. If you want to filter specific files, select those files in the Project Sources Dock and use the right-click context menu to bring up the File Filtering Dialog.

Run Filter Profile Buttons

There are three buttons that can be used to execute the active filter profile on the chosen files: inside selection, outside selection, and everywhere. All three will launch a background job. Once completed, the dynamic grids (if any) will automatically update.

These actions are disabled during point editing.

 **Run Filter Profile Inside Selection**

Executes the active filter profile on the chosen files for soundings falling within the current spatial selection.

 **Run Filter Profile Everywhere**

Executes the active filter profile on the chosen files for all soundings regardless of any selection.

 Filter By System

This button presents a list of all systems that can be filtered. Within this list, you can selectively activate or deactivate the filtering for individual systems.

Qimera Scene Editor Toolbar



- Qimera Scene Editor Toolbar
  - Show Soundings
  - Scene Point Size
  - Scene Point Color

Qimera Scene Editor Toolbar

The Scene Editor Toolbar provides controls for the display of points by editors in the Scene. Editors and tools that display points in the Scene include Swath Editor, Slice Editor, Patch Test, and Wobble Analysis. These options are only available when one of the tools or editors is enabled. The most recent settings are remembered separately for each editor.

 Show Soundings

This option will show or hide the soundings in the Scene.

 Scene Point Size

This option will change the point size drawn in the Scene. This has the same options as the plots (sizes between Small and XX-Large) with the addition of a Match Plot option. When Match Plot is selected it will match the Size option you select for the plot and will automatically update with changes to the plot option.

A single click will cycle through the options, or a long mouse click will display a menu to pick from.

 Scene Point Color

This option will change the Color By mode for the Scene. This has the same options as the plot toolbars in the Swath Editor and Slice Editors. These options include: Match Plot, Vessel (shows default port/starboard color), File, System, Ping, Beam, Selection Depth (scaled to depth range of the plotted points in the Scene), Grid Color Map (depths colored by the color map of the currently selected Dynamic Grid), Intensity, Horizontal TPU, Vertical TPU, and Solid Color. For LAS/LAZ files, there are also color by options for RGB and

Classification. When Match Plot is selected it will match the Color By option you select for the plot and will automatically update with changes to the plot option. If color by Line is used, you will see the color swatches appear next to the line name in the Project Sources Dock.

A single click will cycle through the options, or a long mouse click will display a menu to pick from.

Return to: Qimera Toolbars

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Qimera Specialized Tools

Qimera has a number of specialized tools that launch as separate dialogs instead of docking windows. Some of these tools allow interaction with the 4D Scene during operation and others run as modal operations. Qimera also allows plug-in tools which will grow over time and be individually downloadable by the user. At a future revision, QPS will publish the plugin SDK specification for Qimera so that users can write their own tools like they could with FM Geocoder Toolbox and FM Midwater.

- Qimera 3D Editor
- Qimera Cable/Pipe TOP Detection Tool
  - Qimera TOP Detection Settings Dialog
- Qimera Coverage Extinction Plot
- Qimera Cross Check
- Qimera Dynamic Grid Shifting Tools
  - Qimera Adjust Static Horizontal Shift Tool
  - Qimera Adjust Vertical Shifts Tool
  - Qimera Heave/Swell Removal Tool
  - Qimera Line Height Matching Tool
  - Qimera Static Horizontal Shift Tool
  - Qimera Static Vertical Shift Tool
  - Qimera Varying Vertical Shift Tool
- Qimera Instant Grid Filter
- Qimera Navigation Editor
- Qimera Patch Test
- Qimera SVP Editor
- Qimera Vessel Editor
- Qimera Wobble Analysis

Return to: *Qimera Interface*

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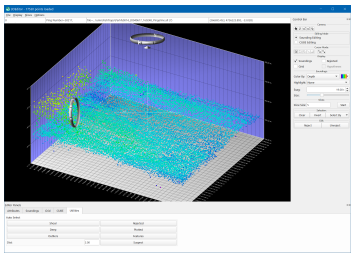
Qimera 3D Editor



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    - Camera Group
    - Editing Mode Group
    - Display Group
    - Soundings Group
    - Slices Group
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      - Select Sounding
      - Select Ping
      - Select File
      - Deselect Sounding
      - Deselect Ping
      - Deselect File
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        - Clear
        - Invert

- Edit Menu
  - Override Hypotheses
  - Reset Hypotheses
  - Delete Hypotheses
  - Undelete Hypotheses
- Hide Menu
  - Hide Selected
  - Hide Unselected
  - Unhide All
- Re-CUBE
- CUBE Panel
- Creating a Custom Hypothesis
- Shortcuts

How to Start

-  button on the Bathymetry Toolbar
- *3D Editor* option from *Dynamic Grid* menu of the Main Menu Bar

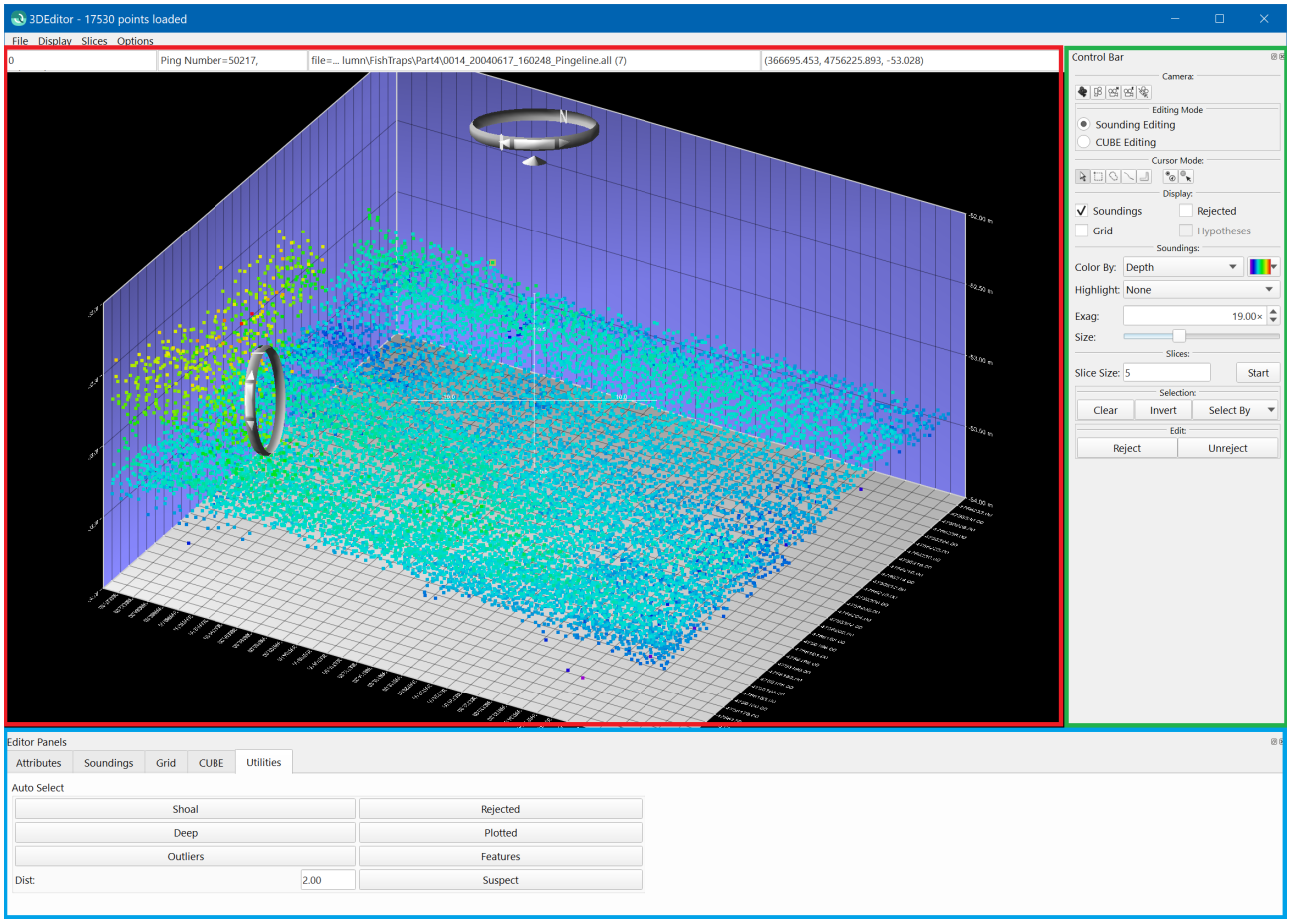
What it Does

This tool allows you to visually edit soundings from a selected area on a Dynamic Grid.

General Description

The general layout of the 3D Editor contains the following components:

- Main Visualization Window (red)
- Control Bar (green)
- Editor Panels (blue)



Main Visualization Window

The Main Visualization Window of the 3D Editor displays the soundings from the QPD files that are being edited. The unedited soundings will be displayed as a set of small cubes that are colored by height. To navigate around the display, the same widget-based interface as Fledermaus is used.

Outside of the soundings shown in the Main Visualization Window is a blue, 3-dimensional grid that represents the boundaries of the loaded data. The Eastings and Northings are displayed along the bottom of the data and in Geographic coordinates, the longitude and latitude are shown.

When the mouse is moved, the sounding located closest to the mouse cursor becomes highlighted and information pertaining to it is displayed at the top of the window. The displayed information includes the ping, beam, line, file, and coordinates. (If the project has an active route, the KP and DX of the sounding will also be shown.) To prevent the sounding information from being constantly updated as the mouse is moving, double-click the left mouse button to lock the currently highlighted sounding. Double-clicking a second time will unlock the sounding.

The 3D Editor contains five modes: Explore, Select, Area Select, Ping Select, and Measure. Each one of these modes can be activated from the Control Bar.

Switching into Select or Area Select mode, and then clicking the left mouse button selects points. Once selected, a white cross will appear over a sounding to indicate that it has been selected. Note that the title bar displays the total number of points being viewed, and the box at the top left of the screen displays the number of selected soundings.
Ping Select mode allows selecting and deselecting whole pings at a time (i.e. one entire ping). To deselect a set of points, hold down the Shift key while clicking or dragging with the left mouse button.

To measure the distance between two soundings, switch into Measure mode and click the left mouse button on the first sounding to measure from. Moving the mouse to another sounding in the display will cause a line to be drawn between the soundings in the Main Visualization Area and the distance in meters will be displayed in the upper left corner of the interface. The compass angle and the angle of declination between the soundings will also be displayed in the upper left corner. Click the left mouse button again to start another measurement.

The following table describes the usage of the three mouse buttons in the available modes. The Explore mode is set as the default.

Modes	**Left MB**	**Control + Left MB**	**Shift + Left MB**	**Middle MB**	**Right MB**
Explore	Pick and drag grid to rotate about either a horizontal or vertical axis.			Move around the scene, and zoom in if mouse moved away from you, or zoom out if mouse moved towards you.	Show right-click menu
Select	Single click to select the highlighted point; drag to select a box shaped area.	Single click to deselect the highlighted point; drag to deselect a box shaped area.	Pick and drag grid to rotate about either a horizontal or vertical axis.	Same as Explore	Same as Explore

Modes	Left MB	Control + Left MB	Shift + Left MB	Middle MB	Right MB
Area Select	Single click to highlighted point; drag to select an irregular area.	Single click to deselect the highlighted point; drag to deselect an irregular area.	Pick and drag grid to rotate about either a horizontal or vertical axis.	Same as Explore	Same as Explore
Ping Select	Single click to select the ping (swath) that the highlighted point is a part of; drag to select all pings that contain a point in the box.	Single click to deselect the ping (swath) that the highlighted point is a part of; drag to deselect all pings that contain a point in the box.	Pick and drag grid to rotate about either a horizontal or vertical axis.	Same as Explore	Same as Explore
Measure	Single click to start measurement. Single click again to stop measurement.			Same as Explore	Same as Explore

Selecting Soundings using Select Mode

Depending upon the flags set for a sounding, it will appear as a different symbol in the Main Visualization Window. How the different soundings appear can be controlled using the Soundings Panel in the Editor Panels or the Control Bar.

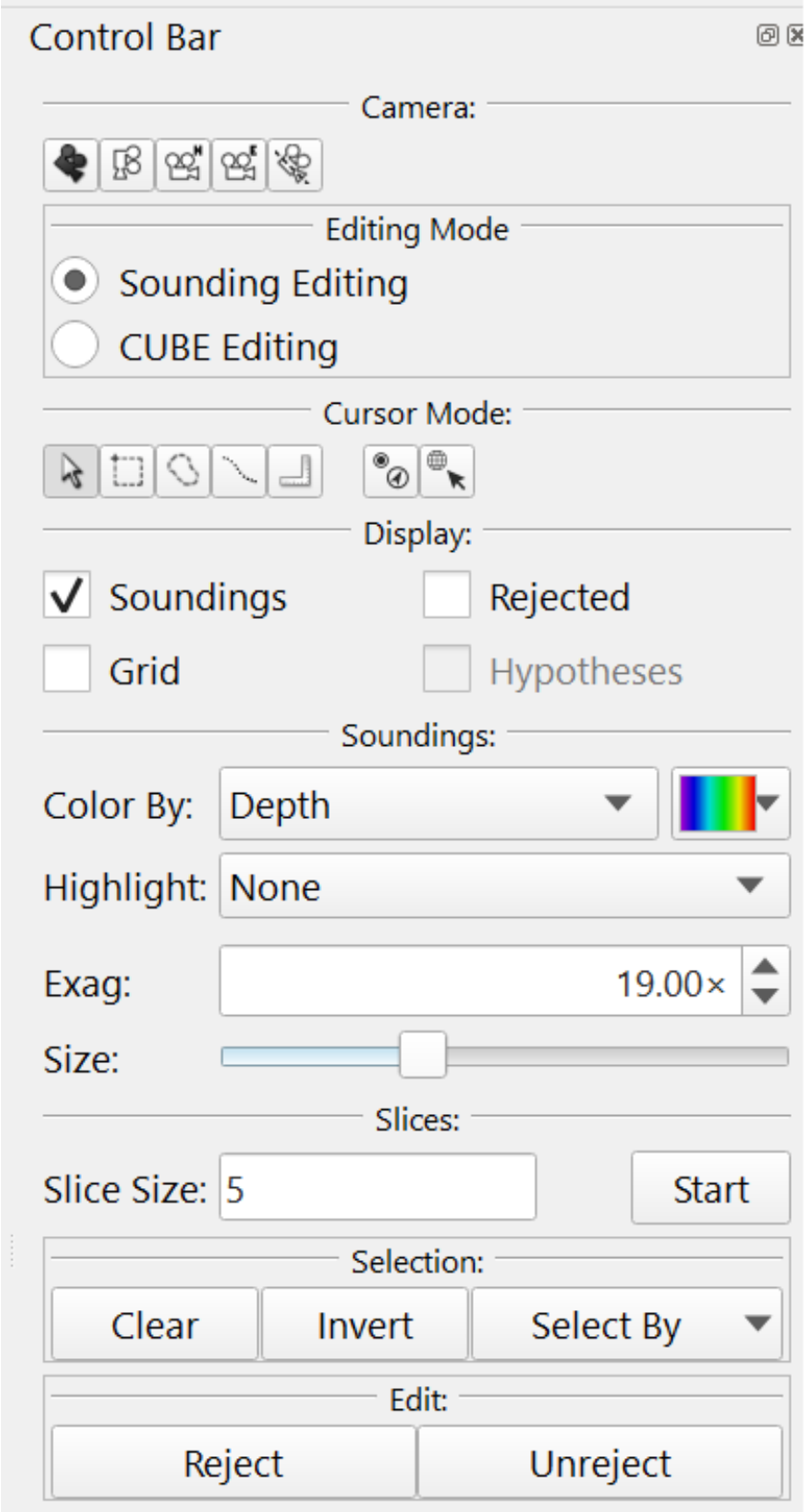
The following table lists all sounding classes in order of priority and lists the default display attributes.

Sounding Type	Default Display Attributes
Deleted	Red Diamond

Sounding Type	Default Display Attributes
Feature	White Cylinder
Plotted	Outlined box colored by depth
Normal	Box colored by depth
Suspect	Yellow Diamond
Additional Sounding	Teal Sphere
User Additional Sounding	Green Sphere

Control Bar

The Control Bar on the right side of the interface is used for controlling the view, editing mode, sounding display, and for simple editing.



Camera Group

The buttons located at the top of the Control Bar allow control of the Camera:

? Unknown Attachment The Reset button will return the viewpoint to the initial position.

? Unknown Attachment The Plan button locates the viewpoint directly above the data.

? Unknown Attachment The North button will allow viewing of the data towards the north.

? Unknown Attachment The East button will moves the camera so it is looking east.

? Unknown Attachment Clicking the Slope button will try to orientate the view so that it is looking along the slope of the data. This option is useful if the data is roughly planar, as the outliers will typically lie aboves or below the slope of the data.

The different cursor modes are described in the previous section on the Main Visualization Window. The four available modes are as follows:

? Unknown Attachment Explore Mode

? Unknown Attachment Select Mode

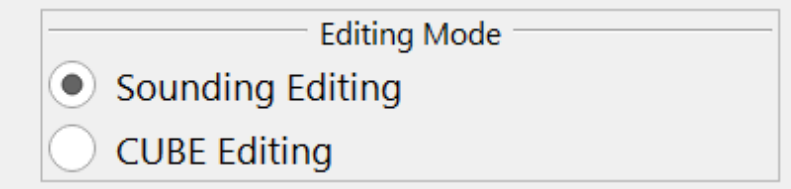
? Unknown Attachment Area Select Mode

? Unknown Attachment Ping Select Mode

? Unknown Attachment Measure Mode

Editing Mode Group

To view the Cube hypotheses in the 3D Editor, click the Cube Editing toggle. See also the Editing CUBE Hypotheses chapter.

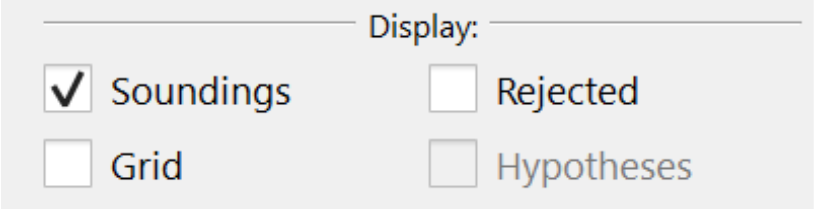


Display Group

The Display group controls which items are visible in the Main Visualization Window. If the Soundings toggle is enabled, all non-rejected soundings are displayed on the screen. If the Rejected toggle is set, all soundings that have been rejected are drawn (these soundings are usually drawn as red diamonds).

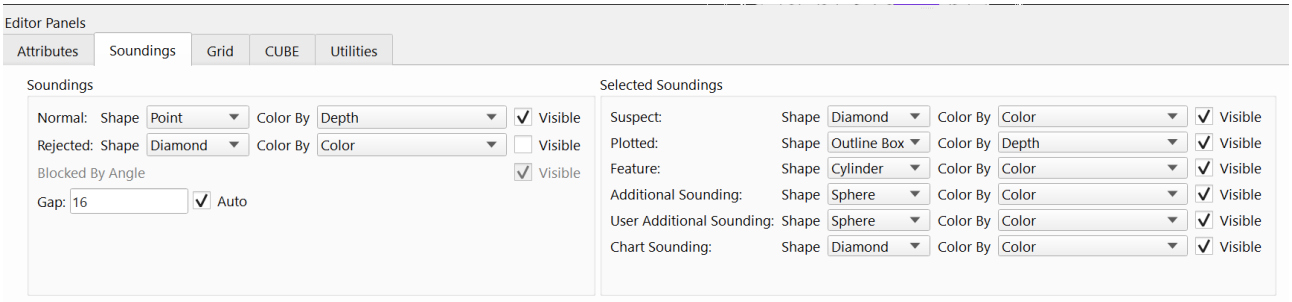
If the Grid toggle is enabled, then the grid is drawn.

If the Hypotheses toggle is enabled, then the Hypotheses are shown while in CUBE Editing mode. (This option is grayed out if there is no CUBE grid).



Soundings Group

The Soundings group allows configuration of various properties of the displayed soundings in the Main Visualization Window. Use the Color By menu to control how non-rejected soundings are displayed on the screen. Additional Soundings and User Additional Soundings will display options is an exception in that it will override rejected soundings display options. The additional soundings display is for soundings that are flagged as additional sounding returns for a beam. The user additional soundings display is for soundings that are flagged as user additional sounding which commonly comes from doing water column picking in Qimera.



Color By Options are listed below. Some of these will allow the colormap to be selected, adjusted for a specific range, or edited. This can be done using the colormap button to the right of the Color By menu.

- Depth
- grid Colormap
- Color
- Ping Counter (`File Unique Ping Identifier`)
- Ping Number (`Source Ping Identifier`)
- Beam
- File
- Horizontal Uncertainty
- Vertical Uncertainty
- Checked
- Custom Hypo. Flag

- Additional Sounding
- User Additional Sounding
- Tide
- System
- Intensity

Highlight Options:

- None
- Checked

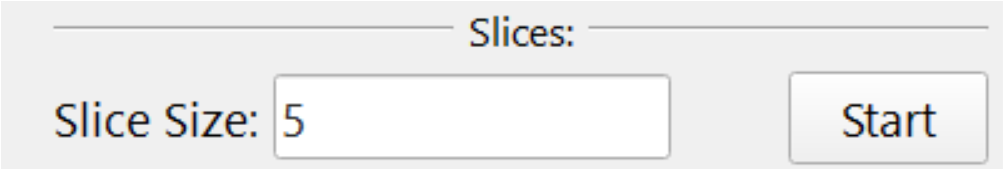
The Highlight By menu allows drawing all soundings that match a certain flag as a lighter color.

The Exaggeration allows exaggerating the height ratio (1.00x represents 1:1 height ratio).

The Size slider controls how large the points are drawn on the screen.

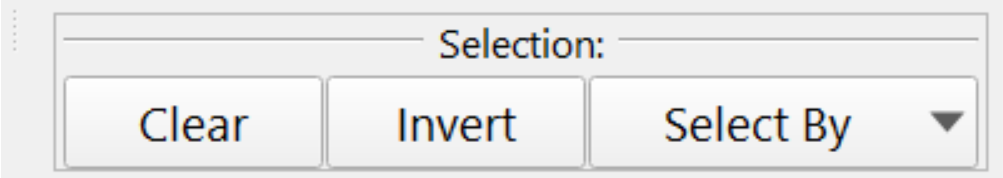
Slices Group

The Slices group allows traversing the scene in slices. See also the slice-based editing chapter.



Selection Group

The current selection can be cleared by clicking the Clear button. To invert the selection (deselect all selected points and select all previously unselected points), click the Invert button. Some extra options for selecting soundings can be accessed by clicking the Select By button. Selecting any of the menu options that correspond to flags (i.e. Modified, Plotted, etc.), will select all soundings in the editor that have that flag set (Certain menu options are grayed out because they do not pertain to the QPD format).



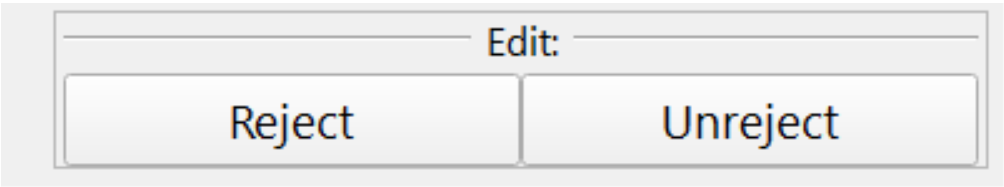
Select By Options:

- Rejected
  - Manually Rejected
  - Filtered Rejected

- Modified
- Checked
- Suspect
- Plotted
- Feature
- Custom Hypo. Flag
- Additional Sounding
- User Additional Sounding
- Shoal
- Deep
- Outliers
- Blocked Relative Depth
- Blocked Range
- Blocked Angle
- Blocked Heave
- Blocked Exclude Beams
- Failed Brightness
- Failed Co-linearity
- Despiked
- Reduced
- Blocked TPU Horizontal
- Blocked TPU Vertical
- Blocked Quality
- Blocked Nadir
- Blocked Across Track
- Blocked Absolute Depth
- Blocked Intensity
- Spline Filtered

Edit Group

Once a selection has been made with the mouse, the selected points can be marked as invalid by clicking the Reject button. Note that the rejected points are not actually removed from the file but a flag is set. To view the rejected points, click the Rejected toggle in the Mode group. The rejected soundings can then be selected with the mouse and undeleted by pressing the Unreject button.



Right-Click Menu

The right-click menu can be accessed by right-clicking on the Main Visualization Window. The Control Bar can be used for simple rejecting and unrejecting of data, but to set other flags (plotted, feature, suspect, etc.), the right-click menu must be used.

Select

The Select Menu gives different options on how to automatically select soundings. Note that some operations have shortcut keys that are listed to the right of the menu item.

Select Sounding

Clicking the Select Sounding menu option will select the highlighted point.

Select Ping

Clicking the Select Ping menu option will select the whole ping that contains the highlighted point.

Select File

The Select File menu option will selects all soundings that have the same file as the highlighted sounding.

Deselect Sounding

The Deselect Sounding menu options will deselect the highlighted point.

Deselect Ping

The Deselect Ping menu option will deselect the whole ping that contains the highlighted point.

Deselect File

The Deselect File menu option will deselect all the soundings that have the same file as the highlighted sounding.

Clear

The Clear option is identical to the button on the Selection Group and is only located here for convenience.

Invert

The Invert option is identical to the button on the Selection Group and is only located here for convenience.

Edit Menu

The Edit Menu is the primary tool for setting flags in the 3D Editor. Typically, you would first make a selection and then choose one of the options from the Edit Menu. If no soundings are selected when an Edit option is chosen, the operation will be applied to the highlighted sounding.

For example, to **quick reject/unreject** a single bad point, ensure no points are selected. Highlight the point by moving the mouse over it, then right-click and select **Edit > Reject/ Unreject**. You can also use the shortcut key "**r**" to quickly **reject** the highlighted point. Similarly, to **unreject** a point, press "**u**" after highlighting it.

Reject

The Reject menu options is identical to the Reject button on the Edit Group

Unreject

The Unreject menu options are identical to the Unreject button on the Edit Group

Set Suspect

The Set Suspect menu option will mark the selected or highlighted sounding(s) with a suspect flag.

Set Plotted

The Set Plotted menu option will mark the selected or highlighted sounding(s) with the plotted flag.

Set Feature

The Set Feature menu option will mark the selected or highlighted sounding(s) with the feature flag.

Clear Suspect

The Clear Suspect menu option will clear the selected or highlighted sounding(s) of the suspect flag.

Clear Plotted

The Clear Plotted menu option will clear the selected or highlighted sounding(s) of the plotted flag.

Clear Feature

The Clear Feature menu option will clear the selected or highlighted sounding(s) of the feature flag.

Hide Menu

The Hide menu can be used to temporarily hide some of the soundings in the display so that other soundings can be viewed more easily. For example, an operator may wish to view just one line or one file at a time. Hiding a sounding makes no changes to the actual file and soundings will remain hidden only as long as the current editor session is open. To view one file at a time, highlight a sounding that is part of that file, click Selection > Select File, and then Hide > Hide Unselected.

Hide Selection

Hides all selected soundings.

Hide Unselected

Hides all unselected soundings.

Unhide All

Unhides all soundings.

Set/Clear Custom Hypothesis

Sometimes an operator may wish to identify a sounding as the chosen height of the grid. See also the Editing-CUBE-Hypotheses chapter.

Re-CUBE

The Recube menu option re-runs the Cube algorithm on the current area being edited.

Menus

File Menu

The File menu is used to save changes, close the 3D Editor, move the visible area, and capture current content as an image of point object. The Move options can be used to systematically scan through the data. The rotate Anticlockwise and rotate Clockwise can be used to rotate the loaded area. To prevent the z range from changing while scanning through data, see the Lock Z Range option on the Options menu.

Save

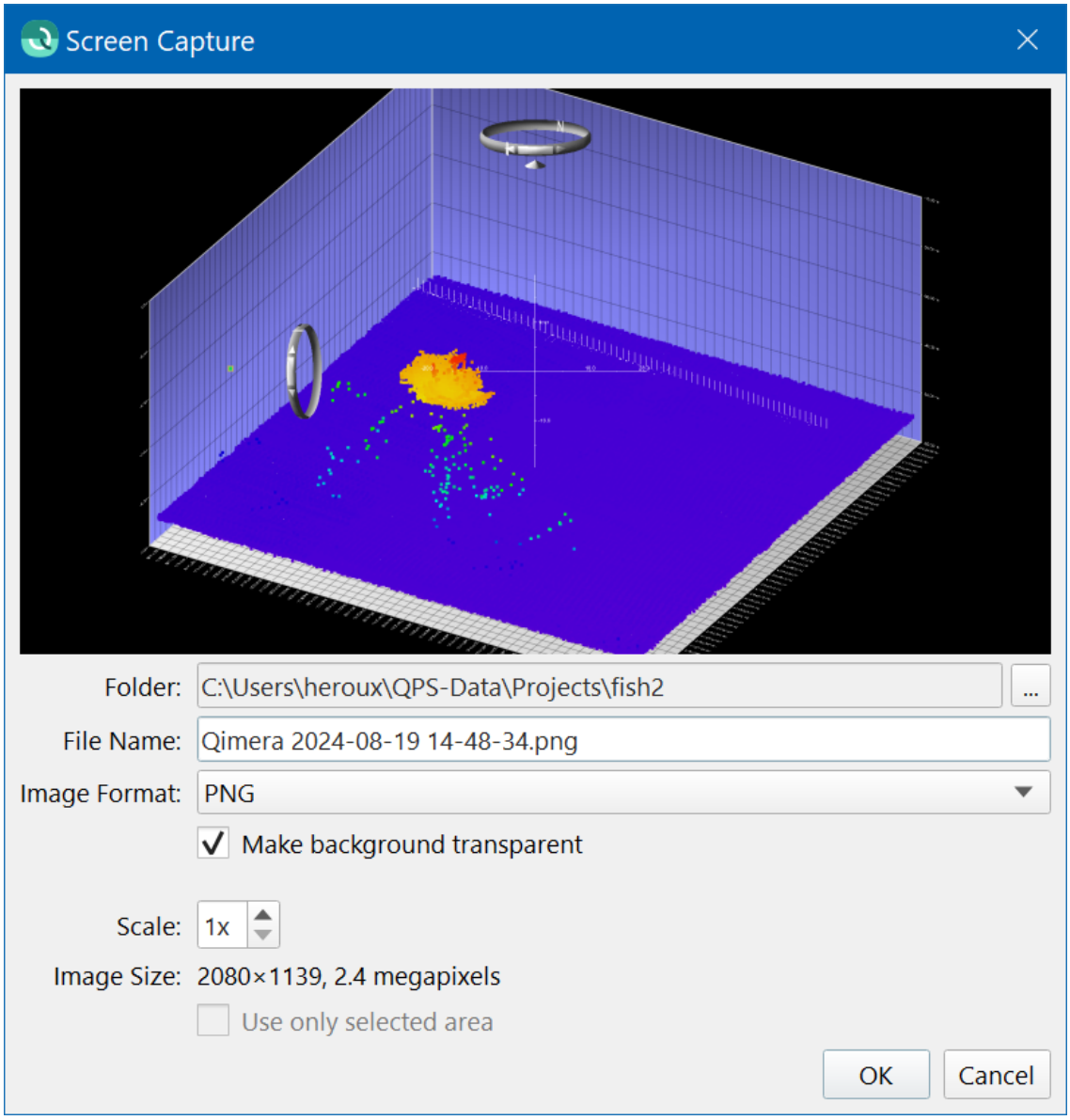
After changes have been made, the Save menu option must be clicked to write the changes to the disk. This will update the grid being displayed in the main Qimera window.

Save and Exit

Save And Exit command saves any changes and then closes the editor. This will update the grid being displayed in the main Qimera window.

Screen Capture

The Screen Capture menu option will bring up the following dialogue,



This gives the ability to take a screen capture of the current 3D Editor at the preferred scale factor and image format and save it to the desired location.

Save Snapshot

The Save Snapshot menu option will create a point object from the soundings displayed and save it to the current Qimera Project in the SD folder. It will also automatically add that object to the Qimera Project Layers. If no soundings are selected it will export all visible soundings in the 3DEditor. If there are soundings selected, it will only export the soundings that are selected.

Exit

The Exit button will close the editor and you will be prompted to save any unsaved changes.

Display Menu

The Display menu controls which items are displayed in the Main Visualization Window.

Show Grid

The Show Grid menu option controls whether the blue fence is displayed around the data points.

Show 3D Grid

The Show 3D Grid menu option controls whether the base of the grid is displayed.

Show Plane

The Show Plane menu option controls whether the base of the grid is displayed.

Show Stalks

The Show Stalks menu option controls whether the lines from each sounding to the base of the grid is displayed.

Show Coordinates

The Show Coordinates menu option controls whether the X, Y, and Z labels are shown along the edges of the grid.

Show Widgets

The Show Widgets menu option controls whether the interaction widgets is displayed.

Show Rulers

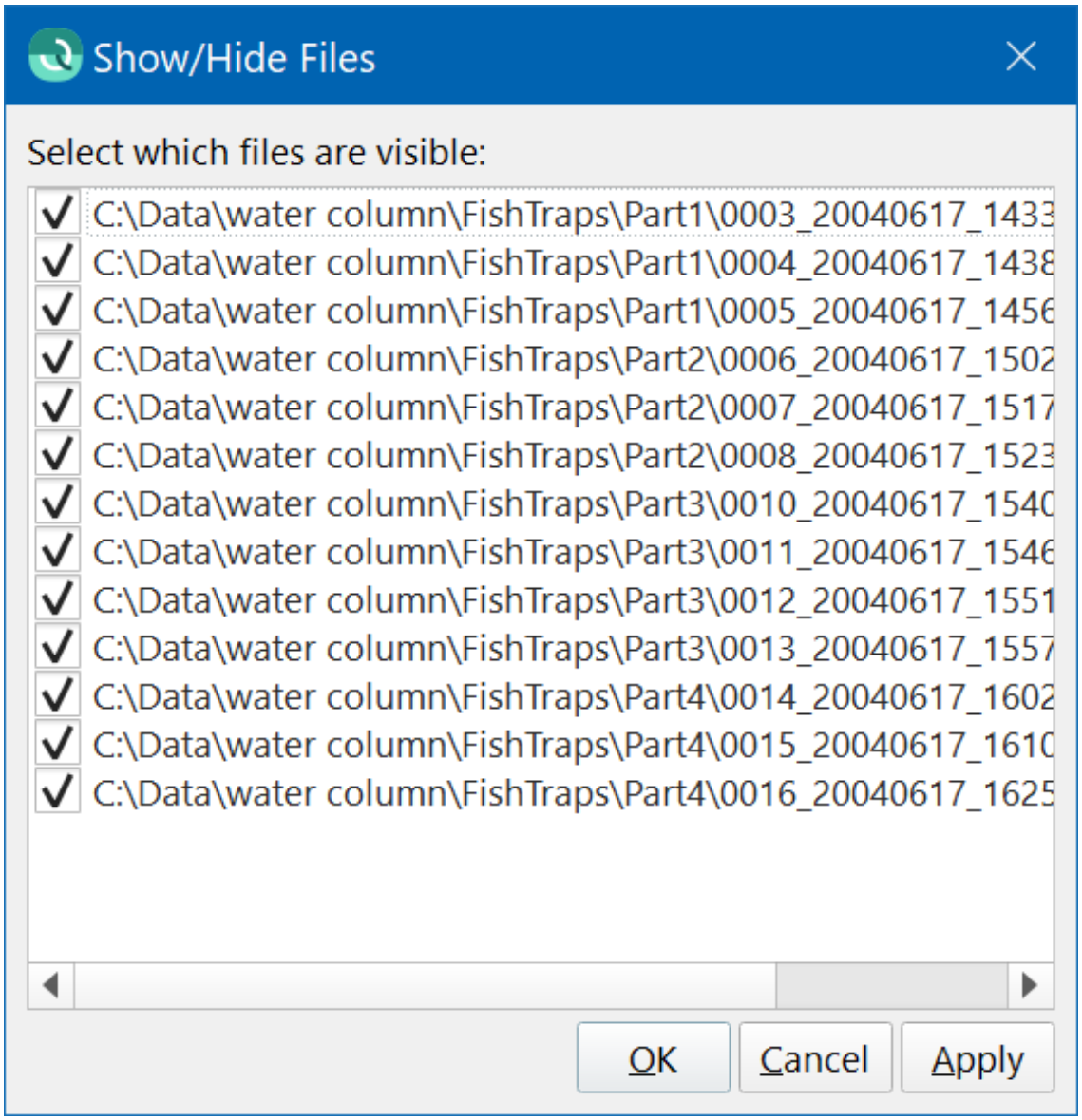
If the interaction widget is visible then the Show Rulers menu option controls determines whether the axes labels are shown.

Show Angles

If the interaction widget is visible then the Show Angles menu option controls determines whether the direction angles are shown.

Show/Hide Files

The Show/Hide Files menu option displays the following dialog.



This dialog shows a list of all files that have soundings loaded in the editor. Check or uncheck the box beside each item to show or hide that item. The Apply button performs the operation without closing the dialog. The OK button applies the operation and closes the dialog and the Cancel button cancels the operation.

Slices Menu

The Slices Menu allows viewing just a portion of the points that are loaded in the 3D Editor. See also the Slice-Based Editing chapter.

Start Slice

Click Start Slice menu option to enter slice-editing mode.

End Slice

Click End Slice menu option to leave slice-editing mode

Next Slice

Click Next Slice menu option to advance to the next slice.

Previous Slice

Click Previous Slice menu option to to return to the last slice.

Options Menu

The Options Menu can be used to control the current interface.

Save Current Interface

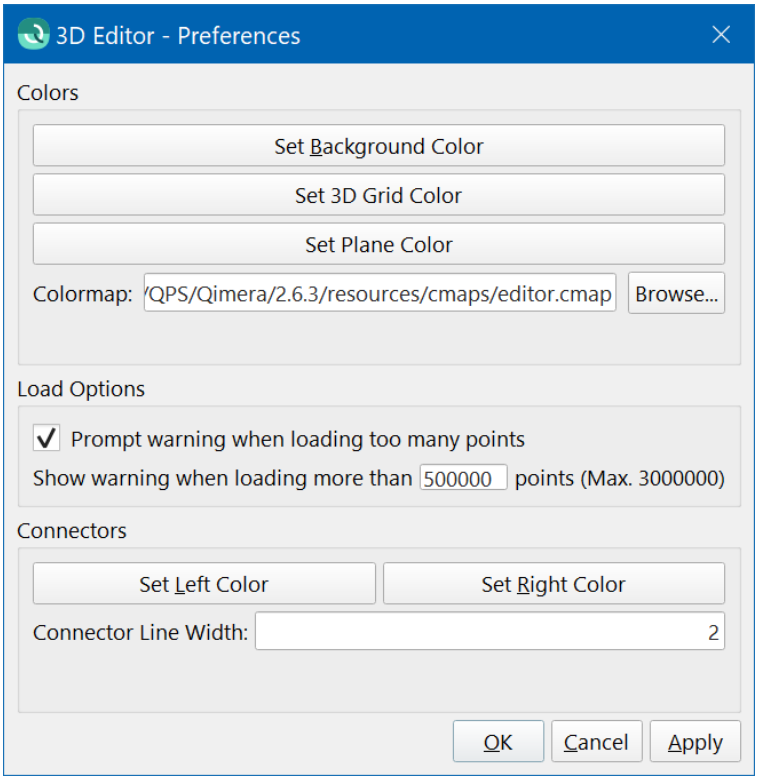
The Save Current Interface menu option writes the current state of the interface to a preference file. The next time the 3D Editor is loaded, the interface will be configured the same as when saved. Included in the current state of the interface is the shape and color of each type of sounding, all display options, background color, and current color map. For example, if you wish the interface to draw soundings with spheres, make the change and select Options > Save Current Interface. Then, every time the editor is loaded, the soundings will be drawn using the desired shapes.

Reset Interface

The Reset Interface menu option returns the interface to the original set of options. Save Current Interface must be selected again to make the changes permanent.

Preferences

The Preferences menu option will bring up the following dialog to change 3D Editor preferences



By clicking the Set Background Color button, a new background color can be selected for the editor using a Standard Color Picker. By clicking the Set 3D Grid Color button, a new 3D grid color can be selected for the editor using a Standard Color Picker. By clicking the Set Plane Color button, a new plane color can be selected for the editor using a Standard Color Picker. Enter a Color map to use when coloring soundings in the Color map field, or select one using a file dialog box by pressing the Browse button.

Toggle on the warning for loading too many points to enable or disable the warning. Also set the number of points for which the warning is shown up to a maximum of 3 million points. If attempting to load more than 3 million points the warning will be shown whether the prompt warning is enabled or not. Basically, 3D Editor stops counting at 3 million points. However, you can still choose to proceed.

Colors for the connectors can also be chosen by clicking on the Set Left Color or Set Right Color buttons (the default is green and red). Adjust the width of connector lines by entering a new value in the Connector Line width text field. Press Apply to apply the selected preferences or OK to apply the preferences and close the dialog. Clicking Cancel will dismiss the dialog without making changes.

Lock Z Range

When the Lock Z Range toggle is enabled, the 3D Editor will not automatically adjust the displayed z range depending upon the data range. Actually, the displayed range may increase if data is loaded outside of the range, but the range will not decrease. This option is useful for comparing different areas in the 3D Editor. When used with the Move

Forward/Backward/Right/Left options on the File menu, the z range will not jump to fit the data. Click the Lock Z Range toggle to turn this option on or off.

Lock Exag

The Lock Exag menu option toggle locks the current exaggeration factor.

Control Bar

The Control Bar menu option toggle controls whether theControl Bar is shown or hidden.

Editor Panels

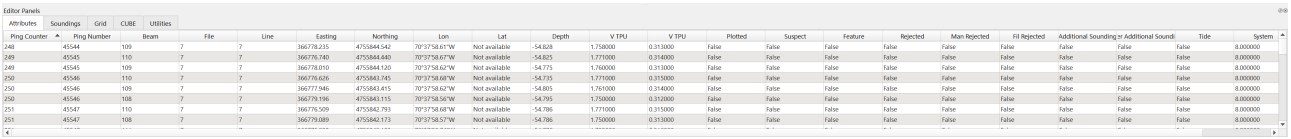
The Editor Panels menu option toggle controls whether the Editor Panels are shown or hidden.

Editor Panels

The Editor Panels are a set of tabs along the bottom of the screen. These tabs are only for advanced editing as most of the editor functionality is contained in the Control Bar and the Right-Click Menu.

Attributes Panel

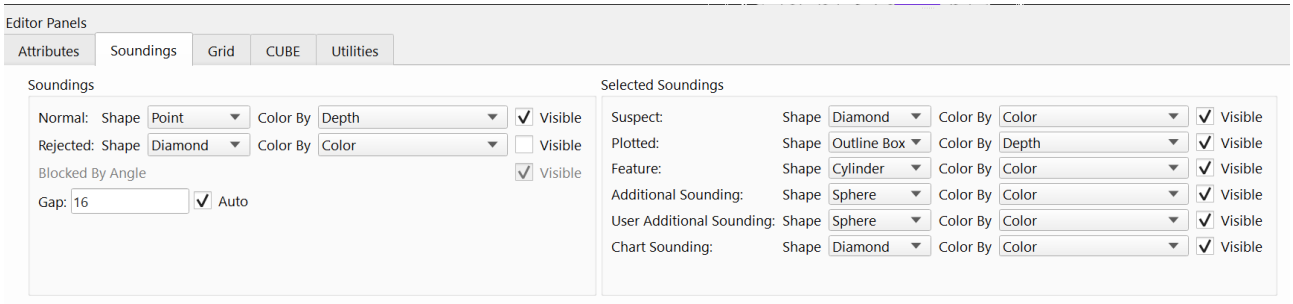
The Attributes Panel displays a table of all currently selected soundings. This table includes all of the information stored in the QPD files for each sounding. When a sounding is selected in the table, it is displayed in a highlighted color and is also highlighted in the Main Visualization Window. To sort the table in ascending or descending order, the headings of the different columns can be clicked with the mouse. Note that to prevent the selected soundings in the Main Visualization Window from changing as the mouse moves, the window can be double-clicked to lock the selection. Also any Horizontal or Vertical TPU values are represented as 95 percent Confident Interval values.



Soundings Panel

The Soundings panel allows control of how different soundings are displayed. The Gap text field indicates the point gap used when exploring the grid and the Auto toggle informs the ShiftScapeTM rendering engine to automatically adjust the gap. There are two main sounding classes: rejected and normal (not rejected), as well as four selected sounding classes: suspect, plotted, feature, additional sounding and user additional sounding. The shape, color, and visibility of each sounding class can be controlled separately. Each sounding can either be displayed as a box, point, sphere, diamond, cylinder, or outlined

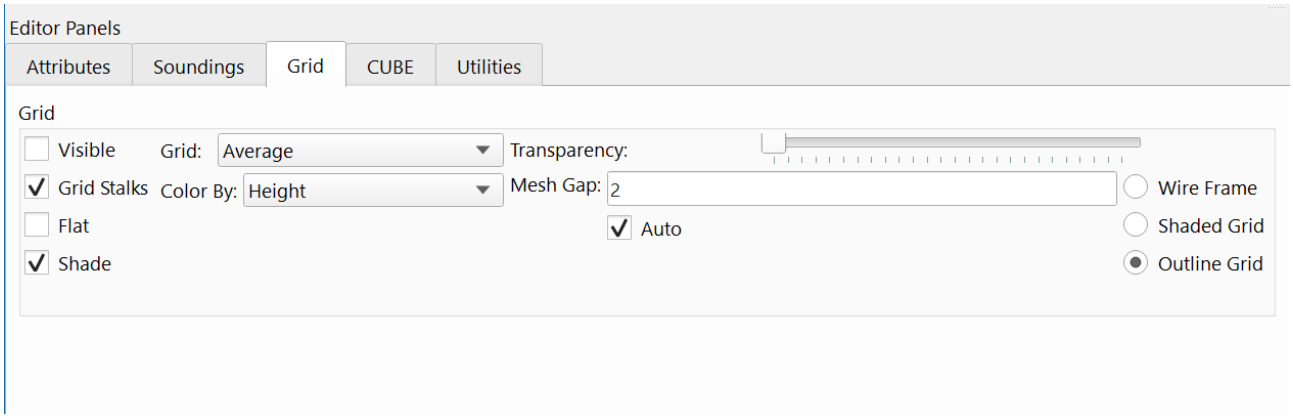
box. For large data sets, displaying soundings as points may be faster than the other shapes. A variety of coloring methods also exist including coloring by depth, solid color, Ping Counter (`File Unique Ping Identifier`), Ping Number (`Source Ping Identifier`), beam, line, file, modified, checked, tide, system, intensity, and heave offset. Blocked By Angle will hide all rejected soundings that are flagged as Blocked by Angle. This helps reduce the number of rejected soundings shown at once in the editor.



Grid Panel

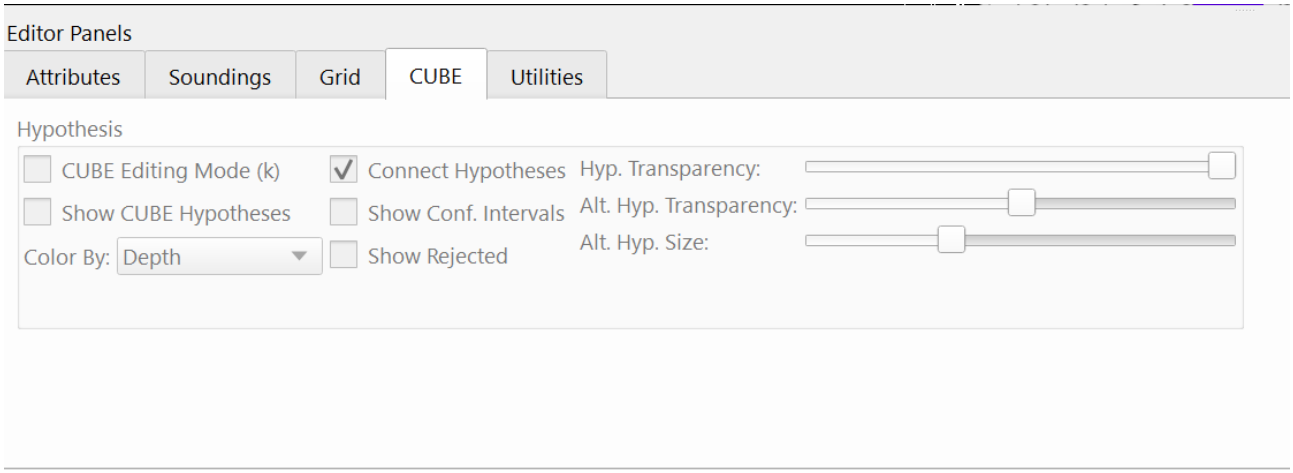
The 3D Editor is now capable of displaying the grid or DTM that result from a set of soundings as shown in figure Displaying a smooth grid in the 3D Editor. The Grid Panel controls how the grid is displayed. To show the grid, select the Visible toggle or click the Grid toggle in the Control Bar. If the Grid Stalks toggle is enabled, a stalk is drawn from each sounding to the created grid. By default, each grid is drawn via interpolation and thus might not match exactly what is expected. To draw each cell at the exact calculated height, enable the Flat toggle. Also, shading is usually applied to the generated grid. At times the shadows can be distracting and can be turned off using the Shade toggle.

The Grid, Color By, Transparency, Mesh Gap, and Auto controls are similar to the Grid Control tab in the main Qimera window. One additional option on this tab is to display an Outlined Grid, which is a regular DTM with a white grid laid on top.



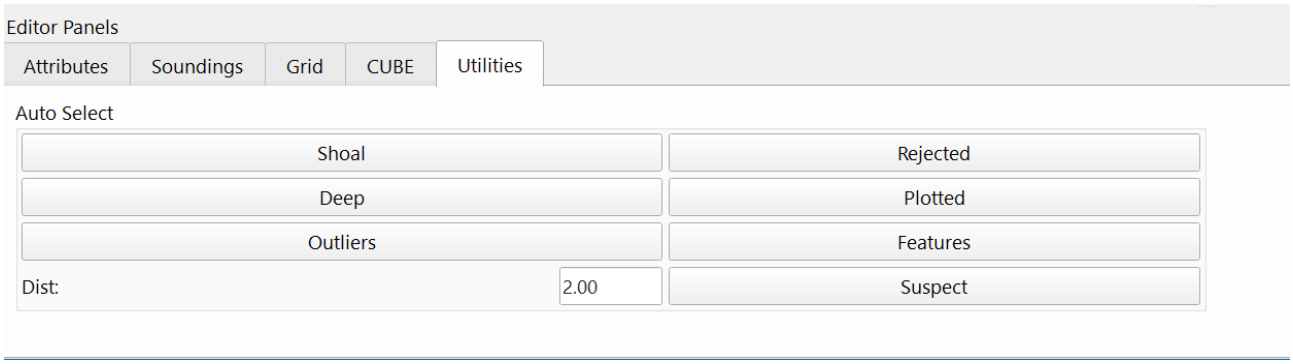
CUBE Panel

A number of additional options for editing hypotheses are included on the Cube panel at the bottom of the screen. See also the Editing CUBE Hypotheses chapter.



Utilities Panel

The Utilities Panel contains a number of utilities for selecting soundings in the editor. Clicking the Shoal button will select the shoalest sounding in the whole area and clicking the Deep button will select the deepest sounding in the whole area. The Outliers button will select all soundings in a bin that are more than Dist meters away from the average bin height. The four buttons on the right side are used to select a set of soundings that have a certain flag set. Clicking the Plotted flag will select all soundings in the editor that have the plotted flag set. The Features, Suspect and Rejected buttons work similarly for their respective flags. These buttons can be used for a search-and-replace type operation. For example, to change all flags in the display from Plotted to Feature, click the Plotted button and then on the right-click menu select Edit > Set Feature and then Edit > Clear Plotted.

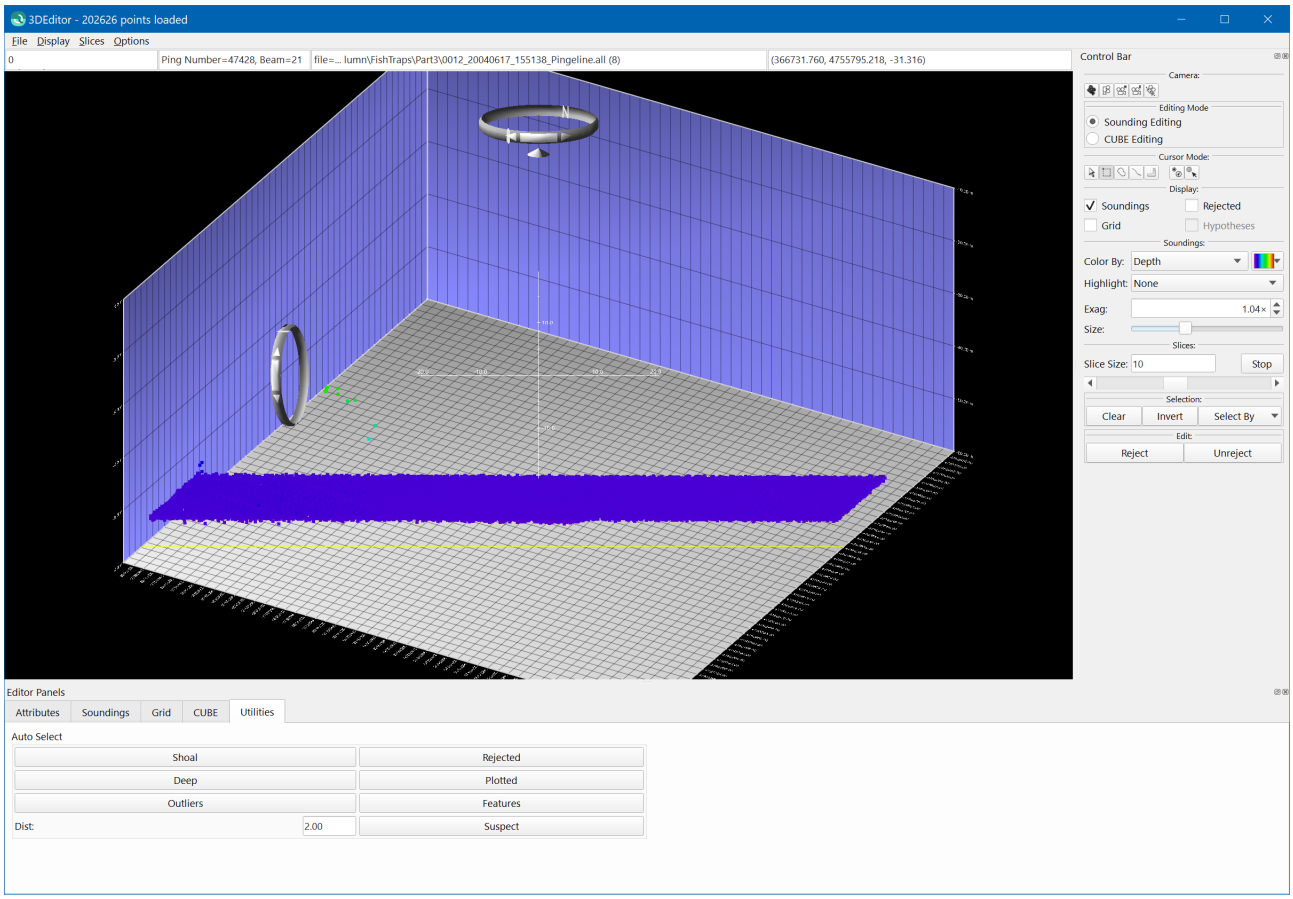


Slice-Based Editing

Slice-Based Editing allows loading a large number of soundings into the 3D Editor and then viewing cross sections of the data in a systematic way to inspect all of the data points. Enter slice-based editing mode by clicking the Slices > Start Slice menu option, or the Start button in the Slices section of the Control Bar. The 3D Editor will show a cross-section of the data containing a certain percentage of the whole range of the data. Yellow lines will be drawn on the base plane to indicate the bounds of the slice. Note that the orientation of the slices is chosen based on the current view direction when slice-mode is started.

Change the percentage of data to be shown by entering a value in the Slice Size field in the Control Bar and pressing Enter (the default is 5 percent). To view the next slice in the data, click the Slices > Next Slice menu option, press F10, or click the right arrow on the scroll bar that appears in the Slices section of the Control Bar. To go back to the previous slice, click Slices > Previous Slice, press F9, or click the left arrow on the slices scroll bar. Note that the central thumb in the slices scroll bar can be dragged to any position to move the slice through the whole range of data.

End slice-ending mode by clicking Slices > End Slice, or press the Stop button in the Slices section.



Editing CUBE Hypotheses

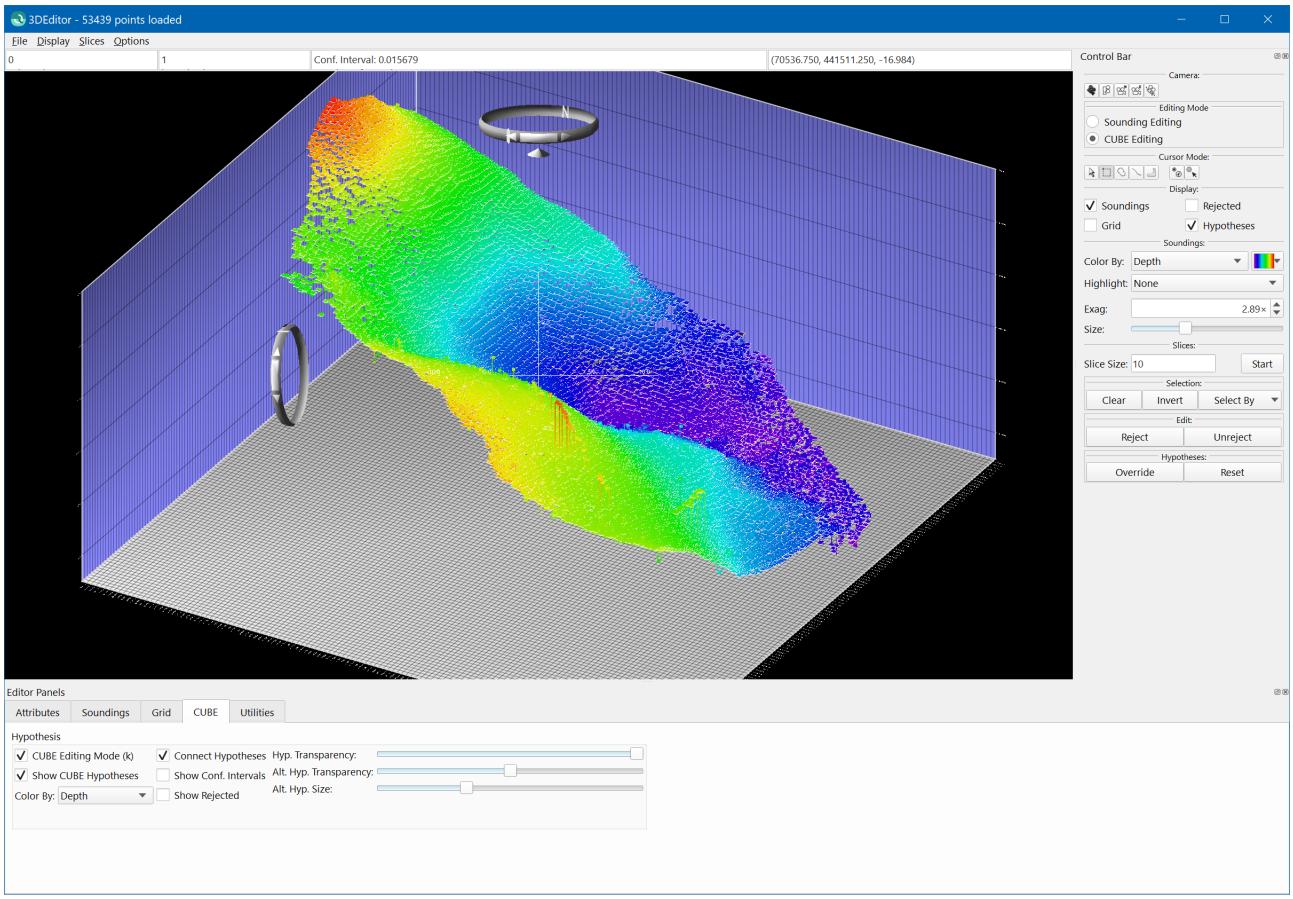
Viewing the CUBE Hypotheses

To view the Cube hypotheses in the 3D Editor, click the Cube Editing toggle, located on the upper right of the Control Bar. When the Cube Editing toggle is activated, the interface of the 3D Editor will change. To indicate the editor is in a different mode, the color of the grid and the color of the status panels will change to yellow. To show the Cube hypotheses without entering Cube editing mode, click the Hypotheses toggle in the Display group.

Each Cube hypothesis is represented as a flat plate, indicating the height of the hypotheses. The currently selected hypothesis is displayed as a large plate, and the alternate hypotheses are displayed as smaller plates. All of the plates in a single bin are joined by a line through their centers.
To hide the soundings in the editor, disable the Soundings toggle. Clicking the grid toggle will show the interpolated grid formed from the Cube hypotheses.

When the Cube Editing toggle is enabled, the interface changes to work on hypotheses instead of soundings (note that the 'k' key can be used to turn on or off Cube editing mode). When moving the mouse over the screen, the closest hypothesis will be highlighted and information about that hypothesis will be displaying in the status bar.

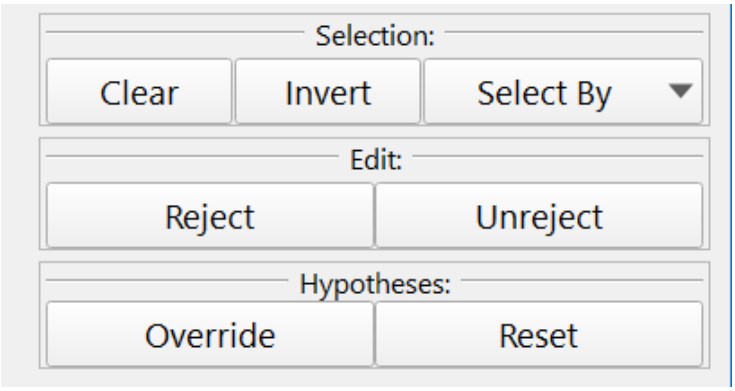
Selecting hypotheses works similar to selecting soundings. Enter any of the selection modes and single click to select a hypothesis, or click and drag to select multiple hypotheses. A hypothesis that is selected will be drawn with a solid white outline. Note that in each bin, at most one hypothesis can be selected at a time.



Editing Hypotheses with the Control Bar

The Control Bar on the right hand side changes slightly when the Cube toggle is enabled. Click the Clear or Invert buttons to modify the selected hypotheses. Clicking the Reject

button will delete the hypotheses in the currently selected bins. The Unreject button will undelete hypotheses that
have been deleted (click the Show Rejected toggle in the Cube Panel to view deleted hypotheses).



The process of marking an alternate hypothesis as the selected hypothesis is called overriding and can be accomplished by selecting alternate hypotheses and clicking the Override button. The selected hypotheses can be reset to the original hypothesis chosen by the Cube algorithm by clicking the Reset button. Overriding is usually the main editing operation when working with Cube grids.

Right-Click Menu

The right-click menu changes when the Cube toggle is enabled.

Select Menu

The Select menu allows hypotheses to be selected, deselected, cleared, and inverted, similar to the Control Bar.

Select Hypothesis

The Select Hypothesis menu option selects the currently highlighted hypothesis.

Deselect Hypothesis

The Deselect Hypothesis menu option clears the selection for the currently highlighted hypothesis.

Select Connected

The Select Connected menu option starts at the currently highlighted hypotheses and spreads out, selecting any neighboring hypotheses that are close enough in depth to their neighbors. Use the Select Connected option to select hypotheses that lie along a flat grid.

Move Selection Up

The Move Selection Up menu option takes any bins that have a hypothesis selected and will have the next highest hypothesis in the bin selected. This command allow all of the shoal hypotheses to be selected easily. For example, press 'C' then 'I' to select all hypotheses, press ']' repeatedly until the topmost hypotheses are all selected, and then press 'O' to override all the hypotheses.

Move Selection Down

The Move Selection Down menu option takes any bins that have a hypothesis selected and will have the next lowest hypothesis in the bin selected. This command allow all of the deep hypotheses to be selected easily. For example, press 'C' then 'I' to select all hypotheses, press '[' repeatedly until the bottommost hypotheses are all selected, and then press 'O' to override all the hypotheses.

Clear

The Clear menu option clears the selection for all hypothesis loaded in the 3D Editor.

Invert

The Invert menu option inverts the selection for all hypothesis loaded in the 3D Editor.

Edit Menu

The Edit menu on the right-click menu contains options similar to the Control Bar. Note that if a selection is made, these commands apply to all of the selected hypotheses, otherwise the command is applied to the currently highlighted hypotheses.

Override Hypotheses

The Override Hypotheses menu option will mark other hypotheses from a bin as the selected hypothesis.

Reset Hypotheses

The Reset Hypotheses menu option resets the selected hypothesis from a bin.

Delete Hypotheses

The Delete Hypotheses menu option rejects a hypotheses.

Undelete Hypotheses

The Undelete Hypotheses menu option unrejects a hypotheses.

Hide Menu

The Hide menu is similar to the menu for editing soundings.

Hide Selected

The Hide Selected menu option hides all of the selected hypotheses.

Hide Unselected

The Hide Unselected menu option hides all of the unselected hypotheses.

Unhide All

The Unhide All menu option unhides all the hypotheses loaded in the 3DEditor.

Re-CUBE

The Recube menu option re-runs the Cube algorithm on the current area being edited. Instead of editing hypotheses, an operator may delete a set of soundings (for example, from a burst failure), and re-run the Cube algorithm to generate better quality hypotheses.

The Recube algorithm can also be run from the Dynamic Grid Tools menu in Qimera.

CUBE Panel

A number of additional options for editing hypotheses are included on the Cube panel at the bottom of the screen.

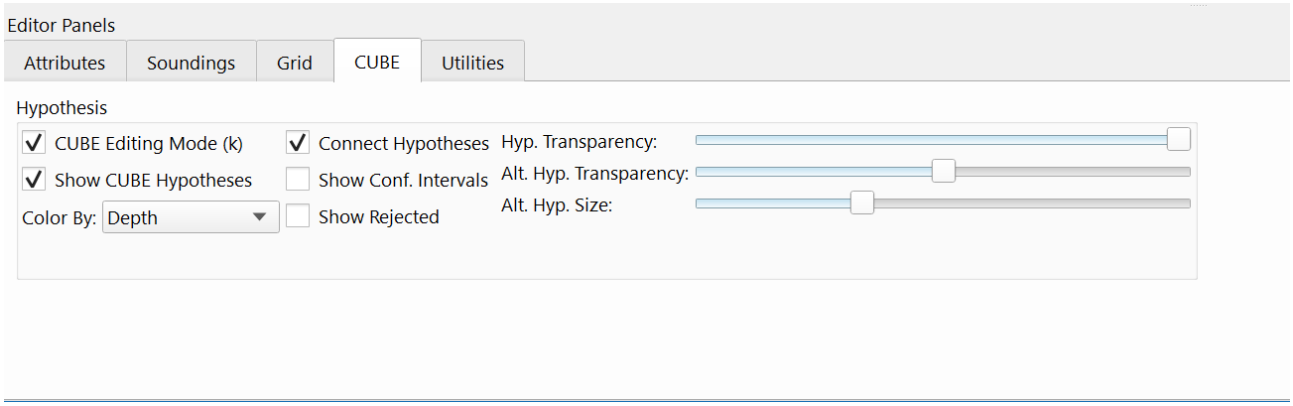
If the Cube panel is not visible, click the Options > Editor Panels menu option. The first toggle, Cube Editing Mode, is identical to the Cube Editing toggle on the upper-right area of the Control Bar. Enabling this toggle switches the interface into hypothesis-editing mode. When the Cube Editing Mode toggle is enable, the Sh ow Cube Hypotheses is automatically enabled as well. However, the Show Cube Hypotheses toggle may be turned on by itself to just view Cube hypotheses without entering hypothesis-editing mode. This option is useful to view Cube hypotheses, but edit the soundings.

The Cube hypotheses can be colored by a number of different methods using the Color By drop-down menu. The Confidence, Num. Soundings, and Hyp. Strength options are read from the extra attributes of the bin). The Overridden option marks all bins as yellow that are set to one of the alternate hypotheses. The Color option allows coloring of the hypotheses by a solid color and the Custom option colors any bins yellow that contain a custom hypothesis.

By default, a line is drawn connecting all hypotheses in a bin. To hide this line, deselect the Connect Hypotheses toggle. If the Show Conf. Intervals toggle is enabled, a line

representing the 95% confidence interval is displayed about each hypothesis. Enabling the Show Rejected toggle will display all hypotheses that have been rejected. This toggle is necessary to unreject hypotheses.

The last three sliders in the Cube panel control how the selected and alternate hypotheses are displayed on the screen. The Hyp. Transparency slider controls the transparency of the selected hypotheses and the Alt. Hyp. Transparency slider controls the transparency of the alternate hypotheses. The sliders range from fully transparent on the far left to fully opaque on the far right. The Alt. Hyp. Size slider controls how large the alternate hypotheses are drawn. The slider value ranges from full size on the far right to hidden on the far left.



Creating a Custom Hypothesis

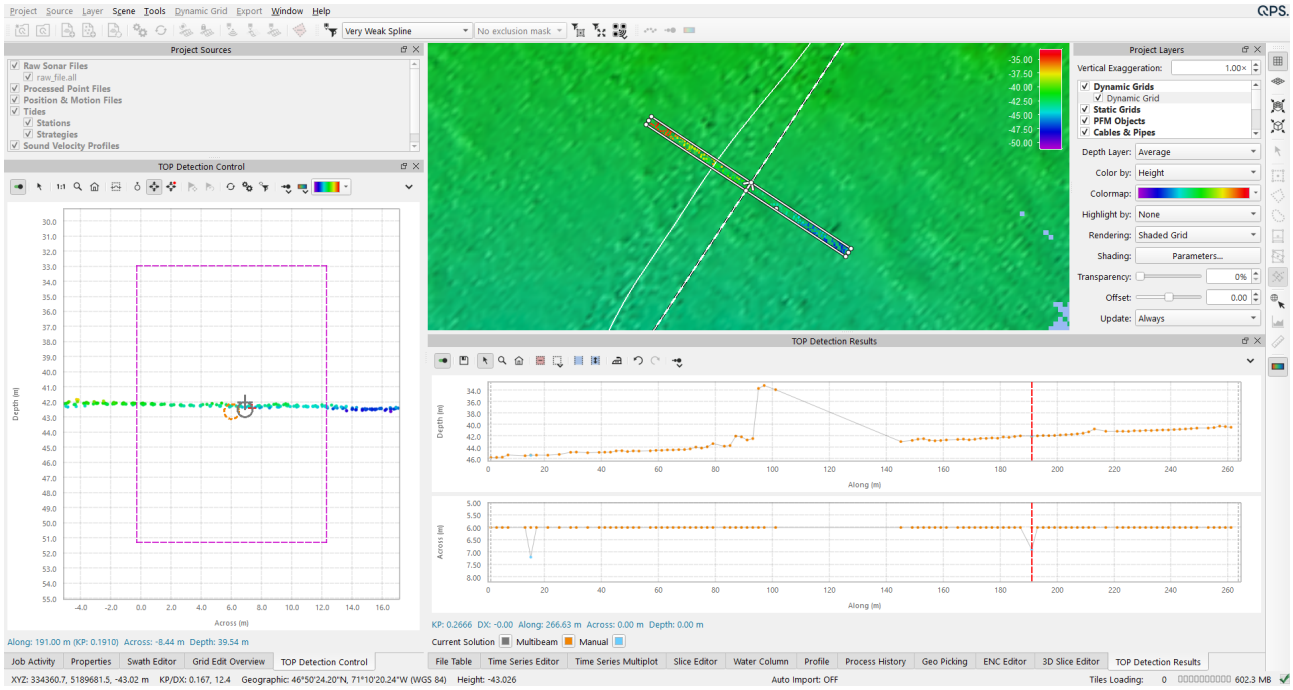
Sometimes an operator may wish to identify a sounding as the chosen height of the grid (this sounding is sometimes called a feature sounding or golden sounding). To accomplish this task, turn off the Cube toggle and turn on the Soundings toggle in the Control Bar. To view the Cube hypotheses at the same time as editing soundings, click the Show Cube Hypotheses toggle in the Cube Panel. While editing soundings, right-click on a sounding and select the Set Custom Hypothesis option from the menu. This action will generate a new hypothesis and place it at the same height as the sounding. The confidence interval for the created hypotheses will be the same as the confidence interval for the sounding. A custom flag called Custom Hypo. Flag will be set for the sounding. To remove the custom hypothesis, override one of the other hypotheses in the bin. Note that only one sounding in a bin can be marked as a custom hypothesis at a time.

Shortcuts

Shortcuts are available for many of the functions within the 3D Editor. To set and review shortcuts click within the main Qimera window and select Project > Configure Shortcuts... More information can be found at Qimera Configure Shortcuts Dialog.

Return to: *Qimera Interface*
Return to: *Specialized Tools*

Qimera Cable/Pipe TOP Detection Tool



- General Description
- Launching the Tool
- TOP Detection Control Dock
  - TOP Detection Control Toolbar
    - Toggle Button
    - Explore Mode
    - 1:1
    - Zoom Mode
    - Reset Zoom
    - Select Detection window
    - Do Single Detection
    - Move Cable/Pipe Manually
    - Snap Detection to Sounding
    - Manually Move X-Point
    - Reset X-Points
    - Detect Over Range...
    - Detection Settings...

        - Run Filter Profile During Detection
        - Plot Point Size
        - Color Plot By
        - Colormap Settings
        - System Selection
        - TOP Detection Control Context Menu
    - TOP Detection Control Context Menu
- TOP Detection Results Dock
    - TOP Detection Results Plot Context Menu
    - Shift Reference to Match Current Solution Dialog
    - TOP Detection Results Toolbar
        - Toggle Button
        - Save
        - Explore Mode
        - Zoom Mode
        - Reset Zoom
        - Select to Delete Detections
        - Selection Mode
        - Select Range
        - Select and Move
        - Smoothing Dialog
        - Undo
        - Redo
        - Plot Point Size
    - TOP Detection Results Context Menu

General Description

The Cable/Pipe TOP Detection tool is used to detect the position of a cable or pipe from the QPDs in a dynamic grid. A slice rectangle moves along a path attempting to detect the position of the cable/pipe within each rectangle. Detections can come from one of two sources:

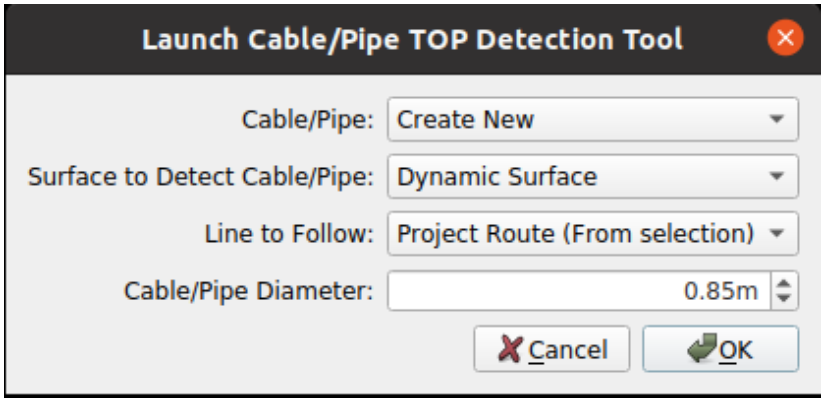
- Multibeam footprints: A least squares algorithm is applied to the footprints to attempt to fit an arc section with a specified diameter that represent upper grid of an exposed cable/pipe
- Cable/pipe tracker data: Specialized sensor hardware can detect the location of a pipe even if buried. If present these will be averaged within the slice rectangle to yield a single detection.

The tool consists of two docks: one displaying the contents of a single slice of the dynamic grid and the other showing along-track plots of the detections made. Once a set of detections has been made they can be inspected, edited, smoothed, discarded. Detection can be rerun with different parameters over all or part of the range.

Once one is satisfied with with the quality of the detections, the detections are saved to produce a dynamic cable/pipe object. Dynamic cables/pipes are rendered as tubes in the 3D scene and appear in the *Cables & Pipes* section of the project layers. These files store not only the 3D location of the pipe sections, but also data about the footprints from which they were detected, allowing the pipe to automatically update its position should those footprints later be moved.

Launching the Tool

The tool can be launched either from the Tools Menu or by right-clicking an existing Dynamic Cable/Pipe in the *Project Layers* dock and selecting *Edit Dynamic Cable/Pipe...* Either way, the following dialog is shown.

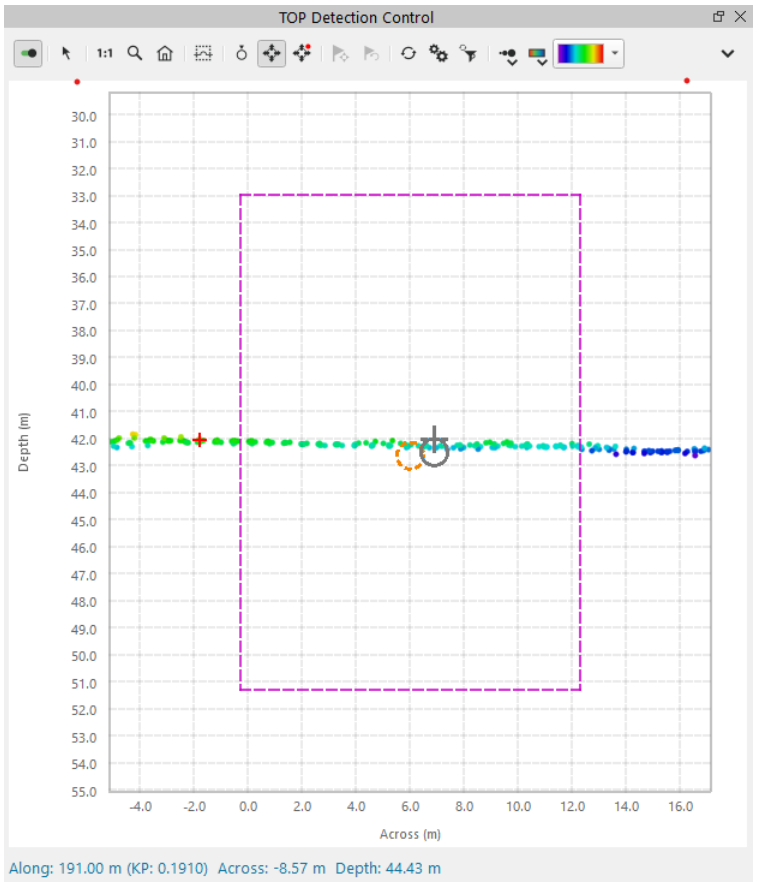


- **Cable/Pipe** - The user must specify whether to create a new Cable/Pipe or edit an existing Dynamic Cable/Pipe.
- **Grid to Detect Cable/Pipe -** The user must specify which dynamic grid to use in order to pull point cloud data from the appropriate QPDs.
- **Line to Follow -** The user must specify whether the Scroll Slice Selection is to follow the project route (default) or an existing SD Line object from the project. Additionally, if editing a Cable/Pipe, the user can specify that Cable/Pipe as the line to follow.
- **Cable/Pipe Diameter -** The real-world, outside diameter of the cable or pipe. Note that this is not necessarily the diameter used for detection calculations. (See TOP Detection Settings Dialog for more detail).

The tool will calculate a valid range along the line to follow over which detections can be performed based on the overlap between the line and the *Grid to Detect Cable/Pipe*. The bounds of this range are represented by the dashed vertical white lines in the TOP Detection Results Plot.

TOP Detection Control Dock

The control dock is used to configure the cable/pipe detection algorithm, visualize the selected detection and its X-Points (if configured), and manually edit the detection or X-Points. Qimera loads all soundings contained within the Scroll Slice Selection and plots them by depth and across-track offset from the *Line to Follow*. Existing solutions or detections at the current location are visible in the plot. Before the first detection is attempted, the TOP Detection Settings Dialog is launched in order to configure the detection algorithm.



TOP Detection Control Toolbar


Toggle Button

Allows the user to close the Cable/Pipe Top Detection Tool

 **Explore Mode**

Explore mode is the primary exploration mode of the tool

 **1:1**

The 1:1 button resets the plot so that the x-axis and y-axis scale are 1:1

 **Zoom Mode**

When in Zoom mode, click and drag an area of the plot to zoom in to

 **Reset Zoom**

The Reset Zoom button resets the plot to fit the extents of the data

 **Select Detection window**

When in Select Detection Window mode, click and drag a rectangle to specify the size and relative location of the detection window: only points falling inside this window will be considered by the TOP detection algorithm. A detection window is required to do any detection.

 **Do Single Detection**

The Do Single Detection button performs a single detection at the current location according to the parameters specified in the TOP Detection Settings Dialog. If successful, a solid circle representing the *Current Solution* will be displayed and will correspond to either a Pipe Tracking or Multibeam detection, depending on which systems are enabled and the *Preferred Solution* option in the TOP Detection Settings Dialog. Multibeam detections will always be shown at the Tracking Cable/Pipe diameter, while Pipe Tracker detections and the Current Solution will always be shown at the Actual Cable/Pipe Diameter.

 **Move Cable/Pipe Manually**

If there is a detection at the current location, Move Cable/Pipe Manually mode allows the user to click and drag the current solution to a desired location. This feature is not available to interpolated solutions.

Snap Detection to Sounding

This tool will allow you to move a pipe detection by snapping to an existing sounding. The detection diameter will be updated with the appropriate value depending on the type of sounding the tool snaps to (ie Multibeam vs Pipe Tracker) and your detection settings.

Manually Move X-Point

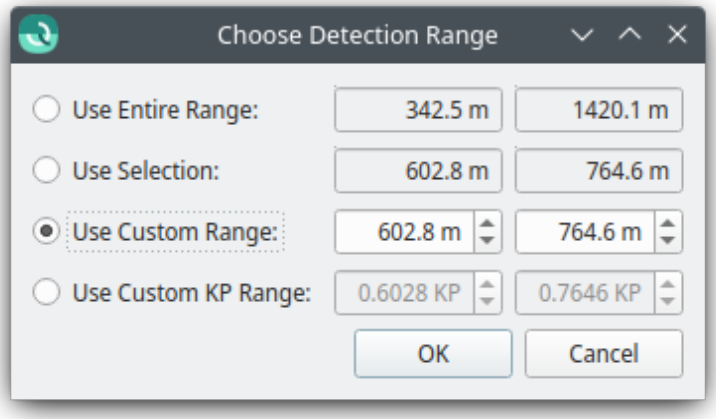
This tool will allow you to move an X-Point. The X-Point will snap vertically based on the grid layer configured in the Generate/Edit X-Point Listings Dialog. To revert the manual edits reconfigure the X-Point listings from the configuration dialog; this will recompute all the X-Points based on the recipe settings.

Reset X-Points

This tool will reset all X-Points that have been moved that are currently displayed in the TOP Detection Control Dock to their original locations.

Detect Over Range...

The Detect Over Range button performs a series of detections at the step interval specified in the TOP Detection Settings Dialog. The Choose Detection Range dialog will be launched, providing several methods specifying the range to detect over.



Detection Settings...

This button launches the TOP Detection Settings Dialog


Run Filter Profile During Detection

When this mode is enabled, the tool will run the active filter profile on the data within the Scroll Slice Selection before performing detection. For more information on managing, selecting and running filter profiles, see the Filter Operation Toolbar. Executing Filter Profiles in Cable/Pipe TOP Detection Control obeys the same option configuration as standard editing. For example, if you are in *Save Edits Instantly* mode, the soundings that are rejected or accepted by the filter will be immediately saved back to the QPDs and the grid will be updated. If you have the *Edit Only Selected* option, the filter profile will run only on the selected lines in the slice.


Plot Point Size

Clicking the first of these icons will change the point and line size drawn in the slice views of the widget. If you click and hold the button, it will display a menu where you can select point sizes between *Small* and *XX-Large*. Simply clicking will cycle through all sizes.


Color Plot By

Clicking the first of these icons will change the *Color By* mode of the points drawn in the widget. If you click and hold the button, it will display a menu where you can select the *Color By* option directly. The options for *Color By* are *Vessel (shows default port/stbd color), File, System, Ping, Beam, Selection Depth (scaled to depth range of the pings in the plot), Grid Color Map (depths colored by the color map of the currently selected Dynamic Grid), Intensity, Horizontal TPU, Vertical TPU and Solid Color*. For LAS/LAZ files, there are also color by options for *RGB* and *Classification*. When *Color By File* is used, you will additionally see the matching colors appear next to the line name in the Project Sources Dock as show below. When Color By *Solid Color* is used, the Colormap Settings will be replaced by the Color Button.


Colormap Settings

This will allow you to select and adjust a colormap for the points drawn in the widget. This allows for the same controls as users would have over the coloration of a Dynamic Grid: selecting a colormap, adjusting the range and editing a colormap. Some settings for Plot Color By do not allow access to a colormap, e.g. color by Vessel, File, System, Ping, Beam and Grid Colormap.



System Selection

Shown only when the dynamic grid includes more than one system, these buttons control which systems will be considered by the TOP detection algorithm. One button is displayed for each multibeam or cable/pipe tracker system present in the dynamic grid, with the system name visible in the button's tooltip. Clicking the button will enable or disable use of the corresponding system within the TOP Detection Tool. Soundings from disabled systems are not shown in the plot.



TOP Detection Control Context Menu

Launch the TOP Detection Control Context Menu

TOP Detection Control Context Menu

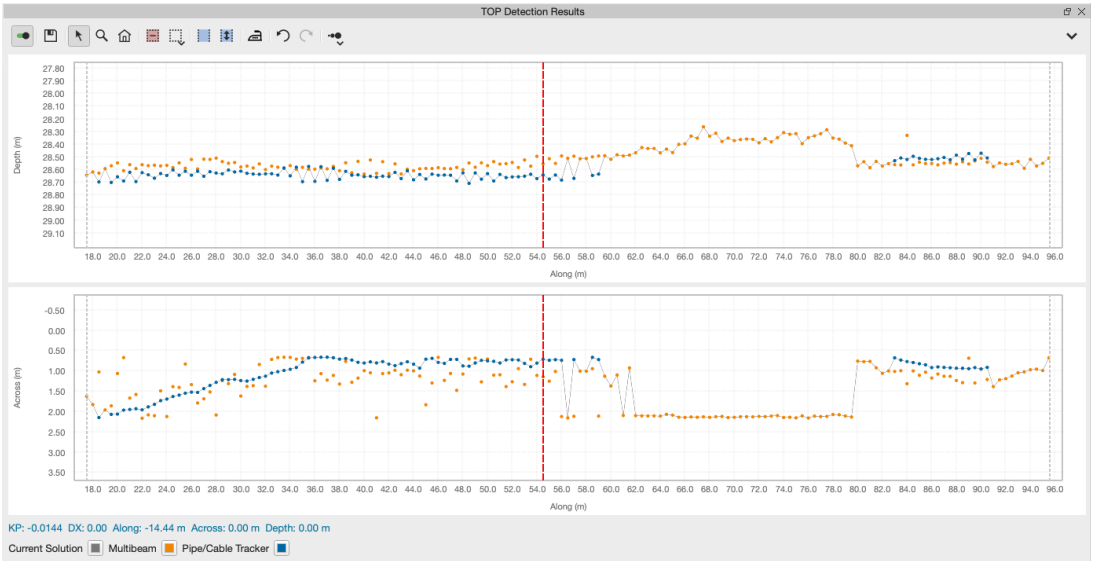
- **Show Cable/Pipe** - Show the circle representing the current solution.
- **Show Solutions** - Show the circles representing each solution.
- **Show X-Point Listings** - Show the X-Point listings, if any.
- **Save To Image** - Save a snapshot of the plot to disk (PNG or JPEG).
- **Show Gridlines** - Show gridlines on the plot.
- **Show Soundings** - This option controls the visibility of points based on their status.
- **Add/Remove Reference Lines** - Launch a dialog allowing the import of .sd lines from the project which can be used for TOP detections. The user may also launch the .Qimera Import Lines Dialog from within this dialog in order to generate and import .sd lines from ASCII files.

TOP Detection Results Dock

TOP Detection results dock is used to view, edit and validate detections. The top plot displays detection depths, while the bottom plot displays detection across-track offsets. Both are shown as functions of distance along the detection line. The solid line represents the **current solution** - the best estimate of the location of the top of the Cable/Pipe over the given range. When the user is satisfied with the current solution, the TOP Cable/Pipe Detection tool will generate and display in the scene, a Dynamic Cable/Pipe from the current solution and add it to the Cables & Pipes section of the Project Layers Dock.

The dashed vertical white lines represent the bounds of the range where the line to follow overlaps the chosen dynamic grid. The dashed vertical red line shows the location of the Scroll Slice Selection currently loaded in the TOP Detection Control Plot. The user can

change the current loaded location by moving the Scroll Slice Selection along the project route using the *W* and *S* keys, by dragging the Scroll Slice Selection in the main Qimera scene, or by CTRL+clicking in the TOP Detection Results plot at the intended mouse location.



At a given location, the current solution can be configured to use any of the following sources:

- A Multibeam detection, if available
- A Pipe/Cable Tracker detection, if available
- A manually moved detection (either moved by the *Move Cable/Pipe Manually* tool in the TOP Detection Control Toolbar, or moved using the *Select And Move* tool in the Top Detection Results Toolbar)
- A point on an imported reference line

When processing the entire line by using the *Process Entire Line* tool in the TOP Detection Control Toolbar, the *Preferred Solution* option in the TOP Detection Settings Dialog dictates which data source is used to make up the current solution. After a solution is generated, the user has the option to manually specify which data source should be used as the current solution at a given location or within a given range. After using the *Select Range* tool to select a range, right-click anywhere on the plot to bring up the TOP Detection Results Plot Context Menu.

TOP Detection Results Plot Context Menu

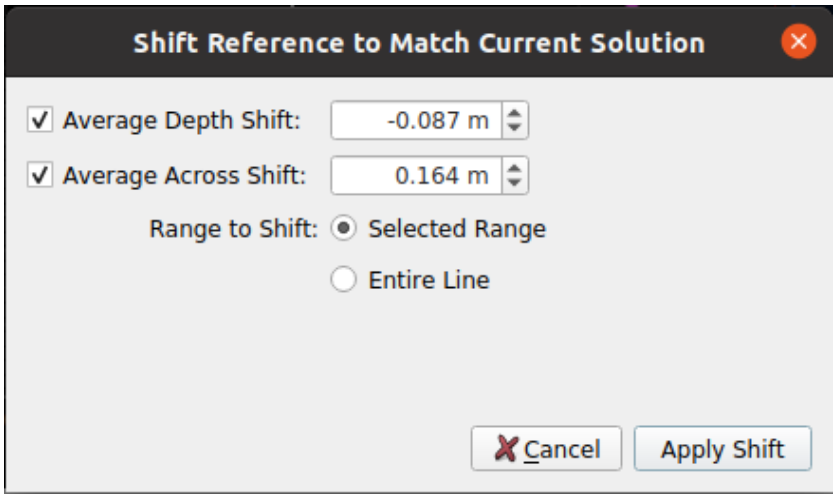
This menu can only be accessed if a range has been selected using the *Select Range* tool in the TOP Detection Results Toolbar.

- **Use Pipe/Cable Tracker -** If available, use Cable/Pipe detections as the source for the current solution over the selected range.

- **Use Multibeam -** If available, use Multibeam detections as the source for the current solution over the selected range.
- **Use *Reference* -** If available, use a point on the reference line as the source for the current solution over the selected range.
- **Align *Reference* To Current Solution -** Launches the *Shift Reference to Match Current Solution* dialog.
- **Smooth Across -** Apply the smoothing filter configured in the *Manage Smoothing Dialog* to the DX plot.
- **Smooth Depth -** Apply the smoothing filter configured in the *Manage Smoothing Dialog* to the depth plot.
- **Smooth Both -** Apply the smoothing filter configured in the *Manage Smoothing Dialog* to both the DX and depth plot.

Shift Reference to Match Current Solution Dialog

This tool allows an imported reference line to be shifted to fit the current solution in the depth and/or across-track directions. The magnitude of the shift can be specified manually or calculated automatically, and can be applied over the entire line or the selected range.



TOP Detection Results Toolbar





Toggle Button

Allows the user to close the Cable/Pipe Top Detection Tool.


Save

In the case of a brand new cable/pipe, this converts the *current solution* to a Dynamic Cable/Pipe, saves it to disk and adds it to Project Layers Dock. If Save Edits Automatically is turned off and the user is editing an existing cable/pipe, this button saves any edits to the pipe. If Save Edits Automatically is turned on, this button will remain disabled.


Explore Mode

Explore mode is the primary exploration mode of the tool.


Zoom Mode

When in Zoom mode - click and drag an area of the plot to zoom in to.


Reset Zoom

The Reset Zoom button resets the plot to fit the extents of the data


Select to Delete Detections

When in this mode, making a selection will remove detections located within selected area


Selection Mode

Allows for Rectangular Select, Polygon Select or Free Select modes

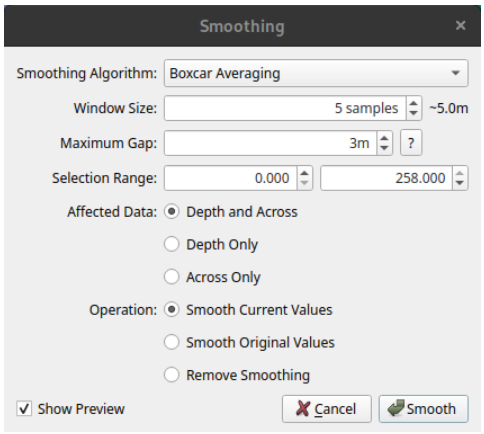

Select Range

Click, drag and then release to select a range. This range can be used in conjunction with the *Smooth Selection* action from this toolbar and the *Detect Over Range action* from the TOP Detection Control Toolbar. This range is also used for all functions in the TOP Detection Results Plot Context Menu.


Select and Move

Click, drag and release to select a range, then click again and drag to manually move the current solution within this range.

Smoothing Dialog



The *Smoothing* Dialog allows you to configure and perform smoothing operations on the pipe solution data. A smoothing preview will be shown in the main dialog when *Show Preview* is checked. The preview will be updated with all changes made to the settings. Selecting the *Smooth* button will apply your settings, smooth your data and close the dialog. Selecting cancel will not apply and close the dialog. All smoothing changes are added to the Undo/Redo stack for the duration of the TOP Detection Tools lifetime.

The Smoothing Algorithm options are;

1. Boxcar Averaging - a moving average filter who's size is based on the *Window Size* sample count.
2. LOWESS - Locally Weighted Scatterplot Smoothing uses non parametric least squares to fit a line to data samples based on the *Window Size* sample count.

The Window Size offers an approximation of time based on the sample count used in the smoothing algorithm.

The Maximum Gap value allows you to smooth across data gaps within or between lines. The smoothing of a sample will never consider samples on the other side of gaps larger than this value. It should be noted that this does not fill in points that have been rejected by the user and all edits will remain intact.

The Selection Range spin boxes allow the data range currently selected in the main dialog to be precisely adjusted. The values shown correspond to the *Along* axis in the main dialog.

The Affected Data radio buttons allow you to select what data the smoothing algorithm will be applied too.

The Operation radio buttons allows you to select which smoothing operation you would like to perform. Smooth Current Values will smooth the current data which may contain

previously smoothed data. Smooth Original Values will remove all previous smoothing and apply smoothing to the original data. Remove smoothing will remove all previous smoothing.

The Show Preview checkbox will show/hide a smoothed representation of your data in the main dialog.


Undo

This will undo the last operation. The undo buffer is pseudo-infinite and limited only by memory. So it will undo each edit in sequence. The Undo buffer clears when you save your edits.


Redo

This will redo the last undo operation. The redo buffer is pseudo-infinite and limited only by memory. So it will redo each edit in sequence. The Redo buffer clears when you save your edits.

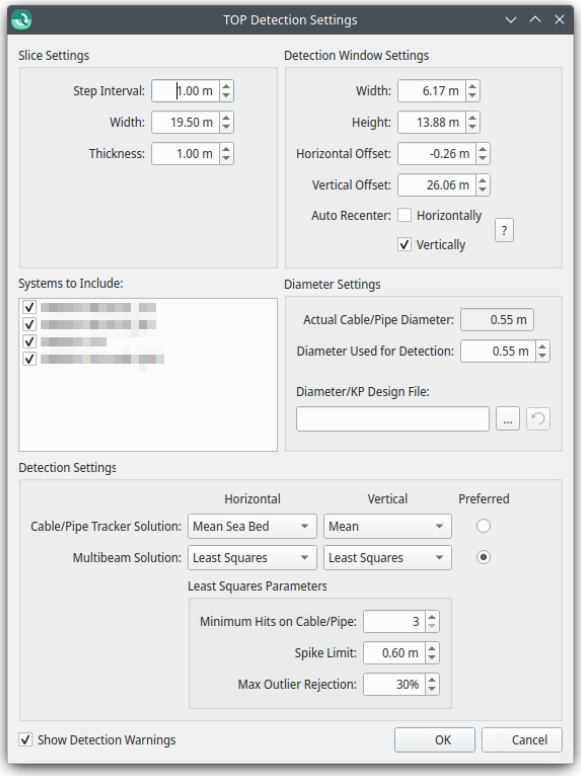

Plot Point Size

Clicking the first of these icons will change the point and line size drawn in the slice views of the widget. If you click and hold the button, it will display a menu where you can select point sizes between *Small* and *XX-Large*. Simply clicking will cycle through all sizes.

TOP Detection Results Context Menu

- **Show Statistics** - Show statistics for the current TOP detections Depth and DX
- **Show Side View** - Show the TOP detections Depth plot
- **Show Above View** - Show the TOP detections DX plot
- **Save A Copy As** - Save a copy of the TOP detections to disk
- **Save Edits Automatically** - This option automatically saves edits.
- **Add/Remove Reference Lines** - Launch a dialog allowing the import of .sd lines from the project which can be used for TOP detections. The user may also launch the Qimera Import Lines Dialog from within this dialog in order to generate and import .sd lines from ASCII files.
- **Clear Solution** - Clears the current TOP detections
- **Clear Imports** - Removed imported .sd line objects from the plot
- **Show Gridlines** - Show gridlines on the plot

Qimera TOP Detection Settings Dialog



The TOP Detection Settings dialog is used to configure the parameters of the TOP detection algorithm, and is split in to three main sections:

- Slice Settings
  - When processing the entire line, **Step Interval** represents the along track distance between detection attempts
  - **Width** and **Thickness** represent the size of the Scroll Selection window in the across track and along track directions, respectively.
- Detection Window Settings
  - **Width** and **Height** represent the size of the tracking window in across-track and depth directions, respectively.
  - **Horizontal Offset** and **Vertical Offset** represent the centre of the tracking window to in across-track and depth directions, respectively.
  - The **Auto Recenter** settings control automatic recentering of the detection window. If checked, the detection window will automatically be recentered on the last successful detection before attempting the next detection.
    - Vertical recentering is very useful when dealing with varying elevation.

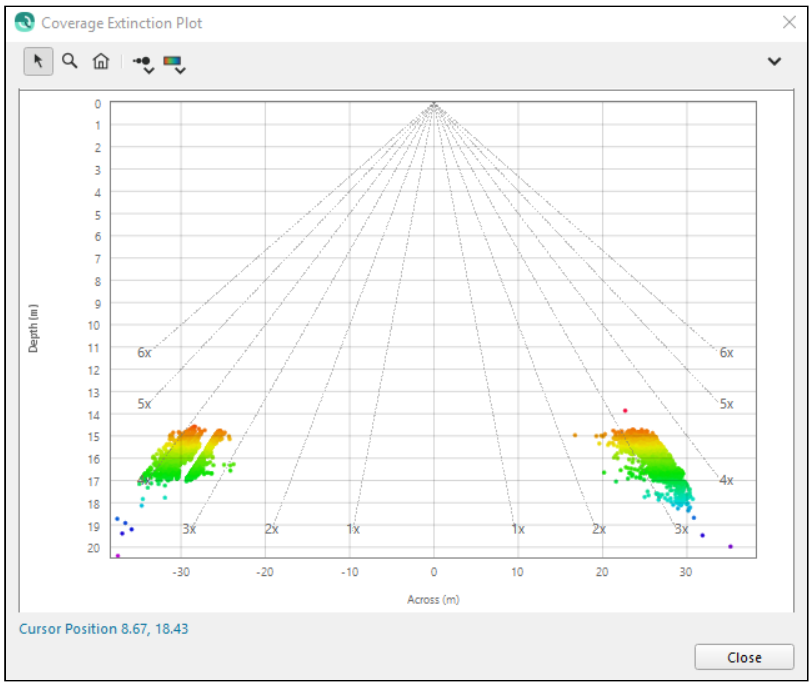
    - Horizontal recentering can be useful when the across-track position of the cable/pipe varies significantly.
    - However, automatic recentering can lead to detections "drifting off", especially in areas without a pronounced cable/pipe.
- Systems to Include
    - This checkable list of systems controls which systems will contribute soundings to the detection process. Unchecking all systems of a particular type will disable some settings specific to that type of sounding. At least one system must be checked.
    - This system selection is mirrored in toolbar of the TOP Detection Control dock.
- Diameter Settings
    - These settings apply only when detecting a pipe from multibeam points.
    - The **Actual Cable/Pipe Diameter** field shows the the nominal diameter of the cable/pipe,
    - The **Diameter Used for Detection** is the diameter used by the detection algorithm will used to determine the cable/pipe's location. Normally this should be the same as the actual diameter, but can be changed to accommodate special scenarios:
        - The detection diameter can be set larger than the actual diameter to handle sections where the cable/pipe is wrapped in a protective collar.
        - The detection diameter can be set smaller than the actual diameter to handle "piggyback" setups where a smaller cable/pipe is placed directly on top of a larger one.
    - Alternatively, loading a **Diameter/KP Design File** file allows the user to specify a varying detection diameters as a function of the project KP.
- Detection Settings
    - The **Multibeam Solution** and **Cable/Pipe Tracker Solution** options refer to the particular method used to determine the horizontal and vertical positions of a detection. The following options are available:

Detection methods	
Fixed Value	Used to detect at the middle of the tracking rectangle.
Shallowest	Used to detect using the shallowest data point, within the tracking rectangle.
Deepest	Used to detect using the deepest data point, within the tracking rectangle.

Detection methods	
Mean Sea Bed	Used to detect using the mean value of all samples within the tracking rectangle.
Least Squares	Used to detect using the least squares method on all samples within the tracking rectangle.

    - When using the Least Squares algorithm, there are additional options available
    - The detection attempt will not succeed if the tracking window contains fewer points than specified by the **Minimum Hits on Cable/Pipe.**
    - **Spike Limit** determines how large a spike can be and still be included in the LSQ calculation.
    - **Max Outlier Rejection** is the percentage of points in the estimation window that can be determined to be outliers before the detection attempt fails.
  - When doing detection with both multibeam and cable/pipe tracker systems, the **Preferred** radio buttons are used specify which detection type should be preferred in the case that both types of detection succeed.
- If checked, the **Show Detection Warnings** option will show a dialog listing any warnings generated by the detection algorithm after each detection run.

Qimera Coverage Extinction Plot



- How to Start
- What it Does
- General Description
  - Toolbar
    - Zoom Out Button
    - Explore Mode
    - Zoom Mode
    - Plot Point Size
    - Plot Color By
    - Menu
      - Save to Image
      - Show Grid Lines

How to Start

- *Coverage Extinction Plot* option from *Tools->Utilities* menu of Main Menu bar

What it Does

This tool lets you assess the swath coverage capabilities of your multibeam system.

General Description

Data to fuel this type of plot usually consists of a set of survey lines running from the shallowest to deepest depth range of the system. As the depth increases, the outermost beams will experience increased difficulty with detection, and the coverage will continue to decrease until even nadir beams can no longer detect the bottom. Having this type of plot capability is very useful during Sea Acceptance Trials so the surveyor can assess the system's swath coverage performance relative to the manufacturer's claimed specifications to ensure compliance. It can also help call attention to sources of noise due to mechanical, acoustic or electrical sources of interference. Repeating these types of field trials before and after visits to ship yards can illuminate issues early on, considering mechanical and electrical changes are often made during dry dock periods. For instance, modifications to the hull made in dry dock can can create flow noise problems. Many examples of this type of plot being used to assess and diagnose system health can be seen in the technical reports produced by the *Multibeam Advisory Committee (MAC)* : http://mac.unols.org/reports .

The image above repeats the analysis of a Kongsberg EM710 data set done by the MAC during a sea trial aboard R/V Falkor (Fall Report 2014, p 18). The graph indicates that the EM710 achieved maximum swath width at a depth of about 500 - 600m, which is within expectation. Full extinction occurred near 2,000m, which was also expected. As with all Qimera plotting widgets, the graph can be saved as a report quality PNG file with full markup of axes, etc.

For more information on navigating the data of the plot, see the section on Qimera Plot Grids.

Toolbar





Zoom Out Button

If you have zoomed into an area of the plot, this button will zoom out to the extents of the data.



Explore Mode

This is the primary exploration mode of the tool. As you move your cursor over the plot, the label in the lower left of the window will update to show the X/Y axis values.



Zoom Mode

When in zoom mode, simply click and drag an area of the plot to zoom into. Or simply single click a location to zoom in a bit on it. Alt-click a location to zoom out a bit. Or hit the Home button to return to the full extents of the data. At any time, you can Shift-Click to drag the plot to a new location. This is especially useful when you are zoomed in.



Plot Point Size

Clicking this icon will change the point size drawn in the widget. If you click and hold the button, it will display a menu where you can select point sizes between *Small* and *XX-Large*. Simply clicking will cycle through all sizes.



Plot Color By

Clicking this icon will change the *Color By* mode of the points drawn in the widget. If you click and hold the button, it will display a menu where you can select the *Color By* option directly. The options for color by are *Vessel, Line, System, Ping Counter (*File Unique Ping Identifier*), Ping Number (*Source Ping Identifier*), Beam, Depth, Intensity, Horizontal TPU and Vertical TPU*.



Menu

Save to Image

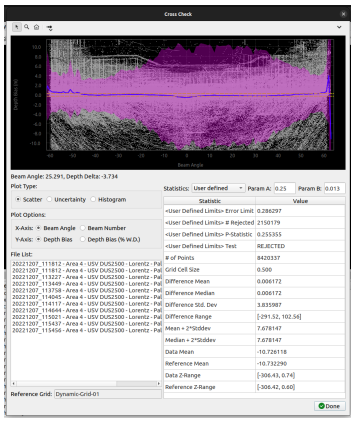
Saves the current plot to a PNG or JPEG file. The image will include all grid lines and annotations labels.

Show Grid Lines

This option will turn grid lines on/off in plot plot area.

Return to: Qimera Interface
Return to: *Specialized Tools*

Qimera Cross Check



- How to Start
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      - Export ASCII Raw Difference Data...
      - Export Plot Image
      - Export Report
  - Plots
    - Scatter Plot
    - Uncertainty Plot
    - Histogram Plot
  - Statistics Computation
  - File List and Reference Grid

How to Start

- *Cross Check* option from *Tools* menu of Main Menu bar.

What it Does

Cross Check performs a statistical analysis of beam footprint values referenced to a selected Dynamic or Static Grid.

General Description

Cross Check requires at least one valid, processed, raw sonar or processed points file and one Dynamic or Static surface to run. Simply select the line or lines you want to use to compute your statistics and the surface you wish to perform the statistics on. The tool consists primarily of a statistics table and a plot area for various views of the data as described below.

For more information on navigating the data of the plot, see the section on Qimera Plot Surfaces.

Toolbar





Explore Mode

This is the primary exploration mode of the tool. As you move your cursor over the plot, the label in the lower left of the window will update to show the X/Y axis values.



Zoom Mode

When in zoom mode, simply click and drag an area of the plot to zoom into. Or simply single click a location to zoom in a bit on it. Alt-click a location to zoom out a bit. Or hit the Home button to return to the full extents of the data. At any time, you can Shift-Click to drag the plot to a new location. This is especially useful when you are zoomed in.



Zoom Out Button

If you have zoomed into an area of the plot, this button will zoom out to the extents of the data.



Cross Check Menu

Reset Zoom

Reset zoom to extents of data.

Show Points

Show the sounding depth bias points for the scatter plot.

Show Mean

Show the mean depth bias line for the scatter plot.

Show Uncertainty (95% c.l.) Envelope

Show the uncertainty envelope for the scatter plot. This is the 95% c.l. envelope.

Show IHO Limits

Show the IHO limits (dashed lines) on any plot.

Export ASCII Statistics and Results Data...

Export the computed statistical data to an ASCII file. This includes the contents shown in the lower right Statistics panel in the Cross Check main window. This results data includes the the mean and standard deviation as binned by angle or beam number. Exported mean and standard deviation respect the view controls for x-axis (beam angle or beam number) and y-axis (depth bias in survey units or in percentage of water depth).

Export ASCII Raw Difference Data...

Export the raw beam difference results data to an ASCII file. This exports the point data shown in the main graph. Exported data currently includes:

1. Survey line number, matched to a list of survey file names in the header of the export file.
2. Ping number, as assigned by the sonar.
3. Beam number, counting from 1.
4. Beam angle in degrees, positive to starboard
5. Beam X (easting) in project units, e.g. meters or feet, etc.
6. Beam Y (northing) in project units, e.g. meters or feet, etc.

7. Beam Z (depth), in project units, e.g. meters or feet, etc.
8. Grid Z, the depth reported in the user selected grid for the beam's location, in project units.
9. Delta Z, difference between Beam Z and Grid Z, in project units

Export Plot Image

Export the plot to a JPEG or PNG image.

Export Report

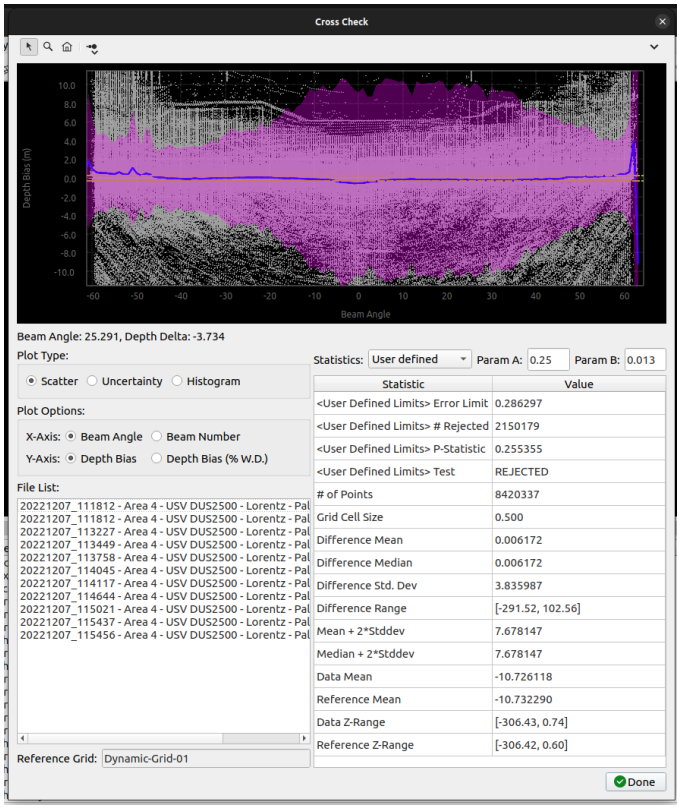
Export the Cross Check information in .html and .pdf formats to the current projects Export directory.

Plots

There are up to three graphical plots available depending on the type of data file that is selected for cross check. Raw files support all plot types. Processed point files only support the histogram plot due to the absence of beam angle information in some point formats.

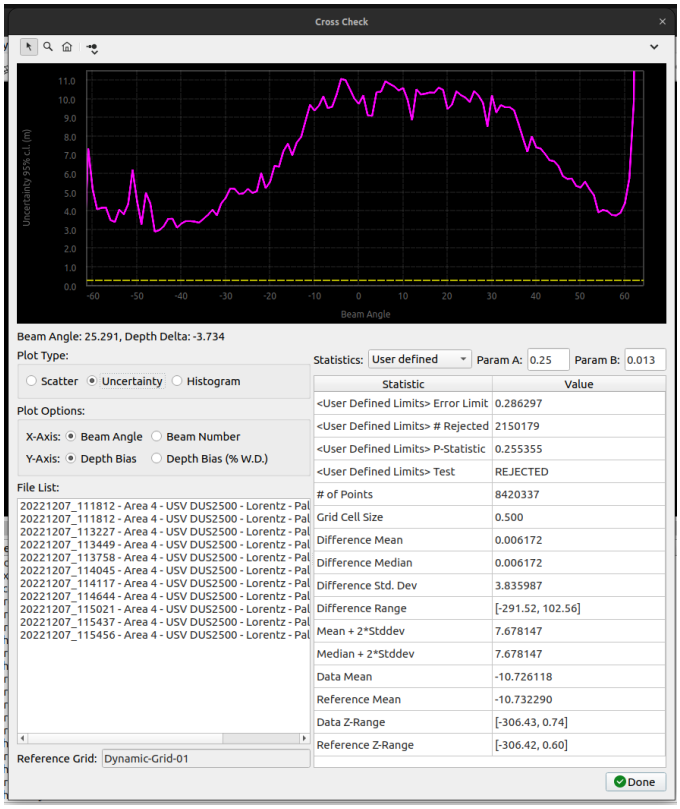
Scatter Plot

The scatter plot displays the individual footprint bias between the computed footprint Z and the reference surface Z. It also displays a mean bias line and an IHO envelope that is the mean bias +/- 1 standard deviation. Finally, it displays limit lines for the selection IHO order. You can change the x-axis to be by beam angle or by beam number. The y-axis can be changed to show depth bias in survey units or depth bias as a percentage of water depth.



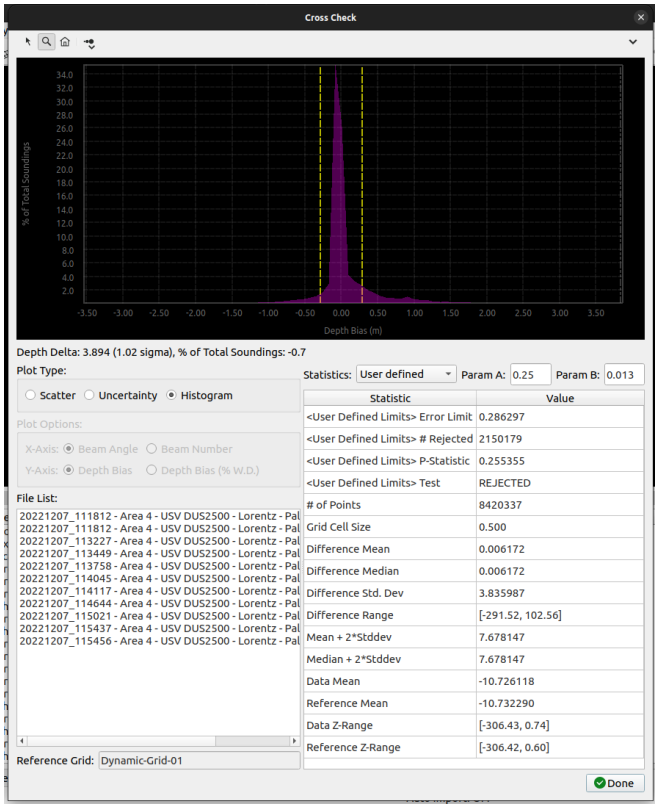
Uncertainty Plot

The uncertainty plot will display depth uncertainties (scaled to 95% confidence level) as well as a dashed IHO limit line that graphically shows the limit that the uncertainties should not exceed. You have the same X/Y axis options as you do for the scatter plot above.



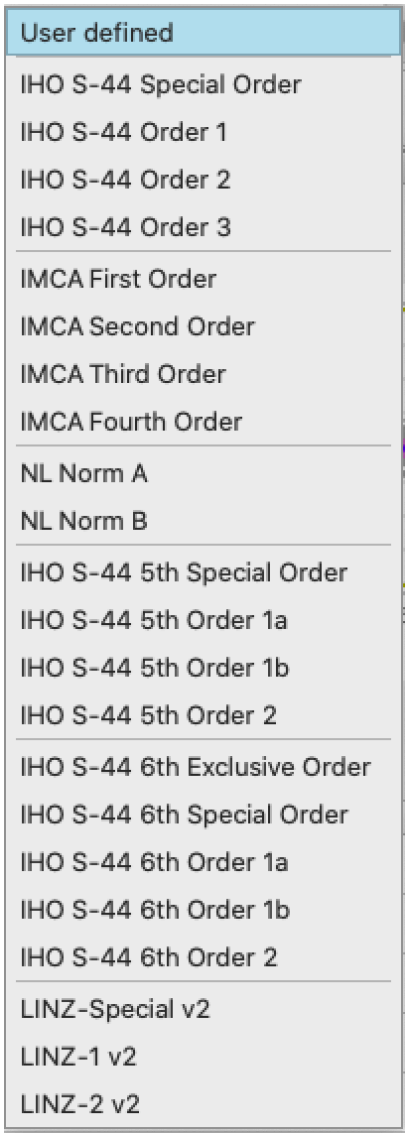
Histogram Plot

This histogram plot shows the depth bias distribution of your data.



Statistics Computation

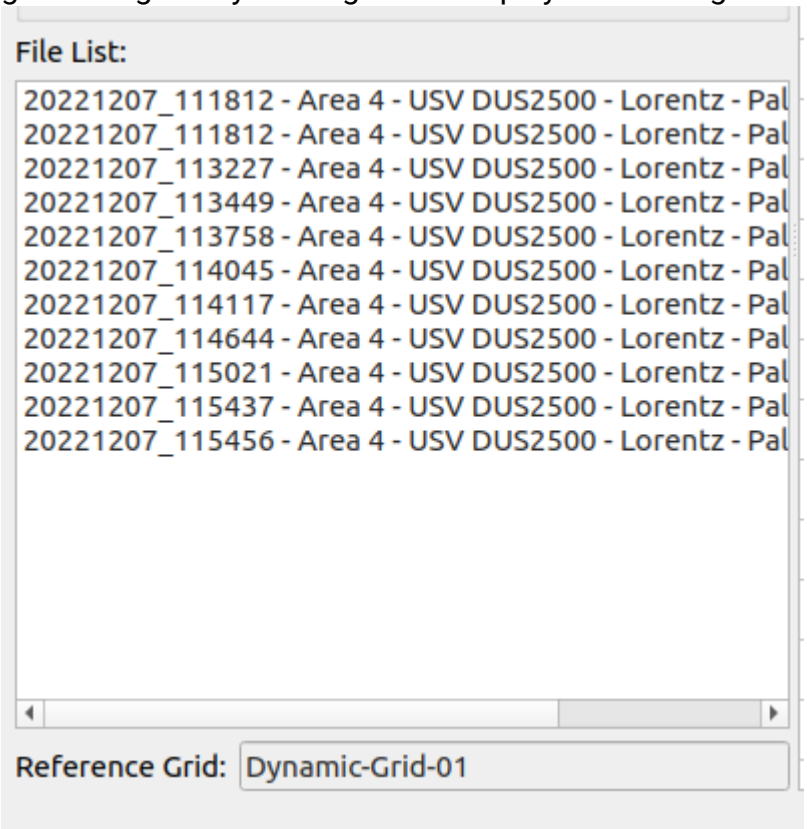
You can select the survey specification order for computing statistics from the following preset Survey Orders:



You can also select *User defined* and enter your own values for parameters A and B, these being the fixed and depth varying components of the standard IHO equation used to specify survey accuracy order. When you change either the custom values or the Order level, the statistics will be automatically recomputed and your plot will update accordingly. The results that you see in the tool will also be those that are used in the exported text files and/or report.

File List and Reference Grid

Starting with Qimera 2.6.2, the name of the dynamic grid and the list of files used in generating the dynamic grid are displayed in a widget.



Return to: Qimera Interface

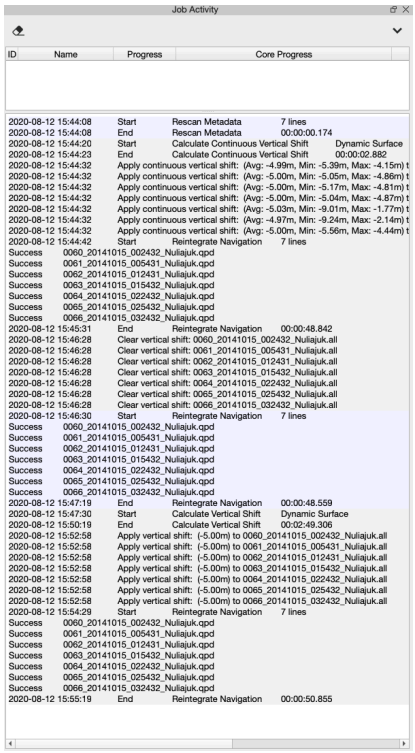
Return to: *Specialized Tools*

Qimera Dynamic Grid Shifting Tools

Qimera has a number of specialized tools that can shift the soundings in a Dynamic Grid in X, Y or Z. Each of these tools is tailored to solve a specific problem. Read the description on how each tool works to see which is best for you.

- Qimera Adjust Static Horizontal Shift Tool
- Qimera Adjust Vertical Shifts Tool
- Qimera Heave/Swell Removal Tool
- Qimera Line Height Matching Tool
- Qimera Static Horizontal Shift Tool
- Qimera Static Vertical Shift Tool
- Qimera Varying Vertical Shift Tool

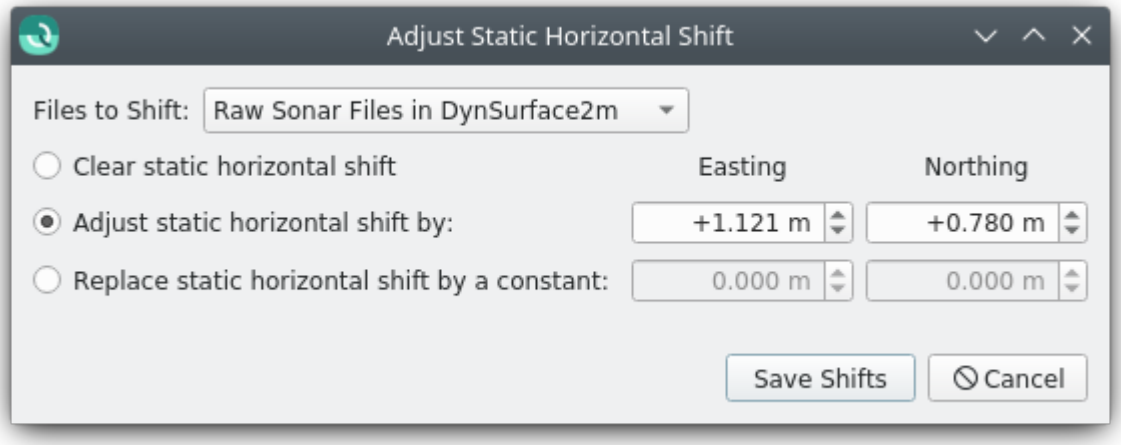
Every shift tool that is used, logs the applied shift in the Job Activity Dock. This data is then saved in the ~project/LogFiles/job-activity.log. An example of this data logging can be seen below.



Return to: *Qimera Specialized Tool*

Return to: *Qimera Table of Contents*

Qimera Adjust Static Horizontal Shift Tool



- How to Start
- What it Does
- General Description
  - Files to Shift
  - Clear static horizontal shift
  - Adjust static horizontal shift by
  - Replace static horizontal shift by
  - Applying the Static Shift

How to Start

Adjust Static Horizontal Shift option from the *Tools→Dynamic Grids Shifts* menu in the Main Menu bar.

What it Does

This dialog is used to clear, set or change the static horizontal shift that is to be applied to a selection of files. The Qimera Static Horizontal Shift Tool is expected to be the primary interface for setting horizontal shifts, but this tool is provided for those needing finer grained or more explicit control over their shifts.

General Description

Files to Shift

This drop down controls the set of files the adjustment will be applied to.

- The first entry, *Selected Raw Sonar Files*, will be enabled if one or more raw sonar files are currently selected in the Project Sources Dock. If selected, the adjustment will be applied to those files and only those files, regardless of which dynamic grids they are used in.
- Further entries appear for each dynamic grid in the project. If selected, the adjustment will be applied to all raw sonar files in that grid.

Clear static horizontal shift

This option will clear the static horizontal shift entirely, setting it to zero and disabling its use in the Processing Settings Dialog.

Adjust static horizontal shift by

This option will add the specified values to the horizontal shift of each file individually.

Replace static horizontal shift by

This option will set the horizontal shift to exactly the values specified, ignoring any shifts set previously in this dialog or in the Qimera Static Horizontal Shift Tool.

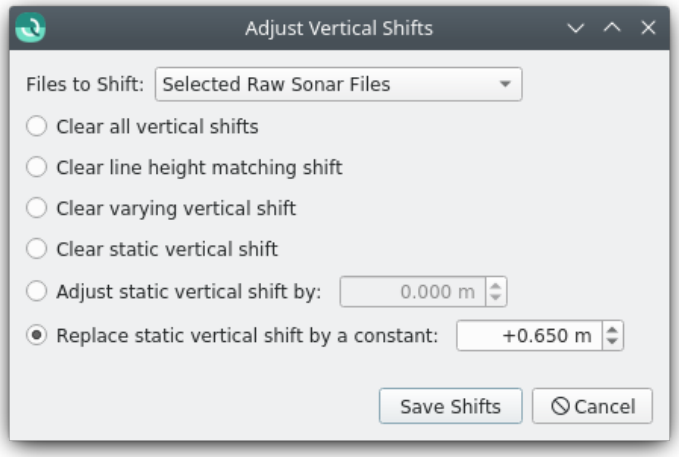
Applying the Static Shift

One satisfied with the selections made above, the user can click the *Save Shifts* button. Qimera will then prompt for confirmation, and then save the shift adjustment to all files chosen under *Files to Shift*. The user may then reprocess those files and see the dynamic grids update.

Return to: *Qimera Dynamic Grid Shifting Tools*

Return to: *Qimera Table of Contents*

Qimera Adjust Vertical Shifts Tool



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  - Clear all vertical shifts
  - Clear line height matching shift
  - Clear varying vertical shift
  - Clear static vertical shift
  - Adjust static vertical shift by
  - Replace static vertical shift by
  - Applying the Static Shift

How to Start

Adjust Vertical Shifts option from the *Tools→Dynamic Grid Shifts* menu in the Main Menu bar.

What it Does

This dialog is used to clear, set or change the different types of vertical shifts that are applied to a selection of files. Qimera has 3 different vertical shifts that are combined to alter the Z position of the transducer which will then change the footprint positions. You can review the shifts applied to each file in the Processing Settings Dialog.

The other vertical shift tools are expected to be the primary interfaces for setting vertical shifts, but this tool is provided for those needing finer grained or more explicit control over their shifts.

General Description

- Applying the Static Shift
  - When you click OK, the desired shift or clear will be applied to every transducer of every file from the selection above. This means that every footprint will be changed by the desired amount in the Z (depth) direction. Once the shifting is complete, Qimera will prompt the user to rebuild any of the affected Dynamic Grids. The applied or cleared shifts can be reviewed in the Processing Settings Dialog.
- Types of vertical shifts
  - Line Height Matching Shift
    - Use the Line Height Matching Tool to set this shift. This shift is specific to each line.
  - Static Vertical Shift
    - Use this tool or the Static Vertical Shift Tool to set this shift. This shift is the same for all lines in the selection.
  - Varying Vertical Shift
    - Use the Varying Vertical Shift Tool to set this shift. This shift may be different for every ping in each file based on the continuous displacement between a dynamic grid and a reference grid.

Files to Shift

This drop down controls the set of files the adjustment will be applied to.

- The first entry, *Selected Raw Sonar Files*, will be enabled if one or more raw sonar files are currently selected in the Project Sources Dock. If selected, the adjustment will be applied to those files and only those files, regardless of which dynamic grids they are used in.
- Further entries appear for each dynamic grid in the project. If selected, the adjustment will be applied to all raw sonar files in that grid.

Clear all vertical shifts

This option will entirely clear all the vertical shifts, setting them to zero and disabling their use in the Processing Settings Dialog.

Clear line height matching shift

This option will entirely clear the vertical shift calculated in the Line Height Matching Tool, setting it to zero and disabling its use in the Processing Settings Dialog.

Clear varying vertical shift

This option will entirely clear the vertical shift calculated in the Varying Vertical Shift Tool, setting it to zero and disabling its use in the Processing Settings Dialog.

Clear static vertical shift

This option will entirely clear the vertical shift calculated in the Static Vertical Shift Tool (or previously set by this dialog), setting it to zero and disabling its use in the Processing Settings Dialog.

Adjust static vertical shift by

This option will add the specified value to the vertical shift of each file individually.

Replace static vertical shift by

This option will set the vertical shift to exactly the values specified, ignoring any shifts set previously in this dialog or in the Static Vertical Shift Tool.

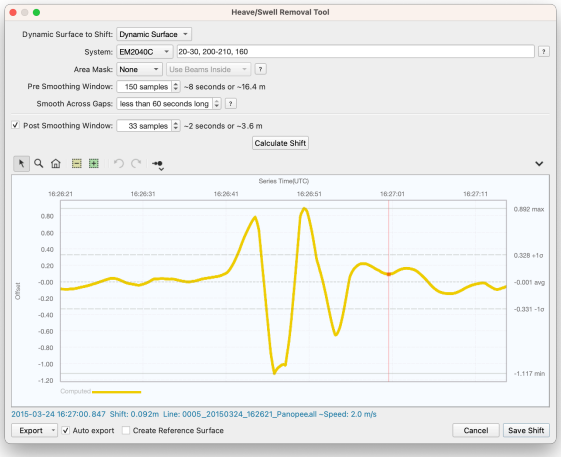
Applying the Static Shift

One satisfied with the selections made above, the user can click the *Save Shifts* button. Qimera will then prompt for confirmation, and then save the shift adjustment to all files chosen under *Files to Shift*. The user may then reprocess those files and see the dynamic grids update.

Return to: *Qimera Dynamic Grid Shifting Tools*

Return to: *Qimera Table of Contents*

Qimera Heave/Swell Removal Tool



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    - Zoom Mode
    - Zoom Out Button
    - Interpolation Edit Mode
    - Validate Edit Mode
    - Undo Button
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    - Menu
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      - Show Statistics
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  - Dynamic Grid to Shift
  - System
  - Area of Computation
  - Area Mask
  - Pre Smoothing Window
  - Smooth Across Gaps
  - Post Smoothing Window
  - Export Button
    - Export to ASCII...
    - Export Plot as Image...
    - Export Window as Image...
    - Export Scene as Image...

- Export All...
- Auto Export Checkbox
- Create Reference Grid
- Cancel Button
- Save Shift Button

How to Start

Heave/Swell Removal Tool option from the *Tools→Dynamic Grid Shifts* menu in the Main Menu bar.

What it Does

This tool will compute a time based heave/swell series along selected lines and shift the grid to reduce the heave/swell artifacts.

General Description

This tool computes a smoothed ping/beam based vertical offset for the current dynamic grid, which is applied to all systems within the associated source files. This tool is designed to allow the user to choose the system and beams which best represent the affected grid area to use for the computation. A Line object can also be selected using the *Area Exclusion Mask* where swaths of beams can be removed from the shift or, only those beams inside the selection will be shifted. Once you save the results using the *Save Shift* button, Qimera will prompt you to reprocess the relevant files after you run the tool and every raw sonar file that is part of the Dynamic Grid you are shifting will have a vertical shift applied on a ping-by-ping basis. Qimera will then automatically update all Dynamic Grids containing the affected lines. A statistical summary of each file's continuous shifts can be reviewed in the Processing Settings Dialog and a review of the shift can be observed in the Time Series Editor under the label *'Heave/Swell Shift'*.

For more information on navigating the data of the plot, see the section on Qimera Plot Grids.

Toolbar





Explore Mode

This is the primary exploration mode of the tool. As you move your cursor over the plot, the label in the lower left of the window will update to show the X/Y axis values, the current vertical offset associated with the time of the cursor position as well as the survey line at that location. The cursor in the Scene in the main app will also update with a red cursor for the synchronized location along the survey line's navigation track.



Zoom Mode

When in zoom mode, simply click and drag an area of the plot to zoom into. Click the Home button to return to the full extents of the data. At any time, you can Shift-Click to drag the plot to a new location, you can also re-position with a middle mouse click. This is especially useful when you are zoomed in.



Zoom Out Button

If you have zoomed into an area of the plot, this button will zoom out to the extents of the data.



Interpolation Edit Mode

If you **Click-Drag** a selection of the time series, Qimera will flag the selected samples invalid and interpolate across the selection using the sample on either side of the selected area. During processing, time series data queries will then use these new interpolated values. This is a simple way to get rid of spikes in your data. You can always undo an edit using the **Undo** button. Once you are satisfied with your edits, you must press the **Save** button. Note that you can do further editing of the height shift in the Time-Series Editor.



Validate Edit Mode

This mode is an easy way to bring back data that you have marked as rejected or for interpolation. Simply **Click-Drag** a selection over the previous edit and Qimera will restore the original data. You can always undo an edit using the **Undo** button. Once you are satisfied with your edits, you must press the **Save** button.



Undo Button

This will undo the last edit actions. It is a pseudo-infinite undo buffer in that you can make several edits in sequence and then undo those edits in the reverse sequence.



Redo Button

This will redo the last undo edit action.



Plot Point Size

Clicking this icon will change the point size drawn in the widget. If you click and hold the button, it will display a menu where you can select point sizes between *Small* and *XX-Large*. Simply clicking will cycle through all sizes.



Menu

Show Current Offset

If you have previously run this tool, this option allows you to control whether or not the previously computed offset is shown in the plot or not. If shown, it is drawn in blue.

Show Statistics

This option allows you to show summary statistics of the time-series of shifts on the graph. It will show the mean, min, max and +/- 1-sigma standard deviation. These are drawn as dashed lines in the graph along with numeric labels on the right-hand side of the plot.

Show Gridlines

This option controls the display of grid lines on the time-series graph.

Dynamic Grid to Shift

Use this combo box to select the Dynamic Grid you wish to shift. It will set the Dynamic Grid you had selected in the Project Layers Dock when you launched the tool.

System

Use this combo box to select the system and beams you would like to to use for the heave calculation for each ping. It is best to select beams that are not affected by variations in topography (ie a ship wreck would not be a good candidate). Mousing over the associated line edit beams box will display a tooltip identifying the available beams for the current system.

Area of Computation

Use this combo box to selected either *Everywhere* or *Inside Selection* to constrain where the algorithm runs the grid difference computation. Selecting the *Inside Selection* option will shift the source pings of all footprints that fall within the selected area. If a ping has footprints that fall inside and outside the selection area all of the footprints will be shifted for that ping.

Area Mask

Use this combo box to select a line object from the Project Layers Dock that can be used to mask areas used in the computation. The line can be used for both exclusion and inclusion. When used for inclusion only the beams inside the selected area will be shifted in the final output.

Pre Smoothing Window

Use this numeric entry field to specify the number of samples/pings which will be used to compute the initial vertical difference from the source data. The minimum is 3 samples which will result in a minimal removal of heave/swell from the source with minimal distortion of the source data.

Smooth Across Gaps

This option allows you to smooth across the small gaps that sometimes occur when logging stops and starts along a survey line. The time window parameter controls the decision on whether the next sample should be included in the current vertical heave computation.

Post Smoothing Window

Use this numeric entry field to specify the number of samples the be used in the post smoothing window. This will further refine the heave/swell removal and can be updated dynamically after the initial computation is done. Increasing the number of samples can reduce any remaining noise in the initial computation.

Export Button

Export to ASCII...

This option allows you to save the entire time-series of vertical shifts as an ASCII output for reporting or further analysis. This is useful in the tool since it exports the time-series for all of the survey lines together in a single export.

Export Plot as Image...

This option allows you to save a view of the time-series graph as an image for reporting purposes. This is useful in the tool since it plots the time-series for all of the survey lines together in a single graph.

Export Window as Image...

This option will export the entire contents of the dialog as an image. This is useful for an overview for reporting.

Export Scene as Image...

This option will export the main Qimera window scene work area as an image.

Export All...

This option will launch a dialog and allow you to specify the location and items you would like to export. The selectable list contains the content listed under 'Export Button'.

Auto Export Checkbox

Selecting this box will automatically save all of the listed exports under the Export Button to a unique timestamp folder in the current projects export directory.

Create Reference Grid

This checkbox will create a static reference grid from the data before the heave/swell shift is applied.

Cancel Button

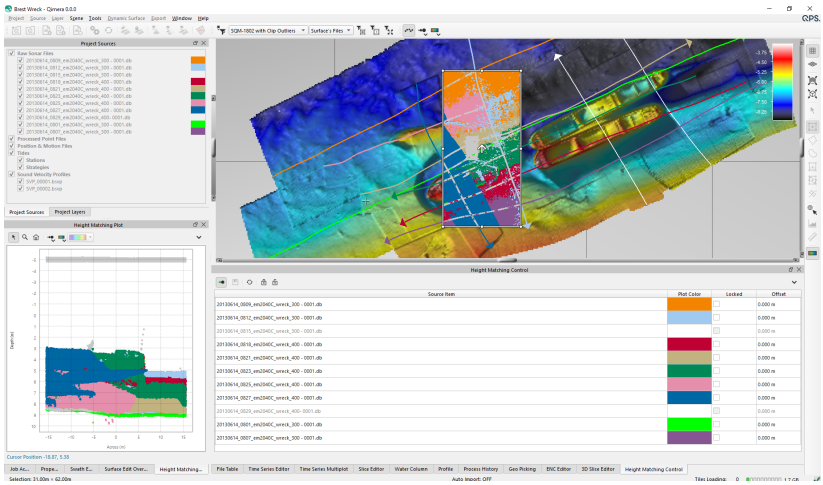
This button will cancel the operation and exit the dialog.

Save Shift Button

Click this button to run the continuous shift computation.

Return to: *Qimera Dynamic Grid Shifting Tools*
Return to: *Qimera Table of Contents*

Qimera Line Height Matching Tool



- How to start
- What it does
- General Description
  - Height Matching Main Application Window
    - Height Matching Selection Area
  - Height Matching Plot Dock
    - Toolbar
      - Explore Mode
      - Zoom Mode
      - Reset Zoom
      - Point Size
      - Color By
      - Dock Options Menu
        - Show Grid Lines
        - Show Soundings
        - Export Offset as Text
        - Export Plot as Image
        - Export Window as Image
        - Export Scene as Image
        - Export All

- Auto Export
- Height Matching Control Window
  - Toolbar
    - On/Off
    - UNKNOWN ATTACHMENT Save
    - Auto Compute
    - Lock All
    - Unlock All
    - Dock Options Menu
      - Save and Exit
      - Revert All Offsets Changes
      - Zero All Offsets
      - Auto Compute
      - Export Offset as Text
      - Export Plot as Image
      - Export Window as Image
      - Export Scene as Image
      - Export All
      - Auto Export

How to start

- *Height Matching Tool* option of the *Tools* menu in the Main Menu bar.
- Preexisting line and geographic selections will be used, but are not required.

What it does

The Height Matching Tool can work to vertically match unlocked lines, via an automated process, to neighboring lines that are either locked or have had an offset determined during the execution of the routine. It will resolve the offsets of all unlocked items using a Least Squares optimization, until all unlocked lines have been shifted. All locked lines will be considered, even if they are separate from each other geographically. The offset value between lines is calculated via footprints from each file that fall into common comparison cells.

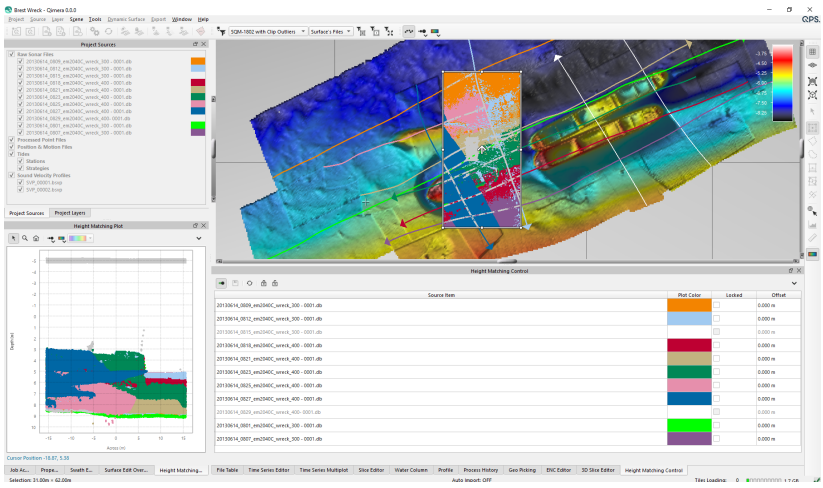
The tool can also be used manually where, after double clicking in the Offset column for an unlocked line, a shift can be manually entered or changed with the mouse wheel.

Applied shift values, once saved, can be enabled, disabled, or reviewed in the Vertical Referencing tab of the Qimera Processing Settings Dialog.

General Description

Height Matching Main Application Window

The Height Matching Tool is meant to work in conjunction with the Qimera 4D Scene in the main Qimera application window. This is where the user selects appropriate spatial subsets of data to examine for the purposes of height matching.

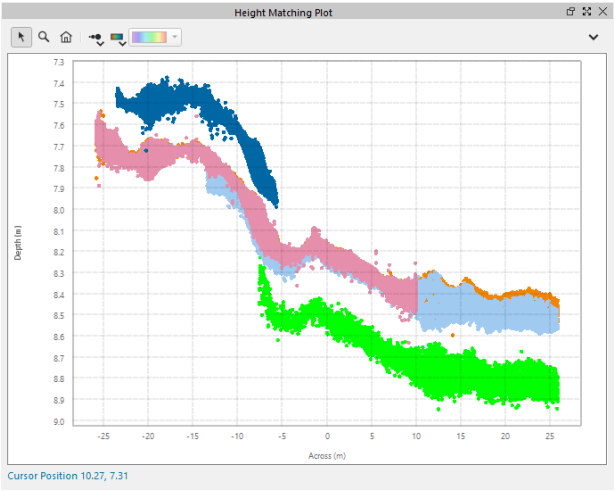


Height Matching Selection Area

The selection area for the plot test is automatically configured on startup. It behaves just like the standard Rectangular Selection so you can use the handles to move or modify the shape. You can also use one of the movement shortcut keys (W, S, A, D) to move the selection to a new location. You can also use the Selection Dimensions Toolbar to more specifically control the size of the selection. The Selection Movement Toolbar is also available to move the selection but only the forward/back buttons are enabled.

Height Matching Plot Dock

This window displays the view of the soundings in the area selected. The selected area in the scene has an arrow that depicts the "view direction" of the soundings. These are then projected onto the plotting grid. As you move the Control Window offsets, the soundings are automatically shifted and their new position appears in the Plot Window. This window behaves like all the other plotting windows with Qimera. For more information on navigation within a plotting window, see the page on Qimera Plotting Grids.



Toolbar

The toolbar at the top of the window controls the view of the plot.

Explore Mode

This is the primary exploration mode of the tool. As you move your cursor over the plot, the label in the lower left of the window will update to show the current value.

Zoom Mode

When in zoom mode, simply click and drag an area of the plot to zoom into. Or hit the Home button to return to the full extents of the data. At any time, you can Shift-Click to drag the plot to a new location or use the middle mouse button. This is especially useful when you are zoomed in. You can always undo an edit using the **Undo** button.

Reset Zoom

If you have zoomed into an area of the plot, this button will zoom out to the extents of the currently viewed attribute.

Point Size

Clicking this button will incrementally change the size of the points and lines in your plot areas. If you click and hold the button, it will display a menu where you can select point sizes between *Small* and *XX-Large*.



Color By

Clicking the first of these icons will change the *Color By* mode of the points drawn in the widget. If you click and hold the button, it will display a menu where you can select the *Color By* option directly. The options for *Color By* are *Vessel (shows default port/stbd color), File, System, Ping Counter (*File Unique Ping Identifier*), Ping Number (*Source Ping Identifier*), Beam, Selection Depth (scaled to depth range of the pings in the plot), Grid Color Map (depths colored by the color map of the currently selected Dynamic Grid), Intensity, Horizontal TPU, Vertical TPU and Solid Color*. For LAS/LAZ files, there are also color by options for *RGB* and *Classification*. When *Color By File* is used, you will additionally see the matching colors appear next to the line name in the Project Sources Dock as show below. When Color By *Solid Color* is used, the Colormap Settings will be replaced by the Color Button.

Certain options will enable the color map button that allows selection or editing of color maps or the selection of a solid color. Some settings for Plot Color By do not allow access to a colormap, e.g. color by Vessel, File, System, *Ping Counter (*File Unique Ping Identifier*), Ping Number (*Source Ping Identifier*)*, Beam and Grid Colormap.



Dock Options Menu

The view options allow you to configure what you see and how you see it in the sounding plot:

Show Grid Lines

Show/Hide the grid lines in your plot grids.

Show Soundings

This sub-menu allows you to change the visibility of rejected, filtered, normal, additional, interpolated or user picked soundings. Any changes to these options will be saved for the next time you perform height matching.

Export Offset as Text

Opens a dialogue for exporting the line names and offset values in the table in the control dock.

Export Plot as Image

Exports a screenshot of the plot.

Export Window as Image

Exports a screenshot Qimera. This option will redock the plot and control docks.

Export Scene as Image

Exports a screenshot of the work area.

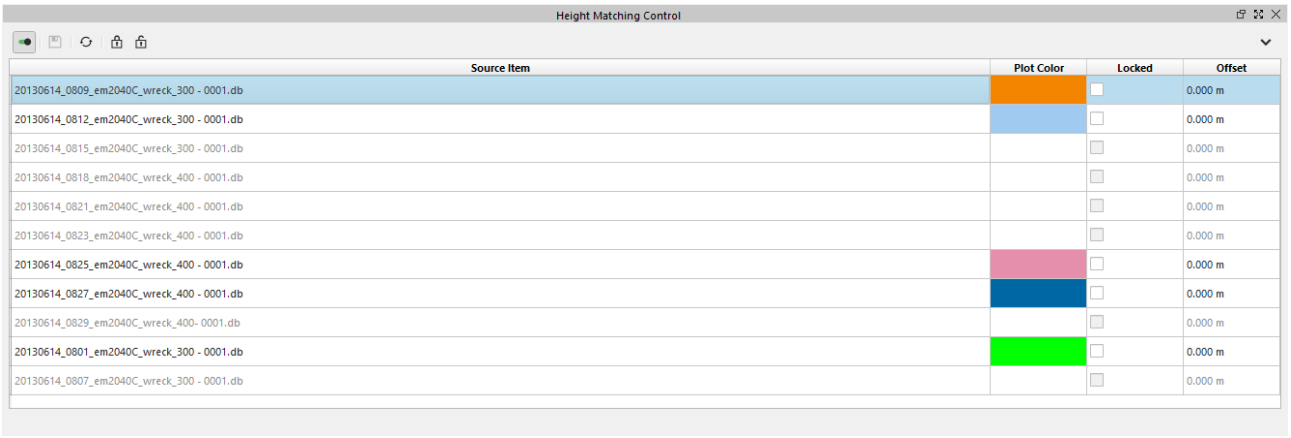
Export All

Exports the four previous options to a folder.

Auto Export

This is a saved setting. If checked, Qimera will export all when the tool is closed.

Height Matching Control Window



The control widget shows a table of the items that can be height matched.

There are four columns in the table:

- **Source Item** - the source item name
- **Plot Color** - the color that is used for correlating data in the plot, in the source tree, and in the scene
- **Locked** - check-boxes for each item to lock their offset and prevent further adjustment
- **Offset** - the currently applied offset, this can be double clicked to modify

Toolbar



The toolbar at the top of the window controls .

 **On/Off**

This button works the same as the Qimera Tools → Height Matching Tool menu option. It will turn the height matching widgets on or off.

UNKNOWN ATTACHMENT **Save**

This button will save the new offsets for each line. The offset applies to the entire line, not just the data in the selection. It will remain greyed out until a change is made to one of the files' offsets.

 **Auto Compute**

This button will launch the Auto Compute routine. This is the routine that automatically computes the offsets for the unlocked lines.

 **Lock All**

This will lock all items. One or more items should be unlocked to use Auto Compute.

 **Unlock All**

This will unlock all items. This is handy after resetting all offsets to zero, for example.

 **Dock Options Menu**

Save and Exit

Same behavior as the button on the toolbar. This options also closes the tool.

Revert All Offsets Changes

This will reset all offsets to the last save. You will be asked to verify this decision as you will lose all of your work.

Zero All Offsets

This will set all offsets to zero.

Auto Compute

This is the routine that automatically computes the offsets for the unlocked lines.

Export Offset as Text

Opens a dialogue for exporting the line names and offset values in the table.

Export Plot as Image

Exports a screenshot of the line height matching plot.

Export Window as Image

Exports a screenshot Qimera. This option will redock the plot and control docks.

Export Scene as Image

Exports a screenshot of the work area.

Export All

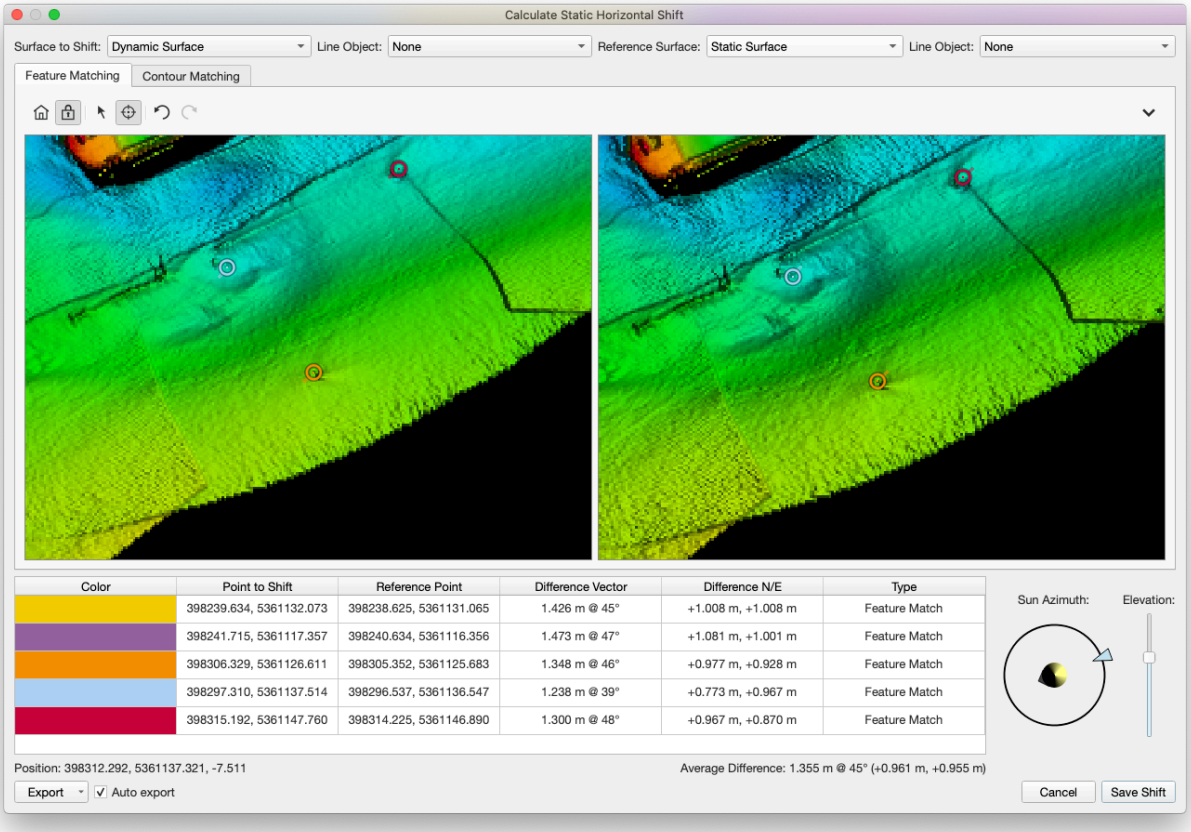
Exports the four previous options to a folder.

Auto Export

This is a saved setting. If checked, Qimera will export all when the tool is closed.

Return to: *Qimera Interface*
Return to: *Specialized Tools*

Qimera Static Horizontal Shift Tool



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    - Feature Matching Pick Mode
    - Contour Matching Pick Mode
    - Undo
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    - Context Menu

- Pair Table
  - Center View on Point Pair
  - Remove Point Pair
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  - Export Table as Text
  - Export Feature View as Image
  - Export Contour View as Image
  - Export Window as Image
  - Export Scene as Image
  - Export All...
- Auto Export Checkbox
- Cancel Button
- Save Shift Button

How to Start

Static Horizontal Shift Tool option from the *Tools→Dynamic Grid Shifts* menu in the Main Menu bar.

What it Does

The Static Horizontal Shift Tool allows a user to align a Dynamic Grid from a survey to another reference grid using either point selection feature matching or contour matching. Feature matching allows the user to select a number of corresponding point pairs on each grid while contour matching allows the user to visually align two contours within a given area. Qimera collects a table of these differences as the user moves around the grid adding more and more pairs, automatically computing the average difference. When satisfied, the user can then choose to apply a shift to the raw sonar files in the dynamic grid to minimise this difference.

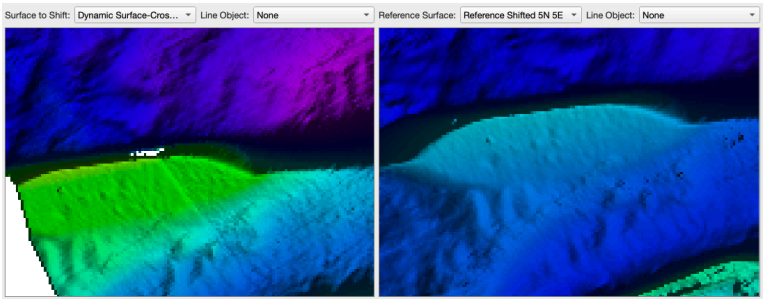
General Description

The average horizontal offset is computed by averaging the horizontal displacement of all fiducial pairs in the Point Table. As fiducial pairs are registered by clicking on like features or manually aligning contours, symbolic color coded icons appear that represent the location of each pick.

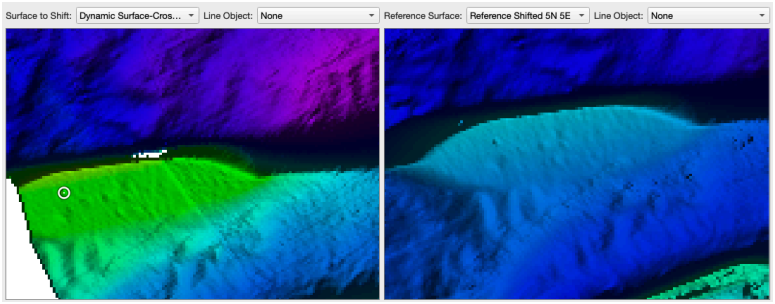
Feature matching will display a circular icon that has a "tail" that extends to the corresponding fiducial position in the opposite grid view. You can start a pick pair in either grid view. The panels below show how the icons appear as you start and finish your pick on a feature. In this example, the user chose a simple bump that appeared in both grids. As you pick, the points are also added to the Point Table.

Contour matching will display two square icons with a connecting line that indicates the start and end location of the manual contour shift. In the associated example we can see four fiducial point pairs generated after four subsequent alignments.

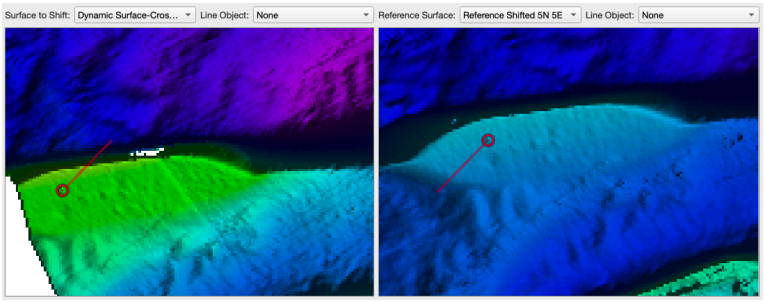
Initial view:



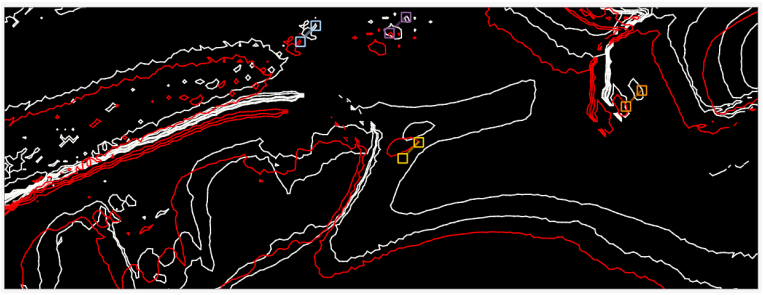
First fiducial point picked:



Matching fiducial point picked:



Contour Matching Fiducial Points:



Toolbar

Feature Matching Toolbar



Contour Matching Toolbar



 Zoom Out Button

If you have zoomed into an area of the plot, this button will zoom out to the extents of the data.

 **Synchronize Grid Views**

When this option is on, the center of each grid view will be the same world geographic location as you pan or zoom. If you uncheck this option, you can then pan/zoom the views independently.

 **Explore Mode**

This is the primary mode of the tool. As you move your cursor over a grid view, the label in the lower left of the window will update to show the Easting, Northing and Depth values. This mode also allows you to pan and zoom the grid views.

 **Feature Matching Pick Mode**

This mode allows you to pick fiducial points on each grid. You can still pan each view by holding down the **Shift** key while left clicking. Remember that the Shift key always

overrides the active mode of a plotting grid and allows you to click-drag to pan the window. For more information about navigating within a plotting window, see the section on Plotting Grids. After you have made a pick, the location will have a white circular icon. It will remain white until you pick the corresponding fiducial point in the opposite window. You can start picking a fiducial point pair in either window. You can use the *Undo* button to undo the last pick you made.



Contour Matching Pick Mode

This mode will enable you to drag the selected *Grid to Shift Line Object* when you are contour matching. You can still pan the view by holding down the **Shift** key while left clicking. After you have completed the translation, click the Save button to save a fiducial pair. The view will reset and the saved start and end locations of the shift will be represented by a color coded box connected by a line for visual reference. You can undo any previous entry using the undo button.



Undo

This will undo the last entered fiducial point or *Remove Point Pair* operation from the table context menu.



Redo

This will redo the undo operation.

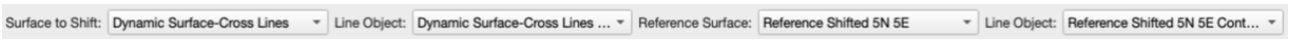


Menu

Remove All Point Pairs

This will clear the point pair table.

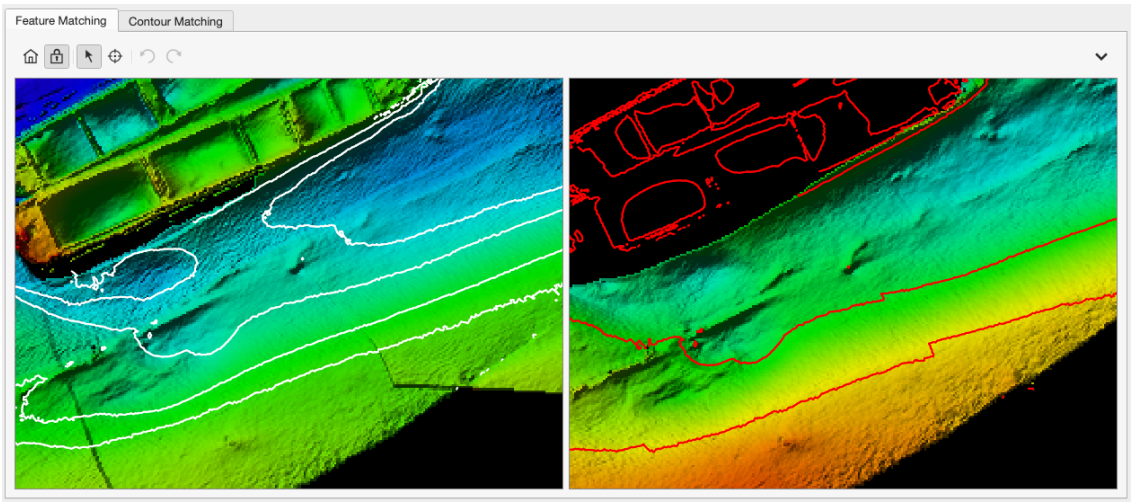
Grid Views



The grid views part of the dialog helps you see corresponding features or contours and pick them as fiducial points to help compute the average XY offset to apply.

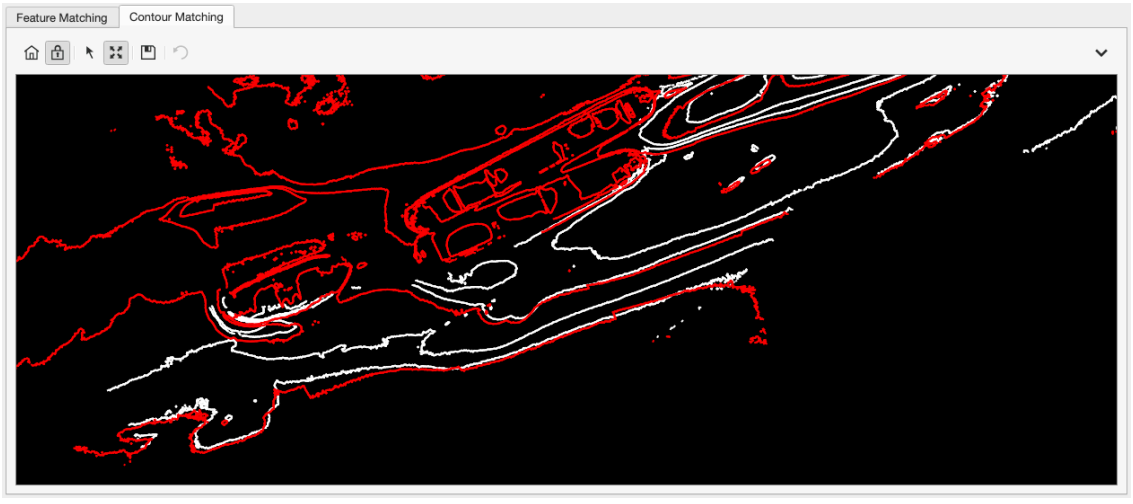
The *Feature Matching* view has a left and right grid view. The left view is the *Grid to Shift* view. The first combo box contains all of the Dynamic Grids in your project. If you started this tool with a Dynamic Grid Selected in the Project Layers Dock, this grid will be selected in the combo box. The *Line Object* combo box helps you display visual aids such as contour lines. Currently you can only display 1 of these in each view for clarity.

The right view is the *Reference Grid* view. The first combo box contains all of the Dynamic and Static Grids in your project. The *Line Object* combo box helps you display visual aids such as contour lines for that grid.



Context Menu

The *Contour Matching* view displays lines or contours selected in the Line Object combo boxes. To ensure easy differentiation it is advised to set the line object layer colors in the Project Layers Dock prior to using this tool.



Pair Table

Color	Point to Shift	Reference Point	Difference Vector	Difference N/E	Type
	366657.901, 4755796.301	366668.669, 4755799.319	11.184 m @ 254°	-10.769 m, -3.018 m	Feature Match
	366661.264, 4755782.848	366671.815, 4755789.640	12.548 m @ 237°	-10.550 m, -6.793 m	Feature Match
	366654.818, 4755882.829	366664.353, 4755886.915	10.374 m @ 247°	-9.535 m, -4.087 m	Feature Match
	366789.420, 4755716.416	366800.495, 4755736.718	23.127 m @ 209°	-11.074 m, -20.303 m	Contour Match

Average Difference: 13.527 m @ 231° (-10.482 m, -8.550 m)

This table contains all of the collected fiducial points pair. The table contains the easting/northing positions of both points, the difference between them expressed as both a distance/bearing and as northing/easting deltas as well as which view was used to generate the pair. All of these differences are averaged to calculate the final average difference shown below the table.

Right clicking on a row displays a context menu offering the following actions:

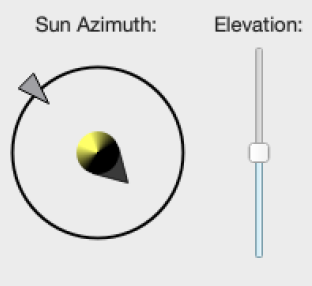
Center View on Point Pair

This option centers the left window on the fiducial point location. If the views are locked, the right view will pan to this geographic location.

Remove Point Pair

This option will remove the currently selected point pair. You can *Undo* this operation.

Lighting Control



The lighting controls help expose features on the grid which can help with picking corresponding fiducial points. See the section on the Shading Parameters Dialog for information on how to use this control. The only difference here is that the control is *Dynamic*, in that, the lighting changes appear instantly on the grids. Additionally, the lighting control pays attention to the state of the *Lock* button on the toolbar.

Export Button

Export Table as Text

This will export the fiducial point table to a text file.

Export Feature View as Image

This will export the Feature Matching tab map view as an image file.

Export Contour View as Image

This will export the Contour Matching tab map view as an image file.

Export Window as Image

This will export the entire contents of the dialog as an image. This is useful for an overview for reporting.

Export Scene as Image

This will export the main Qimera window scene work area as an image.

Export All...

This will launch a dialog and allow you to specify the location and items you would like to export. The selectable list contains the content listed under 'Export Button'.

Auto Export Checkbox

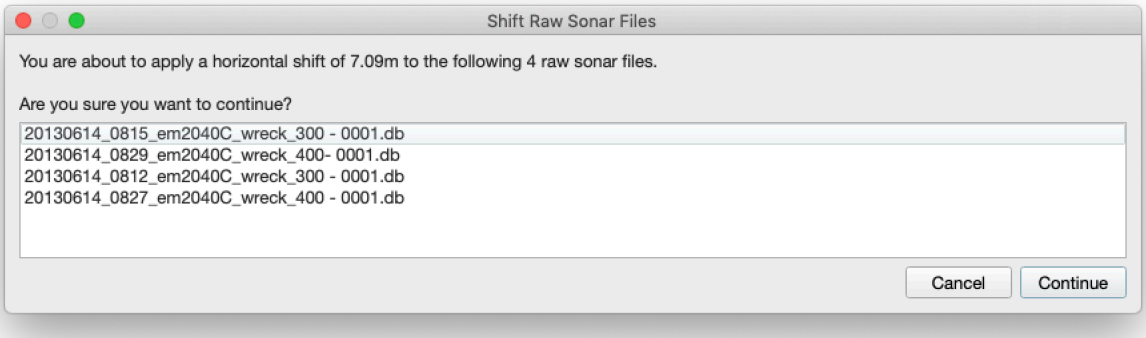
Selecting this box will automatically save all of the listed exports under the Export Button to a unique timestamp folder in the current projects export directory.

Cancel Button

This button will cancel the operation and exit the dialog.

Save Shift Button

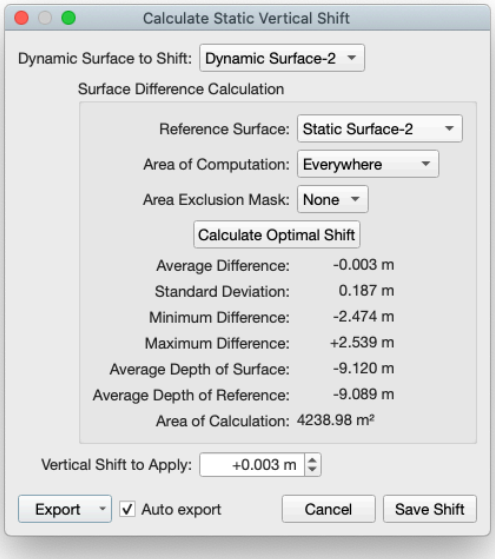
When you click this button, you will get a confirmation dialog indicating the amount of shift applied and which specific raw sonar files will receive the shift. If you click *Cancel*, you will cancel the shift operation. If you click *Continue*, the shift will be applied and Qimera will prompt you to reprocess the affected files.



Return to: *Qimera Dynamic Grid Shifting Tools*

Return to: *Qimera Table of Contents*

Qimera Static Vertical Shift Tool



- How to Start
- What it Does
- General Description
  - Dynamic Grid to Shift
  - Reference Grid
  - Area of Computation
  - Area Exclusion Mask
  - Calculate Optimal Shift Button
  - Vertical Shift to Apply
  - Export Button
    - Export Calculated Results as Text...
    - Export Window as Image...
    - Export Scene as Image...
    - Export All...
  - Auto Export Checkbox
  - Cancel Button
  - Save Shift Button

How to Start

Static Vertical Shift Tool option from the *Tools→Dynamic Grid Shifts* menu in the Main Menu bar.

What it Does

This tool will compute a static (constant) vertical shift between two grids.

General Description

This tool computes an average vertical offset between two grids using the statistical data generated by a traditional grid difference. For more information on the grid difference algorithm, please see the section on the Grid Difference Wizard. You can constrain where the computation is made using a selection in the scene which can be used as the *Area of*

Computation. For example, you could select a known relatively flat area of the seabed. Additionally or alternatively, you can select a line object in the scene to use as an *Area Exclusion Mask*. This will *mask* out areas you don't want to be part of the statistical computation. For example, if the primary survey contains rock dumping and the reference grid does not, you can mask out the area of the rock dumping which allows the algorithm to compute more accurate statistics. It also prevents you from making an odd shaped selection to be used as the *Area of Computation*. Once you save the results using the *Save Shift* button, every raw sonar file that is part of the Dynamic Grid you are shifting will have a static vertical shift applied. Qimera will then prompt you to update all Dynamic Grids containing the affected lines. The static shifts can be reviewed in the Processing Settings Dialog.

Dynamic Grid to Shift

Use this combo box to select the Dynamic Grid you wish to shift. It will set the Dynamic Grid you had selected in the Project Layers Dock when you launched the tool.

Reference Grid

Use this combo box to select the reference grid.

Area of Computation

Use this combo box to selected either *Everywhere* or *Inside Selection* to constrain where the algorithm runs the grid difference computation.

Area Exclusion Mask

Use this combo box to select a line object from the Project Layers Dock that can be used to mask out areas that you don't want used by the grid difference computation.

Calculate Optimal Shift Button

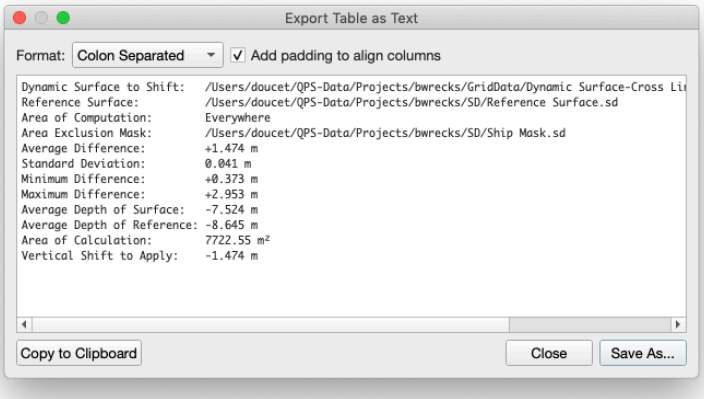
Click this button to run the grid difference computation.

Vertical Shift to Apply

This spin box will contain the result of the grid difference computation. You can change the value before clicking the *Save Shift* button.

Export Button

Export Calculated Results as Text...

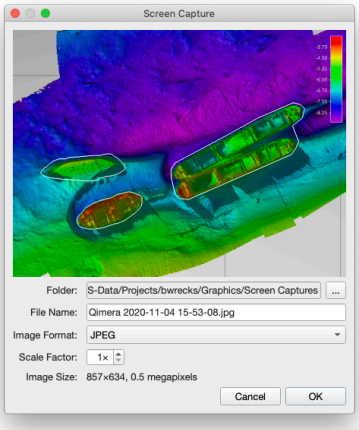


This option allows you to export the results of the shift computation as a .csv file. You can also copy the results to the clipboard to paste into another document.

Export Window as Image...

This option will export the entire contents of the dialog as an image. This is useful for an overview for reporting.

Export Scene as Image...



This option allows you to export a screen capture of the current scene. For more information, see the section on the Screen Capture Dialog.

Export All...

This option will launch a dialog and allow you to specify the location and items you would like to export. The selectable list contains the content listed under 'Export Button'.

Auto Export Checkbox

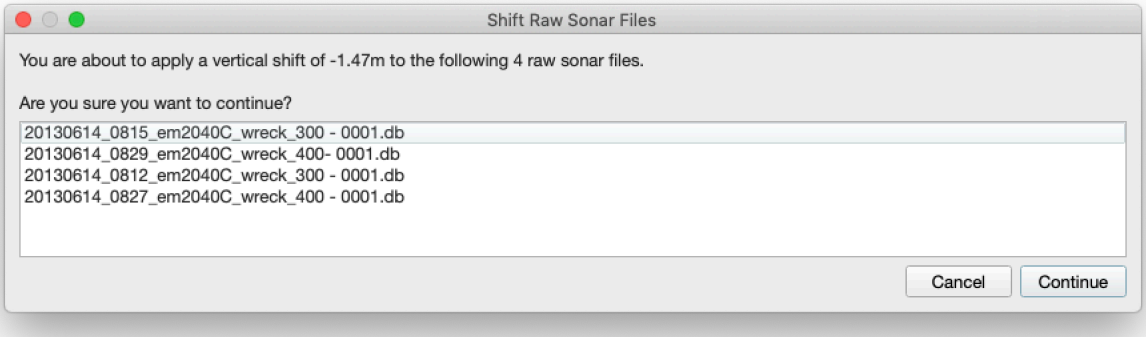
Selecting this box will automatically save all of the listed exports under the Export Button to a unique timestamped folder in the projects export directory.

Cancel Button

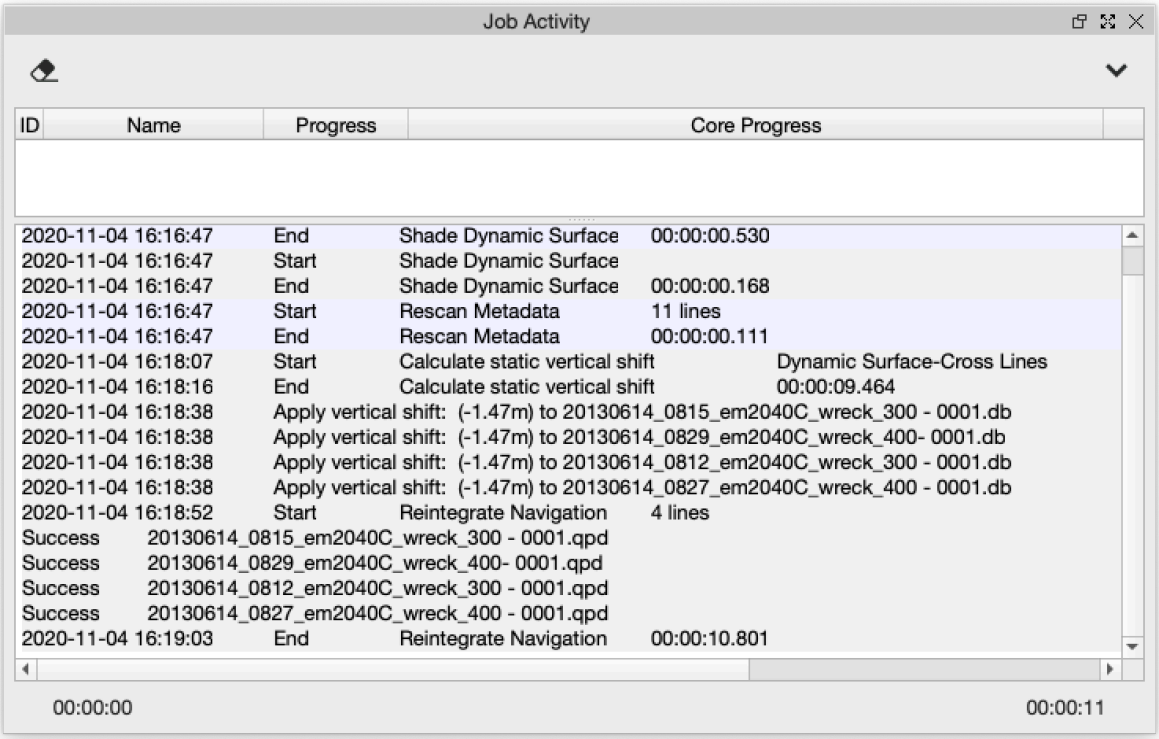
This button will cancel the operation and exit the dialog.

Save Shift Button

When you click this button, you will get a confirmation dialog indicating the amount of shift applied and which specific raw sonar files will receive the shift. If you click *Cancel*, you will cancel the shift operation. If you click *Continue*, the shift will be applied and Qimera will prompt you to reprocess the affected files.



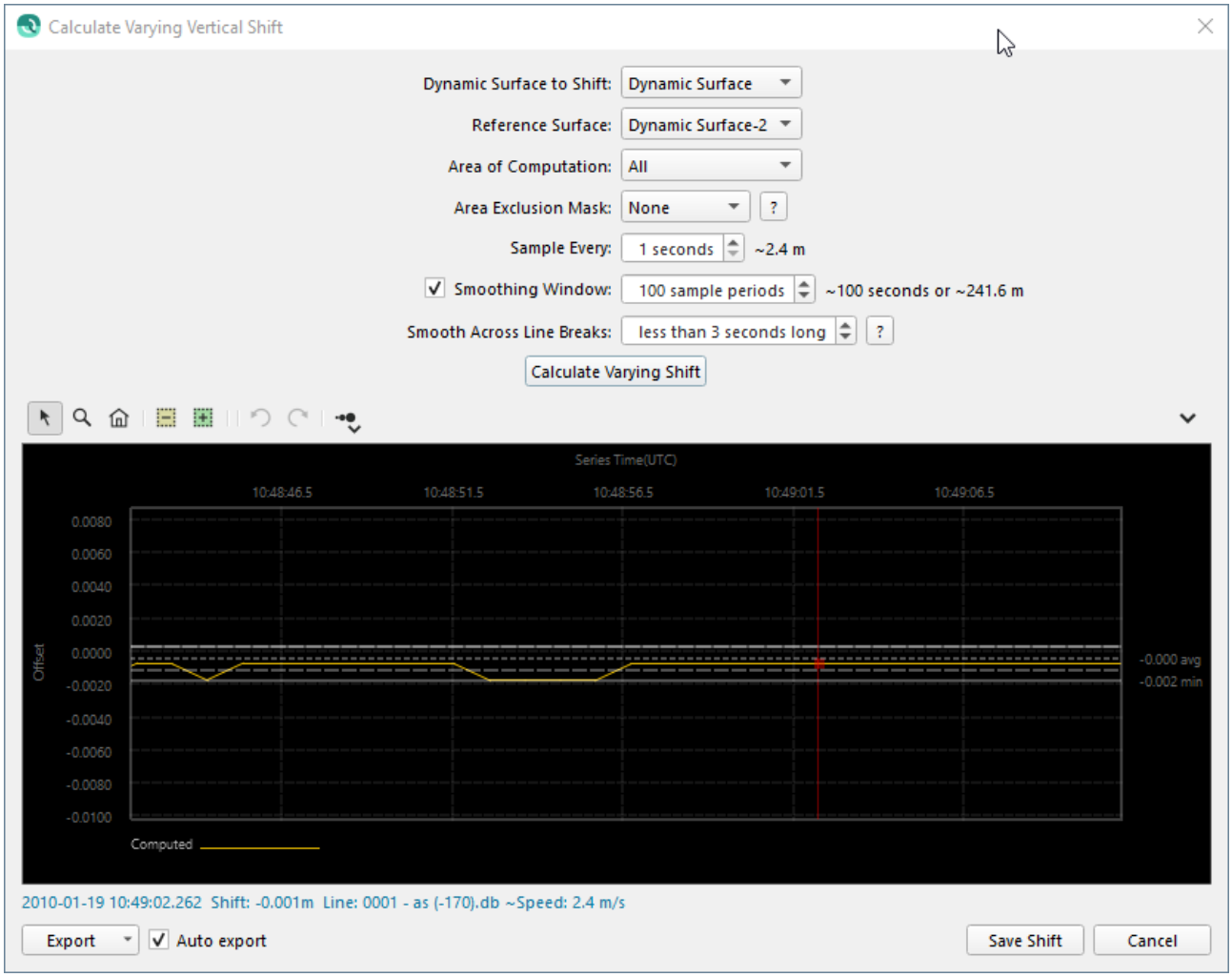
Any vertical shift operation will always appear in the Job Activity window. It will also be saved in the project path LogFiles/job-activity.log file.



Return to: *Qimera Dynamic Grid Shifting Tools*

Return to: *Qimera Table of Contents*

Qimera Varying Vertical Shift Tool



- How to Start
- What it Does
- General Description
  - Toolbar
    - Explore Mode
    - Zoom Mode
    - Zoom Out Button
  - Interpolation Edit Mode
  - Validate Edit Mode
  - Undo Button
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    - Plot Point Size
    - Menu
        - Show Current Offset
        - Show Statistics
        - Show Gridlines
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- Area of Computation
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- Sample Every
- Smoothing Window
- Smooth Across Line Breaks
- Export Button
    - Export to ASCII...
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    - Export Window as Image...
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- Auto Export Checkbox
- Save Shift Button

How to Start

Varying Vertical Shift Tool option from the *Tools → Dynamic Grid Shifts* menu in the Main Menu bar.

What it Does

This tool will compute a continuously varying vertical shift between two grids.

General Description

This tool computes a time-varying vertical offset between two grids using the statistical data generated by a traditional grid difference. The main advantage of this particular tool is that it examines the ping point cloud data in the Dynamic Grid that you wish to shift and uses this to determine the optimal shift along the navigation track, allowing the shift to

thus vary along track. This can be used to correct for a number of dynamic errors such as tide drift, heave bandwidth, or just differences in vertical referencing in between successive surveys. The tool is designed to work optimally, for the moment, for long linear corridor surveys such as those running along a pipe or cable route where the survey must be matched against a previous survey to assess changes in seabed conditions in the vicinity of the pipe or cable.

You can select a line object in the scene to use as an *Area Exclusion Mask*. This will *mask* out areas you don't want to be part of the statistical computation. For example, if the primary survey contains rock dumping and the reference grid does not, you can mask out the area of the rock dumping which allows the algorithm to compute more accurate statistics. The results are computed as a time-series of vertical shifts for all the lines that contribute to the Dynamic Grid, this is done at a fixed time interval and you can smooth the output as well within the tool. There is also the capability to allow for joins across survey lines along the route as long as the time gap between the lines does not exceed the specified tolerance for interpolation across a file boundary. Once you save the results using the *Save Shift* button, the results will be stored for each file as a time-series of shifts that can be reviewed and edited in the time-series editor as a "Height Shift" time-series. Qimera will prompt you to reprocess the relevant files after you run the tool and every raw sonar file that is part of the Dynamic Grid you are shifting will have a continuous vertical shift applied on a ping-by-ping basis. Qimera will then prompt you to update all Dynamic Grids containing the affected lines. A statistical summary of each file's continuous shifts can be reviewed in the Processing Settings Dialog.

For more information on navigating the data of the plot, see the section on Qimera Plot Grids.

Toolbar





Explore Mode

This is the primary exploration mode of the tool. As you move your cursor over the plot, the label in the lower left of the window will update to show the X/Y axis values, the current vertical offset associated with the time of the cursor position as well as the survey line at that location. The cursor in the Scene in the main app will also update with a red cursor for the synchronized location along the survey line's navigation track.



Zoom Mode

When in zoom mode, simply click and drag an area of the plot to zoom into. Click the Home button to return to the full extents of the data. At any time, you can Shift-Click to drag the plot to a new location, you can also re-position with a middle mouse click. This is especially useful when you are zoomed in.

 **Zoom Out Button**

If you have zoomed into an area of the plot, this button will zoom out to the extents of the data.

 **Interpolation Edit Mode**

If you **Click-Drag** a selection of the time series, Qimera will flag the selected samples invalid and interpolate across the selection using the sample on either side of the selected area. During processing, time series data queries will then use these new interpolated values. This is a simple way to get rid of spikes in your data. You can always undo an edit using the **Undo** button. Once you are satisfied with your edits, you must press the **Save** button. Note that you can do further editing of the height shift in the Time-Series Editor.

 **Validate Edit Mode**

This mode is an easy way to bring back data that you have marked as rejected or for interpolation. Simply **Click-Drag** a selection over the previous edit and Qimera will restore the original data. You can always undo an edit using the **Undo** button. Once you are satisfied with your edits, you must press the **Save** button.

 **Undo Button**

This will undo the last edit actions. It is a pseudo-infinite undo buffer in that you can make several edits in sequence and then undo those edits in the reverse sequence.

 **Redo Button**

This will redo the last undo edit action.

 **Plot Point Size**

Clicking this icon will change the point size drawn in the widget. If you click and hold the button, it will display a menu where you can select point sizes between *Small* and *XX-Large*. Simply clicking will cycle through all sizes.

 **Menu**

Show Current Offset

If you have previously run this tool, this option allows you to control whether or not the previously computed offset is shown in the plot or not. If shown, it is drawn in blue.

Show Statistics

This option allows you to show summary statistics of the time-series of shifts on the graph. It will show the mean, min, max and +/- 1-sigma standard deviation. These are drawn as dashed lines in the graph along with numeric labels on the right-hand side of the plot.

Show Gridlines

This option controls the display of grid lines on the time-series graph.

Dynamic Grid to Shift

Use this combo box to select the Dynamic Grid you wish to shift. It will set the Dynamic Grid you had selected in the Project Layers Dock when you launched the tool.

Reference Grid

Use this combo box to select the reference grid.

Area of Computation

Use this combo box to selected either *Everywhere* or *Inside Selection* to constrain where the algorithm runs the grid difference computation. Selecting the *Inside Selection* option will shift the source pings of all footprints that fall within the selected area. If a ping has footprints that fall inside and outside the selection area all of the footprints will be shifted for that ping.

Area Exclusion Mask

Use this combo box to select a line object from the Project Layers Dock that can be used to mask out areas that you don't want used by the grid difference computation.

Sample Every

Use this numeric entry field to specify the time interval over which a time-series shift should be computed. The default is 1-sec, meaning that the ping data will be traversed at 1-sec intervals and each ping that is found at this interval is then used to compare against the reference grid.

Smoothing Window

Use this numeric entry field and checkbox to enable smoothing of the raw vertical shift time-series. This is enabled by default to always give a smooth time-series of vertical shifts such that large jumps will not be observed. When you update the value in the box, the time-series graph will update. You may want to consider making image exports of the unfiltered time-series for reporting, as well as the smoothed time-series.

Smooth Across Line Breaks

This option allows you to smooth the varying vertical shift results across the small gaps that sometimes occur when logging stops and starts along a survey line. If set to "Never", each line's shift time-series is smoothed in isolation without benefit of the survey line before and after, resulting in steps and reduced smoothing at the start and end of each line. The time window parameter controls the decision on whether the stop of one line and the start of another line are close enough in time to smooth across.

Export Button

Export to ASCII...

This option allows you to save the entire time-series of vertical shifts as an ASCII output for reporting or further analysis. This is useful in the tool since it exports the time-series for all of the survey lines together in a single export.

Export Plot as Image...

This option allows you to save a view of the time-series graph as an image for reporting purposes. This is useful in the tool since it plots the time-series for all of the survey lines together in a single graph.

Export Window as Image...

This option will export the entire contents of the dialog as an image. This is useful for an overview for reporting.

Export Scene as Image...

This option will export the main Qimera window scene work area as an image.

Export All...

This option will launch a dialog and allow you to specify the location and items you would like to export. The selectable list contains the content listed under 'Export Button'.

Auto Export Checkbox

Selecting this box will automatically save all of the listed exports under the Export Button to a unique timestamp folder in the current projects export directory.

Cancel Button

This button will cancel the operation and exit the dialog.

Save Shift Button

Click this button to run the continuous shift computation.

Return to: *Qimera Dynamic Grid Shifting Tools*
Return to: *Qimera Table of Contents*

Qimera Instant Grid Filter

- How to Start
- What it Does

How to Start

-  button on the Bathymetry Toolbar.

What it Does

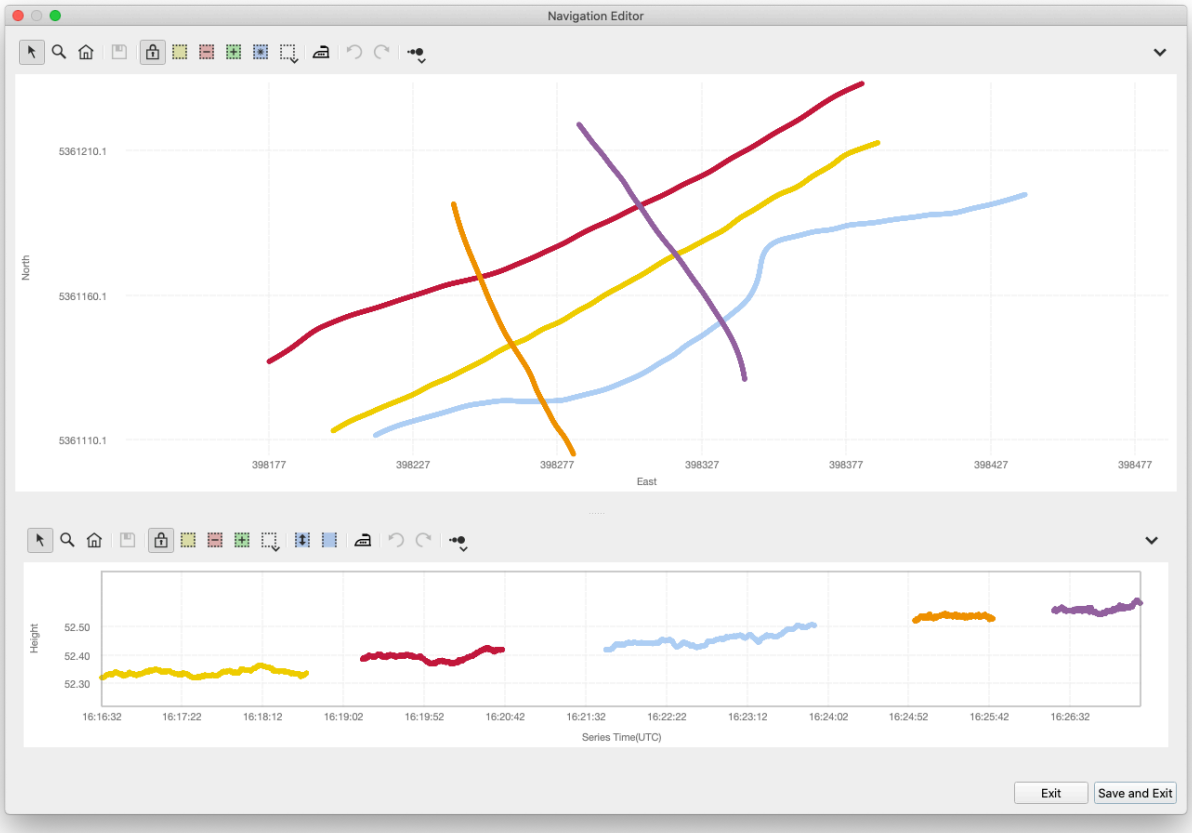
In instant grid filtering mode, making **any** spatial selection **instantly** applies the current filter on the Filter Operation Toolbar to the selected grid.

> As an alternative to this mode, the shortcut key for *Apply Within Selection* button on the Filter Operation Toolbar can be used to apply the current filter, while also providing the opportunity to review the selection prior to filtering.

Return to: Qimera Interface

Return to: Specialized Tools

Qimera Navigation Editor



- Navigation Editor
- Toolbars
  - Explore
  - Zoom In
  - Reset Zoom
  - Save
  - Synchronize XY/Z Edits
  - Editing Tools
  - Select
  - Move Mode
  - Smoothing
  - Plot Point Size
  - Menus
    - Save to Image

- Revert to Original
- Show Original
- Show Rejected
- Show Grid Lines

Navigation Editor

The *Navigation Editor* allows basic inspection and cleanup of horizontal and vertical position data.

To launch the editor, select the source files of interest in the *Project Sources* dock and choose *Navigation Editor...* from the *Tools* menu. The tool will then load the primary horizontal and vertical position times series for those files and display them in a pair of plots. Each source file is assigned its own colour, which is also displayed next to the file in the *Project Sources* dock to help identify and distinguish between files.

Functionally, the *Navigation Editor* is very similar to the *Time Series Editor* dock, but provides addition functionality more specific to navigation editing. The most obvious difference is the 2D plot, which allows viewing X and Y data together for ease of inspection and editing. Below it is the height plot showing the corresponding Z data. Each plot has its own toolbar providing options for editing and navigation. For information on plot grid navigation and editing, see the Qimera Plotting Grids documentation.

A status line at the bottom of the dialog show information about the location the mouse cursor is currently over.

Toolbars

 Explore

This is the primary exploration mode of the plots. Click and drag to pan.

 Zoom In

Click and drag a rectangle to zoom to.

 Reset Zoom

Reset the plot to its initial zoom level, making the entire range of data visible.

 Save

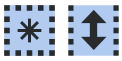
This will save any edits done to the time series. Saving edits will trigger a reaction from the Dynamic Workflow engine, marking the affected files for reprocessing.

 Synchronize XY/Z Edits

If checked, as it is by default, any mode changes or edits performed in the XY plot are automatically performed in the Z plot and *vice versa*. For example rejecting a few seconds of height samples will automatically reject all corresponding horizontal position samples as well. If you would prefer to treat the two plots as completely independent, just uncheck this option.

 Editing Tools

These work identically to how they do in the *Time Series Editor* dock, allow samples to be rejected and for holes to be cut in the time series.

 Select

These tools allow selecting an area of samples for filtering. In the XY plot a rectangular area can be selected. In the Z area a one-dimensional time span can be selected. Holding the Alt key while selecting allows selecting multiple disjoint areas. If the *Synchronize XY/Z Edits* button is checked, this selection will be mirror across both plots.

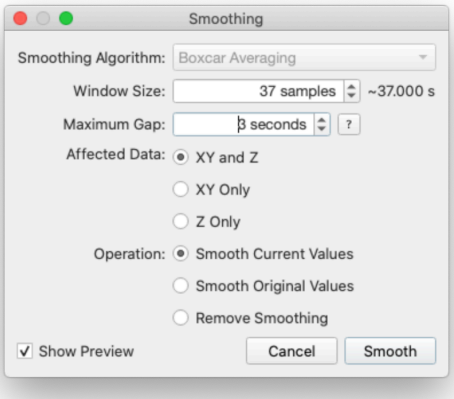
 Move Mode

This tool allows you to shift a selected number of points in the height plot. The samples within the selection window will be highlighted. Then, with the mouse inside this selection area, you can click and drag the points to their new desired location.

 Smoothing

The *Smoothing* Dialog allows you to configure and perform smoothing operations on specified data. A smoothing preview will be shown in the main dialog when *Show Preview* is checked. The preview will be updated with all changes made to the settings. Selecting the *Smooth* button will apply your settings, smooth your data and close the dialog.

Selecting cancel will not apply and close the dialog. All smoothing changes are added to the Undo/Redo stack for the duration of the Navigation Editors lifetime.



The Smoothing Algorithm options are;

1. Boxcar Averaging - a moving average filter who's size is based on the *Window Size* sample count.

The Window Size offers an approximation of time based on the sample count used in the smoothing algorithm.

The Maximum Gap value allows you to smooth across data gaps within or between lines. The smoothing of a sample will never consider samples on the other side of gaps larger than this value. It should be noted that this does not fill in points that have been rejected by the user and all edits will remain intact.

The Affected Data radio buttons allow you to select what data the smoothing algorithm will be applied too.

The Operation radio buttons allows you to select which smoothing operation you would like to perform. Smooth Current Values will smooth the current data which may contain previously smoothed data. Smooth Original Values will remove all previous smoothing and apply smoothing to the original data. Remove smoothing will remove all previous smoothing.

The Show Preview checkbox will show/hide a smoothed representation of your data in the main dialog.

 Plot Point Size

Click to quickly cycle through available point sizes. Click and hold access a menu allowing you to directly choose a size.

Menus

Both plots contain menus allowing access to the following actions:

Save to Image

This option allows saving the current contents of the plot to an image file.

Revert to Original

This action will be enabled if any modifications have been, allowing the data to be rolled back to its original state. This operation cannot be undone and any previous edits will be lost, so a confirmation dialog is shown.

Show Original

This item will show/hide the original data represented as a line. This data line cannot be edited or manipulated in any way and is for visual purposes only.

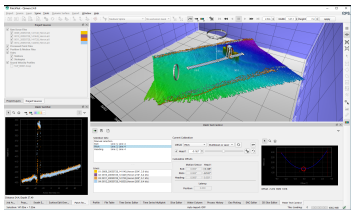
Show Rejected

This item will show/hide rejected data points.

Show Grid Lines

This option will show or hide the grid lines in the plot.

Qimera Patch Test



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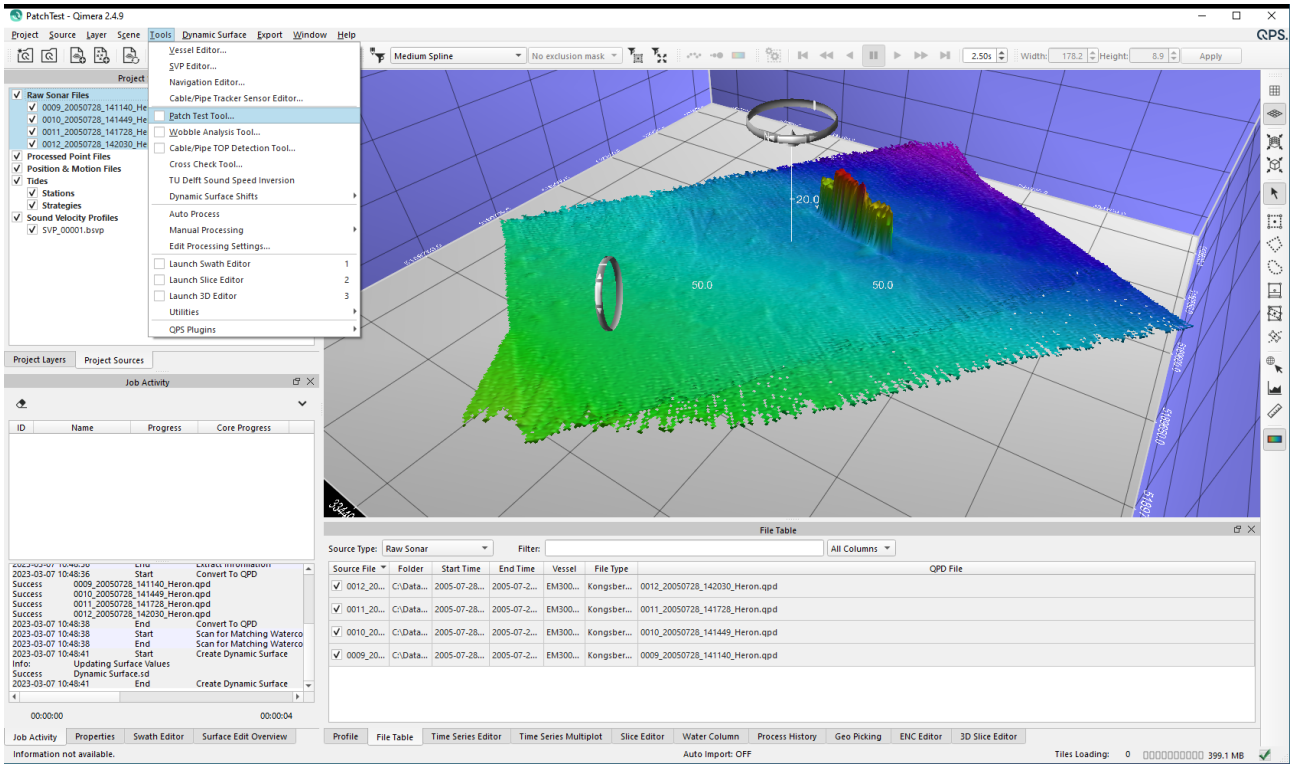
How to Start

- *Patch Test Tool* option from *Tools* menu of Main Menu bar. Ensure the lines you would like to include in the patch test are highlighted in the Project Sources tab.



What it Does

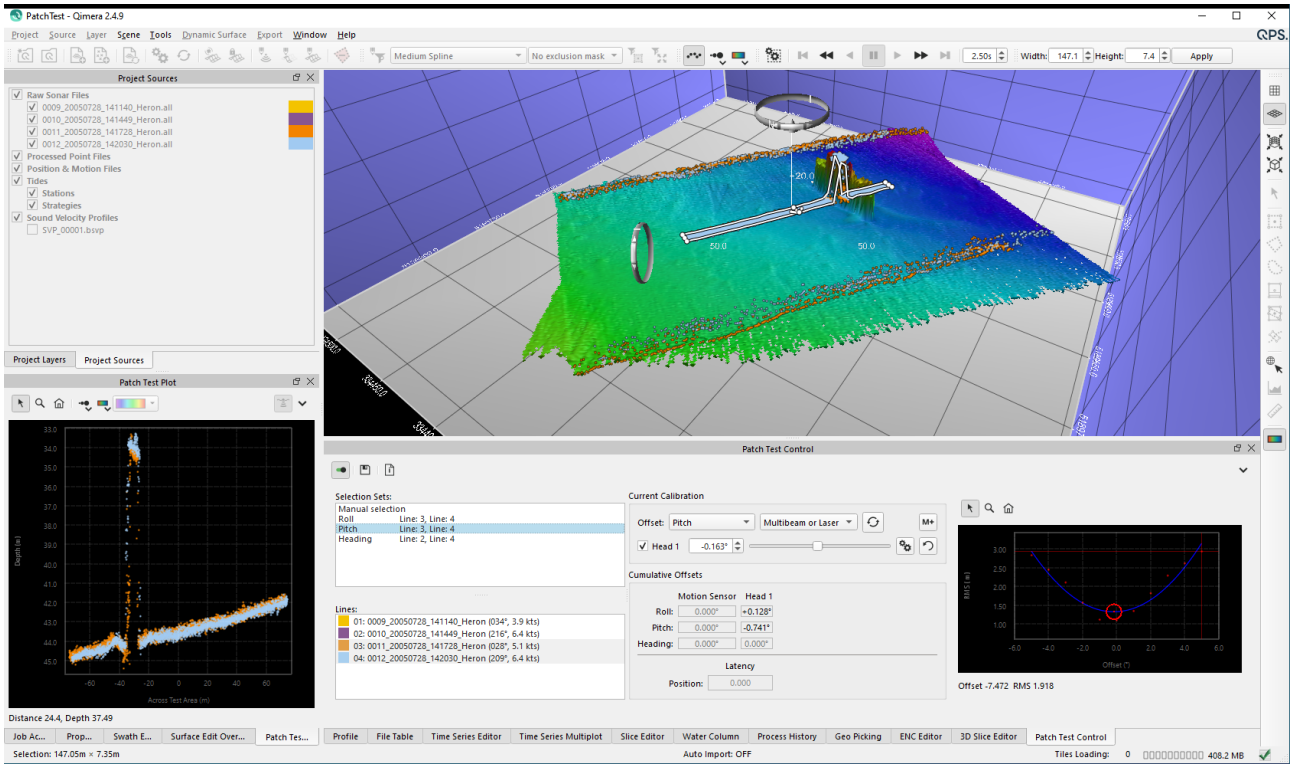
The Qimera patch test tool allows for calibration of the angular offsets of either the multibeam or motion sensor system as well as the time latency of the position system.

General Description

Patch test operations are done using the prioritized position and motion system. If you wish to establish angular offsets or position latency for secondary systems, you must re-prioritize these as the primary sensor for the patch test Raw Sonar Files using the Processing Settings dialog and then run the patch test session again. This will not overwrite the offsets established for the original primary sensors.

Patch Test Main Application Window

The patch test tool is meant to work in conjunction with the Qimera 4D Scene in the main Qimera application window. This is where the user selects appropriate spatial subsets of data to examine for the purposes of calibration. The process begins by selecting 2 or more Raw Sonar Files from the Qimera Project Sources Dock and then accessing Patch Test under the Tools menu. The Patch Test tool will automatically choose the first two lines of the set and then draws a Dynamic Selection box in the Qimera 4D Scene centered on the average location of the two lines. Most of the functionality of Qimera is locked down when running the Patch Test tool so it is advisable to set view preferences prior to running the tool; for example, setting the color map to Copper to better highlight the color coding of footprint locations or survey lines in the scene. Note that some users like to investigate offsets with just a single file. While this is possible to do as of Qimera 1.4, it is largely nonsensical in terms of a typical patch test procedure. In Qimera version 2.1, the patch test controls are now integrated into the main application. This allows use of the patch test and the scene to be more seamless. The user can also float the Plot or Control window allowing for a more customized experience. When the patch test is off, the control docks are automatically hidden to reduce clutter.

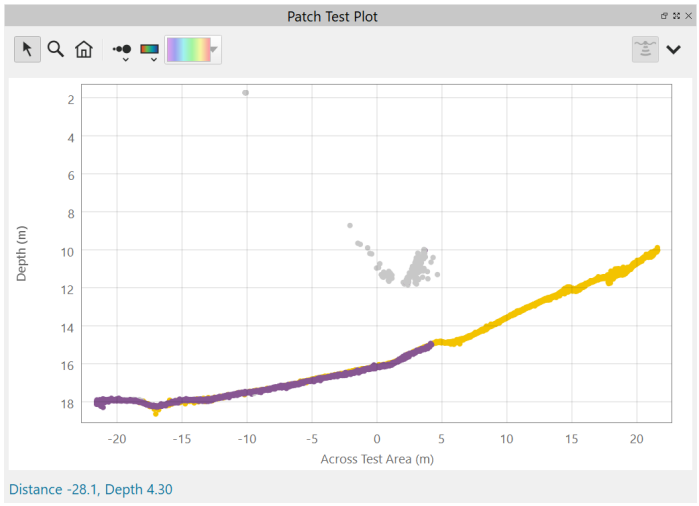


Patch Selection Area

The selection area for the plot test is automatically configured on startup. It will also automatically change when you select one of the precomputed Selection Sets. It behaves just like the standard Rectangular Selection so you can use the handles to move or modify the shape. You can also use one of the movement shortcut keys (W, S, A, D) to move the selection to a new location. You can also use the Selection Dimensions Toolbar to more specifically control the size of the patch selection. The Selection Movement Toolbar is also available to move the selection but only the forward/back buttons are enabled.

Patch Test Plot Window

This window displays the view of the soundings in the area selected for the current patch test. The selected area in the scene has an arrow that depicts the "view direction" of the soundings. These are then projected onto the plotting grid. As you move the Control Window sliders, the soundings are automatically refracted and their new position appears in the Plot Window. This window behaves like all the other plotting windows with Qimera. For more information on navigation within a plotting window, see the page on Qimera Plotting Grids.



Toolbar



The toolbar at the top of the window controls the view of the sounding plot.



Explore Mode

This is the primary exploration mode of the tool. As you move your cursor over the plot, the label in the lower left of the window will update to show the current value. Also, a tracking ball will follow the location in time along the currently selected track in the **4D View**.



Zoom Mode

When in zoom mode, simply click and drag an area of the plot to zoom into. Or simply single click a location to zoom in a bit on it. Alt-click a location to zoom out a bit. Or hit the Home button to return to the full extents of the data. At any time, you can Shift-Click to drag the plot to a new location. This is especially useful when you are zoomed in. You can always undo an edit using the **Undo** button. Once you are satisfied with your edits, you must press the **Save** button.



Reset Zoom

If you have zoomed into an area of the plot, this button will zoom out to the extents of the currently viewed attribute. The other attributes time axis will also match.



Plot Size

Clicking this button will incrementally change the size of the points and lines in your plot areas. If you click and hold the button, it will display a menu where you can select point sizes between *Small* and *XX-Large*.



Color By

This button group changes the "color by" options of the soundings in the plot. Certain options will enable the color map button that allows selection or editing of color maps or the selection of a solid color.



Dock Options Menu

The view options allow you to configure what you see and how you see it in the sounding plot:

Apply Multibeam Offsets to Both TX and RX

This is an advanced option that will force the multibeam system patch test offsets to be applied to both the transmitter and receiver. This only affects multibeam systems whose transmitter and receiver are at different locations (for example, deep water multibeam systems). This option is auto-detected and checked for systems with the transmitter and receiver at the same location.

If this box is unchecked, and you decide not to apply the offsets to both the transmitter and receiver, Qimera will apply the multibeam offsets as follows:

	Tx	Rx
Roll		✔
Pitch	✔	
Heading	✔	

Once this setting is set, you cannot change it unless you re-launch the Patch Test Tool.

Auto Zoom

When enabled, automatically resets zoom to the data extents when performing patch test operations that change the soundings in the plot.

Show Grid Lines

Show/Hide the grid lines in your plot grids.

Show Soundings

This sub-menu allows you to change the visibility of rejected, filtered, normal, additional, interpolated or user picked soundings. Any changes to these options will be persisted for the next time you perform a patch test.

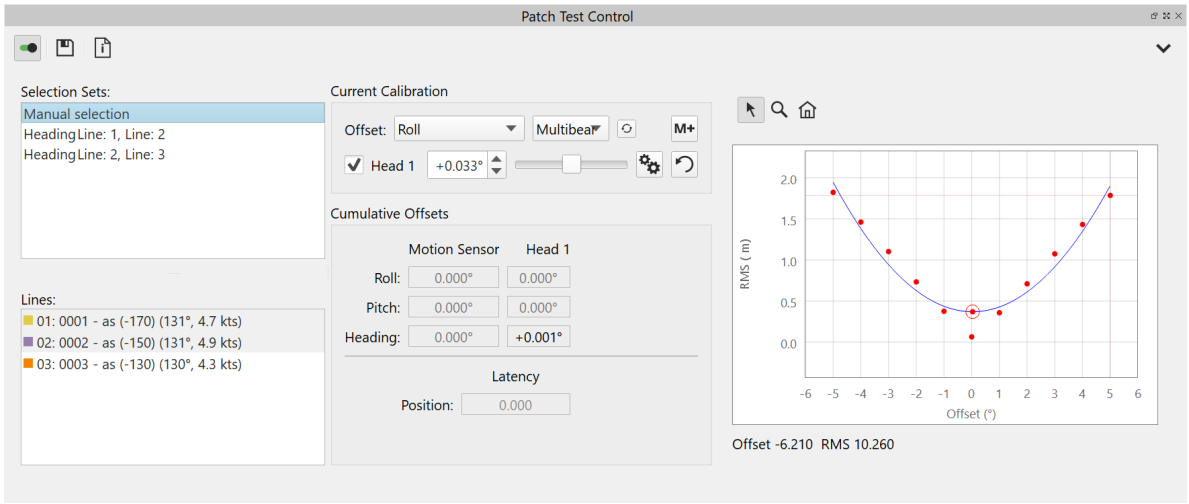
Save Patch Plot to Image

Saves the patch test plot area to an image file (JPEG or PNG).

Save RMS Plot to Image

Saves the RMS plot area to an image file (JPEG or PNG).

Patch Test Control Window



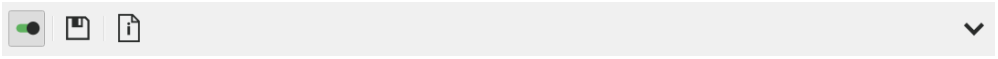
1. ***Selection Sets*:** Qimera will attempt to build a list of all possible reasonable combination of line pairings for any particular patch test calibration parameter. For example, a good candidate pair for a roll offset determination would be a pair of lines that run in opposite directions (reciprocal heading) and roughly the same speed over roughly the same patch of seafloor. All possible pairings are examined for all possible offset types (roll, pitch, heading

and positioning latency) and those that meet predefined criteria are listed in the *Selection Sets* list. You can then choose any pairing from this list; three things will then happen:

a. The *Lines* list selection will be updated to use the two candidate lines.
b. The offset type will update in the *Offset* combo box in the *Current Calibration* area (4). The *slider bar* will be set to 0.0 and the *RMS plot* will reset.
c. The Qimera 4D Scene spatial selection box will be updated to the center position of the two lines with a size and orientation that is appropriate for the type of offset being solved. For example, solving for a roll offset requires a long thin box whose long axis is oriented orthogonal to the vessel track lines. Qimera does not take the seafloor topography into account so the user must position the spatial selection box appropriately over a suitable target area. The *Dynamic Selection* box can be rotated, re-positioned and re-sized via mouse action on the box. Mouse roll-over hint icons will indicate which actions are possible based on the location of the mouse cursor in or on the box.

2. ***Lines*:** If the set of calibration lines provides reasonable auto-pairing selection sets, you will rarely have to use the *Lines* dialog. In the event that the auto-pairing failed, you can still select lines in manual mode (this will be the only item in the *Selection Sets* list available) by selecting lines in the *Lines* list. One or more lines can be selected. Additionally, if you choose one of the auto-paired *Selection Sets* items, you can still add/remove lines from the selection using the Lines list window.
3. ***Current Calibration*:** Once lines are selected, you can adjust the calibration parameter of interest. As you adjust a parameter of interest using the slider bar, the *Sounding Plot* and the *RMS Plot* will both update. The slider bar is adjusted until the soundings from all of the selected lines report consistent results. Alternately, the auto-solve function can be run. Once a suitable result is achieved, the value is added to the *Cumulative Offsets* (5). This tool is explained in more detail below in the next section.
4. ***Cumulative Offsets*:** The patch test tool can be used in an iterative manner, for example the roll, pitch and heading offsets can be roughly determined in a first pass and then improved in a second pass. With this type of workflow, it is important to allow for the accumulation of offsets through the process. As you determine offsets and then incrementally improve them, the total of all offsets are shown in this section of the tool.
5. ***RMS Plot*:** This is a plot of the root-mean-square (RMS) difference between two temporary terrain models derived from the the two currently selected lines (one terrain model for each line, stored only in memory). It will update when running the auto-solve function and also when manually adjusting the slider and spin box widgets in the *Current Calibration* widget set. This plot is explained in more detail below in the next section.

Toolbar



The toolbar at the top of the window controls .



On/Off

This button works the same as the Qimera Tools→Patch Test menu option. It will turn the patch test widgets on or off.



Save

This button will bring up the Save Dialog detailed below.



Show Detail

This button will show the Patch Test Detail dialog detailed below.



Dock Options Menu

Save

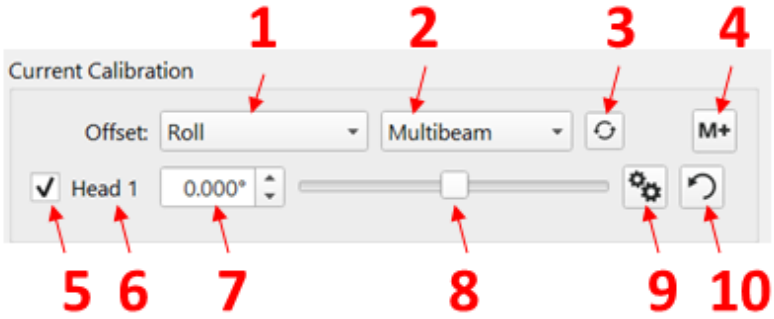
Same behavior as the button on the toolbar.

Clear All Offsets

This will clear all calibration steps. You will be asked to verify this decision as you will lose all of your work.

Patch Test Window - Current Calibration

The image below highlights the controls and the numbered list below the image explains how each is used.



1. Offset type combo box: The type of offset being resolved is chosen from this combo box. The choices are roll, pitch, heading and latency.
2. System selection combo box: The angular offsets as resolved by a patch test can either be attributed to either the multibeam or the motion sensor. This combo box allows you to choose which system you would like to assign the offsets to. In some cases, you may have multibeam sonar offsets that were accurately measured by a marine surveyor and you may want to resolve the unknown angular offsets of the motion sensor. In other cases, the motion sensor is well aligned and you may want to assign the patch test results to the multibeam heads.
3. Auto solve: This launches the auto-solve routine. This is described in more detail in the *RMS Plot* section below.
4. M+ Add calibration: Once you are satisfied with the calibration, the value can be added to the cumulative offsets, these are shown in the *Cumulative Offsets* section.
5. Application: this toggles whether or not this calibration value is enabled or disabled. This is useful for quickly examining before/after scenarios, particularly for screen shots documenting your calibration.
6. Sensor label: this indicates the name of the sensor you are calibrating.
7. Offset adjustment spin box: You can enter the offset in the spin box or adjust it using the adjustment arrows that are part of the spin box controller.
8. Offset adjustment slider bar: You can adjust the offset using this slider bar. Holding down the shift key decreases the sensitivity to mouse movement so that small adjustments can be made to fine tune an offset.
9. Range edit: Adjust the minimum and maximum range of the slider bar. The default is to limit this to +/-5 degrees.
10. Reset zero: Resets the current offset value to zero. The cumulative offset achieved at this point retains its current value.

Patch Test Window - RMS Plot

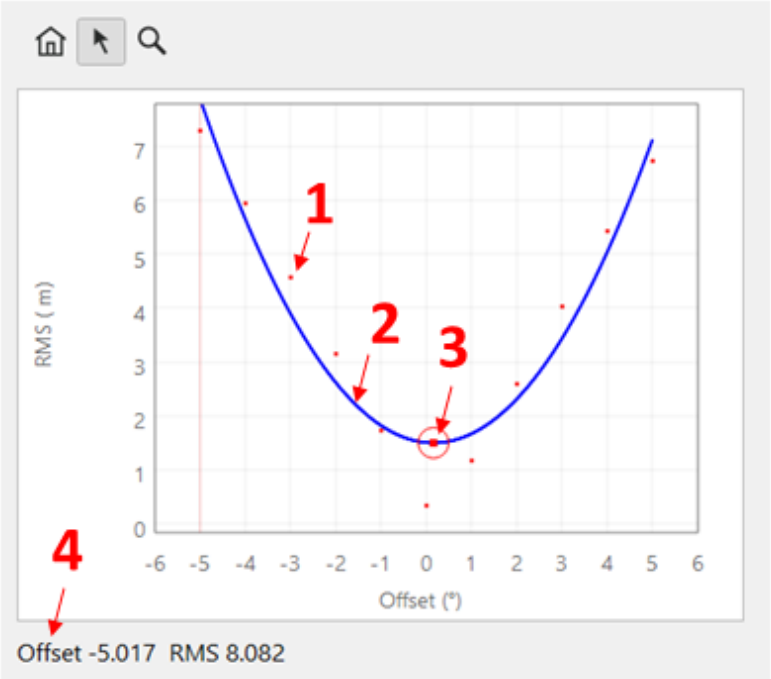
Your eye is amazingly adept at subjectively assessing the quality of the chosen calibration offset by looking at the *Sounding Plot* alone. It is often desirable, however, to have a quantitative assessment of the quality of the chosen calibration value relative to the entire range of possible calibration values. The RMS plot allows you to assess the quality of the calibration in a quantitative way by computing the RMS between two temporary terrain models, one for each of the two currently selected survey lines. This value is computed every time a manual adjustment is made to the Offset Adjustment spinbox and/or slider bar, or when triggering the auto-solve function. The temporary terrain models, which are stored only in memory, are built for the area associated with the spatial selection box. The resolution of the temporary terrain models is determined automatically based on the sounding density in the selected area.

The RMS plot, shown below, has a few graphical components that warrant more explanation. The RMS plot also has a small toolbar at the top that allows for basic view control of the graph with a zoom out button, explore button and zoom button that function in the same manner as they do in the Sounding Plot. The numbered list below provides information about the plot and widget items shown in the RMS plot.

1. RMS value for a particular offset, plotted as red dots, either from the auto-solve or from manual adjustments to the Offset adjustment spinbox and/or slider bar widgets. The number and spacing of plotted points depends on whether they are derived from manual adjustments or from the auto-solve function:
   a. The auto-solve function will compute the RMS values over the range of values associated with the Current Calibration slider bar widget limits (which is adjusted by the Range Edit button). The range is split into ten intervals. A large range in the slider bar widget will necessarilly have a large step size in the auto-solve. Decreasing the range of the slider bar widget will decrease the step size taken during the auto-solve.
   b. Manual adjustment of the slider bar or spinbox widgets in the Current Calibration will dynamically fill in the RMS plot with more points. The update rate of the plot will depend on the speed of your computer and its ability to keep up with your adjustments. This allows you to fill in the gaps between the steps taken by the auto-solve algorithm. Recall that holding down the shift key decreases the sensitivity to mouse movement so that small adjustments can be made to fine tune an offset.
2. Parabolic fit to the RMS values computed during the auto-solve, as determined via the method of Least Squares. All auto-solve actions attempt to fit a parabola, regardless of the shape traced out by the RMS points.
3. Minimum point on the parabola fit to the auto-solve results. The x-value in the graph associated with the parabola minimum is the result from the auto-solve. If the parabola fit is very poor, then the auto-solve does not provide the minimum point as a solution and a warning

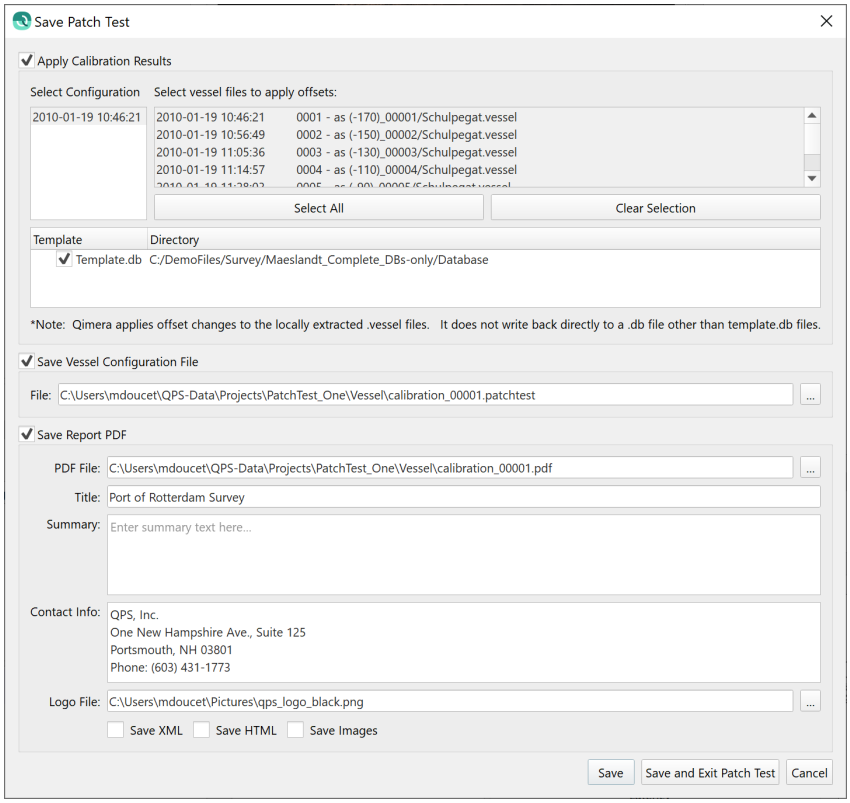
dialog is shown to indicate that perhaps another set of lines or another spatial selection might yield a better result.

4. Text display of the offset and RMS associated with the mouse position in the graph, this updates with mouse motion over the plot.



Patch Test Save Dialog

When you click the save button, the Patch Test Save Dialog will appear. This dialog allows you considerable control over exactly what you will be saving, and how it will be applied.



Apply Calibration Results

Check this option to apply the calibration results to the files in your project. Clicking in the right hand list allows you to perform a standard multi-selection. Qimera stores the total offsets in the patch test results, i.e. the value prior to the patch test with the patch test offset applied. For example, if your initial roll offset was 0.1 deg and your patch test evaluation came up with an additional 0.05 deg, the patch test result file will store the sum of these, i.e. 0.15 deg. When a patch test session file is applied to an existing vessel configuration, the offsets overwrite the values in the vessel configuration to avoid the pitfalls of accidental double application in the case where the offsets are added. For files that are imported at a later stage, you must apply the patch test configuration to the newly imported files as discussed in the Qimera Vessel Editor documentation.

There is an additional option in this dialog that is enabled for Qinsy users who work with Qinsy .db files. You can choose to save the patch test results back to a Template.db file to enable quick turnaround to get straight back to mapping. Qimera will isolate the directories in which the raw .db files came from and will search the directories for template.db files. It will also find a common template.db file in the Common Files folder, if this is configured in Qinsy. These will appear in the "Template" table as additional options to check for update. They will be checked by default. During update, Qimera will examine the MBE systems in the template.db file and will only write out the patch test offsets for the systems that match those that were in the raw .db files that were provided to the Patch Test tool. This prevents writing offsets to another template file which may have a different

MBE system in it. Qimera will also list common shared Template files in the Template table so that these can be updated at the same time.

Save Vessel Configuration File

Check this option to save a .patchtest file to disk. This is useful as it can later be imported into another project created by the same vessel. Use the Vessel Editor to import a previously saved configuration file.

Save Report PDF

This option will save a PDF report of the patch test. You can also provide the following customized components of your PDF report:

- Title
- Summary
- Contact Information
- Company Logo

The custom components will appear on the top of the first page of the report.

Save XML

This option will save an XML version of the patch test calibration steps.

Save HTML

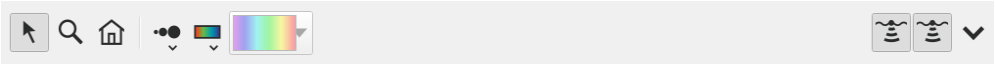
This option will save an HTML version of the patch test report. It will be saved to the same folder as defined by the PDF report. If you select this option, it will automatically select the Save Images option. Saving an HTML version will allow users to customize the report further with the user of an HTML editor.

Save Images

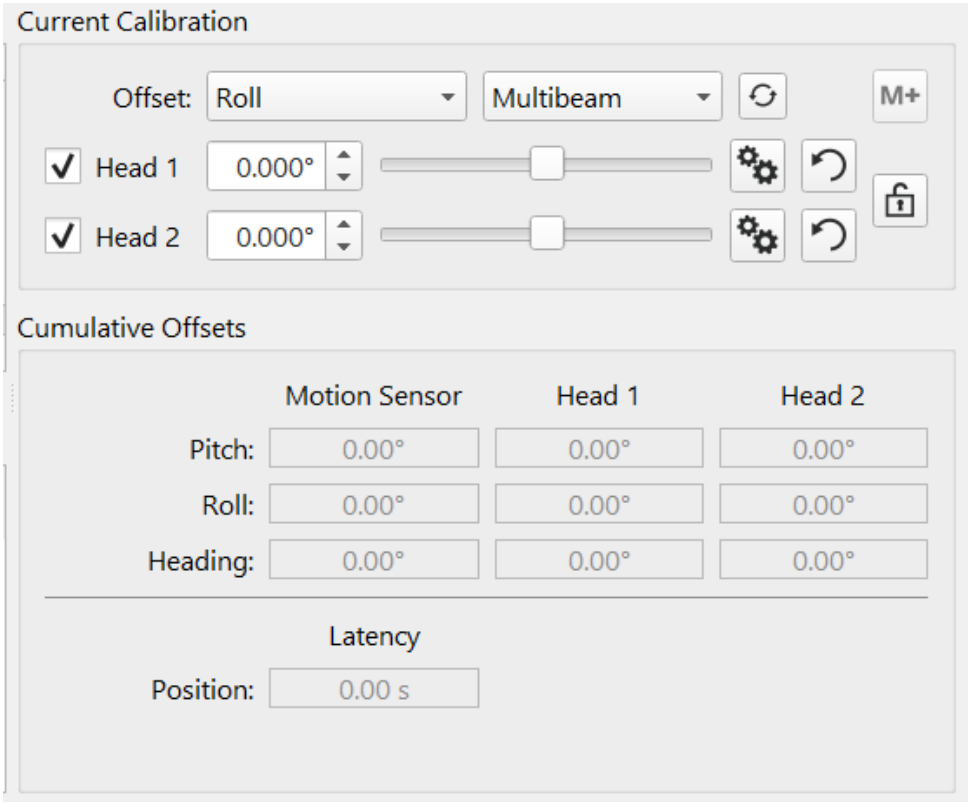
This option saves the images used in the report to the folder defined by the PDF report. Each calibration step has 4 images: Area, Before Calibration, After Calibration and RMS plot.

Patch Testing Multi-Head Systems

If you are patch testing a multi-headed system, you can evaluate the offsets in the same patch test session. View control buttons will be displayed on the right side of the toolbar that lets you toggle the visibility of each of the heads in the sounding plot.



In multi-head mode, the layout of the *Current Calibration* and *Cumulative Offsets* areas will change slightly to accommodate the other heads, as shown below. If you are working with a dual-head multibeam sonar, you will also get the Lock/Unlock button described below. This button will not appear for other multi-head systems.



A second set of control widgets will appear in the *Current Calibration* that allows for separate control of the 2nd head. A second set of cumulative offsets will also be shown in the *Cumulative Offsets* area. A lock button also appears in the *Current Calibration* that allows the slider values to lock relative to each other such that you can establish common offsets shared by both heads, e.g. if the MRU is misaligned, both heads will appear to share a common roll offset but they will also have a residual offset relative to each other.

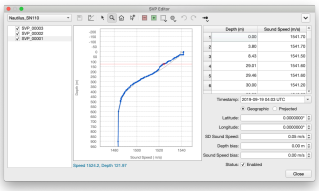
Lock/Unlock

Both heads can be adjusted independently. With the lock button pressed, adjusting the offset from the first head will also adjust the offset of the second head, however, the relative offset between the two heads will be maintained during this operation.

Return to: *Qimera Interface*

Return to: *Specialized Tools*

Qimera SVP Editor



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      - Revert
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      - Check Selected
      - Check Only Selected

- Table Context Menu
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  - Insert After
  - Accept Entry(s)
  - Reject Entry(s)
- Display and Control
- Sample Editing

How to Start

- *SVP Editor* option from *Tools* menu of Main Menu bar
- Context menu of Sound Velocity Profiles → *SVP Editor*

What it Does

The SVP Editor is used to create and edit sound velocity profiles.

General Description

Qimera provides a sound velocity profile (SVP) editor that allows you to edit the SVP information that is extracted from your Raw Sonar Files or from SVP data files that you've imported into your project. The editor consists of a toolbar along the top that controls the interaction mode. The left most panel is a list of SVP files in your project; selecting in this list will update the SVP plot in the middle of the editor. The data from the selected profile is also shown in a text table on the right side of the editor and this allows you to modify the entries. The date/time and position of the SVP are shown in the bottom right corner, along with the estimated sensor uncertainty. The date/time and position (displayed in Geographic or Projected coordinates) enable spatial and time based lookup algorithms in the Processing Settings configuration dialog. The date/time and position of SVP items are populated for the incoming file formats that support this. For data formats that do not record this information, the position will be set to zero and the date/time will be set to January 1st, 1970. If you make any modifications to an SVP, Qimera's Dynamic Workflow Engine will determine which raw sonar files need reprocessing and mark them accordingly in the project tree view.

Toolbar



Combo box

The combo box at the left side of the *Toolbar* allows you to choose the SVP data for a particular vessel. Currently, the display is limited to show the SVP data from a single vessel at a time.



Save Button

This will save any edits made to the SVP data. Again, saving edits will trigger a reaction from the Dynamic Workflow engine. When you save an edit to an SVP, Qimera will create a copy of the original and will display this as a set of revision versions indented below the SVP item in the list view. Each edit session will create a new revision. Qimera will also identify all raw sonar files that require reprocessing due to your changes.



New SVP Button

The new SVP button will allow you to create a new SVP item for that currently selected vessel. You will be presented with a dialog that will prompt you for a name and acquisition date/time. After this step, your new SVP will appear in the SVP list window and it will be given two initial depth/velocity entries covering a depth range from 0 meters to 12,000 meters with a constant sound speed of 1500 m/s. You can graphically add points in the SVP plot or you can edit, add or remove entries in the table view. After creating a new SVP profile, you may need to modify the *SVP Selection Strategy* in the Processing Configuration Dialog.



Explore Mode

This is the primary exploration mode of the tool. As you move your cursor over the plot, the label in the lower left of the window will update to show the interpolated sound speed and depth of the point in the SVP that is closest to your mouse position.



Zoom Mode

When in zoom mode, simply click and drag an area of the plot to zoom into. Or simply single click a location to zoom in a bit on it. ALT-click a location to zoom out a bit. Or hit the Home button on the keyboard to return to the full extents of the data. At any time, you can SHIFT-Click to drag the plot to a new location. This is especially useful when you are zoomed in.



Zoom Out Button

If you have zoomed into an area of the plot, this button will zoom out to the extents of the current set of SVPs.
If you have any SVP files selected in the panel, then the graph's X-Y extents will be constrained to the selected SVP files. If no SVP files are selected, the X-Y extents will be reset to contain all SVP files.



Add Entry Button

The add entry button allows you to add a depth/velocity entry graphically by clicking in the SVP plot window. A new entry will be inserted at the appropriate location in the table view. Once a point is added to the SVP, it cannot be moved graphically, it can only be edited manually in the table view. It can be selected as invalid/valid just like any other point, however.



Reject Selection

This button places the cursor in *Reject Selection* mode. Holding down the CTRL key will invert the mode between *Reject* and *Accept*. Use the selection style and selection area drop down buttons to modify the selection style.



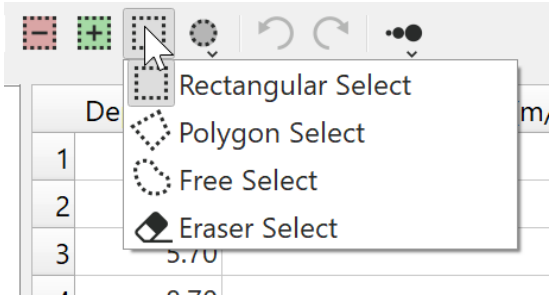
Accept Selection

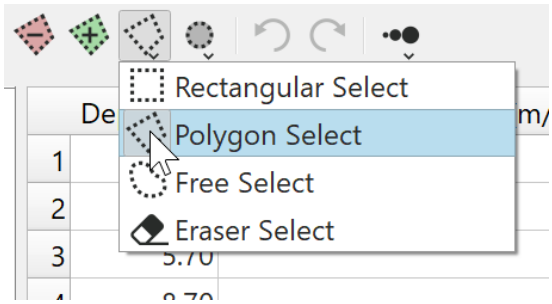
This button places the cursor in *Reject Selection* mode. Holding down the CTRL key will invert the mode between *Reject* and *Accept*. Use the selection style and selection area drop down buttons to modify the selection style.



Selection Style

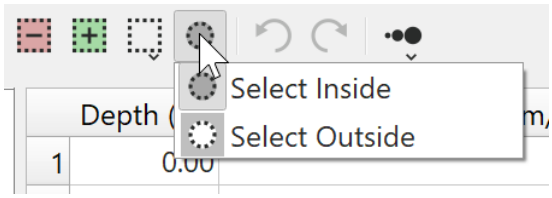
This button changes the selection style of both the *Reject* and *Accept* buttons. Clicking this will rotate through each of the styles, or long pressing will give you a drop down menu to select the style.

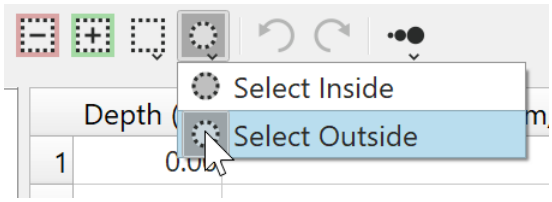




Selection Area

This button changes the selection area of both the *Reject* and *Accept* buttons. Clicking this will rotate through each of the areas, or long pressing will give you a drop down menu to select the area.





See the section on Plot Grid Editing for more information about editing with these tools.

Undo Button

This will undo the last edit actions. It is a pseudo-infinite undo buffer (c'mon, how much memory do you have?) in that you can make several edits in sequence and then undo those edits in the reverse sequence.



Redo Button

This will allow you to recover from an accidental undo operation.



Point Size

Clicking the this icon will change the point and line size drawn in the plot area. If you click and hold the button, it will display a menu where you can select point sizes between *Small* and *XX-Large*. Simply clicking will cycle through all sizes.



SVP Editor Menu

Show Column

This option allows you to change the visibility of SVP attribute columns in the table view. Table options include:

- Depth
- Sound Speed
- Temperature
- Conductivity
- Salinity
- Pressure
- Flags

All of these fields are stored for every sample, even if this type of data was not available during import. At the moment, Qimera only uses the depth and sound speed values. In the future, it will potentially use the other data types for computing sound speed and/or absorption coefficients.

Save Image

This option will allow you to save the plot to a JPEG or PNG image.

Show Grid Lines

This option will show/hide grid lines on the plot.

Hide Rejected Entries

This option will show/hide rejected entries in the table entry.

Tree View Context Menu

If you right click on a selection in the tree view, you will show the tree view context menu.

Revert

This option allows you to revert to a saved revision of your plot

Uncheck Selected

This option will uncheck all SVPs in the current selection. Check state controls visibility of the SVP in the plot.

Check Selected

This option will check all SVPs in the current selection. Check state controls visibility of the SVP in the plot.

Check Only Selected

This option will check all SVPs in the current selection and uncheck those outside of the selection. Check state controls visibility of the SVP in the plot.

Table Context Menu

If you right click on a row in the table, you will show the table view context menu.

Insert Before

Insert a row before the currently selected row.

Insert After

Insert a row after the currently selected row.

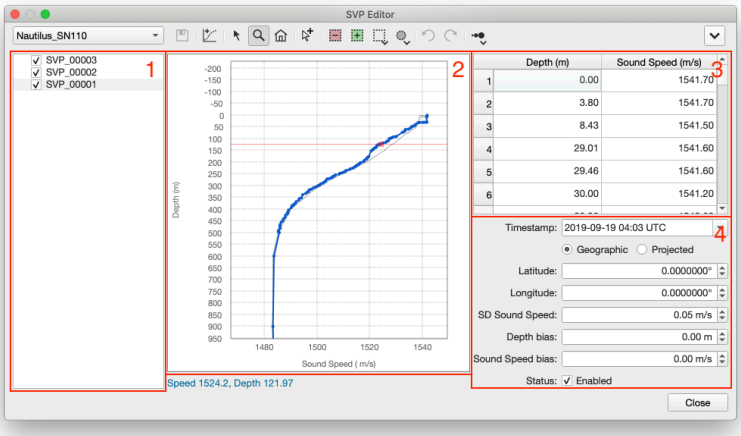
Accept Entry(s)

Accept the selected entry or entries.

Reject Entry(s)

Reject the selected entry or entries.

Display and Control



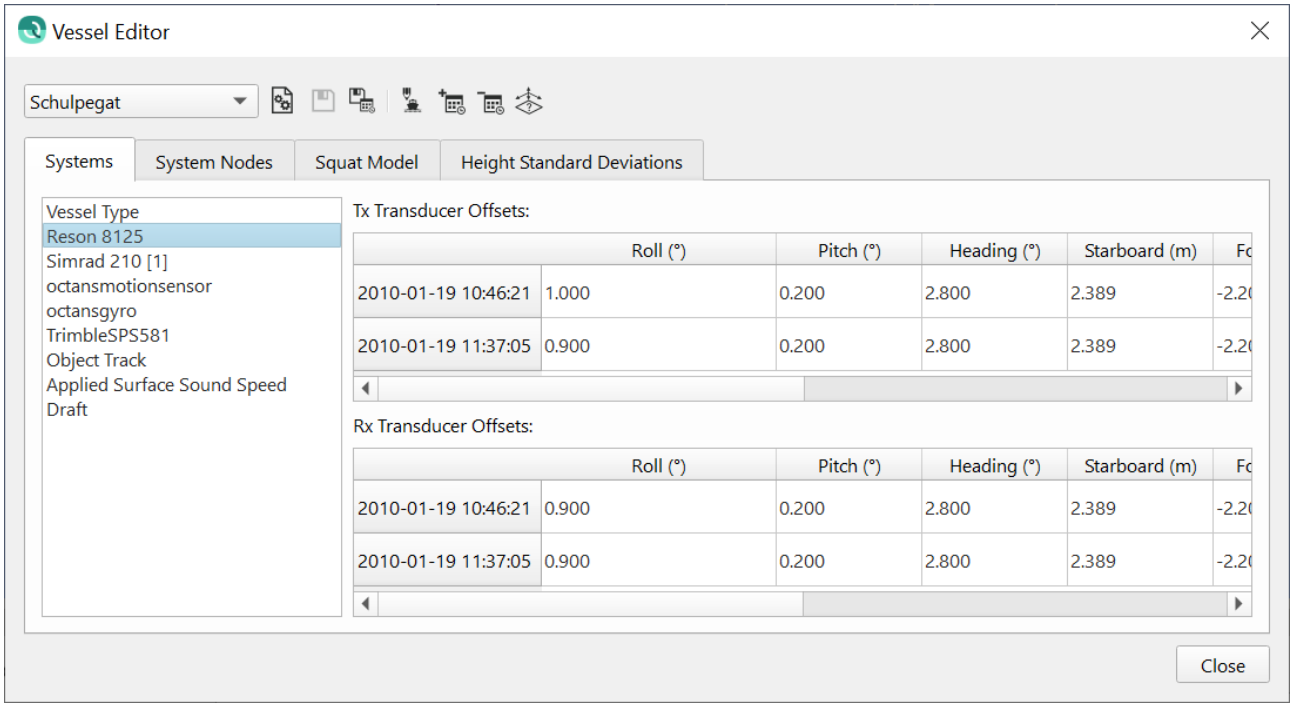
1. ***SVP list view:*** A list view of the SVPs currently associated with the vessel chosen from the combo box in the tool bar. Select items in this list to edit them, the chosen item will be drawn in blue in the SVP plot window. All other items are drawn in the SVP plot in light gray in the background for context.
2. ***SVP plot:*** Graphical plot of all SVPs from the currently selected vessel. The currently selected SVP in the SVP list is drawn in blue, all others are drawn in gray.
3. ***Table entry:*** A tabular list of the data points associated with the currently selected SVP. You can manually edit them be selecting a cell. You can also right click on any item and reject that item or insert a row before/after the currently selected sample. Points selected for deletion in the SVP plot will be drawn in light gray.
4. ***SVP metadata:*** The time stamp and position of the SVP, as detected during import, will be displayed here. You can view and edit the time stamp and position of the SVP, in Geographic or Projected coordinates, and save them back to the file. This will create a new version of the SVP but you can always revert to the original state by right-clicking a revision item in the SVP list and choosing the revert option. You can set the standard deviation (SD) of the SVP measurements and you can also set the calibration bias for the depth sensor and SVP sensor as well in the event that these need to be corrected in post-processing. The tickbox at the very bottom of the metadata section allows you to enable/disable use of the currently selected SVP item for use in processing.

Sample Editing

- Editing SVP sample data can happen either by using the selection tools in the plot area or by directly modifying the table entry values. Table modification can only work on a single SVP selection while plot tool based editing can occur on all currently selected SVPs. Follow the examples in the appendix section on Qimera Plot Grid Editing to use the selection tools for editing samples in the plot area. If you have many SVPs, use the check state of each to show/hide SVPs in order to declutter the plot. Remember that only visible and selected SVPs react to the edit tools. When you reject samples in your data, Qimera will interpolate across the gap. When an SVP that has edits is selected, the deleted samples are shown as red points where they used to occur in the plot.
- If you change the *Show Columns* options of the table view to show *Flags*, you can also see the edit flags *(Deleted, Added, Modified*) for the specific entry as shown below.
- You can use the editing tools to edit more than one SVP at a time in the same way that you edit soundings in the various sounding editors. Simply select all of your SVPs in the list view with the mouse (you can use CTRL/CMD and SHIFT modifier keys) and use one of the selection tools to select the desired samples for deletion. The multi select will disable the table and its editing features.
- You can use the editing tools to edit more than one SVP at a time in the same way that you edit soundings in the various sounding editors. Simply select all of your SVPs in the list view with the mouse (you can use CTRL/CMD and SHIFT modifier keys) and use one of the selection tools to select the desired samples for deletion. The multi select will disable the table and its editing features, aside from SD Sound Speed.

Return to: *Qimera Interface*
Return to: *Specialized Tools*

Qimera Vessel Editor



On this page:

- How to Start
- What it Does
- General Description
  - Toolbar
  - Combo Box
  - Open Configuration
  - Save
  - Save Configuration
  - Edit Vessel Name
  - New Date/Time Entry
  - Remove Date/Time Entry
  - TPU Editor
    - Multibeam
    - Motion Sensor
    - Heading Sensor
    - Position Sensor
    - Surface Sound Speed Sensor

- Draft
- Depth
- Pressure

- Systems Tab
- System Nodes Tab
- Squat Model Tab
- Height Standard Deviations Tab

How to Start

- *Vessel Editor* option from *Tools* menu of Main Menu bar
- Context menu of Raw Sonar Files → *Edit Vessel Configuration*

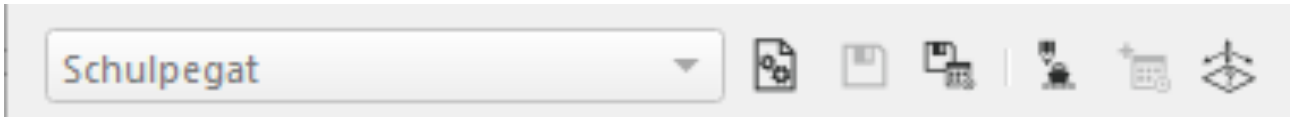
What it Does

The Vessel Editor is used to review and edit all information regarding a particular sensor or system.

General Description

Editing for sensors and systems includes location on the vessel, angular alignment, latency, sign conventions and measurement standard deviations (SD) used for calculating sounding footprint uncertainty. This data is extracted during the initial import of Raw Sonar Files and is stored inside the Qimera project in the *Metadata* folder for the line. Any edits that are performed and saved will trigger a reaction from the Dynamic Workflow engine. The *Systems* tab provides a list of systems associated with the vessel in the left pane, and table of entries on the right containing offset information. The *System Nodes* tab lists all systems associated with the vessel, as well as their respective node. The *Squat Model* tab allows the user to provide a squat model. The *Height Standard Deviations* tab allows the user to enter the uncertainty pertaining to height variables such as Squat, Tide and Load. Control of the display is managed by the toolbar.

Toolbar

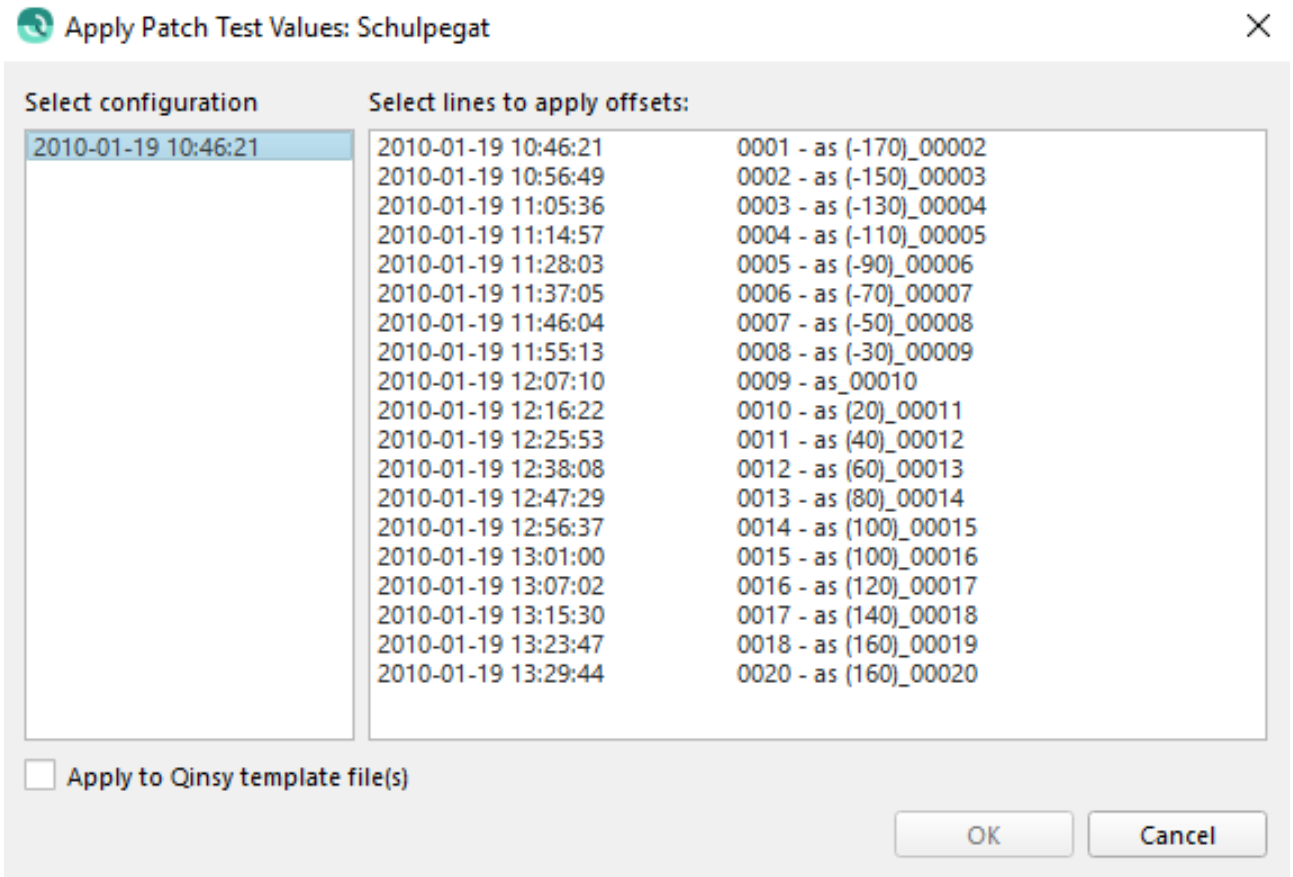


Combo Box

Qimera allows users to create projects with data from multiple sources, of which each may have a unique vessel configuration. The combo box allows for vessel selection. For projects with a single vessel, the combo box will be drawn in gray.

Open Configuration

This will allow you to load a patch test or wobble analysis session file and apply it to the existing vessel configuration. A file selection dialog will allow you to choose the patch test or wobble analysis session output file, and you will then be presented with a list of source item start times to which you can apply the new configuration (shown below) The configuration values, e.g. roll offset of the multibeam head, will replace the value that is currently stored in the vessel configuration. This avoids the problems of accidental double application that could occur if the values from the patch test session were added to the existing values. The tickbox to "Apply to Qinsy template file(s)" will apply patch test offsets to template.db files that are found in the same location as the original .db files. At the moment, the only values that are applied are patch test values for multibeam systems.

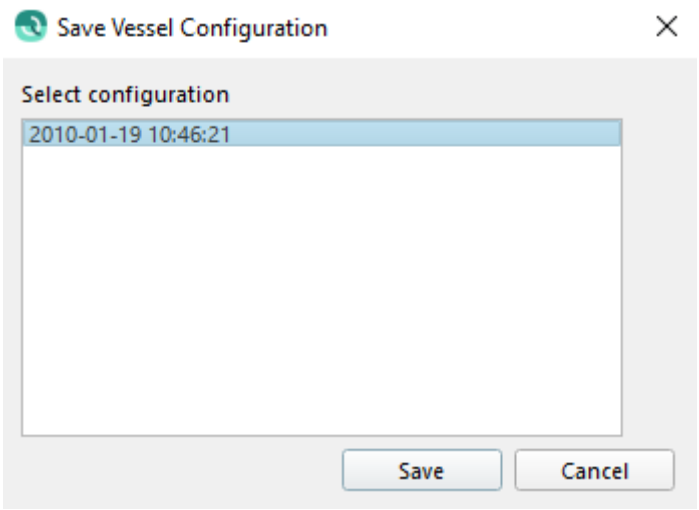


Save

This will save any edits made to any parameter in the vessel configuration. It will trigger a reaction from the Dynamic Workflow engine.

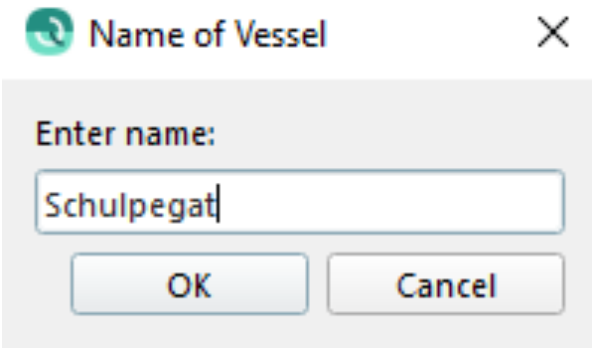
Save Configuration

This will allow you to save a specific date time configuration as a "Template" for use during loading of more raw sonar files or during Automatic Raw File import. You will be presented with a dialog (shown below) to select the date/time configuration to save as a template. The default location for these files is the project/Vessel folder, and can be changed when saving. If you use a template configuration during file loading, it will override any vessel configuration information extracted from the raw sonar file.



Edit Vessel Name

This will let you change the name of the vessel as it appears in the *combo box*. Some multibeam file formats specify a vessel name whereas others do not. In the first case, Qimera will use the vessel name encoded in the incoming data files. In the latter case, the user must specify a vessel name upon import of the first file. Later, they must import sessions of the same file type, which will allow the user to choose from a set of vessels previously created for the incoming file type. Renaming a vessel file does not trigger any reaction from the Dynamic Workflow engine.

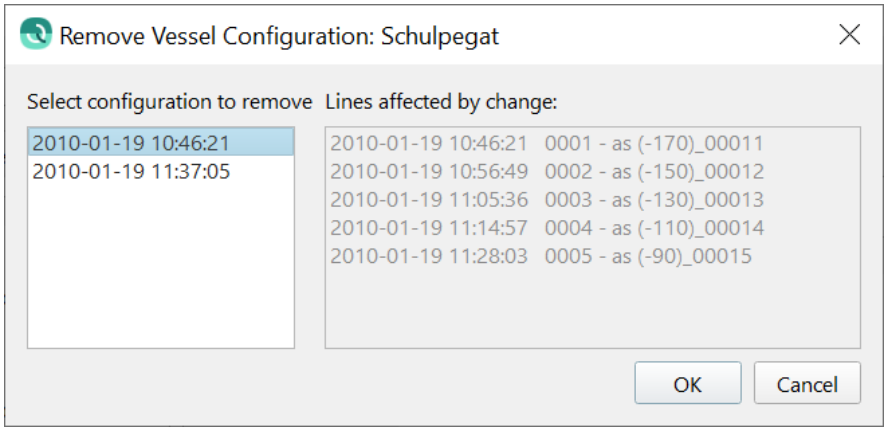


New Date/Time Entry

Qimera stores a vessel configuration file for each source item in the metadata directory associated with the source item. When the vessel editor is run, all of these files are loaded and only the earliest instance of each unique configuration is shown to you. This button allows you to create a new configuration by presenting you with a dialog of all the possible source item start times (shown below). Once a start time for the new configuration is selected, an entry is made in all the time based tables, and you can then make the necessary modifications and save your changes. Saving the vessel configuration will trigger a reaction from the Dynamic Workflow engine, but only for the files that are affected by the change in configuration. In this case, the Dynamic Workflow will trigger for only the files that are affected by the new time based entry.

Remove Date/Time Entry

This button presents you with a dialog listing all the current Date/Time entries for the selected vessel at the left. In the right column, the lines that will be affected by the removal of the entry are shown. Upon clicking 'OK' the selected Date/Time entry will be removed. If it is the first entry, the settings from the second entry will be applied to the files in the first. In all other cases, the settings from the previous Date/Time entry will applied to those in the selected entry. Changes are not saved immediately and can be reviewed in the Vessel Editor dialog.



TPU Editor

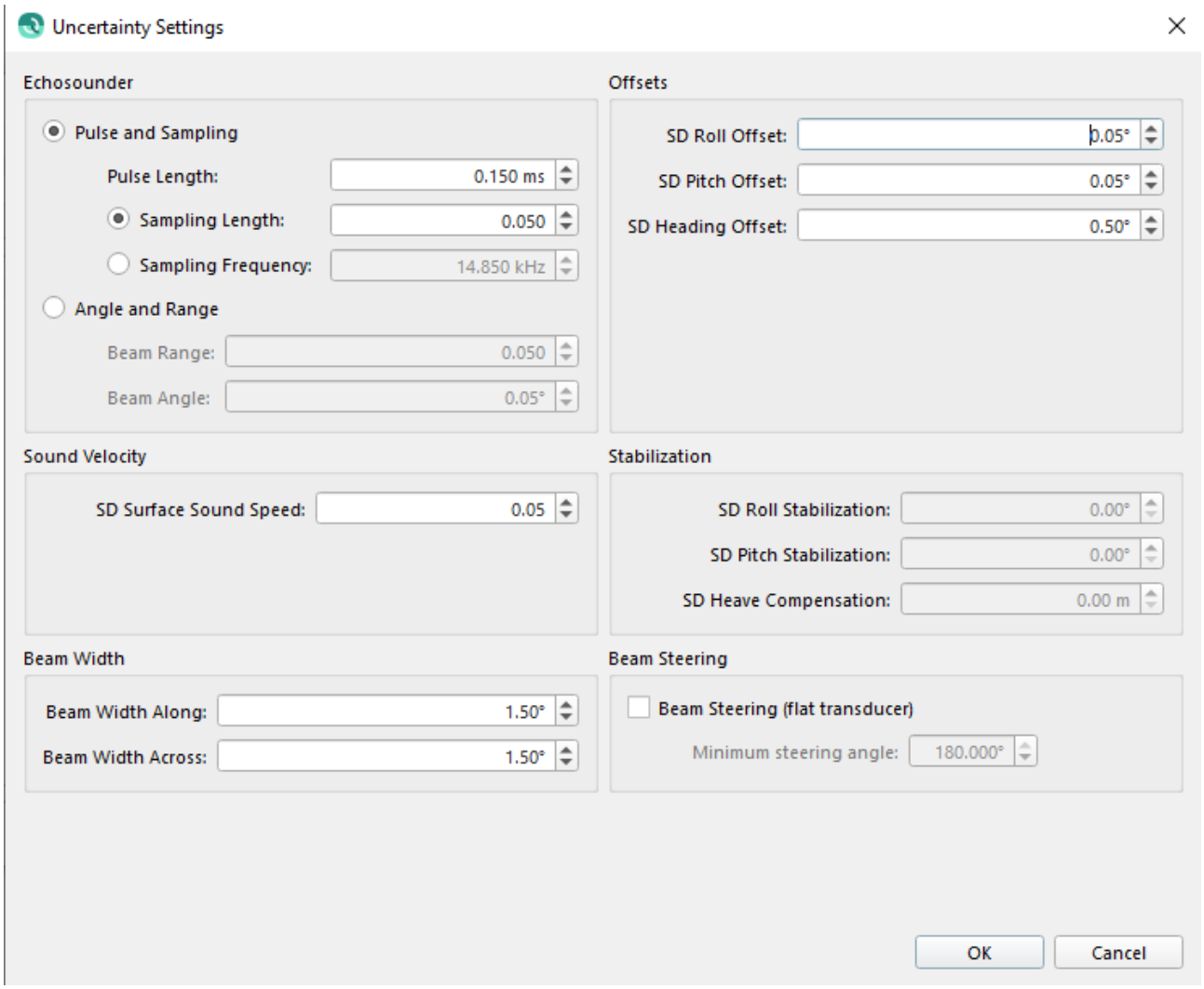
This button will allow you to modify the sensor measurement uncertainty settings. These values are used to compute each sounding footprint's estimated uncertainty. The *TPU button* is sensitive to the system list's current selection and the dialog that results will vary with system types. Edits to TPU parameters will trigger a reaction from the Dynamic Workflow engine once the vessel file is saved. For simple sensors such as a positioning system, you will only be updating the estimated sensor standard deviations. For a more complex system like a multibeam, you will be editing the parameters that are used by an uncertainty model. The dialogs for each system type are shown below. Currently, the only data type that provides this type of information during import is a Qinsy .db file. For all other types of source items, Qimera uses the same default sensor uncertainty parameters that are used by Qinsy when setting up drivers for any given system.

Certain fields within the Uncertainty Settings dialogs will become highlighted in red if the values are suspected to be out of expected range.

Multibeam

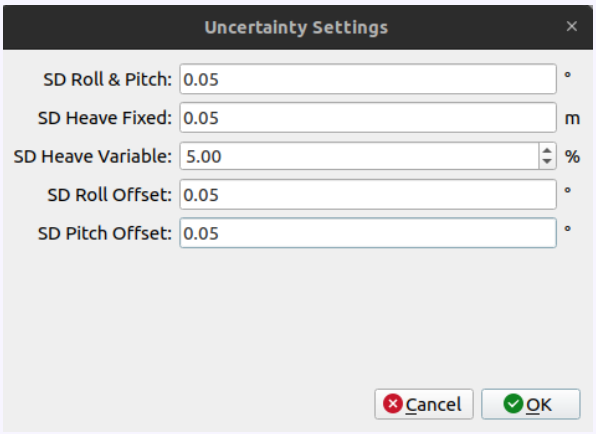
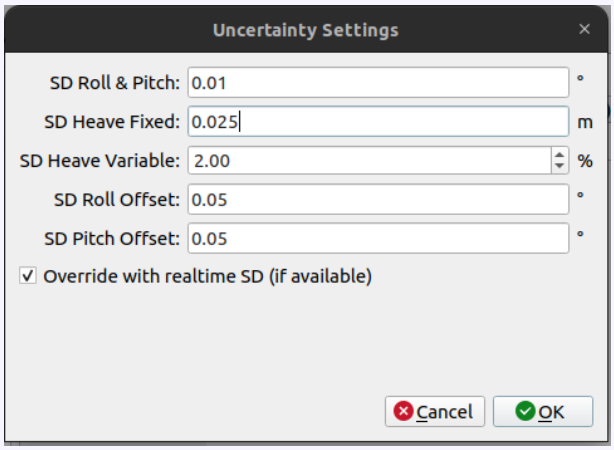
The uncertainty of the multibeam measurements (range and angle, primarily) are either estimated using an uncertainty model that can use pulse length and sampling rate (Pulse and Sampling method), or specified directly using the Angle and Range method. The uncertainties in the installation angles, including patch test alignment angles, are specified in the *Offsets* section. Most modern multibeam systems use sound speed measurements from a surface sensor, and the uncertainty from this sensor can be specified in the *Sound Velocity* section. If a system is stabilized for roll, pitch or heave (only available for Qinsy data for devices that are configured as such in the Qinsy driver), the stabilization uncertainties can be specified in the *Stabilization* section. The beam width in the fore-aft and across-track direction are additional parameters that are used to inform the multibeam uncertainty model, and these can be specified in the *Beam Width* section. The *Beam Steering* section is only used for Qinsy data for devices that support such a

configuration and should not be enabled otherwise. The default values shown in the dialog below are used for source items that do not report these parameters directly.



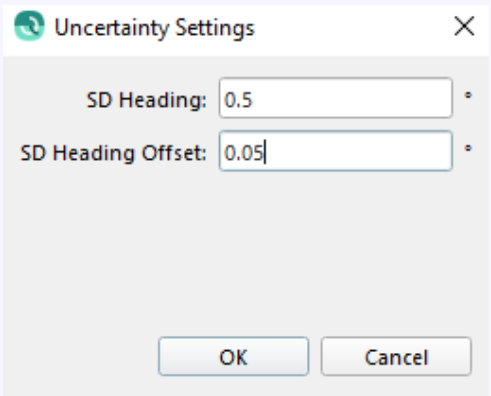
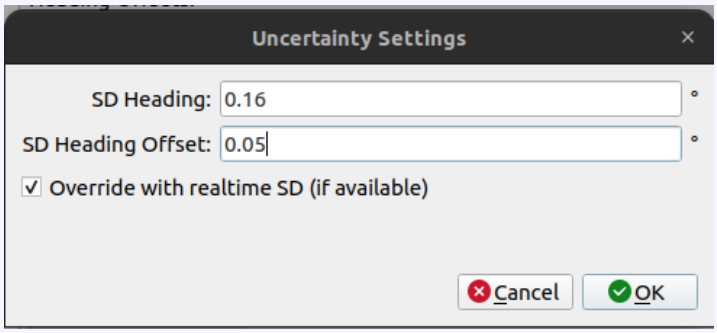
Motion Sensor

Motion sensor uncertainty settings can be configured for the measurements themselves and also for the offsets, i.e. the patch test angular misalignment angles. Heave sensor specifications typically indicate that heave uncertainty has a fixed component, in linear units, and a variable component that varies as a percentage of the heave amplitude. All of these can be specified in this dialog. The default values shown in the dialog below will be used for source items that do not report these parameters directly. In versions prior Qimera v2.8.0 these sensor uncertainty values will be replaced with uncertainties estimated by the sensor if the data from the sensor supports this. Starting with Qimera v2.8.0 the user can optionally choose to perform this override and if the sensor does not support this, these static-values will be used. Currently, this is only available for POSMV (.000) files and for POSPac MMS SBET/RMS files.

Before Qimera 2.8.0	Qimera 2.8.0 and above
	

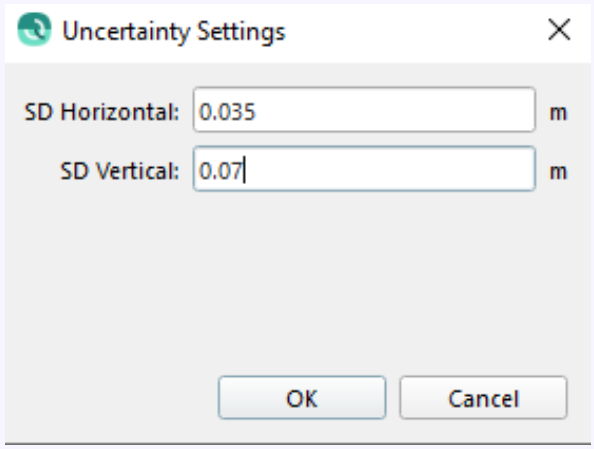
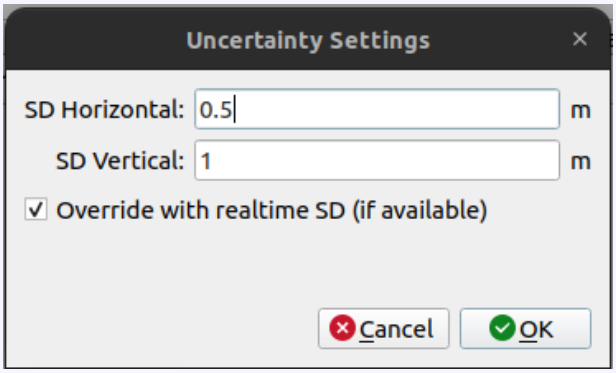
Heading Sensor

The uncertainty of the heading measurement itself and of the angular misalignment offset can be specified in this dialog. A default value of 0.01 degrees and 0.05 degrees is used for source items that do not report these parameters directly. In versions prior Qimera v2.8.0 these sensor uncertainty values will be replaced with uncertainties estimated by the sensor if the data from the sensor supports this. Starting with Qimera v2.8.0 the user can optionally choose to perform this override and if the sensor does not support this, these static-values will be used. Currently, this is only available for POSMV (.000) files and for POSMV MMS SBET/RMS files.

Before Qimera 2.8.0	Qimera 2.8.0 and above
	

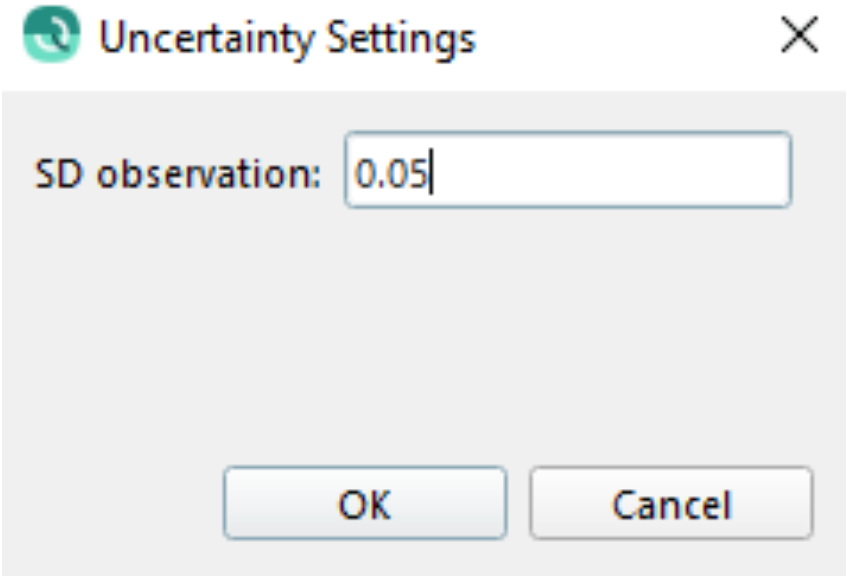
Position Sensor

The uncertainty of the positioning system can be specified in this dialog. The defaults of 0.5 m and 1.0 m represent what is typically achievable with differential positioning corrections. These default values are used for source items that do not report these parameters directly. The vertical uncertainty of the positioning system is only included in footprint uncertainty calculations if the height is used for vertical referencing. In versions prior Qimera v2.8.0 these sensor uncertainty values will be replaced with uncertainties estimated by the sensor if the data from the sensor supports this. Starting with Qimera v2.8.0 the user can optionally choose to perform this override and if the sensor does not support this, these static-values will be used. Currently, this is only available for POSMV (.000) files and for POSMV MMS SBET/RMS files, or for positioning data streams from Qinsy (.db) files for sensors that support this in their particular driver configuration.

Before Qimera 2.8.0	Qimera 2.8.0 and above
	

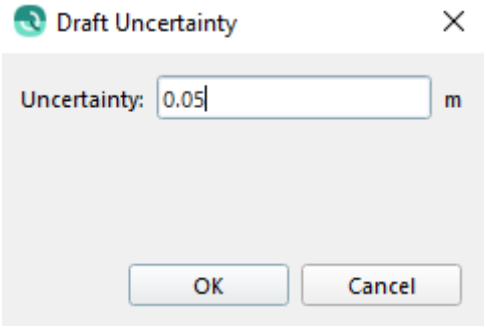
Surface Sound Speed Sensor

The uncertainty of the surface sound speed sensor used in beamforming is specified in this dialog. A default of 0.05 m/s is used for source items that do not report this directly. This value will over-ride the value in the multibeam uncertainty settings dialog if data from a surface sound speed sensor is found.



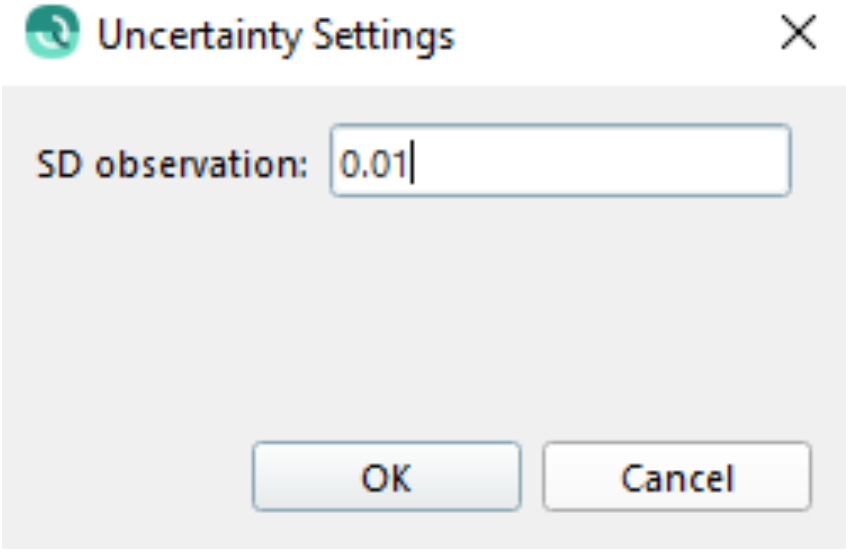
Draft

The uncertainty of the draft measurement can be configured in this dialog. A default value of 0.05 m is used for source items that do not report this directly.



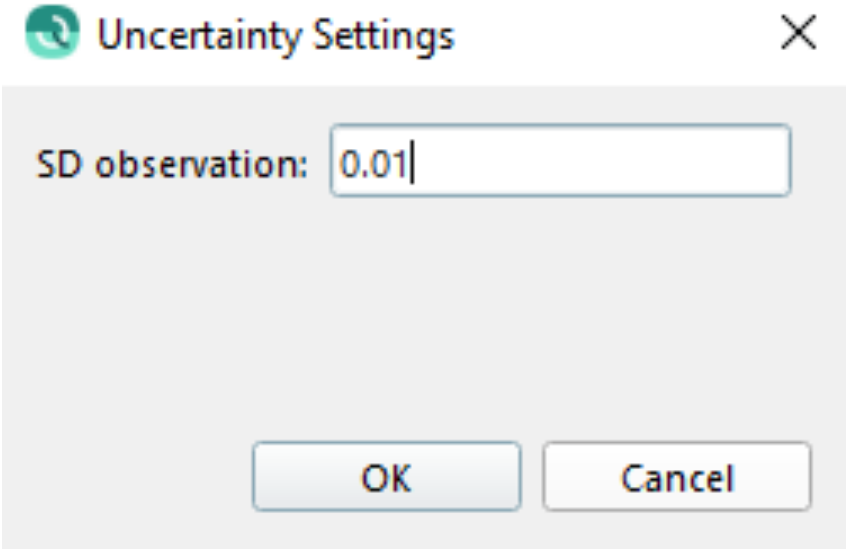
Depth

The uncertainty of the depth measurement can be configured in this dialog. A default value of 0.01 m is used for source items that do not report this directly.

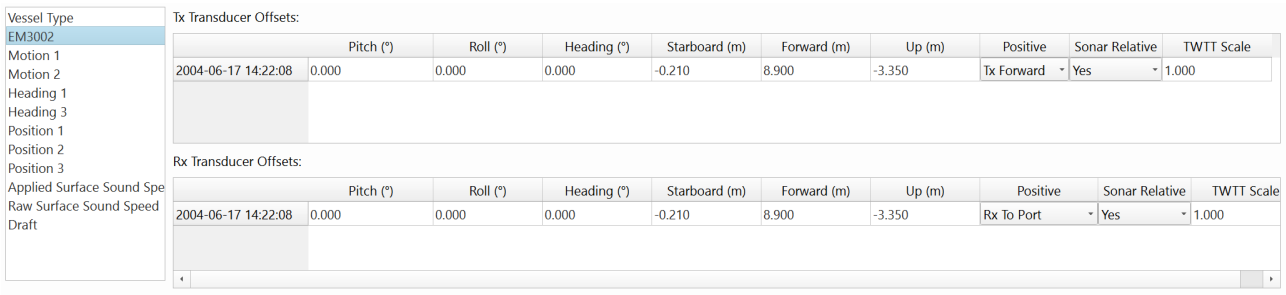


Pressure

The uncertainty of the pressure measurement can be configured in this dialog. A default value of 0.01 bar is used for source items that do not report this directly.



Systems Tab



The systems tab presents you with a list of systems that are associated with the vessel along with a table of time tagged entries that present various sensor parameters. The contents of the system list will vary with the type of source files that are imported into Qimera. These variations are summarized below in two groups:

- **Group 1:** Multiple sensor streams supported. In general, these files can support observations from multiple redundant sensors and their data streams may or may not be present. All systems found in the files will be extracted into the Qimera vessel file. The file formats also typically indicate the primary data stream in the event of the multiple redundant data streams. Data streams typically come from named sensors, Qimera attempts to preserve the system naming when creating the vessel file.
  - Qinsy .db files: Each system that is used in the mathematical computation of sounding footprint locations is included in the Qimera version of the vessel file. All other systems are ignored, for example a wind speed sensor.
  - Kongsberg .all files: This format is for Kongsberg systems only and thus it has a limited set of possible configurations. For example, there can be up to 3 positioning systems present and there can be up to 2 motion sensors. Qimera will create a system for all of the possibilities, even if there is only data from a single system. This allows Qimera to react correctly with configuration changes, such as the addition or removal backup position or motion sensors during acquisition. Presence of these systems in the vessel configuration does not imply that there is data available, this must be confirmed by examining the time-series data available for each source item.
  - Hypack .hsx files: This format can contain a number of systems of varying types. Qimera creates a sensor for each one found in the HSX file. Configuration changes done in real-time, e.g. addition or removal of a sensor, will result in a different vessel file.
- **Group 2:** It is our understanding that the following formats can only support a single motion and single position system. Observation systems are created for this minimal set in the vessel configuration regardless of whether or not there is data present in the source file. This allows Qimera to elegantly deal with configuration changes done during acquisition in that the Qimera user will always be dealing with the same vessel configuration regardless of the absence/ presence of various data streams. Presence of these systems in the vessel configuration does not imply that there is data available, this must be confirmed by examining the time-series data available for each source item.
  - Reson .s7k files: Position, motion, heading, surface sound speed and pressure/depth systems are created.
  - EdgeTech JSF files: Position, motion, heading and surface sound speed systems are created.
  - GSF files: Position, motion, heading, surface sound speed systems are created.
  - ELAC XSE files: Position, motion, heading, surface sound speed systems are created.

- R2Sonic .r2sc files: surface sound speed systems are created. Position, motion, heading information is not contained in the binary file.

The contents of the table of entries will change depending on the currently selected system in the system list.

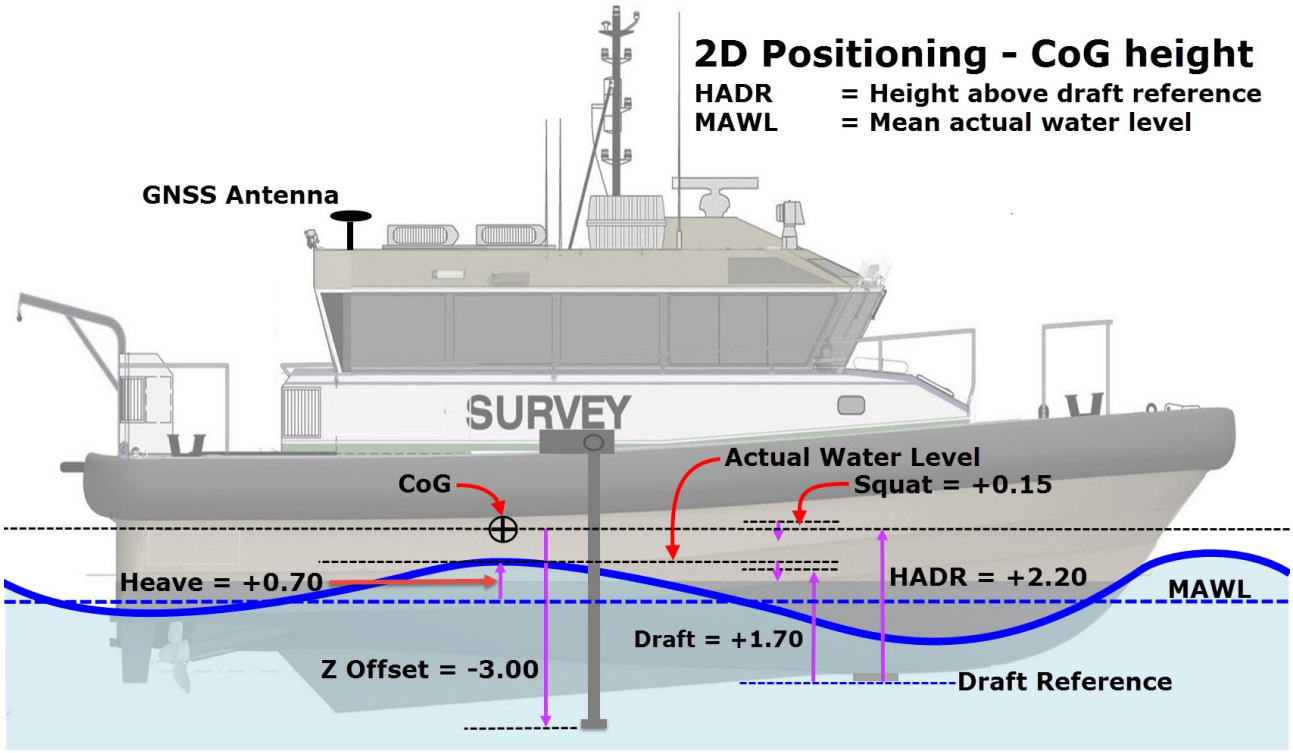
- Multibeam systems
  - Just a general note first before describing the system parameters. Qimera allows you to specify the transmitter and receiver parameters separately to accommodate the general case where this is required. This is absolutely necessary for deep water systems and occasionally necessary for shallow water systems, especially dual head configurations with a shared transmitter. Some sonar systems make a correction to travel-time and/or angles to correct for the separation between transmitter and receiver. Qimera correctly detects and pre-configures this for Qinsy .db format, Kongsberg .all format and Teledyne-Reson .s7k format. For Qinsy users, the option to use a "common acoustic center" forces the location of the transmitter and receiver to be at the same location mathematically in the processing. For these users, they will see a transmitter and receiver with identical locations. In the event that you have a system which already corrects for this, you will still find a transmitter and receiver entry for your multibeam system. In these cases, if you need to correct the location or orientation of the transmitter you will need to apply the same correction to the receiver, and *vice versa*.
  - Pitch/roll/heading angular offsets: Either determined through a marine surveyor's measurements or through a patch test calibration.
  - Starboard/Forward/Up location: Sensor position relative to the CoG. These offsets are used to establish the 3D position of the sensor relative to the CoG.
  - Beam angle sign convention for both transmitter and receiver: The sign convention for the beam angles. This is automatically set for all formats but errors in configuration of the sonar or the acquisition system may result in users needing to correct for this here. When a MBES system is logged in Qinsy, the sign convention is 'standardized' to Qinsy's convention in the logged .DB file.
  - Beam angle reference convention for both transmitter and receiver: Specifies whether beam angles reported by the system are relative to the sonar frame or to the vertical. Some multibeam systems that perform motion stabilization report the corrected beam angles (Sonar Relative = No) whereas others report the raw sonar angles regardless of whether they are motion stabilized or not (Sonar Relative = Yes). Most modern systems report angles relative to the sonar (Sonar Relative = Yes). This setting is automatically set for Qinsy .db files, Reson .s7k and Kongsberg .all files. HSX users may find that this parameter needs to be adjusted.

    - Two-way travel time (TWTT) scale: Specifies a travel-time scaling factor, with a default value of 1.0, that a user can modify to recover from cases where the travel-time is incorrectly encoded in a particular incoming source file. This is not a common occurrence, however, in our work with GSF files in FMGT, we have seen several instances where the travel-time is incorrectly encoded by the source application that writes out the GSF. In some cases, the travel-time is reported as a one-way travel-time (thus a scaling factor of 2.0 would be required to recover from this). In another example, the travel-time was scaled by a factor of 100 (thus a scaling factor of 0.01 would be required to recover from this).
- Laser systems:
    - Pitch/roll/heading angular offsets: Either determined through a marine surveyor's measurements or through a patch test calibration.
    - Starboard/Forward/Up location: Sensor position relative to the CoG. These offsets are used to establish the 3D position of the sensor relative to the CoG.
- Echosounder systems:
    - There are currently no configurable settings. Position and orientation offsets can be reviewed.
- Motion sensor systems:
    - Latency: Time latency of the reported measurements, this number is added to the requested time prior to any lookup of data from this sensor.
    - Heave delay: Additional time delay of the reported heave measurements. Total heave latency is the sum of system latency and heave delay.
    - Pitch/roll/heading angular offsets: Either determined through a marine surveyor's measurements or through a patch test calibration.
    - Starboard/Forward/Up location: Sensor position relative to the CoG. These offsets are used to migrate heave measurements from the reported location to the desired location (usually the CoG).
    - Angle and heave sign conventions. This is automatically set for all formats but errors in configuration of the motion sensor or the acquisition system may result in users needing to correct for this here.
    - Yaw Misalignment: The angular offset in yaw for the motion sensor, relative to the fore-aft longitudinal axis of the survey platform. In situations where the motion sensor is misaligned in the ship's reference frame, the roll and pitch signals reported by the sensor can be subject to cross talk.
- Heading systems:
    - Latency: Time latency of the reported measurements, this number is added to the requested time prior to any lookup of data from this sensor.

  - Angular offset: Either determined through a marine surveyor's measurements or through a patch test calibration.
  - Starboard/Forward/Up location: Sensor position relative to the CoG. These are administrative only and have no effect on the computation of sounding footprint locations.
- Positioning systems:
  - Latency: Time latency of the reported measurements, this number is added to the requested time prior to any lookup of data from this sensor.
  - Starboard/Forward/Up location: Sensor position relative to the CoG. These are used to establish the 3D position of the CoG.
- Surface Sound Speed systems:
  - Offset: An estimate of sensor reading bias that is applied additively to the sensor records prior to being used in any computations.
- Draft:
  - Draft: Depth as reported by a draft sensor or as measured.
  - Height Above Draft Reference (HADR): Height of the CoG above the zero reference point for draft measurement. This value is most meaningful to Qinsy users but less so for users importing data from other data formats.
- Vessel
  - You can change the vessel type between Surface Vessel, ROV, AUV, Towed Fish, Link Tool and unknown/unsupported. Typically Qimera will detect the vessel type during import but this can sometimes fail to happen if the information needed to determine this is missing from incoming data files. In these instances, Qimera defaults to a Surface Vessel type. If you have an AUV, ROV, or Link Tool and your depths do not appear to be corrected for depth/pressure measurements, it is likely that the vessel type is incorrect. You can verify this in the vessel editor and make corrections if necessary.
- Depth
  - Latency: Time latency of the reported measurements, this number is added to the requested time prior to any lookup of data from this sensor.
  - Offset: A static depth offset that is applied additively to the sensor records prior to being used in any computations.
  - Starboard/Forward/Up location: Sensor position relative to the CoG. These are used to establish the 3D position of the CoG.
- Pressure
  - Latency: Time latency of the reported measurements, this number is added to the requested time prior to any lookup of data from this sensor.
  - Offset: A static pressure offset that is applied additively to the sensor records prior to being used in any computations.

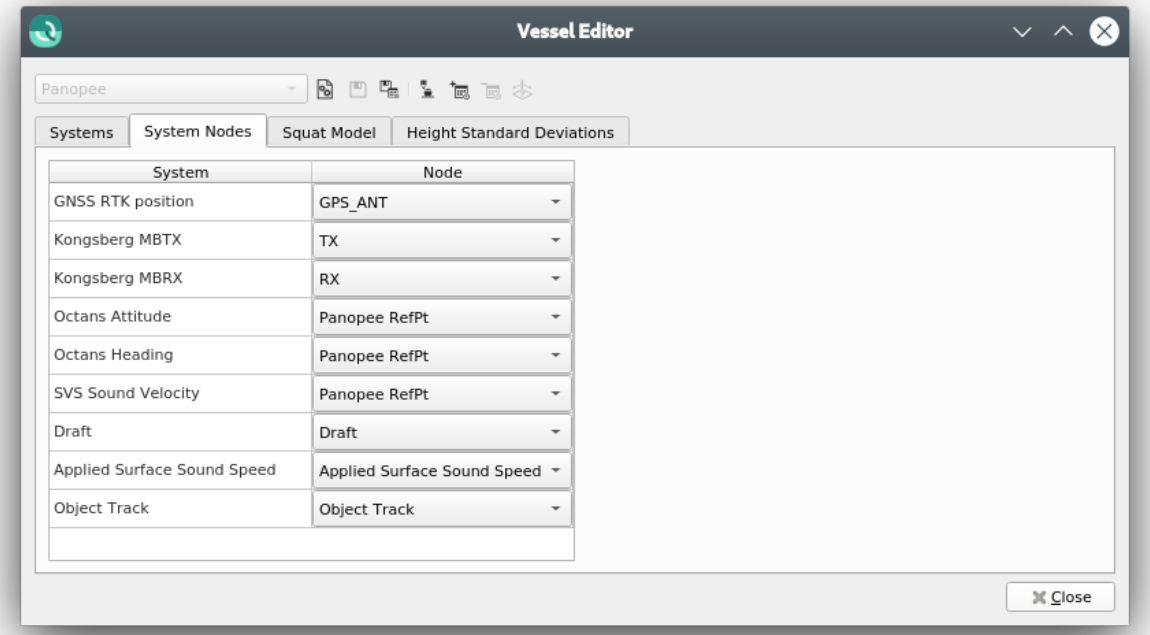
- Scale: A custom scaling factor that can be applied to convert to another pressure unit. Qimera stores pressure in bars.
- Starboard/Forward/Up location: Sensor position relative to the CoG. These are used to establish the 3D position of the CoG.

Here is a graphic depicting values such as HADR, Draft, Draft Reference, Heave, and Squat:

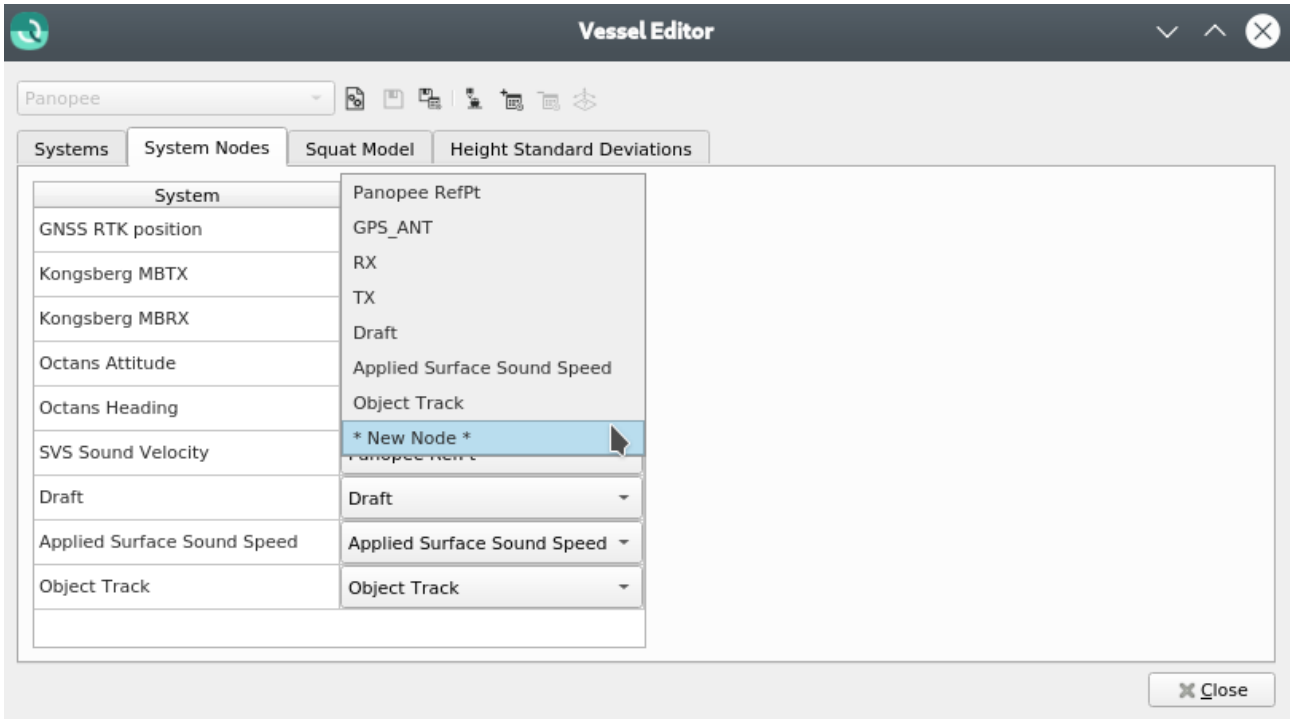


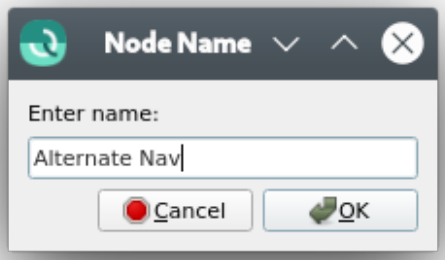
System Nodes Tab

For data from Qinsy DBs, a Systems Node tab will be visible:



This tab allows viewing and editing of the nodes to which each system is linked. Optionally, a new node can also be created:





To move the node, change the offsets of the system linked to the new node.

Squat Model Tab



The squat tab allows you to specify a speed dependent draft corrector lookup table that is used to correct the nominal draft as a function of vessel speed through the water. Currently, only Qinsy (.db) files can provide this information directly, users with other data formats will need to specify this manually by adding/removing rows using the Add Row and Remove Row buttons. Values appearing in the squat table can be edited. The squat correction is only used with vertical referencing methods "Tide" and "None".

Be aware that squat is positive if the vessel sits lower in the water due to the influence of the sea bottom. The units are the same as the project units.

Qimera does not currently support the following Qinsy Squat methods:

- Froude
- Barras
- Polynomial

A Speed vs Squat table defined in the Qinsy DB setup will transfer over to Qimera successfully.

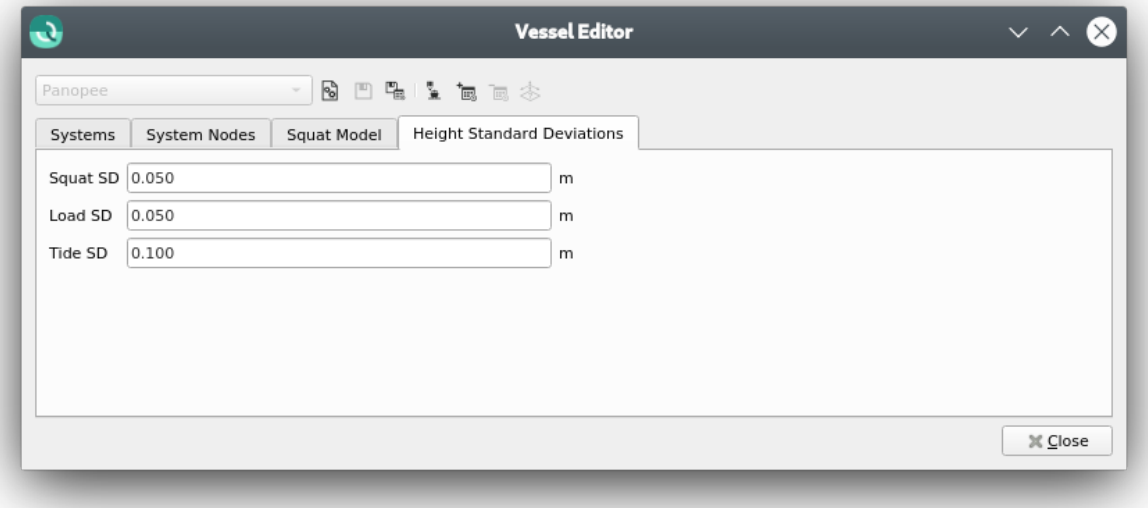
Height Standard Deviations Tab

The Height Standard Deviations tab allows for adjustment of the following standard deviations:

1) Vessel Squat

2) Vessel Load

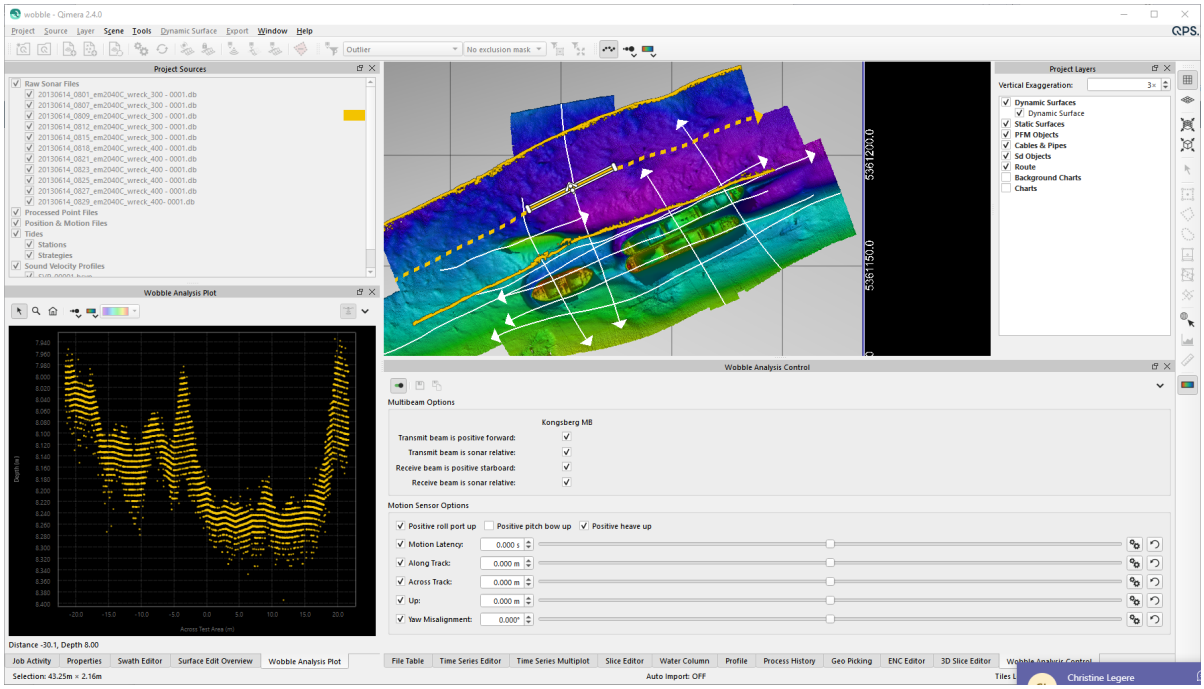
3) Tidal correction



Return to: *Qimera Interface*

Return to: *Specialized Tools*

Qimera Wobble Analysis



- How to Start
- What it Does
- General Description
  - Wobble Analysis Main Application Window
  - Wobble Analysis Control Window
    - Multibeam Options
    - Laser Options
    - Motion Sensor Options
      - Motion sensor adjustment widget
    - Control Window Toolbar
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- Plot Point Size
- Plot Color By
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- Dock Options
    - Auto Zoom
    - Show Grid Lines
    - Show Soundings
    - Save to Image

How to Start

- *Wobble Analysis Tool* option of the *Tools* menu in the Main Menu bar.

What it Does

Qimera provides a wobble analysis tool that allows you to dynamically adjust the echosounder and/or motion sensor configuration in a trial-and-error method to isolate causes of integration errors resulting in so-called "wobbles" in the sounding footprint results.

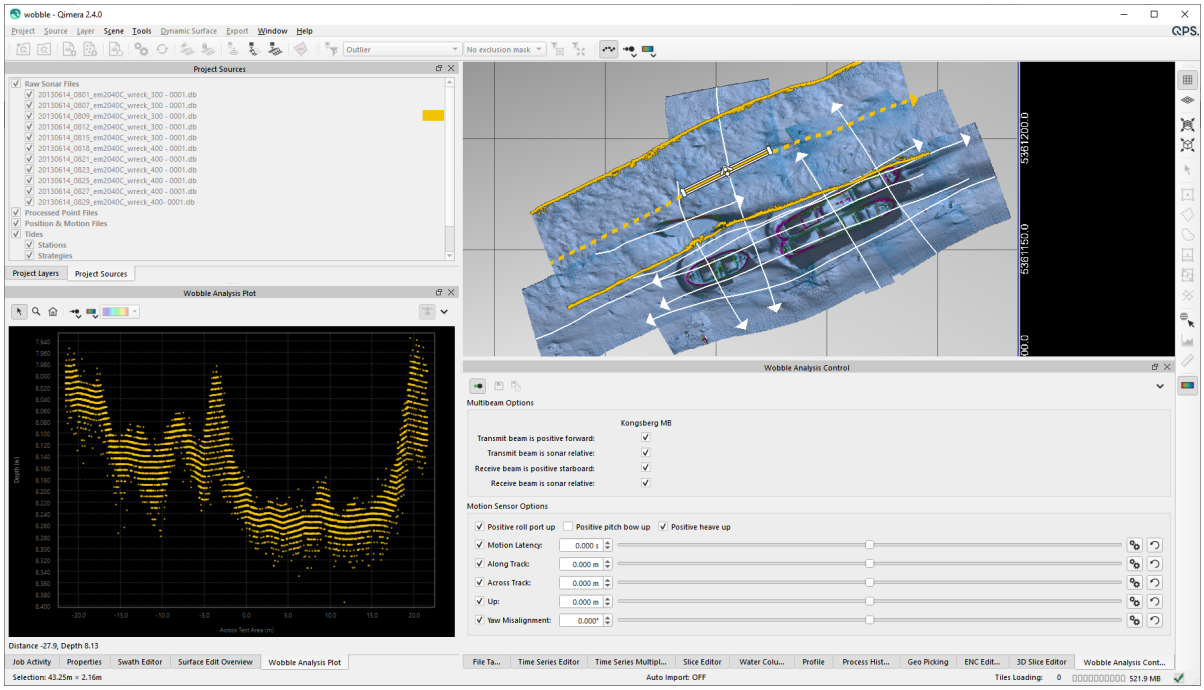
General Description

The tool uses the full refraction engine so that the result you see on the screen is the result you can expect in processing. Wobble analysis operations are done using the prioritized motion sensor system. If you wish to perform an analysis on a secondary system, you must re-prioritize these as the primary sensor for the wobble test Raw Sonar Files using the Processing Settings dialog and then run the Wobble Analysis again. This will not overwrite the configuration changes established for the original primary sensor.

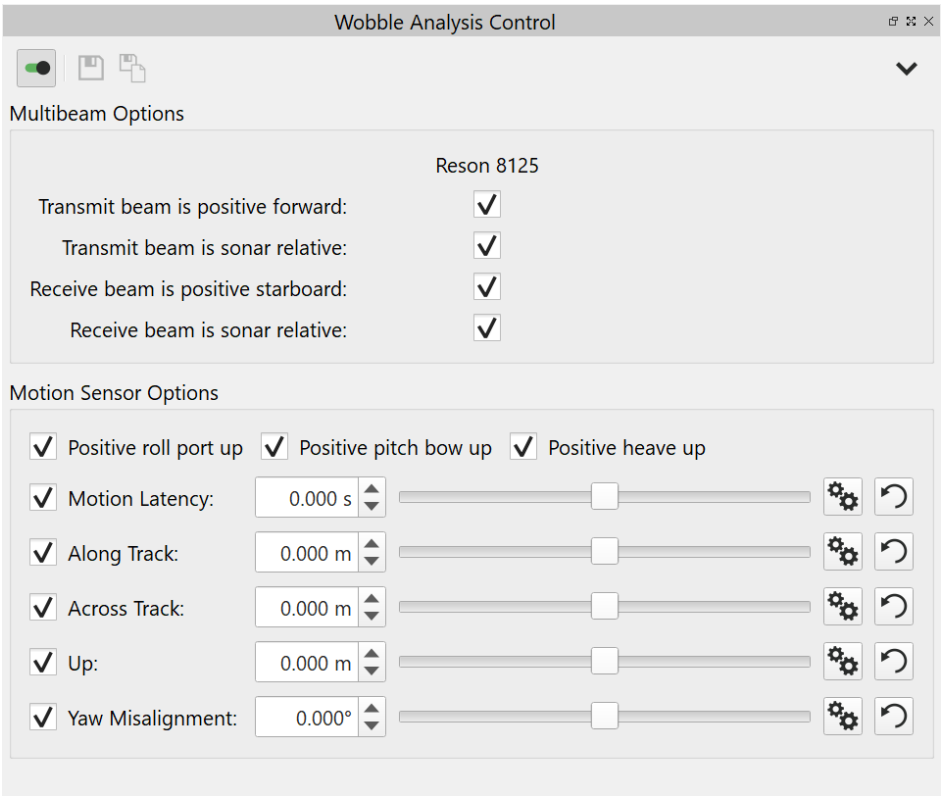
Wobble Analysis Main Application Window

The wobble analysis tool is meant to work in conjunction with the Qimera 4D Scene in the main Qimera application window; this is where the user can choose appropriate spatial subsets of data to examine for the purposes of analysis. The process begins by selecting one Raw Sonar File from the Qimera Project Sources Dock and then accessing Wobble Analysis Tool under the Tools menu. The Wobble Analysis Tool automatically draws a Dynamic Selection box in the Qimera 4D Scene centered on the average location of the selected line. Most of the functionality of Qimera is locked when running the Wobble Analysis Tool so it is advisable to set view preferences prior to running the tool. For

example, setting the color map to Copper to better highlight the color coding of footprint locations and the survey line in the scene. In Qimera version 2.1, the wobble analysis controls and plots are now integrated into the main application. This allows use of the wobble analysis and the scene to be more seamless. The user can also float the Plot or Control window allowing for a more customized experience. When the wobble analysis tool is off, the control docks are automatically hidden to reduce clutter.



Wobble Analysis Control Window



The majority of the user interaction for a wobble calibration is done in the wobble analysis control window. It has 2 main areas, as described in the section below. A toolbar at the top of the window controls the ability to save and exit the tool.

Multibeam Options

For every mulitibeam sensor in your file, you will have the following options:

1. *Transmit beam is positive forward:* This specifies the sign convention of the transmitter beam angle for sensors that allow for steering of the transmitter beam pattern in the fore-aft direction.
2. *Transmit beam is sonar relative*: This specifies whether beam angles reported by the transmitter are relative to the sonar frame or to the vertical (when they are referenced to the vertical, they are pre-corrected for pitch).
3. *Receive beam is positive starboard*: This specifies the sign convention of the receiver beam angle.

4. *Receive beam is sonar relative*: This specifies whether beam angles reported by the receiver are relative to the sonar frame or to the vertical (when they are referenced to the vertical, they are pre-corrected for roll).

Laser Options

There are currently no specific options for laser systems in the wobble analysis control window. However, you can still make adjustments to your primary motion system used by the laser system.

Motion Sensor Options

For the primary motion sensor, you will have the following options:

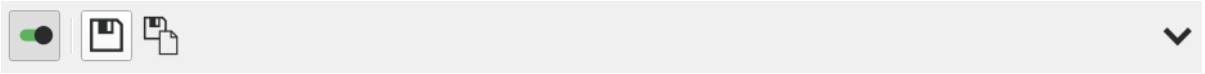
1. *Positive roll port up:* This specifies the motion sensor's sign convention for roll.
2. *Positive pitch bow up*: This specifies the motion sensor's sign convention for pitch.
3. *Positive heave up*: This specifies the motion sensor's sign convention for heave.
4. *Motion Latency*: This specifies the motion sensor's time latency in seconds.
5. *Motion along/across/up position offset*: These three allow you to adjust the motion sensor's spatial offset relative to its existing location. This controls the induced heave effect that occurs when the heave sensor is displaced from the CoG. Similar dynamic errors can occur if the multibeam sonar head location is in error. Adjusting the heave sensor location may account for this but it is advisable to review, and if possible resurvey, the sensor locations on the vessel.
6. *Yaw Misalignment*: This specifies the angular offset in yaw for the motion sensor, relative to the fore-aft longitudinal axis of the survey platform. In situations where the motion sensor is misaligned in the ship's reference frame, the roll and pitch signals reported by the sensor can be subject to cross talk. Adjusting this slider allows you to attempt to solve for the yaw misalignment angle.

Motion sensor adjustment widget



- **Checkbox:** this toggles whether or not this adjustment is enabled or disabled. This is useful for quickly examining before/after scenarios, particularly for screen shots documenting a problem.
- **Offset adjustment spin box:** You can enter the offset in the spin box or adjust it using the adjustment arrows that are part of the spin box controller.
- **Offset adjustment slider bar:** You can adjust the offset using this slider bar. Holding down the shift key decreases the sensitivity to mouse movement so that small adjustments can be made to fine tune an offset.
-  **Range edit:** Adjust the minimum and maximum range of the slider bar. The default is to limit this to +/- 1 sec for time offsets and +/-5 meters for location offsets.
-  **Reset zero:** Resets the current offset value to zero.

Control Window Toolbar



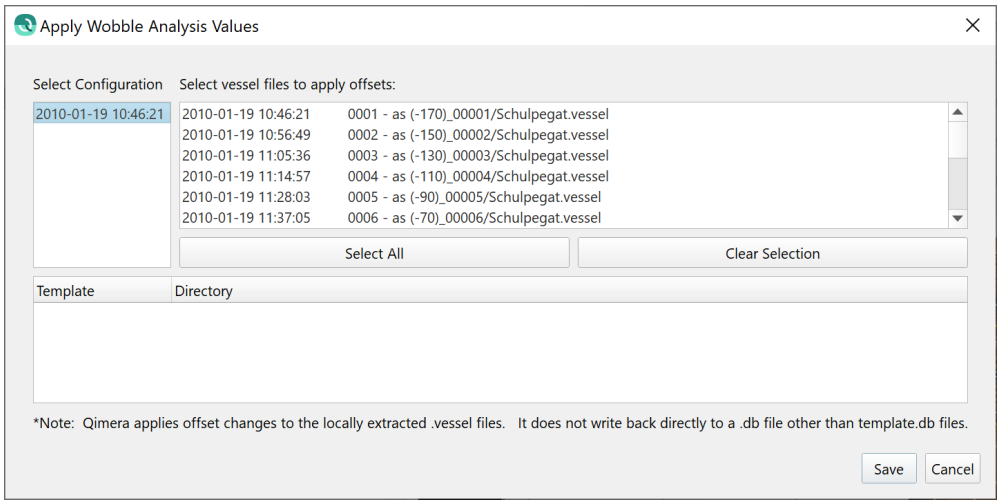
 **On/Off**

This button works the same as the Qimera Tools→Wobble Analysis menu option. It will turn the wobble analysis widgets on or off.

 **Save and Apply Button**

This button allows you to save a copy of your wobble analysis results to a file which can then be applied to the vessel configuration files associated with all raw sonar files from the same vessel. This session file is applied to vessel configuration files by either clicking the *Apply* button or by loading it in the Vessel Configuration Editor. Applying a configuration change will trigger a reaction from the Dynamic Workflow engine. When you apply a configuration change, you will be presented with a file selection dialog in which you choose a file path and provide a file name. This file name will be used to save a wobble analysis session file. Afterward, you will be presented with a dialog (shown below) which allows you to choose which raw sonar files you would like to apply the configuration change to. Clicking in the right hand list allows you to perform a standard multi-selection. For files that are imported at a later stage, you must apply the wobble test configuration file to the newly imported files as discussed in the Qimera Vessel Editor documentation.

The Template window shows all template files available for application of the wobble analysis. They appear here as a checked list.

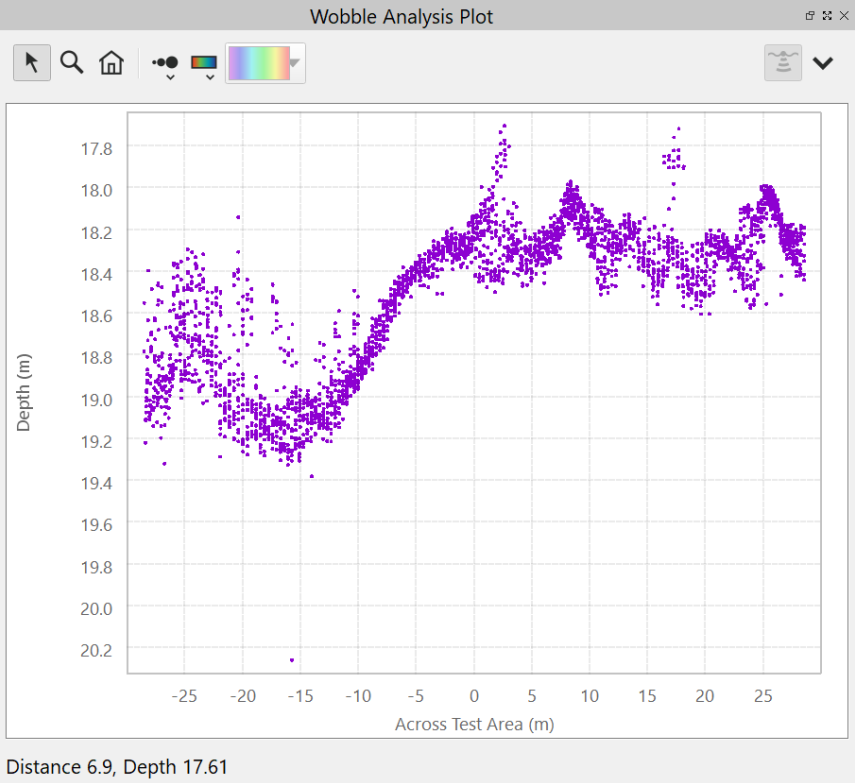




Save Copy

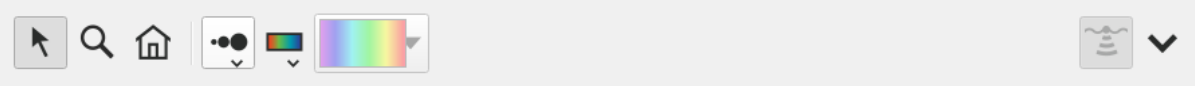
This button allows you to save a copy of your wobble analysis results to a file which can then be applied to the vessel configuration files associated with all raw sonar files from the same vessel at a later time. See the Qimera Vessel Editor documentation for more information on applying configuration files.

Wobble Analysis Plot Window



The plot window shows the footprint solutions for the spatial subset chosen in the Qimera 4D Scene for the selected line. Depth is on the y-axis and distance on the x-axis. The distance on the x-axis is along the long axis of the spatial selection box from the 4D Scene with zero being the center point along the long axis of the box.

Plot Window Toolbar





Explore Mode

This is the primary exploration mode of the tool. As you move your cursor over the plot, the label to the lower left of the sounding plot will update with the current depth/distance of the mouse position. The distance is the distance relative to the midpoint along the spatial selection box's long-axis.



Zoom Mode

When in zoom mode, simply click and drag an area of the plot to zoom into. Or single click a location to zoom in slightly. ALT-click a location to zoom out slightly. Or use the HOME button to return to the full extents of the data. At any time, you can SHIFT-Click to drag the plot to a new location. This is especially useful when you are zoomed in.



Plot Point Size

Clicking this button will incrementally change the size of the points and lines in your plot area. If you click and hold the button, it will display a menu where you can select point sizes between *Small* and *XX-Large*.



Plot Color By

Clicking the first of these icons will change the *Color By* mode of the points drawn in the widget. If you click and hold the button, it will display a menu where you can select the *Color By* option directly. The options for *Color By* are *File, System, Ping, Beam, and Intensity*. When Color By *Intensity* is used, the *Colormap Settings* button will be enabled to change and control the selected colormap.



Colormap Settings

This will allow you to select and adjust a colormap for the points drawn in the widget. This allows for the same controls as users would have over the coloration of a Dynamic Grid: selecting a colormap, adjusting the range and editing a colormap. Some settings for Plot Color By do not allow access to a colormap, e.g. color by File, System, Ping, and Beam.



Dock Options

The view options allow you to configure what you see and how you see it in the sounding plot.

Auto Zoom

When enabled, automatically resets zoom to the data extents when performing operations that change the soundings in the plot.

Show Grid Lines

Show/Hide the grid lines in your plot grids.

Show Soundings

This sub-menu lets you change visibility of *Rejected, Filtered, Edited, Normal and Additional* soundings. For more information on these sounding flags, see either the *Slice* or *Swath* Editor.

Save to Image

Saves the plot area to an image file (JPEG or PNG).

Return to: *Qimera Interface*

Return to: *Specialized Tools*

Qimera Dock Windows

Other than the central 2D/3D scene, the majority of the Qimera window is made up of "docks". Docks are smaller pieces of the user interface, dedicated to a particular piece of functionality, which can be hidden or rearranged to suit the users needs or preferences.

Qimera currently has the following docks:

- Qimera Cable/Pipe Analysis Dock
- Qimera ENC Editor Dock
- Qimera File Table Dock
- Qimera Filter Profile Dock
- Qimera Grid Cell Properties Dock
- Qimera Geo Pick Dock
- Qimera Grid Edit Overview Dock
- Qimera Job Activity Dock
- Qimera PFM Dock
- Qimera Process History Dock
- Qimera Profile Dock
- Qimera Project Layers Dock
- Qimera Project Sources Dock
- Qimera Properties Dock
- Qimera Slice Editor Dock
- Qimera Swath Editor Dock
- Qimera Time Series Editor Dock
- Qimera Time Series Multiplot Dock
- Qimera Water Column Dock

Interacting with Docks

As you move the mouse around the main window, you will notice that the dock under the mouse is indicated by displaying a darker border. Each dock has a title bar containing the name of the dock, a detach/attach () button and a close () button.

Clicking the close button hides a dock from view. To bring back a closed dock, click its entry in the Window Menu.

Clicking the detach/attach button will cause the dock to detach itself from the main window to become an independent window. Clicking it again will cause the dock to reattach to the main window. Docks can also be detached by left-clicking and dragging on the title bar. While dragging a detached dock you can move it around the screen (or even to a second screen) or move it to a new docking area in the main window. Valid docking areas for the selected dock will highlight as you move it over the window. Docks can be

placed side-by-side with each other or stacked on top of one another. A tab bar is shown for navigating between stacked docks.

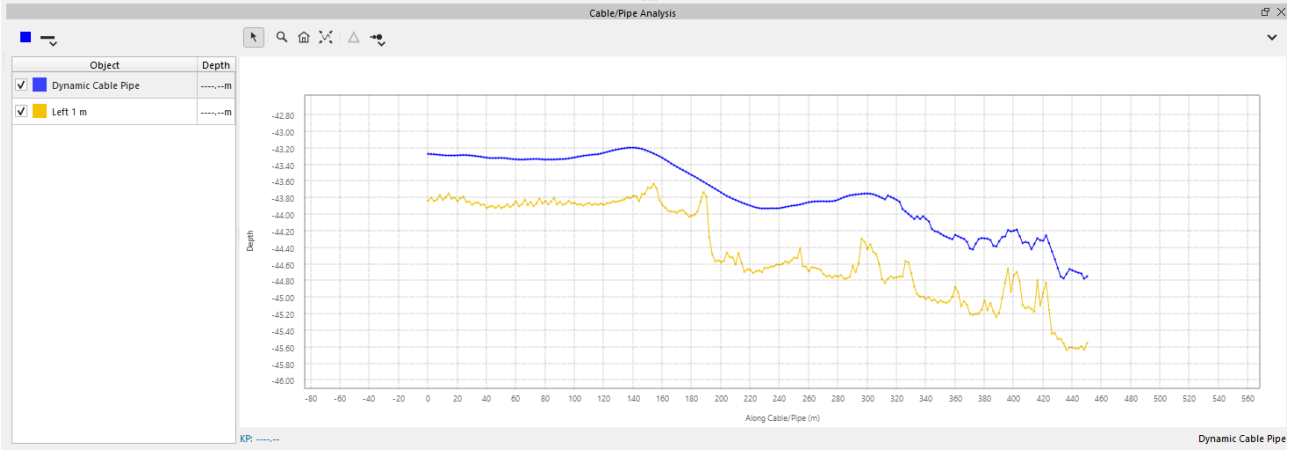
Docks sizes are adjustable, down to a dock specific minimum size. To resize docks attached to the main window, click and drag on the splitters between docks. To resize detached docks, click and drag on the lower right corner of the dock. (Note that a resize cursor isn't always displayed, so unfortunately trial and error may be required.)

The layout of the main window is saved automatically. To save and restore different layouts, see the workspace management options in in the Window Menu.

Return to: Qimera Interface

Return to: Qimera Table of Contents

Qimera Cable/Pipe Analysis Dock



- How to Start
- What It Does
  - Object Table
    - Object Table Toolbar
      - Color Button
      - Line Pattern Button
  - Plot Data
    - Plot Data Toolbar
      - Explore Mode
      - Zoom Mode
      - Zoom Home
      - Zoom to Selected
      - Compute Difference Series
      - Point Size
      - Cable/Pipe Analysis Menu
        - Import Line Object as Reference
        - Compute Depth of Burial
        - Show Statistics
        - Clear Depth of Burial
        - Show Burial Regions

- Export Plot as Image...
- Export to ASCII...
    - Save Configuration, Load Configuration, Restore Defaults
- Export to QGF Line...

How to Start

1. Select Run Cable/Pipe Analysis & Export... menu item when Right-Clicking a Dynamic Cable/Pipe in the Project Layers.
2. If hidden - Select the Cable/Pipe Analysis Dock tab.
3. If hidden - Select Window Menu → Cable/Pipe Analysis Dock.

What It Does

The Cable Pipe Analysis Dock allows the user to analyze their Dynamic Cable/Pipe and associated X-Point Listings. Several forms of analysis information can be exported in ASCII and Image format. If this dock is open and data is loaded any changes to the loaded Dynamic Cable/Pipe or its X-point Listings will be updated automatically including the *Depth of Burial* computation.

Object Table

The *Object Table* contains all plot items that are associated with the current Dynamic Cable/Pipe. Each item can be enabled/disabled using its corresponding checkbox, its color changed using the *Object Table Toolbar Color Button* and its line pattern changed using the *Object Table Toolbar Line Pattern Button*. When mousing over the plot the depth column will be updated with the associated plot item depth.

Object Table Toolbar

This toolbar allows customization of the plot objects.

 **Color Button**

This button will show a dialog that allows the color customization of the currently select plot object.



Line Pattern Button

This button will change the line pattern of the currently selected plot object. If you click and hold the button, you will see a drop down list of the choices. A single click will cycle to the next line pattern.

Plot Data

The Plot Data window visualizes the currently loaded Dynamic Cable/Pipe profile and its associated X-Listings and computed analysis/Depth of Burial plots. Each plots attributes can be configured using the methods outlined in the *Object Table* section.

Plot Data Toolbar



Explore Mode

This is the primary exploration mode of the tool. As you move your cursor over the plot, the label in the lower left of the window will update to show the KP of the cursor location. This will also update the associated Depth column for each plot item in the *Object Table*.



Zoom Mode

When in zoom mode, simply click and drag an area of the plot to zoom into. At any time, you can Shift-Click to pan the plot to a new location. Vertical scale zoom can activated by holding the Ctrl key and using the mouse wheel.



Zoom Home

Zooms to all fields that are checked in the table.



Zoom to Selected

Zooms to all fields selected in the table.



Compute Difference Series

For this to be enabled, you must select two fields in the table. This creates a new series which is the difference between the first selected field and the second selected field. You can delete a difference series by right clicking on it in the table.

 **Point Size**

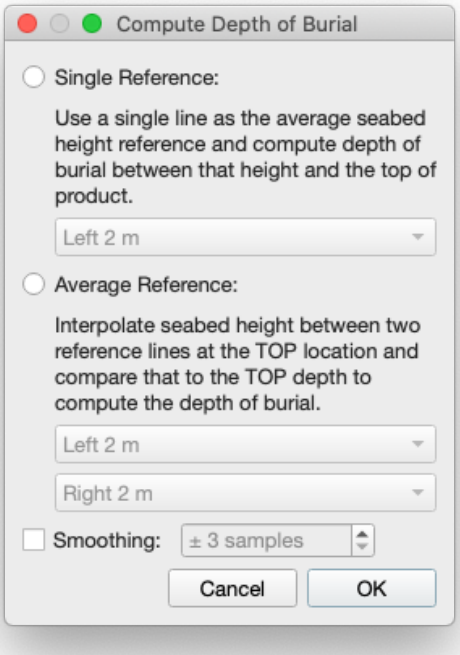
This button will allow you to change the size of the plotted points and lines. Clicking on the button will cycle to the next size. Click and hold to get a drop down menu of sizes to choose from.

 **Cable/Pipe Analysis Menu**

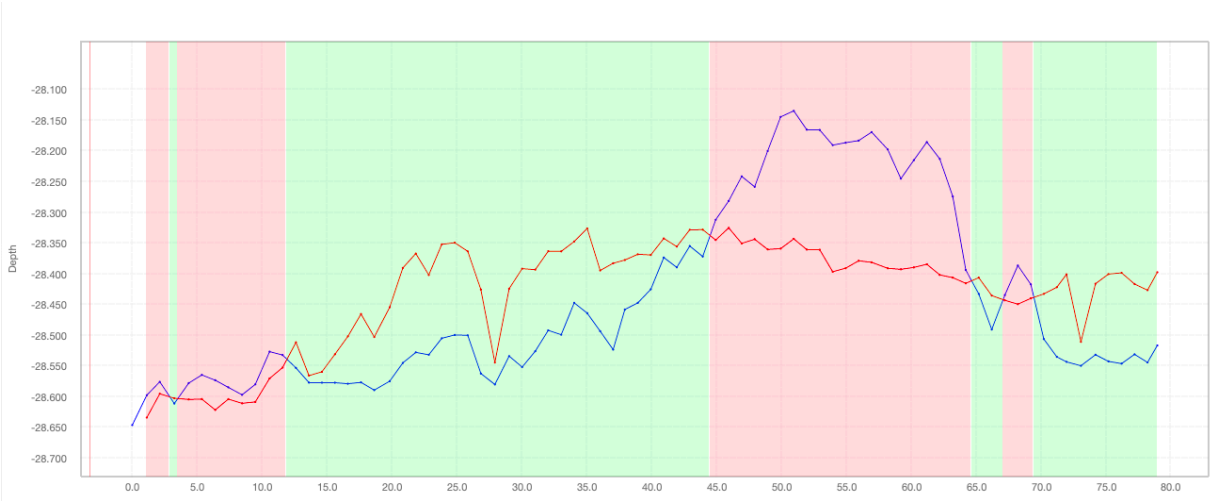
Import Line Object as Reference

This option will launch a dialog listing all of the available Lines that have been added to Qimera that meet the requirement of containing only one segment. The resulting dialog will allow you to select the acceptable lines that you wish to add which can be enabled/ disabled by clicking the associated checkbox. Clicking Ok will add the selected lines to the *Object Table* which can be configured as outlined under the *Object Table* section.

Compute Depth of Burial



This option will launch a dialog that allows you to select appropriate references from the *Object Table* in order to calculate depth of burial and provide visual representation of intersections (Burial Regions) between the current dynamic pipe and the selected reference object(s). A Burial Regions analysis plot object will be added to the *Object Table* that can be configured as outlined in the *Object Table* section. Boxcar smoothing can be applied to the selected reference line using the smoothing checkbox to smooth the resulting analysis plot object. Only a single Depth of Burial calculation can be active at a time. Any changes made will overwrite the previous computation and resultant analysis plot.



The image above shows the resultant Burial Regions from running the computation with a single reference and +/- 3 sample smoothing value. You can see the intersections at which the smoothed analysis object (red) intersects with the dynamic pipe object (blue) indicating buried vs exposed states. The colours of the Burial Regions can be changed by selecting the matching label color at the bottom of the plot.

Show Statistics

This option will display grid lines for the min, max, average, lower quartile and upper quartile of the field.

Clear Depth of Burial

This option will clear any Depth of Burial calculation you have run previously. This option will be disable if you have run no valid computational analysis.

Show Burial Regions

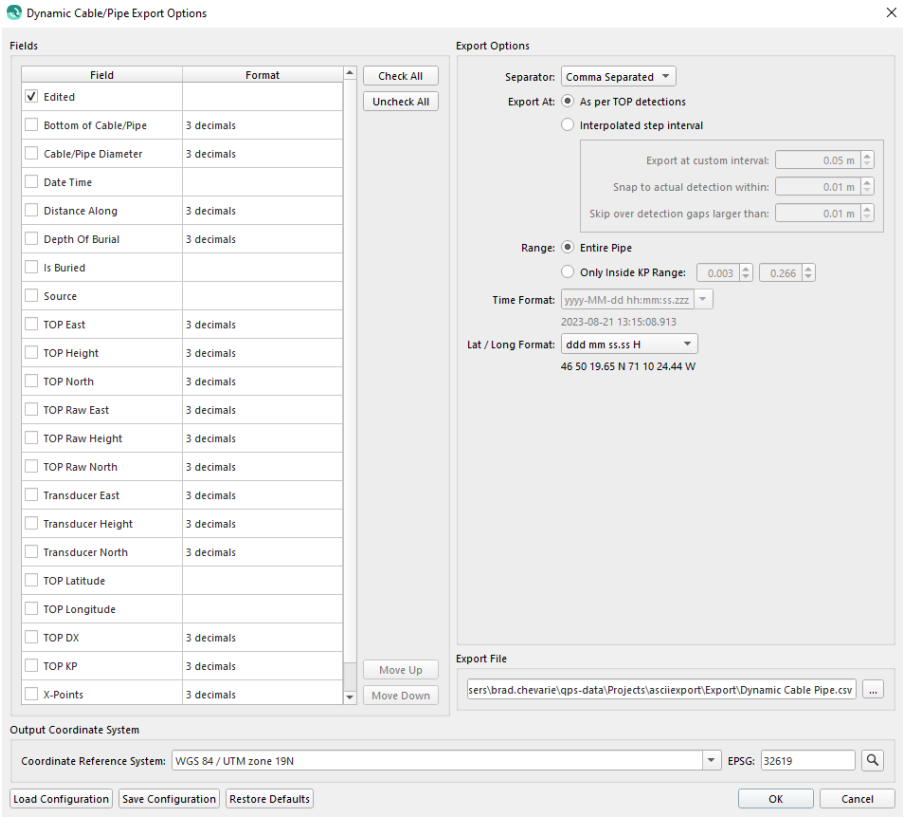
This option will show or hide the Analysis Burial Regions that are produced when running the Depth of Burial computation. This option will be disable if you have run no valid computational analysis.

Export Plot as Image...

This option will export the current visual plot as an image.

Export to ASCII...

This option will launch the *Dynamic Cable/Pipe Export Options* dialog to enable configuration and exporting to ASCII.



- *Fields*: Each field can be enabled or disabled by clicking the corresponding checkbox. Some fields have specific formatting options. The fields can be reordered by selecting a field and using the *Move Up* and *Move Down* buttons. All fields can be enabled or disabled via the *Check All* and *Uncheck All* buttons. Once selection and ordering are completed the configuration can be saved by checking the *Remember Settings* checkbox and clicking *Ok*. This configuration will automatically be reloaded when the dialog is launched.

  Several fields will only be enabled if you meet their qualifications:

  - X-Points - will only be enabled if you have generated X-Point listings for the current Dynamic Cable/Pipe.
  - Depth of Burial - will only be enabled if you have run a Depth of Burial calculation as outlined in the *Depth of Burial* section.
  - Is Buried - will only be enabled if you have run a Depth of Burial calculation as outlined in the *Depth of Burial* section.
- *Separator*: Controls which character will be used to separate fields
- *Export As*: Provides two different options for travelling down the cable/pipe while exporting.
  - With *As per TOP detections* one row is exported for each detection, in order from the start of the pipe. The distance between rows may vary.

    - With *Interpolated Step Interval* interpolated values are exported at a fixed spacing along the cable/pipe.
        - The *Export at custom interval* setting specifies the distance between rows.
        - The *Snap to actual detection within* setting allows rows that are very close to an actual detection to export that detection's values rather than interpolated ones.
        - The *Skip over detection gaps larger than* setting prevents the export from attempting to interpolate across very large gaps between detections where interpolated values are very unlikely to be accurate.
- *Range*: The *Entire Pipe* can be exported, or the export can be limited to a specific KP range.
- *Export File*: This is the file path where the ASCII file will be saved.
- *Lat / Long Format:* This is the degrees minutes seconds format that latitude and longitude fields will be exported as.
- *Output Coordinate System:* This is the coordinate system of the exported data. It is limited to projected coordinate reference systems.

Save Configuration, Load Configuration, Restore Defaults

You can save, load or restore default configurations for this dialog using the corresponding buttons.

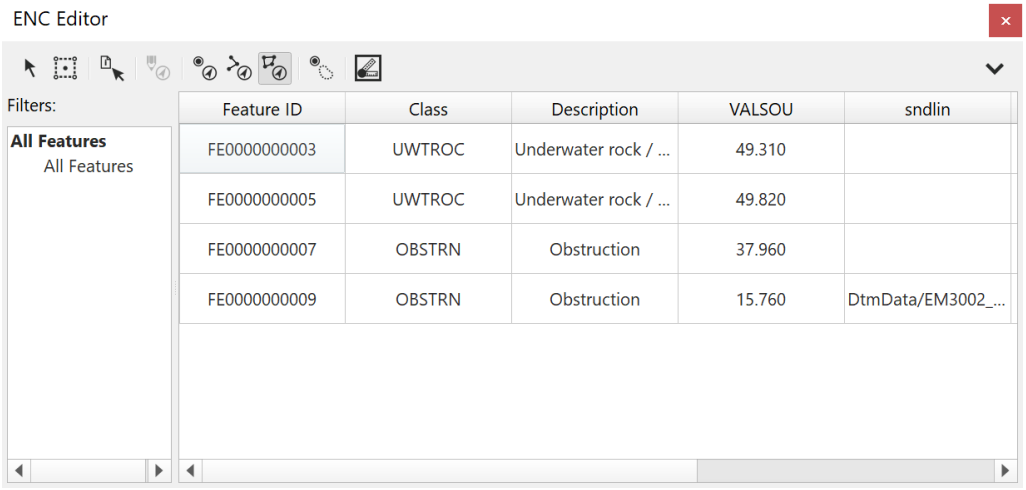
Export to QGF Line...

Exports the selected pipe to a qgfline file.

Return to: Qimera Interface#qimerainterface

Return to: *Dockable Windows*

Qimera ENC Editor Dock



- ENC Editor Dock
  - ENC Editor Toolbar
    - Pick ENC Object
    - Select ENC Objects
    - Query Chart
    - Edit Feature
    - Create Point Object
    - Create Line Object
    - Create Area Object
    - Create Shoalest Point Object
    - Launch Qomposer
    - ENC Editor Menu
      - Edit Feature
      - Configure Columns
      - Import Filter Set
      - Export Filter Set
      - Export Table
  - ENC Editor Menu
  - Create ENC Object Dialog

- Adding/Removing Attributes
- Qimera Attributes
- Edit ENC Object Dialog
- ENC Object Images
- ENC Feature Table
  - ENC Feature Table Context Menu
    - Copy To
    - Move To
    - Edit
    - Center On
    - Delete
- ENC Filter Tree
  - Feature Filters
    - Primitive Type Filters
    - Feature Class Filters
    - Attribute Filters
  - ENC Filter Tree Context Menu
    - Add Filter
    - Add Subfilter
    - Edit Filter
    - Duplicate Filter
    - Remove Filter
- Dynamic ENC Update
  - Grid Connection
  - Sounding Connection

ENC Editor Dock

The ENC Editor Dock allows you to create and edit ENC charts in your project. You can create *point*, *line* and *area* objects with some of the attributes automatically filled in based on the source of the creation. You can create objects directly in the 4D Scene, or, create

point objects that are linked to soundings from any of the sounding based editors. The ENC Editor Dock consists of a filter tree, a feature table and a toolbar.

ENC Editor Toolbar



In order for the toolbar cursor modes to be available, you must have selected a chart layer in your Qimera Project Layers Dock. If you are going to do any editing, that layer must also be unlocked. See the Project Layers Context menu for more information.

 **Pick ENC Object**

This cursor mode allows you to pick an ENC object in the scene. It will only pick ENC objects in the currently selected chart layer not filtered out by the Feature Filters. When you make a selection, all the position nodes appear as red dots in the scene.

 **Select ENC Objects**

This cursor mode allows you to draw a selection rectangle to select ENC objects in the scene. It will only pick ENC objects in the currently selected chart layer not filtered out by the Feature Filters. When you make a selection, all the position nodes appear as red dots in the scene.

 **Query Chart**

This cursor mode allows you to query a location for all ENC information loaded in your project. When you pick in the 4D Scene, the ENC Information Dialog appears, with detailed information near the pick point for all loaded ENC cells.

 **Edit Feature**

This button is enabled if you have a feature selected in the table. When you click it, it will bring up the *Edit ENC Object* dialog described in the following section.

 **Create Point Object**

This button places the scene in ENC Point Object creation mode. Left-click anywhere on a grid to create an ENC Point Object. When you click, it will bring up the ENC Create Object dialog described in the following section.

 **Create Line Object**

This button places the scene in ENC Line Object creation mode. Left-click a series of points on a grid. Right-click to exit and create an ENC Line Object which will bring up the ENC Create Object dialog described in the following section.

 **Create Area Object**

This button places the scene in ENC Area Object creation mode. Left-click a series of points on a grid. Right-click to exit and create an ENC Area Object which will bring up the ENC Create Object dialog described in the following section.

 **Create Shoalest Point Object**

This button places the scene in ENC - Point Object creation mode. Left-click-drag an area selection in the scene. Qimera will determine the shoalest grid-node from all visible Dynamic Grids. It will then bring up the ENC Create Object dialog described in the following section.

 **Launch Qomposer**

This will launch the Qomposer application with the charts in your project.

It is important to note that this icon will only appear if Qomposer is downloaded on the computer.

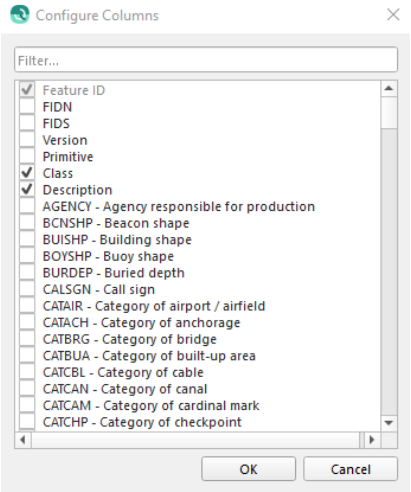
 **ENC Editor Menu**

Edit Feature

This will launch the *Edit ENC Object* dialog shown here.

Configure Columns

This will launch the *Configure Columns* dialog shown below. Check and uncheck the attributes you want to display in the table. You can type an attribute name in the edit field at the top of the dialog to quickly trim the list of possible attributes.



Import Filter Set

This option allows you to import a previously saved filter set.

Export Filter Set

This option allows you to export a filter set for use in other projects.

Export Table

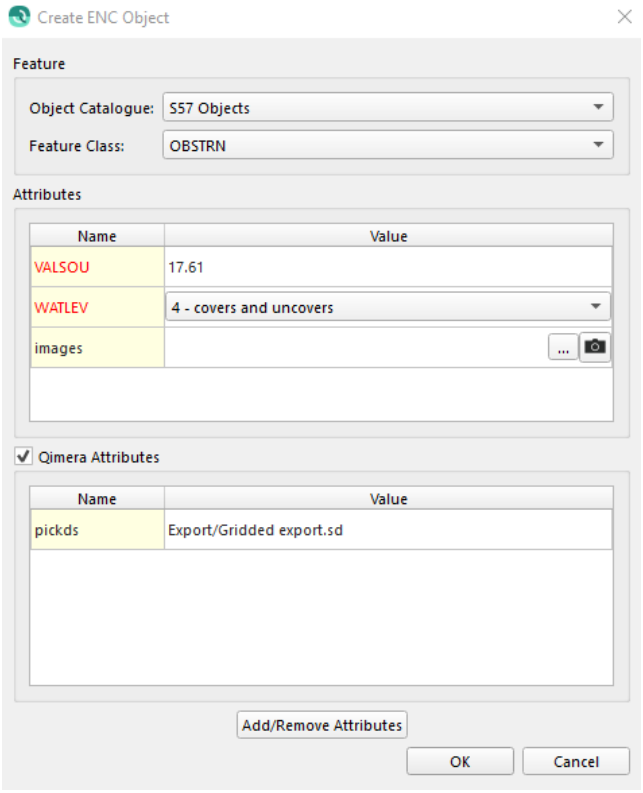
This option allows you to export a semi-colon delimited text file of the table values. The first row of the text file will be the column names.

ENC Editor Menu

Create ENC Object Dialog

This dialog allows you to decide which type of ENC object you are going to create, and the attributes/attribute values that will be associated with it. The *Object Catalog* combo-box allows you to choose between *All Objects, Inland Objects* and *S57 Objects* (default).

The *Feature Class* combo-box allows you to select which feature type you want to create. By default, Qimera will automatically add all of the *Mandatory* attributes for the feature type. Mandatory attributes will appear with a red text label. If you add new attributes, Qimera will remember these the next time you create a feature of the same type.

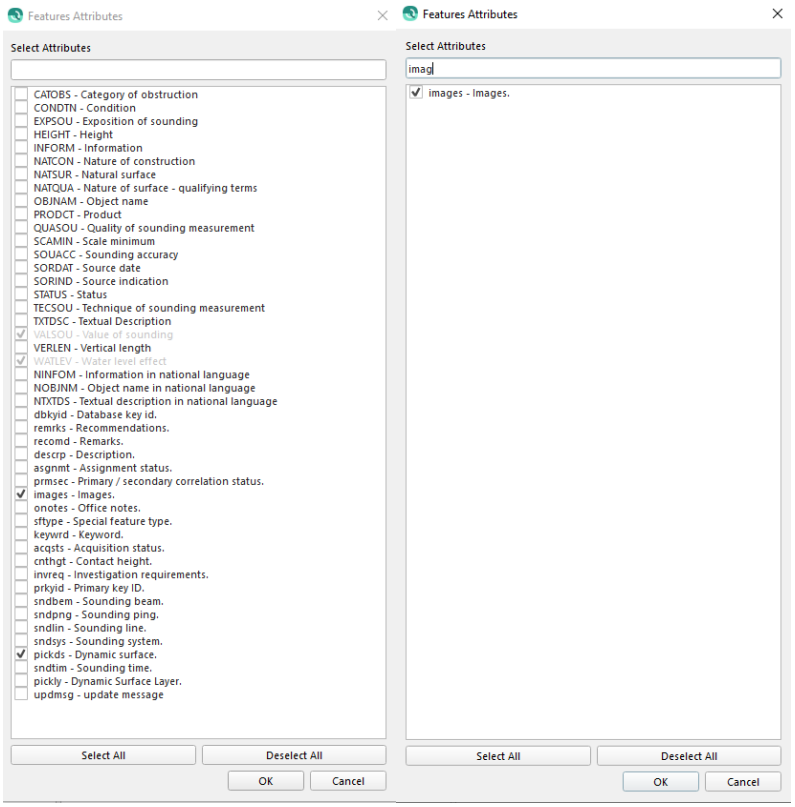


Adding/Removing Attributes

Clicking the *Add/Remove* button brings up the *Feature Attributes* dialog shown below on the left. It will only list the attributes available for the feature type. You will also see any custom attributes that may be available. Check or uncheck attribute names that you want to add or remove from your ENC object. You can also use the *Select All* or *Deselect All* buttons. If an attribute is disabled (grayed out), that means it is a mandatory attribute and cannot be removed. You can filter out a lengthy list by typing in the edit box at the top of the dialog.

It is important to note that the image attribute is not default, and it must be added using this dialog to attach an image to the ENC Object.

An example of the search filter is shown in the right image below.

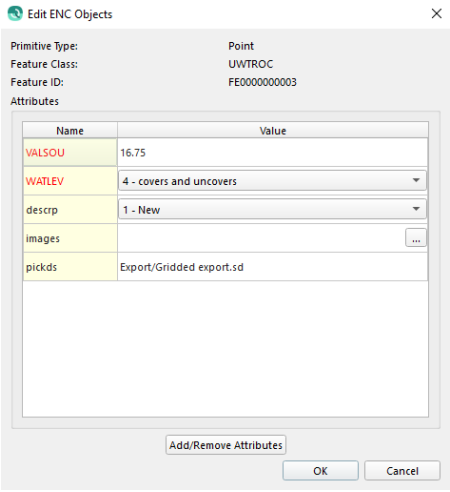


Qimera Attributes

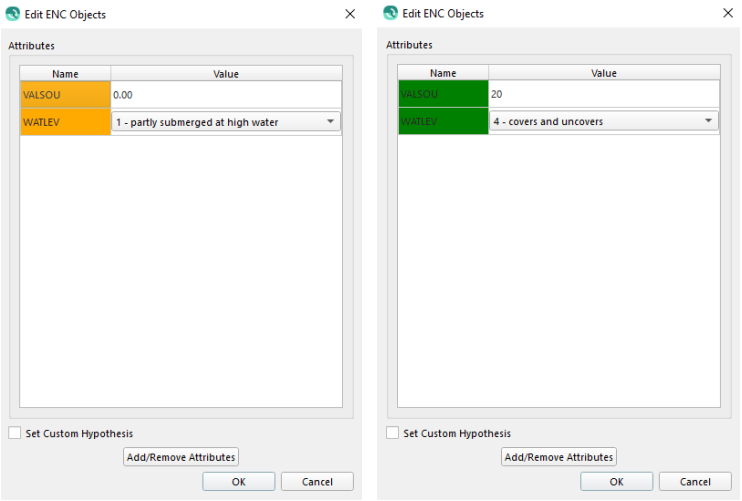
This option allows you to globally include or exclude Qimera custom ENC attributes. Qimera custom attributes enable the use of the *Dynamic ENC Update* described below. This preference will be persisted each time you then try to create a new ENC object.

Edit ENC Object Dialog

This dialog allows you to edit ENC object attributes as well as add or remove attributes. You can bring up this dialog by either double-clicking on a row in the feature table, or clicking on the *Edit Feature* button.



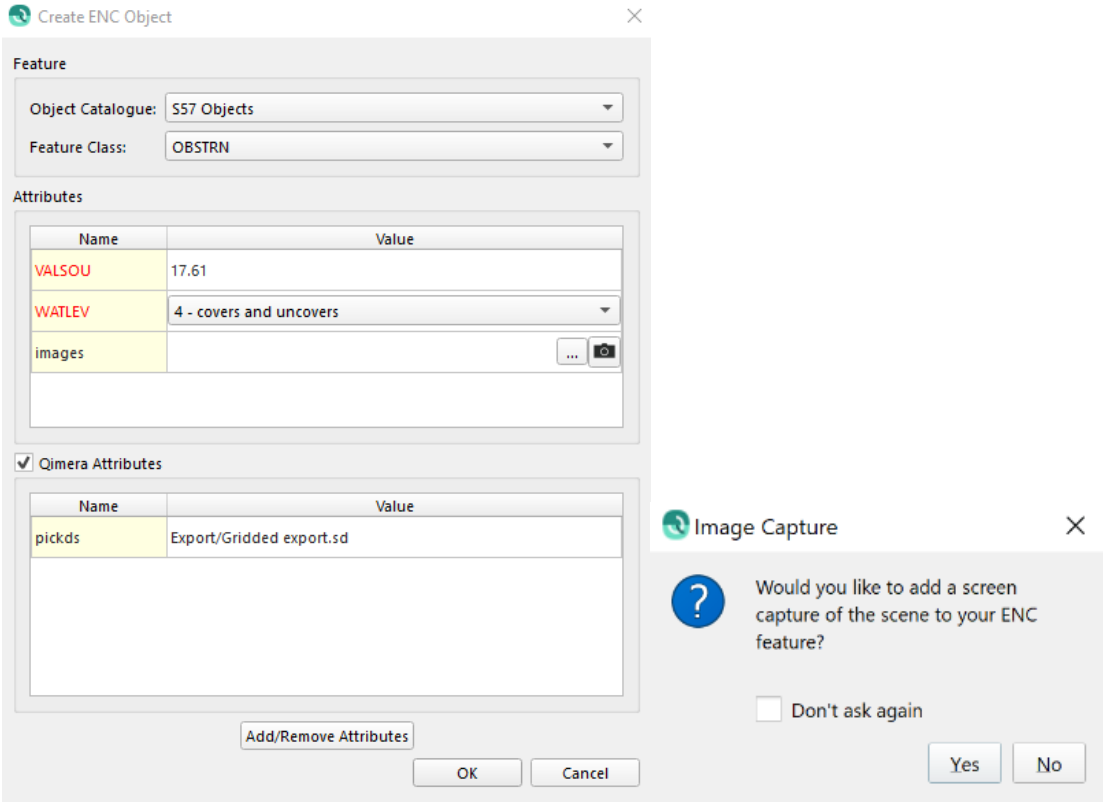
You can also edit more than one feature at a time. Simply select multiple rows in the table and click the *Edit Feature* button. The only attributes that appear in the dialog are the ones that appear in all of the selected features. If the values of those attributes conflict, the attribute label will be orange as shown below to the left. If you don't change the value, the values in the original features will not be changed. If you change the value, the attribute name will appear with a green background as shown below to the right. Then clicking the OK button will change the attribute to that value for all selected features.

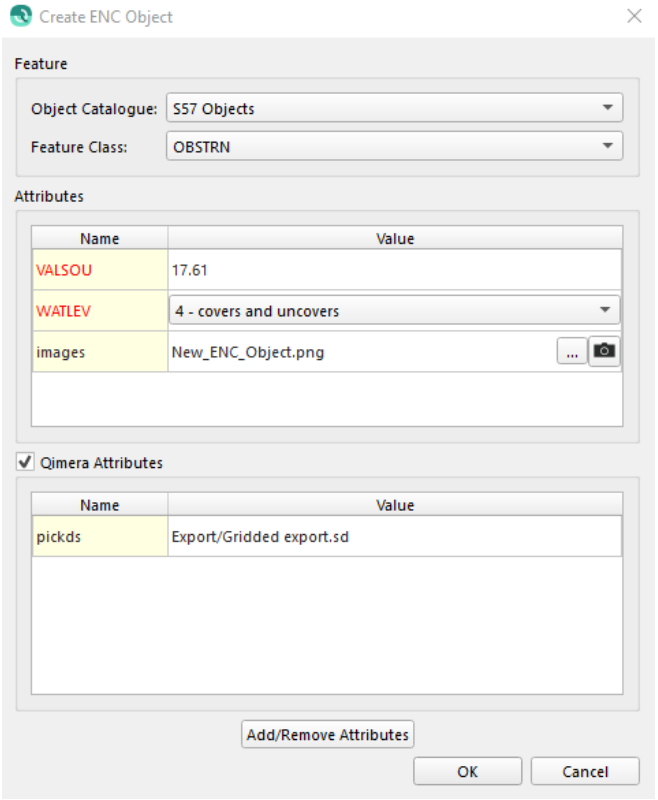


ENC Object Images

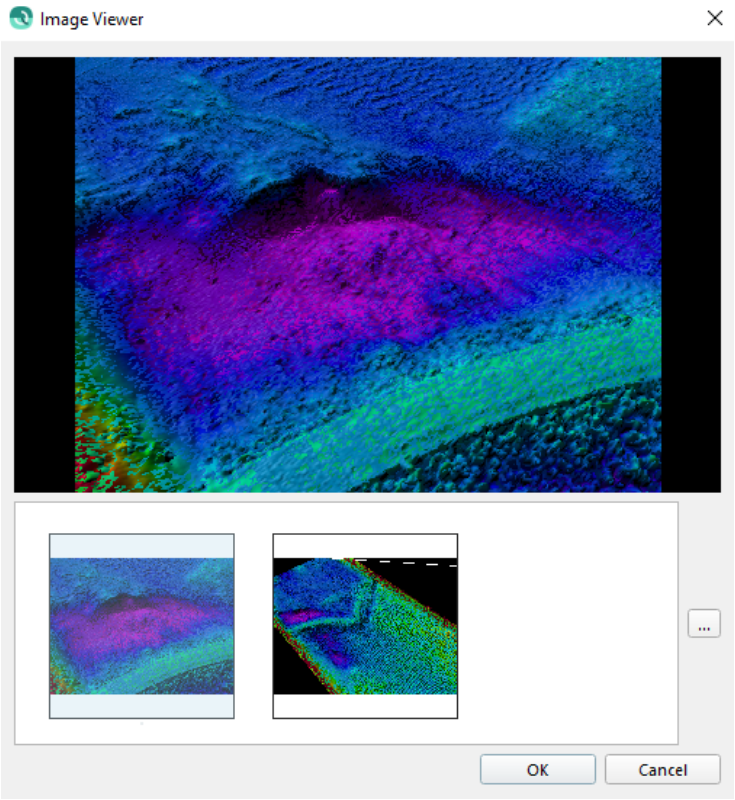
If you add the NOAA *images* custom attribute to your feature, you are able to correlate images to the feature you created via directory search or widget snapshots. Using the camera icon shown below, you are able to create a screenshot of the editor that was used to create the feature. Qimera will ask if you want to additionally add a screenshot of the main scene as shown below. If you click the *Don't Ask Again* option and answer *Yes*, you

will always automatically get a screen capture from the main scene, unless you are creating the object from the main scene. You can turn this off by clearing the option in the *Remembered Prompts* tab of the preferences dialog. The capture capability will screen grab from all of the available ENC Object Creation Widgets (Swath, 3D Editor, Slice Editor, Water Column View, Main Scene).


Create ENC Object
Feature
Object Catalogue: S57 Objects
Feature Class: OBSTRN
Attributes
Name
Value
VALSOU
17.61
WATLEV
4 - covers and uncovers
images
Qimera Attributes
Name
Value
pickds
Export/Gridded export.sd
Add/Remove Attributes
OK
Cancel
Image Capture
Would you like to add a screen capture of the scene to your ENC feature?
Don't ask again
Yes
No


Create ENC Object
Feature
Object Catalogue: S57 Objects
Feature Class: OBSTRN
Attributes
Name
Value
VALSOU
17.61
WATLEV
4 - covers and uncovers
images
New_ENC_Object.png
Qimera Attributes
Name
Value
pickds
Export/Gridded export.sd
Add/Remove Attributes
OK
Cancel

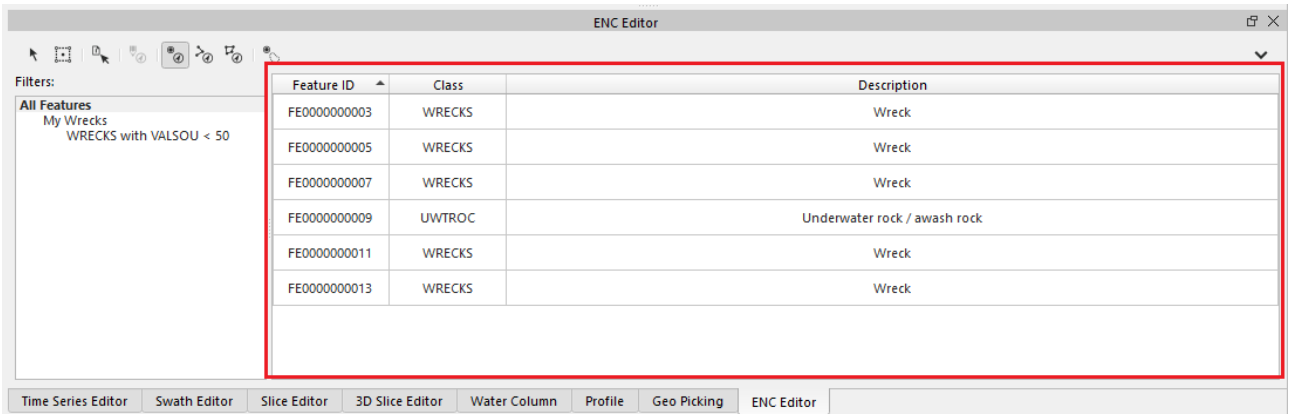
If you click on the *Browse* button, the *Image Viewer* dialog will be shown. Here you see thumbnails of all the images you have added. Clicking on a thumbnail will display it in the main window. You can hit the *Delete* key to delete any currently selected images. To add more images, simply click the *Browse* button from this dialog.



Images are stored along side your charts in the QNC folder of your project. If you select an image outside the Qimera Project, it will be copied locally so that it will always stay connected to your charts.

ENC Feature Table

The ENC Feature Table displays the features of the currently selected Chart Layer in the Layers Dock. You can edit features in the table by double-clicking on a row, or selecting multiple rows and clicking the *Edit Feature* button. Clicking on the column headers will change the sorting of the table entries. You can also right-click on a table row to bring up the ENC Feature Table Context Menu. You can change which columns are displayed using the ENC Editor Menu described here. You can also change the width of the columns by hovering over the column headers.



ENC Feature Table Context Menu

When you right click on a table row, the context menu for the table will popup.

Copy To

Use this option to copy features to another one of your project chart layers. This list will auto populate based on the charts in your project.

Move To

Use this option to Delete a feature from one chart layer and add it to another chart layer.

Edit

Use this option to bring up the Edit ENC Object dialog.

Center On

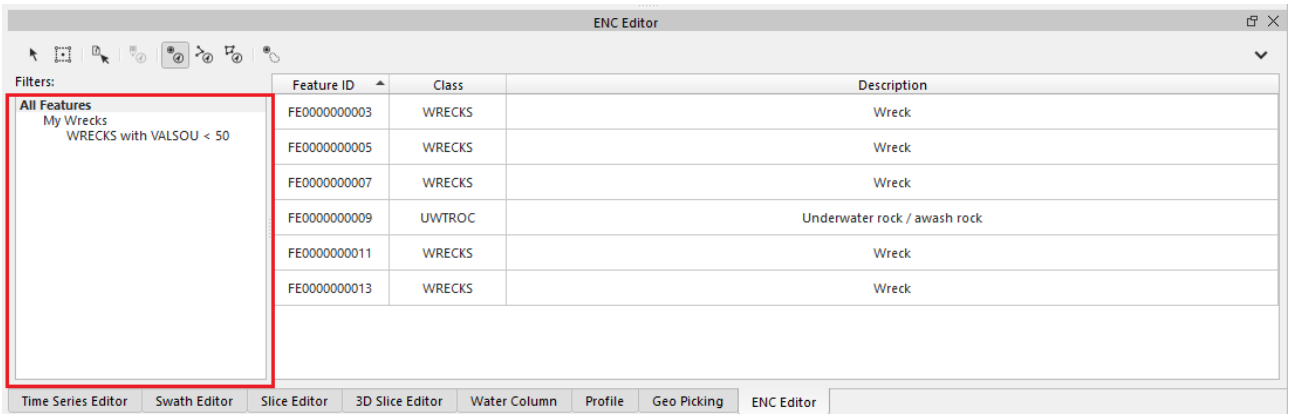
Use this option to center the 4D Scene on the feature.

Delete

Use this option to delete a feature from a chart layer.

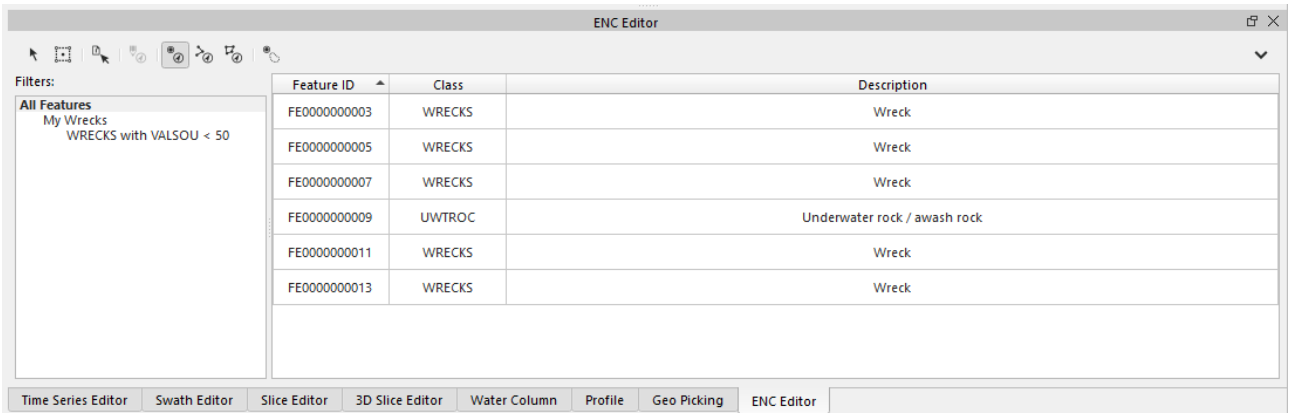
ENC Filter Tree

The filter tree allows you to create filters to reduce the amount of features displayed in your table.

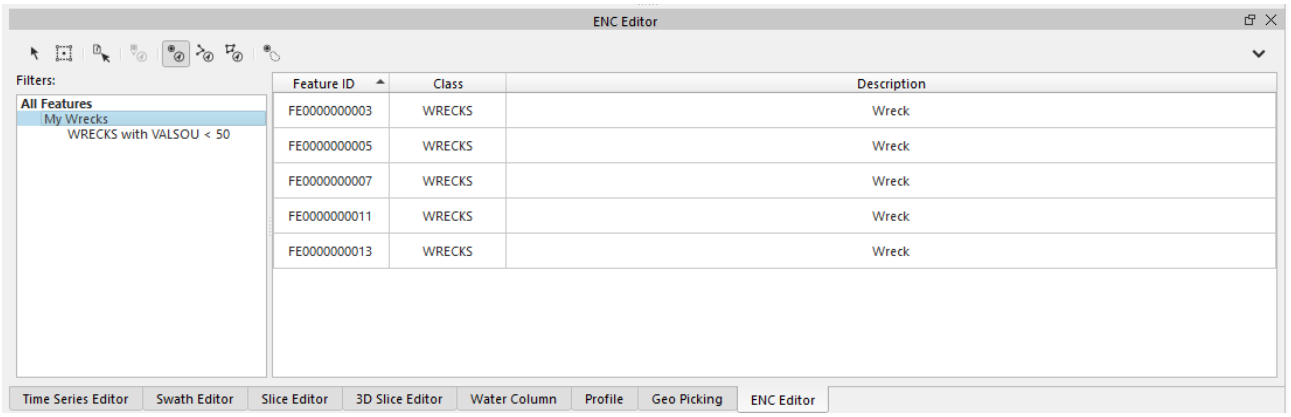


As you click on a filter in the tree, the table is updated accordingly. The filters can be nested allowing for finer refinement of the features in your table. Some examples of simple filter usage are shown below.

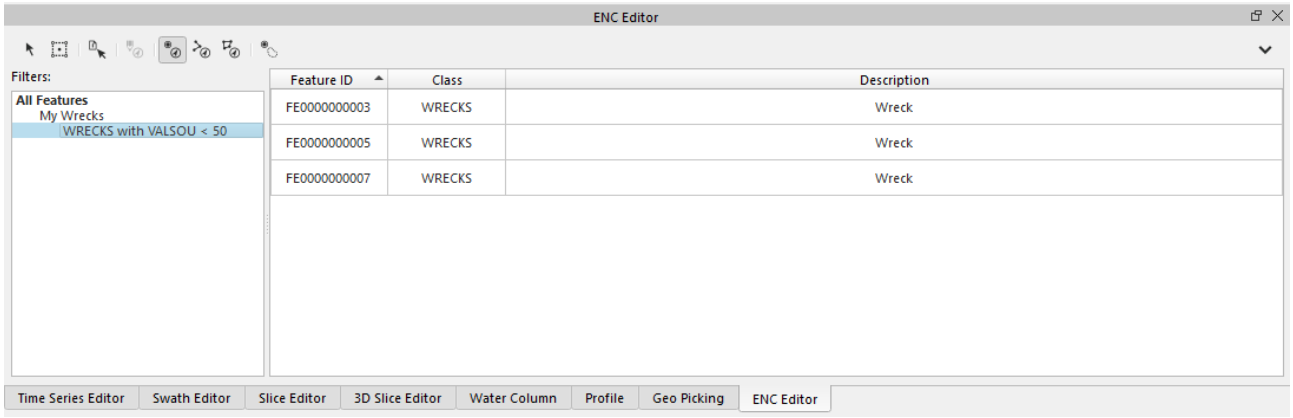
Show all features



Show only wreck features

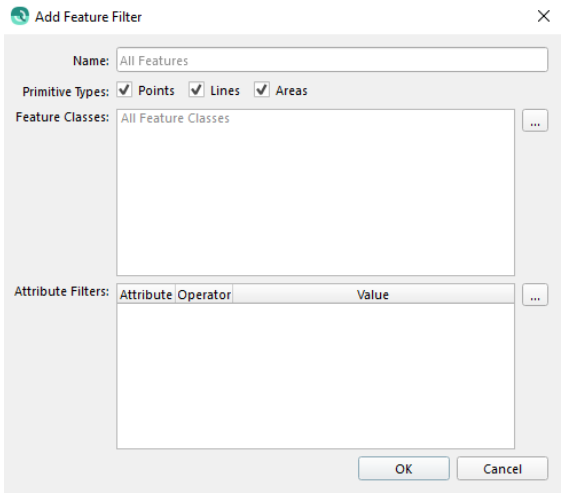


Show only wreck features having depth < 50.0 meters



Feature Filters

When you add new filters using the Filter Tree context menu, you get the *Add Feature Filter* dialog shown below. Filters consist of 3 components listed below. Notice that as the filter is constructed, an informative *Name* is automatically filled in by Qimera. You can override this by typing in your own description in the *Name* field.



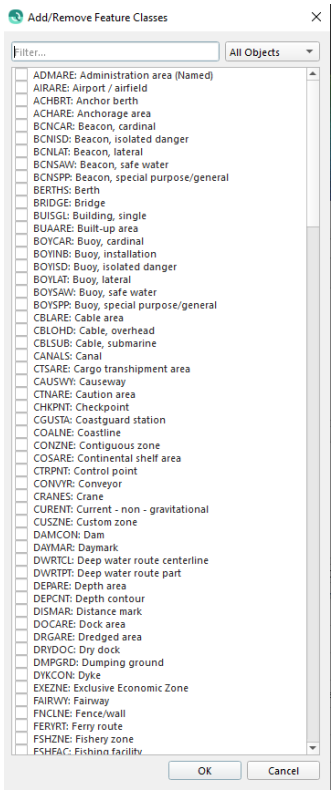
Primitive Type Filters

This will create a filter which only passes the feature type that are checked.

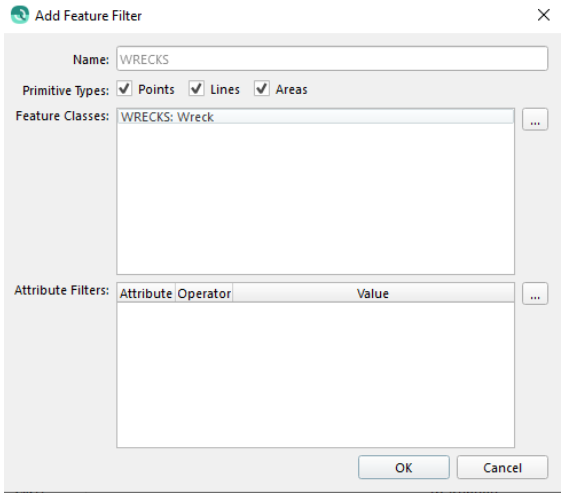
Feature Class Filters

This will create a filter which only passes the feature classes added to the list box. If you don't add any feature class types, all features are passed. Use the "..." button to bring up the Add/Remove Feature Classes dialog shown below. Any feature classes checked will

be added to the list box. You can search for specific feature class types by typing in the search box at the top of the dialog. The list of feature classes will also be reduced based on which *Primitive Type* check boxes you checked.

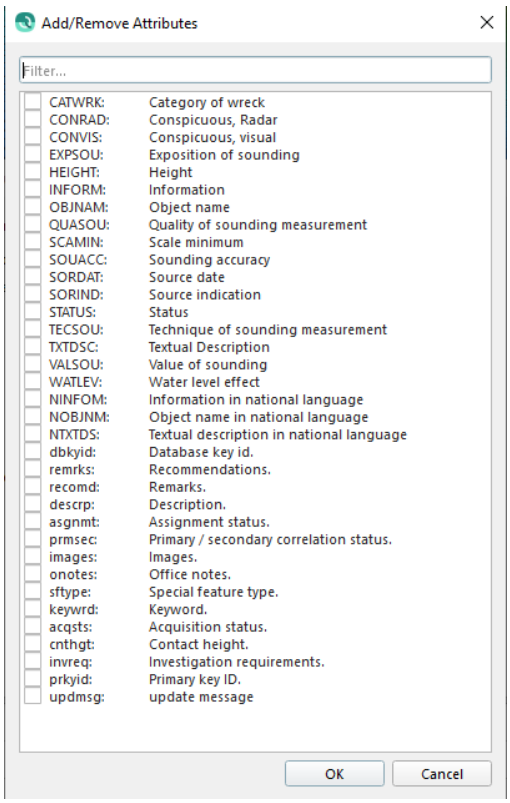


After you select from the Add/Remove Feature Class dialog, your feature class names will appear in the list as shown below.

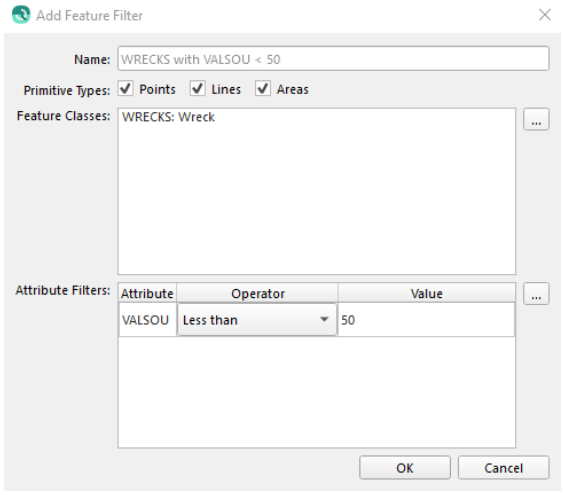


Attribute Filters

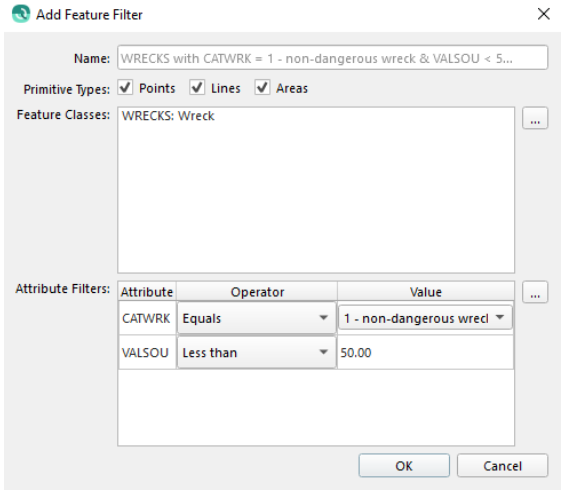
This will create a filter which only passes the features with attributes matching those in the list box. Use the "..." button to bring up the Add/Remove Attributes dialog shown below. Any attributes checked will be added to the list box. You can search for specific attributes by typing in the edit box at the top of the dialog. The list of attributes will also be reduced based on which Feature Classes you have added to the filter.



After you select from the Add/Remove Attributes dialog, your attribute names will appear in the list as shown below. Attributes can have 2 existence operators (*Exists, Does Not Exist)* and 2 equivalency operators (*Equals, Does Not Equal),* and 4 mathematical operators (*Greater Than, Less Than, Greater Than or Equal, Less Than or Equal).* If you are using any of the mathematical operators, you must fill in a value for the attribute. Depending on the attribute type, you will also have to fill in a value when using the equivalency operators.



If an attribute is non-numeric, then you will only have 4 operators (*Exist, Does Not Exist, Equals, Does Not Equal)*. An example of this type of attribute (enumeration) is shown below.



After clicking the OK button, the filter name will appear in your filter tree.

ENC Filter Tree Context Menu

This context menu enables you to configure your filters to reduce what is shown in the table view. Right-click on a node in the filter tree to activate the context menu.

Add Filter

This will add a filter under the root filter. It will display the *Add Feature Filter* dialog described above.

Add Subfilter

This will add a filter under the currently selected filter. It will display the *Add Feature Filter* dialog described above.

Edit Filter

This will allow you to edit the selected feature. It will display the *Edit Feature Filter* dialog that works the same as the *Add Feature Filter* dialog described above.

Duplicate Filter

This will duplicate the currently selected filter. Use the *Edit Filter* option to then make changes to this filter.

Remove Filter

This will remove the currently selected filter.

Dynamic ENC Update

Dynamic ENC Update is a mechanism that automatically changes the Z or XYZ value of a point ENC object each time data is processed in Qimera. The Z value is typically represented by the VALSOU attribute of an ENC object. Qimera automatically fills in the VALSOU value whenever you create a point ENC object or in one of the 4 sounding editors.

Creating Dynamic Objects

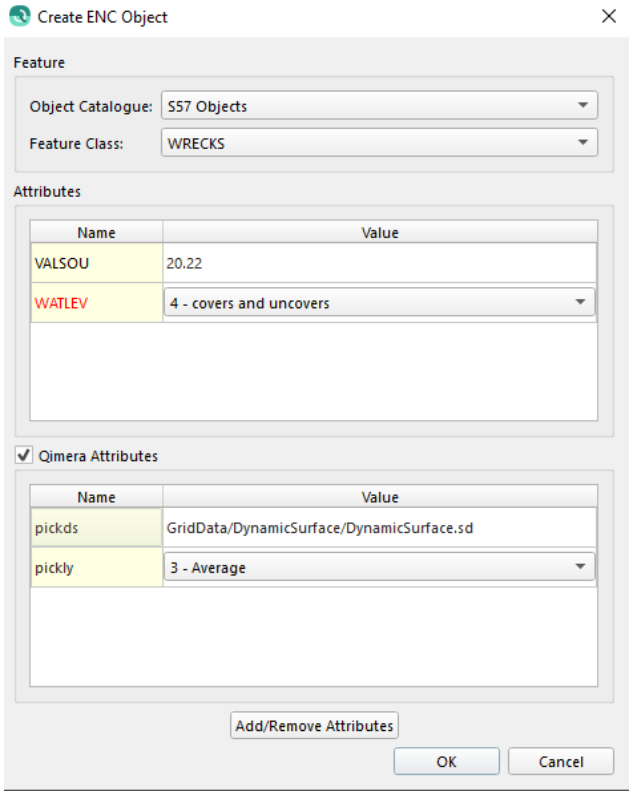
There are multiple ways to create ENC point objects that will benefit from the Dynamic ENC Update mechanism. These are listed below.

 The Create ENC Point object cursor mode from the ENC Editor toolbar. When in this mode, picking on a grid in the scene will create an object with a *Grid Connection* described below.

 Slice Editor, 3D Editor, Swath Editor, and Water Column View toolbars. Clicking on a sounding will create a *Sounding Connection* described below.

Grid Connection

If your ENC object is linked to a grid, it will have the ***pickds*** custom attribute set to the name of the grid in your project. Whenever this grid changes, the VALSOU value of the feature will be automatically updated via a "re-pick" of the depth of the Dynamic Grid.



Sounding Connection

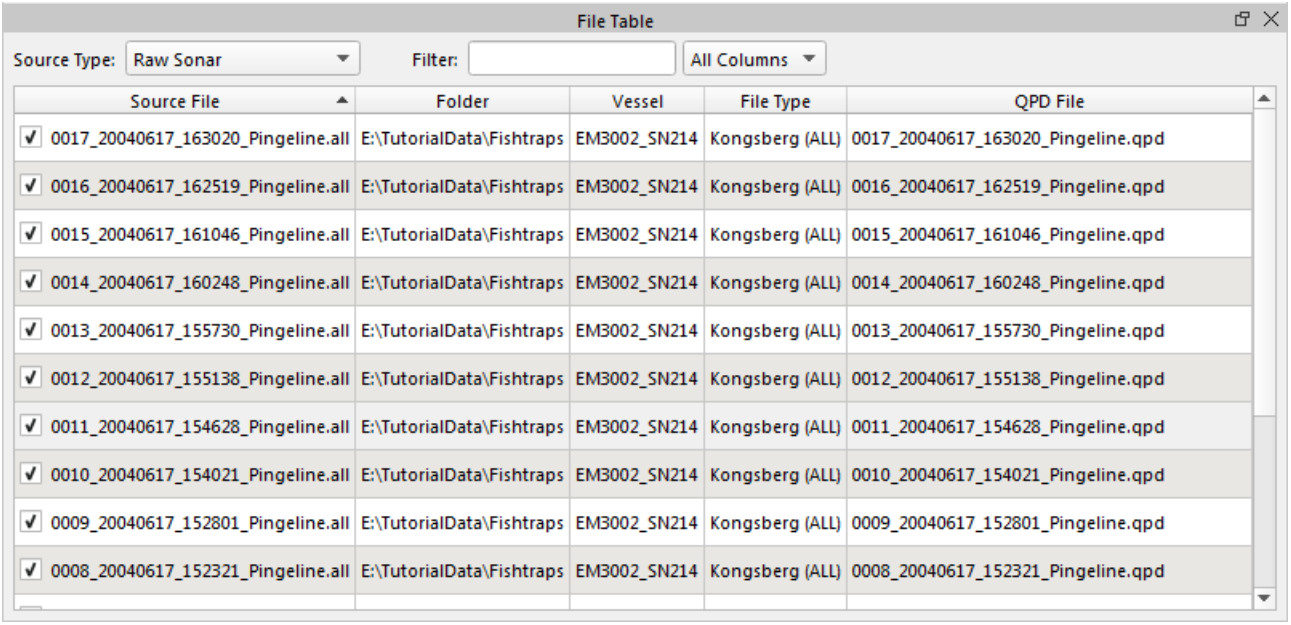
If your ENC object is linked to a sounding, it will have the custom attributes listed below as well as the VALSOU automatically set. Whenever the picked sounding is reprocessed, the linked ENC object VALSOU will be updated to the new Z value of the sounding as well as the XY position.

Attribute	Description
sndbem	The beam number of the sounding
sndpng	The ping number of the sounding
sndsys	The system number of the sounding
sndlin	The line name of the sounding
sndtim	The time of the sounding

All of the *Qimera Attributes* are filled in automatically by Qimera when a sounding is selected. If you do not want Qimera to automatically update an ENC object when data is reprocessed, simply uncheck the option box.

The *Set Custom Hypothesis* option will automatically set the custom hypothesis flag for a sounding when the ENC object is created. This is important if you are doing your editing and ENC object creation based on a CUBE grid.

Qimera File Table Dock



Qimera - File Table

The File Table provides a tabular view of the files shown in the Project Sources window. Because different attributes are available for different types of files, only one source type can be shown at a time in the table. This is controlled by the Source Type drop down, which has options for: Raw Sonar, Processed Points, Position & Motion, Tide, and Sound Velocity Profiles.

For large projects, it can be very convenient to limit the number of files shown in the table to only those matching a particular search string. This is done via the Filter field. As one types into the Filter field, the table is quickly reduced to just those rows containing the search text. By default, all columns of the table are searched, but the column drop down also allows selecting a single column to filter on.

Different columns are available for different source types, but columns can also be individually shown or hidden by right clicking on a column header. Columns can be rearranged by dragging and dropping column headers.

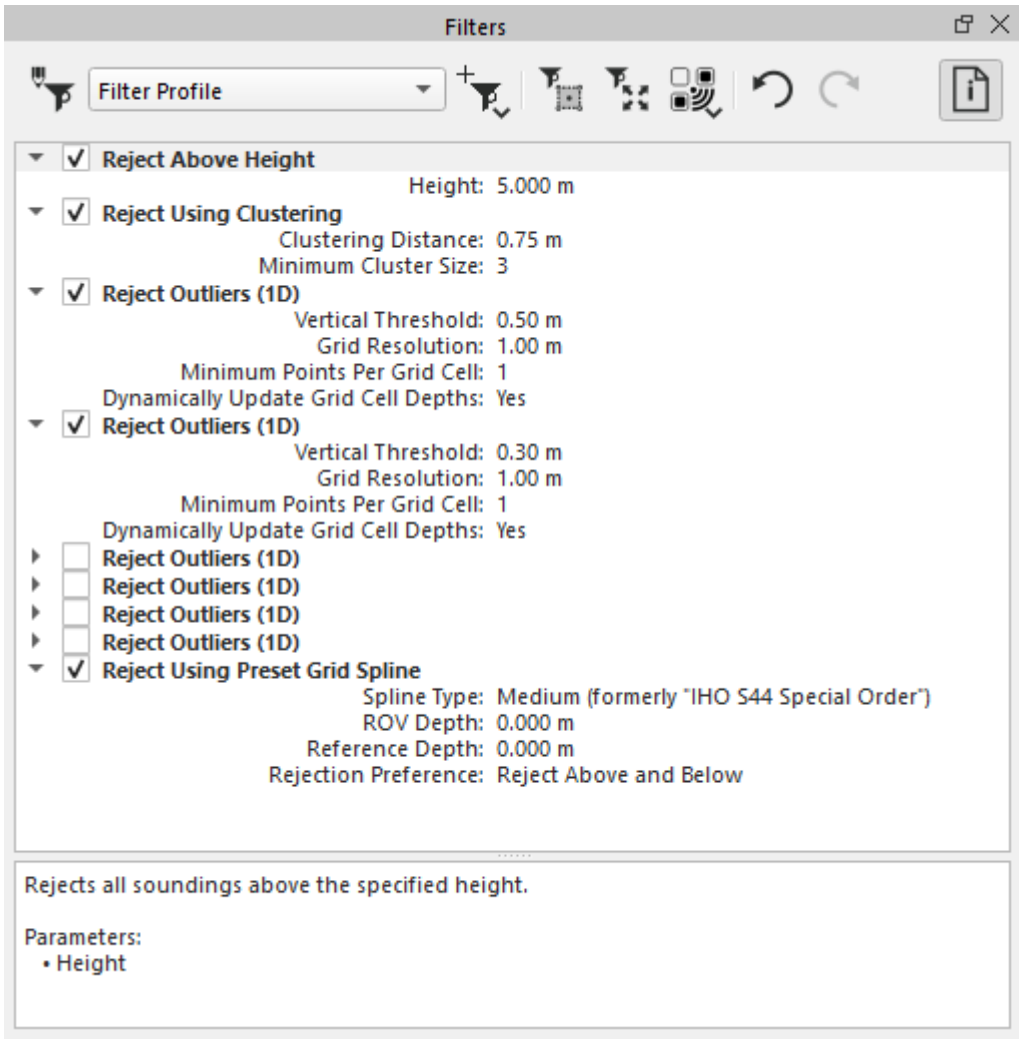
The table can be sorted by clicking on the column headers. Clicking on a column header will sort the table by that column in ascending order. Clicking again will switch to descending order. Sorting can be based on multiple columns. For example, to sort on File Type, then Source File, first click on the Source File header, then on the File Type header. Files will then be sorted by File Type, but in the case where multiple files have the same File Type, those files will be sorted by Source File. Sorting can be reset via the right clicking on a column header and choosing Reset Sorting.

As much as possible, the row selection of the table is synchronized with the selection in the Project Sources tree, allowing one to find files which ever way one finds most convenient.

Return to: Qimera Interface

Return to: *Dockable Windows*

Qimera Filter Profile Dock



- How to Start
- What It Does
  - Dock Toolbar
    - Manage Filter Profiles
    - Current Filter Profile Combo Box
    - Run Filter Profile Inside Selection
    - Run Filter Profile Everywhere
    - Filter By System
    - Undo
    - Redo

- Show Info Panel
- Filter Profile View
  - Item Context Menu
    - Delete
    - Duplicate
    - Move Up
    - Move Down
    - Expand All
    - Collapse All
    - Show/Hide Info Panel
- Filter Information Panel

How to Start

1. Select the Filters Dock tab - initially located in the Project Layers tab group.
2. If hidden - Select the Filters Dock tab. This will be saved for the current workspace.
3. If hidden - Select Window Menu → Filters Dock.

What It Does

The Filter Profile Dock allows the user to manage, configure and run their filter profiles. The Filter Profile dock shares many of the same features and links with the Qimera Filter Operation Toolbar. Filters will be run in sequence from top to bottom for the currently selected profile. Any filters that are unchecked will not be run within the profile.

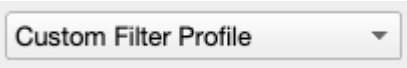
Dock Toolbar

The Filter Profile Dock toolbar contains elements for configuring, adjusting, and applying the filter profiles within Qimera. Numerous items within this toolbar are seamlessly interconnected with their respective counterparts in the Qimera Filter Operation Toolbar which is found in Qimera's Main Toolbar.



Manage Filter Profiles

This button will show the Qimera Manage Filter Profiles Dialog which will be configured with the currently selected filter profile.



Current Filter Profile Combo Box

This combo box showcases the presently active filter profile. All filtering operations will be executed based on the currently selected filter. This list contains both custom and predefined filters.

 Add New Filter

This button facilitates the addition of a new filter to the existing filter profile. A comprehensive list of all available filters will be presented, accompanied by tooltips that can be activated through a brief mouseover. These tooltips provide concise explanations of each filter along with their respective properties.



Run Filter Profile Inside Selection

This button executes the active filter profile on the chosen files for soundings falling within the current spatial selection.



Run Filter Profile Everywhere

This button executes the active filter profile on the chosen files for all soundings regardless of any selection.



Filter By System

This button presents a list of all systems that can be filtered. Within this list, you can selectively activate or deactivate the filtering for individual systems.



Undo

This button enables you to revert any alterations made to the presently active filter profile. Note that once the profile is changed, or if Qimera is closed, the profile will be automatically saved based on its current state and the undo stack will be cleared.



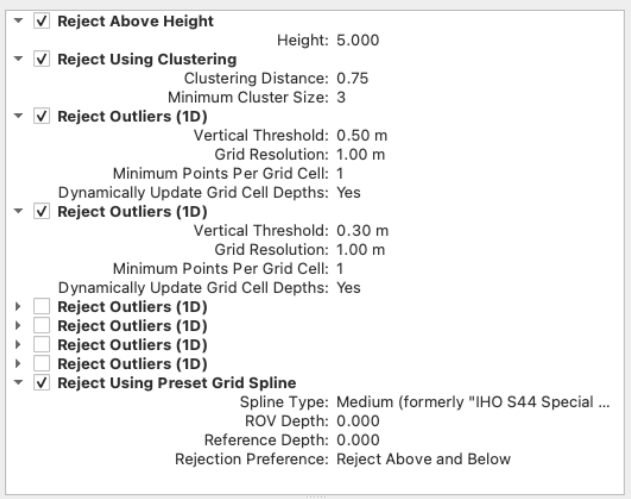
Redo

This button enables you to revert any alterations made to the presently active filter profile. Note that once the profile is changed, or if Qimera is closed, the profile will be automatically saved based on its current state and the undo stack will be cleared.

Show Info Panel

This button will show and hide the Filter Information Panel.

Filter Profile View



The Filter Profile View provides a comprehensive list of the current filters within the active filter profile. It offers the capability to both configure and manage these filters. You can toggle filters on and off using checkboxes, fine-tune their settings by modifying relevant fields, and reposition them within the list to alter their order.

Item Context Menu

Left mouse clicking will present a context menu allowing options that can be performed on the filters within the list and are as follows;

Delete

This will delete the currently selected filter from the active filter profile.

Duplicate

This will duplicate the currently selected filter including all of its current settings.

Move Up

This will move the currently selected filter up one level in the list. This action can also be performed using a drag and drop mouse action.

Move Down

This will move the currently selected filter down one level in the list. This action can also be performed using a drag and drop mouse action.

Expand All

This will expand all the fields within the the currently selected filter profile.

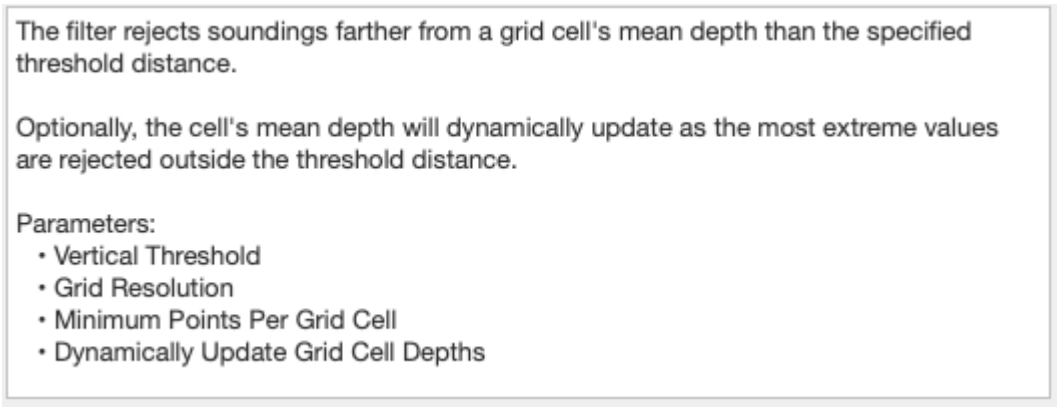
Collapse All

This will collapse all the fields within the currently selected filter profile.

Show/Hide Info Panel

This will show/hide the filter information panel at the bottom of the dock.

Filter Information Panel

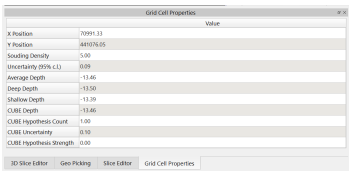


This filter information panel shows information related to the currently selected filter in the active filter profile. This panel can be hidden using the button in the toolbar or by using the context menu item.

Return to: Qimera Interface

Return to: *Dockable Windows*

Qimera Grid Cell Properties Dock



- How to Start
- What it Does
- General Description

How to Start

1. Select the Grid Cell Properties Dock tab - initially located in the Project Layers tab group.
2. If hidden - Select the Grid Cell Properties Dock tab. This will be saved for the current workspace.
3. If hidden - Select Window Menu → Grid Cell Properties Dock.

What it Does

The Grid Cell Properties Dock shows the attribute values for a cell of a dynamic surface that the cursor is hovering over.

General Description

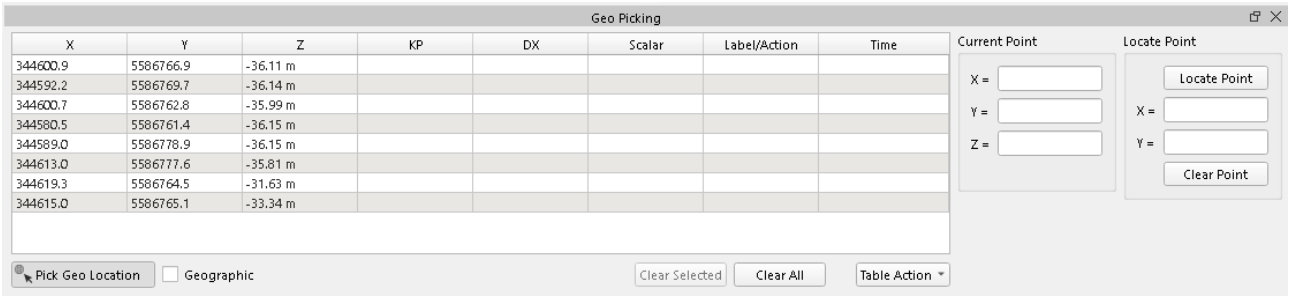
After selecting a dynamic surface from the layers window, Qimera will utilize this dock for viewing Cell information. The Cell Information will not just show cell information for the selected Dynamic Surface from the the layers window, but rather from any dynamic surface that the cursor is hovering over. Qimera will use the x,y position of the cursor and match that up with a Cell from the dynamic surface that the cursor is hovering over.
The Grid Cell Properties Dock will display X, Y position of the cursor, the Sounding Density, the Uncertainty, and the Average, Deep and Shallow Depth values. If CUBE is included with the Dynamic Surface, it will also display the CUBE depth value, the number of hypothesis, the Hypothesis Uncertainty, and the Hypothesis Strength values.

If Coverage and date time is included with the Dynamic Surface, it will also display the Coverage and Date Time.

Return to: *Qimera Interface*

Return to: *Dockable Windows*

Qimera Geo Pick Dock



- Geo Pick Dock
  - Table Controls
    - Geographic
    - Clear Selected
    - Clear All
    - Table Action Menu
      - Create Points Object
      - Append to Existing Point Object
      - Create Line Object
      - Append to Existing Line Object
      - Export Points
  - Point Controls
    - Current Point
    - Locate Point

Geo Pick Dock

The Geo Pick Dock will be populated with geo-locations whenever you are performing a geo-pick in the Qimera tools while the cursor is in *Geo Pick* mode. Look for the cursor mode button with the listed icon. Clicking the left mouse button with the cursor in the *4D Scene* while in *Geo Pick* mode will place a red dot at the location of the pick and fill in an XYZ coordinate entry in the table. When you geo-pick in the scene, the Z value will be derived from the grid you pick from. If you geo-pick in any of the other tools, the Z value will come from the sounding that you picked, or in the case of the Water Column Dock, the sounding that is computed. If your source data has KP (kilometre point) information or an

active route, the KP and DX (across track) information will be populated for each pick. A custom label can be added to each point by modifying the 'Label/Action' table entry.

 Qimera 4D View Toolbar

 Geo Pick Dock

 Qimera Swath Editor Dock

 Qimera Water Column Dock

 Qimera Slice Editor Dock

 Qimera 3D Editor

Table Controls

Geographic

This option allows you to view the table data in geographic coordinates. All exports and usage will be geographic if this option is used.

Clear Selected

This clears the selected entries from the table.

Clear All

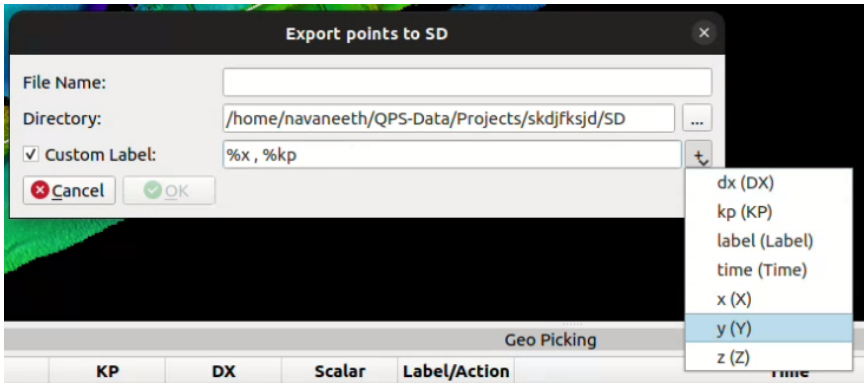
This clears all entries from the table.

Table Action Menu

Create Points Object

This will create an SD Point object from the data in the pick table. Starting with Qimera v2.7.4 users can specify the string-format for labelling each points. The Create Points Object Dialog provides a user-interface where users can specify the filename for the SD file, the export-directory, and use a drop-down-menu to build a `%-formatted string` for the label on each point. Each point can be labelled with the columns in the Geo-Pick Dock (DX, KP, Label, Time, X,Y,Z). The `%-formatted string` can be further customised with input text in the text-edit box for example `Timestmap = %time | (%x,%y,%z)`.

The `%-formatted-string` will be remembered between sessions and can also be used when exporting points to ASCII.



Append to Existing Point Object

This will append the current data to a selected SD Point Object in the Qimera Project Layers Dock.

Create Line Object

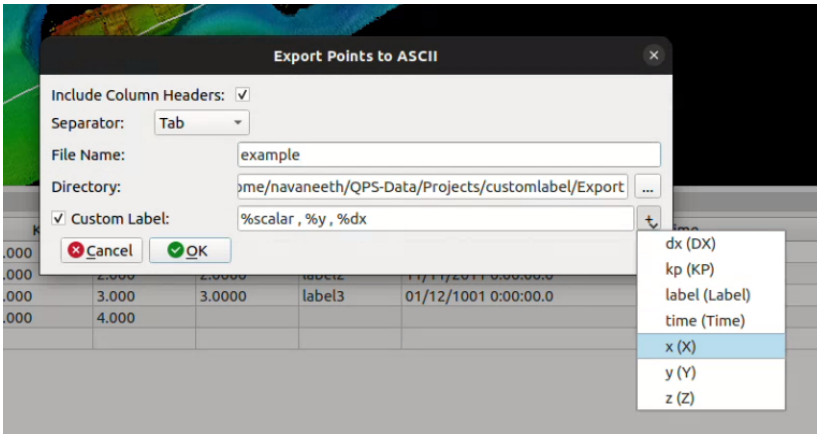
This will create an SD Line object from the data in the pick table.

Append to Existing Line Object

This will append the current data to a selected SD Line Object in the Qimera Project Layers Dock.

Export Points

This will allow you to export the table data to an ASCII file. If *Geographic* is checked, the data will be in geographic coordinates rather than projected. Starting with Qimera v2.7.4 users can specify the string-format for labelling each points. The Create Points Object Dialog provides a user-interface where users can specify the filename for the SD file, the export-directory, and use a drop-down-menu to build a `%-formatted-string` for the label on each point. Each point can be labelled with the columns in the Geo-Pick Dock (DX, KP, Label, Time, X,Y,Z). The `%-formatted-string` can be further customised with input text in the text-edit box for example `Timestmap = %time | (%x,%y,%z)`. The `%-formatted-string` will be remembered between sessions and can also be used when exporting points to SD.



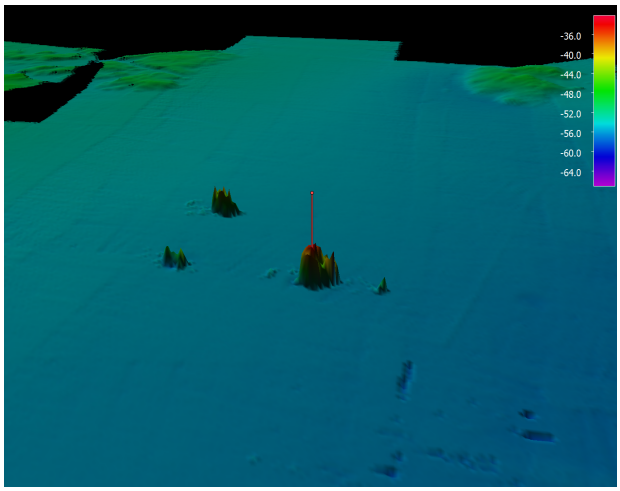
Point Controls

Current Point

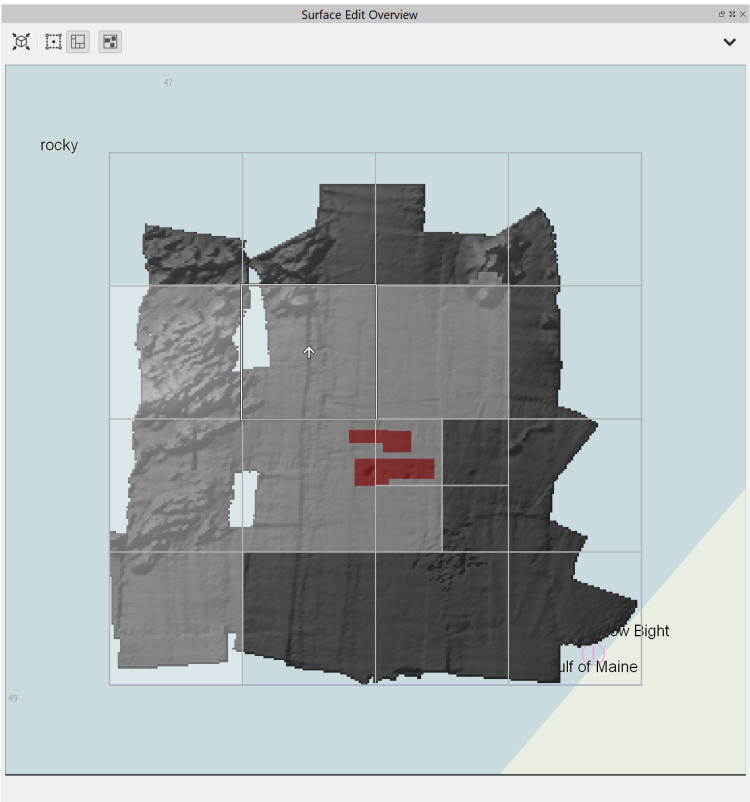
This will show the XYZ position of the last selected point or a selected row in the table.

Locate Point

This will show the XYZ of a selected row in the table. You can edit the XY values and use the *Locate Point* button to move to that location in the scene. When you do, a red "pin" will appear at the location of the pick as shown below. Use the *Clear Point* button to clear the values from the edit fields.



Qimera Grid Edit Overview Dock



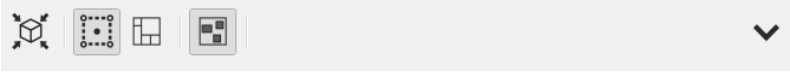
- Grid Edit Overview
  - Grid Edit Overview Toolbar
    - Zoom to Grid
    - Selection Mode
    - Partition Mode
    - Show/Hide Visited/Edited Layer
  - Grid Edit Overview Menu
    - Select Colormap
    - Show Track Lines
    - Show Lines
    - Show ENC
    - Show Visited/Edited
    - Clear Visited/Edited
    - Select Mode

- Export Screen Capture
- Using Grid Partitions

Grid Edit Overview

This widget displays a top down view of the Dynamic Grid currently being edited. This widget is active whenever you are using the 3D Editor or Slice Editor. You can see and modify the current selection in this view as well as the 4D View. The Grid Edit Overview can additionally display an ENC for the area of interest, a *Visited/Edited* layer and a *Partition Grid* for Guided Editing operations. The Partition Grid can only be used when you are in *Fixed Slice, Free Slice,* and *Rectangular* selection mode. See the section on the 4D Scene Toolbar for more information on selection modes. You can opt out of using the Grid Edit Overview on the *General* Tab of the Preferences Dialog. Of note in the version 2.2 release of Qimera, the Grid Edit Overview has been redesigned to be more responsive and have a significantly lower memory footprint.

Grid Edit Overview Toolbar





Zoom to Grid

This will zoom the overview to display the extents of the Dynamic Grid.



Selection Mode

This mode allows you to change the current selection area directly in the Grid Edit Overview. You can only create a new selection in this widget. You do not have the ability to resize, rotate or drag a selection. Those behaviors must still occur in the main scene.



Partition Mode

This mode will show the partition layer and allow for guided editing. You can only use this layer in combination with the *Fixed Slice, Free Slice* or *Rectangular* selection modes. If you have not created a grid partition, you will be presented with the *Partition Grid Setup* dialog described below. See the section on Using Grid Partitions below for more information on using partitions.



Show/Hide Visited/Edited Layer

This will show/hide the visited/edited layer. Visited areas are a white transparent layer while edited areas are a red transparent layer. Use the *Clear Visited/Edited* option from the menu to clear it. The Slice Editor and the 3D Editor write to this layer.

Grid Edit Overview Menu

Select Colormap

Change the colormap of the Dynamic Grid. This colormap will be used only in the context of the Grid Edit Overview.

Show Track Lines

Show/Hide track lines associated with the Dynamic Grid. Lines can be used for *Linked Editing* as described in the section on the Slice Editor.

Show Lines

Show/Hide miscellaneous lines from the scene. Lines can be used for *Linked Editing* as described in the section on the Slice Editor.

Show ENC

This will show/hide the ENC layer. More information on ENCs can be found here.

Show Visited/Edited

This will show/hide the visited/edited layer. Visited areas are a white transparent layer, while edited areas are a red transparent layer. Use the *Clear Visited/Edited* option from the menu to clear it. The Slice Editor and the 3D Editor write to this layer.

Clear Visited/Edited

This will clear the visited/edited layer.

Select Mode

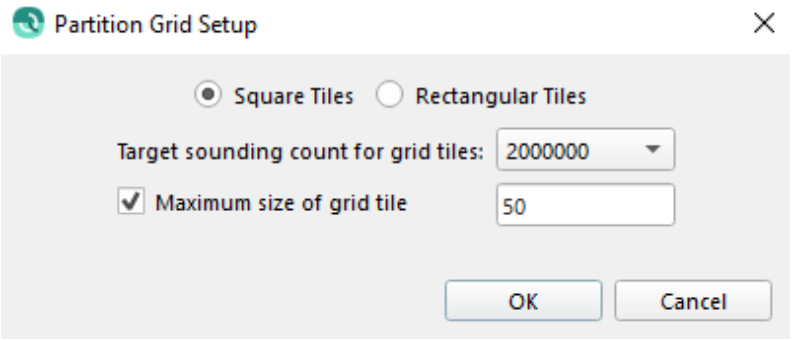
Changes toolbar to Select Mode.

Partition Mode

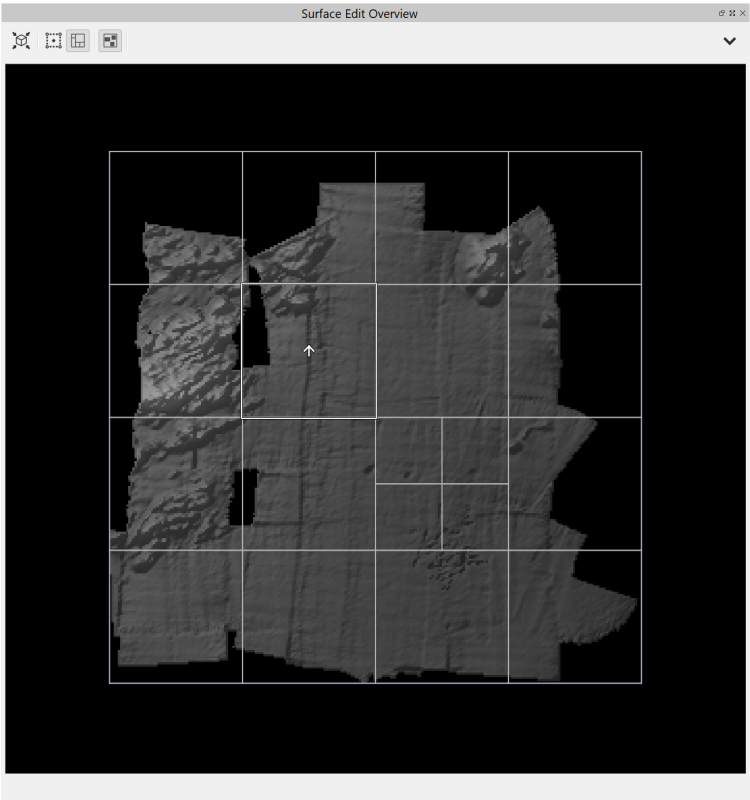
Changes toolbar to Partition Mode.

Generate Partitions

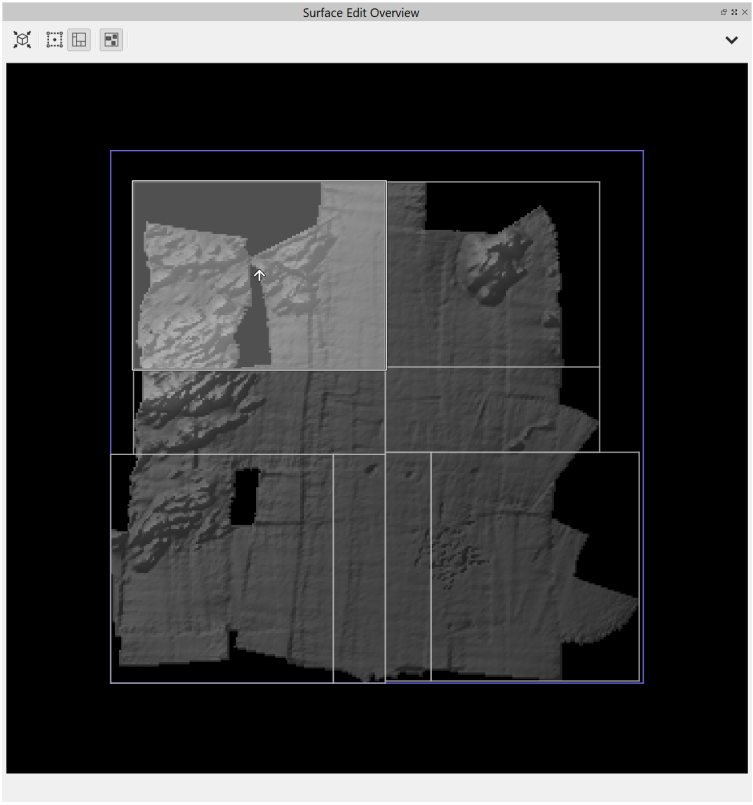
This will launch the *Partition Grid Setup* dialog shown below. Partitions can be either square or rectangular tiles. You must select the tile option, the maximum number of soundings allowed per tile, and optionally, a maximum tile size (square tiles only).



Examples of the two different partitioning types are shown below.



Square, 50k, 200m Limit



Rectangular, 50k Limit

Export Screen Capture

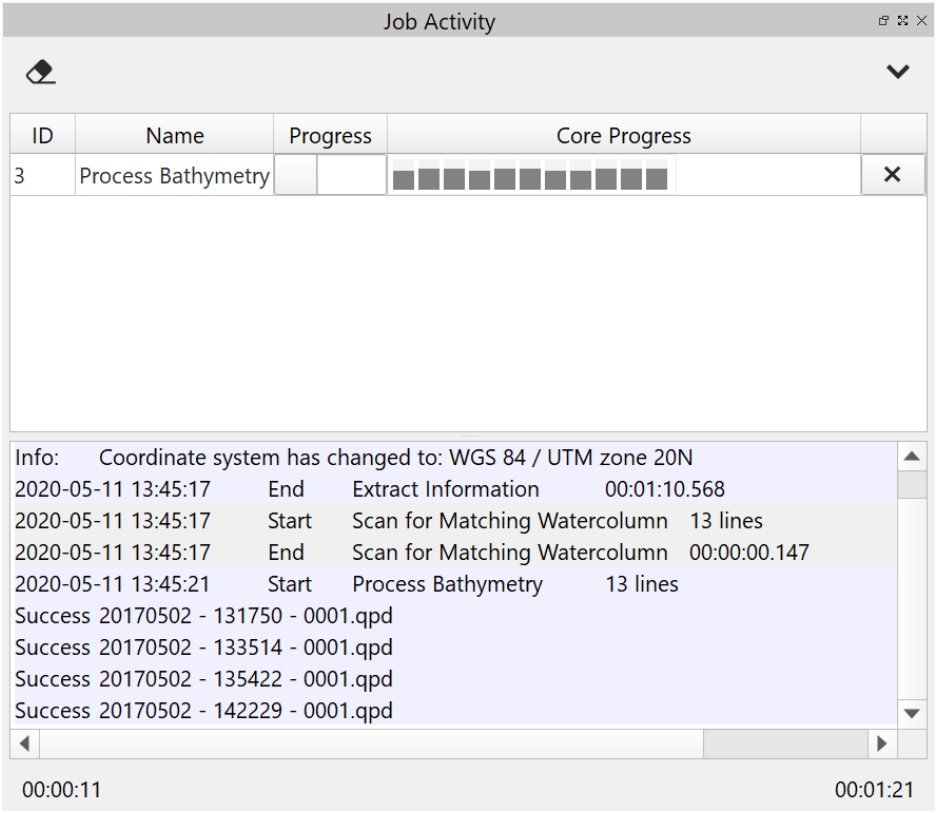
This will export an image of the current state of the Grid Edit Overview.

Using Grid Partitions

Grid partitions can be used to navigation the selection and systematically review and edit the entire grid. To move to a new partition tile, simply click in the desired tile and the selection will move. You can also use the movement shortcut keys (W, S, A, D) with the addition of the **SHIFT** key to move the selection to another tile. Grid partitions can be used with the *Fixed, Free,* and *Rectangular* selection modes.

Remember that you can use grid partitions with either the Slice or 3D Editor. To stop using Grid Partitions, simply choose Select Mode on the toolbar or the associated Select Mode menu option.

Qimera Job Activity Dock



Qimera - Job Activity

Almost every processing job performed by Qimera is performed as background tasks, some of which are multi-core enabled. This allows the user to continue working with their data, such as editing, while they are processing newly added files. The Job Activity window shows a list of all queued jobs. The jobs themselves process linearly and can be cancelled using the Cancel Job button ✕. As the jobs run, the primary progress bar will show the internal progress. The Core Progress will show the multi-core progress for the operation. Many jobs will print success or failure information to the log window. This log is saved to the project log file contained in the project directory *~/LogFiles/job-activity.log*. The clock on the lower left of the dialog indicates run time for the currently running job. The clock on the lower right displays the total run time for all jobs within the Qimera session. This log window is important as any failures or warnings during data importing or processing will be displayed here. If you choose to hide this window, you will still know jobs are running in the background via the icon at the far right of the Qimera Status Bar.

 This button will clear the log window

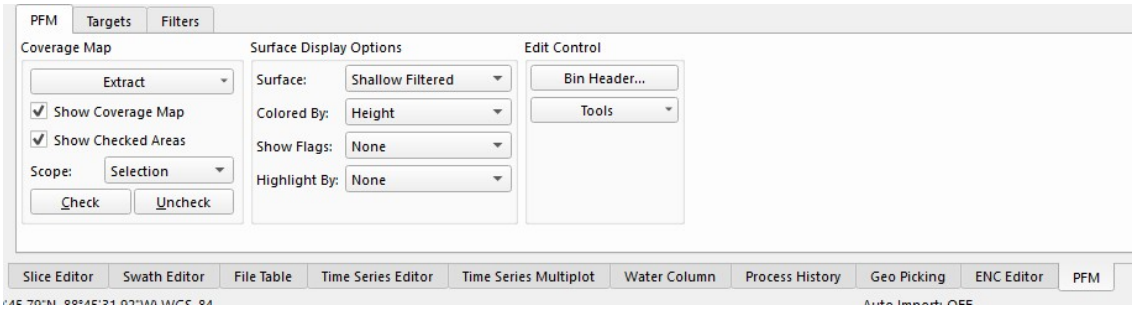
 This button activates the drop down menu

Reset Activity Log

This is the only option of the dropdown menu. It clears the log window.

Return to: Qimera Interface
Return to: *Dockable Windows*

Qimera PFM Dock

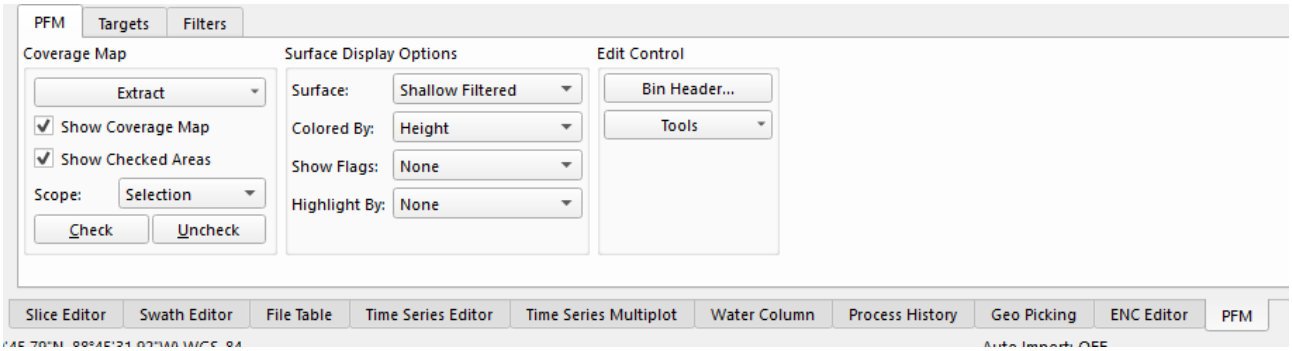


- PFM Dock
  - Coverage Control Panel
    - Coverage Map
    - Surface Display Options
      - Surface Pull-Down Menu
      - Highlight Pull-Down Menu
      - Flags Pull-Down Menu
    - Edit Control
  - Targets Panel
  - Filters Panel
    - Scope
    - Cleaning Filters
    - Plotted Sounding Selection Filters
    - Feature Sounding Selection Filters
      - Feature Filter Algorithm
      - Shoalest Algorithm

PFM Dock

The PFM Dock provides specific tools for working with a PFM object, this includes the coverage, display options as well as editing tools. When a PFM data object is selected in the project layers panel the dock will be activated.

Coverage Control Panel



Coverage Map

A surface object is created for visualization by selecting a region on the coverage map by either extracting the entire area or by using a selection tool to select the desired region. After selecting the area you can use the Extract drop down and select Extract Selected Region. To load the whole surface from the PFM use the Extract drop down and select Extract Entire Area.

The Check button allows the users to set areas that have already been processed and approved. This can then be shown on the visualized surface and also in the overview on the Coverage Control panel. The checked areas will be displayed as grey on the Coverage Map when the Show Checked Areas toggle is enabled. The Check button sets all bins in an area as checked and the Uncheck button undoes this process. The area that is set or reset depends upon the value of the Scope drop-down list. When the scope is Loaded Area, the extracted area is modified; when the scope is Selection, only the area chosen using the Select Mode is modified; when the scope is Entire PFM File, the whole file is modified. Setting or resetting checked areas is recorded in the Audit file.

Surface Display Options

Surface Pull-Down Menu

In addition, the PFM Coverage Control panel has specific tools for working with the surface. The first option is the Surface pull-down menu, which provides a choice between displaying the unfiltered shallow, average or deep surfaces, along with the filtered shallow, average or deep surfaces. The unfiltered surface shows a surface from all available soundings in the PFM file while the filtered surface does not include soundings marked as deleted. The Color pull-down menu directly below the Surface selection menu provides a choice of the attribute used to color the surface:

- Standard deviation;
- Height;
- Sounding density;

- Deleted flag;
- Modified flag;
- Checked flag;
- Suspect flag;
- Plotted flag;
- Feature flag;
- File number;
- Line number; and,
- Custom Flags or Attributes (if they exist).

Highlight Pull-Down Menu

The Highlight menu allows areas of the PFM that have a certain flag set to be highlighted in the main display (highlighted areas will appear lighter than the surrounding areas). Select one of the available flags from the Highlight menu to enable this option. Using highlighting, it is possible to visualize more than one variable at a time (e.g. the surface could be colored by depth and the areas that are checked could be highlighted).

Flags Pull-Down Menu

There is also an option to directly display what bins contain either selected, plotted, or feature soundings. This can be controlled using the Flags pull down. When either of the flags is selected, markers will appear on the surface indicating which bins contain soundings with the given flag (see Figure 139). This option is independent from the set color of the surface. The setting of the flags will be from either the functions on the Filters Panel or from manual edits in the 3D Editor.

Edit Control

The remaining controls on the Coverage Control panel are related to the analysis and editing of the underlying sounding data. Some of these options require a selection on the surface that can be accomplished by entering the Select mode on the top right of the application and clicking and dragging on the surface. The available options in the Edit Control box are outlined as follows:

Bin Header -- Displays summary information about the PFM file, as shown in Figure 3.

The Tools menu button has the following options:

Launch Area Editor – runs the NAVO editor tool on the selected area. This option only works under Linux and the PFM_EDIT environment variable must point to the editor path.

Create Surface Object - Create a surface Fledermaus SD object and add it to the scene.

Create Survey Area Object - This will open a file browser to select the name for the survey area SD object. It will then be automatically added to the scene. A survey area object is a

Fledermaus Line SD object of the outline of the survey area. Qimera will also report the area in square meters.

Create Sounding Density Surface - Create a Fledermaus scalar SD object that shows the density of all soundings (rejected or accepted) that are contained in each cell of the PFM Object.

Apply PFM Edits – Allows you to import PFM edits to apply to the current surface.

Export PFM Edits – Allows you to export PFM edits that have been made to the current surface.

Export Soundings - This operation exports soundings from the selected surface to an ASCII file.

Export Shoal Soundings - This operation exports shoal soundings from the selected surface to an ASCII file.

Export Survey Lines - this option writes a list of all survey lines that intersect the indicated area to an ASCII file. The area to check can either be Selection to output lines just in the selection box, Loaded Area to output lines in the extracted area, or Entire PFM File to output all lines in the PFM file.

Export Survey Files - this option writes a list of all survey data files that intersect the indicated area to an ASCII file. The area can either be set to the selection box by choosing the Selection toggle, the extracted area by selecting the Loaded Area toggle, or the entire PFM by selecting the Entire PFM File toggle.

Export to Google Earth – Exports surface to a Google Earth comparable KML or KMZ file.

Bin Info - displays a dialog box with a number of fields that contain information in each bin. Once the dialog box is shown, move the cursor over the surface in the Explore mode and the fields will display the data for the bin closest to the cursor position.

Cube - contains a submenu with a number of options for working the Cube PFMs. See CUBE Tools for more information.

Targets Panel



A target, sometimes called a contact, is a special point of interest with a number of attached attributes and possibly an attached snippet image file. Targets are stored in a separate XML file using the standard NAVO target format and the file name of the XML file

is stored within the PFM file. When a PFM file is loaded containing a valid targets file, the targets will automatically be displayed and can be editing using the Targets panel shown in Figure 2. Note that targets have only a latitude and longitude position and no depth value is stored (targets are usually displayed as lying on a surface if one is available at the location of the target).

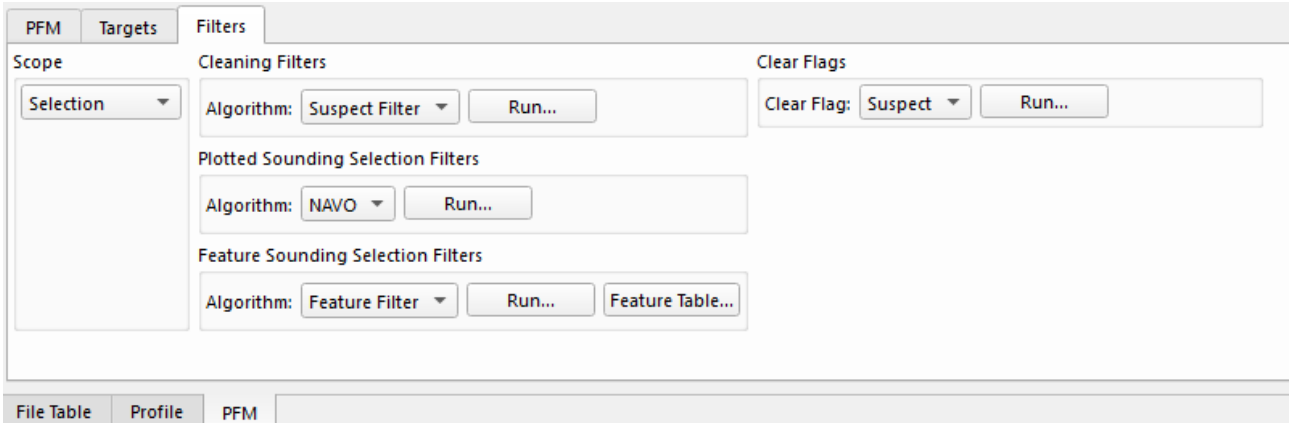
Targets are displayed as spheres in a scene and can be hidden or shown using the Show Targets toggle. The current target file is displayed in the text field at the top of the panel. If a target file exists but is not associated with the current PFM, click the Set Target File button and select the XML file using the standard file dialog box. To create a new targets file, click the Create Target File button and select a new file to create.

If multiple targets exist in the scene the targets will be displayed as yellow. To select a target, enter Select mode and then click near a target. The target will change color to white, indicating that the target is selected and information about the target will be displayed in the Geographic and Projection Position fields. As well, information from the XML file will be displayed in the text area to the right of the fields. To move the target to a new position, click the Edit Positioning button and enter the geographic position of the target in the dialog that is displayed.

To add a target, click the Add Target button and enter the geographic position of the target in the dialog that is displayed. Note that if a point is picked on the surface of a DTM while in Select mode (a white cross will appear on the surface), then the position of the last picked point will be displayed in the Enter Target Position dialog. To delete a target, click on the target while in Select mode and click the Delete Target button.

Some targets have an associated snippet image. If a snippet exists for the target, click the View Snippet button and the image will be loaded in displayed in a separate dialog. To associate a snippet image with a target, select the target, click the Add/Update Snippet button, and select a valid image file.

Filters Panel



The Filters Panel allows filters to be run on the current PFM file.

Scope

All operations in this panel depend on the setting of the Scope pull down menu. The different options for the scope are as follows:

- Selection – area selected by dragging with the mouse in Select mode;
- Loaded Area (default) – currently extracted area; or,
- Entire PFM File – all soundings in the PFM file.

Three types of operations exist in the Filters panel: Select, Clear, and Export. Each operation can be run on the Suspect, Plotted, or Feature flags and the buttons for each flag are located to the right of the flag label. The Select button will run a filter on all soundings in the selection scope to automatically set flags of a certain type. The Clear button will remove the given flag from all soundings in the given selection scope. To save all soundings in the selection scope that have a certain flag, click the Export button.

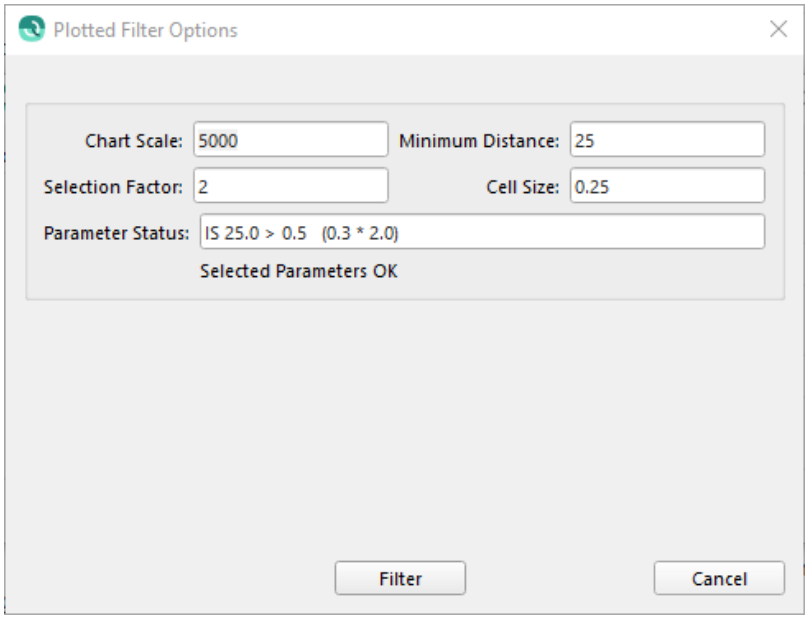
Cleaning Filters

The suspect soundings selection filter assists the user in identifying soundings that may be incorrect. Clicking the Select button beside the Suspect Soundings label will display the Suspect Filter Options dialog. The filter will select all soundings with depths that are more than a certain threshold away from the average depth in a bin. Enter a threshold in the Depth Threshold Difference text field and click the Filter button. Bins that contain suspect soundings can be shown by setting the Color popup menu to Suspect or the Flags menu to Suspect on the Surface Control panel.

Plotted Sounding Selection Filters

The NAVO sounding selection algorithm will select and mark soundings in a PFM with the plotted flag when it selection criterion is set.

Clicking the Run... button opens another dialog that lets you set parameters for the selection process as shown below. Once you have selected desired parameters the filter will run and soundings that pass the selection criterion will have their plotted flag set.



Normally the chart scale is specified to determine the default distance between selected soundings that are entered in the *Chart Scale* text field. For example a value of 20000 implies a chart scale of 1:20000. This gives the default minimum distance between soundings and is based on assuming 5mm text for the resulting chart. You can directly enter the minimum distance, overriding the suggested default for the given chart scale, by typing a new value in the *Minimum Distance* text field. The *Selection Factor* that defaults to two is used in algorithm and generally should be left alone. A smaller number improves the quality of the selection but increases running time (the default has been found to be a good balance). The Cell Size is read from the Dynamic Surface and is fixed. The *Parameter Status* field shows the criterion for running the algorithm. You cannot select soundings if you select an unreasonable chart scale for the cell size of the dynamic surface. The dialog box will display a message just below the parameter status to indicate if the selected parameters are acceptable or not. If they are not you must increase the chart scale (or minimum distance).

Feature Sounding Selection Filters

A dropdown menu in this section currently provides two filter algorithms which can be used to select and mark soundings by setting their feature flag. These are the Feature Filter and the Shoalest algorithm described below. The Feature Table... button will bring up a spreadsheet to of soundings with the filter flag set in the selection scope.

Feature Filter Algorithm

When selected and you click Run..., another dialog will appear to set the selection interval, the z-range minimum, and the z-range maximum. Specify the minimum distance apart of shoals in the horizontal plane (*Selection Interval*), and specify the depth range for

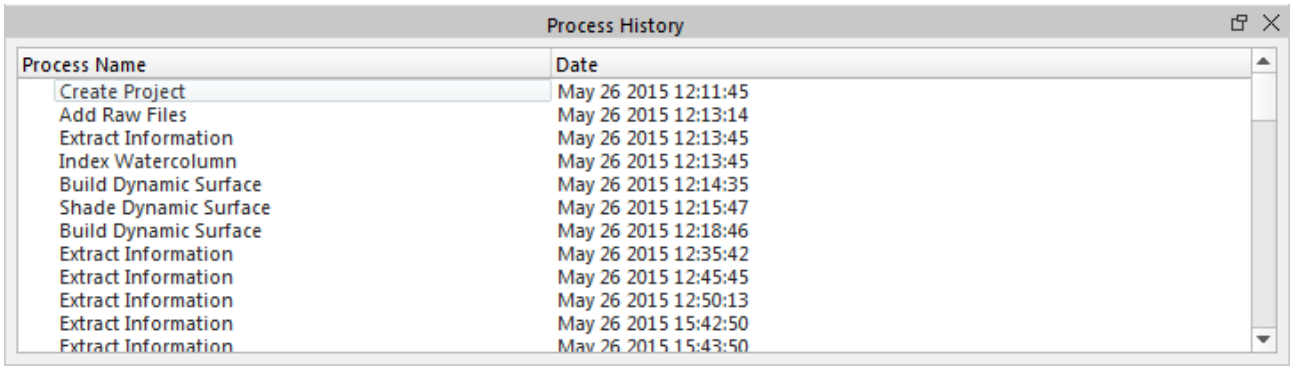
consideration in the *Z Range Minimum* and *Z Range Maximum* text fields. Click the *Filter* button to begin the algorithm.

The actual algorithm is a two-step process. In the first step, it searches through all the data based on the defined cell size and finds the shallowest sounding that is not flagged as deleted and is within the selected depth range. In addition, the entry of the minimum and maximum values allows the user to restrict the process to only those soundings within the selected depth range. The second step prunes the list of selected shoal soundings based on the range interval entered. In this step, the selected soundings are first sorted in descending order. The shallowest is selected and then any sounding that lies within the entered range is deleted. The next shallowest sounding is selected and any soundings that lie within the entered range to it are deleted and so on.

Shoalest Algorithm

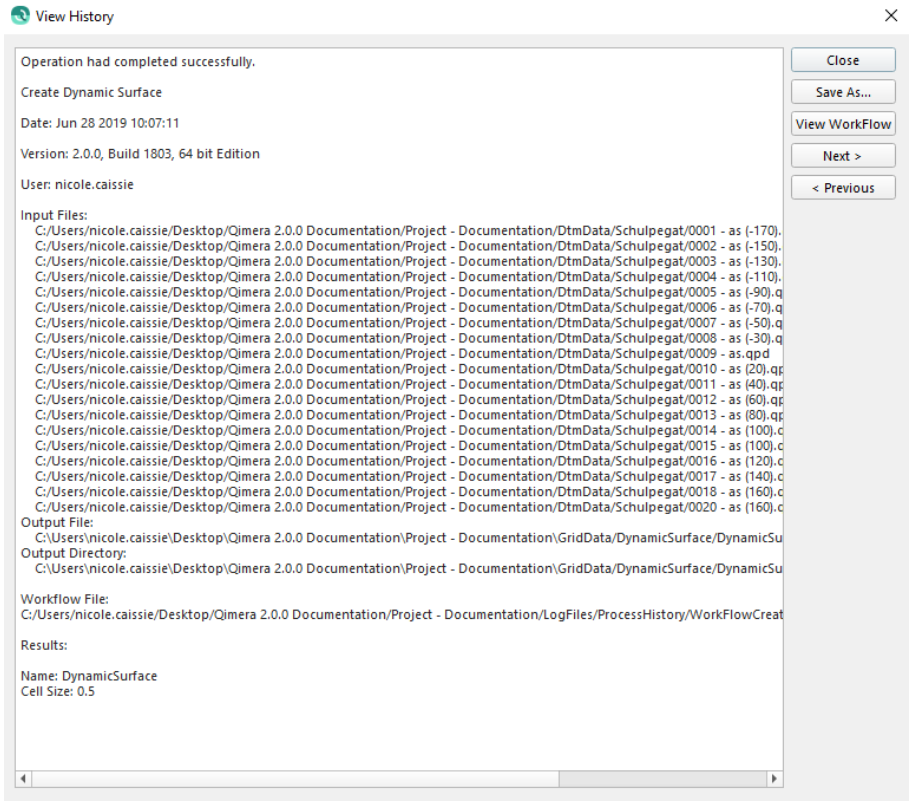
When selected and you click Run... this algorithm will mark the shoalest sounding in each cell of the dynamic surface.

Qimera Process History Dock



Qimera - Process History

The Process History window shows a list of every processing job run on your project. If you **Double-Click** an entry, it will bring up a detail window based on the job type. For example, clicking on the *Create Dynamic Grid* entry displays the following detail dialog.

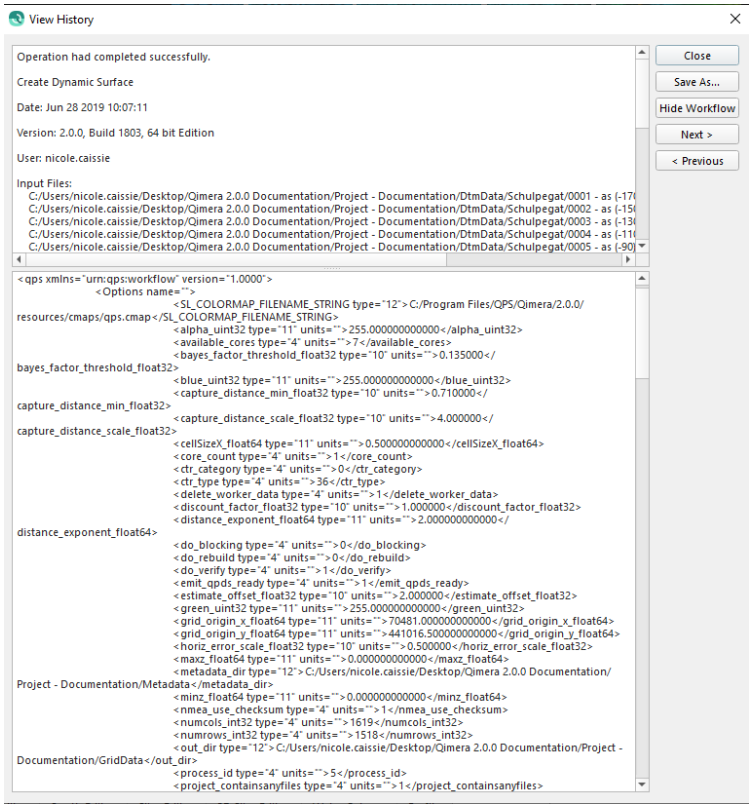


Save As

This allows you to save the workflow data to an XML file.

View Workflow

This shows the underlying detailed workflow information that was part of the job.



Next

This button will take you to the history detail of the next job in the list.

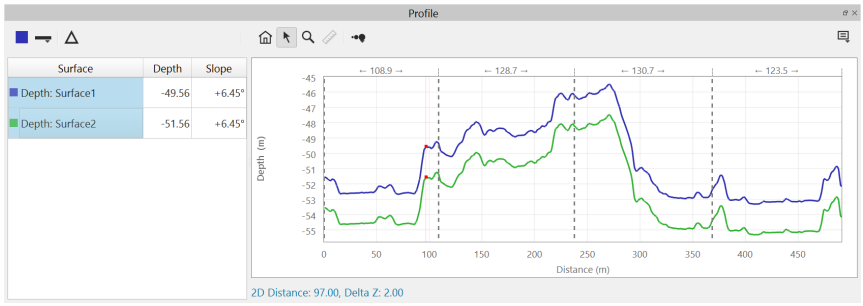
Previous

This button will take you to the history detail of the previous job in the list.

Return to: Qimera Interface

Return to: *Dockable Windows*

Qimera Profile Dock



- Profile Dock
  - Profile Dock Toolbar
  - Line Pattern Button
  - Delta Button
  - Zoom Out Button
  - Explore Mode
  - Zoom Mode
  - Measure Mode
  - Point Size
  - Show Color Map
  - Profile and Cross Profile Vertical Exaggeration
  - Profile Menu
    - Show Statistics
- Profile Dock
  - Save Plot to Image
  - Show Gridlines
  - Lock Depth Scale
  - Clear Differences
  - Use Exaggerate Scale Difference

Profile Dock

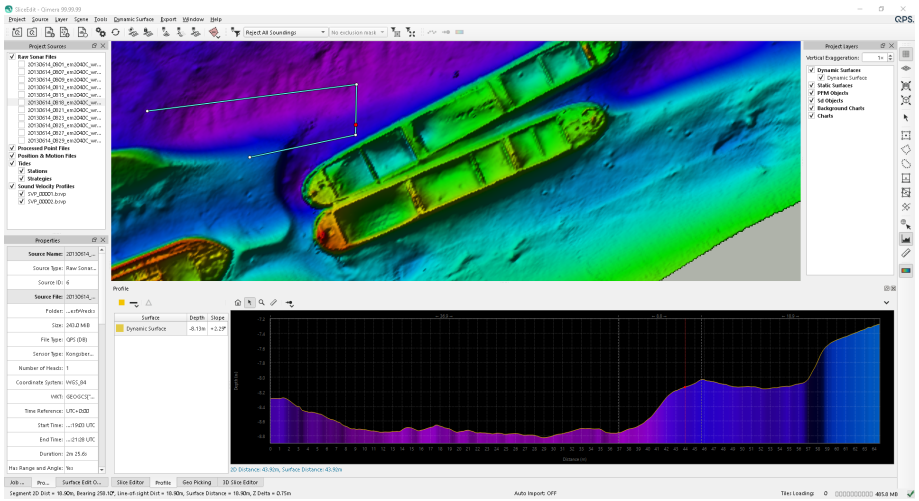
The Profile Dock allows you to view a profile line over one to many grids in order to get detailed or comparative information along the line. To entire profiling mode, click the  button. Then **left-click** points in the scene to define your line segments. End your profile by defining a final point using **right-click**. You can also bring up a profile by

performing a **right-click-drag** as you would in Fledermaus. This will create a single segment profile from any currently active cursor mode. With the scene in plan view mode (2D), clicks can be registered off-grid, while when the scene is in turntable view mode (3D), only clicks on a grid are considered valid. If you start your profile off a grid, it will start once you are over a grid and will end if you extend the profile off a grid. In order to create more than one segment, you must be in Profiling Mode.

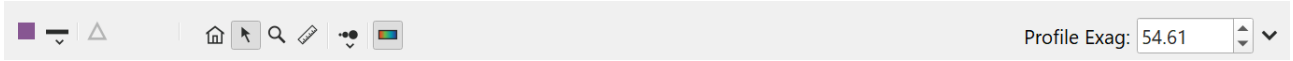
Qimera will generate a unique color-coded profile for every visible Dynamic or Static grid in the current project. If you don't want to see a profile plot, simply uncheck the grid in the Layers View. In the example above, the same grid was gridded twice, where one grid had the line data shifted down by 2 meters.

The plot grid displays the locations and *spans* the distance between each point using a vertical dashed line in the plot. The vertical axis is the profile depth and the X-axis is the 2D distance along the profile. As you move your cursor along the profile plot, you will also see several properties about that point displayed below the plot, including the 2D distance along the profile, the delta Z between the two grids (if exactly two grids are present), the 3D distance along the grid currently selected in the table (if any), and the KP value at the cursor position (if the project has an active route). As you move the cursor over the plot, the *Depth* and *Slope* columns of the table will update to show the values for each grid at that point.

In the **4D View**, the profile draws as a draped line on the topmost grid with a vertical curtain that extends up to the minimum depth. White markers are also drawn at each segment endpoint. A single red marker appears along the plot correlating to the location of the cursor in the plot area of the Profile Dock.



Profile Dock Toolbar





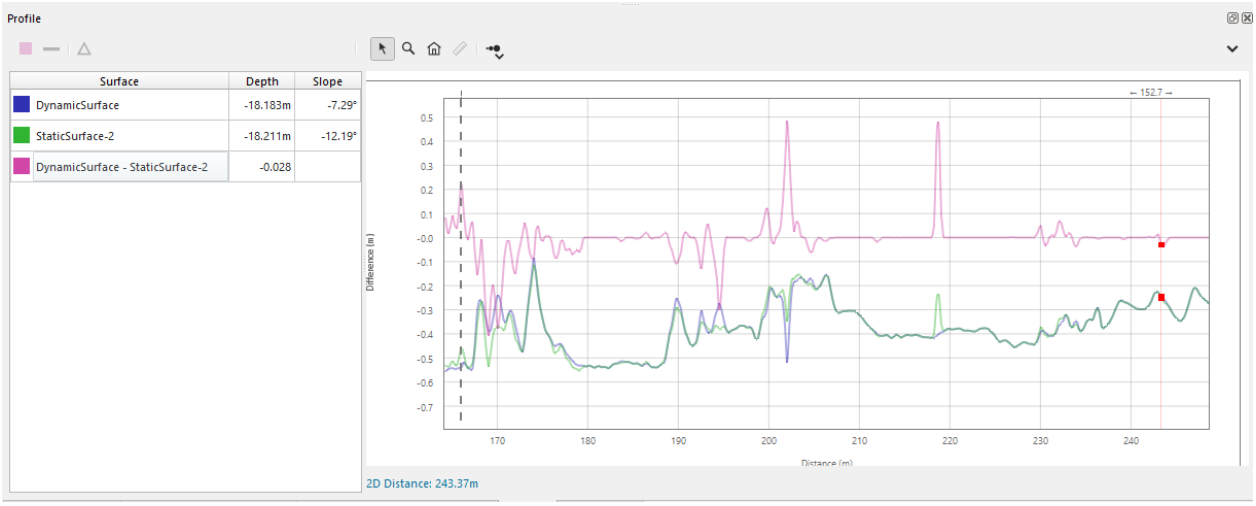
This button will change the color of the currently selected profile plot.

 Line Pattern Button

This button will change the line pattern of the currently selected grid. If you click and hold the button, you will see a drop down list of the choices. If you simply click, it will cycle to the next line pattern. The choices are dots, dashed line, dot-dash line, dot-dot-dash line, and solid line. For more information, please see the section on the Time Series Multiplot.

 Delta Button

This button will compute the difference between 2 selected grids in the table view. Once you select the 2 grids, click on this button to generate a "Difference" plot. When you select the "Difference" entry from the table view, the Y scale will change for the plot showing you the vertical extents of the data. The difference scale can be set relative to the source data by selecting the newly created "Difference" profile and unchecking the 'Use Exaggerated Scale for Differences' profile menu item.



 Zoom Out Button

If you have zoomed into an area of the plot, this button will zoom out to the extents of the currently viewed attributes. All attributes share the same time axis.



Explore Mode

This is the primary exploration mode of the tool. As you move your cursor over the plot, the label in the lower left of the window will update to show the current time and value of the selected attributes. A tracking ball will follow the location in time along the currently selected track in the **4D View**. If you click/drag the plot grid, you can pan around the data. The mouse-wheel will zoom in/out of the plot.



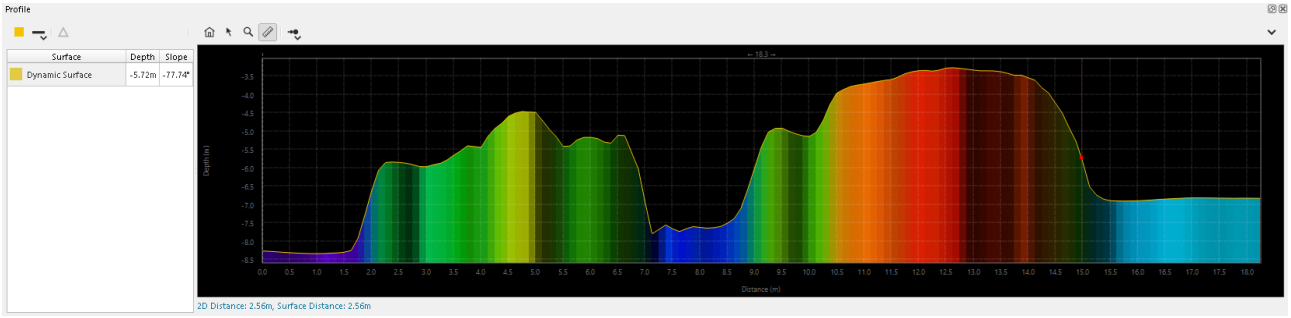
Zoom Mode

When in zoom mode, simply click and drag an area of the plot to zoom into. Click the Home button to return to the full extents of the data. At any time, you can s**hift-click** to drag the plot to a new location. For more information on plotting grid navigation, see the appendix section found here.

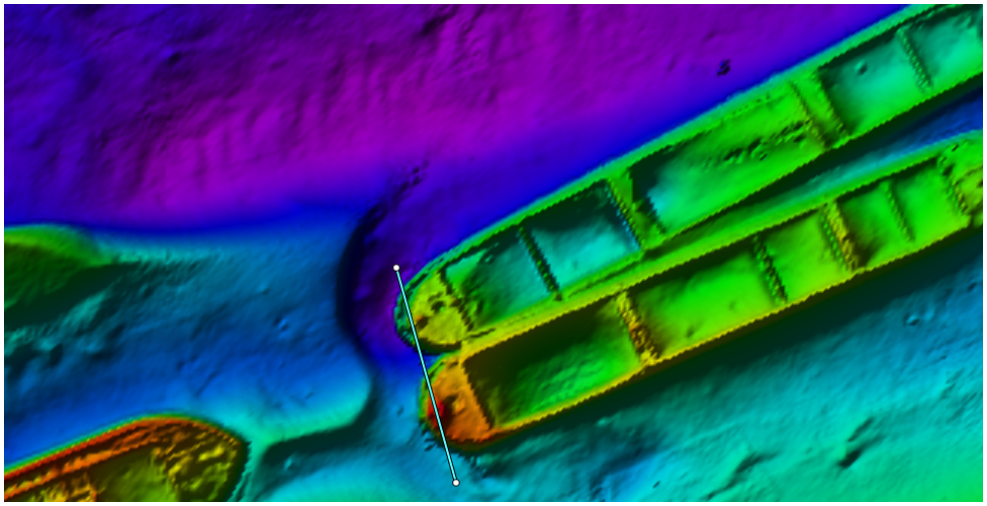


Measure Mode

This mode will allow you to measure along a profile. First, you must select a grid from the table view. Then **left-click** and drag in the plot area to measure between 2 points on the profile. As you drag, you will see corresponding red markers indicating the start and end of your measure in the plot and 4D View. Below the plot you will see specific details about the measurement. These include 2D Distance, grid Distance, Line-of-Sight Distance Line-of-Sight slope, and Delta Z.



Profile Measure in Profile Dock



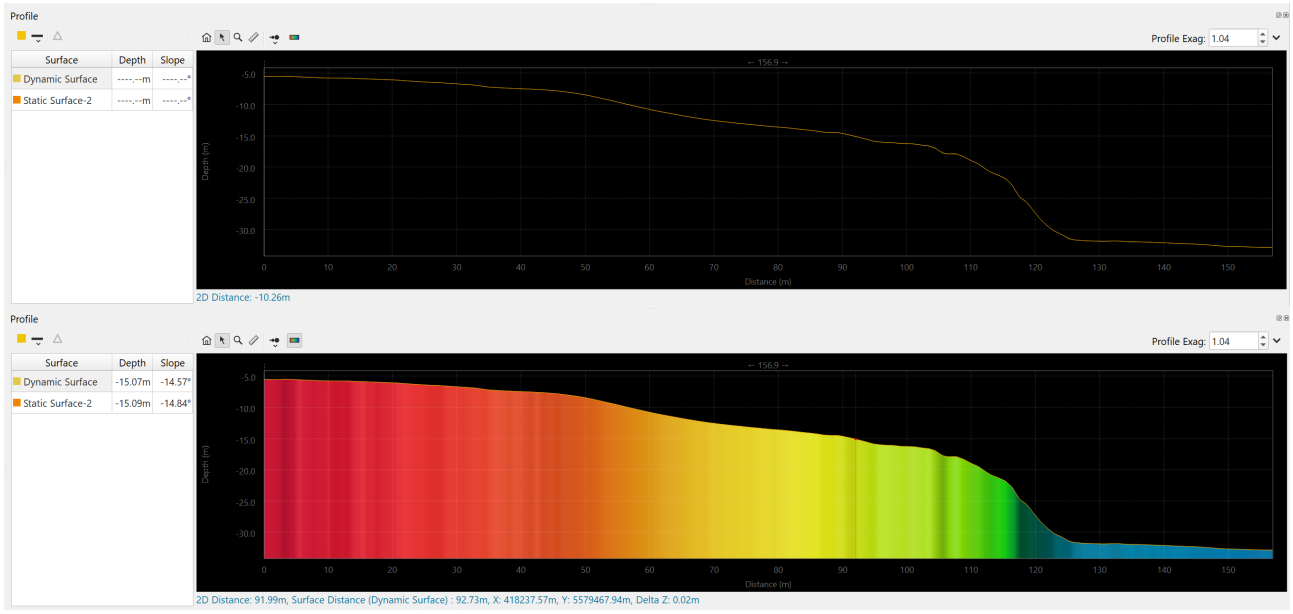
Profile Measure in 4D Scene

 Point Size

This button will allow you to change the size of the plotted points and lines. Sizes range from Small to XX-Large. Clicking on the button will cycle to the next size. Click and hold to get a drop down menu of sizes to choose.

 Show Color Map

This will turn the color map fill of the currently selected profile on or off.





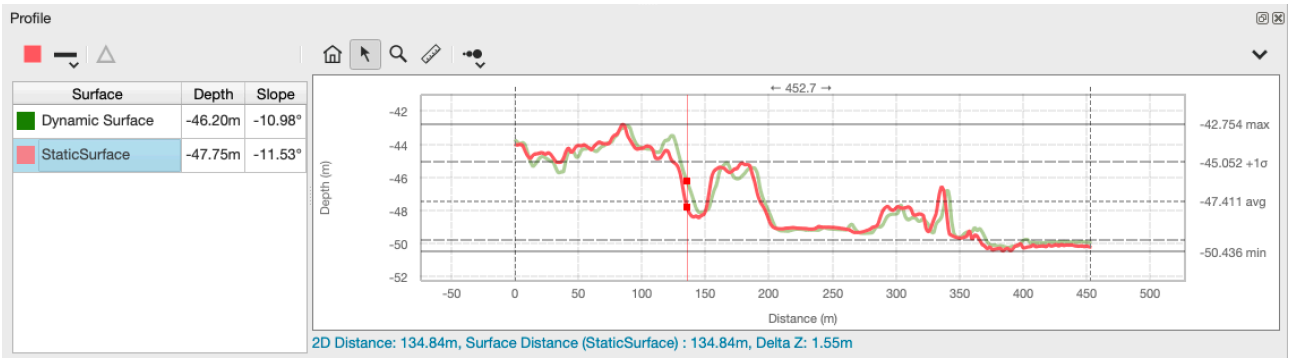
Profile and Cross Profile Vertical Exaggeration

The spin box on the right hand side of the toolbar control the vertical exaggeration scale for the profile graph. Using the Zoom Tool or clicking the Zoom Out Button will automatically adjust the vertical exaggeration scale to fit the selected area or default view accordingly. Vertical exaggeration scale cannot be adjusted while Lock Depth Scale is turned on.


Profile Menu

Show Statistics

This setting turns on the statistics view for the currently selection profile. It will show the minimum and maximum as solid lines, the +/- 1-Sigma as dashed lines and the average as a dotted line. Value labels will appear on the right side of the tool.



Export to ASCII

This will export to an ASCII file with data about the profile. The default folder is the *~myproject/Export* folder. The ASCII file will contain Sample Point, 2D Distance, Easting, Northing, Depth and grid Distance for each grid in the Profile Dock. If the project has a route, the KP value of each point will be included as well.

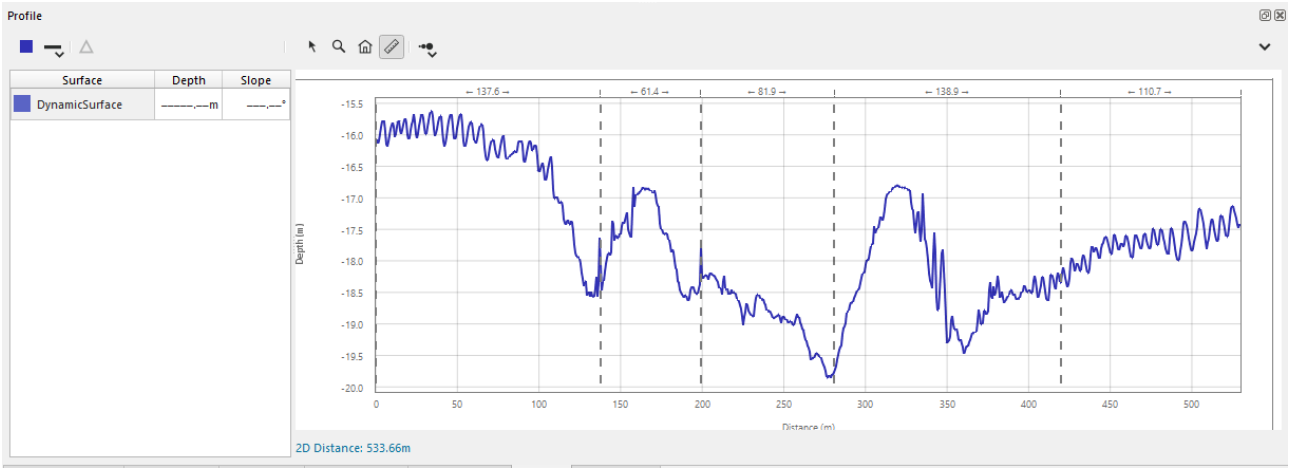
A sample export is shown below.

```
#
#       File       : ascii_export.txt
#       Parameter 1: Sample Point
#       Parameter 2: 2D Distance
#       Parameter 3: Easting
#       Parameter 4: Northing
#       Parameter 5: Depth (DynamicSurface)
#       Parameter 6: 3D Distance (DynamicSurface)
#
#           1           2           3           4           5           6
            1,       0.00,   71010.71,  441377.31,     -15.809,      0.000
            2,       0.25,   71010.50,  441377.45,     -15.922,      0.250
            3,       0.50,   71010.29,  441377.59,     -16.024,      0.500
            4,       0.75,   71010.09,  441377.73,     -16.098,      0.751
            5,       1.00,   71009.88,  441377.86,     -16.131,      1.000
            6,       1.25,   71009.67,  441378.00,     -16.145,      1.250
            7,       1.50,   71009.46,  441378.14,     -16.144,      1.500
            8,       1.75,   71009.25,  441378.28,     -16.133,      1.750
            9,       2.00,   71009.04,  441378.42,     -16.088,      2.000
           10,       2.25,   71008.83,  441378.55,     -16.041,      2.250
           11,       2.50,   71008.63,  441378.69,     -16.000,      2.500
           12,       2.75,   71008.42,  441378.83,     -15.962,      2.750
           13,       3.00,   71008.21,  441378.97,     -15.919,      3.000
           14,       3.25,   71008.00,  441379.11,     -15.878,      3.250
           15,       3.50,   71007.79,  441379.24,     -15.842,      3.500
           16,       3.75,   71007.58,  441379.38,     -15.808,      3.750
           17,       4.00,   71007.37,  441379.52,     -15.775,      4.000
           18,       4.25,   71007.17,  441379.66,     -15.757,      4.250
           19,       4.50,   71006.96,  441379.79,     -15.763,      4.500
           20,       4.75,   71006.75,  441379.93,     -15.772,      4.750
           21,       5.00,   71006.54,  441380.07,     -15.775,      5.000
           22,       5.25,   71006.33,  441380.21,     -15.790,      5.250
           23,       5.50,   71006.12,  441380.35,     -15.839,      5.500
           24,       5.75,   71005.92,  441380.48,     -15.916,      5.750
           25,       6.00,   71005.71,  441380.62,     -16.010,      6.000
           26,       6.25,   71005.50,  441380.76,     -16.096,      6.250
           27,       6.50,   71005.29,  441380.90,     -16.157,      6.500
           28,       6.75,   71005.08,  441381.04,     -16.175,      6.750
           29,       7.00,   71004.87,  441381.17,     -16.184,      7.000
           30,       7.25,   71004.66,  441381.31,     -16.177,      7.251
           31,       7.50,   71004.46,  441381.45,     -16.145,      7.500
```

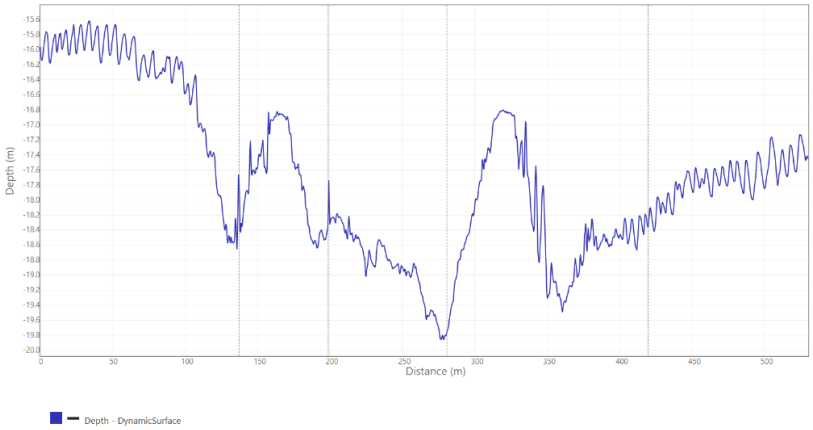
Profile Dock

Save Plot to Image

This will save the current Profile Plot to an image file. The file type by default is PNG. The default folder is the *~myproject/Export* folder. The first image below is the configuration of the Plot before export. The next image is the exported image. Notice that Qimera includes the color and line pattern legend.



Plot to Export



Exported Plot Image

Show Gridlines

This option will show/hide the grid lines in the plot area.

Lock Depth Scale

This will lock the current Y plot range (Depth) so that when you create a new profile over flatter terrain, it doesn't overly exaggerate small details. This allows you to more easily see areas of high depth range. If the new profile contains depths above or below your currently "locked" range, the range will be extended to encompass these new depths so that you don't have to zoom out to see them.

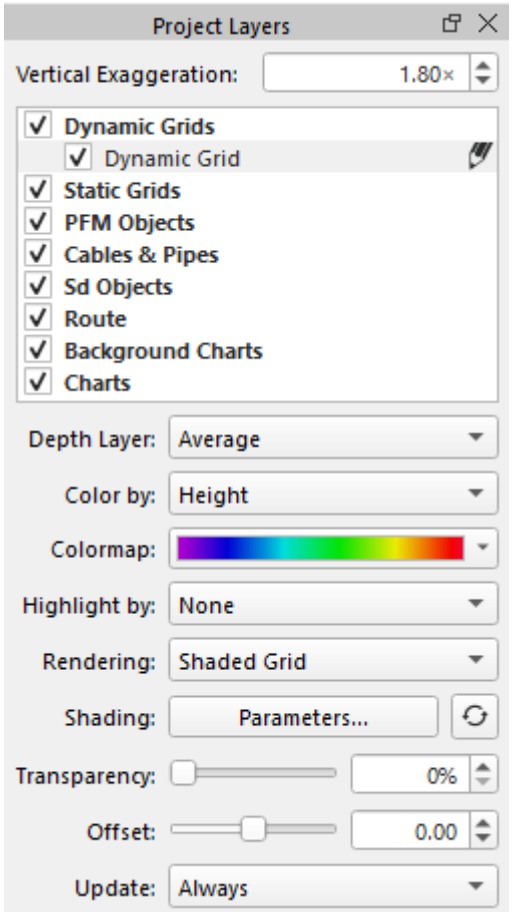
Clear Differences

This will clear the current difference plots from the grid Table. If you create a new profile, difference plots will be automatically cleared.

Use Exaggerate Scale Difference

With the box checked an exaggerated scale will be used causing the selected difference plot data to extend to the bounds of the plot. With the box unchecked the difference series will use the same scale as the two source items used to create the difference series. This item will only be enabled if there is a difference series created.

Qimera Project Layers Dock



- Qimera - Project Layers
  - Vertical Exaggeration
  - Layers Tree
    - Dynamic Grids
    - Static Grids
    - PFM Objects
    - Cables & Pipes
    - Sd Objects
    - Route
    - Background Charts
    - Charts
    - Attributes

- Context Menus
  - Dynamic Grid Context Menu
  - Static Grid Context Menu
  - PFM Object Context Menu
  - Cables & Pipes Context Menu
  - Sd Object Context Menu
  - Route Context Menu
  - Charts Context Menu
  - Common Options

Qimera - Project Layers

The Project Layers dock as show above allows the user to interact with the visual layers of the 3D scene.

Vertical Exaggeration

The vertical exaggeration field controls the exaggeration of the scene along the Z axis. Qimera uses a default exaggeration of 6× to make grid features more prominent, but an exaggeration of 1× can be used for accurate scaling.

Layers Tree

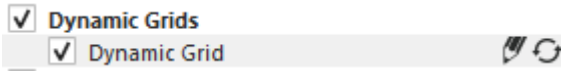
The layers tree shows all of the different layers in the current project. These layers are grouped by type.

Dynamic Grids

Dynamic grids are grids created from raw sonar or processed point source files and which automatically update when the underlying soundings are changed. Dynamic grids are the backbone of Qimera's point cleaning workflow. Most editing and filtering operation are conducted on a dynamic grid.

If there are pending edits to be applied to a dynamic grid, the auto-solve icon will appear to the right of the layer in the tree as shown below. Edits can be applied by pressing theAuto Process button or choosing 'Update From Edits' from the right click popup menu of a Dynamic Grid.

The active grid will be indicated by the pencil icon, to the right of the grid name.



Static Grids

Static Grids are grids which do not change when their underlying data changes. Static grids may be created inside Qimera by gridding points, imported from outside Qimera or created as static snapshots of a dynamic grid.

PFM Objects

PFM Objects are a legacy grid format that contains both the grid cells and their underlying point data. These were used for point editing in previous versions of Fledermaus, but may be imported into Qimera for basic point cleaning.

Cables & Pipes

The *Cables & Pipes* group contains any cable or pipe objects created via the Cable/Pipe Detection Tool.

Sd Objects

The *Sd Objects* group is a catch-all for any other layer type not given its own dedicated category.

Route

The *Route* group contains the active project route, if any. A project can only contain one route. A route is a special line object imported from a .qgfline file that contains distance information for all points along the line. A route typically represents a planned survey line, a pipe or cable route or other line against which locations might be referenced.

When a route is present, any 2D position near that can be expressed in a route relative coordinate system known as KP and DX.

- KP is the "along track" coordinate and represents the distance along the route. This is expressed in thousands of the horizontal survey unit, so for a survey conducted in metres, KP will be expressed in kilometres.
- DX is the "across track" coordinate and represents the perpendicular distance between the given point and the nearest point on the route.

Background Charts

The *Background Charts* group is always empty, but its checkbox controls the visibility of the background charts in the scene when in 2D view.

Charts

Charts are electronic navigational charts in QPS's QNC format.

Attributes

Marker

This attribute is used by Point SD layers. It allows you to change the appearance of the point. The options are Circle, Square, Crosshair, Cube, Diamond, Cylinder, Sphere, Flag, Point, and None.

Point Size

This attribute is used by Point SD layers. It changes the size of the displayed marker.

Depth Layer

This attribute is used by Dynamic Grid layers. It changes the currently displayed depth layer. The options are Average, Shallow, Deep and CUBE.

Color By

This attribute is used by Dynamic Grid layers. It changes how the grid is colored. The options are Height, Uncertainty (95% c.i.), Sounding Density, Checked Flag, Plotted Flag, Feature Flag, Suspect Flag and Cell of Interest. If the Dynamic Grid was built with CUBE, the options would also include # of Hypothesis, Uncertainty, and Hypothesis Strength. Note that the CUBE Uncertainty layer is different than the normal uncertainty layer. The normal Uncertainty layer represents the normal standard deviation, scaled to 95% c.l., of all accepted soundings in the grid cell, regardless of what CUBE believes the depth to be and regardless of the potential number of CUBE hypotheses. On the other hand, the CUBE Uncertainty layer reflects the standard deviation, scaled to 95% c.l., for ONLY those soundings that are associated with the selected hypothesis. If the Dynamic Grid was built with Coverage and Datetime, the options would also include Coverage and Date Time

To color by the cell of interest first use the flag grid cells operation on the grid. See Flag Grid Cell Dialog.

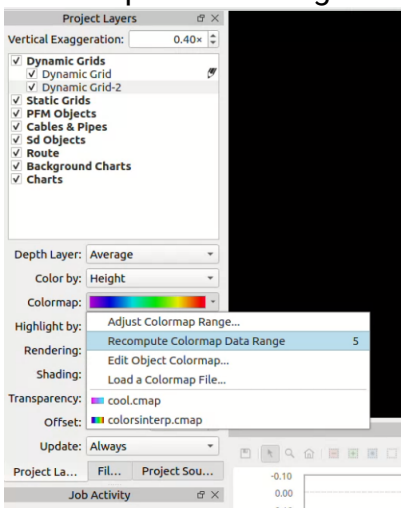
Color By

This attribute is used by Point SD layers. It changes how the marker is colored. The options are Solid, X, Y, Z and any other imported custom attributes contained by the SD object.

Colormap

This popup allows you to see the currently selected colormap. It also allows you to select a colormap file, edit the current colormap, adjust the colormap range, and recompute the colormap range for the *selected* dynamic grid (not the *active Dynamic Grid*) based on the accepted data range. Recomputing the colormap range will also change the user range to

the accepted data range.



Highlight By

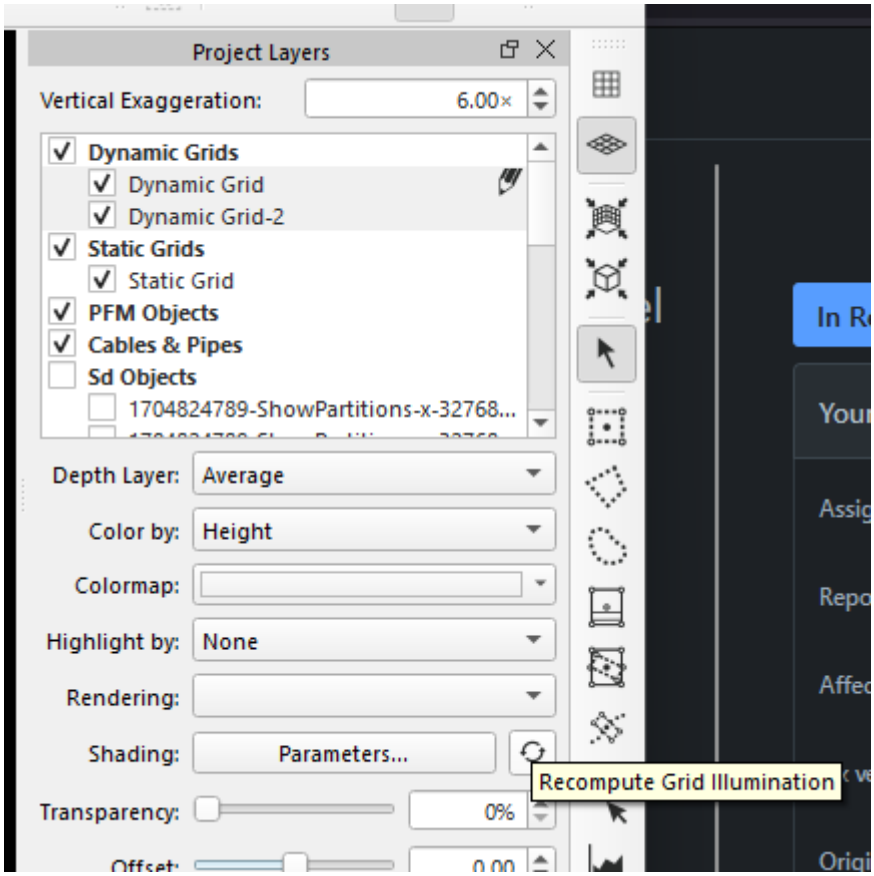
This attribute is used by Dynamic Grid layers. It changes how the grid is highlighted. The options are None, Checked Flag, Plotted Flag, Feature Flag and Cell of Interest. To highlight by the cell of interest first use the flag grid cells operation on the grid. See Flag Grid Cell Dialog.

Rendering

This attribute is used by Dynamic and Static Grids layers. This attribute changes the grid display to either a wire frame display, a solid shaded grid, or plates mode.

Shading

This attribute is used by Dynamic and Static Grid layers. This button launches the Shading Parameters dialog. The "Refresh" Icon will Recompute the Grid Illumination. This will launch a job to re-compute the grid illumination for the currently selected Dynamic Grid. This option is relevant only if you are in *Mixed Shading* mode. This is typically done automatically during dynamic grid generation. If you have an active selection, the computation will be done within the minimum bounding rectangle of that selection.



Transparency

This attribute is used by Image, Scalar, Dynamic, Static Grid layers and Plane SD Layers. It controls the transparency of the layer in the Scene.

Offset

This attribute is used by most 3D layers. It applies a small vertical offset to the layer. This is mostly useful for ensuring that one layer is drawn above or below another.

Height

This attribute is used by Image and Scalar layers. It controls the height location in the scene (Z).

Drape Image

This attribute is used by Static Grid layers. It drapes an Image or Scalar object onto the selected grid.

Drape Onto Scene

This attribute is used by Point and Line SD layers. It drapes each vertex onto the grid layers in the scene. The point nearest (below) the vertex is where it will drape.

Mask Out Grid Areas

This attribute is used by Image layers. It allows all visible Static or Dynamic Grids to mask out portions of the selected image.

Interpolate

This attribute is used by Image and Static Grid layers. It will reduce the visibility of pixel edges by smoothing the colormap based on surrounding pixels.

Update

This attribute is used by Dynamic Grid layers. It can be set to one of three update policies which control when the dynamic grid updates to changes in the underlying point data.

Color

This attribute is used by Plane SD layers. It changes the color of the plane.

Line Thickness

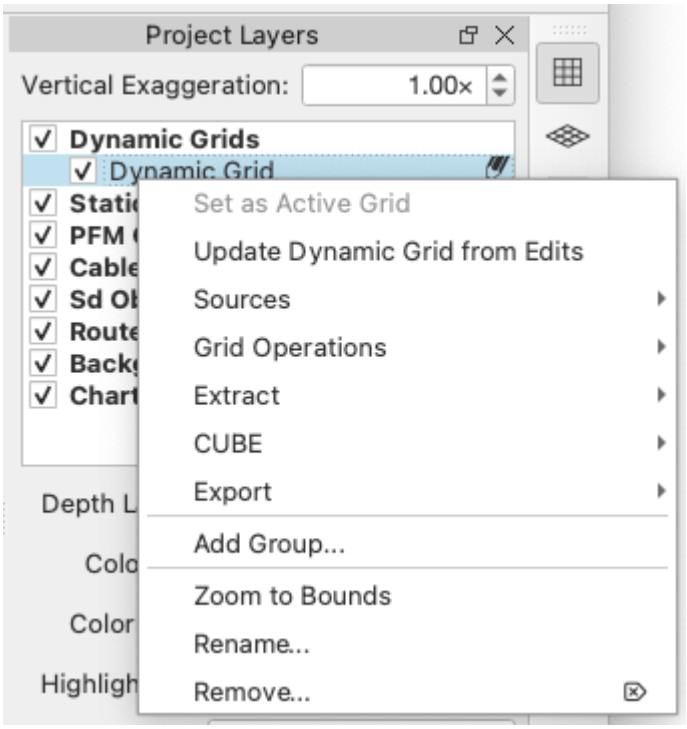
This attribute is used by Line SD layers. It changes the thickness of the line.

Update Policy	**Behavior**
Always	The dynamic grid will automatically update whenever changes are made to the underlying point data.
After Processing	The dynamic grid will automatically update whenever a processing job modifies the underlying point data. Running any filters or manually cleaning in the 3D editor, swath editor or slice editor will not automatically cause an update, but will instead cause the grid to marked as needing an update. This allows one to do quick manual cleaning without having to wait for the grid to update after each edit. When edits are complete, the grid can be updated via its context menu, or by pressing theAuto Process button.
Never	The dynamic grid is completely disconnected from the changes to the underlying point data. The 3D editor cannot be launched on the grid. Neither processing jobs, filters, or the swath editor will cause the grid to update. Note that switching from Never to a different update policy will require a full grid update, which can be quite slow for large grids.

Context Menus

By right clicking on any item in the Project Layer's tree hierarchy a context menu will pop up.

Dynamic Grid Context Menu



Redisplay All Dynamic Grids

Show all of the dynamic grids in the project. Right click on the dynamic grid group for this option.

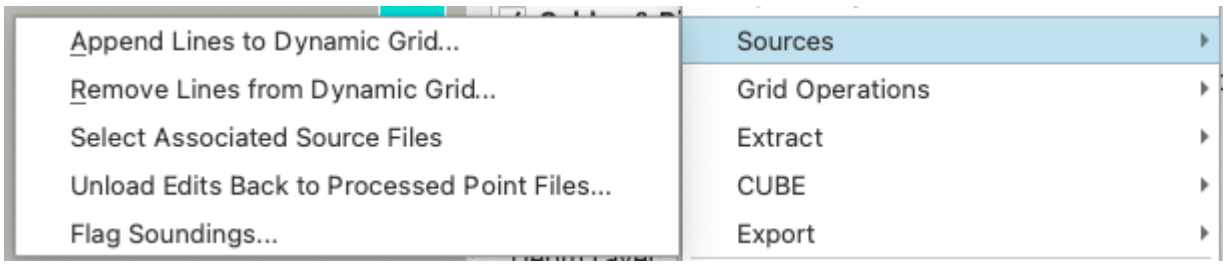
Set Active Grid

Make this selected grid the Active Grid.

Update Dynamic Grid From Edits

This action will update a selected dynamic grid with edits pending. Qimera will warn you with a list of grid names and area requiring update before proceeding. If any of your Dynamic Grid QPDs were used in another project, and edited, Qimera will detect this when it re-opens your project and will mark the grid as requiring update.

Sources



Append Lines to Dynamic Grid...

Launches the Append Lines to Dynamic Grid Dialog.

Remove Lines from Dynamic Grid...

Launches the Remove Lines Dialog.

Select Associated Source Files

This action will clear the current source item selection and select all the source files used to create the grid. Please note that Qimera does not support selecting multiple source file types simultaneously. If your grid was created from both raw and processed point files, a dialog will be displayed, allowing you to choose only one file type.

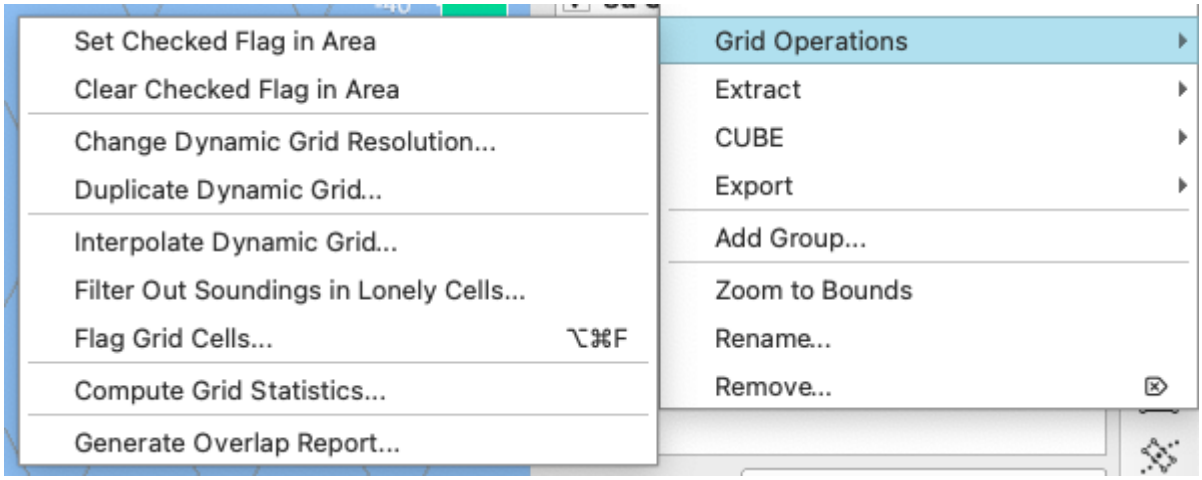
Unload Edits Back to Processed Point Files...

Launches the Unload Edits Back to Processed Point Files. The grid must contain a processed point file that supports unloading.

Flag Soundings...

Launches the Sounding Selection Dialog.

Grid Operations



Set Checked Flag in Area...

This will set the checked bit flag in the cells covered by the current selection. This option will only work if you have a dynamic grid selected and a spatial area selected. You can then view checked areas by using the *Highlight By* option of the Qimera Project Layers Dock for Dynamic Grids. This bit can only be cleared by using the *Reset Checked Area* option below. The checked bit flag is also independent of the visited/edited areas seen in the *Grid Edit Overview Dock*.

Clear Checked Flag in Area...

This will clear the checked bit flag in the cells covered by the current selection. This option will only work if you have a dynamic grid selected and a spatial area selected.

Change Dynamic Grid Resolution...

Launches theChange Resolution dialog.

Duplicate Dynamic Grid...

Launches the Create Dynamic Grid Dialog with the same settings as the selected grid.

Interpolate Dynamic Grid...

Launches theInterpolate Dynamic Grid Dialog used to configure the interpolation algorithm. You can set the minimum neighbors, iterations and interpolation type.

Filter Out Soundings in Lonely Cells...

Launches theQimera Filter Out Soundings in Lonely Cells Dialog used to remove small blocks of cells detached from the main body of the dynamic grid.

Flag Grid Cells...

Launches the Flag Grid Cell Dialog.

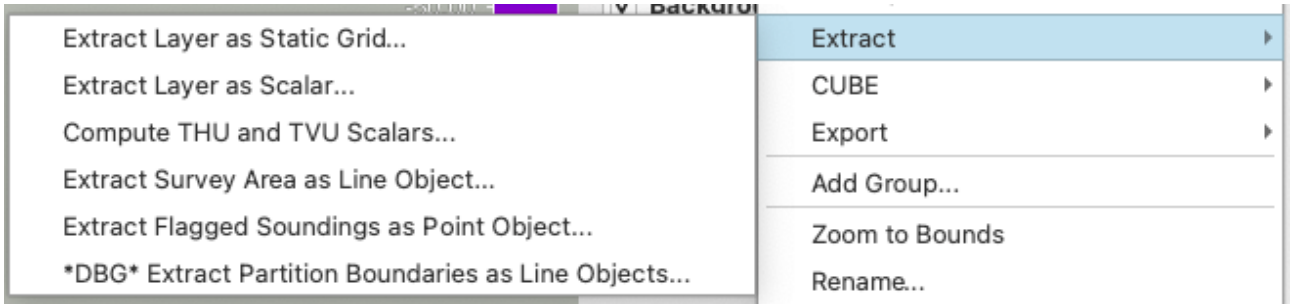
Compute Grid Statistics...

Computes the grid statistics for a given plane height. See Grid Statistics Dialog.

Generate Overlap Report...

Launches the Generate Overlap Report Dialog.

Extract



Extract Layer as Static Grid...

Launches the Snapshot as Static Grid Dialog.

Extract Layer as Scalar...

Launches the Extract Dynamic Grid Layer.

Compute THU and TVU Scalar...

Create total horizontal and vertical uncertainty Sd Objects.

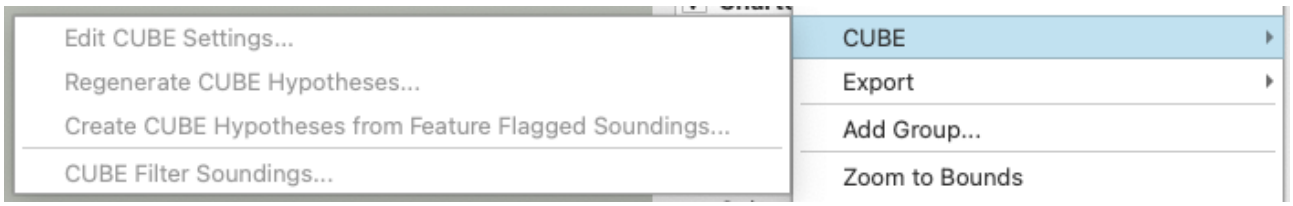
Extract Survey Area as Line Object...

Saves the survey area as a SD line object.

Extract Flagged Soundings as Point Object...

Launches the Create Flag Markers.

CUBE



Edit CUBE Settings...

Launches the CUBE Settings Dialog.

Regenerate CUBE Hypotheses...

Launches the Re-Cube Area Dialog.

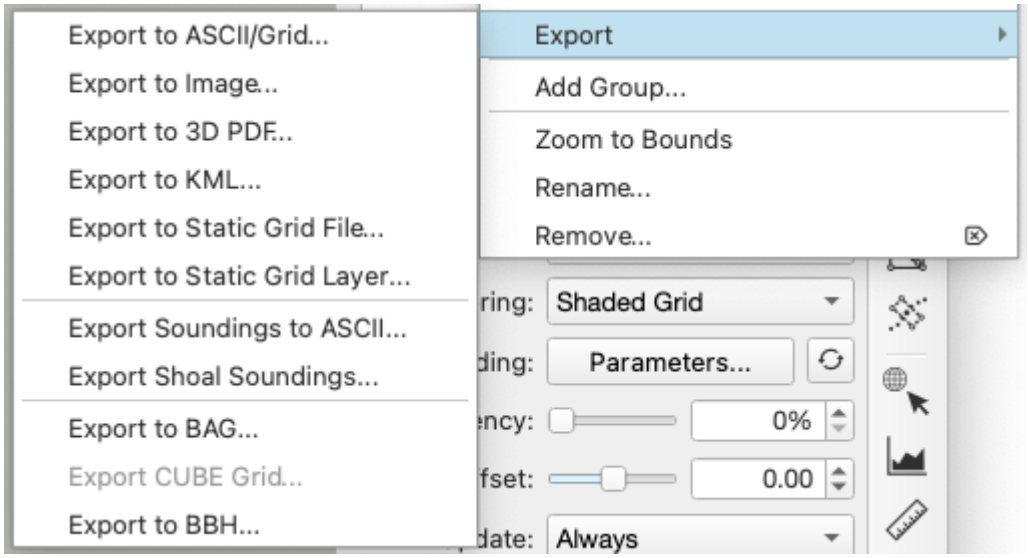
Create CUBE Hypotheses...

Launches the Create Custom Hypothesis from Features Dialog.

CUBE Filter Soundings...

Launches the CUBE Filter Soundings Dialog.

Export



Export to ASCII/Grid...

Launches the Export ASCII/Grid Dialog.

Export to Image...

This option launches the Export Grid as Image Dialog, followed by a file browser dialog to select the filename of the exported image.

Export to 3D PDF...

This will open a file browser dialog to save the currently selected grid as a 3D PDF.

Export to KML...

This option launches the Export Grid to KML Dialog to export the currently selected grid to KML and KMZ formats.

Export to Static Grid File...

This will open a file browser to select the name for the exported Static Grid file.

Export to Static Grid Layer...

This will launch the Export Static Grid Layer dialog.

Export Soundings to ASCII...

Launches the Export Soundings to ASCII Dialog.

Export Shoal Soundings...

Launches the Export Shoal Soundings Dialog.

Export to BAG...

This will launch the Export BAG Grid Wizard.

Export CUBE Grid...

Export the CUBE grid to a .xyz file.

Export to BBH...

Export the dynamic grid to a .bbh file.

Static Grid Context Menu

Export

Export to ASCII/Grid...

Launches the Export Grid Dialog.

Export to Image...

This option launches the Export Grid as Image Dialog, followed by a file browser dialog to select the filename of the exported image.

Export to 3D PDF...

This will open a file browser dialog to save the currently selected grid as a 3D PDF.

Export to KML...

This option launches the Export Grid to KML Dialog to export the currently selected grid to KML and KMZ formats.

PFM Object Context Menu

Set Active Grid

Make this selected grid the Active Grid.

Unload PFM Edits

This action launches the PFM Unload Wizard which saves edits back to processed point files that support unloading.

Set Checked Flag in Area...

Flags the soundings as checked within a selected area.

Clear Checked Flag in Area...

Clears the checked flag within a selected area.

Cables & Pipes Context Menu

Edit Dynamic Cable / Pipe...

This feature will load the Dynamic Cable/Pipe in to theCable/Pipe TOP Detection Tool for inspection or modification.

Edit X-Point Listings...

Launches theGenerate/Edit X-Point Listings dialog to configure the number and property of X-point lines running parallel to the cable or pipe.

Clear X-Point Listings...

This will erase all X-Point listings configured via theGenerate/Edit X-Point Listings dialog.

Filter Soundings Directly Below Cable / Pipe...

This is a filter for cleaning data underneath the pipeline taking its diameter into account, which can be run along a KP-line. It automatically deletes data underneath the pipeline. It works kind of like stencil linked to the pipe diameter, and rejects everything below the pipe center and leaves the upper half circle untouched. If you wish to undo your changes, simply rerun the same filter but with the accept radio button selected. SeeFilter Below Dynamic Cable/Pipe dialog.

Run Cable / Pipe Analysis & Export...

Opens Cable/Pipe Analysis Dock.

Export to QGF Line...

Export the pipe to a .qgfline file.

Merge Dynamic Cable / Pipe...

If you select more than one Cable/Pipe, this option will let you merge dynamic cable/pipes via theMerge Dynamic Cable/Pipes dialog.

Sd Object Context Menu

Load Points into GeoPick tool...

This option is only available for SD point files. It will add the points into the Geo Pick Dock.

Use Line Object as Selection...

Shown only for line objects, this action replaces the current selection, if any, with a freehand selection having the same shape as the line. If the line is not closed, an additional, closing line segment is added.

Use Line Object as Profile...

Shown only for line objects, this action will create a profile object.

Use Line Object as Route...

Shown only for line objects, this action will create a route object.

Add Selection to Line Object...

Shown only for line objects, this action will add the current closed selection to the selected line object.

Create Cable/Pipe from Line Object...

Shown only for line objects, this action will create a Dynamic Pipe object.

Attach Scroll Selection to Line...

Forms a rectangular selection at the start of the route. You can use the W and S keys to step the selection forwards and backwards.

Export

Export options specific to the SD file type.

Route Context Menu

Load Route from QGF file...

This action allows setting the project's active route. If the project already has an active route, it will be replaced.

Create KP Marker Labels...

This actions creates a point object labeling KP values along the project's active route at a specified interval. The action is only enabled If the project has an active route.

Center View on KP...

This action will prompt you to enter a KP value along the project's active route and then move the view to be centered on that KP position.

Center Selection on KP...

This action will prompt you to enter a KP value along the project's active route and then move the selection (and the view) to be centered on that KP position. If you do not currently have a selection, the action will be disabled.

Attach Scroll Selection to Route...

This feature is used in combination with the Scroll Line Select Mode to have the selection follow that route.

Charts Context Menu

Create New Chart...

Import a .qnc file to create a new chart.

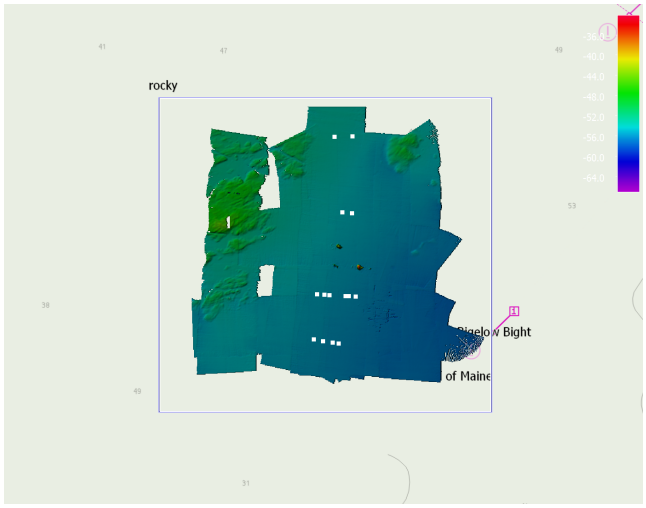
Lock / Unlock Editing...

This allows the user to control which layers are allowed to be edited. If you have a chart layer in your Layers Dock that is not in your project as a QNC file, it will be locked by default and you will not be able to unlock it for editing. If you have an external ENC(.000) that you want to edit, import it into your project using the *Import Files* option above.

Chart on Top...

This will render the ENC charts on top of any dynamic grids without any filled in areas (left image below). By default, charts are drawn below any Dynamic Grids (middle image below) and you have to change the opacity of the Dynamic Grid in order to see ENC symbology underneath the grid (right image below). Remember that charts are only draw when Qimera is in 2D View.







Import Files...

This will import an ENC chart(.000) file, convert it to a QNC and save it in the project QNC folder.

Common Options

Add Files...

This action will add an SD object to the scene. If the SD object is in a different coordinate system than Qimera, it will be re-projected to the project coordinate system. If the context is for a Chart, it will add a QNC(.qnc) file to the layer. QNC files are the optimized versions of ENC(.000) files.

Add Group...

This action will add a custom named group to the tree hierarchy.

Organize...

Order the items in a group by name or by file path. You can also remove a group in this menu.

Zoom to Bounds...

This action will zoom the scene such that the current object fits the viewable area of the window.

Remove...

This action will remove the current selection from the project. Using the shortcut key 'Del' will also remove the current selection from the project.

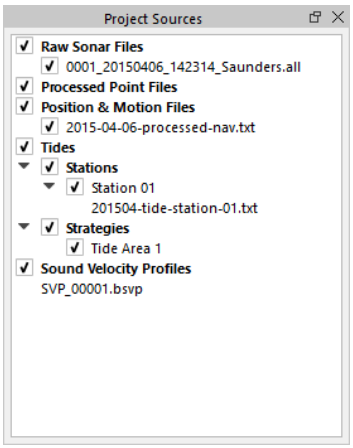
Rename...

This action will rename the current file selected within the project and from its source location.

Return to:*Qimera Interface*

Return to:*Dockable Windows*

Qimera Project Sources Dock



- Qimera - Project Sources
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    - Raw Sonar Files
    - Processed Point Files
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    - Tides
    - Sound Velocity Profiles
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  - Raw Sonar File Processing State
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            - Export to LAS/LASZip
            - Export to FAU
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- Common Context Menu Actions
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- Remove Lines from a Dynamic Grid
- Select in Area
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- Apply Edits from...
- Export QPD Edits
- Add Group
- Create Group From Selection
- Rename Group
- Organize Sub-Menu
  - Order by Name
  - Order by Start Time
  - Regroup by Vessel
  - Regroup by Vessel and Day
  - Regroup by Day and Vessel
  - Regroup by Day and Vessel
  - Regroup by Day
  - Regroup by File Path
  - Remove All Grouping
- Select Sub-Menu
  - Select All Files In the Same Vessel
  - Select All Files With the Same Start Date
  - Select All Files in the Same Folder
  - Select All Missing Files
  - Select All Files With Errors
  - Select All Files that are Ready for Processing
  - Select All Files that are Fully Processed
  - Select All Empty Raw Sonar Files
- Remove
- Zoom to Bounds
- File Paths

- Open Containing Folder
- Find New File Location...
- Find Matching QPD...
- Find Matching WCD...

- Datagram Viewer

Qimera - Project Sources

The Project Sources tab of the Source Files Panel shown in the *Source Files Tab* figure above shows all of the files currently loaded into a project. If you have loaded directories of files, the directory hierarchy will be preserved in the Source Files Tree. There are 5 primary root nodes in the tree. Raw Sonar Files, Processed Point Files, Position & Motion Files, Tide Files and Sound Velocity Profiles.

Source File Tree Nodes

Raw Sonar Files

These nodes are raw sonar files you have imported for Sound Velocity Correction, Dynamic Grid generation and Swath and 3D Editing operations. A list of supported formats can be found here.

Processed Point Files

These nodes are processed point files you have imported for Dynamic Grid generation and 3D Editing operations. A list of supported formats can be found here.

Position & Motion Files

These nodes are either ASCII or binary position and motion files that you have imported to be used during Sound Velocity Correction or Re-Navigation processing. A list of supported formats can be found here.

Tides

Tide nodes represent tidal data brought into the project to support final height determination in the sound velocity correction pipeline or as a Re-Navigation operation. Tide nodes are divided into two categories: tide stations and tide strategies.

Tide stations represent a set of tide measurements all measured at the same location, against the same datum, in the same unit and in the same timezone. Each tide station can contain many tide files, which are shown as its children in the tree. A list of supported tide file formats can be found here.

Tide strategies combine and/or transform the tide data from one or more tide stations to allow for advanced tide modelling. A tide strategy can do weighted interpolation of data between stations or establish a zone inside with station data are offset or scaled. Tide strategies are powerful building blocks from which very complex tide scenarios can be modeled.

Sound Velocity Profiles

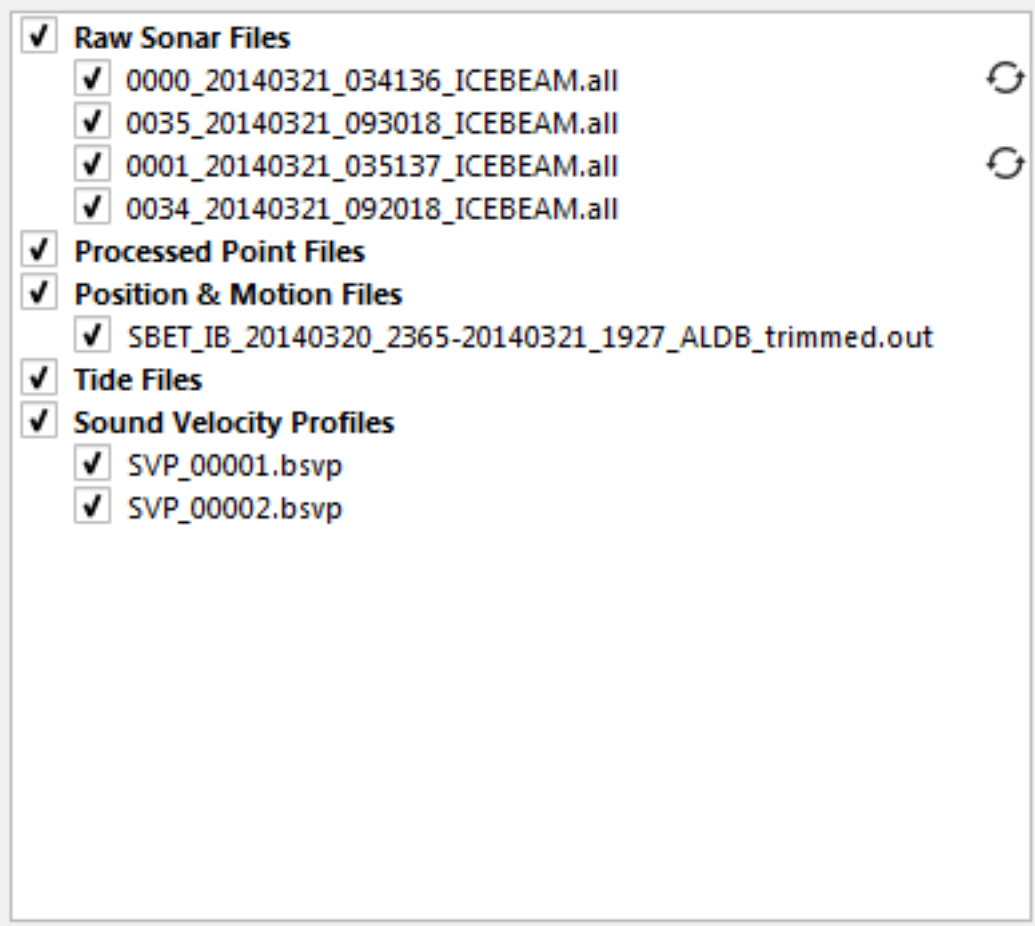
These nodes represent imported data or data extracted from raw sonar files during import. They are displayed here so that you can more easily delete them if they are not needed. They are used during Sound Velocity Correction. A list of supported file formats can be found here.

Selection and Visibility

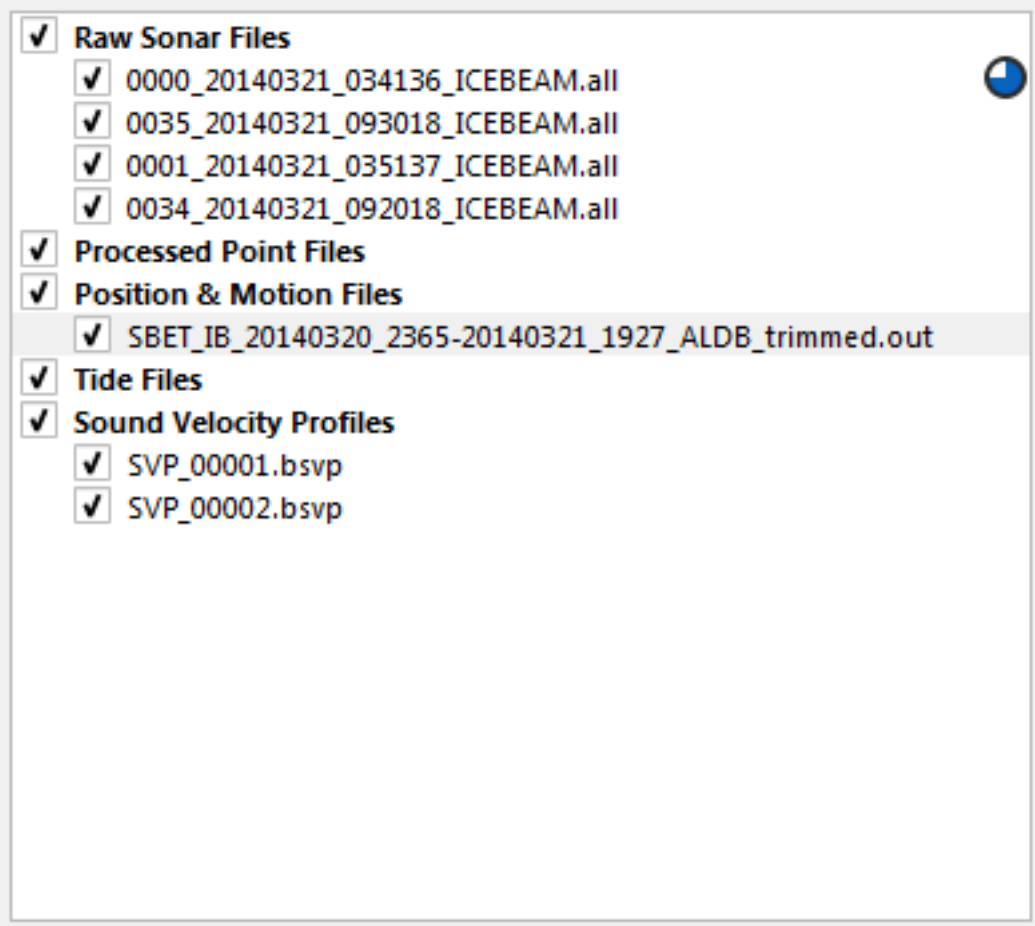
When you select a raw sonar file in the tree, the corresponding track line in the 4D Scene will highlight. Conversely, when you select a track line in the 4D Scene, the associated raw sonar node will highlight. Change the visibility of the node in the 4D Scene by changing the state of the checkbox. Checked is visible, unchecked is invisible.

Raw Sonar File Processing State

When raw sonar files are added to Qimera, they need to ultimately get converted into QPD files through Sound Velocity Correction. If a sonar file requires processing, the auto-solve icon will appear at the right side of the window as shown below. If you hover over the icon, Qimera will tell you exactly which type of processing needs to be accomplished. Whenever you modify data or settings that affect the line, Qimera will know this using the Dynamic Workflow engine and mark the line as requiring further processing.



Pressing the Auto Solve icon will cause the line to be processed. During processing, you will see the job in the Activity Monitor as well as an indication next to the line as to the remaining duration of it's processing



Right Click Context Menus

Because many actions are available to multiple file types the actions are annotated by a type number 1-6 associated with the menus listed below.

Raw Sonar File Context Menu

Add Raw Sonar Files

This action will launch the Qimera Add Raw Sonar Files Dialog dialog to add raw sonar files to your project.

Edit Processing Settings

This action will launch the Processing Parameters dialog for the current selection.

Edit Vessel Configuration

This action will launch the Vessel Editor for the current line selection.

Edit Modified Flags

This action will launch the Manual Modified Flags dialog allowing the user to manually clear or set processing flags.

Dry Run

This action will launch the Dry Run dialog allowing the user to test run the configuration setup for the processing of the selected lines.

Attach Scroll Selection to Trackline

This feature is used in combination with the Scroll Line Select Mode to have the selection follow that Trackline.

Export

Export Soundings to ASCII

Launches the Qimera Export Soundings to ASCII Dialog and will export the selected raw sonar files.

Export to LAS/LASZip

Launches the Qimera Export Soundings to LAS/LASzip Dialog that enables export of individual LAS or LASzip files containing points from the selected file.

Export to GSF

Launches the Qimera Export to GSF Dialog This option will export the selected raw sonar files to GSF files.

Export to SD Points

This option will export the selected sonar files to SD Point objects. Qimera will also pay attention to a spatial selection. You have the option to specify which systems to export. Qimera will add a User Additional system for each multibeam head that will be the container for any water column picks that you add. You also have the option to merge all the lines into a single SD and an option to automatically load the SD object to the scene. Qimera exports the following attributes to the SD Point object: X, Y, Z, Time, System, Ping, Beam, Intensity, Horizontal TPU, and Vertical TPU.

Export to SD Cluster

This option will export the selected sonar files to SD Cluster objects. Qimera will also pay attention to a spatial selection. You will see the same option dialog as you do when exporting SD Points. You have the option to specify which systems to export. You also have the option to merge all the lines into a single SD and an option to automatically load the SD object to the scene.

If you have done water column picking of geophysical processes such as seeps, use this option to export only your water column picks (*SystemName*_UserAdditional) into a single SD Cluster object. Then load this object into Fledermaus to do cluster analysis. Remember you can do water column picking for all of your lines, then export all line picks into a single object using the *Merge to single file* option.

Export to FAU

This option will export the selected raw sonar files to FAU files. The exported data will appear in the project *~/Export* sub-directory.

Export to QTR

This option will export the currently selected raw sonar files to QTR files. The exported data will appear in the project *~/Export* sub-directory.

Export Trackline to ASCII

This option will export ASCII files containing date/time, x, y, and z for the currently selected raw sonar files. The exported data will appear in the project *~/Export* sub-directory. A separate file will be exported for the center of gravity and each sonar head.

Export to NOAA CSV Format

This option exports a CSV file containing metadata for each of the selected raw sonar files. The metadata columns in the CSV file are:

MB Line Filename, Speed, HDG, Longitude Min, Longitude Max, Latitude Min, Latitude Max, Linear Distance, Min Time, Max Time, SVP File Applied, Julian Day, Date (UTC)

Processed Point File Context Menu

Add Point Files

This action will launch the Add Point Files dialog to add processed point files to your project.

Load Associated DB File

Shown only for QPD files, this action will attempt to find and load the corresponding DB file, replacing the QPD file in the source tree in the process. This essentially upgrades the line from point cleaning only to being able to be fully process-able.

Generate Metadata

This action re-generates the metadata for the processed point file.

Edit File Configuration

This action will launch the File Configuration dialog for the current selection.

Edit TPU Setup

This action will launch the TPU Calculation dialog for the current selection.

Unload Changes

This action will launch the Qimera Unload Processed Point File Dialog for the current selection.

Export

Export Soundings to ASCII

Launches the Qimera Export Soundings to ASCII Dialog and will export the selected raw sonar files.

Export to LAS/LASZip

Launches the Qimera Export Soundings to LAS/LASzip Dialog that enables export of individual LAS or LASzip files containing points from the selected file.

Export to FAU

This option will export the selected raw sonar files to FAU files. The exported data will appear in the project *~/Export* sub-directory.

Export to QTR

This option will export the currently selected raw sonar files to QTR files. The exported data will appear in the project *~/Export* sub-directory.

Position & Motion File Context Menu

Add Binary Navigation Files

This action will launch the Navigation Import dialog.

Tide Station and Tide File Context Menu

Add Tide Files

This action will launch the Add Tide File dialog to start the tide file import process, which is also how tide stations are created.

Edit Tide Station

This action launches the Tide Station dialog to edit the properties of an existing tide station. Note that not all properties are editable after creation.

Tide Strategy Context Menu

Create Tide Strategy

This action will launch the Tide Strategy dialog to create a new tide strategy.

Edit Tide Strategy

This action launches the Tide Strategy dialog to edit the properties of an existing tide strategy. Note that not all properties are able to be edited after the initial creation.

Sound Velocity Context Menu

Import SVP Files

Enables selection of an SVP file to import into the project. If applicable, further dialogs will launch in support of the import operation.

SVP Editor

This action will launch the Qimera SVP Editor for the current selection.

Select Associated Source Files

This action will clear the current source item selection and select all the source files that use the selected SVP.

Export

Export to ASCII SVP

Export to Caris SVP

Export to Hypack SVP, Version 2

Export to Hypack SVP, Version 3

Common Context Menu Actions

Append Lines to a Dynamic Grid

This action will launch the Append Lines dialog to append the current selection to a Dynamic Grid.

Remove Lines from a Dynamic Grid

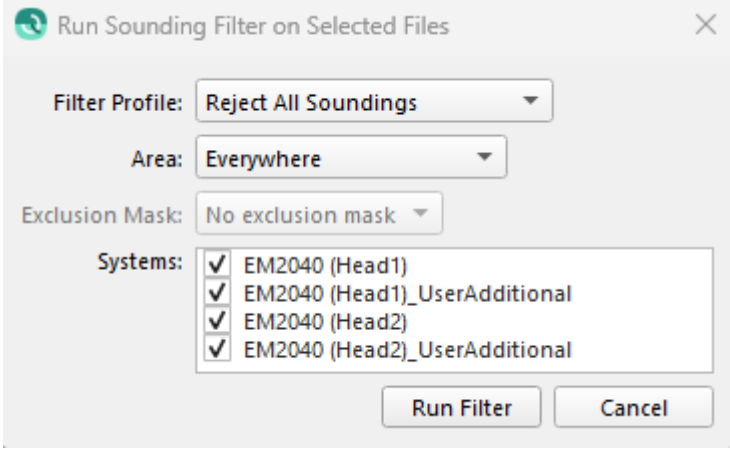
This action will launch the Remove Lines dialog to remove the current selection from a Dynamic Grid.

Select in Area

This action will deselect any lines that are not overlapping the selected area in the 4D view.

Run Sounding Filter on Files

This action will launch the *Run Sounding Filter on Files* dialog shown below. Use the *Filter Profile* drop down to selected which filter you want to run. Use the *Area* drop down to run the filter *Everywhere* or *Inside Current Selection*. You can also use the Exclusion Mask option to prevent the filter from running in a specific area of the survey. You can uncheck systems that you want the filter to ignore. For more information on filtering, see the section on the Filter Operation Toolbar.



Apply Edits from...

This action will apply cleaning edits from *.fau, QPD, or qpdedits* files to their corresponding files in Qimera's project. To use this tool, select the files that correspond to the selected source items. Selected .fau files must include all rejected soundings. If there are multiple systems in the Qimera source files, the files must be split by head, and the file names given on export from Qimera must not be changed in order for edit flags to be properly applied.

Export QPD Edits

Export a .qpdedits file which will be located in the project Export folder. The .qpdedits file is used for transferring point edits from one project to another. It can also be used to create a snapshot of the current cleaning status of the selected files.

Add Group

This action will add a custom named group to the tree hierarchy.

Create Group From Selection

This action will launch the *Add Group* dialog to add a custom named group from the currently selected files to the tree hierarchy.

Rename Group

This action will launch the *Rename Group* dialog to change the name of the selected group.

Organize Sub-Menu

Appears when clicking on groups and provides options for (re)organizing source files within the group. *Alphabetize* reorders files and groups to appear in alphabetical order,

while preserving any group hierarchy. The *Regroup by...* action creates a hierarchy of groups and sorts the files into them. Different file types support different *Regroup by...* operations. These options are: *Regroup by Vessel*, *Regroup by Vessel and Day*, *Regroup by Day and Vessel*, *Regroup by Day*, *Regroup by File Path*.

Remove All Grouping flattens the hierarchy by removing all groups while preserving file ordering.

> ⚠ Note that the *Organize* menu operations are not automatically reapplied if files are later added to or removed from the project. They are one-off operations to organize the source files according to a particular scheme, but the user still has the option to customize via the creation of their own groups or drag-and-drop reordering.

Order by Name

Reorders the contents of the selected group to put the sources in alphabetical order. This preserves all existing groups, but reorders them and their contents.

Order by Start Time

Reorder the contents of the selected group to put the source in order by their start time. Note that not all source types have an associated start time. This preserves all existing groups, but reorders them and their contents.

Regroup by Vessel

Remove all existing groups below the selected group and create a new hierarchy with each vessel being given its own group. Note that not all source types have an associated vessel.

Regroup by Vessel and Day

Remove all existing groups below the selected group and create a new hierarchy with each vessel being given its own group containing subgroups for each day.

Regroup by Day and Vessel

Remove all existing groups below the selected group and create a new hierarchy with each day being given its own group containing subgroups for each vessel.

Regroup by Day and Vessel

Remove all existing groups below the selected group and create a new hierarchy with each day being given its own group containing subgroups for each vessel.

Regroup by Day

Remove all existing groups below the selected group and create a new hierarchy with each day being given its own group. For this purpose, the day is the date on which acquisition of that source began. Not that not all source types have an associated start time.

Regroup by File Path

Remove all existing groups below the selected group and create a new hierarchy mirroring the file folder hierarchy of the sources on disk.

Remove All Grouping

Remove all existing groups below the selected group, flattening the group hierarchy.

Select Sub-Menu

Appears when right clicking on groups or files and provides options for selecting source files within the group. Files and Groups can have different options. These options are: *Select All Files in the Same Vessel, Select All Files with the Same Start Date, Select All Files in the Same Folder, Select All Missing Files, Select All Files with Errors, Select All Files that are Ready for Processing, Select All Files that are Fully Processed, Select All Empty Raw Sonar Files.*

Select All Files In the Same Vessel

Select all files that are from the same vessel as the current selection. This does not include different configurations in that vessel.

Select All Files With the Same Start Date

Select all files that begin on the same day as the current selection.

Select All Files in the Same Folder

Select all files that are in the same folder as the current selection.

Select All Missing Files

Select all files that were not found during project (re)loading.

Select All Files With Errors

Select all files that returned errors during processing.

Select All Files that are Ready for Processing

Select all files that are ready to process.

Select All Files that are Fully Processed

Select all files that have completed their processing.

Select All Empty Raw Sonar Files

Select all Raw Sonar Files that do not contain soundings.

Remove

This action will remove the current selection from the project. Using the shortcut key 'Del' will also remove the current selection from the project.

Zoom to Bounds

This action will zoom the scene to the bounds of the current selection.

File Paths

Open Containing Folder

This action opens a file browser showing the folder containing the selected file.

Find New File Location...

This action allows you to point Qimera to the new location of a file that has moved since it was added to the project. Qimera will use this new location to try to find any other missing files.

Find Matching QPD...

For raw sonar files, this action will allow you to find the matching QPD's for a loaded DB file that failed to match during metadata extraction.

Find Matching WCD...

For raw sonar files, this action will allow you to find the matching WCD files (Kongsberg water column data) for a loaded Kongsberg raw sonar file that failed to match during metadata extraction.

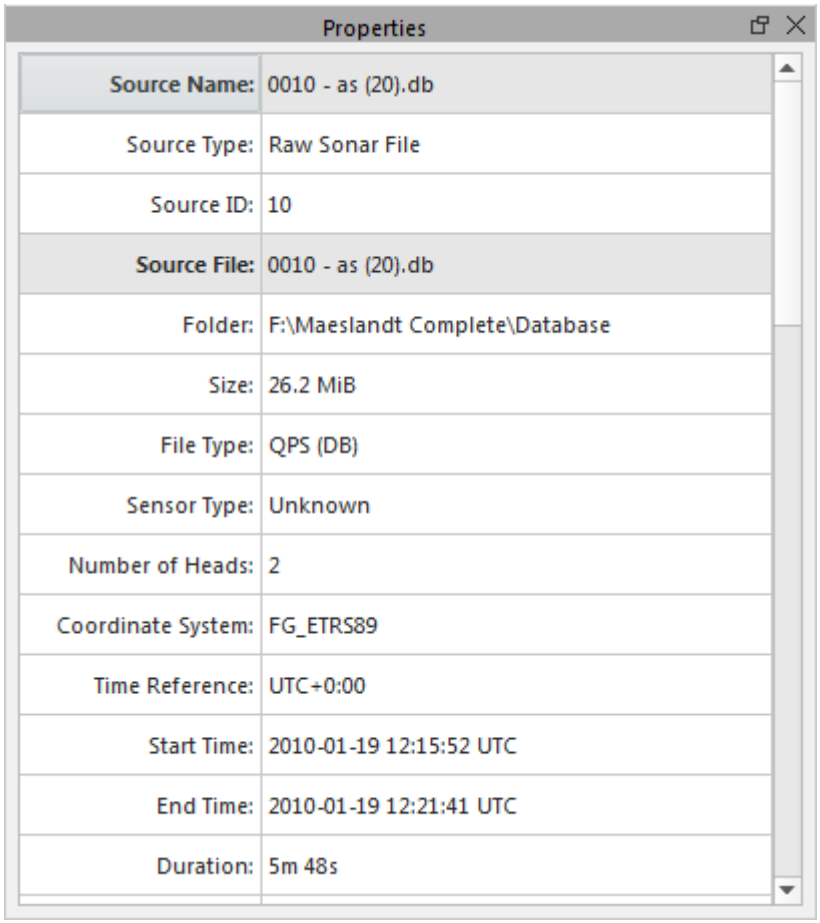
Datagram Viewer

This action will launch the Datagram Viewer dialog, showing the key metadata of the selected file.

Return to: *Qimera Interface*

Return to: *Dockable Windows*

Qimera Properties Dock



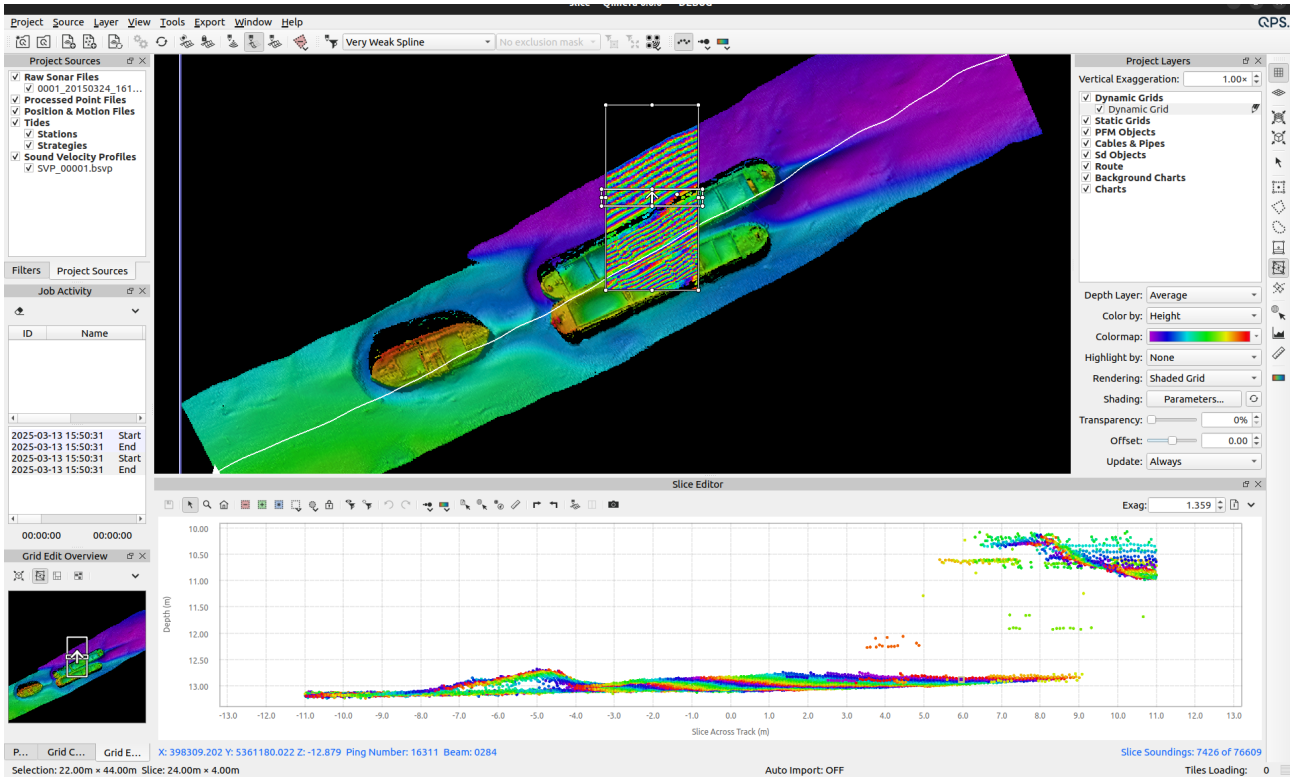
Qimera - Properties

When you select a file from the Project Sources or Project Layers window, the Properties window will list all known attributes of the current selection. There are numerous attributes available for displaying. These can be chosen by right-clicking on the gray Properties Window and checking which attributes to be displayed.

Return to: Qimera Interface

Return to: *Dockable Windows*

Qimera Slice Editor Dock



- Slice Editor
  - Slice Editor Toolbar
    - Save Edits
    - Explore
    - Zoom In
    - Reset Zoom
    - Reject Selection
    - Accept Selection
    - Select and Edit
    - Selection Style
    - Selection Area
    - Lock Selection
    - Run Filter Preview

- Run Filter Profile
- Undo
- Redo
- Plot Point Size
- Plot Color By
- Colormap Settings
- Select Info
- Geo Pick
- Add ENC Point Object
- Measure
- Rotate Right
- Rotate Left
- 3D Slice
- 3D Slice Layout
- Snapshot
- Show Sounding Properties
- Head Visibility

- Slice Editor Menu
  - Auto Load Points
  - Edit Only Selected Files
  - Show Unselected Files
  - Save Edits Manually
  - Save Edits Automatically
  - Save Edits Instantly
  - Update Illumination
  - Automatically Apply Active Filter
  - Auto Set Flag on Select
  - Auto Zoom
  - Lock Vertical Exaggeration

- Auto Track
- Show Cursor Position
- Show Grid Lines
- Show Soundings
    - Show Rejected
    - Show Filtered
    - Show Edited
    - Show Normal
    - Show Additional
- Show Profile
- 3D Options
- Save to Image
- Save Snapshot

- Slice Editor Context Menu
    - Clear Selection
    - Invert Selection
    - Select Line
    - Select System
    - Select By
    - Reject
    - Accept
    - Set Suspect Flag
    - Clear Suspect Flag
    - Set Plotted Flag
    - Clear Plotted Flag
    - Set Feature Flag
    - Clear Feature Flag
- Manual Area Editing Mode
- Guided Area Editing Mode

- Scroll Selection Editing
- Sounding Editing

Slice Editor

The Slice Editor allows you to edit the soundings of your grid in a 2D projected widget. The Slice Editor uses any of the area selection modes but is primarily used with the *Fixed Slice Select* or *Free Slice Select*. Use of these modes is described in detail in section 4D Scene Toolbar.

To start slice editing, simply click the  button from the Bathymetry Toolbar. The 2 key is also the default hot key for this mode. This will create a default *Free Slice* selection in the middle of your Dynamic Grid. You can also create your own area selection to start. Slice editing works in either a *Manual Area, Guided Area* or *Linked Area* editing mode. All of these modes are described in detail below. If you are using *Rectangle*, *Freehand*, or *Polygon* selection mode, Qimera will load all of the soundings that fall within the selection in to the Slice Editor. If you are using *Fixed Slice* or *Free Slice*, Qimera will load only the soundings within the slice portion of the selection into the Slice Editor. The 4D Scene will show all of the soundings within the *Overview* area portion of a slice selection, or main selection if using any other selection mode. An example of this using the *Fixed Slice* selection is shown below.

The Slice Editor works in tandem with the 4D Scene and the Grid Editor Overview. See the specific sections on these windows for additional information. The key is that you can change the selection in either the 4D Scene or the Grid Edit Overview. The Grid Edit Overview allows you to maintain an awareness of your current edit area with respect to your entire survey. The Grid Edit Overview also allows you to see the progress of your editing and display a partitioned grid that allows you to systematically edit your grid. See the section on *Guided Editing* below for information on using a partition overlay.

For information on plot grid navigation and editing, see the page in the manual on Qimera Plotting Grids.

Remember that when the 4D Scene is in a selection mode, simply hold down the **SHIFT** key while using the mouse to perform normal navigation in the scene. If you are using the *Navigate By Default* from the Preferences Dialog, you need to hold down the **SHIFT** key to make a new selection.

Slice Editor Toolbar





Save Edits

This button will save any edits that have been completed.



Explore

This button places the window in *Explore* mode. As you move your cursor over the plot area, you will see a corresponding highlighted (white) sounding in the 4D Scene. Depending on what your *Color By* option is set to, you will see the position, *Ping Counter* (`File Unique Ping Identifier`), *Ping Number* (`Source Ping Identifier`), beam and *Color By* attribute value in the *Cursor Info* section of the widget. If the project has an active route, the KP and DX coordinates will be shown as well. See the section on Plotting Grids for more information on plot grid navigation and control.



Zoom In

This button places the cursor in *Zoom* mode. Please see the section on Plotting Grids for more information on plot grid navigation and control.



Reset Zoom

This button zooms out the plot window to the extents of the data. Please see the section on Plotting Grids for more information on plot grid navigation and control.



Reject Selection

This button places the cursor in *Reject Selection* mode. Holding down the CTRL key will invert the mode between *Reject* and *Accept*. Use the selection style and selection area drop down buttons to modify the selection style.

Accept Selection

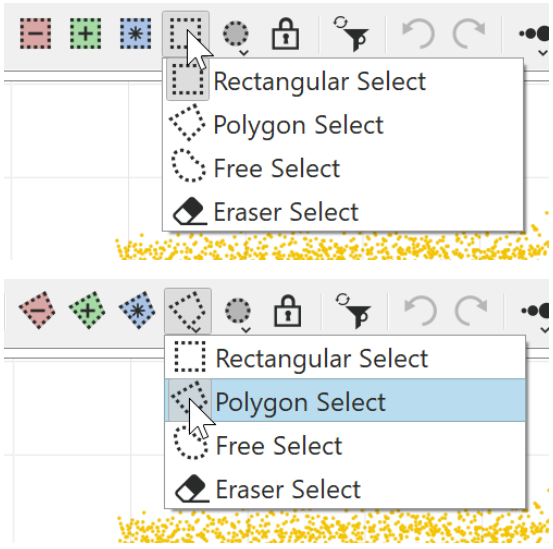
This button places the cursor in *Accept Selection* mode. Holding down the CTRL key will invert the mode between *Reject* and *Accept*. Use the selection style and selection area drop down buttons to modify the selection style.

Select and Edit

This button places the cursor in *Select and Edit* mode. *Select and Edit* mode allows you to select (or deselect) soundings in the slice view using the difference selection tools. Once you have the desired soundings selected, **right-click** on the plot grid to bring up the Slice Editor Context Menu to execute an action on the selected soundings. Holding down the CTRL key will invert the mode between select or deselect.

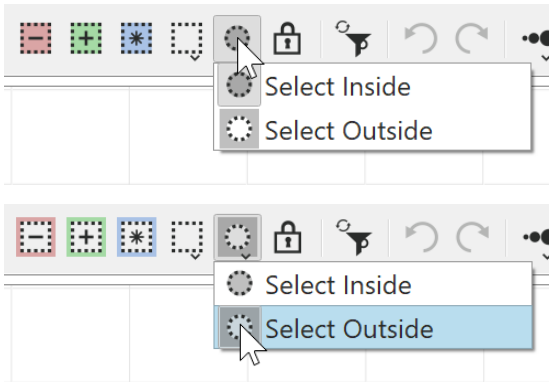
Selection Style

This button changes the selection style of both the *Reject* and *Accept* buttons. Clicking this will rotate through each of the styles, or long pressing will give you a drop down menu to select the style.



Selection Area

This button changes the selection area of both the *Reject* and *Accept* buttons. Clicking this will rotate through each of the areas, or long pressing will give you a drop down menu to select the area.



Lock Selection

This button will enable or disable selection locking, which can be used to automatically edit soundings that fall within the plot selection. *Reject* or *Accept Selection* mode enables this option and makes a selection, the selection will remain and *Reject* or *Accept* footprints as you move the slice through the scene. To clear the selection either disable this option or switch to explore.

See the section on Plot Grid Editing for more information about editing with these tools.

Run Filter Preview

This button activates the Filter Preview feature, applying the active filter profile on the chosen data subset without causing permanent changes. This facilitates the visualization of the active filter's effects on a specific set of points before applying it to either the current selection or the complete dataset using one of the various filter application features. The current filter profile can be viewed and modified in the Qimera Filter Profile Dock and the Filter Operation Toolbar. Any modifications made to the active filter profile will be immediately reflected in the filter preview. The filtered points will be easily distinguishable and color-coded, following the user-defined preferences found in the Qimera Preferences under the plotting colours section.

Run Filter Profile

This button will run the active filter profile on the data within the slice. For more information on managing, selecting and running filter profiles, see the Filter Operation Toolbar. Executing Filter Profiles in the Slice Editor obeys the same option configuration as standard editing. For example, if you are in *Save Edits Instantly* mode, the soundings that are rejected or accepted by the filter will be immediately saved back to the QPDs and the grid will be updated. If you have the *Edit Only Selected* option, the filter profile will run only on the selected lines in the slice.



Undo

This will undo the last operation. The undo buffer is pseudo-infinite and limited only by memory. So it will undo each edit in sequence. The Undo buffer clears when you move your selection.



Redo

This will redo the last undo operation. The undo buffer is pseudo-infinite and limited only by memory. So it will redo each undo edit in sequence. The Redo buffer clears when you move your selection.



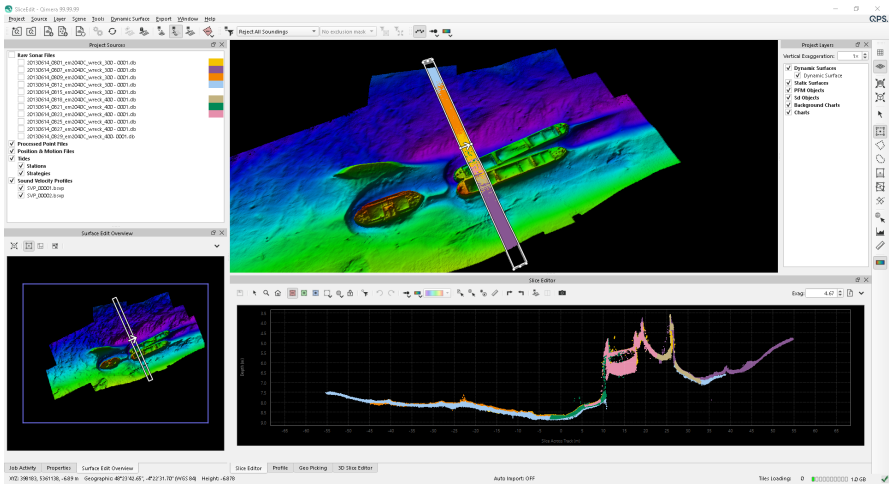
Plot Point Size

Clicking the first of these icons will change the point and line size drawn in the slice views of the widget. If you click and hold the button, it will display a menu where you can select point sizes between *Small* and *XX-Large*. Simply clicking will cycle through all sizes.



Plot Color By

Clicking the first of these icons will change the *Color By* mode of the points drawn in the widget. If you click and hold the button, it will display a menu where you can select the *Color By* option directly. The options for *Color By* are *Vessel (shows default port/stbd color), File, System, Ping Counter (*`File Unique Ping Identifier`*), Ping Number (*`Source Ping Identifier`*), Beam, Selection Depth (scaled to depth range of the pings in the plot), Grid Color Map (depths colored by the color map of the currently selected Dynamic Grid), Intensity, Horizontal TPU, Vertical TPU, Solid Color, and Cell-of-Interest*. For LAS/LAZ files, there are also color by options for *RGB* and *Classification*. When *Color By File* is used, you will additionally see the matching colors appear next to the line name in the Project Sources Dock as show below. When Color By *Solid Color* is used, the Colormap Settings will be replaced by the Color Button. When *Cell-of-Interest* is used, the cells will be colored according to the Flags set in the Flag-Grid-Cells dialog Qimera Flag Grid Cells .



 **Colormap Settings**

This will allow you to select and adjust a colormap for the points drawn in the widget. This allows for the same controls as users would have over the coloration of a Dynamic Grid: selecting a colormap, adjusting the range and editing a colormap. Some settings for Plot Color By do not allow access to a colormap, e.g. color by Vessel, File, System, *Ping Counter* (`File Unique Ping Identifier`), *Ping Number* (`Source Ping Identifier`), Beam and Grid Colormap.

 Color Button.

This will allow you to select a color for the points drawn in the widget. The color button is used for selecting a color for Color By Solid Color.

 **Select Info**

This button places the cursor into *Select Info* selection mode. When you click on a sounding in the plot window, it is highlighted as a white sphere in the scene. It will persist until you either change your selection or pick a new sounding. This way you can correlate what you see in the plot window to what you see in the 4D Scene. If you have the *Sounding Properties* window open, it will also fill in information about the sounding.

 **Geo Pick**

This button places the cursor into a *Geo-Pick* selection mode. When you click on a sounding in the plot window, a position entry is added to the Qimera Geo Pick Dock.


Add ENC Point Object

This button places the cursor in *ENC Point Creation* mode. Each time you click a sounding in the view, the *Create ENC Object* dialog will raise. To learn more about creating ENC objects, see the section on the Qimera ENC Editor Dock. Creating ENC point objects from soundings results in the VALSOU attribute of the feature being automatically assigned to the processed depth of the sounding.


Measure

This button places the cursor into measure mode. Using a **right-click** and drag, you see the Z Delta, X Delta and Range. This measurement is in plot coordinates.


Rotate Right

This button will immediately rotate the *Overview* part of the *Fixed Slice* and *Rectangular Selection* 90 degrees to the right. It will also rotate the *Slice* part of the *Free Slice Selection* 90 degrees to the right.


Rotate Left

This button will immediately rotate the *Overview* part of the *Fixed Slice* and *Rectangular Selection* 90 degrees to the left. It will also rotate the *Slice* part of the *Free Slice Selection* 90 degrees to the left.


3D Slice

This button will launch the embedded 3D Slice Editor, allowing for editing in Slice mode and 3D mode at the same time.


3D Slice Layout

The 3D Slice Layout button allows for control of how the 2D Slice and the 3D Slice plots are drawn. The different options are:

- Horizontal Split 2D/3D Slice: 2D and 3D slice editors share the same dock and are placed next to each other horizontally
- Vertical Split 2D/3D Slice: 2D and 3D slice editors share the same dock and are stacked vertically
- Docked 3D Slice: 3D Slice is drawn in a separate dock, which can be placed any where in the application, or floated independently of the 2D dock



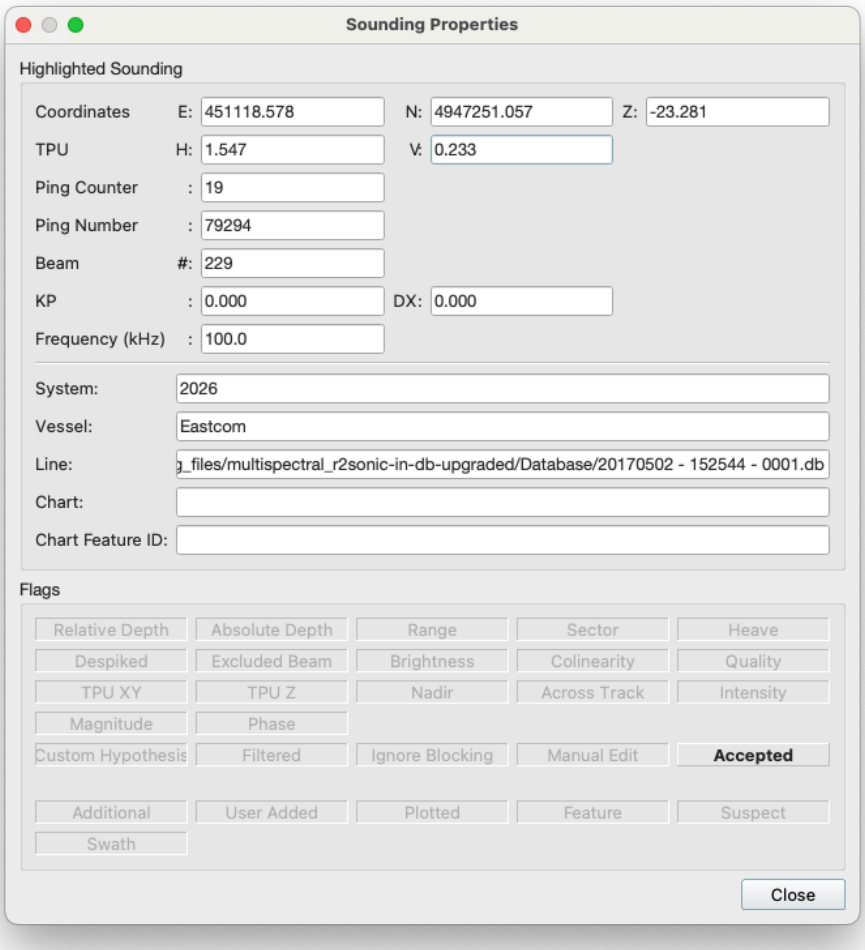
Snapshot

This button will save a Point SD object for the currently selected soundings in the scene and will appear under the **SD Objects** tree on the **Project Layers** widget. You have to be in *Selection and Edit* mode and have some soundings selected to use this feature. The snapshot SD will get the name *'Slice_Snapshot_#####'*. If you wish to use a specific name for the snapshot, use the *Slice Editor Menu* option *Save Snapshot* or hold down the **CTRL** key while you click the button. This will bring up a Save File dialog that will allow you to name the object. Snapshots are meant to be used as simple visual mark up cues in the working area to give you a method to easily keep track of items that you have reviewed, or to perhaps capture objects of interest that require further examination or analysis. You can use these objects as "bookmarks" in your data. To quickly navigate to their location, select them in the **SD Objects** tree and click the **Z** key or use the *Zoom to Object* button of the 4D Toolbar.



Show Sounding Properties

This button will display the Sounding Properties Dialog shown below. As you move your cursor over the soundings in the plot view, the information in the dialog will update accordingly. The top 2 sections of the dialog should be self explanatory. The *Flags Section* shows the detailed information about the QPD status flags for each sounding. If the button is bold and raised, the flag is set.





Head Visibility

With multi head data, Qimera will allow you to individually turn heads on or off during Slice Editing. The tool tip for each button will display the name of the head assigned to the button. You will only see these buttons when you have more than 1 head in your data.



Slice Editor Menu

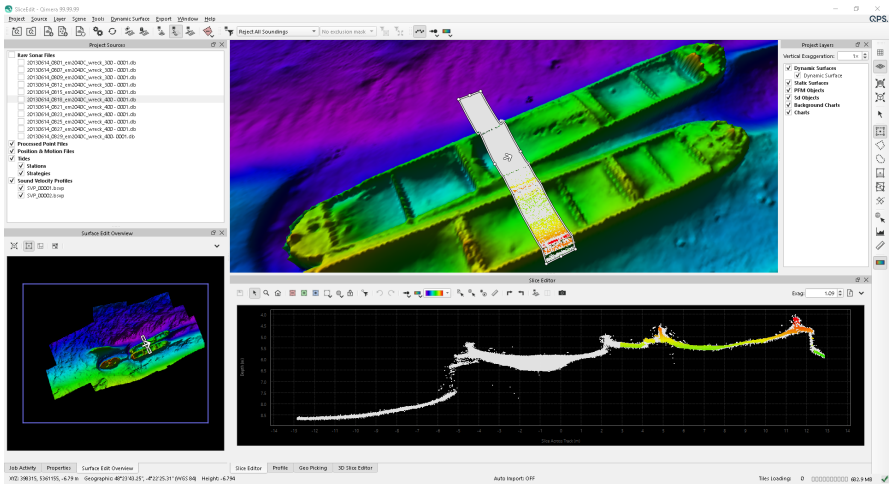
Auto Load Points

By default, when you change the selection location in the scene, the underlying points are automatically loaded to the slice editor. If you are working on large, dense data sets and like to refine your selection first, simply un-check this option and use the **ENTER** key to

load points to the slice editor. When you first start slice editor, it will do a normal auto load, but as you move your selection, it will not load points until after you hit the **ENTER** key. You can change this hotkey using the Hot Key Configuration panel accessed by the File Menu.

Edit Only Selected Files

This option allows you to edit specific lines that appear in your slice. You can select multiple lines from your Project Sources tree or you can **right-click** on a sounding and use the context menu to select the line the sounding belongs to. Lines that are not selected are drawn with a very light gray as shown in the example below. The soundings from the selected lines will always be drawn on top of the unselected lines in the plot view.



Show Unselected Files

This option allows you to show/hide unselected files when you are in the *Edit Only Selected Files* mode. This can greatly reduce the clutter when editing dense data.

Save Edits Manually

This option requires that you click on the Save button to save edits to your QPDs. After saving, any Dynamic Grid with *Update Mode* set to *Always* will immediately update. If you move your selection, you will be prompted to save any unsaved edits.

Save Edits Automatically

This option automatically saves edits when you exit the Slice Editing session or move your selection area. After saving, any Dynamic Grids with *Update Mode* set to *Always* will immediately update.

Save Edits Instantly

This option instantly saves edits when you reject or accept a sounding. After saving, any Dynamic Grid with *Update Mode* set to *Always* will immediately update.

Update Illumination

This option will ask Qimera to recompute illumination on the minimum bounding rectangle of your entire selection after re-gridding from saved edits. This is useful when you have "Cast Shadows" on for your Dynamic Grid. When you save edits in the Slice Editor, the grid only updates in the area of your edits. If you have shadows, your shadows may not be updated. You can use this option, along with an encompassing selection, to ensure that shadows are updated from your edits.

Automatically Apply Active Filter

This option will automatically run the currently active filter whenever the slice selection is moved. This mode is especially useful for "spike hunting". Where you choose an appropriate spline filter, and select an appropriate area with a spike on the grid. Choose the Save mode of your choice from the above options. Finally, **ALT-Left-Click** a new location containing a spike on the grid to automatically apply the filter to the new location.

Auto Set Flag on Select

This option will automatically set a specific bit flag when you make a selection of soundings. This option only works during the *Select and Edit* mode. You can automatically set the *Suspect, Plotted* or *Feature* flag. Decide which flags you want to select then using one of the selection modes, start selecting soundings. You can verify by clearing the selection and using the **Right-Click** context menu to *Select By* the flag of interest.

Auto Zoom

This option will cause the plot area to zoom to the extents of the visible soundings even while moving the slice in a selection. However, if you change the zoom using the zoom tool or the mouse wheel, you will stay in this zoom location. To allow Auto Zoom to work again, simply click on the *Reset Zoom* button.

Lock Vertical Exaggeration

This option locks the vertical exaggeration of the plot area while moving the slice selection.

Auto Track

This option will cause the 4D Scene to center on your current selection.

Show Cursor Position

This option will show a white point in the 4D Scene and the Grid Edit Overview that correlates to the sounding that your cursor is over in the plot area.

Show Grid Lines

This option will turn grid lines on/off in plot area.

Show Soundings

Show Rejected

This option controls visibility of rejected points in both the Slice and 4D Scene. Rejected points could have been rejected by the sonar manufacturer, a blocking filter, or through a manual editing operation. Rejected soundings are dark or light gray. Light gray specify soundings rejected via blocking filters. Other system or manually edited rejected soundings are dark gray.

Show Filtered

This options controls visibility of filtered soundings in both the Slice Editor and 4D Scene. If *Show Rejected* is on, you can decide to separately show/hide soundings that were rejected by a blocking filter. These soundings show up as light gray.

Show Edited

This option controls visibility of soundings that have been manually edited by the user. Editing covers both cases where the user manually rejects or accepts soundings. Once a sounding receives the *Edit* flag, no filter or reprocessing operation will ever change the sounding's accepted or rejected state. The *Edit* (rejected) flag is also set for *Additional* soundings during raw sonar file import. Qimera pays attention to the specific sonar topside settings (i.e. class types for Kongsberg files) to determine which to reject. The *Edit* (rejected) flag is also set for any interpolated soundings found during raw sonar file import. Remember that the user can always perform a manual edit operation to un-reject any soundings marked by Qimera as *Edit* (rejected) during import. See the description below about *Restoring* soundings.

Show Normal

This options controls visibility of *normal* soundings. These are soundings that are neither *interpolated* or considered as *additional*.

Show Additional

This option controls visibility of *additional* soundings. Teledyne Reson calls these "multi detect" soundings while Kongsberg calls these "extra" soundings. For Reson, all additional soundings are automatically accepted during import and the user must remove those that are not desired. For Kongsberg, only the classes that have been configured as visible in SIS during acquisition are accepted at the import stage. The other classes (including class 8) are marked as *rejected* by Qimera upon import, however, they are still imported can be reclaimed by the user by viewing the rejected soundings and re-accepting the desired soundings

Show Profile

This option will control the visibility of the central depth profile from the grid across the long axis of the selection area that is currently active. The profile will drawn as an overlay in the Slice Editor itself and also in the Scene.

3D Options

A sub-menu contains several draw options for the 3D Slice.

- All Grid - Enable/disable drawing of the background grid box entirely, including the grid, plane and coordinates
- Grid - Enable/disable drawing of the background 3D grid mesh
- Plane - Enable/disable drawing of the plane that is drawn underneath the point cloud
- Coordinates Enable/disable drawing of the axis coordinate labels associated with the plane that is drawn underneath the point cloud
- Show Grid - Enable/disable plotting of the Dynamic Grid within the 3D Slice
- Smooth Points - Draw points as smooth points (spheres with a black outline) or as squares
- Wireframe - Plot the Dynamic Grid as a wireframe
- Shaded - Plot the Dynamic Grid as a Shaded Grid
- Outline - Plot the Dynamic Grid as a Shaded Grid along with an outline of the grid cells

Save to Image

This option will save the plots to disk as separate filenames with the format

filename_Above.format or *filrename_Behind.format* or *filename_Side.format*

where *format* is your chosen image format (JPEG or PNG).

Save Snapshot

This does the same operation as the *Snapshot* button on the toolbar with the exception that you can explicitly name the SD file that is created.

Slice Editor Context Menu

The Context Menu is the primary tool for setting flags in the Slice Editor. Typically, you would first make a selection and then choose one of the options from the Edit Menu. If no soundings are selected when an Edit option is chosen, the operation will be applied to the highlighted sounding.

For example, to **quick reject/unreject** a single bad point, ensure no points are selected. Highlight the point by moving the mouse over it, then use the shortcut key **"alt-r"** to quickly **reject** the highlighted point. Similarly, to **unreject** a point, press **"alt-u"** after highlighting it.

When you switch to **Manual Edit mode** or activate the **Edit Only Selected mode**, you can right-click and choose **Reject/Accept** to **reject** or **accept** the selected points.

Both the Slice Editor and 3D Slice Editor feature a right-click context menu. The available options in this menu vary depending on the mode or context in which you're working.

Default Mode: In the default context, the standard right-click menu is displayed. The options available in this menu are detailed below.

2D slice:

- **Navigating with Shortcut Keys:** To load a new area, simply click in the desired direction or use one of the following movement shortcut keys:
  - **Step Forward:** W
  - **Step Backward:** S
  - **Step Left:** A
  - **Step Right:** D
- **Show Soundings:** A sub-menu provides various options to control the visibility of soundings.
- **Lock vertical exaggeration:** This option locks the vertical exaggeration of the plot area while moving the slice selection.
- **Auto zoom**: This option will cause the plot area to zoom to the extents of the visible soundings even while moving the slice in a selection. However, if you change the zoom using the zoom tool or the mouse wheel, you will stay in this zoom location. To allow Auto Zoom to work again, simply click on the Reset Zoom button.
- **Save to image…:** This option will save the plots to disk as separate filenames with the format
- **Save snapshot…:** This does the same operation as the *Snapshot* button on the toolbar with the exception that you can explicitly name the SD file that is created.

3D slice:

- **Navigating with Shortcut Keys:** To load a new area, simply click in the desired direction or use one of the following movement shortcut keys:

- **Step Forward:** W
- **Step Backward:** S
- **Step Left:** A
- **Step Right:** D

- **Show Soundings:** A sub-menu provides various options to control the visibility of soundings.
- **Lock vertical exaggeration:** This option locks the vertical exaggeration of the plot area while moving the slice selection.
- **Auto zoom**: This option will cause the plot area to zoom to the extents of the visible soundings even while moving the slice in a selection. However, if you change the zoom using the zoom tool or the mouse wheel, you will stay in this zoom location. To allow Auto Zoom to work again, simply click on the Reset Zoom button.
- **3D options:** A sub-menu contains several draw options for the 3D Slice.
- **Save to image…:** This option will save the plots to disk as separate filenames with the format
- **Save snapshot…:** This does the same operation as the *Snapshot* button on the toolbar with the exception that you can explicitly name the SD file that is created.

Manual Edit or **Edit Only Selected Mode:** When you switch to Manual Edit mode or activate the Edit Only Selected mode, a different right-click menu is presented. The options for this alternate menu are outlined below.

Clear Selection

This option will clear the current selection.

Invert Selection

This option will invert the current selection.

Select Line

This option will select all soundings that match the line of the current sounding. The current sounding is the one under the cursor. When in *Explore* mode, you will see a red X appear over the sounding as you move your cursor around the plot.

Select System

This option will select all soundings that match the system of the current sounding. The current sounding is the one under the cursor. When in *Explore* mode, you will see a red X appear over the sounding as you move your cursor around the plot.

Select By

This option will select the soundings based on the desired flag or attribute. These are categorized in the table below.

Select By	Description
Shoalest	This will select a single sounding with the minimum depth in the current slice.
Deepest	This will select a single sounding with the maximum depth in the current slice.
Suspect	This will select all soundings with the *Suspect* flag set.
Plotted	This will select all soundings with the *Plotted* flag set.
Feature	This will select all soundings with the *Feature* flag set.
Additional	This will select all soundings with the *Additional* flag set. These are soundings generated by sonars returning more than one solution per beam.
Interpolated	This option is deprecated and will be removed in a future version of Qimera
Blocking Flags: Relative Depth, Absolute Depth, Range, Sector, Heave, Excluded (beam), Brightness, Colinearity, Despiked, Horizontal TPU, Vertical TPU, Quality, Nadir, Across Track, Intensity	This will select all soundings with the selected flag set. For more information on these flags. Please the section on Blocking.

Select By	Description
Filter	This will select all soundings with the *Filter* flag set. This flag is set when certain *Filter Profiles* are run. See the section on Filter Profiles for more information.

These include *Line, System, Suspect, Plotted, Feature, Additional, Interpolated* and the blocking/filtering flags for *Relative Depth, Absolute Depth, Range, Sector, Heave, Excluded, Brightness, Colinearity, Despiked, Horizontal TPU, Vertical TPU, Quality, Nadir, Across Track, Intensity, Spline* and *Cube*.

Reject

Reject the currently selected soundings.

Accept

Accept the currently selected soundings.

Set Suspect Flag

Set the *Suspect* flag for the currently selected soundings.

Clear Suspect Flag

Clear the *Suspect* flag for the currently selected soundings.

Set Plotted Flag

Clear the *Plotted* flag for the currently selected soundings.

Clear Plotted Flag

Clear the *Plotted* flag for the currently selected soundings.

Set Feature Flag

Set the *Feature* flag for the currently selected soundings.

Clear Feature Flag

Clear the *Feature* flag for the currently selected soundings.

Set Classification...

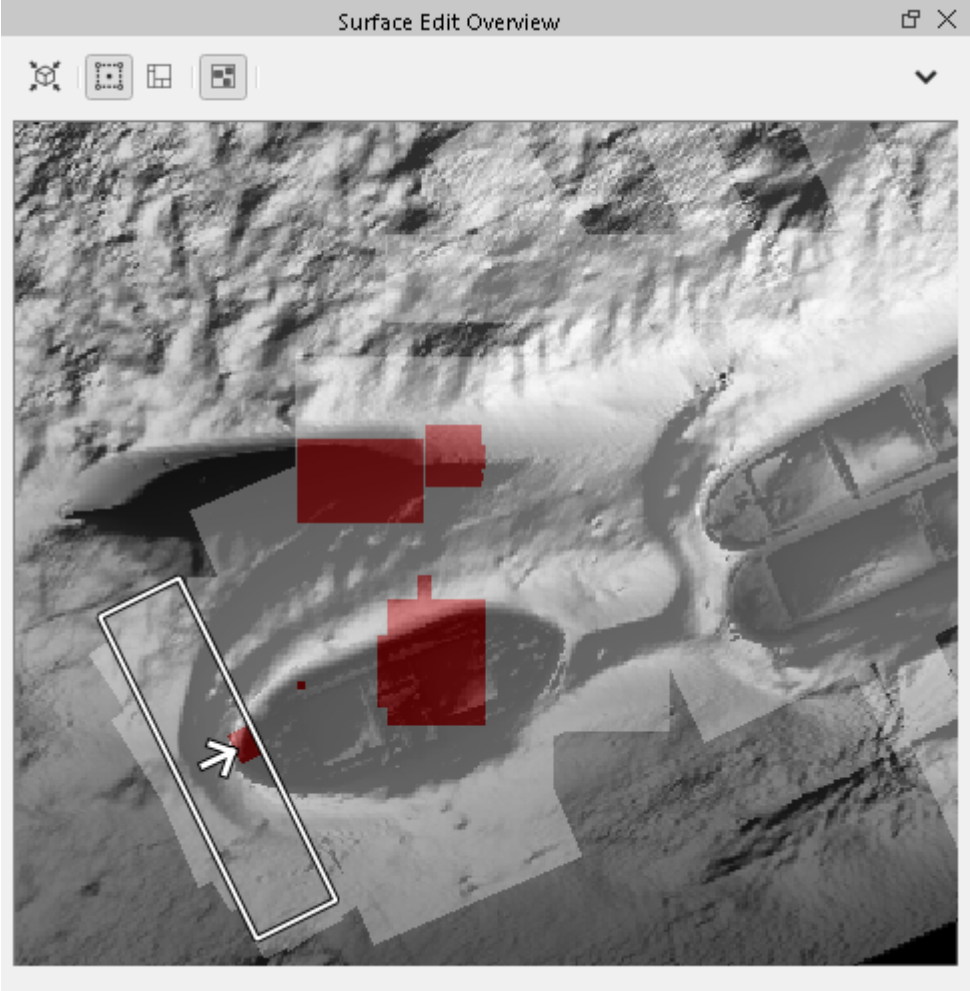
Launch the Qimera Set LAS Classification dialog.

Set Classification to:

Set selected points classification to the most recently used classification set in the Qimera Set LAS Classification dialog.

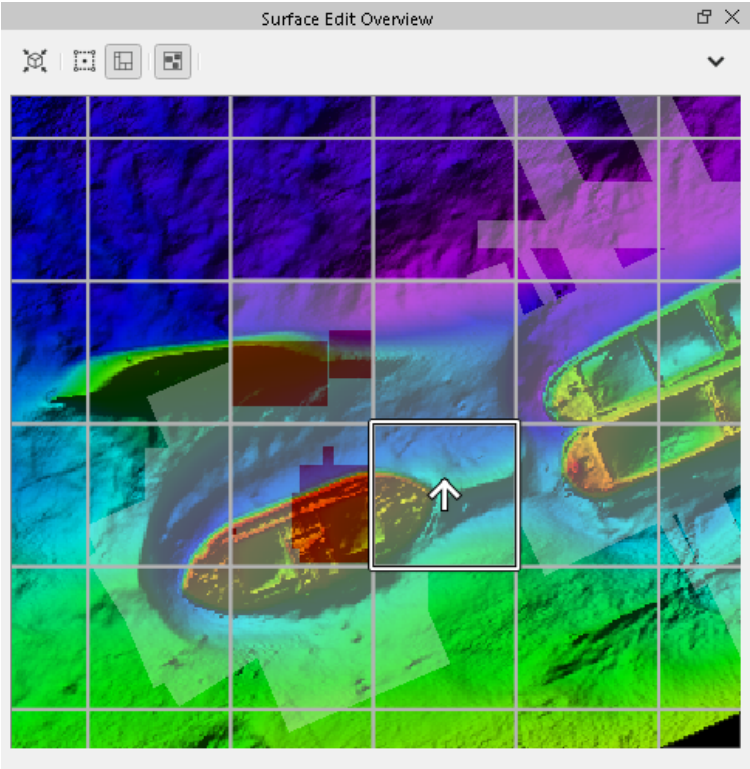
Manual Area Editing Mode

Manual Editing is the default state of the Slice Editor. You simply create a selection area on your Dynamic Grid using any of the area selection tools, do your editing, then move your selection to a new area on the grid. You can change your selection in either the 4D Scene or the Grid Edit Overview. If you have the *Show Visited/Edited* option enable for the Grid Edit Overview, you will be able to see which parts of the Dynamic Grid you have visited (loaded in the slice editor) and which areas you have edited. You can see an example of this below. The visited areas are a transparent white shape that matches the selection where as the edited areas are a transparent red rectangle based on the extents of the soundings you have updated.



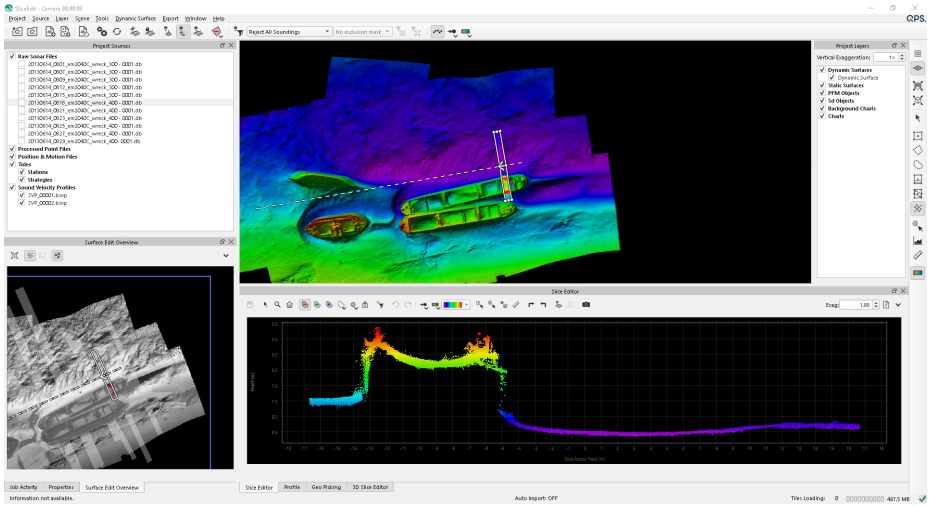
Guided Area Editing Mode

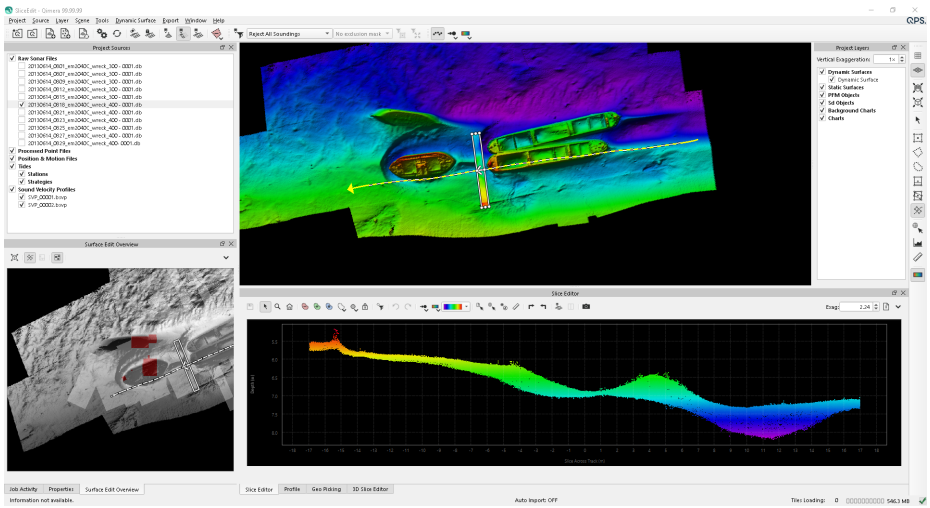
Guided editing mode allows you to do systematic review of your Dynamic Grid. You can use *Fixed Slice, Free Slice,* and *Rectangular Selection* when using a *Partition Grid*. Be sure to read the section on the *Free Slice*, *Fixed Slice* and *Rectangular* selection modes in the section on the 4D Toolbar. Guided Editing ensures that you review the entire grid and limit the amount of soundings that are loaded to the Slice Editor in order to maintain responsiveness. Guided editing mode involves the use of a *Partition Grid* to organize your selections. See how to create a partition grid in the section on the Grid Edit Overview. An example of a grid partition used for guided editing is shown below. To load a new area, simply click in a tile of the partition grid or use one of the movement shortcut keys (W, S, A, D) along with the **SHIFT** modifier. The selection will automatically load the new tile area and you can move the slice through your data. As you move and edit, the *Visited/Edited* overlay is automatically updated.



Scroll Selection Editing

Scroll Selection Editing has replaced the previous Linked Editing mode. You use the Scroll Line Select mode to define a slice area and the line it will follow. See the section on the 4D Toolbar for more information on using this cursor mode. When you are in this mode, you can **CTRL-click** any existing line in the scene to attach your scroll line. You can move along the line by using the standard 4D Scene drag behavior of the rectangular selection, or, simply use the W and S hotkeys. When you are stopped, you can rotate the selection in any direction. When you stop, the soundings within the current selection will be loaded to the scene. The left image below shows a custom defined scroll line. The right image shows the scroll line defined via a **CTRL-click** on an existing track line in the scene.

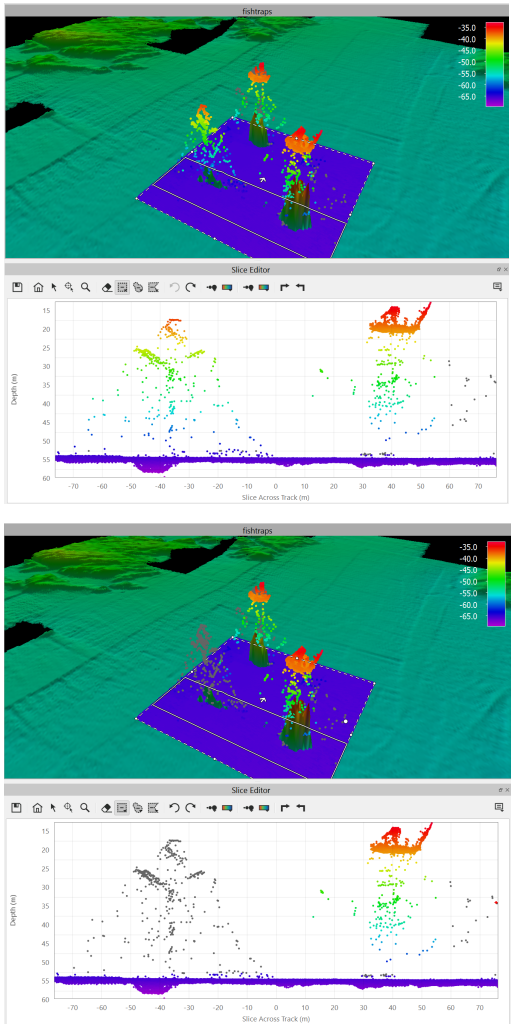




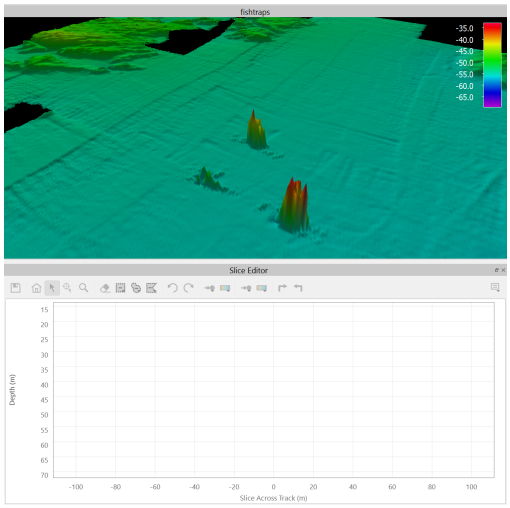
Sounding Editing

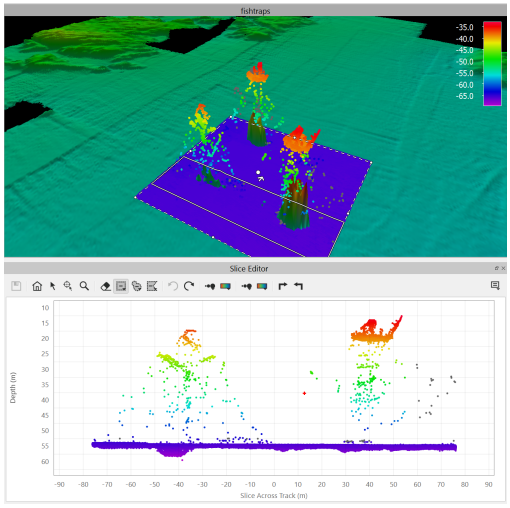
Sounding editing occurs inside the Slice Editor Widget. By default, as you select soundings in the Slice Editor, they are automatically rejected. Depending on what you have set for the *Show Soundings* option, you can also see the rejected soundings as gray points. All accepted soundings are colored by the current *Color By* mode. A before/after example is shown below with *Show Rejected* on. This examples uses the *Save Edits Manually* so the grid will not update until you click on the *Save* icon in the toolbar. This example uses a simple rectangular selection.

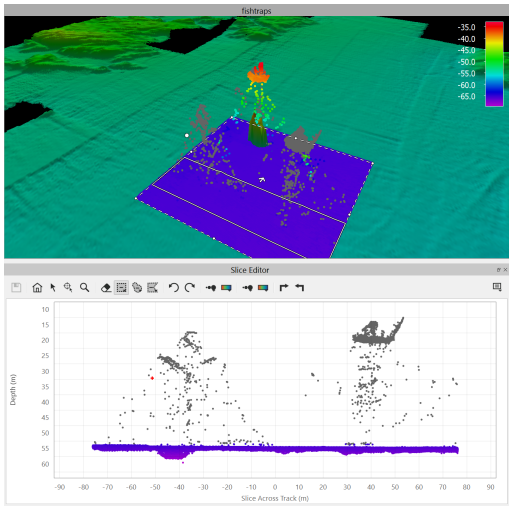
> The images below were intentionally not updated for this version as the behavior remains the same. The only change is with the addition of new toolbar icons which are described above.

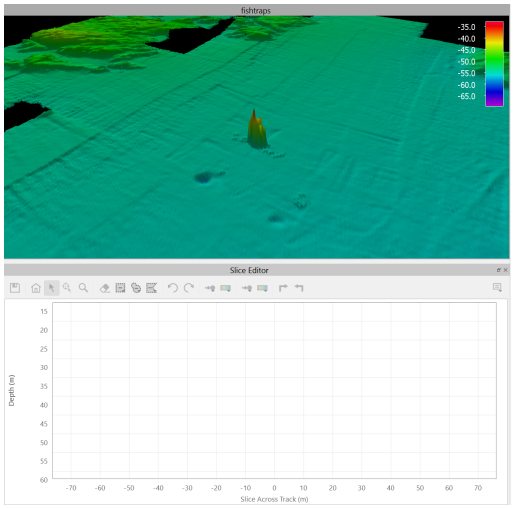


As you can see, the slice view and the 3D view are the same. If you turn off *Show Rejected*, you will not see the soundings that you have rejected. Below is another example using the *Save Edits Instantly* option. In this case, all of the soundings above the primary seafloor are removed. There are 4 images which represent *Before Edits*, *During Editing, After Editing Selection* and *After Editing*.


fishtraps
-35.0
-40.0
-45.0
-50.0
-55.0
-60.0
-65.0
Slice Editor
Depth (m)
Slice Across Track (m)

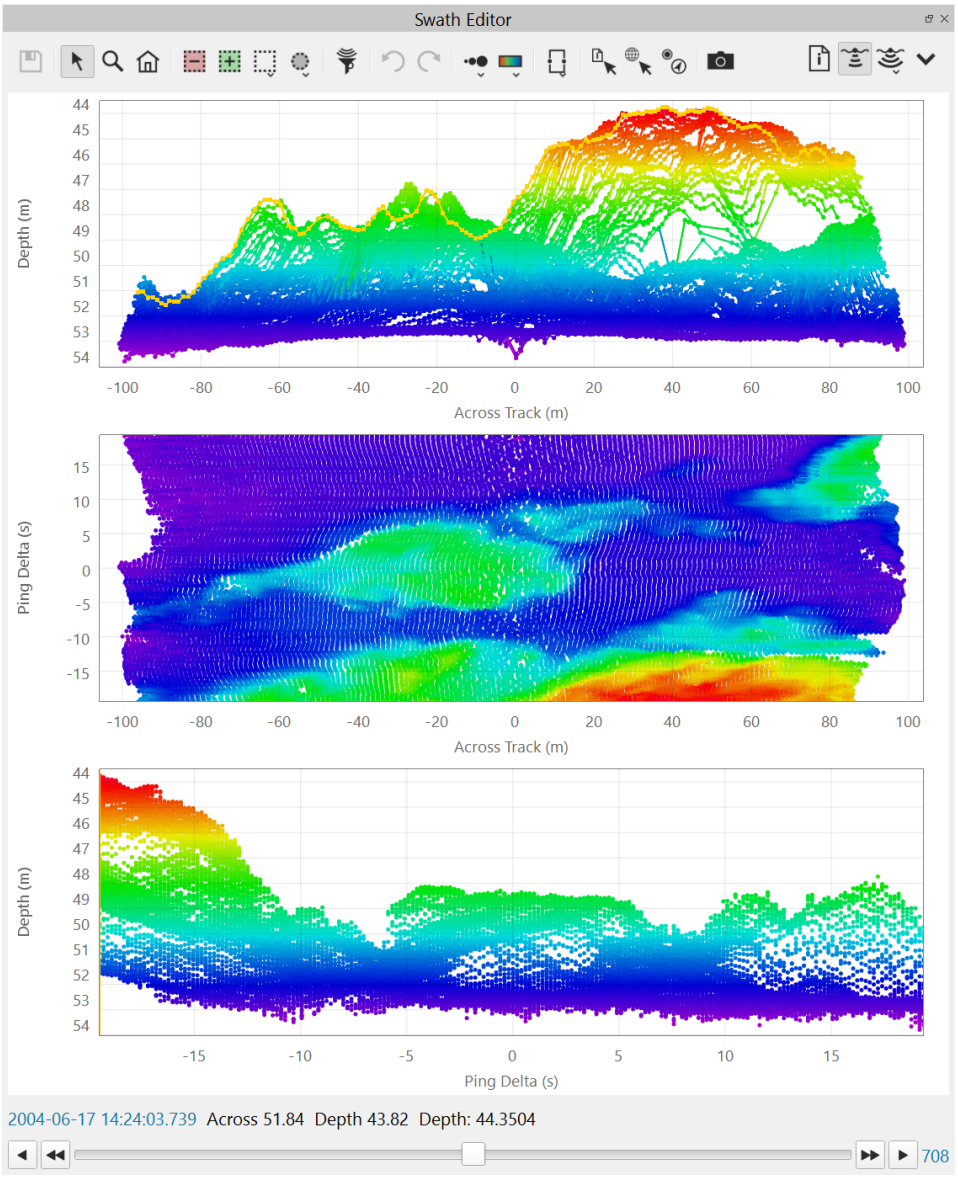

fishtraps
-35.0
-40.0
-45.0
-50.0
-55.0
-60.0
-65.0
Slice Editor
Depth (m)
Slice Across Track (m)


fishtraps
-35.0
-40.0
-45.0
-50.0
-55.0
-60.0
-65.0
Slice Editor
Depth (m)
Slice Across Track (m)



When sounding editing, simply hold down the **SHIFT** key while using the left mouse to pan

Qimera Swath Editor Dock



- Qimera - Swath Editor
  - Toolbar
    - Save Edits
    - Explore
    - Zoom In
    - Reset Zoom
    - Blocking Settings
    - Undo

- Redo
- Plot Point Size
- Plot Color By
- Colormap Settings
- Swath Buffer
- Select Info
- Geo Pick
- Add ENC Point Object
- Snapshot
- Show Sounding Properties
- Head Visibility
- Port/Starboard Visibility

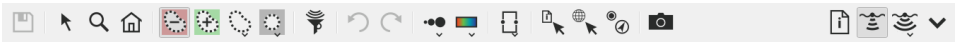
- Menu Options
  - Behind
  - Above
  - Side
  - Auto Zoom
  - Auto Track
  - Draw Lines
  - Auto Contrast
  - Show Grid Lines
  - Show Soundings Options
    - Show Rejected
    - Show Filtered
    - Show Edited
    - Show Normal
    - Show Additional
    - Show Interpolated
  - Jump to Ping Group

- Jump to Timestamp
- Save to Image
- Save Snapshot
- Slider Bar

Qimera - Swath Editor

The Swath Editor allows you to edit soundings directly from a specific processed raw sonar file. After editing is complete, the saved edits will automatically update any associated Dynamic Grid. To start, select a raw sonar file that has been processed from your project. Click on the  button from the Bathymetry Toolbar. For information on plot grid navigation and editing, see the manual on Qimera Plotting Grids.

Toolbar



 **Save Edits**

This button will save any edits that have been completed.

 **Explore**

This button places the window in *Explore* mode. Please see the section on Plotting Grids for more information on plot grid navigation and control.

 **Zoom In**

This button places the cursor in *Zoom* mode. Please see the section on Plotting Grids for more information on plot grid navigation and control.

 **Reset Zoom**

This button zooms out the plot window to the extents of the data. Please see the section on Plotting Grids for more information on plot grid navigation and control.

Reject Selection

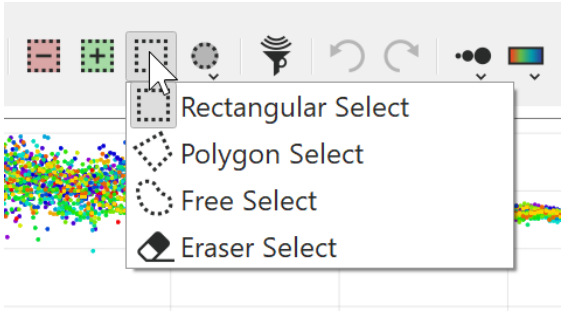
This button places the cursor in *Reject/Delete Selection* mode. Holding down the CTRL key will invert the mode between *Reject* and *Accept*. Use the selection style and selection area drop down buttons to modify the selection style.

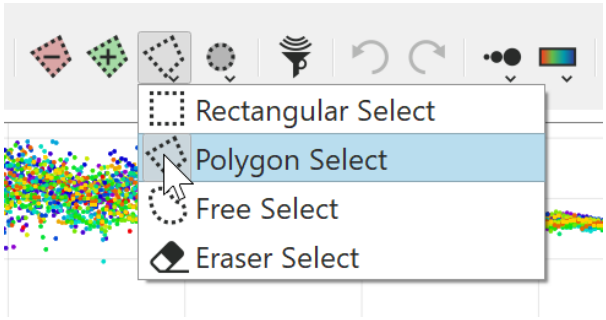
Accept Selection

This button places the cursor in *Reject Selection* mode. Holding down the CTRL key will invert the mode between *Reject* and *Accept*. Use the selection style and selection area drop down buttons to modify the selection style.

Selection Style

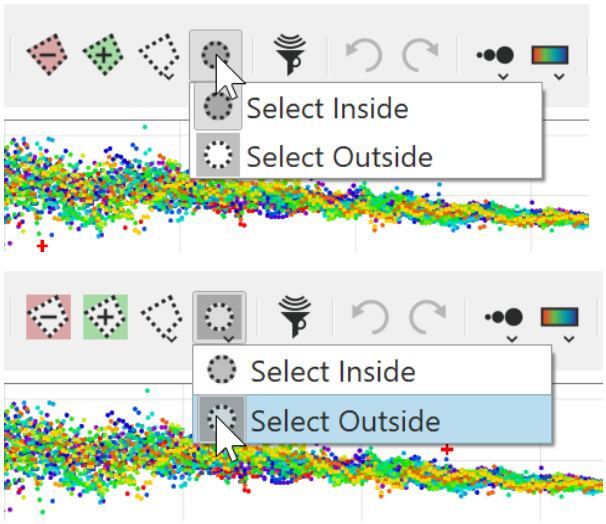
This button changes the selection style of both the *Reject* and *Accept* buttons. Clicking this will rotate through each of the styles, or long pressing will give you a drop down menu to select the style.





Selection Area

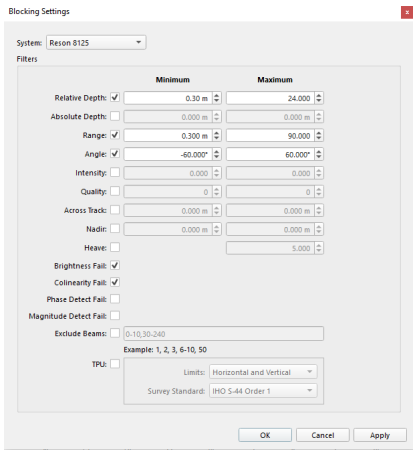
This button changes the selection area of both the *Reject* and *Accept* buttons. Clicking this will rotate through each of the areas, or long pressing will give you a drop down menu to select the area.



See the section on Plot Grid Editing for more information about editing with these tools.

Blocking Settings

This button launches the *Blocking Settings* dialog shown below which allows you to adjust blocking filter settings for the loaded file. When you click *Apply* or *Ok*, you will see the effects immediately in the Swath Editor and in the 4D Scene (rejected/accepted points will have color coding changed accordingly). Note that Dynamic Grids will NOT update until the session edits are Saved. This has the same operational capability as the *Blocking* tab in the *Processing Settings* dialog but allows you to *preview* what effect a particular filter settings will have on the data.



Blocking Settings Dialog



Undo

This will undo the last operation. The undo buffer is pseudo-infinite and limited only by memory. So it will undo each edit in sequence.



Redo

This will redo the last undo operation. The undo buffer is pseudo-infinite and limited only by memory. So it will redo each undo edit in sequence.



Plot Point Size

Clicking the first of these icons will change the point and line size draw in the swath views of the widget. If you click and hold the button, it will display a menu where you can select point sizes between *Small* and *XX-Large*.



Plot Color By

Clicking the first of these icons will change the *Color By* mode of the points drawn in the swath views of the widget. If you click and hold the button, it will display a menu where you can select the *Color By* option directly. The options for color by are *Vessel (shows default Port/STBD color), File, System, Ping Counter (*File Unique Ping Identifier*), Ping Number (*Source Ping Identifier*), Beam, Selection Depth (scaled to depth range of the pings in the plot), Grid Color Map (depths colored by the color map of the currently selected Dynamic Grid) , Intensity, Horizontal TPU, Vertical TPU and Solid Color*. When Color By *Solid Color* is used, the Colormap Settings will be replaced by the Color Button.



Colormap Settings

This will allow you to select and adjust a colormap for the points drawn in the widget. This allows for the same controls as users would have over the coloration of a Dynamic Grid: selecting a colormap, adjusting the range and editing a colormap. Some settings for Plot Color By do not allow access to a colormap, e.g. color by Vessel, File, System, Ping Counter (File Unique Ping Identifier), Ping Number (Source Ping Identifier), Beam and Grid Colormap.



Color Button.

This will allow you to select a color for the points drawn in the widget. The color button is used for selecting a color for Color By Solid Color.


Swath Buffer

Click and hold this button to get a spin box allowing you to change the size of the buffer. Currently, the buffer is limited to a maximum buffer width of 201 pings.


Select Info

This button places the cursor into *Select Info* selection mode. When you click on a sounding in the plot window, it is highlighted as a white sphere in the scene. It will persist until you either change your selection or pick a new sounding. This way you can correlate what you see in the plot window to what you see in the 4D Scene. If you have the *Sounding Properties* window open, it will also fill in information about the sounding.


Geo Pick

This button places the cursor into a *Geo-Pick* selection mode. When you click on a sounding in the plot window, a position entry is added to the Qimera Geo Pick Dock.


Add ENC Point Object

This button places the cursor in *ENC Point Creation* mode. Each time you click a sounding in the view, the *Create ENC Object* dialog will raise. To learn more about creating ENC objects, see the section on the Qimera ENC Editor Dock. Creating ENC point objects from soundings results in the VALSOU attribute of the feature being automatically assigned to the processed depth of the sounding.


Snapshot

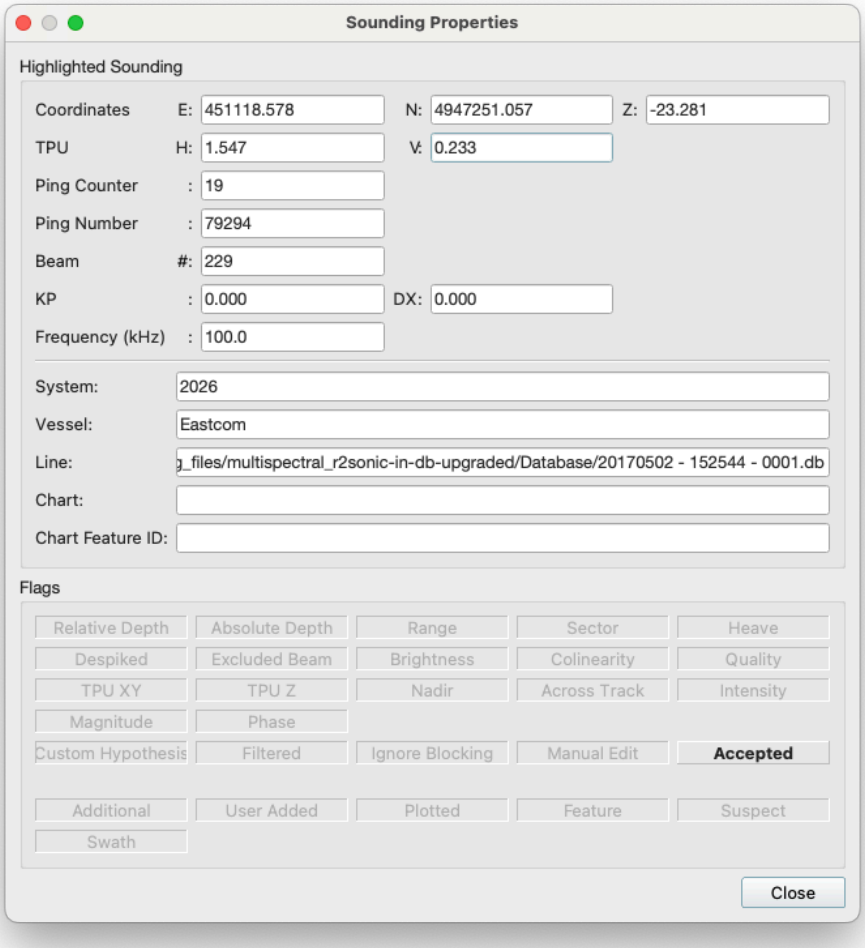
This button will save a Point SD object for the currently selected soundings in the scene and will appear under the **SD Objects** tree on the **Project Layers** widget. The snapshot SD will get the name *'Swath_Snapshot_#####* '. If you wish to use a specific name for the snapshot, use the *Swath Editor Menu* option *Save Snapshot* or hold down the **CTRL** key while you click the button. This will bring up a Save File dialog that will allow you to name the object. Snapshots are meant to be used as simple visual mark up cues in the working area to give you a method to easily keep track of items that you have reviewed, or to perhaps capture objects of interest that require further examination or analysis. You can

use these objects as "bookmarks" in your data. To quickly navigate to their location, select them in the **SD Objects** tree and click the **Z** key or use the *Zoom to Object* button of the 4D Toolbar .



Show Sounding Properties

This button will show the Sounding Properties Dialog shown below. As you move your cursor over the soundings in the plot view, the information in the dialog will update accordingly. The *Flags Section* shows the detailed information about the QPD status flags for each sounding. If the button is bold and raised, the flag is set.





Head Visibility

With multi-head data, Qimera will allow you to individually turn heads on or off during swath editing. The icon displays the vessels relative direction of the heads in the file. The tool tip for these buttons will display the name of the head assigned to the button. There are 3 potential representations of these buttons. Port facing, down facing and starboard facing. You will only see these buttons when you have more than 1 head in your data.

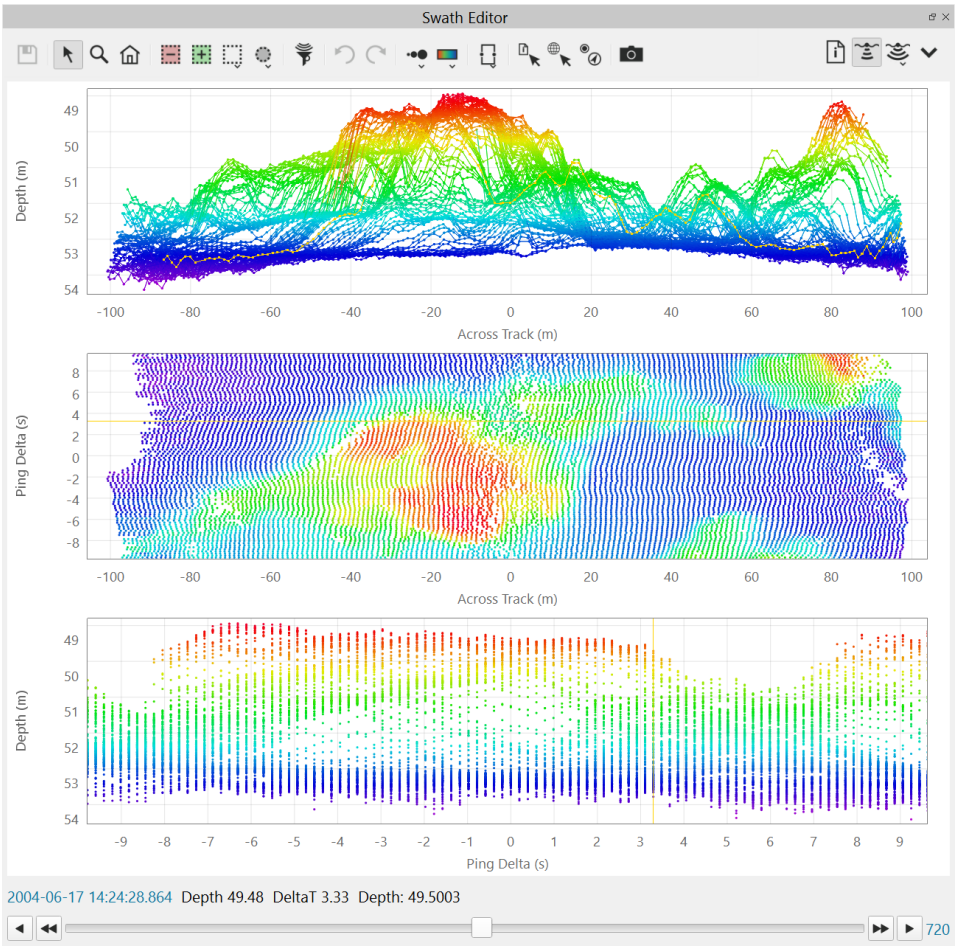
 **Port/Starboard Visibility**

This button is a multi-state button control which soundings are visible relative to the vessel. You can cycle options by clicking, or, if you click and hold, a drop down menu appears with the options and their descriptions. The options are full swath, port swath or starboard swath.

 Menu Options

This button brings up the drop down menu. Description of these options follows.

There are 3 synchronized swath modes that can be shown or hidden. Editing can occur in any of these views. When the mouse moves over the *Above or Side* views, the current ping is rendered in yellow and you will see synchronized views of the data in the Qimera 4D Scene, Time Series Plot window and Water Column window.



Behind

This option shows the view of the swath from behind the vessel. This is the top panel shown above.

Above

This option shows the view of the swath from above the grid. This is the middle panel shown above.

Side

This option shows an oblique view of the swath. This is the bottom panel shown above.

Auto Zoom

This option automatically keeps the bounds of the plot around the current swath buffer. If *Show Rejected* is unselected, the plot will zoom after each edit.

Auto Track

This option automatically keeps the swath centered in the 4D Scene.

Draw Lines

This option controls the visibility of lines connecting the soundings in the *Behind* view.

Auto Contrast

When *Color By* is intensity, Qimera will automatically adjust the grey-scale to maximize the contrast of the imagery data. This is done uniquely for each ping buffer currently in the view and will thus adjust dynamically as you progress through the file encounter different seabed types.

Show Grid Lines

This option will show/hide grid lines in the plot.

Show Soundings Options

Show Rejected

This option controls visibility of rejected points in both the Swath Editor and 4D Scene. Rejected points could have been rejected by the sonar manufacturer, a blocking filter, or through a manual editing operation. Rejected soundings are dark or light gray. Light gray specify soundings rejected via blocking filters. Other system or manually edited rejected soundings are dark gray.

Show Filtered

This option controls visibility of filtered soundings in both the Swath Editor and 4D Scene. If *Show Rejected* is on, you can decide to separately show/hide soundings that were rejected by a blocking filter. These soundings show up as light gray.

Show Edited

This option controls visibility of soundings that have been manually edited by the user. Editing covers both cases where the user manually rejects or accepts soundings. Once a sounding receives the *Edit* flag, no filter or reprocessing operation will change the sounding's accepted or rejected state. The *Edit* (rejected) flag is also set for *Additional* soundings during raw sonar file import. Qimera pays attention to the specific sonar topside settings (i.e. class types for Kongsberg files) to determine which to reject. The *Edit* (rejected) flag is also set for any interpolated soundings found during raw sonar file

import. Remember that the user can always perform a manual edit operation to un-reject any soundings marked by Qimera as *Edit* (rejected) during import. See the description below about *Restoring* soundings.

Show Normal

This option controls visibility of *normal* soundings. These are soundings that are neither *interpolated* or considered as *additional*.

Show Additional

This option controls visibility of *additional* soundings. Teledyne Reson calls these "multi detect" soundings while Kongsberg calls these "extra" soundings. For Reson, all additional soundings are automatically accepted during import and the user must remove those that are not desired. For Kongsberg, only the classes that have been configured as visible in SIS during acquisition are accepted at the import stage. The other classes (including class 8) are marked as *rejected* by Qimera upon import, however, they are still imported can be reclaimed by the user by viewing the rejected soundings and re-accepting the desired soundings.

Show Interpolated

This option controls visibility *interpolated* soundings. These soundings are created only by Kongsberg multibeam echosounders. By default, these are automatically *rejected* by Qimera during import.

Jump to Ping Group

This option will launch a dialog that allows jumping to a specified ping group on the current selected line in the Swath Editor.

Jump to Timestamp

This option will launch a dialog that allows jumping the swath editor to a desired timestamp relative ping. This method of jumping is not constrained by the current selected line loaded into the swath editor but is constrained to files with the same 'Vessel Name' or 'Vessel ID'. If the selected timestamp is not within the time bounds of the relative files, an informational dialog will be displayed.

Save to Image

This option will save the plots to disk as separate filenames with the format

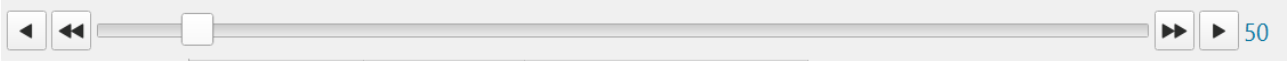
filename_Above.format or *filename_Behind.format* or *filename_Side.format*

where *format* is your chosen image format (JPEG or PNG).

Save Snapshot

This does the same operation as the *Snapshot* button on the toolbar with the exception that you can explicitly name the SD file that is created.

Slider Bar



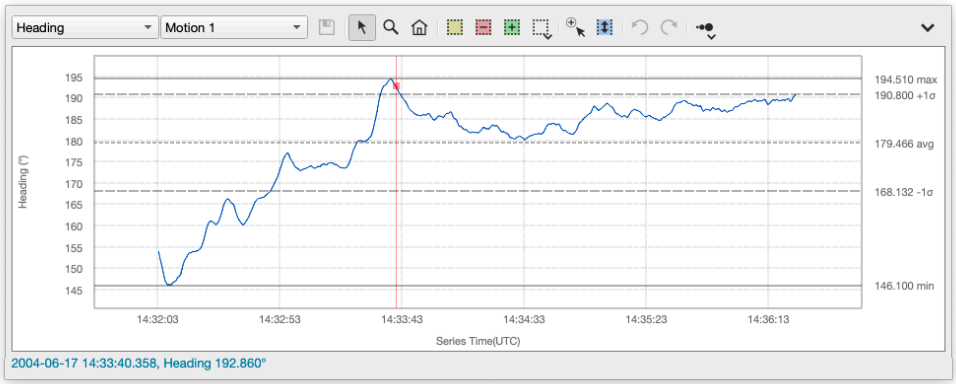
The slider bar is used to navigation the swath buffer along the current track line. As you move the slider, all plot views update in the Swath Editor as well as the temporally synchronized views in the Water Column window, Time Series Plot windows and the Qimera 4D Scene. The current ping group number at the center of the buffer is displayed in the label at the right of the widget. You can also use the shortcut keys **W** and **S** to move forward or back 1 full buffer.

- This button will move the swath back 1 full buffer length.
- This button will move the swath back 1 ping group.
- This button will move the swath forward 1 full buffer length.
- This button will move the swath forward 1 ping group.

Return to: *Qimera Interface*

Return to: *Dockable Windows*

Qimera Time Series Editor Dock



- Qimera - Time Series Editor
  - Toolbar
  - Combo Boxes
  - Save Button
  - Explore Mode
  - Zoom Mode
  - Zoom Out Button
  - Interpolation Edit Mode
  - Invalidate Edit Mode
  - Validate Edit Mode
  - Change Selection
  - Insert Mode
  - Move Mode
  - Undo Button
  - Redo Button
  - Time Series Plot Menu
    - Show Statistics
    - Show Height at COG
    - Line Plot

- Point Plot
- Bar Plot
- Export to ASCII
- Save to Image
- Revert Time Series to Original
- Show Grid Lines

Qimera - Time Series Editor

The Time Series Editor Window is used to display all relevant time series data for the currently selected item in the Source Files Panel. This data was extracted during the initial import of the source file and is stored inside the Qimera project under the *Metadata* folder for the line. As you move your cursor over the data, the current time and value are displayed in the lower left corner of the panel. Control of the display is managed by the toolbar shown below. Any edits that are performed and saved in this window will trigger a reaction from the Dynamic Workflow engine.

The time-series editor is not only an editor, it can also be used as a quality assurance tool to verify consistency in measurements between two or more instruments. It does this by plotting the measurements from all sensors associated with the particular source item. For example, if you have a source file with two motion sensors, the data from both sensors will be displayed simultaneously. The various types of measurements shown in the editor will update when changes are made to the associated sensor in the Qimera Vessel Editor. This includes the sensor's sign conventions (e.g. heave positive up vs. heave positive down), sensor latency and also the sensor bias or calibration offset. This allows you to verify that measurements are consistent across a variety of sensors. If sensors are providing inconsistent measurements, this will be immediately evident in the time-series plots. If you decide to correct the configuration in the Qimera Vessel Editor, the the plot will update immediately after you save your changes and you will be able to confirm the validity of the sensor configuration change.

For information on plot grid navigation and editing, see the page in the manual on Qimera Plotting Grids

Toolbar



Combo Boxes

The first combo box is used to change the specific attribute. Examples of attributes are X/Y position, roll, pitch, height, heading, heave, tide, standard deviations etc. The second

combo box selects the specific source of the attribute as some attributes can come from multiple redundant sources on the vessel. If you have multiple sources, the currently selected source will be drawn in blue. The other sources will be drawn in gray.

 Save Button

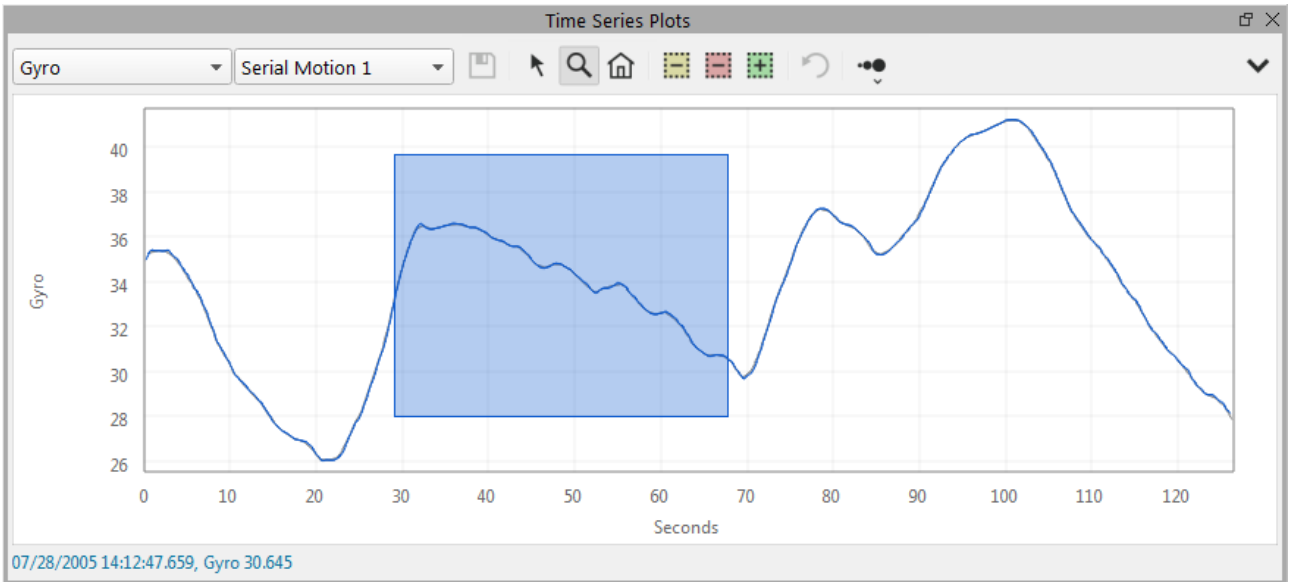
This will save any edits done to the time series. Again, saving edits will trigger a reaction from the Dynamic Workflow engine.

 Explore Mode

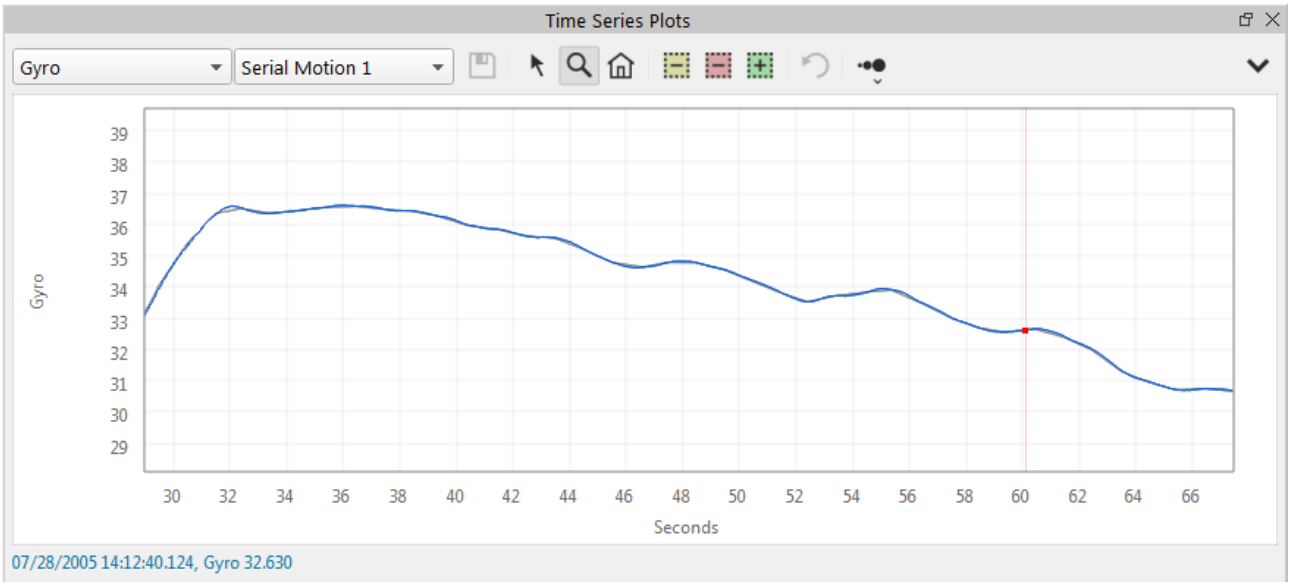
This is the primary exploration mode of the tool. As you move your cursor over the plot, the label in the lower left of the window will update to show the current time, value, and if loaded in the project, the KP of the cursor location. If you have loaded any Route Layers a KP will be displayed. A tracking ball will follow the location in time along the currently selected track series in the **4D View**.

 Zoom Mode

When in zoom mode, simply click and drag an area of the plot to zoom into. Or simply single click a location to zoom in a bit on it. Alt-click a location to zoom out a bit. Or hit the Home button to return to the full extents of the data. At any time, you can Shift-Click to drag the plot to a new location. This is especially useful when you are zoomed in. You can always undo an edit using the **Undo** button. Once you are satisfied with your edits, you must press the **Save** button.



Zoom Mode Rectangle Selection

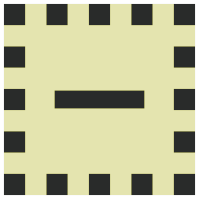


Zoom Mode Rectangle Selection Result



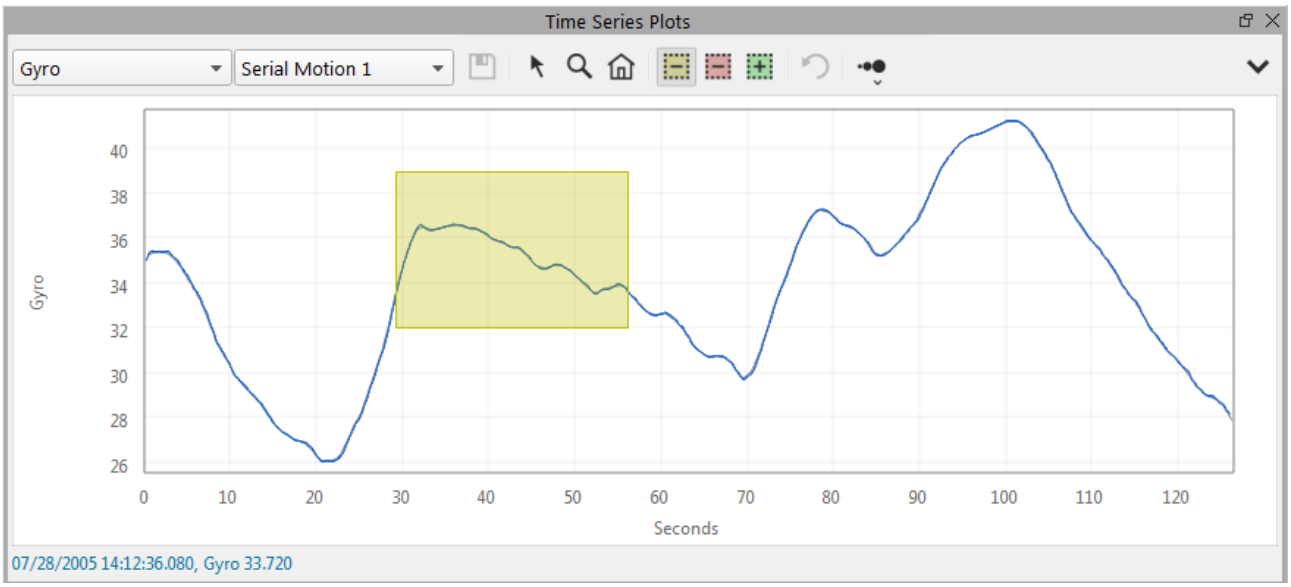
Zoom Out Button

If you have zoomed into an area of the plot, this button will zoom out to the extents of the currently viewed attribute. The other attributes time axis will also match.

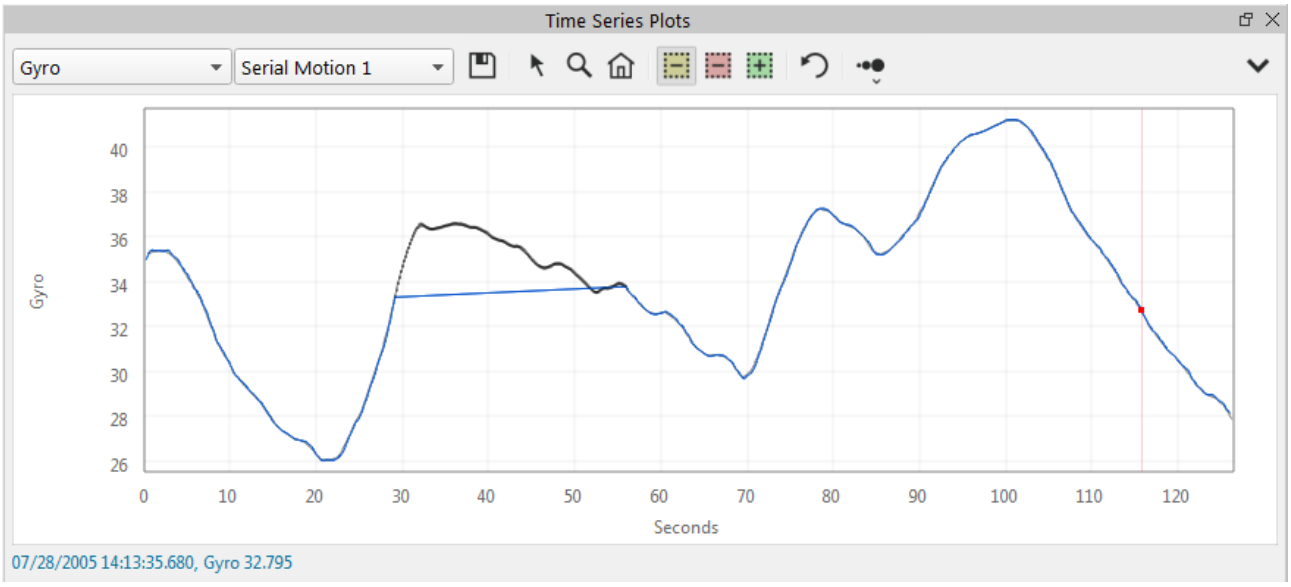


Interpolation Edit Mode

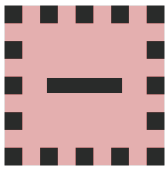
If you **Click-Drag** a selection of the time series, Qimera will flag the selected samples invalid and interpolate across the selection using the sample on either side of the selected area. During processing, time series data queries will then use these new interpolated values. This is a simple way to get rid of spikes in your data. The invalidated data will still display as a gray portion of the time series. The interpolated part of the time series will show as a continuation of the blue time series line. You can always undo an edit using the **Undo** button. Once you are satisfied with your edits, you must press the **Save** button.



Interpolate Mode Selection

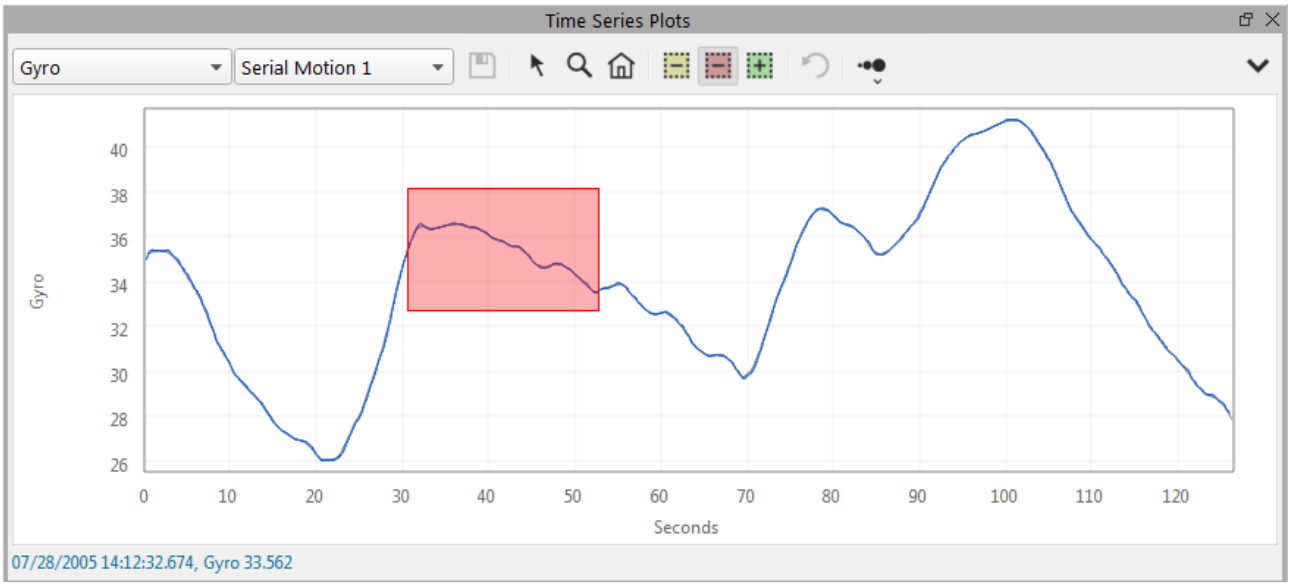


Interpolate Mode Result

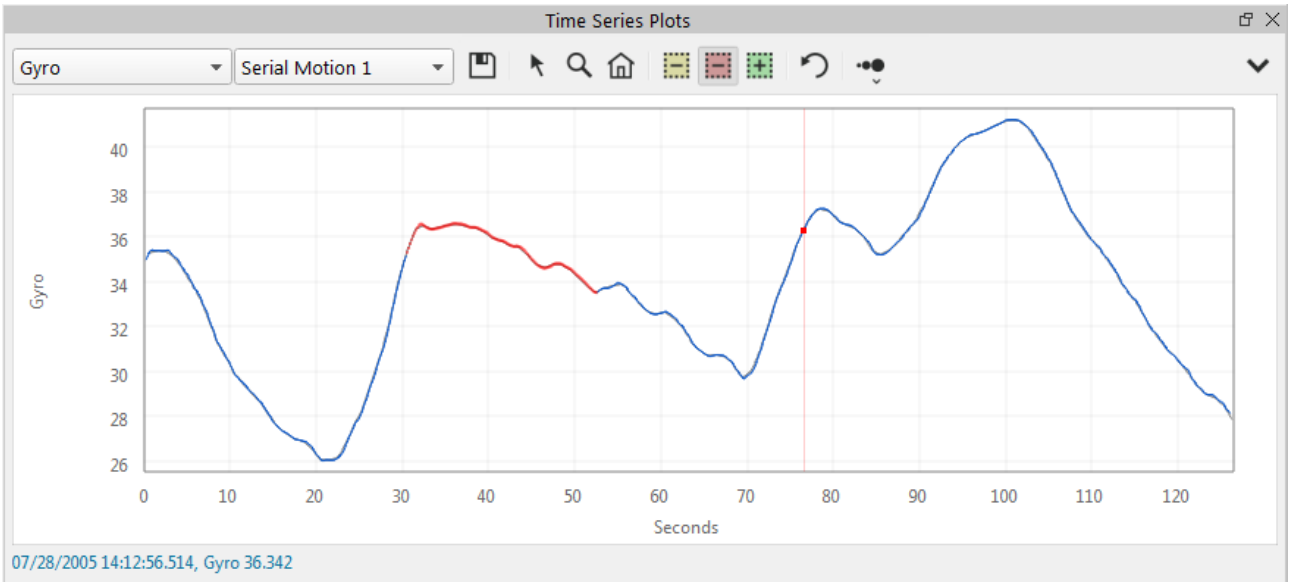


Invalidate Edit Mode

If you **Click-Drag** a selection of the time series, Qimera will flag the selected samples invalid and unusable. During processing, time series data queries to this time range will use secondary or tertiary sources of the data when available. For example, if you have 2 sources of heading and mark a portion of your primary heading data as invalid, Qimera will get heading from the secondary source of this data if available and if the Use Redundant Systems option is enabled in the Preferences dialog. If not available, Qimera will indicate to the processing engine that this data is not available and if required, the ping will not be processed for that . This is a simple way of interleaving higher quality data from a secondary source. The rejected data will display as a red portion of the time series. You can always undo an edit using the **Undo** button. Once you are satisfied with your edits, you must press the **Save** button.



Reject Mode Selection



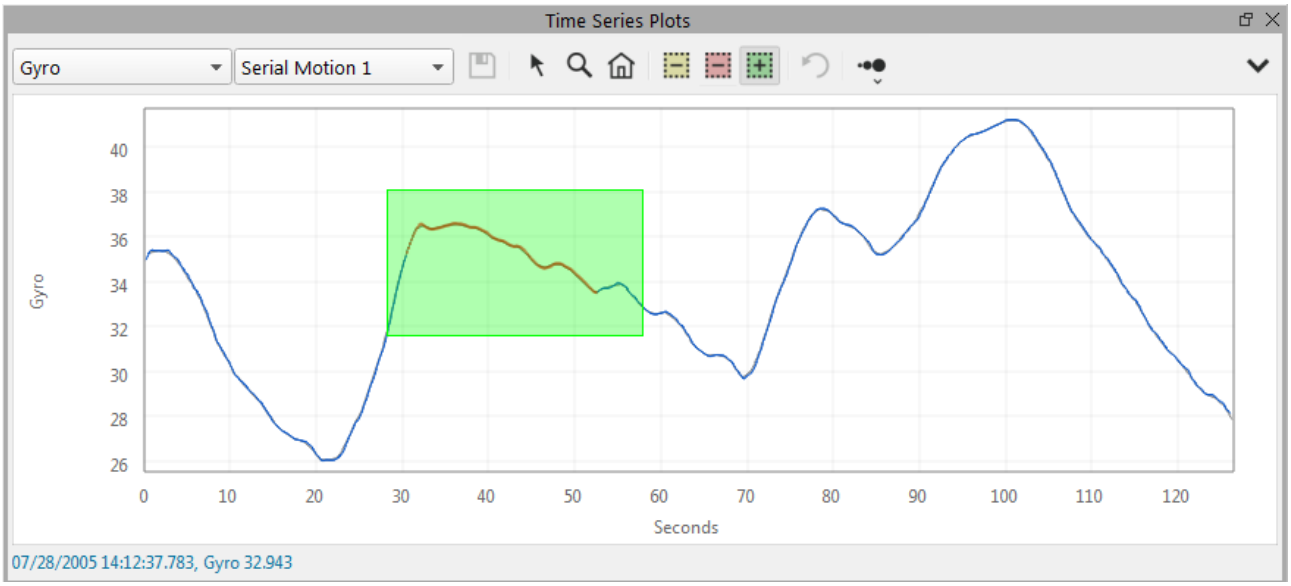
Reject Mode Result



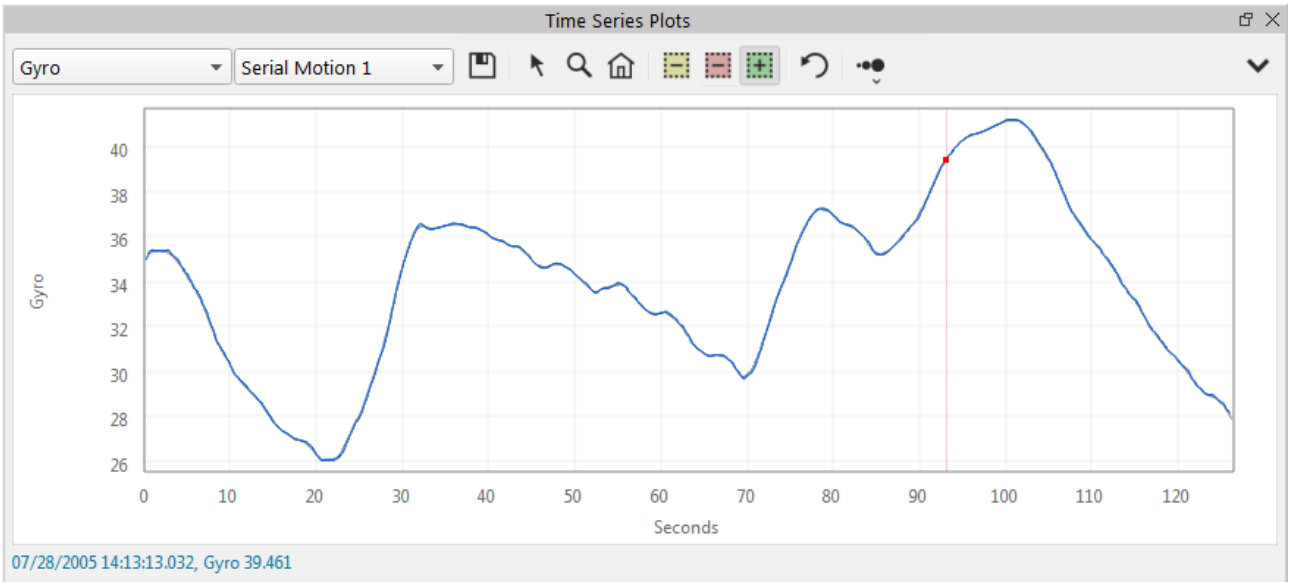
Validate Edit Mode

This mode is an easy way to bring back data that you have marked as rejected or for interpolation. Simply **Click-Drag** a selection over the previous edit and Qimera will restore

the original data. You can always undo an edit using the **Undo** button. Once you are satisfied with your edits, you must press the **Save** button.



Validate Mode Selection



Validate Mode Result

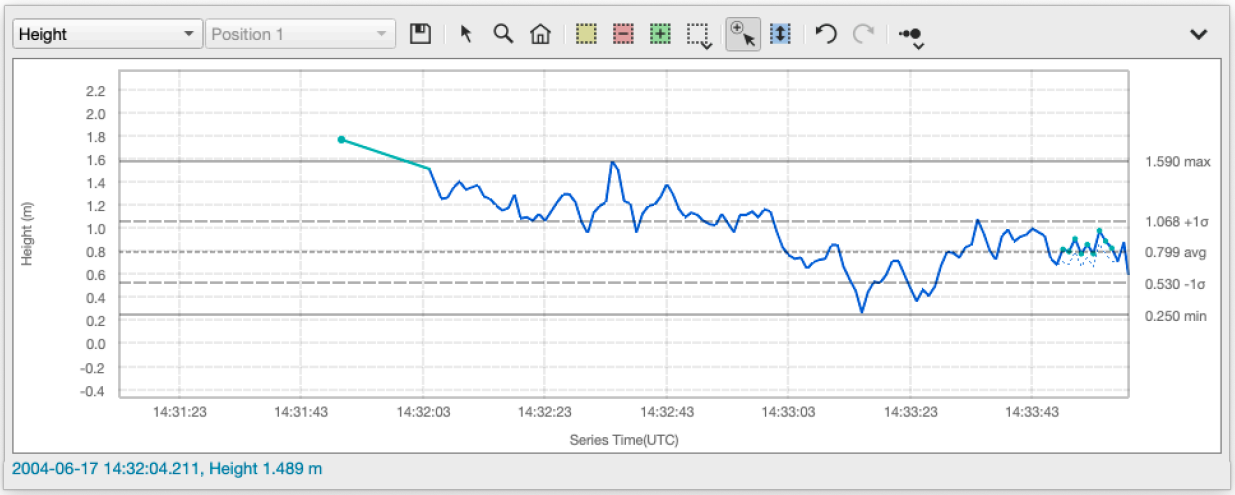
Change Selection

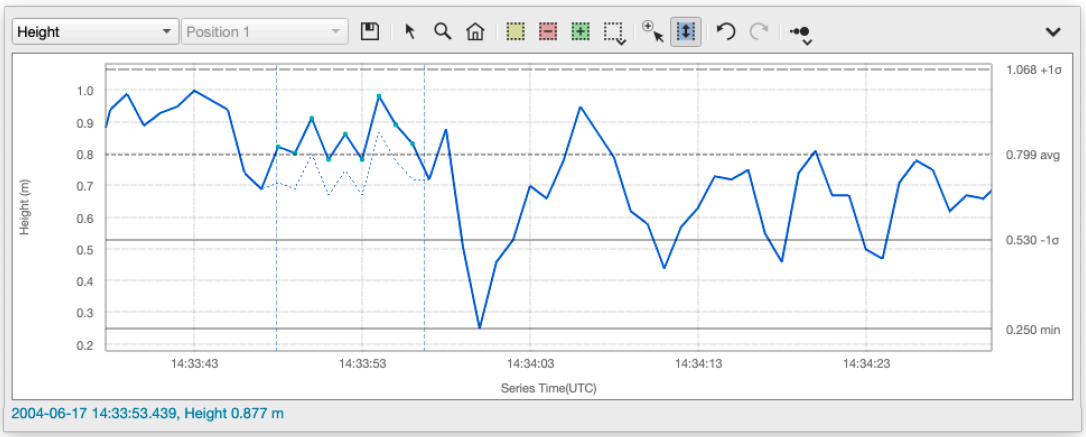
Clicking this button will change the selection to be either rectangle, polygon or lasso select. If you click and hold, you will see a drop-down menu of these options.

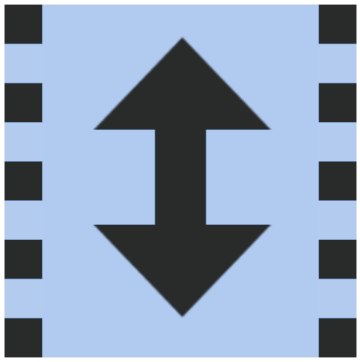


Insert Mode

This mode will allow you to enter sample data before the start of the series or at the end of the series. It will also allow you to enter data that has been Interpolated or Invalidated. When you move the mouse before the start or end, you will see a connecting line drawn between the existing data and your new point. Every mouse click will enter a new point. When are move your mouse over an area that has been interpolated or deleted, you will see a connecting line drawn between the first good data outside the edited area and your new insertion point. Clicking a point here will replace an existing sample data. When you are inserting in an interpolated or invalidated area, you will always be replacing existing data. Qimera will find the nearest data to your mouse down to replace.

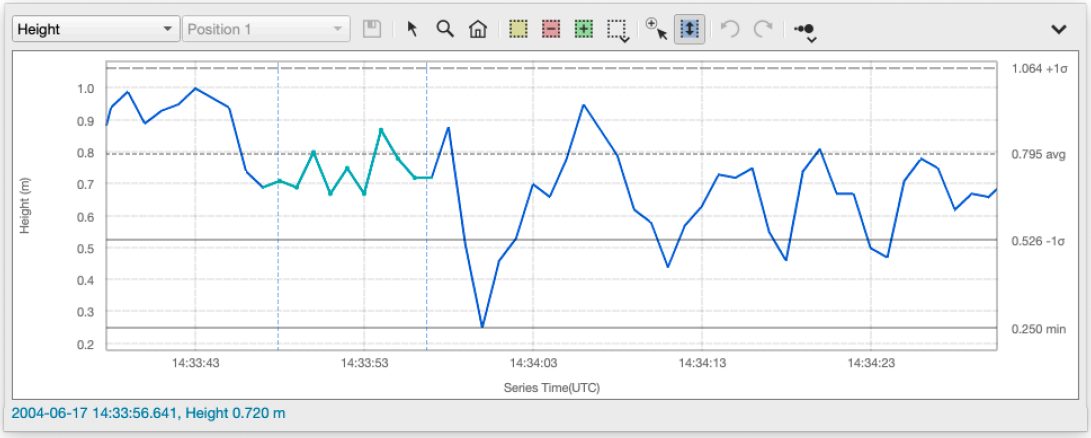


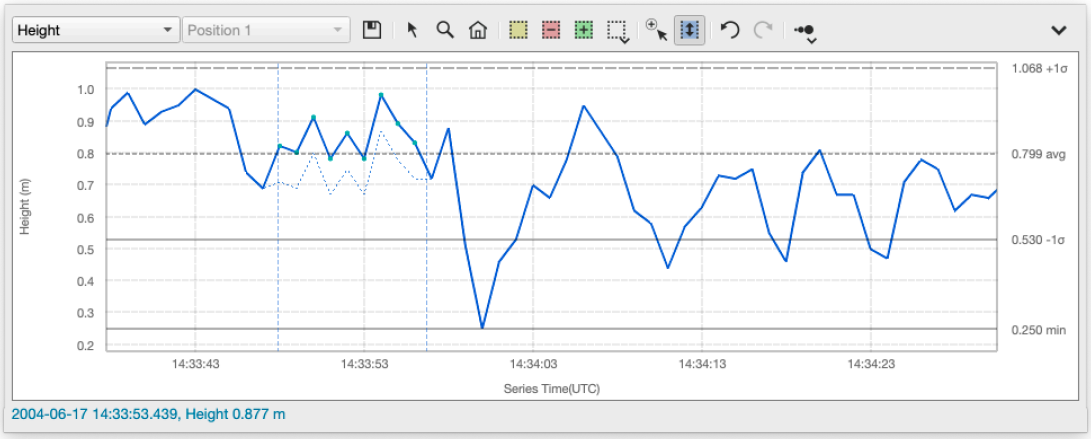




Move Mode

First click and drag out a selection of the time series you want to change. The selection is 1D only, in that it will be selecting a time range containing the samples you want to move. The samples within the selection window will be highlighted. Then, with the mouse inside this selection area, you can click and drag the points to their new desired location. Qimera will represent the original sample data as a dotted line.







Undo Button

This will undo the last edit actions. It is a pseudo-infinite undo buffer (c'mon, how much memory do you have?) in that you can make several edits in sequence and then undo those edits in the reverse sequence.



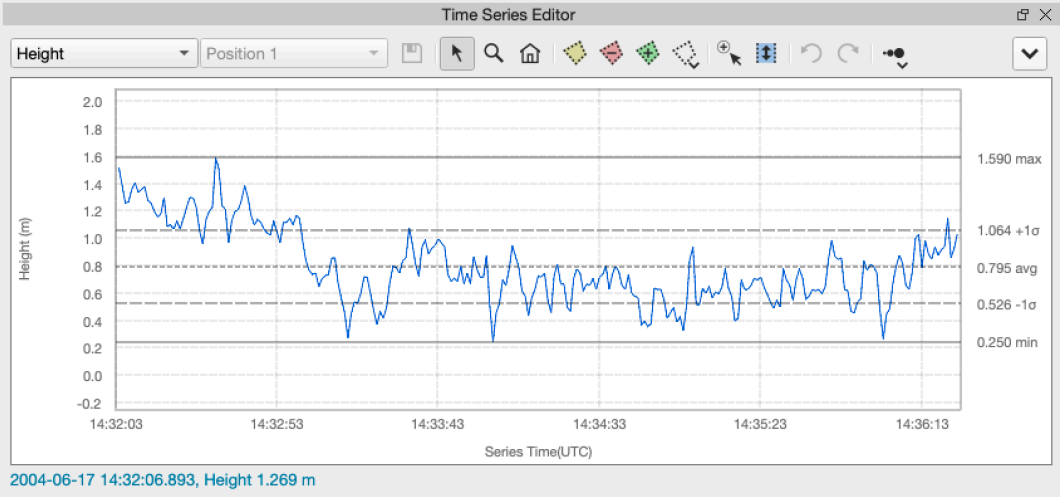
Redo Button

This will redo the last undo edit action.

Time Series Plot Menu

Show Statistics

This setting turns on the statistics view for the current time series data. It will show the minimum and maximum as solid lines, the +/- 1-Sigma as dashed lines and the average as a dotted line. Value labels will appear on the right side of the tool.

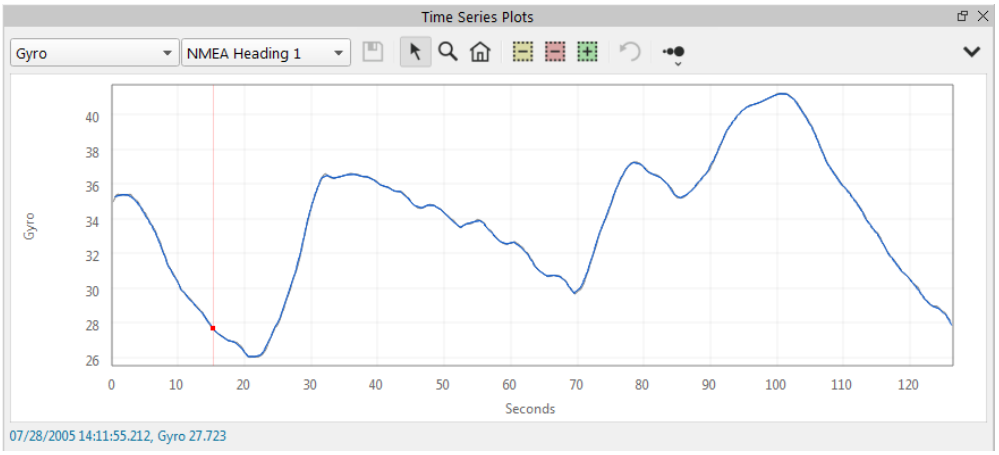


Show Height at COG

This setting only affects the display of the *Height* attribute. When enabled the *Height* plot will be transformed to the (0.0, 0.0, 0.0) location on the vessel, also referred to as the nominal center of gravity (COG). When disable the *Height* plot will be shown at the location reported by each system, often the antenna location or INS reference location.

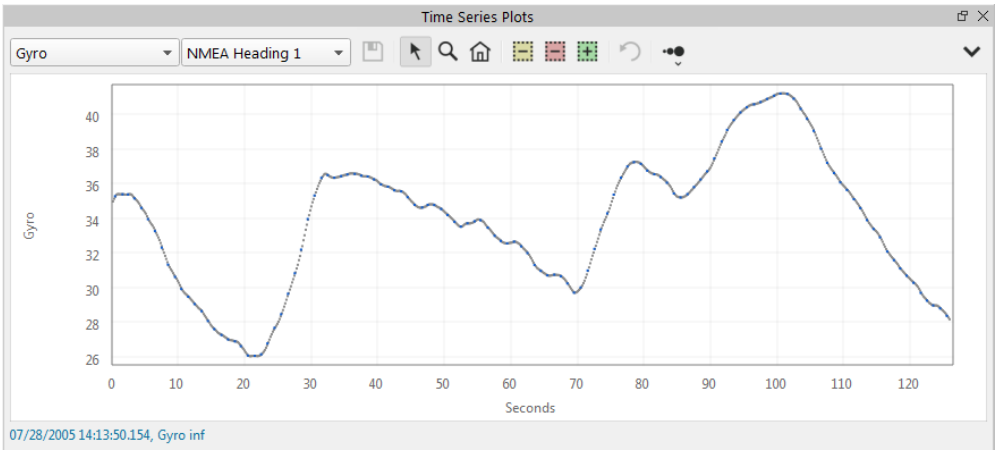
Line Plot

This is the standard display mode for the time series plot window. Data is interpolated over the selected time range.



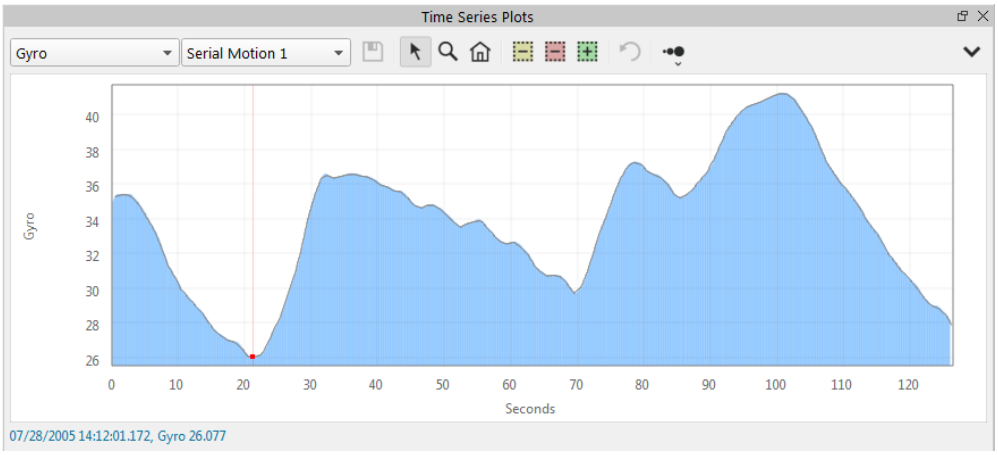
Point Plot

This display mode plots only the actual sample values in the time series. This allows you to see the difference in the update rate of various sources.



Bar Plot

This display mode is pretty much eye-candy but does allow you to more easily see gaps in the time series data. If your data is bi-polar in nature, the negative values will appear in a lighter shade of blue so you can more easily see the transitions.



Export to ASCII

This option allows exporting the Time Series Plot data as an ASCII (.txt) formatted file containing Date, Time, the selected source data and an indication of which points were rejected giving the states of the flags (V=Valid R=Rejected, I=Rejected with interpolation). If you have loaded Route Layer information a KP column will be included. In the event where KPs are available but no data is present the value will be written as 0.00.

Save to Image

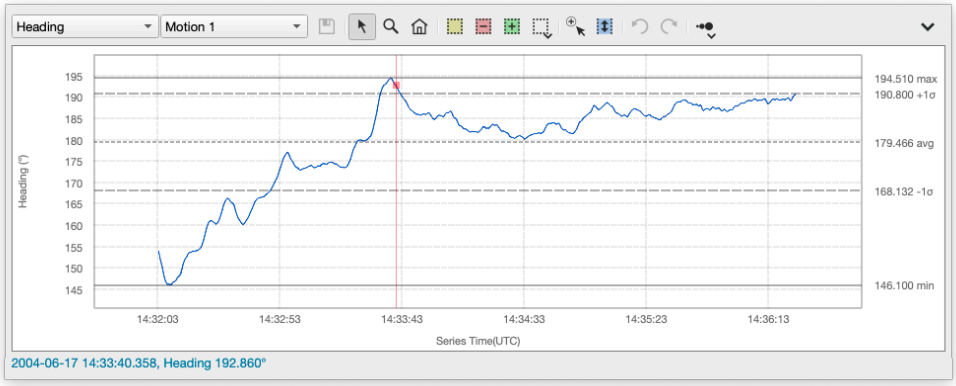
This option allows saving of the current Time Series Plot in .png image format.

Revert Time Series to Original

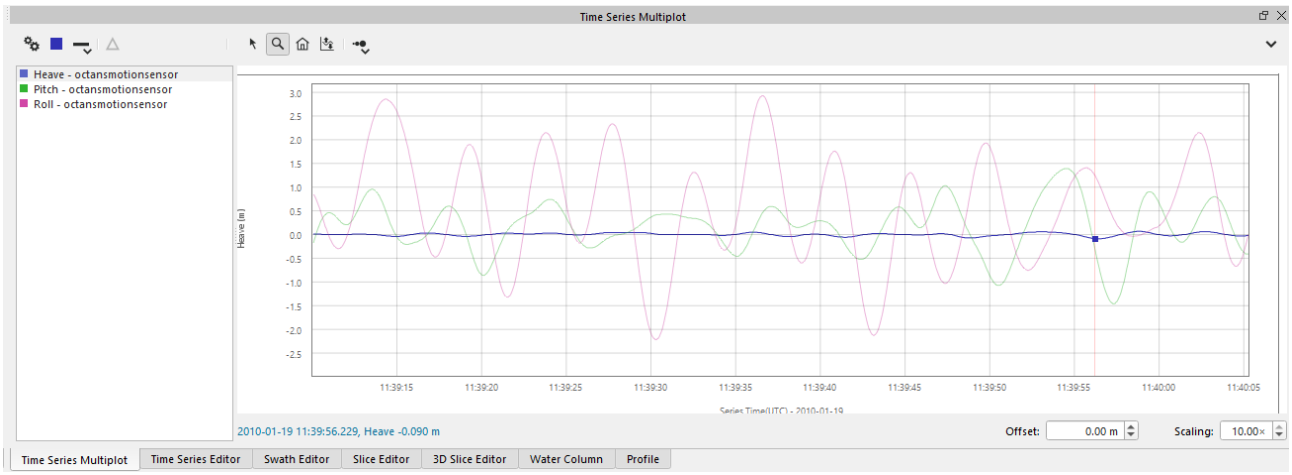
If any modifications are made to a time series this menu item will be enabled. Clicking this menu item will launch a dialog indicating which files will be reverted to their original condition. Clicking 'Ok' will revert/undo all time series edits to the associated files. This operation cannot be undone and any previous edits will be lost.

Show Grid Lines

This option will disable the gird lines on the current plot.


Heading
Motion 1
195
190
185
180
175
170
165
160
155
150
145
Heading (°)
194.510 max
190.800 +1σ
179.466 avg
168.132 -1σ
146.100 min
14:32:03
14:32:53
14:33:43
14:34:33
14:35:23
14:36:13
Series Time(UTC)
2004-06-17 14:33:40.358, Heading 192.860°

Qimera Time Series Multiplot Dock



- Qimera - Time Series Multiplot
  - Toolbar
  - Configure Series
  - Color Button
  - Line Pattern Button
  - Delta Button
  - Zoom Out Button
  - Explore Mode
  - Zoom Mode
  - Scaling Series Mode
  - Point Size
  - Time Series Multiplot Menu
    - Show Statistics
    - Show Height at COG
    - Show Scatter Plot
    - Export to ASCII
    - Save Plot To Image
    - Save Scatter Plot to Image

- Show Gridlines

Qimera - Time Series Multiplot

The Time Series Multiplot allows for temporal visualization of attributes with different scales and units on the same piece of virtual 'paper'. It allows you to correlate time series information from the currently selected file in your project. You can easily move selected time series attributes up or down on the paper and/or change their vertical scale. The configured attributes appear in a list view on the left side of the window. The plotting area displays the attributes by color and line pattern. The horizontal axis of the plot is time. The vertical axis changes according to the currently selected attribute to conserve screen space except during image export. The cursor label in the lower left of the plot area displays the time and value of the selected attributes. The *Offset* and *Scaling* spin-boxes display the vertical offset and vertical scale of the currently selected attribute(s). The Multiplot can display data that was extracted during the initial import of the source file, as well as data that is computed during the refraction process. The Multiplot additionally allows for creation of a simple mathematical difference series that can be added to the display.

For information on plot grid navigation and editing, see the page in the manual on Qimera Plotting Grids. If your plot ever gets a bit foobar, simply select all series' in the list view and set the *Offset* to zero and the *Scaling* to 1.0.

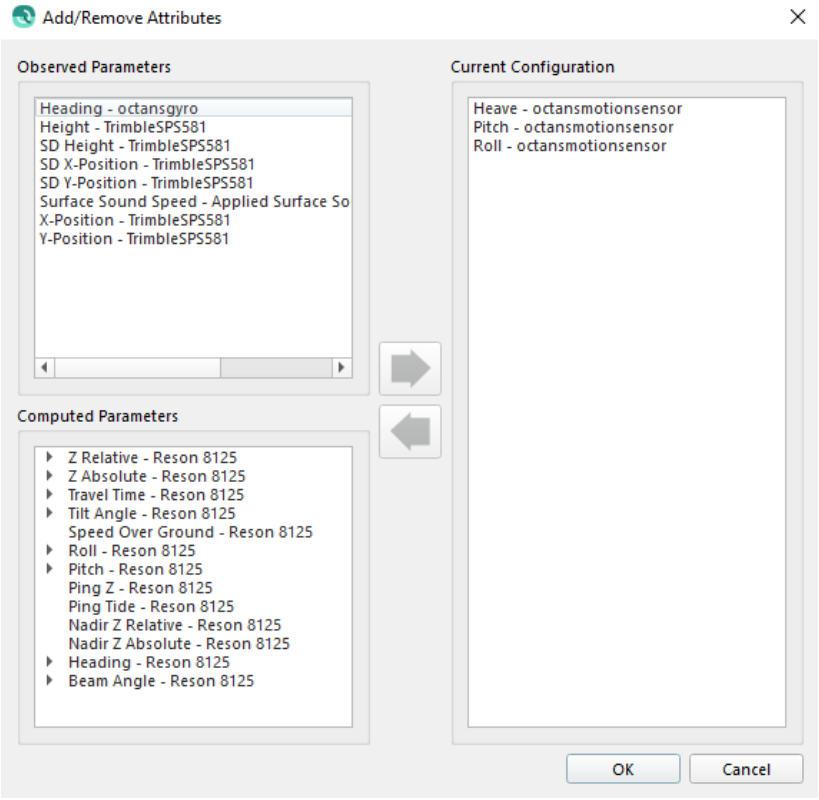
Toolbar



 Configure Series

This will launch the Add/Remove Attributes dialog shown below. Use this to configure what gets displayed on the Multiplot grid. If you change the line selection, the Multiplot will try to utilize the same configuration for the new line, if possible. Missing attributes will be discarded. Use the arrow keys to add or remove time series information from the Multiplot configuration. On the left of the dialog are lists of the observed and computed parameters. Observed parameters are those that were extracted from your raw sonar data and potentially used during processing. The computed parameters are the attributes that are contained in the QPD file after processing, see examples below. As you select and move items into or out of the configuration, they will also move visually between the various lists. The beam computed parameters can be found as sub-lists of the root

attribute, such as 'Travel Time'. Click *OK* to complete your configuration or *Cancel* to return to the current configuration.



Example of computed parameter: Ping Z

The depth of the transducer below datum. If the Vertical Referencing is set to ‘None' this will be the depth of the transducer below the water line calculated with Depth / Pressure, Heave, Draft / HADR / Transducer Z value and any Static Shift. If the Vertical Referencing is set to RTK, this value is just a positioning system interpolated with heave if available, plus any vessel offsets. Finally, if Vertical Referencing is set to Tide, the calculation will be equivalent to 'None’ plus a tide value.

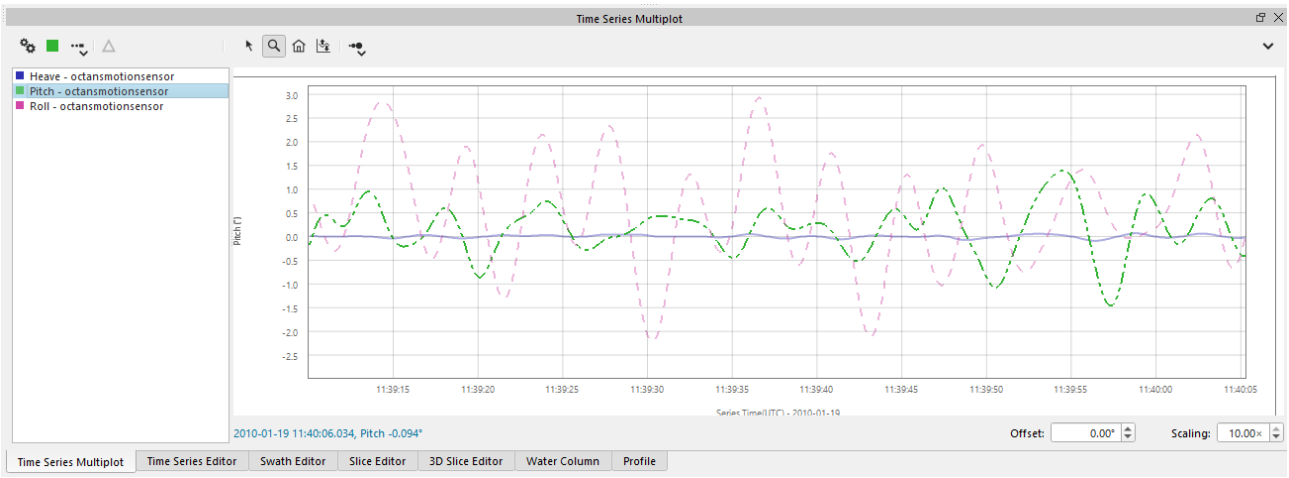
 Color Button

This button will change the color of the currently selected attributes.

 Line Pattern Button

This button will change the line pattern of the currently selected attributes. If you click and hold the button, you will see a drop down list of the choices. If you simply click, it will cycle

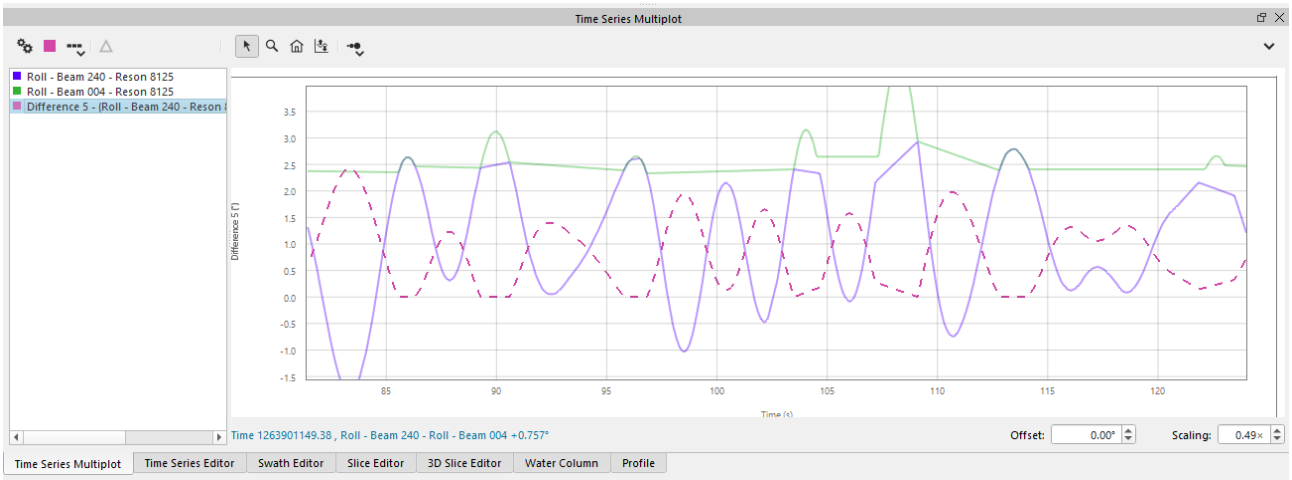
to the next line pattern. The choices include: dots, dashed line, dot-dash line, dot-dot-dash line, and solid line. Some line types are shown below.





Delta Button

This button will compute the difference between 2 attributes with the same units and add the series to the plot. Simply select 2 attributes with the same units and click the button. Below is a difference plot of Beam 240 Roll minus Beam 004 Roll. The order of the difference (a - b) is based on the selection order of the attributes. The series attribute name and the tool tip of the button will also indicate the order.





Zoom Out Button

If you have zoomed into an area of the plot, this button will zoom out to the extents of the currently viewed attributes. All attributes share the same time axis.



Explore Mode

This is the primary exploration mode of the tool. As you move your cursor over the plot, the label in the lower left of the window will update to show the current time and value of the selected attributes. If you have loaded a Route Layer a KP value will be displayed. A tracking ball will follow the location in time along the currently selected track in the **4D View**. If you click/drag the plot grid, you can pan around the data. If you hold Ctrl and click/drag, you can move the currently selected attributes up or down on the plot grid. As you do this you will notice that the *Offset* spin box changes to show what the current vertical offset is from the original state of the plot. You can additional use the spin box to control the offset of the currently selected attributes. If you use the mouse wheel at the same time as holding down the Ctrl key, you can change the vertical scaling of the currently selected attributes as described by the explicit *Scaling Series Mode* below. Shifting or scaling the currently selected series works in all modes using the Ctrl key to modify a click-drag or mouse wheel action. Holding the Shift key during click-drag will allow panning in any of the modes. The mouse-wheel will zoom in/out of the plot.

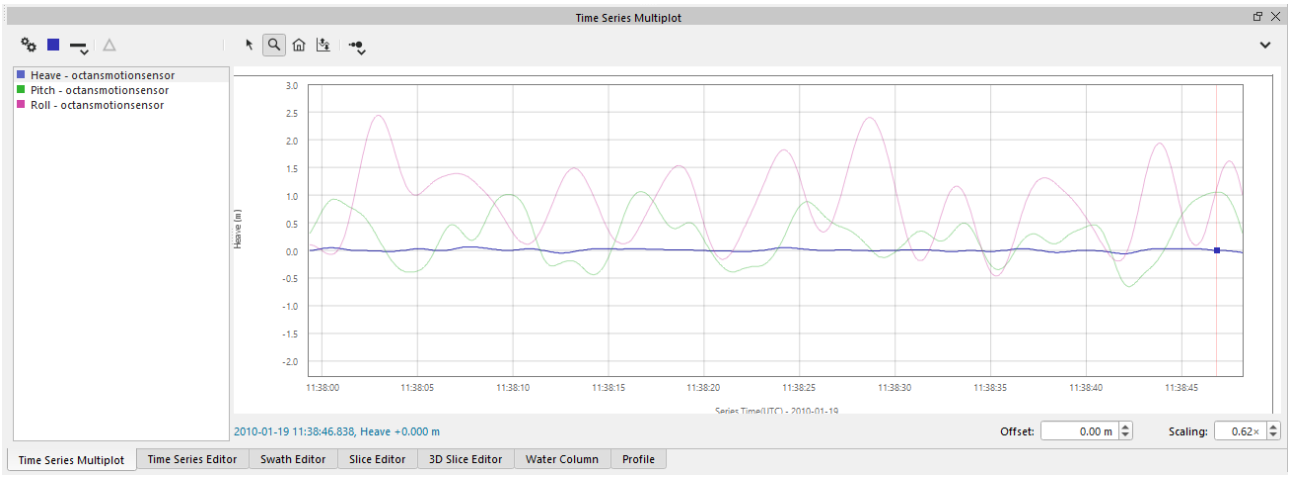


Zoom Mode

When in zoom mode, simply click and drag an area of the plot to zoom the time window. Multiplot only allows for zooming along the time axis. To return to the original plot, simply click the *Zoom Out* button.



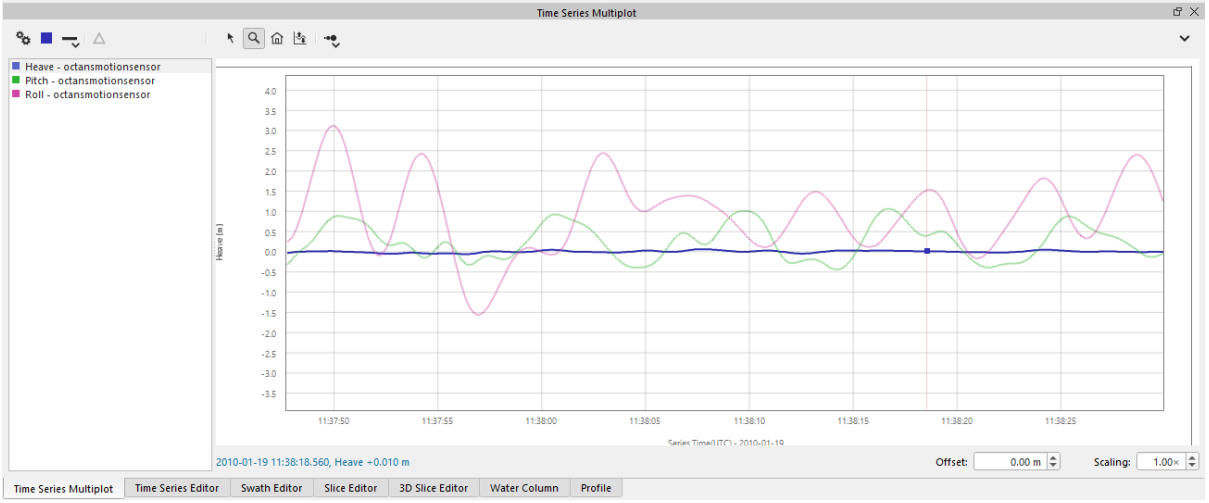
Multiplot Before Zoom



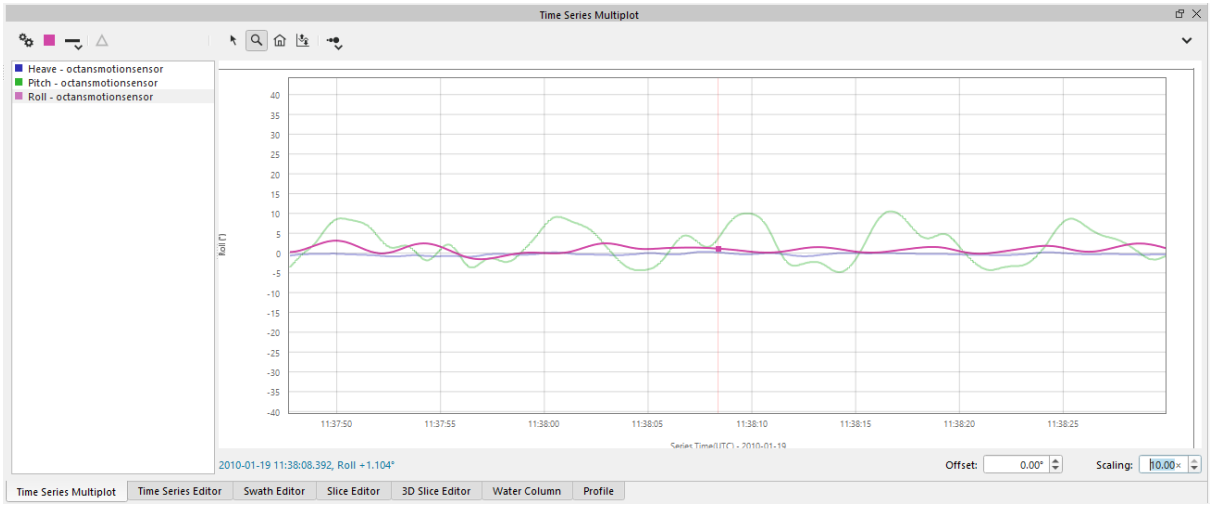
Multiplot After Zoom

 Scaling Series Mode

This will allow you to change the vertical scale of the selected attributes. As you click/drag the cursor left/right or up/down, the vertical scale of the selected attributes will increase or decrease. You can also see the change in the *Scaling* spin box in the lower right corner of the Multiplot window. When attributes are added to the Multiplot, the initial vertical range is Rmin - Rdelta to Rmax + Rdelta where Rdelta is Rmax-Rmin.



Roll Before Scaling



Roll After Scaling



Point Size

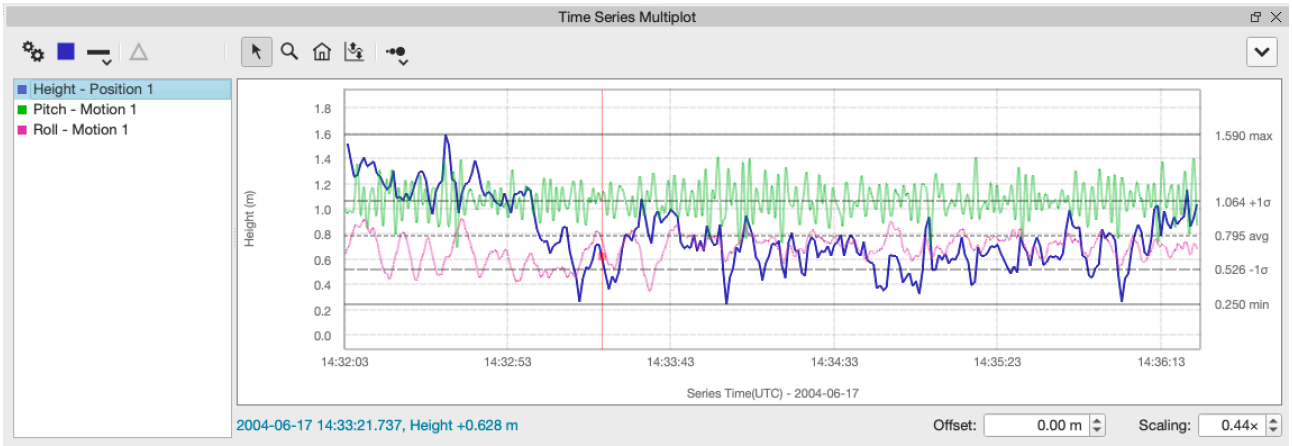
This button will allow you to change the size of the plotted points and lines. Sizes range from Small to XX-Large. Clicking on the button will cycle to the next size. Click and hold to get a drop down menu of sizes to choose from.



Time Series Multiplot Menu

Show Statistics

This setting turns on the statistics view for the currently selection time series. It will show the minimum and maximum as solid lines, the +/- 1-Sigma as dashed lines and the average as a dotted line. Value labels will appear on the right side of the tool.

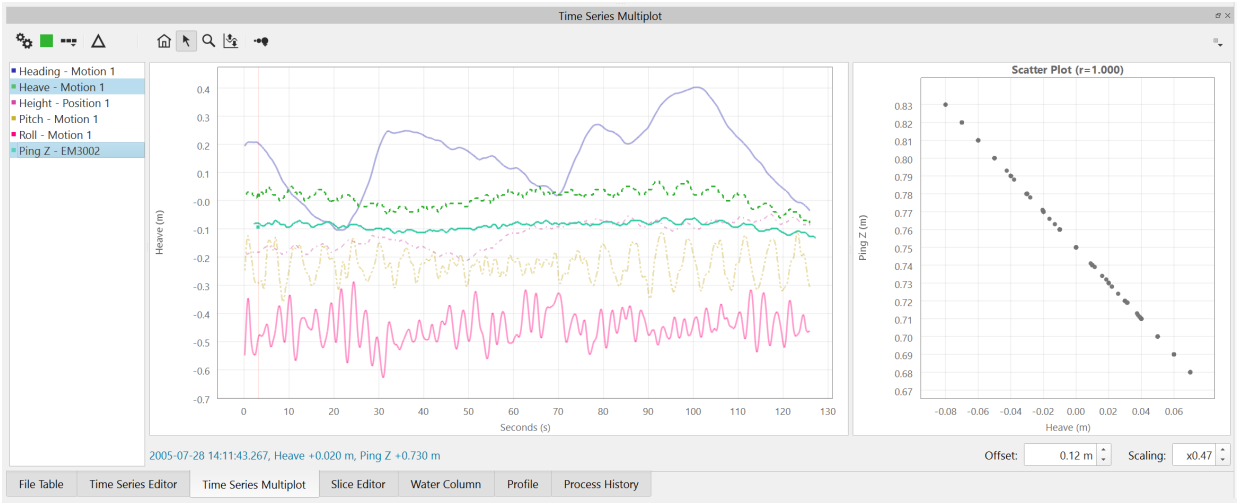


Show Height at COG

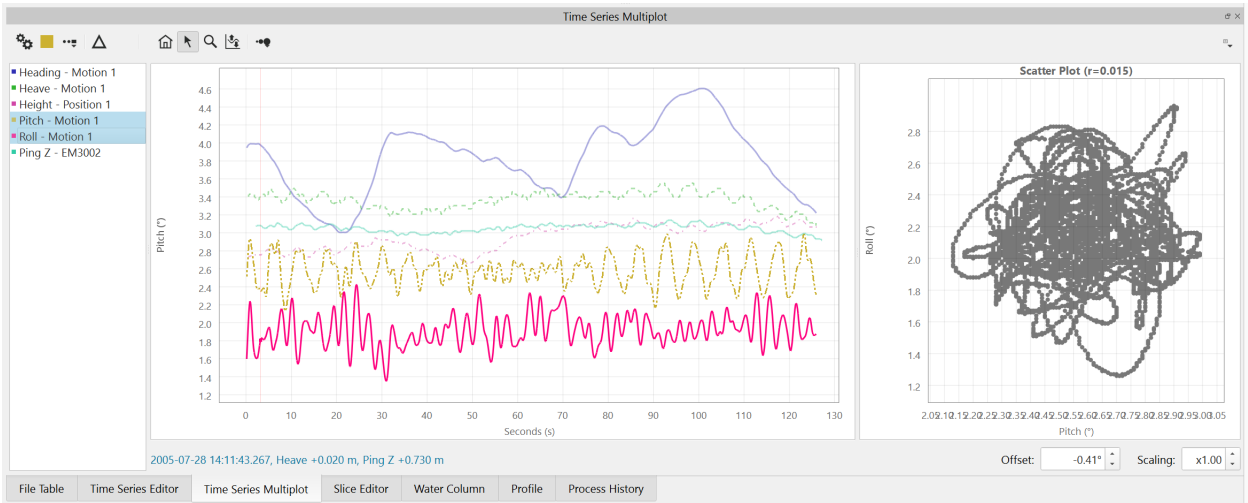
This setting only affects the display of the *Height* attribute. When enabled the *Height* plot will be transformed to the (0.0, 0.0, 0.0) location on the vessel, also referred to as the nominal center of gravity (COG). When disabled, the *Height* plot will be shown at the location reported by each system, often the antenna location or INS reference location.

Show Scatter Plot

This button will split the plot into a time series and scatter plot. The scatter plot will display any 2 selected attributes in your list. The Correlation Coefficient of these attributes will display in the top of the plot. Correlation runs from -1 to +1. There is a splitter handle between the time series and scatter plot so they can be resized the the users desired size.



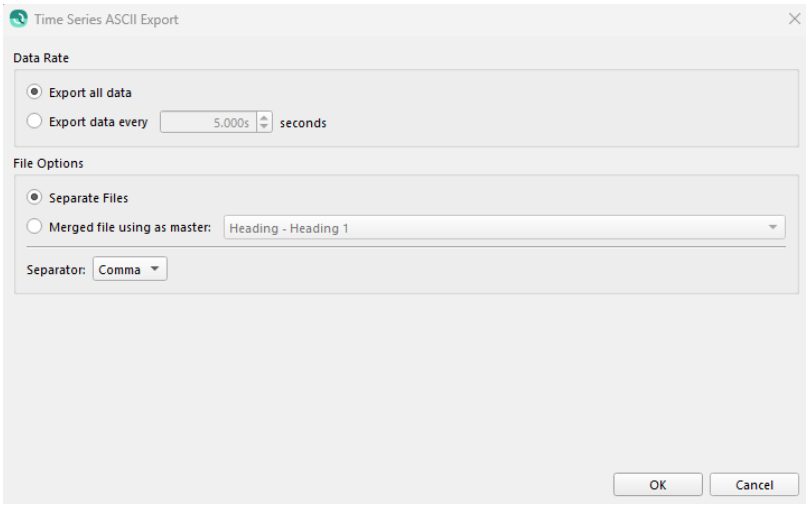
Attributes With High Correlation



Attributes With Low Correlation

Export to ASCII

This will launch the Time Series ASCII Export dialog shown below. The *Data Rate* radio buttons allow you to export every time series sample or a sample rate specified by the *Export data every* spin box. The *File Options radio* button allows you to create a file per attribute type or to merge all attributes into a multi-column file using the selected attributes as the time master. Attributes other than the time master will be interpolated if they occur at different rates than the master time series. All exported files automatically appear in the *~myproject/Export* folder with the naming convention *sourcefilename.attribute name*. If you decide to merge the data, the filename will be *sourcefilename.merged.txt*. If you have loaded a Route Layer and additional KP value column will be exported. Commas, spaces or tabs can be selected as separators in the export.

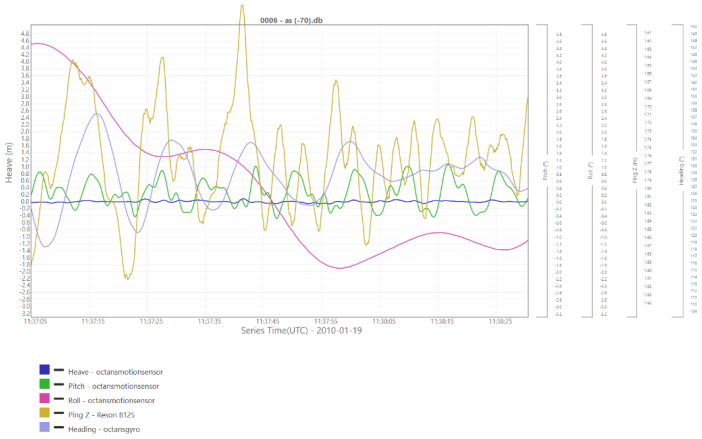


Save Plot To Image

This will save the current Multiplot to an image file. The file type by default is PNG. The default folder is the *~myproject/Export* folder. The first image below is the configuration of the Multiplot before export. The next image is the exported image. Notice that Qimera includes the vertical axes of the other attributes as well as a color and line pattern legend.



Multiplot to Export



Exported Multiplot Image

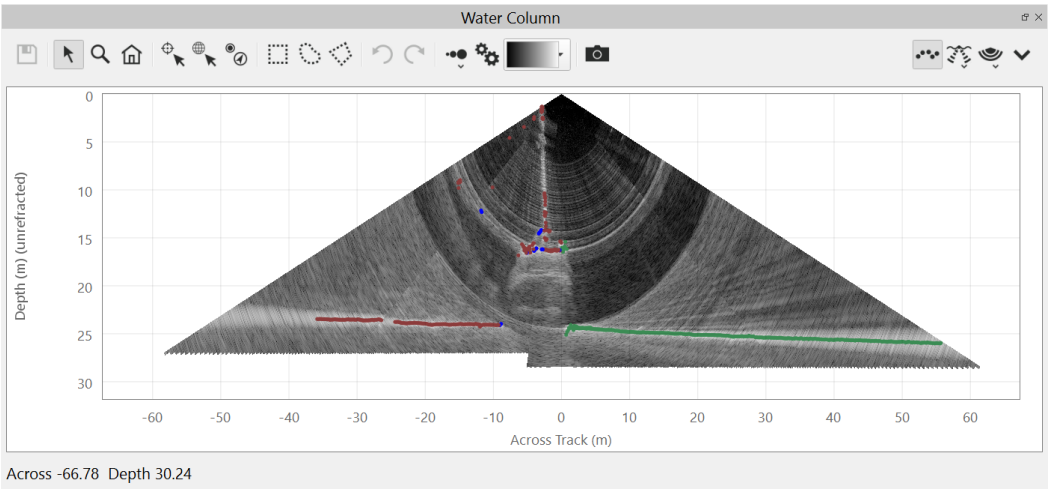
Save Scatter Plot to Image

This will save the scatter plot to an image file.

Show Gridlines

This option will show/hide the grid lines in the plot areas.

Qimera Water Column Dock



- Qimera - Water Column
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    - Normal Soundings
    - Additional Soundings
    - User Picks
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- Filter Settings Dialog
    - Histogram Control
    - Beam Limit Control
    - Range Limit Control
    - Downsample Control
    - Sidelobe Suppression
    - Bottom Suppression
    - Suppress Beyond First Return
    - Override Water Column Packets with TruePix (requires a restart of the Swath Editor)
- Sounding Extraction

Qimera - Water Column

The Water Column window is active whenever you are in Swath Edit mode and your raw sonar data has associated water column information. In early versions of Qimera, this display was a visual aid only and its use was intended to help you determine the validity of bathymetric targets. Since Qimera 1.4, the display can be used to digitize additional soundings. The plot grid works just like all Qimera Plotting Grids in Qimera, you can zoom in/out and pan the display. As you move your Swath Editor buffer, this display shows you the current ping. Depending on the view being used in the Swath Editor, this can be the middle of the swath edit buffer, or the current ping that the mouse is over in the above and oblique views. Detection's are shown as point overlays on the display. Red is for the normal detection's (port side only if dual head). Green is for normal soundings from the starboard head. Blue is for additional detection's from any head. Magenta soundings are user picked soundings. When you pick soundings in the water column view, you are actually adding raw sounding values to the current line. These soundings can be refracted, edited, exported and used in static or dynamic grids. These soundings are added to the *SystemName_UserAdditional* system where *SystemName* is the name of a particular multibeam system. If you want these soundings to appear in any grids you make, be sure to leave the system checked in the grid generation dialog. Also note that the water column display is NEVER corrected for refraction. The depth and distance scaling that the background grid enables should only be used for approximate positioning for items in the water column widget. User picks from the display are stored as raw multibeam range,

angle measurements, refraction corrected, and georeferenced externally from the Swath Editor.

For information on plot grid navigation and editing, see the manual, here: Qimera Plotting Grids

For information on what systems and data formats are supported, see the table here: Qimera Sonar Source Data Import Capabilities

Toolbar





Save Edits

This button will save any edits that have been completed.



Reset Zoom

This button zooms out the plot window to the extents of the data. Please see the section on Plotting Grids for more information on plot grid navigation and control.



Explore

This button places the window in *Explore* mode. As you move your cursor over the plot area, you will see corresponding X/Y axis values display below the plot. These values are NOT refraction corrected. Additionally, see the section on Plotting Grids for more information on plot grid navigation and control.



Zoom In

This button places the cursor in *Zoom* mode. Please see the section on Plotting Grids for more information on plot grid navigation and control.



Add Sounding

This button places the cursor in *Add Sounding* mode. Each time you click a visible water column sample in the view, a sounding will be added for that ping, beam and range. If there is already an existing sounding within +/- 1 sample, no new sounding will be created. New soundings will appear as magenta dots, visible as an overlay to the water column view. You cannot add single soundings on a stacked fan or side view, you can only add single soundings on a single ping fan. This cursor mode is only available on the *Fan View* due to the ambiguous position of the pixel in the *Side Views* described below. Using this mode on the *Side View* will result in moving the current location to the "clicked" ping.



Geo Pick

This button places the cursor in *Geo Pick* mode. Each time you click a visible water column sample in the view, a refracted geo-location is added to the *Geo Pick Dock*. Qimera uses all the processing settings of the current line to perform a refraction operation. Using the Geo Pick Dock, this data can be exported or used to create an SD object in the scene. This cursor mode is only available on the *Fan View* due to the ambiguous position of the pixel in the *Side Views* described below. Using this mode on the *Side View* will result in moving the current location to the "clicked" ping.



Add ENC Point Object

This button places the cursor in *ENC Point Creation* mode. Each time you click a visible water column sample in the view, the Geo Pick operation is performed to create an ENC point feature on the currently selected project ENC layer. To learn more about creating ENC objects, see the section on the Qimera ENC Editor Dock. Creating ENC point objects from water column samples results in the VALSOU attribute of the feature being automatically assigned to the refracted depth of the sounding. This cursor mode is only available on the *Fan View* due to the ambiguous position of the pixel in the *Side Views* described below. Using this mode on the *Side View* will result in moving the current location to the "clicked" ping.



Add Sounding Selection (Rectangular Selection)

This button places the cursor in *Rectangle Selection* mode. **Left-click-drag** a selection rectangle over the water column view to add all visible samples as new soundings. The same logic applies for duplicate sounding protection as when doing single selection. New soundings will appear as magenta dots visible as an overlay to the water column view.



Add Sounding Selection (Lasso Selection)

This button places the cursor in *Lasso Selection* mode. **Left-click-drag** a lasso selection over the water column view to add all visible samples as new soundings. The same logic applies for duplicate sounding protection as when doing single selection. New soundings will appear as magenta dots visible as an overlay to the water column view.



Add Sounding Selection (Polygon Selection)

This button places the cursor in *Polygon Selection* mode. **Left-click** multiple points to define a polygon. Select the initial point to close or **right-click** close. The selected area of the water column view will add all visible samples as new soundings. The same logic applies for duplicate sounding protection as when doing single selection. New soundings will appear as magenta dots visible as an overlay to the water column view.



Undo

This button will undo the previously added soundings. Each sounding addition pushes an undo state onto the undo stack. Once the swath buffer moves, the undo/redo stack is cleared.



Redo

This button will redo the soundings removed from a previous undo operation. Once the swath buffer moves, the undo/redo stack is cleared.



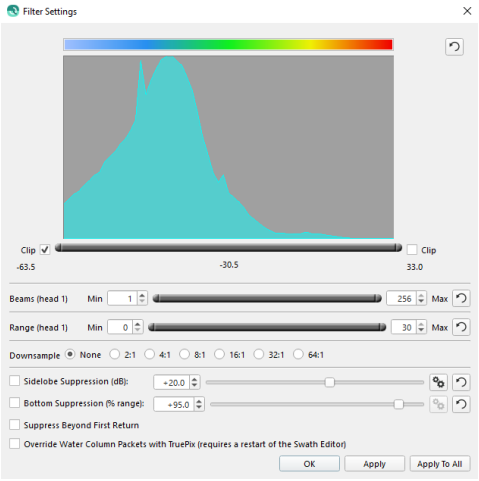
Point Size

This button will allow you to change the size of the plotted sounding solutions. Sizes range from Small to XX-Large. Clicking on the button will cycle to the next size. Click and hold to get a drop down menu of sizes to choose.



Water Column Filter Settings

This button will launch the *Water Column Filter Settings*. This dialog gives you all the controls necessary to filter the sample data that is displayed in the water column views. See the section below for more specifics on how this dialog works.



The intensity values shown in the settings dialog are scaled so they are plotted more effectively in the WaterColumn Dock. Watercolumn intensities outside of the dock, such as geopicks, will use raw intensity values from the watercolumn datagram. Konsberg intensities are already scaled, but intensities from S7K and R2Sonic data are scaled right before plotting is done.



Colormap Control

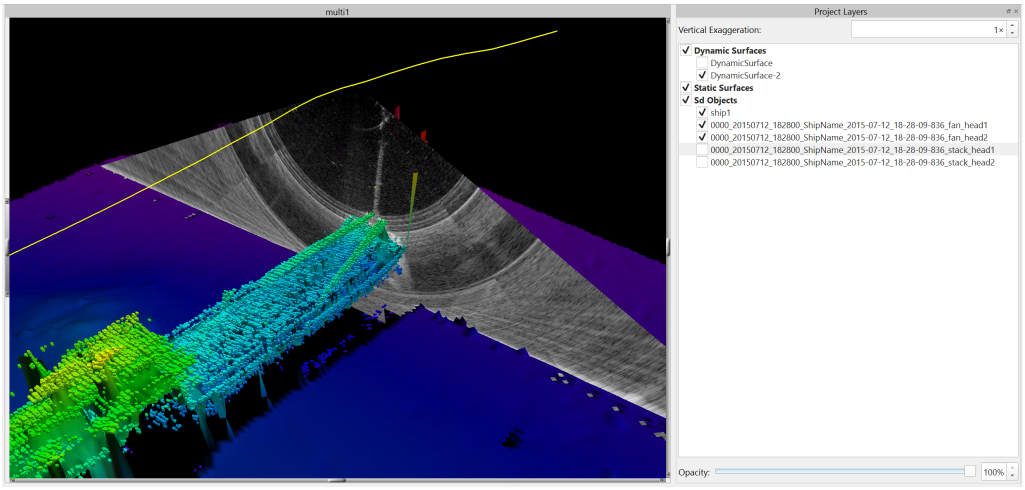
This popup allows you to see the currently selected colormap. It allows you to select a colormap file, edit the current colormap or adjust the colormap range. This control works the same as the one found in the Project Layers Dock.



Fan Snapshot

This button creates a Fan SD object in the scene at the current location and will appear under the **SD Objects** tree on the **Project Layers** widget. If you have a dual head system, 2 SD objects will be created. The snapshot SD will get the name *'Fan_Snapshot_#####'* or Stack_Snapshot_####. If you are in *Fan Stack* mode, the imagery will be stacked and the object will be placed at the current ping location. An example of a Fan Snapshot is shown below. The fan snapshots are NOT refraction corrected. If you wish to use a specific name for the snapshot, use the *Water Column View Menu* option *Save Fan or Stack Snapshot* or hold down the CTRL key while you click the button. CTRL as a modifier will save the fan view while SHIFT as a modifier will save the stack view. This will bring up a

Save File dialog that will allow you to name the object. Snapshots are meant to be used as simple visual mark up cues in the working area to give you a method to easily keep track of items that you have reviewed, or to perhaps capture objects of interest that require further examination or analysis. You can use these objects as "bookmarks" in your data. To quickly navigate to their location, select them in the **SD Objects** tree and click the **Z** key or use the *Zoom to Object* button of the 4D Toolbar.





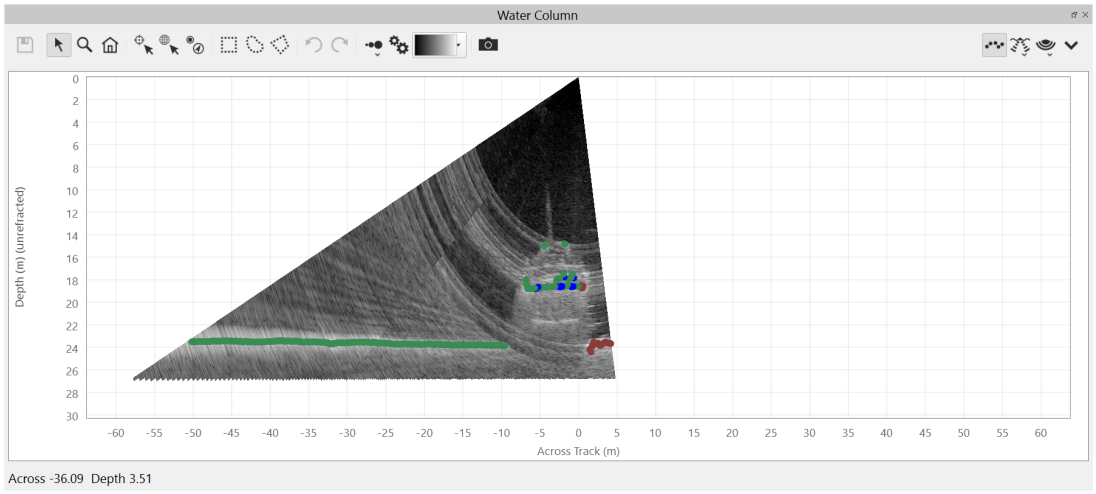
Show Soundings

This toggle button will show/hide all soundings regardless of type. It is a convenient way to turn all soundings on or off while investigating the water column imagery.

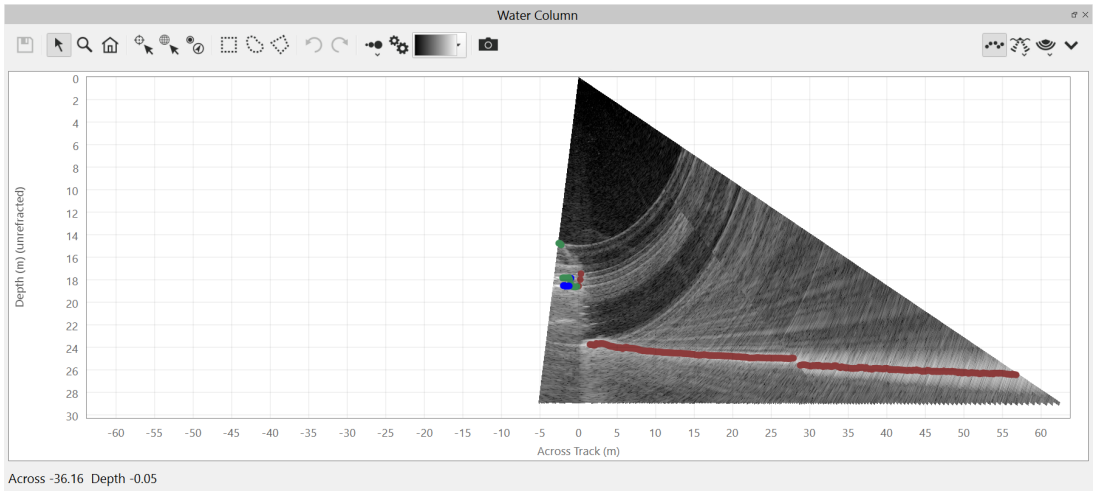


Head View

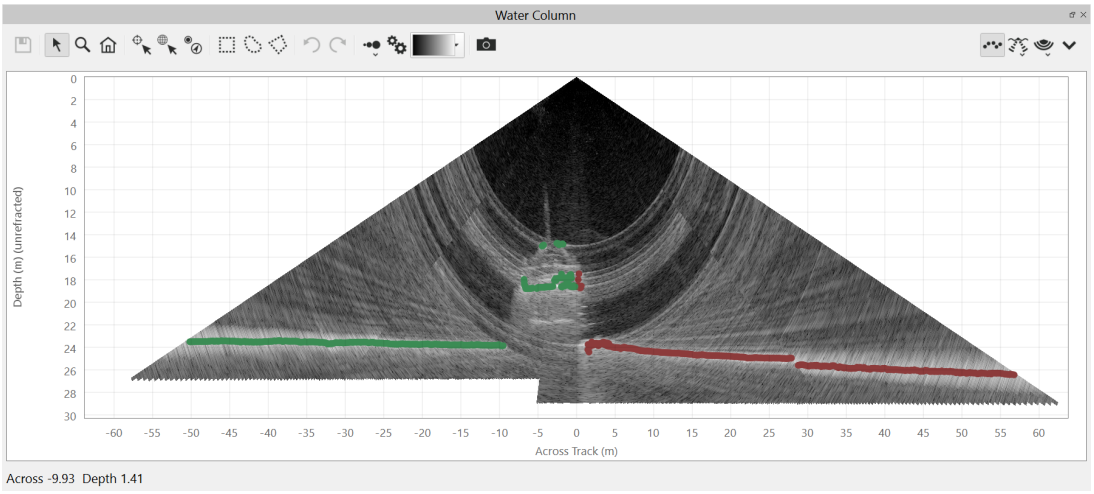
This button can cycle options by clicking or if you click and hold, a drop down menu appear with the options and their descriptions. The options are Dual Head, Port Head, Starboard Head. This controls which heads are displayed in the window, if your data is dual head data.



Port Head View



***Starboard Head* View**



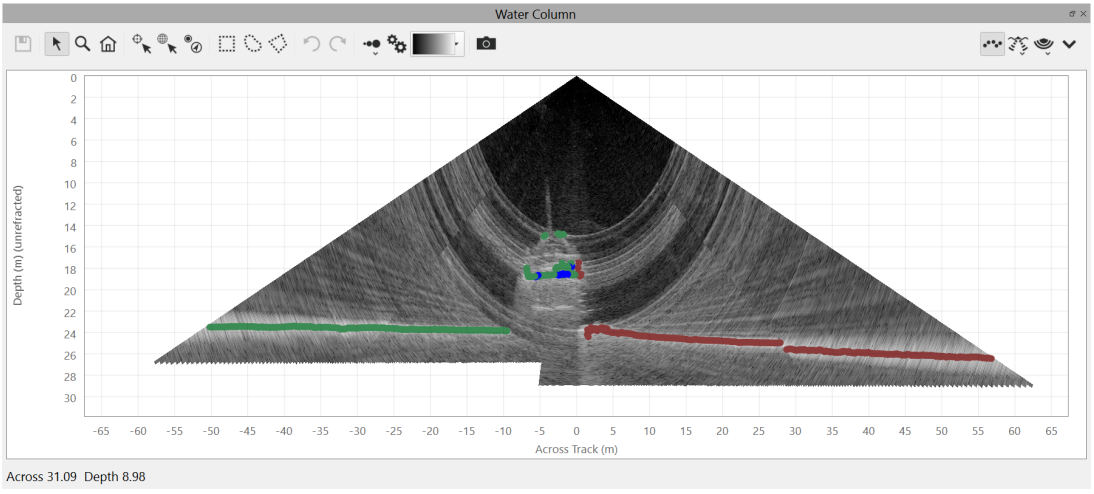


Both Heads



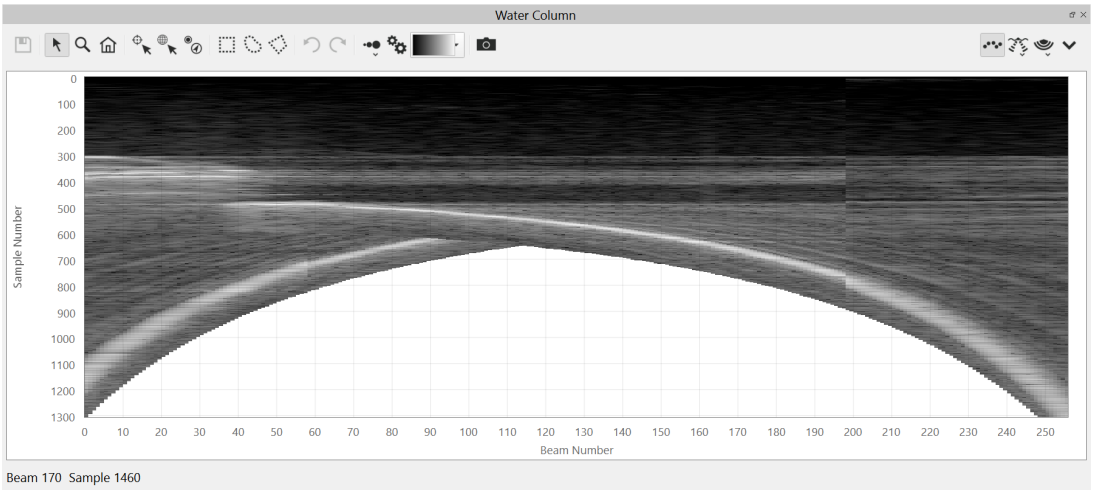
Plot Type

This button can cycle options by clicking or if you click and hold, a drop down menu appear with the options and their descriptions. The options are Wedge view (depth, across track) and Beam/Sample view. Beam/Sample view is mostly useful for multibeam technicians who are examining water column imagery for telltale artifacts when troubleshooting installations or problematic data sets.





Wedge View





Beam/Sample View



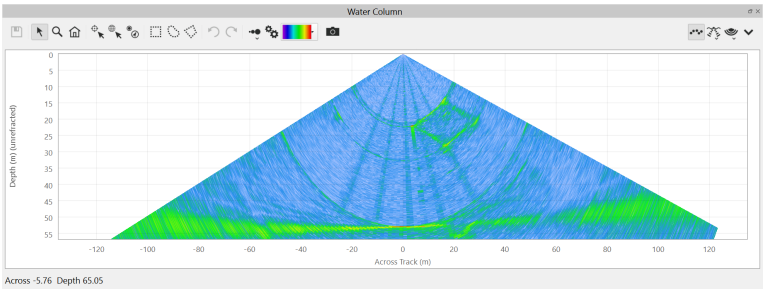
Water Column View Menu

Behind View - Hidden

The water column fan view will not be shown.

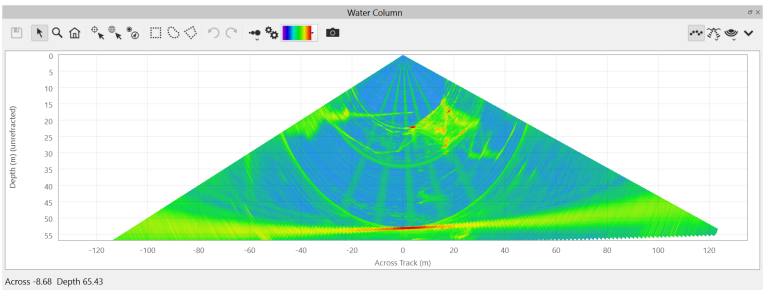
Behind View - Fan

This is the default view of the water column fan. It shows the water column data from the current ping.



Behind View - Stacked Buffer

This is a fan view "stacked" for all of the pings in the current swath buffer using a "shine through" technique in which the strongest return is displayed for each beam and range sample.



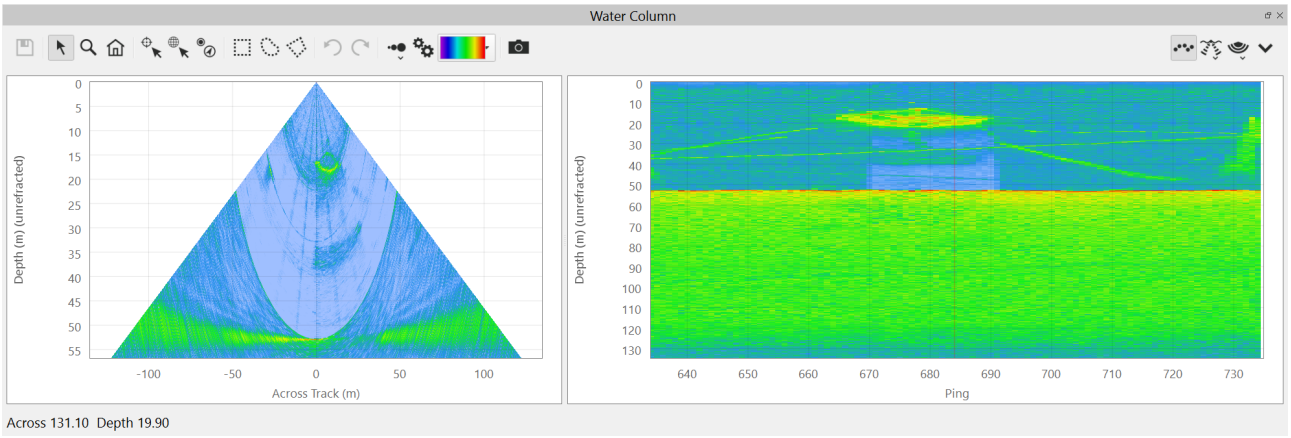
Side View - Hidden

This is the default for the side view.

Side View - Current Buffer

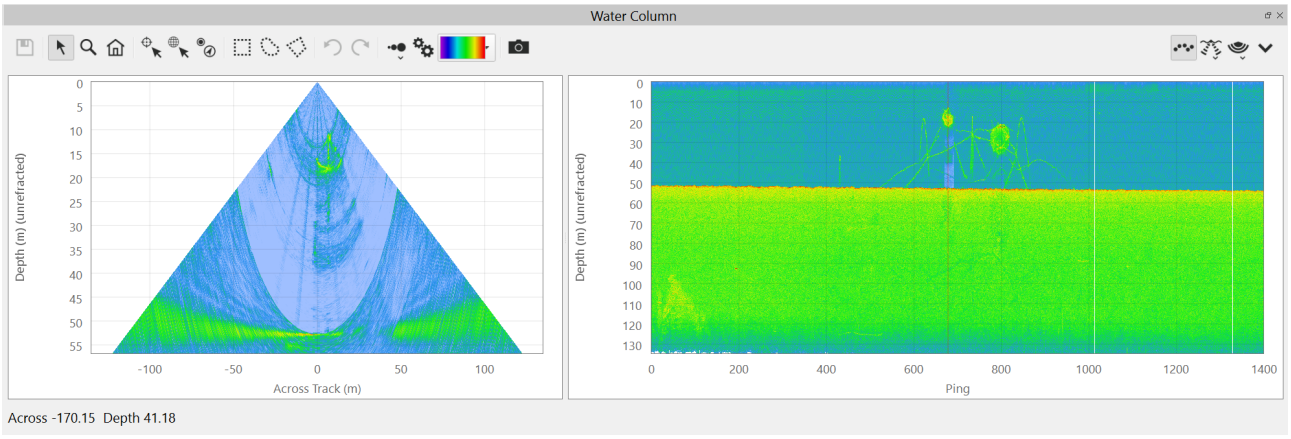
This option will show the stacked side view of the current swath buffer using the same "shine through" method described with the Stacked Fan above. This view will show a depth or range stack depending on the selected stacking option. Using any of the cursor modes on this view will move the ping to the indicated ping number. You cannot use this view to add single soundings, geo-pick a location or add an ENC point object. This is because a picked point on this display represents the accumulation of many beams across the swath. Using any of the selection modes will allow you to add many new soundings to your bathymetric solution. Be sure that before using these options, you first filter out background noise using the options in the settings dialog.

Additionally, a vertical red line is drawn to show the location of the current ping. This line will move as you move the slider in the Qimera Swath Editor Dock.

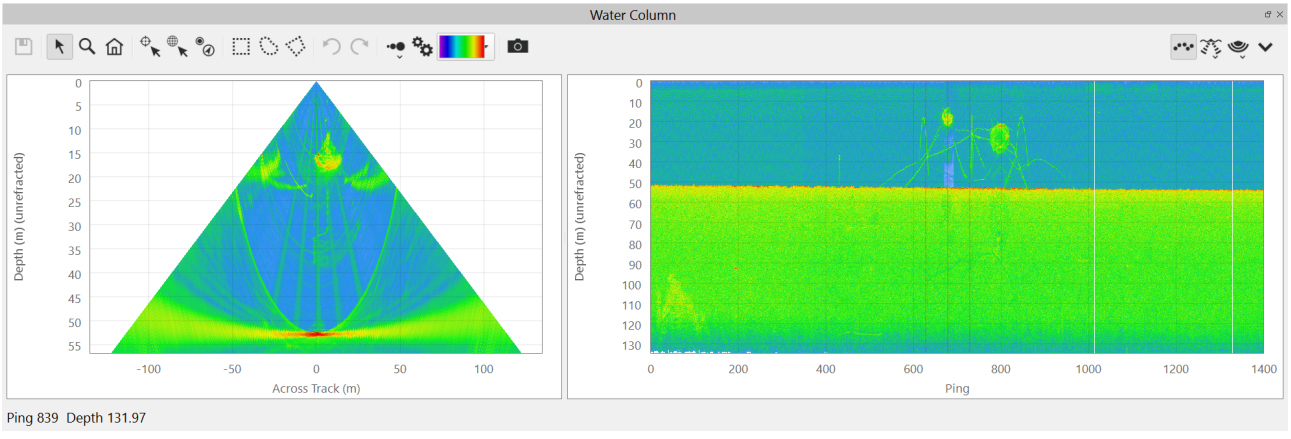


Side View - Entire Line

This option works the same as the one above, except it will show the stacked side view of the entire line. If you are also stacking the fan view, you will see dotted lines alongside the red ping indicator line to show you the ping range in the current fan stack.



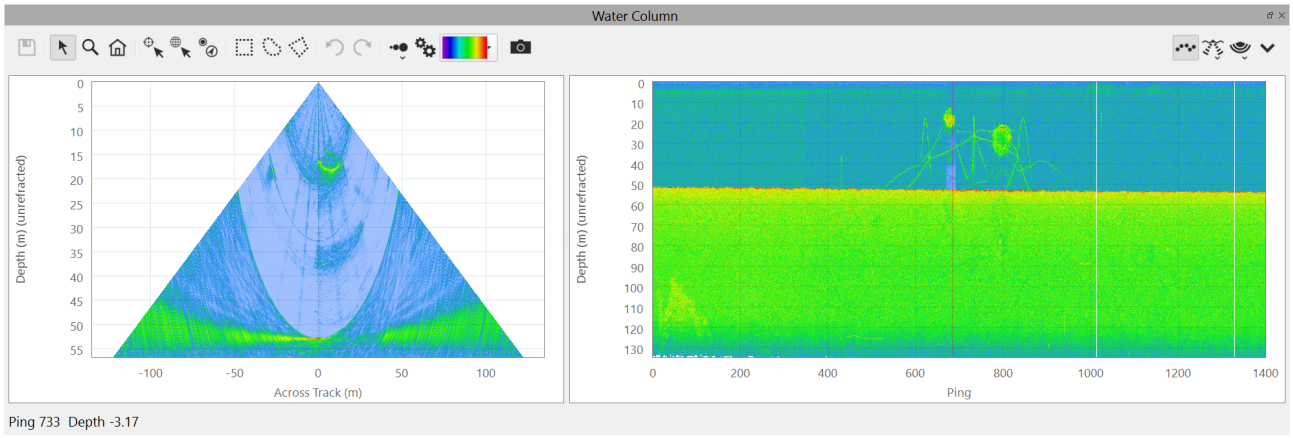
Single Ping Fan View



Stacked Fan View

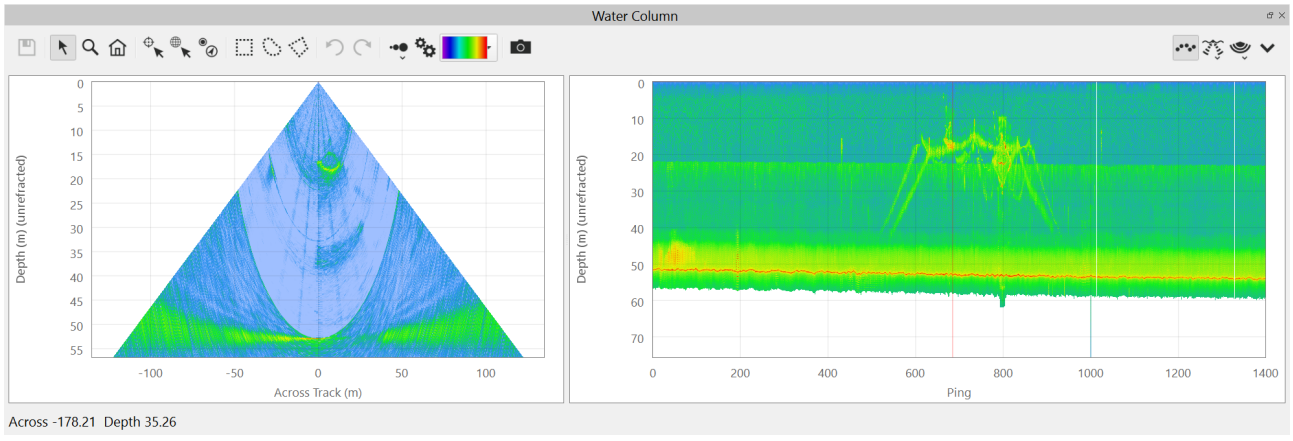
Side View - Stacked by Range

This option will show a range stack in the Side View. Range stacking will display the maximum value from each beam at the same range. This will distort the image as show below.



Side View - Stacked by Depth

This option will show a depth stack in the Side View. Depth stacking takes the maximum value of each beam at a specific depth. This provides an approximate geo-corrected image as shown below. It is as if the view point is looking through the water column perpendicular to the direction of travel.



Set User Picks as Features

This option will automatically set the feature flag of all water column picks. This allows for quick workflows that use the feature flag markup, for example, CUBE processing can use the feature flag to generate custom hypotheses.

Add User Pick for ENC Point

This option will automatically add a user pick for the sounding selected as the ENC point object. This performs the same operation as the *Add Sounding* mode above.

Show Soundings

This option will turn all soundings on/off. It is also accessible via the toolbar button.

Normal

This option will show/hide the normal sounding solutions. They will be colored red (Port) or green (Starboard).

User Picks

This option will show/hide the user picked water column soundings. They will be colored magenta by default.

Additional

This option will show/hide the additional soundings found by the sonar. They will be colored blue.

Save Fan Image

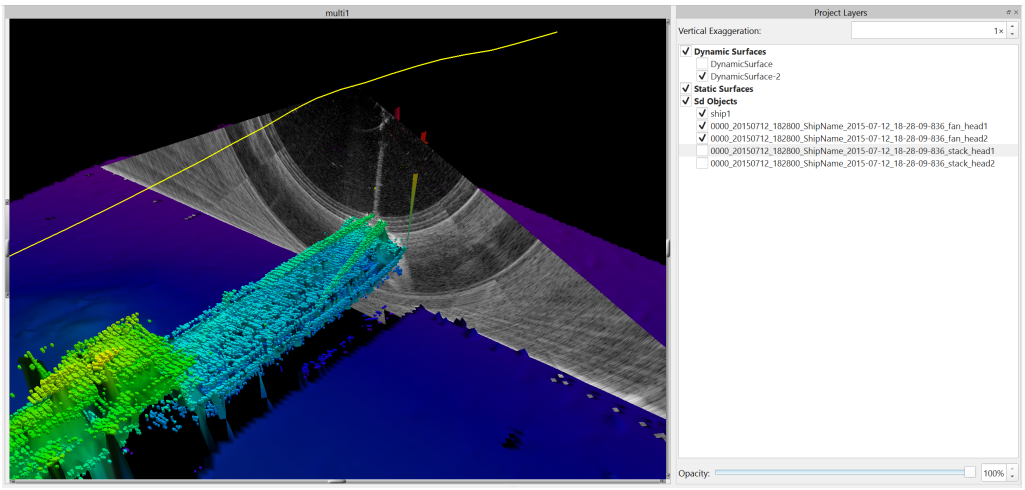
This option will allow you to save a JPEG or PNG of the fan view to disk.

Save Side Image

This option will allow you to save a JPEG or PNG of the side view to disk.

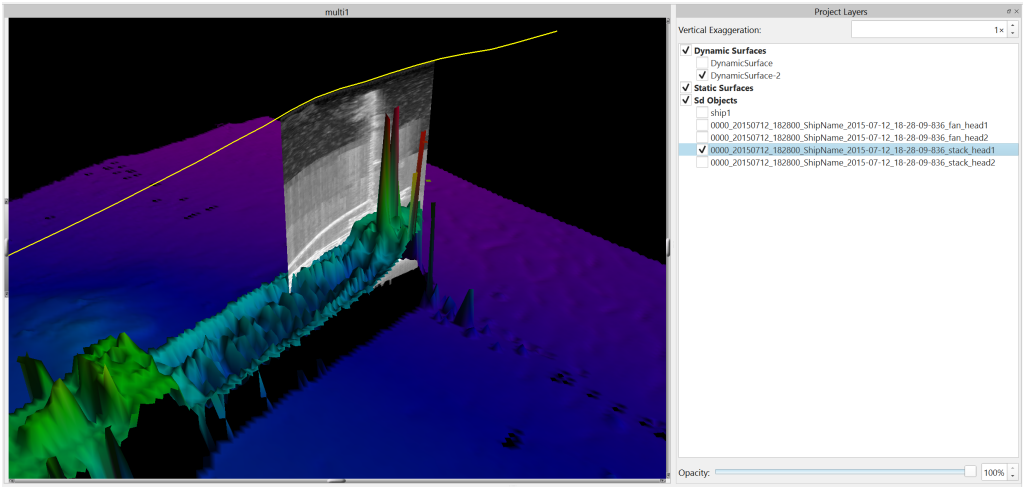
Save Fan Snapshot

This option will allow you to save an SD object of the Fan view at the current ping. If you are in stacked fan mode, the imagery will be stacked. Any constraints applied by the Constraints dialog will also be shown.



Save Side Snapshot

This option will allow you to save an SD object of the Side view of the current buffer. The SD object will follow the track line. Any constraints applied by the Constraints dialog will also be shown.



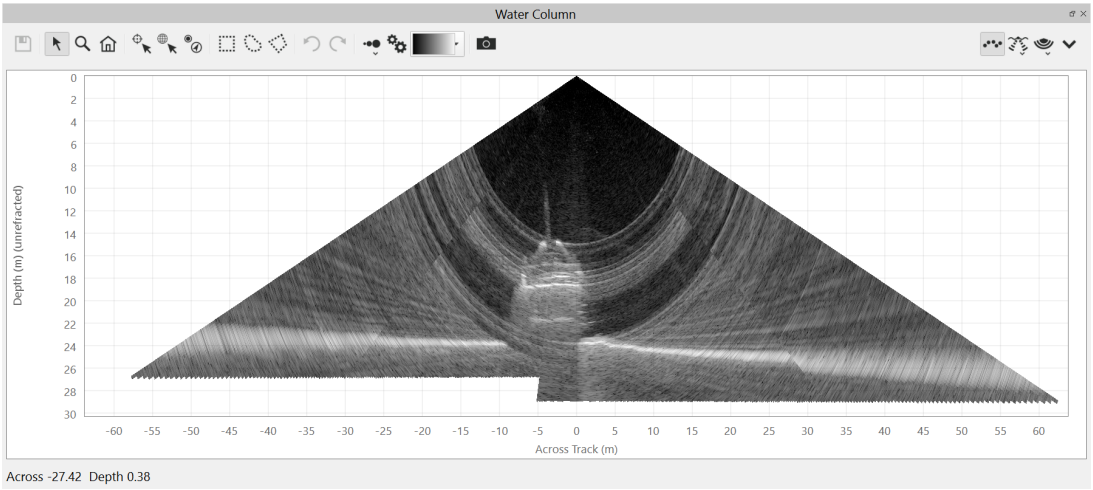
Show Grid Lines

This option will show/hide the grid lines on the plot.

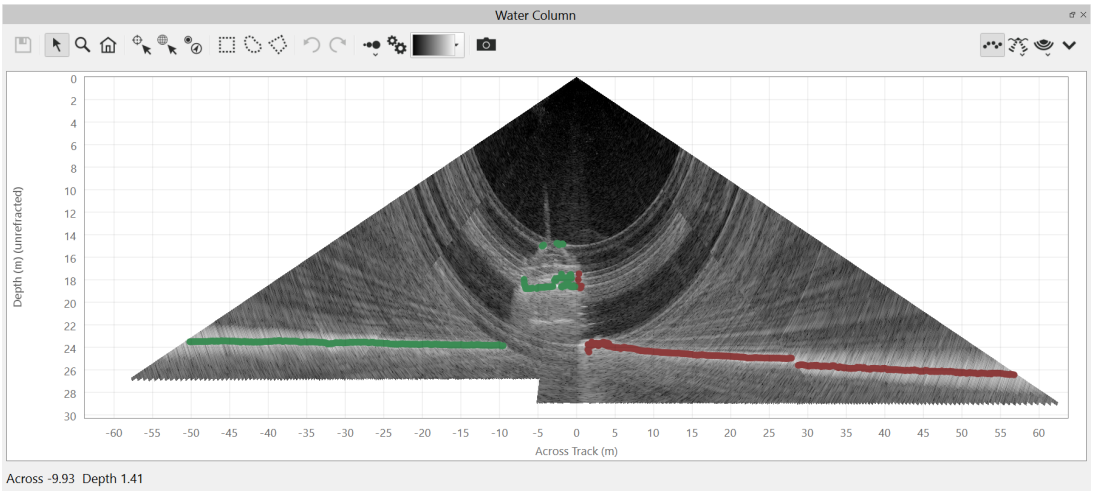
Sounding Views

The water column view can also show the sonar computed soundings as points on the plot. The soundings views are controlled by the menu.

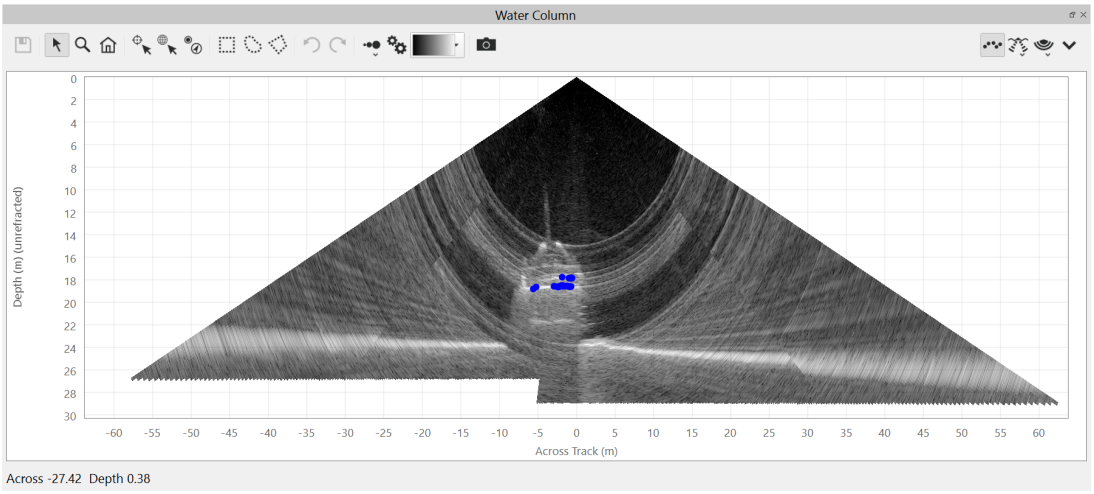
No Soundings



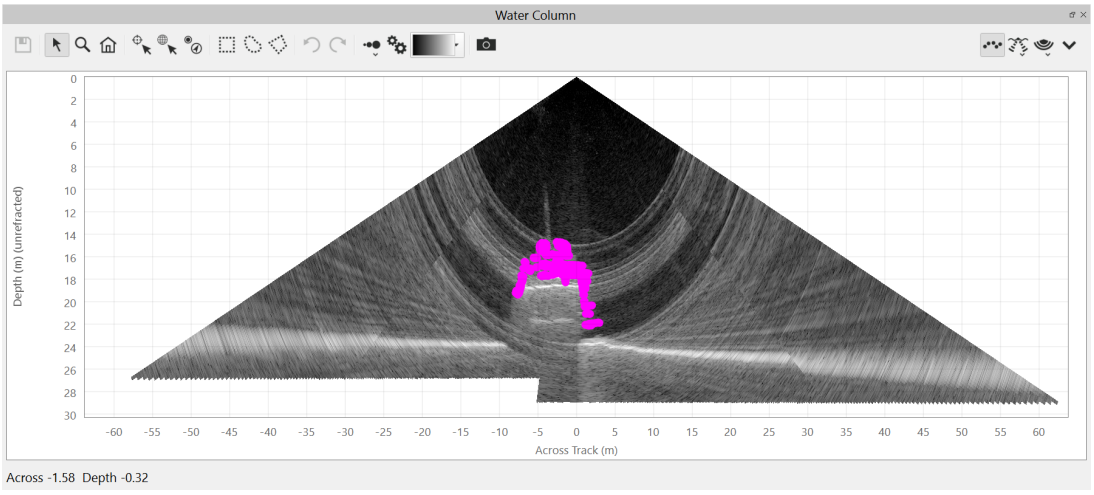
Normal Soundings



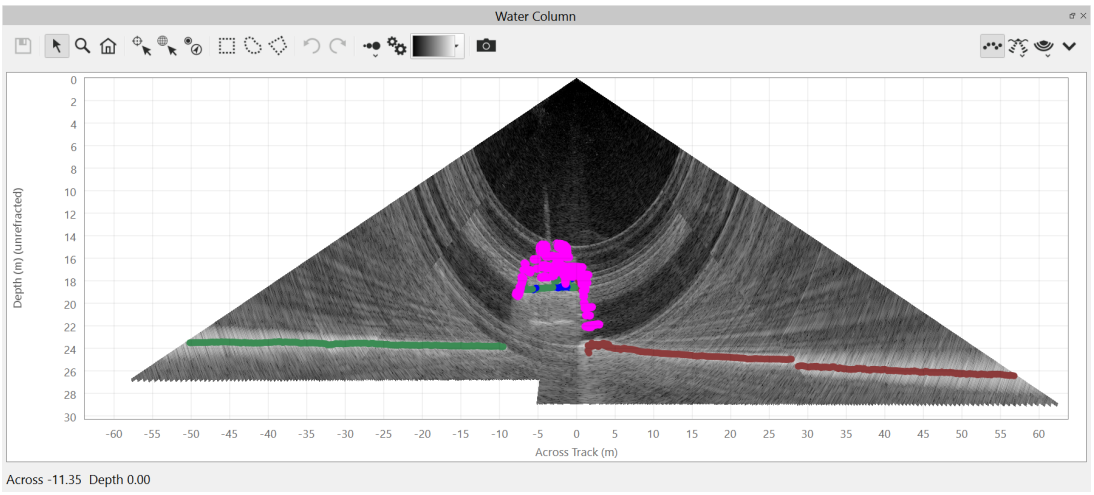
Additional Soundings



User Picks

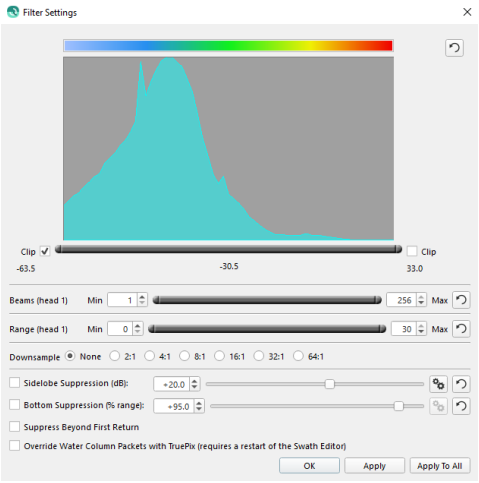


All Soundings



Filter Settings Dialog

This dialog controls the display of the water column data within both the Fan and Side views of the data. It consists of a current histogram control, beam limit control, range limit control, down sample control, and specialized filtering.



Histogram Control

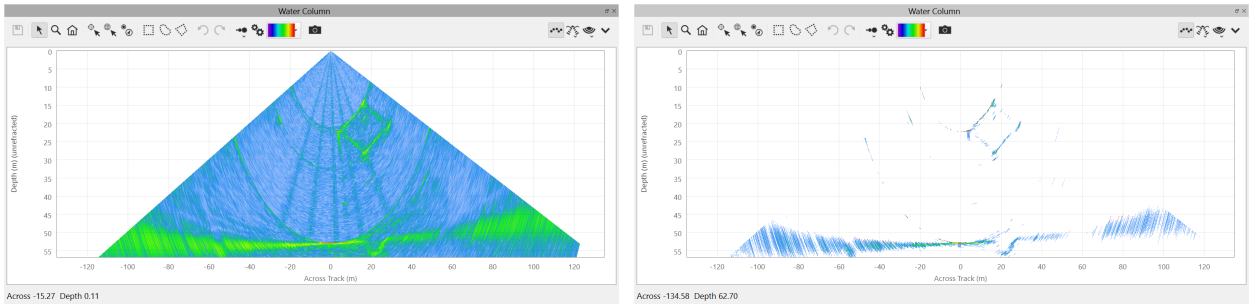
At the top of the histogram control is the current colormap that is used in the water column display. These are the colors that are mapped across the stretched histogram.

The next section of the panel is the histogram display. The cyan histogram is the base histogram for the currently loaded file. As you change the composite slider below the histogram, you will see a blue histogram that represents the "stretched" part of the histogram that you have selected. The vertical cyan dotted lines represent the portion of the main histogram that you are stretching.

The Clip check boxes on the left and right of the histogram allow you to either clip or clamp signal values outside of the minimum or maximum of the composite slider. This allows you to clip or clamp data to the minimum and maximum limits. Clamping keeps the data, while clipping eliminates the data. During minimum clamping, if a value is less than the minimum limit, the value is set to the minimum value. During maximum clamping, if the value is greater than the maximum limit, the value is set to the maximum limit. Clipping results in a "no data" assignment to the samples that are clipped, resulting in a transparent view in image and snapshot products. This also allows for easier selection of particular targets since the signals that are not of interest are ignored when selecting areas in the views.

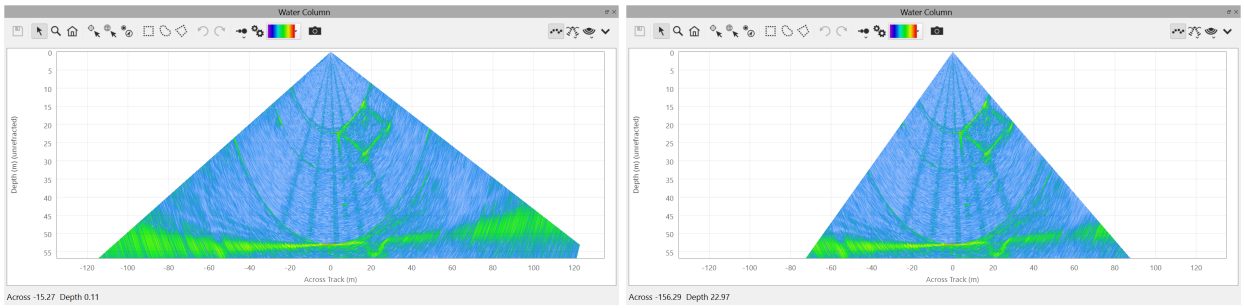
The composite slider at the bottom of the panel is used to set min/max thresholds limits for the water column data. Each end of the slider can be click-dragged to change either the minimum or maximum value of the threshold. The center of the control can also be click-

dragged to move the entire min/max over the desired range. The examples below (before/after) show the result of the histogram settings of -33dB to 0dB.



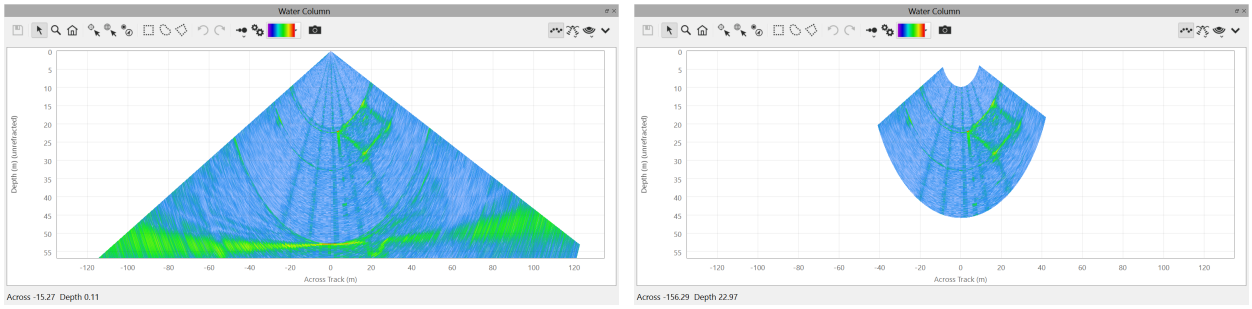
Beam Limit Control

The beam limit control allows you to change which range of beams are viewed in the water column display. If you have dual head data, you will have 2 controls. The composite slider works that same as the one in the histogram in that it allows you to set the min/max limits of the beam numbers. An example is shown below (before/after) using beams 31-134.



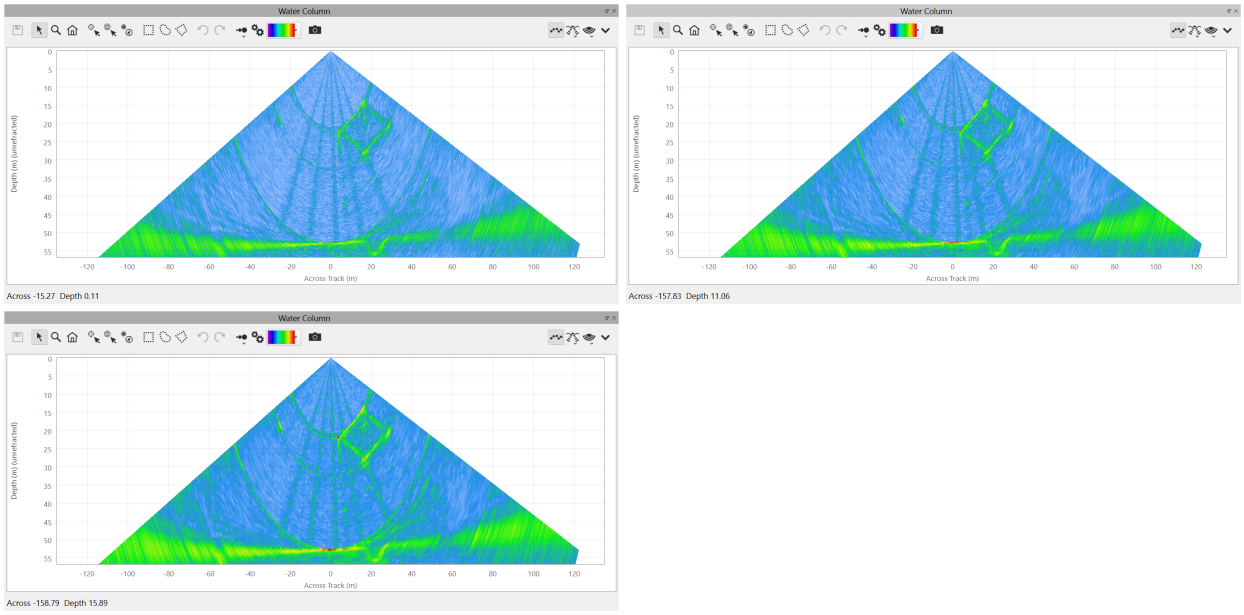
Range Limit Control

The range limit control allows you to change the range of samples viewed in the water column display. If you have dual head data, you will have 2 controls. The composite slider works the same as the one in the histogram in that it allows you to set the min/max limits of the range. Range is an approximate computation utilizing the sample number, sample interval and head sound speed. An example is shown below (before/after) using a range of 10-46.



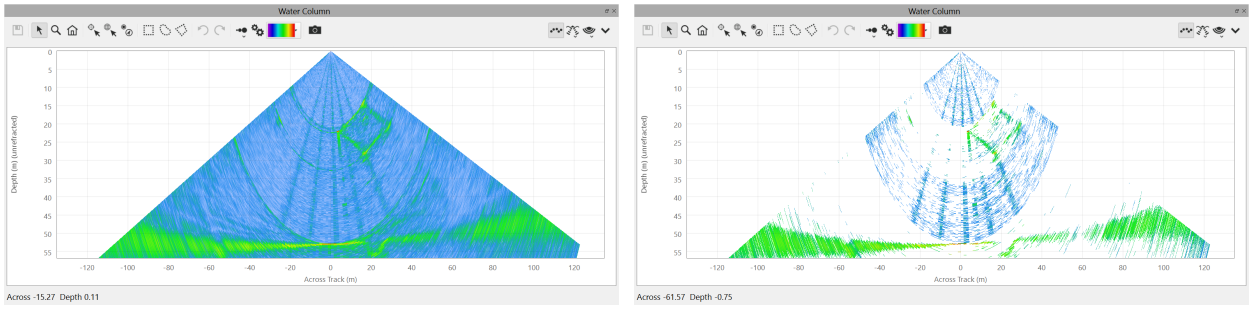
Downsample Control

This allows you to reduce the amount of data that is plotted in the display. Some sonar's have very high resolution time series data. If you find that plot times are slow, you can change your downsample amount. By default, Qimera will do no downsampling to the data. The examples below show no down sampling, 2:1, and 4:1. When downsampling, the resulting resolution of your picks will be downsampled as well. Downsampling is useful for speeding up exploration of data, but returning to a setting of *None* allows you to select data at the highest sampling resolution.



Sidelobe Suppression

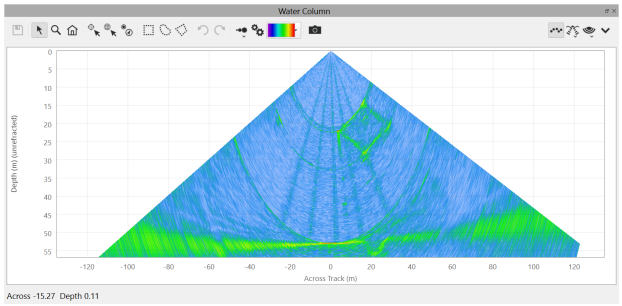
The sidelobe suppression filter will attempt to remove sidelobe artifacts in the water column data. The slider can be used to adjust the cutoff value of the filter. By default, this is 20dB. An example (before/after) is shown below with an 8dB cutoff.

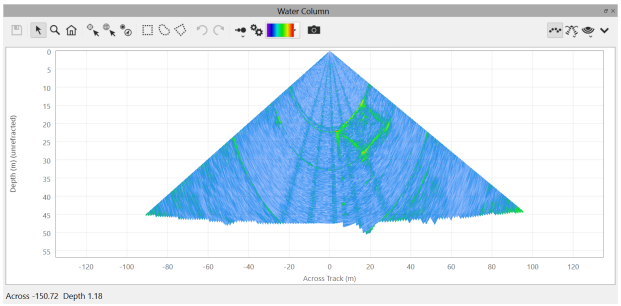


Bottom Suppression

The bottom suppression filter will remove all time series data below the bottom detection. The slider is used to set a range percentage at which the filter starts. By default, this is

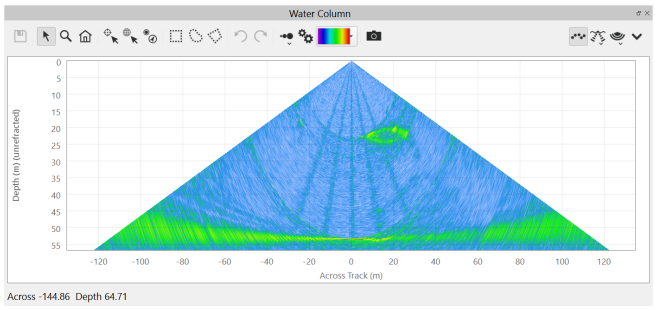
95% of the detected bottom. An example (before/after) is shown below using 90% range. This is useful for removing strong returns from the bottom when a weak return from the water column is desired. This is particularly useful in areas of strong topography.

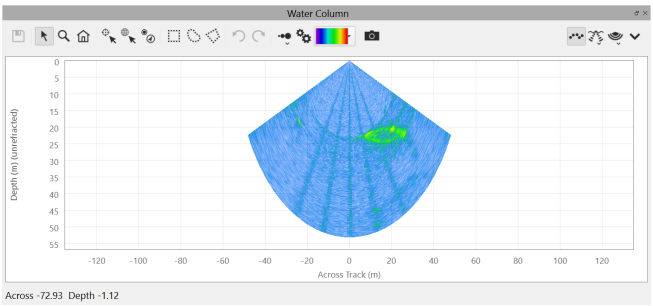




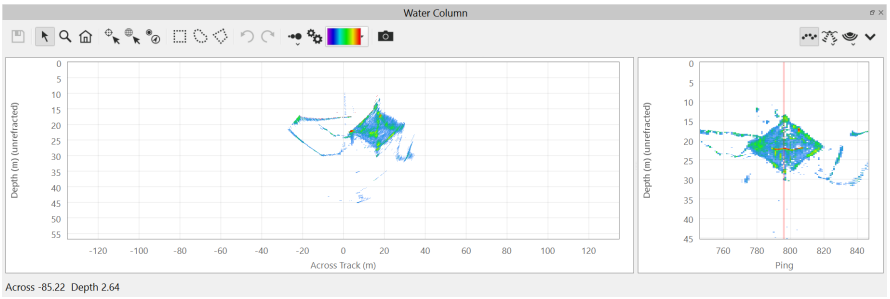
Suppress Beyond First Return

This option will find the first return, typically the nadir return, and suppress water column data beyond that range.





Below is an example using the settings shown in the dialog above. The Fan is in Stack mode and we are left with 2 views of the water column contacts that can be easily selected as additional soundings in either view.

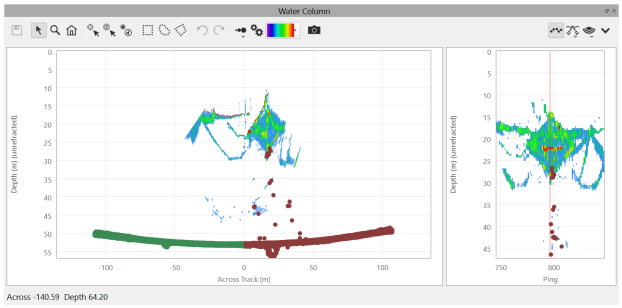


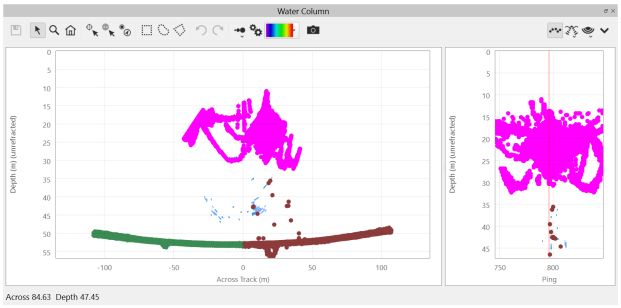
Override Water Column Packets with TruePix (requires a restart of the Swath Editor)

As of Qimera 2.0, the water column viewer can display R2Sonic TruePix packets. TruePix packets (TPX0) will be displayed automatically if R2Sonic Water Column (WCD0) packets are not present in the raw file. If the raw file contains both TruePix and Water Column packets, the Water Column packets will be displayed by default. To override this behavior and view the TruePix packets, check this box and restart the Swath Editor. At this time only TruePix packets containing D1 (16-bit magnitude and direction data) is supported for water column viewing.

Sounding Extraction

Using the Filter Settings dialog to limit the amount of samples that will be considered for extraction, you can then use one of the selection tools to add soundings to your loaded line. The examples below show the water column data before and after adding user picks. Once you have done all of your picking, you must save the results using the *Save* button. The raw sonar file will then become "dirty" and will await re-refraction. To do this, simply exit the Swath Editor and click on the *Auto Process* button. Your user picks will then be refracted and added to your QPD. If you choose to include user picks in a dynamic grid, these will be updated as well. You can also use the *Export* menu for *Raw Sonar Files* to export these soundings to an SD Point or SD Cluster object for further processing and analysis in Fledermaus. You can also export your newly created soundings into a text file from the *Export* menu for *Raw Sonar Files* under the *to Processed Points* option. In this last option, the dialog that launches will allow you to choose which types of soundings to extract from the *Filter Setup* option in the dialog.

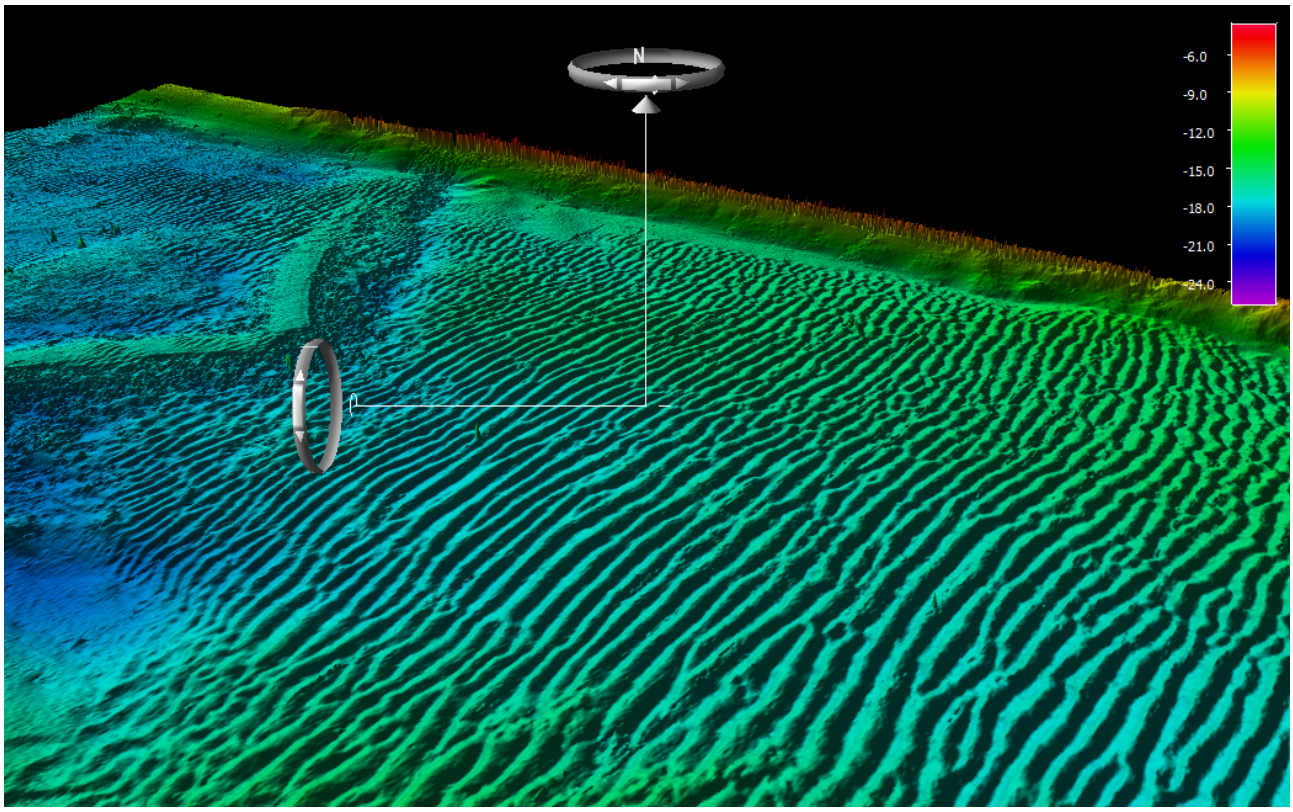




Return to: *Qimera Interface*

Return to: *Dockable Windows*

Qimera 4D Scene



- Qimera 4D Scene
- Scene Navigation
  - Plan View
  - Turntable View
  - Navigation Widget
- Object Visibility
- Object Selection
  - Temporospatial Correlation
- 4D Scene Context Menu
  - Edit Sub-Menu
    - Launch Swath Editor
    - Launch Slice Editor
    - Launch 3D Editor
    - Start Instant grid Filtering Mode
  - Select Sub-Menu
  - Mode Sub-Menu

- Zoom to Selected Objects
- Zoom to Scene
- Show Object Selection Markers
- Show Scene Bounds Box
- Show 3D Turntable Widgets
- Edit Scene Mouse Behavior…
- Create Line Object From Current Selection
- Create Route From Current Selection
- Create Cable/Pipe From Current Selection
- Set Checked Area
- Reset Checked Area
- Select in Area

Qimera 4D Scene

The Qimera 4D Scene is the main window into your integrated visualization of your loaded project. The scene can contain the output products of the bathymetric processing pipeline, raw source file track lines, processed point file track lines or bounding rectangles, Static Grids, Dynamic Grids, and SD objects. The Qimera 4D Scene interaction is very similar to that found in Fledermaus with the additions of some new selection modes. This is the central window widget of the application and thus cannot be floated or hidden. The selection mode used within the 4D Scene corresponds to the selection method chosen in the Qimera 4D Scene Toolbar. In the default Explore mode, you can choose track lines and navigate around the scene. In any other cursor mode, you can navigate by using the **Shift** key as a modifier while clicking.

Scene Navigation

Navigation of the scene is dependent on the viewing mode. These modes are the Plan View and Turntable View.

Plan View

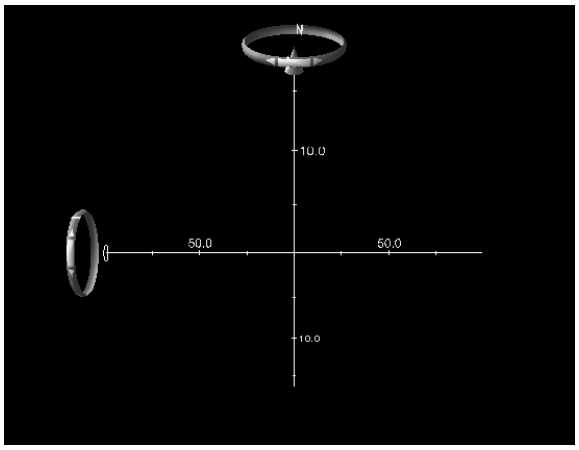
While in Plan View, simply **Left-Click** and drag to pan the scene. Moving the mouse-wheel will zoom in or out of the scene. You can also pan by using the right and lower scroll widget. Use the left scroll widget to zoom.

Turntable View

While in Turntable View, simply **Left-Click** and drag in the horizontal direction to rotate the scene around the current center point. **Left-Click** and drag in the vertical direction to tilt

the scene. **Center-Click** on a point in the scene to change the current point of rotation. You can also use right scroll bar to move the scene up or down, the bottom scroll bar to move the scene left or right, and the left scroll bar to zoom in and out of the scene. While in this mode, you can also interact with the Navigation Widget to navigate within the scene.

Navigation Widget



The Navigation Widget can be used in Turntable View only and allows for mouse-click based navigation of the scene. **Left-Click** and drag on the top crown to rotate the scene about the vertical axis centered at the current point of rotation. **Left-Click** and drag on the left crown to rotate the scene about the horizontal axis perpendicular to the view direction. **Left-Click** and drag on the top arrow to increase or decrease the vertical exaggeration of the scene.

Object Visibility

Visibility of a particular scene object is controlled by the checkbox in either the Project Sources window or Project Layers window. If the object is checked, it will be visible. If not, it will be invisible.

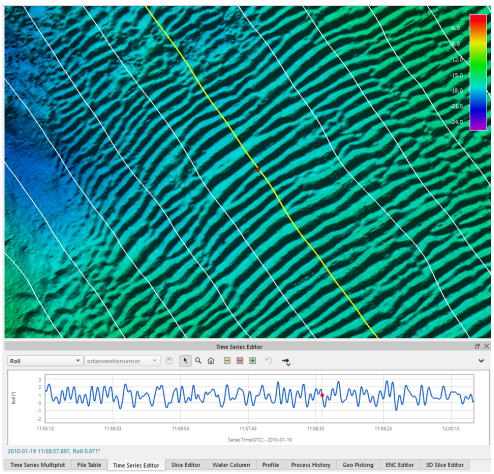
Object Selection

While in Explore Mode, clicking on an object in the scene will select that object if it is selectable. For example, **Left-Click** on a track line will select that line both in the scene and in the Project Sources window. The opposite is also true, if you select in the Project Sources window, the associated track line will highlight in the scene.

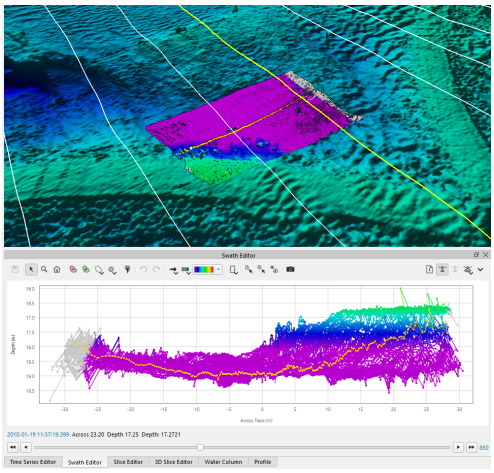
Temporospatial Correlation

Why yes, that is a real word! The scene can show correlation between time based elements in your project and their spatial location within the scene. For example, by simply moving your mouse over the Time Series Plot Window, a correlated location is displayed in

the scene by a red point on the track line, and a red point projected down to the current dynamic grid as shown below.

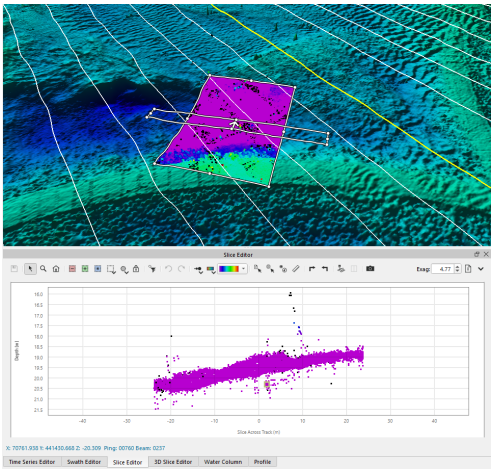


You can also see the correlated swath location when using the Swath Editor Window as shown below.



As you move along the pings in the selected track line, the 4D Scene will update to show the swath contents and location.

The Slice Editor also has a correlated view in the 4D Scene. As you move your selection, the scene will center on the selection if your "Auto Track" option is on.



4D Scene Context Menu

If you right click on the scene, a context menu will appear with the following options, many of which are found in other primary menus.

Edit Sub-Menu

Launch Swath Editor

This will launch the Swath Editor on the selected line. If no line is selected, Qimera will select the first processed raw sonar file line.

Launch Slice Editor

This will launch the Slice Editor on the selected Dynamic Grid using the current area selection. If no area is selected, Qimera will create a slice selection in the center of the selected Dynamic Grid.

Launch 3D Editor

This will launch the 3D Editor on the selected grid area.

Start Instant grid Filtering Mode

This will begin instant grid editing. When the user makes a spatial selection on a Dynamic Grid, the selected Filter will be immediately applied.

Select Sub-Menu

This menu option will allow you to select a layer in the Qimera Project Layers Dock. The sub-menu will populate with the SD objects under the pick point.

Mode Sub-Menu

This menu option will allow you to select one of the primary modes in the Qimera 4D Scene Toolbar.

Zoom to Selected Objects

This button will zoom the scene such that the selected objects fits the viewable area of the window.

Zoom to Scene

This button will zoom out the current view so that all objects within the scene are viewable.

Show Object Selection Markers

Show/Hide the bounding box of the selected scene object.

Show Scene Bounds Box

Show/Hide the scene bounding box.

Show 3D Turntable Widgets

Show/Hide the Fledermaus navigation widget.

Edit Scene Mouse Behavior…

Opens a dedicated dialog to modify the Scene Mouse Behavior options, also shown and described in Qimera Application Preferences Dialog

Create Line Object From Current Selection

Create an SD line object from the current selection and add it to the Qimera Project Layers Dock.

Create Route From Current Selection

Create an SD route object from the current selection and add it to the Qimera Project Layers Dock.

Create Cable/Pipe From Current Selection

Create a Cable/Pipe object from the current selection and add it to the Qimera Project Layers Dock.

Set Checked Area

See description in Qimera Project Layers Dock - Context Menus.

Reset Checked Area

See description in Qimera Project Layers Dock - Context Menus.

Select in Area

This will select all the Raw Sonar Files that have soundings which overlap the selected area.

Return to: Qimera Interface

Return to: Qimera Table of Contents

Qimera Main Menu Bar

> **Qimera v2.7.0 Dynamic Grid Menu**
>
> Starting Qimera v2.7.0 the Dynamic Grid Menu has been removed. Individual elements of this menu have been moved to other places such as the Attribute Panel, Project Layer Dock, and Context Menu.

The Main Menu bar of Qimera provides secondary control functionality as well as repeated actions that are represented elsewhere in the experience as buttons. The primary control functionality of Qimera is handled by the 2 toolbars and the Dynamic Workflow engine.

- Qimera Dynamic Grid Menu
- Qimera Export Menu
- Qimera Help Menu
- Qimera Layer Menu
- Qimera Project Menu
- Qimera View Menu
- Qimera Source Menu
- Qimera Tools Menu
- Qimera Window Menu

Return to: *Qimera Interface*

Return to: *Qimera Table of Contents*

Qimera Dynamic Grid Menu

Qimera v2.7.0 Dynamic Grid Menu

Starting Qimera v2.7.0 the Dynamic Grid Menu has been removed. Individual elements of this menu have been moved to other places such as the Attribute Panel, Project Layer Dock, and Context Menu.
To see the new homes of these features, visit the links below.

- Qimera - Dynamic Grid Menu
  - Create Dynamic Grid
  - Create Clipped Dynamic Grid
  - Change Resolution
  - Duplicate Dynamic Grid
  - Append Lines to Dynamic Grid
  - Remove Lines from Dynamic Grid
  - Unload Changes
  - Select Associated Source Files
  - Interpolate Dynamic Grid
  - Filter Out Soundings in Lonely Cells
  - Re-display Grids
  - Snapshot as Static Grid
  - Create THU and TVU layers
  - Extract Dynamic Grid Layer
  - Create Survey Area
  - Grid Statistics
  - Create Flag Markers
  - Set Checked Area
  - Reset Checked Area
  - Select Sounding
  - Show Cell Info
  - CUBE Sub-Menu
    - Re-CUBE Area

- CUBE Filter Soundings
- Create Hypotheses from Feature
- CUBE Options

Qimera - Dynamic Grid Menu

The dynamic grid menu allows you to perform many operations on a Dynamic Grid, such as: export utilities while others are in analysis or further processing.

> **Recompute Illumination and Recompute ColorMap**
>
> Starting Qimera v2.7.0 the *Recompute-Illumination* and *Recompute-ColorMap* have been moved into the Project Layer Dock.

Create Dynamic Grid

Launches the Create Dynamic Grid dialog.

> Starting Qimera v2.7.0 the *Create Dynamic Grid* has been moved into the Qimera Layer Menu

Create Clipped Dynamic Grid

Launches the Create Clipped Dynamic Grid dialog.

> Starting Qimera v2.7.0 the *Create Clipped Dynamic Grid* feature has been eclipsed by the Duplicate Dynamic Grid

Change Resolution

Launches the Change Resolution dialog.

Starting Qimera v2.7.0 the *Change Resolution* feature has been moved to the Dynamic Grid Context Menu

Duplicate Dynamic Grid

Launches the Duplicate Dynamic Grid dialog.

Starting Qimera v2.7.0 *Duplicate Dynamic Grid* option has been moved into the Dynamic Grid Context Menu in the Project Layers dock.

Append Lines to Dynamic Grid

Launches the Append To Dynamic Grid dialog.

Starting Qimera v2.7.0 the *Append Lines* moved into the Dynamic Grid Context Menu in the Project Layers dock.

Remove Lines from Dynamic Grid

Launches the Remove Lines dialog.

Starting Qimera v2.7.0 the *Remove Lines* moved into the Dynamic Grid Context Menu in the Project Layers dock.

Unload Changes

Launches the Qimera Unload Processed Point File Dialog to save edits back to processed point files that support unloading.

Starting Qimera v2.7.0 the *Unload Changes* has moved to the Dynamic Grid Context Menu in the Project Layers dock.

Select Associated Source Files

This will clear the current line selection and select all the lines in the scene associated with the currently selected Dynamic Grid.

Starting Qimera v2.7.0 the *Select Associated Source Files* has moved to the Dynamic Grid Context Menu in the Project Layers dock.

Interpolate Dynamic Grid

Launches the Interpolate Dynamic Grid Dialog used to configure the interpolation algorithm.

Starting Qimera v2.7.0 the *Interpolate Dynamic Grid* moved into the Dynamic Grid Context Menu in the Project Layers dock.

Filter Out Soundings in Lonely Cells

Launches the Qimera Filter Out Soundings in Lonely Cells Dialog used to remove small blocks of cells detached from the main body of the dynamic grid.

Starting Qimera v2.7.0 the *Filter-Out Soundings in Lonely Cells* has been moved into the Dynamic Grid Context Menu in the Project Layers dock.

Re-display Grids

This will tell the 3D scene to redraw all of its grids which can be useful if any rendering glitches appear or after long editing sessions to make sure you are seeing all of the latest edits.

Starting Qimera v2.7.0 the *Re-Display Grids* has been moved into the Dynamic Grid Context Menu in the Project Layers dock.

Snapshot as Static Grid

This will launch the Snapshot as Static Grid dialog.

Starting Qimera v2.7.0 the *Snapshot as Static Grid* has been moved into the Dynamic Grid Context Menu in the Project Layers dock.

Create THU and TVU layers

This will create two static grids; one for THU and another for TVU. The units are the same as the THU and TVU of a beam, project units (ft/m) scaled to 95% confidence interval.

Starting Qimera v2.7.0 the *Create THU and TVU layers* has been moved into the Dynamic Grid Context Menu in the Project Layers dock.

Extract Dynamic Grid Layer

This will launch the Extract Dynamic Grid Layer dialog.

Starting Qimera v2.7.0 the *Extract Dynamic Grid* has been moved into the Dynamic Grid Context Menu in the Project Layers dock.

Create Survey Area

This will open a file browser to select the name for the survey area SD object. It will then automatically be added to the scene. A survey area object is a Fledermaus Line SD object of the outline of the survey area. Qimera will also report the area in square meters.

Starting Qimera v2.7.0 the *Create Survey Area* has been moved into the Dynamic Grid Context Menu in the Project Layers dock.

Grid Statistics

This will launch the Grid Statistics dialog. This option will be greyed out if you have a static grid selected.

Starting Qimera v2.7.0 the *Grid Statistics* has been moved into the Dynamic Grid Context Menu in the Project Layers dock.

Create Flag Markers

This will launch the Create Flag Markers dialog.

Starting Qimera v2.7.0 the *Create Flag Markers* has been moved into the Dynamic Grid Context Menu in the Project Layers dock.

Set Checked Area

This will set the checked bit flag in the cells covered by the current selection. This option will only work if you have a dynamic grid selected and a spatial area selected. You can then view checked areas by using the *Highlight By* option of the Qimera Project Layers Dock for Dynamic Grids. This bit can only be cleared by using the *Reset Checked Area* option below. The checked bit flag is also independent of the visited/edited areas seen in the *Grid Edit Overview Dock*.

The Set Checked Area option is no longer in the 3D Editor. Starting Qimera v2.7.0 the *Set Checked-Area* has been moved into the Project Layers Dock

Reset Checked Area

This will clear the checked bit flag in the cells covered by the current selection. This option will only work if you have a dynamic grid selected and a spatial area selected.



The Reset Checked Area option is no longer in the 3D Editor. Starting Qimera v2.7.0 the *Reset Checked-Area* have been moved into the Project Layers Dock

Select Sounding

This will launch the Sounding Selection dialog.



Starting Qimera v2.7.0 the *Select Soundings* has been moved into the Dynamic Grid Context Menu in the Project Layers dock.

Show Cell Info

This will launch the Cell Info dialog.



Starting Qimera v2.7.0 the *Cell Info Dialog* has been replaced with the Cell Properties Dock.

CUBE Sub-Menu

Re-CUBE Area

This will launch the Re-Cube Area dialog.



Starting Qimera v2.7.0 the *Re-CUBE Area Dialog* has been moved into the Dynamic Grid Context Menu in the Project Layers dock.

CUBE Filter Soundings

This will launch the CUBE Filter Soundings dialog.

> ⚠ Starting Qimera v2.7.0 the *Cube Filter Soundings Dialog* has been moved into the Dynamic Grid Context Menu in the Project Layers dock.

Create Hypotheses from Feature

This will launch the Create Custom Hypothesis from Features dialog.

> ⚠ Starting Qimera v2.7.0 the *Create Custom Hypothesis from Features Dialog* has been moved into the Dynamic Grid Context Menu in the Project Layers dock.

CUBE Options

This will launch the CUBE Settings dialog.

> ⚠ Starting Qimera v2.7.0 the *CUBE Settings Dialog* has been moved into the Dynamic Grid Context Menu in the Project Layers dock.

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Qimera Export Menu

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    - to Processed Points
    - to GSF
    - to FAU
    - To QTR
    - To SD Points
    - To SD Cluster
  - SD Cluster Export
    - Track to ASCII
  - Processed Point File
    - to ASCII
    - to Processed Points
    - to FAU
    - To QTR
  - Dynamic Grid
    - to ASCII/Grid
    - to Image
    - to 3D PDF
    - to KML
    - to Static Grid File
    - to Static Grid Layer
    - to Soundings
    - to Shoal Soundings
    - to Bag
    - to CUBE
    - to BBH File

- Static Grid
  - to ASCII/Grid
  - to Image
  - to 3D PDF
  - to KML
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  - to grid
  - to Image
- Line Object
  - to XYZ
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- Point Object
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- SVP
  - to ASCII
  - to Caris
  - to Hypack Version 2
  - to Hypack Version 3
- Export s57
- Export Screen Capture
- Export to NOAA CSV Format

Qimera - Export Menu

The export menu allows you to export to various formats from raw files, processed point files, dynamic grids and static grids

Raw Sonar File

This sub-menu is active when Raw Sonar files are selected.

to ASCII

This will launch the Qimera Export Soundings to ASCII Dialog and will export the selected raw sonar files.

to Processed Points

This will launch the Qimera Export Processed Points Dialog and will export the selected raw sonar files.

to GSF

This will launch the Qimera Export to GSF Dialog. If the file has not been processed, you will be asked to process the file first. The files will appear in the Export folder within the Project directory.

to FAU

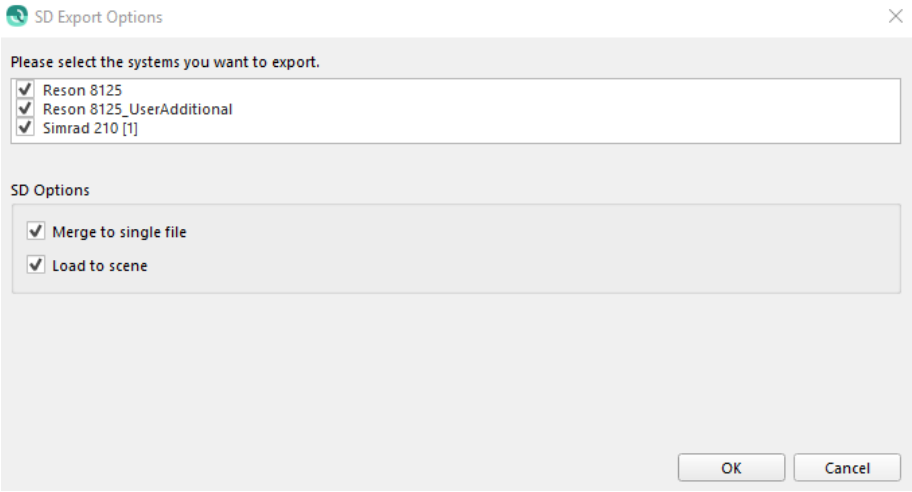
This will launch the Qimera Export to FAU Dialog. The files will appear in the Export folder within the Project directory.

To QTR

This option will export the selected sonar files to a QTR file for use with PREMO. You have the option to export all lines to a single file or individual files for each selected line. The files will appear in the project's *Export* folder.

To SD Points

This option will export the selected sonar files to SD Point objects. Qimera will also pay attention to a spatial selection. You have the option to specify which systems to export. Qimera will add a *User Additional* system for each multibeam head that will be the container for any water column picks that you add. You also have the option to merge all the lines into a single SD and an option to automatically load the SD object to the scene. Qimera exports the following attributes to the SD Point object: X, Y, Z, Time, System, Ping, Beam, Intensity, Horizontal TPU, and Vertical TPU.



To SD Cluster

This option will export the selected sonar files to SD Cluster objects. Qimera will also pay attention to a spatial selection. You will see the same option dialog as you do when exporting SD Points. You have the option to specify which systems to export. You also have the option to merge all the lines into a single SD and an option to automatically load the SD object to the scene.

> **SD Cluster Export**
>
> If you have done water column picking of geophysical processes such as seeps, use this option to export only your water column picks (*SystemName*_UserAdditional) into a single SD Cluster object. Then load this object into Fledermaus to do cluster analysis. Remember you can do water column picking for all of your lines, then export all line picks into a single object using the *Merge to single file* option.

Track to ASCII

This will launch the Qimera Export Track To ASCII Dialog.

Processed Point File

This sub-menu is active when Processed Point files are selected.

to ASCII

This will launch the Qimera Export Soundings to ASCII Dialog and will export the selected processed point files.

to Processed Points

This will launch the Qimera Export Processed Points Dialog and will export the selected processed point files.

to FAU

This will launch the Qimera Export to FAU Dialog. The files will appear in the Export folder within the Project directory.

To QTR

This option will export the selected sonar files to a QTR file for use with PREMO. You have the option to export all lines to a single file or individual files for each selected line. The files will appear in the project's *Export* folder.

Dynamic Grid

This sub-menu is active when a Dynamic Grid is selected.

to ASCII/Grid

This option launches the Qimera Export Grid Dialog to export the selected dynamic Grid to a number of different grid formats.

to Image

This option launches the Qimera Export Grid as Image Dialog, followed by a file browser dialog to select the filename of the exported image.

to 3D PDF

This will open a file browser dialog to save the currently selected Grid as a 3D PDF.

to KML

This option launches the Qimera Export Grid to KML Dialog to export the currently selected Grid to KML and KMZ formats.

to Static Grid File

This will open a file browser to select the name for the exported Static Grid file.

to Static Grid Layer

This will launch the Qimera Export Static Grid Layer dialog.

to Soundings

This will launch the Qimera Export Grid to Soundings dialog.

to Shoal Soundings

This will launch the Qimera Export Shoal Soundings Dialog.

to Bag

This will launch the Qimera Export BAG Wizard.

to CUBE

This will launch the Output Grid dialog.

to BBH File

This will open a file browser to select the name for the exported BBH file.

BBH is an acronym for Basis Bestand Hoogte which is a format used by the Rijkswaterstaat (Dutch government) to store gridded data together with slope information in a database.

The export is only available for dynamic grids as it will require the sounding grid and the QPD footprints the grid is generated from.

For all footprints contributing to a grid cell a regression plane is calculated. From this plane, the slope parameters are calculated and needed for the export.
The calculation is only performed when 6 or more footprints are contributing to a grid cell.

Example:

```
BBH Versie 2.2,grid
70498.50,441528.50,13.97,10,0.036,0.016,6.5369,30.1324,0.058,0.099
70499.50,441528.50,14.11,15,0.098,0.044,15.4769,51.3809,0.216,0.173
70499.50,441529.50,14.27,12,0.063,0.019,12.2955,71.3910,0.207,0.070
70499.50,441530.50,14.33,2,,,,,,
70500.50,441528.50,14.34,14,0.058,0.039,9.1749,14.4456,0.040,0.156
70500.50,441529.50,14.39,16,0.046,0.017,8.5457,54.8438,0.123,0.087
70500.50,441530.50,14.47,12,0.044,0.022,8.6695,50.2053,0.117,0.098
70500.50,441531.50,14.57,5,0.019,,,,,
70501.50,441528.50,14.42,12,0.084,0.037,12.0830,15.8277,0.058,0.206
```

Field description:

Field	Name	Description
1	X	X ordinate of the center of the grid cell
2	Y	Y ordinate of the center of the grid cell
3	Z	Mean depth of all footprints contributing to the grid cell
4	Hit Count	The number of footprints contributing to the grid cell
5	SD	The calculated standard deviation of the footprint depths contributing to the grid cell
6	Corrected SD	The corrected SD for the calculated slope
7	Slope Angle	The slope angle with respect to the vertical
8	Slope Direction	The slope direction with respect to grid north
9	Direction Coefficient X	The direction coefficient of the regression plane in the X-direction
10	Direction Coefficient Y	The direction coefficient of the regression plane in the Y-direction

Fields 6 until 10 are left empty when there are less than 6 footprints contributing to the cell.
Field 5 is left empty when less than 3 footprints are contributing to the cell.

Static Grid

This sub-menu is active when a Static Grid is selected.

to ASCII/Grid

This option launches the Qimera Export Grid Dialog to export the currently selected static grid to a number of different grid formats.

to Image

This option launches the Qimera Export Grid as Image Dialog, followed by a file browser dialog to select the filename of the exported image.

to 3D PDF

This will open a file browser dialog to save the currently selected grid as a 3D PDF.

to KML

This option launches the Qimera Export Grid to KML Dialog to export the selected grid to KML and KMZ formats.

Scalar Object

This sub-menu is active when a Scalar Object is selected.

to grid

This option launches the Qimera Export Grid Dialog to export the selected scalar object to a number of different grid formats.

to Image

This option exports a GeoTIFF or JPEG with a world file for the selected scalar object.

Line Object

This sub-menu is active when a Line Object is selected.

to XYZ

This option launches the Qimera Export Line to XYZ Dialog, followed by a file browser dialog in order to select the exported XYZ filename.

to KML

This option launches a file browser to select the exported KML filename.

to DXF

This option launches the DXF/DWG Revision Dialog, followed by a file browser dialog in order to select the exported DXF filename.

to DWG

This option launches the DXF/DWG Revision Dialog, followed by a file browser dialog in order to select the exported DWG filename.

Point Object

This sub-menu is active when a Point Object is selected.

to File

This will launch a file browser to select the name for the exported file and the format type. In the file browser, use the 'Save as type' drop down menu to specify the file type. You can save line objects as XYZ or KML file types.

SVP

This sub-menu is active when SVP files are selected.

to ASCII

This will output each selected SVP file to the export folder with the naming ***svpfilename.txt***. It will only contain depth (meters) and sound speed (meters/sec).

to Caris

This will launch a file browser to select the name for the exported file. All selected SVP files will be combined into a single export file using the Caris format. The extension of the file will be ***.svp***.

to Hypack Version 2

This will output each selected SVP file to the export folder with the naming ***svpfilename.vel*** in the Hypack version 2 format. It will contain a header line of "*FTP NEW 2"* followed by depth (meters) and sound speed (meters/sec) entries.

to Hypack Version 3

This will output each selected SVP file to the export folder with the naming ***svpfilename.vel*** in the Hypack version 3 format. It will contain a header line

containing latitude, longitude, time and date. An example would be "*FTP NEW 3 39.123456789 -145.123456789 08:46 02/14/2018*". The header will be followed by depth (meters) and sound speed (meters/sec) entries.

Export s57

This will create an ENC file (.000) from the selected *Chart* layer in the *Project Layers Dock*.

Export Screen Capture

This option launches the Qimera Screen Capture Dialog dialog to save the current scene view to an image file.

Export to NOAA CSV Format

This option exports a CSV file containing metadata for each of the selected raw sonar files. The metadata columns in the CSV file are:

MB Line Filename, Speed, HDG, Longitude Min, Longitude Max, Latitude Min, Latitude Max, Linear Distance, Min Time, Max Time, SVP File Applied, Julian Day, Date (UTC)

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Qimera Help Menu

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  - Online Support Desk
  - QPS Home Page
  - Open Crash Dump Folder For Qimera
  - Enable Verbose Logging
  - Enable Console Logging
  - Open Log Folder
  - Show Licence Manager
  - About Qimera

Qimera - Help Menu

The help menu gives you access to version information as well as a link to the online and offline help.

Offline Manual

This menu option will bring up the offline documentation that can be used without an internet connection.

Online Support Desk

This menu option will bring up the online Support Desk web page that can only be used with an internet connection.

QPS Home Page

This menu option will bring up the QPS home page.

Open Crash Dump Folder For Qimera

This menu option will open the location where Qimera places any crash dumps.

(Note that on macOS this will open the user Diagnostic Reports folder that contains crash dumps for all macOS applications including QPS Applications.)

(Note that on Linux this menu option is not available.)

Enable Verbose Logging

This menu option enables more verbose logging that will appear in the logging folder listed below, Open Log File

Enable Console Logging

This menu option enables console logging when you run Qimera from the command line with the -debug option. The output from verbose logging, which will continue to log to a file, will also appear in the console.

Open Log Folder

This menu option opens the Qimera verbose logging folder: C:\Users\username\AppData\Local\QPS\Logs

Show Licence Manager

This menu option opens the License Status dialog, which displays the current licensing status and allows installation of new licenses.

(Note that on macOS, this menu entry is shown under the *Qimera* menu.)

About Qimera

This menu option will display the Qimera About Box that shows the current build number, access to the Qt version used to build Qimera, and information to contact QPS.

(Note that on macOS, this menu entry is shown under the *Qimera* menu.)

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Qimera Layer Menu

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  - Import Image
  - Import Points for Visualization
  - Import Lines
  - Import CAD
  - Import Chart
  - Load Route from QGF File...
  - Create KP Marker Labels...
  - Create Static Grid
  - Create Line Object From Current Selection
  - Create Route From Current Selection
  - Create Dynamic Cable/Pipe From Current Selection
  - Create Plane
  - Contouring
  - Spot Soundings
  - Grid Difference

Qimera - Layer Menu

The layer menu provides the ability to add other contextual data to your project.

Add Fledermaus SD

Add a Fledermaus SD object to the scene. If the SD object is in a different coordinate system than Qimera, it will be re-projected to the project coordinate system.

Import Grid

This option opens a file browser to select supported grid files to import. It will then launch the Import Gridded Data wizard that is used to create a Fledermaus Sonar DTM SD object.

Import Image

This option opens a file browser to select supported image files to import. It will then launch the Import Image dialog that is used to create a Fledermaus Image SD object.

Import Points for Visualization

This option opens a file browser to select supported point files to import. It will then launch the Import Points dialog that is used to create a Fledermaus Point SD object.

Import Lines

This option opens a file browser to select supported line files to import. It will then launch the Import Lines dialog that is used to create a Fledermaus Line SD object.

Import CAD

This option opens a file browser to select AutoCAD DXF/DWG files to import. As well as QGF QPS files. It will then launch the Import CAD dialog that is used to create a Fledermaus Model SD object.
This option now allows selecting multiple files at CAD import. If multiple files are selected, the results are combined in the Loaded CAD file dialog.

Since .sd objects can only contain one object type per file (e.g. points in one file, lines in another), a CAD file is "exploded" into a points and a lines .sd files. And the objects are named the same as the layer they belonged to. These are added under a single group with the group name coming from the CAD file. Visibility can be controlled separately for points and lines as well using the normal mechanisms.

Support was added for color, labeling, and line thickness for DXF/DWG/QGF.

Import ArcGIS Shape

This option opens a file browser to select ESRI Shape files to import. It will then launch the Import ESRI Shape dialog that is used to create a Fledermaus SD object of the appropriate type.

Import Chart

This option opens a file browser to import an ENC chart file (.00*). The ENC will be converted to a Qimera QNC file and added to the project QNC folder and the *Charts* layers in the *Project Layers* dock.

Load Route from QGF File...

This action allows setting the project's active route. The project's active route is used for displaying KP/DX values in various places throughout the Qimera interface. For more information, see the *Project Layers* dock.

If the project already has an active route, it will be replaced.

Create KP Marker Labels...

This action creates a point object labeling KP values along the project's active route at a specified interval. The action is only enabled If the project has an active route. For more details on routes and KP, see the *Project Layers* dock.

Create Static Grid

This option launches the Create Static Grid dialog.

Create Line Object From Current Selection

If you have a spatial selection, this option will create an SD Line object of the selection and add it to the *Project Layers* Dock.

Create Route From Current Selection

If you have a spatial selection, this option will create an SD route of the selection and add it to the *Project Layers* Dock.

This action allows setting the project's active route. The project's active route is used for displaying KP/DX values in various places throughout the Qimera interface. For more information, see the *Project Layers* dock.

If the project already has an active route, it will be replaced.

Create Dynamic Cable/Pipe From Current Selection

If you have a spatial selection, this option will create an SD Dynamic Cable/Pipe object of the selection and add it to the *Project Layers* Dock.

Create Plane

This option will create a 2D plane and add it to the project. A file browser will open where the location and name of the plane can be specified.

Contouring

This option launches the Export Contours dialog to create a contour object within the current project. You can export from either a Dynamic or Static grid.

Spot Soundings

This option launches the Spot Sounding dialog to create depth points within a current project. You can only export from a Dynamic grid.

Grid Difference

This option launches the Grid Difference wizard to compute the statistical differences between two grids.
It will then present the Grid Statistics dialog and insert a Fledermaus Sonar DTM SD object that is a representation of the differences between the two selected grids.

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Qimera Project Menu

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  - Open Project Browser
  - Open Recent Projects
  - Cooperative Cleaning
    - Create Subproject(s) from Current Project...
    - Export Edits to File...
    - Apply Edits from File...
    - Apply Edits from Subproject
  - Project Properties
  - Encapsulate Project
  - Open Project Folder
  - Close Project
  - Preferences
  - Configure Shortcuts
  - Configure Custom Toolbar
  - Quit

Qimera - Project Menu

The project menu is used to create and open projects, access preferences, and create shortcuts.

New Project

This menu option launches the Create Project dialog. If you currently have a project open, it will save and close the current project before creating a new one. See the Getting Started for additional information on creating projects.

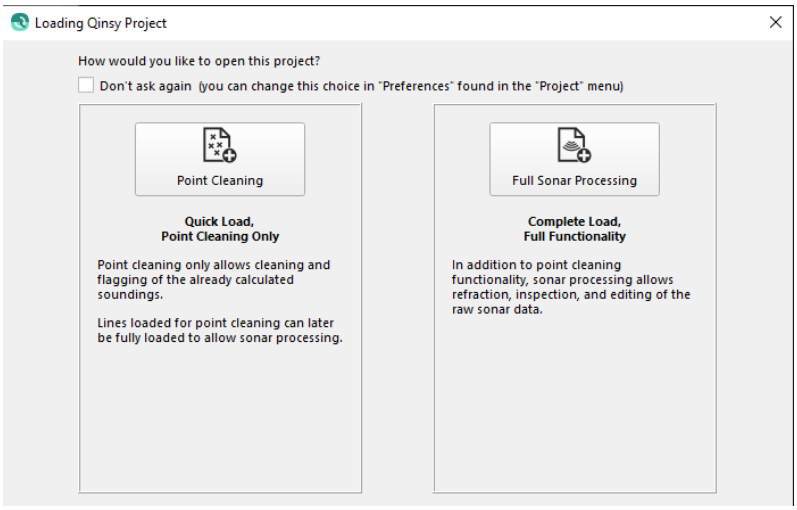
New Cleaning Project...

This menu option launches the Create Cleaning Project dialog. If you currently have a project open, it will save and close the current project before creating a new one. See the Getting Started for additional information on creating projects.

Open Project

This menu option allows you to open an existing QPS project using a file browser dialog. If you currently have a project open, it will save and close the current project before opening a new one.

When opening a QINSy project in Qimera for the first time, you may be asked whether you want load the data as Just *Point Cleaning* or as *Full Sonar Processing*.



As explained in the dialog above, *Full Sonar Processing* opens the project's DB files and allows all Qimera processing operations, but is slower to open as it requires a full scan of those DB files. *Just Point Cleaning* ignores the project's DB files and opens only the QPD results files. This is significantly faster if there is no need to reprocess the data and you wish to quickly begin cleaning. After opening for *Just Point Cleaning*, you can choose to upgrade individual lines for *Full Sonar Processing* using the Load Associated DB File context menu action.

When reopening a project, Qimera will detect any new lines added to the project's dynamic surfaces since the last time the project was open in Qimera. In such cases you will be asked whether you want to load those new lines for *Full Sonar Processing* or for *Just Point Cleaning*, with the same implications as above.

Also, when opening a Qinsy project for the first time, any QGF Survey Line files (.qgfline and .qgfback) will be found and converted to .sd format and added to the Project Layers

Open Project Browser

This menu option allows you to open an existing Qimera project using the Qimera Projects Dialog that contains recently opened projects. For details on opening projects, see Open Project.

Open Recent Projects

This menu option allows easy access to recently opened projects. For details on opening projects, see Open Project.

Cooperative Cleaning

This sub-menu includes options for capabilities to improve workflows for large projects. It is explained in in detail in the section on Qimera Cooperative Cleaning.

Create Subproject(s) from Current Project...

This will create a project containing the area of interest and copies of the associated QPD files. This capability improves workflow for large projects and is explained in the section on Qimera Cooperative Cleaning.

Export Edits to File...

Used with a cleaning subproject, this will generate a single file with the extension .qpdedits that contains all changes made to the subproject. This can be used to efficiently apply edits to the main project without needing to copy the entire subproject.

Apply Edits from File...

This option will apply the changes contained in a *.qpdedits file to the main project. Generally this will have been generated from a subproject, but this can also be used as a means to revert point edits to a project.

Apply Edits from Subproject

This will apply edits from a cleaning subproject and is explained in the section on Qimera Cooperative Cleaning.

Project Properties

This menu option will open the Project Properties dialog, this includes Survey Type/ Description and Geodetic settings.

Encapsulate Project

This menu option will copy all Layer files and files in your Project Sources tree that are external to your project into a *Sources* folder in your project. Qimera will also change all of the paths in the project xml file to be relative. This will allow you to move your project to another file system.

Open Project Folder

Opens a system file dialog at the location of the project folder.

Close Project

This menu option will save and close the current open project.

Preferences

This menu option displays the Preferences Dialog.

(Note that on Mac OS X, this menu entry is shown under the Qimera menu.)

Configure Shortcuts

This menu option displays the Qimera Configure Shortcuts Dialog.

Configure Custom Toolbar

Allows adding, removing and reordering the contents of the Custom Toolbar.

Quit

This menu option will quit Qimera. The currently loaded project will be saved before Qimera exits.

(Note that on Mac OS X, this menu entry is shown under the Qimera menu.)

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    - Polygon Select
    - Freehand Select
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  - Selection Movement
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    - Step Forward
    - Step Backward
    - Step Left
    - Step Right
    - Rotate Counter-Clockwise
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    - Decrease Size
    - Jump to End
    - Play Forward

    - Pause
    - Play Backward
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    - Show Bounding Box
    - Show Bounding Walls
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  - Navigation Widgets
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    - Show Rotation Angles
    - Show Scroll Bars
  - Show Colormap Legend
  - Show Object Selection Markers

Qimera - View Menu

This menu provides control over the current scene by providing a number of actions available in the Qimera 4D Scene Toolbar and allows you to save screen captures or an encapsulated Fledermaus Scene object.

2D View

This option changes the scene to be viewed from above. Navigation can be accomplished by using the mouse. To navigate, use the mouse to **Left-Click-Drag** to pan throughout scene. Use the mouse-wheel or **Center-Click-Drag** to zoom in/out of the scene. Also use a **Center-Click** to re-center the scene.

3D View

This option changes the scene to behave as if it were on a turntable. Use the mouse to **Left-Click-Drag** left or right to rotate the scene. Use the mouse to **Left-Click-Drag** up or down to pitch the scene. Use the mouse-wheel or **Center-Click-Drag** to zoom in/out of the scene. Also use a **Center-Click** to re-center the scene.

Zoom to View

This option zooms out to the extents of all objects in the scene.

Zoom to Selected Objects

This option zooms out to the extents of all selected objects in the scene.

Center View on KP...

This will prompt you to enter a KP value along the project's active route and then move the view to be centered on that KP position. If the project does not have a route, the action will be disabled. For more details on routes and KP, see the *Project Layers* dock.

Tool Modes

Explore Mode

This is the primary cursor mode used for navigation in the scene as described above. Each tool mode can be overridden by holding down the **SHIFT** key to return to navigation behavior.

Rectangular Select

When in this mode, **Left-Click-Drag** to draw a selection box. This selection mode has specific capabilities that are described in detail in the section on the Main Toolbar.

Polygon Select

When in this mode, **Left-Click** to draw the vertices of a polygon selection. Click on the first point to close the selection. This selection mode has specific capabilities that are described in detail in the section on the Main Toolbar.

Freehand Select

When in this mode, **Left-Click-Drag** to draw a selection area. This selection mode has specific capabilities that are described in detail in the section on the Main Toolbar.

Fixed Slice Select

When in this mode, **Left-Click-Drag** to draw a selection overview with slice box. This selection mode has specific capabilities that are described in detail in the section on the Main Toolbar.

Free Slice Select

When in this mode, **Left-Click-Drag** to draw a selection overview with slice box. This selection mode has specific capabilities that are described in detail in the section on the Main Toolbar.

Scroll Select

When in this mode, **Left-Click** and drag a shape to define a selection area. This selection mode has specific capabilities that are described in detail in the section on the Main Toolbar.

Create Profile

When in this mode, **Left-Click-Drag** to draw a profile over a grid. This selection mode has specific capabilities that are described in detail in the section on the Main Toolbar.

Measure Distance

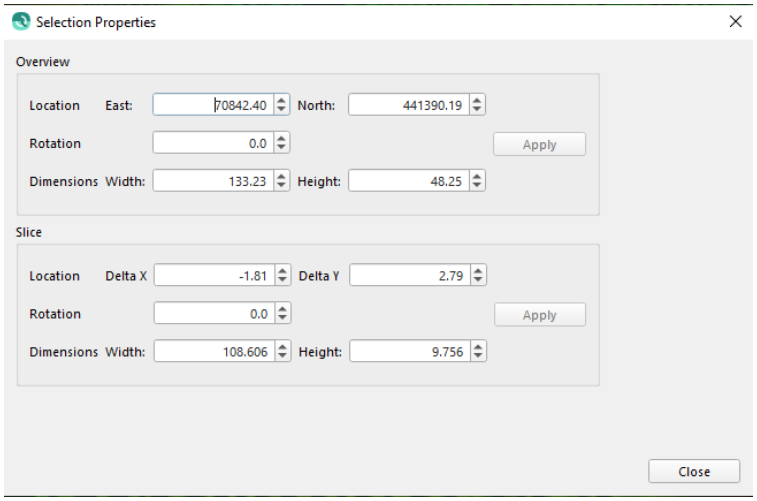
When in this mode, **Left-Click-Drag** to over a grid and see the distance displayed in the status bar. This selection mode has specific capabilities that are described in detail in the section on the Main Toolbar.

Selection Movement

These modes control a spatial selection in the scene that are typically used for editing soundings by the *2D Slice Editor* or *3D Editor*.

Adjust Selection Geometry

This will launch the *Adjust Selection Geometry* dialog shown below. Depending on the type of selection, different sections will be enabled or disabled. Also, see more information on the Qimera Selection Movement Toolbar.



Step Forward

This will move the current selection or slice in the direction of the selection arrow forward by approximately 90%.

Step Backward

This will move the current selection or slice in the direction of the selection arrow backward by approximately 90%.

Step Left

This will move the current selection or slice left of the direction of the selection arrow by approximately 90%.

Step Right

This will move the current selection or slice right of the selection arrow by approximately 90%.

Rotate Counter-Clockwise

This will rotate the current selection or slice anti clockwise by 1 degree.

Rotate Clockwise

This will rotate the current selection or slice clockwise by 1 degree.

Increase Size

This will increase the size of the current selection or slice by 20%.

Decrease Size

This will decrease the size of the current selection or slice by 20%.

Jump to End

If you have a scroll selection, this moves the slice to the end of the selected scroll line.

Play Forward

This will move the current selection or slice by 90% forward by the step interval time.

Pause

This will pause auto-movement of the selection.

Play Backward

This will move the current selection or slice by 90% backward by the step interval time.

Jump to Start

If you have a scroll selection, this moves the slice to the start of the selected scroll line.

Center Selection on KP...

This will prompt you to enter a KP value along the project's active route and then move the selection (and the view) to be centered on that KP position. If the project does not have a route, the action will be disabled. For more details on routes and KP, see the *Project Layers* dock.

Bounding Box

Show Bounding Box

This option will Show/Hide the outer bounding box of the entire scene

Show Bounding Walls

This option will Show/Hide the scene walls if the scene bounding box is shown.

Show Bounding Coordinates

This option will Show/Hide the scene coordinate display.

Navigation Widgets

Show 3D Turntable Widgets

This option will Show/Hide the interaction widgets in the Main Visualization Window.

Show Ruler Marks

This option will Show/Hide the tick marks and labels that are drawn along the turntable widget axis indicating the distance along the axis.

Show Rotation Angles

This option will Show/Hide the compass direction angle that is displayed by the top widget and angle of declination that is displayed by the left widget.

Show Scroll Bars

This option will Show/Hide the scroll bars for the Main Visualization Window.

Show Colormap Legend

This option will Show/Hide the colormap overlay on the scene when a Dynamic or Static grid is selected.

Show Object Selection Markers

This option will Show/Hide the selection highlight markers at the corners of an object's extents in the scene.

For all the other options, please see the section on the Qimera 4D Scene Toolbar.

Return to: *Qimera Main Menu Bar*

Return to: *Qimera Table of Contents*

Qimera Source Menu

- Qimera - Source Menu
  - Add Raw Sonar Files
  - Add Processed Point Files
  - Import and Split Large Processed Point Files
  - Add Binary Navigation Files
  - Add Tide Files
  - Import SVP Files
  - Add QPD Files From Project
  - Import Sub-Menu
    - ASCII Navigation
    - Add QTM File
    - Add PFM File

Qimera - Source Menu

The source menu lets you add data to your current project. This data can be raw sonar files, processed point files, external navigation, external tides external sound velocity profiles or other ASCII time series data.

Add Raw Sonar Files

This will launch the Add Raw Sonar Files dialog to enable you to add raw sonar files to your project.

Add Processed Point Files

This will launch the Add Processed Point Files dialog to enable you to add raw processed point files to your project.

Import and Split Large Processed Point Files

This will launch a file browser to select Large Processed Point Files (ie ASCII XYZ files, B93 Files, and LAS/LAZ Files). If ASCII XYZ files are selected, then Qimera will launch the

Custom ASCII File Configuration dialog. The file(s) will be extracted and split into multiple QPD files and loaded into your project as processed point files.

- The source file is a parent item and the multiple QPDs are added underneath.
- If you split a large point file into into multiple QPDs, it changes how Qimera recognizes the file. For example, given a large B93 file. If it's not split up, Qimera recognizes the file as a B93 that was converted to QPD. If you split it up, then Qimera simply recognizes the file as if you were importing just a QPD file. Because of this, we don't allow certain operations.
- We do not support Edit TPU setup after the fact for sources files with multiple QPDs.
- We do not support Unloading after the fact for sources files with multiple QPDs.

Add Binary Navigation Files

This will launch the file browser to select either POSPac, POSMV, NavLab, SRH or SBTC files. Then Qimera will launch the Navigation Import Configuration dialog to enable you to configure the incoming navigation data.

Add Tide Files

This will launch an open file dialog which will then open Qimera Add Tide File Dialog.

Import SVP Files

This will launch a file browser for batch importing of SVP files. Files must be of the same type. Kongsberg, Reason, Qinsy, Caris, Hypack and ASCII SVPs are all supported. Opens a file browser and then the Import Sound Velocity Profiles Dialog

Add QPD Files From Project

This option will allow you to import QPD files from another Qimera project. This is considered a *merge* capability and is typically used when multiple projects have been processed and cleaned and the user wants to create a final surface for delivery. This workflow is described in Qimera Production Line Processing.

Import Sub-Menu

ASCII Navigation

This will launch a file browser to select the ASCII navigation files. Then Qimera will launch the Import ASCII Navigation dialog to enable you to import external ASCII navigation into your project.

Add QTM File

This will launch a file browser to select a QINSy Qloud QTM file. The QPD files will be extracted and loaded into your project as processed point files.

Add PFM File

This will import a PFM file for cleaning. Qimera now natively supports legacy PFM files in by projected and geographic coordinate systems. PFM files were previously used by the FM Hydro suite of tools.

AUTOMATIC RAW FILE IMPORT

This will launch the Automatic Raw File Import dialog to automatically import, process and append raw sonar files to a growing Dynamic Surface.

Return to: Qimera Main Menu Bar#qimeramainmenubar

Return to: Qimera Table of Contents

Qimera Tools Menu

- Qimera - Tools Menu
  - Vessel Editor...
  - SVP Editor...
  - Navigation Editor...
  - Cable/Pipe Tracker Sensor Editor...
  - Patch Test Tool...
  - Wobble Test Tool...
  - Cable/Pipe TOP Detection Tool...
  - Cross Check Tool...
  - TU Delft Sound Speed Inversion...
  - Dynamic Grid Shifts menu
    - Line Height Matching Tool...
    - Static Vertical Shift Tool...
    - Varying Vertical Shift Tool...
    - Adjust Vertical Shifts...
    - Static Horizontal Shift Tool...
    - Adjust Static Horizontal Shifts...
    - Heave/Swell Removal Tool
  - Auto Process
  - Manual Processing
    - Sound Velocity Correction
    - Direct to QPD
    - Re-Nav XYZ
    - Re-Nav XY
    - Re-Nav Z
    - TCARI
    - Update Spatial Index
    - Rescan Time Series Data
    - Delete Water Column Picks

- Edit Processing Settings...
- Launch Swath Editor
- Launch 2D Slice Editor
- Launch 3D Editor
- Utilities
- QPS Plugins

Qimera - Tools Menu

The tools menu allows you to launch specialized tools, manually execute specific operations on selected lines, or launch a number of plug-in based utility tools.

Vessel Editor...

This option launches the Vessel Editor.

SVP Editor...

This option launches the SVP Editor.

Navigation Editor...

This option launches the Navigation Editor.

Cable/Pipe Tracker Sensor Editor...

This option launches the Cable/Pipe Tracker Sensor Editor tool.

Patch Test Tool...

This option launches the Patch Test tool.

Wobble Test Tool...

This option launches the Wobble Test tool.

Cable/Pipe TOP Detection Tool...

This option launches the Qimera Cable/Pipe TOP Detection Tool

Cross Check Tool...

This option launches Cross Check tool.

TU Delft Sound Speed Inversion...

This will start the TU Delft Sound Speed Inversion on the selected raw sonar files.

Dynamic Grid Shifts menu

Line Height Matching Tool...

This option launches the Line Height Matching tool.

Static Vertical Shift Tool...

This option launches the Calculate Static Vertical Shift tool.

Varying Vertical Shift Tool...

This option launches the Calculate Varying Vertical Shift tool.

Adjust Vertical Shifts...

This option launches the Adjust Vertical Shifts dialog.

Static Horizontal Shift Tool...

This option launches the Calculate Static Horizontal Shift tool.

Adjust Static Horizontal Shifts...

This option launches the Adjust Static Horizontal Shifts dialog.

Heave/Swell Removal Tool

This option launches the Heave/Swell Removal dialog.

Auto Process

This will launch any required processing as determined by Qimera's Dynamic Workflow.

Manual Processing

After any of the above processes are completed (except for spatial index updating), any Dynamic Grids containing these lines and set for *Automatic Update* will be updated.

Sound Velocity Correction

This will manually start a Sound Velocity Correction job on the selected raw sonar files.

Direct to QPD

This will manually start a Direct to QPD job on the selected raw sonar files.

For Kongsberg .ALL and .GSF files this process is run automatically during import. In the event manual sounding solutions have been computed they can be reverted to real-time solutions using this menu item.

Re-Nav XYZ

This will manually start a Re-Nav XYZ job on the selected raw sonar files.

Re-Nav XY

This will manually start a Re-Nav XY job on the selected raw sonar files.

Re-Nav Z

This will manually start a Re-Nav Z job on the selected raw sonar files.

TCARI

This sub-menu is only available if a TCARI model has been imported with Qimera Add Tide Definition File Dialog. It allows for download/import and calculation of the TCARI tide solution.

Update Spatial Index

This will manually start an Update Spatial Index job on the selected raw sonar or processed point files.

Rescan Time Series Data

This will manually start a metadata extraction job the selected raw sonar files. It will extract the original time series data such as position, motion, heading, etc.

Any edits you have done to the time series data for the selected files will be lost.

Delete Water Column Picks

This will delete all water column picks for the selected lines. Any soundings you picked from the water column viewer will be lost.

Edit Processing Settings...

This will launch the Processing Settings dialog for the selected files.

Launch Swath Editor

This will launch the Swath Editor on the selected line. If no line is selected, the first processed raw sonar file will be selected.

Launch 2D Slice Editor

This will launch the Slice Editor on the selected Dynamic Grid using the selected area. If no Dynamic Grid is selected, the first Dynamic Grid will be selected. If no area is selected, an area in the center of the Dynamic Grid will be selected using the Fixed Slice Selection mode.

Launch 3D Editor

This will launch the 3D Editor.

Utilities

This sub-menu contains utilities shipped with Qimera. The sub-menu (the utility) name will reflect the process. There may be instances where utilities are unavailable depending on licensing options.

QPS Plugins

This sub-menu contains plug-ins that can be used with Qimera. The sub-menu (the plugin) name will be the name of the 3rd party that created the filter.

Return to: *Qimera Main Menu Bar*
Return to: *Qimera Table of Contents*

Qimera Window Menu

- Qimera - Window Menu
  - Workspaces
    - Point Cleaning
    - Qimera Default
    - Create New Workspace...
    - Reset Current Workspace to Default
    - Remove Current Workspace
    - Save Current Workspace to File…
    - Load Workspace from File…
  - Lock Window Layout
  - Toolbar Visibility Controls
    - Scene Toolbar
    - Bathymetry Toolbar
    - Filter Operation Toolbar
    - Selection Movement Toolbar
    - Selection Dimension Toolbar
    - Custom Toolbar
  - Dock Visibility Controls
    - 3D Slice Editor Dock
    - Cable/Pipe Analysis Dock
    - ENC Editor Dock
    - File Table Dock
    - Geo Picking Dock
    - Job Activity Dock
    - PFM Dock
    - Process History Dock
    - Profile Dock
    - Project Layers Dock

- Project Sources Dock
- Properties Dock
- Slice Editor Dock
- Grid Edit Overview Dock
- Swath Editor Dock
- TOP Detection Control Dock
- TOP Detection Results Dock
- Time Series Editor Dock
- Time Series Multiplot Dock
- Water Column Dock

Qimera - Window Menu

The window menu allows you show or hide individual dockable windows. It also allows you to create and control custom workspace layouts. Custom layouts are an effective way of customizing particular portions of your workflow tasks.

Workspaces

This sub-menu manages the selection, management and creation of workspaces.

Point Cleaning

This workspace will only show panels that are relevant for just point cleaning in Qimera.

Qimera Default

This is the default workspace for Qimera. All panels appear in their default positions.

Create New Workspace...

This action will launch the Qimera Workspace Creation Dialog allowing the creation of a workspace based on the configuration of a previously defined workspace.

Reset Current Workspace to Default

This action will reset the Qimera workspace to the default layout.

Remove Current Workspace

This action will remove the current named workspace from the list of saved workspaces.

Save Current Workspace to File…

Saves the current workspace to a file that can be shared or loaded into Qimera. The default location is the public user documents Workspaces directory and the default name is the workspace name.

Load Workspace from File…

Allows a workspace file to be loaded to Qimera. The default location checked is the public user documents Workspaces directory.

Lock Window Layout

This will prevent any dockable panels from being floated or moved.

Toolbar Visibility Controls

These checkable actions control the visibility of the corresponding toolbar.

For more information on each control, please visit the link attached to each.

Scene Toolbar

Bathymetry Toolbar

Filter Operation Toolbar

Selection Movement Toolbar

Selection Dimension Toolbar

Custom Toolbar

Dock Visibility Controls

These checkable actions control the visibility of the corresponding dock.
For more information on each control, please visit the link attached to each.

3D Slice Editor Dock

Cable/Pipe Analysis Dock

ENC Editor Dock

File Table Dock

Geo Picking Dock

Job Activity Dock

PFM Dock

Process History Dock

Profile Dock

Project Layers Dock

Project Sources Dock

Properties Dock

Slice Editor Dock

Grid Edit Overview Dock

Swath Editor Dock

TOP Detection Control Dock

TOP Detection Results Dock

Time Series Editor Dock

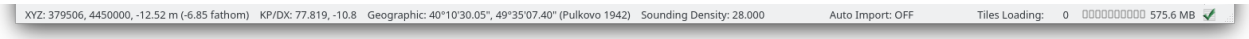
Time Series Multiplot Dock

Water Column Dock

Return to: *Qimera Main Menu Bar*
Return to: *Qimera Table of Contents*

Qimera Status Bar

The Qimera status bar appears at the very bottom of the main Qimera window. It contains the following sections:



Information About the Cursor Position

As the cursor is moved over the 3D scene, the leftmost (and largest) section of the status bar shows information about the point underneath the cursor. The exact information shown will depend on the types of data present in the project and immediately beneath the cursor. In the screenshot above we see:

- **XY position:** This is a simple 2D coordinate shown in the project's projected units. The coordinate's precision can be changed in the preferences.
- **Z position:** If there is an object underneath the cursor, a Z coordinate will be displayed in the project's vertical unit.
- **Z position in alternate units**: An alternate depth unit can chosen in the preferences. If it differs from the project's primary vertical unit, the Z position will be displayed in that unit and inside parentheses.
- **KP/DX**: If the project has a Route layer, the cursor position relative to that route will be shown. To display this information, Qimera calculates the position on the route nearest to the cursor position. KP represents the "along track" component of that position, shown as the distance along the route of that point in project units divided by 1000. DX represents the "across track" component of the position and is displayed in project units. "Across track" refers to the perpendicular distance between the cursor and the route.
- **Geographic position**: This is the XY position converted to the project's projection's underlying geographic coordinate system. The name of the coordinate system is shown in parentheses. The formatting of these coordinates can be changed in the preferences.
- **Layer properties**: Some layer types, such as dynamic grids or scalars, may have additional properties to display about the cursor position. For example, in the screenshot above we can see that dynamic grid cell under the cursor has a sounding density of 28.

Additionally, some cursor modes may use this space to instead show mode-specific information. For example, in measure mode, information about the current measurement line is displayed (shown below).



Auto Import Status

This indicator shows the current status of the *Automatic Raw Sonar Import* feature. If active, the tool tip will show the folder currently being monitored for automatic importing.

Tile Loading Status

The next section contains the *Tile Loading* status. During Dynamic Grid use, grid tiles are streamed from disk at various levels of detail based on the tile's distance from the eye-point. Depending on the size of the grid, loading high detail tiles can be a time consuming process. This section indicates the streaming progress.

Memory Usage

The next section displays the total amount of memory that Qimera has allocated for its own use. Typically the bulk of this will be made up of the grids you have created or ancillary contextual objects you have loaded. The widget goes from green, to yellow, to red indicating how much of the available memory you are using.

Background Job Status

The final section contains an indicator to show that a background job is currently running. If you don't have the Activity Monitor window visible, this provides an indication that background jobs are running. If a red "X" appears on the widget, an error has occurred during processing and you should check for any error messages in the Activity Monitor log window.

Return to: *Qimera Interface*

Return to: *Qimera Table of Contents*

Qimera Wizards and Dialogs

Qimera has many wizards and dialogs. They will be launched through interaction with toolbars, menu bars or context menus. Each is described in detail in the following pages.

- Qimera About Dialog
- Qimera Add Processed Point Files Dialog
- Qimera Add Raw Sonar Files Dialog
- Qimera Add Tide Definition File Dialog
- Qimera Add Tide File Dialog
- Qimera Application Preferences Dialog
- Qimera Automatic Import Dialog
- Qimera Cable/Pipe Tracker Sensor Editor Dialog
- Qimera Calculate Contours Dialog
- Qimera Calculate Spot Soundings
- Qimera Colormap Editor Dialog
- Qimera Colormap Range Adjustment Dialog
- Qimera Configure Custom Toolbar Dialog
- Qimera Configure Shortcuts Dialog
- Qimera Create Cleaning Project Dialog
- Qimera Create Plane Dialog
- Qimera Create Project Dialog
- Qimera Create Static Grid Dialog
- Qimera Custom ASCII File Configuration Dialog
- Qimera Datagram Viewer Dialog
- Qimera Drape Image Dialog
- Qimera Dry Run Dialog
- Qimera Dynamic Grid Dialogs
    - Qimera Snapshot as Static Grid
    - Qimera Extract Dynamic Grid Layer
    - Qimera Append to Dynamic Grid Dialog
    - Qimera Cell Info Dialog
    - Qimera Change Resolution Dialog
    - Qimera Create Clipped Grid
    - Qimera Create Dynamic Grid Dialog
    - Qimera Create Flag Markers Dialog
    - Qimera Create GRD Dialog
    - Qimera CUBE Dialogs

        - Qimera Create Custom Hypothesis from Features Dialog
        - Qimera CUBE Filter Soundings Dialog
        - Qimera CUBE Output Grid Dialog
        - Qimera CUBE Settings Dialog
        - Qimera Re-Cube Area Dialog
    - Qimera Duplicate Dynamic Grid Dialog
    - Qimera Export Grid to Soundings
    - Qimera Export Shoal Soundings Dialog
    - Qimera Export Static Grid Layer Dialog
    - Qimera Filter Out Soundings in Lonely Cells Dialog
    - Qimera Interpolate Dynamic Grid Dialog
    - Qimera Remove Lines Dialog
    - Qimera Sounding Selection Dialog
- Qimera Edit Modified Flags Dialog
- Qimera Export BAG Grid Wizard
- Qimera Export Grid as Image Dialog
- Qimera Export Grid Dialog
- Qimera Export Grid To KML Dialog
- Qimera Export Line to XYZ Dialog
- Qimera Export Processed Points Dialog
- Qimera Export S-57 Dialog
- Qimera Export Soundings to ASCII Dialog
- Qimera Export Soundings to LAS/LASzip Dialog
- Qimera Export to FAU Dialog
- Qimera Export to GSF Dialog
- Qimera Export Track To ASCII Dialog
- Qimera Filter Below Dynamic Cable/Pipe Dialog
- Qimera Flag Grid Cells
- Qimera Generate/Edit X-Point Listings Dialog
- Qimera Generate Overlap Report
- Qimera Geodetic Configuration Overview
- Qimera Geodetic Search Dialog
- Qimera Grid Difference Wizard
- Qimera Grid Statistics Dialog
- Qimera Import ASCII Navigation Dialog
- Qimera Import CAD Dialog

- Qimera Import ESRI Shape Dialog
- Qimera Import Gridded Data Wizard
- Qimera Import Image Dialog
- Qimera Import Lines Dialog
- Qimera Import Navigation Configuration Dialog
- Qimera Import Points Dialog
- Qimera Import Sound Velocity Profiles Dialog
- Qimera License Status Dialog
- Qimera Manage Filter Profiles Dialog
- Qimera Merge Dynamic Cable/Pipes Dialog
- Qimera New System Dialog
- Qimera PFM Unload Wizard
- Qimera Processed Point File Configuration Dialog
- Qimera Processed Point File TPU Calculation Dialog
- Qimera Processing Settings Dialog
- Qimera Project Browser Dialog
- Qimera Project Properties Dialog
- Qimera Projects Dialog
- Qimera Screen Capture Dialog
- Qimera Select Colormap Dialog
- Qimera Select Coordinate System Dialog
- Qimera Set LAS Classification
- Qimera Shading Parameters Dialog
- Qimera Structure from Motion (SfM) Bathymetry Dialog
- Qimera Tide Station Dialog
- Qimera Tide Strategy Dialog
- Qimera TU Delft Sound Speed Inversion Settings Dialog
- Qimera Unload Processed Point File Dialog
- Qimera Workspace Creation Dialog

Return to: *Qimera Interface*

Return to: *Qimera Table of Contents*

Qimera About Dialog



- How to Start
- What it Does

How to Start

- *About Qimera* option of the *Help* menu in the Main Menu bar

What it Does

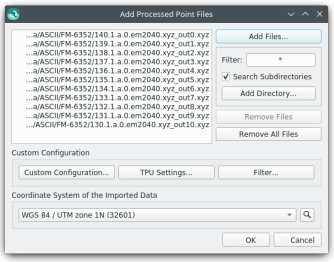
This dialog displays version, build information and release date. This information is important when reporting any problems to QPS Support. It also has the contact email, phone number, and web address.

The *Third Party Library License Information* button displays the copyright and license statements for all the open-source, third party libraries used by Qimera.

Return to: *Qimera Interface*

Return to: *Wizards and Dialogs*

Qimera Add Processed Point Files Dialog



- How to Start
- What it Does
- General Description
  - Add HIPS Files
  - Add Files
    - Custom Configuration
    - File Configuration
    - TPU Settings
    - Filter
      - Filter Construction
      - Filters

How to Start

- button of the Bathymetry Toolbar
- *Add Processed Point Files* option of the *Source* menu in the Main Menu bar

What it Does

This dialog is used to add processed point files to your project.

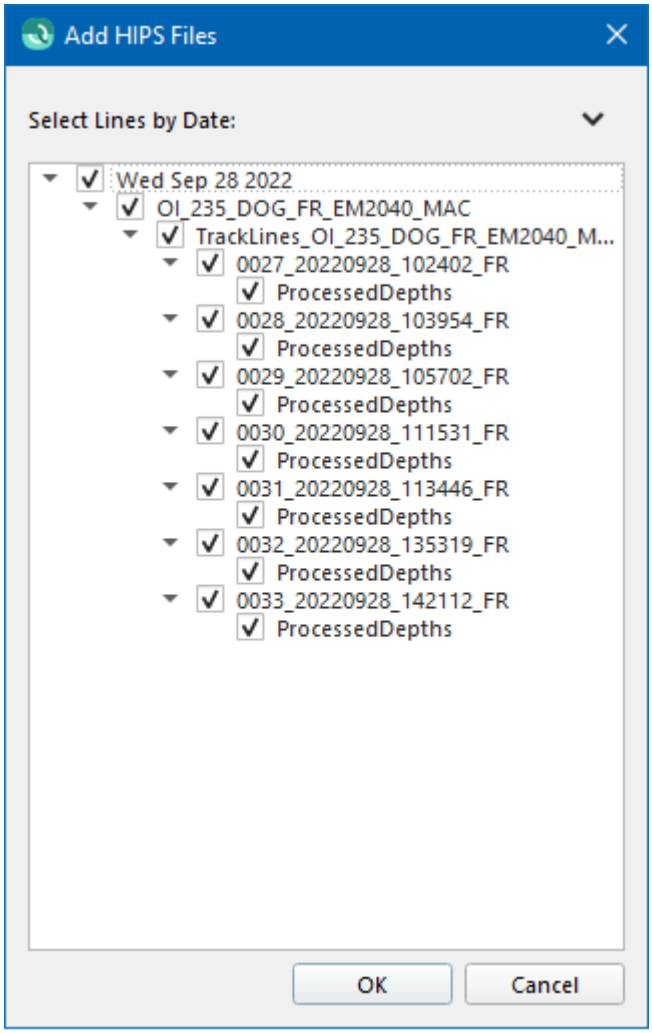
Adding Large Processed Point Files

If you would like to add points from files that are bigger than 1 GB (ie ASCII XYZ files, B93 Files, and LAS/LAZ Files), the preferable way to do this is through Import and Split Large Processed Point Files in the Source Menu.

General Description

Point file data can be entered either by clicking on the '*Add Files*...' button, '*Add HIPS Files*...', or by clicking on the '*Add Directory*...' button. Clicking on the '*Add Files*...' button will bring up a file selection dialog and multiple files can be added at once. Clicking on the '*Add Directory*...' button will bring up a directory selection dialog. This will recursively add any supported Point File Data. In the case where there are multiple supported Point File Data, a filter can be specified in the *Filter Edit* field. For a list of all supported processed point files, please see .Qimera Data Format Specific. Clicking on the 'Add HIPS Files...' button will bring up a directory selection dialog followed by the Add HIPS Files dialog.

Add HIPS Files



Select the desired Lines of HIPS data and hit OK. The selected lines will be added to the Add Processed Points dialog. To add HIPS data, Qimera requires a valid CARIS license. To

point Qimera to the valid CARIS license, refer to the Shared Preference option in the Preference dialog.

Add Files

Adding Processed Point can result in a variety of optional buttons depending on the file format.

Custom Configuration

Clicking the *Custom Configuration* Button will launch the Qimera Custom ASCII File Configuration Dialog dialog. This dialog will allow you to configure your import data.

The following column "*Use As*" types are available:

- X - the easting or longitude of the points.
- Y - the northing or latitude of the points.
- Z - the height or depth of the points, note that you must specify the "*Positive Up*" or "*Positive Down*" option to indicate height or depth respectively.
- Source Identifier - an integer value to indicate the data source, this is can be included in exports to preserve the connection with the source data.

Note: If an ASCII file is added, you will automatically be shown the Custom ASCII File Configuration dialog.

File Configuration

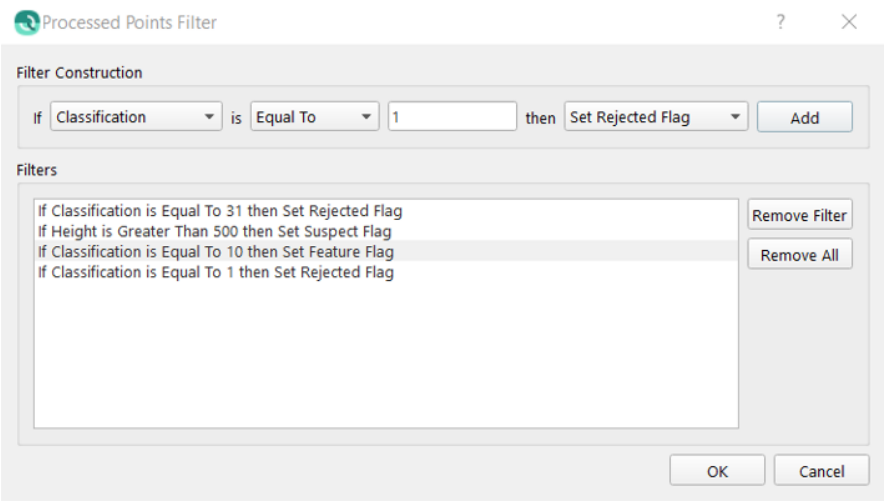
Clicking the *File Config* button launches the Qimera Processed Point File Configuration Dialog.

TPU Settings

Clicking the *TPU Settings* Button will launch the Qimera Processed Point File TPU Calculation Dialog.

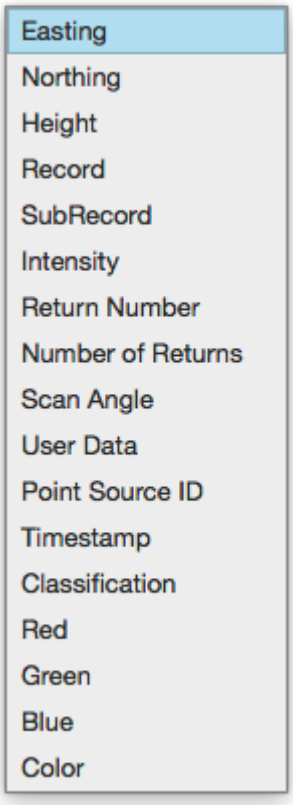
Filter

Clicking the *Filter* Button will launch the Processed Points Filter. This dialog allows the construction of filters during the Processed Point file import process. When files are imported the constructed filters will be applied to the data and reduce manual editing overhead. Constructed filters will be saved for the current import session only and cannot be recalled once the import process has started.

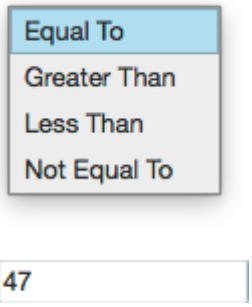


Filter Construction

Selecting the ***If*** combo box will provide a list of items that can be filtered based on the import data file type. The following list reflects items available for the LAS point file format.



Selecting the ***Is*** combo box provides a list of comparison operators. The comparison operator will be associated with the value entered into the adjacent text field.



Selecting the ***Then*** combo box provides a list of options that will be applied to the imported data.



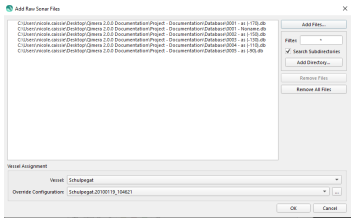
Filters

All accepted filters will be appended to the *Filters* list in a human readable format for review. Filters can be removed individually or exclusively using the *Remove Filter* or *Remove All* buttons.

Return to: Qimera Interface

Return to: Wizards and Dialogs

Qimera Add Raw Sonar Files Dialog



- How to Start
- What it Does
- General Description
  - Adding Files
  - File Format Specific Import Differences
    - Vessel Assignment
    - Geodesy Settings
    - Time Reference

How to Start

-  button of the Bathymetry Toolbar
- *Add Raw Sonar Files* option of the *Source* menu in the Main Menu bar

What it Does

This dialog adds raw sonar files to your project.

General Description

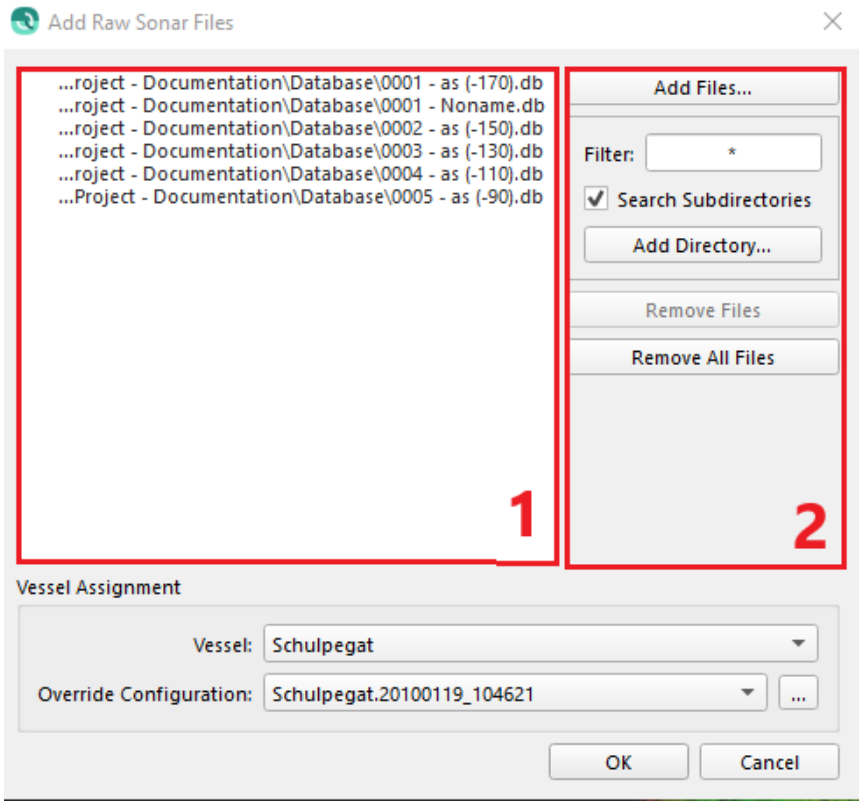
Qimera will allow you to import multiple files from multiple different vessels from multiple days with multiple sensor types all in the same project. For this reason, it is incredibly easy to manage large and complex data sets in Qimera. Since differing files formats provide different types of information, you can only import one type of file at a time, however, note that you can provide data from several different vessels and acquisition days in a single import session as long as they are of the same file format. Once data is imported into Qimera, you can re-arrange your view of the data dynamically to group it by day, vessel or file path in the Project Sources Window.

The file import experience will change slightly from one data format to another depending on what type of information Qimera can extract from the files. Our goal is to import as much information as possible such that we eliminate the amount of user configuration to be done during file import. The contents of 3rd party formats are unfortunately beyond our control and files that you bring into Qimera may be missing crucial pieces of information that limit our capability to provide a completely automated file import experience. We have

provided a few tips in the format specific sections below to help you optimize your data acquisition configuration for 3rd party formats to make the data import experience into Qimera as seamless as possible.

Qimera imports everything from Raw Sonar Files **except** for the multibeam data. This is by design for two reasons: (1) it permits Qimera projects to remain small since it does not need to double up on the disk space, and (2) it allows Qimera to remain flexible to ever evolving data formats in that the software interface can evolve without worrying about maintaining multiple versions of a Qimera specific binary format for multibeam records. During any operations, such as ray tracing, that require the raw multibeam data, Qimera will refer back to the raw data file for this. The one exception to this case is for Hypack HSX files since they are ASCII text files and thus are not very efficient for I/O operations. The multibeam records for these files are converted into a binary format in the project when they are imported.

Adding Files



The file import dialog is broken into two main sections, as shown in the figure above.

1. File list window: A list of files that will be imported. As you select files, or remove them, using the controls in (2), this list will update accordingly. Once this list is populated with files, you can use the mouse and/or keyboard to multi-select files from the list to perform additional operations such as removing them from the import list, see (2) below.

2. File import operations
    a. *Add Files...*: Add files by launching a standard file explorer dialog to select the files you want to add to your project.
    b. *Add Directory....*: Add all files in a directory and/or in all of its subdirectories, this will launch a standard file explorer dialog. You can specify a file extension filter, such as *.db, or *.all and then add a directory of files by choosing the directory. You can only import a single type of data at a time into Qimera.
    c. *Remove Files*: Removes selected files from the import file list (1).
    d. *Remove All Files*: Removes all files from the import file list.

File Format Specific Import Differences

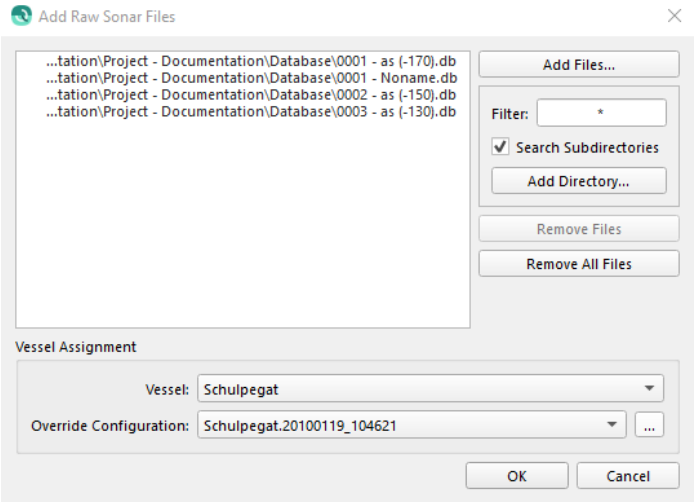
Qimera can process raw sonar files to generate fully corrected and georeferenced sounding footprints for a number of formats. Understandably, the import experience varies slightly from one format to the next based on the type of information that Qimera can automatically extract from the incoming data files. Though the file and directory selection mechanisms are common for all incoming raw sonar data, the import dialog changes layout slightly to accommodate the slight differences between formats. Qimera will disallow import of dissimilar file types in the event that you accidentally choose different file types. Multiple import sessions will be required to accommodate this type of import.

Some small differences between incoming data formats necessitate small changes to the Import dialog, these are explored below. For a full discussion of differences in what is supported in a particular file format, or how Qimera extracts and interprets information, please see Qimera Supported Import Data Formats and Qimera Sonar Source Data Import Capabilities .

Vessel Assignment

For QINSy .db and Kongsberg .all files, the vessel name is stored in the incoming file. Qimera uses the vessel name to group incoming data together by vessel to ease data and processing management. If the vessel name is missing or not specified, you will need to provide a vessel name when you first import the data of a particular type. Follow up import sessions will allow you to choose the vessel that you'd like to associate the incoming data with.

If you have saved a vessel configuration as a template and wish to use it during loading of your new sonar files, select the vessel name first, which will cause Qimera to populate the configuration combo box with all available override configurations for that vessel. You would typically save a configuration using the Vessel Editor. If you have not previously saved any configurations, you can import them to your project using the "..." file browse button. After selection, your dialog would appear as shown below.



When the 4 files above are loaded, their vessel parameters will be overridden by the *Override Configuration* that is selected. Qimera will ensure that the vessel name is consistent with that extracted from the file if the format is QINSy .db or Kongsberg .all. If the selected configuration vessel name does not match the one found in the raw sonar file, the template will not be applied and Qimera will warn you about this in the *Job Activity* window. If you do not want to apply a configuration template, change the *Vessel* selection back to *Auto detect vessel configuration*.

Vessel Assignment

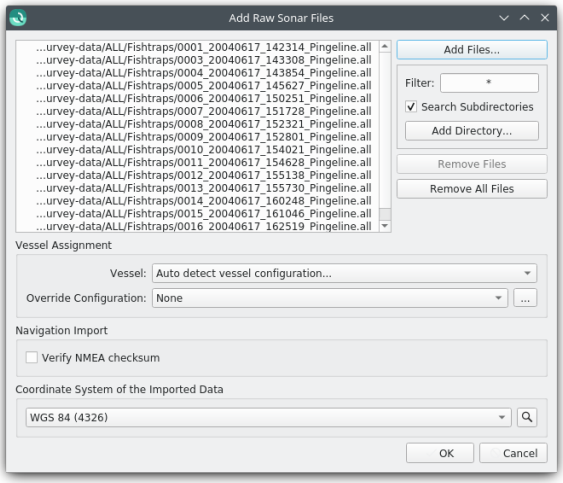
Qimera will remember the last Vessel name and override configuration assuming you want to continue to use this. If not, be sure to change back to *Auto detect vessel configuration*.

Vessel Assignment (when not .db or .all)

If you are working with multiple vessels for raw sonar files that are not QINSy .db or Kongsberg .all, be certain that you have selected the correct vessel name, even if you are not choosing a configuration override. Once the files are loaded, they will be associated with that specific vessel. Once loaded, you cannot change a sonar file's vessel association. You must delete and reload the raw sonar files to change this association (sorry about that).

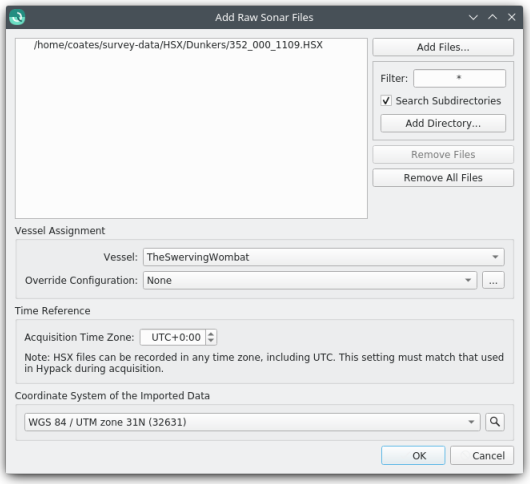
Geodesy Settings

Qimera natively supports direct reading of the geodetic settings for QINSy .db files only. All other formats require that you specify the geodetic settings of the incoming data stream during the import stage. Most incoming file formats provide positioning data in geographic coordinates, i.e. latitude and longitude, and all you will need to do is specify the coordinate frame in which these positions are reported, e.g. WGS84. The default for these cases is WGS84. The only currently supported format which provides positioning as projected data is the HSX format. With HSX, you will need to specify the projection that the data are reported in, this may involve re-visiting your Hypack project to extract the exact projection parameters such as projection meridian, scale factors, etc. Note that this information is NOT stored in the .HSX file at all. The image below shows the additional coordinate reference system selection widget for a .all file.



Time Reference

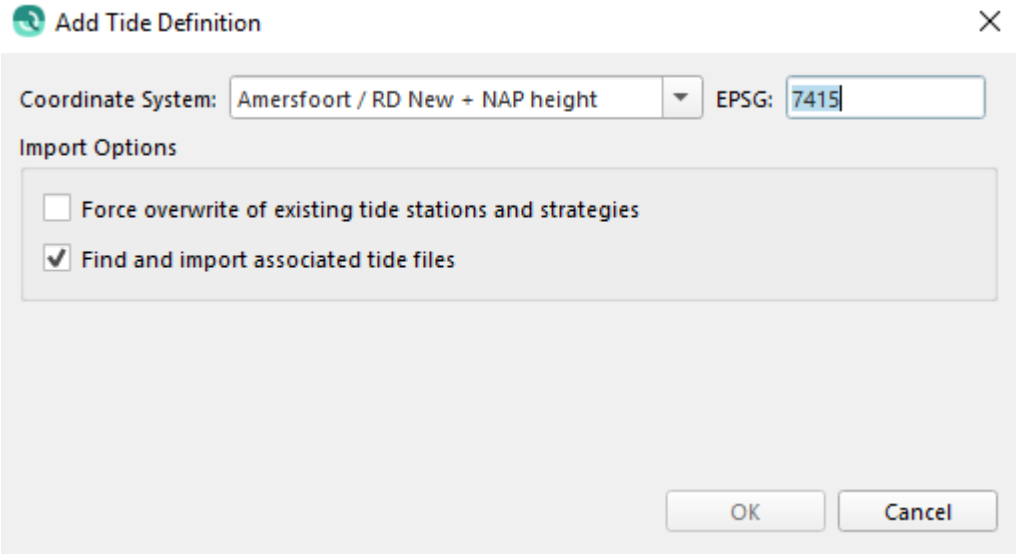
All incoming files are expected to be reporting time in UTC as this is the most common practice in the industry today. Hypack HSX files can be configured to log data in a local time zone and you may need to specify this during import if this is the case. This information is not stored in the HSX file. The image below shows the additional Time Reference acquisition time zone selection widget for a Hypack .hsx file.



Return to: Qimera Interface

Return to: Wizards and Dialogs

Qimera Add Tide Definition File Dialog



- How to Start
- What it Does
- General Description
  - Coordinate System
  - Import Options
- Additional Notes
  - QINSy Tide Definition (QTF) Import
  - Zoned Tide (ZDF) Import
  - Tide Constituent and Residual Interpolation (TCARI)

How to Start

- *Add Tide Files* option of the Source Menu in the Main Menu bar
- **Right-click** on *Tides* or *Stations* group in the *Project Sources* Window and select *Add Tide Files* from the context menu

What it Does

This dialog imports tide definition files, either QINSy Tide Definition (QTF) or Zoned Tide (ZDF), that describe stations, strategies, and associated tide data used for tide corrections.

General Description

The dialog has several section, these are explained below.

Coordinate System

This is the coordinate system of the selected file's position information, this includes station coordinates and area polygons. This is used to transform the coordinates to the project coordinate system.

Import Options

Force overwrite of existing tide station and strategies - (disabled by default) if enabled this will suppress overwrite warnings

Find and import associated tide files - (enabled by default) if enabled, after creating stations and strategies a search for associated tide data files will be made and any file found will be imported to the appropriate station. See notes below for details on how the search for files is made.

Additional Notes

QINSy Tide Definition (QTF) Import

When importing QTF please note that the *Coordinate System* will default to the project projection as this is not specified in the QTF.

If *Find and import associated tide files* is enabled the relative path "..\TideData" will be searched for QTD files included in the QTF. This matches the QINSy folder structure.

Additionally, the imported QTF's interpolation method will be translated to the matching method in Qimera according to the table below:

QINSy Tide interpolation method	**Method after importing to Qimera**
Single	*Single Station*
Virtual	*Single Station*
Linear	• *Two Station Linear Interpolation* - if QTF includes 2 stations, • *Multiple Station Distance Interpolation* - for 3 or more stations

QINSy Tide interpolation method		Method after importing to Qimera
Linear CoTidal		*Linear Co-Tidal Interpolation*
Area		Each area will be imported as an individual strategy
—	*Linear* or *CoTidal*	• *Single station* - if QTF includes only 1 station, • *Two Station Linear Interpolation* - for 2 stations, • *Multiple Station Distance Interpolation* - for 3 or more stations

Zoned Tide (ZDF) Import

There is no metadata in the ZDF that describes the coordinate system used for the zone and station locations, NAD83 is assumed as a default but should be updated to match the ZDF coordinate system.

If *Find and import associated tide files* is enabled the folder containing the ZDF file will be searched. Any recognized tide format with metadata or file name matching the stations in the ZDF file will be imported. If additional information is required in the filename an underscore may be used, anything after the underscore will be ignored when matching against station names in the ZDF.

Each zone will be imported as an individual strategy. The tide method for strategies will be *Single Station* which may include multiple stations order by priority. If multiple stations are listed for a zone in the [TIDE_AVERAGE] section the *Average* method will instead be used.

Tide Constituent and Residual Interpolation (TCARI)

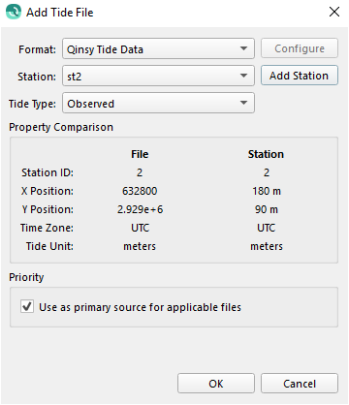
Importing a TCARI model adds a strategy and stations to the project that allow for download and calculation (with TCARI interpretor) of tides.

Find and import associated tide files has no effect.

Return to: Qimera Interface

Return to: Wizards and Dialogs

Qimera Add Tide File Dialog



- How to Start
- What it Does
- General Description
  - Format
    - Configure
  - Station
    - Add Station
  - Tide Type
  - Property Comparison
  - Use as primary source for applicable files

How to Start

- *Add Tide Files* option of the Source Menu in the Main Menu bar
- **Right-click** on *Tides* or *Stations* group in the *Project Sources* Window and select *Add Tide Files* from the context menu

What it Does

This dialog imports tide data used for tide corrections and assigns the data to a station for management.

General Description

The dialog has several sections, these are explained below.

Format

After selecting a tide file the *Format* dropdown will be populated with any Tide Formats that match the file in addition to a *Custom ASCII* option. If the file format is not supported the default is *Custom ASCII*.

Configure

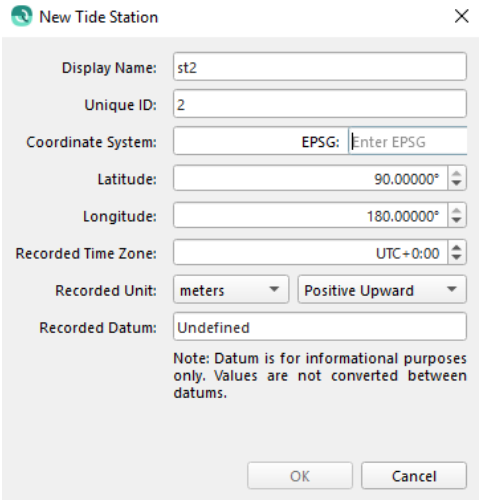
The Configure button is currently only enabled for Custom ASCII format. Clicking it opens the Custom ASCII File Configuration dialog. Be sure to map appropriate fields for both *Time* and *Tide*.

Station

Tide files must be assigned to a station. If there are existing stations the drop down will be blank and a station must be added. If files have already been added to the project the drop down will be populated with the existing stations, and the best match based on metadata in the file will be selected by default.

Add Station

Click *Add Station* will open the *New Tide Station* Dialog. If there is any metadata in the tide file those fields will be automatically filled.



Tide Type

The tide type allows for tides of different priority to be imported for the same time period.

The three types in increasing priority are *Predicted*, *Observed*, and *Verified*. The highest priority tide type that is available at any given time will be applied to raw sonar files when processed with vertical referencing set to Tide mode (see Processing Settings Dialog for more information).

Property Comparison

The property comparison is for reviewing the station details to see if the agree with the file's metadata.

	File	Station
Station ID:	2	2
X Position:	632800	180 m
Y Position:	2.929e+6	90 m
Time Zone:	UTC	UTC
Tide Unit:	meters	meters

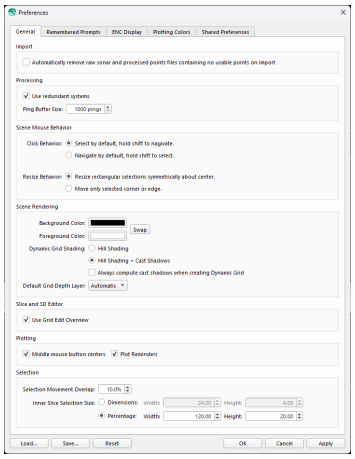
Use as primary source for applicable files

When checked this option will make the imported files take the highest priority in the Processing Settings Dialog and switch the Vertical Referencing Method to *Tide*.

Return to: Qimera Interface

Return to: Wizards and Dialogs

Qimera Application Preferences Dialog



- How to Start
- What it Does
- General Description
  - Preferences - General
    - Import
    - Processing
    - Scene Mouse Behavior
      - Click Behavior
      - Resize Behavior
    - Scene Rendering
    - Slice and 3D Editor Options
      - Use Grid Edit Overview
    - Plotting
      - Middle Mouse Button Centers
    - Selection
  - Remembered Prompts
  - ENC Display
    - Chart Data Folder
    - Chart Presentation
    - Chart Depth
    - Chart Information
  - Plotting Colors
    - Theme
    - Color Description and Color
    - Reset
  - Shared Preferences
    - Startup Options
    - Display Options

- Alternate Depth Unit Options
- Geographic Coordinate Formats
- Projected Coordinate Formats
- Default Grid Shading Options
- System Options
- HIPS Licensing
- Load and Save Preferences

How to Start

- *Preferences* option of the *Project* menu in the Main Menu bar

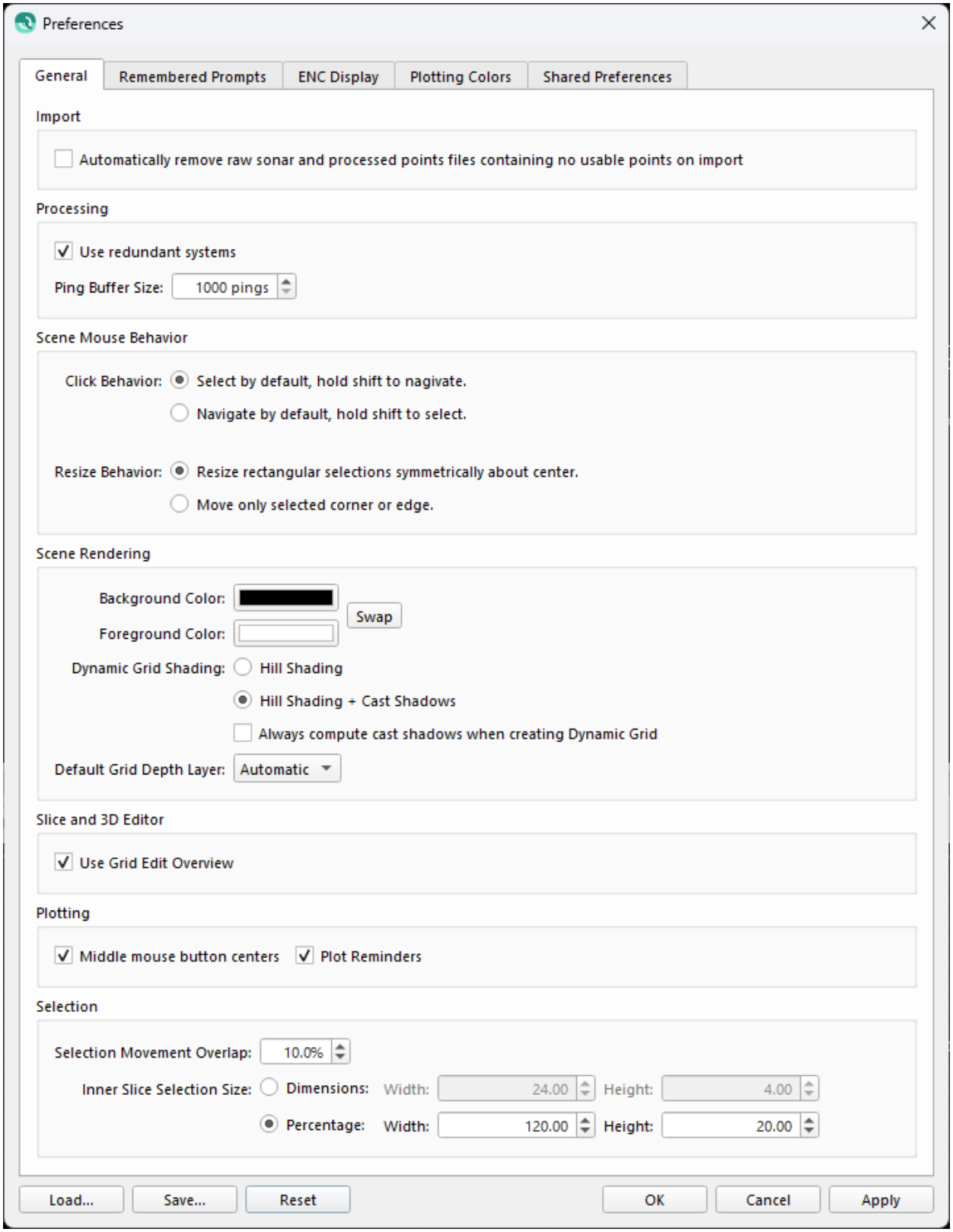
What it Does

This dialog is used to modify application preferences.

General Description

Preferences are used across all projects created by Qimera. They are not project specific. There are 5 preference tabs which are described below.

Preferences - General



Import

The *Import* group has an option to *Automatically remove raw sonar and processed points files containing no usable points on import*. Checking this box will let Qimera automatically remove raw sonar files or processed points files that were found to have no usable points (empty) after the file is initially scanned. Unchecking this box means that you would have to manually remove those files from the project. This manual removal is made easier with the *Select All Empty Raw Sonar Files* context menu.

Processing

The *Processing* group has two configurable options. The first option, '*use redundant systems*' allows you to configure Qimera to use data from backup sensors. This is applicable in the event that the primary sensor is either missing data, or a time span of data has been edited in the Time-Series Editor using the *Invalidate Edit* mode. If backup data is of reasonable quality, it is preferable to enable this option. If backup data is of poor quality, or incorrect, it is advised to disable this option.

The second option, 'Ping Buffer Size', allows you to change the ping buffer memory size during sound velocity correction. During sound velocity correction, Qimera will buffer the processed pings into memory and write them at all at once. The size of this buffer determines how many are stored before writes to disk. The large this buffer, the more efficient your processing will be.

Scene Mouse Behavior

Click Behavior

Some user workflows prefer scene navigation by default for any mouse interaction. Some user workflows prefer original mouse behavior. You can change the mouse navigation behavior of Qimera by changing this option.

The *Selected by Default* option allows mouse interaction with the scene to perform the operations allowed by the selected mode. For example, in *Rectangular Select* mode, if you left-click-drag over a grid in the scene, you will create a selection area. Doing this in another location will create a new selection area. If you want to navigate within the scene, you have to hold down the SHIFT key.

The *Navigate by Default* option will navigate the scene with any mouse interaction for any selected mode. In order to use the capabilities of the selected mode, you must hold down the SHIFT key. For example, if you are in *Area Select* mode, you must hold down the SHIFT key to select a new area.

Resize Behavior

For *Rectangular* and *Free/Fixed Slice Select* modes you can resize the selections by clicking and dragging one of the corner or edge “handles” (dots), changing this option changes how the other sides of the selection change as you drag.

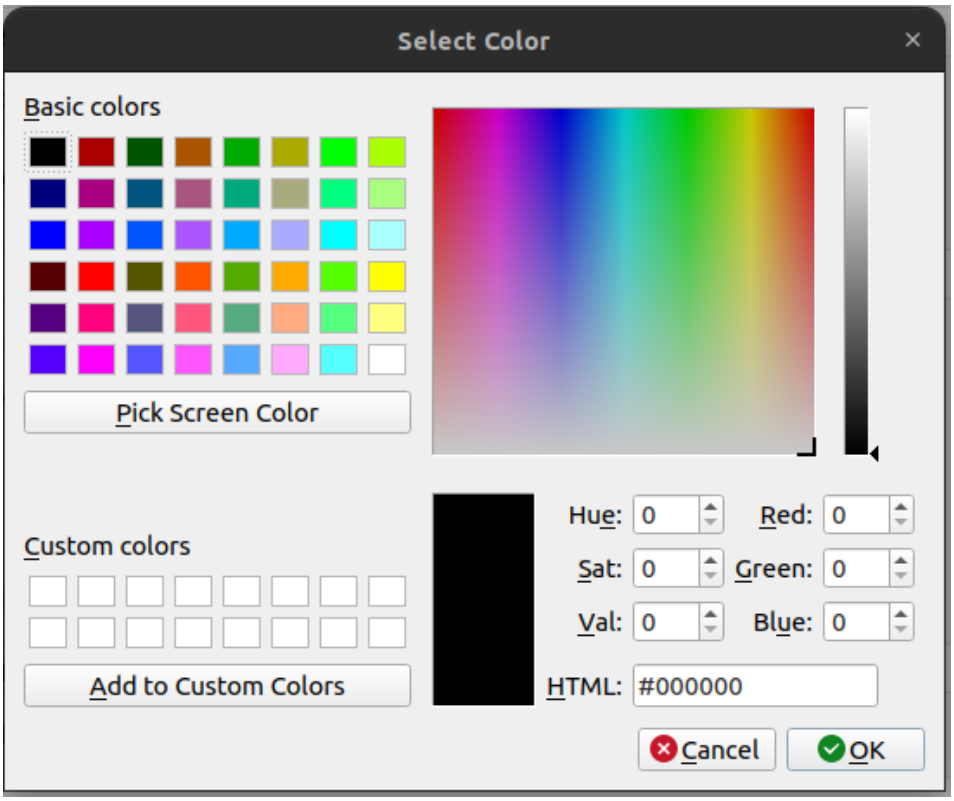
The *Resize rectangular selections symmetrically about center* option changes all sides and corners such that the center of the selection stays fixed.

The *Move only selected corner or edge* option will only modify the corner or edge being dragged, which will adjust the center of the selection but leave the opposite edge or corner fixed.

Scene Rendering

The *Background Color* and *Foreground Color* options allow you to change the colors of 4D Scene. Use the *Swap* button to swap the foreground and background color.

To change the background or foreground color, simply click on the colored area of the *Background* or *Foreground Color* button to populate the *Select Color* dialog box, as shown below.



The *Dynamic Grid Shading* group options allow you to change the shading mode of the Dynamic Grid. The major difference is how the shadows are represented. For *Hill Shading*, the shadows are shown through a standard hill shading algorithm. This is all done by the video hardware and requires no additional processing, this generally gives the quickest grid and re-grid times. The *Hill Shading + Cast Shadows* option will show Fledermaus cast

shadows using the Fledermaus shading engine. While superior to hill shading, there is additional processing required to generate the additional illumination parameters. The effect being when you first create a grid or switch grids, Qimera will start a process to generate the illumination parameters. During this process, the display switches back to *Hill Shading* mode until the process completes and the cast shadows are shown. The larger the grid, the bigger the processing time to generate the cast shadows. For Qinsy users, the configuration that most closely matches the visualization available in Qinsy while online is *Hill Shading*.

If you are primarily using *Hill Shading*, then the cost to generate the illumination parameters is wasted during the initial build. You can speed up grid creation by delaying the illumination processing by unchecking 'Always compute cast shadows when creating Dynamic Grid'. If you later decide to switch to *Hill Shading + Cast Shadows*, then Qimera will start a process to generate the illumination parameters at that time.

The *Default Grid Depth Layer* allows the user to have a preferred view when reviewing Dynamic Grids, e.g. Shallow, Average, Deep The default is the Average layer.

Slice and 3D Editor Options

Use Grid Edit Overview

By default, the Grid Edit Overview loads the Dynamic Grid and *Visited/Edited* areas overlay whenever you use the 2D Slice or 3D Edtior. You can turn this behavior off using this checkbox. This can help improve performance if you are editing a very large grid on an older computer.

Plotting

Users can enable and disable a few plot options for the various plot widgets in Qimera. Firstly, you can configure the mouse behavior to be such that a click of the middle mouse will recenter the plot. The second option is to have the text overlay reminders in the plots that require some user action in order to load data.

Middle Mouse Button Centers

By default, clicking the middle mouse button in a plotting grid will re-center the plot to that location. You can disable this feature using this preference.

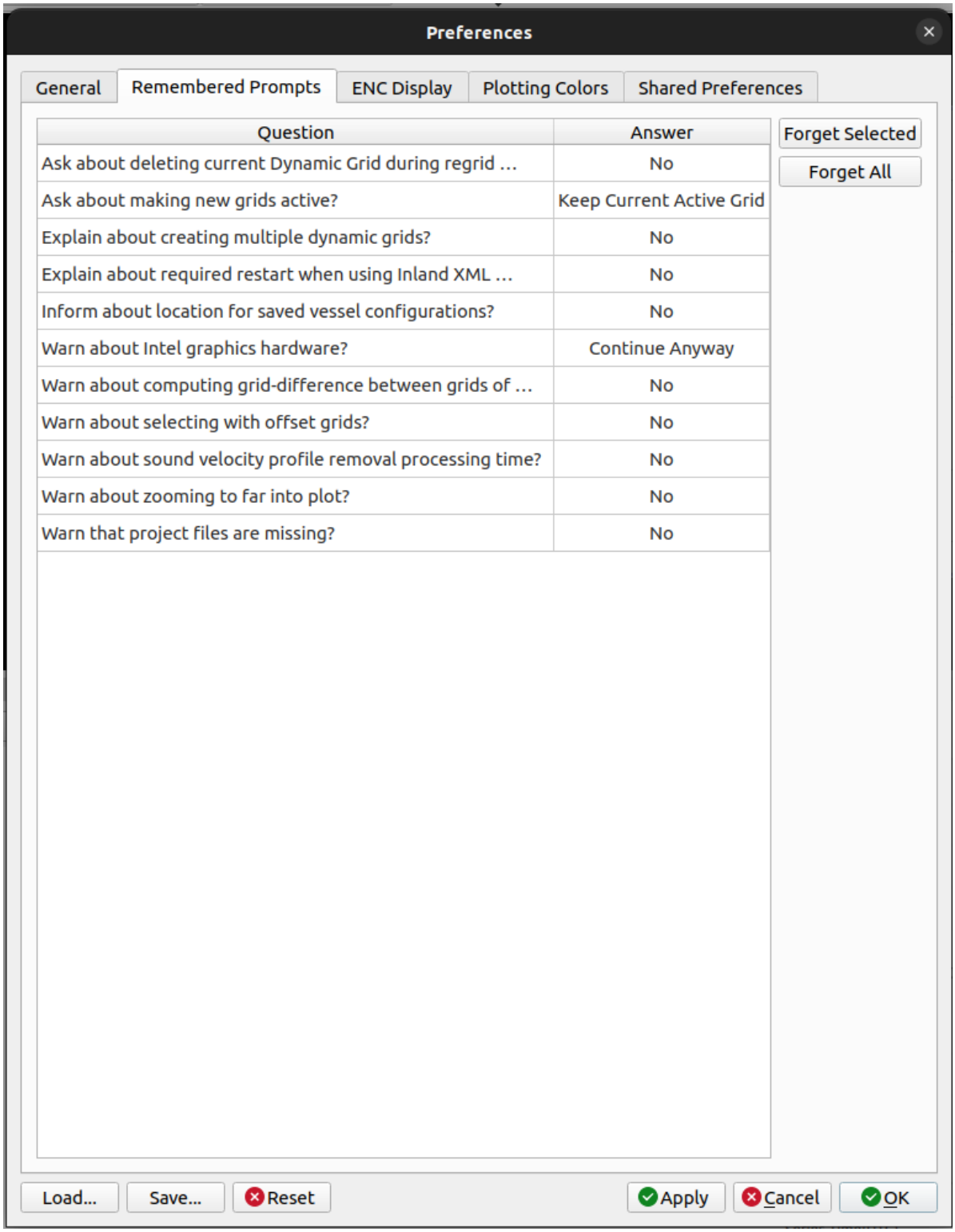
Selection

Selection Movement Overlap specifies the percentage of overlap when advancing a selection using the movement keys.

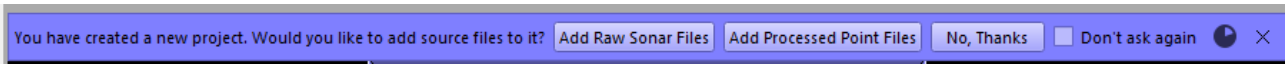
The *Inner Slice Selection Size* allows setting the default inner selection rectangle size when Fixed Slice Select or Free Slice Select selection modes are used. Using the *Dimensions* radio button option will set the absolute values for width and height of the inner selection box independent of the outer selection box . Using the *Percentage* radio button option will set the inner selection box dimensions to values computed from the percentages entered and the dimensions of the outer selection box.

Once accepted the values will be stored and recalled for the current operating system user for each selection.

Remembered Prompts



A key mechanism of Qimera's Dynamic Workflow is to prompt the user with questions about the next logical step in the process. For example, after you create a project, Qimera will show you the following prompt.



If you click the *Add Raw Sonar Files* option, Qimera will launch the *Add Raw Sonar Files* dialog. If this is your preferred action, simply check the *Don't ask again* option and Qimera will always perform this action when you create a new project. It will also remember if you select any of the other options and have the check box selected. The answer will then appear in the *Remembered Prompts* table as shown below.

In addition to the prompt bar noted above, many message boxes in Qimera will contain *Don't ask again* or *Don't show this message again* with check boxes. If the user checks these boxes, that will also populate in the *Remembered Prompts* table.

If you decide to change your original answer to the *Don't ask again* or *Don't show this message again* check boxes in order to populate the prompts once again, simply select the row of the question asked by the Dynamic Workflow feature and click *Forget Selected*. Click *Forget All* to enable return of all prompts.

ENC Display

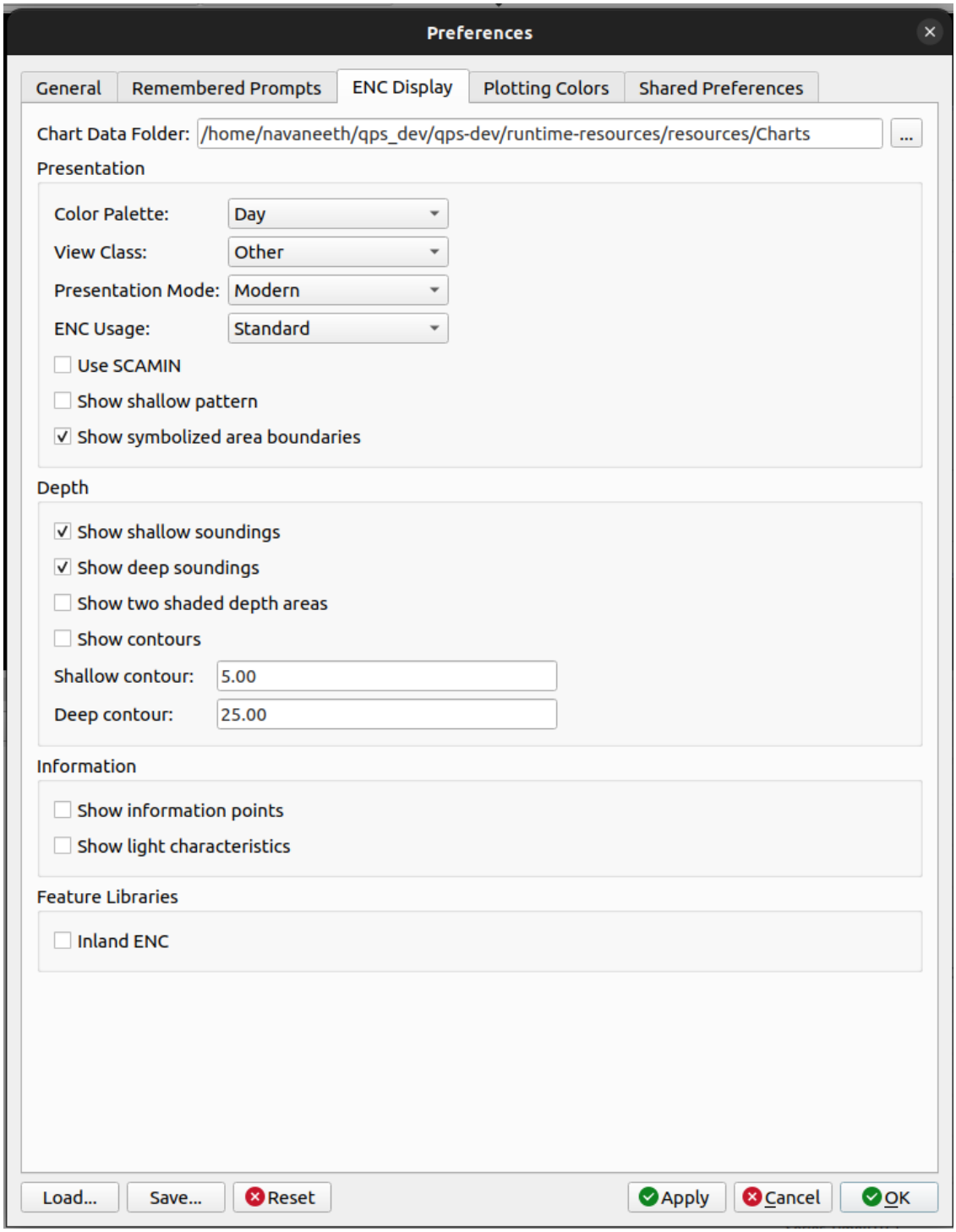


Chart Data Folder

This path dictates where Qimera will look for QNC files to load for chart display. Change this only if you want to use QNC files from outside the default hierarchy.

On Windows, this preference is shared with the ENC Administrator. Changing it in one application will update the other.

Chart Presentation

The *Color Palette* option can be Day, Dusk, Night

The *View Class* option can be Base, Standard or All. This determines the amount of background data in the chart such as buoys and sector lights.

The *Presentation Mode* option effects how various features are symbolized. Traditional, Simplified and Modern symbol sets are available.

The *ENC Usage* option controls how Qimera transitions between charts in the same area as the view scale changes. "Standard" employs the usages levels standardized by the IHO. "Use Compilation Scale" employs the usages specified by the maker of the chart.

The *Use SCAMIN* option displays objects only when the scale is smaller than the minimum scale set for that specific object. This prevents cluttering of the screen when zooming out.

The *Show Shallow Pattern* option displays a pattern to indicate a shallow area.

The *Show Symbolized Area Boundaries* option enables the display of boundaries around areas.

Chart Depth

The *Show Shallow Sounding* option shows actual depth numbers.

The *Show Deep Sounding* option shows actual depth numbers.

The *Show Two Shaded Depth Areas* option shows shallow and deep water separated by the safety contour, which is a thick gray line. The default is four shades of blue: dark blue for shallow water to light blue for deep water.

The *Show Contours* option shows lines connected places of the same depth.

The *Shallow Contour* option shows a line around a shallow area. Set the depth value for this contour. Only enter when *Show Depth Contours* is activated.

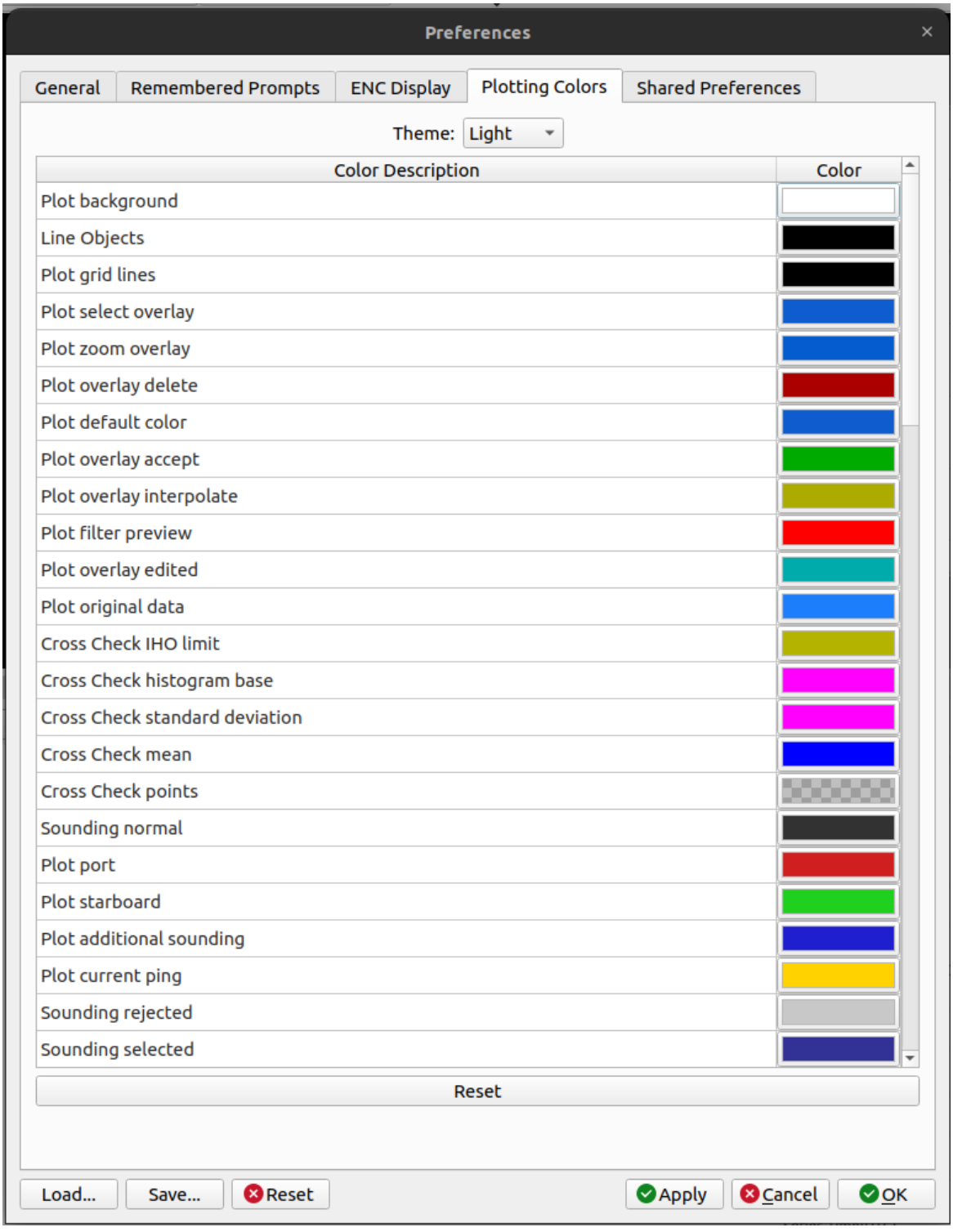
The *Deep Contour* option shows a line around a deep area. Set the depth value for this contour. Only enter when *Show Depth Contours* is activated.

Chart Information

The *Show Information Points* option will show an information symbol with an object which has additional information available.

The *Show Light Characteristics* option shows the light features of buoys and sector lights.

Plotting Colors



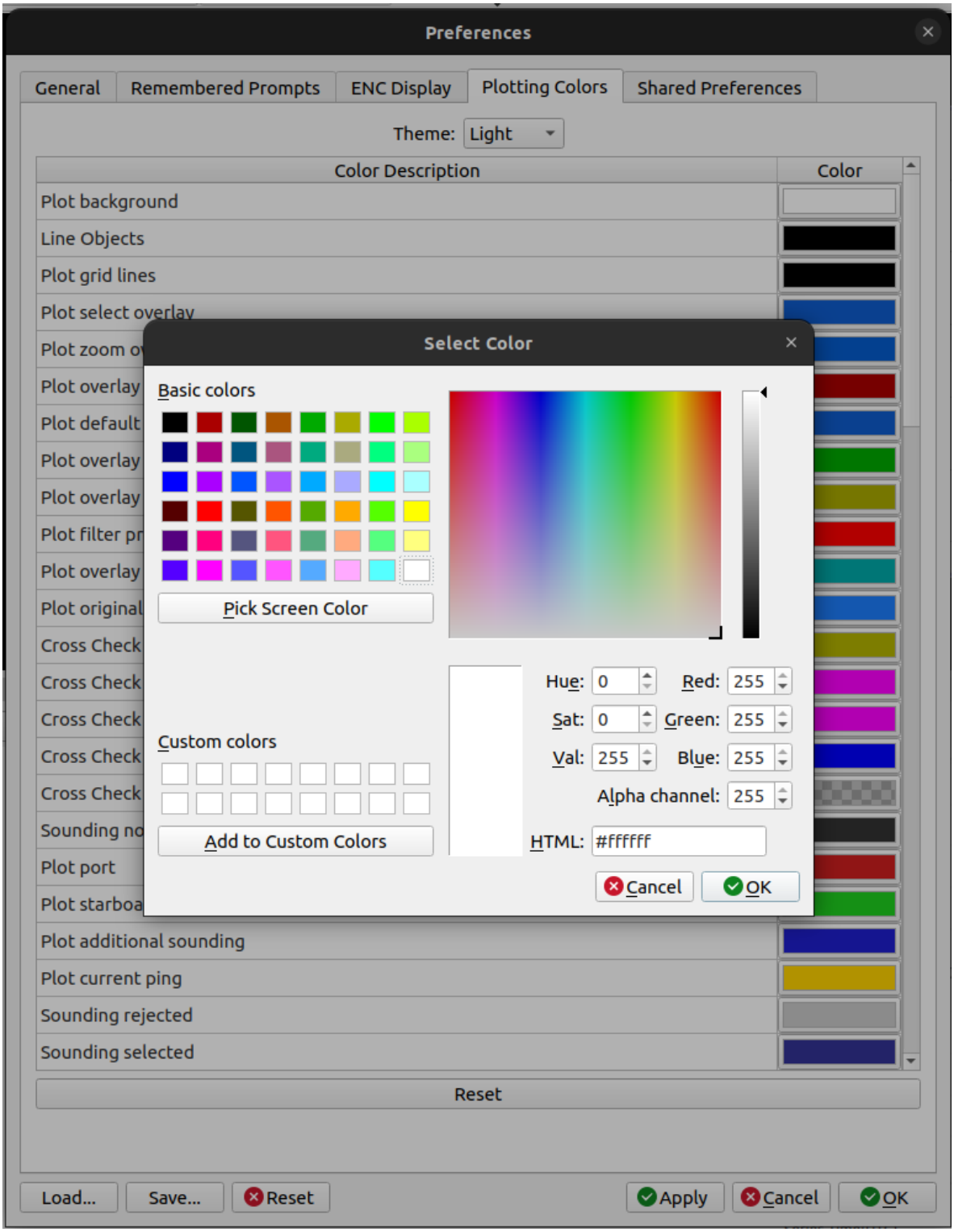
Theme

Users can choose from a dark, light or custom theme for all of the plots used in Qimera's widgets, like the Slice Editor, Time-Series Editor, etc. The dark palette configures plots for a dark background, and the light does the opposite. Users can create their own custom theme as well.

Color Description and Color

The table layout of this tab lists all the various items that are configurable for plotting, including the plot background. Clicking on any of the colors in the *Color* column of the *Plotting*

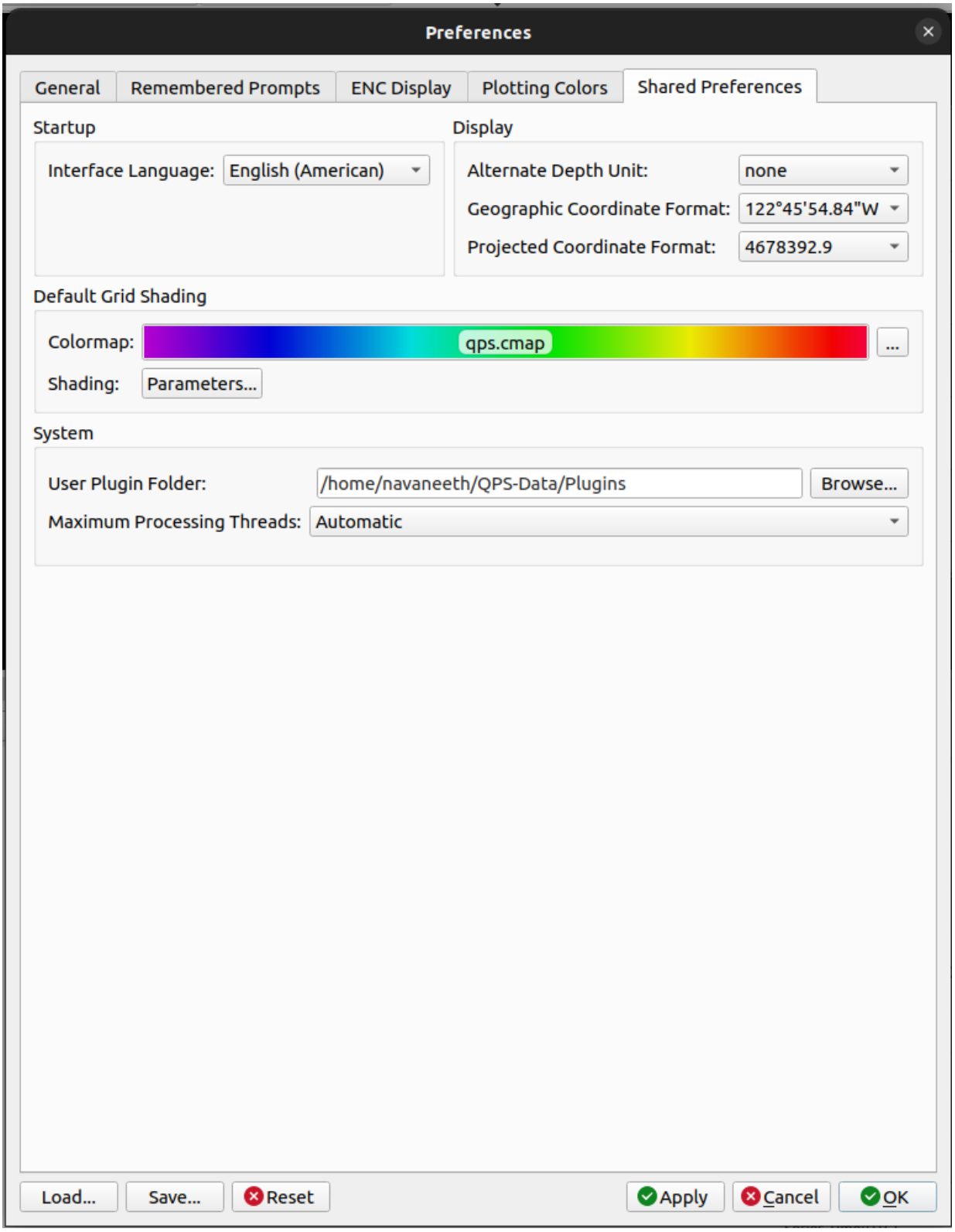
Colors tab will launch the color selection widget, shown below.



Reset

The reset button in this tab will restore the various themes back to their default settings corresponding to the configuration that was standard with the currently installed release.

Shared Preferences



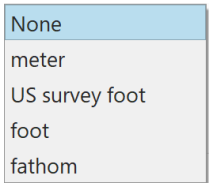
Startup Options

The *Interface Language* combo box allows you to select the language to be used by the user experience when Qimera is restarted. This list will increase over time and new language packs will be available from the download section of Qimera on the QPS website.

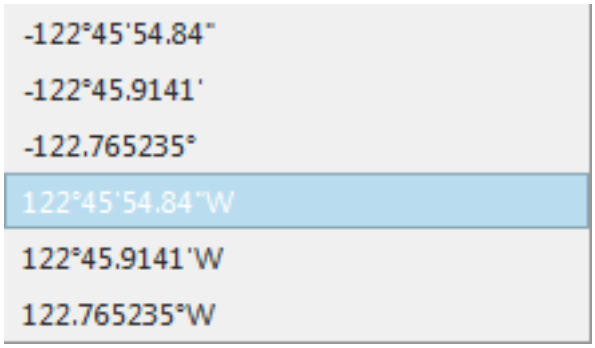
Display Options

These options change how geographic or projected coordinates are viewed in dialogs and the Status Bar of Qimera.

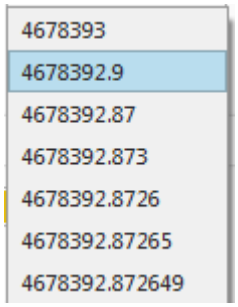
Alternate Depth Unit Options



Geographic Coordinate Formats



Projected Coordinate Formats



Default Grid Shading Options

Please see the sections on the *Shading* and *Colormap* dialog for more information on this section. These options are used whenever creating Dynamic or Static grids in Qimera.

System Options

The *User Plugin Path* allows you to specify a directory from which application plugins will be loaded (in addition to the system plugin directory). This only applies in scenarios where there is a need to load plugins other than those installed with Fledermaus.

The *Maximum Processing Threads* dropdown limits the number of tasks the applications will attempt to run in parallel. Setting it too high may reduce system responsiveness, while setting it too low may fail to make efficient use of processing capabilities. It should generally be left at "Automatic".

The *ArcGIS License Checkout* dropdown allows you to specify which, if any, ArcGIS license type you would like to point to when using ArcGIS integration features. "Automatically Determine License Type" is the default for convenience purposes, but can be slower than choosing a specific license type, especially when checking out licenses over a network. Note that this setting is only available on ArcGIS capable licensed copies of Fledermaus.

HIPS Licensing

The *HIPS Version* dropdown box allows you to specify whether you are using a HIPS 9 or 11 license. This is used when importing HDCS data.

When the HIPS Version is set to 9, the *HIPS License Path* field allows you to specify the HIPS license file, which is typically located in the System folder of the CARIS installation path.

When the HIPS Version is set to 11, the *HIPS License Host* field allows you to specify the HIPS 11 license string - either the license server's hostname for a server license, or "no-net" for a HIPS 11 local license.

The *Test HIPS Licensing* button performs a license check based on the parameters specified in the HIPS Version and HIPS License Path/Host fields.

Load and Save Preferences

Starting Qimera 2.7.1, the Preferences Dialog has capability to save/load custom preferences to/from disk.



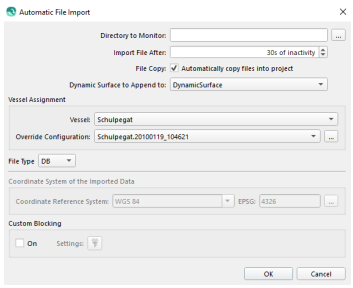
Only those specific attributes that are settable within the Preferences Dialog can be saved and loaded.
Attributes within the “Shared Preferences” pane are not saved/loaded to/from disk

because these attributes are shared between Fleidermaus and Qimera. Saving and loading these attributes might result in unexpected behavioral changes to both applications.
Attributes within the “Remembered Prompts” pane are not saved/loaded to/from disk because their values are set by other Dialogs.
The Save/Load feature only applies to those attributes that are set within the Preferences Dialog.
By default, the preferences are written to a directory `Preferences`. The `Preferences` directory is in the same location as the `Projects` directory.

Return to: *Qimera Interface*

Return to: *Wizards and Dialogs*

Qimera Automatic Import Dialog



- How to Start
- What it Does
- General Description
  - Wait Time
  - QINSy

How to Start

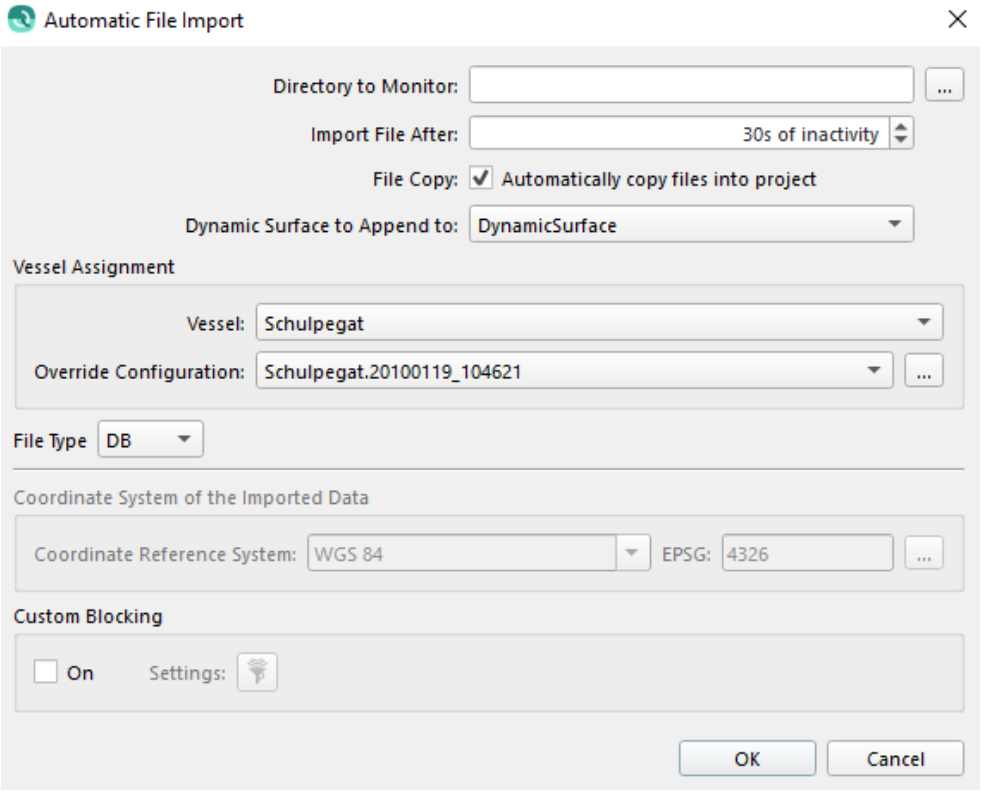
- Click the

   button on the Bathymetry Toolbar or select the *Automatic Raw File Import* action from the *Source* menu.

What it Does

The dialog enables Qimera to automatically import and process sonar files to extend a Dynamic Grid during live survey operations.

General Description



Qimera can be part of a "live" acquisition environment to automatically process raw sonar files and append them to a growing Dynamic Grid. Simply create an empty Qimera project, launch the Automatic Import dialog as shown above, and complete the required entries.

- Use the *Directory to Monitor* selector to designate the folder to watch where your live data is expected to appear.
- Set the *Import File After* field to tell Qimera how long to monitor a file size for changes before adding it to the project. In other words, a file will not be imported unless its file size has remained fixed in size for at least this amount of time.
- Use the *File Copy* option to automatically copy the raw sonar file into the Qimera project before processing. If you are running on a laptop connected to the network, this will allow you to leave the survey vessel with an intact Qimera project that you can continue to work with remotely. Raw sonar files will be copied to the *~myproject/Sources* folder prior to being imported.
- *Use the Dynamic Grid to Append to* combo box to select which Dynamic Grid to automatically append newly processed lines. If you don't specify a grid, you will be prompted to define the grid details when you click **OK**. This is the same experience you have when creating a Dynamic Grid from files in your project using the Bathy Toolbar.
- The *Vessel Assignment* works the same as the *Add Raw Sonar Files* dialog in that you can specify a template configuration file that will be used to override the vessel setup parameters

when the lines are loaded. See the section on Vessel Assignment in the Add Raw Sonar Files Dialog section of the reference manual to see how to use this feature.

- The *File Type* tells Qimera Live the file extensions to look for in the monitored folder. Supported file type are DB, QPD, ALL, KMALL, S7K, GSF, JSF, HSE, and HSX. The chosen file type will also determine which sections of the dialog are required. If not required, they will either be disabled or hidden.
- The *Coordinate System* of the imported data should be entered for file types other than **DB** and **QPD**.
- *Custom Blocking* can be turned on and configured using the *Settings* button. This allows you to create 2 blocking templates for up to 2 heads that will override any blocking performed during acquisition. For example, if your online QINSy system had angle blocking set to +/- 70 degrees so that you could see hazards on your next pass, but your delivery requires +/-60 degrees of coverage in the final product. You can have Qimera override the QINSy blocking to ensure that the Dynamic Grid being built has the proper coverage. See the Processing Settings Dialog section on blocking for more information.

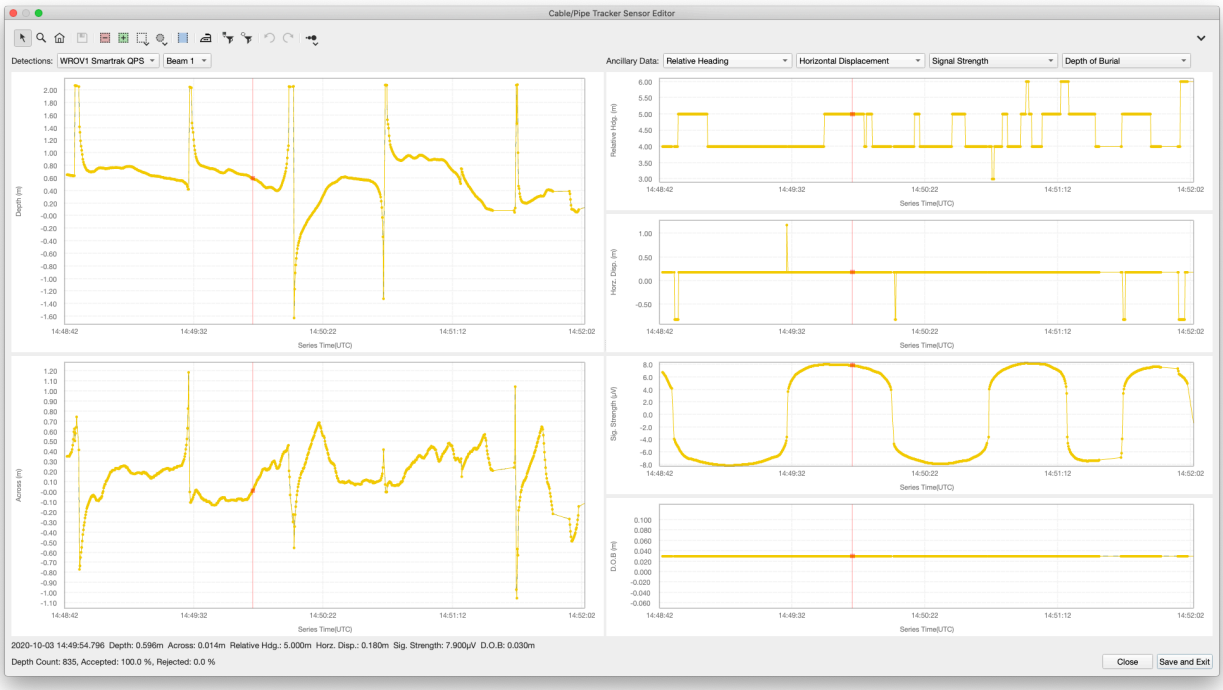
When the automatic raw file importer is running, the icon on the Bathymetry Toolbar will animate and the Qimera Status Bar will indicate that Auto Import is on. Hovering the mouse over the indicator in the status bar will show the directory that is being monitored in a tooltip. To turn off Automatic Import, simply click the button in the toolbar or the action in the menu.

> **Wait Time**
>
> You should test Automatic Import with any new acquisition system to determine the most appropriate *Wait Time*. As long as a file is continuing to grow in size, Qimera will not add it to the project. Some acquisition systems may buffer their file writing so testing this is important to verify that you are indeed getting a complete file.

> **QINSy**
>
> Qimera will not allow you to open an active QINSy project. You must create a **separate** project for Qimera and monitor the database folder of the QINSy project to prevent other metadata collisions in the project. Additionally, you can configure QINSy to copy files to an alternate directory at end-of-line. You can then have Qimera monitor this directory for additional source safety.

Return to: *Qimera Interface*
Return to: *Wizards and Dialogs*

Qimera Cable/Pipe Tracker Sensor Editor Dialog



- How to Start
- What it Does
  - Toolbar
    - Explore
    - Reset Zoom
    - Save Edits
    - Reject Selection
    - Accept Selection
    - Selection Style
    - Selection Area
    - Range Selection
    - Smoothing Dialog
    - Manage Clipping Filters
    - Run Clipping Filters
    - Undo
    - Redo

- Plot Point Size
- Toolbar Menu
  - Save Edits
  - Vertical Layout
  - Horizontal Layout
  - Export Plot as Images
  - Revert to Original
  - Show Original
  - Show Grid Lines
- Detections Comboboxes
- Ancillary Comboboxes

How to Start

1. Select a raw source file with Cable/Pipe Tracker Sensors and select Tools → Cable/Pipe Tracker Sensor Editor...

What it Does

This dialog allows you to edit and smooth any pipe tracker sensor data. When changes are saved and the dialog is closed the changes will be written back to the QPD files. If these QPD files are related to any dynamic grids present an update will be performed on the associated grids. Smoothing Filter changes will be written back to any associated Dynamic Pipes. Accepting/Rejecting/Clipping sensor data **will not** remove dynamic pipe nodes and it is recommended that you re-process any dynamic pipes manually after saving any of these edits.

Toolbar



The dialog toolbar contains everything you need to interact with this dialog and its associated plots.



Explore

This is the primary exploration mode of the tool. All the plots are linked, therefore exploring in one plot will match the horizontal span in another plot. As you move your cursor over the plot, the label in the lower left of the window will update to show information based on the selected Source data and *Ancillary Plots*.



Zoom In

When in zoom mode, simply click and drag an area of the plot to zoom into. At any time, you can Shift-Click to pan the plot to a new location. Vertical scale zoom can activated by holding the Ctrl key and using the mouse wheel.



Reset Zoom

If you have zoomed into an area of the plot, this button will zoom out to the extents of all the plot data. This will reset all plots due to their zoom/scroll linkage.



Save Edits

Selecting this button will save any edits you have made. Once changes are saved the undo/redo stack will be cleared.



Reject Selection

This button places the cursor in *Reject Selection* mode. Use the selection style and selection area drop down buttons to modify the selection style. Rejecting in one plot will reject the same time based data in all of the plots. This includes sensors that are not currently plotted.



Accept Selection

This button places the cursor in *Accept Selection* mode. Use the selection style and selection area drop down buttons to modify the selection style. Accepting data in one plot

will accept the same time based data in all of the plots. This includes sensors that are not currently plotted.

Selection Style

This button changes the selection style of both the *Reject* and *Accept* buttons. Clicking this will cycle through each of the styles, or long pressing will give you a drop down menu to select the style.

Selection Area

This button changes the selection area of both the *Reject* and *Accept* buttons. Clicking this will cycle through each of the options, or long pressing will give you a drop down menu to select the option.

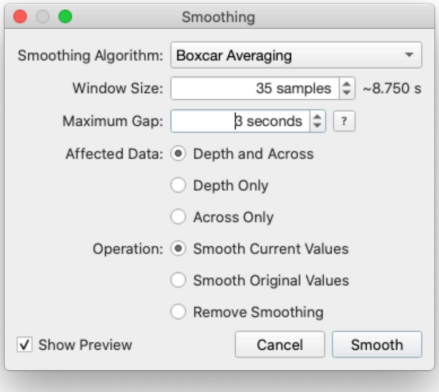
Range Selection

This button changes the selection tool to *Selection Range* mode which can be used for *Smoothing Filters* and *Clipping Filters* depending on the plot type selected.

If you have a *Range Selection* on the Depth and Across plots you will be able to Manage and Run the *Smoothing Filters*. Any smoothing will only be applied to the Depth and Across data.

If you have a *Range Selection* on any of the ancillary plots this will enable the *Manage Clipping Filters* and *Run Clipping Filters.* Any clipping filters will reject its associated *Ancillary* data and therefore reject time based samples in all available data.

Smoothing Dialog



The *Smoothing* Dialog allows you to configure and perform smoothing operations on specified data. A smoothing preview will be shown in the main dialog when *Show Preview* is checked. The preview will be updated with all changes made to the settings. Selecting the *Smooth* button will apply your settings, smooth your data and close the dialog. Selecting cancel will not apply and close the dialog. All smoothing changes are added to the Undo/Redo stack for the duration of the Cable/Pipe Tracker Sensor Editors lifetime.

The Smoothing Algorithm options are;

1. Boxcar Averaging - a moving average filter who's size is based on the *Window Size* sample count.
2. LOWESS - Locally Weighted Scatterplot Smoothing uses non parametric least squares to fit a line to data samples based on the *Window Size* sample count.

The Window Size offers an approximation of time based on the sample count used in the smoothing algorithm.

The Maximum Gap value allows you to smooth across data gaps within or between lines. The smoothing of a sample will never consider samples on the other side of gaps larger than this value. It should be noted that this does not fill in points that have been rejected by the user and all edits will remain intact.

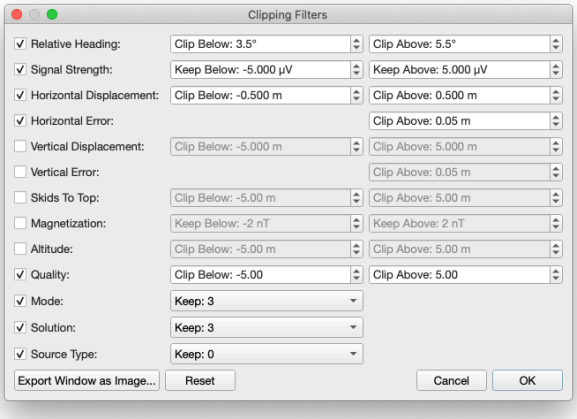
The Affected Data radio buttons allow you to select what data the smoothing algorithm will be applied too.

The Operation radio buttons allows you to select which smoothing operation you would like to perform. Smooth Current Values will smooth the current data which may contain previously smoothed data. Smooth Original Values will remove all previous smoothing and apply smoothing to the original data. Remove smoothing will remove all previous smoothing.

The Show Preview checkbox will show/hide a smoothed representation of your data in the main dialog.

Manage Clipping Filters

This will launch the *Clipping Filters* dialog that allows for the configuration of filters that apply to *Ancillary* data. Each available filter will displayed and can be enabled or disabled using the checkbox and its limits modified using the associated spin boxes. Filters are defined as Clip Inside, Clip Outside or Keep and can be identified by the text in the combo boxes. Only filters related to available *Ancillary Data* will be visible so you may not have all the available options displayed in the image below. You can export the dialog as an image for reporting using the *Export Window as Image* button.



Run Clipping Filters

This button will run the current *Clipping Filters (accept/reject)*. If no *Range Selection* is made it will run on the full extent of the data. Clipping filter are applied in the same way as the *Accept* and *Reject* selection tools in that it will apply the edits to all sensor data both visible (plotted) and non-visible (not plotted). You can *Undo / Redo* all filters in the order in which they are checked in the *Manage Clipping Filters* dialog.

Undo

This will undo the last operation. The undo buffer is pseudo-infinite and limited only by memory. So it will undo each edit in sequence. The Undo buffer clears when you save your edits. If you have run multiple *Clipping Filters* they will be stacked in the order as shown in the *Manage Clipping Filters* dialog.



Redo

This will redo the last undo operation. The redo buffer is pseudo-infinite and limited only by memory. So it will redo each edit in sequence. The Redo buffer clears when you save your edits.



Plot Point Size

This button will change the point and line size drawn in the plots. If you click and hold the button, it will display a menu where you can select point sizes between *Small* and *XX-Large*. Simply clicking will cycle through all sizes.



Toolbar Menu

Save Edits

This item will save any edits and will clear any undo redo items.

Vertical Layout

This item will convert the dialog into a vertical layout form.

Horizontal Layout

This item will convert the dialog into a horizontal layout form.

Export Plot as Images

This item will export all visible plots as images to a user specified directory. Note that this will not export non-visible sensor data and 'only' the visible plots on screen.

Revert to Original

This item will revert all smoothing, clipping and edits applied to the selected System and Beam number and all current unsaved edits will be lost. The data will be reverted to its original form.

Show Original

This item will show/hide the original data represented as a line. This data line cannot be edited or manipulated in any way and is for visual purposes only.

Show Grid Lines

This item will show/hide plot gridlines.

Detections Comboboxes



The *Detections Comboboxes* list the Systems and beams available in the source data that can be plotted. Switching system or beam will require saving or discarding any unsaved changes.

Ancillary Comboboxes

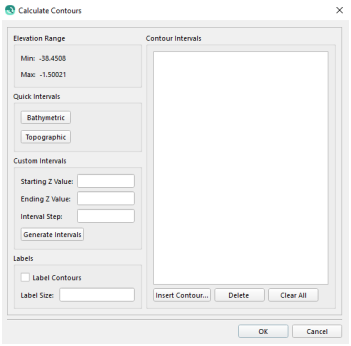


The Ancillary Comboboxes list the Ancillary data this is available to plot. If no ancillary data is present in the source files these comboboxes will be set to 'None'. If you wish to only observe a single plot you can manullay set the other comboboxes to 'None'. Switching Ancillary comboboxes does not require saving of the data.

Return to: *Qimera Interface*

Return to: *Wizards and Dialogs*

Qimera Calculate Contours Dialog



- How to Start
- What it Does
- General Description

How to Start

- *Contouring* option of the *Layer* menu in the Main Menu bar

What it Does

This dialog creates contours on grids in your project.

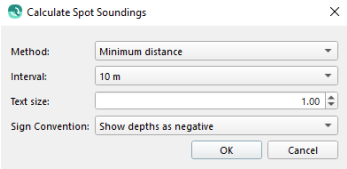
General Description

This process is available for a Static or Dynamic grid. It is necessary to specify which elevations will be contoured. The easiest way to generate intervals is to click on either the Bathymetric or Topographic Quick Intervals button. Clicking either of these buttons will add a number of intervals in the Contour Intervals list box. To generate contours at regular intervals specify the minimum and maximum starting elevation and the elevation step amount in the Starting Z Value, Ending Z Value and Interval Step fields. Once these values are specified, clicking on the Generate Intervals will automatically add the appropriate contours to the list. Note that only intervals that fall within the range of the selected data object will be added. Specific intervals can also be added directly by clicking the Insert Contours... button. The new interval will then be added to the list. Intervals can be removed by highlighting them and clicking the Delete button. The Clear All Values will clear all the entries in the list.

Labels can be generated for the contours by enabling the Label Contours toggle. If the Label Contours toggle is turned on, enter the size of the labels to be generated in the Label Size field. The size entered is approximately the height of the letters in units of the data. Once the desired contour intervals have been specified, clicking the OK button will prompt to save a generated the contour file and make it appear in the scene. The Cancel button simply closes the dialog without performing the contouring operation.

Return to: *Qimera Interface*
Return to: *Wizards and Dialogs*

Qimera Calculate Spot Soundings



- How to Start
- What it Does
- General Description

How to Start

- *Spot Soundings* option of the *Layer* menu in the Qimera Main Menu Bar.

What it Does

This dialog creates spot soundings on the current dynamic grid in your project.

General Description

This process is available for a Dynamic grid. There are two ways of creating the spot soundings.

- Minimum Distance, creates spot soundings at least the specified distance apart.
- Fixed Spacing, creates spot soundings at fixed intervals.

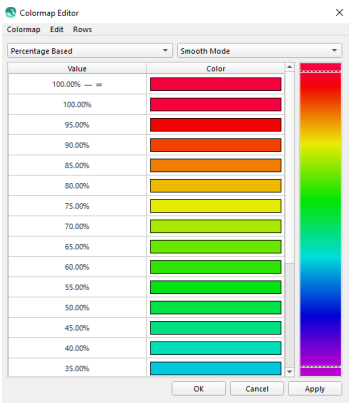
These options will determine the position and distance of the points that will be shown in the scene. The specified distance is set with the Interval drop down.

The spot soundings have a label showing the depth. The label size can be adjusted using the Text Size control. The default is 1 but this can still seem rather big when using low values as interval. The Sign Convention is an option to show the depths of the spot soundings as either a positive number or a negative number. When all the options are set, Qimera will ask you to save the file. After saving the file, the spot soundings will be shown in the scene. It is possible to adjust the settings of the spot soundings in the Attribute Panel. This will pop up when you click on the spot soundings layer in the Project Layers dock.

Return to: Qimera Interface

Return to: Qimera Main Menu Bar

Qimera Colormap Editor Dialog



- How to Start
- What it Does
- General Description
- Menubar Actions

How to Start

- Select a layer that uses a colormap, click the *Colormap* button in the Attribute Panel and choose *Edit Colormap...*

What it Does

The colormap editor allows many colormap operations including:

- Creating a new colormap from scratch
- Loading a colormap from multiple formats
- Editing the current colormap
- Saving the current colormap to multiple formats

General Description

The colormap editor is made up of several components:

- The menu bar contains many actions related to colormap files or editing. See below for more detailed descriptions.
- The scaling mode drop down changes the way the colormap is scaled to data.
  - *Percentage Based* colormaps scale themselves relative to whatever data they are applied to.
  - *Fixed Range* colormaps specify a range of absolute values.
- The blending mode drop down changes the way colors blend between values.
  - In *Smooth Mode*, colors blend smoothly and continuously from value to value.
  - In *Banded Mode*, the colormap is divided into discrete ranges or bands of solid color.

    - In *Mixed Mode*, the color immediately above and below each value can be specified allowing both smooth and discrete transitions.
- The table is where the colormap data can be viewed and edited. Cells can be edited via double click or the F2 key. The context menu provides some editing conveniences. The actual columns displayed in the table depend on the current blending mode.
    - In *Smooth Mode*, *Value* and *Color* columns are shown.
    - In *Banded Mode*, *Range* and *Color* columns are shown.
    - In *Mixed Mode*, *Value*, *Color Below* and *Color Above* columns are shown.
- The preview shows the current state of the colormap being edited. The dashed lines represent the top and bottom of the colormap's range. The sections outside these dashed lines show the above and below range colors.
- At the bottom of the window are the standard dialog buttons. While the colormap editor is a dialog, it also behaves much like a stand alone colormap editing application. This makes the meaning of the dialog buttons somewhat less obvious.
    - The *Apply* button applies the colormap as shown in the dialog to the selected layers. This operation is completely independent of any loading or saving of colormap files that was done.
    - The *OK* button is identical to the Apply button, except that it closes the dialog.
    - The *Cancel* button closes the dialog without applying the current colormap to the selected layers. It does not cancel any previous presses of the Apply button or any file based operations performed while the dialog was open.

Menubar Actions

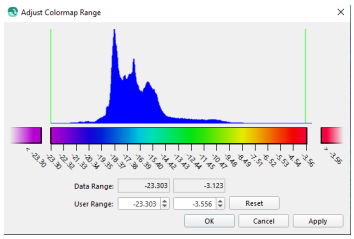
- *Colormap* Menu
    - *New...* - Shows the *New Colormap* dialog for creating a new colormap from scratch, which shows:
        - Scaling type
        - Blending mode
        - Minimum and maximum values
        - Minimum and maximum colors
        - The number of stops
        - A preview of the stop values based on the values chosen
    - *Load from File...* - Opens a colormap file from disk, replacing the currently loaded colormap. Note that this colormap is not immediately applied to the selected layers, OK or Apply must still be pressed. The supported formats are:

    - Fledermaus CMAP Files (*.cmap)
    - QINSy CLR Files (*.clr)
    - QINSy XML Files (*.xml)
    - ASCII Files (*)
    - Caris Files (*.cma)
    - Gimp/POV-Ray Files (*)
    - GMT Files (*.cpt)
    - GRASS Files (*)
  - *Save to File...* - Saves the current colormap to disk as a colormap file. The supported formats are:
    - Fledermaus CMAP Files (*.cmap)
    - QINSy XML Files (*.xml)
    - ASCII Files (*)
- *Edit* Menu
  - *Copy* - Copies the current value or color to the clipboard.
  - *Paste* - Pastes a value or color from the clipboard.
  - *Interpolate Values Between Selected Rows* - Evenly spaces the values between the first and last selected rows.
  - *Interpolate Colors Between Selected Rows* - Evenly blends the colors between the first and last selected rows.
  - *Reverse Colormap*: Reverses the position of every color in the colormap. The minimum color becomes the maximum color, and so on. No change is made to the values.
- *Rows* Menu
  - *Insert Row* - Inserts a new row above the selected row. The value and color are interpolated to be halfway between the surrounding rows.
  - *Delete Row* - Removes the selected row.
  - *Change Number of Rows...* - Rescales the colormap to have the specified number of evenly spaced rows.
  - *Rescale Full Range...* - Rescales a fixed range colormap to a new minimum and maximum.

Return to: Qimera Interface

Return to: Wizards and Dialogs

Qimera Colormap Range Adjustment Dialog



- How to Start
- What it Does
- General Description
  - With a Single grid Selected
  - With Multiple Grids Selected

How to Start

- Select one or more grids (or scalars), click the *Colormap* button in the Attribute Panel and choose *Adjust Colormap Range...*

What it Does

This dialog adjusts how colormap is applied to the range of values in the selected layers.

General Description

The dialog shows two ranges:

- The *Data Range* is the actual range of values found in the selected files. This is not user editable.
- The *User Range* is a separate range that can override the data range when coloring the grid.

The actual effect of the user range depends on the scaling type of the colormap.

- For *Percentage Based* colormaps, it adjusts the minimum and maximum that the relative scaling occurs between.
- For *Fixed Range* colormaps, it just adjusts the minimum and maximum outside of which values should be considered out of range.

With a Single grid Selected

If only one grid is selected, a histogram is shown, as in the image above. This shows where in the range the majority of the data lies, making it easier to choose a user range. Left clicking on the histogram sets the user minimum. Right clicking sets the maximum.

The *Reset* button, resets the user range to match the data range.

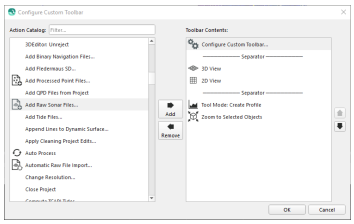
With Multiple Grids Selected

If multiple grids are selected, the histogram and reset buttons are hidden and the user range defaults to the data range.

Return to: *Qimera Interface*

Return to: *Wizards and Dialogs*

Qimera Configure Custom Toolbar Dialog



- How to Start
- What it Does
- General Description
  - Filter
  - Action Catalog
  - Tool Bar Contents
  - Add
  - Remove
  - Up/Down
  - Ok
  - Cancel

How to Start

- *Configure Custom Toolbar...* option of the *Project* menu in the Main Menu bar.
- If the Custom Toolbar is visible and the *Configure Custom Tool Bar...* action is added to the toolbar it can be launched by clicking the action icon. 

What it Does

This dialog is used to configure items in the Custom Toolbar.

General Description

This dialog enables the customization of the Custom Toolbar by providing access to pre-determined actions. Actions can be filtered, added and removed, sorted and separated to facilitate the customization needs. All changes will be reflected in the Custom Toolbar upon completion.

Filter

The *Action Catalog Filter* can be used to search and narrow the list of actions.

Action Catalog

The *Action Catalog* list contains all available actions that can be added to the Custom Toolbar. Included as the first element in the list is a line separator that can be used for visual separation between actions.

Tool Bar Contents

The *Tool Bar Contents* list contains all the actions, separators and ordering that are currently applied to the Custom Toolbar.

Add

The *Add* button will add the selected Action in the *Action Catalog* list to the *Tool Bar Contents* list.

Remove

The *Remove* button will remove the selected Action from the *Tool Bar Contents* list.

Up/Down

The *Up* or *Down* button will move the currently selected Action in the *Tool Bar Contents* list in the appropriate direction. An order change in the *Tool Bar Contents* list will be reflected in the Custom Toolbar from Left to Right or Top to Bottom depending on the layout orientation of the Custom Toolbar.

Ok

Clicking Ok will apply the new layout as defined in the *Tool Bar Contents* list to the Custom Toolbar and close the dialog.

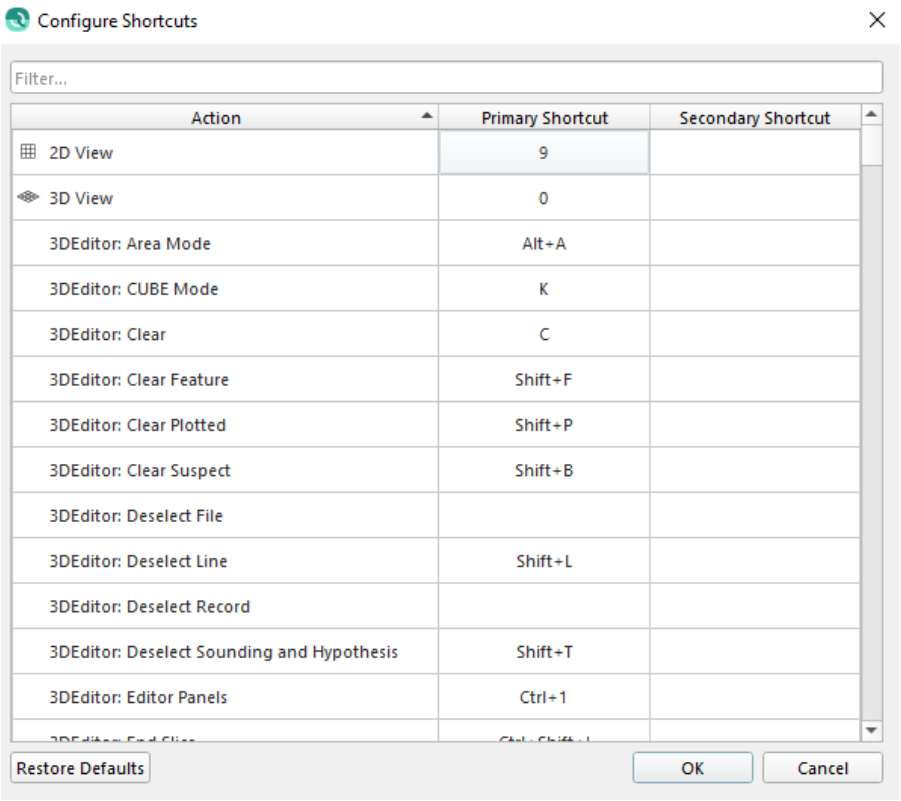
Cancel

Clicking Cancel will revert all changes.

Return to: Qimera Interface

Return to: Wizards and Dialogs

Qimera Configure Shortcuts Dialog



- How to Start
- What it Does
- General Description
  - Filter
  - Action Shortcuts
  - Primary and Secondary Shorcuts
  - Restore Defaults
  - Ok and Cancel

How to Start

1. Configure Shortcuts... option of the Project menu in the Main Menu Toolbar.
2. Using the default shortcut key Ctrl-0 or CMD-0 (zero) for Windows/Linux and Mac respectively.

What it Does

This dialog allows the user to configure their own shortcuts for predefined actions within the application. Each action can contain two shortcuts that must not conflict with any other action shortcut. In the event a conflict occurs, notification will be given and the option to unset the conflicting action will provided. All user defined shortcuts will be saved for all future instances of the application.

General Description

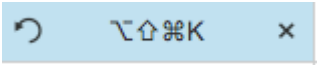
Filter

The *Filter* text field is used to search for a shortcut. Shortcuts can be found using their *Action Name* or *Primary* and *Secondary* Shortcut keys.

Action Shortcuts

The *Action* column defines the application action the shortcut will affect. This column cannot be modified and all actions are governed by the application. In particular cases the action within the *Action* column will contain a Group ID followed by the Action to help clarify where the shortcut is used, for example: "3DEditor: Clear Suspect". This Action Shortcut will only be used when the 3D Editor is open and Active.

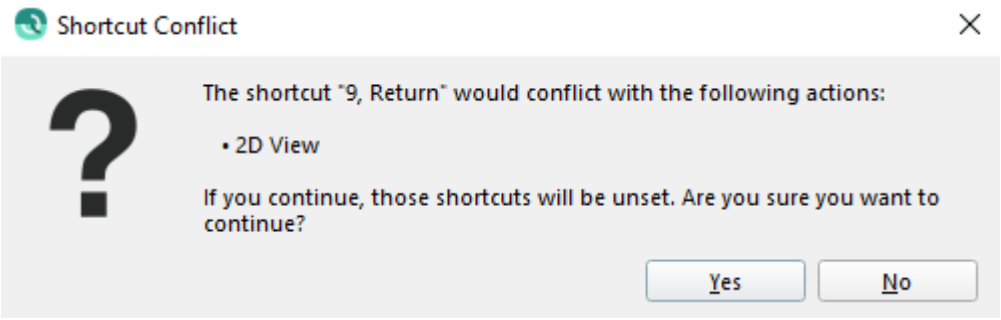
Primary and Secondary Shorcuts



The *Primary* and *Secondary* Shortcut columns display the application shortcuts for the corresponding Action. Action shortcuts can be set by clicking the cell and entering a key sequence on the keyboard. If the shortcut is not in conflict it will be displayed in the cell.

When a cell is selected it may contain two additional icons. The  button will reset the Action Shortcut to the application default. The  button will clear the Action Shortcut.

In the event a Action Shortcut is entered and is in conflict with another shortcut, the user will be notified with the option to unset the conflicting shortcut. No two Actions can have the same shortcut.



Restore Defaults

Clicking *Restore Defaults* will restore all the Shortcuts for all Actions to their default values.

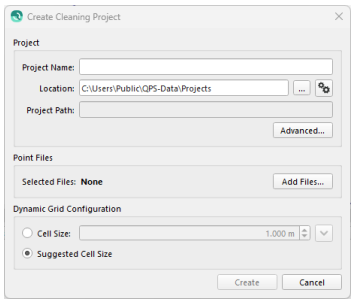
Ok and Cancel

Clicking *Ok* will apply all the changes the user has made. Clicking *Cancel* will revert all changes to their state before the Configure Shortcuts dialog was launched.

Return to: Qimera Interface

Return to: Wizards and Dialogs

Qimera Create Cleaning Project Dialog



- How to Start
- What it Does
- General Description
  - Project
  - Point Files
  - Dynamic Grid Configuration

How to Start

- *New Cleaning Project* option of the *Project* menu in the Main Menu bar
- *New Cleaning Project* option of the Qimera Welcome dialog

What it Does

This dialog allows for quick creation of a project for editing of processed point files.

General Description

At a minimum, a unique project name, a selection of point files, and a Dynamic Grid cell size selection is required to create and open a cleaning project. See below for

Project

Just as in the Create Project Dialog, a unique *Project Name* is required. Qimera will create a folder with this name in the *Location* directory for the project. The *Project Path* shows the full path at which the project folder will be created.

The *Advanced* button will take you to the Create Project Dialog to edit addition project details like survey type, description, and geodetic settings.

Point Files

The *Add Files* button will take you to the Add Processed Point Files Dialog to add processed point files, and configure specific properties for the import of the files.

Dynamic Grid Configuration

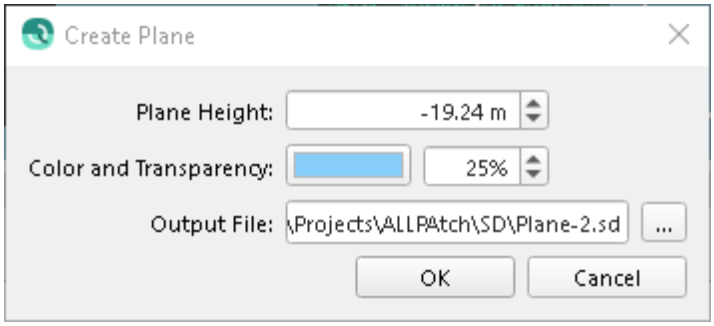
If selecting a specific *Cell Size* there are the same options as in the Create Dynamic Grid Dialog.

If the priority is to quickly to see the data, you can select *Suggested Cell Size*. Here though the properties of the point files are unknown until after the import. The suggested cell size can't be shown here, but will be determined during the project creation after the point files are imported.

Return to: *Qimera Interface*

Return to: *Wizards and Dialogs*

Qimera Create Plane Dialog



- How to Start
- What it Does
- General Description
  - Plane Height
  - Color and Transparency

How to Start

1. Create Plane... option of the Layer menu of the Main Menu toolbar.

What it Does

This dialog will allow the user to create a 2D plane encompassing the full area of the current project extents. The created plane will be automatically loaded into your current Qimera project as an SD Object and its setting can be modified using the Qimera Project Layers Dock.

General Description

Plane Height

This is the height where the plane will be created. The default value will be the lowest point in the project dataset.

Color and Transparency

Selecting the 'Color' button will launch a system specific dialog allowing selection of the plane colour.

Adjusting the transparency will adjust the percieved visibility of the plane and therefore any object above and below the plane. 100% transparency will create an invisible plane.

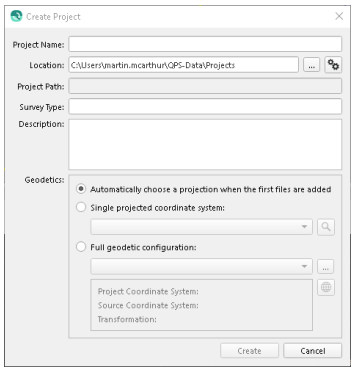
Output File

This is the location where the plane will be saved. The default location will be the current projects SD directory. The folder path and name can be changed by manually editing the path or selecting the '...' button which will launch a system specific file manager dialog.

Return to: *Qimera Interface*

Return to: *Wizards and Dialogs*

Qimera Create Project Dialog



- How to Start
- What it Does
- General Description
  - Project Name
  - Location
  - Project Path
  - Survey Type
  - Description
  - Geodetics

How to Start

-  button on the Bathymetry Toolbar
- *New Project* option of the *Project* menu in the Main Menu bar
- *New Project* option of the Qimera Welcome dialog

What it Does

This dialog closes the previous project if one is open and creates a new empty project.

General Description

This dialog has the following options. The layout on disk of the project is described here.

Project Name

Enter the name you want for your project. Qimera will create a folder with this name in the *Location* directory.

Location

This is the directory path where your project folder will be created. To change it, simply click on the *Browse* button and browse to a new folder.

Project Path

This shows the full path at which the project folder will be created.

Survey Type

A free form, optional field describing the type of survey being conducted.

Description

Use this section to describe your project. This information will be saved in the *qpsproject.xml* file and can be edited using the Project Properties dialog option of the Main Menu bar.

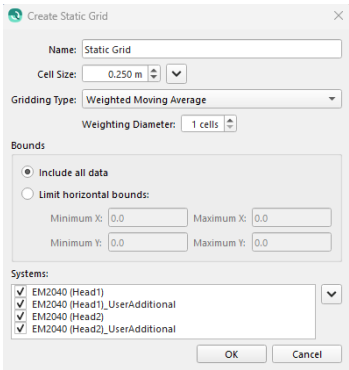
Geodetics

This section specifies the geodetic configuration of the project. Every project has a projected coordinate reference system (CRS) describing all the data *inside* the project. While data may be imported from or exported to other coordinate systems, the project coordinate system will be used as the CRS for data storage and processing.

- Choose *Automatically choose a projection when the first files are added* to have the application attempt to select an appropriate projected CRS when the first files are added to the project.
  - If the first files added use a projected CRS, that CRS will become the project CRS.
  - If the first files added use a geographic CRS, the application will select the appropriate WGS 84 UTM Zone based on the location of the data.
  - If the first files added lack a CRS, the user may be prompted to explicitly choose one.
- Choose *Single projected coordinate system* to specify a predefined CRS.
  - Click the dropdown to quickly search coordinate systems by name or EPSG number.
  - Or click the magnifying glass button to open a dialog with advanced search capabilities.
- Choose *Full geodetic configuration* for complete control over the project's geodetic settings.
  - Click the dropdown to quickly search known configurations.
  - Click the ... button to load an existing configuration from a .wkt or .db file.
  - Click the globe button to open the Geodetic Configuration Overview dialog to specify the advanced details including:
    - Custom coordinate systems
    - Custom and predefined source coordinate systems
    - Custom and predefined transformations

Return to: Qimera Interface
Return to: Wizards and Dialogs

Qimera Create Static Grid Dialog



- How to Start
- What it Does
- General Description

How to Start

- button of the Bathymetry Toolbar
- *Create Static Grid* option of the *Layer* menu in the Qimera Main Menu Bar.

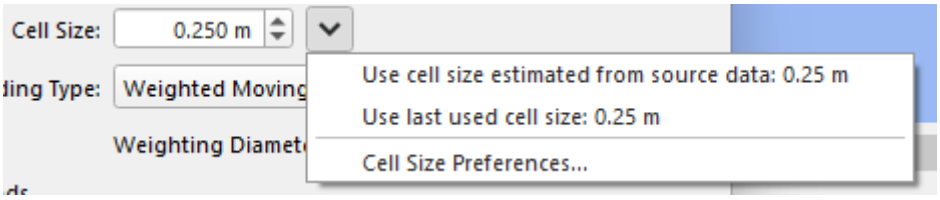
What it Does

This dialog launches a job to create a static grid from a line selection.

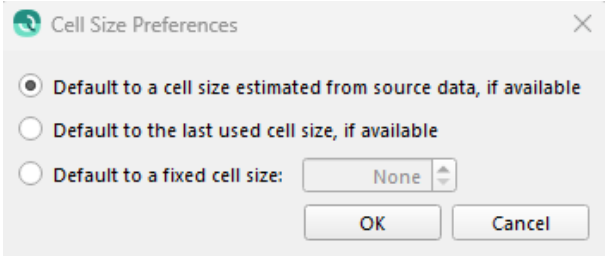
General Description

Make sure you have selected the lines you want to use to build the static grid then select the option to create a static grid and the above dialog will appear. By default it will be called "Static Grid" but it is suggested that you choose a more meaningful name for your grid. If the current project already has a static grid named "Static Grid" it will append a dash followed by a number as the default name.

The system will use the selected lines to suggest a potentially good default resolution for processing but you can override it with whatever value you feel is suitable. To set the cell size, you can use the spin box or select one of the options in the menu. Qimera can estimate the value with the "Use cell size estimated from source data" option, or you can set the cell size used to create the last grid with the "Use last used cell size" option.



"Cell Size Preferences" opens a dialog were you can set the default cell size options. These preferences will be remembered when you create another static grid.



By default, a static grid will be built to enclose all the data chosen to be added. If you selected a rectangular area from the main window before bringing up this dialog then those bounds will be shown but the "Limit Horizontal Bounds" will NOT be checked by default. You must choose “Limit Horizontal Bounds“ to use the constrained area as an additional step. By default all available systems in the raw survey data are selected to be included in the grid and are listed in the systems section. You can choose to remove data from specific systems by un-checking that system. If you are building a Static Grid from Processed Point files there will be no systems to choose from.

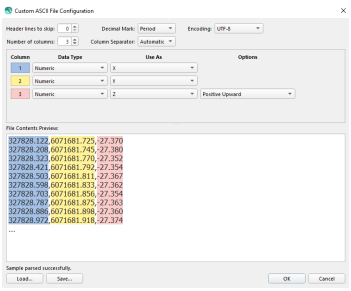
The gridding type will specify the gridding algorithm that controls how a set of points are gridded. There are four types of grids that can be used from irregularly spaced XYZ data:

1. Weighted Moving Average – the default weighted average algorithm. Specify the weight diameter in the 'Weight Diameter' section.
2. Shallow Biased – minimum value in the cell
3. Median Filtered – median value in the cell
4. Deep - the deepest value in the cell

Return to: Qimera Interface

Return to: Qimera Wizards and Dialogs

Qimera Custom ASCII File Configuration Dialog



NOTE: Any edits made to this page should also be made to Custom ASCII File Configuration Dialog!

- How to Start
- What it Does
- General Description
  - Header Lines to Skip
  - Number of Columns
  - Decimal Mark
  - Column Separator
  - Save Configuration...
  - Load Configuration...
  - Column Properties
    - Column
    - Data Type
    - Use As
    - Options
  - File Contents Preview

How to Start

- This dialog isn't launched on its own, but is instead used by various other dialogs to import ASCII data.

What it Does

This dialog allows the user to describe the layout (and potentially the meaning) of a plain text data file, so that the application can properly parse and import the data.

The dialog maintains a history of past used configurations and when launched will attempt find a configuration matching the contents of the current file.

General Description

The dialog is divided into three main sections: settings applying to the entire file at the top, the configuration of the individual columns in the middle, and a marked up preview of file contents.

Header Lines to Skip

Many ASCII files have one or more header lines, providing metadata about the file. Use this setting to have the application skip over all such lines before attempting to interpret any data.

Number of Columns

Set this to the total number of columns (fields) in the file. Note that even if only the first few columns are need to be imported, all fields must be described to ensure the data is read properly.

Decimal Mark

Switch this field from *Period* to *Comma* if the file was generated in a language that use commas to separate the whole and fractional parts of a number.

Column Separator

This setting controls how the characters between the end of one column and the beginning of the next are interpreted. The common separators *Comma*, *Space* and *Tab* can be selected directly, or choose *Other* to specify any other single character. The default option, *Automatic*, treats and group of commas, spaces or tabs as a separator.

Save Configuration...

Saves the current state of the dialog to file to be later loaded and applied to a different file or moved to another computer.

Load Configuration...

Loads a configuration file previously saved via *Save Configuration...*.

Column Properties

Each column in the data file has its own row of configuration options. The number of rows is controlled by the *Number of Columns* setting.

Column

Shows the number of the column and the color used to highlight that column in the *File Contents Preview*.

Data Type

Specifies the type (in a computer science sense) of data contained the column. This is entirely separate from what the value means or how it should be interpreted.

- Numeric
  - Used for decimal numbers which may or may not have a fractional part following a decimal point.
  - Which character is treated as the decimal point is controlled by the *Decimal Mark* setting.
  - Some numeric fields provide an option for specifying the sign convention used.
- *Integer*
  - Used for positive or negative whole numbers.
  - The only reason to prefer *Integer* fields over *Numeric* ones is that they occupy half the memory and disk space.
- *Text*
  - Used for sequences of characters that should be interpreted as just that.
  - Options control whether the text is variable length, double quoted, single quoted, or fixed length.
- *Date-Time*
  - Used for dates and/or times that are stored as several component parts.
  - A format string is used to specify the format of the data. Press the *Format Help* button for a detailed description of the format description syntax, along with lots of examples.
  - To parse time store as just a number of seconds, it is much easier to just use a *Numeric* field.
- *Degrees-Minutes-Seconds*
  - Used for latitudes or longitudes that have minute or seconds components or that use a N/S or E/W suffix to indicate sign.
  - Again, a format string is used to specify the format of the data. Press the *Format Help* button for a detailed description of the format description syntax, along with lots of examples.
  - To parse latitudes or longitudes stored as a signed number of decimal degrees, it is much easier to just use a *Numeric* field.

Use As

Controls how the column is used by the import process. The available options are entirely dependent on the kind of import being performed. If no field mapping is specified, the column with be ignored entirely. Some field mappings are mandatory while others are optional.

Note that some imports do not allow specifying this directly in the ASCII configuration dialog and require using a separate dialog to map the input columns to data fields.

Options

This shows additional configuration options which depend on the values chosen for *Data Type* and *Use As*. See the *Data Type* section for more details.

File Contents Preview

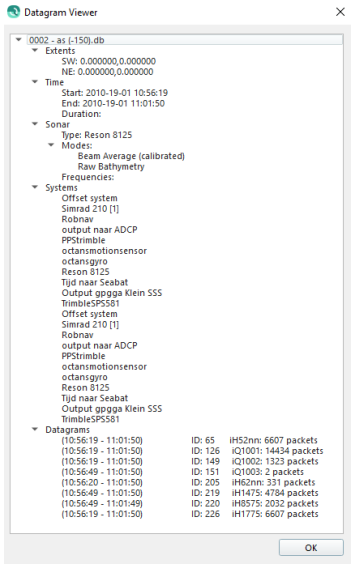
This displays a preview of the first few lines of the file, marked up to show how the columns were interpreted and where errors, if any, occurred. If multiple files are being imported, previews are shown for each.

A small message below the preview indicates whether the sample was parsed successfully.

Return to: Qimera Interface

Return to: Wizards and Dialogs

Qimera Datagram Viewer Dialog



- How to Start
- What it Does
- General Description

How to Start

- *Datagram Viewer* menu option in the raw sonar files context menu
- *Datagram Viewer* menu option in the *Tools->QPS* sub-menu of the Main Menu bar.

What it Does

This dialog shows detailed metadata of a selected raw sonar file.

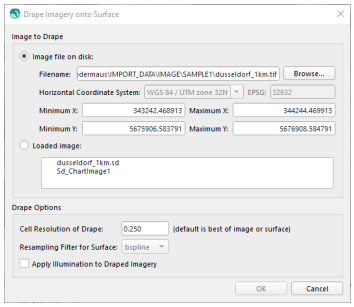
General Description

This dialog contains information on the spatial extents, time duration, Sonar type and mode information and all datagram counts available in the file. This is a useful raw sonar file inspection tool. It can be accessed from the **Right-click** context menu of the Project Sources window and runs on the currently selected file. It can also be accessed from the *Tools->QPS* menu and work on a file chosen by the user.

Return to: Qimera Interface

Return to: Wizards and Dialogs

Qimera Drape Image Dialog



- How to Start
- What it Does
- General Description
  - Image from Disk
  - Loaded image
  - Cell Resolution
  - Resampling Method
  - Apply Illumination

How to Start

Click the Drape Image button in the Project Layers panel when a static grid is activated.

What it Does

Use this dialog to drape an image onto a static grid. The image will appear to lie on the grid. Shading may optionally added, otherwise there will be no shading applied.

General Description

The dialog is divided into two main sections: an area to select an image and an area to set drape options. The first area, the image to drape area, is broken into two further options with a radio button for each option. Only one of the options may be chosen at a time, the first option loads an image from disk. The coordinate system and bounds may be specified or corrected in this area. The second option lists images that are already loaded in Qimera. Any image shown may be selected.

The lower main area has three options, the cell size to use, the resampling method to use if the cellsize of the grid and image do not match and an option to select illumination for the image.

Image from Disk

An image may be selected from disk. Click browse or enter the path and file name of an image in the text field then click Browse to load the specified image. This way, a specified

path can be easily localted, if desired. If the image has bounds and a coordinate system defined, they will be listed in the fields below the file name. It is possible to edit the bounds or change the coordinate system if corrections are required.

The image will be reprojected if the coordinate system does not match the project coordinate system. Do not change the coordinate system or bounds to match the project. Qimera will correctly reproject the image if necessary to the correct bounds and coordinate system for the project.

Loaded image

Choose one of the selected images to drape. Only one image may be selected from the list, and only one of an Image from disk or loaded image may be selected.

Cell Resolution

The best of the resolution of the grid or image will be automatically filled in here. The value may be changed, if desired. Usually, images have higher resolution (smaller number), so this value will be the resolution of the image. If so, the image will not be resampled. Otherwise, the image will be resampled using the method specified in the Resampling Method field.

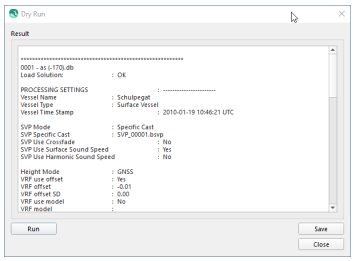
Resampling Method

Should the image require resampling to match the resolution of the grid or if the cell resolution is otherwise different than the resolution of the image, the method to use may be selected here.

Apply Illumination

To apply illumination to the draped image check this box. The image will then have cast shadows from the grid features applied.

Qimera Dry Run Dialog



r

- How to Start
- What it Does
- General Description
  - Processing Settings Section
  - Input Data Availability Section
  - Input Data Usage Section

How to Start

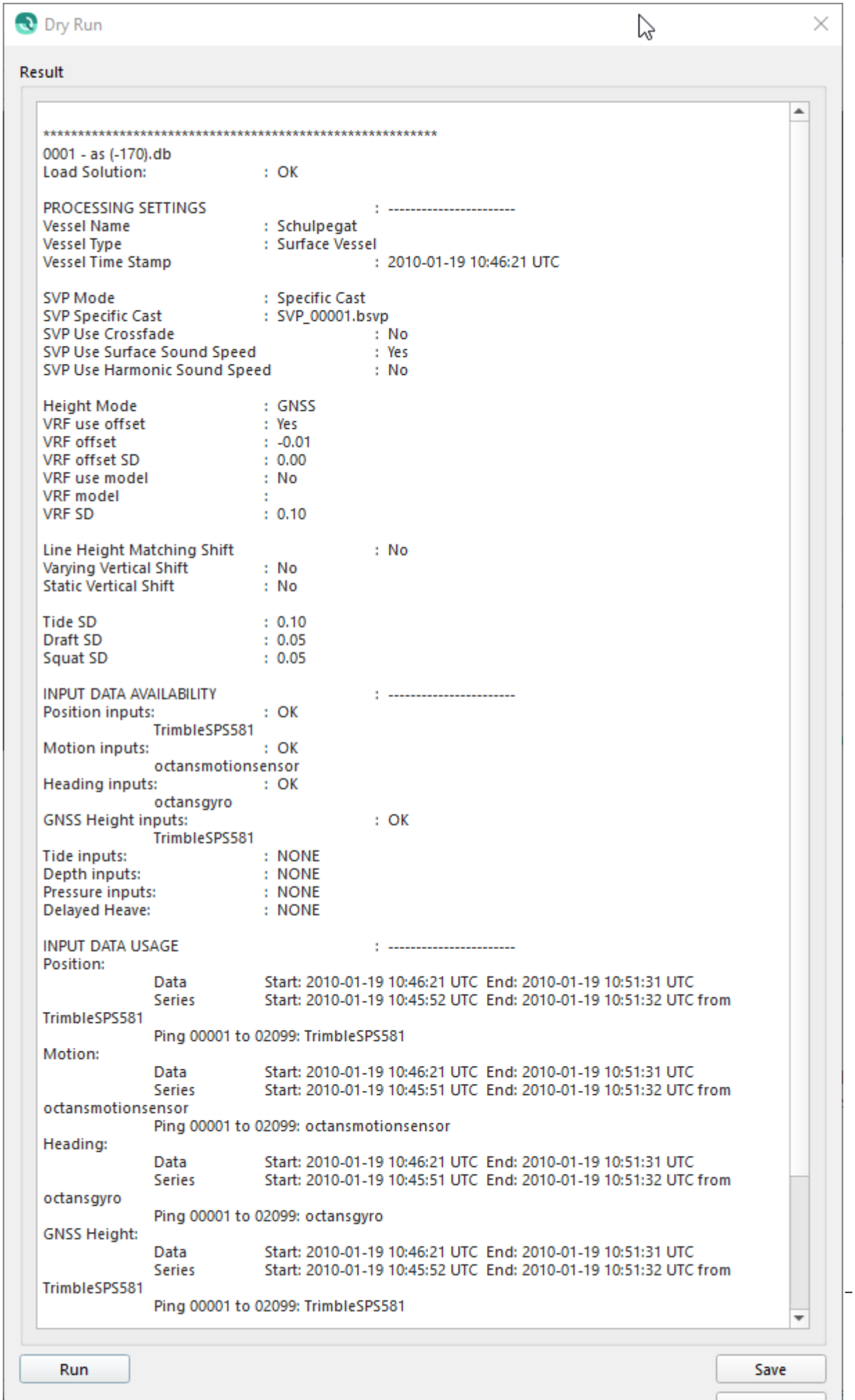
- **Right-click** context menu for raw sonar data

What it Does

Runs a simulated processing session for a line selection.

General Description

This dialog runs on the line selection from the *Project Sources* tree view. When you click on the *Run* button, the utility stands up a line processing configuration for Qimera to process, but runs the processing without actually engaging the engine at the beam level. In this way, you get to see all the choices that Qimera will be provided and the time series lookup results that will happen during processing. For example, the following is a *Dry Run* output that was the result of a Kongsberg file using height information from an imported POSPac file.


Dry Run
Result
****
0001 - as (-170).db
Load Solution: : OK
PROCESSING SETTINGS : ----------
Vessel Name : Schulpegat
Vessel Type : Surface Vessel
Vessel Time Stamp : 2010-01-19 10:46:21 UTC
SVP Mode : Specific Cast
SVP Specific Cast : SVP_00001.bsvp
SVP Use Crossfade : No
SVP Use Surface Sound Speed : Yes
SVP Use Harmonic Sound Speed : No
Height Mode : GNSS
VRF use offset : Yes
VRF offset : -0.01
VRF offset SD : 0.00
VRF use model : No
VRF model :
VRF SD : 0.10
Line Height Matching Shift : No
Varying Vertical Shift : No
Static Vertical Shift : No
Tide SD : 0.10
Draft SD : 0.05
Squat SD : 0.05
INPUT DATA AVAILABILITY : ----------
Position inputs: : OK
TrimbleSPS581
Motion inputs: : OK
octansmotionsensor
Heading inputs: : OK
octansgyro
GNSS Height inputs: : OK
TrimbleSPS581
Tide inputs: : NONE
Depth inputs: : NONE
Pressure inputs: : NONE
Delayed Heave: : NONE
INPUT DATA USAGE : ----------
Position:
Data Start: 2010-01-19 10:46:21 UTC End: 2010-01-19 10:51:31 UTC
Series Start: 2010-01-19 10:45:52 UTC End: 2010-01-19 10:51:32 UTC from
TrimbleSPS581
Ping 00001 to 02099: TrimbleSPS581
Motion:
Data Start: 2010-01-19 10:46:21 UTC End: 2010-01-19 10:51:31 UTC
Series Start: 2010-01-19 10:45:51 UTC End: 2010-01-19 10:51:32 UTC from
octansmotionsensor
Ping 00001 to 02099: octansmotionsensor
Heading:
Data Start: 2010-01-19 10:46:21 UTC End: 2010-01-19 10:51:31 UTC
Series Start: 2010-01-19 10:45:51 UTC End: 2010-01-19 10:51:32 UTC from
octansgyro
Ping 00001 to 02099: octansgyro
GNSS Height:
Data Start: 2010-01-19 10:46:21 UTC End: 2010-01-19 10:51:31 UTC
Series Start: 2010-01-19 10:45:52 UTC End: 2010-01-19 10:51:32 UTC from
TrimbleSPS581
Ping 00001 to 02099: TrimbleSPS581
Run
Save

Processing Settings Section

This first section shows all of the options selected by the Processing Settings dialog.

Input Data Availability Section

This shows the time series data order as prioritized in the Processing Settings dialog.

Input Data Usage Section

This section show where time series samples came from at the time resolution of 1 ping. It also shows which SVP was used for which pings.

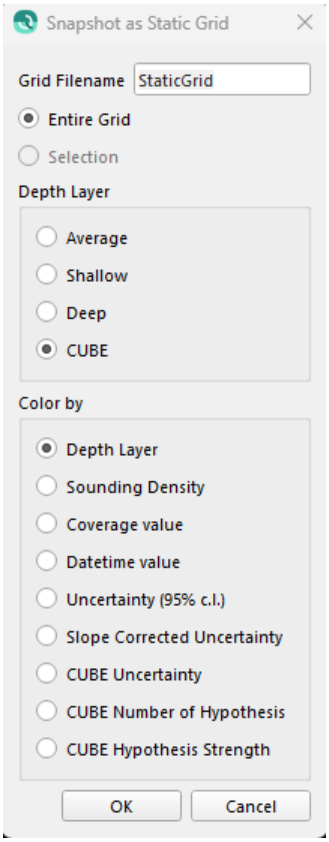
Return to: Qimera Interface
Return to: Wizards and Dialogs

Qimera Dynamic Grid Dialogs

The following set of dialogs are specific to Dynamic Grid processing. They are accessible via the Dynamic Grid menu in the main menu bar.

- Qimera Snapshot as Static Grid
- Qimera Extract Dynamic Grid Layer
- Qimera Append to Dynamic Grid Dialog
- Qimera Cell Info Dialog
- Qimera Change Resolution Dialog
- Qimera Create Clipped Grid
- Qimera Create Dynamic Grid Dialog
- Qimera Create Flag Markers Dialog
- Qimera Create GRD Dialog
- Qimera CUBE Dialogs
  - Qimera Create Custom Hypothesis from Features Dialog
  - Qimera CUBE Filter Soundings Dialog
  - Qimera CUBE Output Grid Dialog
  - Qimera CUBE Settings Dialog
  - Qimera Re-Cube Area Dialog
- Qimera Duplicate Dynamic Grid Dialog
- Qimera Export Grid to Soundings
- Qimera Export Shoal Soundings Dialog
- Qimera Export Static Grid Layer Dialog
- Qimera Filter Out Soundings in Lonely Cells Dialog
- Qimera Interpolate Dynamic Grid Dialog
- Qimera Remove Lines Dialog
- Qimera Sounding Selection Dialog

Qimera Snapshot as Static Grid



- How to Start
- What it Does
- General Description
  - Slope Corrected Uncertainty

How to Start

- *Extract Layer as Static Grid* option from *Dynamic Grid - Extract* context menu in the Project Layers dock.

What it Does

Creates a snapshot of a dynamic grid as a static grid and adds it to the scene.

General Description

Use this option after selecting a dynamic grid to create a snapshot of the dynamic grid as a static grid. The operation can be applied to the entire Dynamic Grid or simply a selection of the Dynamic Grid.

Slope Corrected Uncertainty

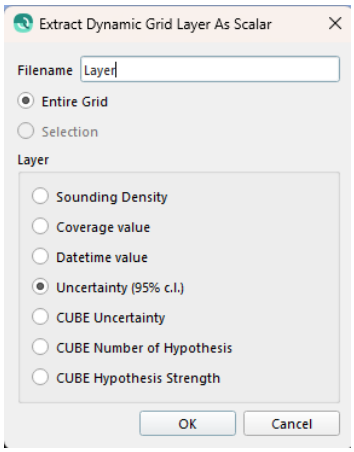
The *Slope Corrected Uncertainty* surface is created by looking at each cell's neighbours and adjusting the 95% CI Uncertainty to try to remove the effect of the regional slope. The slope calculation from the neighbouring cells is an approximation, as is the correction factor, so minor effects of slope will still be visible in some cases. This also means that if the uncertainty is already quite small, it will sometimes be reduced to zero.

Return to*: Qimera Dynamic Grid Dialogs*

Return to: *Wizards and Dialogs*

Return to: Qimera Interface

Qimera Extract Dynamic Grid Layer



- How to Start
- What it Does
- General Description

How to Start

- *Extract Layer as Scalar* option from *Dynamic Grid - Extract* context menu in the Project Layers dock.

What it Does

Extract a layer, such as the Sounding Density, from a dynamic grid and adds it to the scene as an Sd Object. The layers available for extraction will vary depending on if the Dynamic Grid was created with the CUBE algorithm or not. Standard Dynamic Grid only contain the Bin Count and the Uncertainty layers. CUBE grids will also contain the CUBE Uncertainty, CUBE Number of Hypotheses and CUBE Hypothesis Strength.

Note that CUBE Uncertainty layer is different than the usual Dynamic Grid Uncertainty layer.

- The regular Uncertainty layer for a Dynamic Grid reflects the standard deviation, scaled to 95% c.l., of all accepted soundings, regardless of whether or not they are used for a CUBE grid. It does not include rejected soundings in the calculation.
- The CUBE Uncertainty layer reflects the standard deviation, scaled to 95% c.l., of the accepted soundings that contributed to the selected hypothesis.

In both cases, the standard deviation is scaled to 95% c.l. via the scaling factor of 1.96.

Similarly, Coverage and Datetime grids will include Coverage and Datetime as options.

General Description

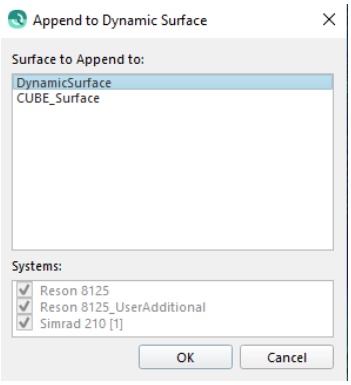
Use this option after selecting a dynamic grid to extract a property layer from a dynamic grid. The operation can be applied to the entire Dynamic grid or simply a selection of the Dynamic grid.

Return to*: Qimera Dynamic Grid Dialogs*

Return to: *Wizards and Dialogs*

Return to: Qimera Interface

Qimera Append to Dynamic Grid Dialog



- How to Start
- What it Does
- General Description

How to Start

- *Append Lines* option from *Dynamic Grid* menu of Main Menu bar
- Context menu of processed point files
- Context menu of raw sonar files

What it Does

This dialog allows you to append lines to a Dynamic Grid.

General Description

When selected, this option lets you append any lines you have highlighted to any dynamic grid that exists in your project. Make sure you have selected the survey lines to add first then bring up the Append dialog shown above. Select the dynamic grid to append the lines to from the list of grids in the project and click "OK" to start to appending job. If the survey lines contain multiple systems you can select which ones to use from the Systems list in the dialog box. If any System from the list is already part of the selected dynamic grid, it will be disabled as it has already been added.

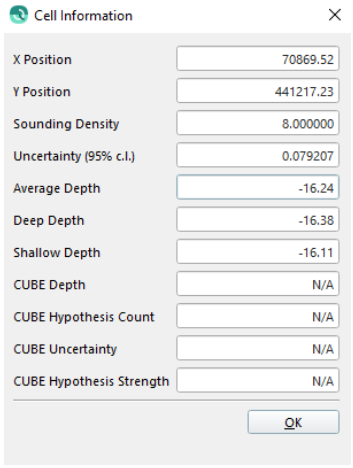
Return to: Qimera Dynamic Grid Dialogs

Return to: Wizards and Dialogs

Return to: Qimera Interface

Qimera Cell Info Dialog

> Starting Qimera v2.7.0 the *Dynamic Grid Menu* has been removed and the *Cell-Info Dialog* has been replaced with the Cell-Properties Dock.



- How to Start
- What it Does
- General Description

How to Start

- *Show Cell Info* option from *Dynamic Grid* menu of Main Menu bar

What it Does

This dialog shows the attribute values for a cell of a dynamic grid that the cursor is hovering over.

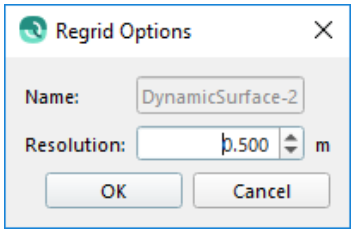
General Description

After selecting a dynamic grid from the layers window, Qimera will utilize this dialog for viewing Cell information. The Cell Information will not just show cell information for the selected Dynamic Grid from the the layers window, but rather from any dynamic grid that the cursor is hovering over. Qimera will use the x,y position of the cursor and match that up with a Cell from the dynamic grid that the cursor is hovering over. The Cell Information dialog will display X, Y position of the cursor, the Sounding Density, the Uncertainty, and the Average, Deep and Shallow Depth values. If CUBE is included with the Dynamic Grid, it will also display the CUBE depth value, the number of hypothesis, the Hypothesis Uncertainty, and the Hypothesis Strength values.

Return to: *Qimera Dynamic Grid Dialogs*
Return to: *Wizards and Dialogs*
Return to: Qimera Interface

Qimera Change Resolution Dialog

> **Qimera v2.7.0 Dynamic Grid Menu**
>
> Starting Qimera v2.7.0 the Dynamic Grid Menu has been removed.



- Qimera v2.7.0 Dynamic Grid Menu
- How to Start
- What it Does
- General Description

How to Start

- *Change Resolution* option from the context menu of the Project Layer

What it Does

This dialog allows you to change the resolution of a Dynamic Grid.

General Description

After selecting a dynamic grid from the project layers window this option lets you change the resolution of the dynamic grid. If a dynamic grid was created at 0.5 m, but the final deliverable was at 2 m, you can change the resolution with this option. To do this, select the dynamic grid and either select *Change Resolution* from the Dynamic Grid Menu or use the context menu (right-click).

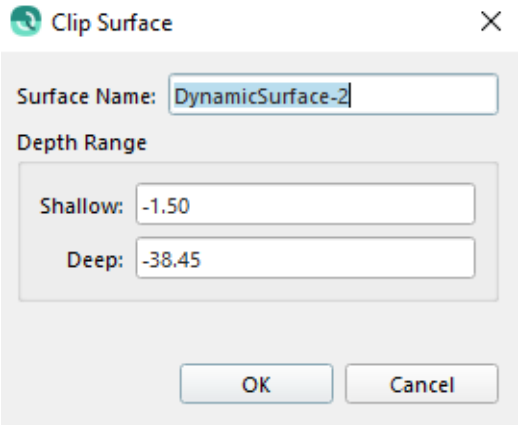
Return to: *Qimera Dynamic Grid Dialogs*

Return to: *Wizards and Dialogs*

Return to: Qimera Interface

Qimera Create Clipped Grid

> **Create Clipped Dynamic Grid**
>
> Starting Qimera v2.7.0 the *Create Clipped Dynamic Grid* feature has been eclipsed by the Duplicate Dynamic Grid. This feature will no longer be required and the documentation will be removed.



- Create Clipped Dynamic Grid
- How to Start
- What it Does
- General Description
- Editing Clipped Grids

How to Start

- *Create Clipped Surrface* option from *Dynamic Grid* menu of Main Menu bar

What it Does

This dialog allows you to create a clipped grid of the currently selected grid. You are able to select the depth range that you desire in the final dynamic grid that is created.

General Description

This feature will clone the currently selected grid and run a clipping filter on all the cells for the grid. This occurs for all layers within the grid (shallow, deep, average, CUBE). If the cell depth is outside the clipping range, the cell will be marked as invalid. It should be noted that no soundings are rejected during this operation. This capability can be used to aid in

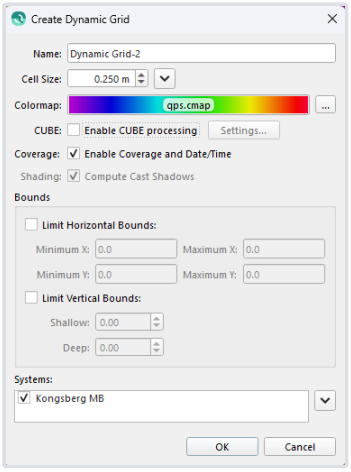
cleaning data within a certain depth range. All exports, including those of CUBE grid, will only export the remaining valid cells of your clipped grid.

Editing Clipped Grids

Clipped grids are in reality just another Dynamic Grid. When they are created, the *Update* option for the grid is set to *Always*. What this means is that if you edit soundings that are part of the original clipped grid, this grid will update and *Re-Clip* itself. If you don't want this grid to continually update during edit operations, simply change the *Update* option to *Manual*. However, if you need to update soundings that are part of the clipped grid, you can allow Qimera to perform an update operation or use the **right-click** context menu of the grid to request *Update Dynamic grid From Edits*. After any type of update operation, automatic or manual, Qimera will re-clip the grid to the originally specified depth range.

Qimera Create Dynamic Grid Dialog

> **Create Dynamic Grid**
>
> Starting Qimera v2.7.0 the *Create Dynamic Grid* has been moved into the Qimera Layer Menu



How to Start

- button of the Bathymetry Toolbar
- *Create Dynamic Grid* option of the *Dynamic Grid* menu in the Layer Menu bar

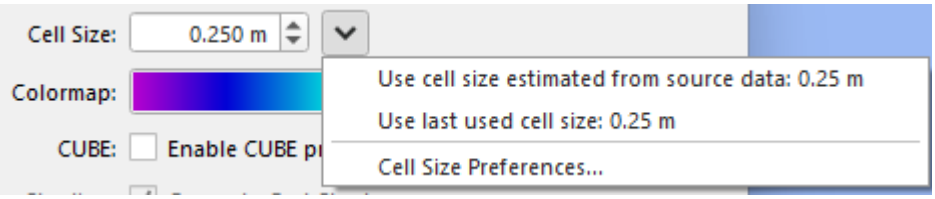
What it Does

This dialog is used to create a Dynamic Grid using a selection of raw sonar files or processed point files.

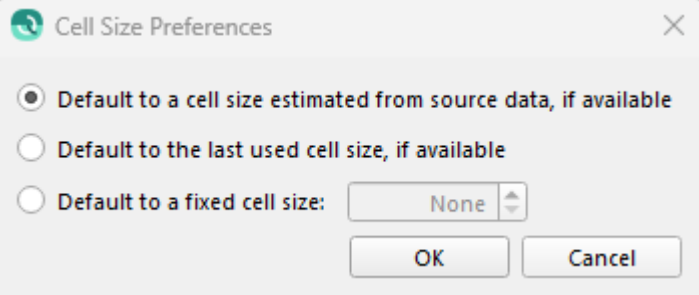
General Description

Make sure you have selected the lines you want to use to build the grid then select the option to create a dynamic grid and the above dialog will appear. By default it will be called "Dynamic Grid" but it is suggested that you choose a more meaningful name for your grid. If the current project already has a dynamic grid named "Dynamic Grid" it will append a dash followed by a number as the default name. The system will use the selected lines to suggest a potentially good default resolution for processing but you can override it with whatever value you feel is suitable.

To set the cell size, you can use the spin box or select one of the options in the menu. Qimera can estimate the value with the "Use cell size estimated from source data" option, or you can set the cell size used to create the last grid with the "Use last used cell size" option.



"Cell Size Preferences" opens a dialog were you can set the default cell size options. These preferences will be remembered when you create another dynamic grid.

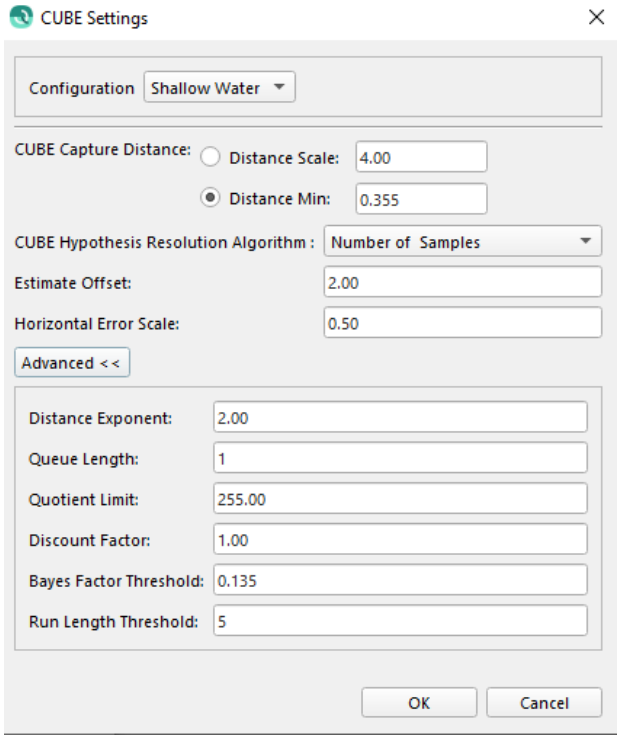


The qps.cmap is the default color map used for the grid unless you have changed it in the preferences. Clicking the "..." button to the right brings up the Select Colormap dialog allowing you to choose other built in color maps to locate one of your own.

You can speed up grid creation by delaying the illumination processing by unchecking 'Compute Cast Shadows' (See Qimera Application Preferences Dialog for more details).

If you want to do CUBE processing check the "Enable CUBE processing" check box. When checked you can fine tune the specific CUBE options via the "Settings..." button. By default a dynamic grid will be built to enclose all the data chosen to be added. You can override this by entering in custom bounds (in the project's coordinate system) and making sure the "Limit Horizontal Bounds" option is selected. If you selected a rectangular area from the main window before bringing up this dialog then those bounds will be shown but the "Limit Horizontal Bounds" will NOT be checked by default. You must choose “Limit Horizontal Bounds“ to use the constrained area as an additional step. You can also limit the vertical range of the grid with the second set of vertical limits. At the bottom of the dialog, you will be presented with a list of systems that can be included in the grid. By default all available systems in the raw survey raw are selected to be included in the grid and are listed in the systems section. You can choose to remove data from specific systems by un-checking that system. If you are building a Dynamic grid from Processed Point files there will be no System to choose from.

The CUBE settings dialog is shown below and lets you adjust the default options used when building a dynamic grid with the CUBE layer included.



CUBE Settings Dialog

The Configuration drop down menu is used to set the defaults of the other options in the dialog. Choices include "Default", "Shallow Water", "Deep Water", and "Custom" and are described below.

Additional choices are read from CUBEParams.xml and include; "NOAA_0.5m", "NOAA_1m", "NOAA_2m", "NOAA_4m", "NOAA_8m", "NOAA_16m", and "NOAA_32m". More custom choices can be configured by simply adding to the end of the Xml. The CUBEParams.xml is located here: C:\Users\Public\Documents\QPS\Resources\CUBEParams.xml.

Setting	Description
Distance Scale	Scale on predicted or estimated depth for how far out to accept data. (unitless; typically 5% for hydrography but can be greater for geological mapping in flat areas with sparse data)

Setting	Description
Distance Min.	Only accept data with this radius.
Resolution Algorithm	When running the CUBE algorithm, sometimes multiple hypotheses are generated. The algorithm must make a best guess on which hypothesis is correct using a *Hypothesis Resolution Algorithm*. The following algorithms are supported: • *Num. Samples* – The hypothesis containing the most soundings will be chosen. • *Neighborhood* – The algorithm searches all the neighbors of the cell looking for a cell with only one hypothesis. If a cell is found with one hypothesis, this cell is used as a guide in choosing a hypothesis; otherwise the *Num. Samples* algorithm is used. • *Num. Samples + Neighborhood* – A combination of the two previous algorithms. • *Predicted Grid* – The algorithm computes the median grid of the input soundings as uses that grid as a guide in choosing the hypothesis.
Estimate Offset	Threshold for significant offset from current estimate to warrant an intervention.
Horizontal Error Scale	This parameter is used to control the exponential growth of a soundings vertical uncertainty as a function of distance from the node.
Distance Exponent	Exponent on distance for variance scale.
Queue Length	Length of median pre-filter sort queue.
Quotient Limit	Outlier quotient upper allowable limit.
Discount Factor	Discount factor for evolution noise variance.

Setting	Description
Bayes Factor Threshold	Bayes factor threshold for either a single estimate, or the worst-case recent sequence to warrant an intervention.
Run Length Threshold	Run-length threshold for worst-case recent sequence to indicate a drift failure and hence to warrant an intervention.

CUBE Capture Distance specifies how close a sounding must be in x/y distance to where the seafloor is being estimated. When building a dynamic grid the estimation point is the center of each cell in the grid. Thus you should never choose a distance which is smaller than the diagonal length of a cell or the grid might not get a value contribution from all samples in the incoming data. Generally speaking a diameter that is 1.25 * the cell size is a good option. The *Distance Scale* option adjusts the capture radius based on depth. For example if you choose 5% and the water depth was 25 meters for a particular incoming sounding then it would have a capture radius of 1.25m. This means it would contribute a value to any cells whose center was no more then 1.25 meters away from the measurement. The *Distance Minimum* is exactly that - every sounding is assigned exactly the same capture diameter as that which is given.

Internally, the CUBE algorithm has no concept of cells. A sounding may contribute to many different hypotheses depending on how far away the sounding is away from the hypothesis center in the XY plane. The *Capture Distance* option controls how far the sounding can be to contribute to a hypothesis and the algorithm assumes that deeper soundings will be less accurate. If the distance from the hypothesis center to the sounding is less than the sounding height multiplied by the *Capture Distance* percentage, the sounding will be included in the hypothesis. Smaller *Capture Distance* values result in less soundings contributing to a hypothesis and larger values result in more soundings contributing to a hypothesis. If the *Capture Distance* is too small, holes may appear in the data. In some cases, this *Capture Distance* does not make sense so to turn the algorithm off, enter 100 as the *Capture Distance* value.

Settings for the different Configurations:

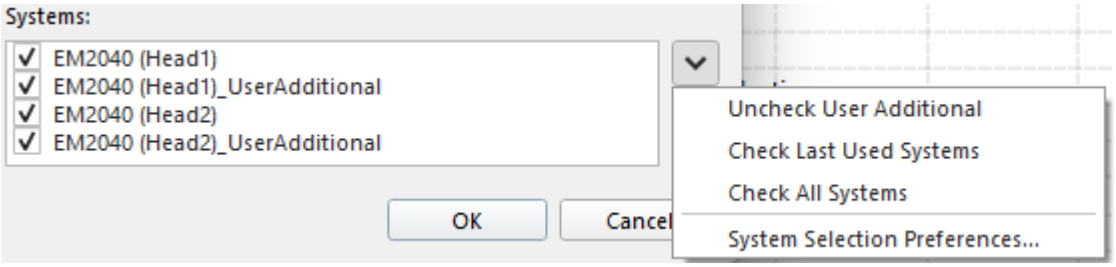
Setting	Default	Deep	Shallow	Custom
Distance Scale	5%	20%	4%	5%
Distance Min.	0.5	2.0	0.71	0.5
Resolution Algorithm	Predicted Grid	Predicted Grid	Number of Samples	Predicted Grid
Estimate Offset	4.0	3.0	2.0	4.0
Horizontal Error Scale	2.95	2.95	0.5	2.95
Distance Exponent	2.0	2.0	2.0	2.0
Queue Length	11	11	11	11
Quotient Limit	30.0	30.0	30.0	30.0
Discount Factor	1.0	1.0	1.0	1.0
Bayes Factor Threshold	0.135	0.135	0.135	0.135
Run Length Threshold	5	5	5	5

If building a Dynamic Grid with CUBE from Processed Point Files, a new dialog will appear if TPU Setup parameters have not been set. This is needed to calculate the proper TPU values for each sounding. For more information please refer to Processed Point File TPU Calculation Dialog.

If you want to do processing for grid Coverage or processing for Date and Time data, check the “Enable Coverage and Date/Time” box. By default, this will have the value last used when creating a Dynamic Grid.

You can select what systems you wish to include in the dynamic grid using the systems list.

The menu can be used to quickly check or uncheck the desired systems.



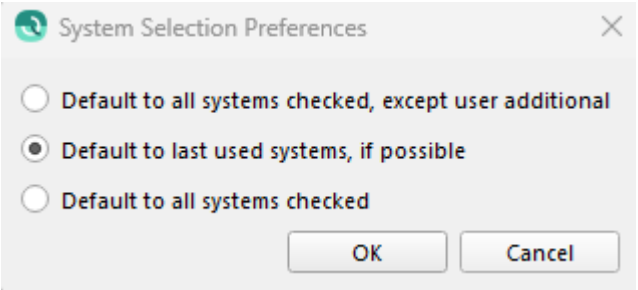
"Uncheck User Additional" unchecks all user additional systems in the list.

"Check Last Used Systems" checks only the systems used in the previously created dynamic grid.

If there are no previous dynamic grids, all systems will be checked.

"Check All Systems" will check all systems in the list.

Use the "System Selection Preferences" option to set the default behavior of the systems list.

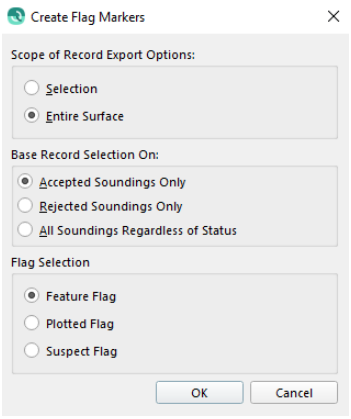


Return to: *Qimera Dynamic Grid Dialogs*

Return to: *Wizards and Dialogs*

Return to: Qimera Interface

Qimera Create Flag Markers Dialog



- How to Start
- What it Does
- General Description

How to Start

- *Create Flag Markers* option from *Dynamic Grid* menu of Main Menu bar

What it Does

This operation creates a Fledermaus SD point object of soundings

General Description

This object contains soundings marked with the **Feature Flag**, **Plotted Flag**, or the **Suspect Flag**, based of the selected criterion. If you have selected a rectangular area in the main window, the **Selection** option will only add soundings that fall within the selected area. You can further restrict the selection criteria based on the Accepted, Rejected, or all soundings.

Return to: Qimera Dynamic Grid Dialogs

Return to: Wizards and Dialogs

Return to: Qimera Interface

Qimera Create GRD Dialog

How To Start

- *Create GRD* option from *Dynamic Surface* menu of Main Menu bar

What it Does

This option creates a new QPS GRD file.

General Description

This option will launch a file save browser used to name your GRD file.

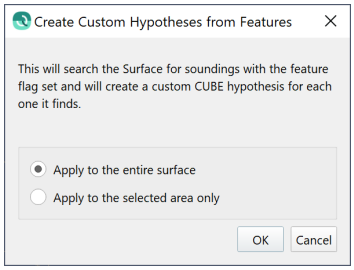
Return to: Qimera Dynamic Grid Dialogs
Return to: Wizards and Dialogs
Return to: Qimera Interface

Qimera CUBE Dialogs

The following set of dialogs are specific to CUBE processing and are accessible via the CUBE Sub-Menu of the Dynamic Grid Context Menu.

- Qimera Create Custom Hypothesis from Features Dialog
- Qimera CUBE Filter Soundings Dialog
- Qimera CUBE Output Grid Dialog
- Qimera CUBE Settings Dialog
- Qimera Re-Cube Area Dialog

Qimera Create Custom Hypothesis from Features Dialog



- How to Start
- What it Does
- General Description

How to Start

- *CUBE* sub-menu of the *Dynamic Grid* context menu option in the Project Layer dock.

What it Does

This dialog lets you create custom CUBE hypothesis at the height of each soundings in a cell that has the feature flag set.

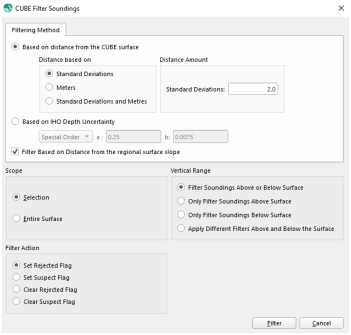
General Description

You can select if you want to apply it to the entire grid or only the selected area.

Return To: *CUBE Dialogs*

Return To: *Dynamic Grid context Menu*

Qimera CUBE Filter Soundings Dialog



- How to Start
- What it Does
- General Description

How to Start

- *CUBE* sub-menu of the *Dynamic Grid* context menu option in the Project Layer dock.

What it Does

The CUBE Filter Soundings dialog lets you reject soundings based on the current CUBE grid.

General Description

Soundings that are far enough away from the grid based on selected criteria can be marked as rejected. If you have a good CUBE grid this can help eliminate a lot of noisy data in the selected dynamic grid. The Filtering Method lets you setup this selection criterion. The distance can be based sounding distance from the CUBE grid via several methods including Standard Deviations (actually the CUBE Uncertainty) of the data in a cell, in Meters, or by a combination of both (if either passes then the sounding will be rejected). A second option lets you filter based on the computed IHO Depth Uncertainty whereby the expected maximum uncertainty of a sounding is computed based on the parameters provided and if the soundings uncertainty is larger then that it is a candidate to be rejected. By default these selection criteria are based on a flat grid cell. However if you check the Filter Based on Distance from the regional grid slope then the system will calculate the slope of the of a given cell from the selected hypothesis and some of it's neighboring cell's selected hypotheses. From this slope the distance of each sounding is measured perpendicular to the slope. The calculation is more intensive then the flat grid assumption but generally yields superior results. The calculation is more intensive then the flat grid assumption but generally yields superior results.

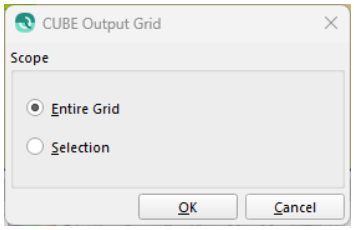
You can choose to Apply this filter to only soundings above the grid, only below the grid, both above and below, or select different criteria for above and below. If one chooses different criteria for above and below the CUBE grid you will get two tabs for entering the filtering parameters, one for each.

By default the action is to mark soundings as rejected that are selected by the filter however you can reverse the nature of the filter by telling the algorithm to Clear the rejected flag as well. Sometimes this is useful to run the algorithm on an area, if you over filter then change it to clear the rejected flag and run it again to reverse your filter and try again with new parameters. Note however that clearing the rejection flag could bring back soundings which have been previously rejected by other operations. As well as setting or clearing rejected flag, soundings can be marked as suspect or suspect flags cleared.

Return To: *CUBE Dialogs*

Return To: *Dynamic Grid Context Menu*

Qimera CUBE Output Grid Dialog



- How to Start
- What it Does
- General Description

How to Start

- Export CUBE Grid option from *Dynamic Grid* context menu option in the Project Layer dock.
- Export CUBE Grid option from Dynamic Grid submenu in the Export Menu

What it Does

This option creates a text output file of the CUBE grid with X, Y, CUBE estimated depth and the CUBE uncertainty.

Note that CUBE Uncertainty layer is different than the usual Dynamic Grid Uncertainty layer.

- The regular Uncertainty layer for a Dynamic Grid reflects the standard deviation, scaled to 95% c.l., of all accepted soundings, regardless of whether or not they are used for a CUBE grid. It does not include rejected soundings in the calculation.
- The CUBE Uncertainty layer reflects the standard deviation, scaled to 95% c.l., of the accepted soundings that contributed to the selected hypothesis.

In both cases, the standard deviation is scaled to 95% c.l. via the scaling factor of 1.96.

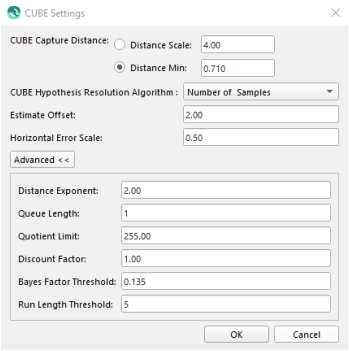
General Description

You can either create a grid from the current area selection or from the entire selected grid.

Return To: *CUBE Dialogs*

Return To: *Dynamic Grid Context Menu*

Qimera CUBE Settings Dialog



- How to Start
- What it Does
- General Description

How to Start

- *CUBE* sub-menu of the *Dynamic Grid* context menu option in the Project Layer dock.

What it Does

This dialog provides editing of key CUBE processing parameters.

General Description

The uncertainty associated with the CUBE nodes is the total vertical uncertainty as built from the soundings which: (1) fall within the capture radius of the node, and (2) are consistent with the primary node hypothesis. Primary node hypotheses are determined from the Disambiguation method defined at the time of CUBE grid building (Most Soundings, Nearest Neighbors, etc.). The uncertainties associated with the soundings are both Horizontal and Vertical, based on all the individual uncertainties associated with the systems that are associated with a MBES configuration.

Setting	Description
Distance Scale	Scale on predicted or estimated depth for how far out to accept data. (unitless; typically 5% for hydrography but can be greater for geological mapping in flat areas with sparse data)
Distance Min.	Only accept data with this radius.

Setting	Description
Resolution Algorithm	When running the CUBE algorithm, sometimes multiple hypotheses are generated. The algorithm must make a best guess on which hypothesis is correct using a *Hypothesis Resolution Algorithm*. The following algorithms are supported: • *Num. Samples* – The hypothesis containing the most soundings will be chosen. • *Neighborhood* – The algorithm searches all the neighbors of the cell looking for a cell with only one hypothesis. If a cell is found with one hypothesis, this cell is used as a guide in choosing a hypothesis; otherwise the *Num. Samples* algorithm is used. • *Num. Samples + Neighborhood* – A combination of the two previous algorithms. • *Predicted Grid* – The algorithm computes the median grid of the input soundings as uses that grid as a guide in choosing the hypothesis.
Estimate Offset	Threshold for significant offset from current estimate to warrant an intervention.
Horizontal Error Scale	This parameter is used to control the exponential growth of a soundings vertical uncertainty as a function of distance from the node.
Distance Exponent	Exponent on distance for variance scale.
Queue Length	Length of median pre-filter sort queue.
Quotient Limit	Outlier quotient upper allowable limit.
Discount Factor	Discount factor for evolution noise variance.
Bayes Factor Threshold	Bayes factor threshold for either a single estimate, or the worst-case recent sequence to warrant an intervention.

Setting	Description
Run Length Threshold	Run-length threshold for worst-case recent sequence to indicate a drift failure and hence to warrant an intervention.

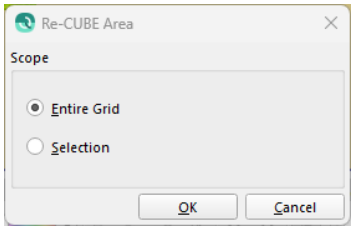
CUBE Capture Distance specifies how close a sounding must be in x/y distance to where the seafloor is being estimated. When building a dynamic grid the estimation point is the center of each cell in the grid. Thus you should never choose a distance which is smaller than the diagonal length of a cell or the grid might not get a value contribution from all samples in the incoming data. Generally speaking a diameter that is 1.25 * the cell size is a good option. The *Distance Scale* option adjusts the capture radius based on depth. For example if you choose 5% and the water depth was 25 meters for a particular incoming sounding then it would have a capture radius of 1.25m. This means it would contribute a value to any cells whose center was no more then 1.25 meters away from the measurement. The *Distance Minimum* is exactly that - every sounding is assigned exactly the same capture diameter as that which is given.

Internally, the CUBE algorithm has no concept of cells. A sounding may contribute to many different hypotheses depending on how far away the sounding is away from the hypothesis center in the XY plane. The *Capture Distance* option controls how far the sounding can be to contribute to a hypothesis and the algorithm assumes that deeper soundings will be less accurate. If the distance from the hypothesis center to the sounding is less than the sounding height multiplied by the *Capture Distance* percentage, the sounding will be included in the hypothesis. Smaller *Capture Distance* values result in less soundings contributing to a hypothesis and larger values result in more soundings contributing to a hypothesis. If the *Capture Distance* is too small, holes may appear in the data. In some cases, this *Capture Distance* does not make sense so to turn the algorithm off, enter 100 as the *Capture Distance* value.

Return To: *CUBE Dialogs*

Return To: *Dynamic Surface Context Menu*

Qimera Re-Cube Area Dialog



- How to Start
- What it Does
- General Description

How to Start

- *CUBE* sub-menu of the *Dynamic Grid* context menu option in the Project Layer dock.

What it Does

This dialog lets you re-run the CUBE algorithm on a dynamic grid.

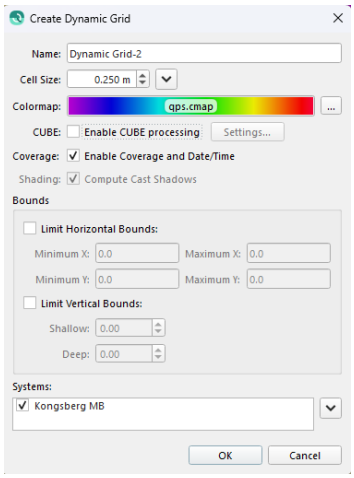
General Description

You can re-run the CUBE algorithm on a dynamic grid for either the selected area from the main window or on the entire grid. It will utilize the current CUBE parameters which have been set by the user. If you do this any selected hypothesis in the given area will be reset based on the results of the algorithm for the selected area of interest. Normally this is used if one run a sounding filtering algorithm first then want to utilize CUBE on the now reduced(more clean) set of soundings that remain un-rejected.

Return To: *CUBE Dialogs*

Return To: *Dynamic Surface Context Menu*

Qimera Duplicate Dynamic Grid Dialog



- How to Start
- What it Does
- General Description

How to Start

- *Duplicate Dynamic Grid* option from the Dynamic Grid Context Menu in the Project Layers dock.

What it Does

This dialog allows you to duplicate a Dynamic Grid.

General Description

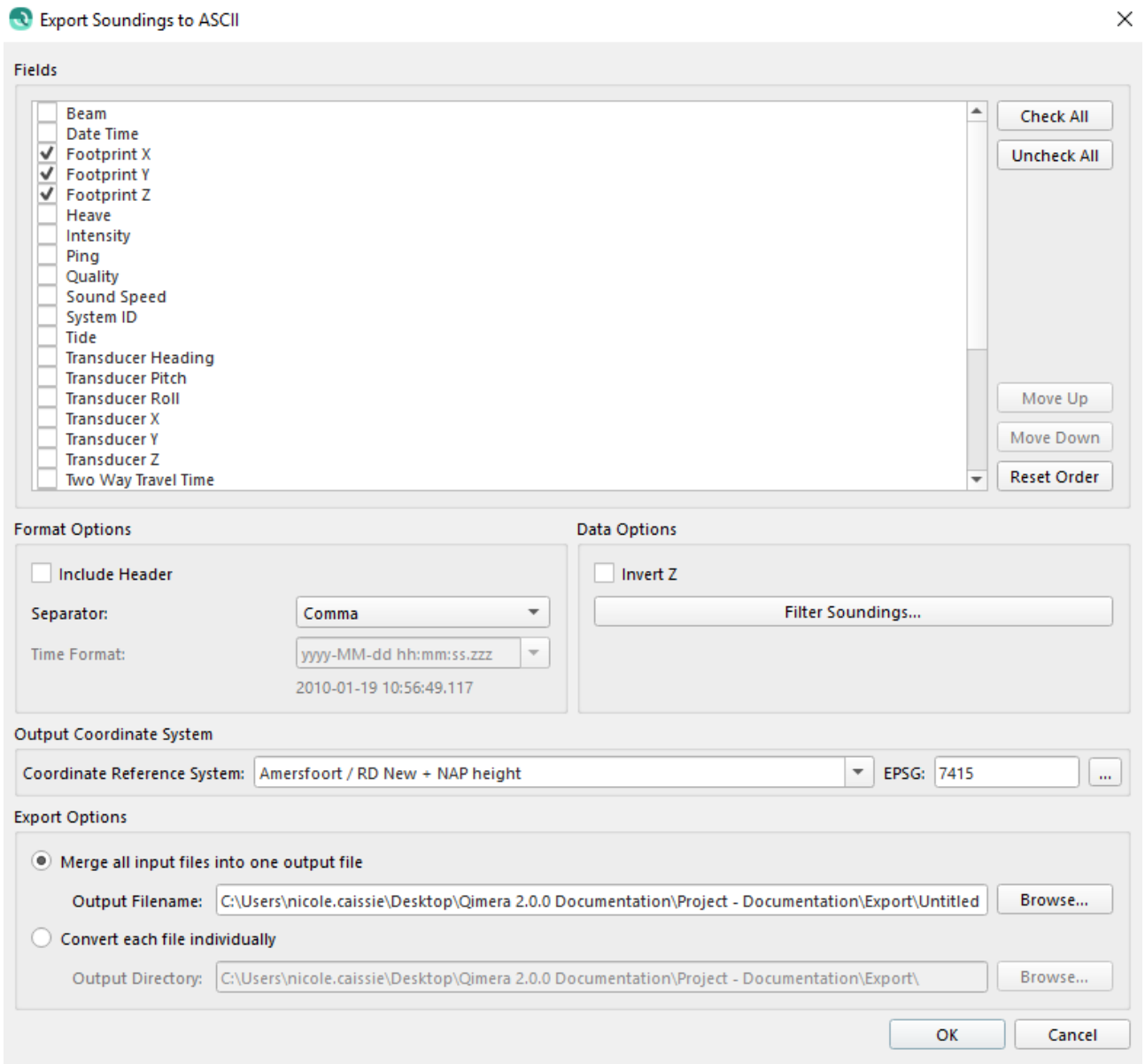
After selecting a dynamic grid from the project layers window this option lets you duplicate the dynamic grid. This option displays the familiar Create Dynamic Grid dialog allowing you to select or change any parameter without having to re-select the source files. To do this, select the dynamic grid and select *Duplicate Dynamic Grid* from the context menu (right-click) grid operations. More information on this Dialog can be found in the Create Dynamic Grid Dialog.

Return to: *Qimera Dynamic Grid Dialogs*

Return to: *Wizards and Dialogs*

Return to: Qimera Interface

Qimera Export Grid to Soundings



- How to Start
- What it Does
- General Description
  - Fields
  - Format Options
  - Data Options
  - Filter Dialog
    - Scope Of Record

- Base Record Selection On
- Refine Selection
- Systems

- Output Coordinate System
- Export Options

How to Start

1. to Soundings... option of the Export→Dynamic Grid sub-menu of the Main Menu toolbar.

What it Does

This dialog is used to Export dynamic grid information to configurable ASCII output.

General Description

After selecting a dynamic grid from the project layers, this option can be used to export dynamic grid information created from the source files used to build the grid. If you have selected an area with the selection tool the main work area you can limit the export to that region.

Fields

Each field can be enabled or disabled by clicking the checkbox for the corresponding item. The fields can be moved by drag and drop or by selecting the desired field and using the *Move Up* and *Move Down* buttons. Global checking and unchecking can be performed using the corresponding buttons *Check All* and *Uncheck All*. The initial ordering of the *Fields List* is aphabetical based and can be re-applied using *Reset Order* button. Once selection and ordering are completed the configuration will be saved when the *Ok* button is clicked. This configuration will automatically be loaded when the dialog is launched.

Format Options

Selecting the *Include Header* checkbox will result in the final output file containing a header reflecting the selection in the *Fields Group*. The Header text will be preceded by '#' and include the selected *Separator* between the fields.

The *Separator* combobox allows the user to choose from a pre-set list or enter a custom, single character, separator. When selecting the *Custom* option a Textfield is displayed allowing the user to enter their desired separator.

The *Time Format* can be modified when the *Date Time* field is selected in the *Fields* list. There are several predefined formats that can be selected or the user can enter their own format in the combobox. An ASCII example of the selected format output is displayed below the *Time Format* combobox. The *Time Format* expression can be separated by any ASCII character the user chooses. The last used *Time Format* will be saved and loaded by default when the user selects 'OK' to start the export.

The following formatting options can be used when manually creating a *Time Format*;

Expression	**Output**
h	the hour without a leading zero (0 to 23 or 1 to 12 if AM/PM display)
hh	the hour with a leading zero (00 to 23 or 01 to 12 if AM/PM display)
m	the minute without a leading zero (0 to 59)
mm	the minute with a leading zero (00 to 59)
s	the second without a leading zero (0 to 59)
ss	the second with a leading zero (00 to 59)
z	the milliseconds without a leading zero (0 to 999)
zzz	the milliseconds with leading zeros (000 to 999)
AP or A	AM/PM display (upper-case)
ap or a	am/pm display (lower-case)

Expression	Output
d	the day as number without a leading zero (1 to 31)
dd	the day as number with a leading zero (01 to 31)
ddd	the abbreviated day name (Mon to Sun)
dddd	the full day name (Monday to Sunday)
M	the month as a number without a leading zero (1-12)
MM	the month as a number with a leading zero (01-12)
MMM	the abbreviated month name (Jan to Dec)
MMMM	the full month name (January to December)
yy	the year as two digit number (00 - 99)
yyyy	the year as a four digit number (2018)

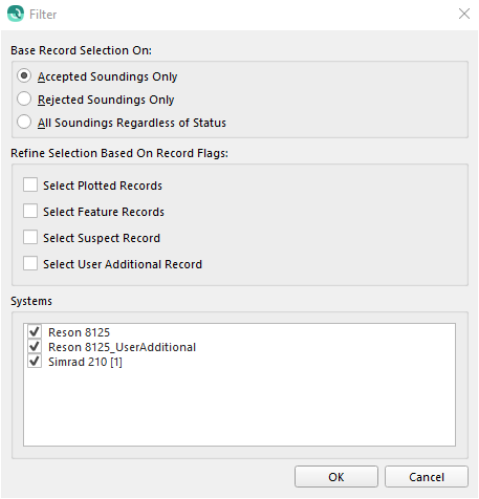
Data Options

Selecting the *Invert Z* option will invert all height values. Currently this corresponds to Footprint Z, Transducer Z and Vessel Z.

Selecting the *Filter Soundings...* Button allows additional filtering options by launching the Filter Dialog.

Filter Dialog

The *Filter* dialog allows filtering data prior to exporting. All user selections will be saved on export excluding the Scope of Record and Systems list for all future exports.



Scope Of Record

If a selection is made using one of the selection tools in the main work area, this option will allow the user to export based on that selection or the entire area. If the scope of record option is not visible your selection may have been cleared prior to launching the dialog.

Base Record Selection On

Filter soundings based on All Soundings, Accepted Soundings or Rejected Soundings.

Refine Selection

Filter soundings based on flags applied by the user at a previous processing stage.

Systems

In the case of a multi head system a filter can be used to remove additional data collection systems by unticking the corresponding system box.

Output Coordinate System

The *Output Coordinate System* is used to change the coordinate system that the resulting output will be referenced to. By default the project system will be set on launch.

Export Options

If multiple files are selected for export these can be merged into one single export file using the *Merge* radio button or written to individual files using the *Convert each file*

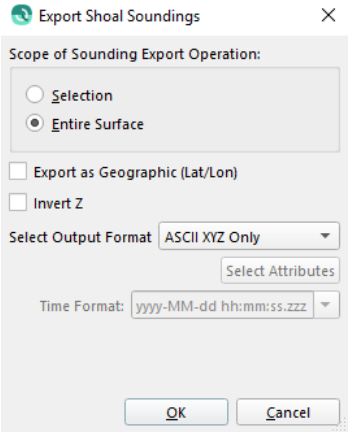
individually radio button. Folders and files can be created using the corresponding browse buttons or entering text into the fields following your operating system convention.

Return to*: Qimera Dynamic Grid Dialogs*

Return to: *Wizards and Dialogs*

Return to: Qimera Interface

Qimera Export Shoal Soundings Dialog



- How to Start
- What it Does
- General Description

How to Start

- *Export Shoal Soundings* option from *Dynamic Grid* context menu in the Project Layers dock.

What it Does

This option lets you export the shoal soundings from the files used to create the selected dynamic grid.

General Description

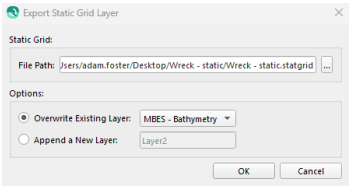
This dialog will output a text file that contains a set of XYZ points representing the shoalest sounding in each cell of the selected area. If you have selected a rectangular area in the main view you can limit the export to that region by setting the Scope of Record Export to Selection instead of the Entire Grid. If the 'Export as Geographic (Lat/Lon)' toggle is set the soundings will be converted to geographic coordinates before they are output. The output format can be specified with the Select Output Format drop-down list and can either be ASCII XYZ Only, ASCII XYZ + Attributes, NAVO/CarisAscii, or ASCII + Date Time . When choosing to export Horizontal or Vertical Errors as additional Attributes, these will be represented as a 95% Confidence Interval value. When choosing ASCII + Date Time there will be an option to specify the Date/Time format from the drop down menu or simply editing the drop down menu.

Return to: *Qimera Dynamic Grid Dialogs*

Return to: *Wizards and Dialogs*

Return to: Qimera Interface

Qimera Export Static Grid Layer Dialog



- How to Start
- What it Does
- General Description

How to Start

- *Export Static Grid Layer* option from *Dynamic Grid* drop down of *Export* menu of Main Menu bar

What it Does

This operation exports the selected Dynamic Grid to a new or existing layer in an existing Static Grid file.

General Description

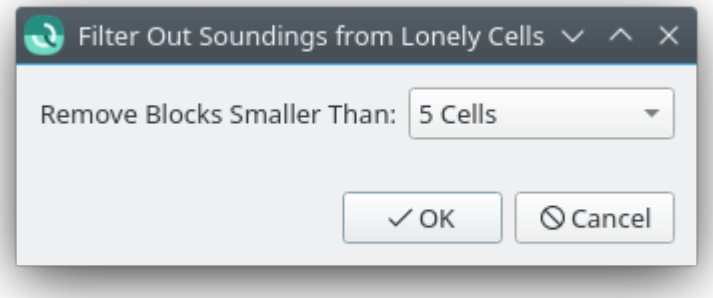
After selecting a dynamic grid from the project layers, this option can be used to export the selected dynamic grid to a new or existing layer in an existing Static Grid. Choose a Static Grid file to export to using the *Browse* button, and then choose to overwrite a layer or to append a new layer.

Return to: Qimera Dynamic Grid Dialogs

Return to: Wizards and Dialogs

Return to: Qimera Interface

Qimera Filter Out Soundings in Lonely Cells Dialog



- How to Start
- What it Does

How to Start

Select the *Filter Out Soundings in Lonely Cells...* option from *Dynamic Grid - Grid operations* context menu in the Project Layers dock.

What it Does

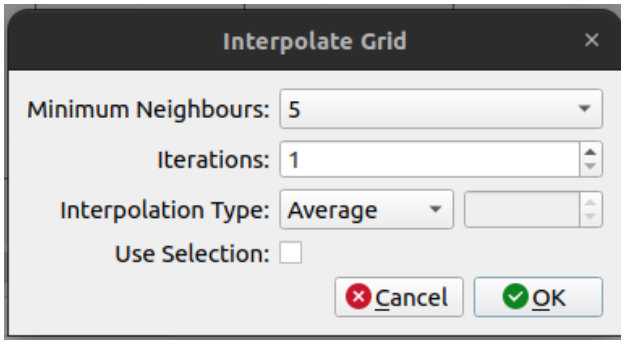
This tool searches the dynamic grid for small groups of cells detached from the main body of the dynamic grid and removes them. This can be a very useful clean up as it can significantly simplify the results of operations like contouring or survey area calculation.

Upon finding a "lonely island" containing fewer than the given number of cells, all soundings in those cells are rejected and marked as filtered, causing the cells to be removed from the dynamic grid.

Return to: Qimera Interface

Return to: *Wizards* and Dialogs

Qimera Interpolate Dynamic Grid Dialog



- How to Start
- What it Does
- General Description
  - Iteration
  - Minimum Neighbors
  - Interpolation Type
    - Average
    - Fixed Value

How to Start

Select *Interpolate Dynamic Grid....* option from *Dynamic Grid - Grid Operations* context menu in the Project Layers dock.

What it Does

Allows for small holes in a dynamic grid to be filled using the average value from one or more of the surrounding cells. By default, the interpolation will be performed on all the data present in the project. If you selected a rectangular area from the main window before bringing up this dialog then the "Use Selection" checkbox will be enabled but will NOT be toggled ON by default. You must choose “Use Selection“ to use the constrained area as an additional step.



The Interpolate Dynamic Grid Dialog allows for only the Dynamic Grid to be interpolated, this does not interpolate the Soundings.

Since grid interpolations exist only on the Grid and not within the associated QPD files the grid interpolations will **NOT** carry over from a Cleaning Project to the Master Project.

It is recommended that interpolation of a grid is only done after all other edits are already completed to the grid.

General Description

Iteration

The number of times the algorithm is run over the entire grid. Each iteration takes into account the previous iterations cellular results. The maximum number of iterations is 50.

Minimum Neighbors

The '*Minimum Neighbours'* ComboBox is used to identify what cells will be interpolated. The valid neighbours are considered the 8 cells surrounding the current empty cell containing a depth value. If the current cell does not contain the required number of neighbours it will remain empty.

Interpolation Type

The '*Type*' combo box is used to choose the interpolation method.

Average

The resultant cell depth will be an average based on the surrounding cells. A new cell will be populated only if it meets the requirements configured in the 'Minimum Neighbours' and 'Iterations' settings.

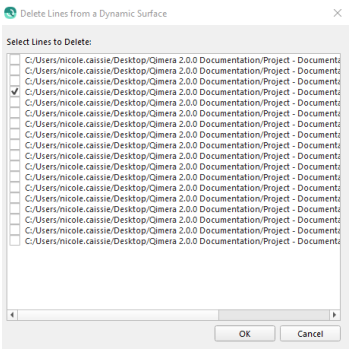
Fixed Value

The resultant cell depth will be the fixed value entered in the associated spin box. A new cell will be populated only if it meets the requirements configured in the 'Minimum Neighbours' and 'Iterations' settings.

Return to: *Qimera Interface*

Return to: *Wizards* and Dialogs

Qimera Remove Lines Dialog



- How to Start
- What it Does
- General Description

How to Start

- *Remove Lines from Dynamic Grid* option from *Dynamic Grid - Sources* context menu in the Project Layers dock.
- Context menu of processed point files
- Context menu of raw sonar files

What it Does

This dialog allows you to remove lines from a Dynamic Grid.

General Description

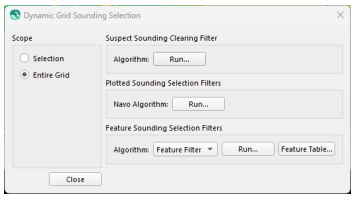
After selecting a dynamic grid from the project layers window this option lets you remove the data from one or more lines that was used to build the grid. For example say one accidently added the "..._0009_20050728_..." line as shown in the dialog above. Simply uncheck that line and click *Ok* and the dynamic grid will be updated with all data from the unchecked line removed. If you open this dialog again that line will no longer appear as part of the dynamic grid. By default only the lines that are currently selected in the Project Sources tree will be marked as checked. To add more lines you the append to a dynamic grid option.

Return to: Qimera Dynamic Grid Dialogs

Return to: Wizards and Dialogs

Return to: Qimera Interface

Qimera Sounding Selection Dialog



- How to Start
- What it Does
- General Description
  - Selecting Soundings to Mark Suspect
  - Selecting Soundings to Mark Plotted
  - Feature Selection Filters
    - Feature Filter Algorithm
    - Shoalest Algorithm

How to Start

- *Flag Soundings...* option from *Dynamic Grid - Sources* context menu in the Project Layers dock.

What it Does

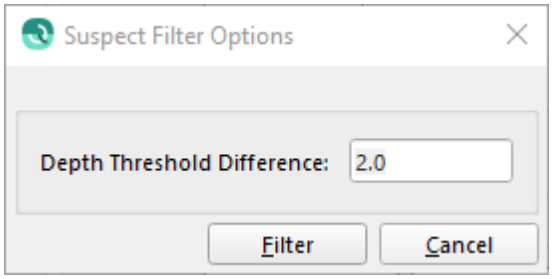
This dialog runs the soundings selection operation on the currently selected grid .

General Description

After selecting a dynamic grid from the layers window utilize this dialog for various sounding selection actions. If you have selected a rectangular area from the main window you can restrict the actions to the selected area by changing the scope from Entire Grid to Selection.

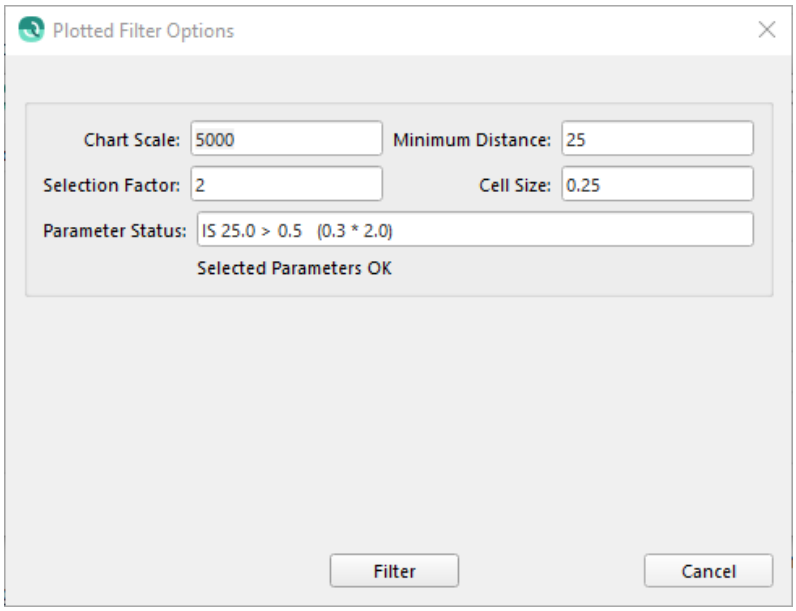
Selecting Soundings to Mark Suspect

The suspect soundings selection filter assists the user in identifying soundings that may be incorrect. Clicking the *Run* button in the *Suspect Sounding Clearing Filter* section will display the *Suspect Filter Options* dialog. The filter will select all soundings with depths that are more than a certain threshold away from the average depth in a cell. Enter a threshold in the *Depth Threshold Difference* text field and click the *Filter* button



Selecting Soundings to Mark Plotted

The NAVO sounding selection algorithm will select and mark soundings in a dynamic grid with the plotted flag when it selection criterion is set. Clicking the Run... button opens another dialog that lets you set parameters for the selection process as shown below. Once you have selected desired parameters the filter will run and soundings that pass the selection criterion will have their plotted flag set.



Normally the chart scale is specified to determine the default distance between selected soundings that are entered in the *Chart Scale* text field. For example a value of 20000 implies a chart scale of 1:20000. This gives the default minimum distance between soundings and is based on assuming 5mm text for the resulting chart. You can directly enter the minimum distance, overriding the suggested default for the given chart scale, by typing a new value in the *Minimum Distance* text field. The *Selection Factor* that defaults to two is used in algorithm and generally should be left alone. A smaller number improves the quality of the selection but increases running time (the default has been found to be a good balance). The Cell Size is read from the Dynamic Grid and is fixed. The *Parameter Status* field shows the criterion for running the algorithm. You cannot select soundings if you select an unreasonable chart scale for the cell size of the dynamic grid. The dialog box will display a message just below the parameter status to indicate if the selected parameters are acceptable or not. If they are not you must increase the chart scale (or minimum distance).

Feature Selection Filters

A dropdown menu in this section currently provides two filter algorithms which can be used to select and mark soundings by setting their feature flag. These are the Feature Filter and the Shoalest algorithm described below. The Feature Table... button will bring up a spreadsheet to of soundings with the filter flag set in the selection scope.

Feature Filter Algorithm

When selected and you click Run..., another dialog will appear to set the selection interval, the z-range minimum, and the z-range maximum. Specify the minimum distance apart of shoals in the horizontal plane (*Selection Interval*), and specify the depth range for consideration in the *Z Range Minimum* and *Z Range Maximum* text fields. Click the *Filter* button to begin the algorithm.

The actual algorithm is a two-step process. In the first step, it searches through all the data based on the defined cell size and finds the shallowest sounding that is not flagged as deleted and is within the selected depth range. In addition, the entry of the minimum and maximum values allows the user to restrict the process to only those soundings within the selected depth range. The second step prunes the list of selected shoal soundings based on the range interval entered. In this step, the selected soundings are first sorted in descending order. The shallowest is selected and then any sounding that lies within the entered range is deleted. The next shallowest sounding is selected and any soundings that lie within the entered range to it are deleted and so on.

Shoalest Algorithm

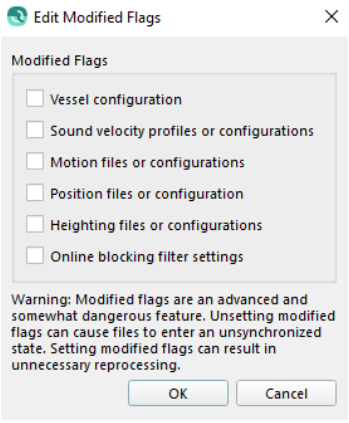
When selected and you click Run... this algorithm will mark the shoallest sounding in each cell of the dynamic grid.

Return to*: Qimera Dynamic Grid Dialogs*

Return to: *Wizards and Dialogs*

Return to: Qimera Interface

Qimera Edit Modified Flags Dialog



- How to Start
- What it Does
- General Description

How to Start

- **Right-click** context menu of raw sonar files

What it Does

Manually resets raw sonar file 'dirty' flags.

General Description

As you change or edit a number of input information for the Dynamic Workflow engine, Qimera will "dirty" certain flags of a raw sonar file. These flags tell Qimera the types of processes that need to run on a file during any *Auto-Solve* session. This dialog allows you to activate or deactivate these flags. You should pay attention to the warning at the bottom of the dialog as manually changing these flags makes the state of the associated lines ambiguous. An use case of a reason to use this flag is as follows:

1) The user has a project consisting of a number of raw sonar files when they then process and produce a Dynamic Surface

2) The user imports some GNSS height information from a POSPac file.

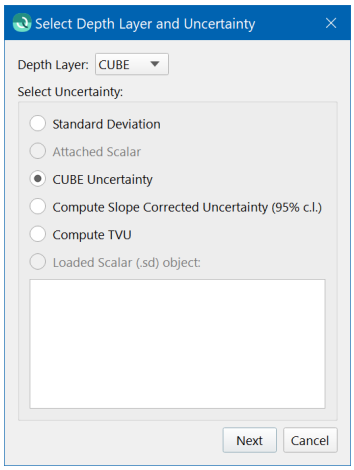
3) Qimera marks all overlapping files as needing processing. The users realizes they produced the POSPac file incorrectly so they answer *No* when Qimera asks to process the data.

4) The user removes the invalid POSPac file

5) The lines are still marked as needing processing. The user selects the lines and launches this dialog. They then simply uncheck the *Heighting files or configurations* flag and click *OK*. Qimera will then indicate that those lines need no further processing.

Return to: Qimera Interface
Return to: Wizards and Dialogs

Qimera Export BAG Grid Wizard



- How to Start
- What it Does
- General Description
  - Page 1
  - Page 2
  - Page 3

How to Start

- *Export BAG Grid* option of the *Export* menu in the Main Menu bar

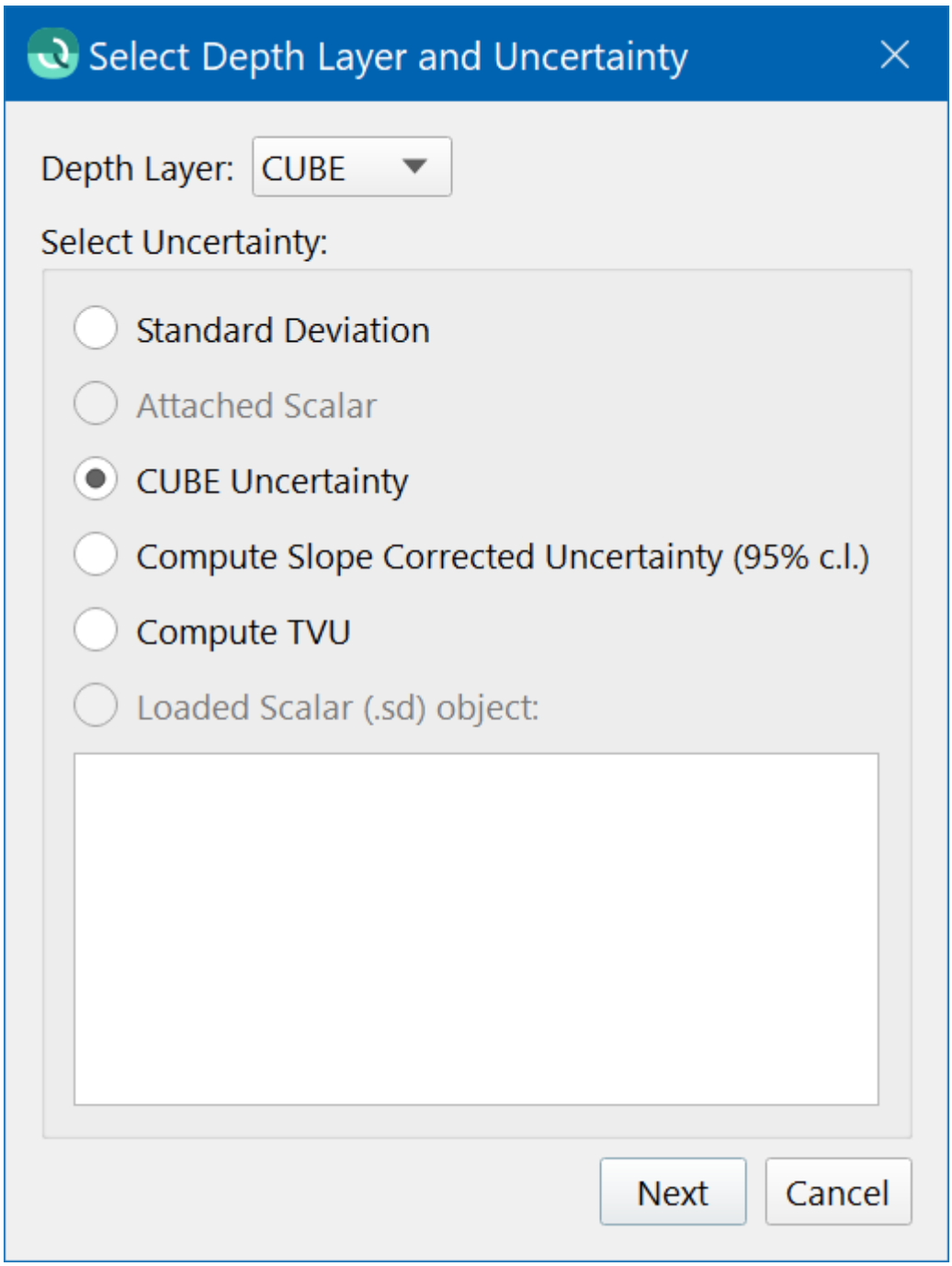
What it Does

This dialog is used to export a bag grid from a selected surface.

General Description

This dialog is launched via the *Export to BAG Grid* option of the *Export* menu in the Main Menu bar. This option allows the current selected Dynamic Grid to be exported to a bag grid.

Page 1



The "Depth Layer" dropdown allows you to select the specific depth layer you wish to export during the BAG export process. This dropdown menu is automatically populated with the depth layer currently displayed based on what you have selected in the *Project Layers Dock*.

The "Select Uncertainty" radio button is initially configured based on what you have selected in the *Project Layers Dock*.

For example, if a single Dynamic Grid is selected and doesn't include CUBE then "Standard Deviation" will be set initially. However, if you selected a single Dynamic Grid that includes CUBE then "CUBE Uncertainty" will be initially set.

Project Layers Selection	Initial Radio Button Option
Single Dynamic Grid	Standard Deviation
Single Dynamic Grid with CUBE	CUBE Uncertainty
Single Dynamic Grid with attached Scalar	Attached Scalar
Multiselect Dynamic Grid and Sd Object (e.g. TVU)	Loaded Scalar (.sd) Object
Multiselect Dynamic Grid and Static Grid (e.g. Slope Corrected Uncertainty)	Loaded Scalar (.sd) Object

You can choose to override this option. For example, if CUBE Uncertainty is initially set, you can change to Standard Deviation instead.

Some options may be unavailable. For example, if the current selected Dynamic Gric doesn't include CUBE, then the option for "CUBE Uncertainty" will be greyed out.

If you don't have a TVU layer as part of your project, you can choose to compute TVU on the fly by choosing "Compute TVU". The same applies to Slope Corrected Uncertainty.

When multiselecting, the loaded scalar will be automatically selected from the list of available scalars. Alternatively, you can single select a dynamic surface and pick a scalar from the list of loaded scalars after the fact.

If you chose CUBE Uncertainty then the uncertainty layer will come from the CUBE surface.

Radio Button Option	Resulting BAG Uncertainty
Standard Deviation	Surface Standard Deviation

Radio Button Option	Resulting BAG Uncertainty
CUBE Uncertainty	CUBE Surface Uncertainty
Attached Scalar	Surface Attached Scalar is used as Uncertainty
Compute TVU	The TVU layer is computed on the fly and used as Uncertainty.
Compute Slope Corrected Uncertainty (95% c.l.)	The Slope layer is computed on the fly and used as Uncertainty.
Loaded Scalar (.sd) object	The Loaded Scalar is used as Uncertainty.

Note that CUBE Uncertainty layer is different than the usual Dynamic Grid Uncertainty layer.

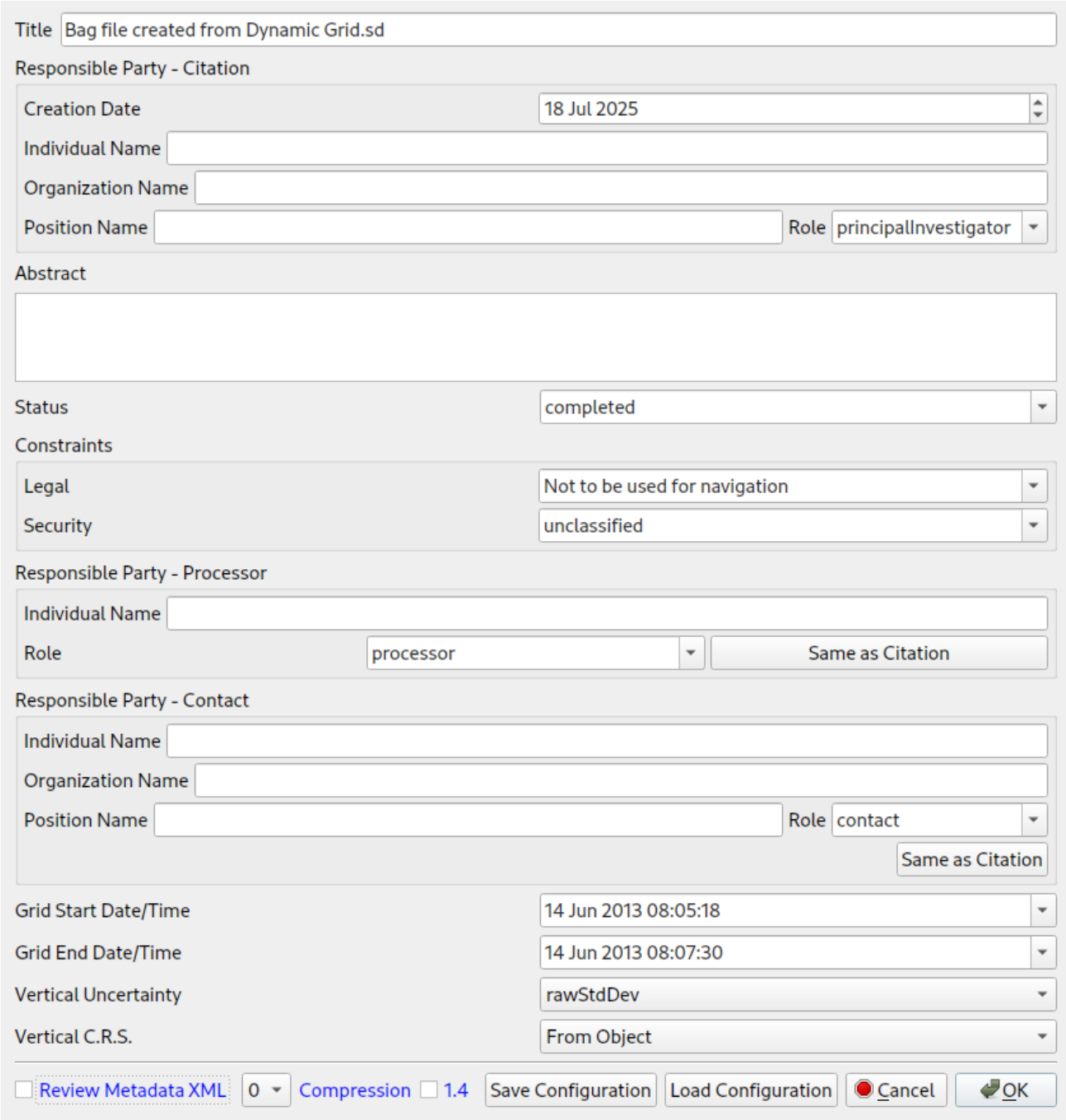
- The regular Uncertainty layer for a Dynamic Grid reflects the standard deviation, scaled to 95% c.l., of all accepted soundings, regardless of whether or not they are used for a CUBE grid. It does not include rejected soundings in the calculation.
- The CUBE Uncertainty layer reflects the standard deviation, scaled to 95% c.l., of the accepted soundings that contributed to the selected hypothesis.

In both cases, the standard deviation is scaled to 95% c.l. via the scaling factor of 1.96.

Page 2

This will launch a file browser to select the name for the exported BAG.

Page 3



This dialog simply gathers all the metadata information that can be stored with a bag grid. BAG metadata .xml files can be saved and loaded using the configuration buttons.

The Vertical Uncertainty tag will be initially set based on the option you chose on page 1:

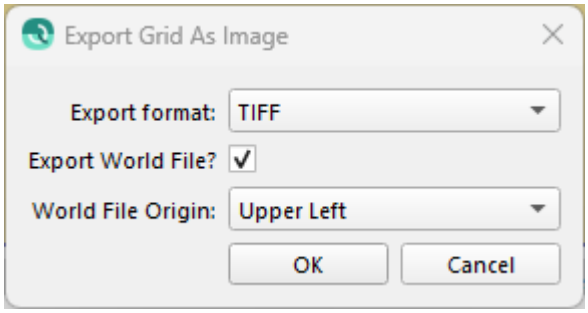
For example, if you chose "CUBE Uncertainty" on page 1, then Vertical Uncertainty will be initially set to "cubeUncert" on page 2.

Page 1 Option	Initial Vertical Uncertainty
Standard Deviation	rawStdDev
CUBE Uncertainty	cubeUncert
Attached Scalar	productUncert
Compute TVU	productUncert
Compute Slope Corrected Uncertainty (95% c.l.)	productUncert
Loaded Scalar (.sd) object	productUncert

You can still change it from the dropdown.

Return to: *Qimera Interface*
Return to: *Wizards and Dialogs*

Qimera Export Grid as Image Dialog



How to Start

Export to Image option of the *Dynamic Grid* in the *Export* drop down in the Main Menu bar

What it Does

This dialog allows the export of a georeferenced image file (either TIFF or JPEG) of the surface's colours.

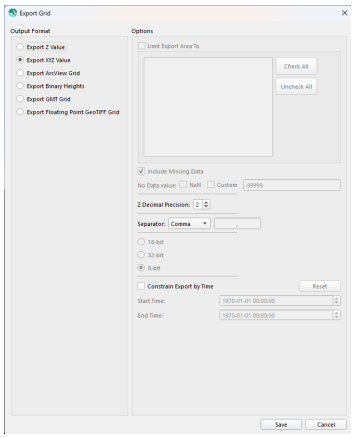
General Description

Specify the image format using the Export Format drop down menu. Note that for JPEG export, a World File with the origin at the upper left, compatible with major GIS packages, is automatically generated alongside the JPEG file.

TIFF files are written as GeoTIFFs with full georeferencing information. Optionally, by checking the *Export World File* checkbox, a Tiff World File (TWF) can be generated alongside the exported TIFF file. The origin of the World File can be set using the *World File Origin* drop down menu.

What you see, is what you get. If the preference for Surface Shading is set to Hill Shading, the exported image will have Hill Shading. If the Preferences for Surface Shading is set to Hill Shading + Cast Shadows, the exported image will have Hill Shading + Cast Shadows.

Qimera Export Grid Dialog



- How to Start
- What it Does
- General Description

How to Start

- *Export ASCII/Grid* option of the *Dynamic Grid* in the *Export* drop down in the Main Menu bar

What it Does

This dialog is used to export grid information from a selected grid layer.

General Description

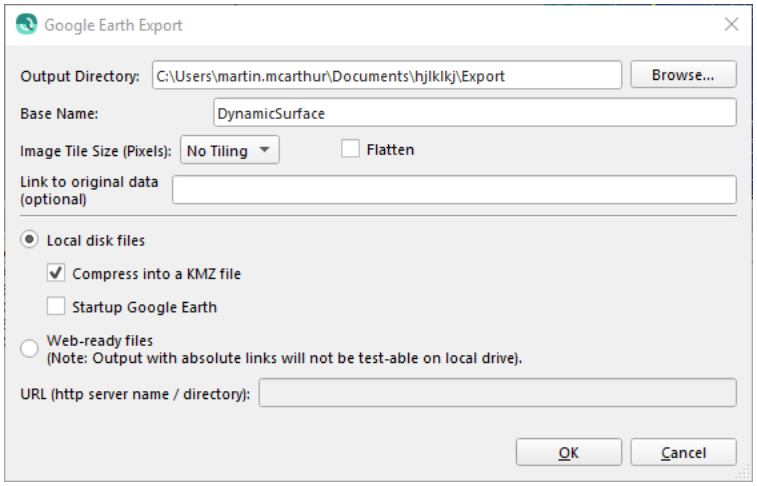
This dialog is launched via the *Export ASCII/Grid* option of the *Export* menu in the Main Menu bar. This option allows the current selected Dynamic Grid or Static Grid to be exported to another supported grid. When saving the data, areas of the surface containing no data may be included with the output file if the Include Missing Data option is on. If missing data is included, a special value is written for these data points, indicated by the No Data Value text field. When writing a binary file, you may specify either writing an 8-bit or 16-bit number, or a 32-bit greyscale value containing red, green, blue, and alpha components. When exporting to ASCII X and XYZ Grids, there is an option to specify decimal precision of the Z value being written. Exports can be limited to the area made by an Sd line object or a selection made in the workarea. The multiple files option allows for each export area to be exported to a unique file. If limiting a dynamic grid to multiple areas, the exporter forces the multiple files option to be enabled.

If the grid was created with Coverage and datetime enabled, there will be the option to limit the export to a specific date/time range.

Return to: *Qimera Interface*

Return to: *Wizards and Dialogs*

Qimera Export Grid To KML Dialog



- How to Start
- What it Does
- General Description
  - Output Directory
  - Base Name
  - Image Tile Size
    - Flatten
  - Link To Original Data
  - Local Disk Files
    - Compress into a KMZ file
    - Startup Google Earth
  - Web-ready files
    - URL

How to Start

1. Export to KML... option from the Export→Dynamic Grid sub-menu of the Main Menu toolbar.
2. Export to KML... option from the Export→Static Grid sub-menu of the Main Menu toolbar.

What it Does

This dialog will export the selected Grid to a Google Earth comparable KML or KMZ file.

General Description

Exporting to KML can be configured with the following options.

Output Directory

The *Output Directory* indicates the path to the directory where the file will be saved. This path can be modified using the *Browse* button.

Base Name

The *Base Name* textfield contains the filename that will be used when saving the file.

Image Tile Size

Selecting an *Image Tile Size* from the *ComboBox* will limit KML files to the selected tile/ pixel size. Additional files will be created to ensure the entire Grid is exported. If *No Tiling* is selected a single KML will be exported.

Flatten

When '*Flatten'* is unchecked all KML exports are created with Altitude Mode 'clampToSeaFloor'. This mode ignores any altitude values and drapes the feature on the bottom of any major body of water. If the feature is located away from a body of water the feature will be clamped to the ground level instead.

Checking the '*Flatten'* button export the KML with no Altitude Mode resulting in a flat image.

Link To Original Data

Including a link in this textfield will add the KML link tag in the exported file.

Local Disk Files

Creates the file on the local disk with the two following options;

Compress into a KMZ file

Compresses the KML files into a single KMZ file. This will not delete the original KML files.

Startup Google Earth

Selecting this option will attempt to launch the Google Earth Application if it is installed on the local pc with the exported file.

Web-ready files

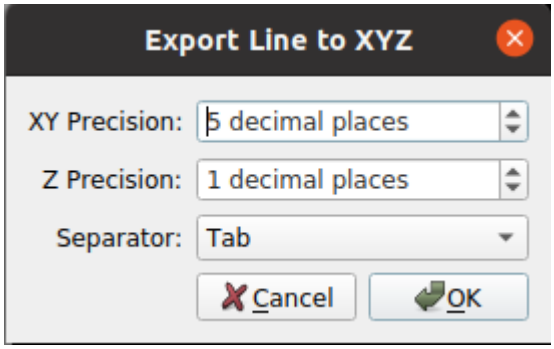
Files can be uploaded to a server after creation.

URL

The url of the server.

Return to: Qimera Interface
Return to: Qimera Wizards and Dialogs

Qimera Export Line to XYZ Dialog



How to Start

Export to XYZ... option of the Export→Line Object menu in the Qimera Main Menu Bar

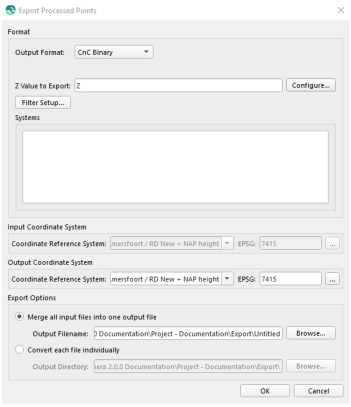
What it Does

This dialog allows the user to export a Line Object to XYZ format with configurable precision and separator character.

General Description

The XY Precision and Z Precision fields set the number of decimal places used to represent the exported coordinates.
The Separator field specifies whether to insert a Comma, a Space, or a Tab between the X,Y, and Z values of each coordinate.

Qimera Export Processed Points Dialog



- How to Start
- What it Does
- General Description
  - Format
  - Output Coordinate System
  - Export Options

How to Start

- *Processed Points* option of the *Export→ Raw Sonar File* sub-menu of the Main Menu bar

What it Does

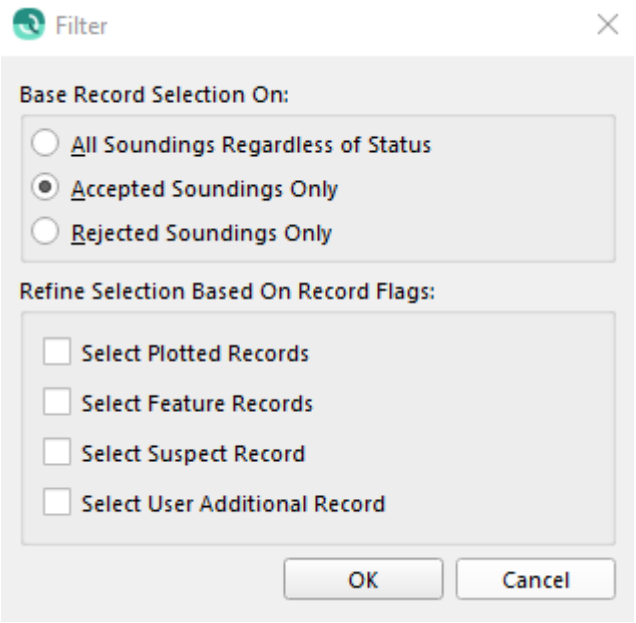
This dialog is used to export raw or processed points to another supported processed point format.

General Description

Format

The *Format* group allows you to format your data for export. Selecting the *Output Format* combo box will let you choose one of several export options. The *Z Value Export* allows you to configure which value will be exported as the Z value for your data set. Click the *Configure* button to choose the configuration of the x,y and z values of your export.

The *Filter Setup* button launches Filter Dialog. This dialog gives the options to export all soundings, only accepted soundings or only rejected soundings. Extra filters can be added to only export soundings that only have the flags Plotted, Feature, Suspect, or User Additional (water column picks) set.



Output Coordinate System

The *Output Coordinate System* allows the user to change the coordinate system that the resulting output will be referenced to. By default the project system will be set on launch.

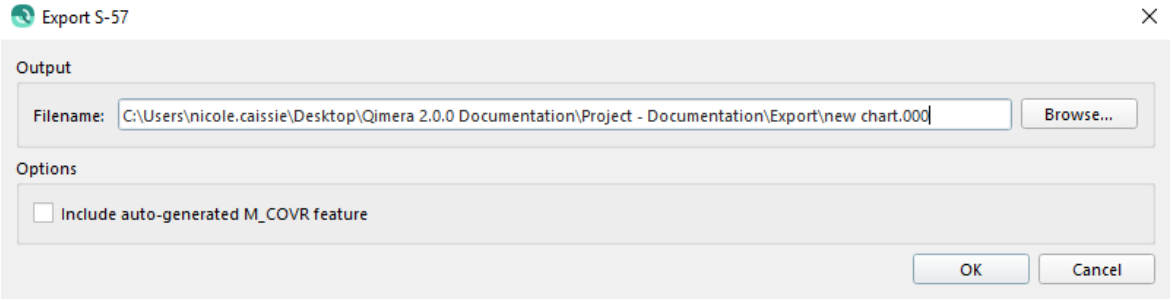
Export Options

The user can select a output directory that the ASCII Track files will be written to. If a folder is selected that already contains files with identical names the user will be warned about overwriting.

Return to: Qimera Interface

Return to: Wizards and Dialogs

Qimera Export S-57 Dialog



- How to Start
- What it Does
- General Description
  - Output
  - Options

How to Start

1. Export S-57... option in the Export menu of the Main Menu toolbar.

What it Does

This dialog is used to convert QNC formatted ENC files to S-57 format.

General Description

This dialog can be used to convert and export QNC formatted ENC files as S-57 format with the option to include the M_COVR feature.

Output

The output group can be used to define the location where the S-57 file will be saved and its file name. Paths can be entered manually or the browse button can be clicked providing a generic save file dialog. If an existing file will be overwritten you will be prompted with the option to cancel the export.

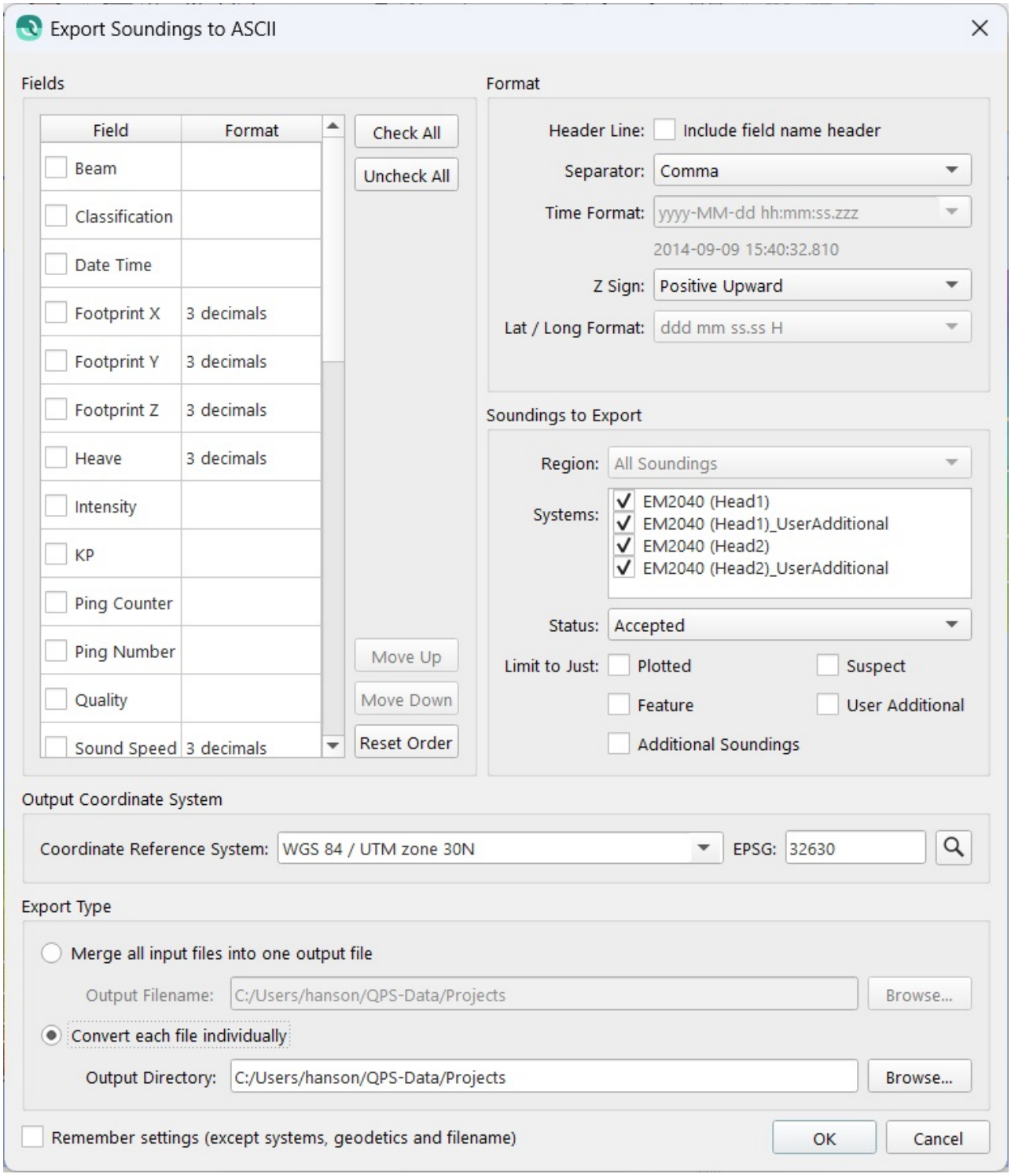
Options

The Include auto-generated M_COVR feature checkbox allows the inclusion of the M_COVR coverage feature in the exported S-57 file. This checkbox is unchecked by default.

Return to: *Qimera Interface*

Return to: *Wizards and Dialogs*

Qimera Export Soundings to ASCII Dialog



- How to Start
- What it Does

- General Description
  - Fields
  - Format
  - Soundings to Export
  - Output Coordinate System
  - Export Type
  - Remember Settings

How to Start

1. to ASCII... option of the Export→Raw Sonar File sub-menu of the Main Menu toolbar.
2. to ASCII... option of the Export→Processed Point File sub-menu of the Main Menu toolbar.
3. to ASCII... option of the Source→Export sub-menu when selecting a file in the Project Sources window.

What it Does

This dialog is used to Export Soundings to ASCII format with user configurable fields.

General Description

This dialog can be used to export user configurable ASCII files on a per file basis or merged into a single dataset. If you have created a dynamic or static grid and selected an area in the main work area you can limit the export to that region.

Fields

Each field can be enabled or disabled by clicking the checkbox for the corresponding item. The fields can be moved by selecting the desired field and using the *Move Up* and *Move Down* buttons. Global checking and unchecking can be performed using the corresponding buttons *Check All* and *Uncheck All*. The initial ordering of the *Fields List* is alphabetical and can be re-applied using *Reset Order* button. The format column allows for selection of how many decimal places of precision will be displayed in the export file. To edit this, double click on the cell and use the spinbox to set the value.

Due to our internal storage format, the tide field will only display a resolution of centimetres. Even if more decimal places are used, the first two decimal points will determine the precision.

If the output coordinate system is geographic, then X and Y fields will have their format column disabled. They will instead be formatted according to the latitude / longitude combobox. X fields will map to longitude and Y fields will map to latitude. Once selection and ordering are completed the configuration can be saved by checking the *Remember Settings* checkbox and clicking *Ok*. This configuration will automatically be loaded when the dialog is launched.

Format

Selecting the *Header Line* checkbox will result in the final output file containing a header reflecting the selection in the *Fields Group*. The header text will be preceded by '#' and include the selected *Separator* between the fields.

The *Separator* combobox allows the user to choose from a pre-set list or enter a custom, single character, separator. When selecting the *Custom* option a Textfield is displayed allowing the user to enter their desired separator.

The *Time Format* can be modified when the *Date Time* field is selected in the *Fields* list. There are several predefined formats that can be selected or the user can enter their own format in the combobox. An ASCII example of the selected format output is displayed below the *Time Format* combobox. The *Time Format* expression can be separated by any ASCII character the user chooses. The last used *Time Format* will be saved and loaded by default when the user selects 'OK' to start the export.

The following formatting options can be used when manually creating a *Time Format*;

Expression	**Output**
h	the hour without a leading zero (0 to 23 or 1 to 12 if AM/PM display)
hh	the hour with a leading zero (00 to 23 or 01 to 12 if AM/PM display)
m	the minute without a leading zero (0 to 59)
mm	the minute with a leading zero (00 to 59)
s	the second without a leading zero (0 to 59)

Expression	Output
ss	the second with a leading zero (00 to 59)
z	the milliseconds without a leading zero (0 to 999)
zzz	the milliseconds with leading zeros (000 to 999)
AP or A	AM/PM display (upper-case)
ap or a	am/pm display (lower-case)

Expression	Output
d	the day as number without a leading zero (1 to 31)
dd	the day as number with a leading zero (01 to 31)
ddd	the abbreviated day name (Mon to Sun)
dddd	the full day name (Monday to Sunday)
M	the month as a number without a leading zero (1-12)
MM	the month as a number with a leading zero (01-12)
MMM	the abbreviated month name (Jan to Dec)
MMMM	the full month name (January to December)
yy	the year as two digit number (00 - 99)

Expression	Output
yyyy	the year as a four digit number (2018)

The *Z Sign* combo box allows you to choose the positive direction of z-axis values.

Soundings to Export

The *Region* combo box can be used to select either the full area or a selected area to export. This combo box will be disabled if no selection is made prior to launching the dialog and will default to the full area of the selected source item(s).

The *Systems* list can be used to refine your export selection in cases where source files have multiple data collection systems. Systems can be enabled for export by checking the system in the list.

The *Status* combo box can be used to refine your selection based on only Accepted, Rejected or both Accepted and Rejected soundings.

The *Limit to Just* checkboxes can be used to refine the selection to only the selected flags. Multiple flags can be selected for export.

Output Coordinate System

The output coordinate system allows the user to change the coordinate system that the resulting output will be referenced to. By default the project system will be set on launch. If a geographic coordinate system is selected, X and Y fields will have their format column disabled in the table. The latitude / longitude combo box and example label will then be enabled.

Export Type

If multiple files are selected for export these can be merged into one single export file using the *Merge* radio button or written to individual files using the *Convert each file individually* radio button. Folders and files can be created using the corresponding browse buttons or entering text into the fields following your operating system convention.

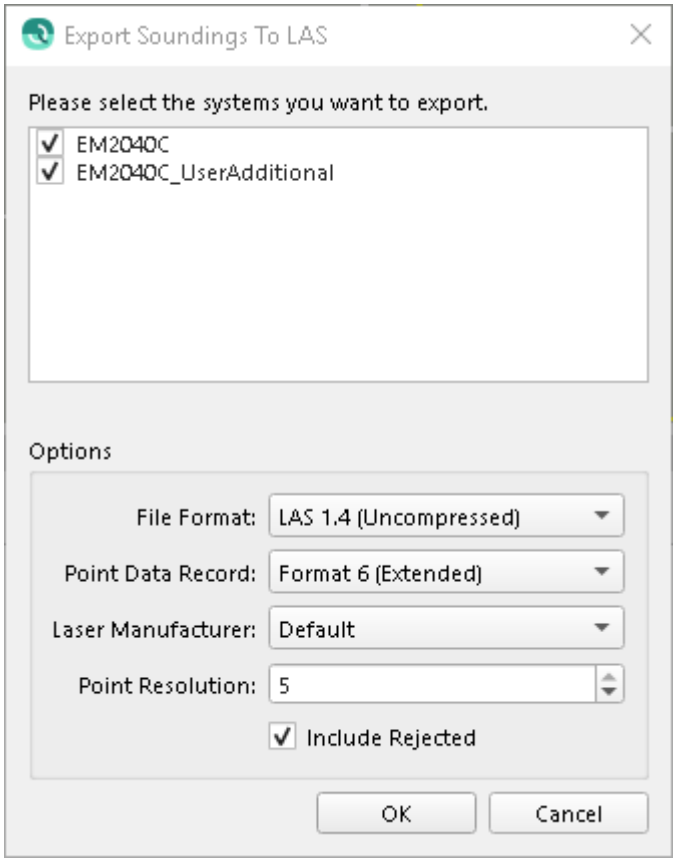
Remember Settings

The *Remember Settings* checkbox can be used if you want the dialog to continue to launch with your current settings. It should be noted that *Systems, Output Coordinate System* and *filenames* will not be remembered.

Return to: *Qimera Interface*

Return to: *Wizards and Dialogs*

Qimera Export Soundings to LAS/LASzip Dialog



- How to Start
- What it Does
- General Description
  - Systems
  - Options
    - File Format
    - Point Data Record
      - Format 0
      - Format 1
      - Format 6
    - Laser Manufacture
    - Point Resolution
    - Include Rejected

How to Start

1. to LAS/LASzip... option of the Export→Raw Sonar File sub-menu of the Main Menu toolbar.
2. to LAS/LASzip... option of the Export→Processed Point File sub-menu of the Main Menu toolbar.
3. to LAS/LASzip... option of the Source→Export sub-menu when selecting a file in the Project Sources window.

What it Does

This dialog is used to export soundings to LAS or LASzip formatted files.

General Description

This dialog can be used to export Raw or Processed Point files to individual LAS or LASzip formatted files. The file format, point record format and the output resolution can be configured as well as inclusion of rejected point records in the final export.

Systems

In the case of a multi device system, the checkboxes allow addition/removal of their respective device data from the final export.

Options

The following options allow additional configuration of the exported dataset.

File Format

The 'File Format' combobox specifies the output header format of the exported dataset. LAS and LASzip are both supported along with several associated version formats.

Point Data Record

The 'Point Data Record' combobox configures the exported point record format. If the file format is less than v1.4, point data record 6 will not be available for export.

The current supported point record formats and their exported data items are;

Format 0

- X, Y, Z

- Intensity
- User Data (Quality)
- Classification (Support 0-31)

Format 1

- X, Y, Z
- Intensity
- User Data (Quality)
- Classification (Support 0-31)
- GPS Time

Format 6

- X, Y, Z
- Intensity
- User Data (Quality)
- Classification (Support 0-255)
- GPS Time

For more information on LAS point formats please see LAS Specification available online.

Laser Manufacture

Some manufactures use intensity values which do not fit within the LAS Specifications Standards. To correct this issue a laser manufacture can be selected and its intensity values will be scaled to ensure it fits within the LAS Specifications. Selecting the 'Default' option will not scale the intensity value and is recommend if your manufacture is unknown.

Point Resolution

The point resolution defines the density of the exported points. This value represents the number of decimal places to be exported for each point. Using the metric system, Resolution = 3 would be mm resolution, 1.234m and Resolution = 2 would be cm resolution, 1.23m. It should be noted that this exporter does not attempt to interpolate missing data from your original data set. If your original data set is cm resolution a mm resolution export (Resolution = 3) will have multiple points in the exact same location for the each cm point you are exporting.

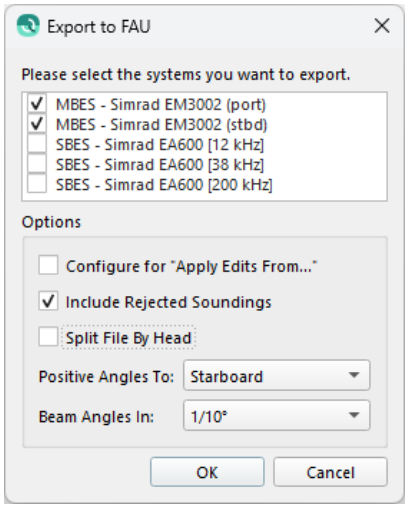
Include Rejected

Checking the 'Include Rejected' checkbox will include all soundings flagged as rejected in a previous workflow. This will result in a larger export file size.

Return to: Qimera Interface

Return to: Wizards and Dialogs

Qimera Export to FAU Dialog



- How to Start
- What it Does
- General Description
  - Systems
  - Options

How to Start

1. to FAU... option of the Export→Raw Sonar File sub-menu of the Main Menu toolbar.
2. to FAU... option of the Export→Processed Point File sub-menu of the Main Menu toolbar.
3. to FAU... option of the Source→Export sub-menu when selecting a file in the Project Sources window.

What it Does

This dialog allows the user to Export Soundings to the FAU file format. Depending on the file type and data collection methods additional options may be available in the *Options* group.

General Description

Systems

The *Systems* group contains all the systems available for export. Selecting the checkbox next to a system will include it in the exported dataset. Depending on the export file format multiple systems may be available for export.

Options

The *Options* group contains additional options that can be applied to the exported data**.**

Configure for "Apply Edits from..." checks and disables certain options required to ensure the exported FAU can have edits applied back to the source file with Apply Edits from... option on raw and processed files.

Include Rejected Soundings will include all the rejected soundings in the output dataset. The rejected soundings will be flagged as rejected in the output FAU.

Split File By Head will export multiple files based on the number of selected systems. This option is only enabled when there are multiple systems available for export. The resulting files will have the system name appended to their filename.

The next two options were enabled in Qimera release 1.7.6 as a result of multiple definitions in different FAU format description documents. They Default to the way Qimera exported to FAU for versions 1.7.5 and older (Positive Angles to Starboard and Beam Angles in 1/10 degree).

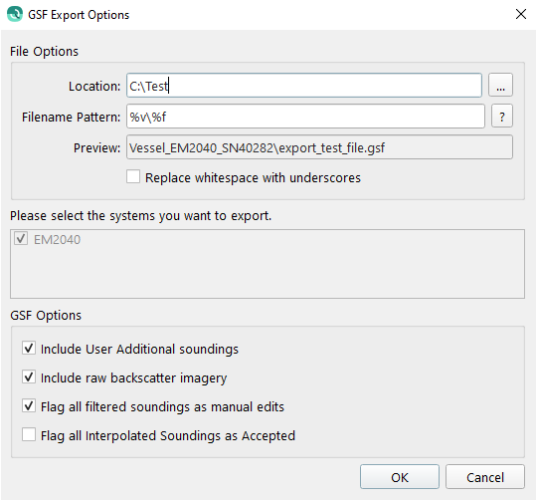
Positive Angles To "*Starboard*" or "*Port*" will save the Beam Angles with the Positive Direction to the chosen side.

Beam Angles In "*1/10*" or "*1/100*" degree allows the choice of Beam Angle Resolution.

Return to: Qimera Interface

Return to: Wizards and Dialogs

Qimera Export to GSF Dialog



- How to Start
- What it Does
- General Description
  - File Options
  - Systems
  - Options

How to Start

1. to GSF... option of the Export→Raw Sonar File sub-menu of the Main Menu toolbar.
2. to GSF... option of the Source→Export sub-menu when selecting a file in the Project Sources window.

What it Does

This dialog allows the user to Export Soundings to GSF format.

General Description

File Options

The *File Options* group contains options for the GSF file save location and custom file naming.

Location is where the file will be saved.

Filename Pattern allows a pattern to be specified for naming the GSF file. Further directories can be specified here for a save location (i.e. saving by Vessel Name), and if they do not exist will be created during the export. These are denoted using the directory separator for the given operating system ("\" on Windows). Custom text can be added anywhere in the filename pattern. Format specifiers can be added to the filename pattern to automatically insert project/file specific information into the filename and directory structure, these are:

- %v: Vessel name
- %f: Source file name
- %s: System name(s)

Preview displays a sample filename/directory structure as it would appear given the specified filename pattern.

Replace whitespace with underscores will replace any whitespace characters with underscores throughout the specified filename pattern, including in source filenames, vessel names, or system names that have been included using format specifiers.

Systems

The *Systems* group contains all the systems available for export. Selecting the checkbox next to a system will include it in the exported dataset. Depending on the export file format, multiple systems may be available for export.

Options

The *Options* group contains additional options that can be applied to the exported dataset. If an option is greyed out, it is not available for the current file.

Include User Additional soundings will include any additional water column picks selected by the user in a previous processing workflow.

Include raw backscatter imagery will include the backscatter/snippet information if available. Unticking this box will prevent backscatter post-processing ability in other application including FMGT. If this is greyed out for data coming from Qinsy, ensure both 'Raw Bathymetry Storage' and 'Raw Snippet Storage' options are enabled in the MBES Driver Specific Parameters dialog in Qinsy.

Flag all filtered soundings as manual edits will change filtered flags to manual flags in the exported GSF. This has been made the default to align with the most common GSF interchange workflows.

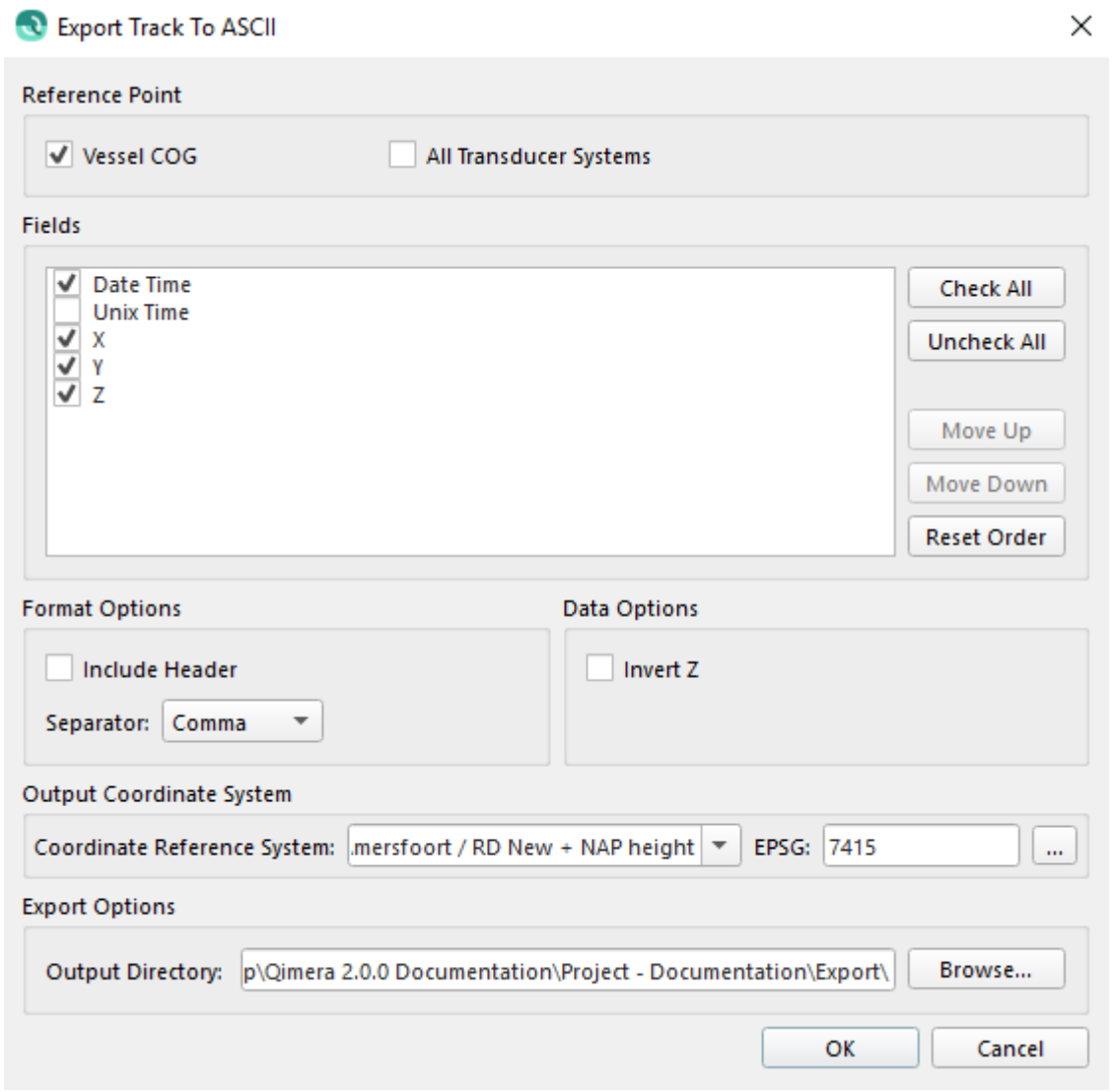
Flag all Interpolated Soundings as Accepted will accept soundings from Kongsberg systems with the interpolated detection class. The interpolated soundings are useful for backscatter post-processing in other applications such as FMGT.

Interpolated soundings

Interpolated soundings are soundings that a Kongsberg system can generate for beams that don't have accurate bottom detection, this is often at the outer swath of the ping. They are interpolated or extrapolated from neighbouring beams. The snippet corresponding to this beam is valid which can be exported with a GSF as valid soundings for Backscatter processing. Generally the interpolated soundings should not be used for Bathymetric data processing but can be used for Backscatter processing.

Return to: Qimera Interface
Return to: Wizards and Dialogs

Qimera Export Track To ASCII Dialog



- How to Start
- What it Does
- General Description
  - Reference Point
  - Fields
  - Format Options
  - Data Options
  - Output Coordinate System
  - Export Options

How to Start

1. Track to ASCII... option of the Export→Raw Sonar File sub-menu of the Main Menu toolbar.
2. Track to ASCII... option of the Source→Export sub-menu when selecting a file in the Project Sources window.

What it Does

This dialog can be used to export Vessel Tracks to ASCII with user configurable fields. The exported files, depending on the Reference Point selection, will be appended with '*_cog_*' and '*_head_#*' in the desired output directory.

General Description

Reference Point

There are two available reference point items that can be exported, Vessel COG and All Transducer Systems. The Vessel COG exports the track of the defined vessel centre of gravity for each source file. The All Transducer Systems checkbox will export the track of all systems/heads available in the source file.

Fields

Each field can be enabled or disabled by clicking the checkbox for the corresponding item. The fields can be moved by drag and drop or by selecting the desired field and using the *Move Up* and *Move Down* buttons. Global checking and unchecking can be performed using the corresponding buttons *Check All* and *Uncheck All*. The initial ordering of the *Fields List* is aphabetical and can be re-applied using *Reset Order* button. Once selection and ordering are completed the configuration will be saved when the *Ok* button is clicked. This configuration will automatically be loaded when the dialog is presented for all future instances.

Format Options

Selecting the *Include Header* checkbox will result in the final output file containing a header reflecting the selection in the *Fields Group*. The Header text will be preceded by '#' and include the selected *Separator* between the fields.

The *Separator* combobox allows the user to choose from a pre-set list or enter a custom, single character, separator. When selecting the *Custom* option a Textfield is displayed allowing the user to enter their desired separator.

Data Options

Selecting the *Invert Z* option will invert all height values.

Output Coordinate System

The output coordinate system allows the user to change the coordinate system that the resulting output will be referenced to. By default the project system will be set on launch.

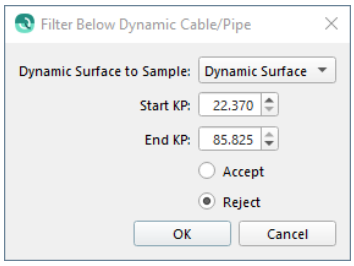
Export Options

The user can select a output directory that the ASCII Track files will be written to. If a folder is selected that already contains files with identical names the user will be warned about overwriting.

Return to: Qimera Interface

Return to: Wizards and Dialogs

Qimera Filter Below Dynamic Cable/Pipe Dialog



- How to Start
- What it Does
- General Description
  - Dynamic Surface to Sample
  - Start KP/End KP
  - Accept/Reject

How to Start

- *Cable/Pipe Context Menu in* Qimera Project Layers Dock.

What it Does

This is a filter for cleaning data underneath the pipeline taking its diameter into account, which can be run along a KP-line. It automatically deletes data underneath the pipeline. It works kind of like stencil linked to the pipe diameter, and rejects everything below the pipe center and leaves the upper half circle untouched. If you wish to undo your changes, simply rerun the same filter but with the accept radio button selected.

General Description

Dynamic Surface to Sample

This dropdown lets you select which surface to sample.

Start KP/End KP

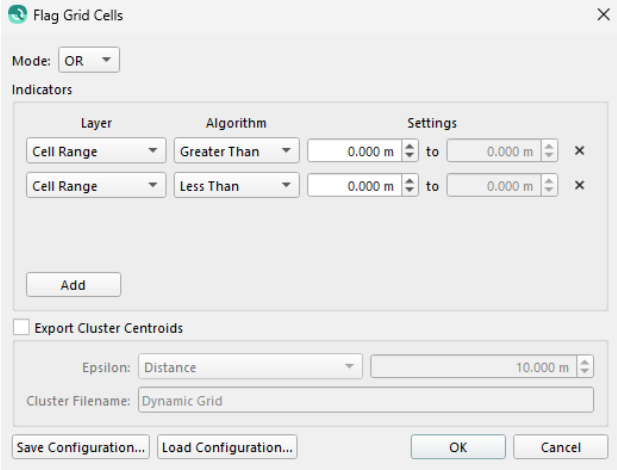
These spin boxes let you specify the start and end KP.

Accept/Reject

This radio button lets you choose between accept and reject. If you wish to undo your changes, simply rerun the same filter but with the accept radio button selected.

Return to: Qimera Interface
Return to: Wizards and Dialogs

Qimera Flag Grid Cells



- How to Start
- What it Does
- General Description
  - Mode
  - Indicators
  - Export Cluster Centroids
  - Save and Load Configuration

How to Start

Right-click on a Dynamic Grid, Grid Operation, and Flag Grid Cells. You can also use the shortcut ctrl + alt + f.

What it Does

The dialog sets which cells in a grid should be flagged. After setting the indicators here, you can view the flagged grid cells by changing the Color By or Highlight By settings on the grid to Cell of Interest. The slice editor can also be colored by the cell of interest Qimera Slice Editor Dock.

General Description

Mode

Set to AND if all indicators must be true for a cell to be flagged. Set to OR if just one of the indicators must be true for a cell to be flag.

Indicators

Indicators are the conditions that must be satisfied for a cell to be flagged. To add a new indicator, click the add button and update the desired layer, algorithm and range. These can later be removed using the 'X'.

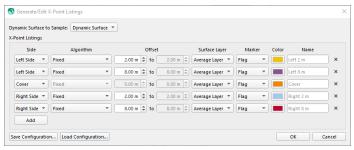
Export Cluster Centroids

Checking export cluster centroids will perform a clustering algorithm and produce a points object that can be used to geolocate groups of flagged cells. The epsilon parameter can be used to define the maximum distance between two samples for them to be considered in the same group. The file name defines the points object's name that will be automatically added to the project when the operation is complete. The points can then be loaded into the geo pick tool Qimera Project Layers Dock#SdObjectContextMenu.

Save and Load Configuration

You can save the dialog options into a xml file using the Save Configuration button. You can then reload the configuration using the Load Configuration button. This will automatically populate the mode, indicators, and export settings you previously used.

Qimera Generate/Edit X-Point Listings Dialog



- How to Start
- What it Does
- General Description
  - Dynamic Grid to Sample
  - Add/x

How to Start

- *Cables & Pipes Context Menu in* Qimera Project Layers Dock.

What it Does

X-Lines refers to cross sections in Qinsy and any other survey software packages. X-point listings get updated when processing is done in Qimera and the surface is updated.

The X-Point Listings are created using picking. The user will be able to designate Fixed, Shallow, Deep or Mean Seabed X-Point Listings. When choosing anything other than fixed, the user will be able to designate a minimum and maximum across track window to use for the surface picks.

General Description

Dynamic Grid to Sample

This dropdown lets you select which grid to sample.

X-Point Listings

This table is organized as follows:

Side	Algorithm	Offset	Surface Layer	Marker	Color	Name
Left Side Rigth Side Cover	Fixed Shallowest in Window Deepest in Window Average in Window	Min/ Max	Average Layer Shallow Layer Deep Layer	Flag Circle Square Crosshair Cube Diamond Cylinder Sphere Point	Color Picker	The default name will be format like so: <side>-<min-max>

Add/x

Save/Load Configuration

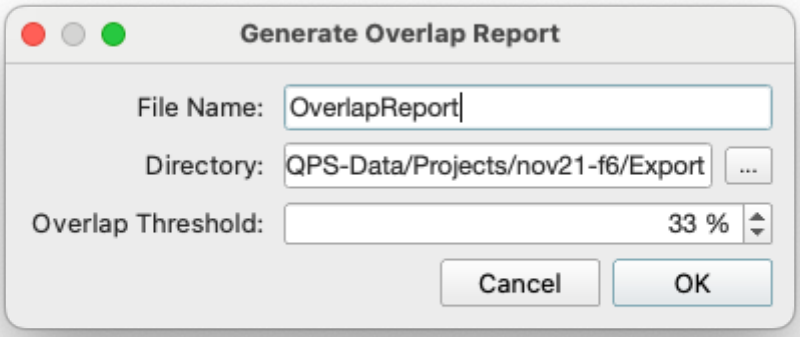
These button let you save/load predefined .xml configurations from disk. This enables reusing configurations.

Return to: Qimera Interface

Return to: Wizards and Dialogs

These button lets you add/remove X-Point Listings.

Qimera Generate Overlap Report



Coverage Requirement

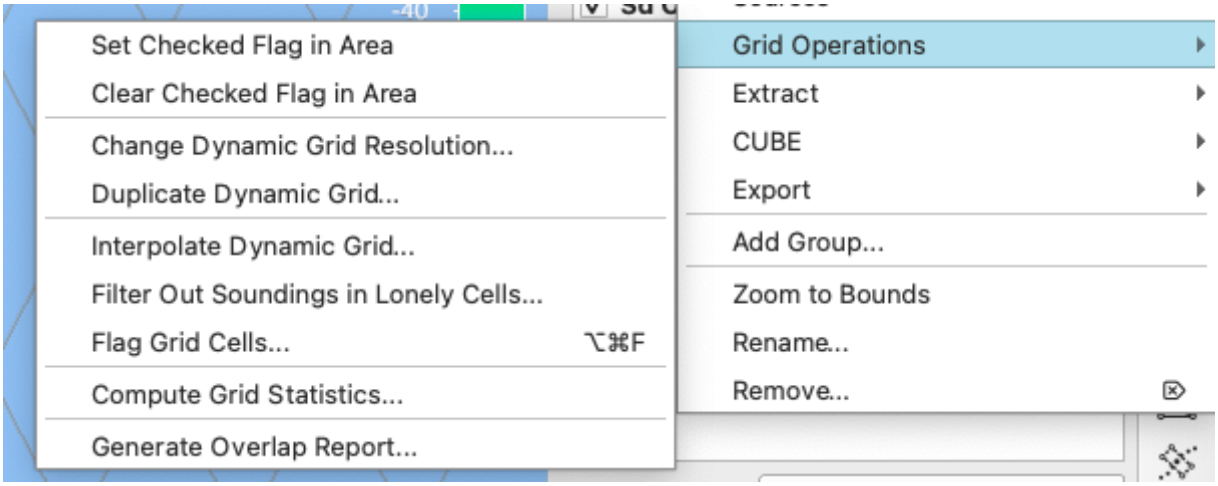
The grid used to generate the Overlap Report must contain the coverage property in order for the report to be successful. Ensure that the *Coverage* checkbox is checked when the grid is created:

Coverage: ☑ Enable Coverage and Date/Time

- How to Start
- What it does
- General Description
  - File Name
  - Directory
  - Overlap Threshold
  - Limitations
    - Algorithm
    - QPD Polygon
- Report Information
- Sample Report

How to Start

Right click on a Dynamic Grid, choose *Grid Operations,* click on *Generate Overlap Report*



What it does

This tool generates an ASCII text report outlining the amount that a given line is overlapped by other lines. It also provides a means to set a threshold which determines if a given line meets an overlap % criteria.

General Description

File Name

The file name of the ASCII text report.

Directory

The folder in which the report file will be written. The default location is the *Export* folder of the current project

Overlap Threshold

The % value used to determine if a given sonar file passes or fails the overlap requirement. The pass / fail status will be listed in the report file.

Limitations

Algorithm

The report generation algorithm is currently very simple and does not discriminate which portion of a swath is overlapped by other lines. This means that the overlap requirement could be met by a another line that runs directly over the top of the line in question, or crosses it at 90 degrees.

If a survey is conducted in a standard configuration, with each subsequent line overlapping and following the previous, the report will provide a meaningful measure of the amount that a given line was overlapped by others.

The Overlap report should be accompanied by an export of the Coverage layer for completeness and visual confirmation.

QPD Polygon

The QPD polygon used to approximate the bounds of the line's data coverage is created during QPD processing. It's a simplified approximation and does not represent an exact mask of each grid cell that contains data from the QPD in question. Small variations in Overlap calculation results may occur.

Report Information

In the header there is an outline of how the results are computed:

Each line in the report corresponds to one QPD file.

A grid cell is considered to be overlapped if it has a coverage value of 2 or greater.

The overlap threshold is the percentage of cells in the QPD polygon that must be overlapped for the QPD to be considered as passing.

A QPD is considered to have passed if the percentage of overlapped cells in the QPD polygon is greater than or equal to the specified overlap threshold.

There is also a header line outlining the comma delimited results for each line:

QPD filename,

# of grid cells within QPD polygon,

# of cells in polygon with coverage >= 2,

% with coverage >= 2,

Result (Pass/Fail)

Sample Report

```
# Qimera Line Overlap Report
# Generated by Qimera
# Date: Tue Nov 25 11:17:42 2025
#
# Each line in the report corresponds to one QPD file.
# A grid cell is considered to be overlapped if it has a coverage value of 2 or
greater.
```

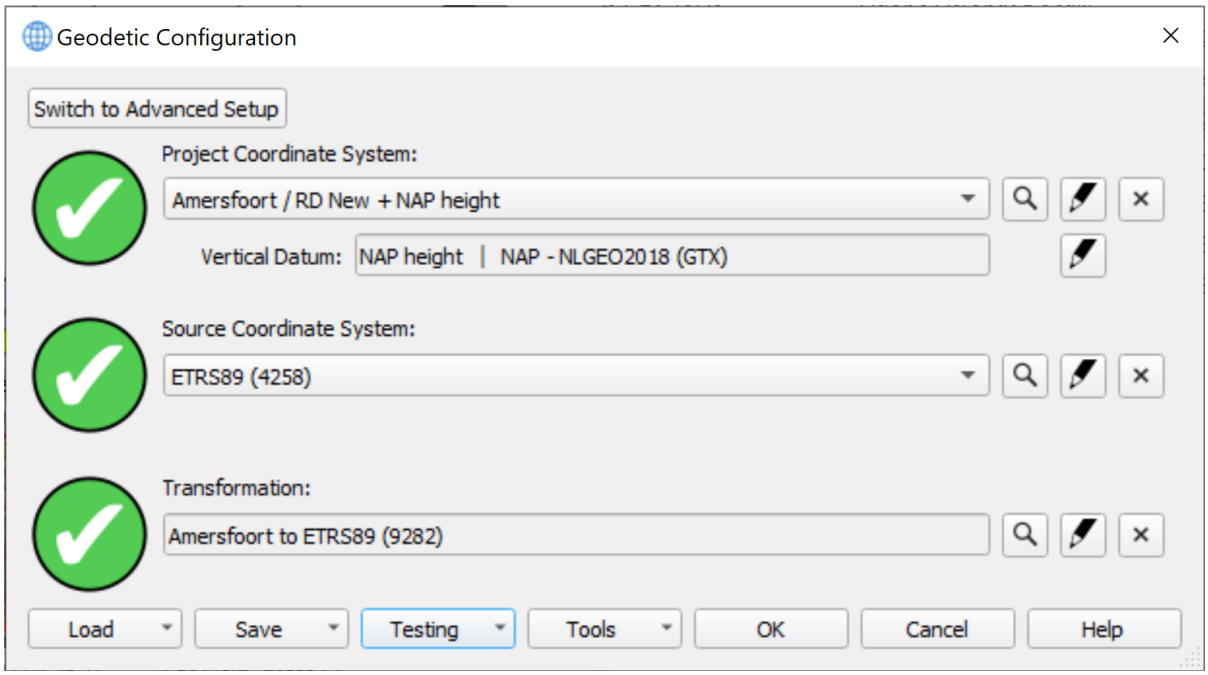
```
# The overlap threshold is the percentage of cells in the QPD polygon that must be
overlapped for the QPD to be considered as passing.
# A QPD is considered to have passed if the percentage of overlapped cells in the QPD
polygon is greater than or equal to the specified overlap threshold.

   Specified Overlap Threshold: 33
   Grid File: /Users/QPS/QPS-Data/Projects/overlap-project/GridData/Dynamic Grid/
Dynamic Grid.dyngrid
   Total QPDs Analyzed: 45
   QPDs Passing: 39

The columns are:
QPD filename, # of grid cells within QPD polygon, # of cells in polygon with coverage
>= 2, % with coverage >= 2, Result (Pass/Fail)
0000_20130510_170808_Heron,181,181,100.00,Pass
0001_20130510_171716_Heron,832,826,99.28,Pass
0002_20130510_175716_Heron,628,628,100.00,Pass
0003_20130510_183716_Heron,946,933,98.63,Pass
0004_20130510_191716_Heron,415,414,99.76,Pass
0005_20130510_195716_Heron,938,911,97.12,Pass
0006_20130510_203716_Heron,891,884,99.21,Pass
0007_20130510_210639_Heron,25833,15975,61.84,Pass
0008_20130510_211158_Heron,48885,8807,18.02,Fail
0009_20130510_211947_Heron,83772,9072,10.83,Fail
0010_20130510_212837_Heron,44675,6752,15.11,Fail
0011_20130510_213211_Heron,44559,8637,19.38,Fail
0012_20130510_213908_Heron,47726,8190,17.16,Fail
0013_20130510_214635_Heron,33905,7014,20.69,Fail
0014_20130510_215257_Heron,10625,4139,38.96,Pass
0015_20130510_215430_Heron,30209,17219,57.00,Pass
0016_20130510_215852_Heron,65251,46808,71.74,Pass
0017_20130510_220939_Heron,6278,6004,95.64,Pass
0018_20130510_221328_Heron,960,957,99.69,Pass
0019_20130510_221555_Heron,29518,22920,77.65,Pass
0020_20130510_222622_Heron,19929,16188,81.23,Pass
0021_20130510_222908_Heron,10489,7622,72.67,Pass
0022_20130510_223117_Heron,30745,15693,51.04,Pass
0023_20130510_223954_Heron,2523,2510,99.48,Pass
0024_20130510_224149_Heron,918,918,100.00,Pass
0025_20130510_224255_Heron,20976,15578,74.27,Pass
0026_20130510_225029_Heron,24262,21568,88.90,Pass
0027_20130510_225457_Heron,6314,6230,98.67,Pass
0028_20130510_225750_Heron,21950,9727,44.31,Pass
0029_20130510_230330_Heron,17480,12327,70.52,Pass
0030_20130510_230854_Heron,22,22,100.00,Pass
0031_20130510_231104_Heron,3804,3353,88.14,Pass
0032_20130510_231435_Heron,2307,2261,98.01,Pass
0033_20130510_231618_Heron,3434,3120,90.86,Pass
```

```
0034_20130510_232155_Heron,1790,1757,98.16,Pass
0035_20130510_232248_Heron,6427,5843,90.91,Pass
0037_20130510_234554_Heron,1643,1352,82.29,Pass
0038_20130510_234800_Heron,4194,2127,50.72,Pass
0039_20130510_235537_Heron,700,529,75.57,Pass
0040_20130510_235941_Heron,1246,561,45.02,Pass
0041_20130511_000208_Heron,705,484,68.65,Pass
0042_20130511_000542_Heron,3846,2631,68.41,Pass
0043_20130511_000859_Heron,596,591,99.16,Pass
0044_20130511_001121_Heron,3958,3218,81.30,Pass
0045_20130511_001659_Heron,12581,6710,53.33,Pass
```

Qimera Geodetic Configuration Overview



On this page:

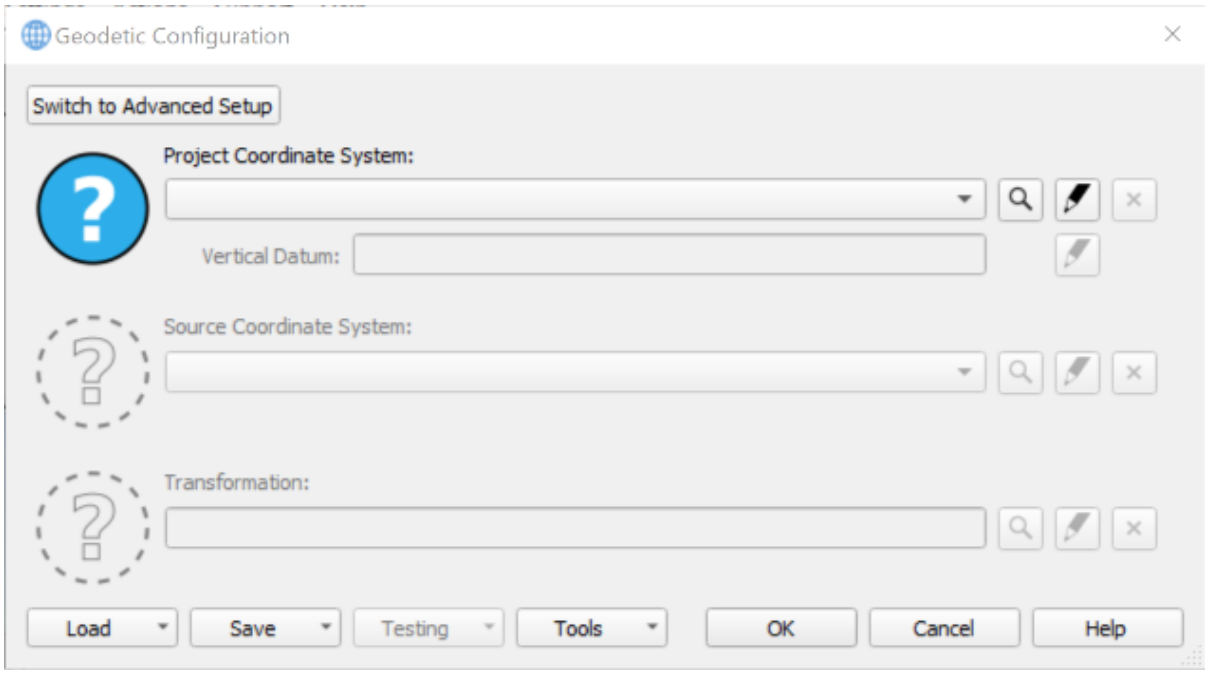
- Geodetic Configuration Overview
  - Guided Setup
    - Project Coordinate System
    - Vertical Datum
    - Source Coordinate System
    - Transformation
    - Load
    - Save
    - Testing
    - Tools
    - Help
  - Advanced Setup
    - Configuration

- Map
- Parameters
- WKT

Geodetic Configuration Overview

This dialog is a shared component between Qinsy, Qimera and Fledermaus 8 and is used to set up a full Geodetic Configuration. You can choose between the *Guided Setup* or *Advanced Setup* using the labeled button at the top of the dialog.
A Geodetic Configuration consists of, at a minimum, a *Project Coordinate System*. Additionally it can contain a Source Coordinate System and optionally a *Transformation* between the datum in the *Project Coordinate System* and the datum in the Source Coordinate System.
You can also optionally have a *Vertical Coordinate System*.

Guided Setup



The *Guided Setup* walks you through the configuration steps by implying a specific order to the steps you must take to setup a Geodetic Configuration.
The first step is the selection of the *Project Coordinate System*. For Qinsy and Qimera, this is the geodetic definition for your processed products such as QPD files and Dynamic Surfaces.
After you have selected a *Project Coordinate System* you can configure a *Vertical*

Coordinate System. Once your *Project Coordinate System* is configured, you can add a *Source Coordinate System*.
For Qinsy and Qimera, this can define the coordinate system used when importing navigation information.
After you add a *Source Coordinate System*, you will be able to configure a specific *Transformation* that is used to transform coordinates between your *Source Coordinate System* and the target geographic component of your *Project Coordinate System*.

Project Coordinate System

Use the combo box to see a list of *Recently Used, User Defined* and *EPSG Defined* projected coordinate systems.
You can select from the list or start typing to filter the contents of the list.

Optionally you can use the *Search* button  to launch the *Search Coordinate System* dialog which allows you to search for *Projected* or *Compound* coordinate systems.

Finally you can use the *Edit* button  to launch the *Coordinate System Setup* dialog.
This dialog allows you to create a completely custom coordinate system. Use the *Remove* button  to remove the current component from the configuration.

Vertical Datum

Use the *Edit* button  to launch the *Vertical Datum Setup* dialog.
This button becomes enabled once you have defined the *Project Coordinate System*.

Source Coordinate System

Use the combo box to see a list of *Recently Used, User Defined* and *EPSG Defined* geographic coordinate systems.
You can select from the list or start typing to filter the contents of the list.

Optionally you can use the *Search* button  to launch the *Search Coordinate System* dialog which allows you to search for *Geographic* coordinate systems.

Finally you can use the *Edit* button  to launch the *.Setup Geographic CRS v1.0* dialog.
This dialog allows you to create a completely custom geographic coordinate system.

Use the *Remove* button  to remove the current component from the configuration.
This widget becomes enabled once you have defined the *Project Coordinate System*.

Transformation

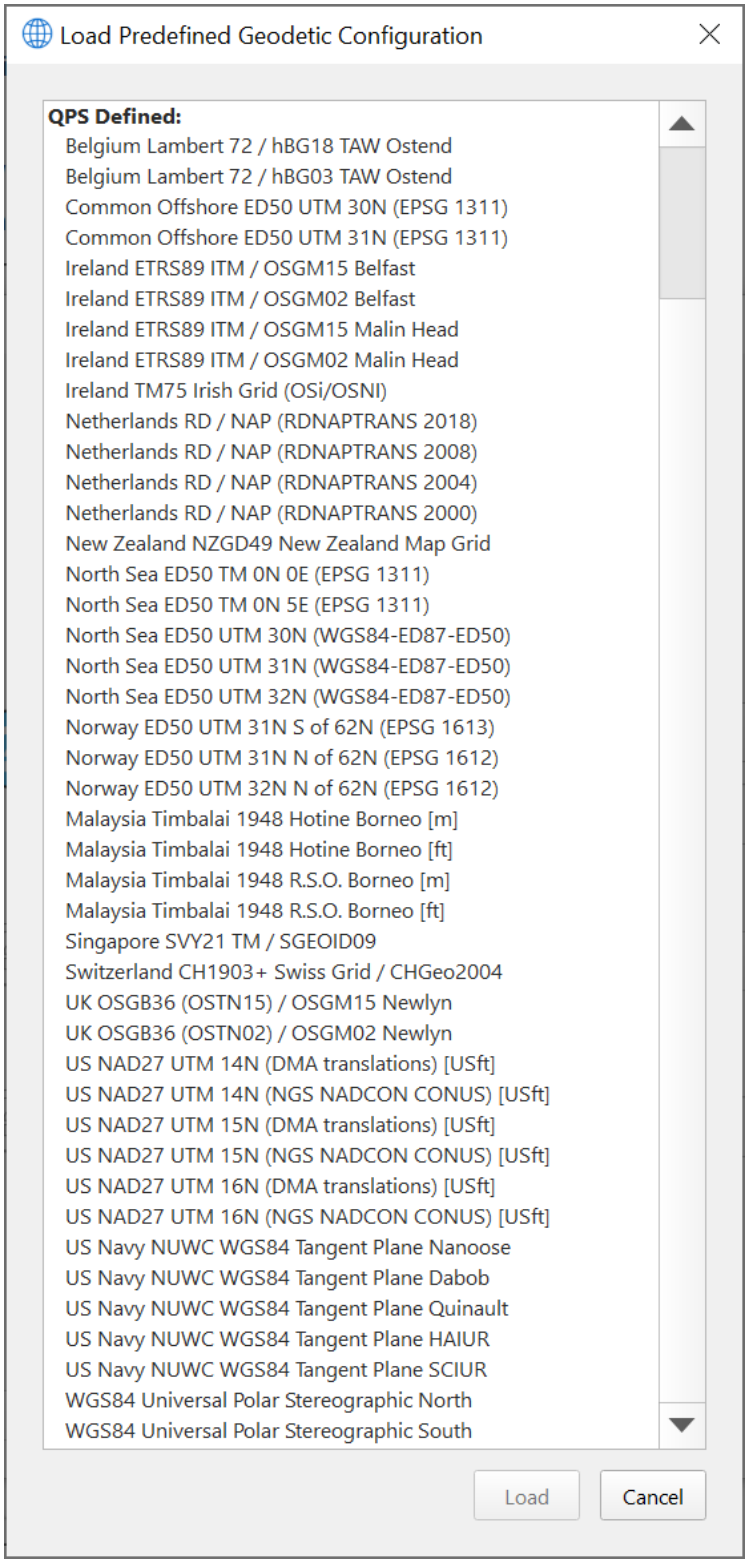
Use the *Search* button  to launch the *Search Dialog,* which searches **specifically** for transformations between the *Source Coordinate System* and the geographic component of

your *Project Coordinate System*.

Use the *Edit* button  to launch the *Transformation Setup* dialog.
It will pre-populate the Source/Target Coordinate System with your *Source Coordinate System* and your the geographic component of your *Project Coordinate System*.
You can then proceed to create a custom transform for your configuration. Use the *Remove* button  to remove the current component from the configuration.
This widget becomes enabled once you have defined the *Project Coordinate System* and a *Source Coordinate System*.

Load

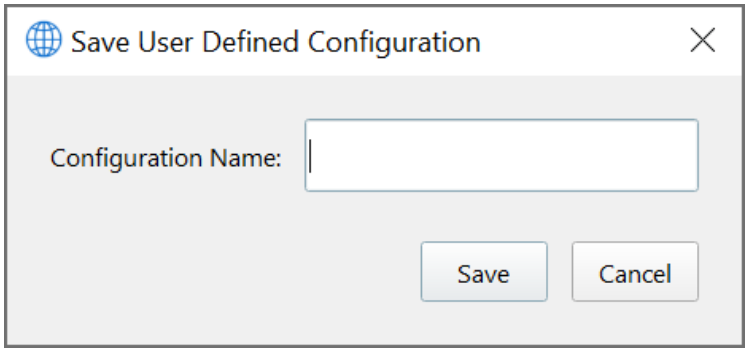
The *Load Predefined Configuration* option will launch the *Load Predefined Geodetic Configuration* dialog shown below.
Simply select a configuration from the list.



The *Import Configuration from file* option will launch a file browse dialog so that you can import a previously exported configuration (*.wkt) or import the geodetic configuration from a Qinsy database (*.db).

Save

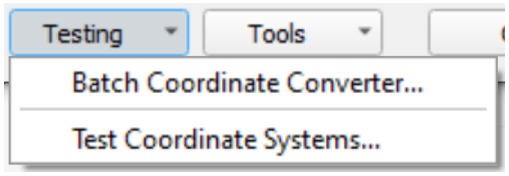
The *Save As User Defined Configuration* option will launch the dialog shown below.
The configuration will be available in the *Load Predefined Geodetic Configuration* dialog the next time it is used.



The *Save Configuration to File* option will export the current configuration to a file.
Use this option if you need to send your configuration to other users.

Testing

Clicking the *Testing* button displays a popup menu with the following contents:



The test tools have the purpose of coordinate conversion.

Either launch the ***Batch Coordinate Converter*** wizard or the ***Test Coordinate Systems*** dialog.

Tools

Open Configuration Folder... option will open the folder location of the saved user defined configurations.

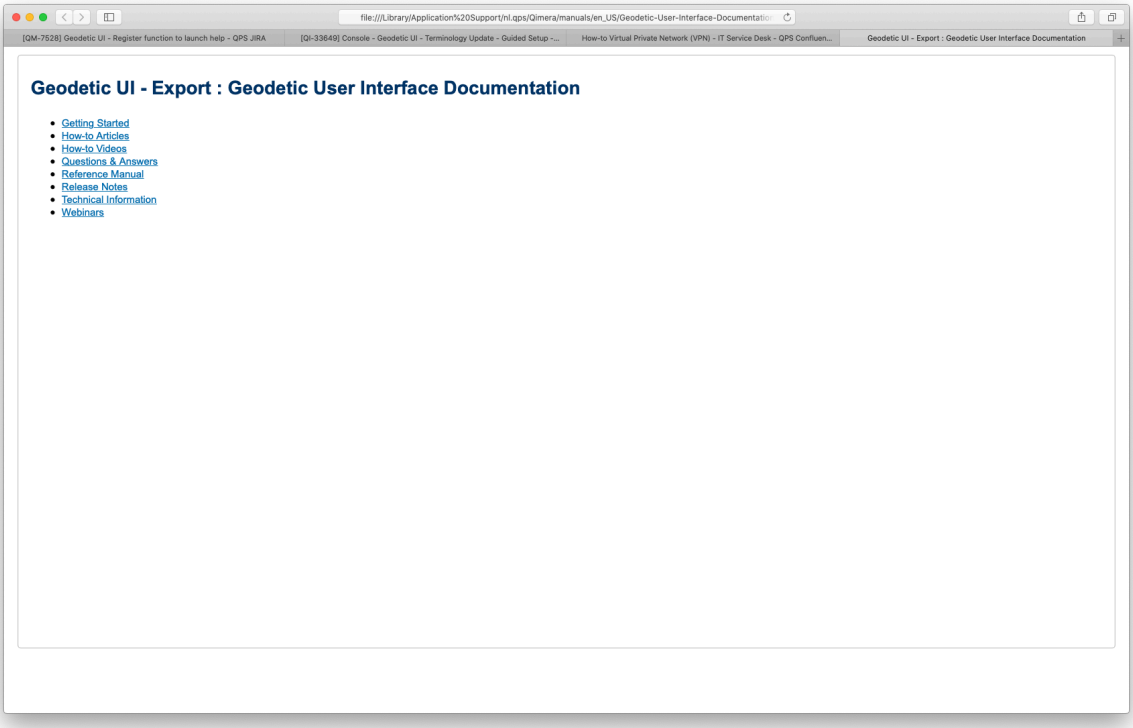
Open Height Model Folder... option will open the folder location of user defined height models.

Refresh Resources option will reload user defined configurations and height models and should be used after modifying files in either location.

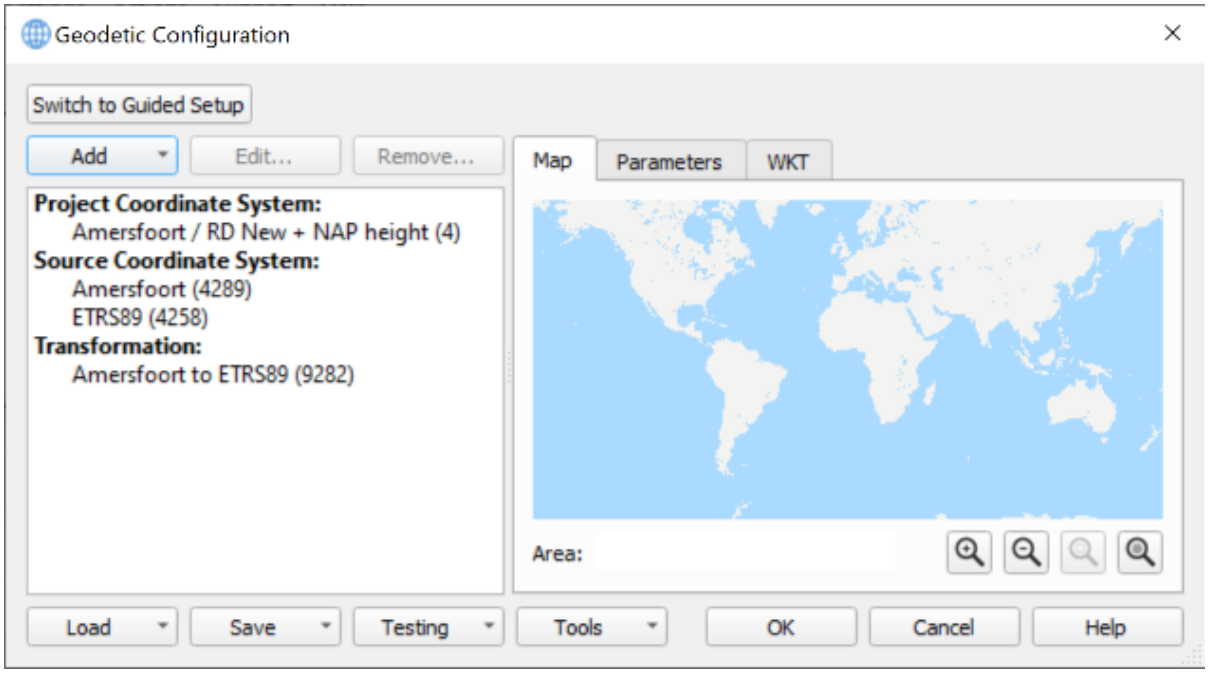
Upgrade GEOIDMODELS.xml... option opens a utility for generating companion WKT files for user defined height models defined in a legacy GEOIDMODELS.xml file.

Help

The *Help* button with launch the Geodetic User Interface help documentation.



Advanced Setup



Configuration

The *Configuration* list displayed at the left side of the *Advanced Setup* dialog shows you the detailed information about your current geodetic configuration.
Clicking a text label not bold in this list updates the contents of the *Map, Parameters* and *WKT* tabs at the right side providing more detail.
Using a selection in the list you can also edit or remove an entry using the buttons described below.

Add

The *Add* button will allow you to add the following components to your configuration:

Projected Coordinate System

This launches the *Search Coordinate System* dialog and allows you to search for either *Projected* or *Compound* coordinate systems.
If your configuration already has a *Project* Coordinate System, the one you choose will replace the existing one in your configuration.
Qinsy and Qimera require the *Project Coordinate System* to be a *Projected* coordinate system as apposed to a *Geographic* coordinate system.

Source Coordinate System

This launches the *Search Coordinate System* dialog and allows you to search for *Geographic* coordinate systems.
If your configuration already has a Source Coordinate System, the one you choose will replace the existing one in your configuration.

Transformation

This launches the *Transformation Selection* dialog embedded in the *Search Dialog* and searches **specifically** for transformations between the Source Coordinate System and the geographic component of your *Project Coordinate System.*

Custom Projected Coordinate System

This launches the *Coordinate System Setup* dialog.
This dialog allows you to create a completely custom coordinate system for the *Project Coordinate System* part of your configuration.

Custom Source Coordinate System

This launches the *Geographic Coordinate System Setup* dialog.
This dialog allows you to create a completely custom coordinate system for the *Project Coordinate System* part of your configuration.

Custom Transformation

This launches the *Transformation Setup* dialog.
It will pre-populate the Source/Target Coordinate System with your *Source Coordinate System* and the geographic component of your *Project Coordinate System*.
You can then proceed to create a custom transform for your geodetic configuration.

Edit

The *Edit* button will bring up the *Setup* dialog for the currently selected configuration component.

Remove

The *Remove* button will remove the currently selected configuration component.

Map

For more details on this tab, see the *Map Tab* section of the *Search Dialog*.

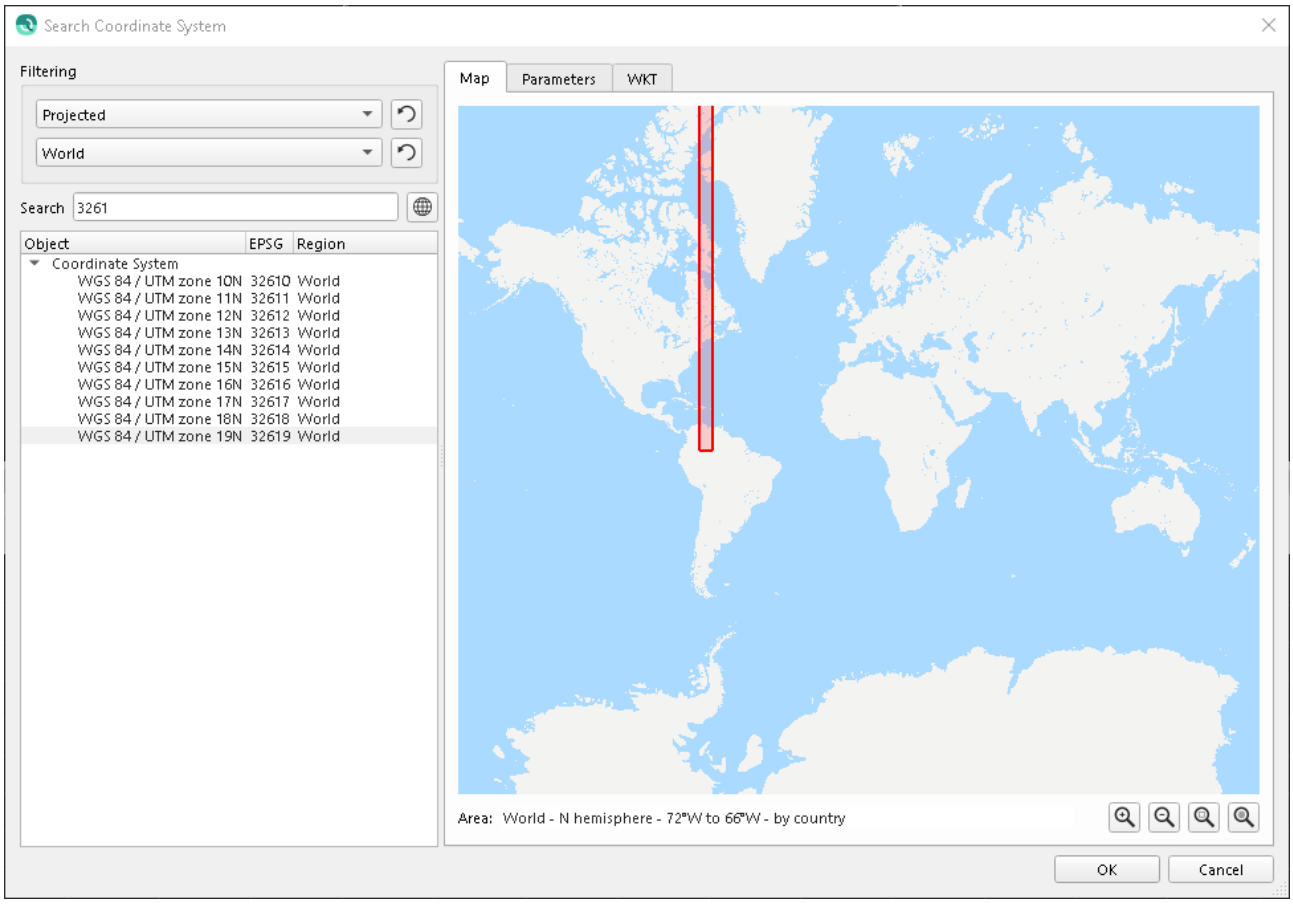
Parameters

For more details on this tab, see the *Parameters Tab* section of the *Search Dialog*.

WKT

For more details on this tab, see the *WKT Tab* section of the *Search Dialog*.

Qimera Geodetic Search Dialog



On this page:

- Search Dialog
  - Filtering
  - Search
  - Results List
  - Map
  - Parameters
  - WKT

Search Dialog

The Search Dialog is used for any type of geodetic component searching. When you search, you will always get the same user experience. The only difference is the geodetic component you are searching on. For example, the Search Dialog is used to search for

geographic or projected coordinate systems, map projections, geodetic datums, and transformations. For the purpose of this reference manual section, we will use projected coordinate system searching as our example.

Filtering

Filtering allows you to reduce the number of geodetic items that are searched whenever the search edit text is changed. The first filter is the geodetic item type. For example, if you are searching for a project coordinate system, your choices are *All, Projected,* and *Compound*. The first filter will change according to what geodetic item type you are searching (i.e. coordinate systems, datum, transformation...) . The second filter is the geodetic Area that will be searched. The first two choices are *All Areas* and *Map*. These first choices will be followed by every available country area from *Aaland Islands* through *Zimbabwe*. All Areas will not restrict you search by area. The Map option will restrict your search to the geodetic items that define an area of use that intersects the current map view. When this option is chosen, as you pan/zoom around the map, the tree view will change to display the geodetic items available in that area. To reset any filter simply click on the following button:



Search

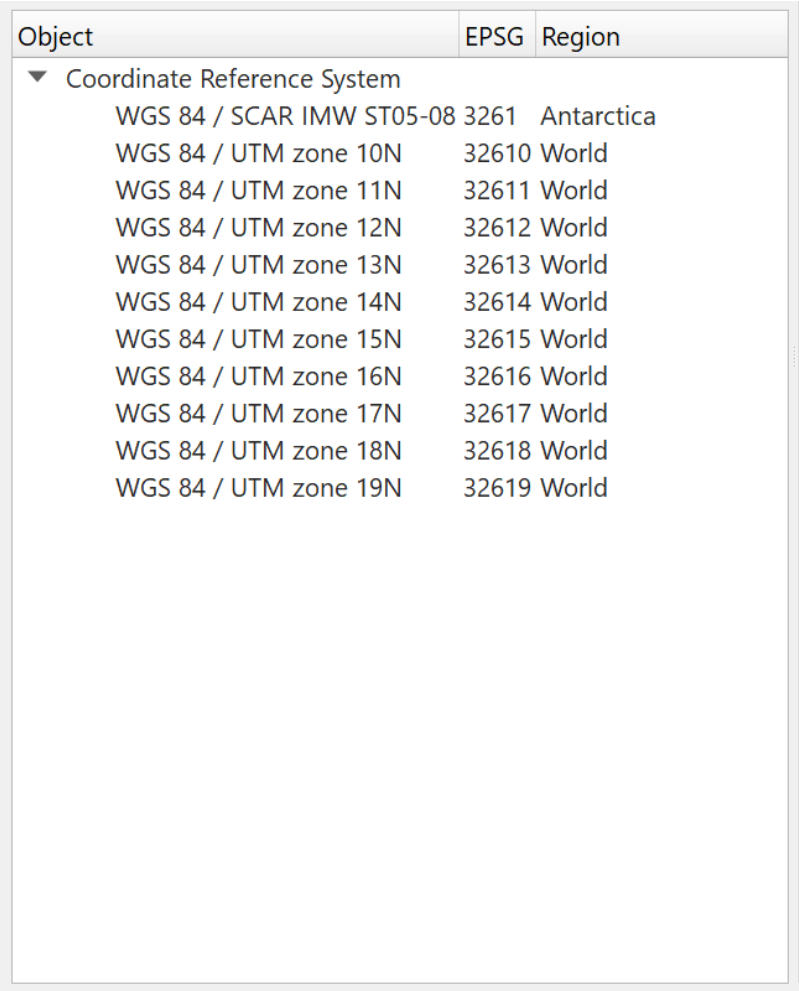
The search text area is used to search for text tokens or EPSG codes of the geodetic items. If the search text is blank, the object list will contain every geodetic item that fits the constraints of your filters. As you type, the geodetic list is automatically updated with results that contain your search text. Remember you can search for numeric EPSG codes or text tokens. The text tokens will search both the geodetic item name and the region name. Examples of search text are: "32619", "Amersfoort", "GDA2020 MGA". The first yields the specific coordinate system with that EPSG code. The second example yields 2 projected and 1 compound coordinate system. The last yields 14 coordinate systems. If you have only 1 search token and it is numeric, the interface will consider that as an EPSG code and search accordingly. If you have more than one search token, it will use those to search against the geodetic item name and the area of use. If all tokens are found, the item will be added to the list. This can be considered an "AND" search of your tokens so the more tokens you have, the more refined the search will be. The only variant of the multiple search token logic is when you are searching for transformations. If you have 2 search tokens and they are both numeric, these will be used as the source or target entries for a transformation. For example, in the search text box for the Geodetic Configuration Overview, you could enter "4230 4326" which would give you a number of results for transformations between ED50 and WGS 84.

When you select one of the results from your query in the geodetic list, the corresponding area of use will be highlighted on the map and displayed in text under the map next to the

"Area:" label (if an area is defined for this geodetic item). It will additionally fill out the Parameters tab and the WKT tab with the relevant information for the geodetic item.

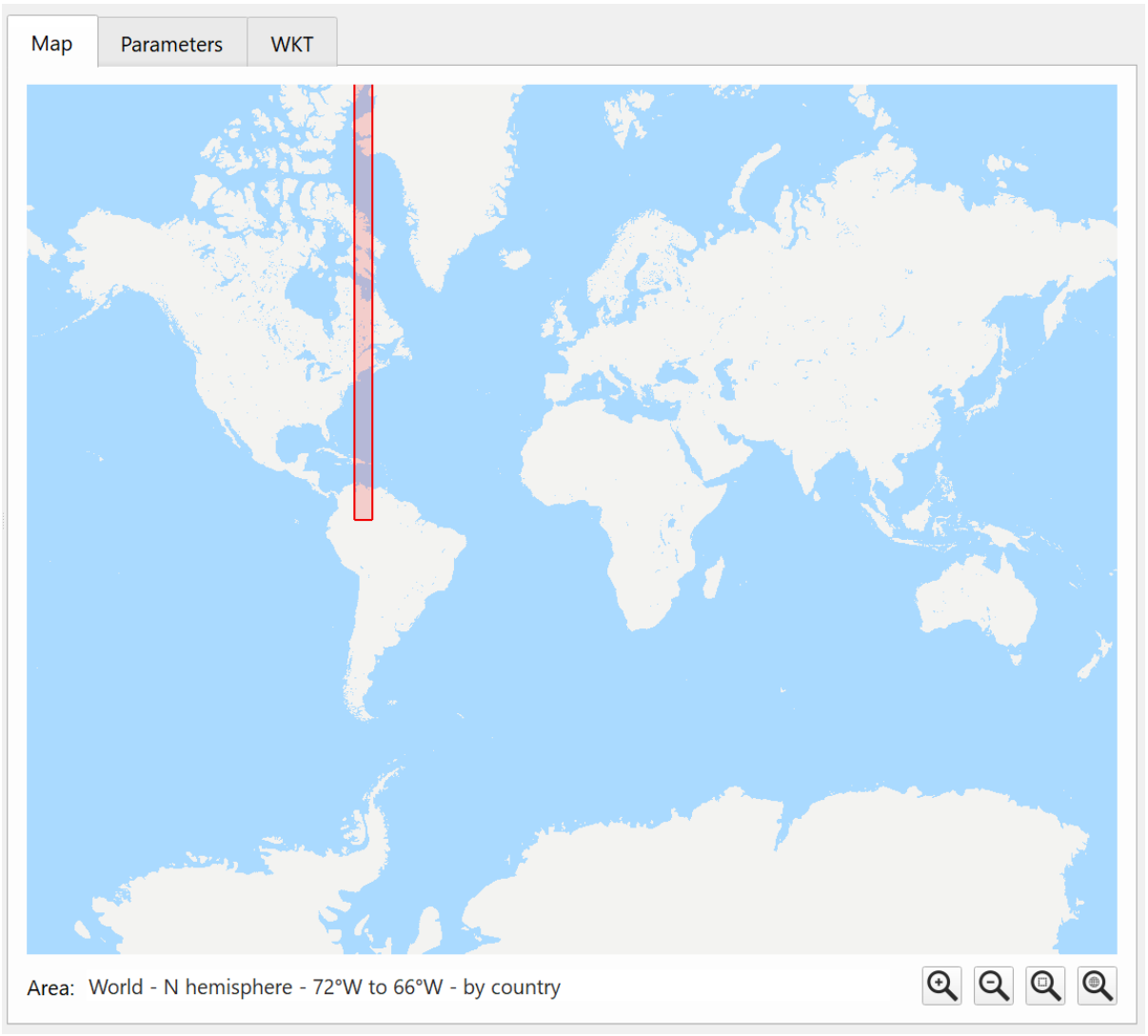
The globe button is a quick way to search based on the current map view. This button will clear the search tokens and just search on the area. The geodetic list will be filled with the items whose area of use intersects the current map view. If you want to add tokens to an map area search, change the second filter to *Map* and then add the specific search tokens.

Results List



The results list contains the result of the search combined with the selected filters. The results list will show the geodetic item Name, EPSG code and Region. The Region is the primary component of the detailed area of use. When you select an entry from this list, the selected item will be used to highlight an area of use on the map, fill in the Parameter tab and fill in the WKT string tab. Additionally, when you select an entry from this list and click the OK button, that item will be loaded to the widget that called it.

Map



This tab shows the current map view highlighting the selected geodetic item's area of use. It can also be used as a spatial component of your search.

Map Navigation

Use the left-mouse-button to click and drag the map to a new location. Use the mouse wheel to zoom in and out of the map.

Map Toolbar

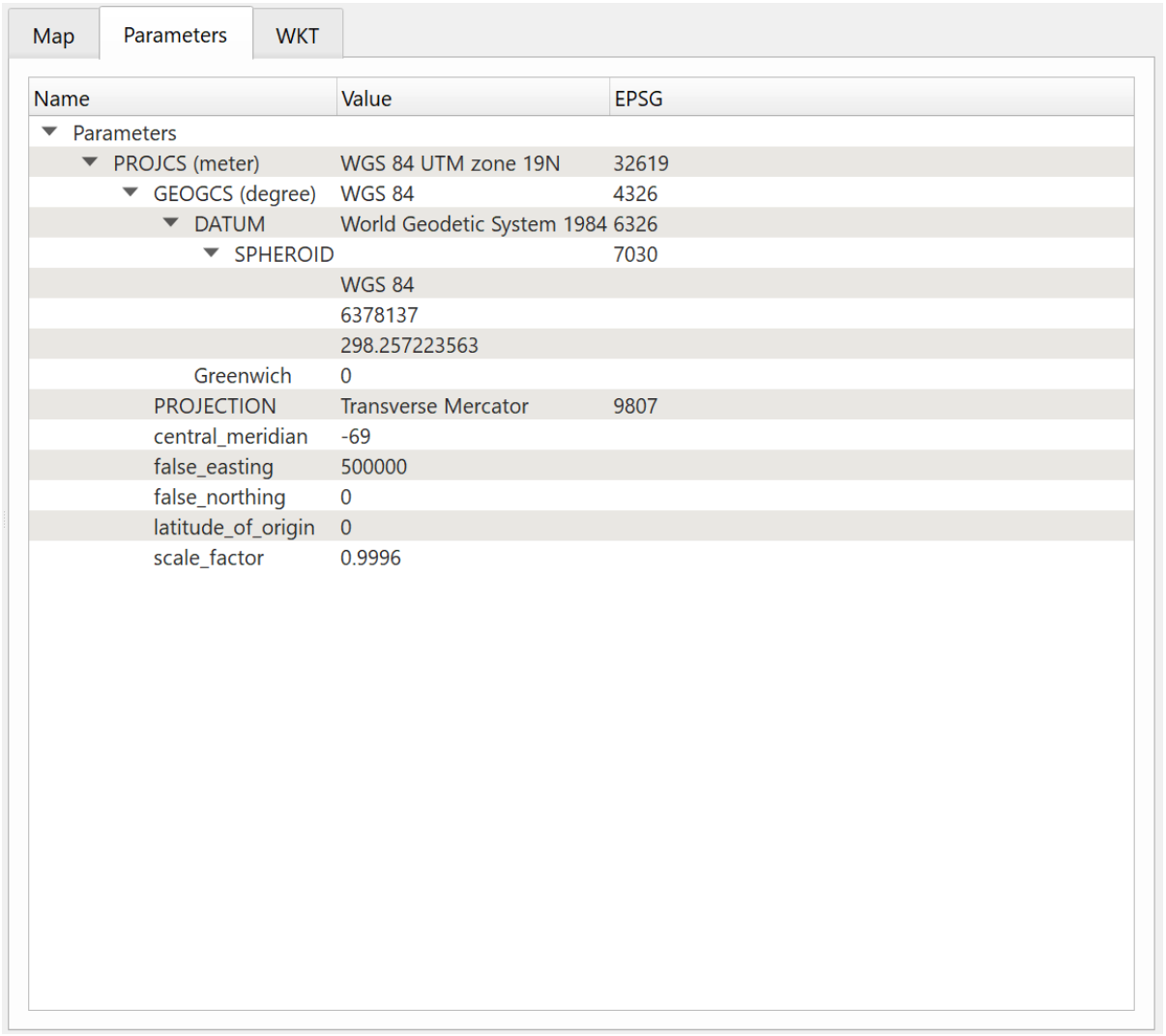
 Use this button to zoom in on the map.

 Use this button to zoom out on the map.

 Use this button to zoom to the center of the selected area of use.

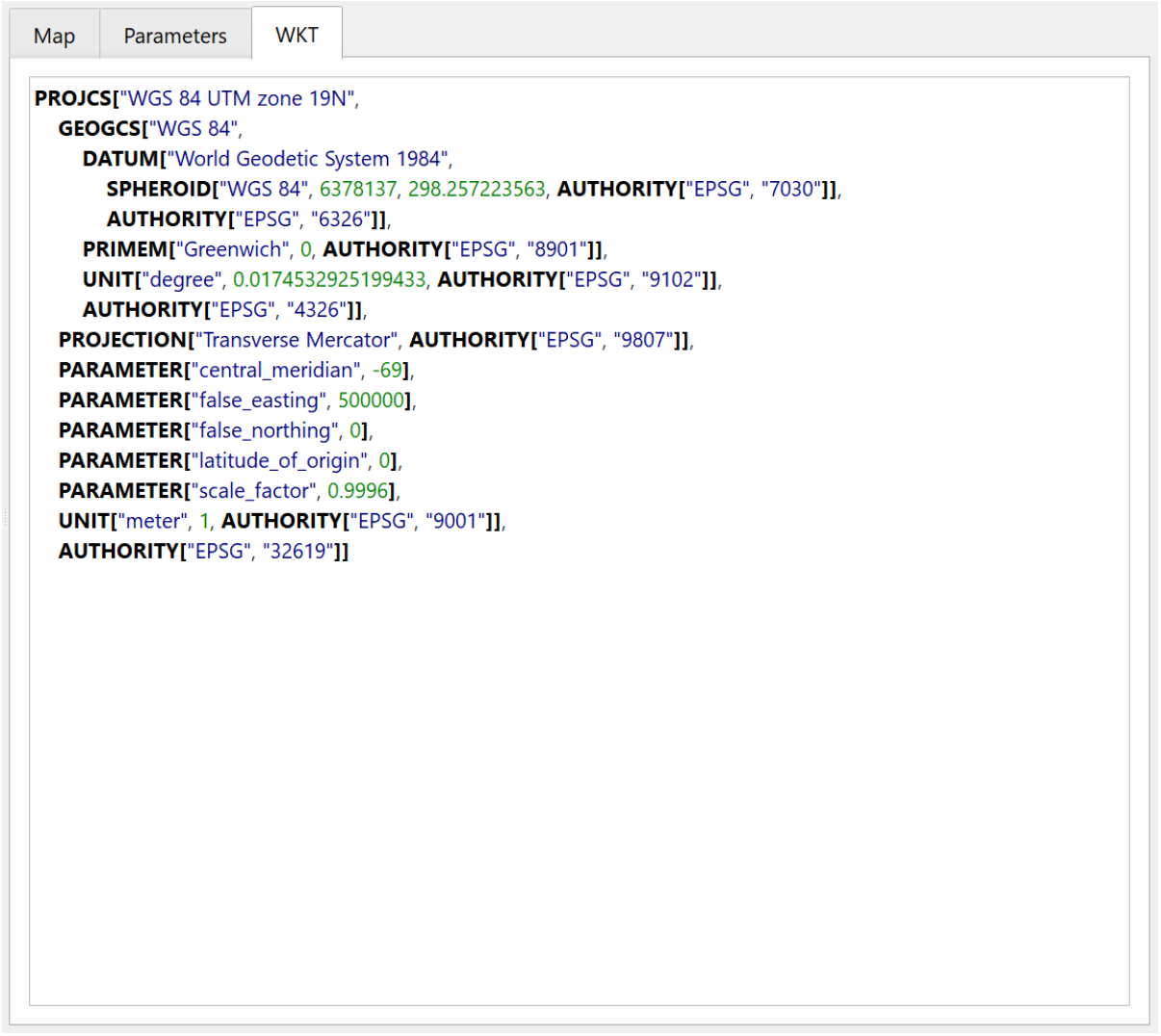
 Use this button to zoom out to the extents of the map.

Parameters



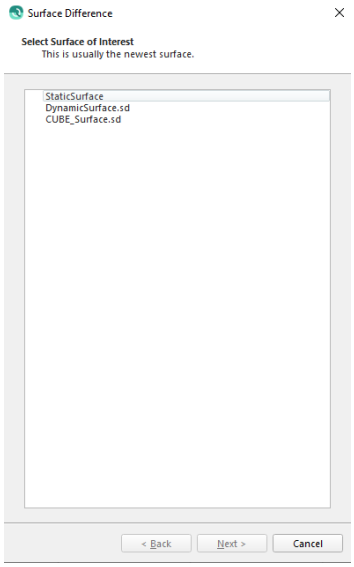
This tab shows the attributes and associated values of the selected geodetic item.

WKT



This tab shows the Well-Known Text (WKT) string that is created by the geodetic engine based on the attributes of the selected geodetic item.

Qimera Grid Difference Wizard



- How to Start
- What it Does
- General Description
  - Page 1
  - Page 2
  - Page 3
  - Page 4
  - Page 5
  - Grid Statistics Summary Dialog

How to Start

- *grid Difference* option of *Layer* menu in Main Menu bar

What it Does

This dialog computes the difference between two selected grids and produces a difference grid object in the scene.

General Description

The Grod Difference wizard is used to initiate several kinds of grid-grid and grid-plane queries. Object types that can be queried are selectable through page 1 and page 2 of the wizard, and the type of query to be applied is selected via the query type radio buttons on page 3. The selected query is applied to the specified data objects, and the scope of the query is specified on page 4 of the wizard. By default, the query is applied to the common or intersection area of both input grids. However, a polygon can be used to constrain the query scope to within a certain area.

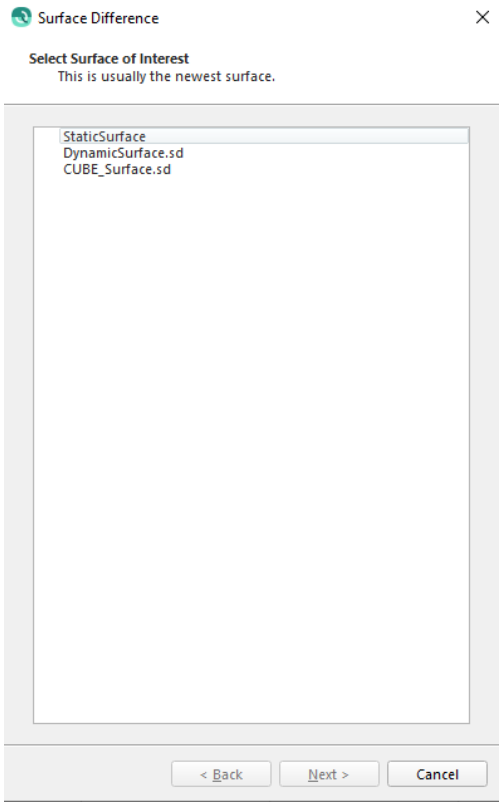
Whenever you perform grid difference operations the algorithm always works in the following manner.

- It determines which grid has the highest resolution (smallest bin size). If both have the same resolution than the first grid (Grid of Interest) is used as the highest.

- For each bin of the highest resolution grid the algorithm determines the height at the bin center from the other grid using a distance weighted average interpolation of the nearest bins at the point of interest. Data nulls (holes in the grid) are accounted for in this calculation.
- The difference is then determined from the two height values and written to the output file.

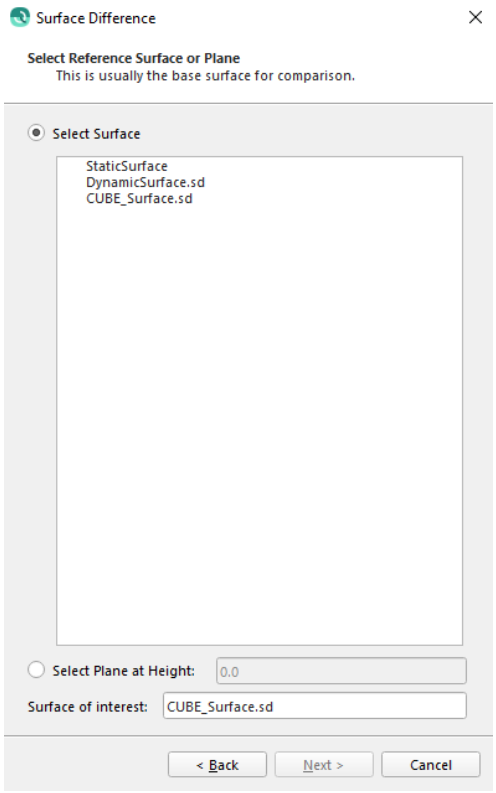
In doing the interpolation, if the interpolation point falls in a data holiday or outside the bounds of the second grid then no difference will be determined at that point. The resulting difference grid will have the same cell centers as the highest resolution grid but will be cropped as necessary to include only the grid area in common for both grids (and to account for any further constraints set on page 4 of the wizard). For example, if one grid is fully contained inside the other then the resulting difference grid will only cover that contained area.

Page 1



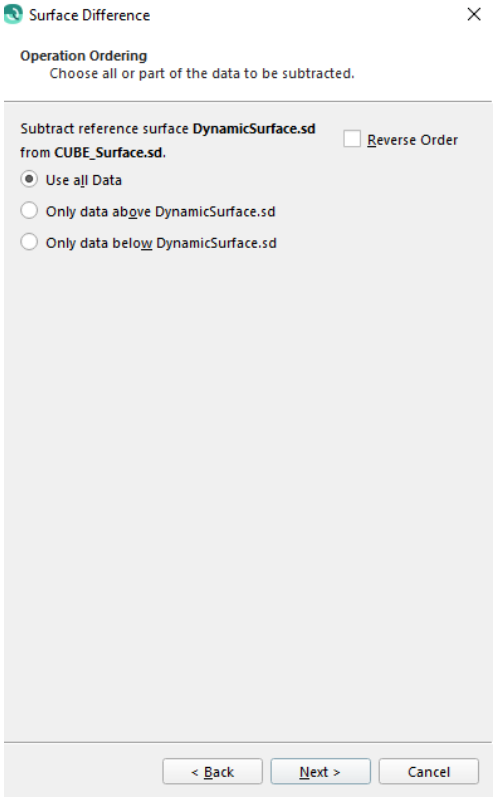
Select the first grid for the difference operation. Click **Next** to proceed to the next page of the wizard or **Cancel** to cancel the operation.

Page 2



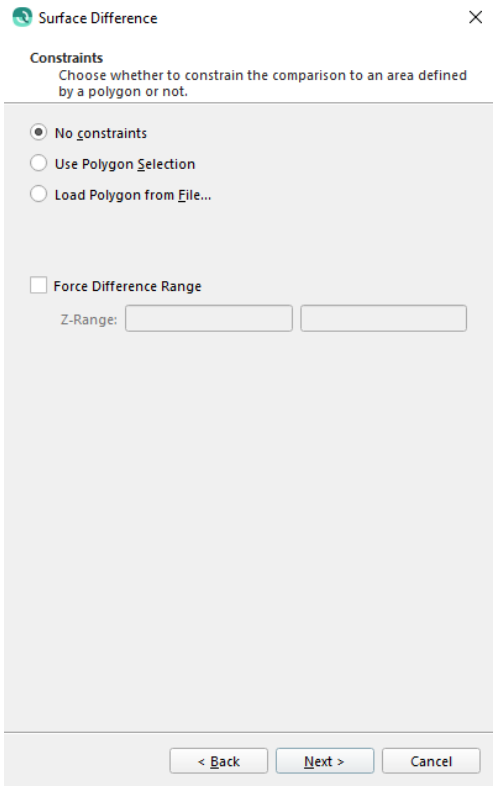
Select the second grid for the difference operation. Click **Next** to proceed to the next page, **Back** to return to the previous page of the wizard or **Cancel** to cancel the operation.

Page 3



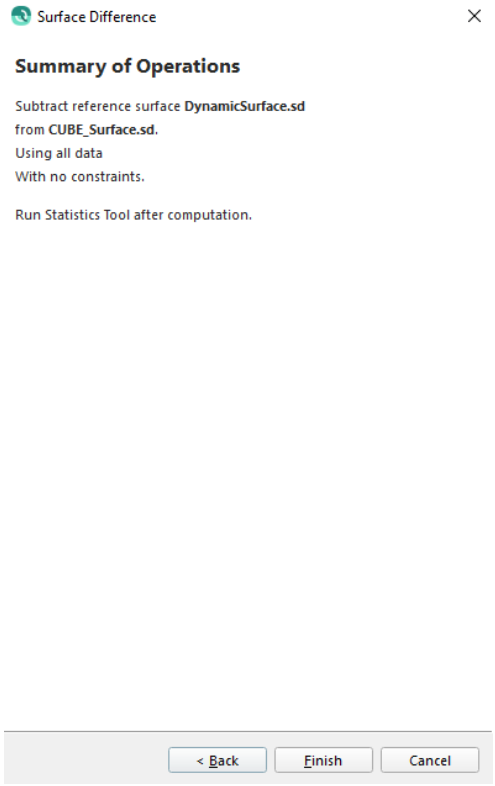
Select which data to use for the difference operation. Click **Next** to proceed to the next page, **Back** to return to the previous page of the wizard or **Cancel** to cancel the operation.

Page 4



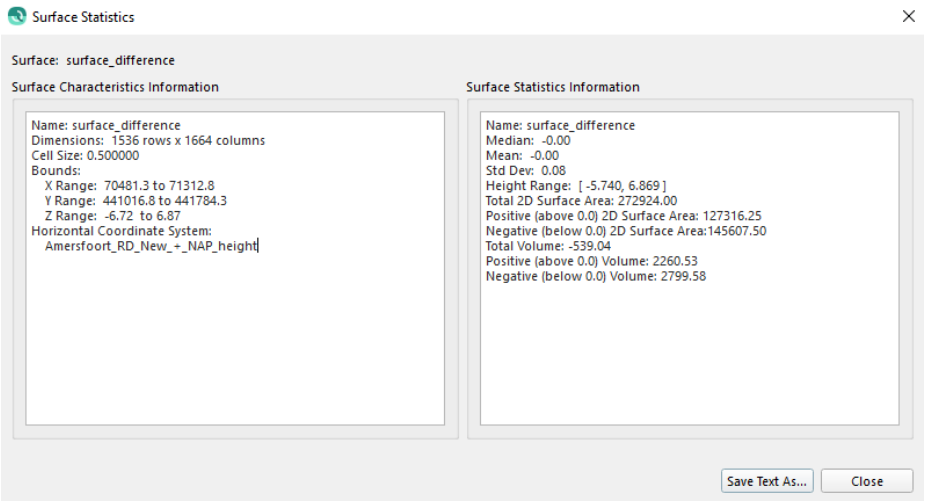
Select the constraints of the difference operation. When loading constraints from a polygon file it is important to note that these files can only be ACSII files. Click **Next** to proceed to the next page, **Back** to return to the previous page of the wizard or **Cancel** to cancel the operation.

Page 5



Review your selected options for the difference operation. Click **Finish** to proceed or **Cancel** cancel the operation. When complete, a Fledermaus static grid will be added to the project representing the results of the grid difference operation. You will also see the statistics for the grid difference.

Grid Statistics Summary Dialog

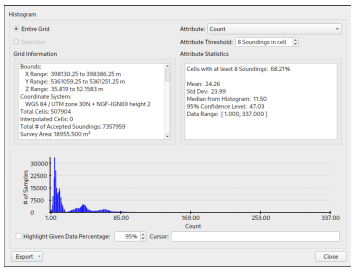


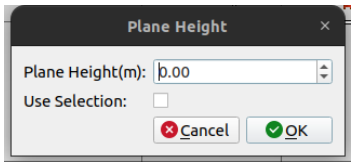
This dialog displays the resulting statistical information from the grid difference operation. You can save the statistics to a text file using *Save Text As* button.

Return to: *Qimera Interface*

Return to: *Wizards and Dialogs*

Qimera Grid Statistics Dialog





- How to Start
- What it Does
- General Description

How to Start

- *Compute Grid Statistics* option of the Dynamic Grid Context Menu in the Project Layers dock.

What it Does

This dialog displays statistical information about the selected grid or selection.

General Description

The Grid Statistics dialog functions similarly to a wizard, guiding you through the necessary steps. Initially, an input dialog with a spin box will appear, allowing you to select the desired depth above or below the reference plane. The spin box enables you to specify a plane other than the default value of 0.0. This plane height is crucial for the Survey Area and volume calculations, as it determines the area and volume above or below the selected plane.

Once you've entered the plane height, the main Grid Statistics dialog box will be displayed, as shown in the figure above. The left text box provides detailed Grid Information, while the right text box presents Attribute Statistics. Below these two sections, a histogram of the data is displayed for further analysis.

By default the statistics will be computed for the entire grid. If you selected a rectangular area from the main window before bringing up this dialog then the "Use Selection" checkbox will be enabled but will NOT be toggled ON by default. You must choose "Use Selection" to use the constrained area as an additional step.

The Attribute dropdown box is used to select which Attribute Statistics are shown in the right text box and the histogram. Additionally, some layers have an Attribute Threshold

option, allowing a threshold to be specified for that layer. This threshold is calculated and displayed in the Attribute Statistics.

Underneath the histogram, you can specify what percentage of the given data you want highlighted. The Cursor field shows the bin average when you hover over the histogram. The bin highlight is shown as a red line.

THU/TVU and Slope Corrected Uncertainty need to run additional calculations, therefore, the statistics for those are calculated on demand. Initially, "Compute TVU/THU" and "Compute Slope Corrected Uncertainty" are the options in the Attribute dropdown. Once they are run once, their name in the dropdown changes to be "THU/TVU" / "Slope Corrected Uncertainty".

The Export dropdown offers the three options for Grid Statistics exports:

- Save Text: Saves the information displayed in the Grid Information and Attribute Statistics boxes.
- Export Window as Image: Saves the entire Grid Statistics window as either a PNG or JPEG image.
- Export Histogram to ASCII: Saves the information displayed in the Grid Information and Attribute Statistics boxes and appends the data in the histogram in CSV format.

The histogram image can be saved by right-clicking the context menu over the histogram.

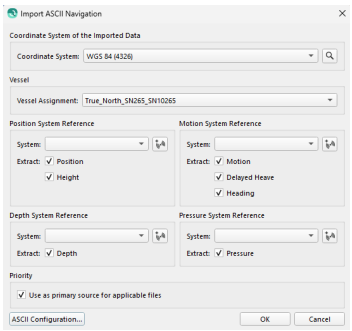
The Percentage of grid cells filled / Filled Cells / Empty Cells only show when a selection is made.

The Cell Size shows variable precision depending if the data is geographic or projected. Note that as typical for calculations in geographic coordinate systems, the average latitude is used for calculating the cell sizes. It is assumed that the data is reasonably well distributed. In this case, any loss north of center is made up by excess south. For data sets with more data north or south of the midpoint, the accuracy of the result will vary with latitude and size of the data set. More northerly data sets will have more error depending on how uneven the distribution of the data is. In testing, a comparison of the same geographic data reprojected to UTM was a small fraction of one percent difference in area.

Return to: *Qimera Interface*

Return to: *Wizards and Dialogs*

Qimera Import ASCII Navigation Dialog



- How to Start
- What it Does
- General Description
  - Coordinate System of the Imported Data
  - Vessel
  - Position and Motion System Reference
    - Creating a new System
    - Using an existing system
  - Priority

How to Start

- *Import ASCII Navigation* option of the *Source->Import sub*-menu in the Main Menu bar.
- You'll need to first configure the ASCII fields via the *Custom ASCII Configuration* button which shows the Custom ASCII File Configuration dialog.
  - *X Value*, *Y Value* - these fields are used for importing Longitude/Latitude or Easting/Northing position pairs, both field must be mapped to import, these data are managed on the *Position, Motion, Heading* tab in Processing Settings Dialog
  - *Roll*, *Pitch*, *Heave* - these fields are used for importing vessel motion, these data are managed on the *Position, Motion, Heading* tab in Processing Settings Dialog, all three fields must be mapped to import
  - *Heading* - heading or gyro measurements, these data are managed on the *Position, Motion, Heading* tab in Processing Settings Dialog
  - *Height* - accurate heights, such as RTK, these data are managed on the *Vertical Referencing* tab in Processing Settings Dialog
  - *Delayed Heave* - filtered heave signal, such as TrueHeave, these data are managed on the *Vertical Referencing* tab in Processing Settings Dialog
  - *Depth* - depth measurements from sub-surface vehicles, these data are managed on the *Depth* tab in Processing Settings Dialog

What it Does

Generic ASCII data can be imported into Qimera using the ASCII importer tool.

General Description

Measurements such as position, motion, heading, height, delayed heave, and depth can be imported with the dialog.

The dialog has several sections, these are explained below.

> You must have at least one *Raw Sonar Files* imported before importing ASCII navigation because the navigation data must be attached to a vessel.

Coordinate System of the Imported Data

Specify the datum of the data being imported. Navigation data will be converted to the project datum specified in the Project Properties Dialog.

Vessel

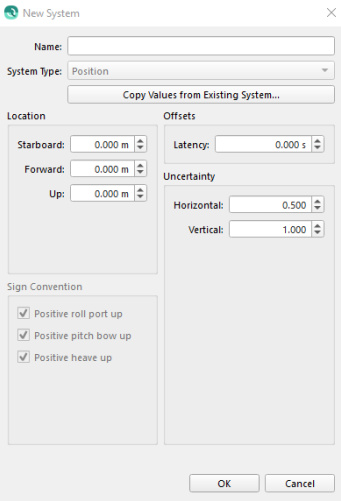
Navigation data must be attached to a vessel. Simply select the vessel from the dropdown for which the navigation is being imported.

Position and *Motion System Reference*

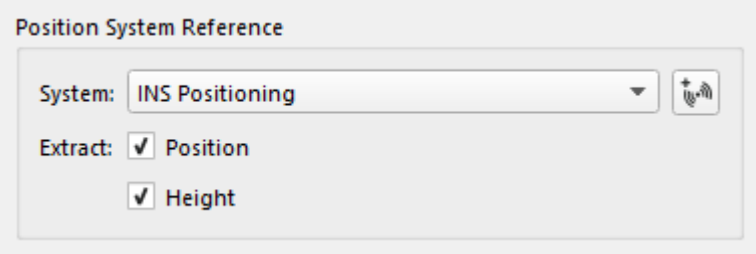
All imported navigation data must be additionally attached to a new system. If you have not imported ASCII data previously in the project you will need to create new systems for import data types. Otherwise you can use previously configured systems. After systems are created they can be further modified in the Qimera Vessel Editor.

Creating a new System

1. To create a new system click the  button next to the system drop down.



2. After after reviewing and accepting values in the *New System* dialog the new system should be shown in the dropdown. Check the data types that are to be extracted into the system.



Using an existing system

If you previously imported ASCII data the systems created during the import will be listed in the *System* drop down. Simply select the appropriate system and check the import data types.

Using an existing systems means all settings will be identical. If different uncertainty or offset settings for the system may be needed it is advisable to create a new system with copied settings.

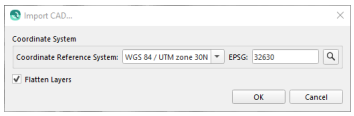
Priority

When checked this option will make the imported systems take the highest priority in the Processing Settings Dialog.

This option is checked by default.

Return to: Qimera Interface
Return to: Wizards and Dialogs

Qimera Import CAD Dialog



- How to Start
- What it Does

How to Start

- *Import CAD* option of the *Layer* menu in the Main Menu bar

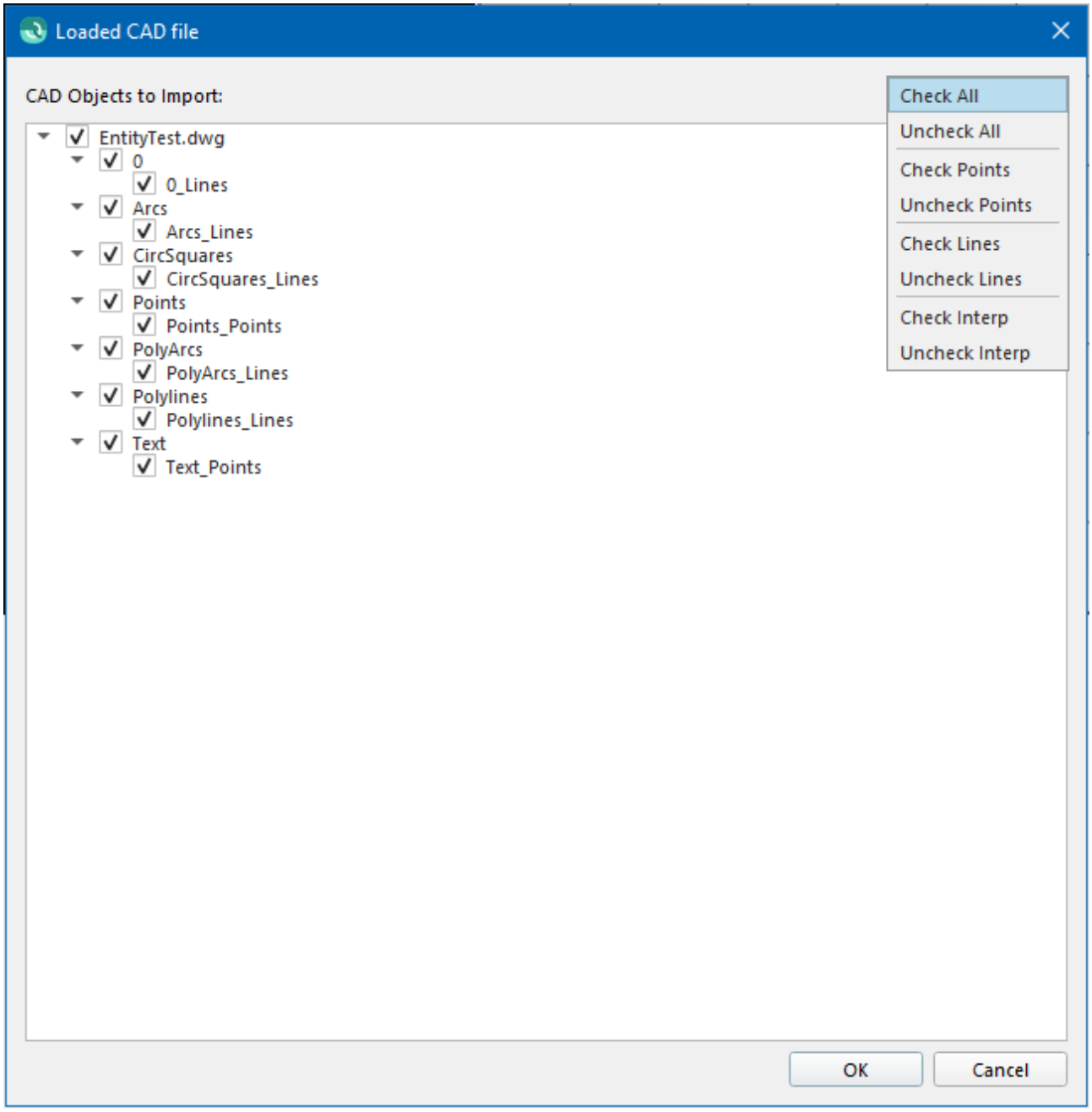
What it Does

This dialog imports AutoCAD DXF/DWG files into your project as a visual layer. As well as QGF QPS files.

General Description

The coordinate reference system displays the coordinate system extracted from the DXF file. If this is not correct, change it via the "..." button and use the Coordinate System Selection dialog. This importer will create a Fledermaus SD model object and it will be added to the scene. It will appear under the *SD Objects* node of the Project Layers window.

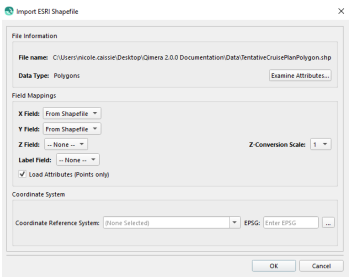
After the user selects the coordinate system, another dialog pops up which allows the user to select which CAD layer to import.



Return to: *Qimera Interface*

Return to: *Wizards and Dialogs*

Qimera Import ESRI Shape Dialog



- How to Start
- What it Does
- General Description

How to Start

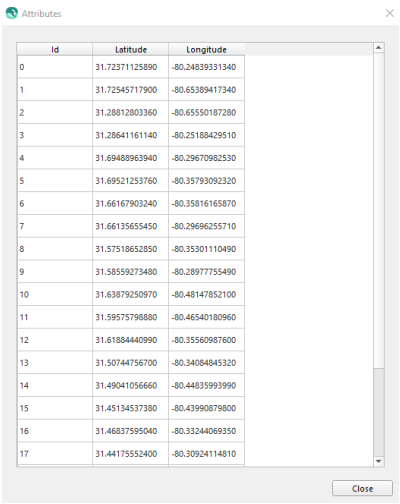
- *Import ArcGIS Shape* option of the *Layer* menu in the Main Menu bar

What it Does

This dialog imports an ESRI shape file into your project as a visual layer.

General Description

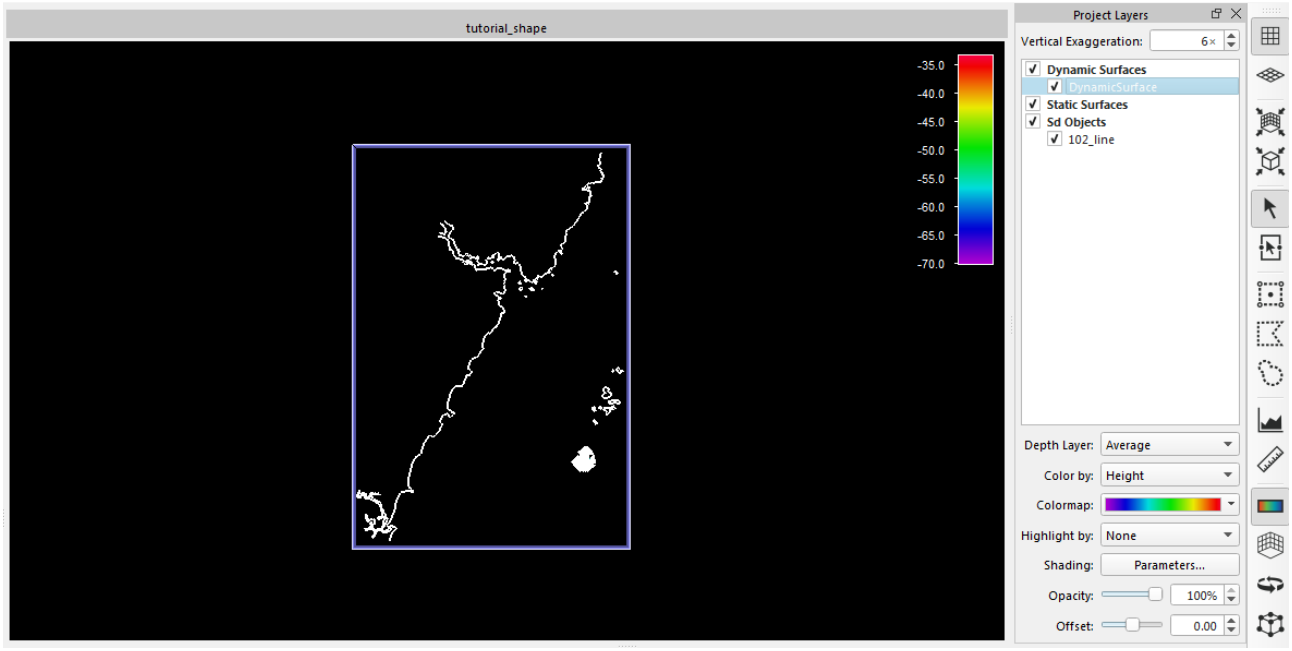
This import dialog allows you to add ESRI shape file objects to your scene as visual layers. The *File Name* shows you the file you have selected. The *Type* shows you the shape file type. Possible types are Point (2D), Polyline (2D), Polygon (2D), Multipoint (2D), PointZ (3D), PolylineZ (3D), PolygonZ (3D), MultipointZ (3D), and MultiPatch. The *Examine Attributes* button launches a dialog that lists all of the attribute fields and the rows of data for the object.



The *X-Field, Y-Field,* Z-Field and *Label Field* combo boxes tell Qimera which fields to map against the x, y, z and label (for point and line importing). The *Z-Conversion Scale* allows

you to invert the imported *Z* value. When importing *Point* objects, the *Load Attributes* will load all the other attributes of the object even if not mapped to x, y, z, or label. The *Coordinate System* dialog shows the coordinate system of the shape file. Qimera will automatically re-project this data to the project's coordinate system.

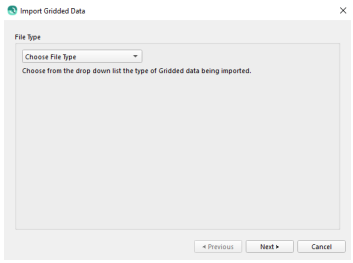
Show below is a coastline shape file imported into the scene and the corresponding layer object in the *SD Objects* node of the Project Layers window.



Return to: Qimera Interface

Return to: Wizards and Dialogs

Qimera Import Gridded Data Wizard



- ow to Start
- What it Does
- General Description
  - Import Gridded Data File Type Page
  - ASCII Gridded Data Page
  - ASCII Gridded Data - XYZ Variable Page
  - Input Coordinate System Page
  - Grid Information (Bounds) Page
  - Z Coordinate Options and Output Coordinate System Page
  - Output SD Type Page

ow to Start

- *Import Grid* option of the *Layer* menu in the Main Menu bar

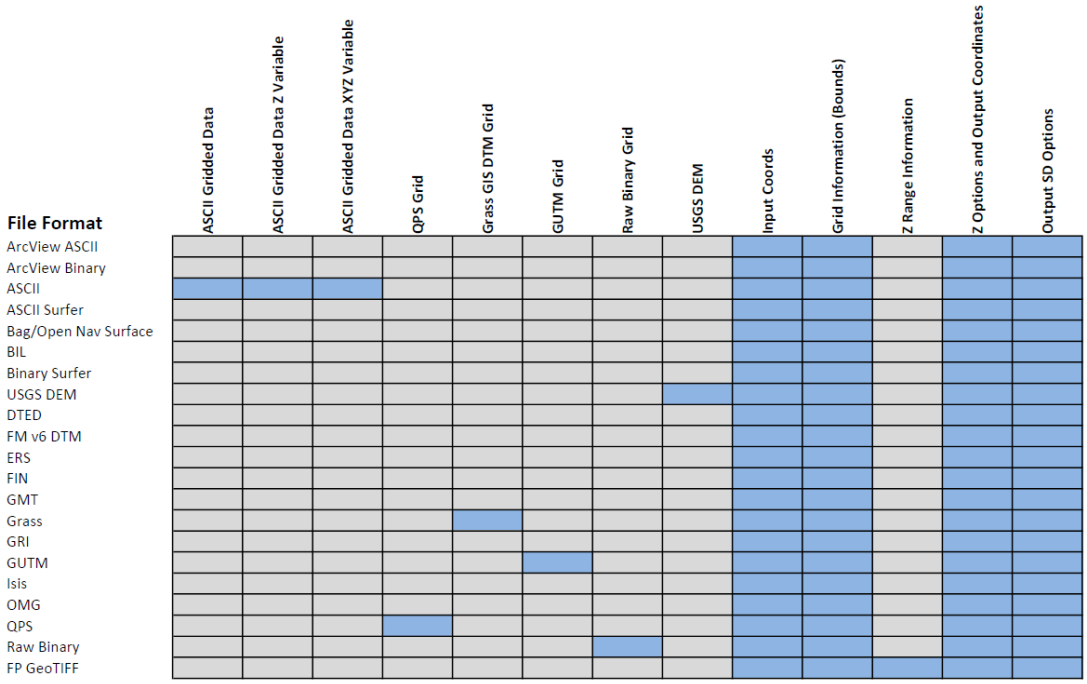
What it Does

This dialog imports gridded data and creates a grid in your project as a visual layer.

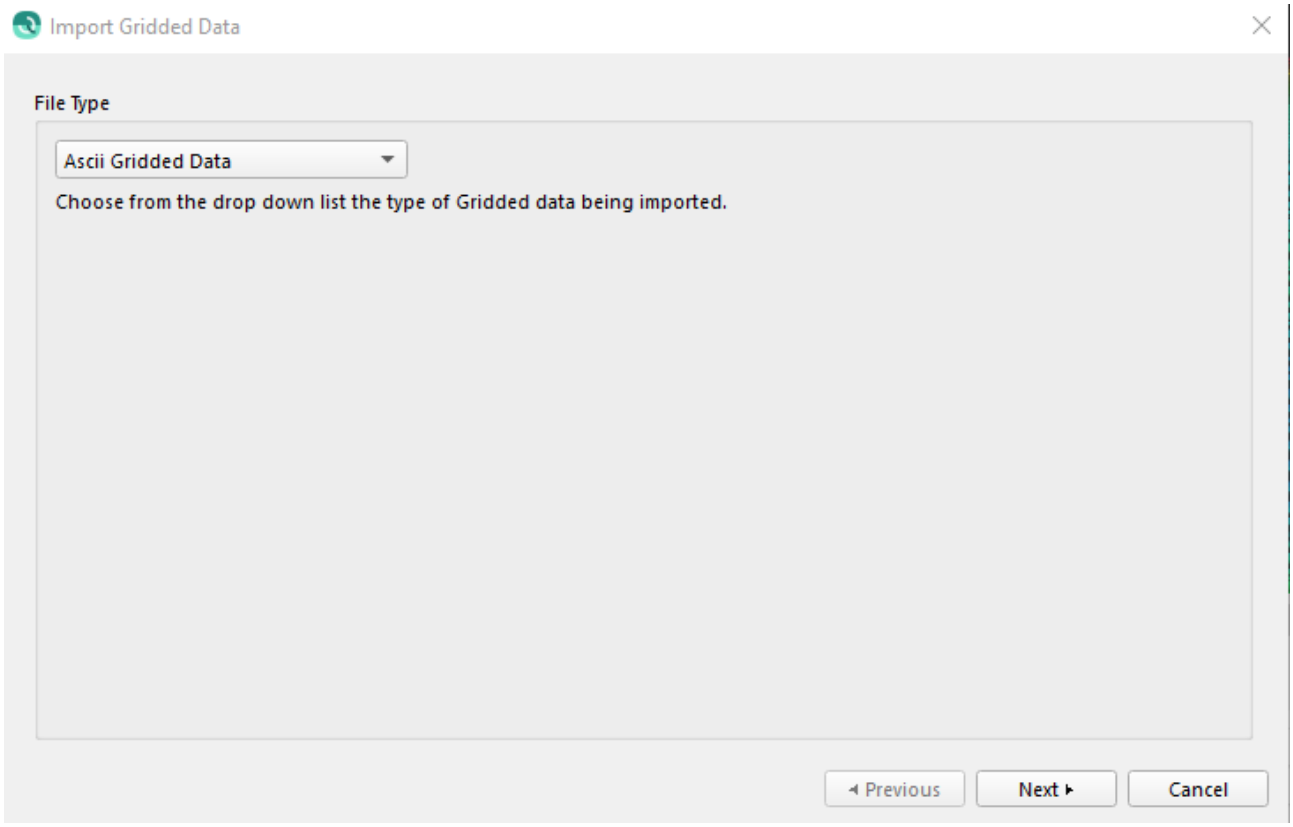
General Description

This dialog supports many different formats with a configurable wizard appropriate to the format. Please see the spreadsheet below to see which pages of the wizard are used for which format types. The pages and their use is listed after the spreadsheet.

Wizard Page

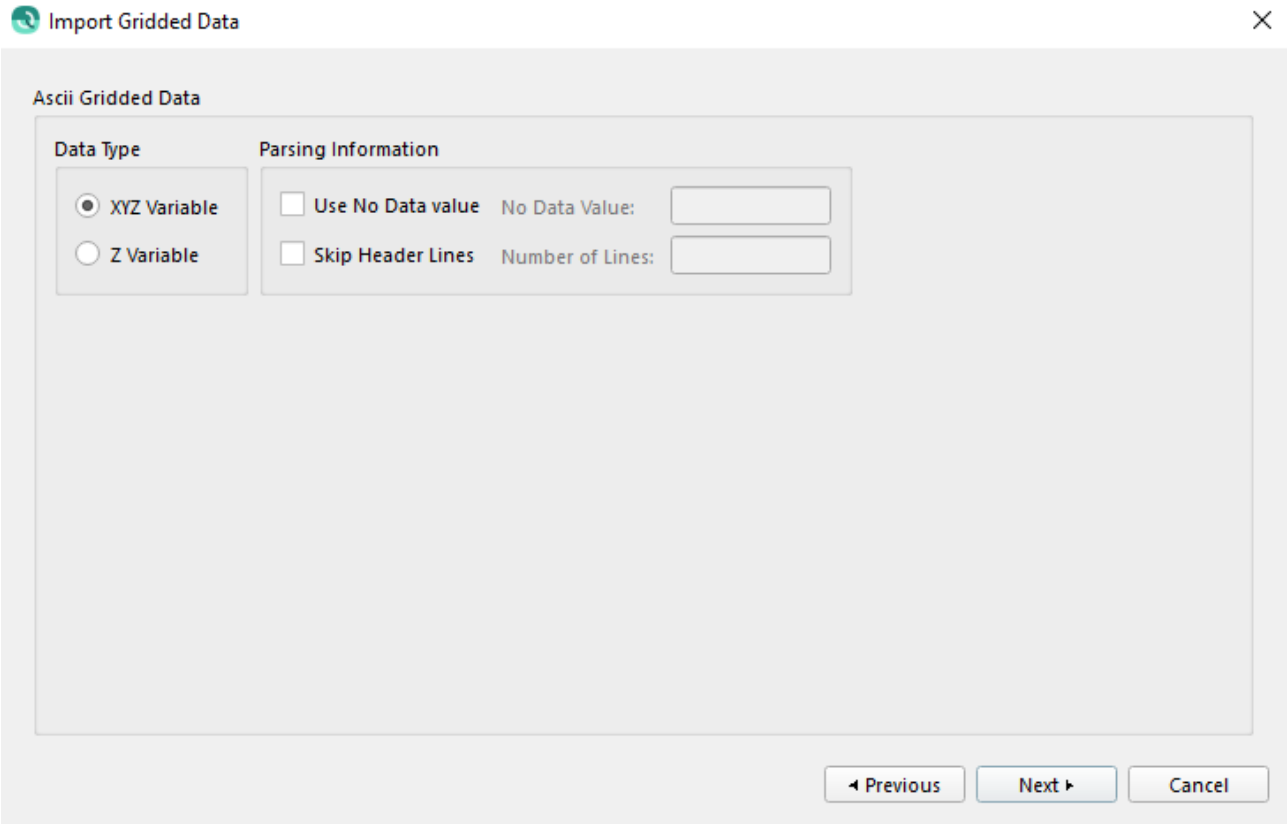

File Format
ASCII Gridded Data
ASCII Gridded Data Z Variable
ASCII Gridded Data XYZ Variable
QPS Grid
Grass GIS DTM Grid
GUTM Grid
Raw Binary Grid
USGS DEM
Input Coords
Grid Information (Bounds)
Z Range Information
Z Options and Output Coordinates
Output SD Options
ArcView ASCII
ArcView Binary
ASCII
ASCII Surfer
Bag/Open Nav Surface
BIL
Binary Surfer
USGS DEM
DTED
FM v6 DTM
ERS
FIN
GMT
Grass
GRI
GUTM
Isis
OMG
QPS
Raw Binary
FP GeoTIFF

Import Gridded Data File Type Page



This page is used to choose the file type of Gridded Data that is being imported.

ASCII Gridded Data Page



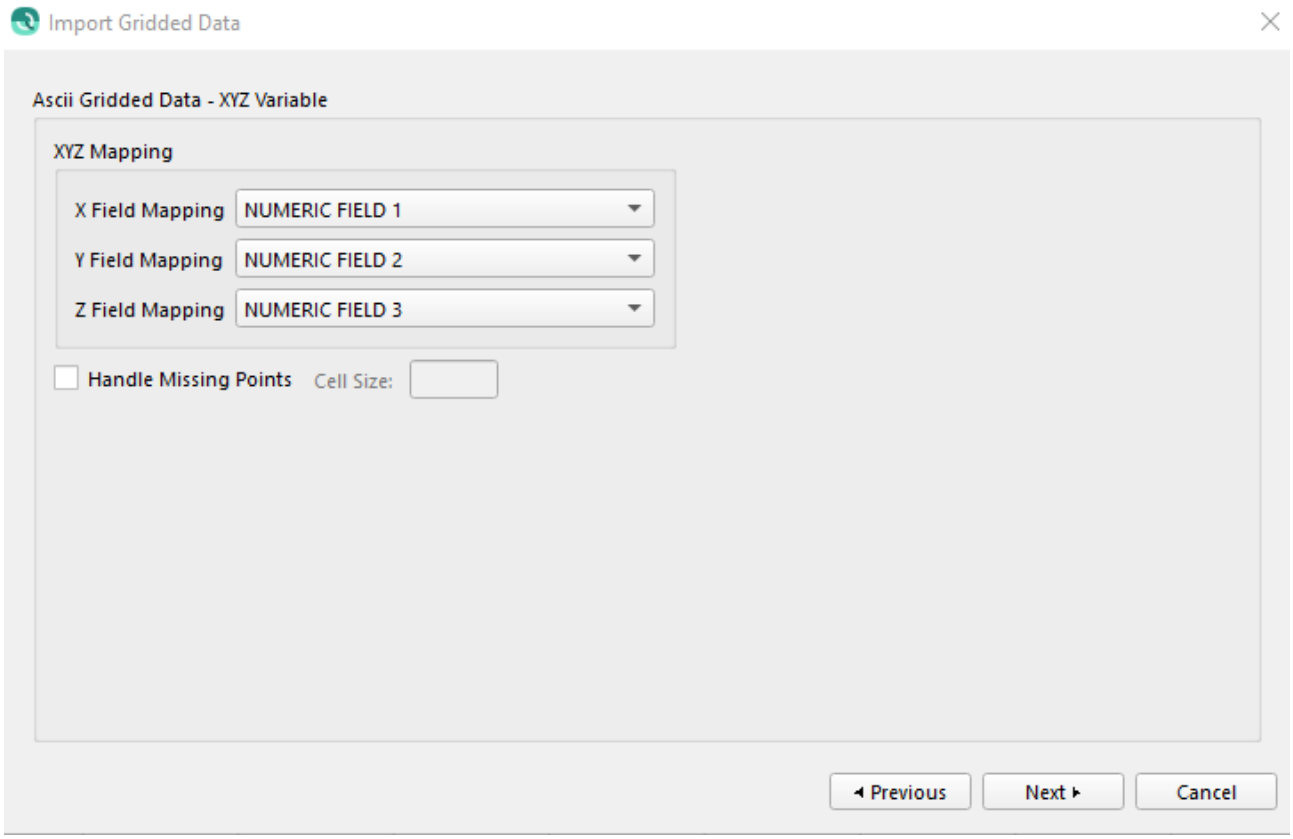
This page is used for gridded ASCII data that can contains either XYZ or Z values. The data in this file should start at the lower left corner moving up to the upper right corner, row by row (ie. South to North, West to East ordering). Fields in the ASCII file may be separated by spaces or tabs, not commas. All lines in the ASCII file starting with the character '#' are treated as comments. Normally information required to properly interpret the file, namely the number of rows and columns of the data, must be entered in the textfields provided; however, the converter attempts to automatically scan any comments at the beginning of the text file and extract the required information if available. If the ASCII file contains the lines "#NROWS = xxx" and "#NCOLS = xxx" then the dimensions can be read directly from the file by pressing Scan for Information. The converter is also smart enough to automatically recognize ascii export grid files produced from the ArcView software package.

You may wish to change the following optional settings:

1. A special Z value can be specified as a flag for missing data. If a Z value in the input file matches this special value then the associated data point will be flagged as missing in the output file. To use this option check the Use Special Value box and enter this special value in the textfield provided.

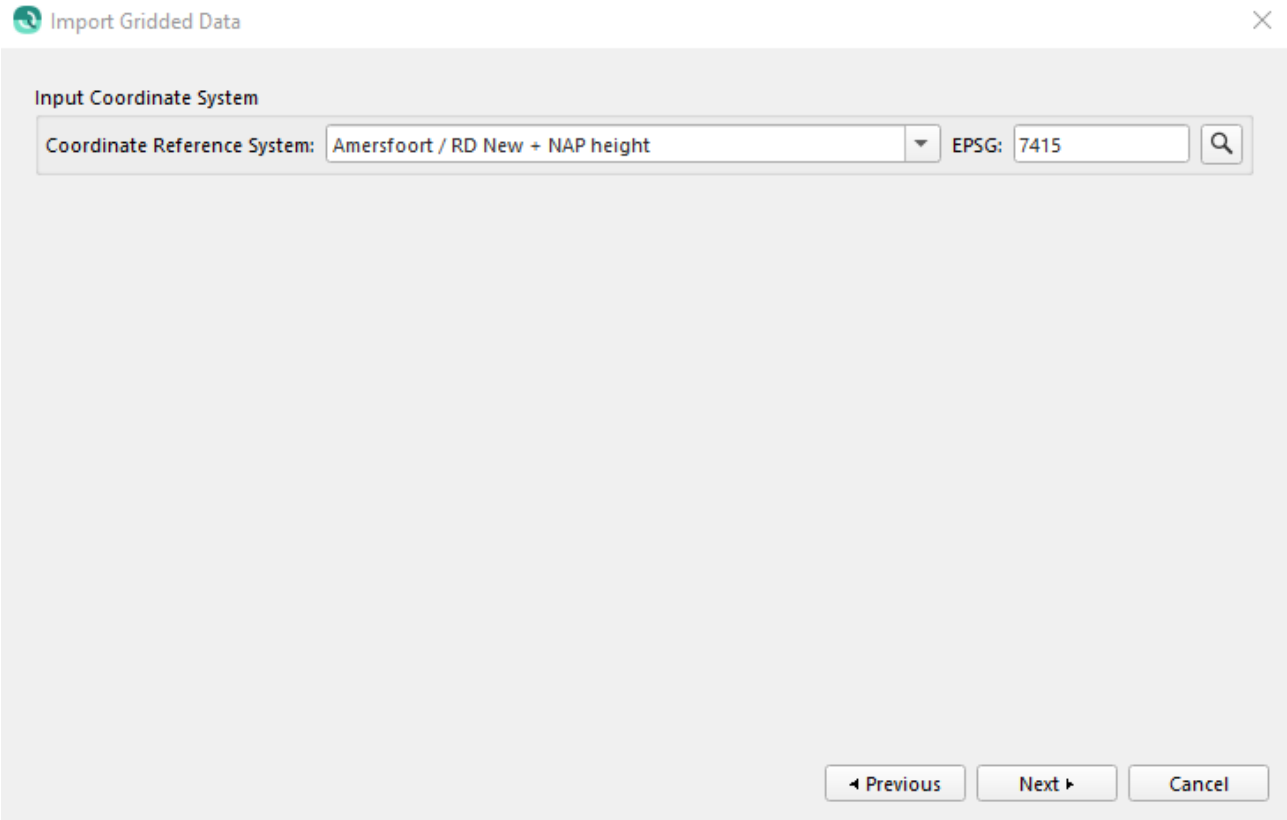
2. To ignore a set number of lines at the beginning of the ASCII file, check the Skip Header Lines option and enter the number of lines to skip in the accompanying text field. This option is useful because some ASCII files may contain header information at the beginning of the file that the converter cannot understand.
3. To check for missing data points in XYZ files check the Handle Missing Grid Points box. As Qimera scans the data it checks to make sure that each data point occurs. Any missing points are flagged as such in the output file. By default this option is not selected and it is assumed that the data file has all the required data points. To properly identify missing points, Qimera must be informed of the data cell size using the accompanying textfield.

ASCII Gridded Data - XYZ Variable Page



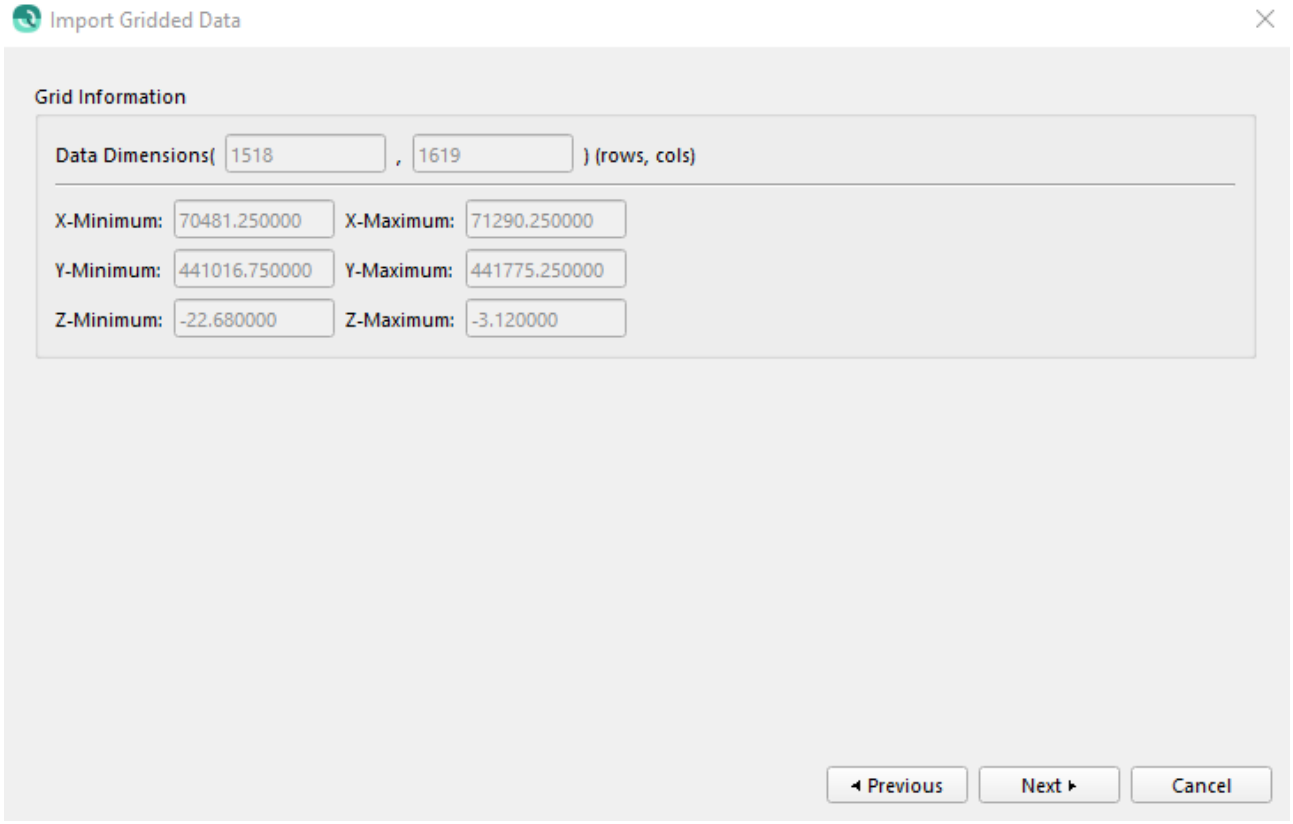
This page is used for gridded ASCII data that contains XY coordinates paired with any number of other variables to be visualized (e.g. temperature, pressure). Choose from the X, Y, Z field mapping from the list of dropdown fields. You can choose to reverse the ordering of the data rows in files containing only Z values. If your data is from north to south, this option allows you to read it in properly. To reverse the read order check the Reverse North/ South Order box.

Input Coordinate System Page



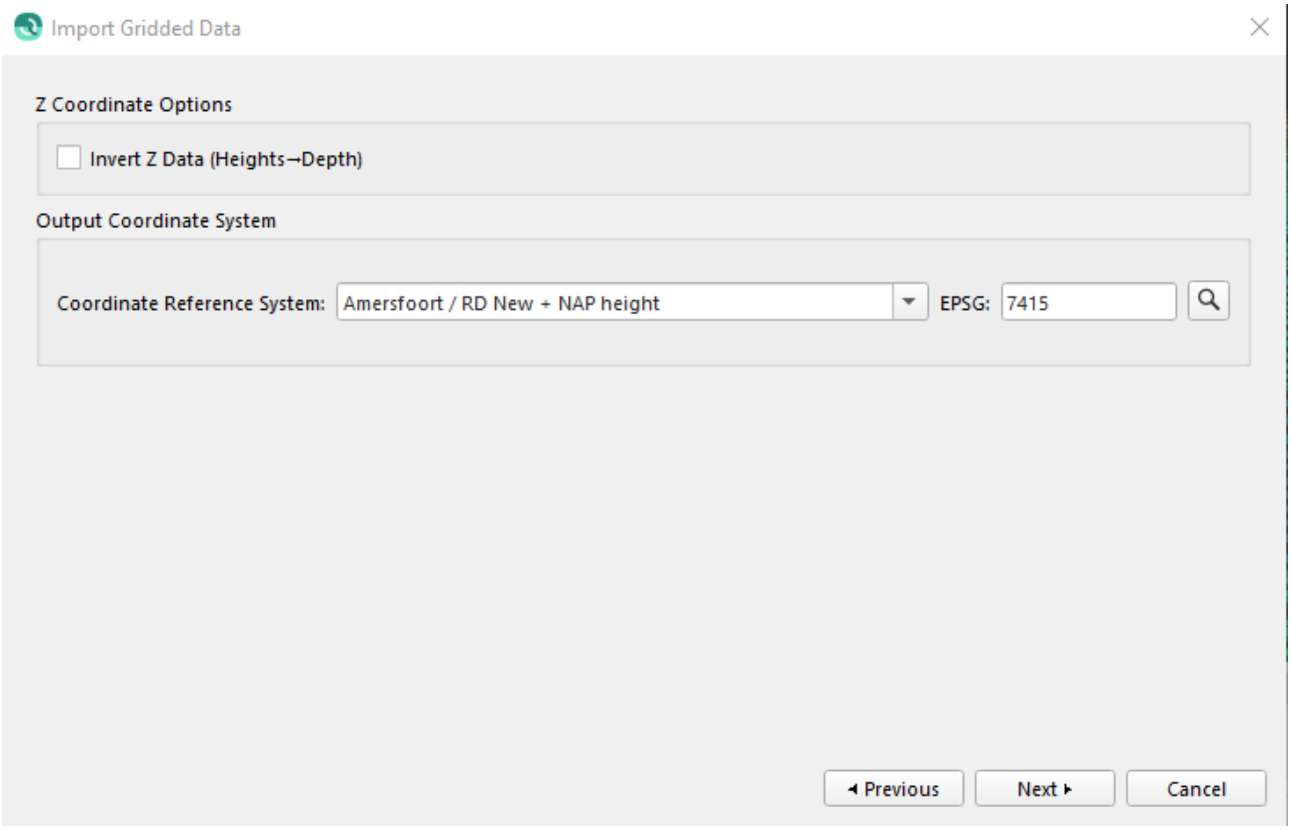
This page is used by all grid import types. This is the coordinate system of the gridded data. See the section on Selecting Coordinate Systems for more information.

Grid Information (Bounds) Page



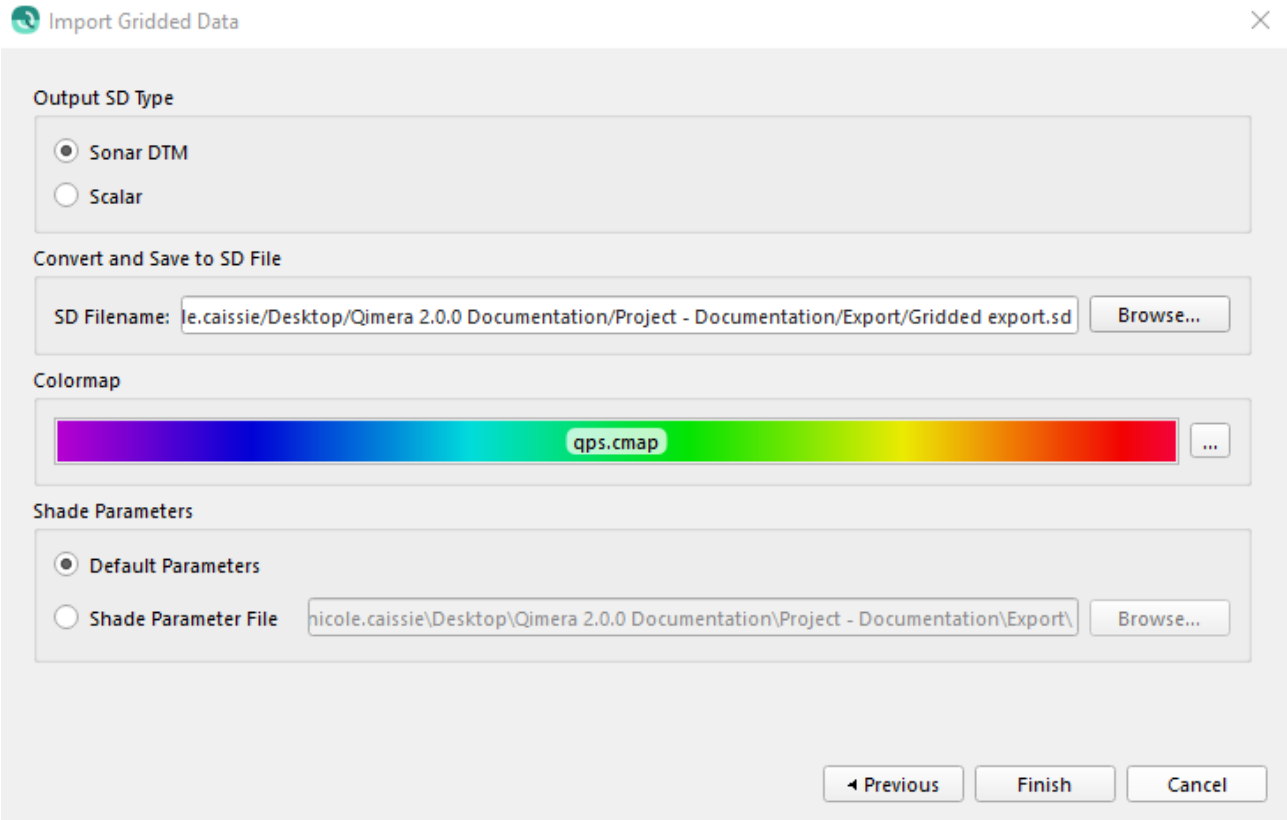
This page is used by all grid import types. This page shows what Qimera believes are the decoded bounds of the grid data.

Z Coordinate Options and Output Coordinate System Page



This page is used by all grid import types. This is the output coordinate system of the gridded data. Select your project coordinate system or Qimera will re-project the grid into the project coordinate system. See the section on Selecting Coordinate Systems for more information. You can also use this page to invert the Z values.

Output SD Type Page

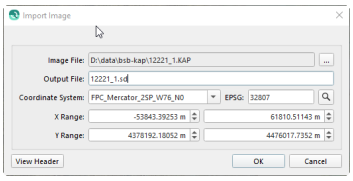


This page is used by all grid import types. You can select to product a Fledermaus DTM SD object or a Fledermaus Scalar SD object. You define the output filename as well as the default color map. When importing a Sonar DTM, you can also select the shading parameter options.

Return to: *Qimera Interface*

Return to: *Wizards and Dialogs*

Qimera Import Image Dialog



- How to Start
- What it Does
- General Description

How to Start

- *Import Image* option of the *Layer* menu in the Main Menu bar

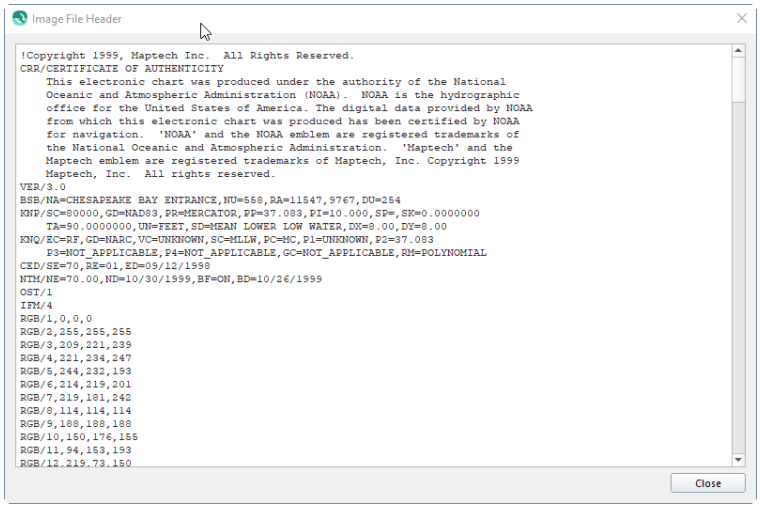
What it Does

This dialog imports an image into your project as a visual layer.

General Description

The *Image File* section displays the current image file name so that you can use the "..." to change to a new file if the file cannot be parsed. The coordinate reference system displays the coordinate system extracted from the image file (i.e. Geo TIFF). If this is not correct, change it via the "..." button and use the Coordinate System Selection dialog. The X/Y range defines the bounding box of the image. If you wish to import part of the image, modify these values accordingly. This importer will create a Fledermaus SD image object and it will be added to the scene. It will appear under the *SD Objects* node of the Project Layers window.

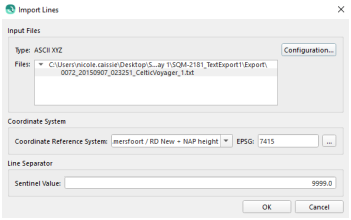
For images that have an ASCII text header, i.e. BSB/KAP images, the View Header button will appear. Clicking this button will show the ASCII header as it is stored on disk. The following is an illustration of the ASCII header dialog that appears after clicking View Header:



Return to: Qimera Interface

Return to: Wizards and Dialogs

Qimera Import Lines Dialog



- How to Start
- What it Does
- General Description

How to Start

- *Import Lines* option of the *Layer* menu in the Main Menu bar

What it Does

This dialog imports 2D or 3D polylines from ASCII files into your project as a visual layer.

General Description

After selecting a file, the Custom ASCII File Configuration dialog is automatically be shown. Later, pressing the *Configuration...* button shows the dialog again.

The *Coordinate System* options section is used to define the coordinate system of the input data. See the Coordinate System Selection dialog for more information.

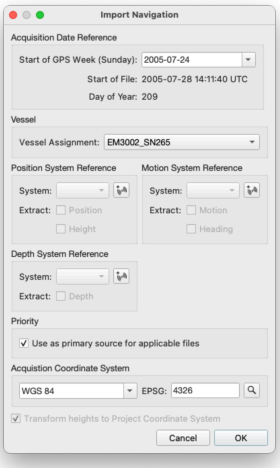
If the data file contains multiple polylines, specify the line separator *Sentinel Value* which is used to separate those polylines.

The import will create a Fledermaus SD line object which will be added to the scene and appear under the *SD Objects* node of the Project Layers window.

Return to: Qimera Interface

Return to: Wizards and Dialogs

Qimera Import Navigation Configuration Dialog



- How to Start
- What it does
- General Description
  - POSPac Data
  - Vessel
  - Position, Motion, Depth and Pressure System Reference
    - Creating a new System
    - Using an existing system
  - Importing an SBET as a depth
  - Priority
  - Acquisition Date Reference
  - Acquisition Coordinate System
  - Transform heights to Project Coordinate System
  - Delayed True Z and True Heave
  - Delayed Heave

How to Start

- *Add Binary Navigation Files* option of the *Source* menu in the Main Menu bar.

What it does

The *Navigation Import Configuration* dialog is for importing navigation data logged or processed with third party software. See Position and Motion Formats for supported data types.

General Description

The dialog has several sections, these are explained below.

POSPac Data

When importing POSPac SBET files, 'sbet' must be part of the base name of the file. The base name is the part of the file path preceding the extension and after the directory.

Applanix's POSPac creates SBETs which can also have an associated RMS file. This RMS file contains standard deviation information that Qimera can then use and display. This file is however not necessary in order to process the SBET into imported data.

Qimera will automatically search for the SBET's associated RMS file. If the RMS file is not found Qimera will inform the user within the Job Activity Dock.

Example of message in Job Activity Dock: "Info: No matching RMS file found for: **SBET FILE NAME"

If you have an associated RMS file, it must have the same naming except that 'sbet' is replaced with 'smrmsg' (and it must reside in the same directory). If this naming convention is not used, Qimera will not be able to auto-recognize the file type.

POSMV Data

POSMV logged data can have any filename extension. The default is .000, .001, etc but extensions like .nav or .bin will also work.

Vessel

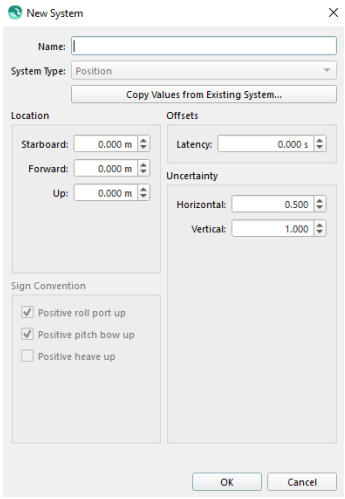
Navigation data must be attached to a vessel. Simply select the vessel from the dropdown for which the navigation is being imported.

Position, Motion, Depth and Pressure System Reference

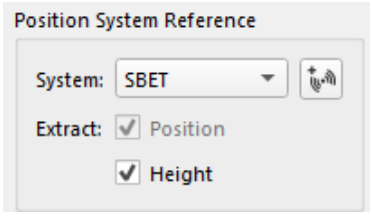
All imported navigation data must be attached to a new system. If you have not imported navigation data previously in the project you will need to create new systems for import data types. Otherwise you can use previously configured systems. After systems are created they can be further modified in the Qimera Vessel Editor.

Creating a new System

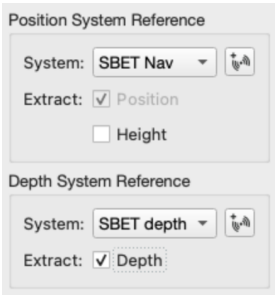
1. To create a new system click the  button next to the system drop down.



2. After reviewing and accepting values in the *New System* dialog the new system should be shown in the dropdown. Check the data types that are to be extracted into the system.



or



Using an existing system

If you previously imported ASCII data the systems created during the import will be listed in the *System* drop down. Simply select the appropriate system and check the import data types.

Using an existing systems means all settings will be identical. If different uncertainty or offset settings for the system may be needed it is advisable to create a new system with copied settings.



Importing an SBET as a depth

If a depth system is created, the option exists to import the SBET as a depth system instead of a height. Only one of the height & depth checkboxes can be checked at the same time. The vertical value in the SBET will have any model shifts applied (just like the heights would be) and will be usable as a platform depth instead of a height. Just like heights, the depth must be brought in with the position so model shifts can be applied.

If the priority checkbox is checked, the following settings will be changed automatically:

- the new system will be added to the top of the list in the Depth Source Priorities.
- If there is a valid tide for given raw sonar file, the Vertical Referencing Method will be set to 'Tide'.

These settings are in the Processing Settings dialog.

Priority

When checked this option will make the imported systems take the highest priority in the Processing Settings Dialog.



This option is checked by default.

For formats that have depth and pressure observations, such as Kongsberg NavLab, depth will alway take the highest priority. If pressure is desired to be highest priority, you will need to uncheck the Depth Source Priorities in the Processing Settings Dialog.

Acquisition Date Reference

For formats that use relative time references, such as POSPac and POSMV, an absolute time reference is needed. The time is stored as GPS seconds-of-week so the week in which the data was logged is needed.

The *GPS Week* dropdown shows a calendar date picker. The date-selector also accepts inputs via keyboard hot-keys and numeric keystrokes. The hotkeys for moving between yyyy , mm , dd are tab or ctrl+right , shift+tab or ctrl+left. The hotkeys for moving within the yyyy mm dd are left, right. The hotkeys for changing the values are `up` and `down`

Pick the Sunday of the week during which the data was collected.

Based on the picked week the computed start of the earliest file being imported will be shown below the dropdown.

For formats that store the full time reference, such as Kongsberg NavLab, SRH (PFreeHeave), SBTC and SBIC, the Acquisition Date Reference will only show the Start of File and Day of Year for reference. No need to pick the GPS Week.

SBTC note: SBTC navigation files are in GPS time. Qimera uses a lookup table to compute the number of leap seconds between UTC and GPS time. If the table is not up to date, a positional data shift may be noticeable in the surface.

To fix this shift, the user can apply a latency value of 1 second in the vessel editor and re-nav the source files. This latency value should be applied to the new Position and Motion Systems created upon import of the binary navigation.

Acquisition Coordinate System

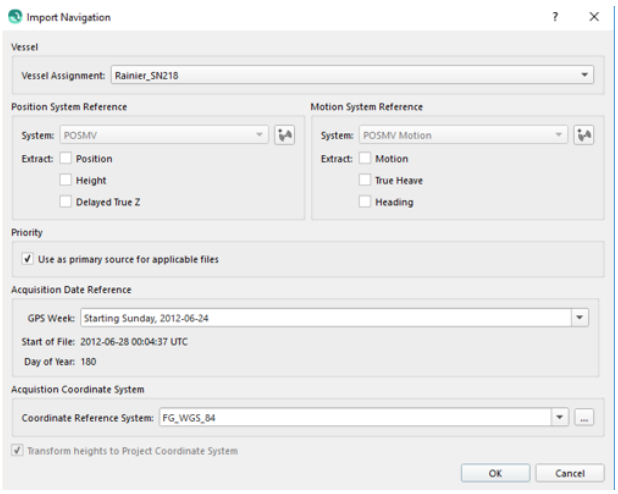
Specify the datum of the data being imported. Navigation data will be converted to the project datum specified in the Project Properties Dialog.

Transform heights to Project Coordinate System

This is checked by default. If unchecked the heights with have no geodetic transform applied and thus be referenced to the Acquisition Coordinate System.

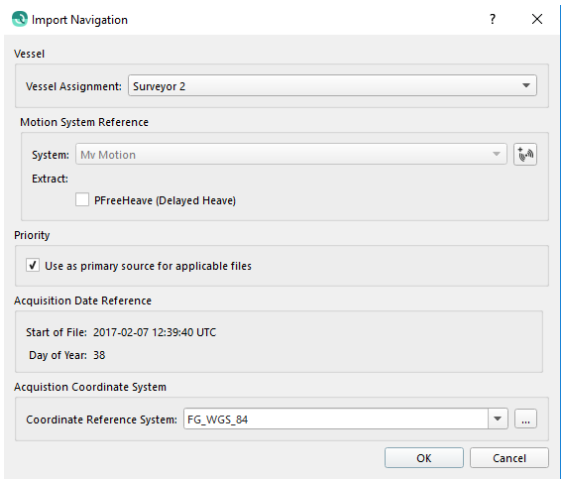
Delayed True Z and True Heave

When importing from an Applanix POSMV file, you have the additional option of importing Delayed True Z or True Heave. The True Z import requires logging group 114 (True Z and True Tide data) during acquisition, while the true heave import requires the logging of group 111 (Heave and True Heave data).



Delayed Heave

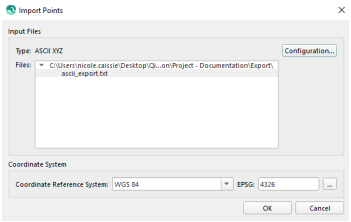
When importing from a Kongsberg PFreeHeave (SRH) file, you have the option of importing PFreeHeave if the appropriate packet is looged to the file.



Return to: *Qimera Interface*

Return to: *Wizards and Dialogs*

Qimera Import Points Dialog



- How to Start
- What it Does
- General Description

How to Start

- *Import Points* option of the Layer menu

What it Does

This dialog imports points from ASCII or processed point files into your project as a visual layer.

General Description

If the selected file is a plain text file, the Custom ASCII File Configuration dialog will automatically be shown.

Pressing the *Configuration...* button will relaunch the Custom ASCII File Configuration dialog if the selected file is plain text. Otherwise, is will show a field mapping dialog to control which input fields will be used to populate which point attributes.

The *Coordinate System* options section is used to define the coordinate system of the input data. See the Coordinate System Selection dialog for more information.

The import will create a Fledermaus SD point object which will be added to the scene and appear under the *SD Objects* node of the Project Layers window.

Return to: Qimera Interface

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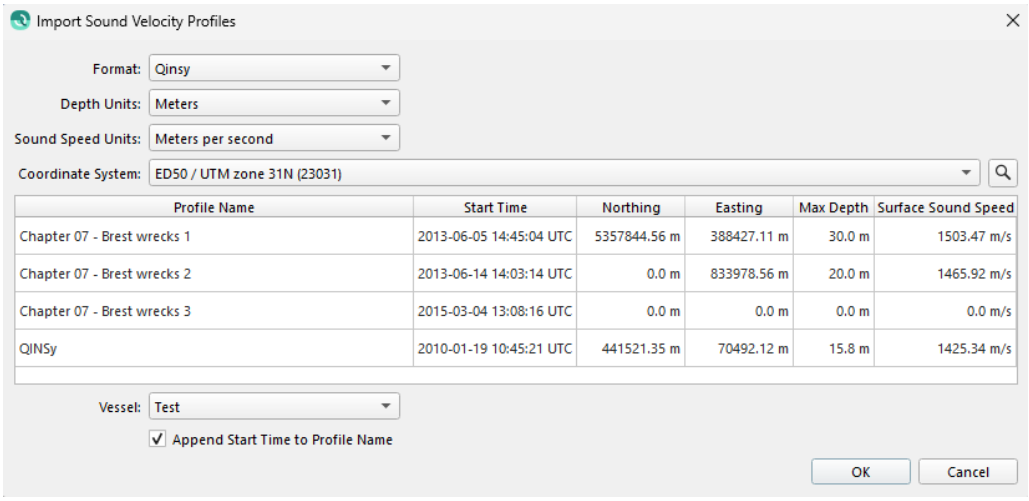
Qimera Import Sound Velocity Profiles Dialog



How to Start

- *Import SVP Files* option of the *Source* menu in the Main Menu bar

What it Does

This dialog is used to batch import all types of SVP files.

General Description

This dialog handles the import of Kongsberg, Qinsy, Reason, Hypack, Caris and ASCII SVP files.

The dialog has several sections, these are explained below.

Format

The type of SVP file. This type should be automatically detected based on the selected files.

Depth Units

The depth units. Can be set to feet or meters. This should be automatically detected.

Sound Speed Units

The sound speed units. Can be set to feet per second or meters per second. This should be automatically detected.

Coordinate System

If you are specifying position of the SVP, you will need to provide the coordinate frame that the position is referenced to.

SVP Table

Profile names can be updated here. For certain file type the position and start times can be set here. Alternately, you can configure this at a later stage in the SVP Editor.

Vessel

The SVP will need to be assigned to a specific vessel, choose the vessel from the combo box in this section of the dialog.

Appending Start Time

If this box is checked, the imported profile names will be appended with their start time.

Return to: *Qimera Interface*

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Qimera License Status Dialog

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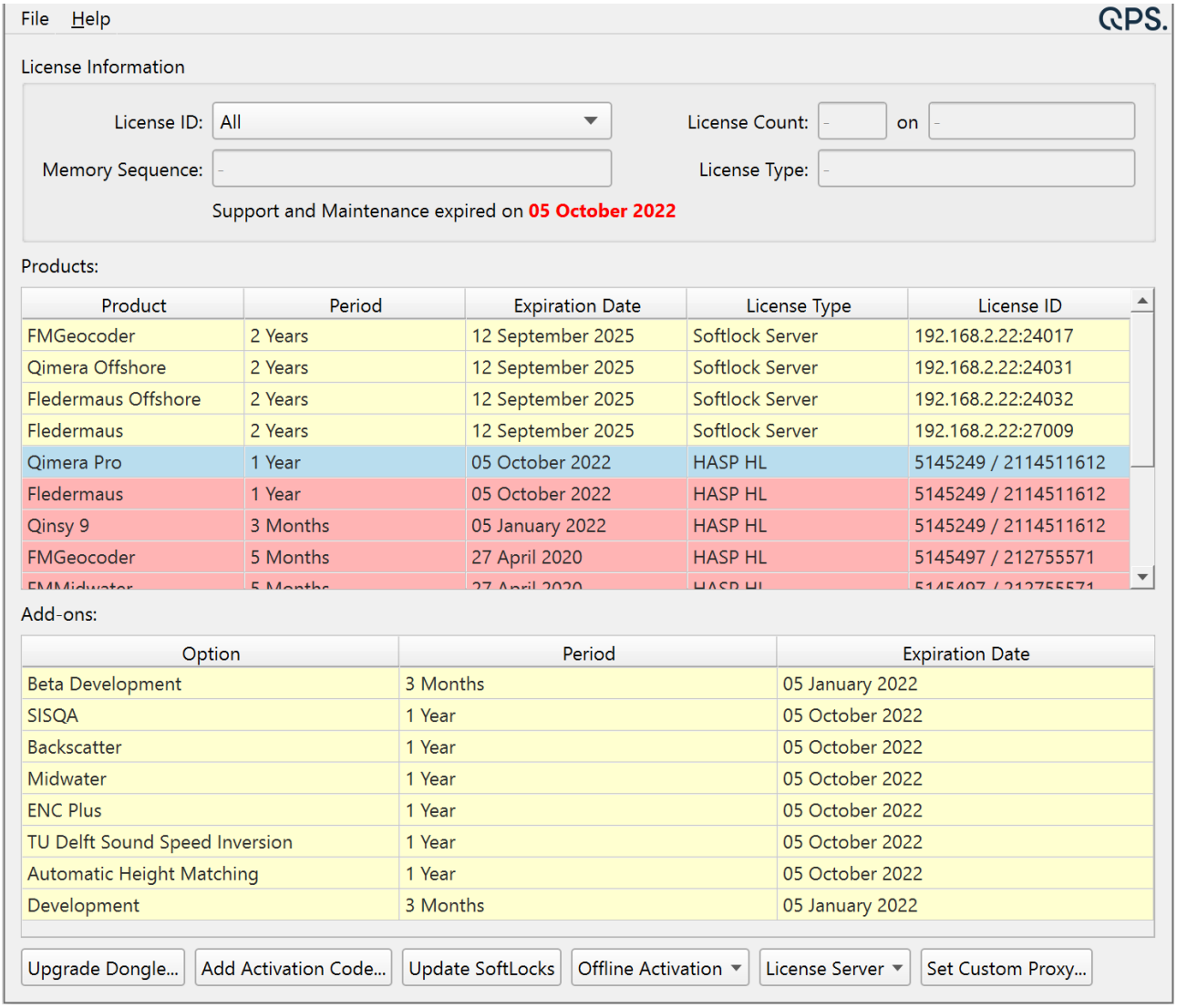
  - Add Activation Code
  - Update Softlocks



How to Start

1. Launch the standalone license-manager.exe located in C:\Program Files\Common Files\QPS\License-Manager OR
2. Launch the License Manager from each QPS Application
   a. Window/Linux - View License Status... under Help Menu in the Menu Bar
   b. macOS - View License Status... under the Application Name in the Menu Bar

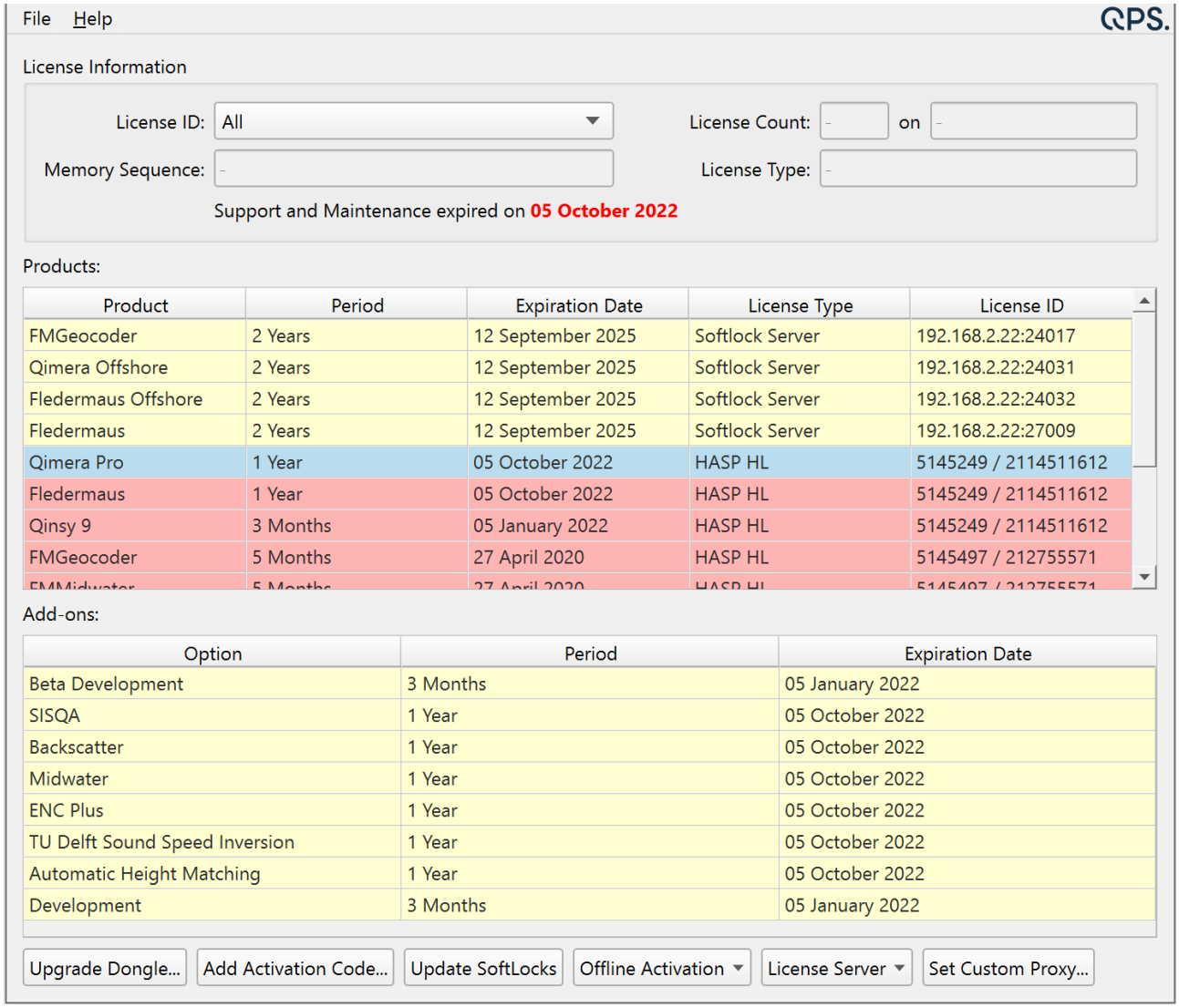
What it does

This dialog manages QPS product licenses across its entire software suite.

General Description

In order to run any software in the QPS Suite, a valid license must be available for the software application.
QPS applications currently support Softlock and HASP Dongle licenses that are fully integrated into the License Status Dialog.
When you purchase a QPS software application you will be provided with licenses of your choosing.

License status



License Information

The *License Information* group contains information for the currently selected license in *License ID* combo box.
Selecting a License in the *License ID* combo box will filter the *Product* table to only contain that license.

Product

The *Product* table contains information for all HASP and Softlock product licenses attached to the device.
If a Softlock license is no longer needed on the device it can be deactivated using the *Deactivate* combo box cell and selecting online or offline deactivation.

Add-Ons

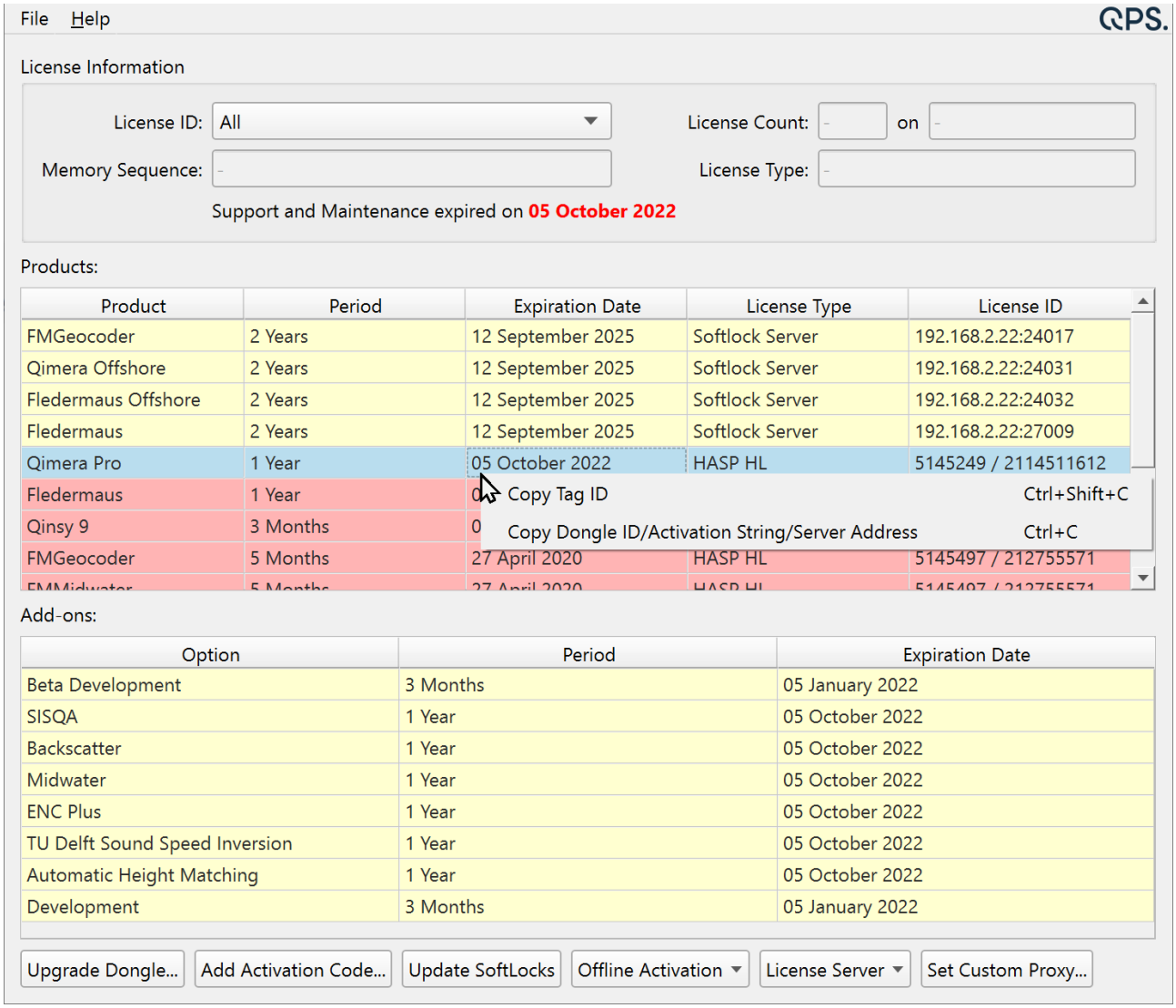
The *Add-Ons* table displays any additional functionality your License may offer for a particular product line.
Selecting a License in the *Product* table will filter the *Add-Ons* for the selected License.

Copy License ID or Tag ID

In the case that a license ID needs to be conveniently copied from the License Manager, simply right click (click with the right mouse button) on the product for which the license ID is to be copied, then select one of Copy License ID or Copy Tag ID.
The option to select depends on what is to be copied. The Tag ID is one of the following: for dongles, it is the number that appears on the printed tag attached to the physical dongle, for softlocks, it is the 7 digit number like a virtual tag ID starting with the digits 520, for servers, this is the same as the license ID.
The license ID is one of the following: for dongles, it is the number electronically associated with a dongle, shown in tandem with the tag ID in the display separated by a slash; for softlocks, it is the 28 character activation code separated with dashes, not including the product number or name' for server licenses, this is the location of the server for that product.

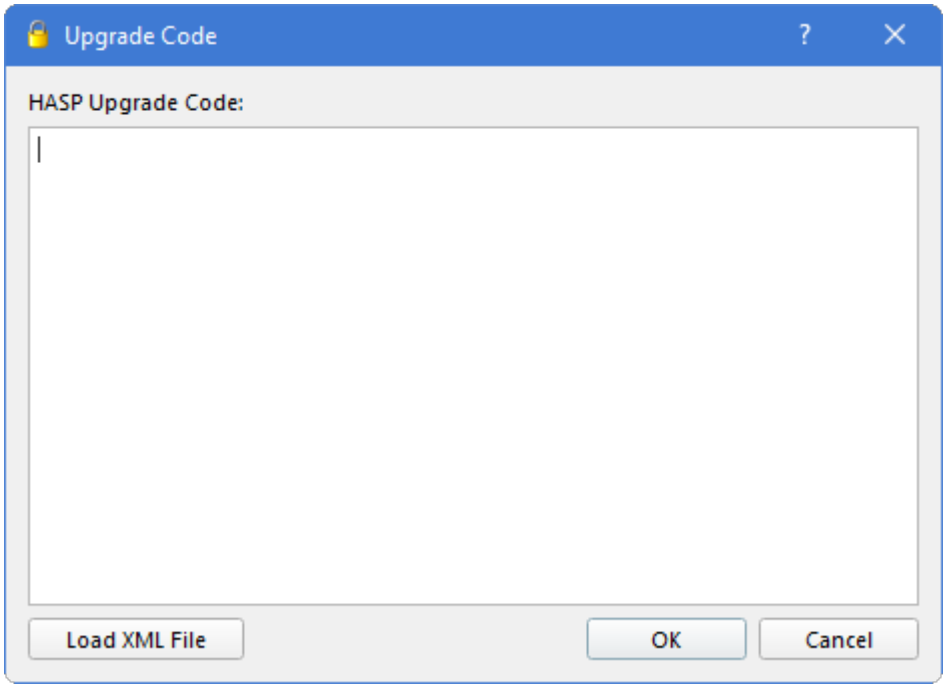
Shortcut keys are available. It is sufficient to click on the product row, then press the control, shift and C keys together (Ctrl+Shift+C) to copy the tag ID. The license ID may be copied as before in v1.2 by pressing Ctrl+C.

See an example of the right click menu in the following:



Upgrade Dongle

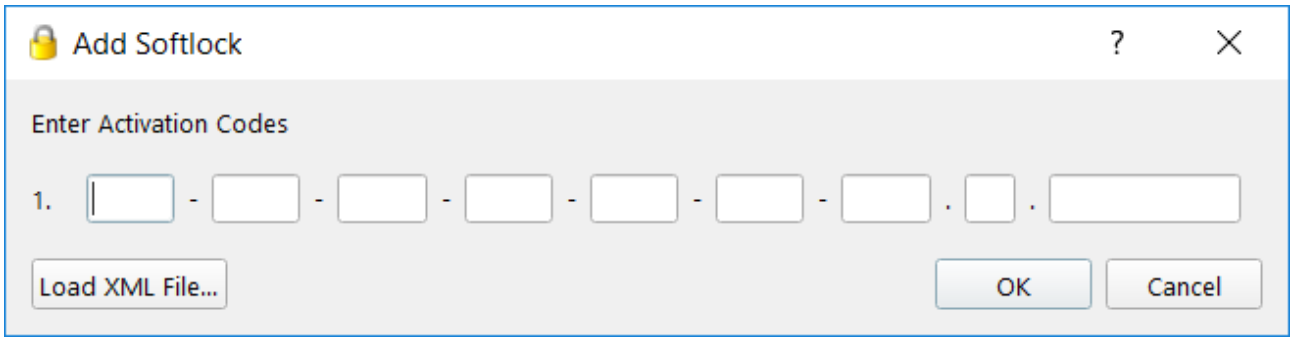
Selecting a HASP dongle from the License ID combo box will enable the button to *Upgrade Dongle*.
QPS will provide a HASP Upgrade code that will have to be entered or loaded into the Upgrade Code Dialog Window.



Press *Load XML File* to browse for the file. When you open it, the code will automatically be loaded into this window.
After pressing *OK* the dongle will be upgraded and will be ready for use.

Add Activation Code

This is meant only for Softlock licenses.



Selecting the *Add Activation Code...* button launches a new dialog to add a new Softlock License obtained through QPS.
The Softlock license key can be entered manually, pasted into the first text field, or loaded with an appropriate XML file using the *Load XML File* button.
Clicking *OK* will apply the new Softlock License for use.

Be connected

An active Internet connection is required for the activation to complete.

In exceptional cases an offline activation may be used. The file created during offline activation must then be sent by Internet to QPS. The file can be sent from another computer or network.

Update Softlocks

This will refresh an existing Softlock.

At the moment of writing (August 2019) only the newly added product licenses will be visible.

The product licenses already available on the Softlock will be invisible.

They need to be added manually from the old *.xml file and can be used from there onward.

This means you will need to store the Soflock activation codes for later use.

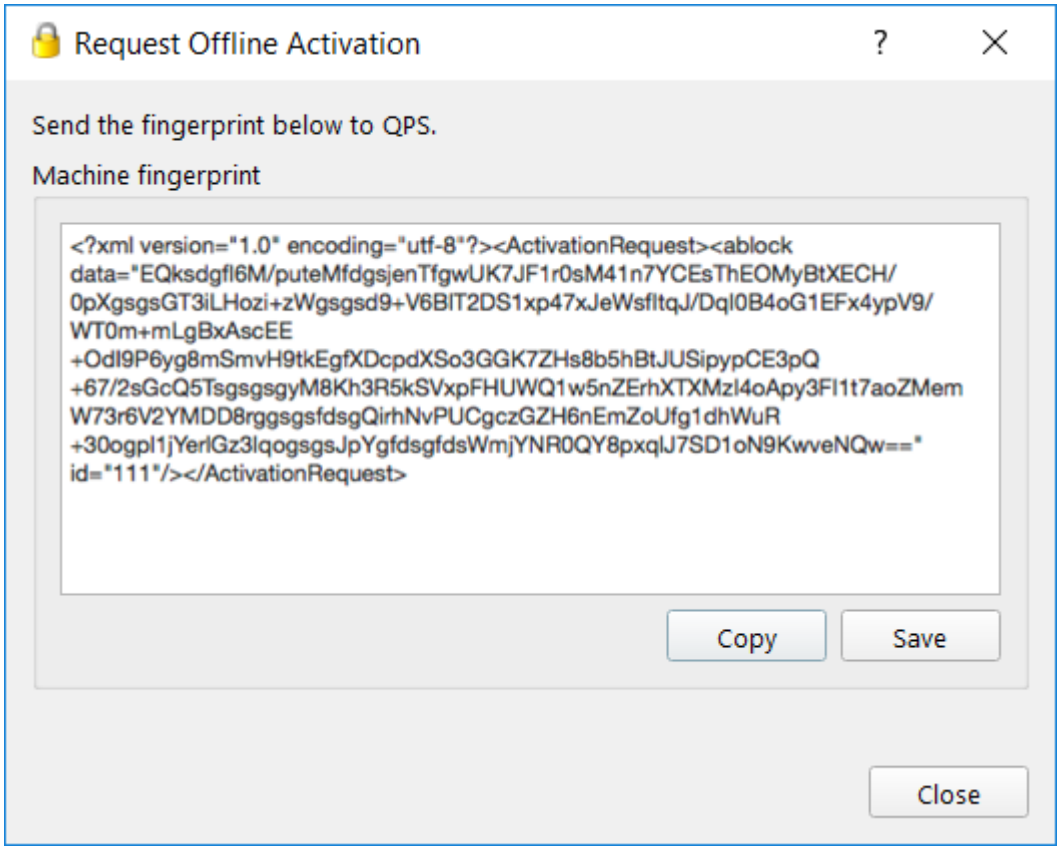
If changes have been made to a Softlock License, for example new Add-Ons requested, the local Softlock License will have to be updated.
This can be done manually using the *Update Softlocks* button.

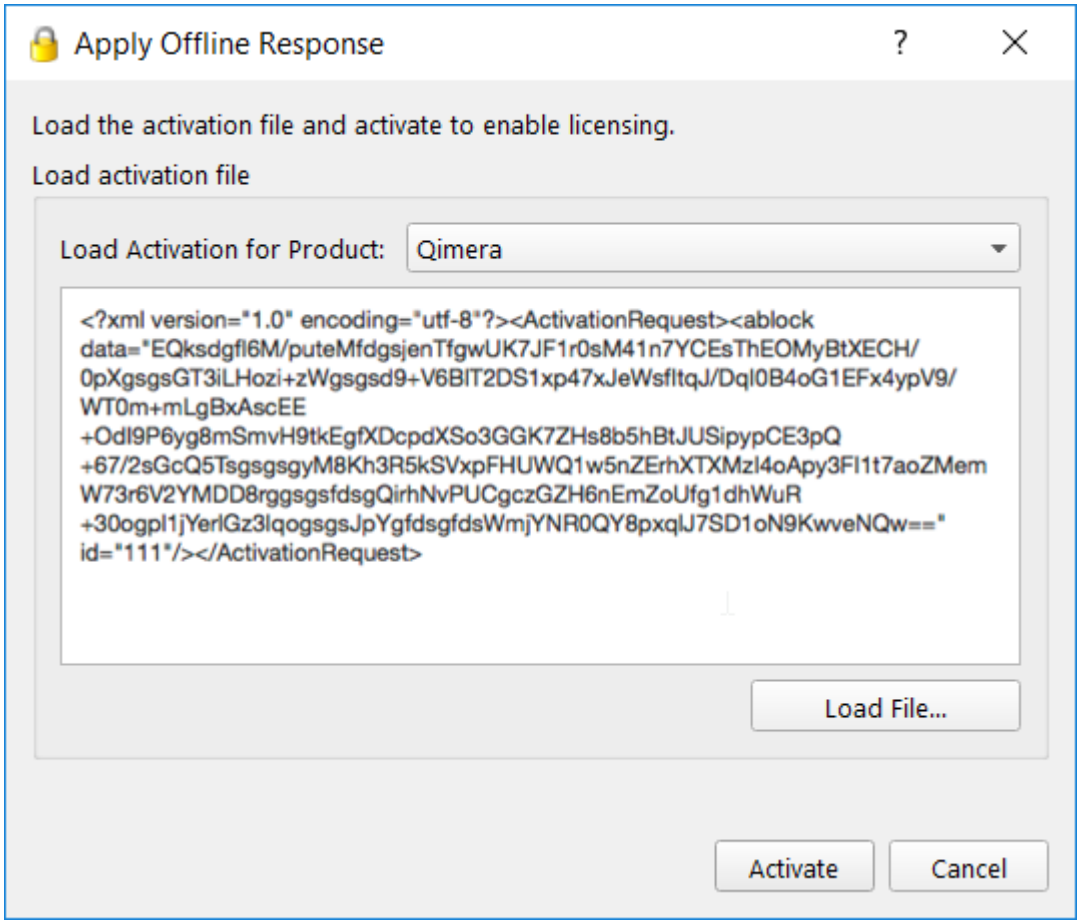
Softlocks are automatically updated whenever a licensed application is started and when the License Manager is opened, if the computer with the application is connected to the Internet. So, in general it should not be necessary to use the *Update Softlocks...* button. However, if the need arises, the status of the licenses may be easily updated by clicking *Update Softlocks...*.

Offline Activation

This option will only be offered in exceptional cases.
An Offline Activation code will only be supplied for a limited time, approximately 1 year, or for the time the license is valid.

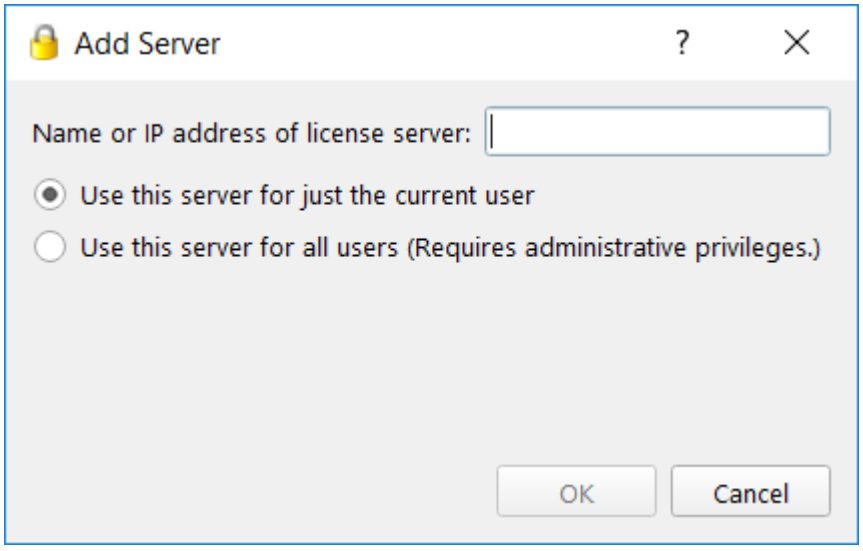
In the event of limited internet connectivity *Offline Activation* can be performed by clicking the *Offline Activation* button.
After selecting *Generate Request...* you will be required to enter your QPS supplied Softlock Product Key which will generate an XML formatted machine fingerprint that must be provided to QPS.
QPS will then provide an XML formatted activation string that can be applied using the *Apply Response...* option of the *Offline Activation* button.


Request Offline Activation
?
Send the fingerprint below to QPS.
Machine fingerprint
<?xml version="1.0" encoding="utf-8"?><ActivationRequest><ablock
data="EQksdgfl6M/puteMfdgsjenTfgwUK7JF1r0sM41n7YCEsThEOMyBtXECH/
0pXgsgsGT3iLHozi+zWgsgsd9+V6BlT2DS1xp47xJeWsfltqJ/Dql0B4oG1EFx4ypV9/
WT0m+mLgBxAscEE
+OdI9P6yg8mSmvH9tkEgfXDcpdXSo3GGK7ZHs8b5hBtJUSipypCE3pQ
+67/2sGcQ5TsgsgsgyM8Kh3R5kSVxpFHUWQ1w5nZErhXTXMzl4oApy3FI1t7aoZMem
W73r6V2YMDD8rggsgsfdsgQirhNvPUCgczGZH6nEmZoUfg1dhWuR
+30ogpl1jYerlGz3lqogsgsJpYgfdsgfdsWmjYNR0QY8pxqlJ7SD1oN9KwveNQw=="
id="111"/></ActivationRequest>
Copy
Save
Close



Connect to Server

This option is meant for IT managers.



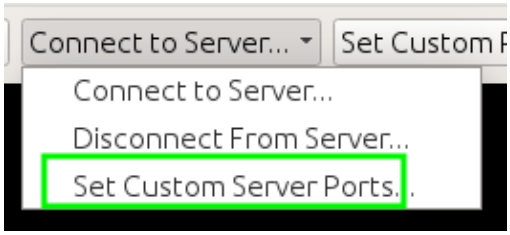
If a license server has been configured it can be used to distribute licenses over a network. Enter the IP address of the license server and select the appropriate user option and select *OK*.

Disconnect from server

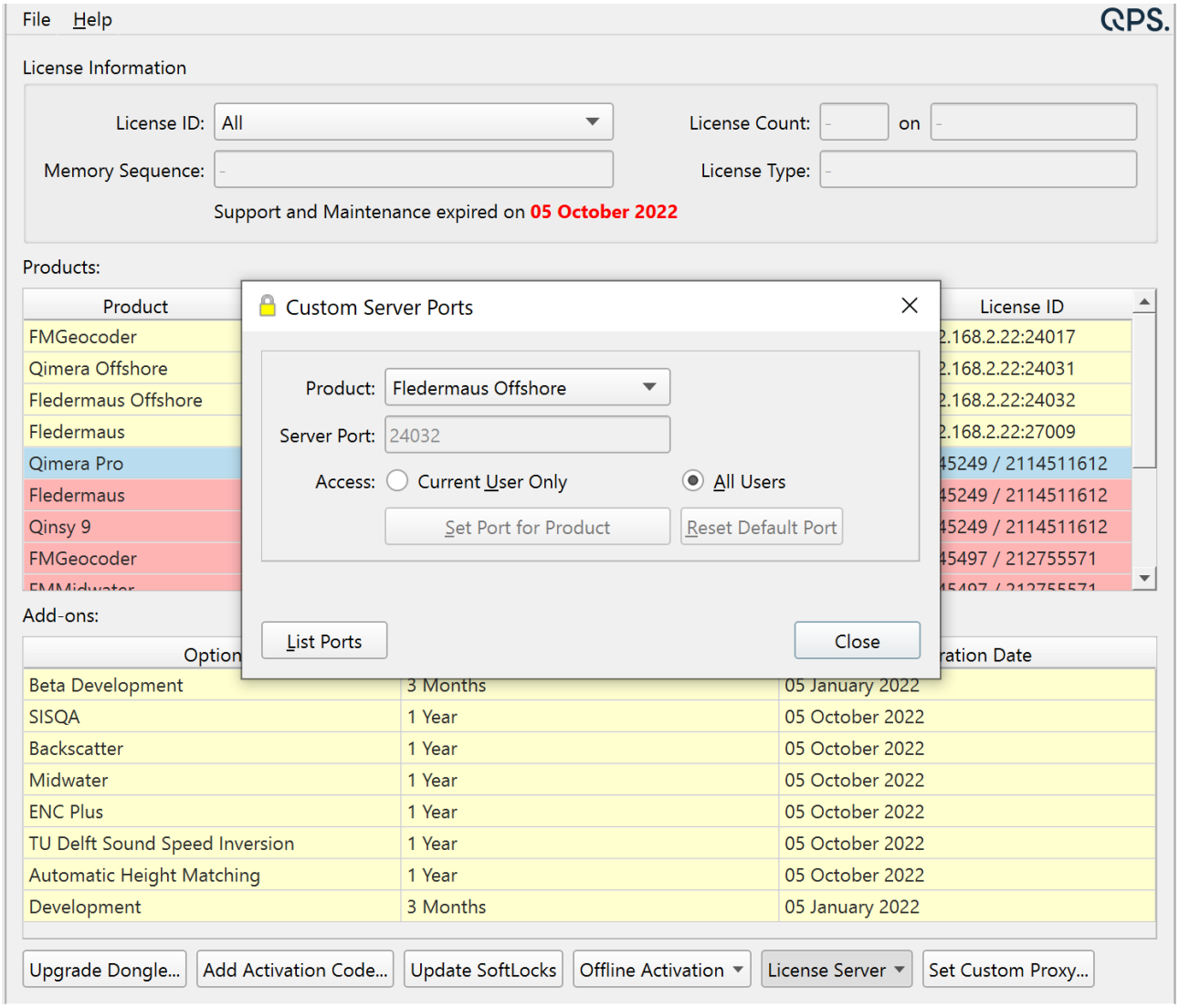
If a license server has been connected to in the past this option will become available even if the server is offline.
Disconnecting from a server will prompt the user to confirm the requested disconnect. It should be noted that the licenses will remain active until the application is closed.

Set CUSTOM PORTS

It is possible to set the ports used to connect to the server on a case-by-case basis. The default ports used range from 24000 to 24033 at this time, though only ports 24011 to 24033 may actually be used.
In future, lower port numbers (down to 24000) may be used.



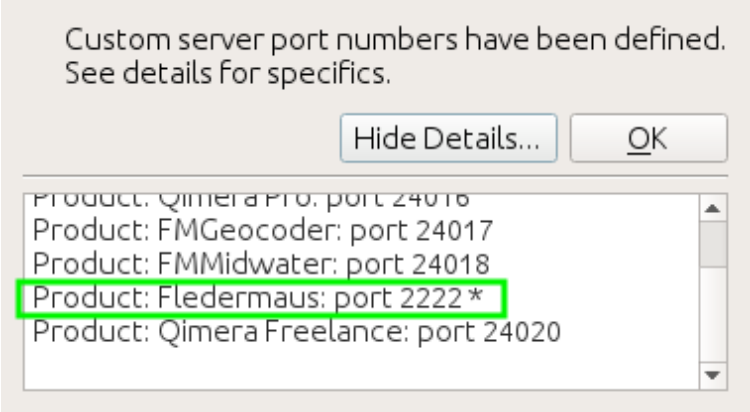
The port used by any product may be changed by selecting the Set Custom Ports menu item from the Connect to Server button menu. Select the product and desired port number, then click Set Port for product.
The port used for licensing for that product (and any other chosen products) will be changed. The default port number for a selected product can be easily restored by clicking on the Reset Default Port button.
Any products that are currently running must be restarted for the changes to take effect.



Note: The server port can be changed by any user when using the *Current User Only* access level. However, only when License Manager is *Run As Administrator* can the ports be changed for *All Users*. For regular users, select *Current User Only* to change the port. Administrators may change the port used for all users on the current machine only by starting License Manager with *Run As Administrator*. Otherwise, the *Server Port* field will be read-only and cannot be changed.

A list of ports used by each product can be retrieved by clicking the List Ports button. The port used by each product will be listed next to the applicable product. Custom ports will be highlighted with a star ``*'' next to any product that has a custom port.

In the example attached, note that Fledermaus was assigned port 2222 and a star appears next to the port number.



Care should be taken that no two products use the same port. The port number for the product must match the port number set in the matching configuration file for the product, TurboFloatServer-config.xml.
The configuration for the Fledermaus server would in this case be configured as seen here (where the configuration is boxed in green). Note that the port used for both the client and the server are the same.

```
<?xml version="1.0" encoding="utf-8"?>
<config>
        <!--
                Setup the port you want the TurboFloat Server to bind to.
        -->
        <bind port="2222"/>
```

TurboFloatServer-config.xml

Set Custom Proxy

This option is meant for IT managers.

By default, License Manager uses whatever proxies your users have set for their system. Where License Manager reads these proxy settings from differs between operating systems:

- Windows: The proxy settings are read from Internet Explorer.
- Mac OS X: The proxy settings are read from the system internet settings.
- Linux: The proxy settings are read from the environment variables `http_proxy` or `all_proxy`.

You can overwrite the default system proxy settings by specifying a proxy server address. When using custom proxies they must be in the form Proxy in the form: http://username:password@host:port/

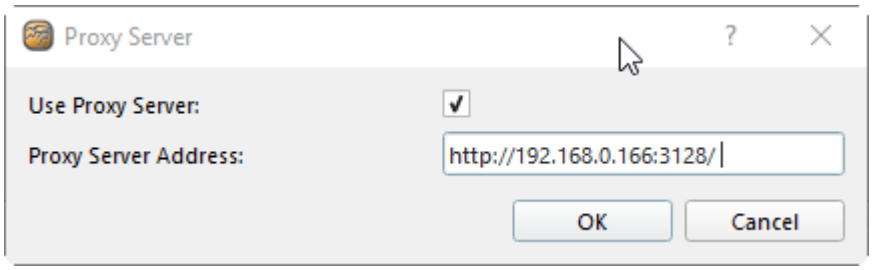
- Example 1 (just a host): http://127.0.0.1/
- Example 2 (host and port): http://127.0.0.1:8080/
- Example 3 (all 3): http://user:pass@127.0.0.1:8080/

Note: If the port is not specified, License Manager will default to using port 1080 for proxies.

- To set a custom proxy simply check 'Use Proxy Server' and specify a proxy server address and press OK.
- To clear a previously set custom proxy simply uncheck 'Use Proxy Server' and press OK.

License Manager also support NTLM proxies on Windows. To use NTLM proxies you must also specify the domain. For example:

http://DOMAIN\username:password@host:port/



Commandline Activation

The commandline can be used to activate a softlock license in an automated manner. The -silent option in conjunction with the -activate option can be used to activate a single activation code.
It is an error to specify either of these options without the other.

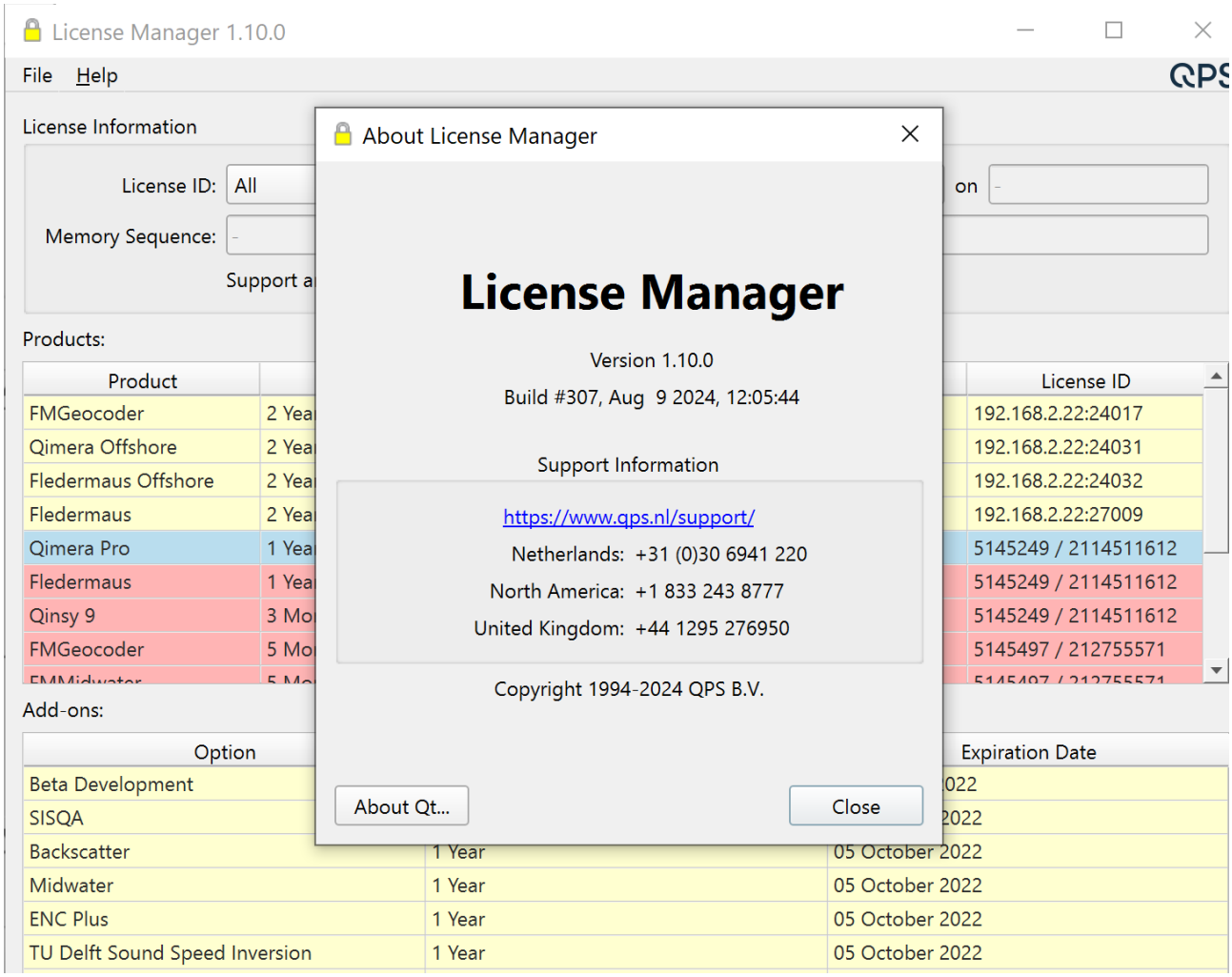
When attempting to connect to a server, the License Manager will first attempt to set a system-wide connection so that all users on the machine may access the license.
If the app does not have enough privileges to set a system-wide connection, it will fall back to licensing only the user that it is running as.

```
Usage is: license-manager
    [ -silent ]
    [ -activate <activation-code> ]
    [ -licserver <license-server> ]
    [ -licproxy <proxy-server> ]
    [ -clearserver ]
    [ -debug ]
```

- `-silent` tells the LicenseManager not to show the GUI.
- `-activate <activation-code>` tells the LicenseManager to activate the specified code. Must be used in conjunction with `-silent` .
- `-licserver <license-server>` tells the LicenseManager to connect to the specified license server IP address or hostname. Must be used with `-silent` .
- `-licproxy <proxy-server>` tells the LicenseManager to use the specified proxy server IP address or hostname. May be used in conjunction with `-licserver` . Must be used with `-silent.`
- `-clearserver` tells the LicenseManager to clear any and all connections to a license server. Must be used with `-silent` . Helpful if the license server is not available or down.
- `-debug t` ells the LicenseManager to print additional information while in `-silent` mode to aid in diagnostics. If used, it must be the first option on the command line.
- `-h` displays the usage information.
- `-ver` displays the version information.
- The exit code indicates if the activation was successful or not, zero for success, non-zero for failure.

Help

Clicking the *Help* menu item will give you online and offline options for viewing *'How-to'* manuals for the License Manager and HASP Dongles.
An *About* dialog option is also available. This will show the version number of the License Manager and some other details.



How-to Articles

Primarily for ICT managers, not for individual Softlock License users.

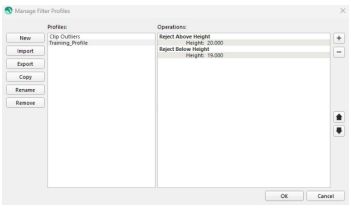
Troubleshooting

1) Modern Windows operating systems can have something called Hyper-V (or Hyper Visor) turned on. Having this active causes some processes to be run in a virtual machine (VM).
By default, QPS softlocks are restricted and won't work on an OS that is running within a VM or one that has Hyper-V enabled.
If you are unable to use the licensing due to this restriction, QPS may be able change the configuration of your license to enable use on a VM / Hyper Visor based machine.

2) If your license is not activating successfully, ensure that you can view wyday.com in a web browser.
If you cannot see this page (this is the same address that the license software uses to

authenticate), it may be necessary to whitelist wyday.com, or perhaps use a proxy if your organization has one in place.

Qimera Manage Filter Profiles Dialog



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  - New
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- Profile Editing
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  - Reject Specific Beams
  - Reject All Soundings
  - Accept All Soundings
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  - Accept or Reject User Soundings
  - Reject All But Specific Frequency

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- Respect Individual Qinsy Blocking Flag
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- Clear Flags
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- Apply Z-Shift Correction
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- Reject Outliers (True 3D)
- Reject or Accept Specific Classifications
- Set Classification
- Reject Outside of Intensity Range
- Reject Above Uncertainty Threshold
- Reject Specific Quality Values
- Reject Outside of Angle Range
- Reject Outliers (1D)

How to Start

This dialog is launched via the  icon on the Filter Operation Toolbar.

What it Does

This dialog allows the user to create, import, edit and remove custom filter profiles. Filter profiles are a set of operations which are applied sequentially to a set of soundings. Filter operations can modify soundings in a number of ways, most commonly by rejecting undesirable soundings, but also through modifying flag data or shifting sounding position.

Note that filters run from the Filter Toolbar will set the 'Filter' bit in the QPD when rejecting points. By doing so, we can differentiate these rejected soundings from soundings rejected via manual editing in the Swath, Slice and 3D Editors (these set the 'Manual Edit' flag). This allows you to apply and revert filters using the filter toolbar without being worried about losing any manual editing that may have been done.

The dialog is divided into two main halves: filter profile management happens on the left, while the profiles and their constituent operations are edited on the right. The profile selected on the left dictates which profile is edited on the right.

Profile Management

Profiles List

This list contains all the custom profiles that the user has created or imported.

New

This button creates a new, empty filter profile after asking for a profile name.

Import

This button imports a filter profile from a file. Both Qimera's own .profile format as well as Qloud's .qfd file formats are supported. Please note, however, that not all of Qloud's filter operations have a perfect equivalent in Qimera, so profiles should always be reviewed for subtle discrepancies after import.

Export

This button allows for a profile to be exported into Qimera's .profile format.

Copy

This button duplicates the currently selected profile after asking for a new profile name.

Rename

Renames the currently selected profile after asking for a new name.

Remove

Removes the currently selected profile after asking for confirmation.

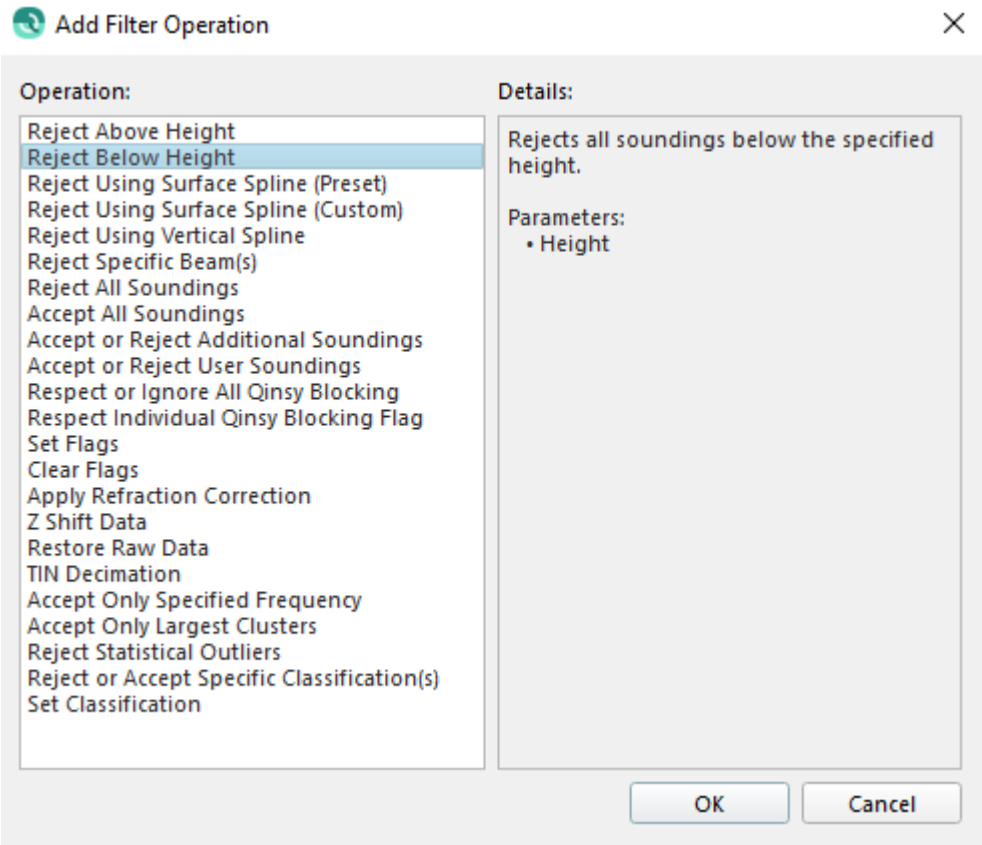
Profile Editing

Operations List

This list shows all of the operations making up the current profile along with their editable parameters. Operation names are shown in bold. Operation parameters are shown across two columns with the name on the left and the value on the right. Click on a parameter value to edit it.


Add New Operation

This button shows the Add Filter Operation dialog, allowing you to choose a new operation to be appended to the profile.



This dialog lists the names all of the available operations on the left. Selecting an operation name shows a description of that operation in the *Details* pane on the right. Click *OK* to add the selected operation or *Cancel* to cancel.

See the (2.6) Qimera Manage Filter Profiles Dialog#Available Filter Operations section for more information on the individual operations.

 Remove Operation

This button removes the selected operation from the list.

 Move Operation Up

This button moves the selected operation up in the list of operations. Operations higher in the list are executed before the operations that follow them.

 Move Operation Down

This button moves the selected operation down in the list of operations. Operations lower in the list are executed before the operations that precede them.

Available Filter Operations

Qimera has several filter operations which can be combined to produce interesting results. See below for a list of all operations and a brief description of what they do.

These descriptions have been copied directly out of the app. If you wish to make edits here, please make them in the source code first (or ask a developer, if you aren't one). That will hopefully help to keep the two consistent.

Reject Above Height

Rejects all soundings above the specified height.

Parameters:

- Height

Reject Below Height

Rejects all soundings below the specified height.

Parameters:

- Height

Reject Using Preset Grid Spline

Fits a 3D spline grid through noisy point data and rejects all soundings that are too far from the grid. The spline type is chosen from a list of presets.

The 3D spline grid is a representation of the local topography built using approximately 50-100 soundings at a time. The grid is calculated using a weighted least squares method through the available soundings. The grid is area based and takes contributions from many survey lines simultaneously. The criteria for spike detection depends on the expected sounding vertical accuracy, which scales with filter strength. Strong filters filter more data than weak filters.

The ROV Depth is positive downward and is added to the sounding depth (which is most likely negative) to reference the sounding to be relative to the sensor as opposed to the water surface.

The Reference Depth can be used to adjust the reduced soundings to get back to values relative to the water level. This can be used, for example, when working on a lake where the depths can be very large when referenced to mean sea level. The reference depth is subtracted from the reduced soundings.

The Rejection Preference is used to specify which soundings are rejected in relation to the computed spline depth. The options are Reject Above and Below, Reject Above and Reject Below.

Parameters:

- Spline Type
- ROV Depth
- Reference Depth
- Rejection Preference

Reject Using Custom Grid Spline

Fits a 3D spline grid through noisy point data and rejects all soundings that are too far from the grid. The spline type is chosen by manually specifying all parameters.

The 3D spline grid is a representation of the local topography built using approximately 50-100 soundings at a time. The grid is calculated using a weighted least squares method through the available soundings. The grid is area based and takes contributions from many survey lines simultaneously. The criteria for spike detection depends on the expected sounding vertical accuracy.

The Grid Spline performs basically the same operation a data processor would do manually: it attempts to determine what the bottom, or a feature on the bottom is, by fitting a grid spline through the noisy footprint data and filtering out any footprints that lie too far away from this grid.This is done in two passes:

1. The first pass will filter large blunders to create a well-fitting grid spline.
2. A second pass will filter noise.

The grid spline used in this algorithm is known in literature as a Thin Plate Spline see: (Bookstein, 1989). “The Tin Plate Spline is the two-dimensional analog of the cubic spline in one dimension.” (Belongie)

Parameters:

- ***Minimum Point Count:*** Increase the minimum point count to allow the filter to better model the seafloor, however this will typically come at the expense of increased processing time.
- ***Expected Sounding Vertical Accuracy:*** Expected accuracy is expressed in percentage of water depth.
- ***First Pass SD & Second Pass SD:*** First and second pass SD factor is a scaling factor applied to the standard deviation that controls two consecutive spline fitting passes. Low values filter strongly, high values filter weakly. The first pass SD should not be too high to ensure that blunders are eliminated on the first pass to allow for a better fit on the 2nd pass.
- ***ROV Depth:*** The ROV Depth is positive downward, and is added to the sounding depth (which is most likely negative) to reference the sounding to be relative to the sensor as opposed to the water surface.
- ***Reference Depth:*** The Reference Depth can be used to adjust the reduced soundings to return to values relative to the water level. This can be used, for example, when working on a lake where the depths can be very large when referenced to mean sea level. The reference depth is subtracted from the reduced soundings.
- ***Rejection Preference:*** The Rejection Preference is used to specify which soundings are rejected in relation to the computed spline depth. The options are *Reject Above and Below*, *Reject Above* and *Reject Below*.

The First Pass

A grid spline will be deformed if large spikes are present. In other words, blunders (large spikes in the data) have an effect on the fitted grid. These spikes need to be removed to achieve a grid that fits ‘nicely’.

A grid spline is considered a nice fit, if the RMS of all differences between the grid and the actual points is smaller than the set threshold. This value will be called the deviation in this report and is expressed as Pα.

The threshold is the first filter parameter and is expressed as a percentage (default 0.5%) of the depth.

As the grid is calculated, if the deviation is larger than the threshold, then four points will be removed from the spline dataset:

1. the footprint with the maximum height,

2. the footprint with the minimum height,
3. the footprint with the largest positive difference with the grid
4. the footprint with the largest negative difference with the grid.

The grid is then recalculated and if the deviation is below the threshold, the grid is determined to be a 'nice' fit. However, if the deviation is still above the threshold, the four points listed above are removed again, and a grid will be fitted again. This process iterates until either the deviation target is attained, or more than half of the initial points are discarded.

As soon as a grid with the grid deviation fitting below the threshold is available ('*fits nicely*'), all points which exceed the threshold are filtered out. The parameter is the first-pass SD factor.

The Second Pass

Once the largest errors are filtered all remaining points are used for new spline grid. This second pass (C2.Pα) is then used to filter out all the soundings with a Standard Deviation difference greater than C2.

Note that points that were filtered in the first pass can be unfiltered in the second pass. This is necessary because the grid that was determined in the first pass was calculated with a reduced dataset.

Filter parameters

To summarize, the grid Spline filter has four relevant parameters:

1. The number of points processed at once. If this number is reduced, the filter takes significantly less computation time, but accuracy is affected. Intuitively, one can understand that if not enough points are considered, a local cluster of blunders may be considered as a valid grid. The number of points should be set as high as possible, while a reasonable filter speed is maintained. A higher number of data points will allow the filter to more accurately follow the surveyed terrain.
2. The first-pass SD factor. Recommended range: [1.0 … 4.0], where 1.0 is a strong filter action and 4.0 a weak one. It is important that this factor is set to such a value that large blunders are eliminated, so it should not be too high. Since the grid spline determined in the first pass is not as accurate as the spline of the second pass, this factor should also not be set too low, to prevent the accidental filtering of valid data points. A good starting point seems to be: 2.0.
3. The second-pass SD factor. Recommended range: [1.0 … 4.0]. This is the most important parameter in my opinion. Once a grid with a certain difference to the original data points has been determined, this parameter determines if a point is filtered or not.

4. Approximation factor, expressed in a percentage of the depth. This is similar to the IHO orders that specify a minimal vertical TPU to achieve when surveying. One can say that the expected accuracy of the survey must be used as this parameter.

Reject Using Vertical Spline

Rejects soundings by fitting a vertically-oriented, 3D spline to the soundings and rejecting outliers from that spline.

This filter is only appropriate for filtering vertical grids such as quay walls and will work best in combination with an area polygon selection.

The higher the detail of the spline, the fewer soundings will be rejected.

Parameters:

- Spline Type
- ROV Depth

Reject Specific Beams

Rejects all soundings from the specified beam(s).

In a dual MBES configuration, specified beams are rejected from each system.

If a dynamic grid is created with only one system, the filter will be run only on that system.

The Beams to Disable are specified by a comma-separated list of ranges. For example "1-10, 48, 52, 91-100"

Parameters:

- Beams to Disable

Reject All Soundings

Rejects all soundings within the selected area, regardless of their properties.

This is useful primarily for cropping unwanted areas out of a survey.

Parameters: None

Accept All Soundings

"Unrejects" all soundings within the selected area (excluding Additional Soundings).

This clears any filtering, undoes any manual rejection and potentially ignores blocking.

Parameters: None

Accept or Reject Additional Soundings

Accepts or rejects all Additional Soundings within the selected area.

Additional Soundings are soundings that some echosounders report above and beyond the usual number provided by their bottom detection algorithms. For Kongsberg Maritime echosounders, these are call Extra Detections. For Teledyne-Reson echosounders, these are called Multi-Detect.

Parameters:

- Action

Accept or Reject User Soundings

Accepts or rejects all User Soundings within the selected area.

User soundings are soundings the user created in the water column view.

Parameters:

- Action

Reject All But Specific Frequency

Rejects all soundings that were acquired by a frequency different than the specified frequency. When acquiring bathymetry with multi-frequency sonars such as the R2Sonic multi-spectral sonar, it allows the user to generate a grid using only a specific frequency. The user must use the *Revert All Filtering* or *Clear Flags* with *Filter* option to reset the soundings before performing another use of this filter on a different frequency. This filter is for advanced users and knowledge of the sonar frequencies needs to be known in advance.

Parameters:

- Frequency to Accept

Respect or Ignore All Qinsy Blocking

Rejects or accepts soundings by respecting or ignoring the original Qinsy blocking flags.

Any sounding with a blocking flag set will be rejected, unless blocking flags are being ignored (or it has been manually accepted).

Parameters:

- Blocking Flags

Respect Individual Qinsy Blocking Flag

Rejects soundings by respecting a particular online Qinsy blocking flag.

Any sounding with the selected blocking flag set will be rejected.

Parameters:

- Flag

Set Flags

Sets any of the flags Plotted, Feature, or Suspect for the soundings.

Parameters:

- Set Plotted Flag
- Set Feature Flag
- Set Suspect Flag

Clear Flags

Clears the specified data status flags for all soundings.

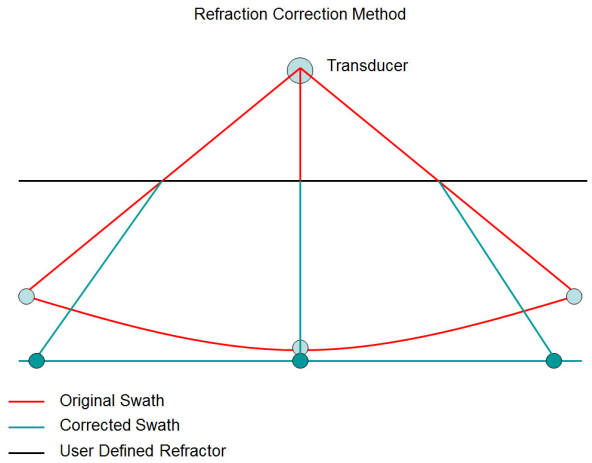
Clearing the Manual Edit flag or Filtered flag may cause rejected soundings to become accepted, if no other reason remains for rejecting them.

Parameters:

- Clear Manual Edits
- Clear Filtered Flag
- Clear Feature Flag
- Clear Plotted Flag
- Clear Suspect Flag

Apply Refraction Correction

Applies an empirical refraction correction based on a simplified refraction model which introduces a sound speed correction at a specified depth level. The idea is to define a 'Refractor' plane below the MBE transducer which delineates the depth at which the refraction correction is applied to the SV profile used during acquisition. When you set a depth of 10 meters, it means that all the depths below 10 meters are affected by the refraction correction. No refraction corrections are applied to depths that are above the specified refractor depth. The following diagram illustrates the basic premise of the filter. The filter can be applied to 'Rejected/Flagged' soundings using the 'Filter Rejected' option. If this option is set to 'No' on 'Accepted' soundings will be filtered.



The refraction correction is stored separately from the corrected sounding and can be reset with the "Restore Raw Data" filter.

Parameters:

- Refractor Depth
- Sound Velocity Correction
- Filter Rejected

Apply Z-Shift Correction

Applies the specified shift to all soundings, moving them in the Z direction.

The shift is stored separately from the corrected sounding and can be reset with the "Restore Raw Data" filter.

Parameters:

- Z Shift

Restore Raw Data

Re-enables all soundings disabled by manual editing and filtering and re-disables soundings that were previously blocked but then later re-accepted through manual editing. Can also reset the custom XYZ shift that may have been applied with the Z-Shift filter or the Refraction Correction filter.

Parameters:

- Reenable Disabled Soundings
- Reset XYZ Shift

Decimate to TIN Vertices

Rejects soundings using a triangulated irregular network (TIN), leaving only those soundings required to capture the shape of the grid.

A coarse TIN is constructed. Triangles are then subdivided by inserting outlier soundings. This process is repeated until no sounding is farther than the tolerances from the mesh. Finally, all soundings which are not part of the TIN are rejected.

Set the Tolerance as % of Depth to zero to disable the relative tolerance.

Reduce the Maximum Link Distance to increase the density of the TIN.

Parameters:

- Absolute Tolerance
- Tolerance as % of Depth
- Maximum Link Distance

Reject Using Clustering

Divides points into clusters and rejects all soundings that do not belong to the largest cluster.

Instead of examining the entire point set at once, it may be divided into smaller subsets. The filter is then applied to each subset independently. The Buffer Size determines the maximum number of points in a subset.

For each subset of points, clusters will be determined. Two points that lie within the Clustering Distance of each other will be grouped into the same cluster. The Clustering Distance must therefore be larger than the 3-D separation between points on the grid and their closest neighbor on the grid. But it should be smaller than the separation between noise points and the grid.

All but the largest cluster for each subset of points will be rejected. Points in clusters with a size smaller than the Minimum Cluster Size will be rejected as well.

This filter works best on a grid with a consistent depth. Steep gradients may lead to a larger than average separation between points on the grid, which may result in erroneous rejection of points on or near the gradient.

Parameters:

- Clustering Distance
- Minimum Cluster Size

Reject Outliers (True 3D)

Rejects points with large mean distance from its neighbors.

For each point the filter first determines the mean distance between it and its N closest neighbors, where N equals the Number of Neighbors for Mean Distance parameter.

Then it determines the statistical distribution (the mean and standard deviation) of the mean distances calculated in the first step. Finally, the filter rejects all points with a mean distance to its neighbors greater than the overall mean plus a factor times the overall standard deviation. The factor is specified as the parameter Outlier Threshold.

The lower the Outlier Threshold, the more points are rejected by the filter. If the filter rejects valid grid points, increase the threshold.

In order for the filter to work, more points have to be loaded at a time than are actually considered for filtering, because the filter requires neighboring points to be known. How many extra points need to be loaded, depends on the Distance Between Points and the Number of Neighbors. The Distance Between Points is a measure of the distance between a point and its immediate neighbor(s).

This filter works best if the noise in the data is sparsely distributed. If the data contains clusters of high density noise, the filter is less likely to work. For such a data set the filter might be made useful by increasing the Number of Neighbors for Mean Distance.

Parameters:

- Number of Neighbors for Mean Distance
- Outlier Threshold
- Distance Between Points

Reject or Accept Specific Classifications

Rejects or accepts all soundings with the specified classifications. The Classifications to Disable are specified by a comma separate list of ranges. For example "1-10, 48, 52, 91-100". This filter currently only works for LAS/LAZ point file formats.

Parameters:

- Action
- Classifications

Set Classification

Applies the specified classification value to soundings. Classification values can range from 0 to 255. This filter currently only works for LAS/LAZ point file formats.

Parameters:

- Classification

Reject Outside of Intensity Range

Rejects all soundings with an intensity outside the given range. Soundings with an intensity lower than the minimum or higher than the maximum values will be rejected.

Parameters:

- Minimum Intensity
- Maximum Intensity

Reject Above Uncertainty Threshold

Rejects all soundings above a specified maximum Total Horizontal Uncertainty or maximum Total Vertical Uncertainty.

Note that uncertainties, both horizontal and vertical, are expressed at the 95% confidence level.

Parameters:

- Uncertainty Type
- Maximum Uncertainty

Reject Specific Quality Values

Rejects all soundings with any of the specified quality values set in the list of ranges.

The quality values to reject are specified by a comma separated list of ranges. For example "1-3, 5, 7-10"

Parameters:

- Quality Values to Reject

Reject Outside of Angle Range

Rejects all soundings that lie outside of the set angular range. The beam angle is measured from nadir, positive to starboard. The valid range is -180 to +180 degrees.

> This filter is intended for use only with Multibeam or Laser data that has an accompanying raw source file. FAU files are also supported but other processed points files do not have the necessary data fields filled.
>
> Parameters:

- Minimum Angle
- Maximum Angle

Reject Outliers (1D)

Rejects all soundings greater than the *Vertical Threshold* distance from a grid mean. The grid is created on-the-fly based on the *Grid Resolution* parameter.

If the *Dynamically Update Grid Cell Depths* option is used, as the most extreme soundings are rejected the cell's mean depth will by updated to reflect the remaining soundings.

While the *Rejection Preference* defaults to both *Above* and *Below*, either can also be selected and then soundings only from that direction will be removed to in order to meet the *Vertical Threshold*.

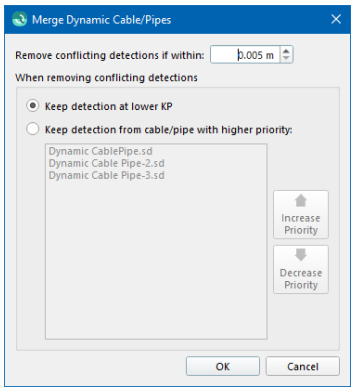
Parameters:

- Vertical Threshold
- Grid Resolution
- Minimum Points Per Grid Cell
- Dynamically Update Grid Cell Depths
- Rejection Preference

Return to: *Qimera Interface*

Return to: *Wizards and Dialogs*

Qimera Merge Dynamic Cable/Pipes Dialog



- How to Start
- What it Does
  - Remove conflicting detections if within
  - When removing conflicting detections;

How to Start

- *Cable/Pipe Context Menu in* Qimera Project Layers Dock.

What it Does

This dialog presents the user with an option to select the cable/pipe priority in the merge process for how it should behave in areas of overlap. A simple GUI list with an option to re-order the list of cable/pipes.

General Description

Remove conflicting detections if within

This spin box let you specify the threshold.

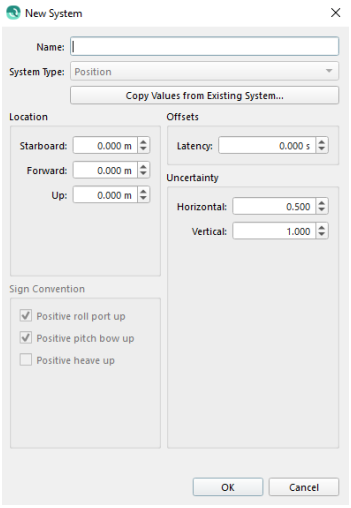
When removing conflicting detections;

This radio button lets you choose between *Keep detection at lower KP* or *Keep detection from cable/pipe with higher priority*.

Return to: Qimera Interface#qimerainterface

Return to: Wizards and Dialogs

Qimera New System Dialog



- How to Start
- What it Does
- General Description
  - Copy System Properties

How to Start

-  button of the Vessel Editor
-  button of the Import ASCII Navigation Dialog or Import Navigation Configuration Dialog under *Position Reference System* or *Motion Reference System*.

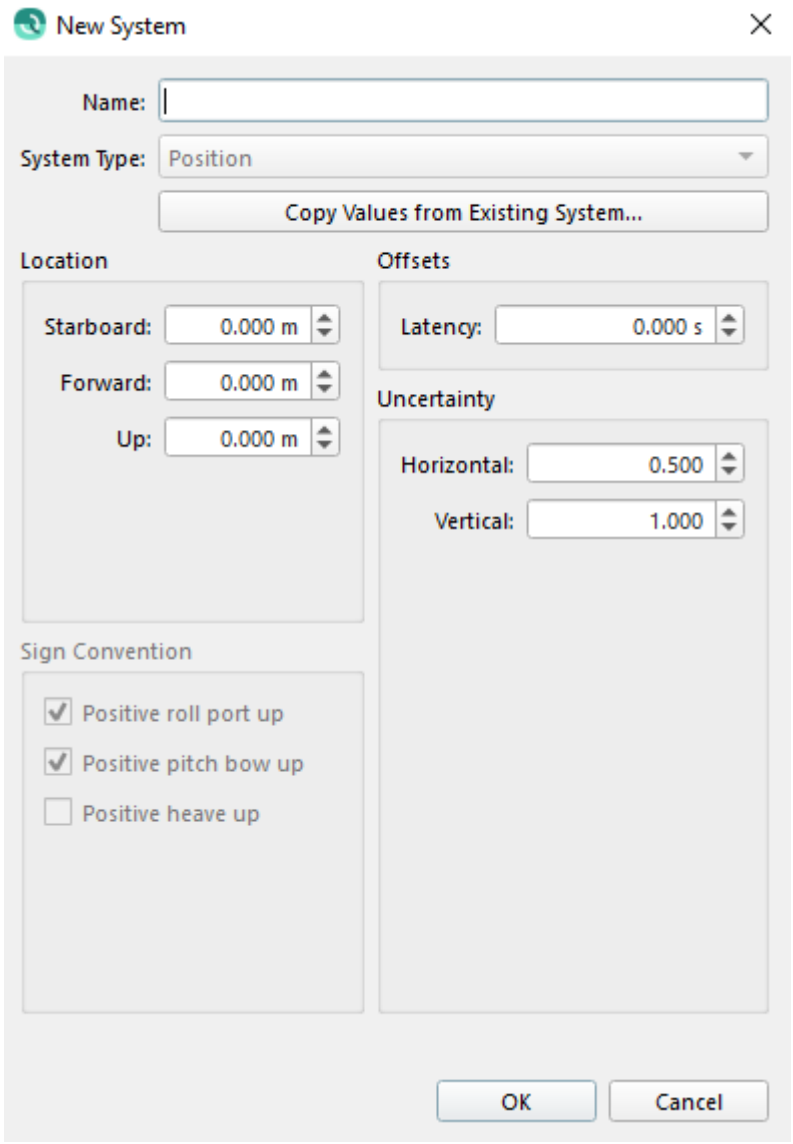
What it Does

This dialog creates a new named system with the input *Location*, *Offsets*, and *Uncertainty* property settings for the specified system type.

General Description

The *New System* dialog (shown below) allows you to specify a name, system type and available settings for the system type. If creating a new system for ASCII or Binary Navigation Import the *System Type* will be preconfigured.

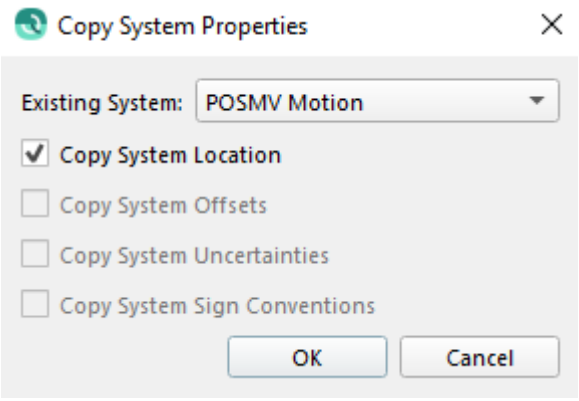
Either enter the appropriate *Location*, *Offsets*, and *Uncertainty* property settings or use *Copy Values from Existing System...* to copy and edit values from an existing system.



Copy System Properties

When *Copy Values from Existing System...* is clicked in the *New System* dialog the following dialog is shown. You can only copy from existing vessel systems.

The set of properties that are allowable for copy will depend on the type of system you are creating and the type of system that you are copying from. For example, you cannot copy the angular offsets or uncertainties of an existing motion sensor to a newly created position system. Once you have chosen which properties you wish to copy, these values will be used to populate the appropriate fields in the *New System* dialog. You can edit these values after you have copied them.



Return to: Qimera Interface
Return to: Wizards and Dialogs

Qimera PFM Unload Wizard



How to Start

Unload PFM Edits option of PFM context menu in Qimera Project Layers Dock

What it Does

This dialog prompts the user to unload edits from PFM to processed point files.

General Description

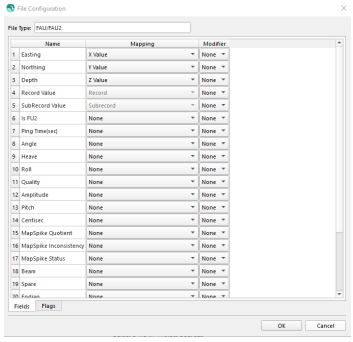
PFM files that are added to Qimera can be edited. Usually this involves modifying soundings as rejected or not but can also change whether a sounding is marked as Feature, Plotted, or Suspect. Once you have edited a PFM data set, edits temporarily stored in the PFM can be applied back to the original source files using the Unload PFM option. Some formats such as GSF also support writing back whether a sounding is marked as Feature, Plotted, or Suspect. If the processed point file format does not support unloading, this operation cannot be completed and the wizard will notify the user.

When choosing to unload changes, the Unload wizard will appear. An option is given to clear all modified flags when the operation has completed. This will slow down the operation slightly and discard information about how soundings have been edited. But if further edits are made, it will speed up unloading if it needs to be done again for those particular files. If the source files are ASCII, instead of unloading to the original source file users can instead save all the valid data to a new ASCII file.

Return to: Qimera Interface

Return to: Qimera Wizards and Dialogs

Qimera Processed Point File Configuration Dialog



- How to Start
- What it Does
- General Description

How to Start

- *Edit File Configuration* option of processed point file context menu.

What it Does

This dialog controls how Processed Point Files are configured upon import.

General Description

If the file(s) being configured is an ASCII file it will use the configuration as described in Custom ASCII File Dialog. If the file(s) is not ASCII, it will use the dialog as described below.

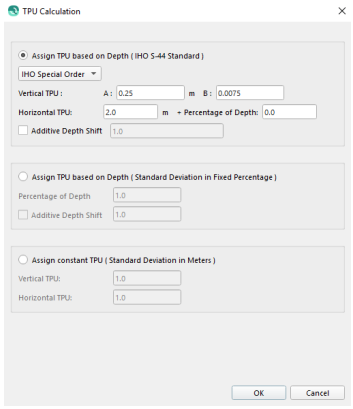
The file type is displayed and a table displaying all the input fields for the current input files. The Mapping column indicates how a given field is used during the process operations. By changing the Mapping values, different fields can be used for both the value to grid as well as the X and Y value. In addition to changing what fields are used, any field can also be inverted by setting the Modifier column to Invert. The second tab in the configuration dialog is the Flags control that is used to specify which input flags are used to reject data during any process operations. This table contains two columns. One to display the flag name, and another to specify whether to accept, reject, exclude the data or mark that data as feature, suspect or plotted for data that has the given flag set to true.

If the File Configuration has been changed for any Processed Point File loaded in Qimera, and that Processed Point file has an associated QPD file, the QPD file will automatically be regenerated. Before the QPD is regenerated, a warning will pop up because any edits made to the QPD file will be lost.

Return to: Qimera Interface

Return to: Wizards and Dialogs

Qimera Processed Point File TPU Calculation Dialog



- How to Start
- What it Does
- General Description

How to Start

- *Edit TPU Setup* option of processed points context menu.

What it Does

This dialog controls TPU settings for processed point files.

General Description

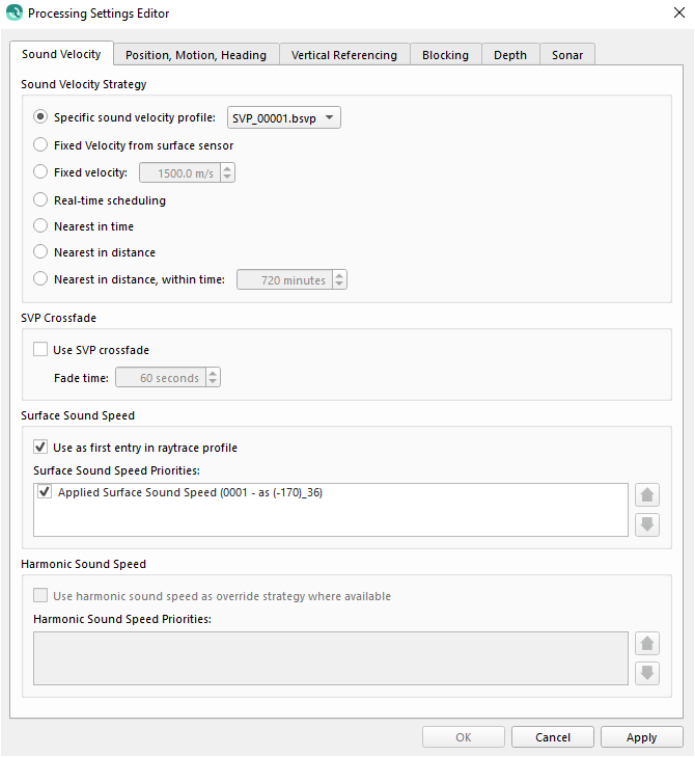
TPU Calculation Setup presents a dialog used to calculate the Horizontal and Vertical TPU values for each sounding in the file. This setup is only necessary when building a Dynamic Grid with CUBE. If this setup is not done before building a Dynamic Grid with CUBE then this dialog will be prompted when building a Dynamic Grid.

There are four options for the source of TPU:

1. If the Point File format contains precomputed TPU values, then the first option the dialog presents for setup is to use those default values. If the format does not contain TPU values this option will not be presented in the dialog.
2. The next option is to calculate the TPU based on Depth using IHO S-44 Standard.
3. The third option is to assign the TPU based on a standard deviation in fixed percentage of the depth value for each sounding.
4. The final option is simply assign a constant value used for all soundings for both vertical and horizontal TPU.

Return to: Qimera Interface
Return to: Wizards and Dialogs

Qimera Processing Settings Dialog



- How to Start
- What it Does
- General Description
- General Notes
  - Processing Settings Conflict
  - System Prioritization
- Sound Velocity
  - Sound Velocity Strategy
  - SVP Crossfade
    - Use SVP crossfade
  - Surface Sound Speed
    - Use as first entry in ray trace profile
    - Surface Sound Speed Priorities
  - Harmonic Sound Speed
    - Use harmonic sound speed as override strategy where available
    - Harmonic Sound Speed Priorities
- Position, Motion, Heading

    - Position Source Priorities
    - Motion Source Priorities
    - Heading Source Priorities
    - Include time series data from adjacent lines
- Vertical Referencing
    - Vertical Offset
    - Vertical Referencing Method
- Depth
    - Depth Source Priorities
    - Pressure Source Priorities
    - Reference Pressure and Water Density
- Blocking
    - Reson Specific Blocking
- Sonar
    - Interpolated soundings
- Shifts
    - Use Static Vertical Shift
    - Use Line Height Matching Shift
    - Use Varying Vertical Shift
    - Use Static Horizontal Shift
    - Review Shifts Button
        - Export Button

How to Start

- 

  button on the Bathymetry Toolbar
- Edit Processing Parameters option of raw sonar files context menu

What it Does

This dialog provides access to key options used during raw sonar processing.

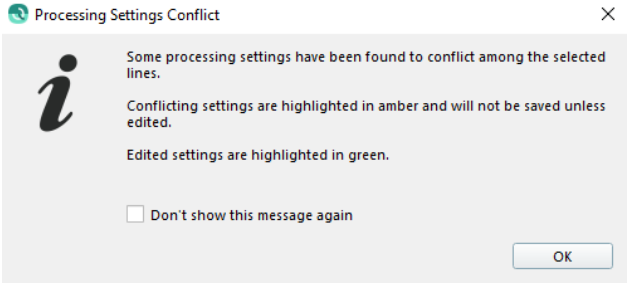
General Description

The processing settings dialog configures settings in the processing pipeline. This configuration controls all of the settings that affect the mathematical operations that are required to compute sounding footprint location. The settings can be edited for one or more files at a time, this is controlled by the items that you've selected in the Raw Sonar Files tree prior to launching the dialog. The dialog will highlight which types of settings have conflicting values among the set of files that you are configuring. In this manner, you can maintain different settings between files when you need or make a global change to all the configurations if you need to. For example, some files may use GNSS heighting and others may use tide for vertical referencing. You can select all of the files and change the sound speed processing strategy without worrying about losing the configuration settings you may have set for vertical referencing. Each page of the processing settings is described below.

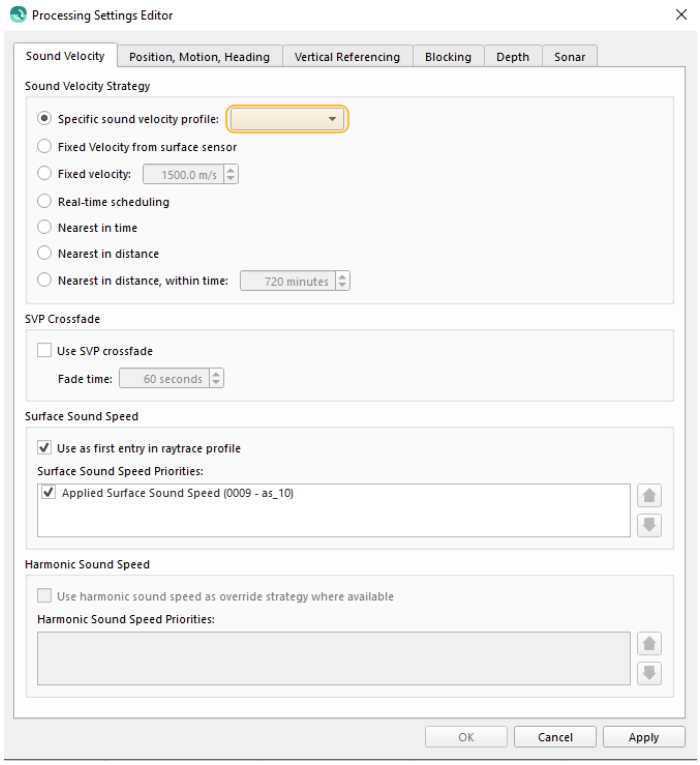
General Notes

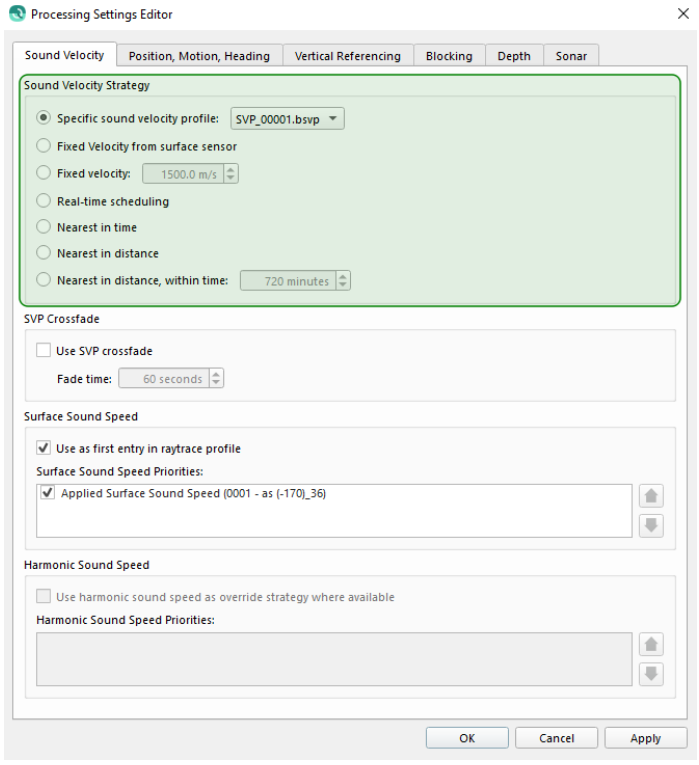
Processing Settings Conflict

If multiple lines are selected with conflicting settings a warning dialog will be shown.



In the dialog conflicting settings will be highlighted amber (see top image below). Other settings can be modified and saved without affecting the conflicting settings. If an option is selected for a conflicting setting it will then be highlighted green (see bottom image below) and saved to all selected raw sonar files.


Processing Settings Editor
Sound Velocity
Position, Motion, Heading
Vertical Referencing
Blocking
Depth
Sonar
Sound Velocity Strategy
Specific sound velocity profile:
Fixed Velocity from surface sensor
Fixed velocity:
1500.0 m/s
Real-time scheduling
Nearest in time
Nearest in distance
Nearest in distance, within time:
720 minutes
SVP Crossfade
Use SVP crossfade
Fade time:
60 seconds
Surface Sound Speed
Use as first entry in raytrace profile
Surface Sound Speed Priorities:
Applied Surface Sound Speed (0009 - as_10)
Harmonic Sound Speed
Use harmonic sound speed as override strategy where available
Harmonic Sound Speed Priorities:
OK
Cancel
Apply

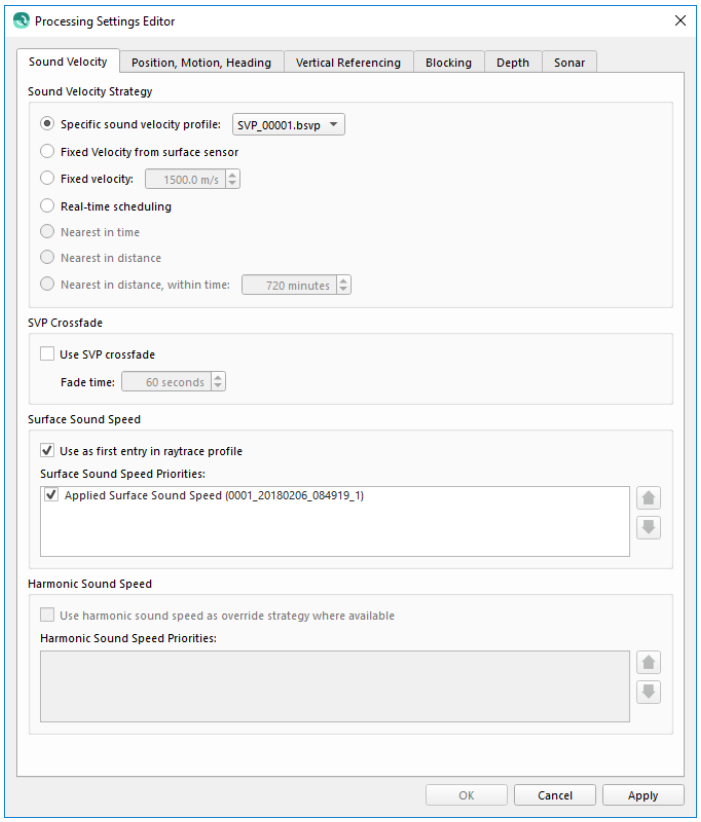

Processing Settings Editor
Sound Velocity
Position, Motion, Heading
Vertical Referencing
Blocking
Depth
Sonar
Sound Velocity Strategy
Specific sound velocity profile:
SVP_00001.bsvp
Fixed Velocity from surface sensor
Fixed velocity:
1500.0 m/s
Real-time scheduling
Nearest in time
Nearest in distance
Nearest in distance, within time:
720 minutes
SVP Crossfade
Use SVP crossfade
Fade time:
60 seconds
Surface Sound Speed
Use as first entry in raytrace profile
Surface Sound Speed Priorities:
Applied Surface Sound Speed (0001 - as (-170)_36)
Harmonic Sound Speed
Use harmonic sound speed as override strategy where available
Harmonic Sound Speed Priorities:
OK
Cancel
Apply

System Prioritization

There can be multiple source systems for a given type of sensor data. Qimera allows for prioritization, or ordering and enabling or disabling of those systems for each type of sensor data.

Each source can be individually enabled/disabled and prioritized. To prioritize select the source and use the arrow buttons to the right of the frame. Sources are prioritized from top to bottom.

Sound Velocity



The *Sound Velocity* settings tab is used for configuring the sound velocity, or sound speed used during ray tracing.

Sound Velocity Strategy

There are several sound velocity strategies. Qimera will protect you from choosing nonsense SVP strategies by disabling strategies for which there is insufficient information in the SVP files to allow correct lookup. For example, if one or more SVP files do not contain a valid observation time, then all time-based lookups will be disabled. Likewise for position. In the example above, the two distance based strategies are disabled because some of the SVPs do not have a valid position. The time and position for SVP files can be

updated in Qimera's SVP Editor. Once you enter this info for all of the vessel's SVPs, you can then revisit the processing configuration dialog to choose the appropriate strategies.

Strategy	Description
Specific sound velocity profile	This option will only use the selected sound velocity profile for all selected raw sonar files.
Fixed Velocity from surface sensor	This option will use the surface sound speed sensor value to represent the entire water column. Strictly speaking, no ray tracing is done. Instead the surface sensor used for beamforming is used to scale the travel-time into a range measurement.
Fixed velocity	This option will use the input sound speed value. Strictly speaking, no ray tracing is done. Instead the specified value is used to scale the travel-time into a range measurement.
Real-time scheduling	If the imported raw sonar files include sound velocity profiles this option will use the profile from the time it is included in the sonar file.
Nearest in time	This option will use all available profiles and select the profile nearest in time for each ping. All SVP casts must have their observation time entered to allow this option.
Nearest in distance	This option will use all available profiles and select the profile nearest in distance for each ping. All SVP casts must have their position entered to allow this option.
Nearest in distance within time	This option will use profiles within the given time window and select the profile nearest in distance for each ping. All SVP casts must have their observation time and position entered to allow this option.

SVP Crossfade

Use SVP crossfade

This option will enable or disable the use of SVP crossfade. The crossfade will blend the small transition zone when switching between one SVP to another, this occurs

when using Sound Velocity lookup strategies like "Nearest in distance" and "Nearest in Time". When this option is enabled, you can adjust the Fade Time, which is the time in seconds that is used for blending the two SVPs. Qimera will automatically find the transition zone and use the Fade time window to blend from one SVP to the next SVP, smoothing the transition.

Surface Sound Speed

Use as first entry in ray trace profile

This option will enable or disable the use of surface sound speed as the first entry into the SVP for ray tracing.

Surface Sound Speed Priorities

The *Surface Sound Speed Priorities* lists all available sources of surface sound speed. Each source can be individually enabled/disabled and prioritized. To prioritize select the source and use the arrow buttons to the right of the frame. Sources are prioritized from top to bottom.

Harmonic Sound Speed



This is configurable only if harmonic sound speeds are estimated with the TU Delft Sound Speed Inversion tool.

The harmonic sound speed will override the strategy configured above for both surface sound speed and the entire water column when available and enabled.

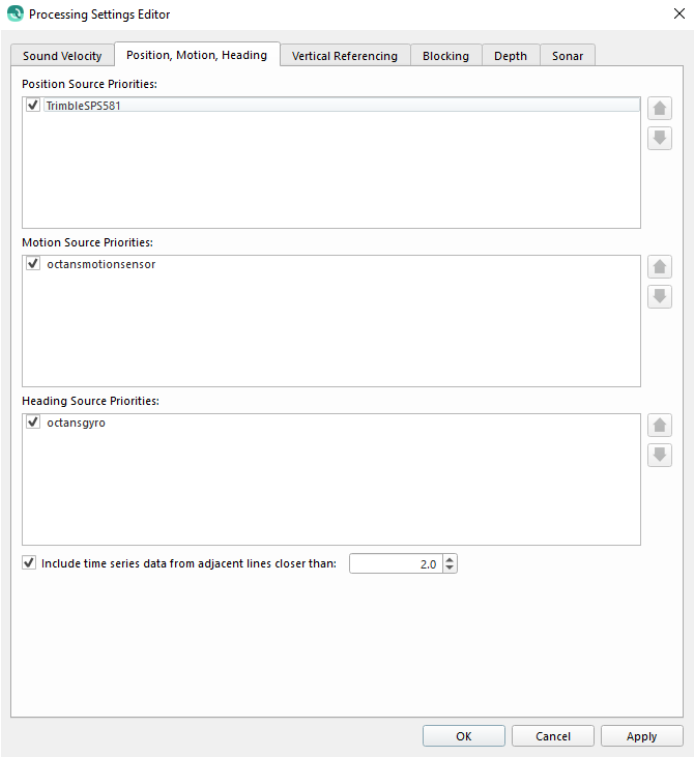
Use harmonic sound speed as override strategy where available

This option will enable or disable the use of the harmonic sound speed for both surface sound speed and the entire water column.

Harmonic Sound Speed Priorities

The *Harmonic Sound Speed Priorities* lists all available sources of surface sound speed. Each source can be individually enabled/disabled and prioritized. To prioritize select the source and use the arrow buttons to the right of the frame. Sources are prioritized from top to bottom.

Position, Motion, Heading



The *Position, Motion, Heading* settings tab provides source prioritization for position, motion and heading systems.

Position Source Priorities

The *Position Source Priorities* lists all available sources of position. Each source can be individually enabled/disabled and prioritized. To prioritize select the source and use the arrow buttons to the right of the frame. Sources are prioritized from top to bottom.

Motion Source Priorities

The *Motion Source Priorities* lists all available sources of motion which includes roll, pitch and heave. Each source can be individually enabled/disabled and prioritized. To prioritize select the source and use the arrow buttons to the right of the frame. Sources are prioritized from top to bottom.

Heading Source Priorities

The *Heading Source Priorities* lists all available sources of heading. Each source can be individually enabled/disabled and prioritized. To prioritize select the source and use

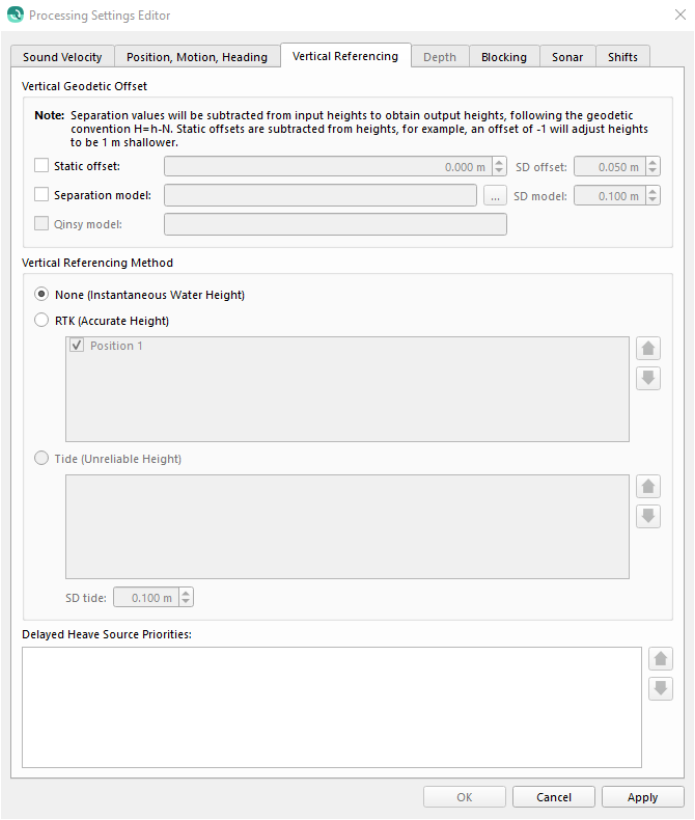
the arrow buttons to the right of the frame. Sources are prioritized from top to bottom.

Include time series data from adjacent lines

If enabled, this option will included source data from adjacent raw sonar files that terminate or begin within the specified time. This can be useful if small data gaps are noticed where raw sonar files are terminated and restarted.

This is specifically useful for systems that have a low update rates. For example if using a 1 Hertz positioning system and logging is started between position records it is likely that the first ping will not be processed. By including adjacent source data the position records can then be interpolated for those pings.

Vertical Referencing



The *Vertical Referencing* settings tab provides applying vertical offsets, selecting the vertical method, and prioritizing delayed heave

Note for underwater vessels the vertical referencing settings only affect the vertical position of the vessel but do not affect the depth used for ray tracing. See Depth Settings below for further discussion.

Vertical Offset

In this section vertical offsets can be enabled and configured.

Please note that *Vertical Offsets* are applied to all vertical referencing methods. If offsets are only applicable to a specific vertical referencing method they must be enabled or disabled appropriately when switching method.

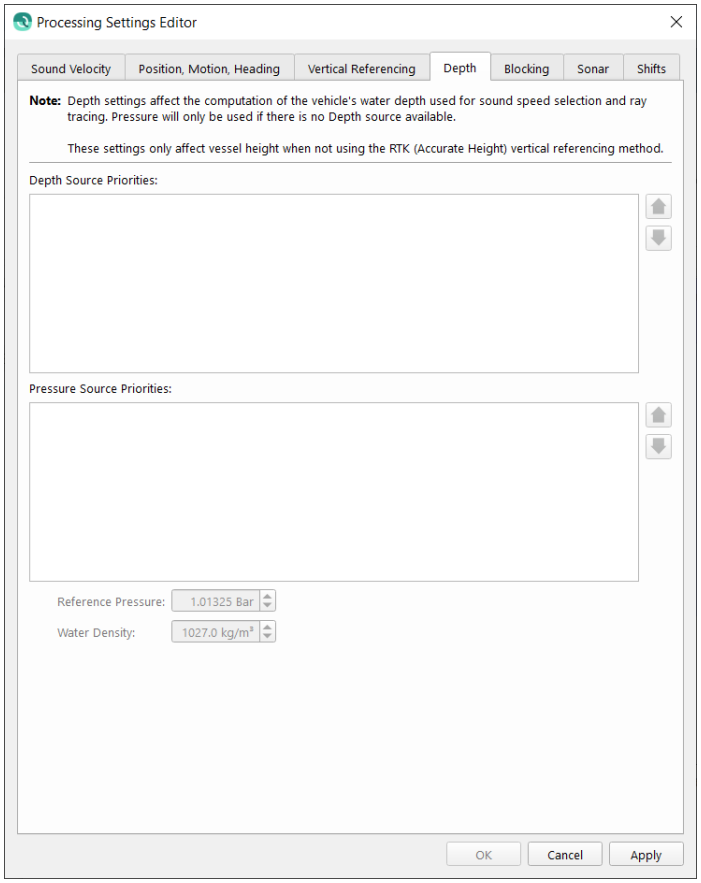
Eg. If using *Tide* as your *Vertical Referencing Method* these will be in addition to any offsets configured in a tide strategy.

Type	Description
Static Offset	This is a single offset that will be applied universally. **Suggested use:** • With GNSS/GPS heighting, if working in a small area this could be used to offset from the ellipsoid to the local tide datum. • With Tide heighting if tidal data is reference to MSL this could be used to offset to the Chart Datum.
Separation model	You may select an SD grid file. If not in the project's datum you will be prompted to transform the grid. The offset that is applied is based on the vessel location on the grid. **Suggested use:** • When working in larger areas with GNSS/GPS heighting the tidal datum is likely to change relative to the ellipsoid, use of a geoid model can be employed to offset to local MSL. • When working in an area with highly variable water height datums, such as a river, a model of the river datum offsets coupled with a water height gauge imported as tides could be employed.
Qinsy model	This is not a configurable option. This displays any Geoid file configured in Qinsy Database files that will be applied to vertical referencing.

Vertical Referencing Method

Method	Description
None (Instantaneous Water Height)	If this method is selected the water depth used during ray tracing will be used to vertically position the vessel. Included corrections: • Draft • Squat • Heave or Delayed heave if available • Vessel lever arms
RTK (Accurate Height)	If this method is selected the GNSS, GPS, or IMU heights will be used to vertically position the vessel. The only correction applied are the lever arm offsets. Note: For height data less than or equal to 25 Hz the heave data will be combined to create a high frequency time series.
Tide (Unreliable Height)	This method can only be selected if tide file has been imported that overlaps the selected line. If this method is selected the tide height will be added as a corrector to the water depth to vertically position the vessel. Included corrections: • Draft • Squat • Heave or delayed heave if available • Vessel lever arms • Tide height

Depth



The depth settings tab is used for configuring settings related to underwater vessels. These settings will be used in the calculation of the water depth of the vessel primarily for sound speed selection. **Priority is given to depth sources if both depth and pressure are available.** In this scenario, if you want to force the use of pressure instead of depth, you can untick the depth time-series in their priority list.

If depth or pressure sources are available and enabled the water depth calculation will only include sensor depth/pressure and the lever arm corrections necessary to translate this to the CoG of the vessel. This affects the *None* or *Tides* vertical referencing method but **does not affect the *RTK (Accurate Height)* vertical referencing method**.

Depth Source Priorities

The *Depth Source Priorities* lists all available sources of vessel depth. Each source can be individually enabled/disabled and prioritized. To prioritize select the source and use the arrow buttons to the right of the frame. Sources are prioritized from top to bottom.

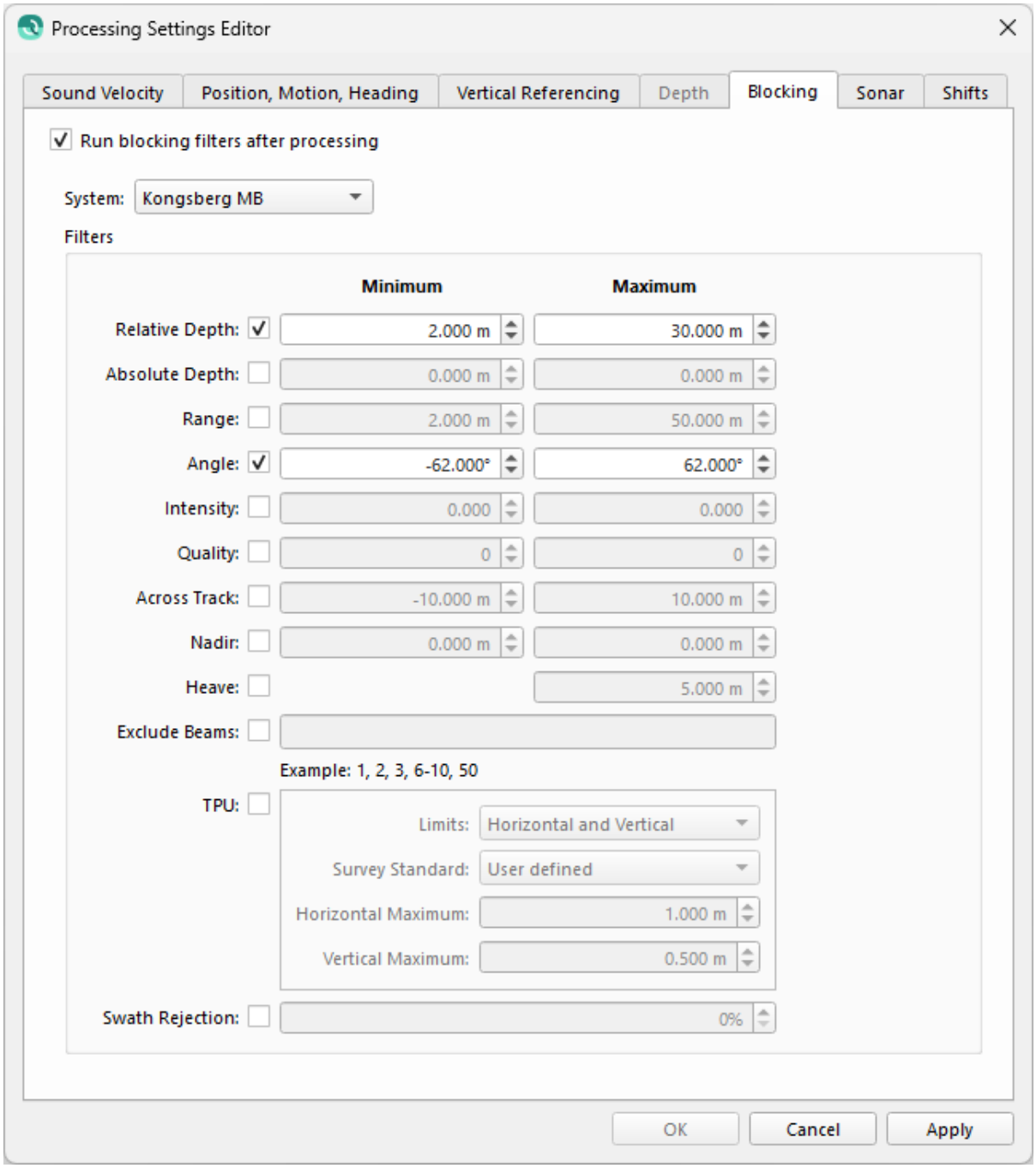
Pressure Source Priorities

The *Pressure Source Priorities* lists all available sources of pressure. Each source can be individually enabled/disabled and prioritized. To prioritize select the source and use the arrow buttons to the right of the frame. Sources are prioritized from top to bottom.

Reference Pressure and *Water Density*

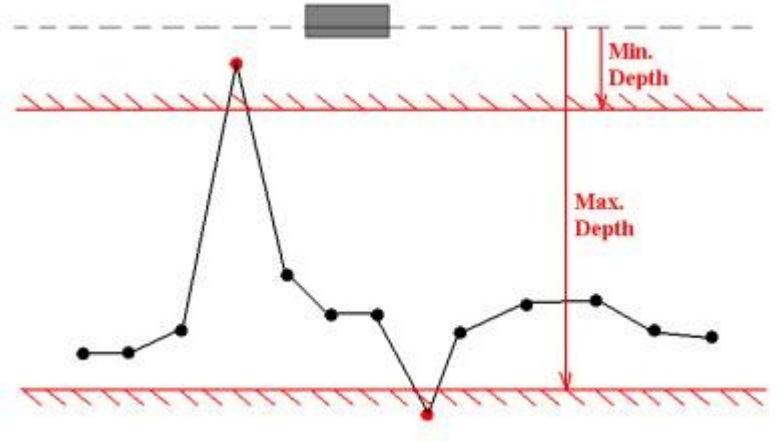
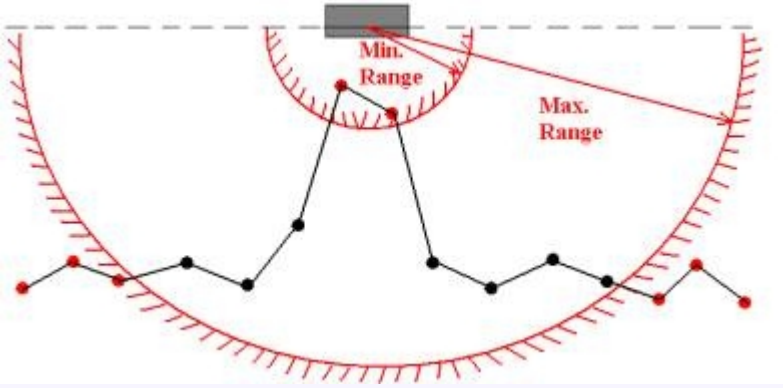
These settings are used to convert the pressure data to depth, Qimera is using the UNESCO EOS80 full formula to convert pressure to depth. If scale factors or offsets are needed for specific sources they can be configured in the Qimera Vessel Editor.

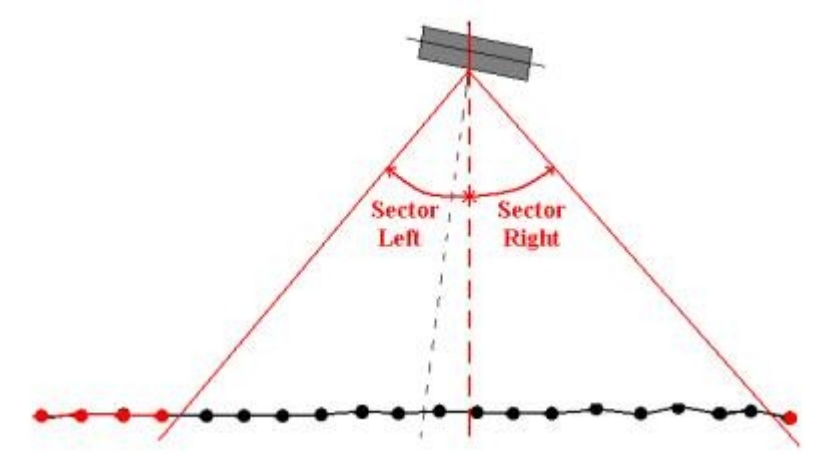
Blocking



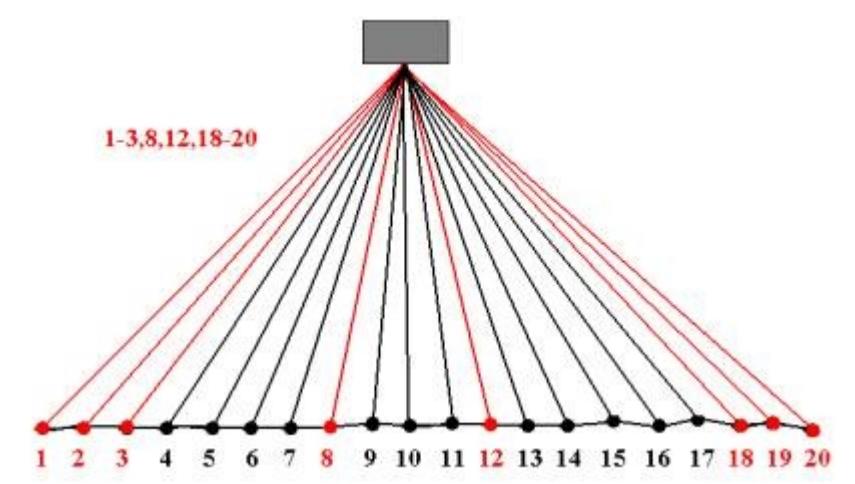
The *Blocking* settings tab provide configuration to exclude soundings based on filter options. All filters are disabled by default, to enable check the box next to the name.

All soundings outside the minimum and maximum for the given filter will be excluded from grid and flagged as rejected.

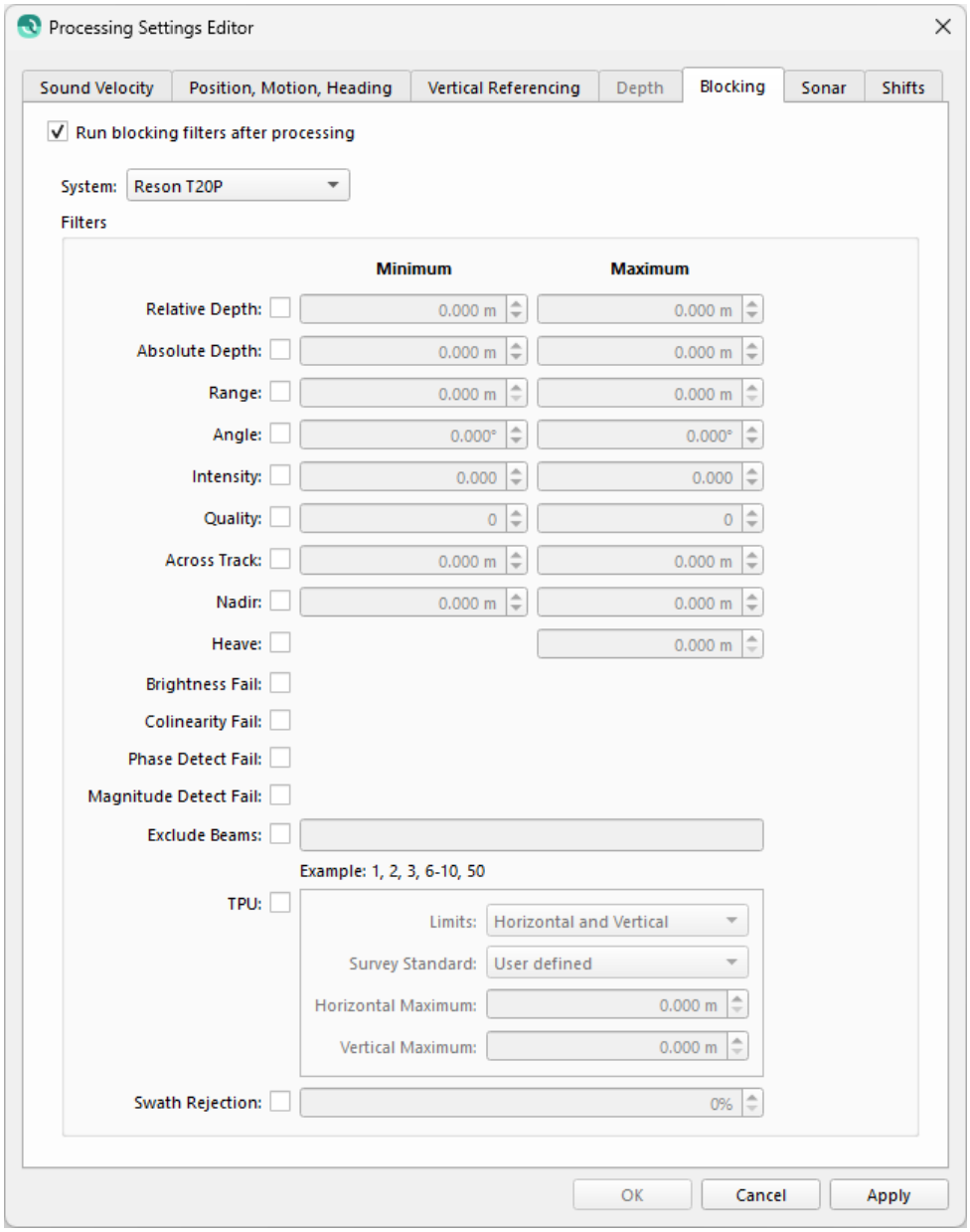
Method	Description
Relative Depth	This filter will clip all data that falls outside the specified depth range, as measured from the echosounder transducer. Depth values should be entered as positive for values below the transducer, or negative for values above the transducer. An example is shown below: 
Range	This filter clips all data that falls outside the specified range (distance) as measured from the transducer. An example is shown below: 

Method	Description
Angle	All data that falls outside the given angles to the port (negative) and starboard (positive) side of the lead line through the center of the transducer is clipped. Port and starboard side are defined relative to the heading of the transducer, which is normally the same as the object heading on which the transducer is mounted. The advantage of the sector exclusion over the beam exclusion is that the beams are removed depending on the direction where they are coming from instead of always removing the same number of beams. When the ship is experiencing significant roll the angle exclusion will allow for that roll angle and remove more beams on one side of the transducer than on the other side. An example is shown below: 
Intensity	Data will be excluded based on the Intensity (backscatter) values. Useful for interferometric systems.
Quality	This filter will exclude beams outside the min/max quality values.
Absolute Depth	This filter will clip all beams with absolute depth values (which include any height) outside the specified min/max values.

Method	Description
Heave	This filter removes the depth observations when the change in heave between two consecutive measurements is greater than the entered value. The entered value for this filter is the rate of change of the heave, and not the actual heave itself.
TPU Horizontal	The Total Propagated Uncertainty (TPU) of a point is a measure for the accuracy to be expected for such a point, when all relevant error sources are taken into account. This filter will exclude beams where the horizontal TPU exceeds the max value.
TPU Vertical	The Total Propagated Uncertainty (TPU) of a point is a measure for the accuracy to be expected for such a point, when all relevant error sources are taken into account. This filter will exclude beams where the vertical TPU exceeds the max value.

Method	Description
Exclude Beams	Excludes certain beams solely based upon the number of the beam as defined by the multibeam manufacturer. This filter is useful for switching off beams which are providing “bad” data. Although this filter can exclude the outer beams, a better option is the 'Sector outside' filter. Groups of beams can be defined by a hyphen (-) between them; groups or beams can be separated using a colon (:). An example is shown below. This example will exclude beams 1 to 3, beam 8, beam 12 and beams 18 to 19 when creating the DTM or grid. 
Across Track	This filter will exclude beams outside the min/max across track distance.
Nadir	This filter will exclude beams inside the min/max across track distance.
Swath Rejection	Flags all the footprints in an entire ping when a certain percentage of footprints have already been flagged by another filter.

Reson Specific Blocking

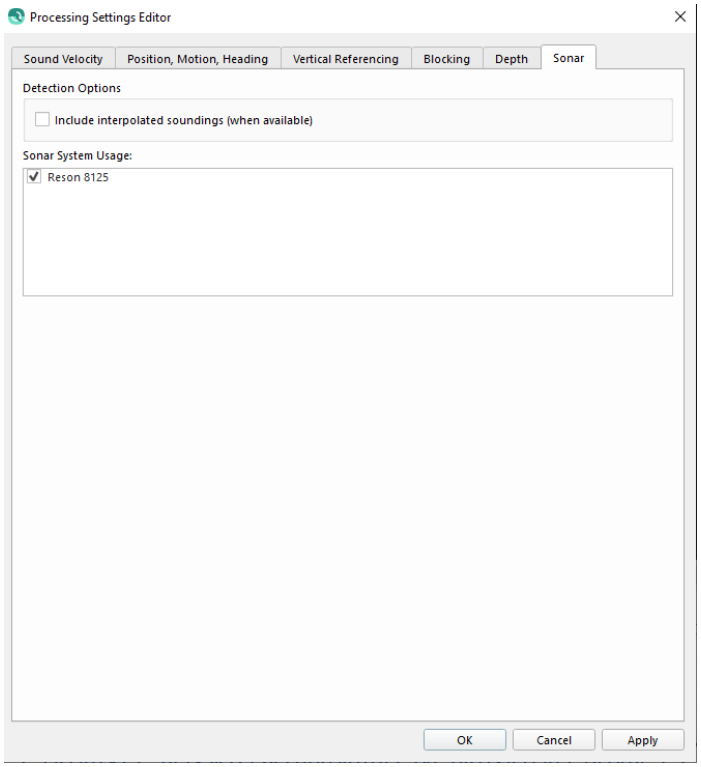


For Reson systems there are four additional blocking filters. These relate to specific Quality values stored by the system, and allow more flexibility than the Quality blocking filter.

- Brightness Fail
- Colinearity Fail
- Phase Detection Fail
- Magnitude Detect Fail

To learn more about the Reson specific quality flags please check your hardware manual, or the decoding notes in the QPS Drivers Manual for your system.

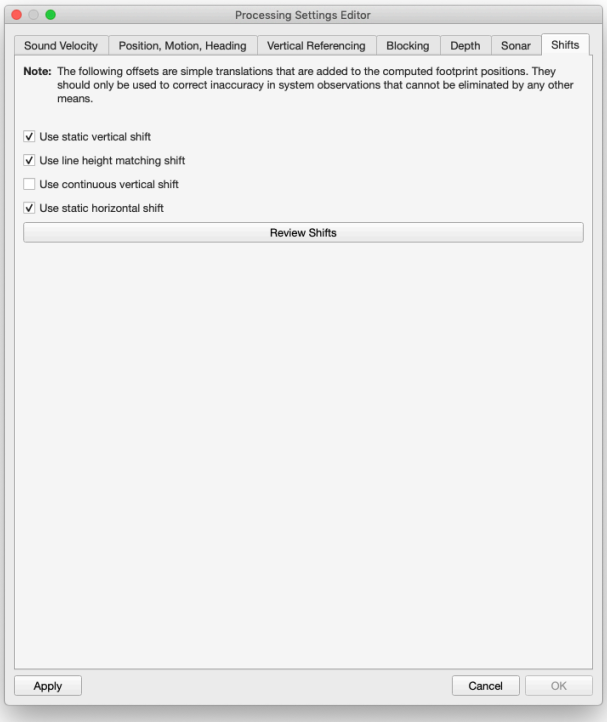
Sonar



The *Sonar* settings tab provides control over system pings that will be included in the generated QPD. More specifically, the system will be included but all pings will be excluded if the *Sonar System Usage* checkbox is unchecked for a system. You can also decide to *include interpolated soundings* by checking the box in the Detection Options, this is only applicable for Kongsberg .all and .kmall formats. If this interpolated soundings box is left unchecked, the interpolated soundings will be flagged as *rejected* soundings. This setting can be overridden when exporting the file to a GSF by a checkbox in the export dialog.

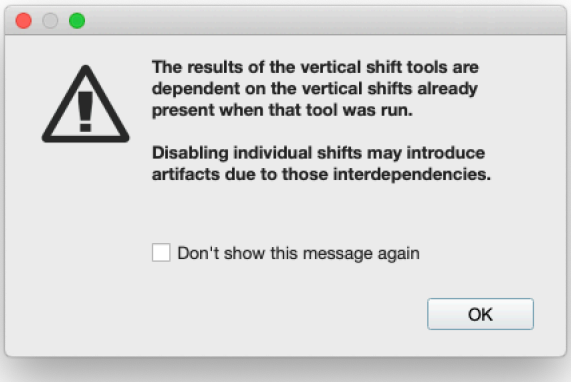
> **Interpolated soundings**
>
> Interpolated soundings are soundings that a Kongsberg system can generate for beams that don't have accurate bottom detection, this is often at the outer swath of the ping. They are interpolated or extrapolated from neighbouring beams. The snippet corresponding to this beam is valid which can be exported with a GSF as valid soundings for Backscatter processing. Generally the interpolated soundings should not be used for Bathymetric data processing but can be used for Backscatter processing.

Shifts



The *Shifts* Settings tab allows you to enable or disable the use of vertical or horizontal shifts in your files. Shifts are applied to every ping in order to offset soundings by a computed or set XY or Z displacement. These check boxes do not delete the numerical data associated with the specific shift, they merely enable or disable the use of the shift in the final sounding location computation.

In the case of vertical shifts, if you have used more than one vertical shift, and you later disable one of the shifts, you will get the following warning dialog. This is because each shift may be dependent on a shift that was calculated earlier in your processing. It is recommended that you determine the best shift methodology that fits your particular needs before using more than one vertical shift tool.



Use Static Vertical Shift

That Static Vertical Shift value is computed using the Static Vertical Shift tool. It can also be set, adjusted or cleared using the Adjust Vertical Shifts tool. Use this option to control when to use the static vertical shift.

Use Line Height Matching Shift

The Line Height Matching shift value is computed using the Line Height Matching tool. It can also be cleared using the Adjust Vertical Shifts tool. Use this option to control when to use the line height matching shift.

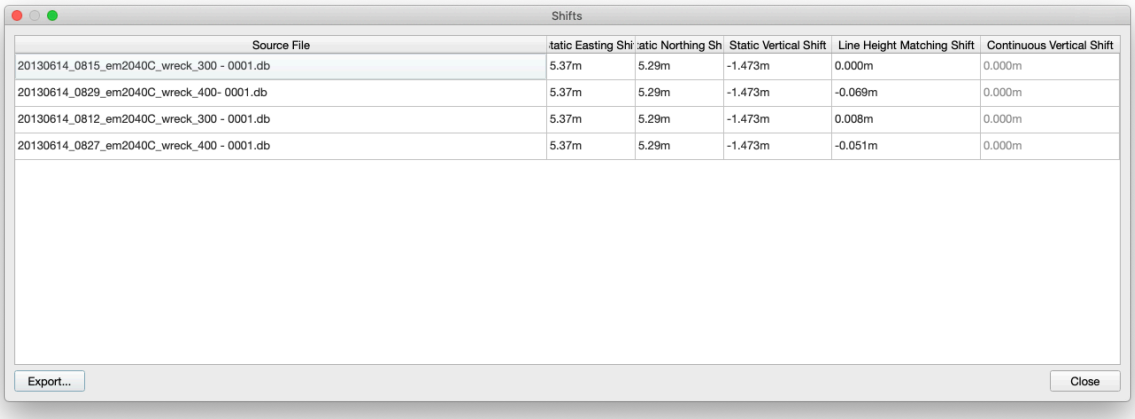
Use Varying Vertical Shift

The Varying Vertical shift value is computed using the Varying Vertical Shift tool . It can also be cleared using the Adjust Vertical Shifts tool. Use this option to control when to use the varying vertical shift.

Use Static Horizontal Shift

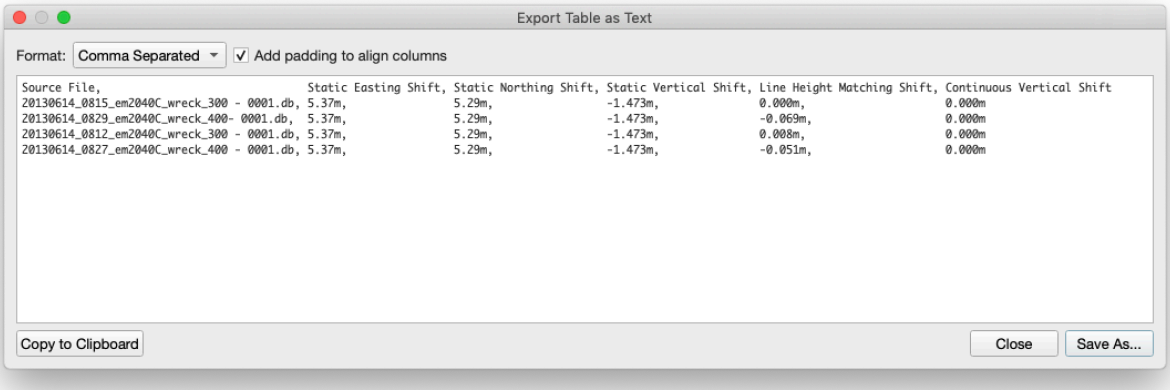
The Static Horizontal shift value is computed using the Static Horizontal Shit tool. It can also be set, adjusted or cleared using the Adjust Static Horizontal Shift tool. Use this option to control when to use the static horizontal shift.

Review Shifts Button



This button brings up the Shifts dialog that shows you all of the shifts for the selected raw sonar files. This table is not an editable and is for display purposes only. If a shift type is unchecked, the column value will appear disabled in the table.

Export Button

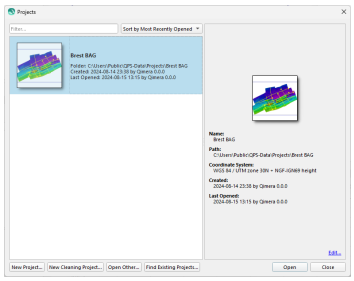


Click on the Export button to get the table exporter. Here you can copy the values to the clipboard or save them as a .csv file.

Return to: *Qimera Interface*

Return to: Wizards and Dialogs

Qimera Project Browser Dialog



- How to Start
- What it does
- General Description
  - New Project...
  - New Cleaning Project...
  - Open Other...

How to Start

- The dialog is shown automatically when Qimera is started up.
-  button from the Bathymetry Toolbar
- *Open Project Browser...* option of the Project menu

What it does

This dialog allows you to create a new project or load a previous project via a visual list.

General Description

When Qimera starts, the *Welcome to Qimera* dialog displays a list of previously created projects. Either **Double-Click** the desired entry or select it and click the *Open* button.

New Project...

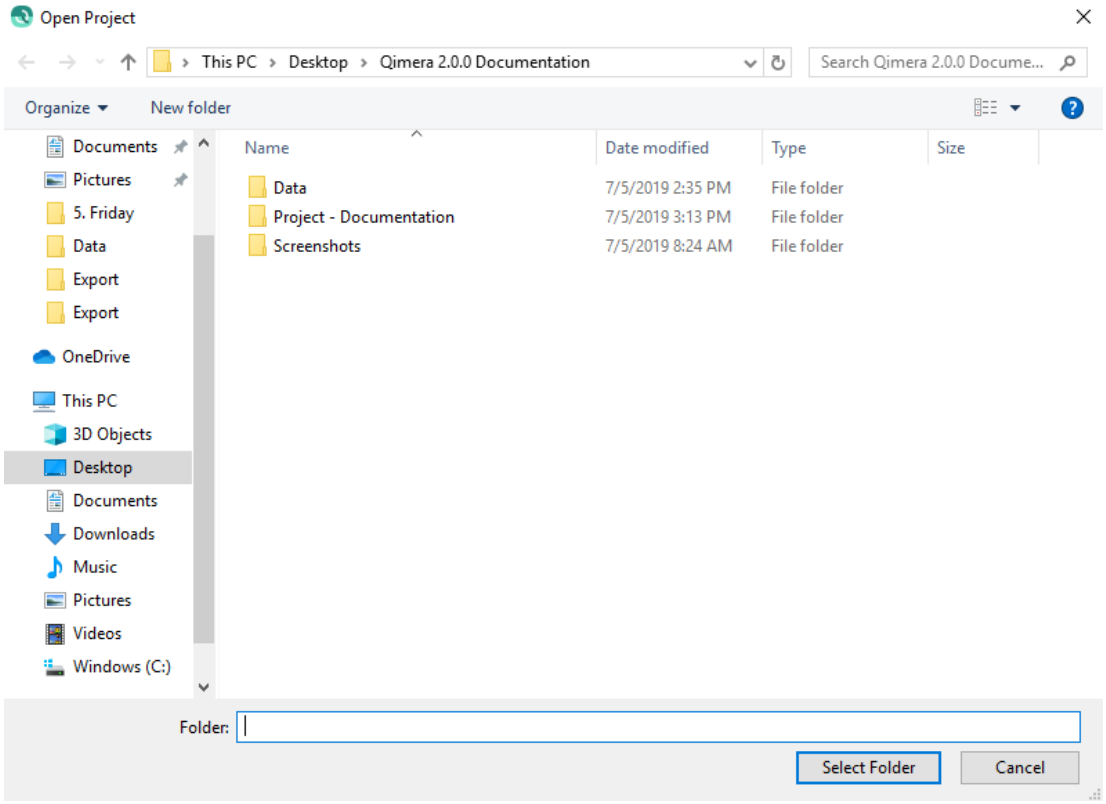
The *New Project...* button will take you to the Create Project Dialog, this is the same as the *New Project* option from the Project Menu, or the  button from the Bathymetry Toolbar.

New Cleaning Project...

The *New Cleaning Project...* button will take you to the Create Cleaning Project Dialog, this is the same as the *New Cleaning Project* option from the Project Menu.

Open Other...

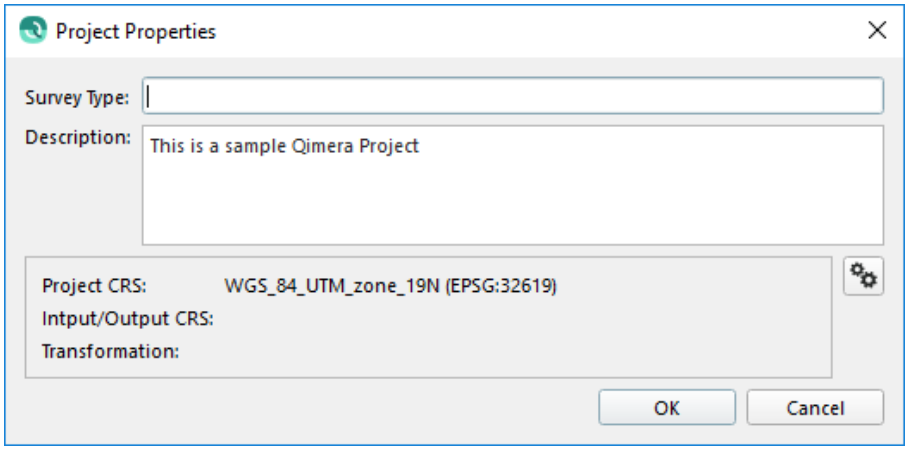
If you click the *Open Other* button, you will get the same dialog as the *Open Project* option from the Project Menu. This is simply a folder browser dialog as show below. Qimera projects contain a *qpsproject.xml* file inside the folder that tells Qimera that this is a valid project. If you open a QINSy project, Qimera will create that XML file for future reference and storage of Qimera metadata. Simply browse to the project you want to load and **Double-Click** or click on the **Select Folder** button.



Return to: Qimera Interface

Return to: Wizards and Dialogs

Qimera Project Properties Dialog



- How to Start
- What it Does
- General Description

How to Start

- *Project Properties* option of the *Project* menu in the Main Menu bar

What it Does

This dialog allows you to view the coordinate system, survey type and description of the project.

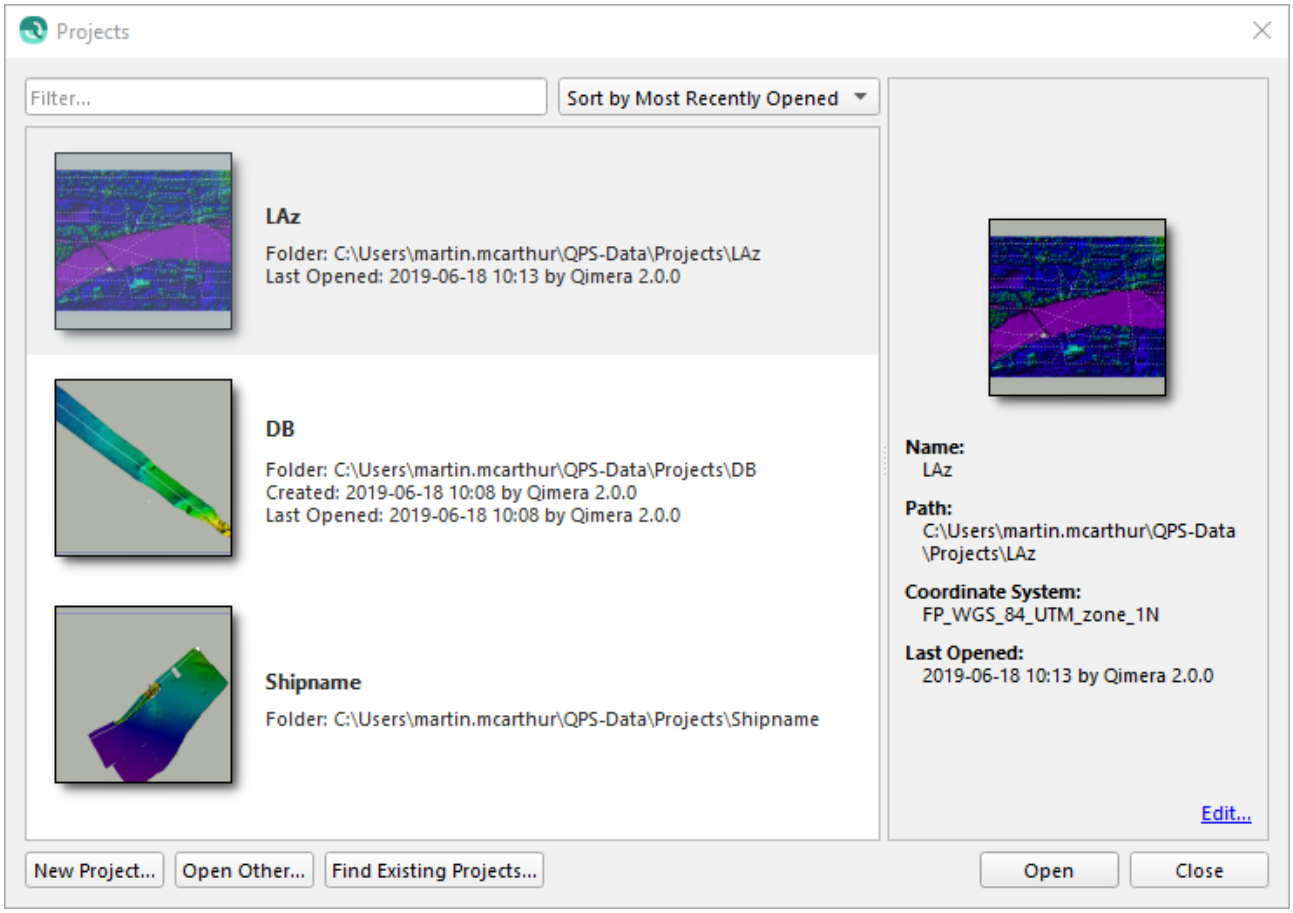
General Description

The user may edit the survey type and description and it will be saved to the project xml file. Editing of the coordinate reference system is only allowed if no data has been added to the project. If you have no data, you can click the  button to bring up the *Select Coordinate System* dialog. Once data has been added, the project coordinate system is fixed throughout the lifetime of the project.

Return to: Qimera Interface

Return to: Wizards and Dialogs

Qimera Projects Dialog



- How to Start
- What it Does
- General Description
  - Sort By
  - Projects List
    - Context Menu
  - New Project
  - Open Other
  - Find Existing Projects
  - Open
  - Close

How to Start

1. Shown at Qimera Startup.
2. Open Project Browser... option of the Project menu item in the Main Menu toolbar.

What it Does

This dialog allows you to open existing or create a new Qimera projects.

General Description

This dialog allows you to open an existing Qimera project using a custom browse dialog that contains recently opened projects or create a new project. If you currently have a project open, it will save and close the current project before opening a new one.

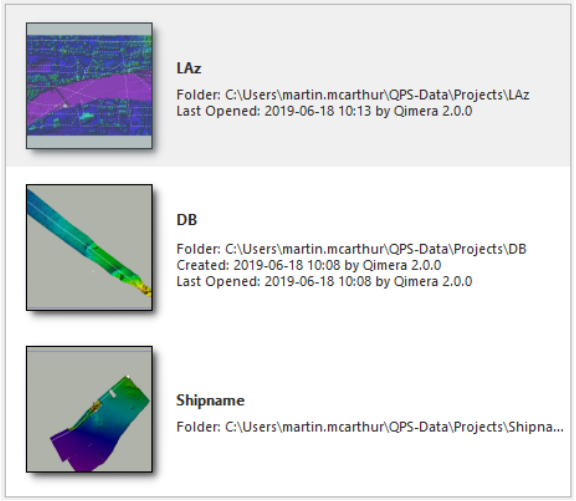
FILTER

Typing in this search field will reduce the items in the list based on the characters entered. This is useful when the '*Projects List*' becomes large.

Sort By

This drop down menu will sort the *'Projects List'* based on the selection.

Projects List



This list displays all recently opened projects including the project name, location, date created, last modified date and an image representing the work area.

Context Menu

Right clicking any of the items in the *'Projects List'* will display a context menu allowing the modification of the selected item.

- Open Folder will open the project folder in the operating system file explorer.
- Edit Properties will allow you to modify metadata concerning the Survey Type and Description of the project.
- Remove From List will remove the selected item from the *'Projects List'*.
- Remove All Projects from List will clear the list of all projects. You will be presented with a dialog informing you that you are removing all projects from the list. This does not delete the projects.

New Project

This button will display the *'Create Project'* dialog to assist in the creation of a new project. The newly created project will be added to the recent *'Projects List'*.

Open Other

This button will display a generic operating system search dialog allowing the selection of a project not visible in the recent *'Projects List'*. The chosen project will be added to the project list and opened.

Find Existing Projects

This button is used to add an existing project to the *'Projects List'*. When clicked it will display a generic operating system search dialog that will allow you to search for an existing project. When you have found your project you will be informed if it can be added to the *'Projects List'* or not. This process will not open the project.

Open

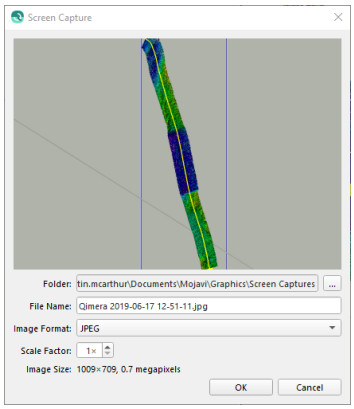
Select the project you want to use from the '*Projects List'* and click the 'Open' button. The selected project will be opened and any existing open project will be saved and closed. You may also double click on the desired project in the '*Projects List'* to open.

Close

Closes the Projects dialog.

Return to: Qimera Interface
Return to: Wizards and Dialogs

Qimera Screen Capture Dialog



- How to Start
- What it Does
- General Description
  - Folder
  - File Name
  - Image Format
  - Scale Factor

How to Start

- *Export Screen Capture...* option of the *Export* menu in the Main Menu bar

What it Does

This dialog is used to export the current scene display to a supported image format.

General Description

A screen shot of the current scene can be saved using this dialog. The export file location, name, format type and resolution must be specified in this dialog.

Folder

The folder where the exported image will be saved. The default folder will point to /Graphics/Screen Captures in the current Qimera project directory.

File Name

The filename of the exported image including its format extension. If the extension is removed it will be automatically applied based on the format selected in the '*Image Format*' Combo Box.

Image Format

This Combo Box allows selection of the exported image format. Current supported export formats are JPG, PNG, TIFF, EPS. The *'Copy to Clipboard'* option will copy the image to the operating system clipboard and allow for pasting into an external application.

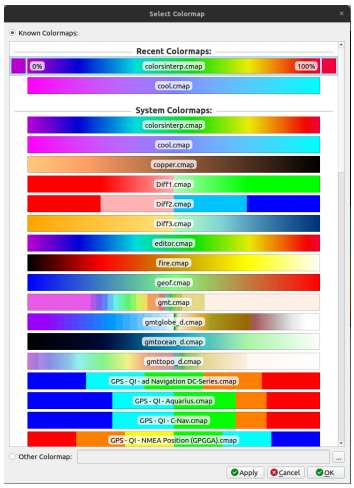
Scale Factor

Increasing the scale factor will increase the resolution of the resulting image. The resulting image size and megapixel values will be displayed next to the *'Image Size'* label.

Return to: Qimera Interface

Return to: Wizards and Dialogs

Qimera Select Colormap Dialog



- How to Start
- What it Does
- General Description

How to Start

- *Load Colormap File* option of theColormap dropdown on the Static and Dynamic grid attribute panel
- *Colormap* option on the *Shared Preferences* tab of the Application Preferences Dialog

What it Does

This dialog provides a non-visual (and frankly 1980's) list of available colormaps to choose.

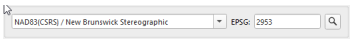
General Description

For *System Colormaps*, simply select the entry from the list and click *OK*. Select *User Colormaps* to load a previously saved colormap not part of the default colormap list.

Return to: Qimera Interface

Return to: Wizards and Dialogs

Qimera Select Coordinate System Dialog



- How to Start
- What it Does
- General Description

How to Start

- ... button in the coordinate system option of Add Processed Point Files dialog
- ... button in the coordinate system option of Create Project dialog
- ... button in the coordinate system option of Project Properties dialog
- ... button in the coordinate system option of Import ASCII Navigation dialog
- ... button in the coordinate system option of Import ASCII SVP dialog
- ... button in the Add Station dialog of Add Tide File dialog
- ... button in the coordinate system option of Import ESRI Shape dialog
- ... button in the coordinate system option of Import Image dialog
- ... button in the coordinate system option of Import Lines dialog
- ... button in the coordinate system option of Import Points dialog
- ... button in the coordinate system option of Import Navigation Configuration dialog

What it Does

This dialog allows the user to select or create a coordinate system for use by Qimera

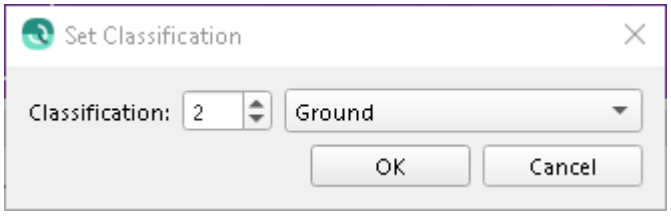
General Description

Use the combo box to see a list of *Recently Used, User Defined* and *EPSG Defined* projected coordinate reference systems. You can select from the list or start typing to filter the contents of the list. Optionally you can use the *Search* button  to launch the *Search Coordinate Reference System* dialog which allows you to search for *Projected* or *Compound* coordinate systems.

Return to: *Qimera Interface*

Return to: *Wizards and Dialogs*

Qimera Set LAS Classification



- How to Start
- What it Does
- General Description
- LAS Format specification
  - Classification

How to Start

1. In the Slice Editor make a selection using the 'Select and Edit' tool ( ).
2. Right click and select 'Set Classification...' to launch the dialog.
   a. You may also use the 'Set Classification to: ' option in the right click menu, to set the classification of the selected points to the most recently used value.

What it Does

This dialog can be used to set the classification of selected soundings. This tool is only available for use on supported file types (.LAS, .LASZip).

General Description

This dialog will allow the user to set the classification of selected points, in supported file types. If 'Color-By: Classification' is selected in the settings of your window, newly classified points will be automatically color coded.

Once a classification is chosen you may use the right click option 'Set Classification to:' to quickly set selected points to the most recently used classification.

You can also use or set the associated keyboard shortcuts for launching the dialog or setting selected points to the most recent classification. Please see Configure Shortcuts.

LAS Format specification

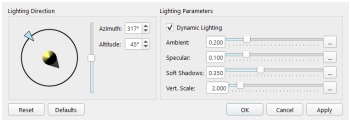
The current spec is written against the following spec: https://www.asprs.org/wp-content/uploads/2010/12/LAS_1_4_r13.pdf

Classification

Each classification has a numerical and textual representation. Changing either of these options will update the other accordingly.

Return to: Qimera Interface
Return to: Wizards and Dialogs

Qimera Shading Parameters Dialog



- How to Start
- What it Does
- General Description
  - Dynamic Lighting Toggle
  - Lighting Direction
  - Ambient
  - Specular
  - Soft Shadows
  - Vertical Scale

How to Start

- Shading *Parameters* button of Static or Dynamic grid attribute panel
- *Default Grid Shading* section of *Shared Preferences* tab in Application Preferences dialog

What it Does

This dialog controls shading parameters for grid generation.

General Description

Dynamic Lighting Toggle

When this option is toggled on the amount of illumination a grid receives is adjusted in a manner that enhances the illumination for relatively flat grids and reduces it for mountainous grids. This tends to make most grids look good with the default settings but at the expense of accurate reported vertical exaggeration and sun altitude angles. This is what Fledermaus version 7 did for illuminating grids. If accurate sun elevation and vertical exaggeration values matter to you more the the look of the grid then don't use this option. You can achieve the same or a similar look without the dynamic lighting on but you will generally have the adjust the sun elevation to make it higher in the sky than the default (~63 degrees) and then increase the vertical scale until the desired look is achieved. The amount of elevation and vertical scale will depend on the shape and z-range of the grid.

Lighting Direction

The arrow in this box represents the sun direction, which can be rotated to any azimuth from 0 to 360 degrees by clicking and dragging the left mouse button inside the box. The sphere in the middle of the diagram displays the current direction and length of the cast shadows. Dragging the slider located on the right side of the Shadow Direction box adjusts the sun altitude from 0 to 90 degrees, where 0 degrees indicates the sun would be at the horizon and 90 degrees would indicate the sun would be directly overhead. In the example shown in the figure the light is coming from the North West (upper left) and the sun is at 45 degrees in the sky (halfway). On the right of the area, both the azimuth and altitude can be edited directly.

The rest of the parameters are controlled via the following slider controls.

Ambient

This slider controls the amount of ambient or background light in the lighting model. It primarily affects the amount of light that appears in cast shadows. High ambient light makes the entire image brighter and the shadows less distinct.

Specular

This slider controls the amount of glossy highlight that appears. High specular makes the grid appear to be very glossy. Low specular will provide a matte finish.

Soft Shadows

This slider controls how sharp or soft the shadow edges are.

Vertical Scale

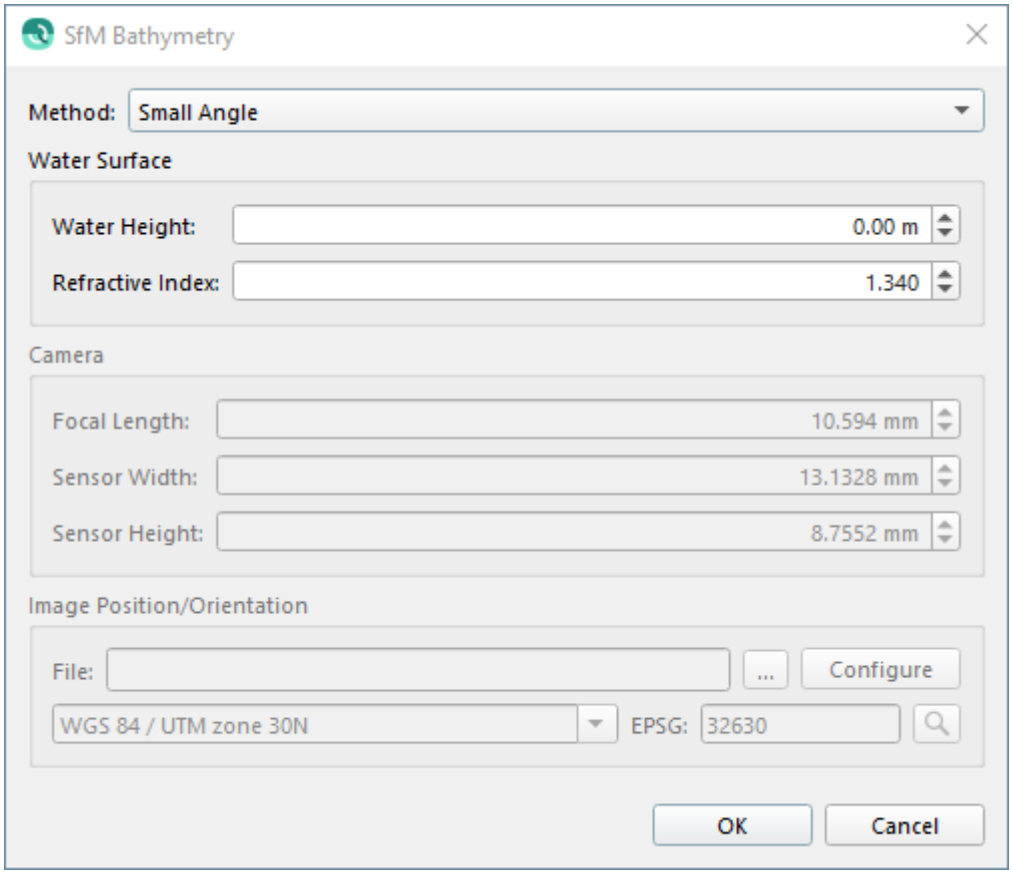
The height of the grid can be artificially increased or decreased to change the shadow length. Occasionally this is useful to enhance a low relief grid or reduce a very high relief grid. It is usually better to use the Shadow Direction/Length box to configure and adjust the shadow length.

All of the sliders work in a standard way. To change the position of the slider select and drag it using the left mouse button. To go directly to a specific part of the slider bar click the middle mouse button.

Return to: *Qimera Interface*

Return to: *Wizards and Dialogs*

Qimera Structure from Motion (SfM) Bathymetry Dialog



- How to Start
- What it Does
  - General Description
  - Method
  - Water Surface
    - Water Height
    - Refractive Index
  - Image Position/Orientation
    - File
    - Coordinate Reference System

How to Start

After obtaining and activating a valid SfM Bathymetry license from QPS...

You can select SfM Correction... option of the Tools → Utilities sub-menu of the Main Menu toolbar.

What it Does

This dialog is used to correct for refraction errors in submerged data acquired from airborne photogrammetry, commonly referred to as "Structure from Motion", or SfM. This can be applied to Processed Point Files.

Because of the large density difference between air and water, light reflected off submerged objects and observed from the air will be significantly refracted. From an airborne camera's perspective the submerged objects will appear shoaler than they are in reality.

While the refraction correction is dependent on the angle of incidence with the water, with photogrammetry the exact angle of incidence of any given point is unknown because it is the combination of multiple camera positions. There are two methods available to estimate a correction. The Dietrich method tries to find all the camera positions or images that may have contributed to a point and averages the correction. The small angle approach does not remove all refraction errors, but removes a large error which is easy to model and correct for even with an unknown incidence angle.



This should not be used in conjunction with the Z-Shift Data filter (see Manage Filter Profiles) as it will remove any previously applied shifts.

General Description

The various settings for SfM Bathymetry tool are described below.

Method

Method	Description
Dietrich	Camera properties are used to compute the field of view of each image. A point is refraction corrected for the incidence angle of each image for which it falls within the field of view. The final correction to a point is the average of all corrections. This is the preferred and default method.

Method	Description
Small Angle	This method makes the assumption that all incidence angles are at or near perpendicular with the water surface, or in other words that they are small angles of incidence. For a downward facing camera with a horizontal field of view of 70 degrees the error due to refraction is between 25% and 32% of water depth. The default setting of 1.34 for the refractive index of water will account for between 100% of the refraction error at nadir (near the camera track) to 70% at the outer extents of the field of view (away from the camera track). This will account for the majority of the refraction error but will leave some of the data in the outer extents of the field of view shoal biased a maximum of 10% of water depth. For the same camera configuration a scale factor of 1.48 will overcorrect with 140% of the refraction error at nadir to 100% at the outer extents of the field of view. This will deep bias the data near the camera track up to 10% of water depth, but in some cases may be preferable for matching data at the edge of the aerial survey with acoustic derived bathymetry in deeper waters. Use if you do not have access to camera positions and orientations.

Water Surface

This group of settings relates to describing the water surface and it's properties.

Water Height

This is the height of the water in your vertical datum when the data was acquired.

For example, if your data is referenced to mean sea level (MSL) and the tide was 1.0 meters below MSL during data acquisition then the water height should be entered as -1.0 meters.

Refractive Index

This is the refractive index for water with respect to air. This should generally not be modified unless you are using the Small Angle method and can accept some deep biasing of the data.

Camera

Focal Length, *Sensor Width*, and *Sensor Height* should be provided by the camera manufacturer or accessible within your SfM processing software. All values should be in millimeters. These are used to compute the field of view of the camera.

These settings are only applicable to the Dietrich method

Image Position/Orientation

These settings are only applicable to the Dietrich method and are ***required***

File

This is the "Omega Phi Kappa" file export from you SfM software describing the image, or camera positions and orientations. You will have to configure the ASCII parser for the 6 required fields: X, Y, Z, Omega, Phi, and Kappa.

X, Y, and Z are easting, northing, and height, or longitude, latitude, and height respectively.

Omega, Phi, and Kappa are the rotations about the X, Y, and Z axes respectively. This is a convention specific to photogrammetry and is different from our standard rotation conventions.

Coordinate Reference System

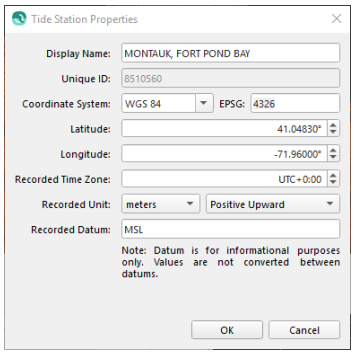
This should be the coordinate reference system (CRS) of the positions in the file. This is required in order to relate the image positions with project data.

The default is the project CRS, which assumes there is no transform.

Return to: Qimera Interface

Return to: Wizards and Dialogs

Qimera Tide Station Dialog



- How to Start
- What it does
- General Description
  - Display Name and Unique ID
  - Coordinate System and Coordinates
    - Geographic Coordinates
    - Projected Coordinates
  - Recorded Time Zone
  - Recorded Unit
  - Recorded Datum

How to Start

- *Add Station* button in the *Add Tide File* Dialog
- **Right-click** the station in the *Project Sources* Window and select *Edit Tide Station* in the context menu
- **Double-click** the station in the *Project Sources* Window

What it does

The dialog allows for creating or editing a *Tide Station* that can be used as a tide source for vertical referencing.

General Description

Tide Stations are used for grouping tide data files from the same source and using those files for tide correction in vertical referencing or in Tide Strategies.

> After creation a tide station's *Unique ID*, *Recorded Time Zone*, and *Recorded Unit* are no longer modifiable unless all tide files are removed from the station.

The various fields of the dialogue are described below.

Display Name and *Unique ID*

The *Display Name* and *Unique ID* are used for identifying stations throughout Qimera. Other than display they are also used for matching new tide files during import to the station when the format supports header data.

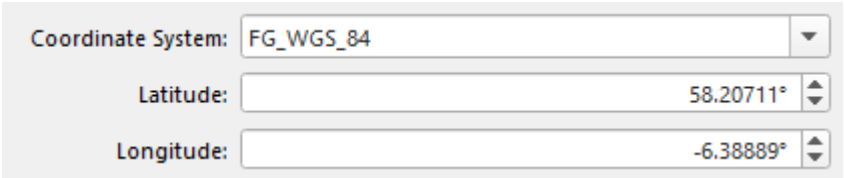
Both fields can be identical as long as the ID is unique in the project. In many cases though tide gauges will have a unique numeric identifier which may not be useful for identifying and instead a location name may be used for the *Display Name*.

Coordinate System and Coordinates

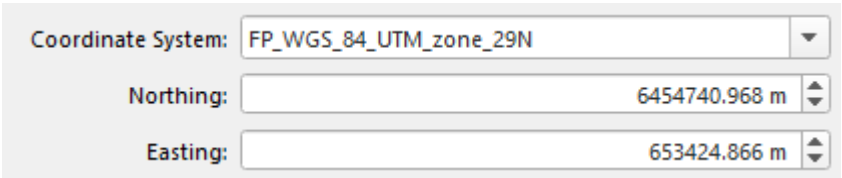
By selecting the appropriate *Coordinate System* the station coordinates can be entered in either geographic or projected.

Station coordinates are optional but must be set for the station to be used in an interpolated or distance weighted *Tide Strategy*.

Geographic Coordinates



Projected Coordinates



Recorded Time Zone

The *Recorded Time Zone* specifies the time zone of the tide measurements in tide files imported to the station. On import this setting is used to transform tide data imported to the station into the project time frame, which is UTC.

Recorded Unit

The *Recorded Unit* specifies the units and the sign convention of the tide measurements in tide files imported to the station. Both settings are applied on import of a tide file. The unit setting is used to transform tide heights into the project units specified in the project coordinate system. The sign convention is used to convert to the application reference frame which is "Positive Upward" for tides. The sign convention is set to "Positive Upward" by default, an example of when it should be set to "Positive Downwards" is if tide values get increasingly positive as the tide goes out.

Recorded Datum

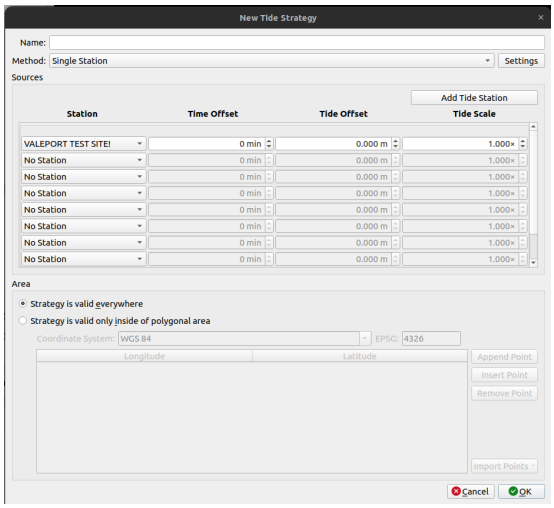
The *Recorded Datum* is for informational purposes only and is not used for any transformation of tide values.

Return to: Qimera Interface

Return to: Wizards and Dialogs

Return to: Add Tide File Dialog

Qimera Tide Strategy Dialog



How to Start

- **Right-click** on *Tides* or *Strategies* group in the *Project Sources* Window and select *Create Tide Strategy* from the context menu
- **Right-click** on an existing Strategy in the *Project Sources* Window and select *Edit Tide Strategy* from the context menu
- **Double-click** on an existing Strategy in the *Project Sources* Window

What it does

The dialog allows for creating or editing a *Tide Strategy* that can be used as a tide source for vertical referencing.

General Description

Tide strategies can be used to apply advanced computations, constraints, and offsets to compute a tide estimate for a region or vessel location based on measured tide values. The *Tide Strategy* dialog is used to configure all of the settings needed for the tide estimation.

The dialog has several section, these are explained below.

Name

The name is only used for display purposes and only needs to be unique within the project.

Method

The selection of a *Method* changes the computation used and is based on the number of stations being used and the desired computation.

Each of the available methods are described below.

Single Station

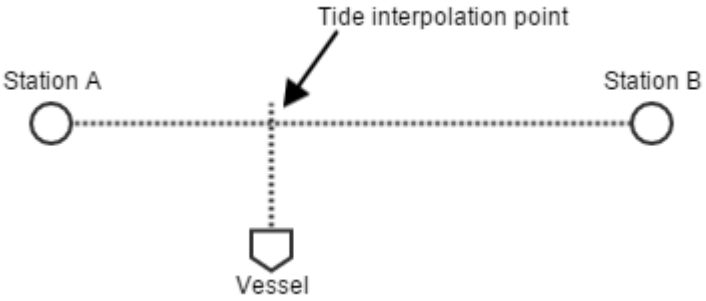
The *Single Station* method allows for applying source offsets or area constraints to a single station. If more than one station is included in *Sources* the additional stations will be switched to in order based on data availability.

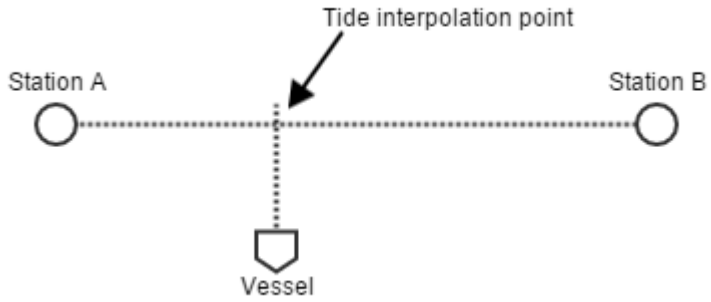
Average

Averages tide measurements from all stations available from *Sources*.

Two Station Linear Interpolation

The *Two Station Linear Interpolation* method uses the projected position of the vessel onto the straight line connecting two tides stations. The tide value is interpolated on the straight line between the two stations.

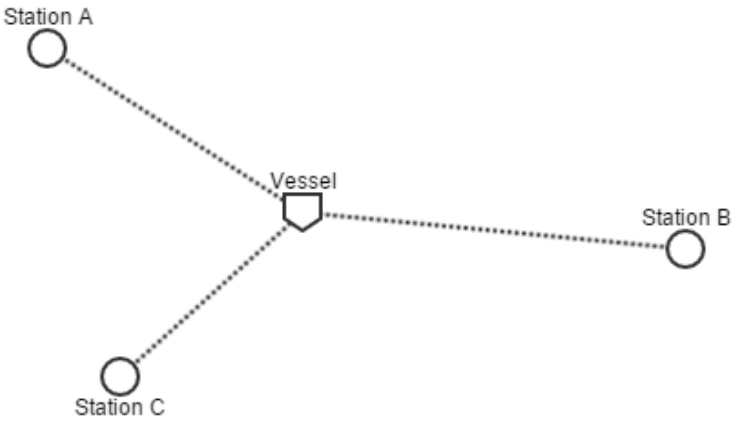


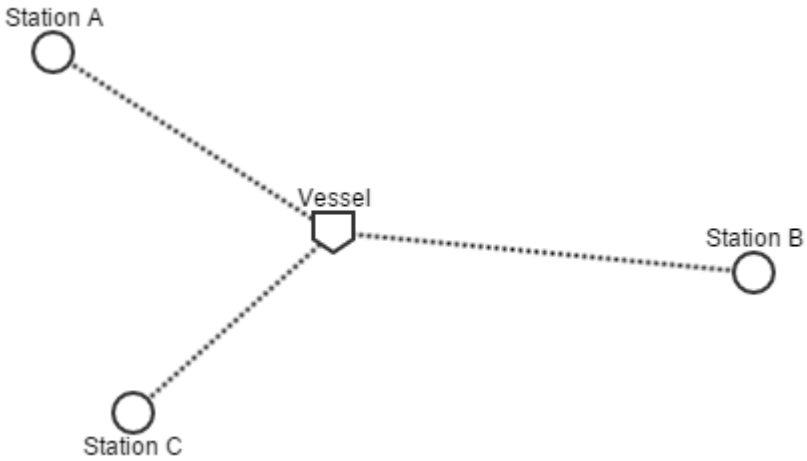


If the location of the vessel passes either station instead of extrapolating the nearest station will be used.

Multiple Station Distance Interpolation

The *Multiple Station Distance Interpolation* method performs a weighted average of all tide stations included in the strategy. The weighting is determined by the vessel distance to each station, the closer a station is the more influence it has on the resulting tide value.



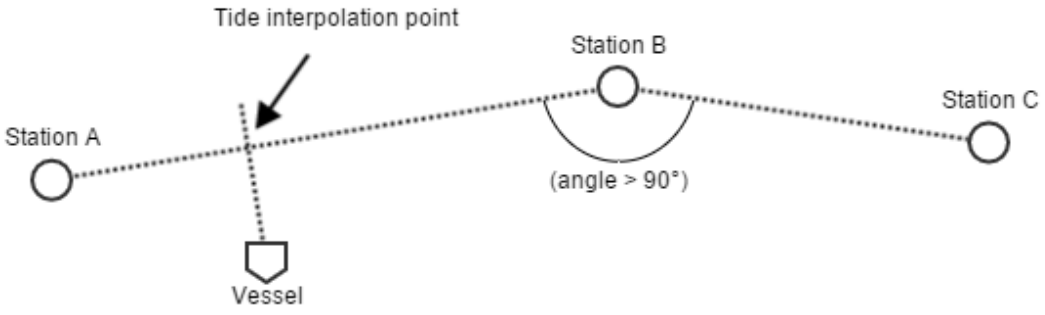


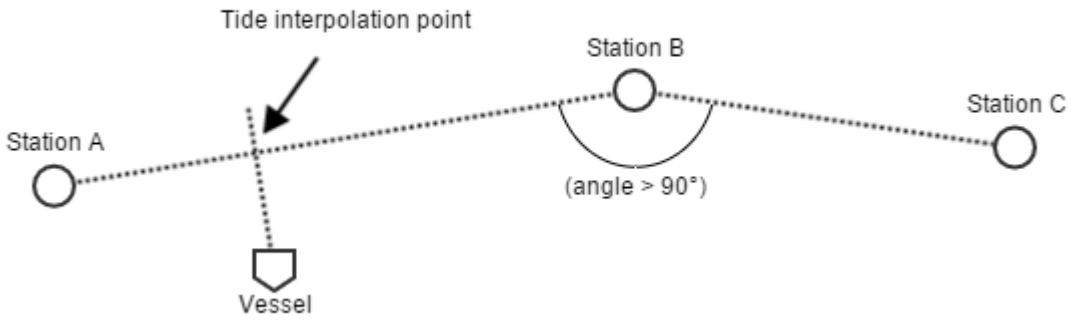
Linear Co-Tidal Interpolation

The *Linear Co-Tidal Interpolation* method interpolates both the tidal phase and amplitude between 2 stations. It is similar to the *Two Station Linear Interpolation*

method as it uses the projected position of the vessel onto the straight line connecting the two nearest tides stations. More than 2 stations can be stringed together but the line connecting the stations cannot make an angle of less than 90 degrees.

The phase interpolation is computed by detecting the nearest high water in time at both of the nearest 2 stations. The time offset between the 2 high waters is weighted by distance on the line connecting the 2 stations and used to shift the tide signals to a common phase.





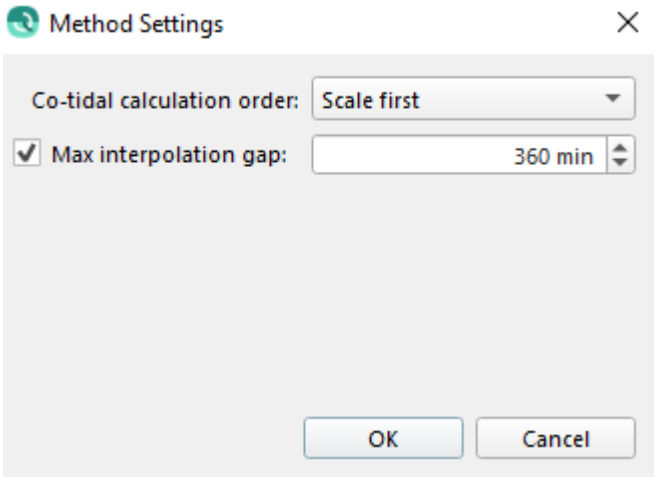
Tide measurements can't be determined past the terminal stations in the line of stations.

Tide Constituent and Residual Interpolation (TCARI)

The *TCARI* strategy is used to show information about about a TCARI model imported through Add Tide Definition File Dialog. The strategy does not directly provide any tide calculations.

Settings

Clicking the *Settings* button next to the method will launch a dialog that presents general settings for all methods.



Co-Tidal calculation order

This relates to the order that the offset and scale factor configured in the *Sources* section are applied. The tide computation will use one of the following equations based on this setting:

Option	Equation
Scale first (default)	$\text{Computed Tide}\,(t_{ping}) = \text{Station Tide}\,(t_{ping} + \text{Time Offset}) \times \text{Tide Scale} + \text{Tide Offset}$
Offset first	$\text{Computed Tide}\,(t_{ping}) = (\text{Station Tide}\,(t_{ping} + \text{Time Offset}) + \text{Tide Offset}) \times \text{Tide Scale}$

Where t_{Ping} is the time of the ping.

Max interpolation gap

If enabled, this is the maximum time between tide measurements to allow interpolation of the measurement. This can be used to prevent interpolation across large outages.

When interpolation is prevented by this setting the next lower priority tide source that is available will be used.

Sources

The *Sources* section is used for selecting appropriate stations for the method, and setting any offsets or scaling of tide values. The number of station dropdowns is determined by the selected method.

The offsets and scale factor are applied to the station tide measurements before inclusion in the method's calculation for each ping time. See the *Settings* section above for how these are used in the calculation.

Area

The area settings are used to restrict the use of a strategy to a specific geographic area. By default strategies are applied throughout the project.

If using a polygon to restrict the area where the method is valid, or in other words to be applied, the polygon can be entered manually or imported in either geographic or projected coordinates.

The *Coordinate System* must be set and will be used to convert the polygon from the input system to the project coordinate system.

Manual Point Entry

The buttons to the right of the table are used to insert or delete polygon points. Once inserted a points coordinates can be modified directly in the table.

Importing Points

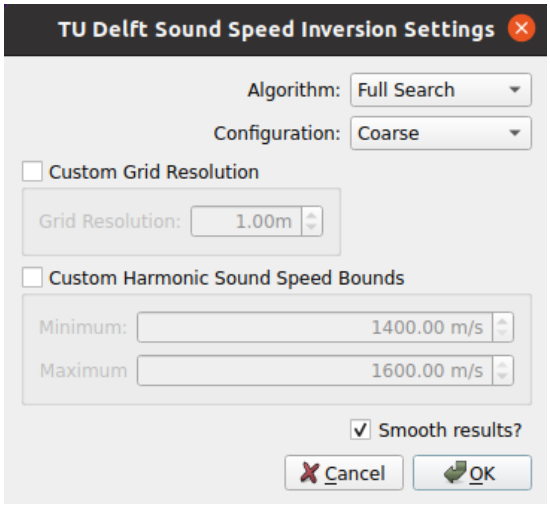
There are three options for importing a polygon. The options for importing are available from the Import Points dropdown at the bottom right side of the table.

- *Import from current selection in scene* - if you have made a selection with one of the select tools on the 4D Scene Toolbar the selection coordinates will be imported to the polygon table (disabled if no selection made)
- *Import from line object* - if you have already imported an SD line object to the project this can be imported as the polygon (disabled if no line objects imported)
- *Import from ASCII file* - this will launch the Custom ASCII File Import dialog, which will allow for import of formats that list one coordinate per line

Return to: Qimera Interface

Return to: Wizards and Dialogs

Qimera TU Delft Sound Speed Inversion Settings Dialog



- How to Start
- What it does
- General Description
  - Algorithm
    - Quick Search
    - Full Search
  - Configuration
    - Coarse
    - Fine
    - Very Fine
  - Custom Grid Resolution
  - Smooth Results
- References

How to Start

- *TU Delft Sound Speed Inversion* option of the *Tools* menu.

What it does

This dialog is for selecting and configuring the TU Delft Sound Speed Inversion algorithm of the users choice. This will be run on each of the selected raw sonar files using any

available soundings in the selected dynamic surface to constrain the harmonic sound speed estimate.

After the algorithm is finished a new Harmonic Sound Speed attribute will be available in the Time Series Editor and Processing Settings - Sound Velocity tab.

QPD files created in QINSy prior to 8.18, Qimera prior to 1.6, or with Direct to QPD will not have sufficient information to run the algorithm and will require sound velocity correction in Qimera prior to use. If needed a separate dialog will ask if you wish to reprocess the files to continue.

General Description

The selected settings will be used to compute a harmonic sound speed estimate time series for each of the selected raw sonar files.

The various fields of the dialog are described below.

Algorithm

There are two algorithms to choose from with the main trade off being between speed and sensitivity to noisy data.

Quick Search

As the name implies, this is the quickest of the two algorithms. This option is best for relatively flat bathymetry with minimal artifacts aside from those associated with sound speed.

Full Search

The slower of the two algorithms, this option is best for data with variable bathymetric relief or some noise artifacts.

Configuration

The configuration options allow for trade offs between speed and precision.

Coarse

The fastest of the options, this is best for environments expected to have more gradual changes in sound speed. This option will only consider a fraction of the soundings

Fine

This option provides twice the estimates of sound speed at about twice the computation time as compared to the Coarse option. This option makes use of half of the available soundings.

Very Fine

The slowest of the options, this is best for environments where very abrupt changes in sound speed are expected. This option makes use of all available soundings.

Custom Grid Resolution

This settings allows the user to specify the grid size used to calculate the sound speed inversion values.

Smooth Results

Enabling this option will make a weighted moving average of the resulting harmonic sound speed time series. This is most beneficial for the Quick Search which is more prone to poor estimates in noisy environments.

References

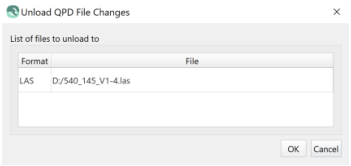
For the interested user, there are two publications that describe the underlying algorithm.

1. Shallow Survey 2018 paper and presentation.
2. Academic paper in IEEE.

Return to: *Qimera Interface*

Return to: *Wizards and Dialogs*

Qimera Unload Processed Point File Dialog



- How to Start
- What it Does
- General Description

How to Start

- *Unload Changes* option of processed point file context menu.
- *Unload Changes* option from the Dynamic Grid Context Menu

What it Does

This dialog will display all the the processed point files selected to be unloaded to.

General Description

Processed point files that are added to Qimera can be edited. Usually this involves modifying soundings as rejected or not but can also change whether a sounding is marked as Feature, Plotted, or Suspect. Before edits can be made, a processed point file is converted to a QPD file. If the process point file supports unloading, (refer to the processed point file table at Qimera Supported Import Data Formats) then the edits made to the QPD file can be unloaded back to the original processed point file. All processed point file formats support changing a sounding from being accepted to rejected and vice versa. Some formats such as GSF also support writing back whether a sounding is marked as Feature, Plotted, or Suspect. FAU files also allow for applied depth changes to be written back.

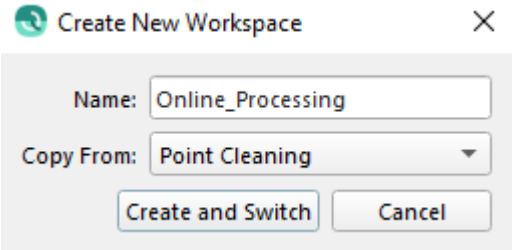
When choosing to unload changes, the Unload dialog will appear. This simply gives a preview of all the files that will be unload to and their respective formats. When a FAU file is being unloaded an option to unload applied depth changes is given.

Instead of unloading back to the original processed point file, there is also the option to save the file(s) as an ASCII XYZ file. To do this use the Qimera Export Processed Points Dialog.

Return to: Qimera Interface

Return to: Wizards and Dialogs

Qimera Workspace Creation Dialog



- How to Start
- What it Does
- General Description

How to Start

Selecting the Create New Workspace... option of the Window→Workspaces sub-menu in the Main Menu toolbar.

What it Does

This dialog is used to create new workspaces using a copy of a previously defined workspace as a starting point.

General Description

Creating a new workspace is achieved by entering a name in the *Name* field and selecting a previously defined workspace from the *Copy From* combo box. The new workspace will be created and selected and any modifications to the layout will be automatically saved to the new workspace.

Return to: Qimera Interface

Return to: Wizards and Dialogs

Questions & Answers

This space contains the frequently asked questions for Qimera

- Qimera - Data Format Specific
- Qimera - Licensing
  - Qimera - License Levels
  - New QPS Licensing
- Qimera - General
  - Qimera - Shortcut keys overview (configurable)
- Qimera - Processing

Qimera - Data Format Specific

This page contains frequently asked questions for Qimera.

On this page:

- Is the Qinsy online Kalman positioning filtering used by Qimera when processing DB files?
- When working with Qinsy data, are all parts of the Qinsy project necessary? Or, are only the .db files required? Are the .db files self contained? Is there any benefit to copying a whole Qinsy project locally before starting to work with it in Qimera?
- When working with QINSy data, is there any way to query the data after it is loaded into Qimera in order to find the coordinate system of the imported data?
- With QINSy data, does the project auto-reproject to UTM if that option is left on during project creation?
- I would like to import my QINSy DB files that have an ROV with multibeam as well as my hull mounted multibeam system into Qimera, is this possible?
- When adding .hsx files, the Add Raw Sonar Files dialog requests a 'Time Reference/Acquisition Time Zone'. Is this information pulled from the .hsx file?
- Hypack data may or may not have SVP information available during the SVP strip stage of import. What determines whether or not this info is available in the .hsx?
- Why is Qimera not reading my Binary Navigation SBET (.out) files?
- Which data packages are needed for Qimera to work with Kongsberg HISAS?

Is the Qinsy online Kalman positioning filtering used by Qimera when processing DB files?

If you have QPDs, they will import automatically into Qimera. If you re-process the QPDs in Qimera, you will get new position data using Qimera's computation engine, which is different from Qinsy's computation engine. There is no Kalman filtering in Qimera; the position stream straight from the observed values is used. If filtering was applied in the original QPD, it will be lost.

As of Qimera 1.6.0, the navigation source for multiple objects will be extracted from the QINSy QPD and saved. This allows for support for previously unsupported object navigation types. Full reprocessing can then be carried out without the loss of the Qinsy navigation solution.

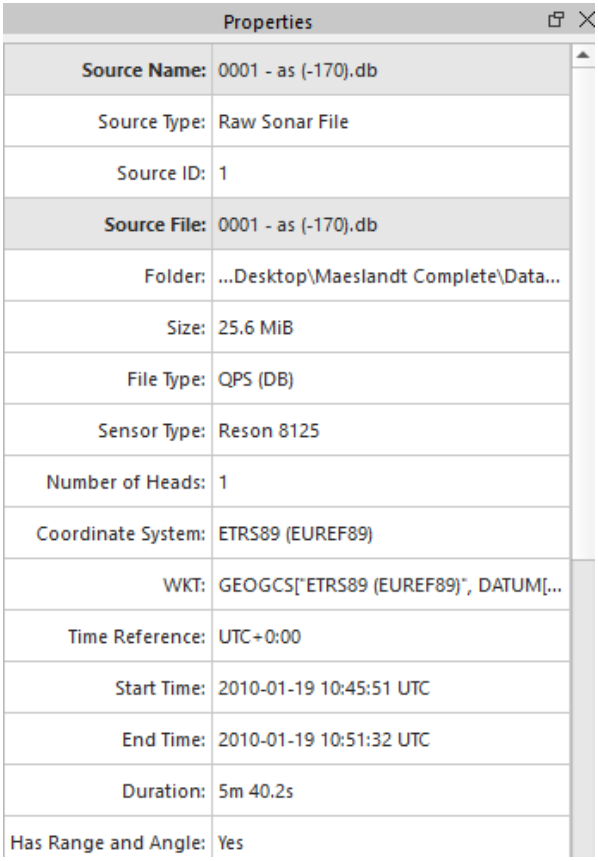
When working with Qinsy data, are all parts of the Qinsy project necessary? Or, are only the .db files required? Are the .db files self contained? Is there any benefit to copying a whole Qinsy project locally before starting to work with it in Qimera?

Qimera will load the .db files and will import and convert the data from the ancillary sensors into the Qimera project. If there are pre-existing QPDs in the usual location, then Qimera will find these QPDs and you can begin examining the data and create gridded products immediately. The .db files are self contained and no other data is extracted from any other file. Qimera will never modify the .db file so you don't necessarily need to make a backup, you can work with Qimera directly in your Qinsy project folder.

As of Qimera 1.6.0, .db's containing multiple objects, and the navigation type for said objects which contain the multibeam system, are not currently supported in Qimera. Therefore, the QINSy QPD's will be needed.

When working with QINSy data, is there any way to query the data after it is loaded into Qimera in order to find the coordinate system of the imported data?

Yes, if you select the database in the Project Sources window you can then view the coordinate system and other properties of the data by selecting the Properties tab in the tab page list. It will also show you the co-ordinate system of the projected .qpd as well.



Has Intensity:	Yes
Has Beam Time Series:	No
Has Water Column:	No
Has Runtime Settings:	Yes
Has Points:	No
Has Vessel Config:	Yes
Has Motion:	Yes
Has SVP:	Yes
Has Tide:	No
QPD File:	0001 - as (-170).qpd
Folder:	...or Documentation\DtmData\Schulp...
Size:	21.0 MiB
Vessel Name:	Schulpegat
Line Name:	
Comment:	Online Tide Applied
User Name:	
Start Time:	2010-01-19 10:46:21 UTC
End Time:	2010-01-19 10:51:31 UTC
Duration:	5m 10.2s
Start KP:	0.00
End KP:	0.00
Coordinate System:	Amersfoort_RD_New_+_NAP_height
WKT:	COMPD_CS["Amersfoort_RD_New_+_...
Total Soundings:	503760
X Range:	70481.34 — 71074.80
Y Range:	441016.25 — 441538.13
Z Range:	-67.30 — -45.29
Validated Soundings:	489165 (97.1%)
Validated X Range:	70481.34 — 71072.85
Validated Y Range:	441016.64 — 441533.89
Validated Z Range:	-65.16 — -51.28

With QINSy data, does the project auto-reproject to UTM if that option is left on during project creation?

No, it does not. When you import .db data, Qimera inherits the projection system that was chosen in QINSy.

I would like to import my QINSy DB files that have an ROV with multibeam as well as my hull mounted multibeam system into Qimera, is this possible?

Previous to Qimera 1.6.0 this is not possible, Qimera is limited to supporting one object DB files, unless your ROV has its own associated navigation string, motion sensor etc. we do not support USBL positioning.

If you have a QINSy QPD for each DB, Qimera 1.6.0 and later will support the extraction of the QINSy nav solution and will allow for full reprocessing of that data.

When adding .hsx files, the *Add Raw Sonar Files* dialog requests a 'Time Reference/Acquisition Time Zone'. Is this information pulled from the .hsx file?

Hypack can be configured to record the data in the local time zone. When merging Hypack data with externally recorded data, such as POSMV or SBET files (which are both referenced to UTC), Qimera needs to be able to understand what time zone the .hsx data was recorded in, if it wasn't configured to work in UTC. Unfortunately, the time zone offset relative to UTC is not recorded in the .hsx file and the user must provide this information on import.

Hypack data may or may not have SVP information available during the SVP strip stage of import. What determines whether or not this info is available in the .hsx?

A user can choose to load a profile during acquisition in Hypack, in this case, the SVP that's loaded will be written out to the .hsx file. If no SVP is specified, then there won't be one in the .hsx file.

Why is Qimera not reading my Binary Navigation SBET (.out) files?

Qimera does not recognize the (.out) extension because POSPac's internal data formats all have the same (.out) extension regardless of what is actually in the file. In POSPac's internal data format, approximately 15 files share the same extension, which presents

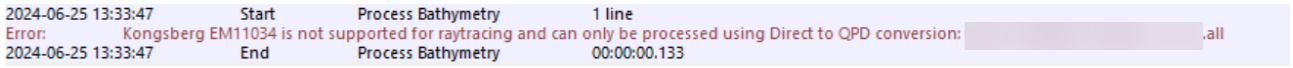
issues for Qimera. The main issue is there is nothing in the files that actually distinguish the contents of the file. Therein the user must manually rename the basename of the Binary Navigation SBET file. We realize asking the user to rename files is generally considered a bad practice, however in general this is a single file per day of acquisition. Renaming the file is the only way to ensure that the user doesn't accidentally select the wrong .(out) file. Regardless of the (.out) file selected, the file would be read by Qimera with no way to distinguish if the file is indeed the correct one for this particular task.

When importing POSPac SBET files, 'sbet' must be part of the base name of the file. The base name is the part of the file path after the directory and preceding the file extension. If you have an associated RMS file, it must have the same naming except that 'sbet' is replaced with 'smrmsg'. If this naming convention is not used, Qimera will not be able to auto-recognize the file type.

Which data packages are needed for Qimera to work with Kongsberg HISAS?

Kongsberg HISAS data can be imported using the Kongsberg .all format. Qimera facilitates the import of these files and can generate QPD (footprints) for the data through the "Direct to QPD" workflow.

However, it is important to note that Qimera does not support ray tracing for this data. Consequently, external navigation or adjustments to settings will not yield new calculated footprints.



The table below outlines the data packages required by Qimera to effectively work with HISAS data, as well as those that are optional.

Datagram ID	Required data packets	Comment
ID 65: Attitude	✅	
ID 78 or 123: Raw range and angle	✅	
ID 80: Position	✅	
ID 88: XYZ	✅	

Datagram ID	Required data packets	Comment
ID 104: Depth	⚠	Strictly speaking, this field is not mandatory for file import; however, it is a crucial field to possess. If the vessel depth is non-zero, the footprint depths will be inaccurate, and this error is irretrievable.
ID 67: Clock	ℹ	
ID 85: SVP	ℹ	
ID 73: Installation Parameters Start	ℹ	
ID 82: Runtime Parameters	ℹ	Any Installation parameters that are missing could cause offsets to not be included in the establishment of footprint positions
ID 105: Installation Parameters Stop	ℹ	

Qimera - Licensing

This page contains frequently asked questions for Qimera.

- Qimera - License Levels
- New QPS Licensing

Qimera - License Levels

General Description

Qimera Clean allows you to edit a dynamic surface. With Qimera Clean you can import any supported Point File Formats for Visualization. Kongsberg (.all) and NAVO GSF (.gsf) can be imported, but they are converted directly to (.qpd) files and cannot be further processed, meaning that the file format will come in as points and their positions cannot be updated. **Qimera** allows you to fully process QINSy (.db)**,** Kongsberg (.all & .kmall), Reson (.s7k), Hypack (.hsx), Edge Tech(.jsf), NAVO GSF(.gsf), Elac SeaBeam(.xse), and R2Sonic (.r2sc) files. **Qimera Offshore** provides capability for cable and pipeline processing, including TOP detection from multibeam data, as well as sensor processing for cable and pipe-tracker systems. A number of add-ons are included with Qimera Offshore as well, as described in the table below.

Capability	Qimera Clean	Qimera	Qimera Offshore
File Loading			
DB			
QPD			
ALL			
KMALL			
S7K			
HSX			
JSF			
GSF			

Capability	Qimera Clean	Qimera	Qimera Offshore
XSE			
R2SC			
Processed Points (see link below)			
File Processing*	**Qimera Clean**	**Qimera**	
DB			
QPD			
ALL			
KMALL			
S7K			
HSX			
JSF			
GSF			
XSE			
R2SC			

Capability	Qimera Clean	Qimera	Qimera Offshore
Tools	**Qimera Clean**	**Qimera**	
Vessel Editor			
SVP Editor			
Path Test			
Wobble Test			
Time Series	***View Only***		
Processing Settings			
Time Series Multiplot	***View Only***		
Water Column	***.ALL (View Only)***		
Water Column Point Extraction		***Midwater Add-on***	***Midwater Add-on***
TU Delft Sound Speed Inversion	***TU Delft Add-on (Qinsy QPD only)***	***TU Delft Add-on***	***Included***
ENC Editor	***ENC Plus Add-on***	***ENC Plus Add-on***	***ENC Plus Add-on***
Structure from Motion Bathymetry Refraction Correction	***SfM Add-on***	***SfM Add-on***	***SfM Add-on***

Capability	Qimera Clean	Qimera	Qimera Offshore
Automatic Height Matching		***Automatic Height Matching Add-on***	***Included***
HIPS I/O	***HIPS I/O Add-on***	***HIPS I/O Add-on***	***HIPS I/O Add-on***

* Processing includes refraction, recompute XYZ, recompute XY, recompute Z

For more information on Processed Points importing, see Qimera Supported Import Data Formats. QPDs can also be imported as Processed Points.

Return to: *Qimera Interface*

Return to: *Wizards* and Dialogs

New QPS Licensing

Question	Answer
How has licensing changed in the most recent versions of QPS software?	QPS is retiring the use of node-locked (ethernet) licenses (single use and server) and blue Flex dongles. These types of licenses will not work with Qimera v1.6 and Fledermaus v7.8 and newer. Qimera v1.6 and Fledermaus v7.8 and newer will require a new **softlock license** or a **Hasp dongle** (both of these license types are available for Windows/Mac/Linux). QINSy will continue to require a Hasp dongle. In the future, softlock licensing may become available to QINSy clients.
How do I activate or update a softlock or HASP dongle?	As of QINSy (v8.18), Qimera (v1.6) and Fledermaus (v7.8) you will notice that there is now a 'License Manager'. The License Manager will automatically open if a license is not installed on the machine and you open the software. If you do have a license installed on the machine you can find the License Manager by navigating to Help> View License Status. The License Manager will be used to activate softlock licenses and update Hasp dongles. Softlock licenses and Hasp license codes will be distributed as an XML file that can be uploaded to the License Manager. Alternatively, it is possible to open the XML file in a text editor and manually enter the code into the License Manager. Note, licenses that begin with 514 correspond to Hasp dongles; the 514XXX number should match the number on the dongle tag. Licenses that begin with 517 correspond to micro Hasp dongles. Licenses that begin with 520 correspond to softlock licenses (single and server). You can find more information about the License Manager and how to activate and update licenses in the inline Help file.

Question	Answer
What are the benefits of softlock activation?	• You don't need to ship dongles around to share your licenses in your team or between projects. You can now deactivate a license on a machine in the office and free up its use for field personnel. All that is required is to send the activation code to the recipient. • You don't need to worry about dongles being lost or damaged. • You don't need to worry about physically securing dongles while not in use. • You no longer wait for a dongle to be shipped when you need additional licenses, QPS just needs to send you an activation code.
If a softlock activation code is used, then deactivated and not used is it still valid?	Yes it is. It will remain valid for the lifespan of the license.
How often can I deactivate and reactivate a softlock license?	You can activate/deactivate/reactivate a softlock license as often as you like.
How often do softlocks need to access the internet?	A softlock license activated on a single machine will check back to QPS servers every few days in order to get the latest license information and to confirm the license is still valid. If the License Manager cannot connect to the Internet, it will wait a short period and then try again. If the License Manager fails again, the softlock will enter a **90 day grace period** where it will remain active without internet access. If the License Manager cannot connect after those 90 days, the softlock license will stop working.

Question	Answer
Can softlocks be moved from one machine to another?	Yes softlocks can be moved from one machine to another, but must be properly deactivated and re-activated in order to do so. To move a softlock license from one machine to another it requires deactivation on the first machine, and then a new activation on the second machine. Both the deactivation and the new activation require an internet connection. So if a machine is disconnected from the internet and is in the 90 day grace period, the softlock cannot be deactivated until the computer (and License Manager) has access to the internet.
Can softlocks be used with a virtual machine?	For security reasons softlock licenses can not be used to activate on a virtual machine. In some circumstances we may allow VM activation's for license servers, so please contact QPS if you have questions about using a virtual machine as a license server.
Can I use my new softlock license with older versions of the software?	• Fledermaus versions older than v7.8 and Qimera versions older than v1.6 will NOT work with a softlock license. Softlock licenses are not currently available for QINSy, although testing is underway and they may be available for QINSy in the near future. • Fledermaus versions 7.8 and newer and QM versions 1.6 and newer require a softlock or Hasp dongle license; old Flex dongles (blue dongles) and node-locked (ethernet) licenses will not work with the most recent versions of the software. • Hasp dongles will continue to work for all QINSy versions.
My dongle has multiple products on it. If I choose to use a softlock instead, how will this affect my licensing?	Each product will get its own activation code. The big benefit of this is that you can now "split up" your product licenses that might have previously been tied to a single dongle. For example, if you had a single dongle with an active code for QINSy and Qimera, you could only use this on one computer. With softlock activation codes, you can run QINSy on one computer (using a Hasp dongle) and Qimera on another computer (using a softlock). Previously, you would have needed two separate dongles for this.

Question	Answer
What is a HASP dongle driver? Do I need this?	Yes, anyone using a HASP dongle needs a HASP dongle driver installed on their computer. The HASP driver allows the dongle to communicate with your computer's operating system and is necessary for the computer to recognize your license. Sentinel is the maker of the HASP dongle that QPS is now using for all dongle licensing. Sentinel (a separate company from QPS) maintains and updates the drivers periodically, and therefore it may be necessary for you to visit the Sentinel site to download the most up-to-date driver for the dongle. If ever a dongle doesn't seem to be working on a computer, the first thing to do is to make sure you have the most up-to-date dongle driver installed on the computer. Link to where you can download the most up-to-date Sentinel HASP drivers for Windows/Mac/Linux: https://sentinelcustomer.gemalto.com/sentineldownloads/?s=&c=End+User&p=HASP+HL&o=all&t=Runtime+%26+Device+Driver&l=all# Users working on Windows machines may prefer to use the "Sentinel HASP LDK - Windows GUI Run-time Installer", and users working on Mac machines may prefer to use the "Sentinel HASP LDK Mac OS X Run-time GUI Installation". Information regarding the HASP drivers can also be found on the downloads pages of the QPS website: QINSy Downloads Page, Qimera Downloads Page, and Fledermaus Downloads Page.

<table>
<tr><th>Question</th><th>Answer</th></tr>
<tr><td>What should I do with my old blue Flex dongle? Do I return it?</td><td>Yes, we are asking that clients ship the old blue Flex dongles back to us. Before doing so, please first activate your new license and make sure that it is working for you.
Please return your dongles to your local retail office.
<table>
<tr><th>Netherlands Office</th><th>USA Office</th><th>UK Office</th></tr>
<tr><td>Handelsweg 6 - 2
3707 NH Zeist
The Netherlands</td><td>QPS
C/O Teri Bridges
One New Hampshire Ave, Suite 125
Portsmouth, New Hampshire 03801
USA</td><td>2B Banbury Office Village, Noral Way
Banbury, Oxfordshire OX 16 2SB
United Kingdom</td></tr>
</table></td></tr>
<tr><td>What information do I need to know before attempting to install a new server license?</td><td>The server licenses are a bit more complex than softlock licenses and require the person installing the server license to have computer administrator privileges, and knowledge of both the network and the firewall settings. An internet connection to the server is also needed.
We have guides for installing softlock license servers on:
Windows (How-to Softlock License Server - Windows Setup),
Mac (How-to Softlock License Server - Mac OS X Setup), and
Linux (How-to Softlock License Server - Linux Setup).
The guide relative to your operating system should be reviewed before installing a server license.</td></tr>
<tr><td>Who can see the activation key associated with a server license?</td><td>If using a network server, only the administrator who manages the server will need to know/see the activation key. All client machines connecting to the server would just need to know the server IP or host name. Only machines that have access to that server would be able to use a license.</td></tr>
</table>

Question	Answer
I'm a Qastor user, am I affected by the new licensing?	Yes, softlocks are also now available for Qastor users, and Hasp dongles continue to be an available option as well. Please refer to How-to Upgrade a Dongle/Softlock - Qastor 3 for specific information.
What information is contained in the activation request xml?	Wyday (the licensing provider) intentionally does not detail exactly what the makeup of the XML is, or how it is constructed. It contains indentification information on several hardware components of the PC. Here is an example: ~~~~~~~~~~~~~~~~~~~~~~~~~~~~ <?xml version="1.0" encoding="utf-8"?><ActivationRequest><ablock data="dtxG3v+Xlj1/ nhTBrhvGHMgFPNqEMXYgPEiN2ZZ8Od0FzXFQGKhjlaaxWV6DsGFej aYpACr6nXbEyKSCM/bQI/ NAby13HPJljeUGJUf9wXnloPdgZrNIbY6wT6vjGUSEQo9bxfrvXCOoQ WH58N1UtODhI8D1jmFRkXLogWVLVKw7cJIUp+2lt404ukakiU7kDa4 omatE5iPIFCux2G25SlHf3mUHzdovY9L4vcph8qmTHdNWQ7hgaJ7X GXl8j/KnYU50AnTGto3DgktHLnCBWRAUqgqpgfFbEyxchHRiId6c/ RU3uU5eU6YvuQo0PMdAz48UwqLloLhalXCVYlsiQGHsyLAvb20tz+ +7QSEm4AKHe1beKZlFP+aX1gR8A+zwCVE4dp9gJMF3A5G5DTCb2 Ck86J4VSopF8EvD9xzzuo538SltDzD+4AgNeRU3r8FQViYI0c33inA+c aWcPTfY/ QBCHewm8NAgkNVr9lc52lCyabzgGiEf4HlvAZiuXtmt7pMsuP08/ yojcmHNklYj4V5/ DLD92OZaWGMAFC8GYr2Cij496VxHWC0z0OvsI2/3Yeq/4L/ +xMljrg5pQ24r2aWiVd/ 4WYRMyrAexqlm38bDyIVnDZZobngh1qdlyHvy5ILBX2yk3U5qwy9hb5 Tr6vgm6lqw5swW4IhY5jiuQhg=" id="4283"/></ActivationRequest> ~~~~~~~~~~~~~~~~~~~~~~~~~~~~
How much can the hardware on a softlock server change before the license stops working?	Wyday uses what they call a ‘fuzzy fingerprint’. They do not disclose this fully, for their own proprietary reasons. Generally, one or two hardware components can be changed and the fingerprint match will still be valid.

Qimera - General

This page contains frequently asked questions for Qimera.

On this page:

- Can a user choose to disable the Welcome Screen?
- Are there hotkeys available in Qimera?
- What is the status of laser support in Qimera?
- In the Preferences, what is the Questions and Answer box for?
- What types of raw files are supported by Qimera?

Can a user choose to disable the Welcome Screen?

No, this is not possible.

Are there hotkeys available in Qimera?

Yes there are, please see the page of Qimera - Shortcut keys overview (configurable) for a list of the hot keys available in the Qimera user interface and the 3D Editor.
For Qinsy shortcuts please see the page Qinsy - Shortcut keys overview.

What is the status of laser support in Qimera?

Raw laser data is currently supported if it is logged via QINSy. It is possible to change the vessel offsets, reprocess, and apply post processed navigation. As of Qimera 2.1, it is now possible to use the Patch Test Tool but not the Wobble Analysis tool. Non QINSy laser data can be imported as processed point files which will allow you to clean the files as part of a Dynamic Surface.

In the Preferences, what is the Questions and Answer box for?

Qimera prompts the user at several stages for input during data import and processing operations. The user can choose "Yes/No" and can also have the project remember the answer such that the next time the program doesn't bother with asking the same question over and over. The user can reset all the "remembered" answers in the project preferences.

What types of raw files are supported by Qimera?

At the moment QINSy .db files, Reson (.s7k), Kongsberg .(all), Generic Sensor Format (.gsf), Edgetech (.jsf), Elac Seabeam (.xse), R2Sonic (.r2sc), and Hypack (.hsx) files are supported as Raw Files. You can find more information on our Qimera Data Format Information page.

Qimera - Shortcut keys overview (configurable)

The Qimera Configure Shortcuts Dialog allows the user to configure their own shortcuts for predefined actions within the application. Each action can contain two shortcuts that must not conflict with any other action shortcut.

List of Default Shortcuts (Hotkeys):

Action	Primary Shortcut	Secondary Shortcut
2D View	9	
3D View	0	
3D Editor: Area Mode	Alt+A	
3D Editor: CUBE Mode	K	
3D Editor: Clear	C	
3D Editor: Clear Feature	Shift+F	
3D Editor: Clear Plotted	Shift+P	
3D Editor: Clear Suspect	Shift+B	
3D Editor: Deselect Line	Shift+L	
3D Editor: Deselect Sounding and Hypothesis	Shift+T	
3D Editor: Editor Panels	Ctrl+1	
3D Editor: End Slice	Ctrl+Shift+I	

Action	Primary Shortcut	Secondary Shortcut
3D Editor: Exit	Ctrl+Q	
3D Editor: Explore Mode	Alt+Space	
3D Editor: Hide Selected	V	
3D Editor: Hide Unselected	Shift+V	
3D Editor: Invert	I	
3D Editor: Measure Mode	Alt+M	
3D Editor: Move Selection Down	[	
3D Editor: Move Selection Up	]	
3D Editor: Neighbors	N	
3D Editor: Next Slice	F10	
3D Editor: Override Hypotheses	O	
3D Editor: Previous Slice	F9	
3D Editor: Record Select Mode	Alt+R	
3D Editor: Reject	R	
3D Editor: Reset Hypotheses	Shift+O	
3D Editor: Save	Ctrl+S	

Action	Primary Shortcut	Secondary Shortcut
3D Editor: Save and Exit	Ctrl+Shift+S	
3D Editor: Select Line and Connected	L	
3D Editor: Select Mode	Alt+S	
3D Editor: Select Sounding and Hypothesis	T	
3D Editor: Set Feature	F	
3D Editor: Set Plotted	P	
3D Editor: Set Suspect	B	
3D Editor: Show Widgets	H	
3D Editor: Show/Hide Files...	Ctrl+F	
3D Editor: Show/Hide Lines...	Ctrl+L	
3D Editor: Start Slice	Ctrl+I	
3D Editor: Target Mode	G	
3D Editor: Toggle Rejected	Ctrl+R	
3D Editor: Unhide All	Ctrl+Shift+V	
3D Editor: Unreject	U	
Close Project	Ctrl+F4	

Action	Primary Shortcut	Secondary Shortcut
Dynamic Surface: Color by CUBE Uncertainty	Alt+0	
Dynamic Surface: Color by Checked	Alt+4	
Dynamic Surface: Color by Density	Alt+3	
Dynamic Surface: Color by Feature	Alt+6	
Dynamic Surface: Color by Height	Alt+1	
Dynamic Surface: Color by Hypothesis Strength	Alt+9	
Dynamic Surface: Color by Interpolated	Alt+=	
Dynamic Surface: Color by Number of Hypotheses	Alt+8	
Dynamic Surface: Color by Plotted	Alt+5	
Dynamic Surface: Color by Rejected	Alt+-	
Dynamic Surface: Color by Suspect	Alt+7	
Dynamic Surface: Color by Uncertainty (95% c.l.)	Alt+2	
Dynamic Surface: Show Average Layer	Ctrl+3	
Dynamic Surface: Show CUBE Layer	Ctrl+4	
Dynamic Surface: Show Deep Layer	Ctrl+1	

Action	Primary Shortcut	Secondary Shortcut
Dynamic Surface: Show Shallow Layer	Ctrl+2	
Export to 3D PDF…	F8	
Launch 3D Editor	3	
Launch Slice Editor	2	
Launch Swath Editor	1	
Manual Load 2D Slice Points	Ctrl+Enter	Ctrl+Return
New Project...	Ctrl+N	
Open Project Folder	Ctrl+F	
Open Project	Ctrl+O	
Offline Manual…	F1	
Online Support Desk	Ctrl+f1	
Re-display Surfaces	F5	
Recompute Colormap Range	5	
Redo Edit	Ctrl+Y	
Reset Checked Area	Ctrl+Shift+K	
Run Filter Profile Inside Selection	Shift+R	

Action	Primary Shortcut	Secondary Shortcut
Save Edits	Ctrl+S	
Selection: Decrease Height	-	
Selection: Decrease Height (Outer)	Shift+-	
Selection: Decrease Width	Ctrl+-	
Selection: Decrease Width (Outer)	Ctrl+Shift+-	
Selection: Increase Height	=	Numpad +
Selection: Increase Height (Outer)	Shift+=	Shift+Numpad +
Selection: Increase Width	Ctrl+=	Ctrl+Numpad +
Selection: Increase Width (Outer)	Ctrl+Shift+=	Ctrl+Shift+Numpad +
Selection: Remove Last Point	Esc	
Selection: Rotate Clockwise	E	
Selection: Rotate Clockwise (Outer)	Shift+E	
Selection: Rotate Counter-clockwise	Q	
Selection: Rotate Counter-clockwise (Outer)	Shift+Q	
Selection: Step Backward	S	Backspace
Selection: Step Backward (Outer)	Shift+S	Shift+Backspace

Action	Primary Shortcut	Secondary Shortcut
Selection: Step Forward	W	Space
Selection: Step Forward (Outer)	Shift+W	Shift+Space
Selection: Step Left	A	
Selection: Step Left (Outer)	Shift+A	
Selection: Step Right	D	
Selection: Step Right (Outer)	Shift+D	
Set Checked Area	Ctrl+K	
Show 3D Turntable Widgets	H	
Show Colormap Legend	L	
Show Scene Bounding Box	B	
Slice Editor: Clear Selection	Ctrl+X	
Slice Editor: Preview Filter Profile	Shift+P	
Slice Editor: Run Filter Profile	Shift+F	
Slice Editor: Set Classification to Most Recently Used	Ctrl+Shift+S	
Slice Editor: Set Classification…	Ctrl+Shift+C	
Toggle 2D/3D View	T	

Action	Primary Shortcut	Secondary Shortcut
Toggle Display of Rejected Soundings	Ctrl+R	
Tool Mode: Create Profile	O	
Tool Mode: Explore	X	
Tool Mode: Fixed Slice Select	C	
Tool Mode: Free Slice Select	Shift+C	
Tool Mode: Freehand Select	F	
Tool Mode: Measure Distance	M	
Tool Mode: Polygon Select	P	
Tool Mode: Rectangular Select	R	
Tool Mode: Scroll Slice Select	Shift+L	
Undo Edit	Ctrl+Z	
Zoom to Scene	Shift+Z	
Zoom to Selected Objects	Z	

Qimera - Processing

This page contains frequently asked questions for Qimera.

On this page:

- I have a skull and crossbones next to my raw files, what does this mean?
- Can I re-process data after cleaning?
- How do I change the geodetic system of the project?
- How is the Suggest Cell Size Calculated when building a surface?
- What is the difference between Erase Invalid and Select Invalid when using the Swath Editor?
- In the Processing Settings Editor what is, 'Include time series data from adjacent lines closer than *.** seconds'? Should this ever be turned off or changed, and if so what is the optimum time scale?
- In the Processing Settings Editor how is the priority sorted out and assigned in the Position, Motion, Heading Tab? Do these come from the online settings or have their own criteria?
- What projections does QPS recommend for users who would prefer to work in unprojected space but are not able to?
- Does Qimera automatically recognize the source file projection for any Raw Sonar data type?
- Does Qimera automatically recognize the source file projection for any Processed Points data type?
- Does the option to export .GSF files from the source file menu export all soundings to .GSF regardless of status?
- How does Export Processed Points from the source menu differ from Export Soundings in the Dynamic Surface menu?
- Is TPU re-calculated after SBET application?
- While cleaning data, if you open an area but didn't change any soundings, how does one know which areas have already been worked on?
- Previously, Suspect Flagging was a way of testing CUBE before rejecting everything. What is the workaround for that now?
- Will the Spline filter work on the Dynamic Surface or on the files?
- When you have a large survey and want to apply a Spline filter is is possible to constrain the filter to a smaller area or to only apply it to specific files?
- When working on a Dynamic Surface, does it matter which layer you have selected? If you have the average layer selected are you then editing the average layer?
- Where does Qimera display/show the Source datum extracted from the Raw Data?
- There are some soundings from the noise at the sonar head and I don't want to see them. Can Qimera filter these soundings directly when I input the data?

- When I apply Patch Test results, the angular offsets are not the same for Tx and Rx transducers in the Vessel Editor, why?

I have a skull and crossbones next to my raw files, what does this mean?

This means that the data you brought into Qimera doesn't contain enough information to process it. Here are two examples:

1) Reson .s7k file may only contain ping information (ranges and angles for the multibeam measurements) without containing information for position, motion, SVP, etc, in the source file. Qimera cannot process this data without the additional information. If you import external navigation, motion, etc, then the skull and crossbones will disappear.

2) In case of relative positioning like USBL or object linking in data collected in Qinsy, Qimera needs the QPD object track for the navigation. If you experience a skull and crossbones when Qinsy db files are loaded, you will need to replay the files in Qinsy and have Qinsy to create the QPD files before reading the project in Qimera.

Can I re-process data after cleaning?

The ideal workflow is to have the data processed before the validation/cleaning is done. You may encounter a situation in where your data was all validated and you find you need to re-process. This can be done under certain circumstances, the QPD sounding status will be retained, however, this will not work after a z-shift and re-process will re-set the z-shift. SBET application is an example of a z-shift. There may be a solution for your job and this needs to be looked at by a QPS Support engineer, so please do not hesitate to get in contact.

How do I change the geodetic system of the project?

There may be a way to change the geodetics *after* the project was created and the data has been processed, without having to make a new project. For example, if the project is created and you realize the geodetic setup was wrong.

A possible solution is depending on the scenario:

- If the project input datum is correct and the output system is set up wrong, you may be okay by exporting to the different output system, for the client deliverable. It will be in the processed points export dialog.
- If at least one of the geodetic systems in the erratic project is correct (and the other is wrong), you may be okay re-projecting the project. This needs to be done in the following way: set up a new Qimera project in the correct geodetic system (perhaps even a datum transformation), import the processed and validated data from the erratic project, telling Qimera what the

system of the import data is and have Qimera perform the datum transformation at the import.
- If none of the above applies and you have encountered a different scenario, please contact QPS Support.

How is the Suggest Cell Size Calculated when building a surface?

When data is imported or reprocessed, we generate a histogram of the depths in the file. When a user wants to grid a set of data, we normalize the histograms for each file and combine them into a master histogram for which we determine the depth associated with the highest count of soundings. We calculate a footprint size at that water depth based on a 1 degree beamwidth assumption and then round this up to the nearest "nice" pixel size. For instance, instead of returning 0.42 m as the pixel size, it would return 0.50 m. This is not meant to be an optimal or perfect cell size, but rather to help the user who may not fully know about cell size selection. The beamwidth assumption feature allows the user to create a map that is reasonable on their first try. If the area covered by the selected lines has a wide range of depths, then the pixel size will not work well in both the deepest and the shallowest areas (you may get gaps or empty cells in the deep areas and low resolution in the shallow areas). Also, the suggested cell size does not consider the sounding density at all.

What is the difference between Erase Invalid and Select Invalid when using the Swath Editor?

They are two different tools that allow for manual marking of soundings as invalid. The "Erase" tool is a circle whose radius is controlled by the middle mouse wheel. Left-click and hold down the mouse button and drag the cursor to "Erase" bad soundings. This is inspired by Paint and Photoshop type cursor modes. The "Select Invalid" mode allows a user to draw a rectangle box around soundings they want to remove. Left-click and hold down the mouse button to draw a rectangle. Soundings in the rectangle will be flagged as bad. Edits in both modes can be undone with the "Undo" icon.

In the Processing Settings Editor what is, *'Include time series data from adjacent lines closer than *.** seconds'*? Should this ever be turned off or changed, and if so what is the optimum time scale?

It can happen on occasion that the first few pings in a data file will occur prior to the arrival of a navigation fix. For example in shallow water where the navigation comes in at 1 Hz and the mutlibeam might be pinging at 25 Hz. This can also happen at the end of a file. If we do nothing about this, you may find that gaps in coverage will occur at file breaks that occur along a survey line.

This setting allows the navigation and other time-series data lookup to sneak a peek at time-series from data files that occur immediately before and after the file being processed to give additional data points to interpolate over the gap.

Data files that are neighboring in time must be within 1 sec of the requested time in order to be considered. If the user is still seeing gaps, increasing the value to a slightly higher value may address the gap. There is not a good reason to ever disable this.

In the Processing Settings Editor how is the priority sorted out and assigned in the Position, Motion, Heading Tab? Do these come from the online settings or have their own criteria?

e.g. if an SBET file is added to the project does this have to be set as the primary motion source?

The priority source that was configured in real-time during acquisition is chosen if it is possible to deduce this from the source data file (e.g. .all and .db, but not .hsx and .s7k). If you add SBET or external navigation/motion, they are currently "promoted" to be the top priority source. The user can change the lookup priority in the Processing Configuration dialog box by bumping the desired data source item up to the top of the list.

What projections does QPS recommend for users who would prefer to work in unprojected space but are not able to?

Examples are users crossing multiple zones who do not want to create custom projections, and users in the research/scientific community who prefer working in unprojected space and prefer unprojected products.

Users will need to assess what projection is most suitable for their situation. There are three extra projections that were added to the common coordinate systems to support this re-projection issue - Mercator and Polar Stereographic projections for Arctic and Antarctic but there are no plans in the immediate future for others.

Does Qimera automatically recognize the source file projection for any Raw Sonar data type?

The source file coordinate system and the project coordinate system are automatically recognized when importing QINSy DB files. For all other file types the coordinate information needs to be set manually. For the Kongsberg *.all and the RESON .s7k formats, it will assume the navigation data is in WGS84 lat/long. For Hypack HSX files these are

always in a projected coordinate system which must be set manually.

Does Qimera automatically recognize the source file projection for any Processed Points data type?

The source file coordinate system and the project coordinate system are automatically recognized when importing QINSy QPD files. For any other file type of Processed Point data, users must specify the projection. Qimera looks at the file to make an educated guess if it's projected or geographic. If it's geographic it will default to WGS84. If it's projected, and the Project's Coordinate System is set (which always has to be projected if it's set) it will default to the Project's coordinate system. If not, it will default to UTM North Zone 1. But remember, these are just default values, users still have to confirm or change them.

Does the option to export .GSF files from the source file menu export all soundings to .GSF regardless of status?

All soundings are exported. If they have been rejected for some reason, either through Blocking, Spline filtering, CUBE filtering, or manual editing, then the corresponding beam is marked as "Rejected" in the GSF. GSF flag capabilities are much simpler than what is supported with QPDs, so we can only mark a sounding as either good or bad in the GSF.

How does *Export Processed Points* from the source menu differ from *Export Soundings* in the Dynamic Surface menu?

Export Processed Points differs from *Export Soundings* in the Dynamic Surface because there are more formats to choose from (instead of just XYZ). *Export Processed Points* allows you to specify a different Z-value if exporting ASCII, and it can re-project to a different coordinate system. Probably the biggest difference is that you are dealing with individual files. This means you can pick a single file, or multiple files to export. You can also convert them to individual files, or merge the output into one big file. With the Dynamic Surface *Export Soundings*, you are exporting from all lines of data included with that Surface.

Is TPU re-calculated after SBET application?

The TPU is currently only recalculated if you 're-raytrace' the data. So, if you import SBET data for position or height, Qimera will 're-navigate' your data which is much faster than re-raytracing, however you will not get an updated TPU.

To update TPU:

1. Import SBET, say 'no' when Qimera prompts you to re-navigate data.
2. Update TPU parameters for the SBET system in the vessel configuration file. You will want to change the values to reflect what it actually is. Once you save the new vessel configuration, all the multibeam data files that are associated with the vessel file will be marked as requiring full re-raytrace. (If you have the SMRMSG file and the SBET file with the same names in the same folder, the SBET will take the TPU values from the SMRMSG file)
3. Click the auto-process button to re-raytrace the data.

While cleaning data, if you open an area but didn't change any soundings, how does one know which areas have already been worked on?

Currently this can only be tracked while editing data in the Slice Editor. Areas that have been viewed have a light grey overlay in the Surface Edit Overview dock. Areas that have been edited are overlayed with a light red colour. These overlays can be turned on or off by toggling the 'Show Visited / Edited' checkbox in the Surface Edit Overview menu. They can also be cleared by selecting 'Clear Visited/Edited' in the same menu. This overlay is unique to each dynamic surface.

Previously, *Suspect Flagging* was a way of testing CUBE before rejecting everything. What is the workaround for that now?

We have suspect, plotted and feature flagging, but each user decides how to use them (PFM).

It affects the soundings of the QPD - the dynamic surface gets updated for all layers.

- It has to be based on the CUBE surface.
- Create survey area

Will the Spline filter work on the Dynamic Surface or on the files?

The filter works on the QPD files but the results are updated in the Dynamic Surface. The Spline filter can either be applied to all the files that make up the Dynamic Surface, or by selecting files manually and running it on those files.

When you have a large survey and want to apply a Spline filter is is possible to constrain the filter to a smaller area or to only apply it to specific files?

It is possible to apply the Spline filter to the full dynamic surface, specific files, and within a selected area.

When working on a Dynamic Surface, does it matter which layer you have selected? If you have the average layer selected are you then editing the average layer?

It doesn't matter which layer you have selected because when working on the Dynamic Surface, you are editing the soundings, not the layers (GRID file). The Dynamic Surface is broken down from the GRID file and the QPD's. The QPD's will keep the changes, and the GRID will get updated; editing is based on the points and the grid gets updated on it. The display is what you have selected: you should edit and see in the shallow surface; if you have CUBE you will be editing the CUBE surface.

Where does Qimera display/show the Source datum extracted from the Raw Data?

If you select a raw file and then go to the properties tab you will see the Coordinate System.
Whatever is shown in the properties tab for the raw file is what is being used as the basis for the transformation and projection to the project coordinate system.

There are some soundings from the noise at the sonar head and I don't want to see them. Can Qimera filter these soundings directly when I input the data?

You can use the processing settings to change the filters. For this kind of noise, you could filter either by either depth or range from the sonar.

In Qloud the ISO-44 standard (95% Posteriori Confidence Interval) is used for the Spline filter, is this the same in Qimera?

Yes.

When I apply Patch Test results, the angular offsets are not the same for Tx and Rx transducers in the Vessel Editor, why?

Qimera separates the two transducers in its vessel offsets. The Patch Test Tool will apply the offset corrections to the transducer at which they will have an effect. Roll to Rx, Pitch

and Heading to Tx. The values from the Patch Test can also be applied to the motion sensor data instead of the mounting offsets of the transducers.

Technical Information

- Qimera and Fledermaus Important File Locations
- Qimera Data Format Information
- Qimera File Size Recommendations
- Qimera Operating systems
- Qimera System Requirements
- Qimera Technical Documentation
- QPS File Compatibility Information

Qimera File Size Recommendations

This page contains an overview of the recommended maximum sizes for the different file types used within Qimera.

- Database files
- QPD files
- Grid files
- QGF files
  - CAD
  - VOM
- Image files
  - Geotiff
  - ECW

File type	Recommended max. size	To be used	Comments
Database	500 MB	Possible: 2Gb	If larger: • Risk of reducing performance (replay/ Qimera/FMGT)
QPD	250 MB	Possible: 4Gb Recommended: 1Gb	The max limit on Qimera is 4Gb. However, this is not recommended as it will slow down the application. Any file that produces a QPD more the 4Gb will get a message "*source file has to many points and could not be imported*" • If a processed point file use the https://qpssoftware.scrollhelp.site/qimera/qimera-source-menu#QimeraSourceMenu-ImportandSplitLargeProcessedPointFiles • If a raw sonar file, see if the acquisition application can split the file

File type	Recommended max. size	To be used	Comments
Grid	Sounding grid • 50 Gb Dynamic (with qpd's) • 50 Gb		If larger: • Cooperative Cleaning
QGF(CAD)	• 4 Gb (current limit)		• Decimated (removing and simplifying items in the drawing) • Try CAD functions to simplify the drawing • No Blocks, Large Radius, ARC • 50km max. suggested distance from working area • Delete layers that are not used or empty
QGF - Vertical Offset Model (VOM)	• 15MB		For more info, please have a look at this page: • How-to Create a Geoid or Vertical Offset Model (VOM)
Image files	Geotiff Distance: • 1000m^2 Size: • no limit ECW Distance: • 1000km 2 Size: • 100 Gb		Dependent on Geodetic location If Geotiff misformed/misplaced: • Decrease size (divide into several Geotiffs) • Create ECW instead of Geotiff

Qimera and Fledermaus Important File Locations

Locations of important files and folders for Qimera and Fledermaus.

- Geodetics
  - Windows
    - QPS Geodetics Installer files
    - Custom user Geodetics
  - Mac OS
    - QPS Installer Geodetics
    - Custom user Geodetics
  - Linux
    - QPS Installer Geodetics
    - Custom user Geodetics
- User Preferences
  - Windows
  - Mac OS
  - Linux

Geodetics

Windows

QPS Geodetics Installer files

C:\Program Files(x86)\Common Files\QPS\Geo

QPS Geodetics files are automatically placed in the correct location when installed.

Custom user Geodetics

C:\Users\Public\Documents\QPS\Shared\Geo

Custom geoid models should be placed in the Geoid subfolder along with the relevant WKT or GEOIDMODELS.xml file.

Mac OS

QPS Installer Geodetics

/Library/Application Support/nl.qps/Common

QPS Geodetics files are automatically placed in the correct location when installed.

Custom user Geodetics

/Users/$USER/Library/Application Support/QPS/Shared/Geo

Custom geoid models should be placed in the Geoid subfolder along with the relevant WKT or GEOIDMODELS.xml file.

Linux

QPS Installer Geodetics

These need to be manually moved alongside the Qimera executable that is in use.

If Qimera is in:

/opt/QPS/Qimera/bin/qimera

Then the geodetics files need to be in:

/opt/QPS/Qimera/resources/QINSy_Geodetics/

Example:

```
/opt/.../Qimera/resources/QINSy_Geodetics >>> ls -l

total 20
drwxr-xr-x 2 root root 4096 Dec  5  2019 Geoid
drwxr-xr-x 2 root root 4096 Dec  5  2019 NadCon
-rw-r--r-- 1 root root 2059 Dec  5  2019 settings.xml
drwxr-xr-x 2 root root 4096 Dec  5  2019 Setup
drwxr-xr-x 2 root root 4096 Dec  5  2019 Shift
```

Custom user Geodetics

/home/$USER/.local/share/QPS/Shared/Geo/

Custom geoid models should be placed in the Geoid subfolder along with the relevant WKT or GEOIDMODELS.xml file.

User Preferences

> ⚠ This User Preferences section is only visible to QPS Staff.

Windows

C:\Users\%username%\AppData\Local\QPS

Mac OS

/Users/$USER/Library/Preferences/QPS

Linux

/home/$USER/.config/QPS

Qimera Data Format Information



The import and processing of raw data formats is dependent on licensing. In Qimera, go to the Help drop-down menu and choose View License Status to view your current license coverage.

Go to Qimera - License Levels to see what is available.

- Qimera Supported Import Data Formats
- Qimera Sonar Source Data Import Capabilities
- Qimera Supported Tide Formats
- Zoned Tides (ZDF) format

Return to: Qimera Knowledge Base

Qimera Supported Import Data Formats

Supported Formats for Import

- Supported Formats for Import
  - Source
    - Raw Sonar File Formats
    - File Format Specific Import Differences
      - QPS .DB Format
      - Kongsberg .ALL Format (MB56)
      - Reson .S7K Format
      - Hypack .HSX Format
      - EdgeTech JSF Format
      - NavO GSF Format
      - ELAC SeaBeam XSE Format
      - Kongsberg .KMALL Format
    - Processed Point Files
    - Position and Motion Formats
  - Other Source Data formats
  - Tide File Formats
    - Tide Data Files
    - Tide Definition Files
  - Supported Layer Data Formats
    - Grid formats
    - Image Formats
    - IMPORT
    - Image Formats
    - EXPORT
    - Point File Formats for Visualization
    - Line File Formats

Source

Raw Sonar File Formats

> ⚠ The import and processing of raw data formats is dependent on licensing. In Qimera, go to the Help drop-down menu and choose View License Status to view your current license coverage.

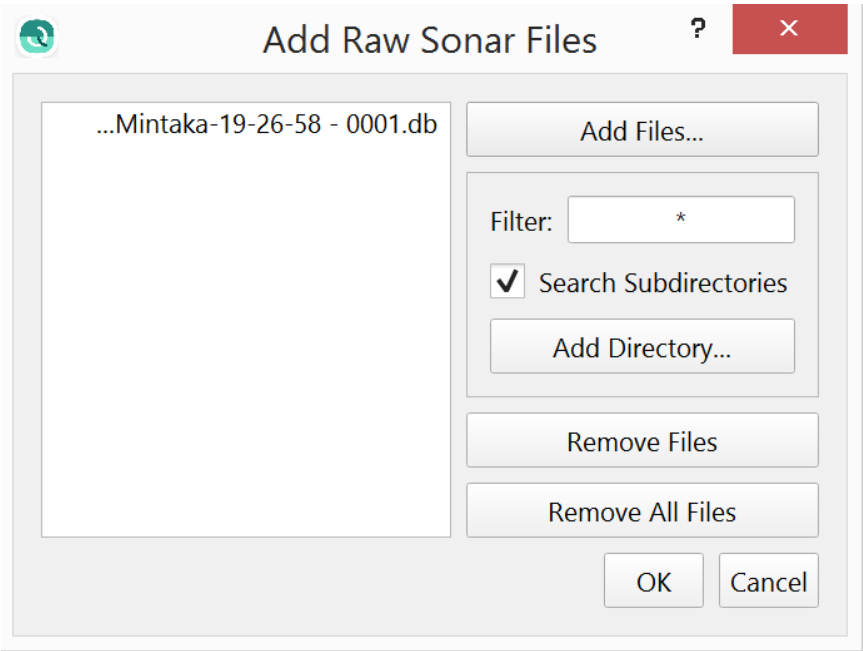
Format	Extension	Additonal Information	Links
Qinsy	DB	QPS format - Qinsy database	
Kongsberg	ALL & WCD	Kongsberg Maritime format - SIS database	
Kongsberg	KMALL & KMWCD	Kongsberg Maritime format, new in 2017.	
Reson	S7K	Reson Seabat 7000 series echosounder format	
Hypack	HSX	Hypack raw format	
EdgeTech	JSF	EdgeTech bathymetric sidescan echosounder format	
NAVO GSF	GSF	Generic Sensor Format, interchange format for multibeam data	https://www.leidos.com/maritime/gsf
Elac SeaBeam	XSE	Wartsila ELAC SeaBeam format	
R2Sonic	R2SC	R2Sonic Binary format	

File Format Specific Import Differences

Qimera can process raw sonar files to generate fully corrected and georeferenced sounding footprints for a number of formats. Understandably, the import experience varies slightly from one format to the next based on the type of information that Qimera can automatically extract from the incoming data files. Several file format specific nuances are explored below for each of the supported import file formats, along with images of the *Add Raw Sonar File* import dialog for clarity when necessary.

QPS .DB Format

The QPS .DB format as recorded in Qinsy provides the cleanest import experience since Qimera is capable of determining all that it needs to know from the file itself. This includes all sensor locations, offsets, data types, geodesy settings, vessel names, etc.



Kongsberg .ALL Format (MB56)

The Kongsberg .ALL format provides much of the information that Qimera requires with the exception of the coordinate reference system used by the raw positioning data stored in the file. The lower portion of the import dialog provides a drop down list to specify the type of coordinate frame that the positioning data is referenced to. The default is WGS-84.

The vessel name is sometimes stored in the .ALL file, in this event it is used directly. Otherwise, the sonar model number and serial number are used to craft a unique vessel name. The vessel name is used to help associate files from the same vessel together after multiple import sessions. We encourage you to specify a vessel name in Kongsberg's SIS program during your survey setup to help you identify data files from different vessels in Qimera. This is especially important If you find yourself using the

same sonar head on vessels of opportunity. Taking the time to name the vessel in SIS will make data management quite simple in Qimera. If you have multiple Kongsberg sonar systems on the same vessel, we strongly encourage you to give different vessel names to the two systems to ease data management in Qimera.

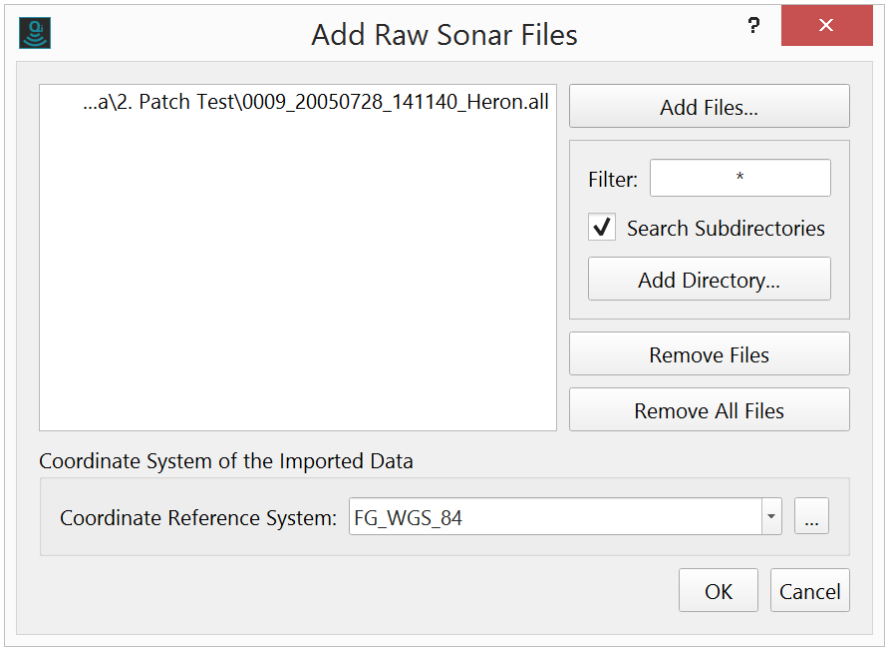
The .ALL format does not encode the position of an SVP file and you will need to enter this information manually after importing your .ALL files in the SVP Editor. The date/time of the SVP is encoded in the .ALL file but it is only as correct as the data that was provided to SIS, we encourage you to verify the date/time stamping of your SVP profiler and processing software that provides this to SIS in real-time to ensure that it is correct and reporting UTC time as well.

Qimera does not extract tide data from the .ALL format so you may need to provide that separately using the Tide Importer.

Full sonar processing is not currently supported for some of the older Kongsberg systems. The systems that fall into this category are the EM1002, EM3000, EM300, and EM120. Data from these systems can be imported in Qimera using the '*Add Raw Sonar Files*' dialog but processing is limited to applying SBETs, Navigation, and Tides. Point cleaning, including use of the Swath Editor, and creation of surfaces is all possible.

Tools and processing steps that are not supported for these files are: *Patch Test* and *Wobble Analysis* tools, any edits to *Vessel Configuration*, *Time Series*, or *SVP* settings that trigger sound speed reprocessing.

Qimera supports Water Column Data stored in the separate .WCD file.



Reson .S7K Format

The Reson .S7K format provides much of the information that Qimera requires with the exception of the coordinate reference system used by the raw positioning data stored in the file and the vessel name.

Upon import of the first file into a project, you will be prompted to provide a vessel name. This vessel name can be the same from one project to another. Once a vessel name has been provided, the *Vessel Assignment* combo box in the import dialog will be updated with the vessel name. The vessel name is used to help associate files from the same vessel together after multiple import sessions. In a later import session of the same data type, you will find the *Vessel Assignment* combo box will be pre-populated with any vessel names that you've created on previous import sessions to the project. In the event that you are importing data from another vessel into the same project, clicking the combo box will allow you to select "Use new vessel configuration...", at which point you will be prompted to provide a new vessel name. Once that is done, be sure to select that vessel name from the *Vessel Assignment* combo box.

The lowest portion of the import dialog provides a drop down list to specify the type of coordinate frame that the positioning data is referenced to. The default is WGS-84.

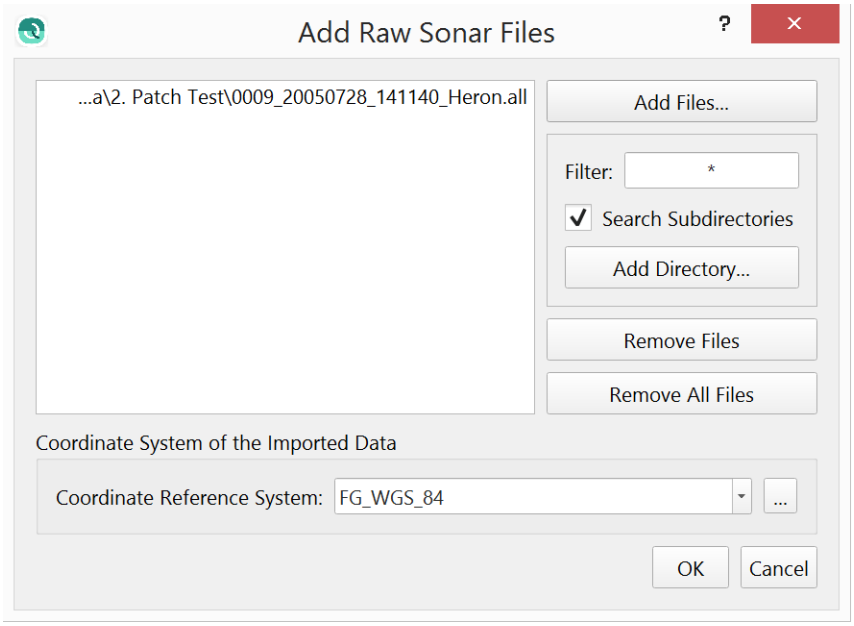
It is important to note that .S7K files can come from two different sources: PDS2000 or the Reson sonar controller. When .S7K files are provided by PDS2000, they can be populated with vessel configuration information such as the sensor locations, angular alignments, draft, etc. Qimera will extract these values and will use them during processing. You can, of course, modify the values that are extracted in the Vessel Editor dialog. If you record data using the Reson sonar controller software, the .S7K files do not contain vessel offsets and you will need to enter these manually in Qimera prior to processing if they are non-zero.

For users who record .S7K data using the Reson sonar controller software, it may be possible to have .S7K files that also do not contain any ancillary sensor data such as motion, position or SVP. You will still be able to import these .S7K files, however, you will need to provide additional data separately after import of the .S7K files:

- Motion and/or position through ASCII import or Binary Import dialog
- SVP import

Qimera does not extract tide data from either or the two variants of .S7K format so you may need to provide that separately using the Add Tide File Tool.

Note that PDS2000 .S7K files may contain SVP but the date/time is not encoded in the datagram and you will need to enter this information manually in the SVP Editor if you want to take advantage of time-based SVP Selection Strategies in the Processing Settings dialog. The same datagram format allows for encoding the position of the cast. If this is present, Qimera will extract it. If not, you will be warned about this on import and you will need to specify the position manually in the SVP Editor after import. We encourage you to provide this information to PDS2000 such that the record that it records is as fully populated as possible.



Hypack .HSX Format

The Hypack .HSX format provides much of the information that Qimera requires with the exception of the geodesy settings and projection system used by the projected positioning data stored in the file and potentially a time-zone offset and potentially a vessel name.

Upon import of the first file into a project, you will be prompted to provide a vessel name if one is not found in the file. This vessel name can be the same from one project to another. Once a vessel name has been provided, the *Vessel Assignment* combo box in the import dialog will be updated with the vessel name. The vessel name is used to help associate files from the same vessel together after multiple import sessions. In a later import session of the same data type, you will find the *Vessel Assignment* combo box will be pre-populated with any vessel names that you've created on previous import sessions to the project. In the event that you are importing data from another vessel into the same project, clicking the combo box will allow you to select "Use new vessel configuration...", at which point you will be prompted to provide a new vessel name. Once that is done, be sure to select that vessel name from the *Vessel Assignment* combo box. We encourage you to specify the vessel name in Hypack during your survey setup to help you identify data files from different vessels in Qimera. If you provide HSX data with a vessel name, you will not be presented with the *Vessel Assignment* combo box.

The time reference is used to indicate the time offset, in hours, from UTC to the time zone that Hypack was configured to record data with. It is possible to have Hypack record data with time stamps other than UTC and in these cases you will need to indicate the time offset relative to UTC. If you don't know what this value is, you should consult with the individuals that recorded or provided the data. It is possible to leave this field set to zero, however, you may have difficulties in aligning your raw sonar data with external data sources that are imported separately such as tide, SVP, binary navigation files, etc. Unfortunately, there is no mechanism to record this time offset in the .HSX format so you

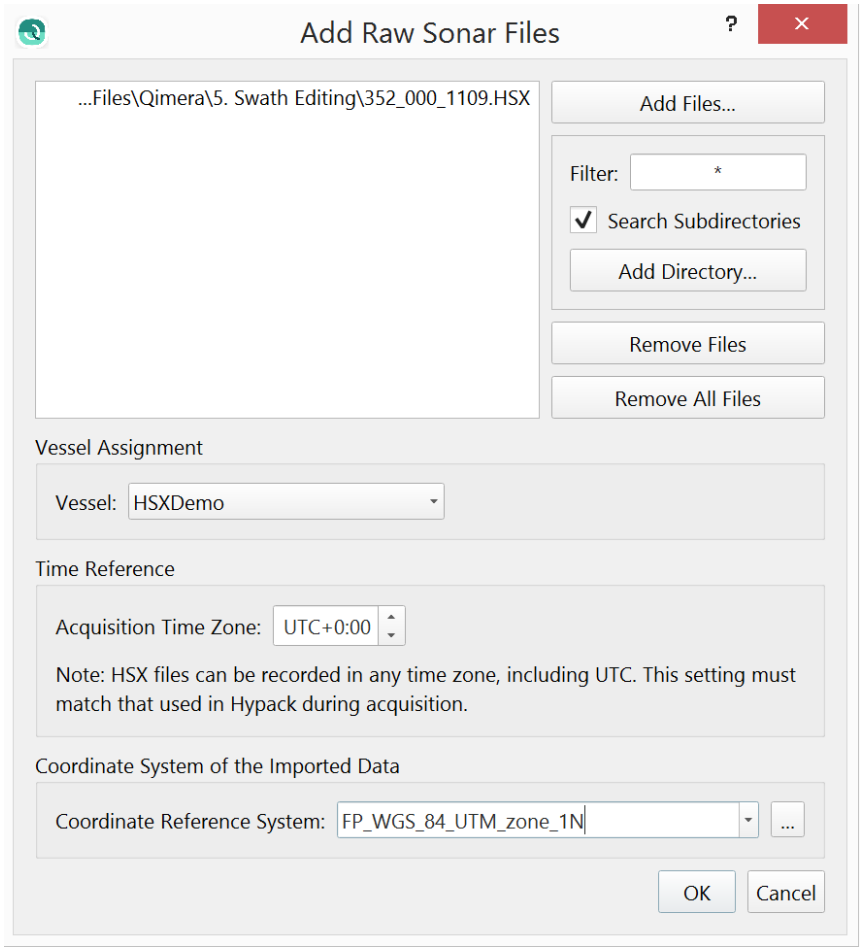
must provide it during the import stage if it is non-zero. Once data are imported, you cannot adjust this value so it is important to identify the correct value prior to import. We encourage you to configure Hypack to record data in UTC for a seamless data import experience into Qimera.

The lowest portion of the import dialog provides a drop down list to specify the geodetic settings and projection that the positioning data is referenced to. Hypack HSX files do not provide this information and the positioning data is stored in projected format without any reference to the projection or geodetic settings. You will need to specify this by choosing a common projected coordinate frame from the combo box or by clicking the Select Coordinate System button labelled '...' to the right of the combo box. This will launch the Coordinate System selection dialog and you will be provided with the full set of supported projection systems supported by Qimera. In the event that Hypack has been configured with an unknown or poorly supported projection, it may be difficult to match this in Qimera. We encourage you to keep projection configurations simple in Hypack and to perform complex geodetic configuration in Qimera. Though you need to specify the projection of the incoming HSX data during the import stage, you can separately specify the desired projection of your Qimera project during project creation.

Qimera does not extract raw tide data from HSX format so you may need to provide that separately using the Tide Importer. The TID record provided by the HSX record gives a total height corrector but it is not possible to determine if it is a true tidal corrector or a GNSS/GPS height corrector from the HSX file alone.

The following supplementary files that might be logged alongside the HSX are not used: .7k, .raw.

HSX format can provide SVP information but it has no mechanism to encode the date/time or position of the cast. You will need to specify these manually after import using the SVP Editor if you want to take advantage of spatial and/or time based SVP Selection Strategies in the Processing Settings dialog.



EdgeTech JSF Format

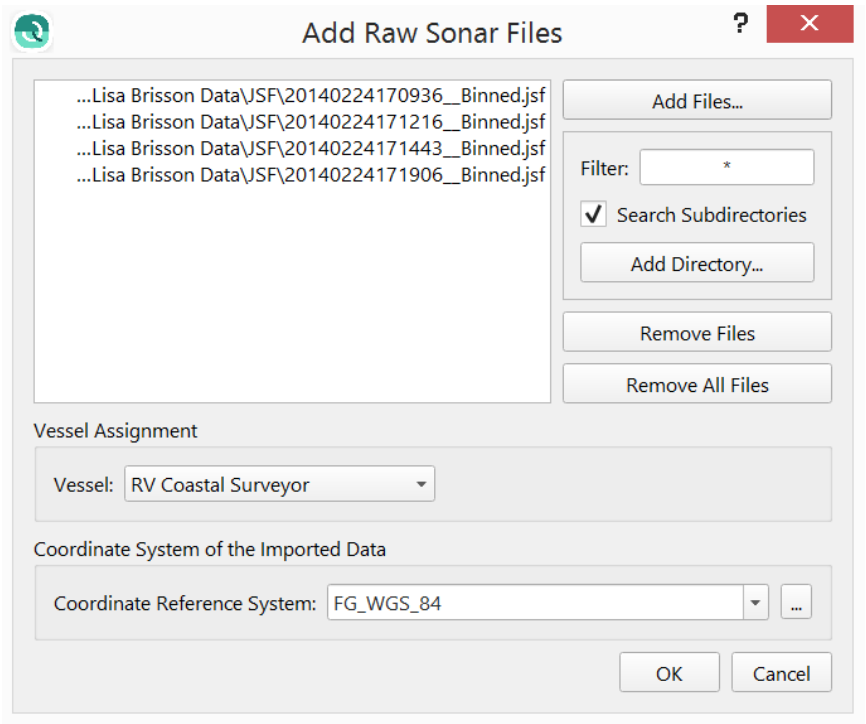
The EdgeTech JSF format provides much of the information that Qimera requires with the exception of the vessel configuration, sound velocity profile and the vessel name.

Upon import of the first file into a project, you will be prompted to provide a vessel name. This vessel name can be the same from one project to another. Once a vessel name has been provided, the Vessel Assignment combo box in the import dialog will be updated with the vessel name. The vessel name is used to help associate files from the same vessel together after multiple import sessions. In a later import session of the same data type, you will find the Vessel Assignment combo box will be pre-populated with any vessel names that you've created on previous import sessions to the project. In the event that you are importing data from another vessel into the same project, clicking the combo box will allow you to select "Use new vessel configuration...", at which point you will be prompted to provide a new vessel name. Once that is done, be sure to select that vessel name from the Vessel Assignment combo box.

There is no vessel sensor location or alignment information in a JSF file for Qimera to query and extract so user entry will be required. Qimera treats the EdgeTech 6205 system as a dual head system, each with a unique transmitter and receiver. According to the manufacturer, the receivers have nominal mount angles of +/-60 degrees relative to the

vertical. Beam angles reported by the sonar have this nominal mount angle included, these angles are removed to arrive back at the raw sonar relative angles. This permits corrections for surface sound speed errors in Qimera. Patch test alignment angles will be added with the correct sign convention to the nominal mount angles of +/-60 degrees. It is important to note that the transmitter/receiver pairs are treated as two separate systems. Data entry for the positions of each will be required for the most accurate results.

The JSF format does not support sound velocity profiles or tide measurements in the file. Users will be required to provide this information separately if required.

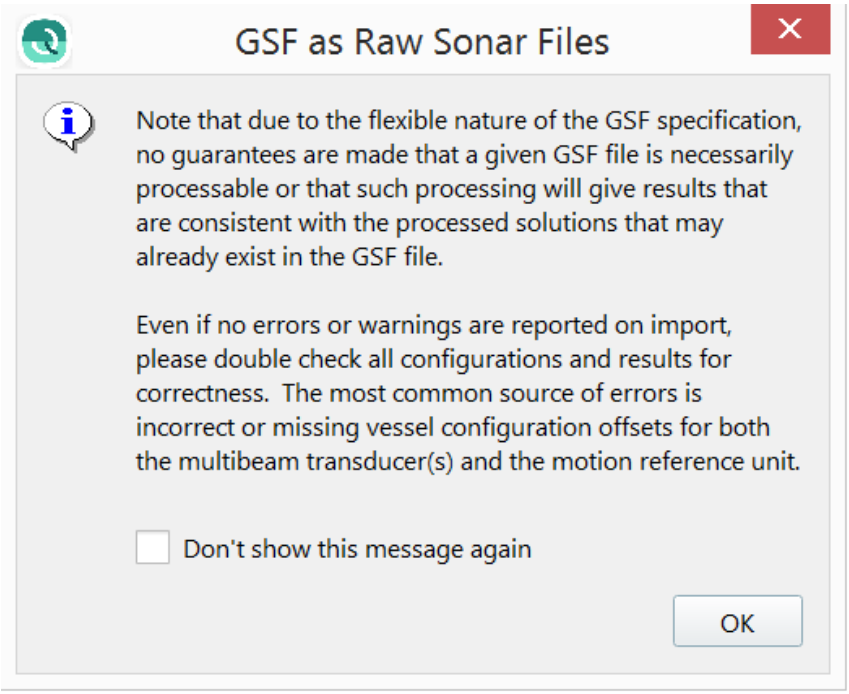


NavO GSF Format

NavO's Generic Sensor Format (GSF) is an interchange format for echosounder data. The format comes with a software I/O library that is freely available for use in applications such as Qimera. It can be used to store the georeferenced and fully corrected results from hydrographic processing software such as Qimera, however, it can also contain the raw information that is found in all the other formats discussed on this page. Though the GSF I/O software library is freely available, there are no built-in mechanisms or even standards to enforce users of the I/O library to ensure that all necessary ancillary information is stored in the file. In other words, you can have very little of the required data to process data in a GSF file or you can have all of the required data. Most providers of GSF files do provide the final sounding footprint solutions, that is largely how the GSF file format is used currently in the industry. The provision of ancillary data and supporting information, such as sensor location offsets, will vary from one vendor to another. Due to the flexible nature of the format, you can find yourself in a situation where a GSF file has sounding results that can be imported as Point Files and can be used to generate a bathymetric surface that is free of artifacts. The same file, if imported as a raw sonar file and then re-

processed, may very likely result in a bathymetric surface that suffers from one or more artifacts due to missing and/or incorrect ancillary information and data in the file. For this reason, a warning dialog is provided to you as a reminder when you import GSF files, as shown in the image below.

When using a GSF file from an unfamiliar source for the first time, we strongly encourage you to review the data and information that is extracted from the file to gain an appreciation of the limitations of the GSF file that came from a particular source. Once you have gained such an appreciation, please communicate it back to us and we can update our internal and/or external documentation to help our Support personnel and the Qimera community.



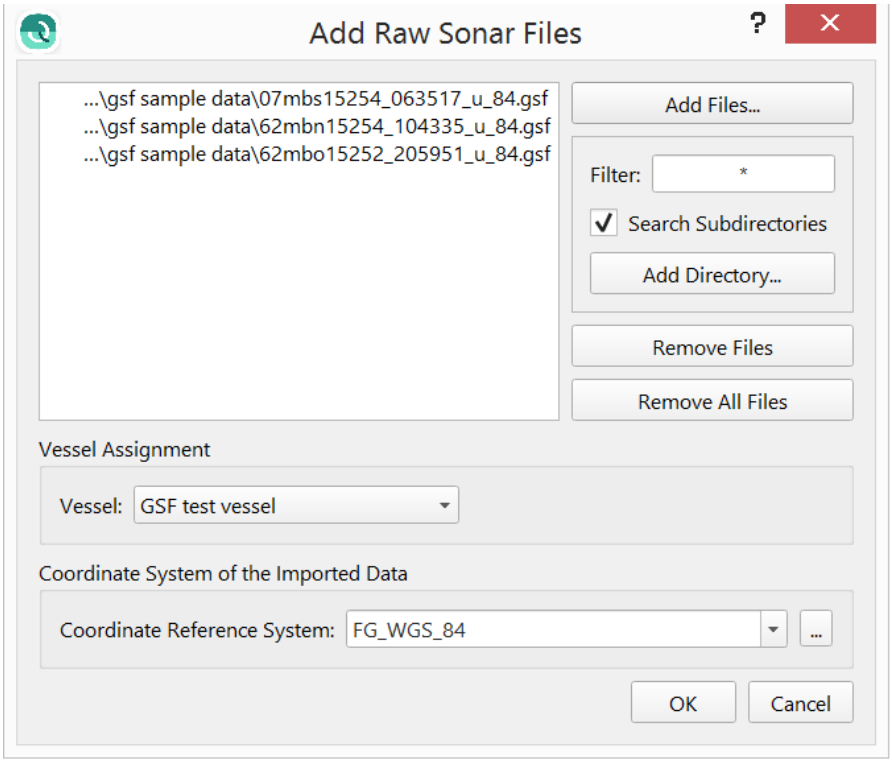
If you are working with GSF files, it is **very strongly** recommended to import them as Processed Point files first and to create a reference Static Surface to establish a baseline expected result. After this is done, you should import and process the same file as a Raw Sonar file and then create another Static Surface from this to compare with your baseline expected result. If discrepancies are found, you will need to evaluate the quality of the supporting ancillary information that is found in the file to determine the root cause. We realize that Qimera is not perfect and that there are sometimes bugs, however, in the case of discrepancies between the two Static Surfaces, it is much more likely that the GSF file does not contain the necessary information to support full re-processing. You should always verify processing capability prior to embarking on a processing project that will depend on GSF files when receiving GSF files from a source that is unfamiliar to you. We cannot stress this enough: *Verify your workflow long before starting your project*.

All warnings aside, the GSF import experience is fairly straightforward.

Upon import of the first file into a project, you will be prompted to provide a vessel name. This vessel name can be the same from one project to another. Once a vessel name has

been provided, the *Vessel Assignment* combo box in the import dialog will be updated with the vessel name. The vessel name is used to help associate files from the same vessel together after multiple import sessions. In a later import session of the same data type, you will find the *Vessel Assignment* combo box will be pre-populated with any vessel names that you've created on previous import sessions to the project. In the event that you are importing data from another vessel into the same project, clicking the combo box will allow you to select "Use new vessel configuration...", at which point you will be prompted to provide a new vessel name. Once that is done, be sure to select that vessel name from the *Vessel Assignment* combo box.

The lowest portion of the import dialog provides a drop down list to specify the type of coordinate frame that the positioning data is referenced to. The default is WGS-84.



Some further discussion is warranted on the impacts of missing or incorrect information that can occur with particular variants of GSF files.

Depending on the source of the GSF file, the files can be populated with vessel configuration information such as the sensor locations, angular alignments, draft, etc. Qimera will extract these values and will use them during processing. You can, of course, modify the values that are extracted in the Vessel Editor dialog. If your GSF files do not contain sensor offsets, you will need to enter these manually in Qimera prior to processing. Qimera will warn you in the event of all sensor offsets being zero.

The GSF format allows for encoding the position and acquisition time of an SVP file, however, if either of these are not provided, you will need to enter this information manually after importing your .gsf files in the SVP Editor. We encourage you to verify the date/time stamping of your SVP information.

Tide information can be encoded in the GSF file, when this is found in the file, it is extracted and the vertical referencing configuration is set up to use this information during processing.

As mentioned previously, GSF is often used to transmit corrected sounding footprint information from one software package to another. When this type of information is found in the file, Qimera can generate a QPD directly from this. The QPS standard for QPDs is to reference sounding footprint locations relative to the sonar head; the sonar head is referenced to the CoG using a separate set of 3D offsets that are stored internally with the ping data on a ping-by-ping basis along with the 3D georeferenced location of the CoG. Since GSF files reference their sounding locations relative to the vessel reference point, the conversion process uses the sonar head linear offsets to re-reference the soundings to the sonar head. In the event that the GSF file does not provide the sonar head offsets, or if the values are incorrect, this re-referencing exercise will generate QPDs that are inconsistent with the pre-processed soundings in the file. Furthermore, if the waterline and/or sonar head Z offset is incorrect or missing, you may find that you have a static vertical offset in your results. In this situation, you may have to manually enter the appropriate sensor location offsets in the Vessel Editor and then re-process the data to achieve acceptable results.

Motion sensor data can be encoded in the GSF for each ping and can also be encoded as a separate time-series data stream. In the first case, there may be issues in re-processing data if the ping rate of the system is low such as when working in deeper water. Qimera will warn you if the imported motion sensor measurements are at a low update rate. In this case, it is advised that you import the motion sensor data separately from an alternate source to achieve the best results.

Positioning data in a GSF is reported for each ping and may have a low update rate when working in deeper water. If re-positioning processing is required, it is advised that you import the position sensor data from an alternate source to achieve the best results.

Surface sound speed information in the GSF file is extracted from sensor specific subrecords which may or may not be present.

Multibeam raw measurements, i.e. beam travel-time and beam angle, are typically available in the GSF file. The GSF format does not clearly specify the beam angle sign convention, nor does it provide a mechanism to indicate whether beam angles are referenced to the sonar face or to the vertical direction. You may find that you'll need to use the Wobble Analysis Tool to adjust the sign convention of beam angles and/or the beam angle referencing. In some rare cases, the travel-time is incorrectly scaled. In this case, you can adjust the TWTT Scale for the sonar system in the Vessel Editor. We have seen instances where the travel time is reported as a one-way travel time instead of the expected two-way travel time. We have also seen cases where the travel-time is multiplied by an arbitrary scale such as 100. In these cases, please inform QPS Support of this particular scenario so that we can inform other users and potentially get in touch with the software vendor that provided the GSF file to help them improve the quality of their GSF export files.

We'll say it one last time: *Verify your workflow long before starting your project*.

GSF manual and filtered flags are respected. When a GSF is imported as either a Raw Sonar file or as a Processed Points file, the manual and filtered flags will be respected and carried through to the QPD.

ELAC SeaBeam XSE Format

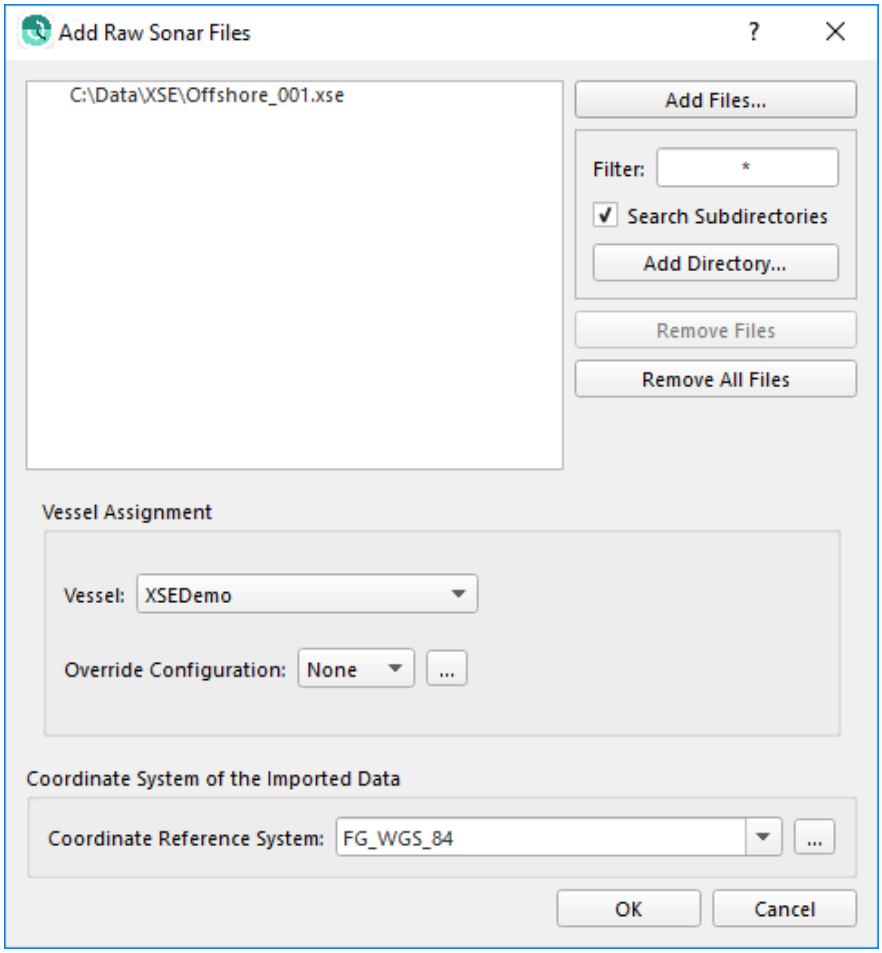
The ELAC .XSE format provides much of the information that Qimera requires with the exception of the coordinate reference system used by the raw positioning data stored in the file and the vessel name.

Upon import of the first file into a project, you will be prompted to provide a vessel name. This vessel name can be the same from one project to another. Once a vessel name has been provided, the Vessel Assignment combo box in the import dialog will be updated with the vessel name. The vessel name is used to help associate files from the same vessel together after multiple import sessions. In a later import session of the same data type, you will find the Vessel Assignment combo box will be pre-populated with any vessel names that you've created on previous import sessions to the project. In the event that you are importing data from another vessel into the same project, clicking the combo box will allow you to select "Use new vessel configuration...", at which point you will be prompted to provide a new vessel name. Once that is done, be sure to select that vessel name from the Vessel Assignment combo box.

The lowest portion of the import dialog provides a drop down list to specify the type of coordinate frame that the positioning data is referenced to. The default is WGS-84.

The .XSE format does not encode the position of an SVP file and you will need to enter this information manually after importing your .XSE files in the SVP Editor. The date/time of the SVP is encoded in the .XSE file but it is only as correct as the data that was provided to HydroStar, we encourage you to verify the date/time stamping of your SVP profiler and processing software that provides this to HydroStar in real-time to ensure that it is correct and reporting UTC time as well.

Qimera will extract tide if it is logged in the .XSE file. If it is not logged in the .XSE file, you will have to provide tide separately using the Add Tide File Tool.



R2Sonic .R2SC Binary Format

The R2Sonic R2SC format is a raw format that does not contain all of the information that Qimera requires.

Upon import of the first file into a project, you will be prompted to provide a vessel name. This vessel name can be the same from one project to another. Once a vessel name has been provided, the *Vessel Assignment* combo box in the import dialog will be updated with the vessel name. The vessel name is used to help associate files from the same vessel together after multiple import sessions. In a later import session of the same data type, you will find the *Vessel Assignment* combo box will be pre-populated with any vessel names that you've created on previous import sessions to the project. In the event that you are importing data from another vessel into the same project, clicking the combo box will allow you to select "Use new vessel configuration...", at which point you will be prompted to provide a new vessel name. Once that is done, be sure to select that vessel name from the *Vessel Assignment* combo box.

The lowest portion of the import dialog provides a drop down list to specify the type of coordinate frame that the positioning data is referenced to. The default is WGS-84.

There is no vessel sensor location or alignment information in a R2SC file for Qimera to query and extract so user entry will be required.

The R2SC format only contains the raw multibeam range and angle information. Position, motion and heading information will need to be added separately via Add Binary Navigation Files or Import ASCII Navigation. After adding Navigation and Motion, the R2SC files will show that it needs to be processed and the "Auto Process" button will need to be pushed.

The R2SC format does not support sound velocity profiles or tide measurements in the file. Users will be required to provide this information separately if required.

Kongsberg .KMALL Format

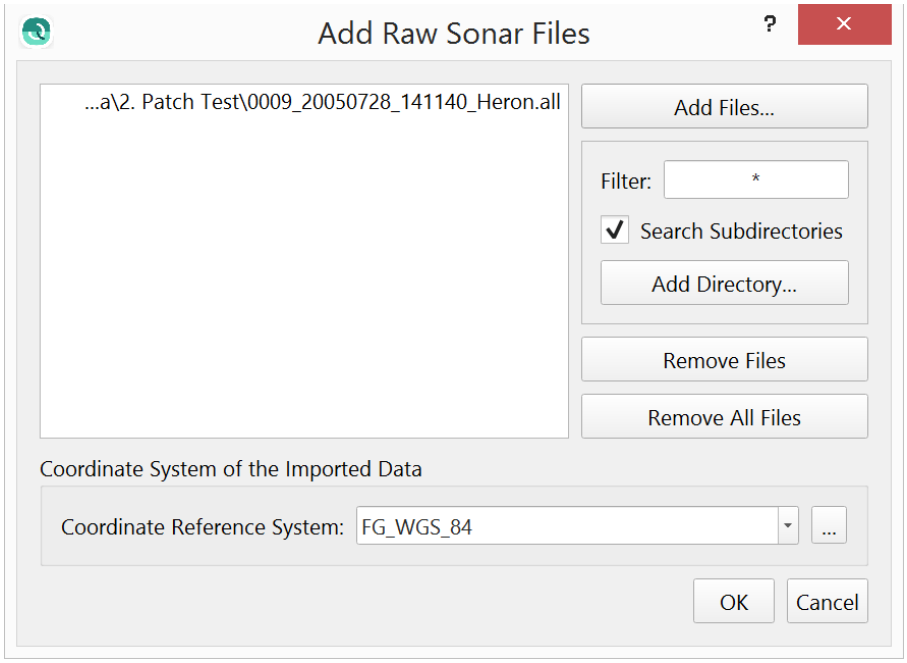
The Kongsberg .KMALL format provides much of the information that Qimera requires with the exception of the coordinate reference system used by the raw positioning data stored in the file. The lower portion of the import dialog provides a drop down list to specify the type of coordinate frame that the positioning data is referenced to. The default is WGS-84.

The vessel name is not currently stored in the .KMALL file as it was previously in the .ALL format. The sonar model number and serial number are used to craft a unique vessel name. The vessel name is used to help associate files from the same vessel together after multiple import sessions. The vessel offsets for all sensors is stored in the .KMALL format, Qimera reads these and uses them appropriately during all processing such that no further vessel configuration is required.

The .KMALL format allows users to encode the position of an SVP file and we encourage operators to take advantage of this by correctly populating the position of an SVP cast during acquisition. This allows direct use of SVP selection strategies such as "Nearest in distance", etc, without further data entry in Qimera. The date/time of the SVP is encoded in the .ALL file but it is only as correct as the data that was provided to SIS, we encourage you to verify the date/time stamping of your SVP profiler and processing software that provides this to SIS in real-time to ensure that it is correct and reporting UTC time as well.

Qimera does not extract tide data from the .KMALL format so you may need to provide that separately using the Tide Importer.

Qimera supports Water Column data stored in the separate .KMWCD file.



Raw sonar file format capabilities and what Qimera is extracting from the raw sensor source files in import are explained in this supporting document - Qimera Sonar Source Data Import Capabilities .

Processed Point Files

Format	Extension	Can Unload To	Links
9-Column ASCII Lidar	.all		
ASCII XYZ	.asc, .cor, .csv, .txt, .xyz		
CnC Binary	.bin	✓	
CnC Trace	.trace		

Format	Extension	Can Unload To	Links
Danish Geographic FAU	.fge	✓	
Danish FAU/FAU2	.fau, .fu2	✓	
Geoswath Kongsberg	.sff		
Hydro 93 Binary	.b93		
Hypack Hysweep	.hs2	✓	
IVS Binary	.ivs		
LADS Mark II	.caf		
LAS	.las	✓	
LASzip	.laz		
MBSystem Fast Bathymetry File	.fbt		
MPA/CARIS ASCII			
MapInfo MIF	.mif		
NAVO GSF	.gsf, .d0, .d1, .d2	✓	
NAVO/CARIS ASCII			
Neptune PROC	.depth	✓	

Format	Extension	Can Unload To	Links
OMG Merge	.merged	✅	
PFM	.pfm		Unloading not possible when importing as processed points
PDS2000	.pds		
QPS QPD Versions 1 & 2	.qpd		
RAN HTF	.htb, .htf	✅	
SHOALS 1K	.hof	✅	
SHOALS Hydro/ Topo Airborne	.abh,	✅	
SHOALS OUT	.out	✅	
SHOALS TOF	.tof		
SHOM Pivot	.piv		
Swedish Binary DIS	.bdi	✅	
XSE Data Exchange	.xse		
CARIS Processed Depths *License dependencies apply	.hdcs	✅	

Position and Motion Formats

Format	Extension	Additional Information	Links
Applanix	.000, .001, etc	Applanix POSMV raw logging format, navigation and uncertainty values are extracted, along with Delayed True Z if available	
Applanix	SBET	Applanix POSPac MMS format. Contains Time, Lat, Lon, Height, XYZ velocities, roll, pitch, heading, wander angle, XYZ accelerations, XYZ angular rate of rotations.	
Applanix	SMRMSG	Applanix POSPac RMS format. This is imported alongside an SBET to provide observation standard deviations for the SBET data.	
Kongsberg	.BIN	Kongsberg NavLab format	
NovAtel	SBTC, SBIC	NovAtel Inertial Explorer's SBTC/SBIC smoothed and combined tightly/loosely coupled trajectory format	
Kongsberg Seatex	.SRH	Kongsberg PFreeHeave delayed heave format	

Other Source Data formats

Import Formats
ASCII Navigation
ASCII Tides

Import Formats
ASCII SVP
Caris SVP
Hypack SVP
QINSy SVP Database
Reson SVP
Kongsberg ASVP

Tide File Formats

Tide Data Files

QPS Tide File Formats	
QINSy Tide Data	.qtd
QINSy Regular Tide File	
Tide Data Providers and Formats	
BODC Tide format	
NOAA CO-OPs (OPeNDAP and TideBot)	
Additional Formats	
Caris Tides	.tid

Swedish Maritime Authority	.niv
ARGOSS - Fixed Format	
COWLIS - Canadian Hydrographic Service	
MSQ Dialmace Format	
PREDUCT - Dutch Navy	.qtr
RIKZ - Dutch Public Works	
SHOM	

Qimera supported Tide File formats specifications, metadata and sources are detailed in the supporting document Qimera Tide File Formats

Tide Definition Files

Name	Extension	Documentation
QINSy Tide Definition	.qtf	QINSy KBE - Howto Tide
Zoned Tides	.zdf	Zoned Tides (ZDF) format

Supported Layer Data Formats

Grid formats
ArcView Binary Grid

Grid formats
ArcView Ascii Grid
Ascii Gridded Data
Ascii Surfer Grid
BAG/Open Navigation Surface
BIL DEM
Binary Surfer Grid
ER Mapper Grid .ers
Final Survey Grid .fin
Fledermaus Version 6 DTM
Floating Point GeoTIFF Grid
Fugro GRI
GMT Grd
Grass GIS DTM
GUTM Grid
ISIS grd
OMG R4/mos

Grid formats
QPS Grid
Raw Binary Grid
USGS DEM

Image Formats IMPORT	Image Formats EXPORT
.tif	.tif
.tiff	.tiff
.jpg	.jpg
.png	
.kap	
.jpg2	

Point File Formats for Visualization
See the Qimera Supported Import Data Formats#Processed-Point-Files.

Line File Formats	
CAD	dxf/dwg/qgf
ArcGIS Shapefiles	shp
ASCII lines	xyz,asc

Qimera Sonar Source Data Import Capabilities

Qimera Raw Sensor Files

This document explains in detail what Qimera is extracting from the raw sensor source files on import.

> ⚠ The import and processing of raw data formats is dependent on licensing. In Qimera, go to the Help drop-down menu and choose View License Status to view your current license coverage.

> ℹ Please also see Qimera Supported Import Data Formats for additional information on each format.

- Qimera Raw Sensor Files
  - DB
  - ALL (mb56,mb58)
  - S7K
  - HSX
  - JSF
  - GSF
  - XSE
  - R2SC
  - KMALL

Qimera attempts to initially extract as much information as possible from the raw sensor files at the point of import. Some files provide much of the information necessary to begin data processing immediately while others only provide some. In some cases, some information is provided but metadata is missing. For example, the .ALL format provides SVP casts but it does not provide the geographic position of the SVPs.

Qimera will recommend the best workflow for source files that a user attempts to import as either Raw Sensor or Processed Points. Qimera if presented with Raw Sensor files as Processed Points Source Files will ask you to import as Raw Sensor to enable full use of file contents during the dynamic processing.

DB	**Processed MB**	QPD from QINSy used if it exists.
	RAW MB	Yes.
	Water Column Imagery	Water column imagery is supported for the following manufacturers: Kongsberg (.all and .kmall format), Reson, R2Sonic (Water Column - WCD0 and TruePix - TPX0 → D1 magnitude and direction) and Norbit.
	Vessel Configuration	Yes.
	SVP	Yes, if it exists. Users may wish to correctly set the acquisition date and location of the SVP during entry into QINSy to enable space/time based SVP lookup.
	Surface Sound Speed	Yes, if it exists. This would be raw sensor data. The value stored in the multibeam record, i.e. that used in beam forming, is extracted as a separate time-series as well.
	Orientation	Yes, all streams.
	Position	Yes, all streams.
	Height	Yes, all streams.
	Tide	Yes, all tide stations. Qimera only allows use 1 station however for v1.0.

	Pressure	Yes, all streams.
	Sonar Settings	Sonar settings are only used to populate GSF sensor specific records during export from Qimera. QINSy must be configured to record these records. Please consult the QINSy knowledge base to verify which records you may need.
	Other	Seabed imagery records (snippets, etc) are only used to populated GSF sensor specific records during export from Qimera. QINSy must be configured to record these records. Please consult the QINSy knowledge base to verify which records you may need.

ALL (mb56, mb58)	**Processed MB**	Yes, if Direct to QPD enabled.
	RAW MB	Yes.
	Water Column Imagery	Yes.
	Vessel Configuration	Yes, from the Installation datagram.
	SVP	Yes. No position is available for SVP. Observation time is available but may be incorrect depending on the original source of the SVP provided to SIS.
	Surface Sound Speed	Yes, if raw sensor data is available. The value used in beamforming is extracted from the Range/Angle datagram as well as a separate time-series.
	Orientation	Yes. Raw sensor values are calculated by removing angular offset corrections applied by Kongsberg and by removing lever arm corrections applied by Kongsberg.

	Position	Yes, all streams. Raw height is extracted from NMEA strings to circumvent Kongsberg "motion correction" of position.
	Height	Yes, but users should note that some NMEA data streams do not specify the geoid/ellipsoid separation. If no geoid/ellipsoid separation exists, then the NMEA height **may** represent a value that is referenced to a geoid, but the specific geoid is not encoded in the data stream.
	Tide	No.
	Pressure	Yes. Depth can be extracted from the Depth (104 record) or from the position record. This is only done for subsurface platforms (based on setting of DSH field in the Installation datagram).
	Sonar Settings	Sonar settings from the Runtime datagram, Installation datagram and sonar records (depth, range/angle, seabed imagery) are only used to populate GSF sensor specific records during export from Qimera.
	Other	Seabed imagery datagrams are only used to populate GSF sensor specific records during export from Qimera.

S7K	**Processed MB**	Not available in this format.
	RAW MB	Yes. Raw MB Bathymetry is read from the 7027 record or the 7004 & 7006 record (7004/7006 must be paired, one has range and one has angle). For Hydrosweep systems, the 7047 record is read.
	Water Column Imagery	Water column imagery is supported for older style packets (7018) and also the newer compressed water column format (7042).

Vessel Configuration	Relative offsets between transmitter and receiver are imported from the 7503 record. Full vessel geometry is extracted from the 7030 record but this record only exists in files coming from PDS2000 and not from the Sonar User Interface (SUI). For Integrated Dual Head (IDH) systems, only the 7503 record is considered, as advised by Teledyne-Reson.
SVP	Yes, if it exists. Position can be available if entered by user during acquisition. Time of observation is not available. SVP/ CTD information is imported from the 1009 or 1010 record.
Surface Sound Speed	Yes. This is the value used for beamforming, it is extracted from record 7000. The raw sensor values are not stored separately in the file and the value used for beamforming may have been filtered by the acquisition system.
Orientation	Yes, if it exists. Heading is imported from the 1013, 1015, or 1016 record. Roll/Pitch/Heave is imported from the 1012 or 1016 record.
Position	Yes, if it exists. File format supports single stream only. Position is imported from the 1003 or 1015 record.
Height	Yes, if it exists. File format supports single stream only. GNSS/GPS Height is read from the 1003 or 1015 record.
Tide	No
Pressure	Yes, depth (not pressure) is extracted from Depth datagram (1008).
Sonar Settings	Yes. Sonar Settings are used to help Qimera understand if the sonar is roll stabilized and are also used for speed of sound, sampling rate, etc. The sonar settings are read from the 7000 record.

	Other	Snippets are read from the 7028 or 7008 record; Qimera does not use these records but will pass this information into an exported GSF for use in FMGeocoder Toolbox (FMGT). Ancillary Measurements are read from the S7K. If these are missing, Qimera will still allow the data to be imported, but alternate sources for this information will need to be provided. Norbit sonars use this format as well, some deviation from general comments may be experienced by end users.

HSX	**Processed MB**	Not available in this format.
	RAW MB	Yes.
	Water Column Imagery	No.
	Vessel Configuration	Yes, if available. Hypack is sometimes set up without offsets and zero values will be found in the HSX file. Users may need to enter offsets in Qimera in this case.
	SVP	Yes. Position and time of observation are not available.
	Surface Sound Speed	Yes. The RMB record provides the surface sound speed, if available.
	Orientation	Yes.
	Position	Yes. Project coordinates in HSX file are reprojected if necessary into the Qimera project projection. The user must specify the coordinate frame of the HSX files coordinates regardless.
	Height	No. There is no "height" record and position records only contain X/Y.

	Tide	Yes, if it exists. The tide record, however, can contain GPS heights and the contents of this record cannot be determined from the HSX file alone.
	Pressure	n/a
	Sonar Settings	Sonar setting records are not stored in HSX data and are thus not immediately available to Qimera. GSFs exported may have the correct sensor ID but they will not have any sonar specific records completed.
	Other	Seabed imagery snippet records are not stored in HSX data and are thus not immediately available to Qimera. GSFs exported will not have any imagery data. .raw and .7k files logged alongside the HSX are not used by Qimera.

JSF	**Processed MB**	Not available in this format.
	RAW MB	Yes.
	Water Column Imagery	No.
	Vessel Configuration	Not available in this format.
	SVP	Not available in this format.
	Surface Sound Speed	Yes.
	Orientation	Yes, if available.

	Position	Yes, if available.
	Height	Yes, if available.
	Tide	Not available in this format.
	Pressure	Yes, depth (not pressure) can be extracted from the 3002 record if working with the EdgeTech 2205
	Sonar Settings	Not applicable.
	Other	Imagery data is not currently supported. This includes sidescan and water column.

GSF	**Processed MB**	Yes, but these are not used by default as of version 2.2.0. Users can convert the processed MB to to QPD using the "Direct to QPD" operation under the Tools menu.
	RAW MB	Yes, if beam travel-times and angles are available.
	Water Column Imagery	No.
	Vessel Configuration	Yes, if available.
	SVP	Yes, if available. Position and time may be present but these should be verified upon import.
	Surface Sound Speed	Yes, but only if the sonar specific subrecords are available. There is no generic surface sound speed field in the standard GSF ping header record.

	Orientation	Yes. Update rates may be low if the raw motion data is not stored in the file since the only other source is the ping header, in which case the ping rate may be too low to provide enough motion sensor data.
	Position	Yes, a single stream of information only, the position is stored in the ping header and its update rate is thus limited by the sonar ping rate.
	Height	Yes, a single stream of information only, the height is stored in the ping header and its update rate is thus limited by the sonar ping rate.
	Tide	Yes, if populated in the ping header record.
	Pressure	Yes, from the depth corrector field in the ping header record.
	Sonar Settings	Sonar settings in the sonar specific subrecords are not used.
	Other	Seabed imagery, if present, will be carried across during re-export into another GSF but only for Kongsberg, Reson and R2Sonic systems.

XSE	**Processed MB**	Not available in this format.
	RAW MB	Yes.
	Water Column Imagery	No.
	Vessel Configuration	Yes, from Ship Frame.
	SVP	Yes, if available. No position information is available.

	Surface Sound Speed	Yes, if available.
	Orientation	Yes, if available.
	Position	Yes, if available.
	Height	Yes, if available.
	Tide	Yes, if available from the Tide Frame.
	Pressure	No.
	Sonar Settings	Sonar settings are not used.
	Other	Imagery data is not currently supported. This includes sidescan and water column.

R2SC	**Processed MB**	Not available in this format.
	RAW MB	Yes.
	Water Column Imagery	No.
	Vessel Configuration	Not available in this format.
	SVP	Not available in this format.
	Surface Sound Speed	Yes, if available.

	Orientation	Not available in this format.
	Position	Not available in this format.
	Height	Not available in this format.
	Tide	Not available in this format.
	Pressure	Not available in this format.
	Sonar Settings	Sonar settings are only used to populate GSF sensor specific records during export from Qimera.
	Other	Seabed imagery datagrams are only used to populate GSF sensor specific records during export from Qimera.

KMALL	**Processed MB**	Support for processed soundings being directly converted is not currently implemented. Will be implemented after further joint testing with Kongsberg. Qimera will compute its own footprint solutions.
	RAW MB	Yes.
	Water Column Imagery	Yes.
	Vessel Configuration	Yes, from the Installation datagram.
	SVP	Yes. Contrary to the .ALL format, it is possible to record the cast position. This is decoded and operators are encouraged to populate these fields during acquisition. Observation time is available but may be incorrect depending on the original source of the SVP provided to the acquisition system.

	Surface Sound Speed	Yes, if raw sensor data is available. The value used in beamforming is extracted from the Range/Angle datagram as well as a separate time-series.
	Orientation	Yes. Raw sensor values are calculated by removing angular offset corrections applied by Kongsberg and by removing lever arm corrections applied by Kongsberg.
	Position	Yes, all streams. Raw height is extracted from NMEA strings to circumvent Kongsberg "motion correction" of position. Since Qimera 2.8.1, position is also extracted from the SKM attitude datagrams.
	Height	Yes, but users should note that some NMEA data streams do not specify the geoid/ellipsoid separation. If no geoid/ellipsoid separation exists, then the NMEA height **may** represent a value that is referenced to a geoid, but the specific geoid is not encoded in the data stream. Since Qimera 2.8.1, height is also extracted from the SKM attitude datagrams.
	Tide	No.
	Pressure	Not currently implemented.
	Sonar Settings	Sonar settings are only used to populate GSF KMALL sensor specific records during export from Qimera.
	Other	Seabed imagery datagrams are only used to populate GSF sensor specific records during export from Qimera.

Unknown macro: 'saabstylesheet'

Qimera Supported Tide Formats

Qimera supports a large number of tide formats including QPS proprietary, tide data providers and industry standard tide formats.
This document details the tide data formats that are supported and provides examples of the formats and metadata where relevant. It also provides links to tide data providers.

On this page:

- QPS Formats
  - QINSy Tide Data (*.qtd)
  - QINSy regular tide file
- Tide Data Providers and Formats
  - UK Tide Gauge Network, BODC Tide format
    - Data Source
    - Example
  - NOAA CO-OPs
    - Data Source
    - Examples
- Additional Formats
  - Caris Tides (*.tid)
  - Swedish Maritime Authority (*.niv)
  - ARGOSS - Fixed Format
  - COWLIS - Canadian Hydrographic Service
  - MSQ Dialmace Format
  - PREDUCT - Dutch Navy (*.qtr)
  - RIKZ - Dutch Public Works
  - HMS - Fixed Format (*.log)
  - DMY HMS - Fixed Format
  - YMD HMS - Fixed Format
  - Finnish Maritime Administration
  - SHOM

QPS Formats

QINSy Tide Data (*.qtd)

Binary tide files generated from QINSy Processing Manager.

Documentation on creating QTD files can be found in the Knowledge base here: Howto Tide - Tidal data

QINSy regular tide file

The date format is day/month/year

Eample QINSy regular tide file format

```
24/10/2009 10:10 1.24
24/10/2009 10:20 1.10
24/10/2009 10:30 0.98
```

Tide Data Providers and Formats

UK Tide Gauge Network, BODC Tide format

Data Source

Data from the UK tide gauge network is accessible from the British Oceanographic Data Centre.

Example

Example BODC Tide File format

```
Port:              P001
Site:              Newlyn
Latitude:          50.10300
Longitude:         -5.54283
Start Date:        01JAN2011-00.00.00
End Date:          31DEC2011-23.45.00
Contributor:       National Oceanography Centre, Liverpool
Datum information: The data refer to Admiralty Chart Datum (ACD)
```

```
Parameter code:    ASLVBG02 = Surface elevation (unspecified datum) of the water body
by bubbler tide gauge
  Cycle    Date      Time    ASLVBG02   Residual
 Number yyyy mm dd hh mi ssf         f          f
     1) 2011/01/01 00:00:00     4.134     -0.022
     2) 2011/01/01 00:15:00     4.304     -0.015
     3) 2011/01/01 00:30:00     4.455     -0.004
     4) 2011/01/01 00:45:00     4.561     -0.013
     5) 2011/01/01 01:00:00     4.663     -0.001
     6) 2011/01/01 01:15:00     4.732      0.003
     7) 2011/01/01 01:30:00     4.770      0.002
     8) 2011/01/01 01:45:00     4.799      0.015
     9) 2011/01/01 02:00:00     4.781      0.004
    10) 2011/01/01 02:15:00     4.742     -0.004
    11) 2011/01/01 02:30:00     4.678     -0.016
    12) 2011/01/01 02:45:00     4.598     -0.023
    13) 2011/01/01 03:00:00     4.515     -0.014
    14) 2011/01/01 03:15:00     4.395     -0.026
    15) 2011/01/01 03:30:00     4.267     -0.032
```

NOAA CO-OPs

Data Source

Preliminary and verified tide data for the US is available from the CO-OPS Data Retrieval website. Metadata should be included.

Examples

Example of CO-OPs Preliminary (with metadata)

```
1  ================================================================================
   ========================================
2                 Station Metadata
3  ================================================================================
   ========================================
4
5     Station Id          :   8454000
6     Station Name        :   Providence
7     State               :   RI
8     Latitude            :   41.8071
9     Longitude           :   -71.4012
10    Begin Date          :   20141006
11    End Date            :   20141006
```

```
   Time Zone          :   GMT
   Datum              :   MLLW
   Unit               :   Meters
================================================================================
    Center for Operational Oceanographic Products and Services Data Disclaimer
================================================================================
    These preliminary data have not been subjected to the National Ocean Services (NOS)
    Quality Control procedures, and do not necessarily meet the criteria and standards
    of official NOS data. They are released for limited public use with appropriate caution.

================================================================================
    Name             --   Description
================================================================================
    ID               --   Station ID
    D                --   is an assigned value of 1
    S                --   is the product data type
    Date Time        --   Date and time
    WL               --   Water level height
    Sigma            --   Standard deviation of 1 second samples used to compute the water level height
    O                --   Count of number of samples that fall outside a 3-sigma band about the mean
    F                --   A flag that when set to 1 indicates that the flat tolerance limit was exceeded
    R                --   A flag that when set to 1 indicates that the rate of change tolerance limit was exceeded
    L                --   A flag that when set to 1 indicates that either the maximum or minimum expected water
                          level height limit was exceeded
================================================================================
ID      D S  Date       Time    WL      Sigma   O F R L
================================================================================
8454000 1 WL 2014-10-06 00:00   1.368   0.004   0 0 0 0
8454000 1 WL 2014-10-06 00:06   1.326   0.007   0 0 0 0
8454000 1 WL 2014-10-06 00:12   1.281   0.007   0 0 0 0
8454000 1 WL 2014-10-06 00:18   1.223   0.008   0 0 0 0
8454000 1 WL 2014-10-06 00:24   1.173   0.006   0 0 0 0
```

Example of CO-OPs Verified (with metadata)

```
================================================================================
================================
               Station Metadata
================================================================================
================================
   Station Id         :   8454000
   Station Name       :   Providence
   State              :   RI
   Latitude           :   41.8071
   Longitude          :   -71.4012
   Begin Date         :   20140801
   End Date           :   20140801
   Time Zone          :   GMT
   Datum              :   MLLW
   Unit               :   Meters
================================================================================
================================
    Center for Operational Oceanographic Products and Services
================================================================================
================================
================================================================================
================================
    Name             --   Description
================================================================================
================================
    ID               --   Station ID
    Date Time        --   Date and time
    WL               --   Water level height
    Sigma            --   Standard deviation of 1 second samples used to
compute the water level height
    I                --   A flag that indicates that the water level value
has been inferred
    F                --   A flag that when set to 1 indicates that the
flat tolerance limit was exceeded
    R                --   A flag that when set to 1 indicates that the
rate of change tolerance limit was exceeded
    T                --   A flag that when set to 1 indicates that the
temperature difference tolerance limit was exceeded
================================================================================
================================
ID      Date       Time    WL      Sigma   I F R T
================================================================================
================================
8454000 2014-08-01 00:00   0.726   0.001   0 0 0 0
8454000 2014-08-01 00:06   0.734   0.002   0 0 0 0
```

```
8454000 2014-08-01 00:12   0.746   0.002   0 0 0 0
8454000 2014-08-01 00:18   0.758   0.001   0 0 0 0
8454000 2014-08-01 00:24   0.765   0.001   0 0 0 0
8454000 2014-08-01 00:30   0.767   0.001   0 0 0 0
8454000 2014-08-01 00:36   0.769   0.001   0 0 0 0
```

Additional Formats

Caris Tides (*.tid)

The date format maybe be one of:

- year/month/day hours:minutes
- year/month/day hours:minutes:seconds

Example Caris tides format

```
--------
2000/11/01 00:00 0.522
2000/11/01 01:00 0.317
2000/11/01 02:00 0.395
2000/11/01 03:00 0.751
2000/11/01 04:00 1.296
2000/11/01 05:00 1.848
2000/11/01 06:00 2.339
2000/11/01 07:00 2.589
```

Swedish Maritime Authority (*.niv)

Example of Swedish Maritime Authority format

```
56432:hamnmatning
20040819,1240, -0.06
20040819,1250, -0.05
20040819,1300, -0.03
20040819,1310, -0.02
20040819,1320, -0.02
20040819,1330, -0.04
20040819,1340, -0.04
20040819,1350, -0.04
20040819,1400, -0.05
20040819,1410, -0.04
```

ARGOSS - Fixed Format

See www.tidal-info.com for more information.

COWLIS - Canadian Hydrographic Service

CHS COWLIS format

```
---------------------- LIBEX file dump ----------------------
----------------------- STN00905.OBS -----------------------
------------------ Time Zone:  GMT ( 0.0) ------------------
---------------------- Invariant Fields ----------------------
Name             Type Size    Units Value
-------------------------------------------------------------
station_id       CHAR    5          00905
station_name     CHAR   16          St. John's, NFLD
data_product     CHAR    3          wlo
start_time       INTG    4  seconds 91/11/01 00:00:00
end_time         INTG    4  seconds 91/11/16 00:00:00
file_date        INTG    4  seconds 92/04/14 19:24:24
max_water_level  REAL    4   metres    1.640
min_water_level  REAL    4   metres    0.050
-------------------------------------------------------------
----------------------- Variant Fields -----------------------
Name             Type Size    Units
-------------------------------------------------------------
time             INTG    4  seconds
water_level      REAL    4   metres
std_dev          REAL    4   metres
-------------------------------------------------------------
1980/01/01 00:00:00   0.0   0.030
2010/12/31 23:59:59   0.0   0.030
-------------------- End Of LIBEX File ----------------------
```

MSQ Dialmace Format

```
DDMMYYYYHHMM x.xxx
```

Where:

DD = Day (01-31)
MM = Month (01-12)
YYYY = Year

HH = Hour (00-23)
MM = Min (00-59)
x.xxx = Tide value in meters

Example:

```
240619930000 2.227
240619930010 2.257
240619930020 2.282
240619930030 2.302
240619930040 2.312
240619930050 2.317
240619930100 2.315
240619930110 2.300
240619930120 2.277
240619930130 2.242
240619930140 2.197
240619930150 2.150
```

PREDUCT - Dutch Navy (*.qtr)

```
HY95069_1_SSS
M2
43
/ / *
TMP/GLLWS
WGS84
15/11/95 01:52:31 52;25;11.100N 003;45;17.802E -0.217
15/11/95 01:52:32 52;25;11.170N 003;45;17.847E -0.217
15/11/95 01:52:33 52;25;11.272N 003;45;17.881E -0.217
```

RIKZ - Dutch Public Works

```
YYYYmmddHHMM eeeeee.ee nnnnnn.nn xx.xxx
```

Where:

YYYY = Year (01-31)
mm = Month (01-12)
dd = Day (01-31)
HH = Hour (00-23)
MM = Min (00-59)

eeeeee.ee = Easting (UTM 5E) in meters
nnnnnn.nn = Northing (UTM 5E) in meters
xx.xxx = Tide value in meters

HMS - Fixed Format (*.log)

The filename for the format indicated the date, and should be in the format "YYYMMDD.log"

```
HH:MM:SS xxxxx
```

Where:

HH = Hour (00-23)
MM = Min (00-59)
xxxxx = Tide value in m or cm

Example:

```
00:00:01 24.69 Bige -0.09 24.78 56
00:01:01 24.69 Bige -0.09 24.78 56
00:02:01 24.69 Bige -0.09 24.78 56
00:03:01 24.69 Bige -0.09 24.78 56
```

DMY HMS - Fixed Format

```
dd/mm/YY HH:MM xxxx
```

Where:

dd = Day (01-31)
mm = Month (01-12)
YY = Year (00-99)
HH = Hour (00-23)
MM = Min (00-59)
xxxx = Tide value in m or cm

Example:

```
15/09/00 08:30 -2.02
15/09/00 08:40 -2.01
15/09/00 08:50 -2.01
15/09/00 09:00 -1.93
```

YMD HMS - Fixed Format

```
YYYYMMDD HHMM xxxx
```

Where:

YYYY = Year (0000 - 9999)
MM = Month (01-12)
DD = Day (01-31)
HH = Hour (00-23)
MM = Min (00-59)
xxxx = Tide value in m or cm

Example:

```
20000808 0000 -12
20000808 0010 -27
20000808 0020 -43
20000808 0030 -58
20000808 0040 -73
20000808 0050 -88
20000808 0100 -101
20000808 0110 -115
20000808 0120 -127
```

Finnish Maritime Administration

```
YYYY DD mm HH xx
```

Where:

YYYY = Year
dd = Day (1-31)
mm = Month (1-12)
HH = Hour (0-23)
xx = Tide value in cm

SHOM

Example:

```
# Station : BREST
```

```
# Longitude : -4.49503994
# Latitude : 48.38290024
# Organisme fournisseur de données : SHOM / Marine nationale
# Fuseau horaire : UTC
# Unité : m
# Source 1 : Données brutes temps réel
# Source 2 : Données brutes 10 minutes temps différé
# Source 3 : Données validées temps différé
# Source 4 : Série horaire validée
Date;Valeur;Source
24/03/2015 00:00:25;1.055;1
24/03/2015 00:01:25;1.041;1
24/03/2015 00:02:25;1.030;1
24/03/2015 00:00:00;3.055;2
24/03/2015 00:10:00;4.041;2
24/03/2015 00:20:00;5.030;2
```

Zoned Tides (ZDF) format

This document describes details of the ZDF Zoned Tides format.

On this page:

- Format Description
  - General Notes
  - Sections
    - [ZONE_DEF_VERSION_2] or [ZONE_DEF_VERSION_3]
    - [ZONE]
    - [TIDE_STATION]
    - [TIDE_ZONE]
    - [TIDE_AVERAGE]
    - [OPTIONS]
- Example: OPR-K354-KR-2011

Format Description

General Notes

All fields are comma delimited, there is no specification on whitespace usage between fields though. All sections should be followed by a blank line.

Sections

- [ZONE_DEF_VERSION_2] or [ZONE_DEF_VERSION_3]
- [ZONE]
- [TIDE_STATION]
- [TIDE_ZONE]
- [TIDE_AVERAGE]
- [OPTIONS]

[ZONE_DEF_VERSION_2] or [ZONE_DEF_VERSION_3]

This is the header section that specifies the ZDF version. It has no records.

[ZONE]

This section is repeated for each zone to define the polygon in which the associated gauge(s) and correctors are applicable.

The first line contains

- zone label
- vertex count

Following records contain the position of each vertex with

- latitude
- longitude

Example:

```
[ZONE]
WGM277,5
29.224709, -91.185916
29.220308, -91.160837
29.005056, -91.282961
28.968641, -91.399733
29.224709, -91.185916
```

[TIDE_STATION]

This is a list of all the tide stations referenced by zones or tide averages.

Unless otherwise specified (as in version 3) the tide files are assumed to be located in the same directory as the .zdf and take the form of "*(station label)*.tid"

In **version 2** each record includes

- station label
- latitude
- longitude

Example:

```
[TIDE_STATION]
8762075, 29.115000, -90.206700
8763535, 29.173333, -90.975000
...
```

In **version 3** the record additionally includes

- maximum amplitude (meters)

- uncertainty value
- (optional) tide file path.

Example:

```
[TIDE_STATION]
8762075, 29.115000, -90.206700, 2.0, 0.15, C:\Tides\8762075.tid
8763535, 29.173333, -90.975000, 1.5, 0.10, C:\Tides\8763535.tid
...
```

[TIDE_ZONE]

This defines the relationship between the zones and the tide stations.

For **version 2** each record contains

- zone label
- station label
- priority - this can be: PRIM, SEC, TER, or PRELIM; meaning: primary, secondary, tertiary, or preliminary, respectively.
- time offset, or corrector (minutes)
- amplitude scalar, also referred to as range corrector - this is a multiplier for the tide height to scale the amplitude
- (optional) tide file path

Example:

```
[TIDE_ZONE]
CGM716, 8763535, PRIM, -24, 0.836
WGM264, 8763535, PRIM, -36, 0.963
...
```

For **version 3** the tide file path is not an option, but the follow additional fields are included

- tidal shift (meters) - this is a vertical shift of the tide height to be added after scaling
- uncertainty - this is an uncertainty for the tidal zone

Example:

```
[TIDE_ZONE]
CGM716, 8763535, PRIM, -24, 0.836, 0.0, 0.2
WGM264, 8763535, PRIM, -36, 0.963, 0.0, 0.2
...
```

[TIDE_AVERAGE]

These are lists of tide stations to average for use in the designated zone. Averaging is done after corrections specified in [TIDE_ZONE] are applied.

In many cases no averaging is needed but stations are listed redundantly in this section.

Records include

- zone label
- comma separated list of 2 or more station labels to average

Example:

```
[TIDE_AVERAGE]
CGM716,8763535,8763535
WGM264,8763535,8763535
...
```

[OPTIONS]

There are only two standard options

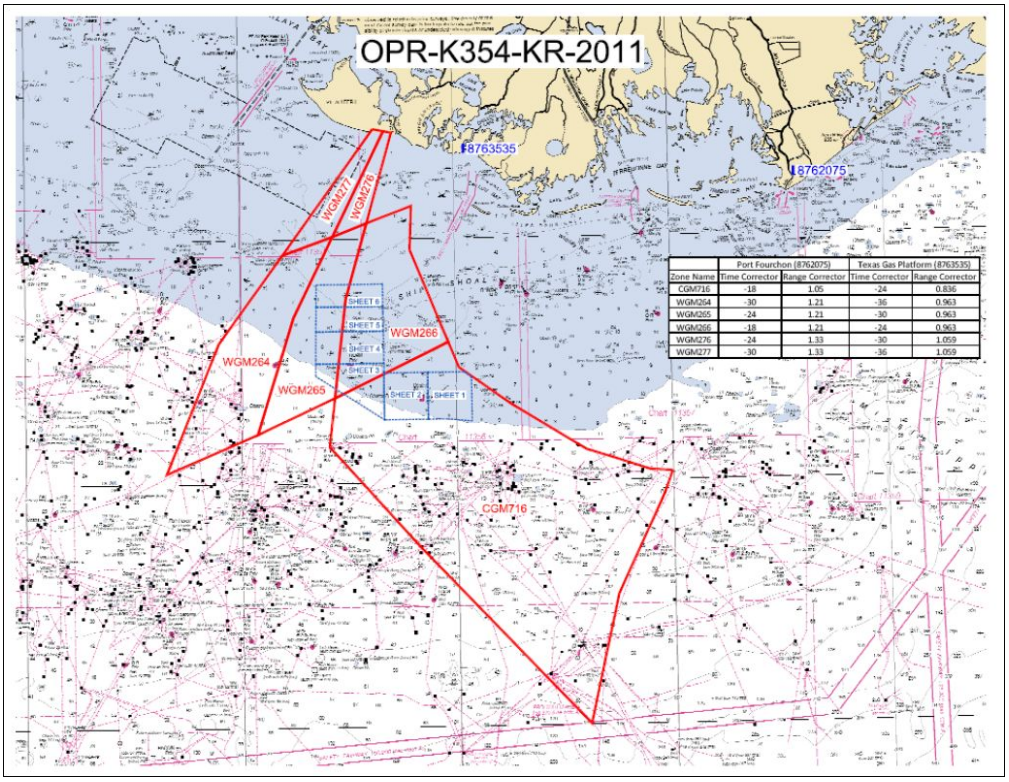
- Outage (minutes) - if missing records, the time after which to switch to the next priority station
- Interval (seconds) - final interval of tide heights loaded into the line

Example:

```
[OPTIONS]
Outage, 30
Interval, 360
```

Example: OPR-K354-KR-2011

This example comes from the Body and Appendices of NOAA Descriptive Report H12331.



Location of survey area, tide zones, tide stations 8762075 and 8763535 and the time/range correctors for those tide stations.

ZDF file (version 2)

```
[ZONE_DEF_VERSION_2]

[ZONE]
CGM716,14
28.516196,-90.501009
28.471404,-90.519688
28.265943,-90.630658
28.001139,-90.699347
28.371610,-91.091603
28.575123,-91.295343
28.674869,-91.281683
28.786847,-91.016701
28.734720,-90.992780
28.658449,-90.872902
28.562754,-90.699401
28.547356,-90.644364
28.519663,-90.553010
28.516196,-90.501009

[ZONE]
```

```
WGM264,7
28.968641,-91.399733
29.005056,-91.282961
28.841561,-91.375255
28.601696,-91.461815
28.522274,-91.674134
28.788473,-91.550173
28.968641,-91.399733

[ZONE]
WGM265,7
29.005056,-91.282961
29.032404,-91.203049
28.876853,-91.254013
28.674869,-91.281683
28.601696,-91.461815
28.841561,-91.375255
29.005056,-91.282961

[ZONE]
WGM266,7
29.032404,-91.203049
29.066476,-91.098476
28.977116,-91.103401
28.786847,-91.016701
28.674869,-91.281683
28.876853,-91.254013
29.032404,-91.203049

[ZONE]
WGM276,5
29.220308,-91.160837
29.217374,-91.142446
29.032404,-91.203049
29.005056,-91.282961
29.220308,-91.160837

[ZONE]
WGM277,5
29.224709,-91.185916
29.220308,-91.160837
29.005056,-91.282961
28.968641,-91.399733
29.224709,-91.185916

[TIDE_ZONE]
CGM716,8763535,PRIM,-24,0.836
WGM264,8763535,PRIM,-36,0.963
```

```
WGM265,8763535,PRIM,-30,0.963
WGM266,8763535,PRIM,-24,0.963
WGM276,8763535,PRIM,-30,1.059
WGM277,8763535,PRIM,-36,1.059

[TIDE_STATION]
8762075,29.115000,-90.206700
8763535,29.173333,-90.975000

[TIDE_AVERAGE]
CGM716,8763535,8763535
WGM264,8763535,8763535
WGM265,8763535,8763535
WGM266,8763535,8763535
WGM276,8763535,8763535
WGM277,8763535,8763535

[OPTIONS]
Outage, 30
Interval, 360
```

Qimera Operating systems

Qimera software up to 2.0.0 runs on the Windows, Mac and Linux. Because of the large number of possible system configurations, Qimera is guaranteed to run on a number of official supported systems as outlined below. Qimera may run successfully on other systems, however QPS makes no warranty on Qimera running on these systems. See the notes below for more information about supported platforms. For information on the minimum hardware requirements for PC systems, please see our Qimera System Requirements page.

Windows Platforms

- Windows 10* 64 bit (Excluding 'N' and 'KN' versions of Windows 10 , ex: Windows 10 Enterprise N or Windows 10 Pro N. If you want to try using an 'N' or 'KN' version of Windows 10, this link may help: Media Feature Pack for N and KN versions of Windows 10.)
- Windows 11 64 bit

Macintosh Platforms

- Mac OS X version 10.15.x

Linux Platforms

Check the Installation Guidelines v8.5 for further requirements, guidelines or libraries, in particular if the app does not start.

- RedHat Enterprise Linux 7 (64 bit)
- RedHat Enterprise Linux 8 - Requires `X.org`, currently does not work with `Wayland` (app will fail to start with an error about `wayland`).
- Ubuntu 18.04 LTS
- Ubuntu 20.04 LTS
- Ubuntu 22.04 as of 22.04.1 - Requires `X.org`, currently does not work with `Wayland` (app will fail to start with an error about `wayland`).
    -

⚠ Ubuntu's Unity user interface is no longer compatible with Qimera, as of Qimera 2.0. Other desktop environments, such as Gnome, are suggested instead.

RELATED TOPICS

- Qimera System Requirements
- Installation Guidelines v8.5

Qimera System Requirements

The following table lists the minimum and recommended hardware specifications for PC machines running Intel Based hardware. For information on which operating systems and platforms are supported, see our Qimera Platforms Overview page.

Minimum Machine Configuration (see below for our recommended specifications)

CPU	Intel i3 2.4+Ghz / AMD equivalent.
Memory	8GB+
Graphics Card	• Nvidia 100 series or better (GeForce 100M or newer for mobile) • AMD HD4xxxx or better • Intel HD2000 or better • Support for OpenGL 3.0+
Monitor	A resolution of 1280x1024 or better.
Mouse	2 Button with Scroll Wheel, 3 button mouse or trackpad with equivalent functionality.

Recommended Machine Configuration

CPU	Intel i5 or i7 2.6Ghz+ / AMD equivalent
Memory	16GB+
Storage Device	Solid State Drive (SSD)
Graphics Card	• Nvidia GeForce 700, 900, or 10xx series or better (GeForce 600M or better for mobile) • AMD R5/R7/R9/RX or better • Support for OpenGL 4.1+

Monitor	A resolution of 1600x1200 or better.
Mouse	2 Button with Scroll Wheel or 3 button mouse.

Extra notes

- When choosing hardware, please be aware that spending thousands on Workstation class components may not result in marked performance benefits when compared to a fast gaming processor and video card.
- Qimera is designed to maximize CPU core utilization and many operations will use as many CPU cores as available and as a 64 bit application will utilize whatever memory is available (when appropriate). That said, testing has shown that gains from having additional threads available may drop off after 8 to 12 threads. Due to disk I/O limitations, having many many threads will not necessarily result in better performance. It is not advisable to invest in a processor with extremely high numbers of cores / threads purely for processing with Qimera.
- Support for two or more displays is highly desirable especially in demanding data processing tasks.
- Ensure that any external monitors are plugged into the graphics card ports rather than the onboard ports.
- Having multiple hard disks/SDDs to separate source data and project data onto separate drives can substantially boost processing performance.
- Reference for Nvidia and AMD graphics cards and Intel integrated Graphics including information on the supported OpenGL versions:
  - Nvidia
  - AMD
  - Intel
- Windows Remote Desktop does not support 3D OpenGL Applications very well so running Qimera through Remote Desktop connection can cause unforeseen issues. If you are utilizing an NVidia card they have made available a small application that enables support for this. It can be downloaded from NVidia's site at https://developer.nvidia.com/designworks. Once downloaded you will be required to run it once and reboot your machine and the feature should be enabled.
- Using a USB Driver Graphic Card from a USB Docking station might result in OpenGL error, a quick workaround for this is to plug in the display cable straight in the video output of the laptop.

RELATED TOPICS

Qimera Platform Overview

Qimera Technical Documentation

- Changes affecting Kongsberg .all users - Qimera 1.1.3 and later
- GSF file usage and limitations
- Installation Guide
- New Features for Managing and Applying Tides in Qimera
- Object Track from Qinsy projects
- SVP extraction and processing configuration

Changes affecting Kongsberg .all users - Qimera 1.1.3 and later

1. **What was the problem?** The time stamp for position and height data in .all files was being read from the NMEA string in all cases, even if the user had configured SIS to use the system time.
2. **Who is affected?** This will affect Qimera users who import .all data. If you have pre-existing projects, you may want to re-import your navigation. New projects will correctly respect the timing settings that were configured during acquisition. If you have existing projects where you have already imported and applied a different source of navigation, e.g. an SBET file, you are not affected.
3. **What is the effect?** If you are affected, you may have been seeing slight along-track positional errors that would be consistent with the same type of error you would get from a position time latency.
4. **What should you do?**
    a. The bug fix will address this for new projects, no action or change in your workflow is required for a new project.
    b. For existing projects created in older versions of Qimera, you may want to take advantage of the new fix. This is done by opening your existing projects in the new version of Qimera (1.1.3 or later), select the .all files in your project, navigate to Tools -> Manual Processing -> Rescan Time Series Data. This will launch a new dialog in which you should select Position and Height for re-import. This will re-extract the position data from the selected .all files and will apply the correct time stamp. This will necessarily mark the selected files as requiring re-processing. Re-process the data and your QPDs will then be updated for the correct navigation. Re-navigation is a fast re-processing step compared to re-ray tracing so the time impact should be minimal for most users. Dynamic Surfaces that use the affected QPDs will update automatically unless you have turned off automatic updates.
    c. For large projects, you can determine if you are affected by following the above procedure with slight differences:
        i. Open your existing project in the new version of Qimera
        ii. Select a single line, create a Static Surface for this line, name it “Before”.
        iii. Re-scan the navigation and height data as instructed above for this single line only.
        iv. Re-process the single line.
        v. Create a 2nd Static Surface for this line, name it “After”
        vi. Select the two surfaces and compare to see if there is a change. If there is a difference, then you should re-scan the Position and Height for all of your .all files.
5. **How can you get help?** Contact us if you would like help determining if you are affected by this or if you have questions: QPS Support

GSF file usage and limitations

GSF files from a number of 3rd party software vendors have been giving a number of clients some trouble when importing into Qimera. The GSF format is a suitable data container for the interchange of georeferenced soundings but transferring raw sonar measurements, as well as all necessary ancillary data and sensor configuration, can be more difficult with this file format. There are three processing paths for GSF in Qimera, these are examined below with some information to help you decide the best way forward. Please get in touch with us if you find oddities or discrepancies and we can start collecting the known limitations associated with various sources of GSF files. This will help us to help other clients as well as giving us good information to feedback to other software vendors that provide the GSF format as an export option.

Import as Processed Points

When importing as processed points, the georeferenced solutions are taken "as is" and can be used directly for production of grid products. Creation of a Dynamic Surface will convert the GSF files into a QPD file, allowing for geospatial visualization and editing of your point data. This is the equivalent capabilitty that FM Hydro users would have been used to with the Fledermaus based geospatial processing tools we have offered in the past. This particular import path will not allow any georeferencing or mathematical correction of sounding positions. The GSF format is well suited for this particular application and few problems are expected as this particular workflow has been offered with FM Hydro for a number of years. This particular approach will give you the best representation of what your GSF file contains. In other words, if you are having problems importing GSF data as a raw sonar data, this is the best fall back solution in that it should give you a faithful conversion of your soundings into QPD format as the mathematics that are used to do this do not rely on any information in the GSF other than the soundings themselves.

Import as Raw Sonar Data

The second option is to import the GSF as a raw sonar file. When you do this, the GSF is mined for raw sensor data such as motion, position, surface sound speed, etc. Also, Qimera extracts the vessel geometry such as the sensor locations on the vessel and their angular orientations. After this stage, Qimera is ready to do one of two things, these are examined below. In either of the two scenarios below, if your results are inconsistent with your expectations after import and conversion to QPD, we recommend instead importing your GSF files as Processed Points. This will allow you to generate grid products and to edit your data points, but you will not be able to re-process data. If you find yourself in this situation, please get in touch with us and we'll see if a fix is possible. It may very well be that there is no fix possible due to missing or incorrect information in the file.

Direct Conversion to QPD

You can allow for a direct conversion of the georeferenced soundings into a QPD. This is the default option in Qimera and can be disabled in the *Preferences* dialog under the *General Tab* by unticking the option to "Automatically convert Kongsberg/GSF sonar data on import" option. If you leave this option enabled, a little bit of math is done to undo the vertical correctors that were applied to the soundings in the GSF, such as tide and draft, and store them into the equivalent storage fields in the QPD. Qimera then uses the sensor lever arms that were encoded in the file along with the motion sensor measurements in the file to compute and remove the horizontal and vertical offsets between the vessel reference point and the sonar head. This creates a QPD file that is 100% consistent with how Qimera would have created had it done all of the mathematical processing itself. This is done to facilitate quick re-processing of horizontal and/or vertical positioning, including tide. Inconsistencies between the GSF soundings and the Qimera soundings can occur when vertical correctors are reported but not applied, or *vice versa*, or when sensor locations are incorrectly reported or not reported at all.

Full Recalculation from Raw Measurements

If you've opted out of the option to allow a direct conversion to QPD, or if you've changed a processing configuration option that necessitates full sounding recalculation, then Qimera will start from scratch with all of the raw sensor measurements and will ray trace and georeference the soundings according to your processing configuration. There are several ways that things can go wrong, leading to incorrect results.

Multibeam Measurements

Problems can occur when the raw sonar measurements do not conform to expectation. For example, the beam angles and/or travel-times are incorrectly encoded. In this situation, you may find that the reported depths are significantly incorrect. The sign convention for the beam angles may also vary from one software vendor to another as there is not a strict enforcement of this. In these situations, you'll notice that soundings are flipped around from port to starboard and *vice versa*. These can both be fixed to some extent in the *Vessel Editor* by setting the travel-time scale and the receiver and/or transmitter beam angle sign conventions.

Vessel Configuration

If the sensor locations and angular alignments are incorrect or missing in the GSF, you may need to track down what those values should be and then input them in Qimera's *Vessel Editor*. Furthermore, the GSF format does not strictly enforce how dual head systems are represented. There may be cases where Qimera cannot detect that data are from a dual-head system, leading to gross errors in application of sensor offsets, etc. These scenarios may be recoverable but you should get in touch with us for some help in identifying the correct steps to achieve what you need. In the event that there is no

workaround, we may be able to provide a fix but our ability to do so depends on whether the necessary information is encoded in the file.

Motion Sensor Measurements

A GSF file may or may not have the full motion sensor data stream at its full output rate. Qimera will warn you about this, watch for warnings in the *Job Activity* widget during import.

Sound Speed Measurements

Several problems can occur with sound speed profiles as well, if they are provided at all. Notably, the position and/or time of observation may be missing. Check for warnings on import in the *Job Activity* widget for information, or have a look at any profiles that are extracted using the *SVP Editor*. The GSF format lacks a mechanism to represent sophisticated sound speed application strategies. For example, you may have chosen a sound speed application strategy such as "Nearest in Distance" in a particular 3rd party software package, but this decision cannot be encoded in the GSF format. Though Qimera may have all of the raw sensor data, there is no mechanism for it to be able to choose the same strategy that you may have applied in your processing elsewhere. Understandably, there will then be discrepancies between Qimera's re-processed solutions and the original georeferenced soundings. You can set the correct sound speed profile selection strategy in Qimera's *Processing Settings* dialog under the *Sound Velocity* tab.

Vertical Referencing

The GSF format allows for encoding of a traditional tide and a GPS tide vertical corrector. There is also the possibility to store the ellipsoidally referenced height and the geoid/ellipsoid separation value. These data fields may or may not be filled out, and the sign conventions may or may not be followed.

Installation Guide

Introduction

This page contains brief notes for installation requirements or instructions for the supported platforms, Windows, Mac and Linux. References are to Fledermaus 8 (Fm8), but apply to Qimera as well.

Table of contents:

- Introduction
- Windows
- Macintosh
- Linux
  - RedHat Enterprise Linux 7
    - Summary
    - Installing Required Libraries
    - Examples of Error Messages
    - Update System
  - RedHat Enterprise Linux 8
    - Summary
    - Enabling X.org
    - Installing Required Libraries
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    - Update System
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    - System Update
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    - Installing Required Libraries

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- Ubuntu 22.04 LTS
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    - System Update

Windows

This page applies equally to Fledermaus 8 and Qimera 2. The install location is "\Program Files\QPS\Fledermaus8\<version>" by default for Fm8 and "\Program Files\QPS\Qimera\" for Qimera.

Macintosh

This page applies equally to Fledermaus 8 and Qimera 2. The install location is "/Applications/QPS/FM8.app/" for Fm8 and "/Applications/QPS/Qimera.app" for Qimera.

Linux

Note that neither Fledermaus 8 nor Qimera support Wayland, X.org is required. Specific distros may have additional requirements, outlined in the following for each distro. Other distros than those listed may work if equivalent packages that contain the necessary libraries are available.

It is assumed that a normal or standard desktop installation is used. Installation from minimal installation is not covered or supported.

Start Fledermaus from the command line to see errors. There is usually a lot of output, most of which is not error messages. In the event of an error, a short message will result. Check the section, Examples of Error Messages, for the relevant distro that you are using for an illustration of the error and the package to install.

Be sure that your system is up to date and that it has the latest packages available. If an error occurs when installing packages stating "Package cannot be found" or similar, update your system.

Select your system from the list:

- RedHat Enterprise Linux 7
- RedHat Enterprise Linux 8

- Ubuntu 18.04 LTS
- Ubuntu 20.04 LTS
- Ubuntu 22.04 LTS

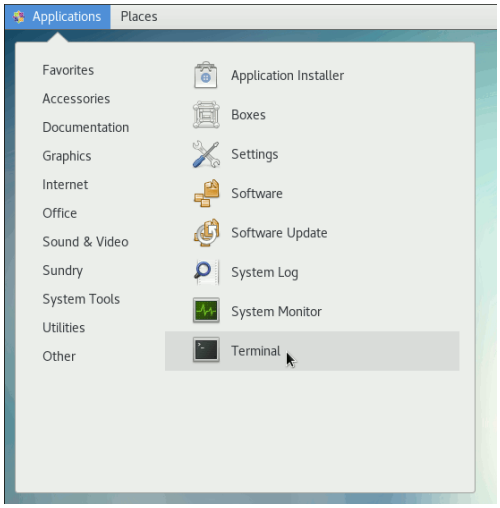
RedHat Enterprise Linux 7

Summary

Also, CentOS 7. On a clean system, two libraries must be installed to enable QPS applications to run

- May require the mesa-libGLU package.
- May require the libglvnd-opengl package.

If Fledermaus does not start, open a Terminal and run Fledermaus from the command line. To open a terminal (click Applications, then mouse over System Tools and finally click on Terminal). See the following illustration:

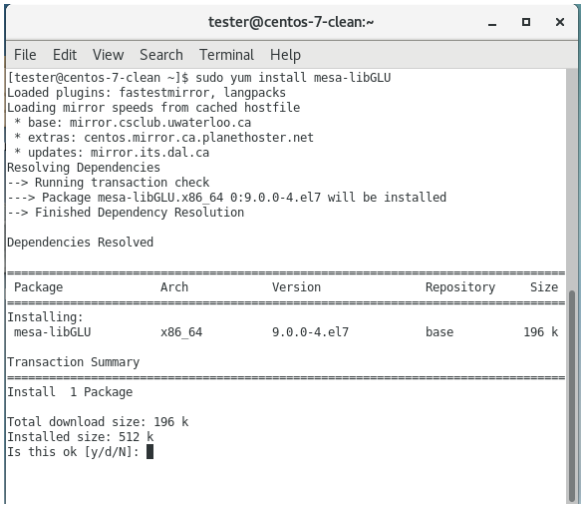


Installing Required Libraries

Install the mesa-libGLU library as follows, using the yum command. The command is:

sudo yum install mesa-libGLU

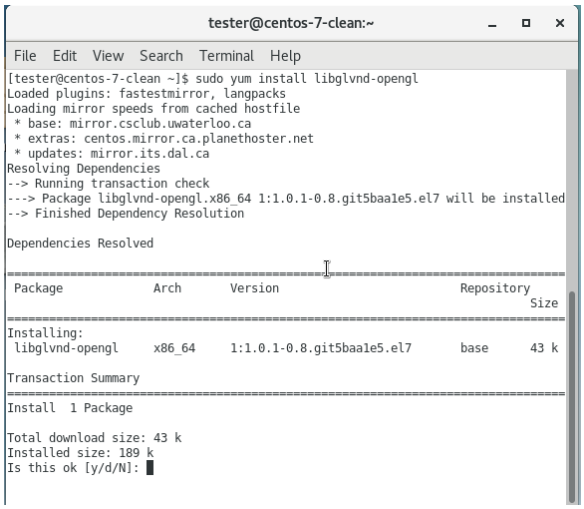
Respond with "y" to install the package and press Enter.



Also install the libglvnd-opengl package if required. The command is:

sudo yum install libglvnd-opengl

Respond with "y" to install the package and press Enter.



Examples of Error Messages

Start Fledermaus from the command line to see errors. There is usually a lot of output, most of which is not error messages. In the event of an error, a short message will result.

An example showing the error for a missing OpenGL library:

```
[tester@centos-7-clean bin]$ ./fm8
./fm8: error while loading shared libraries: libOpenGL.so.0: cannot open shared obje
ct file: No such file or directory
[tester@centos-7-clean bin]$
```

An example showing the error for missing mesa-libGLU:

```
[tester@centos-7-clean bin]$ ./fm8
./fm8: error while loading shared libraries: libGLU.so.1: cannot open shared object
file: No such file or directory
[tester@centos-7-clean bin]$
```

Update System

To ensure that your system is up-to-date, in particular if an error occurs when installing packages stating that the package is not available, update your system. In RHEL7 or CentOS7, open a terminal, thenrun the following command, then type "y" and press Enter:

```
sudo yum update
```

Back to RHEL7

Back to Introduction

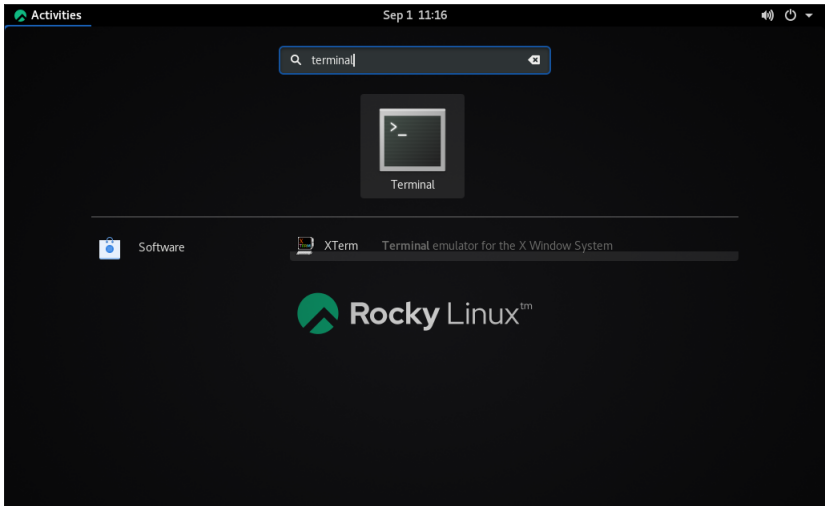
RedHat Enterprise Linux 8

Summary

Also, Rocky Linux 8. Note that RHEL8 support requires X.org to run QPS applications. The following libraries may have to be installed to run the applications:

- May require the `mesa-libGLU` package.
- May require the following three packages (app will fail to start with an error about `xcb):`
  - `xcb-util-image xcb-util-keysyms xcb-util-renderutil`
- May also require the following package, if required: `xcb-util-wm`

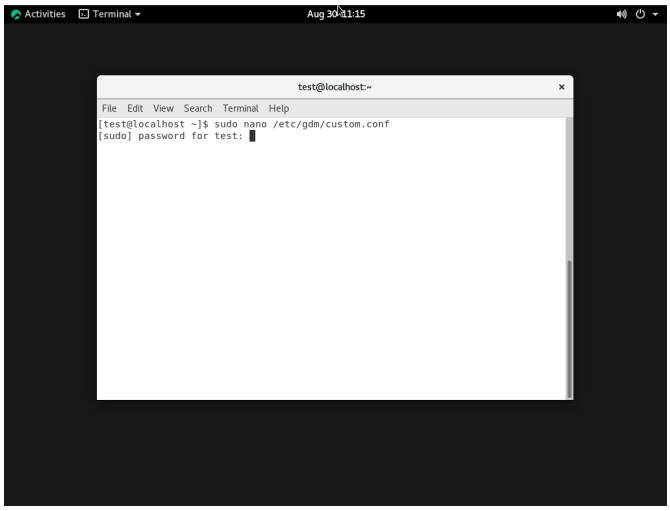
If Fledermaus does not start, open a Terminal and run Fledermaus from the command line. To open a terminal (click Activities, then type `terminal`, finally click the terminal icon or press Enter). See the following illustration:



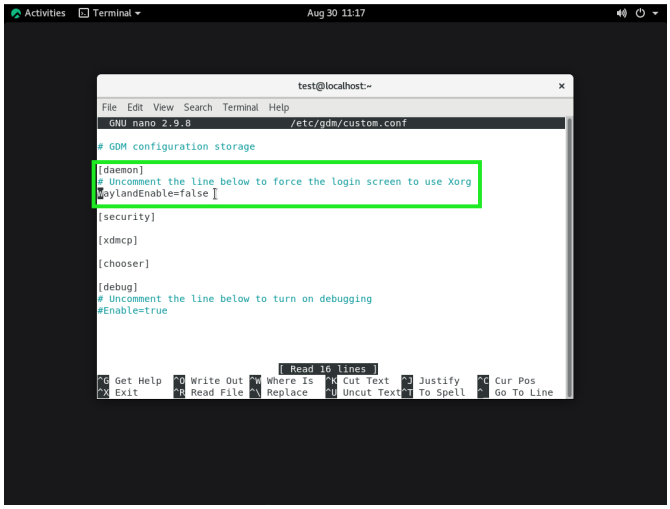
Enabling X.org

Requires `X.org`, currently does not work with `Wayland` (app will fail to start with an error about `wayland`).

To enable X.org, edit the file, /etc/gdm/custom.conf:



Then uncomment or add the line, WaylandEnable=false, as seen here:



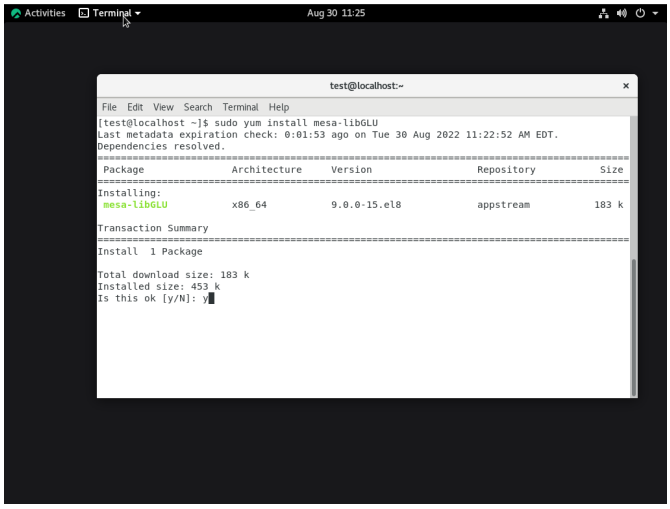
Save the file, then reboot the machine. The machine should now use X.org.

Installing Required Libraries

Install the mesa-libGLU library as follows, using the yum command. The command is:

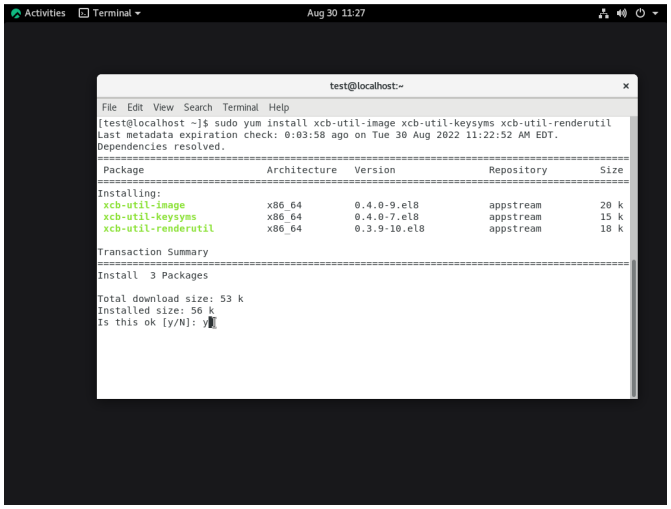
```
yum install mesa-libGLU
```

Respond with "y" to install the package and press Enter.

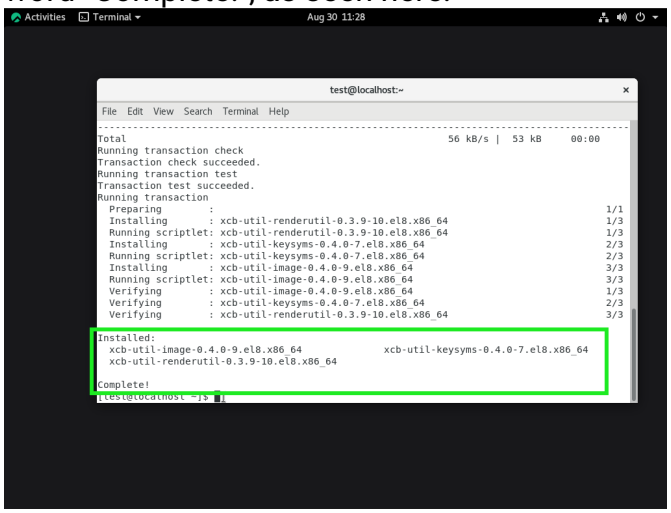


Similarly, install the xcb packages as follows, pressing "y" then Enter to install the packages. The command is:

```
yum install xcb-util-image xcb-util-keysyms xcb-util-renderutil
```



Successful installation of packages finishes with a list of the installed packages and the word "Complete!", as seen here:



If Fledermaus still does not start (in particular on RedHat CentOS8), try installing `xcb-util-wm:`

```
yum install xcb-util-wm
```

Examples of Error Messages

Start Fledermaus from the command line to see errors. There is usually a lot of output, most of which is not error messages. In the event of an error, a short message will result. An example showing the error for missing mesa-libGLU:

```
[test@localhost bin]$ ./fm8
./fm8: error while loading shared libraries: libGLU.so.1: cannot open shared object file: N
o such file or directory
[test@localhost bin]$
```

An example showing an error message with xcb:

```
[test@localhost bin]$ ./fm8
qt.qpa.plugin: Could not load the Qt platform plugin "xcb" in "" even though it was found.
This application failed to start because no Qt platform plugin could be initialized. Reinst
alling the application may fix this problem.

Available platform plugins are: xcb.

Aborted (core dumped)
[test@localhost bin]$
```

Update System

To ensure that your system is up-to-date, in particular if an error occurs when installing packages stating that the package is not available, update your system. In RHEL8 or Rocky Linux 8, run the following command, then type "y" and press Enter:

```
sudo yum update
```

```
[test@localhost ~]$ sudo yum update
Rocky Linux 8 - AppStream                       9.0 kB/s | 4.8 kB     00:00
Rocky Linux 8 - BaseOS                          7.7 kB/s | 4.3 kB     00:00
Rocky Linux 8 - Extras                          5.5 kB/s | 3.5 kB     00:00
Dependencies resolved.
================================================================================
 Package                Architecture Version                Repository    Size
================================================================================
Upgrading:
 systemd                x86_64       239-58.el8_6.4         baseos       3.6 M
 systemd-container      x86_64       239-58.el8_6.4         baseos       757 k
 systemd-libs           x86_64       239-58.el8_6.4         baseos       1.1 M
 systemd-pam            x86_64       239-58.el8_6.4         baseos       483 k
 systemd-udev           x86_64       239-58.el8_6.4         baseos       1.6 M

Transaction Summary
================================================================================
Upgrade  5 Packages

Total download size: 7.5 M
Is this ok [y/N]: y
```

Back to RHEL8

Back to Introduction

Ubuntu 18.04 LTS

Summary

The following libraries may have to be installed to run the applications:

- May require the package `libopengl0.`
- May require Ubuntu packages `libxcb-xinerama0` and `libxcb-xinput0` (app will fail to start with an error about `xcb`) `.`

If Fledermaus does not start, open a Terminal and run Fledermaus from the command line. To open a terminal (click Activities, then type `terminal`, finally click the terminal icon or press Enter). See the following illustration:



Installing Required Libraries

It is assumed that a standard desktop installation of Ubuntu 18.04 is being used. There may still be a few libraries to install to enable Fledermaus 8 to run. The libraries required are listed above, the following is a step-by-step guide illustrating to those not familiar with installing packages from the command line on Ubuntu on how to install the requisite packages. See the Summary for the list of possible addtional packages required.

First, open a terminal (click Activities, then type `terminal`, then click the terminal icon or press Enter). Install the libopengl0 package as follows. The command is:

```
sudo apt install libopengl0
```

```
tester@ubuntu-1804-clean:bin$ sudo apt install libopengl0
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following NEW packages will be installed:
  libopengl0
0 upgraded, 1 newly installed, 0 to remove and 0 not upgraded.
Need to get 31.3 kB of archives.
After this operation, 237 kB of additional disk space will be used.
Get:1 http://ca.archive.ubuntu.com/ubuntu bionic-updates/main amd64 libopengl0 a
md64 1.0.0-2ubuntu2.3 [31.3 kB]
Fetched 31.3 kB in 0s (233 kB/s)
Selecting previously unselected package libopengl0:amd64.
(Reading database ... 164852 files and directories currently installed.)
Preparing to unpack .../libopengl0_1.0.0-2ubuntu2.3_amd64.deb ...
Unpacking libopengl0:amd64 (1.0.0-2ubuntu2.3) ...
Setting up libopengl0:amd64 (1.0.0-2ubuntu2.3) ...
Processing triggers for libc-bin (2.27-3ubuntu1.6) ...
tester@ubuntu-1804-clean:bin$
```

If an error concerning xcb occurs, install the xcb packages as follows, using the following command:

```
sudo apt install libxcb-xinerama0 libxcb-xinput0
```

```
tester@ubuntu-1804-clean:bin$ sudo apt install libxcb-xinerama0 libxcb-xinput0
[sudo] password for tester:
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following NEW packages will be installed:
  libxcb-xinerama0 libxcb-xinput0
0 upgraded, 2 newly installed, 0 to remove and 0 not upgraded.
Need to get 34.6 kB of archives.
After this operation, 188 kB of additional disk space will be used.
Get:1 http://ca.archive.ubuntu.com/ubuntu bionic-updates/main amd64 libxcb-xiner
ama0 amd64 1.13-2~ubuntu18.04 [5,264 B]
Get:2 http://ca.archive.ubuntu.com/ubuntu bionic-updates/main amd64 libxcb-xinpu
t0 amd64 1.13-2~ubuntu18.04 [29.3 kB]
Fetched 34.6 kB in 0s (230 kB/s)
Selecting previously unselected package libxcb-xinerama0:amd64.
(Reading database ... 164859 files and directories currently installed.)
Preparing to unpack .../libxcb-xinerama0_1.13-2~ubuntu18.04_amd64.deb ...
Unpacking libxcb-xinerama0:amd64 (1.13-2~ubuntu18.04) ...
Selecting previously unselected package libxcb-xinput0:amd64.
Preparing to unpack .../libxcb-xinput0_1.13-2~ubuntu18.04_amd64.deb ...
Unpacking libxcb-xinput0:amd64 (1.13-2~ubuntu18.04) ...
Setting up libxcb-xinerama0:amd64 (1.13-2~ubuntu18.04) ...
Setting up libxcb-xinput0:amd64 (1.13-2~ubuntu18.04) ...
Processing triggers for libc-bin (2.27-3ubuntu1.6) ...
tester@ubuntu-1804-clean:bin$
```

Examples of Error Messages

In the event that the libopengl0 package is required, the following error occurs:

```
tester@ubuntu-1804-clean:bin$ ./fm8
./fm8: error while loading shared libraries: libOpenGL.so.0: cannot open shared
object file: No such file or directory
tester@ubuntu-1804-clean:bin$
```

This error occurs when the xcb libraries need to be installed. Note the mention of the platform plugin xcb.

```
tester@ubuntu-1804-clean:bin$ ./fm8
qt.qpa.plugin: Could not load the Qt platform plugin "xcb" in "" even though it
was found.
This application failed to start because no Qt platform plugin could be initiali
zed. Reinstalling the application may fix this problem.

Available platform plugins are: xcb.

Aborted (core dumped)
tester@ubuntu-1804-clean:bin$
```

System Update

To ensure that your system is up-to-date, in particular if an error occurs when installing packages stating that the package is not available, update your system. In Ubuntu, open a terminal, then run the following sequence of commands, responding with "y" to the prompts:

```
sudo apt update
sudo apt upgrade -d
sudo apt upgrade
```

Back to Ubuntu 18.04
Back to Introduction

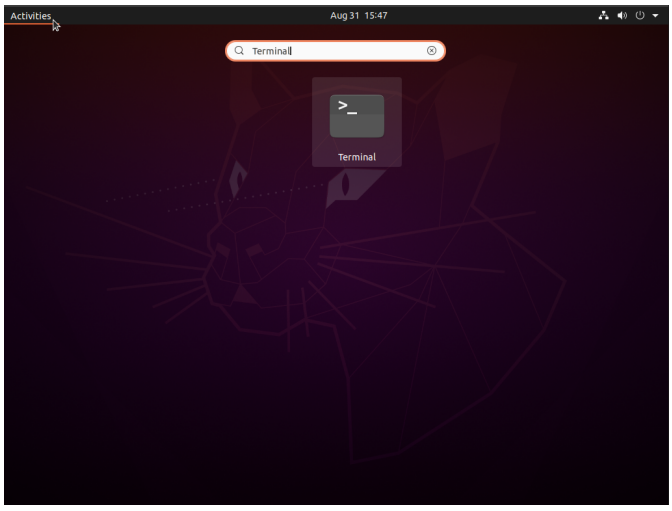
Ubuntu 20.04 LTS

Summary

A normal or standard install of Ubuntu 20.04 may require the following libraries to be installed:

- May require Ubuntu packages `libxcb-xinerama0` and `libxcb-xinput0` (app will fail to start with an error about `xcb`).
- May require the Ubuntu package `libjpeg62`

If Fledermaus does not start, open a Terminal and run Fledermaus from the command line. To open a terminal (click Activities, then type `terminal`, then click the terminal icon or press Enter). See the following illustration:



Installing Required Libraries

It is assumed that a standard desktop installation of Ubuntu 20.04 is being used. There may still be a few libraries to install to enable Fledermaus 8 to run. The libraries required are listed above, the following is a step-by-step guide illustrating to those not familiar with

installing packages from the command line on Ubuntu on how to install the requisite packages. See the Summary for the list of possible addtional packages required.

If an error concerning xcb occurs, install the xcb packages as follows, using the following command:

```
sudo apt install libxcb-xinerama0 libxcb-xinput0
```

```
tester@ubuntu-20:bin$ sudo apt install libxcb-xinerama0 libxcb-xinput0
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following NEW packages will be installed:
  libxcb-xinerama0 libxcb-xinput0
0 upgraded, 2 newly installed, 0 to remove and 0 not upgraded.
Need to get 34.6 kB of archives.
After this operation, 201 kB of additional disk space will be used.
Get:1 http://ca.archive.ubuntu.com/ubuntu focal/main amd64 libxcb-xinerama0 amd6
4 1.14-2 [5,260 B]
Get:2 http://ca.archive.ubuntu.com/ubuntu focal/main amd64 libxcb-xinput0 amd64
1.14-2 [29.3 kB]
Fetched 34.6 kB in 0s (140 kB/s)
Selecting previously unselected package libxcb-xinerama0:amd64.
(Reading database ... 180267 files and directories currently installed.)
Preparing to unpack .../libxcb-xinerama0_1.14-2_amd64.deb ...
Unpacking libxcb-xinerama0:amd64 (1.14-2) ...
Selecting previously unselected package libxcb-xinput0:amd64.
Preparing to unpack .../libxcb-xinput0_1.14-2_amd64.deb ...
Unpacking libxcb-xinput0:amd64 (1.14-2) ...
Setting up libxcb-xinput0:amd64 (1.14-2) ...
Setting up libxcb-xinerama0:amd64 (1.14-2) ...
Processing triggers for libc-bin (2.31-0ubuntu9.9) ...
tester@ubuntu-20:bin$
```

The command for `libjpeg62`, required for processing meshes:

```
sudo apt install libjpeg62
```

Examples of Error Messages

This error occurs when the xcb libraries need to be installed. Note the mention of the platform plugin xcb.

```
tester@ubuntu-20:bin$ ./fm8
qt.qpa.plugin: Could not load the Qt platform plugin "xcb" in "" even though it
was found.
This application failed to start because no Qt platform plugin could be initiali
zed. Reinstalling the application may fix this problem.

Available platform plugins are: xcb.

Aborted (core dumped)
tester@ubuntu-20:bin$
```

System Update

To ensure that your system is up-to-date, in particular if an error occurs when installing packages stating that the package is not available, update your system. In Ubuntu, open a terminal, then run the following sequence of commands, responding with "y" to the prompts:

```
sudo apt update
sudo apt upgrade -d
sudo apt upgrade
```

Back to Ubuntu 20.04

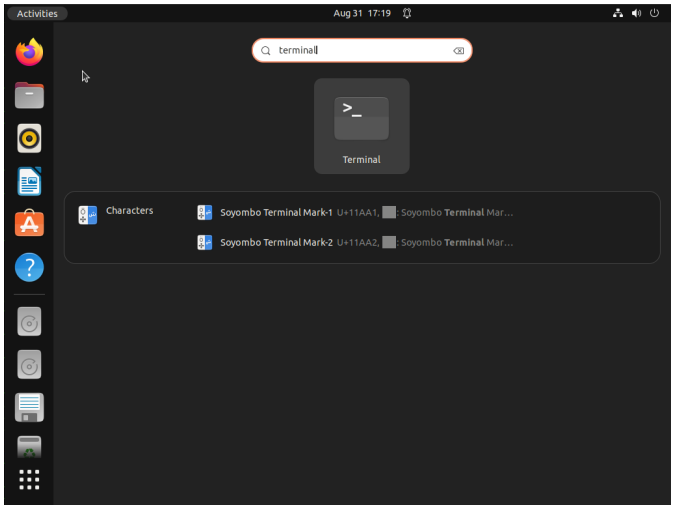
Back to Introduction

Ubuntu 22.04 LTS

As of Ubuntu 22.04.1 with the following as required:

- May require Ubuntu packages `libxcb-xinerama0` and `libxcb-xinput0` (app will fail to start with an error about `xcb`).
- May require the Ubuntu package `libjpeg62`
- Requires `X.org`, currently does not work with `Wayland` (app will fail to start with an error about wayland).

If Fledermaus does not start, open a Terminal and run Fledermaus from the command line. To open a terminal (click Activities, then type `terminal`, then click the terminal icon or press Enter). See the following illustration:



Enabling X.org

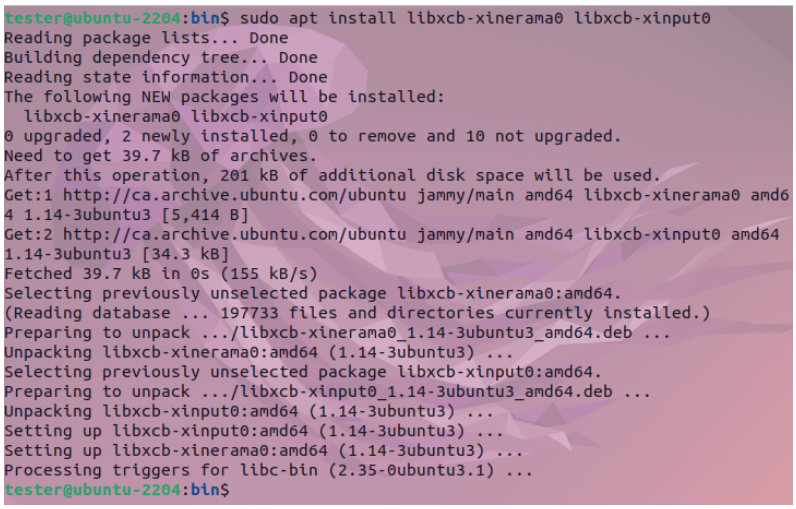
See the section for RHEL8: Enabling X.org

Installing Required Libraries

It is assumed that a standard desktop installation of Ubuntu 22.04 is being used. There may still be a few libraries to install to enable Fledermaus 8 to run. The libraries required are listed above, the following is a step-by-step guide illustrating to those not familiar with installing packages from the command line on Ubuntu on how to install the requisite packages. See the Summary for the list of possible addtional packages required.

If an error concerning xcb occurs, install the xcb packages as follows, using the following command:

```
sudo apt install libxcb-xinerama0 libxcb-xinput0
```

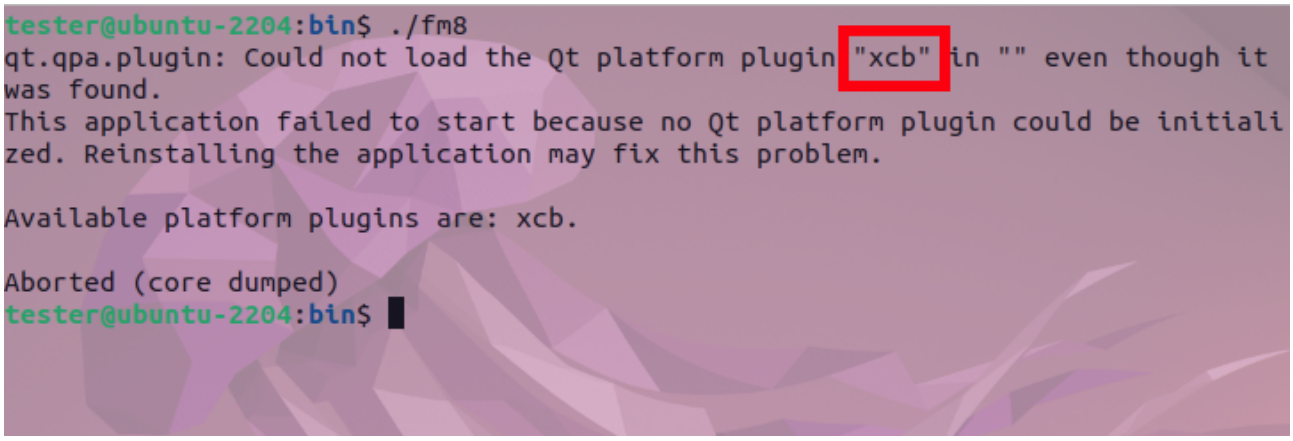


The command for `libjpeg62`, required for processing meshes:

```
sudo apt install libjpeg62
```

Examples of Error Messages

This error occurs when the xcb libraries need to be installed. Note the mention of the platform plugin xcb.



System Update

To ensure that your system is up-to-date, in particular if an error occurs when installing packages stating that the package is not available, update your system. In Ubuntu, open a terminal, then run the following sequence of commands, responding with "y" to the prompts:

```
sudo apt update
sudo apt upgrade -d
sudo apt upgrade
```

Back to Ubuntu 22.04

Back to Introduction

Transmission (pulse) Frequency use in Qimera

- Qimera and Qinsy frequency support by version
- How it works in Qimera
- Where to find frequency information
- Operations that support frequency

Qimera and Qinsy frequency support by version

Starting in Qinsy 9.7.0, sonar transmission frequency was stored in the DB records on a per-ping basis.

Starting in Qinsy 9.8.0 and Qimera 2.8.0, frequency can be stored in the QPD on a per-ping basis.

How it works in Qimera

Starting in Qimera 2.8.0, when a raw sonar file is imported into Qimera, the QPD frequency field is populated where possible. Improvements have been made in terms of which file formats support filling this field.

Having the frequency field within the QPD ensures that any frequency operations, like filtering, are just as quick as other point based operations.

When a Qinsy DB file is brought into Qimera, the frequency will be read directly from the DB ping information. If it's not found (the DB pre-dates Qinsy 9.7.0), the raw sonar records (if stored) are used to populate the frequency. For all other data types, the frequency is read from the raw sonar records during indexing (for any file containing watercolumn data & all HSX files), or during file processing (all other files).

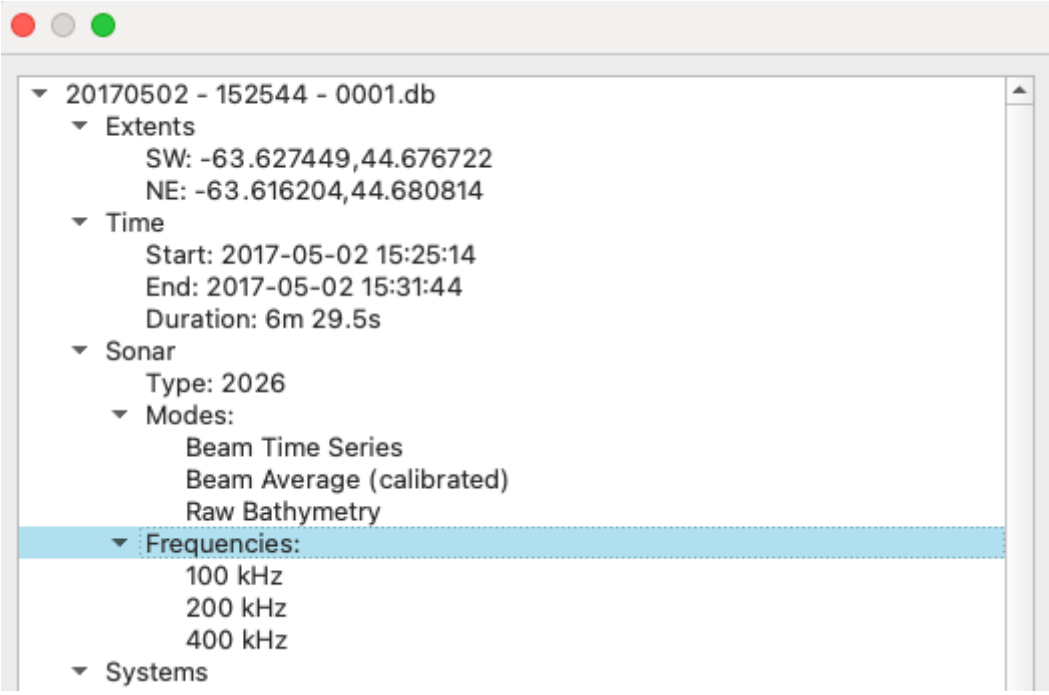
QPS Staff Only - As per the previous paragraph, watercolumn files and all HSX files have a special step where we create a QBA file in the metadata folder. The QBA file is a mini DB file that is used to quickly reference information on ping & beam lookups. This is done because it offers a performance increase for watercolumn lookups in the Swath Editor. It also offers a large performance increase for all HSX files, which are natively ASCII format and therefore slow to navigate through.

The QBA file is created during the indexing step of file import. When a QPD is then created during processing, we do a quick lookup of the frequency stored in the QBA file.

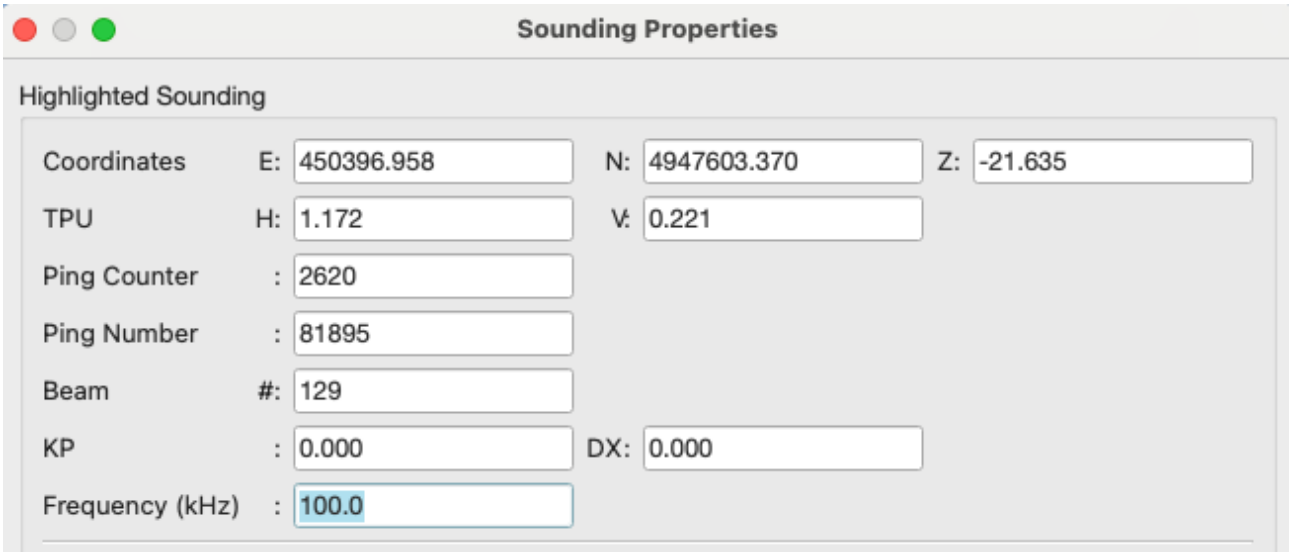
If the file does not have a populated QBA file available, then the frequency needs to be gathered from the raw sonar records for each ping.

Where to find frequency information

The frequencies contained within a raw sonar file can be most easily found via the Datagram Viewer:

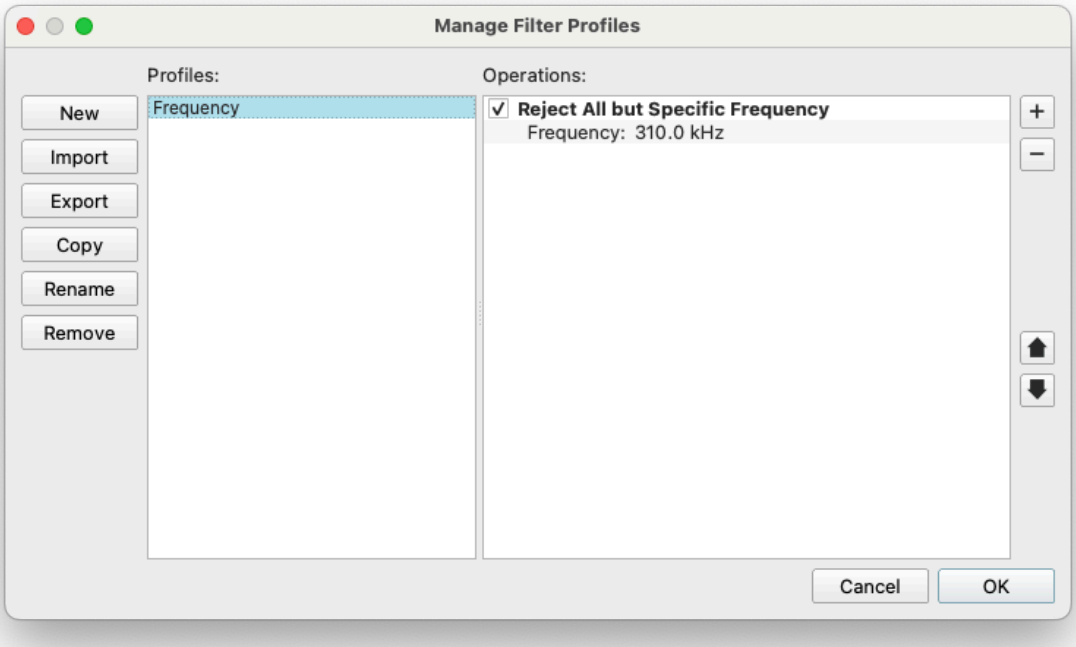


The frequency of a specific ping / beam can be seen via the Sounding Properties dialog in the Slice or Swath Editors:



Operations that support frequency

- Frequency filtering profile:



New Features for Managing and Applying Tides in Qimera

When: The release of Qimera 1.1 includes Tide stations and Tide Strategies, two new features that add significant functionality for managing and applying tidal data to raw sonar files.

What are the changes?

In Qimera 1.0 tide files were treated as standalone data objects, similar to imported navigation files. But unlike navigation data, which are imported to vessel systems, there was no mechanism for grouping tide data from multiple files, customizing textual representation, or applying offsets or correctors. Introduced in Qimera 1.1, Tide Stations and Tide Strategies provide similar functionality for tide data that vessel systems provide for navigation data. This enables high level functionality such as tidal zoning and multi-station computations. The new functionality continues to be integrated in the Dynamic Workflow, meaning as you make changes the affected raw sonar files will be appropriately marked dirty.

What is a Tide Station? What is it used for?

Tide Stations are used for grouping, identifying, and importing of tide files from a single source, such as a tide gauge or predictive model. Tide Stations include information shared by all the tide files which is used for identification and conversion to project units, this shared information includes station name, unique identifier, position, units, time zone and tidal datum.

If tidal data is intended to be applied directly to raw sonar files the Tide Stations are exposed in *Processing Settings* for prioritizing tidal data for use in *Vertical Referencing*. For larger projects with multiple tide gauges this allows for selective application of the stations and smart switching if there is limited data availability or gauge outages. For more advanced applications Tide Stations can also be employed in Tide Strategies.

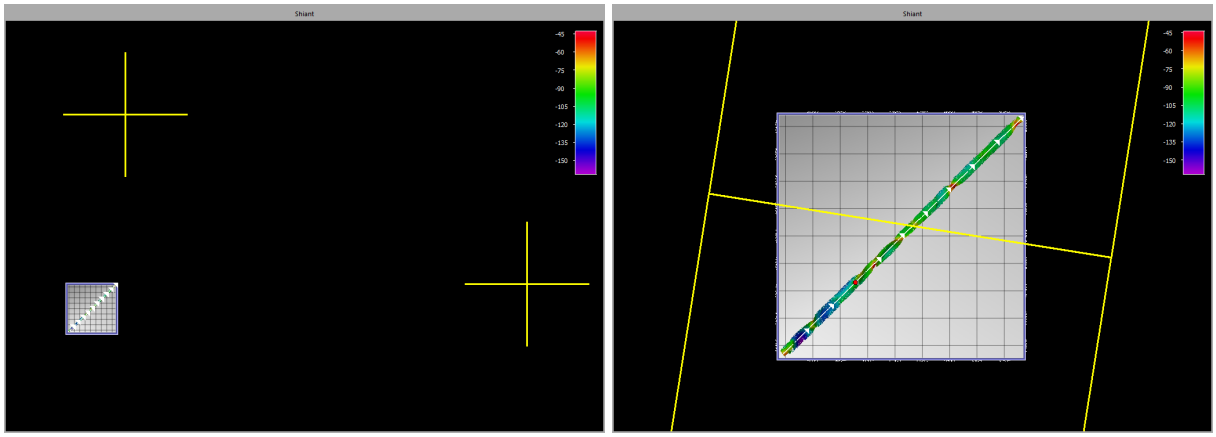
What is a Tide Strategy? What is it used for?

Tide Strategies offer options for applying offsets, scale factors, advanced methods, and spatial constraints to one or more Tide Station.

Like Tide Station, Tide Strategies can also be used as a prioritized data source in the *Processing Settings* > *Vertical Referencing* tab. This allows for smart switching between multiple Tide Strategies and Tide Stations in both time and position.

New Visualizations

The geographic information for both Tide Stations (left) and Tide Strategies (right) are also visualized in the work area for easy contextualization with raw sonar files.



This can be valuable for understanding the spatial relationship of tidal data to the hydrographic data and especially useful for troubleshooting data issues such as tide busts.

Where to get more help?

There are several HowTo's discussing tides and their use in Qimera projects:

- How-to Apply Tides
- How-to Tide Strategy

And as always there is detailed information about the various dialogues in the Interface Documentation:

- Qimera Add Tide File Dialog
- Qimera Tide Station Dialog
- Qimera Tide Strategy Dialog

Object Track from Qinsy projects

The *Object Track* system preserves the positioning solution from advanced Qinsy computation setups.

Since:	Qimera 1.6

- Description
- Requirements
- FAQ
  - What is the Object Track system?
  - How is the Object Track system helpful?
  - Where will I see the Object Track?
  - Can I edit the Object Track?
  - How do I update the Object Track modified in Qinsy?

Description

Users opening Qinsy projects for full sonar processing in Qimera will see a new positioning system starting with Qimera 1.6. The *Object Track* system is extracted from paired DB/ QPD to preserve the Qinsy positioning solution. This brings two improvements: (1) It improves the consistency between Qinsy and Qimera object positioning, and (2) it enables raw sonar processing of objects positioned by means of a USBL system, layback system, or linked node.

Since Qimera 2.4.0, the transducer depth will be extracted for each ping in the QPD in certain circumstances. This is used as a platform depth if the vessel is configured as a subsurface type (AUV, ROV, Link Tool) and there is no other depth or pressure sensor configured.

Requirements

Object tracks are only available in Qimera if the QPD has a multibeam system enabled and logged for the object.

FAQ

What is the Object Track system?

It is a virtual system that represents the Qinsy Computation CoG positioning track stored in the QPD. This includes horizontal position, height, and TPU from computation.

How is the Object Track system helpful?

This position track preserves advanced computation setups computed online or in replay with Qinsy. This also allows for the import of objects which do not have positioning systems but are instead positioned by means of a USBL system, layback system, or linked node.

Where will I see the Object Track?

- New system in the Vessel Editor located at the CoG
- New processing settings priority items for position and vertical referencing
- New position, height, and associated standard deviation time series in the Time Series Editor dock

Can I edit the Object Track?

You can reject or reject and interpolate the data extracted for the *Object Track* the same as for all other time series data in Qimera. You **cannot** edit the QPD in Qinsy and see the changes in Qimera without taking additional steps described below.

How do I update the Object Track modified in Qinsy?

This can be refreshed if replayed or modified in Qinsy with *Rescan Time Series Data* found in the *Tools* menu under *Manual Processing*. Select the DB raw files associated with the modified QPD in the Project Sources and start *Rescan Time Series*. In the dialog check both *Height* and *Position*.

SVP extraction and processing configuration

Qimera not only scans for and extracts SVP information from incoming multibeam files, it also sets the SVP processing configuration based on the SVPs found in the file and the metadata that is associated with them.

Extraction

Qimera scans the incoming multibeam file for SVP data and if it finds any, these are written into the file's metadata directory. Qimera will always warn the user about files that have one or more SVP casts with missing time of acquisition and/or position of acquisition. The user can provide this information at a later stage in the SVP Editor.

After the scan is complete, Qimera copies new instances of SVP observations to the project's SVP directory in the vessel folder associated with the incoming source file. Existing files in this directory are first checked to see if they are duplicates and only new SVP observations are added. This is necessary as many source items may share the same SVP observation, but the user will prefer to only have to deal with a single instance of the SVP observation. In the event that a user edits one of the SVP files, Qimera will compare incoming new SVP files against the original record in the SVP directory. This allows imports to occur with over-writing edits that a user might have made on a particular SVP cast.

Processing Configuration

Many imported multibeam data files require ray bending corrections. Given a set of multibeam data files and a set of SVP casts, it is necessary to provide a mechanism in which any given multibeam data file can be associated with one or more SVP casts for the purpose of ray bending corrections. This is done in Qimera by selecting a "**Sound Velocity Strategy**". The currently supported strategies are:

- Specific sound velocity profile: associate a single SVP file to a multibeam file
- Fixed velocity from surface sensor: use the sound velocity from the surface sensor (this is usually reported in the multibeam ping packets) to create an SVP with constant velocity across the entire depth range
- Fixed velocity from user specification: same as "Fixed velocity from surface sensor", however, the user specifies the sound velocity to use.
- Real-time scheduling: match the application of sound speed profiles as they were applied during acquisition
- Nearest in time: use the SVP times of observation to determine which is nearest in time for any given ping time. The selected SVP can vary on a ping-by-ping basis.
- Nearest in distance: use the SVP position of observation to determine which is nearest in distance for any given ping location. The selected SVP can vary on a ping-by-ping basis.

- Nearest in distance, within user specified time: Same as "nearest in distance", however, a time constraint imposes a maximum allowable time difference between the ping time and the SVPs being considered.

At the end of the data extraction from a multibeam source file, Qimera makes an attempt to configure the most reasonable SVP lookup strategy for the incoming source file. The following decision process is used for all incoming multibeam data that is supported by Qimera and it is based on the number of SVP observations found in the source file.

1) If no SVP is found, the multibeam file's SVP selection algorithm is configured as "**Fixed velocity from surface sensor**". This allows users to compute sounding footprints, although with a potential refraction artifact, using the single sound velocity measurement that is typically provided in the multibeam data ping packet. This value is typically a measurement from a surface sound speed sensor that is provided to the multibeam for beam forming and beam steering purposes. For this configuration option, the user is warned that Qimera has had to resort to using this approach due to lack of SVP measurements.

2) If one and only one SVP is found, the multibeam file's SVP selection algorithm is configured as "**Specific sound velocity profile**". This case will cover the vast majority of cases.

3) If multiple SVPs are found in the file, the strategy depends on the availability of additional metadata concerning the SVP:

3a) If there is sufficient information in the incoming source file to determine the time interval over which any given SVP was used, the file's selection algorithm is "**Real-time scheduling**". This forces the use of a lookup scheduling file which indicates the which SVP is to be used at any particular point in time. This mimics what would have been done in real-time during acquisition, hence the name "Real-time scheduling". The additional information that is required to determine this is the "time of application" of an SVP (note that this is different than the time of observation). This can currently be determined only for Kongsberg .all files and GSF files in which the SVP "time of application" field is populated.

3b) If there is insufficient information to reconstruct the times of application of the many SVP casts, Qimera attempts to configure a reasonable lookup strategy based on whether or not the file format supports recording of the SVP time of acquisition and its position. For all of the three scenarios below, the user is warned about the selection strategy that is being chosen on their behalf.

3b-1) If SVP positions are available but SVP observation times are not, the selection strategy is "**Nearest in distance**".

3b-2) If SVP times are available, the selection strategy is "**Nearest in time**".

3b-3) If SVP times and positions are not available, the selection strategy is "**Fixed velocity from surface sensor**".

All of these SVP Velocity Strategies can be changed at any time after data import. The Processing Settings Editor will not allow users to choose strategies when the SVP files that are in the project do not support the decision making process. For example, if one or more SVP casts are missing the position of observation, the user will not be able to choose "Nearest in distance" or "Nearest in distance, within time" until they provide the required missing information. The options that are unavailable to the user are grayed-out in the configuration dialog, and the mouse tool tip indicates the reason why any particular option is unavailable.

QPS File Compatibility Information

- QPD Compatibility
- DB Compatibility
- Surface File Compatibility

QPD Compatibility

As of the release of **Qimera 1.1**, Qimera uses a new version of the QPD format that is incompatible with the previous releases of **Fledermaus (7.4.5.b and older), Qimera (1.0.7 and older),** and **QINSy (older than 2015.11.28.1)** software. Opening an older QPD file in Qimera 1.1 or newer will upgrade it to the new version, making the QPD unusable in older versions of the noted QPS applications. If this will break your current workflow, and you can not upgrade the newer versions of Fledermaus and QINSy.

The new version of the QPD format is compatible with the current and future versions of **Qimera (1.1 and newer)**, **Fledermaus (7.5.0 and newer),** and **QINSy (2015.11.28.1 and newer)**.

QPDs created by Qinsy 9.x or Qimera 2.x are compatible with Qimera 1.1 and newer.

QPD Files		Compatible with Qimera Version:		
		1.0	1.1 to 1.7	2.x
Created in Versions:	Qinsy 8.10.2015.06.29.1 or older Qimera 1.0	Y	Y[1]	Y[1]
	Qinsy 8.10.2015.11.28.1 to 8.18.3 Qimera 1.1 to 1.7	N	Y	Y
	Qinsy 9.0 or newer Qimera 2.0 or newer	N	Y	Y
[1] QPD will be upgraded				

DB Compatibility

QINSy DBs created by QINSy 8.18.0 and later are only compatible with Qimera 1.6.0 and later, and Fledermaus 7.8.0 and later.

QINSy DBs created by QINSy 9.0.0 and later are only compatible with Qimera 2.0.0 and later, and Fledermaus 8.0 and later.

DB Files		Compatible with Qimera Version:		
		1.0 to 1.5	1.6 & 1.7	2.x
Created in Versions:	Qinsy 8.17.1 and older[1]	Y	Y	Y
	Qinsy 8.18.x	N	Y	Y
	Qinsy 9.0 or newer	N	N	Y
[1] Very old DB files cannot be used in any version of Qimera				

Surface File Compatibility

Dynamic Surfaces created by Qinsy 9 are only compatible with Qimera 2.0 and later.

Dynamic Surfaces[1]		Compatible with Qimera Version:		
		1.0	1.1 to 1.7	2.x
Created in Versions:	Qinsy 8.18.0 and newer Qimera 1.0 to 1.7	Y	Y	Y[2]

	Qinsy 9.0 and newer Qimera 2.0 and newer	N	N	Y

[1] Dynamic surfaces cannot be imported into a project, they must be created by Qinsy or Qimera in the project in question.

[2] Dynamic surfaces will be upgraded to new format upon opening the project for the first time.

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