NOAA Kongsberg Water Column Processing for CARIS HIPS 11

Bobby Short, PHB, March 2020, v11.2.3

WARNING: Due to working within raw MBES folders, consult with the FOO or CST before proceeding.

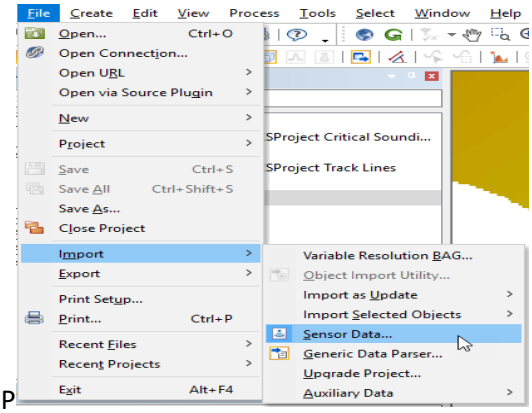
Experienced users: This is the same workflow as processing MBES data, with the exception of the user organizing .wcd files in the same folder as the .all files and checking the *Carry Over Raw Data Files* in Import Options.

Data Organization

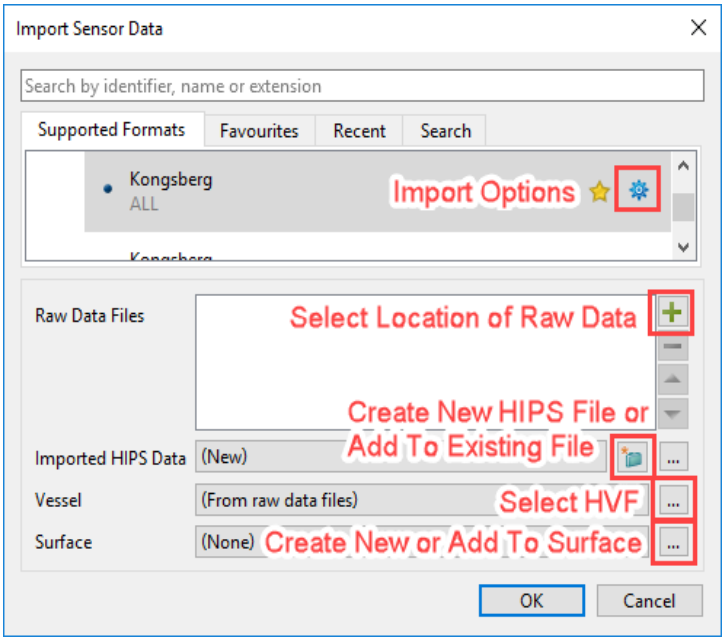
- Input raw Kongsberg .wcd files within the same folder as raw Kongsberg .all files. Make sure lines are named the same but have different extensions.

Import Sensor Data

- Click on the  icon or:



P



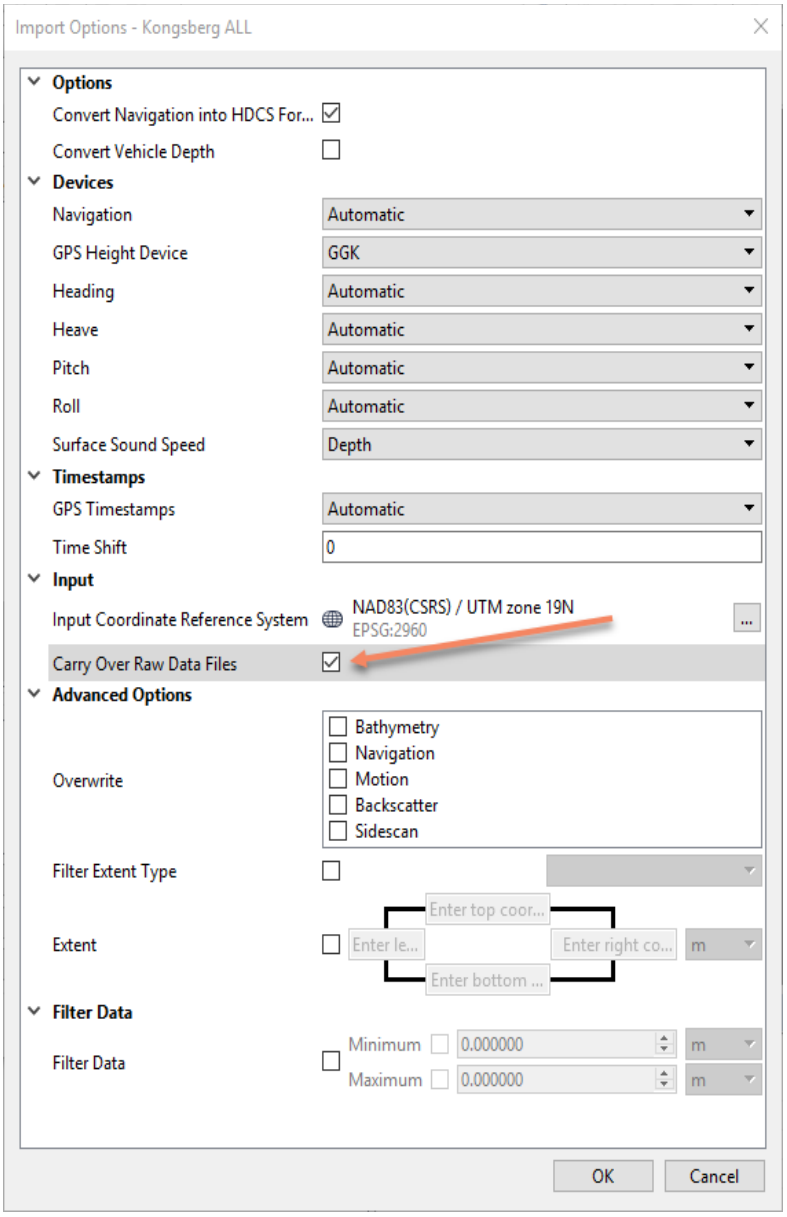
Import Options (Kongsberg) allow user to modify how data will be converted (see below).

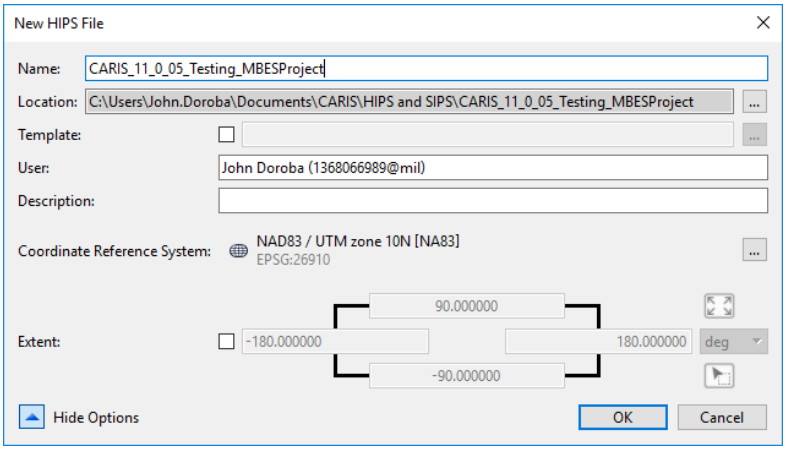
*Select Raw Data Files. Selecting the .all files will include the .wcd information. You **do not** need to try and select the .wcd files.*

Select HIPS project. One can also create a new HIPS project at initial conversion.

Select HVF file from preferred location. It is no longer part of HDCS folder and can be stored wherever desired.

A preliminary surface can be created to show coverage. After Import Sensor





Select CARIS Hydrographic Data Cleaning System (HDCS) format in order to work exclusively from CARIS HDCS as opposed to reading/writing corrections to Kongsberg .ALL files.

Do Not Convert Vehicle Depth. Only, select if sonar has associated depth of sensor (ie: AUV).

Select Automatic in order to use datagram that is active in acquisition.

Select GGK which is fleet standard because it contains the ellipsoid height. If the real time solution is sufficient quality, then this could be used without SBETs. It is usually not, and SBETs used to override navigation and height same as GGA, etc.

Select Depth Surface Sound Speed for sound velocity at transducer.

Select Coordinate Reference System of the Raw Data.

*Carry Over Raw Data Files. This is the key step in incorporating water column data into the process. **See Note Below*

Do not apply navigation or depth filters to data during conversion. Depth filtering is mostly used for finer filtering which involves knowing the dataset before applying filters. Navigation filtering is somewhat outdated and served a purpose when GPS fliers were regularly encountered.

Name the project.

Select project destination.

Select project CRS.

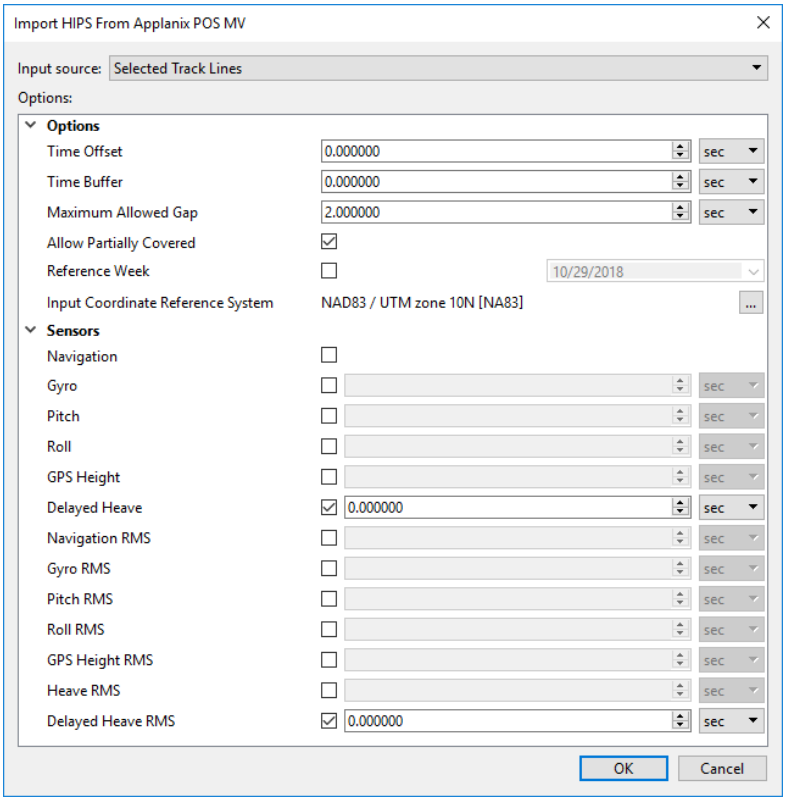
Click OK

Data is only imported at this point. Corrections are not applied.

** After hitting OK, the workflow is the same as processing MBES without WCD. To jump to *Viewing Processed WCD*, click here.

Import Auxiliary Data

Delayed Heave



The default Maximum Allowed Gap is 2.0, but can be modified/documented by OPS, CST, etc. to resolve minor issues. Making the gap too large can lead to data artifacts, in which case, the data must be re-acquired.

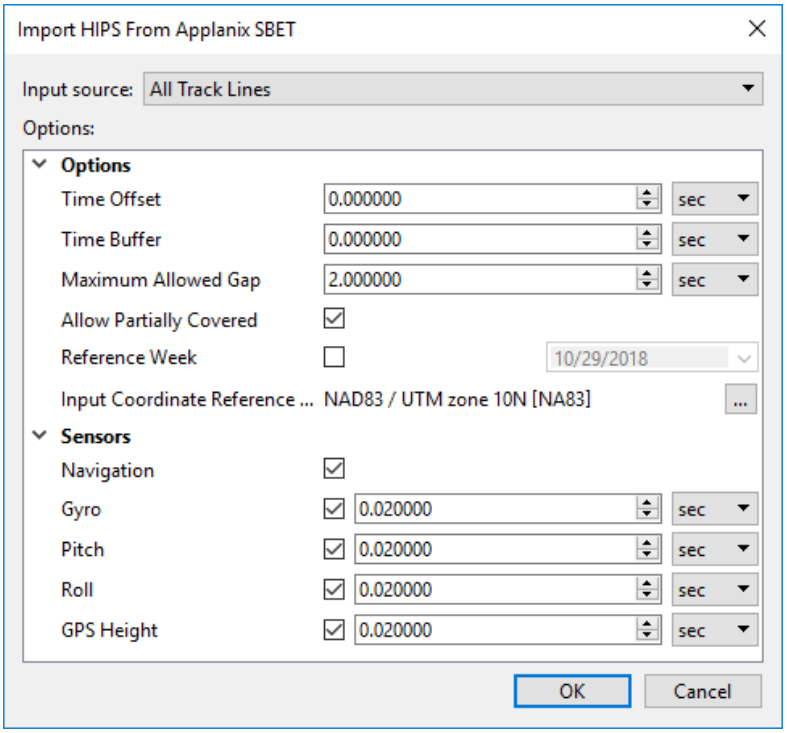
Allow partially covered, but be aware that sections to which the .000 file did not apply may need to be reacquired or another Delayed Heave file.

Select the Reference Week when Delayed Heave files are not the same GPS week as data (data acquired past UTC midnight on Saturday without starting new file).

Select Coordinate Reference System of the Raw Data.

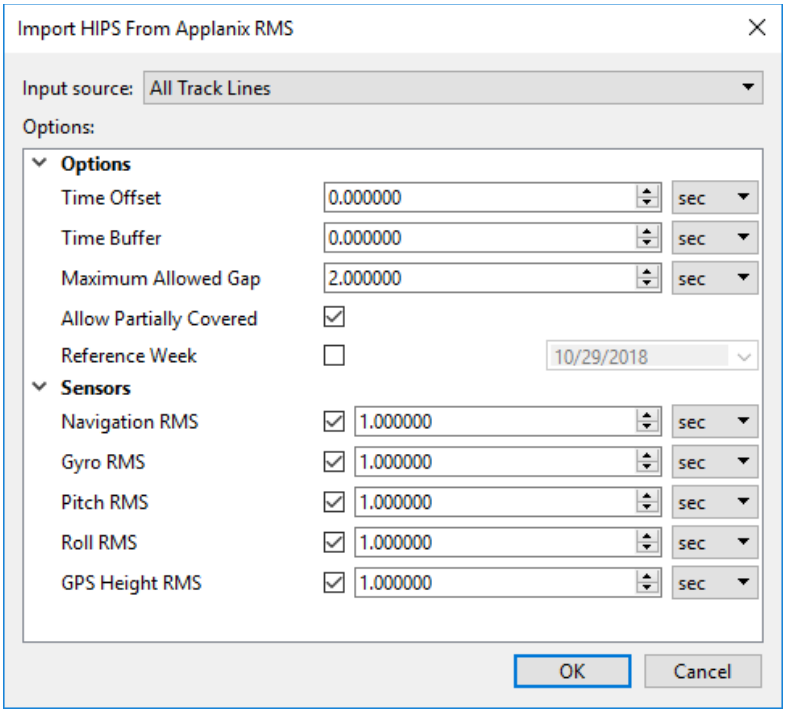
Only apply Delayed Heave corrections and error files. Nav/Att will use realtime values corrected via SBET/RMS.

SBET



All SBET correctors are applied, but down-sampled because Applanix export data is excessive and output at a higher rate (200 Hz) than we acquire (50Hz).

RMS



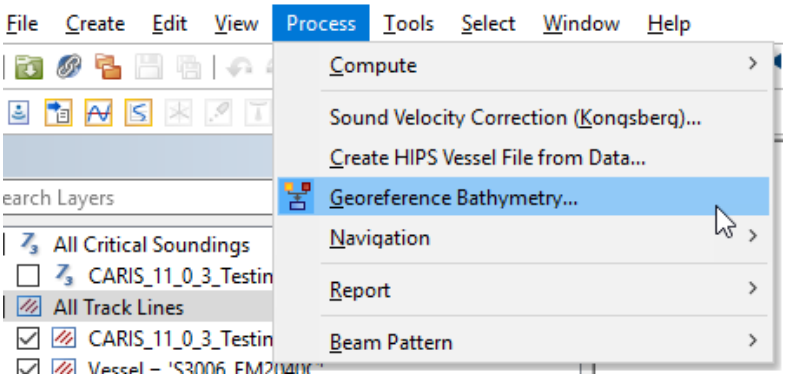
All associated RMS errors are applied, but these are not down-sampled because RMS values are similar to those acquired.

Data is only imported at this point. Corrections are not applied.

Process Data

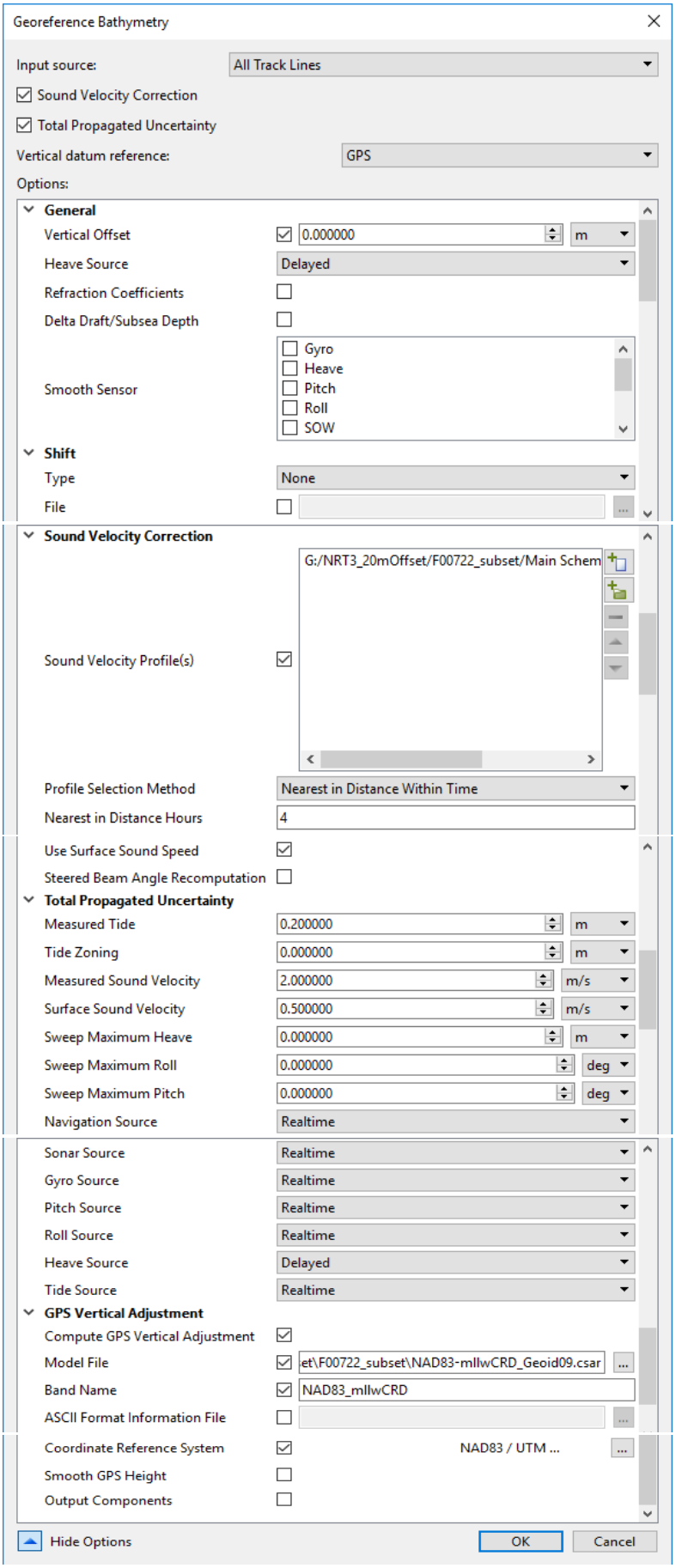
HIPS 11 combines three processes (sound velocity corrections, TPU computations, and vertical datums transformations) that were performed separately along with "merge" to correctly position each sounding. The process, Georeference Bathymetry, combines the application of vertical and horizontal correctors with the merge function. The user defines the way by which imported data is utilized via the Georeference Bathymetry process. Once these parameters are defined, the process uses the correctors to process the data.

Georeference Bathymetry



This process converts along track/across track depths in raw data into latitude, longitude, and depth by combining the ship navigation with the horizontal and vertical offsets from the HIPS vessel file and ancillary files (POS, SBET, SVP). This geographically references the sounding position and depth.

Ellipsoidally Referenced Survey



Corrections are applied. Data is considered processed

Select Lines to be georeferenced

Select SVC in order to use SVP files, NIDWT

Select TPU in order to apply TPU

Select GPS (ERS) or traditional tides

Select Vertical Offset "0" or deselect box for SEP model

Select Delayed Heave

Do Not Select Refraction Coefficients or Delta Draft/Subsea Depth. Delta draft is not the same as dynamic draft in this situation although the terms are often used synonymously. This option is only for sonars with a depth of sensor associated with it (ie: AUV)

Do Not Smooth Sensors or perform a data Shift unless special circumstance exists.

*Select SVP files to CARIS SVC and choose method. To use .all SVP leave box unchecked. *Even though raytracing was performed in near real time by SIS, SVC must be applied in order to apply Delayed Heave when the Reference Point (RP) is not at the Transducer for Kongsberg Systems. If Realtime Heave is applied to Konsgberg data and the RP is not at the transducer, then there will be heave artifacts. Furthermore, if Delayed Heave is applied elsewhere (ie: Import POS) there will also be heave artifacts as the other correctors are not applied using the same heave.*

Tide (measure and zoning) uncertainties will change by project. Sound Speed (measured and surface) will change with method. For TCARI, Tide should be zero.

Select Realtime for uncertainty values that come from data (MBES, SBET, etc). If vessel is selected, the uncertainty values will come from the HVF. If "Realtime" is selected, but uncertainty values are not available in the raw data, then the "Vessel" .HVF values will be used.

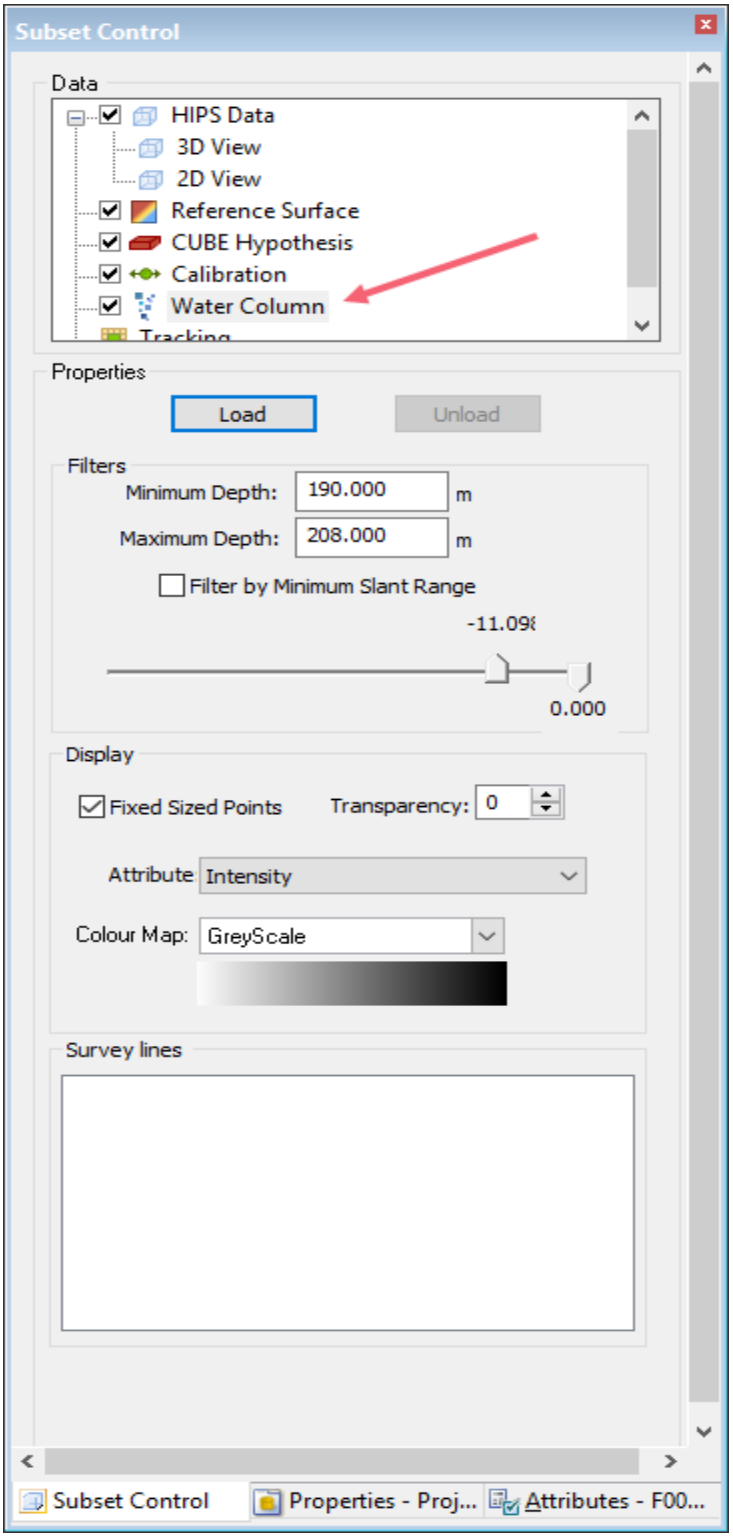
Select Delayed for Heave Source if delayed heave has been applied during processing.

Select Static to use tides values entered in dialogue for SEP and zone tides. If using TCARI, value should be Realtime.

*If TCARI values are loaded but a separation model is loaded after, be sure to select static not realtime if you want to use SEP (or any other static method) TPU values.

Viewing Processed Water Column Data

Subset Editor



Create a subset over a line with WCD.

Within the Subset Control window, click on Water Column.

Filter your minimum/maximum depth to the range in which your desired search object resides.

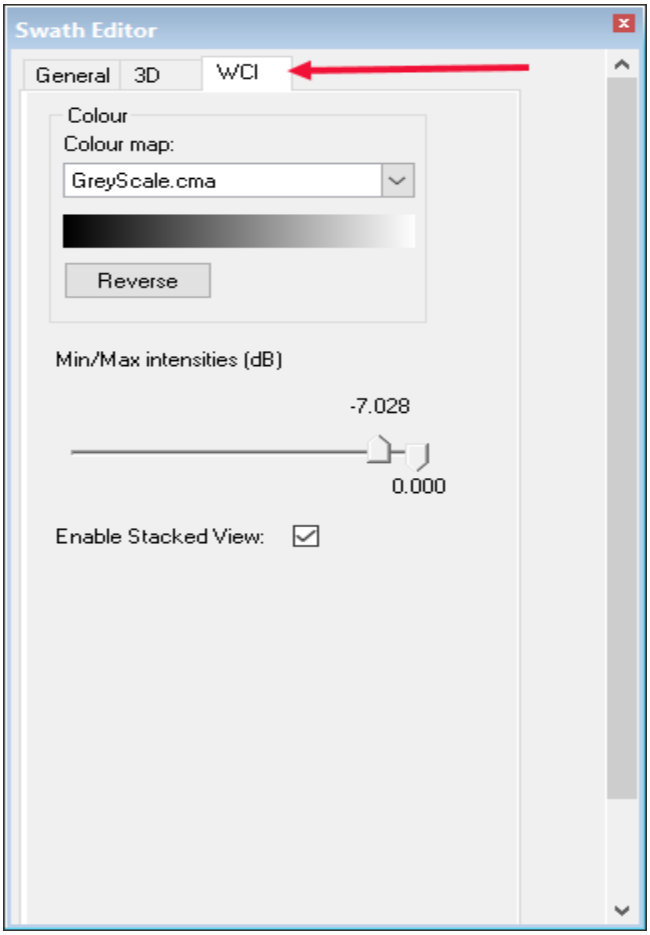
Click Load. Progress will accumulate within the Load button itself until it completes and changes to Open. Click open.

The 2D and 3D Subset Editor boxes should populate with Water Column Data and the lines with available WCD should populate in the Survey Lines box.

Use the intensity slide bar until the object you are trying to view comes into focus.

You can view WCD in conjunction with MBES data.

Swath Editor



Open Swath Editor.

In Swath Editor, click on a line with WCD and make sure a 3rd tab (WCI; next to General & 3D) is visible.

Place your view over the object you are looking for and raise/lower your intensity to conduct your search. The Water Column Across window should give you your best image.

Stacked view is optional.

WCD is a valuable tool. The wreck in the capture below was found in approx. 206m of water depth.