W00591

U.S. Department of Commerce
National Oceanic and Atmospheric Administration
National Ocean Service

DESCRIPTIVE REPORT

Type of Survey:	Basic Hydrographic Survey
Registry Number:	W00591

LOCALITY

State(s):	Maine
General Locality:	Gulf of Maine
Sub-locality:	2.5NM W of Monhegan Island

2020

CHIEF OF PARTY
Peyton Benson

LIBRARY & ARCHIVES

Date:

U.S. DEPARTMENT OF COMMERCE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION	REGISTRY NUMBER:
HYDROGRAPHIC TITLE SHEET	**W00591**

INSTRUCTIONS: The Hydrographic Sheet should be accompanied by this form, filled in as completely as possible, when the sheet is forwarded to the Office.

State(s):	**Maine**
General Locality:	**Gulf of Maine**
Sub-Locality:	**2.5NM W of Monhegan Island**
Scale:	**20000**
Dates of Survey:	**04/16/2020 to 10/20/2020**
Instructions Dated:	**N/A**
Project Number:	**ESD-AHB-21**
Field Unit:	**State of Maine**
Chief of Party:	**Peyton Benson**
Soundings by:	**Kongsberg Maritime EM 2040C (MBES)**
Imagery by:	**Kongsberg Maritime EM 2040C (MBES Backscatter)**
Verification by:	**Atlantic Hydrographic Branch**
Soundings Acquired in:	**meters at Mean Lower Low Water**

Remarks:

Any revisions to the Descriptive Report (DR) applied during office processing are shown in red italic text. The DR is maintained as a field unit product, therefore all information and recommendations within this report are considered preliminary unless otherwise noted. The final disposition of survey data is represented in the NOAA nautical chart products. All pertinent records for this survey are archived at the National Centers for Environmental Information (NCEI) and can be retrieved via https://www.ncei.noaa.gov/.

Products created during office processing were generated in NAD83 UTM 19N, MLLW. All references to other horizontal or vertical datums in this report are applicable to the processed hydrographic data provided by the field unit.

DESCRIPTIVE REPORT MEMO

April 04, 2023

MEMORANDUM FOR: Atlantic Hydrographic Branch

FROM: Report prepared by AHB on behalf of field unit
Peyton Benson, Research Coordinator, Maine Coastal Program

SUBJECT: Submission of Survey W00591

This survey was conducted by the Maine Coastal Program's Maine Coastal Mapping Initiative (MCMI) as part of a multi-agency cooperative agreement to help inform policy decision-making related to Maine's coastal waters by increasing the volume of high quality bathymetric data sets.

The following final deliverables for MCD and NCEI Archival were created during the HDR: survey outline, MLLW BAGs, 4-meter GeoTiff, and GeoImage PDF.

All soundings were reduced to Mean Lower Low Water using TCARI. The horizontal datum for this project is North American Datum of 1983 (NAD 83). The projection used for this project is Universal Transverse Mercator (UTM) Zone 19.

There is no DAPR for this survey.

All data were reviewed for DTONs and none were identified in this survey.

Maine Coastal Program acquired the data outlined in this report. Additional documentation from the data provider may be attached to this report.

This survey does meet charting specifications and is adequate to supersede prior data.

2020 Descriptive Report of Seafloor Mapping: Vicinity of Casco Bay, Mid-coast Maine, Vicinity of Matinicus Island

Chief of Party – Benjamin Kraun, Project Hydrographer, Contractor to the Maine Coastal Program

Program Manager – Claire Enterline, Research Coordinator, Maine Coastal Program

Maine Coastal Mapping Initiative, May 2021

Disclaimer

These data and information published herein are accurate to the best of our knowledge. Data synthesis, summaries and related conclusions may be subject to change as additional data are collected and evaluated. While the Maine Coastal Program makes every effort to provide useful and accurate information, investigations are site-specific and (where relevant) results and/or conclusions do not necessarily apply to other regions. The Maine Coastal Program does not endorse conclusions based on subsequent use of the data by individuals not under their employment. The Maine Coastal Program disclaims any liability, incurred as a consequence, directly or indirectly, resulting from the use and application of any of the data and reports produced by staff. Any use of trade names is for descriptive purposes only and does not imply endorsement by The State of Maine.

For an overview of the Maine Coastal Mapping Initiative (MCMI) information products, including maps, data, imagery, and reports visit: https://www.maine.gov/dmr/mcp/planning/mcmi/index.htm.

Acknowledgements

The Maine Coastal Mapping Initiative would like to acknowledge the efforts of the University of Maine sediment laboratory personnel, Hodgdon Vessel Services, and Maine Coastal Mapping Initiative team for contributing to the success of the 2020 survey season. The individual contributions made by many were an integral part of sampling, analysis, and synthesis of data collected for this project. Funding for this study was provided by provided by the National Oceanic and Atmospheric Administration Office of Coastal Management (award numbers NA18NOS4190097, NA18NOS4190097) the Maine Department of Marine Resources Bureau of Science, The Nature Conservancy, Maine Inland Fisheries & Wildlife and the State Wildlife Grant Program, and the Maine Outdoor Heritage Fund.

Maine Coastal Mapping Initiative
Maine Coastal Program
Department of Marine Resources

DESCRIPTIVE REPORT

Type of Survey:	Navigable Area
Registry Number:	

LOCALITY

State(s):	Maine
General Locality:	Gulf of Maine
Sub-Localities:	Vicinity of Casco Bay, Mid-coast Maine, Vicinity of Matinicus Island

2020

CHIEF OF PARTY
Benjamin Kraun, Hydrographer, Contractor to the State of Maine

LIBRARY & ARCHIVES

Date:

MAINE COASTAL MAPPING INITIATIVE MAINE COASTAL PROGRAM	REGISTRY NUMBER:
HYDROGRAPHIC TITLE SHEET	

INSTRUCTIONS: The hydrographic sheet should be accompanied by this form, filled in as completely as possible, when the sheet is forwarded to the Office.

State(s):	**Maine**
General Locality:	**Gulf of Maine**
Sub-Locality:	**Vicinity of Casco Bay, Mid-coast Maine, Vicinity of Matinicus Island**
Scale:	
Dates of Survey:	**04/15/2020 to 11/19/2020**
Instructions Dated:	
Project Number:	
Field Unit:	***Amy Gale***
Chief of Party:	**Benjamin Kraun, Hydrographer, Contractor to the State of Maine**
Soundings by:	**Multibeam Echo Sounder**
Imagery by:	**Multibeam Echo Sounder Backscatter**
Verification by:	
Soundings in:	**meters at Mean Lower Low Water**

Remarks:

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Suggested citation:
Kraun, B.S., 2021. 2020 Descriptive report of seafloor mapping: vicinity of Casco Bay, mid-coast Maine, vicinity of Matinicus Island. Maine Coastal Mapping Initiative, Maine Coastal Program, West Boothbay Harbor, ME. 99 p.

ABSTRACT

During the survey season (April - November) of 2020 the Maine Coastal Mapping Initiative (MCMI) conducted hydrographic surveying using a multibeam echosounder (MBES) in the waters off Casco Bay, mid-coast Maine, and Penobscot Bay, Maine. The surveying was conducted in part to support the Maine Department of Marine Resources' (DMR) efforts to enhance coastal resiliency through identification, characterization, and protection of fisheries critical to the state's marine environment and economy. The surveys also coincide with state and federal efforts to update coastal data sets and increase high resolution bathymetric coverage for Maine's coastal waters. A total of approximately 45 mi^2 (117 km^2) of high-resolution multibeam data were collected. 39 mi^2 (101 km^2) were collected in the "mainscheme" area of federal (18 mi^2) and state (21 mi^2) coastal marine waters. Approximately 6 mi^2 (16 km^2) were collected in nearshore waters for the purposes of assessing nearshore and riverine sand movement. During the 2020 survey season the MCMI also collected sediment samples, water column data, and video in 42 locations, 30 samples of which coincide with areas summarized in this report.

1.0 Area Surveyed

The 2020 mainscheme survey areas were located off Maine's southern and mid-coast regions in the Gulf of Maine, with sub-localities of the vicinity of Casco Bay, west of Monhegan Island, west of Matinicus Island, and sections of the Sheepscot River and Back River, Maine as shown in Figures 1 through 5. The approximately 45 mi^2 (117 km^2) combined survey areas adjoin the eastern and northeastern extents of the areas mapped by MCMI in 2017 and 2019 (2017 MCMI data accepted by NOAA, who lists the surveys as W00450) as well as the southern extent of NOAA survey H12477 (mapped in 2012 by Williamson & Associates, Inc. in 2012) (Figures 9-12). These data were not collected in direct accordance with the *NOS Hydrographic Surveys Specifications and Deliverables* and the *Field Procedures Manual* requirements; however, both documents were referenced during acquisition for guidance.

Survey limits of each main sub-locality are listed in Table 1. Specific dates of data acquisition for the mainscheme survey are listed in Appendix A.

Table 1 – 2020 mainscheme survey limits

Casco Bay

Southwest Limit	**Northeast Limit**
43° 29' 13" N 69° 59' 5" W	43° 33' 13" N 69° 50' 38" W

Mid-coast Region, Inshore

Southwest Limit	**Northeast Limit**
43° 50' 57" N 69° 43' 57" W	44° 0' 4" N 69° 39' 32" W

Monhegan Island

Southwest Limit	**Northeast Limit**
43° 43' 59" N 69° 23' 3" W	43° 47' 52" N 69° 19' 55" W

Matinicus Island

Southeast Limit	**Northwest Limit**
43° 49’ 27” N 68° 53’ 53” W	43° 53’ 5” N 68° 57’ 30” W

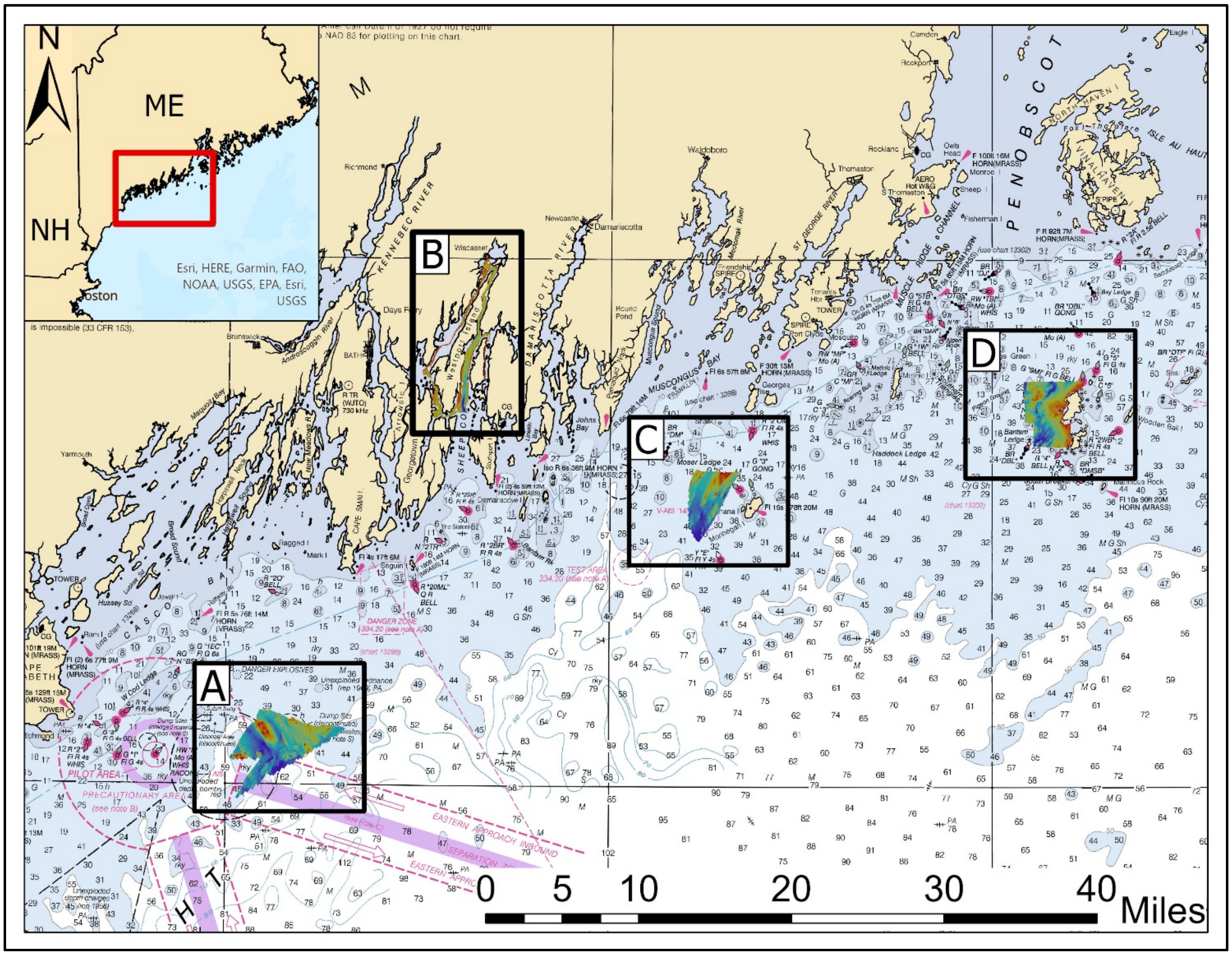


Figure 1 – General localities of 2020 mainscheme and inshore survey coverage off southern, mid-coast, and Penobscot Bay, Maine.

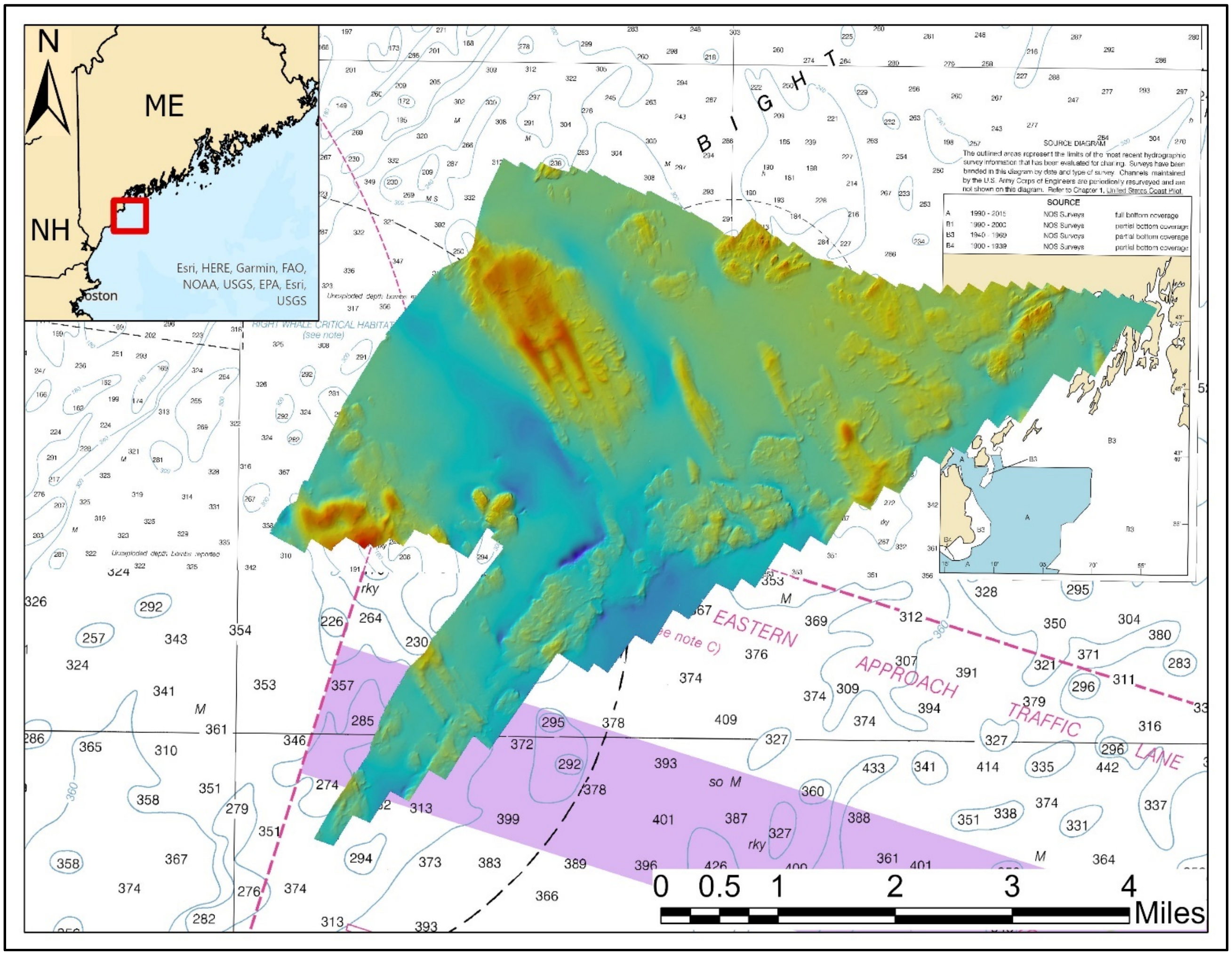


Figure 2 – General locality of survey coverage off Casco Bay, Maine, shown in box A in figure 1. Shaded relief bathymetry is overlain on NOAA nautical chart 13290.

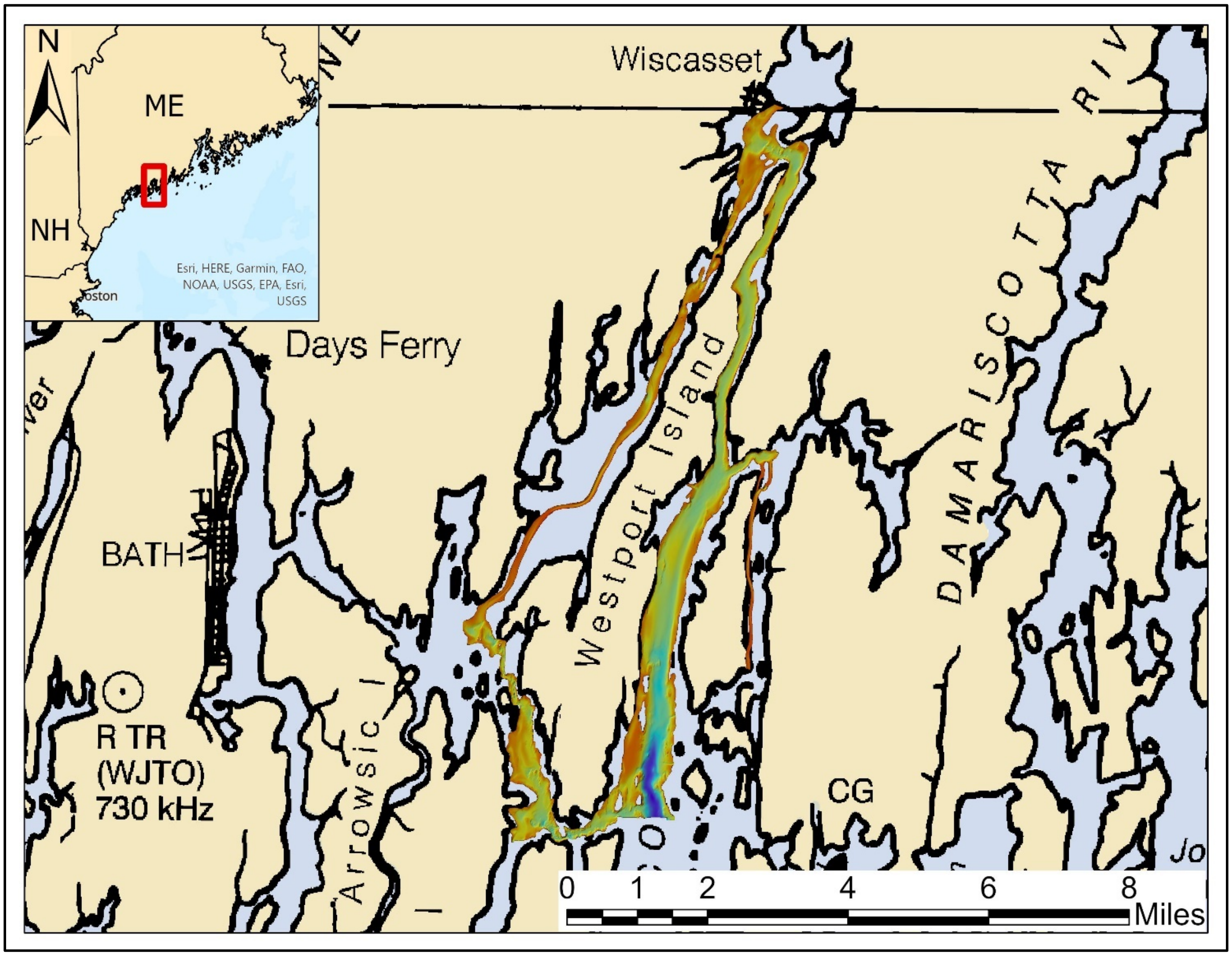


Figure 3 – General locality of inshore survey coverage within sections of the Sheepscot River and Back Rivers in mid-coast Maine, shown in box B in figure 1. Shaded relief bathymetry is overlain on NOAA nautical chart 13260.

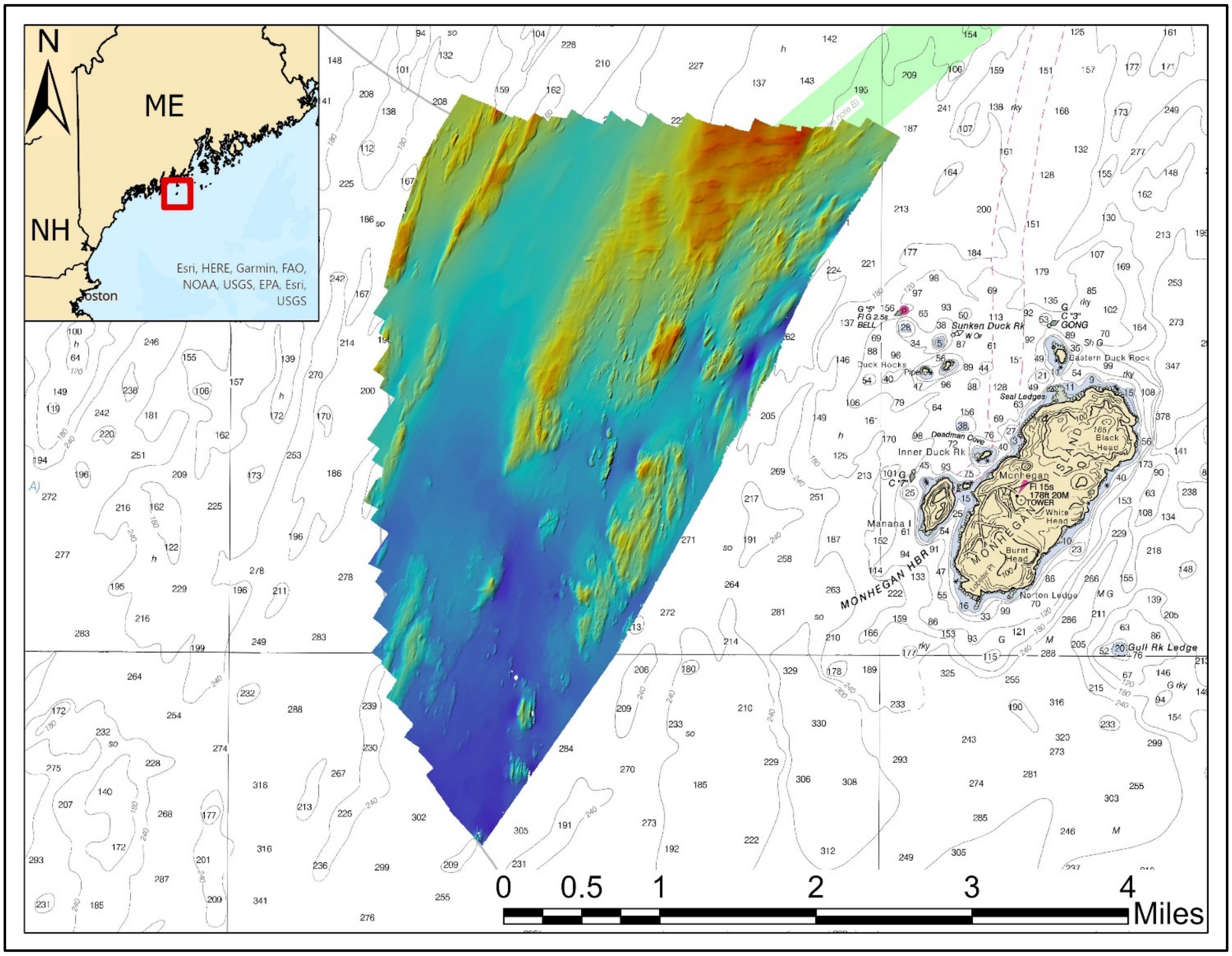


Figure 4 – General locality of survey coverage off Monhegan Island, Maine. Area is shown in box C in figure 1. Shaded relief bathymetry is overlain on NOAA nautical chart 13301.

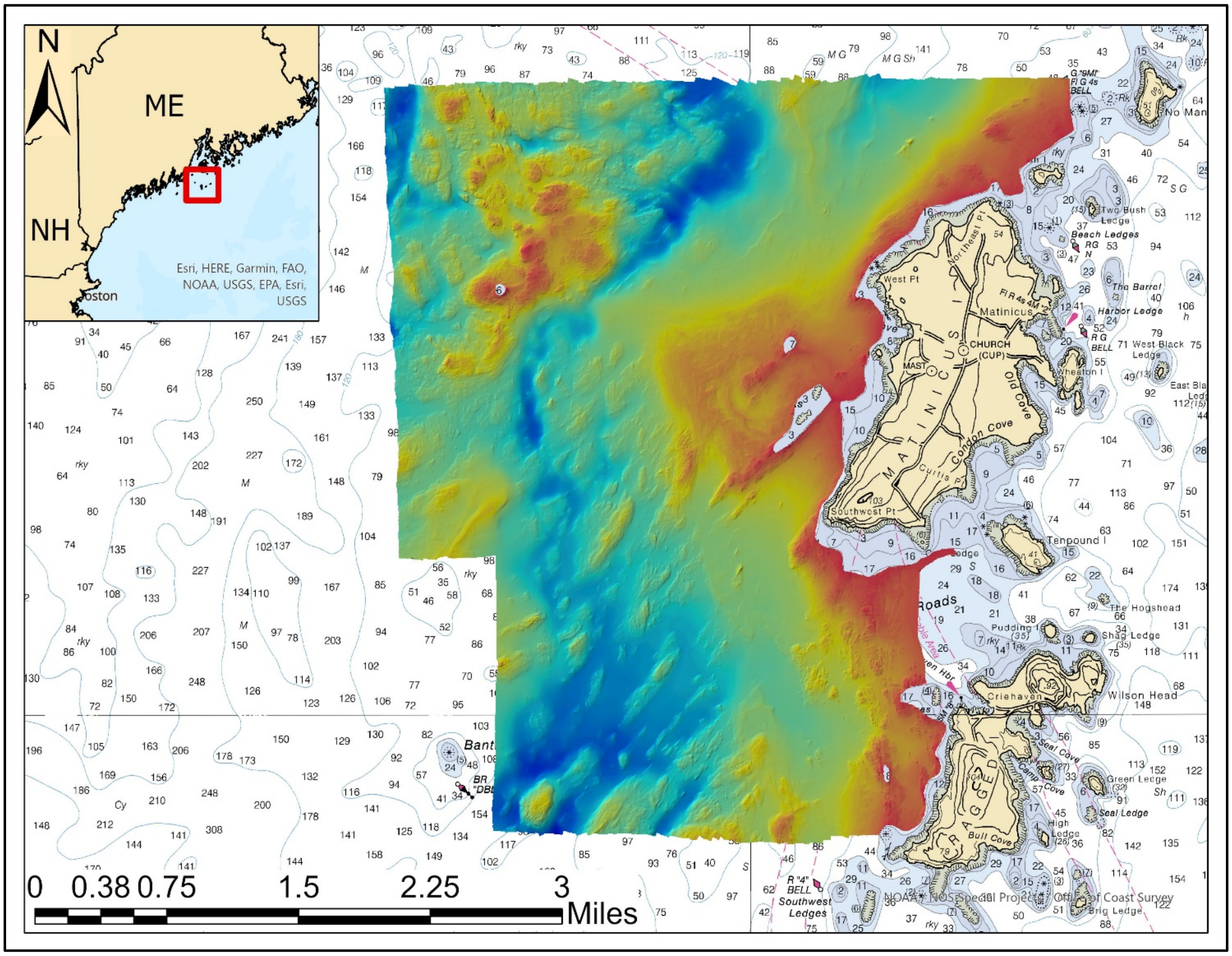


Figure 5 – General locality of survey coverage off Matinicus Island, Maine. Area is shown in box D in figure 1. Shaded relief bathymetry is overlain on NOAA nautical chart 13303.

1.1 Survey Purpose

This survey was conducted by the Maine Coastal Program's Maine Coastal Mapping Initiative (MCMI) as part of a multi-agency cooperative agreement partially funded by the National Oceanic and Atmospheric Administration (NOAA) Office of Coastal Management, the Maine Department of Marine Resources (DMR), The Nature Conservancy (TNC), Maine Inland Fisheries & Wildlife's State Wildlife Grant, and the Maine Outdoor Heritage Fund. The purpose of this project was to help inform policy decision-making related to Maine's coastal waters by increasing the volume of available high-quality bathymetric, benthic habitat, geochemical, and geologic datasets as well as providing new data in the areas covered by several NOAA nautical charts: 13286, 13288, 13290, 13293, 13296, 13301, 13302, and 13303. These data were acquired and processed to meet Office of Coast Survey bathymetry standards as best as possible and were shared with the NOAA Office of Coast Survey (OCS) for review.

1.2 Survey Quality

The entire survey should be adequate to supersede previous data.

1.3 Survey Coverage

Numerous small holidays (gaps in MBES coverage) exist within the surveyed area, and normally occurred as sonic shadows in areas of locally high relief and/or highly irregular bathymetry. Analyses of bathymetric data show that the least depths were achieved over all features, and that holidays have not compromised data integrity.

2.0 Data Acquisition

The following sub-sections contain a summary of the systems, software, and general operations used for acquisition and preliminary processing during the 2020 survey season.

2.1 Survey Vessel

All data were collected aboard the Research Vessel (R/V) Amy Gale (length = 10.7 m, width = 3.81 m, draft = 0.93 m) (Figure 6), a former lobster boat converted to a survey vessel and contracted to the MCMI. The vessel was captained by Caleb Hodgdon of Hodgdon Vessel Services. Surveys were based out of ports in Boothbay Harbor and South Portland, ME. The EM2040C transducer, motion reference unit (MRU), AML MicroX surface sound speed probe, and dual GNSS antennas were pole-mounted to the bow; pole raised (for transit) and lowered (for survey) via a pivot point at the edge of the bow. The main cabin of the vessel served as the data collection center and was outfitted with four display monitors for real time visualization of data during acquisition.

Figure 6 – R/V Amy Gale shown with pole-mounted dual GPS antennas, Kongsberg EM2040C multibeam sonar, MRU (not visible), and surface sound speed probe (not visible) in acquisition mode

2.2 Acquisition Systems

The real-time acquisition systems used aboard the R/V Amy Gale during the 2020 surveys are outlined in Table 2. Data acquisition was performed using the Quality Positioning Services (QPS) Qinsy (Quality Integrated Navigation System; v.8.18.2 to start season and v.9.2.2 later) acquisition software. The modules within Qinsy integrated all systems and were used for real-time navigation, survey line planning, data time tagging, data logging, and visualization.

Table 2 – Major systems used aboard R/V Amy Gale

Sub-system	Components
Multibeam Sonar	Kongsberg EM2040C and processing unit
Position, Attitude, and Heading Sensor	Seapath 330 processing unit, HMI unit, dual GPS/GLONASS antennas, MRU 5 motion reference unit (subsea bottle), Fugro 3610 Receiver and AD-341 antenna
Acquisition Software and Workstation	Qinsy software v.9.2.2 and 64-bit Windows 10 PC console
Surface Sound Velocity (SV) Probe	AML Micro X with SV Xchange
Sound Velocity Profiler (SVP)	Teledyne Odom Digibar S sound speed profiler
Ground-truthing/Sediment Sampling Platform	Ponar grab sampler, GoPro Hero 3+ video camera, dive light, dive lasers, YSI Exo I sonde

2.3 Vessel Configuration Parameters

In 2017, the MCMI contracted Doucet Survey, Inc. to perform high-definition (precision ±5mm) 3D laser scanning of the Amy Gale and all external MBES system components (e.g. MRU, GPS antennas, and EM2040C) (Figures 6 and 7). The purpose of the laser scan survey was to refine and or verify the precision of hand-made vessel reference frame measurements for future surveys. All points were referenced to the center point of the base of the MRU (mounted inside the pole and directly atop the EM2040C transducer) (Figure 8), which served as the origin (e.g. 0,0,0), where ‘x’ was positive forward, ‘y’ was positive starboard, and ‘z’ was positive down. The laser scan survey results only differed from hand-made measurements by ≤ 3mm for all nodes of interest. Reference measurements for each component were entered into the Seapath 330 Navigation Engine (Table 3) and converted so all outgoing datagrams would be relative to the location of the EM2040C transducer (e.g. EM2040C was used as the monitoring point for all outgoing datagrams being received by Qinsy during acquisition). Additional configuration and interfacing of all systems were established during the creation of a template database in the Qinsy console.

These offset values were not changed for the 2020 survey season. See appendices for specific settings as entered in the Seapath 330 Navigation Engine (Appendix B) and for the template database (Appendix C) used during data acquisition while online in Qinsy. Configuration settings of the EM2040C were assigned in the EM Controller module of Qinsy (Appendix D).

Table 3 – 2017 equipment reference frame measurements for Seapath 330

Equipment	x (m)	y (m)	z (m)
MRU	0.000	0.000	0.00
Antenna 1 (port)	0.158	-1.245	-3.000
Antenna 2 (starboard)	0.158	1.252	-3.035
EM2040C	0.036	0.000	0.133

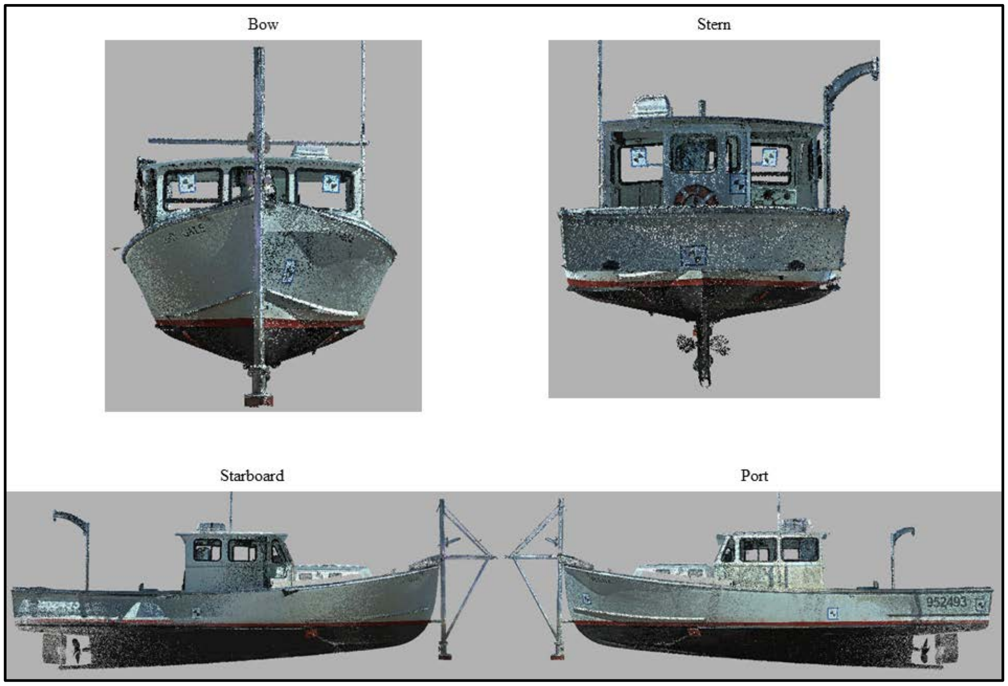


Figure 7 – Amy Gale RGB color images generated from 3D laser scan survey (GPS antennas and external cabling not included in survey) data (.pts file converted to .las for visualization)

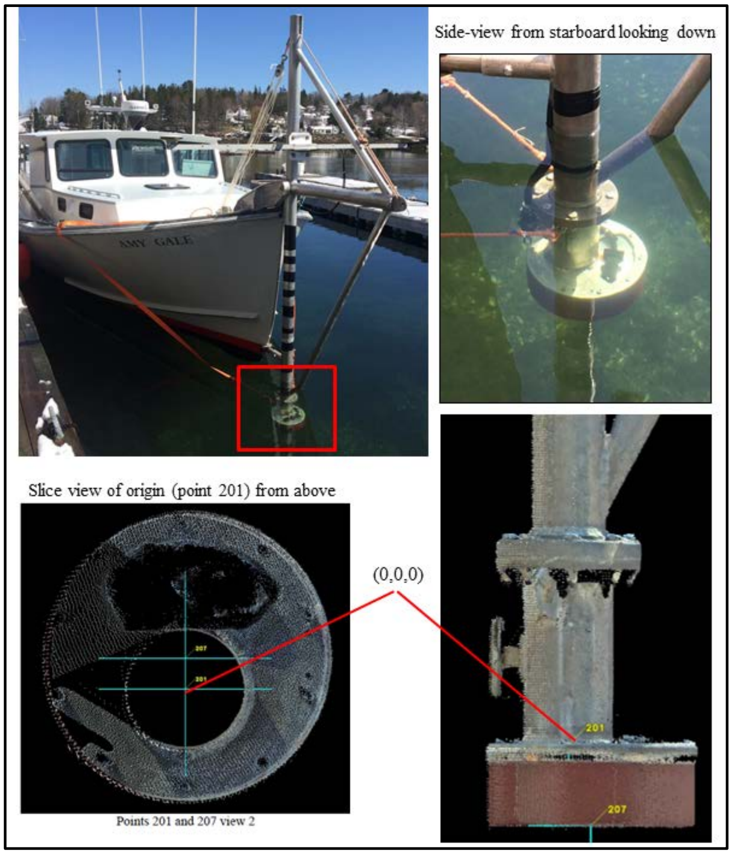


Figure 8 – Amy Gale origin (point 201 in RGB images) for vessel reference frame(s); origin is center point within the base of the pole (center point of base within internally-mounted motion reference unit (MRU) point 201 in images above)

2.4 Survey Operations

The following is a general summary of daily survey operations. Once the survey destination was reached, the sonar pole mount was lowered into survey position and its bracing rods were fastened securely to the hull of the ship via heavy-duty ratchet straps. Electric power to all systems was provided by a 2000-watt Honda *eu2000i* generator. Occasionally two *eu2000i* generators were simultaneously used if any auxiliary equipment needed additional electricity. Immediately following power-up, all interfacing instruments were given time to stabilize (e.g. approximately 30-45 minutes for Seapath to acquire time tag for GPS). Next, the desired Qinsy project (e.g. mainscheme, inshore, etc.) was selected for data acquisition. All files (e.g. raw sonar files, sound speed profiles, grid files, etc.) were recorded and stored within their respective project subfolders on a local drive. Prior to surveying, a sound speed cast was taken and imported into the 'imports' folder of the current project. After confirming a close match between the upcast and downcast data, the profile was applied to the sonar (EM2040C) in the Qinsy Controller module. Data were gridded at 0.5 to 4 meters for real-time visualization, depending on expected water depth range. Raw sonar files were logged in the Qinsy Controller module in .db format and saved directly onto the hydrographic workstation computer. All data were backed up daily on an external hard drive. At the end of each day's survey, sonar and navigation systems were powered down and the pole mount was raised and fastened for transit back to port. Upon arriving at the dock, all external instruments/hardware were visually inspected and rinsed with freshwater to prevent corrosion.

2.5 Survey Planning

Line planning and coverage requirements were designed to meet requirements for NOAA hydrographic standards (NOAA Field Procedures Manual, 2017). In the mainscheme area, parallel lines were mostly planned several days prior to surveying and run in a NE-SW or E-W pattern, depending on the location. Lines were spaced at consistent intervals to obtain a minimum of 20% overlap between full swaths. Soundings from beam angles outside of ±60 degrees from the nadir were blocked from visualization during acquisition, thus increasing the true minimum full-swath overlap. This online blocking filter was recommended by QPS field engineers with the intent of eliminating noisy outer beams from the final product, thereby increasing the overall contribution of higher quality soundings. All data was acquired at approximately 6 - 6.5 knots, although some areas required slower speeds to ensure safe operation of the vessel around obstructions (e.g. fishing gear, docks, ledges, etc.).

2.6 Calibrations

Several patch tests were conducted aboard the R/V Amy Gale at the beginning of the 2020 survey season to correct for alignment offsets. After an initial application of patch test values data not tide-corrected, a second patch test was applied once verified tide data was available from NOAA. During the test, a series of lines were run to determine the latency, pitch, roll, and heading offset. The patch test data were processed using the Qimera (v.2.1.1) patch test tool. After calibration was complete, offsets (Tables 4) were entered into the template database in Qinsy. Full built-in self-tests (BIST) were performed at semi-regular intervals throughout the season to determine if any significant deviations in background noise were present at the chosen survey frequency of 300KHz.

Table 4 – 2020 patch test calibration offsets for EM2040C

Type	Offset
Roll (degrees)	0.332
Pitch (degrees)	0.279
Heading (degrees)	-0.181

3.0 Quality Control

3.1 Crosslines

Due to unforeseen scheduling conflicts, crosslines were not run during the 2020 field season. For other quality control information, see section 3.2 of this report regarding 2020 data junctions with past MCMI and NOAA surveys.

3.2 Junctions

The following junctions were made with this survey. The Maine Coastal Program's Mapping Initiative conducted ongoing surveys in the areas of Saco Bay and Monhegan Island aboard the R/V Amy Gale from 2018 to 2019. The areas of overlap between the 2020 survey and the 2018-2019 junction survey were evaluated for sounding agreement by performing surface (4-meter resolution) difference tests in Fledermaus (v.7.8.6, 64-bit), where the junctioning surface (2018-2019) was subtracted from the new 2020 surface. A summary of surface details is shown in Table 5. Surface difference test results are shown in Table 6. The extents of overlap between the 2018-2019 base surface and the corresponding 2020 junction surface are illustrated in Figures 9 and 10. The surfaces used for these tests are submitted with the data in these surveys.

Survey ID W00450 was conducted by the Maine Coastal Program's Mapping Initiative aboard the R/V Amy Gale in 2017 and accepted by NOAA. The areas of overlap between the 2020 survey and the 2017 junction survey were evaluated for sounding agreement by performing surface (4-meter resolution) difference tests in Fledermaus (v.7.8.6, 64-bit), where the junctioning surface (2017) was subtracted from the new 2020 surface. A summary of surface details is shown in Table 5. Surface difference test results are shown in Table 6. The extent of overlap between the 2017 base surface and the corresponding 2020 junction surface is illustrated in Figure 10. The surfaces used for these tests are submitted with the data in these surveys.

Survey ID W00448 was conducted by the Maine Coastal Program's Mapping Initiative aboard the R/V Amy Gale in 2016 and accepted by NOAA. The areas of overlap between the 2020 survey and the 2016 junction survey were evaluated for sounding agreement by performing surface (2-meter resolution) difference tests in Fledermaus (v.7.8.6, 64-bit), where the junctioning surface (2016) was subtracted from the new 2020 surface. A summary of surface details is shown in Table 5. Surface difference test results are shown in Table 6. The extent of overlap between the 2016 base surface and the corresponding 2020 junction surface is illustrated in Figure 11. The surfaces used for these tests are submitted with the data in these surveys.

Survey ID H12477 was conducted by Williamson & Associates, Inc in 2012 and accepted by NOAA. The areas of overlap between the 2020 survey and the 2012 junction survey were evaluated for sounding agreement by performing surface (8-meter resolution) difference tests in Fledermaus (v.7.8.6, 64-bit), where the junctioning surface (2012) was subtracted from the new 2020 surface. A summary of surface details is shown in Table 5. Surface difference test results are shown in Table 6. The extent of overlap between the 2012 base surface and the corresponding 2020 junction surface is illustrated in Figure 12. The surfaces used for these tests are submitted with the data in these surveys.

Table 5 – 2020 Survey Junctions

Registry Number/Surface Name	**Grid Resolution**	**Area**	**Year**	**Field Unit**	**Relative Location(s)**
MCMI	4 meters	Casco Bay	2018-2019	R/V Amy Gale	W and S
MCMI	4 meters	Monhegan Island	2018-2019	R/V Amy Gale	W
MCMI (NOAA W00450)	4 meters	Monhegan Island	2017	R/V Amy Gale	W and N

MCMI (NOAA W00448)	2 meters	Inshore (Sheepscot River)	2016	R/V Amy Gale	S
NOAA H12477	8 meters	Matinicus Island	2012	M/V Nooit Volmaakt R/V Resolution	N

Table 6 – Summary of surface difference test results for overlapping (junction) surveys

Junction Surface ID	New (2020) Surface ID	Median (m)	Mean (m)	Std. Dev. (m)
MCMI_2018_2019_SacoBay_4m_mllw	MCMI_2020_CascoBay_4m_mllw	0.15	0.16	0.44
MCMI_2018_2019_Monhegan_4m_mllw	MCMI_2020_Monhegan_4m_mllw	-0.05	-0.06	0.25
MCMI_2017_mainscheme_4m_mllw	MCMI_2020_Monhegan_4m_mllw	-0.03	-0.04	0.65
MCMI_2016_inshore_2m_mllw	MCMI_2020_Inshore_2m_mllw	-0.01	0.04	0.46
H12477_MB_8m_MLLW_Combined	MCMI_2020_Matinicus_8m_mllw	-0.46	-0.38	0.17

Several factors are thought to contribute to the high standard deviation in several of the overlapping surveys (particularly the Monhegan Island area): poor agreement in rocky areas, filtering procedures, and survey conditions (e.g. weather and sea state). The most disagreement between surfaces was in areas with a steep, rocky seabed.

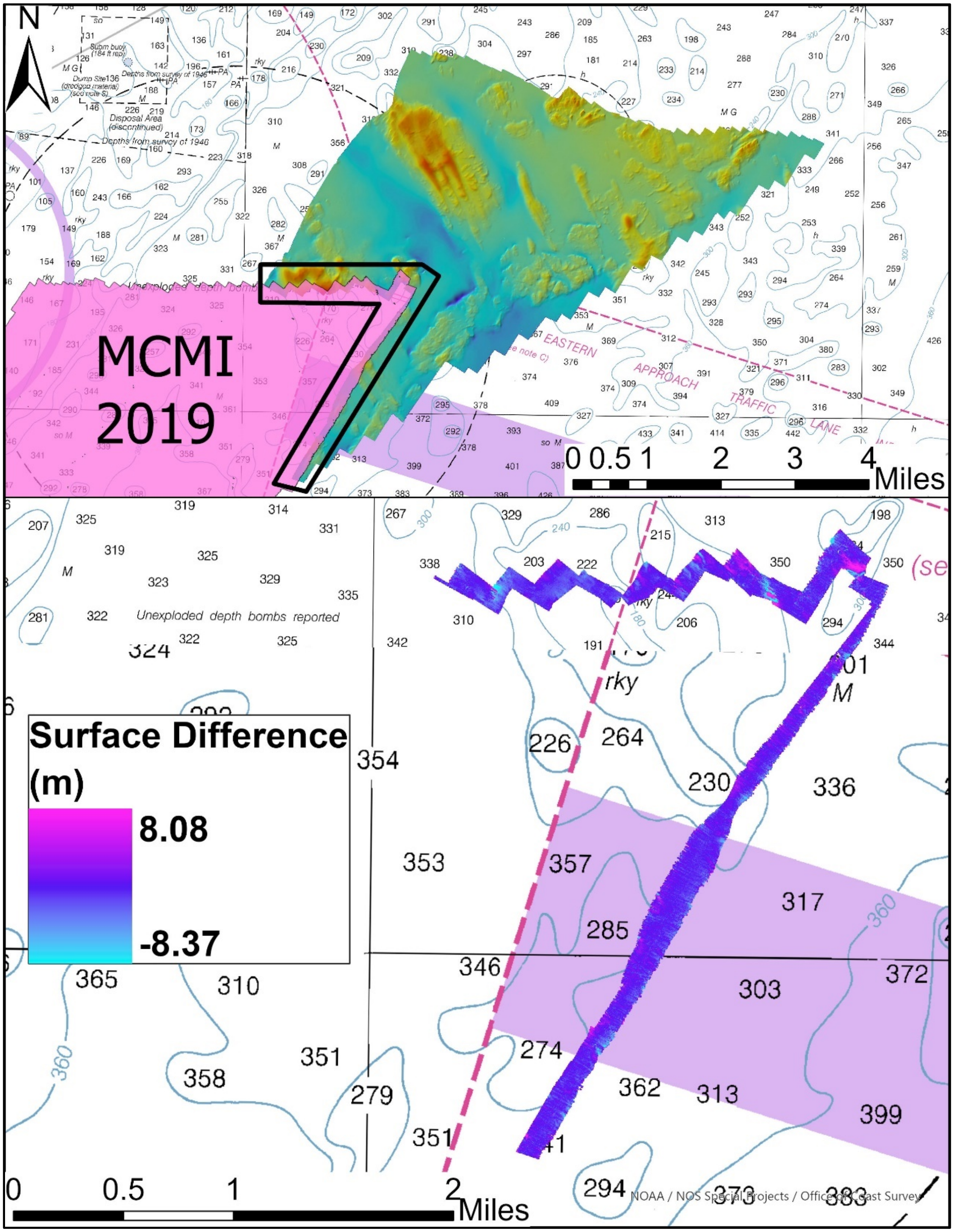


Figure 9 – Junctioning area between 2020 survey and MCMI 2018-2019 Saco Bay survey (top pane). 4-meter surfaces shown as surface difference results in lower pane.

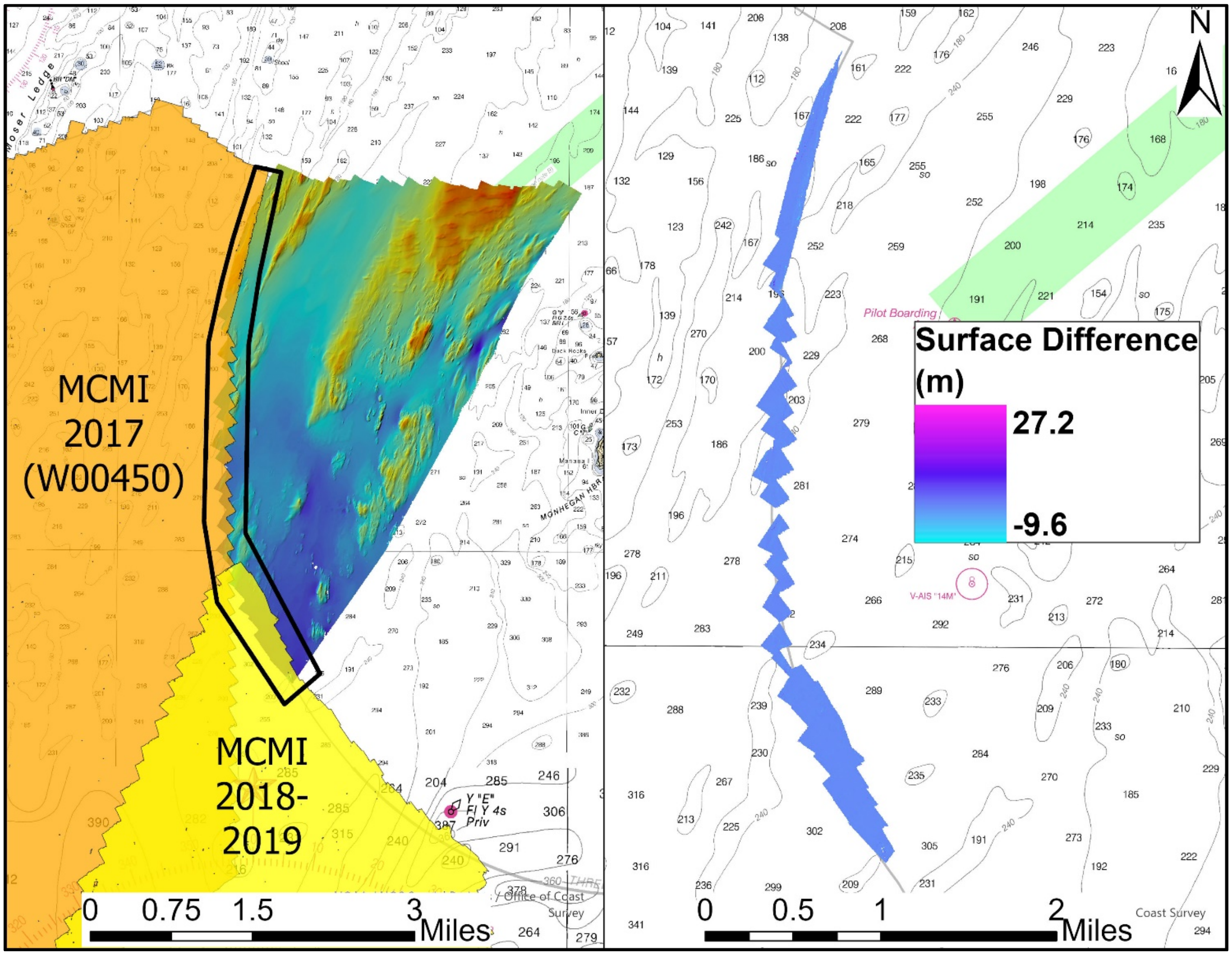


Figure 10 – Junctioning areas between 2020 survey and NOAA OCS survey W00450 (orange) and MCMI 2018-2019 Monhegan Island survey (yellow). 4-meter surfaces shown as surface difference results in right pane.

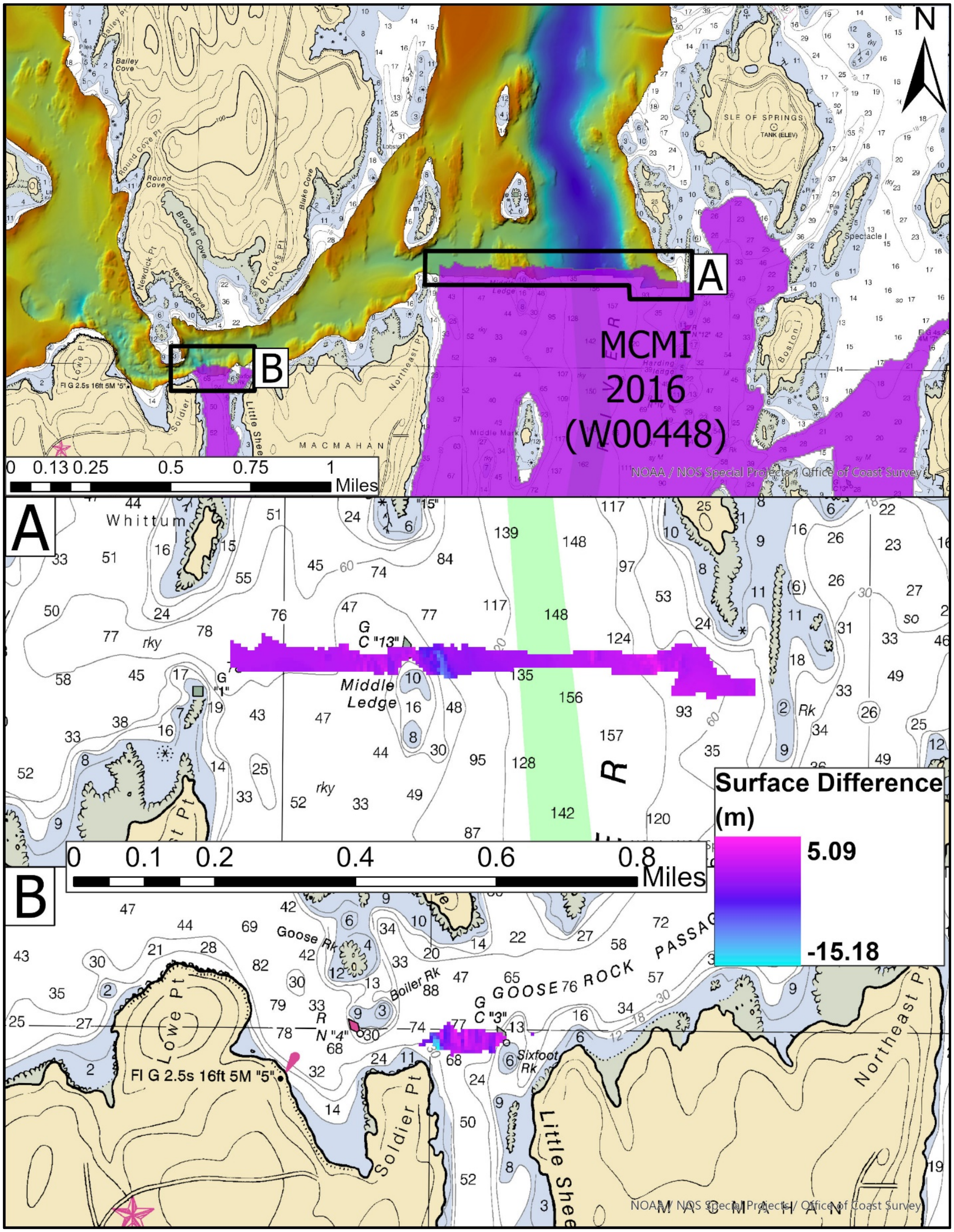


Figure 11 – Junctioning areas between 2020 survey and NOAA OCS survey W00448 (top pane). 2-meter surfaces shown as surface difference results in middle and bottom panes.

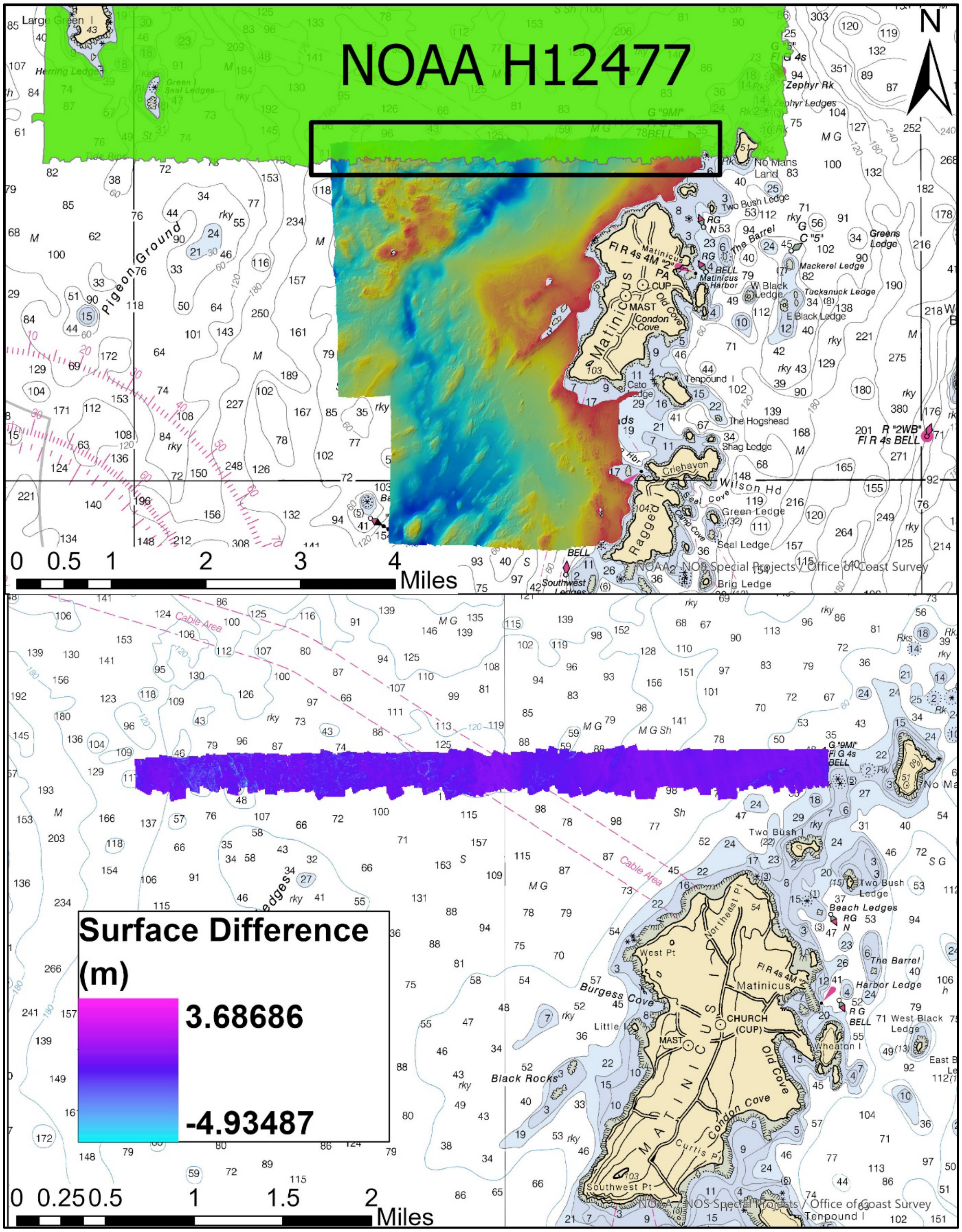


Figure 12 – Junctioning area between 2020 survey and NOAA OCS survey H12477 (top pane). 8-meter surfaces shown as surface difference results in lower pane.

3.3 Equipment Effectiveness

Sonar

Sonar data were acquired with a Kongsberg EM2040C set to a survey frequency of 300 kHz, high-density beam forming, with 400 beams per ping. Although the EM2040C allowed full swath widths at this frequency, lines from previous year's survey run at comparable depths contained considerable noise in outer beams (> ±60 degrees from the nadir as identified by QPS engineers). As a result (and as per QPS recommendation), soundings greater than ±60 degrees from the nadir were not included in final bathymetric surfaces.

3.4 Sound Speed Methods

Sound speed cast frequency: A total of 107 sound speed casts were taken within the boundaries of the 2020 surveys. All sound speed cast measurements were collected using the Teledyne Odom Digibar S profiler. Sound speed casts were taken as needed throughout the survey, which was generally when the observed surface sound speed (monitored and visualized in real-time using the AML MicroX SV sensor) differed from the surface sound speed in the active profile by more than 2 meters per second. In certain instances, supplemental casts were taken when there was reason to suspect significant changes in the water column (e.g. change in tide, abrupt changes in seafloor relief, etc.). During the collection of sound speed casts, logging was stopped to download and apply the new cast and was resumed when the boat circled around and came back on the survey line. Throughout the duration of the survey, the surface sound speed was observed in real-time (by the AML Micro X SV probe). Although sound speed data were recorded in raw sonar files, the raw sound velocity profiles (.csv) were also submitted with the survey data.

A quality comparison between the AML Micro X SV sensor and the Teledyne Odom Digibar S profiler was not performed. However, real-time comparisons between surface sound speed observed by the AML Micro X SV and the surface sound speed entry in the Digibar S profile suggested these instruments agreed.

4.0 Data Post-processing

The following is a summary of the procedures used for post-processing and analysis of survey data using Qimera (v.2.1.1, 64-bit edition) and Fledermaus (v.7.8.6, 64-bit edition) software.

4.1 Horizontal Datum

The horizontal datum for these data is WGS 84 projected in UTM zone 19N (meters).

4.2 Vertical Datum and Water Level Corrections

The vertical datum for these data is mean lower-low water (MLLW) level in meters. A tidal zoning file ("Maine_Tide_Zoning.zdf") containing time and range corrections for verified tide station data was provided by NOAA OCS to MCMI in May 2020. This file was used to apply time corrections, tide height offsets, and tide scale (range) for collected data in each zone listed in Table 7.

Table 7 – Tide zones and corrections referenced to verified Wells, ME (8419317) and Portland, ME (8418150) tide station data

Survey Area	Tide Station	Zone ID	Time Correction (mins.)	Tide Scale
Casco Bay	8419317	NA7	-12	0.99
Monhegan Island	8418150	NA6	-6	0.96
Inshore	8418150	ME30	18	1.0
		ME31	6	0.99
		ME38	36	0.99
		ME61	6	1.0
		ME65	6	0.99
		ME70	12	0.96
		ME74	30	0.96
		ME84	6	0.96
		ME86	0	0.98
		ME96	18	0.96
Matinicus Island	8418150	NA17	-6	0.98

4.3 Processing Workflow

The general post-processing workflow in Qimera was as follows:

1. Create project
2. Add raw sonar files (e.g. metadata extracted and processed bathymetry data converted to .qpd, including vessel configuration and sound velocity)
3. Add tide zoning file (.zdf) and associated tide data and integrate into raw files
4. Create dynamic surface with NOAA CUBE settings enabled for desired resolution (e.g. 2-meter, 4 meter)
5. Review and edit soundings/clean surface with slice editor tool, 3D editor tool, and available filters
6. Duplicate surfaces at other grid sizes, if desired
7. Export final surface to .BAG file and CUBE surface
8. Export processed data in. GSF format for backscatter processing

CUBE

A CUBE (Combined Uncertainty and Bathymetry Estimator) surface was created for editing and as a starting point for final products. The corresponding NOAA cube setting (e.g. “NOAA_4m” configuration, Figure 13) was selected for each surface depending on the grid size of the surface.

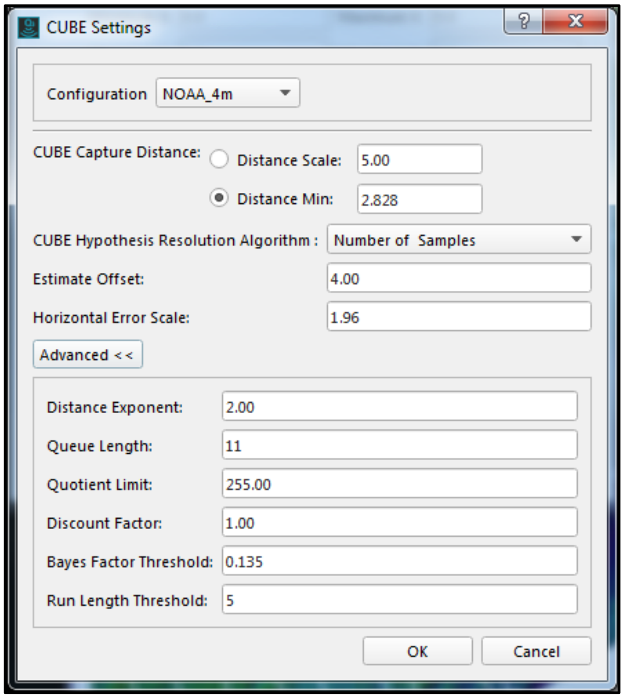


Figure 13 – CUBE settings parameters window shown with settings for NOAA 4-meter grid resolution

4.4 Final Surfaces

The following surfaces and BAGs were submitted with the survey data.

Table 8 – Surfaces submitted with 2020 survey data

Surface Name	Resolution (m)	Depth Range (m)	Surface Parameter
MCMI_2020_CascoBay_2m_mllw	2	51.8 – 134.0	N/A
MCMI_2020_CascoBay_4m_mllw	4	51.9 – 133.5	N/A
MCMI_2020_CascoBay_8m_mllw	8	52.0 – 132.8	N/A
MCMI_2020_Monhegan_2m_mllw	2	43.6 – 97.4	N/A
MCMI_2020_ Monhegan _4m_mllw	4	43.7 – 97.2	N/A
MCMI_2020_ Monhegan _8m_mllw	8	43.9 – 97.2	N/A
MCMI_2020_Inshore_2m_mllw	2	0.1 – 45.8	N/A

MCMI_2020_Inshore_4m_mllw	4	0.1 – 45.6	N/A
MCMI_2020_Matinicus_1mgrid_0_to_30m _clip_mllw	1	0.8 – 30.0	N/A
MCMI_2020_Matinicus_2m_mllw	2	3.0 – 56.9	N/A
MCMI_2020_ Matinicus _4m_mllw	4	3.1 – 56.8	N/A
MCMI_2020_ Matinicus _8m_mllw	8	3.3 – 56.7	N/A

4.5 Backscatter

Backscatter was logged in the raw .db files. The .db files also hold the navigation record and bottom detections for all lines of surveys. Processed sonar files containing multibeam backscatter data (snippets and beam-average) were exported from Qimera v.2.1.1. in .GSF format. QPS Fledermaus Geocoder Toolbox (FMGT; v.7.8.6, 64-bit edition) was used to import, process, and mosaic time-series backscatter data. Default backscatter processing settings were used to create the mosaic, except for the Angle Varied Gain (AVG) filter and AVG window size, which were set to 'Adaptive' and '100', respectively. Backscatter mosaics of the data were gridded at 2-meter and 4-meter resolution and exported in greyscale (files ending in "gs") and floating-point (files ending in "db") GeoTIFF format. The mosaics are shown in Table 9 and Figures 14 through 17. The GSF files containing the extracted were submitted with the data in this survey.

Table 9 – Backscatter mosaics submitted with 2020 survey data

Mosaic Name	Pixel Size (m)
MCMI_2020_CascoBay_backscatter_2m_db	2
MCMI_2020_CascoBay_backscatter_4m_db	4
MCMI_2020_Monhegan_backscatter_2m_db	2
MCMI_2020_Monhegan_backscatter_4m_db	4
MCMI_2020_Inshore_backscatter_2m_db	2
MCMI_2020_Inshore_backscatter_4m_db	4
MCMI_2020_Matinicus_backscatter_2m_db	2
MCMI_2020_Matinicus_backscatter_4m_db	4

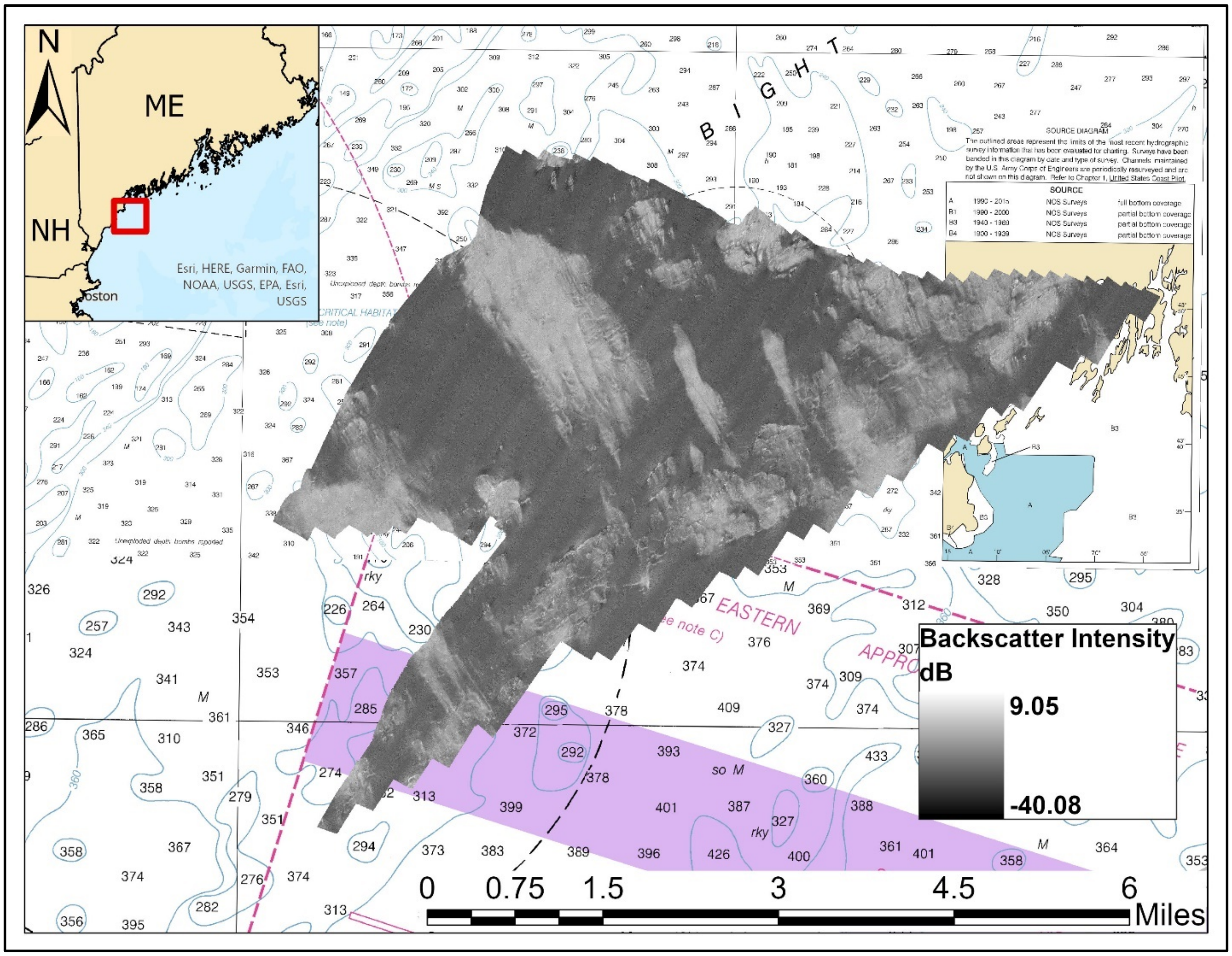


Figure 14 – Backscatter mosaic (4-meter pixel size) of 2020 Casco Bay survey area.

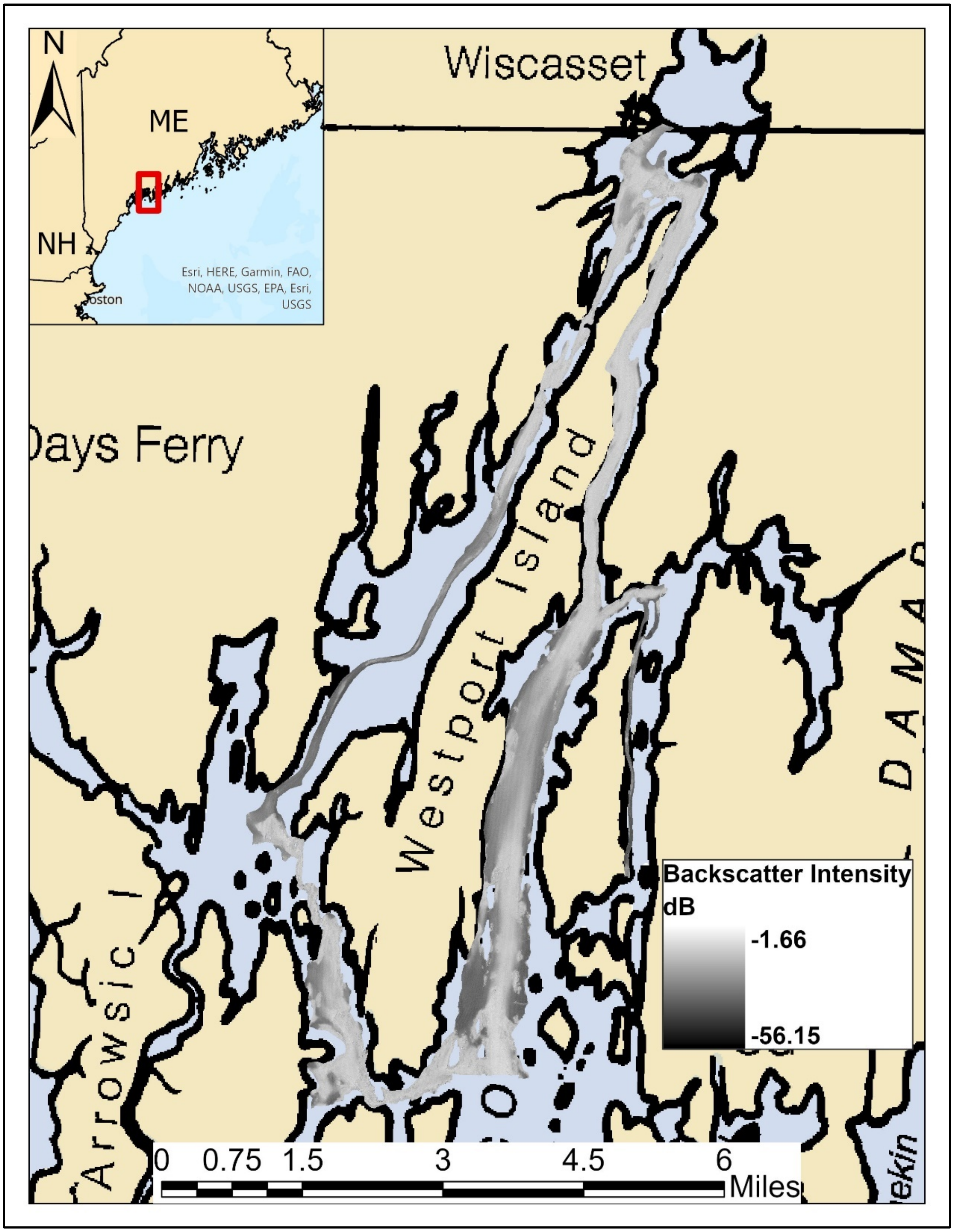


Figure 15 – Backscatter mosaic (2-meter pixel size) of 2020 Inshore survey area.

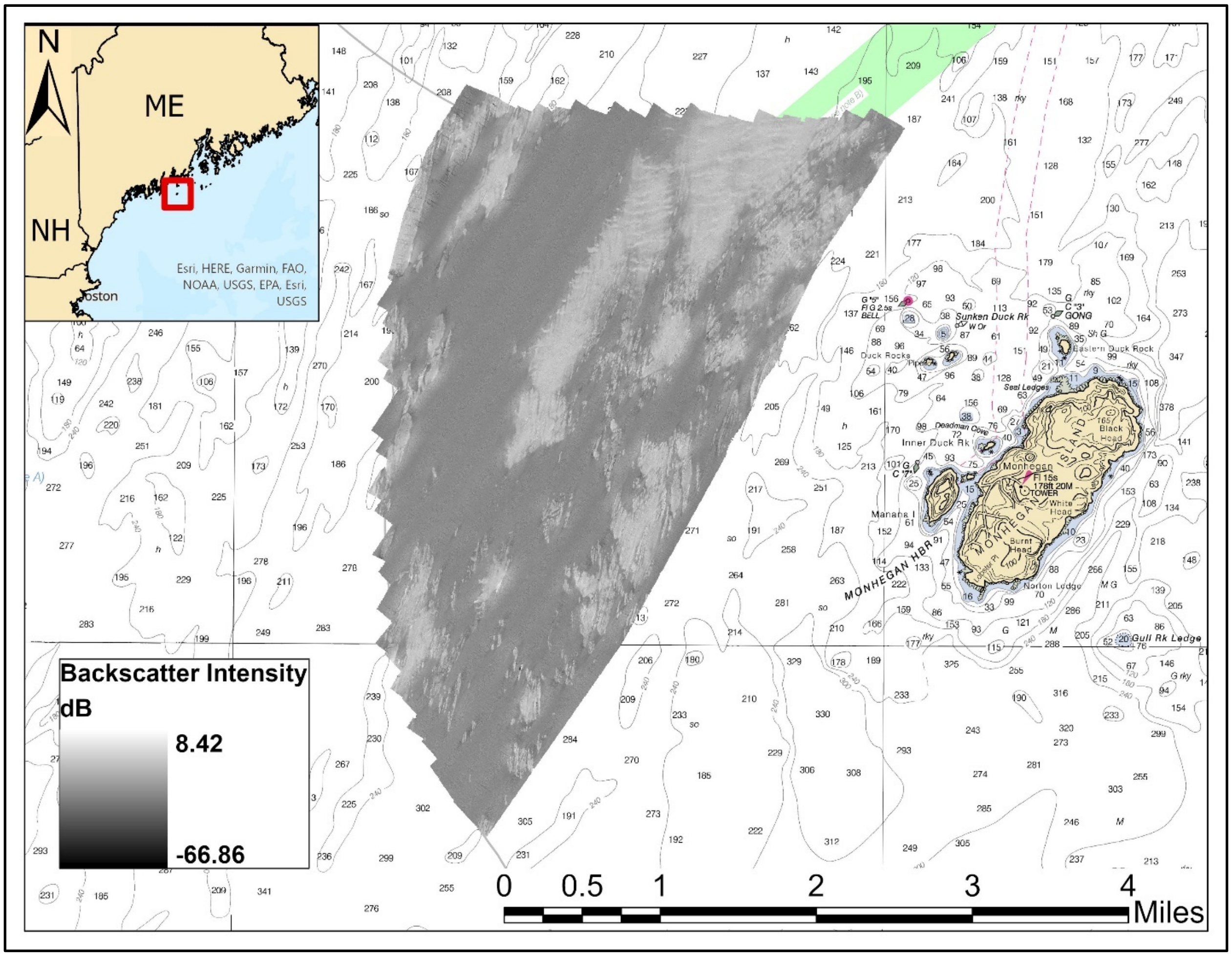


Figure 16 – Backscatter mosaic (4-meter pixel size) of 2020 Monhegan Island survey area.

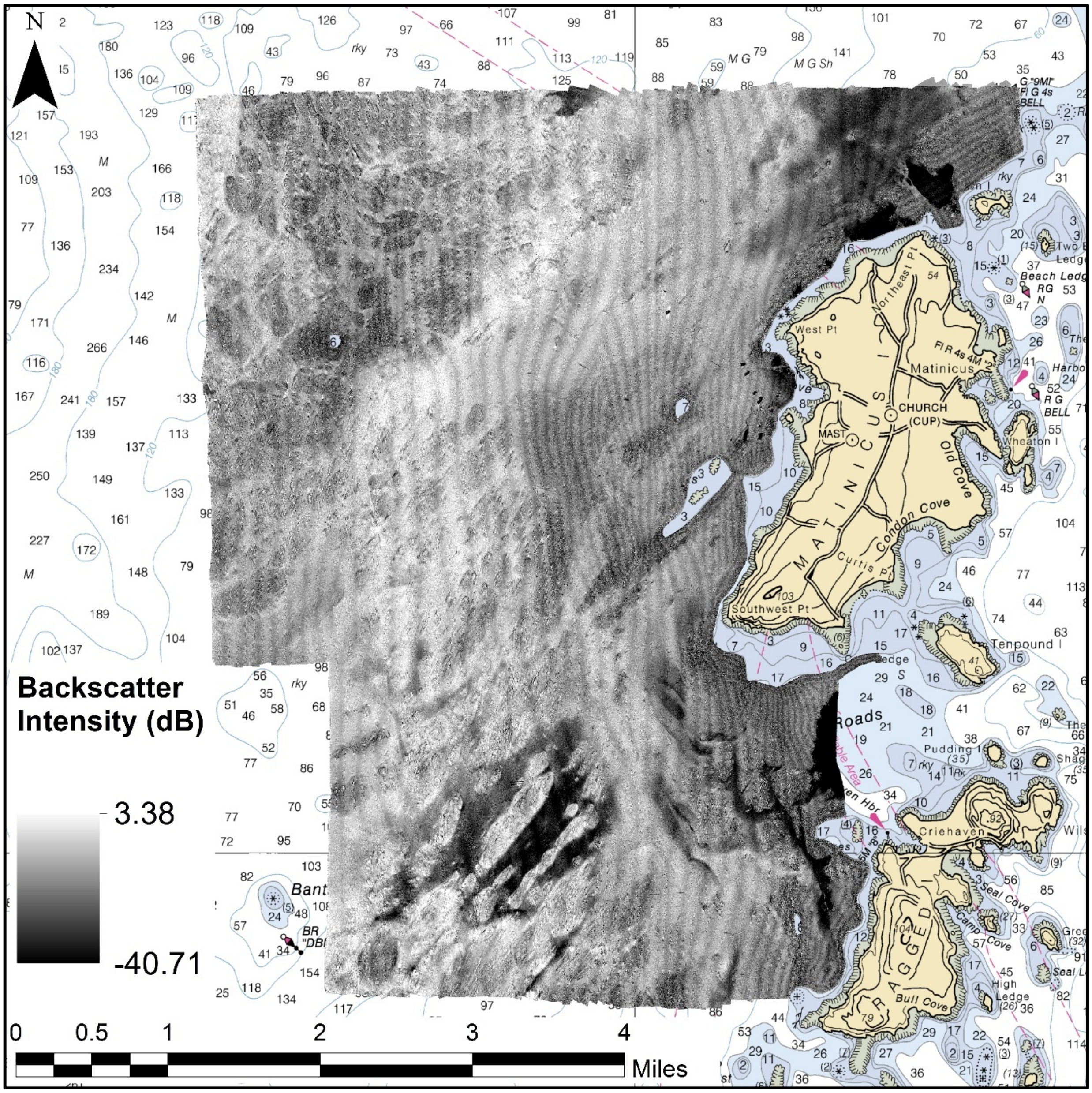


Figure 17 – Backscatter mosaic (4-meter pixel size) of 2020 Matinicus Island survey area.

5.0 Results

5.1 Charts Comparison

The hydrographer conducted a qualitative comparison of reclassified bathymetry data and depth contours from the surveyed area to the charted soundings and contours. The largest scale (i.e. greater than 1:100,000) raster navigational charts which cover the survey areas are listed in Table 10. Prior hydrographic surveys in the vicinity were conducted by NOAA between 1854 and 1954 and some consisted only of partial bottom coverage. These data were not compared with data collected by the MCMI.

Table 10 – Largest scale raster charts in survey area

Chart	Scale	Source Edition	Source Date	Most Recent NTM Date
13286	1:80,000	34	3/1/2019	10/15/2020
13288	1:80,000	44	2/1/2016	5/6/2021
13290	1:40,000	41	10/1/2019	5/6/2021
13293	1:40,000	36	3/1/2016	4/1/2021
13296	1:15,000	26	1/1/2012	6/25/2020
13301	1:40,000	22	12/1/2018	5/20/2021
13302	1:80,000	25	4/1/2019	1/21/2021
13303	1:40,000	15	3/1/2017	6/18/2020

<u>Chart 13286</u>

The entire Casco Bay survey area coincides with chart 13286. Charts with scales 1:80,000 (and smaller) inherently contain very generalized contours. As shown in Figure 18, the agreement between chart contours and new survey data (reclassified at 60 feet intervals; same as chart) is generally good at depths less than 360 feet (110 meters).

<u>Chart 13288</u>

The entire Casco Bay, Monhegan Island, and inshore survey areas coincide with chart 13288. The majority of the inshore survey area is generalized beyond comparison, however. Charts with scales 1:80,000 (and smaller) inherently contain very generalized contours. As shown in Figures 19 through 20, the agreement between chart contours and new survey data (reclassified at 60 feet intervals; same as chart) is generally good at depths less than 300 feet (91 meters). Agreement becomes increasingly poor at depths beyond 300 feet throughout the surveyed areas, particularly in the Monhegan Island area (Figure 21). This disagreement is likely due to the low resolution and lack of full bottom coverage during prior surveys rather than over generalization. It is recommended that contours within the survey area be revised; though since only a relatively small total surface area deeper than 300 feet exists in the survey area, this disagreement could also be considered negligible.

Chart 13290

The majority of the Casco Bay survey area coincides with chart 13290. As shown in Figure 22, the agreement between chart contours and new survey data (reclassified at 60 feet intervals; same as chart) is generally good at depths less than 360 feet (110 meters).

Chart 13293

The entire inshore survey area coincides with chart 13293. Surveyed depths have good overall agreement with charted contours and soundings (Figure 23), although individual soundings may disagree at any given location.

Chart 13296

The majority of the inshore survey area coincides with chart 13296. Surveyed depths have good overall agreement with charted contours and soundings (Figure 24), although individual soundings may disagree at any given location.

Chart 13301

The entire Monhegan Island survey area coincides with chart 13301. As shown in Figure 25, the agreement between chart contours and new survey data (reclassified at 60 feet intervals; same as chart) is generally good at depths less than 300 feet (91 meters).

Chart 13302

The entire Matinicus Island survey area coincides with chart 13302. Charts with scales 1:80,000 (and smaller) inherently contain very generalized contours. As shown in Figure 26, the agreement between chart contours and new survey data (reclassified at 60 feet intervals; same as chart) is generally good at depths less than 120 feet (37 meters). Agreement becomes increasingly poor at depths beyond 120 feet throughout the surveyed area. This disagreement is likely due to the low resolution and lack of full bottom coverage during prior surveys rather than over generalization. It is recommended that contours within the survey area be revised.

Chart 13303

The entire Matinicus Island survey area coincides with chart 13303. As shown in Figure 27, the agreement between chart contours and new survey data (reclassified at 60 feet intervals; same as chart) is generally good at depths less than 120 feet (37 meters). Agreement becomes increasingly poor at depths beyond 120 feet throughout the surveyed area, though less so than for chart 13302.

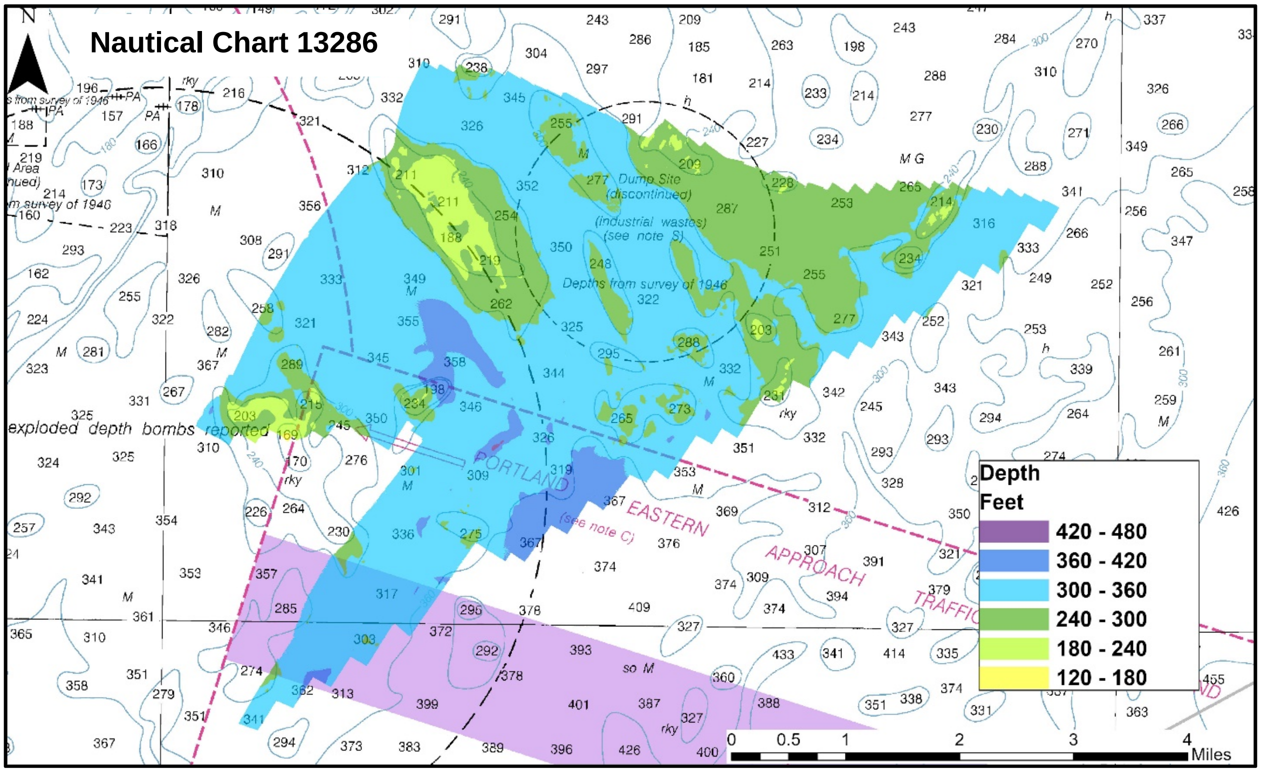


Figure 18 – Comparison between surveyed depth in Casco Bay area (reclassified at 60-feet intervals, by color) and chart 13286 (scale: 1:80,000, 60-feet contour intervals).

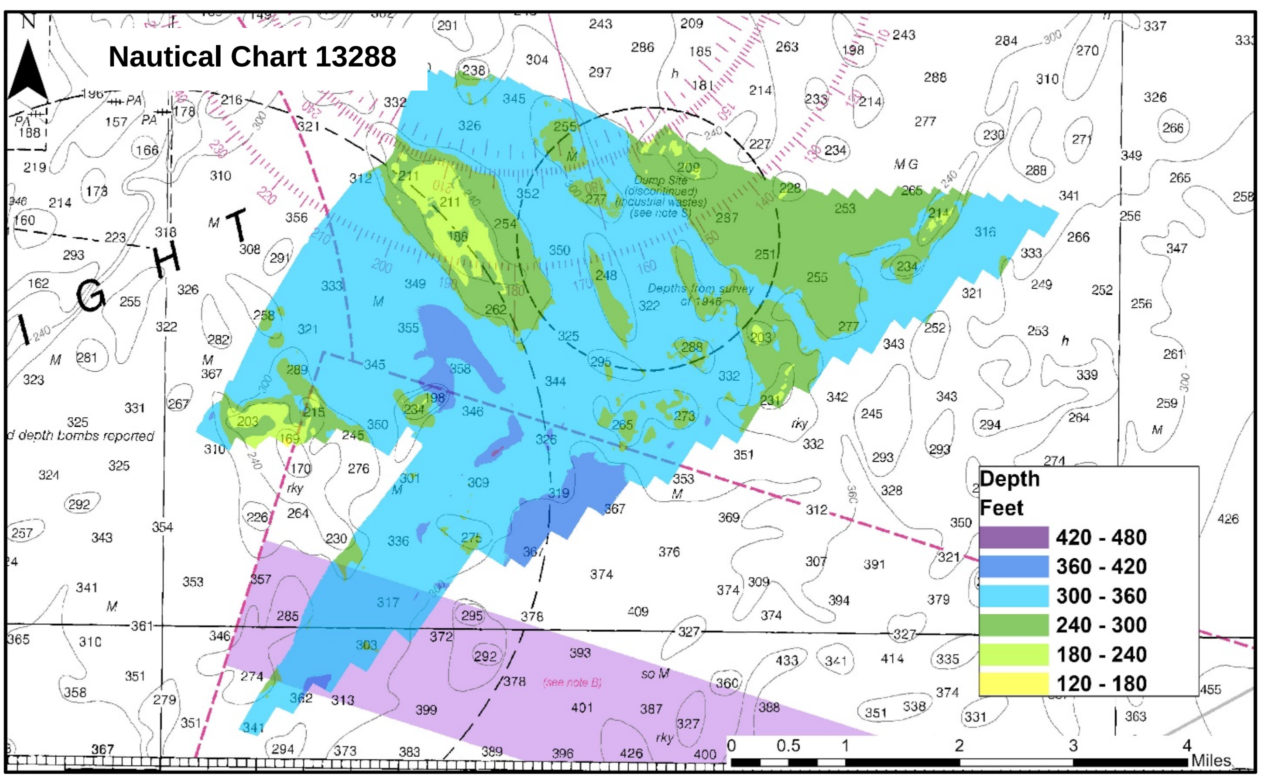


Figure 19 – Comparison between surveyed depth in Casco Bay area (reclassified at 60-feet intervals, by color) and chart 13288 (scale: 1:80,000, 60-feet contour intervals).

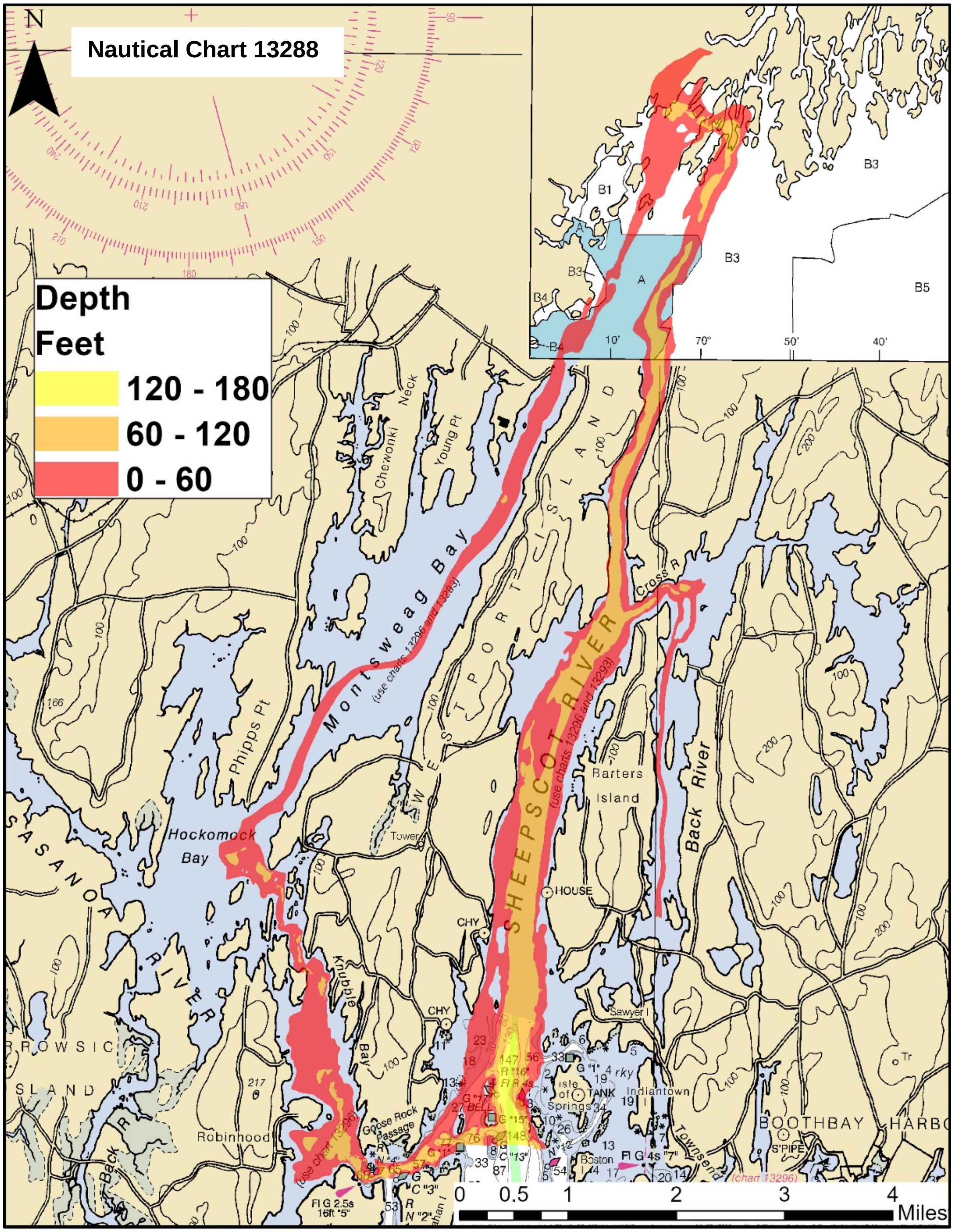


Figure 20 – Comparison between surveyed depth in inshore area (reclassified at 60-feet intervals, by color) and chart 13288 (scale: 1:80,000, 60-feet contour intervals).

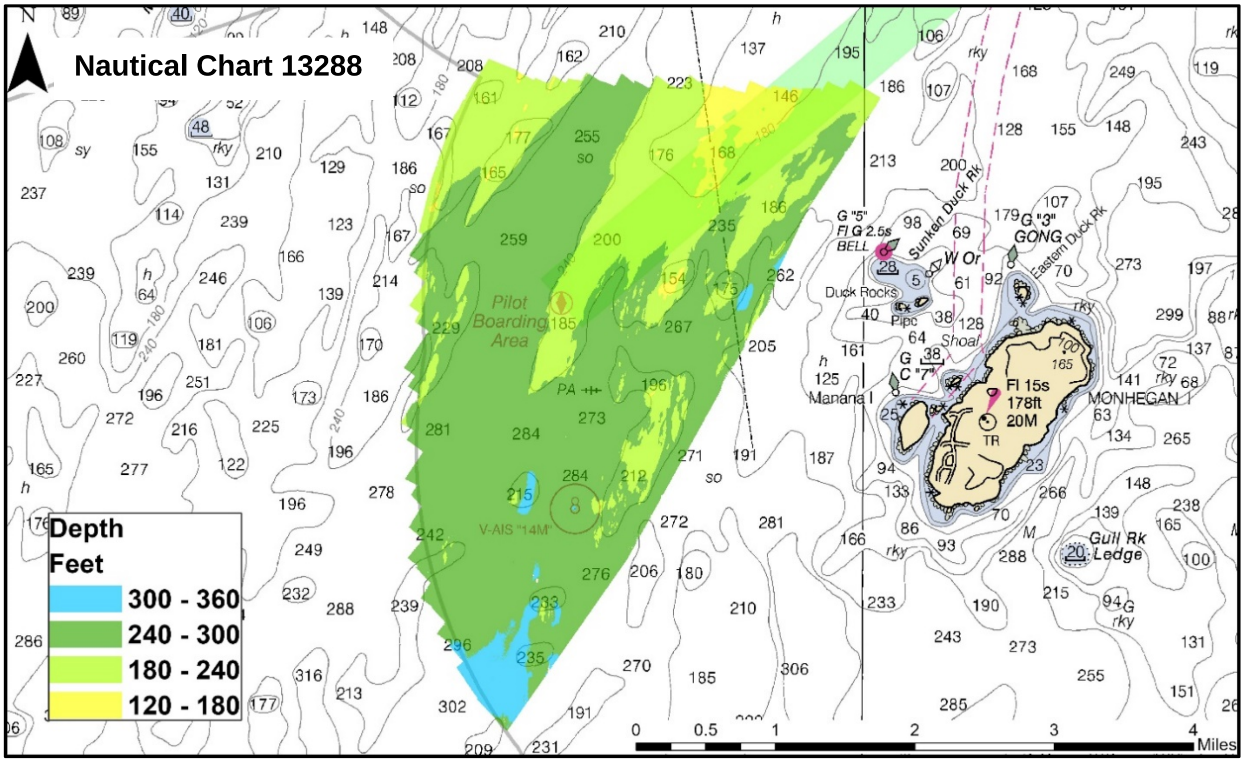


Figure 21 – Comparison between surveyed depth in Monhegan Island area (reclassified at 60-feet intervals, by color) and chart 13288 (scale: 1:80,000, 60-feet contour intervals).

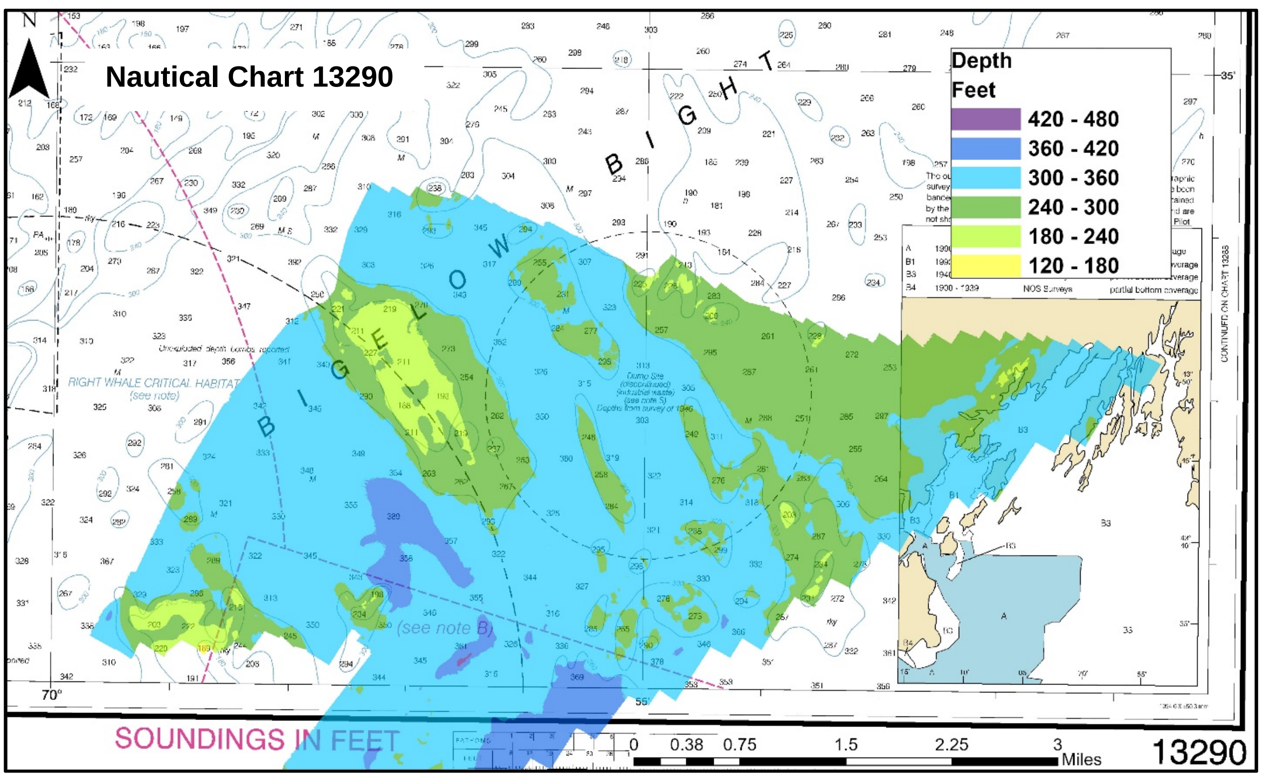


Figure 22 – Comparison between surveyed depth in Casco Bay area (reclassified at 60-feet intervals, by color) and chart 13290 (scale: 1:40,000, 60-feet contour intervals).

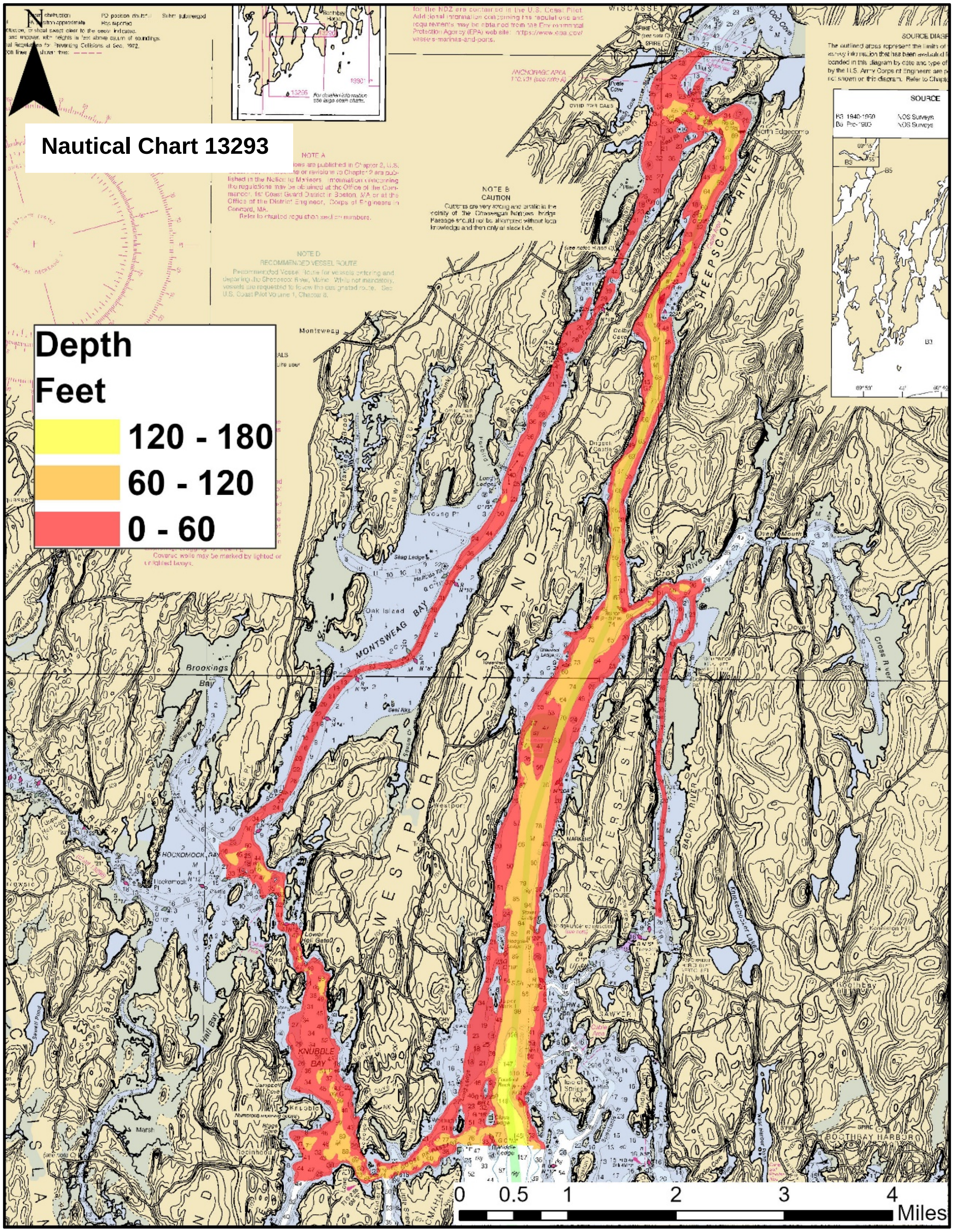


Figure 23 – Comparison between surveyed depth in inshore area (reclassified at 60-feet intervals, by color) and chart 13293 (scale: 1:40,000, 60-feet contour intervals).

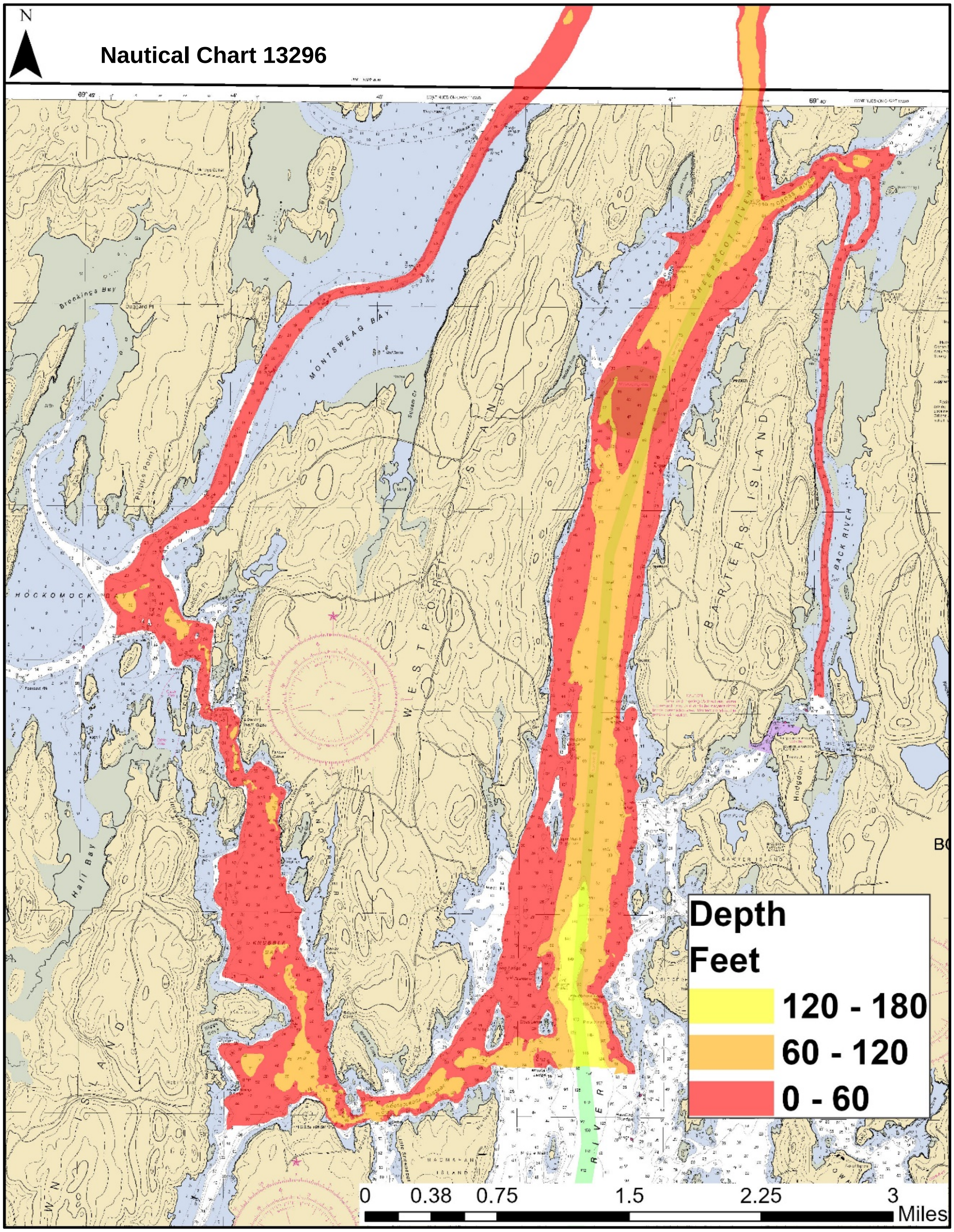


Figure 24 – Comparison between surveyed depth in inshore area (reclassified at 60-feet intervals, by color) and chart 13296 (scale: 1:15,000, 60-feet contour intervals).

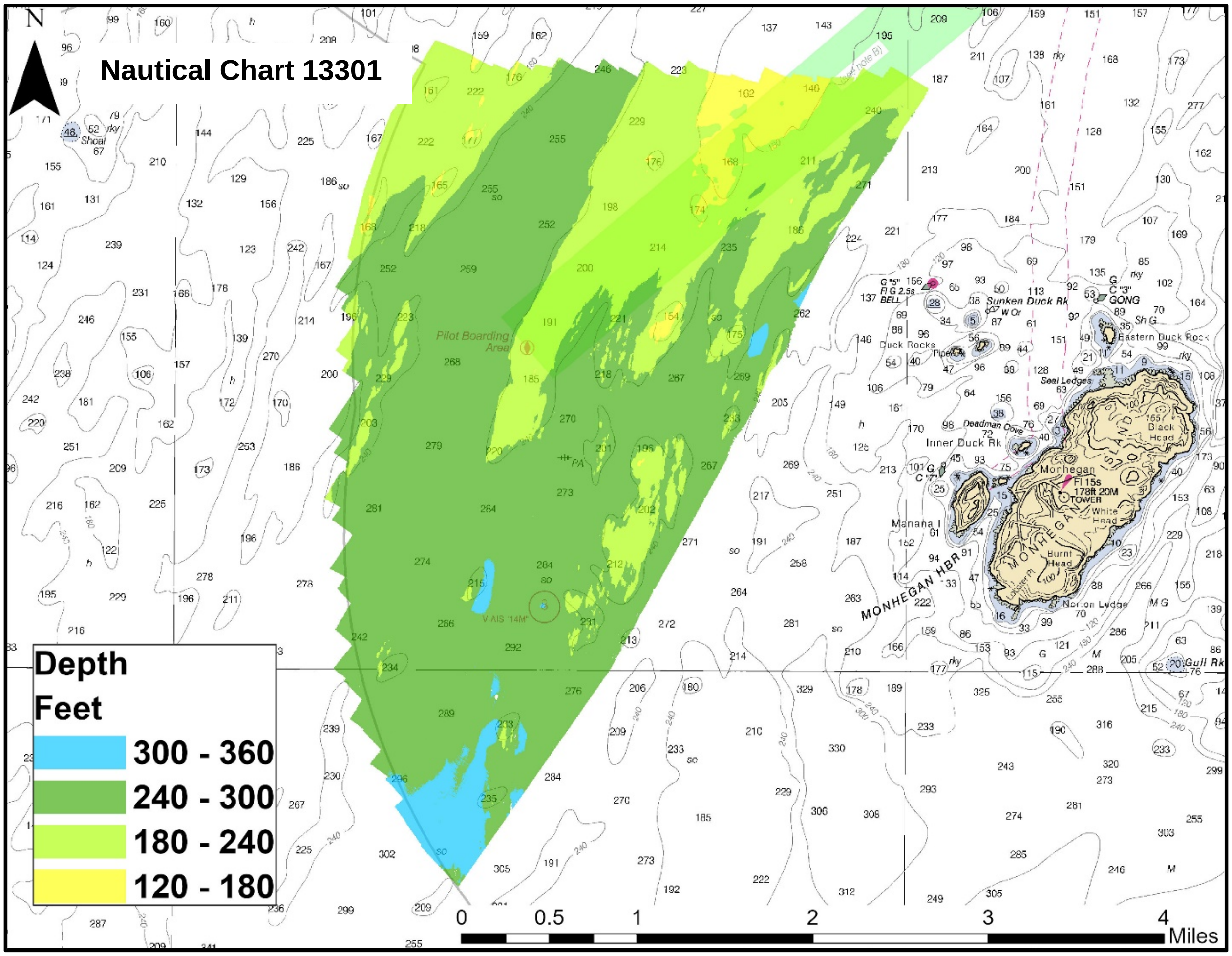


Figure 25 – Comparison between surveyed depth in Monhegan Island area (reclassified at 60-feet intervals, by color) and chart 13301 (scale: 1:40,000, 60-feet contour intervals).

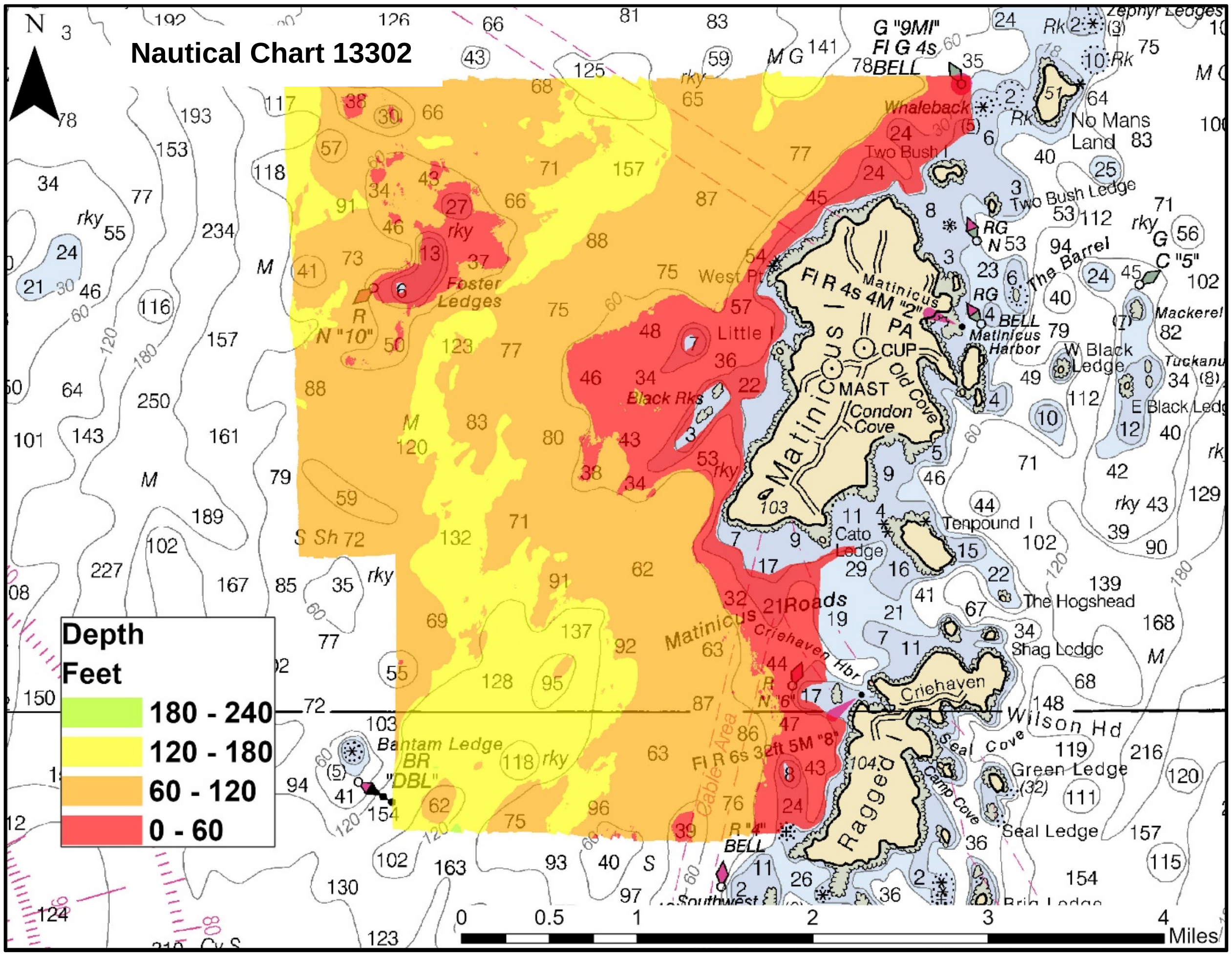


Figure 26 – Comparison between surveyed depth in Matinicus Island area (reclassified at 60-feet intervals, by color) and chart 13302 (scale: 1:80,000, 60-feet contour intervals).

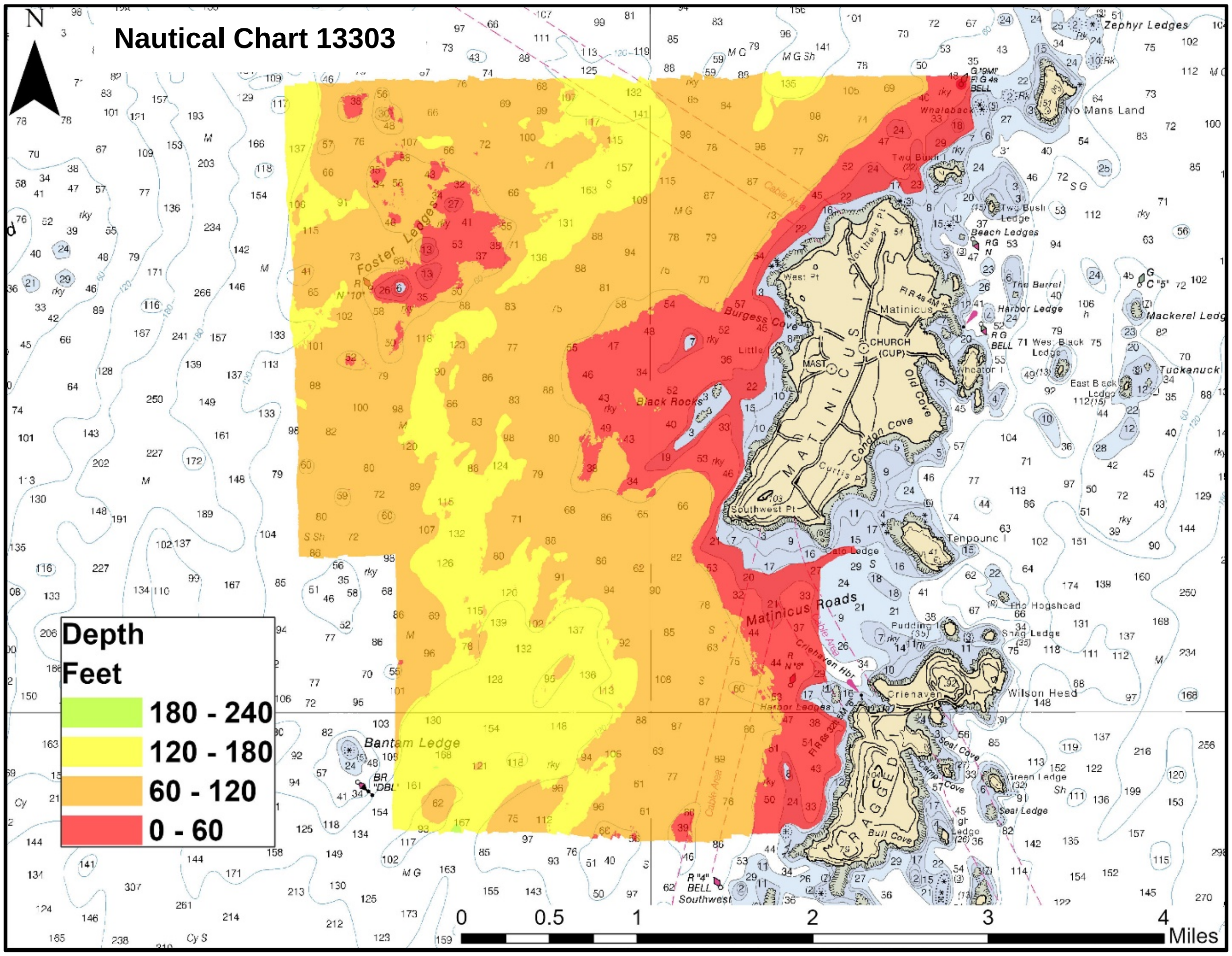


Figure 27 – Comparison between surveyed depth in Matinicus Island area (reclassified at 60-feet intervals, by color) and chart 13303 (scale: 1:40,000, 60-feet contour intervals).

5.2 Uncharted Features

An uncharted wreck was found in the Sheepscot River off Birch Point in/near the town harbor of Wiscasset, Maine (Figure 28). The object was identified in real-time by the hydrographer on November 4, 2020. An additional 0.5-meter surface was created to visualize and illustrate the feature at finer resolution (insets of Figures 28 and 29).

The depth of this feature was approximately 0 to 8 meters. A mast is clearly visible coming out of the water from the wreck (Figure 29). Coordinates and additional attributes are listed in Table 11. The wreck was surveyed through normal line coverage, and two additional lines were run over the wreck with water column data collection enabled in Qinsy (Table 12). The suspected wreck is oriented northeast (bow)-southwest (stern) and appears to be upright but slightly listing to port.

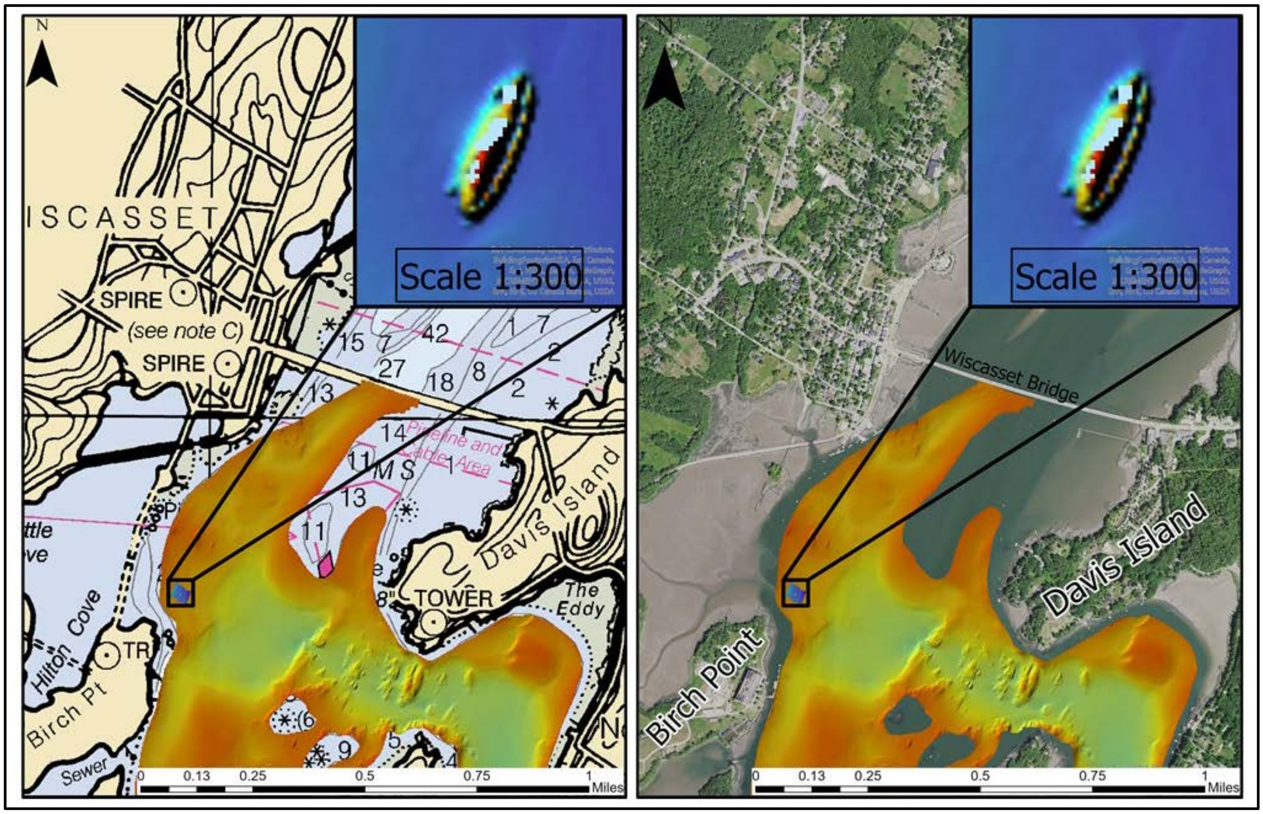


Figure 28 – Location of suspected uncharted wreck located in 2020 survey area, off Birch Point in the Sheepscot River. Inset shows 50-cm gridded data overlain on 2-meter gridded bathymetry data.

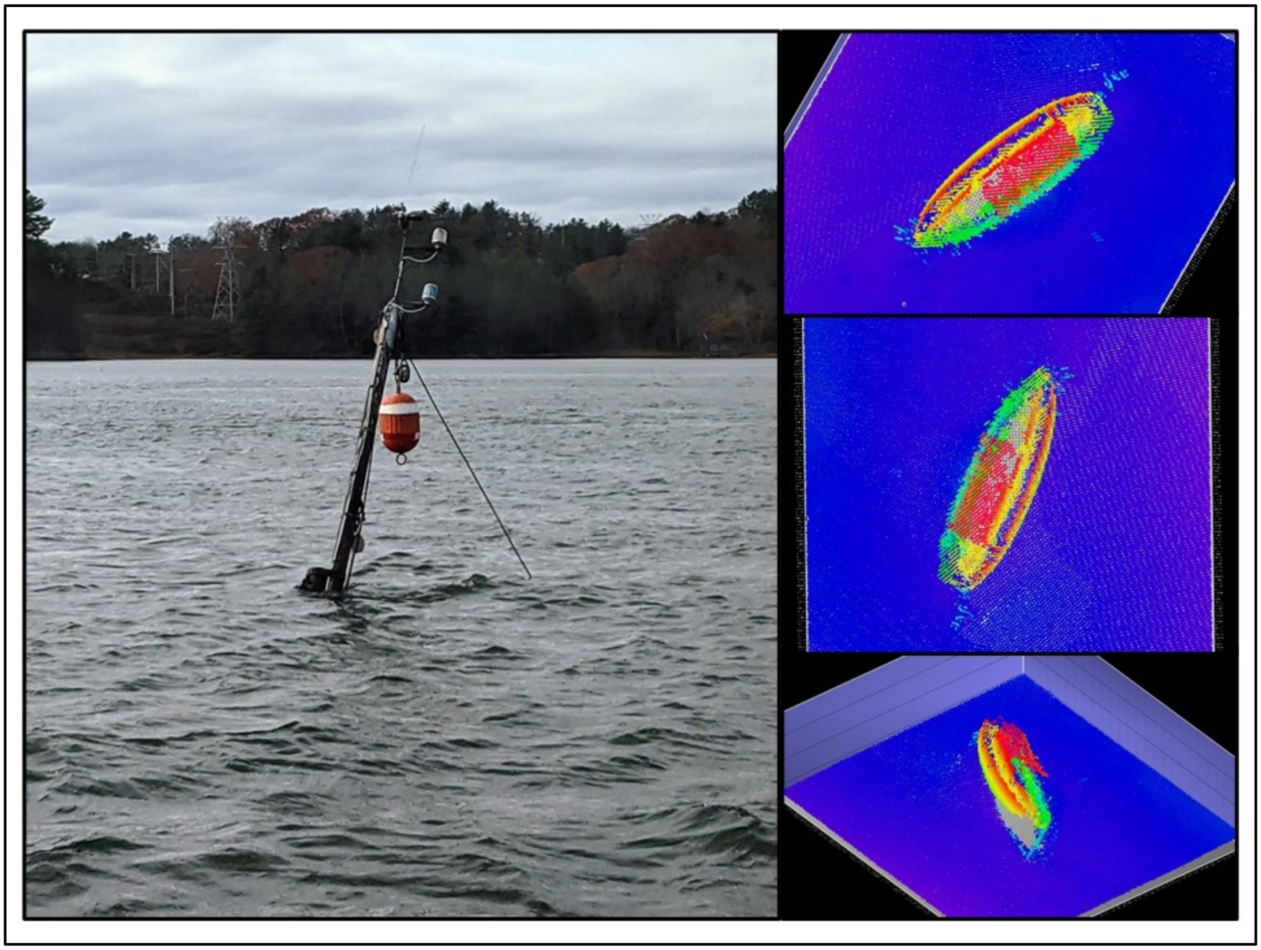


Figure 29 – Suspected uncharted wreck mapped in 2020 survey area. Photograph of exposed mast (left) taken in the field on day of survey. Qimera soundings view window (right panes) show clear structure of boat.

Table 11 – Coordinates and summary attributes of suspected uncharted wreck

Latitude	**Longitude**	**Length (m)**	**Width (m)**	**Orientation**
43° 59’ 39.195” N	69° 41’ 52.447” W	20.1	6.5	NE-SW

Table 12 – Additional storage file names containing wreck

Database filename
1417_110420_Amy Gale – 0001.db
1418_110420_Amy Gale – 0001.db

5.3 Bottom Samples

A total of 42 bottom samples, 30 in area summarized in this report and 12 outside the scope of this report, were collected in state waters to supplement existing sediment data collected previously by other agencies (Maine Geological Survey and University of Maine) in the Matinicus Island survey area (Figure 30). The results of grain-size and video analyses will be used to calibrate, refine, and digitize interpretations of seafloor substrate. These data are also used to investigate how these data relate to benthic infauna in the survey area.

Additional details on the bottom samples are provided in Table 13. More detailed analysis of grain size composition of these samples and benthic fauna composition will be determined after laboratory processing is complete for the collected samples.

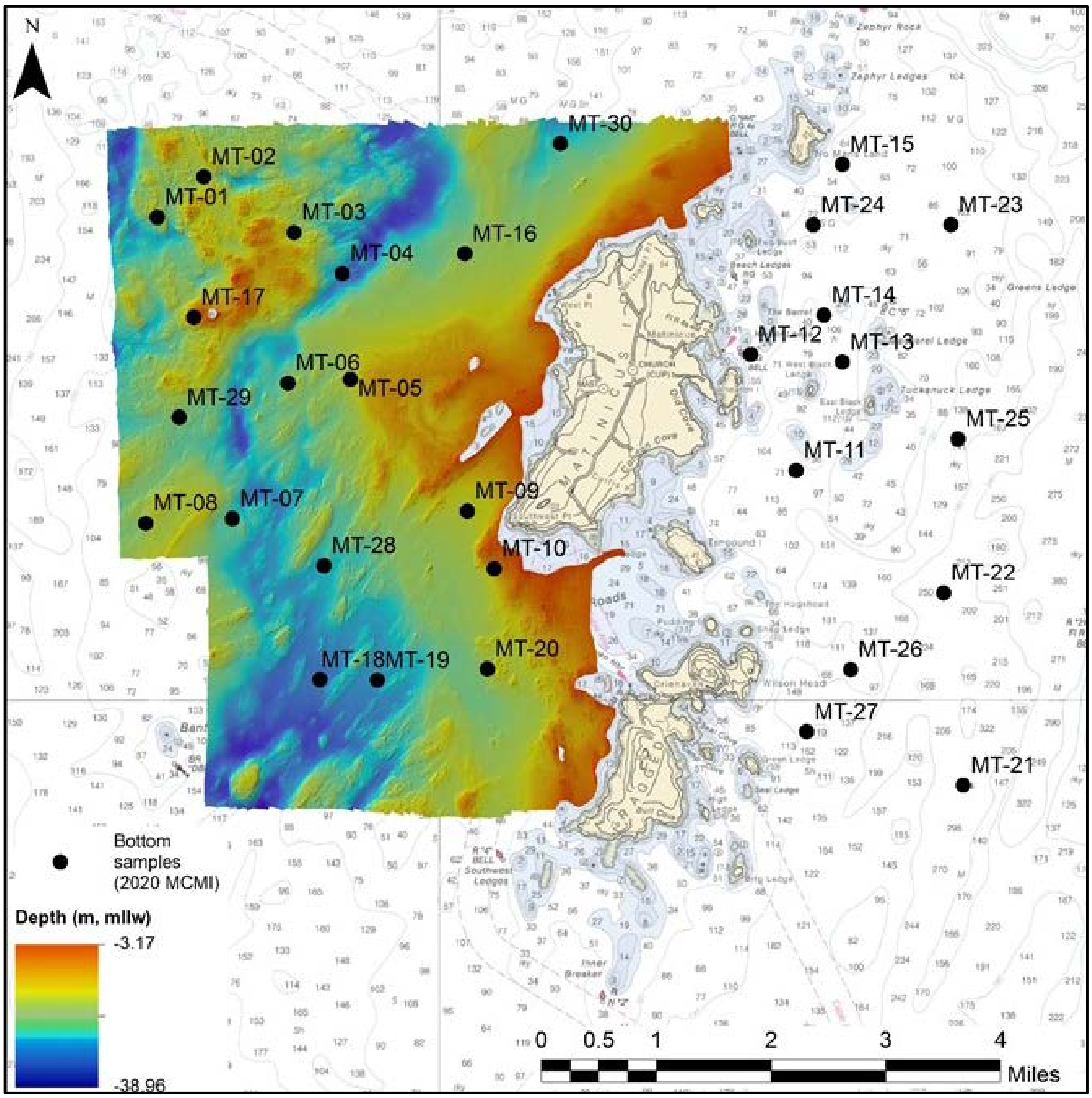


Figure 30 – Bottom sample locations collected near Matinicus Island.

Table 13 – Grab Sample Information

Site Name	Date	Latitude (decimal degrees N)	Longitude (decimal degrees W)	Depth (m)	Grain Size (field observation)	Backscatter Intensity (dB)	Kelp Present?
MT-01	7/21/20	43.877150	-68.952083	27.8	shell hash, trace fine gravel	-13.63	
MT-02	7/21/20	43.880817	-68.946200	26.5	shell hash	-12.37	
MT-03	7/21/20	43.875767	-68.934850	26.6	rock	-12.05	Y
MT-04	7/21/20	43.872050	-68.928767	46.3	mud with shell hash and some fine gravel	-8.27	
MT-05	7/21/20	43.862450	-68.927767	24.4	large rock in ponar	-9.85	
MT-06	7/21/20	43.862117	-68.935600	31.9	several cobbles 10-20 cm in length	-10.48	
MT-07	7/21/20	43.849800	-68.942617	38.7	mud with shell hash and some fine gravel	-9.53	
MT-08	7/21/20	43.849400	-68.953517	28.5	shell hash mixed with gravel, some mud	-11.74	
MT-09	7/24/20	43.850500	-68.913017	23.3	pebble-sized gravel and shell hash	-15.83	Y
MT-10	7/24/20	43.845283	-68.909667	16.2	rock with kelp	N/A	Y
MT-11	7/24/20	43.854183	-68.871617	27.4	mix of cobbles and shell hash, some gravel	N/A	
MT-12	7/24/20	43.864717	-68.877367	17.5	fine shell hash	N/A	Y
MT-13	7/24/20	43.864017	-68.865817	23.8	shell hash	N/A	Y
MT-14	7/24/20	43.868283	-68.868117	31.2	shell hash, trace mud	N/A	
MT-15	7/24/20	43.881933	-68.865817	22.6	rock	N/A	Y
MT-16	7/28/20	43.873833	-68.913333	29.3	muddy gravel and intact shells, some shell hash	-9.85	
MT-17	7/28/20	43.868083	-68.947483	13.3	rock with kelp	-8.90	Y
MT-18	7/28/20	43.835217	-68.931600	47.2	fine sandy mud, some shell fragments	-16.46	
MT-19	7/28/20	43.835167	-68.924350	43.7	mud	-15.83	
MT-20	7/28/20	43.836183	-68.910517	27.4	rock	-12.68	
MT-21	7/28/20	43.825633	-68.850583	79.6	mud	N/A	
MT-22	7/28/20	43.843083	-68.853067	63.1	mud with pebble-sized gravel intermixed	N/A	
MT-23	8/6/20	43.876467	-68.852133	38.7	sandy mud, some fine gravel	N/A	
MT-24	8/6/20	43.876450	-68.869467	25.1	gravel with shell hash, some mud	N/A	
MT-25	8/6/20	43.857050	-68.851250	46.0	rock	N/A	
MT-26	8/6/20	43.836133	-68.864750	48.2	rock	N/A	
MT-27	8/6/20	43.830500	-68.870300	54.1	muddy shell hash	N/A	
MT-28	8/6/20	43.845550	-68.931067	43.0	gravelly mud	-10.48	
MT-29	8/6/20	43.859000	-68.949300	34.2	mud with some shell hash	-8.27	
MT-30	8/6/20	43.883817	-68.901317	39.4	gravelly mud, some sand intermixed	-11.42	

6.0 Summary

From April to November of 2020, MCMI collected a total of approximately 45 mi^2 (117 km^2) of high-resolution multibeam data. 39 mi^2 (101 km^2) were collected in the "mainscheme" area of federal (18 mi^2) and state (21 mi^2) coastal marine waters. Approximately 6 mi^2 (16 km^2) were collected in nearshore waters. Except for numerous small holidays, multibeam coverage was 100% in all areas surveyed. Survey data were processed with 4-meter grid resolution, although 2-meter and 8-meter surfaces were also generated for submission with this report. Comparisons between these survey data and the largest scale nautical charts in the immediate vicinity show good overall agreement except for in surveyed areas at depths greater than 120 feet (locality off Matinicus Island) and 300 feet (all other localities). Overall, these data are of sufficient quality to supersede previous data collected in the vicinity. It is recommended that the corresponding charts be updated to reflect these data.

MCMI has utilized final data products for high-resolution backscatter and bathymetry to refine existing seafloor sediment maps. When combined with existing geophysical (e.g. seismic reflection profiles and side-scan sonar) data, these data may also be used to refine interpretations of coastal/nearshore geomorphology and three-dimensional assessments of potential sediment resources/valley fill in the region. In addition, these data are a critical component of benthic habitat classification and modeling performed by MCMI. Overall, these data have a variety of applications and are an invaluable resource to public and private agencies who wish to manage and understand coastal and marine resources more effectively.

These data were acquired and processed to meet Office of Coast Survey bathymetry standards as best as possible and were shared with the NOAA Office of Coast Survey for review.

Please contact the Maine Coastal Program's Research Coordinator for additional information or data requests.

References

NOAA, 2017. NOS hydrographic surveys specifications and deliverables: U.S Department of Commerce National Oceanic and Atmospheric Administration. 162 Pages.

U.S. Department of the Interior, 2014. Proposed geophysical and geological activities in the Atlantic OCS to identify sand resources and borrow areas north Atlantic, mid-Atlantic, and south Atlantic-Straits of Florida planning areas, *final environmental assessment.* OCS EIS/EA BOEM 2013-219 U.S. Department of the Interior Bureau of Ocean Energy Management Division of Environmental Assessment Herndon, VA, January 2014.

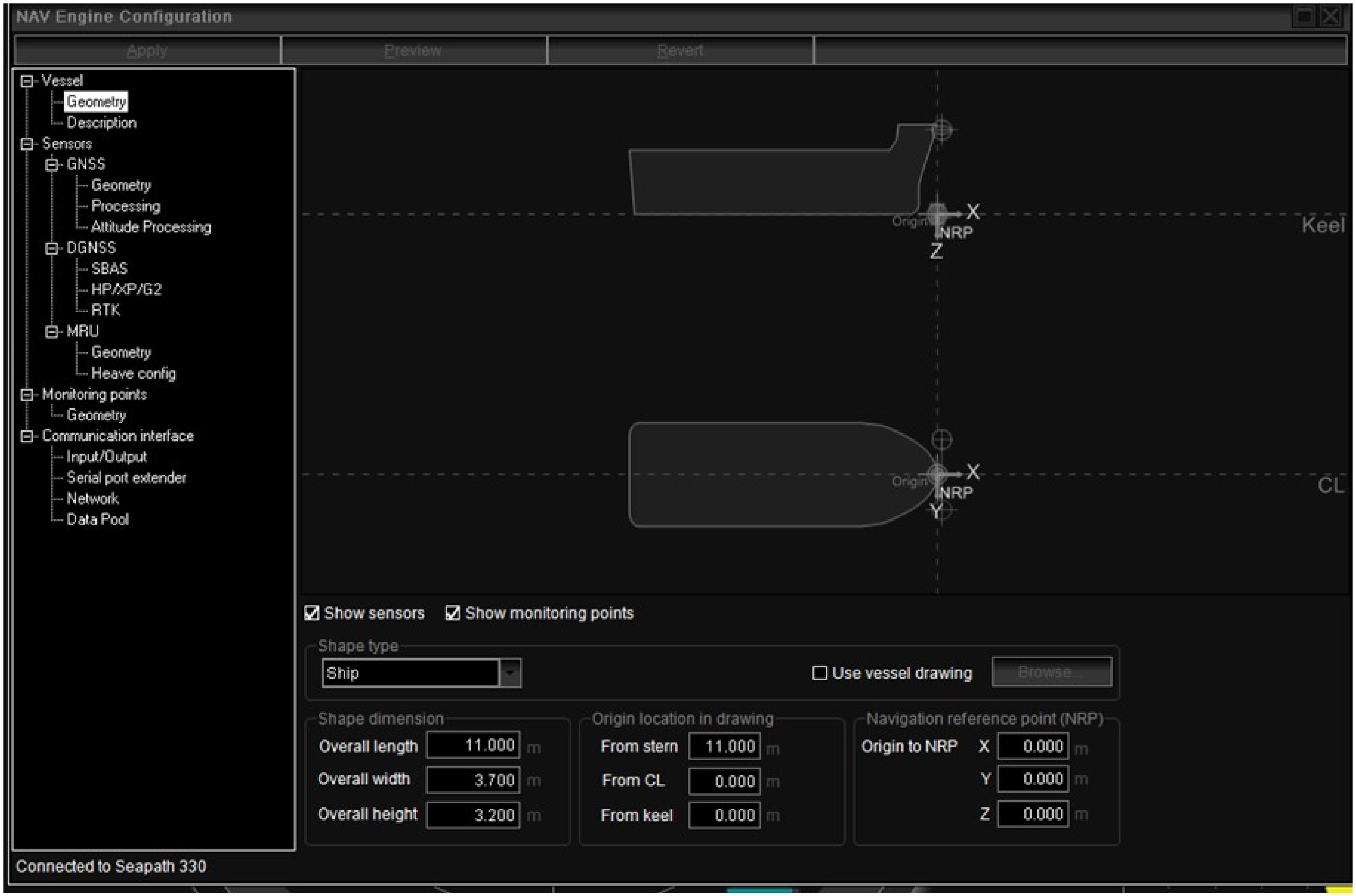
Appendix A – Specific dates of data acquisition for surveys

Dates (mm/dd/yy) of Data Acquisition for 2020 Surveys*

Mainscheme	Inshore
4/16/20	4/15/20
5/6/20	5/11/20
5/26/20	5/14/20
6/1/20	5/18/20
6/17/20	5/25/20
6/18/20	6/2/20
6/23/20	6/4/20
6/26/20	6/8/20
7/6/20	6/9/20
7/7/20	6/16/20
7/14/20	8/13/20
7/22/20	8/14/20
7/23/20	8/19/20
7/27/20	8/25/20
7/30/20	8/27/20
8/7/20	9/3/20
8/10/20	10/5/20
8/20/20	10/21/20
9/4/20	10/22/20
9/7/20	10/26/20
9/8/20	10/28/20
9/10/20	11/4/20
10/19/20	11/9/20
10/20/20	11/10/20
	11/12/20
	11/13/20

*Dates of surveys not summarized in this report not listed

Appendix B – 2020 Configuration settings for Seapath 330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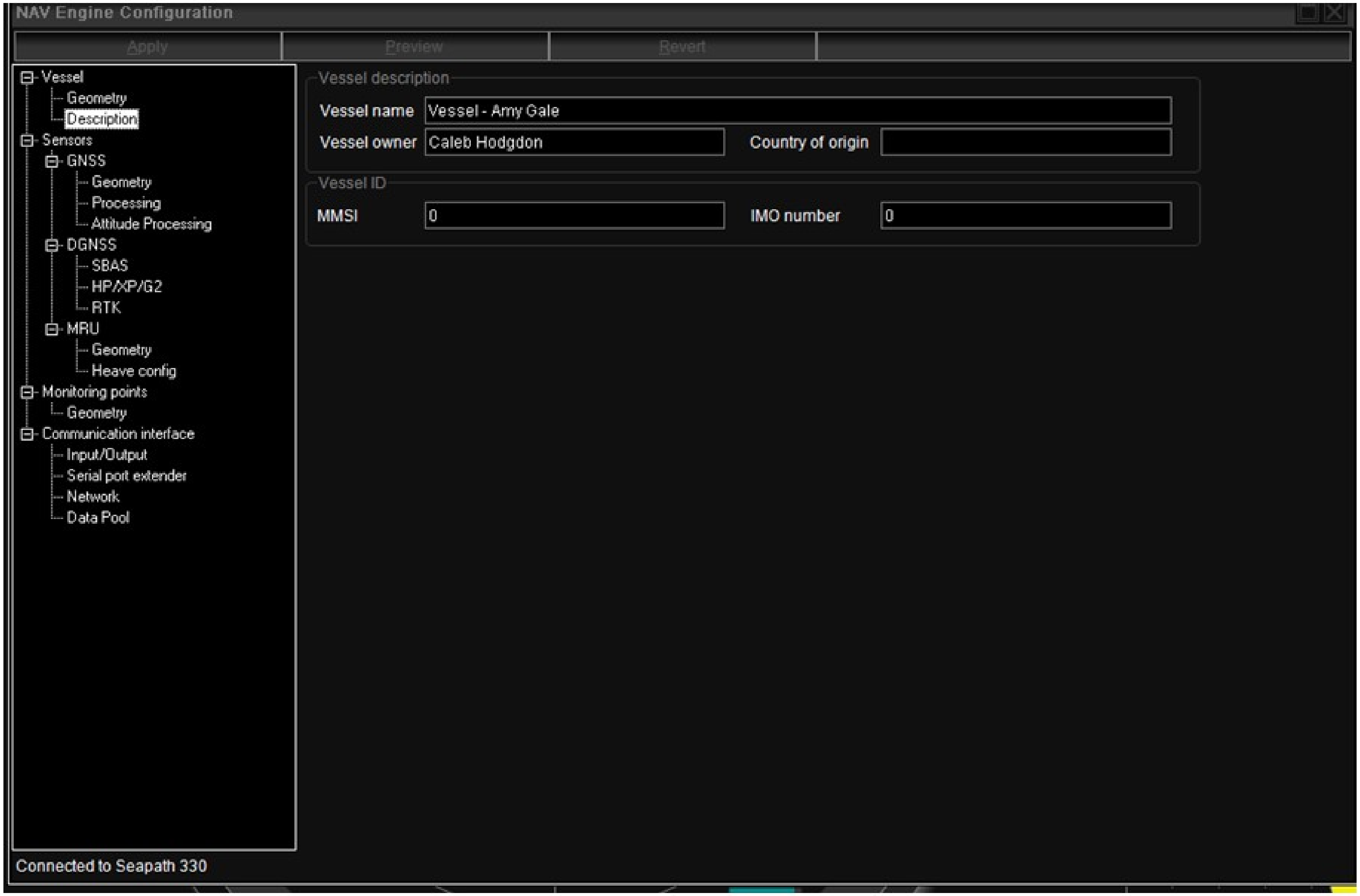
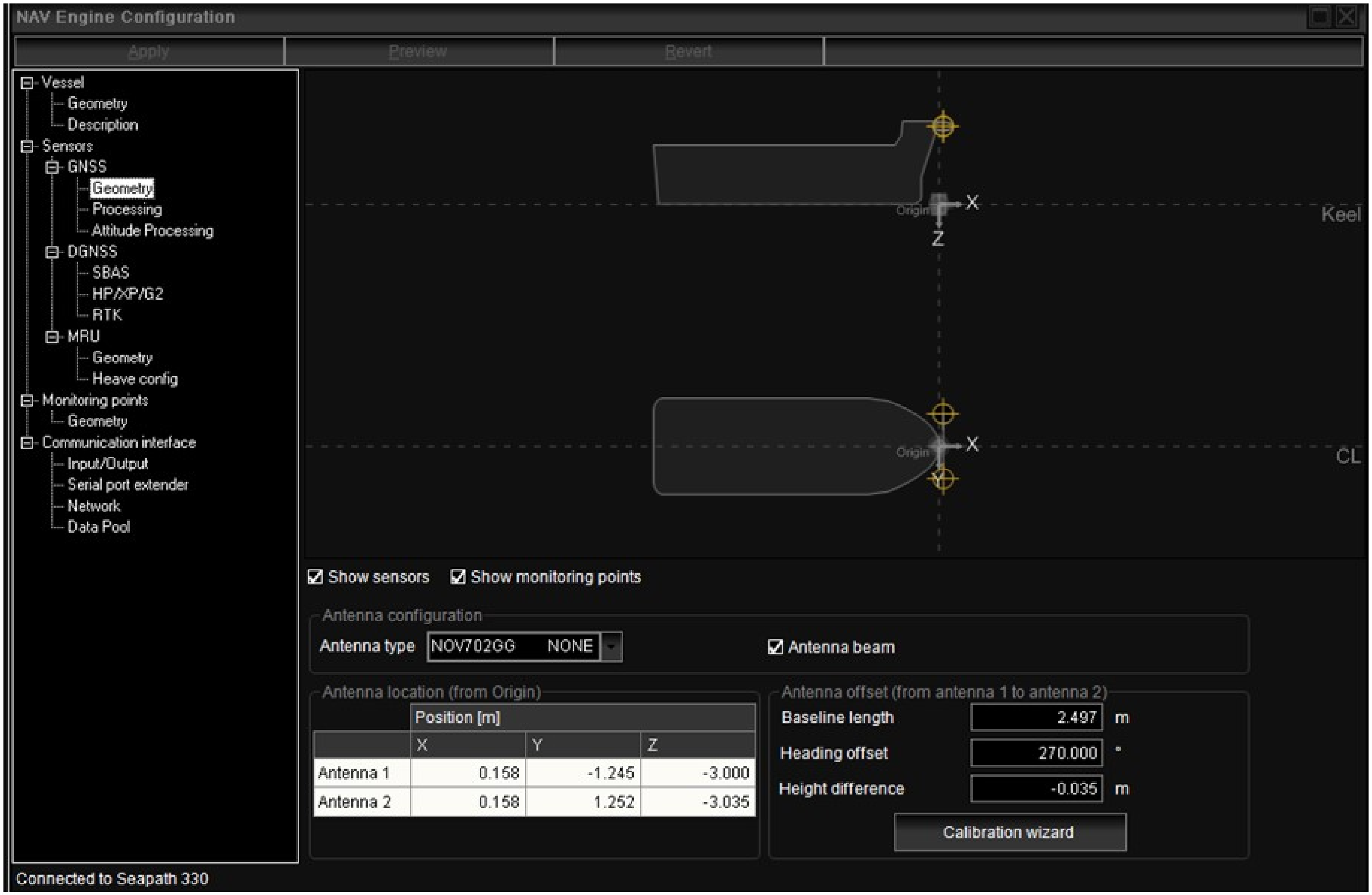
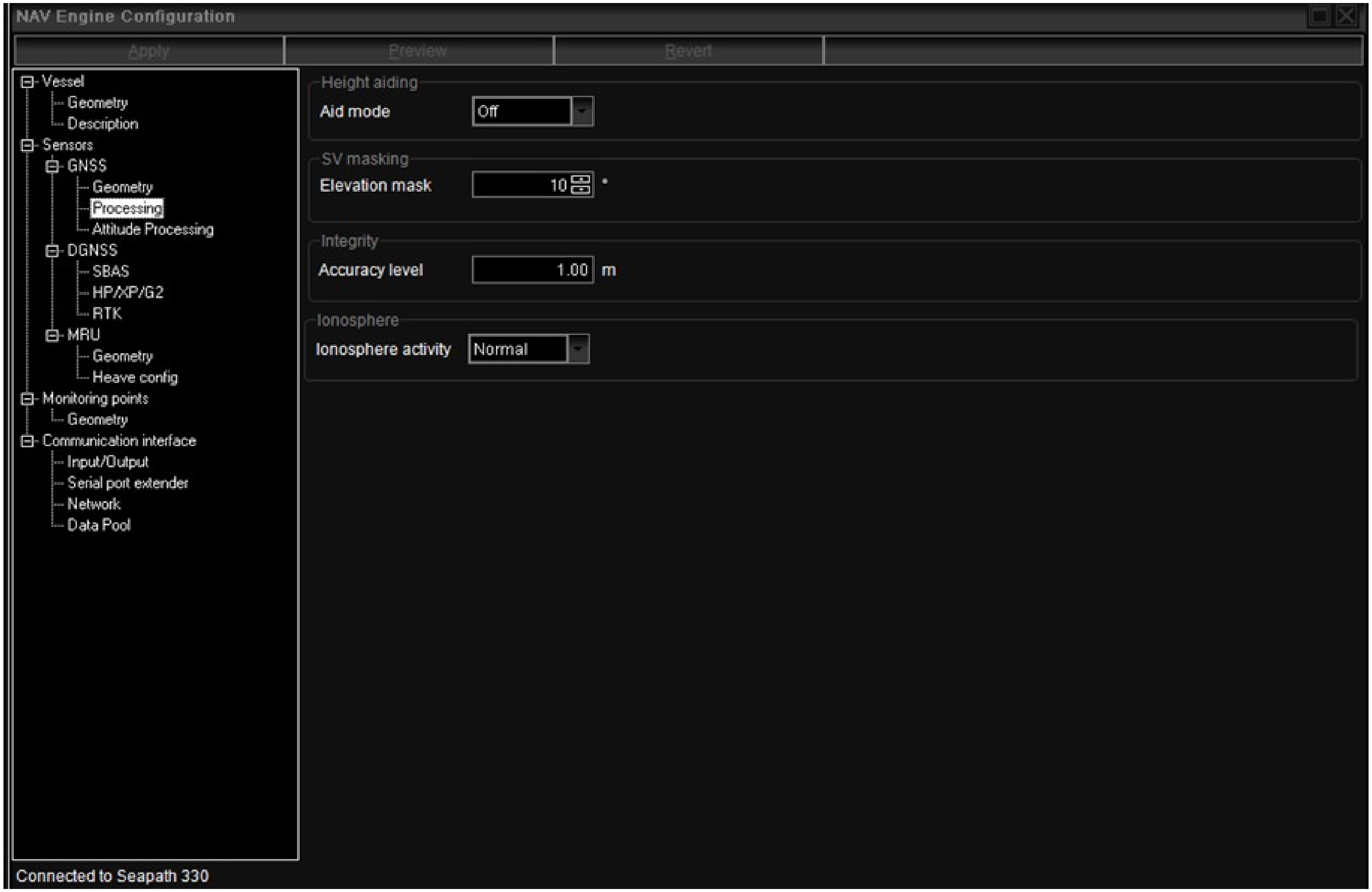
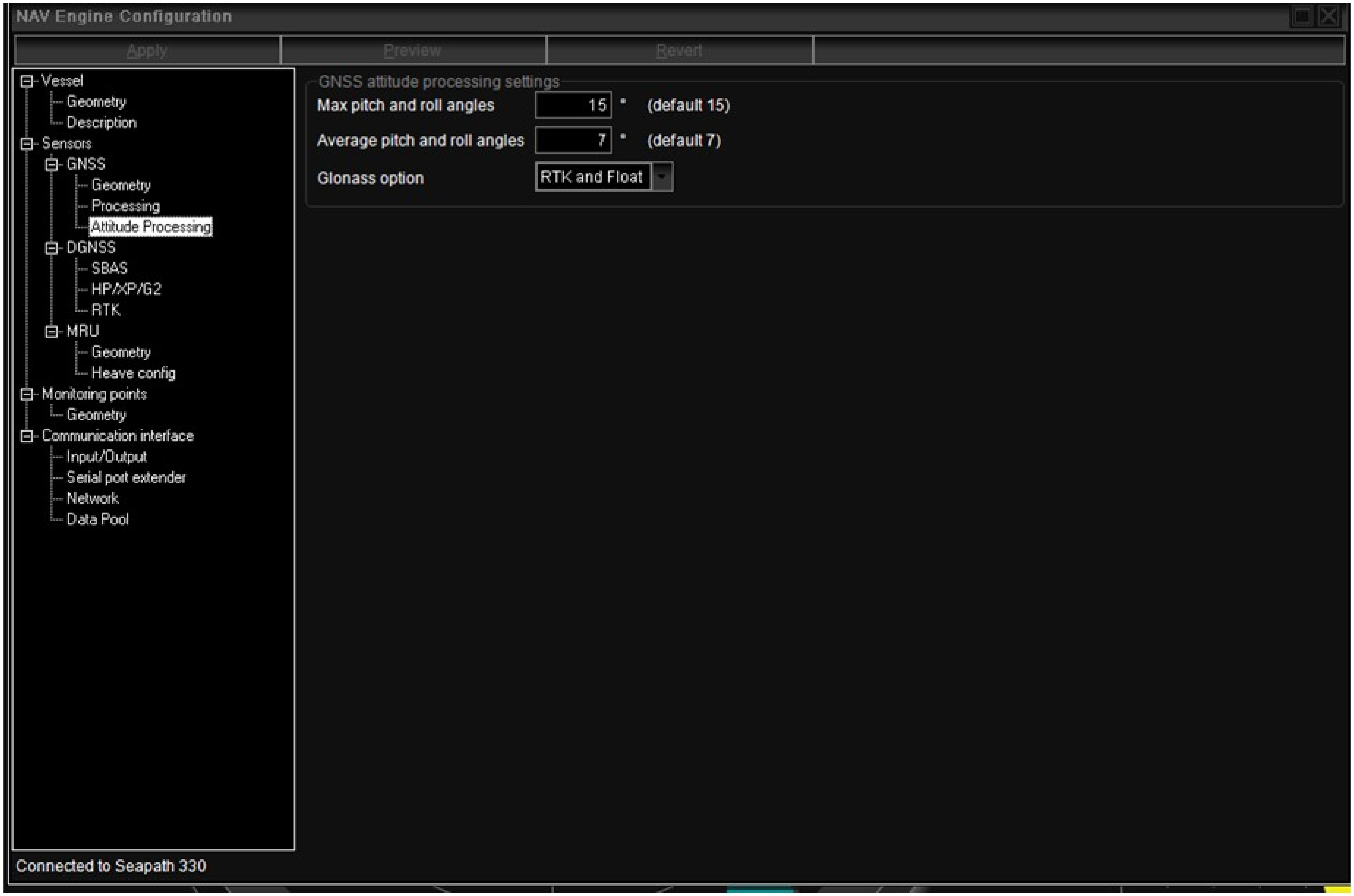
Apply
Preview
Revert
Vessel
Geometry
Description
Sensors
GNSS
Geometry
Processing
Attitude Processing
DGNSS
SBAS
HP/XP/G2
RTK
MRU
Geometry
Heave config
Monitoring points
Geometry
Communication interface
Input/Output
Serial port extender
Network
Data Pool
X
NRP
Z
Keel
X
NRP
Y
CL
Show sensors
Show monitoring points
Shape type
Ship
Use vessel drawing
Browse...
Shape dimension
Overall length 11.000 m
Overall width 3.700 m
Overall height 3.200 m
Origin location in drawing
From stern 11.000 m
From CL 0.000 m
From keel 0.000 m
Navigation reference point (NRP)
Origin to NRP X 0.000 m
Y 0.000 m
Z 0.000 m
Connected to Seapath 330

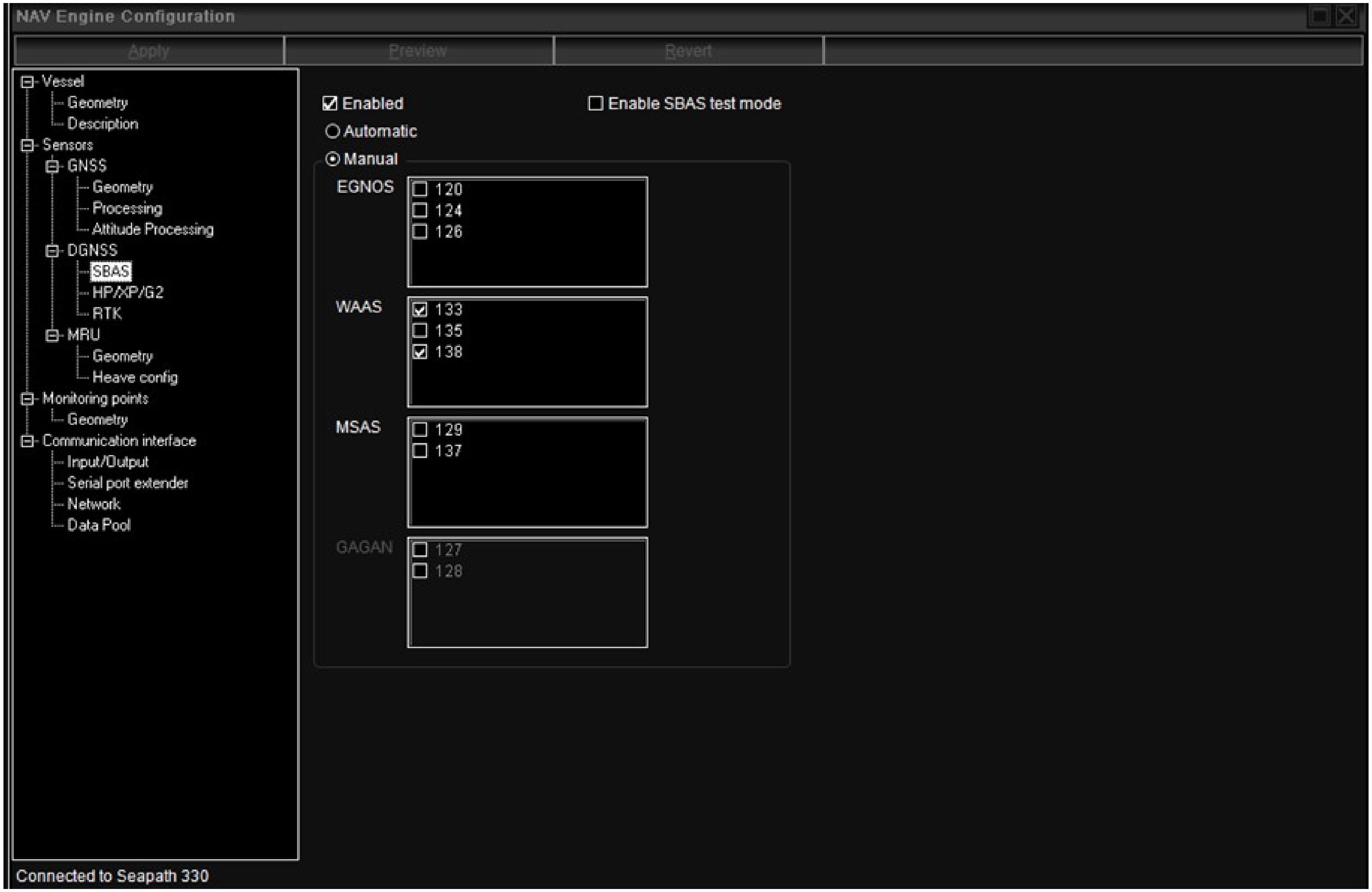

NAV Engine Configuration
Apply
Preview
Revert
Vessel
Geometry
Description
Sensors
GNSS
Geometry
Processing
Attitude Processing
DGNSS
SBAS
HP/XP/G2
RTK
MRU
Geometry
Heave config
Monitoring points
Geometry
Communication interface
Input/Output
Serial port extender
Network
Data Pool
Vessel description
Vessel name
Vessel - Amy Gale
Vessel owner
Caleb Hodgdon
Country of origin
Vessel ID
MMSI
0
IMO number
0
Connected to Seapath 330

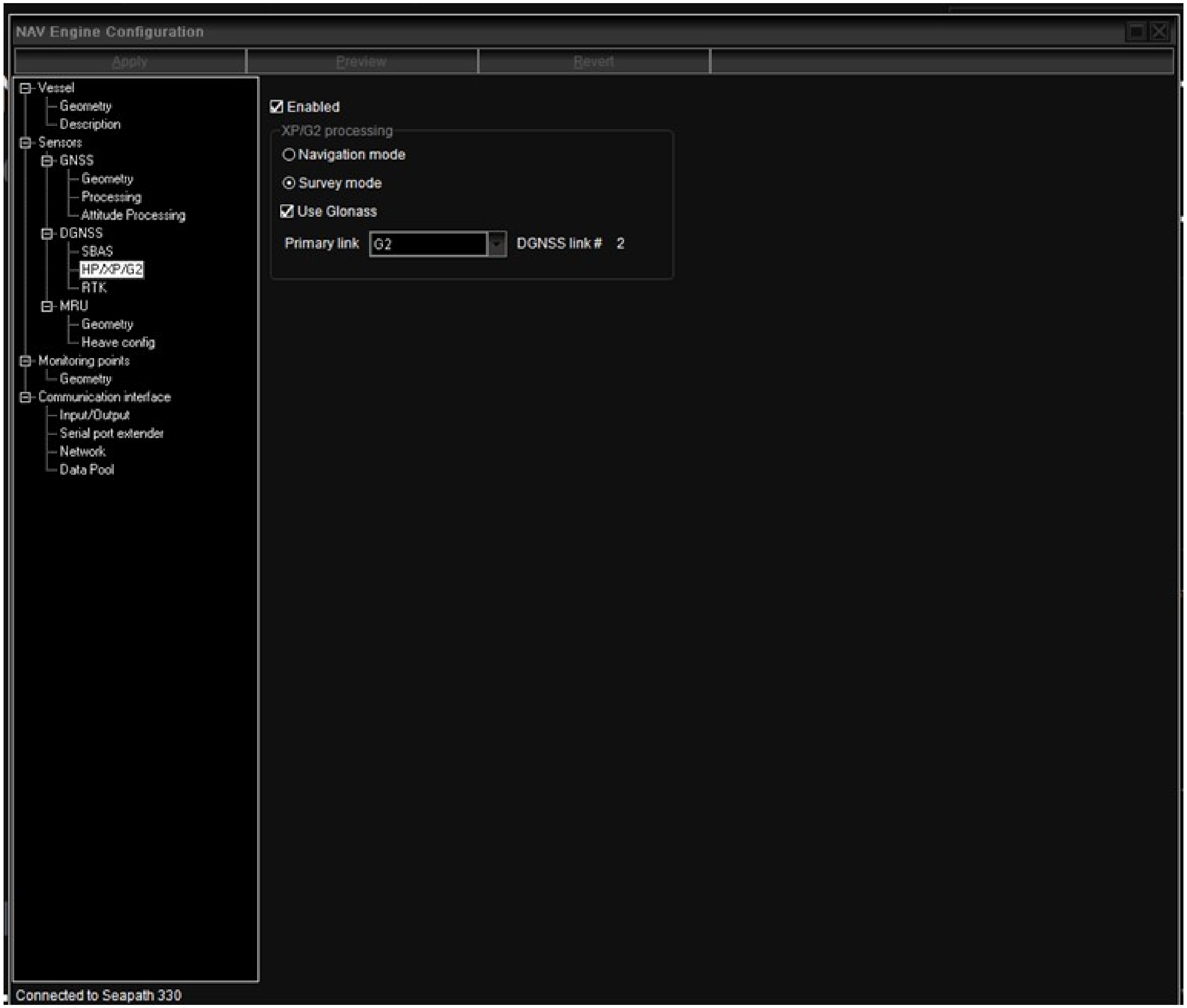

NAV Engine Configuration
Apply
Preview
Revert
Vessel
Geometry
Description
Sensors
GNSS
Geometry
Processing
Attitude Processing
DGNSS
SBAS
HP/XP/G2
RTK
MRU
Geometry
Heave config
Monitoring points
Geometry
Communication interface
Input/Output
Serial port extender
Network
Data Pool
X
Z
Keel
X
CL
Show sensors
Show monitoring points
Antenna configuration
Antenna type
NOV702GG NONE
Antenna beam
Antenna location (from Origin)
Position [m]
X
Y
Z
Antenna 1 0.158 -1.245 -3.000
Antenna 2 0.158 1.252 -3.035
Antenna offset (from antenna 1 to antenna 2)
Baseline length 2.497 m
Heading offset 270.000 °
Height difference -0.035 m
Calibration wizard
Connected to Seapath 330

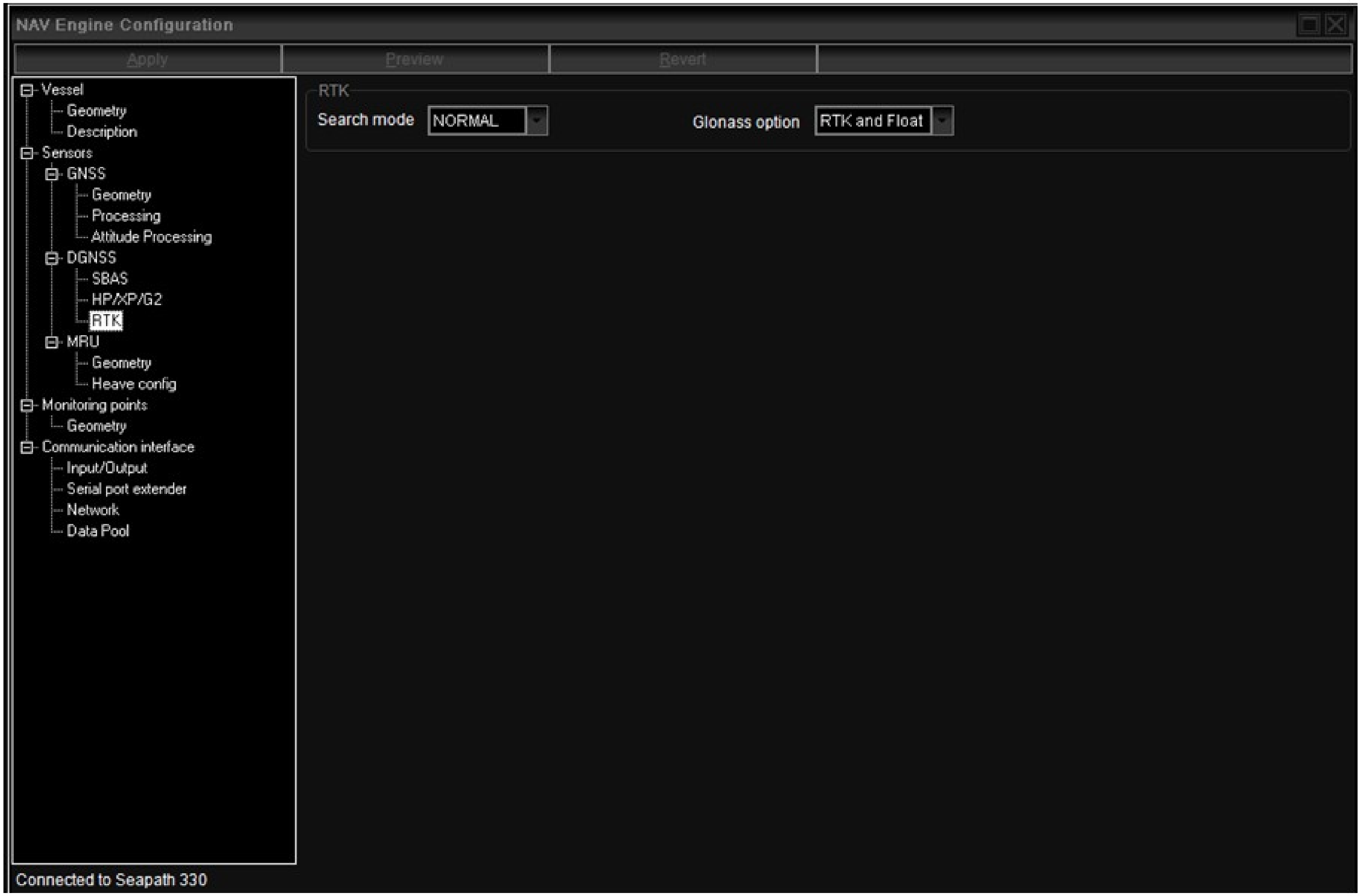


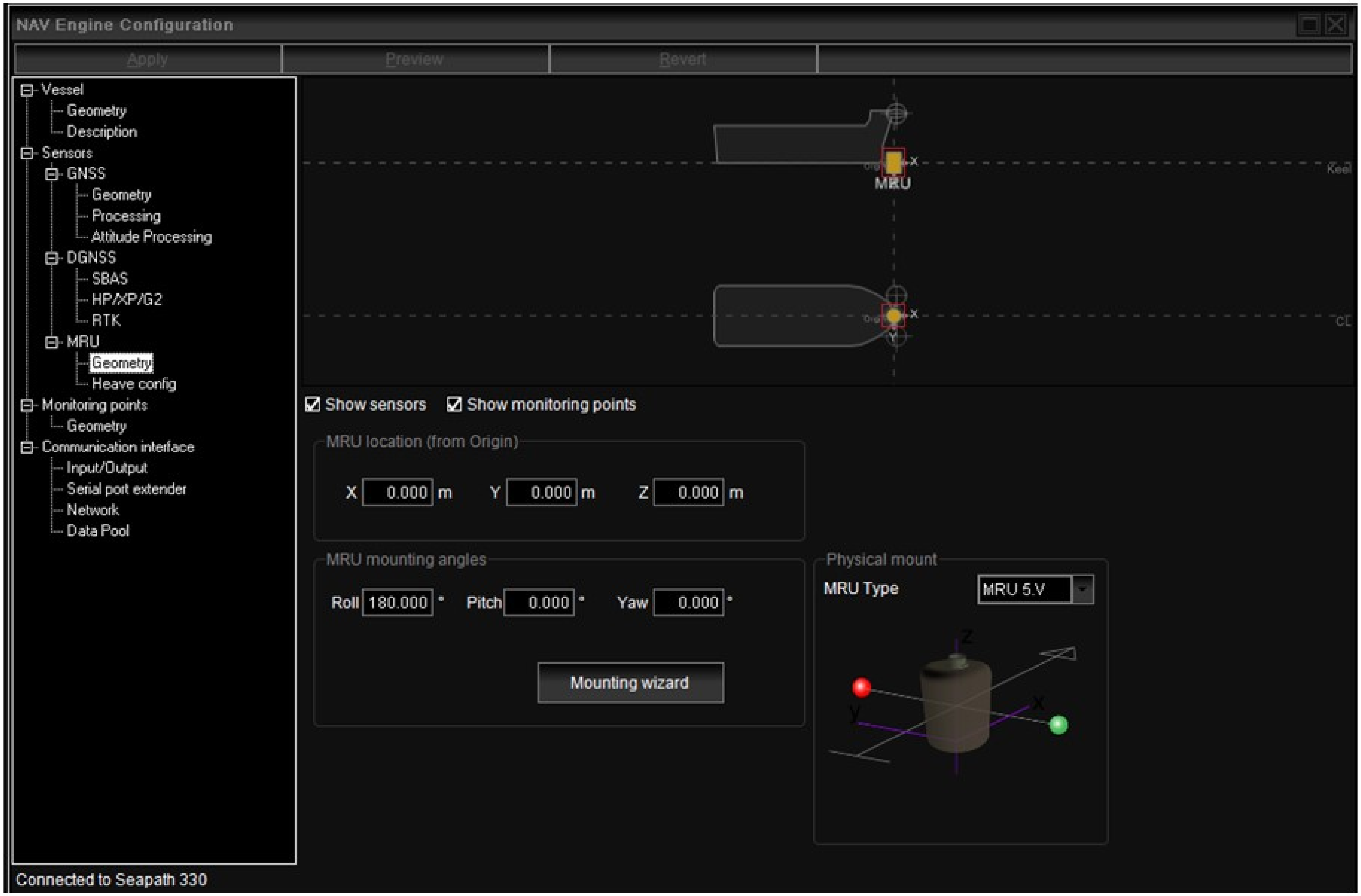
NAV Engine Configuration
Apply
Preview
Revert
Vessel
Geometry
Description
Sensors
GNSS
Geometry
Processing
Attitude Processing
DGNSS
SBAS
HP/XP/G2
RTK
MRU
Geometry
Heave config
Monitoring points
Geometry
Communication interface
Input/Output
Serial port extender
Network
Data Pool
Height aiding
Aid mode
Off
SV masking
Elevation mask
10
°
Integrity
Accuracy level
1.00
m
Ionosphere
Ionosphere activity
Normal
Connected to Seapath 330

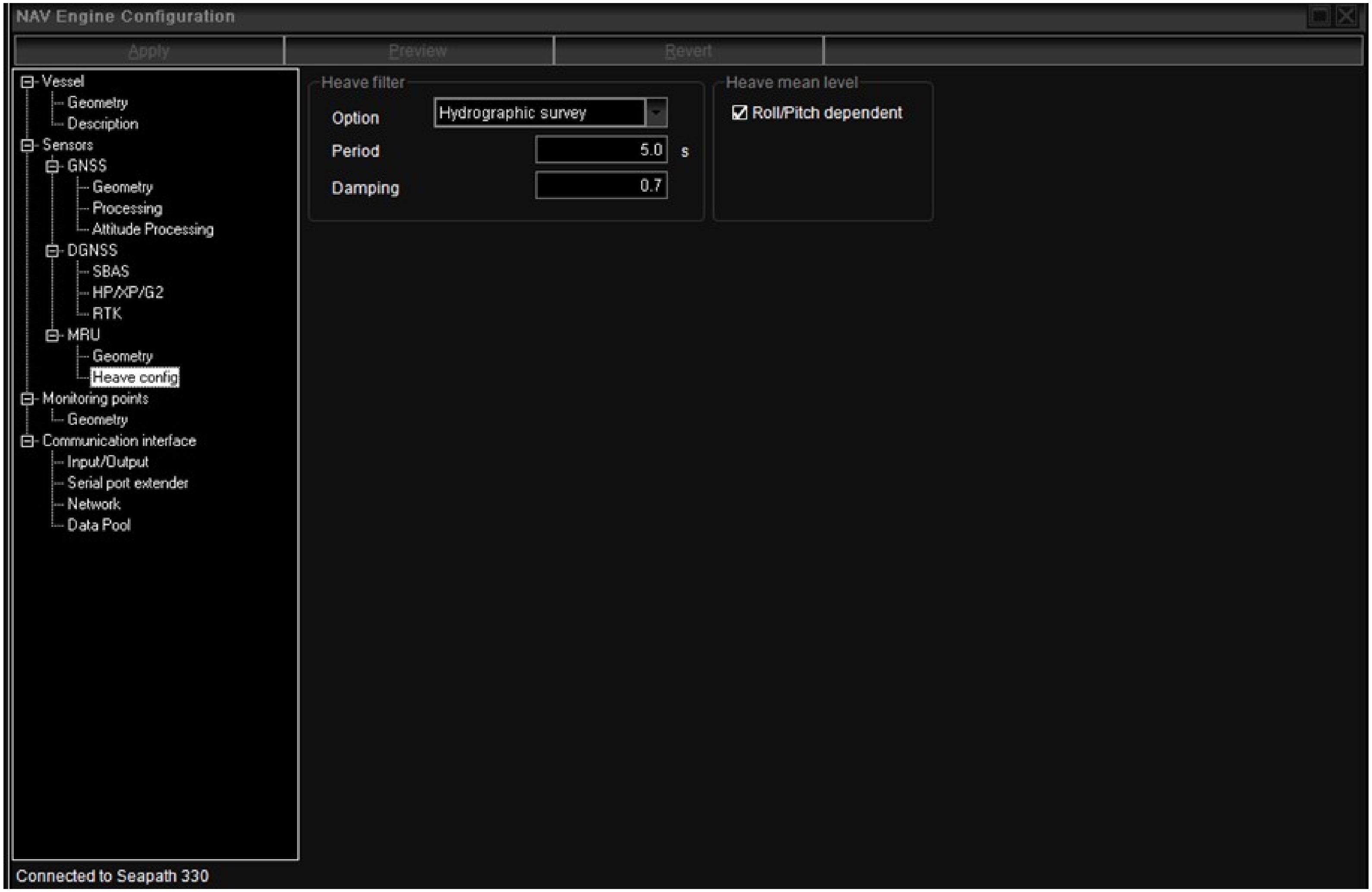

NAV Engine Configuration
Apply
Preview
Revert
Vessel
Geometry
Description
Sensors
GNSS
Geometry
Processing
Attitude Processing
DGNSS
SBAS
HP/XP/G2
RTK
MRU
Geometry
Heave config
Monitoring points
Geometry
Communication interface
Input/Output
Serial port extender
Network
Data Pool
GNSS attitude processing settings
Max pitch and roll angles 15 ° (default 15)
Average pitch and roll angles 7 ° (default 7)
Glonass option RTK and Float
Connected to Seapath 330

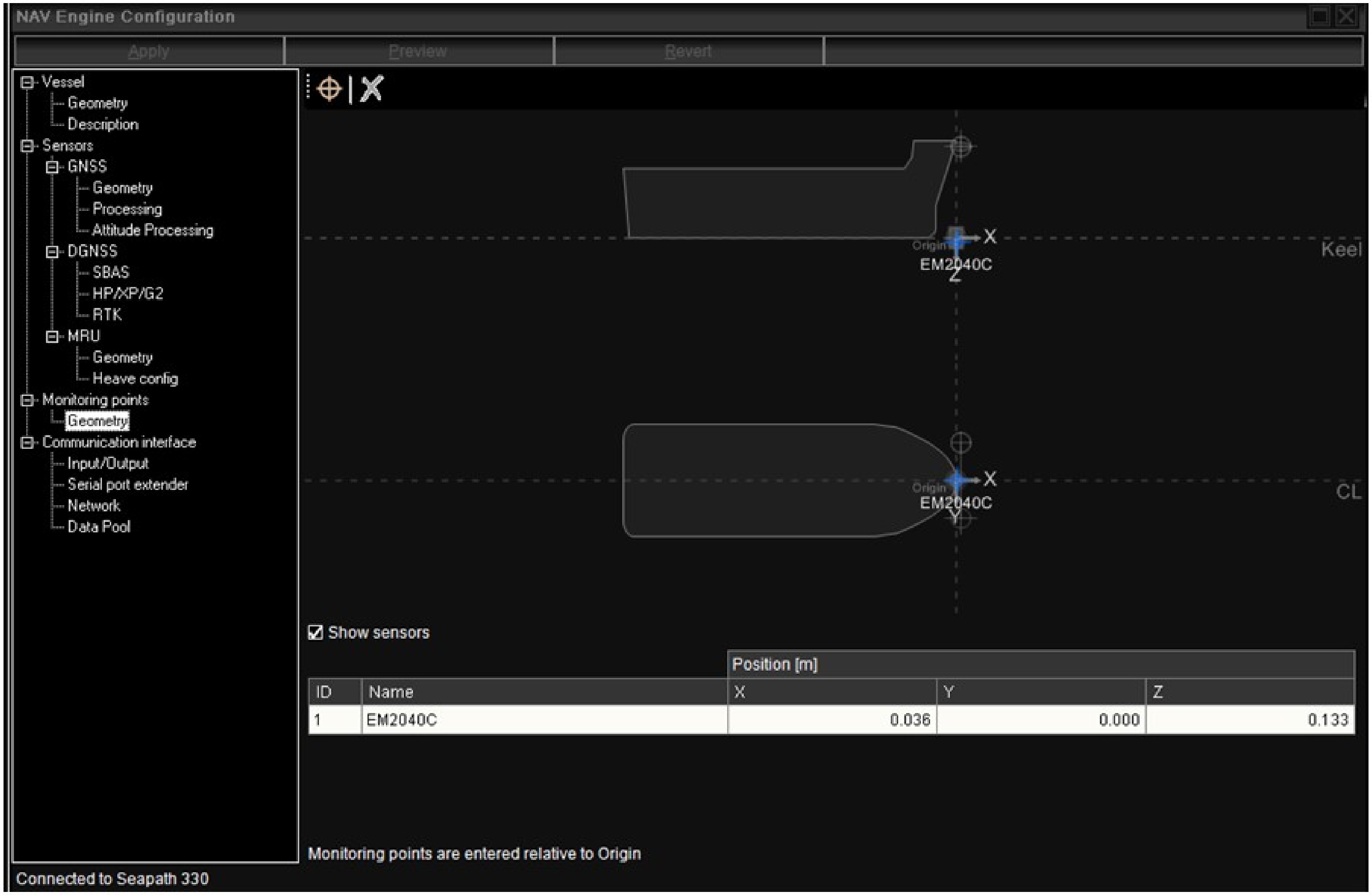

NAV Engine Configuration
Apply
Preview
Revert
Vessel
Geometry
Description
Sensors
GNSS
Geometry
Processing
Attitude Processing
DGNSS
SBAS
HP/XP/G2
RTK
MRU
Geometry
Heave config
Monitoring points
Geometry
Communication interface
Input/Output
Serial port extender
Network
Data Pool
Enabled
Enable SBAS test mode
Automatic
Manual
EGNOS
120
124
126
WAAS
133
135
138
MSAS
129
137
GAGAN
127
128
Connected to Seapath 330

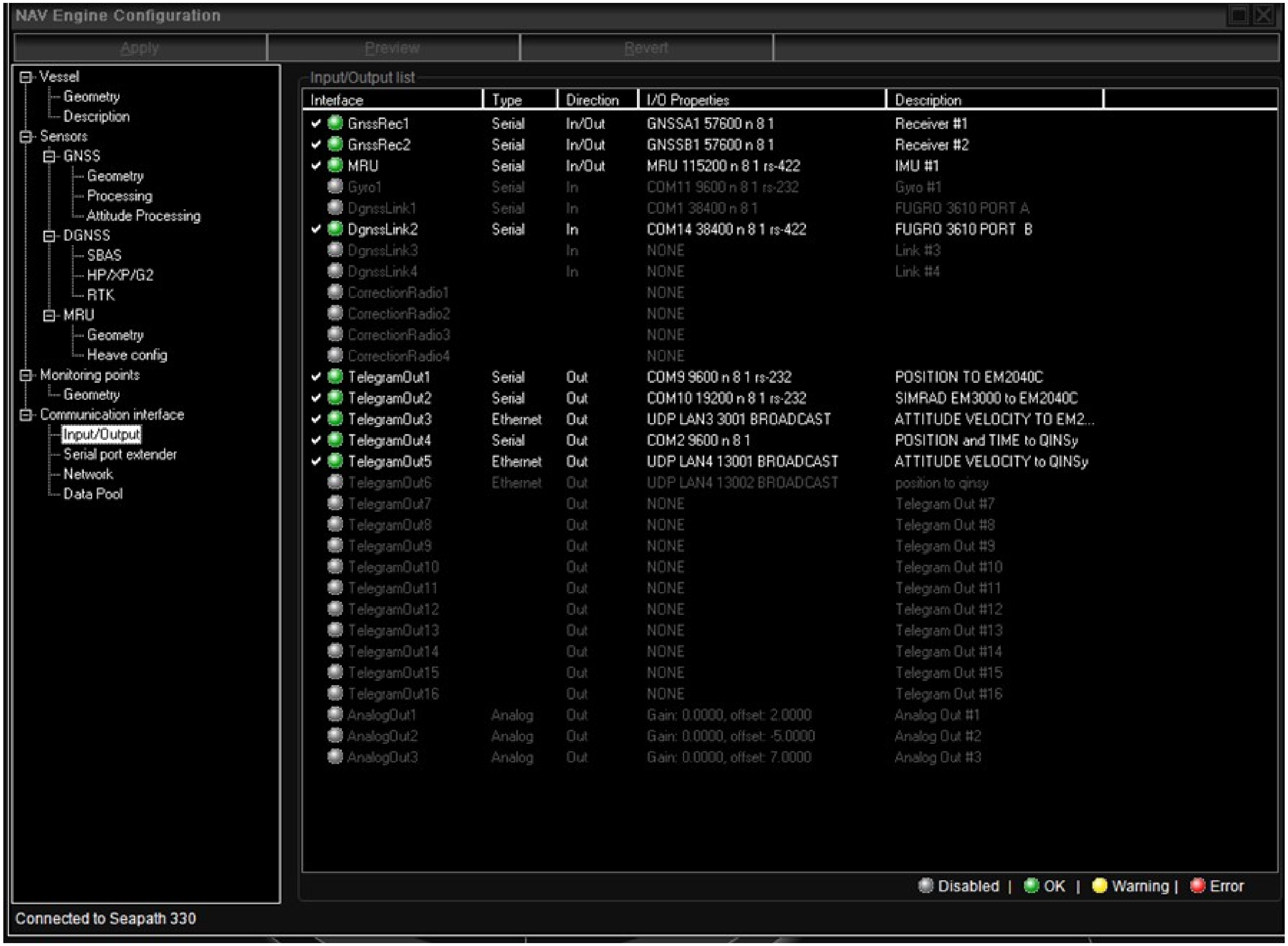

NAV Engine Configuration
Apply
Preview
Revert
Vessel
Geometry
Description
Sensors
GNSS
Geometry
Processing
Attitude Processing
DGNSS
SBAS
HP/XP/G2
RTK
MRU
Geometry
Heave config
Monitoring points
Geometry
Communication interface
Input/Output
Serial port extender
Network
Data Pool
Enabled
XP/G2 processing
Navigation mode
Survey mode
Use Glonass
Primary link
G2
DGNSS link #
2
Connected to Seapath 330

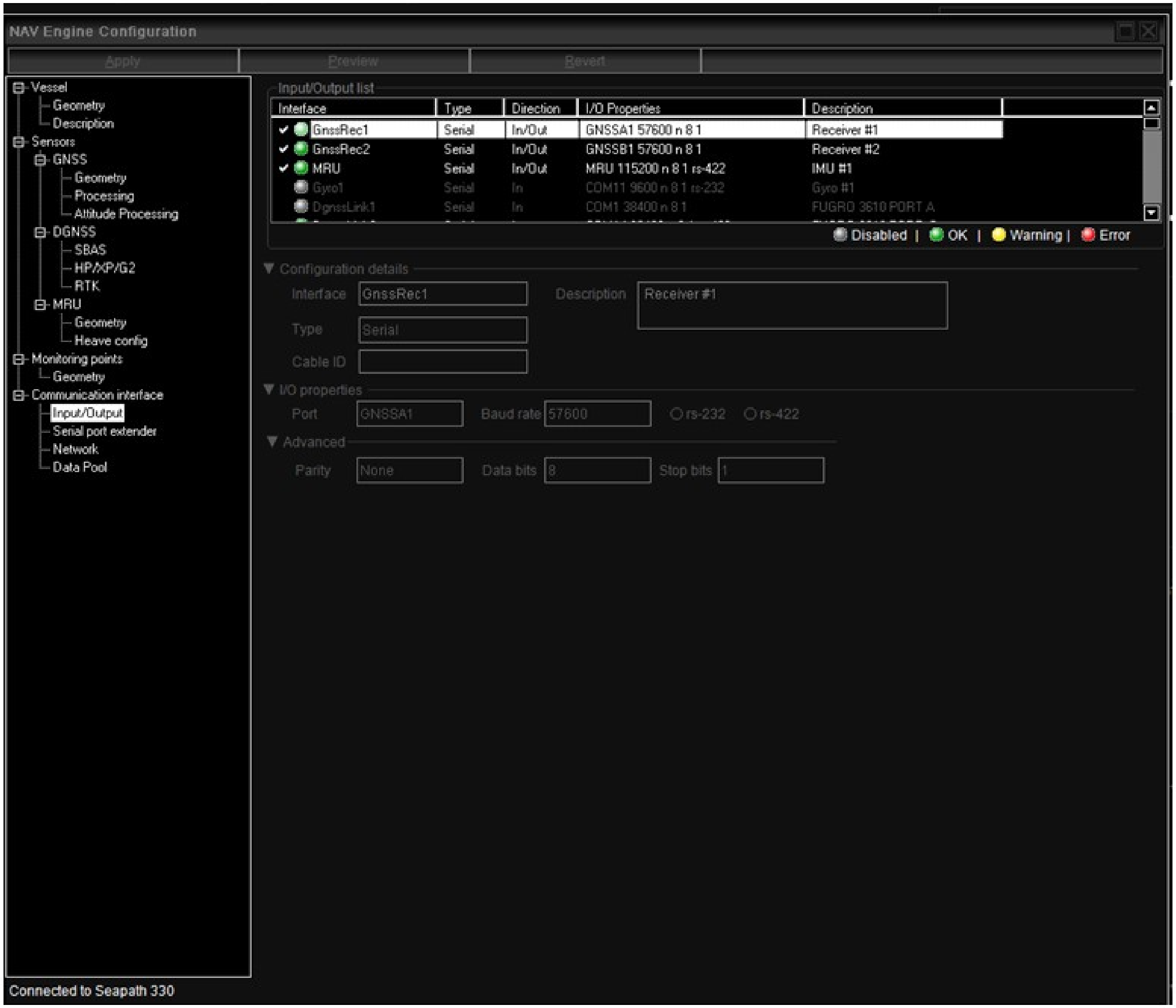

NAV Engine Configuration
Apply
Preview
Revert
Vessel
Geometry
Description
Sensors
GNSS
Geometry
Processing
Attitude Processing
DGNSS
SBAS
HP/XP/G2
RTK
MRU
Geometry
Heave config
Monitoring points
Geometry
Communication interface
Input/Output
Serial port extender
Network
Data Pool
Connected to Seapath 330
RTK
Search mode
NORMAL
Glonass option
RTK and Float

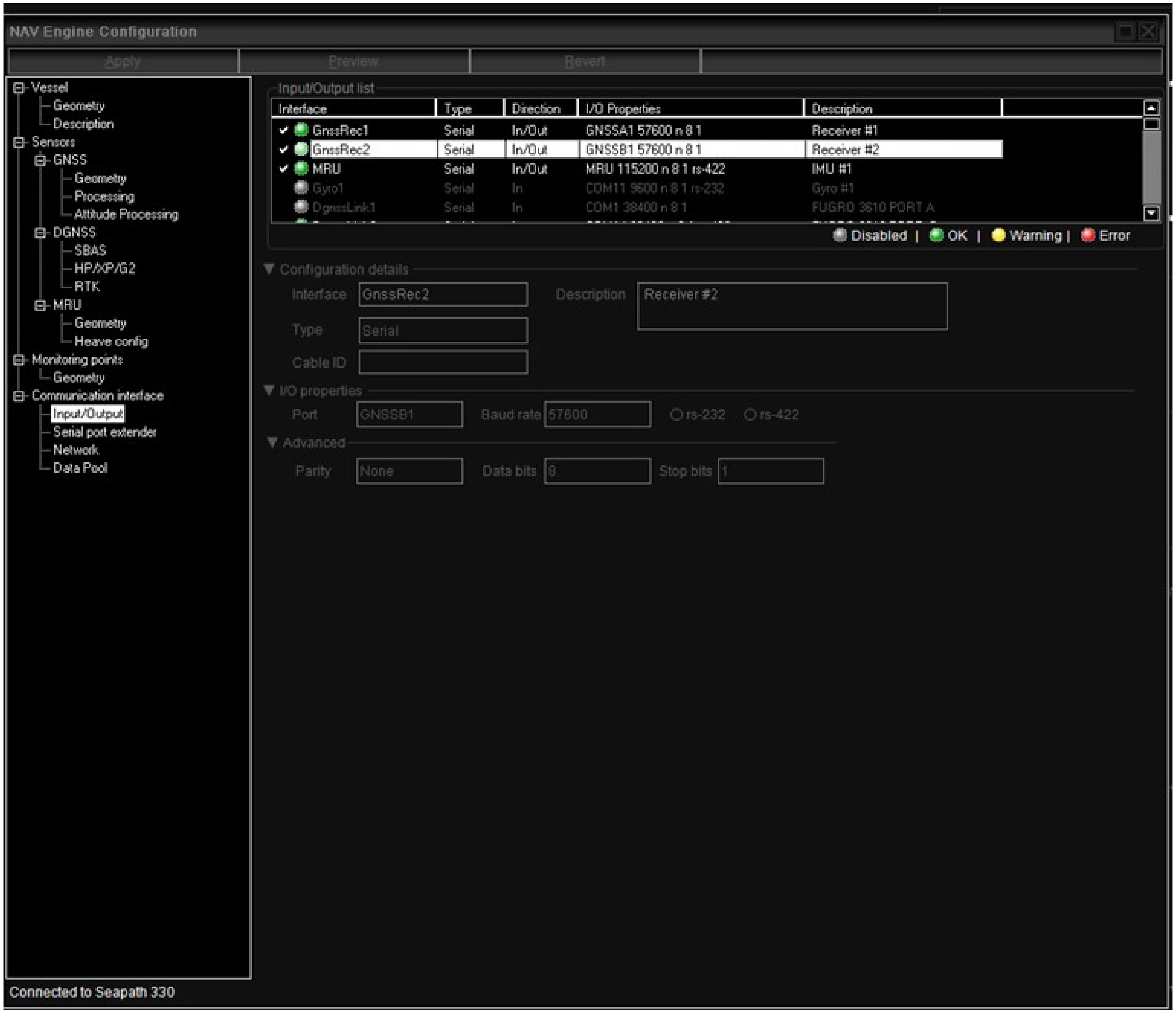

NAV Engine Configuration
Apply
Preview
Revert
Vessel
Geometry
Description
Sensors
GNSS
Geometry
Processing
Attitude Processing
DGNSS
SBAS
HP/XP/G2
RTK
MRU
Geometry
Heave config
Monitoring points
Geometry
Communication interface
Input/Output
Serial port extender
Network
Data Pool
MRU
Keel
CL
Show sensors
Show monitoring points
MRU location (from Origin)
X 0.000 m
Y 0.000 m
Z 0.000 m
MRU mounting angles
Roll 180.000 °
Pitch 0.000 °
Yaw 0.000 °
Mounting wizard
Physical mount
MRU Type
MRU 5.V
Connected to Seapath 330

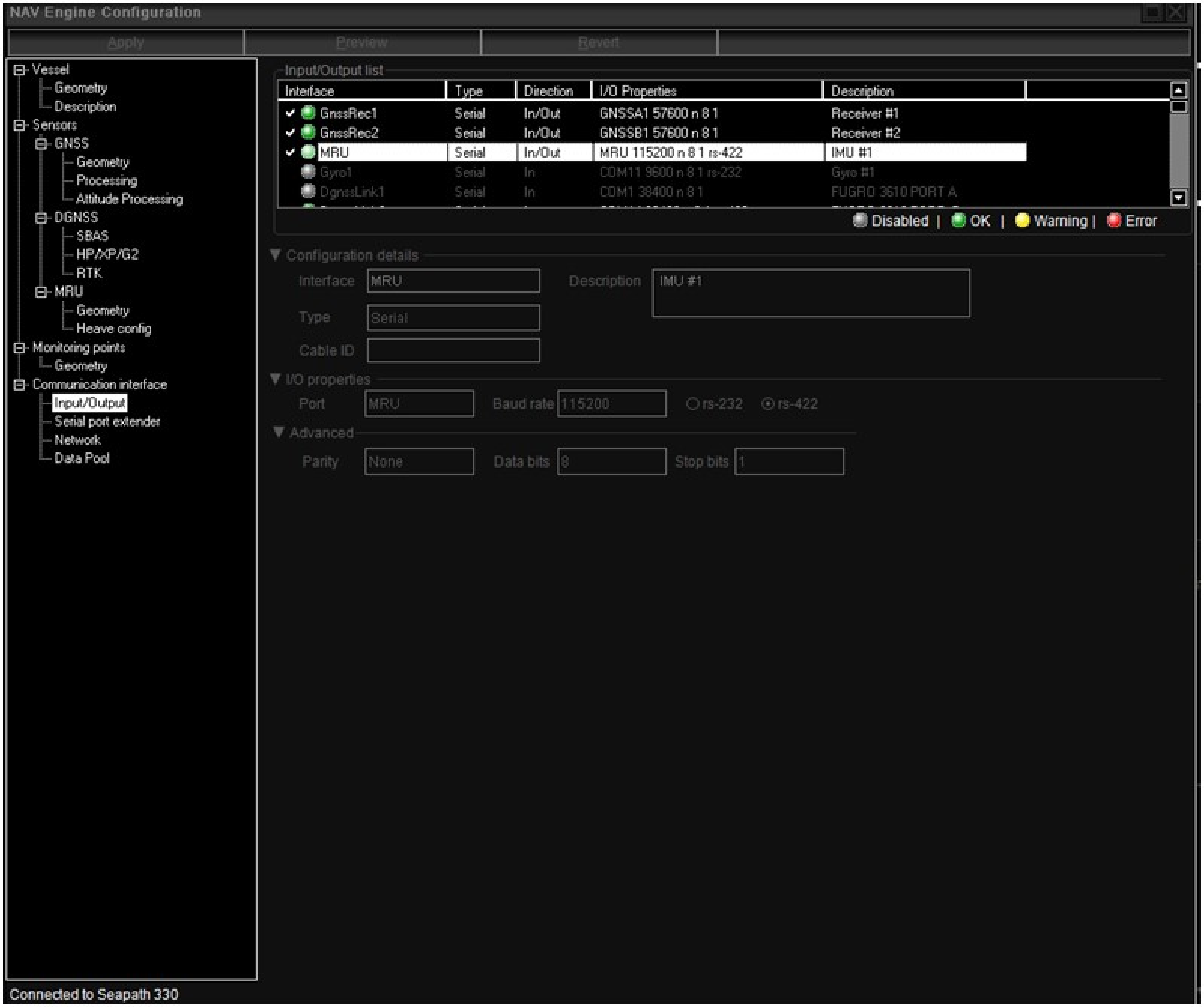

NAV Engine Configuration
Apply
Preview
Revert
Vessel
Geometry
Description
Sensors
GNSS
Geometry
Processing
Attitude Processing
DGNSS
SBAS
HP/XP/G2
RTK
MRU
Geometry
Heave config
Monitoring points
Geometry
Communication interface
Input/Output
Serial port extender
Network
Data Pool
Heave filter
Option
Hydrographic survey
Period
5.0
s
Damping
0.7
Heave mean level
Roll/Pitch dependent
Connected to Seapath 330

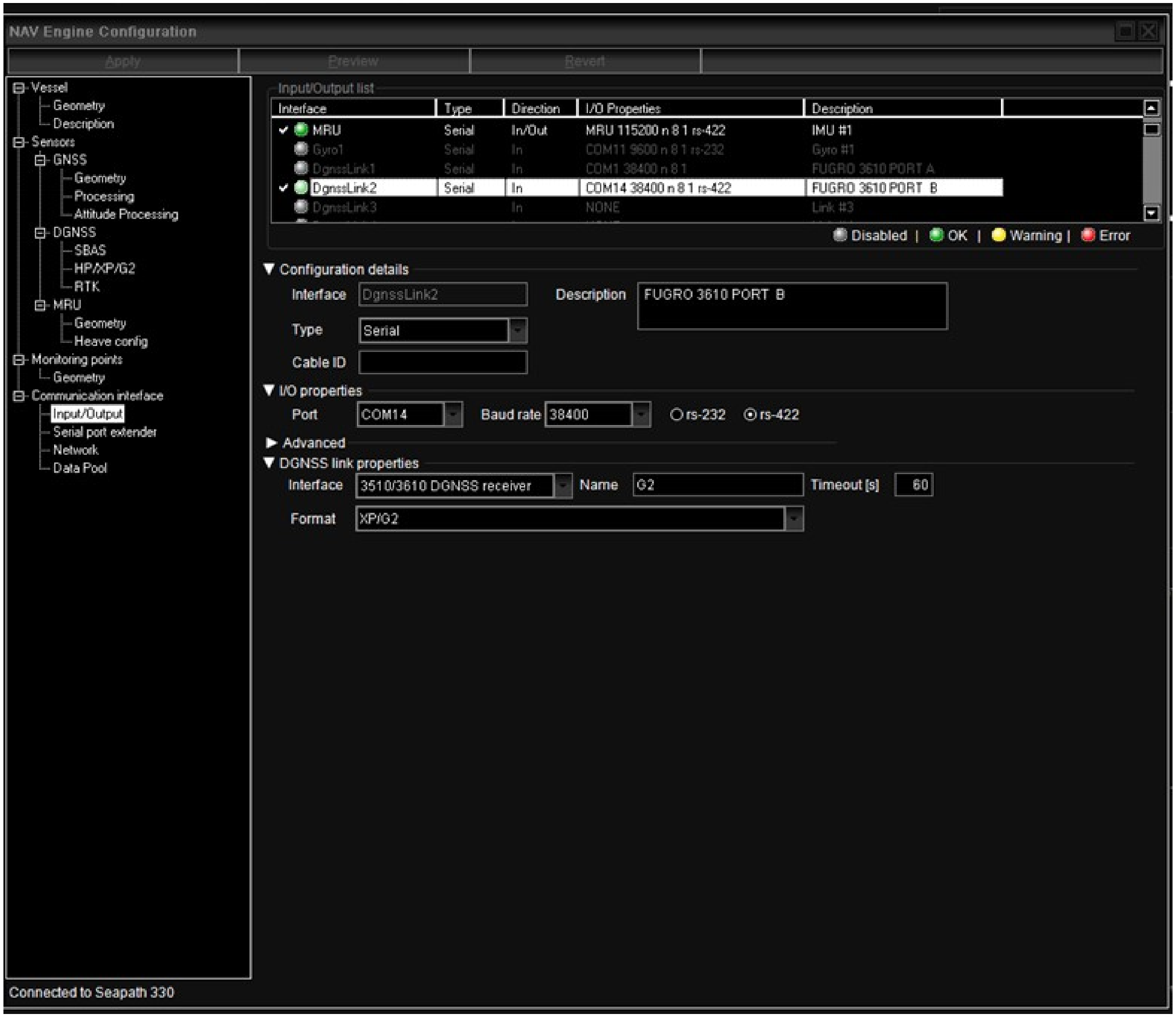

NAV Engine Configuration
Apply
Preview
Revert
Vessel
Geometry
Description
Sensors
GNSS
Geometry
Processing
Attitude Processing
DGNSS
SBAS
HP/XP/G2
RTK
MRU
Geometry
Heave config
Monitoring points
Geometry
Communication interface
Input/Output
Serial port extender
Network
Data Pool
X
Z
EM2040C
Keel
X
Y
EM2040C
CL
Show sensors
Position [m]
ID
Name
X
Y
Z
1
EM2040C
0.036
0.000
0.133
Monitoring points are entered relative to Origin
Connected to Seapath 330

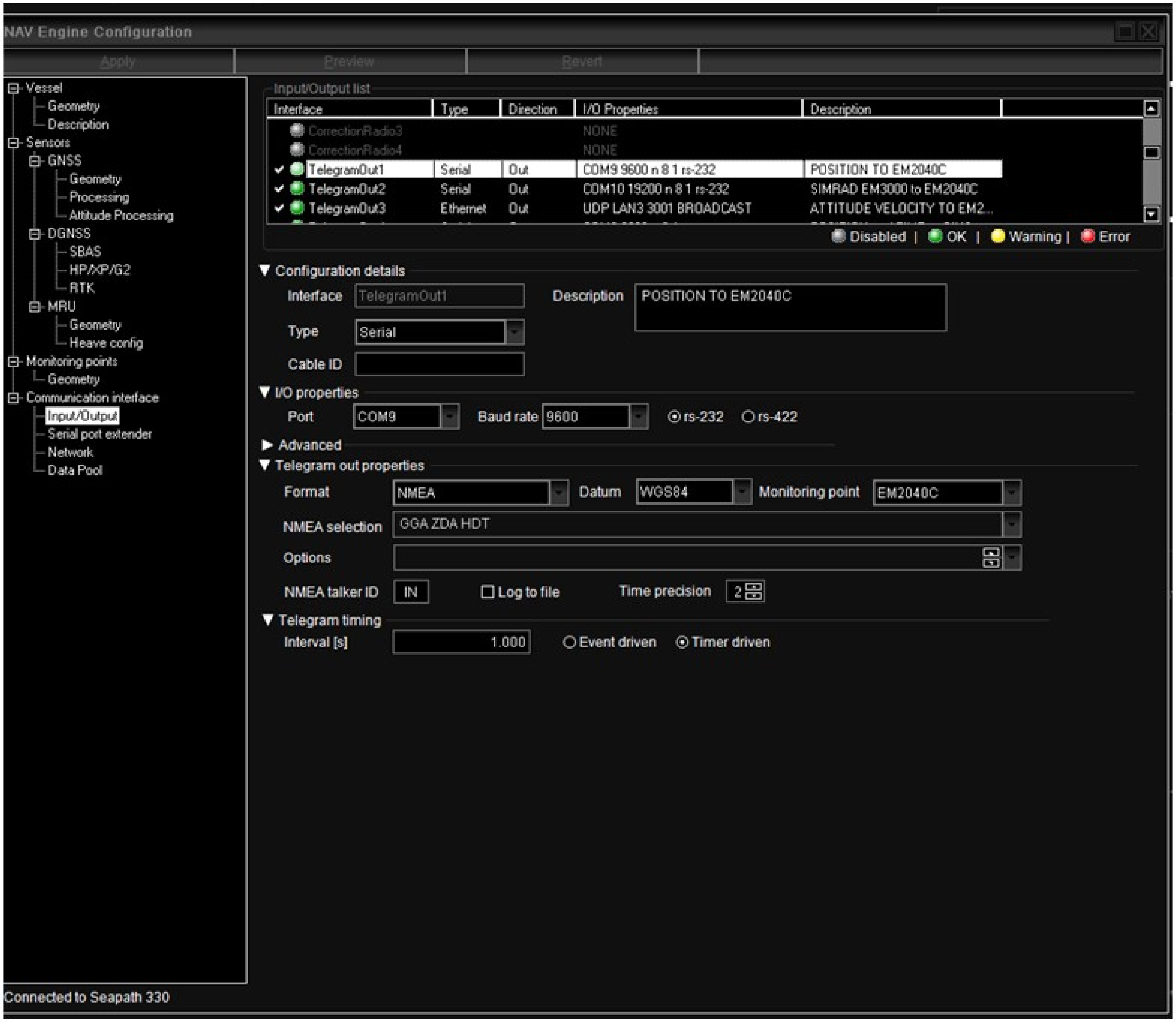

NAV Engine Configuration
Apply
Preview
Revert
Vessel
Geometry
Description
Sensors
GNSS
Geometry
Processing
Attitude Processing
DGNSS
SBAS
HP/XP/G2
RTK
MRU
Geometry
Heave config
Monitoring points
Geometry
Communication interface
Input/Output
Serial port extender
Network
Data Pool
Input/Output list
Interface
Type
Direction
I/O Properties
Description
GnssRec1 Serial In/Out GNSSA1 57600 n 8 1 Receiver #1
GnssRec2 Serial In/Out GNSSB1 57600 n 8 1 Receiver #2
MRU Serial In/Out MRU 115200 n 8 1 rs-422 IMU #1
Gyro1 Serial In COM11 9600 n 8 1 rs-232 Gyro #1
DgnssLink1 Serial In COM1 38400 n 8 1 FUGRO 3610 PORT A
DgnssLink2 Serial In COM14 38400 n 8 1 rs-422 FUGRO 3610 PORT B
DgnssLink3 In NONE Link #3
DgnssLink4 In NONE Link #4
CorrectionRadio1 NONE
CorrectionRadio2 NONE
CorrectionRadio3 NONE
CorrectionRadio4 NONE
TelegramOut1 Serial Out COM9 9600 n 8 1 rs-232 POSITION TO EM2040C
TelegramOut2 Serial Out COM10 19200 n 8 1 rs-232 SIMRAD EM3000 to EM2040C
TelegramOut3 Ethernet Out UDP LAN3 3001 BROADCAST ATTITUDE VELOCITY TO EM2...
TelegramOut4 Serial Out COM2 9600 n 8 1 POSITION and TIME to QINSy
TelegramOut5 Ethernet Out UDP LAN4 13001 BROADCAST ATTITUDE VELOCITY to QINSy
TelegramOut6 Ethernet Out UDP LAN4 13002 BROADCAST position to qinsy
TelegramOut7 Out NONE Telegram Out #7
TelegramOut8 Out NONE Telegram Out #8
TelegramOut9 Out NONE Telegram Out #9
TelegramOut10 Out NONE Telegram Out #10
TelegramOut11 Out NONE Telegram Out #11
TelegramOut12 Out NONE Telegram Out #12
TelegramOut13 Out NONE Telegram Out #13
TelegramOut14 Out NONE Telegram Out #14
TelegramOut15 Out NONE Telegram Out #15
TelegramOut16 Out NONE Telegram Out #16
AnalogOut1 Analog Out Gain: 0.0000, offset: 2.0000 Analog Out #1
AnalogOut2 Analog Out Gain: 0.0000, offset: -5.0000 Analog Out #2
AnalogOut3 Analog Out Gain: 0.0000, offset: 7.0000 Analog Out #3
Disabled | OK | Warning | Error
Connected to Seapath 330

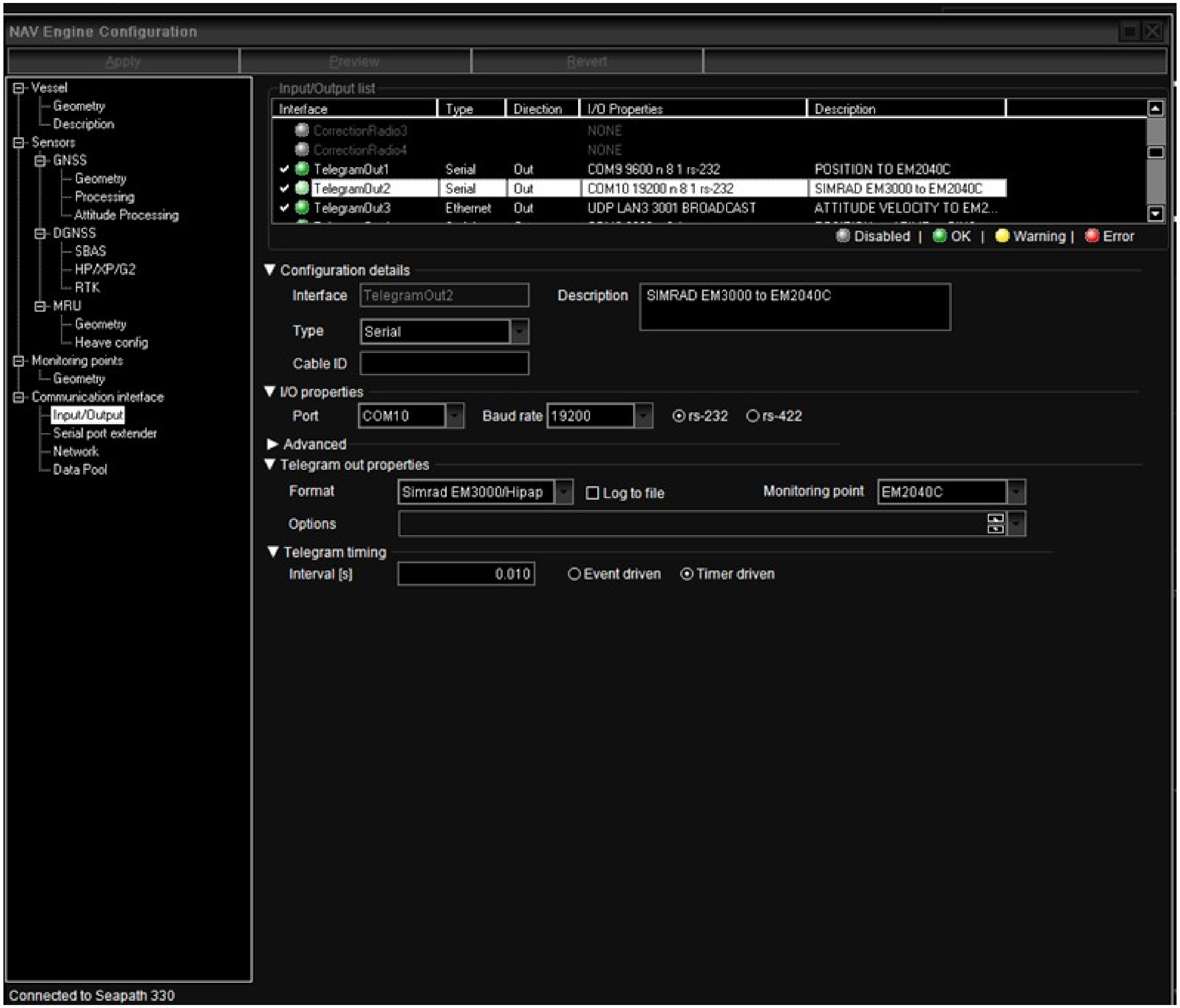

NAV Engine Configuration
Apply
Preview
Revert
Vessel
Geometry
Description
Sensors
GNSS
Geometry
Processing
Attitude Processing
DGNSS
SBAS
HP/XP/G2
RTK
MRU
Geometry
Heave config
Monitoring points
Geometry
Communication interface
Input/Output
Serial port extender
Network
Data Pool
Input/Output list
Interface | Type | Direction | I/O Properties | Description
GnssRec1 | Serial | In/Out | GNSSA1 57600 n 8 1 | Receiver #1
GnssRec2 | Serial | In/Out | GNSSB1 57600 n 8 1 | Receiver #2
MRU | Serial | In/Out | MRU 115200 n 8 1 rs-422 | IMU #1
Gyro1 | Serial | In | COM11 9600 n 8 1 rs-232 | Gyro #1
DgnssLink1 | Serial | In | COM1 38400 n 8 1 | FUGRO 3610 PORT A
Disabled | OK | Warning | Error
Configuration details
Interface GnssRec1
Description Receiver #1
Type Serial
Cable ID
I/O properties
Port GNSSA1
Baud rate 57600
rs-232
rs-422
Advanced
Parity None
Data bits 8
Stop bits 1
Connected to Seapath 330

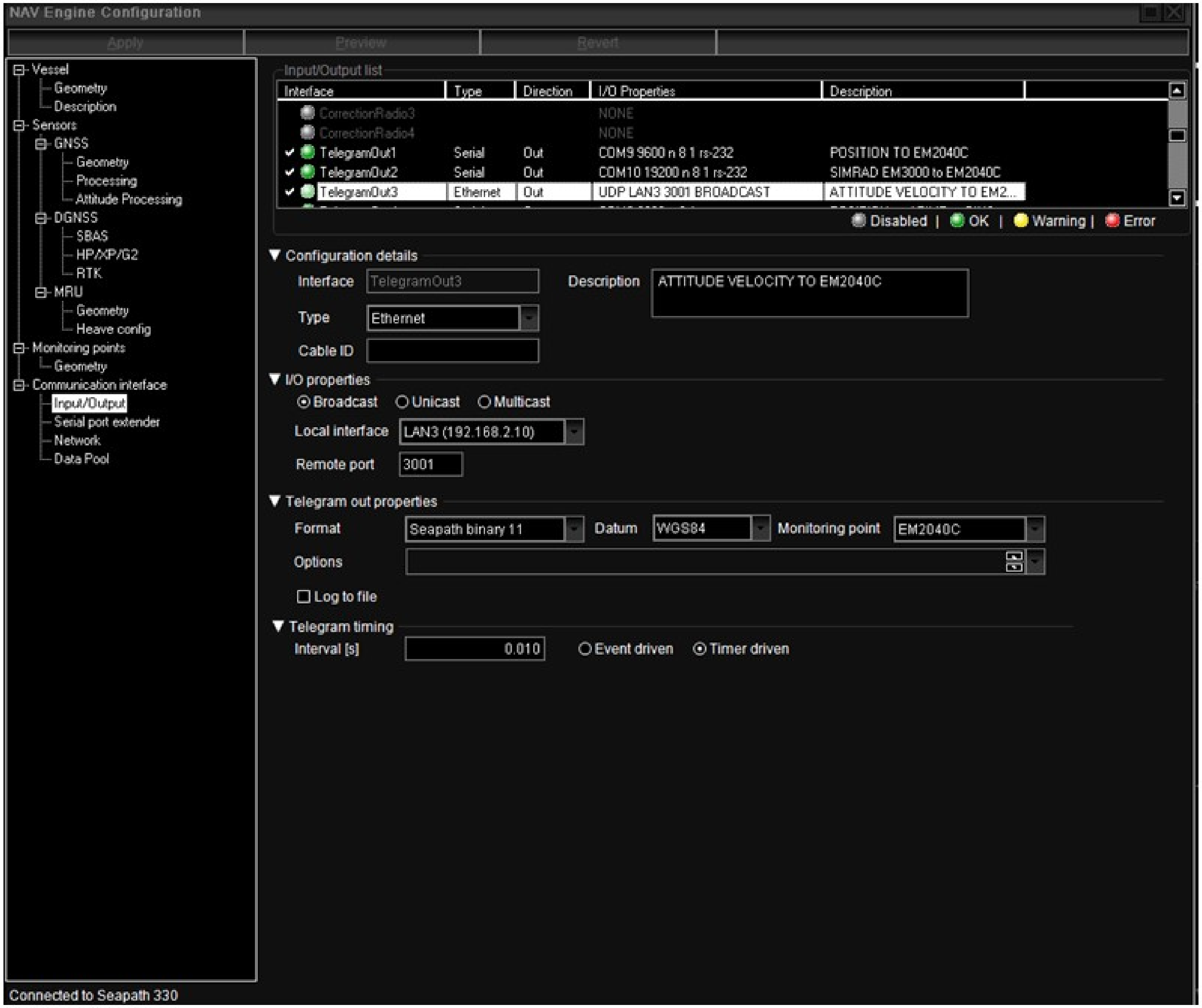

NAV Engine Configuration
Apply
Preview
Revert
Vessel
Geometry
Description
Sensors
GNSS
Geometry
Processing
Attitude Processing
DGNSS
SBAS
HP/XP/G2
RTK
MRU
Geometry
Heave config
Monitoring points
Geometry
Communication interface
Input/Output
Serial port extender
Network
Data Pool
Connected to Seapath 330
Input/Output list
Interface
Type
Direction
I/O Properties
Description
GnssRec1 Serial In/Out GNSSA1 57600 n 8 1 Receiver #1
GnssRec2 Serial In/Out GNSSB1 57600 n 8 1 Receiver #2
MRU Serial In/Out MRU 115200 n 8 1 rs-422 IMU #1
Gyro1 Serial In COM11 9600 n 8 1 rs-232 Gyro #1
DgnssLink1 Serial In COM1 38400 n 8 1 FUGRO 3610 PORT A
Disabled | OK | Warning | Error
Configuration details
Interface
GnssRec2
Description
Receiver #2
Type
Serial
Cable ID
I/O properties
Port
GNSSB1
Baud rate
57600
rs-232
rs-422
Advanced
Parity
None
Data bits
8
Stop bits
1

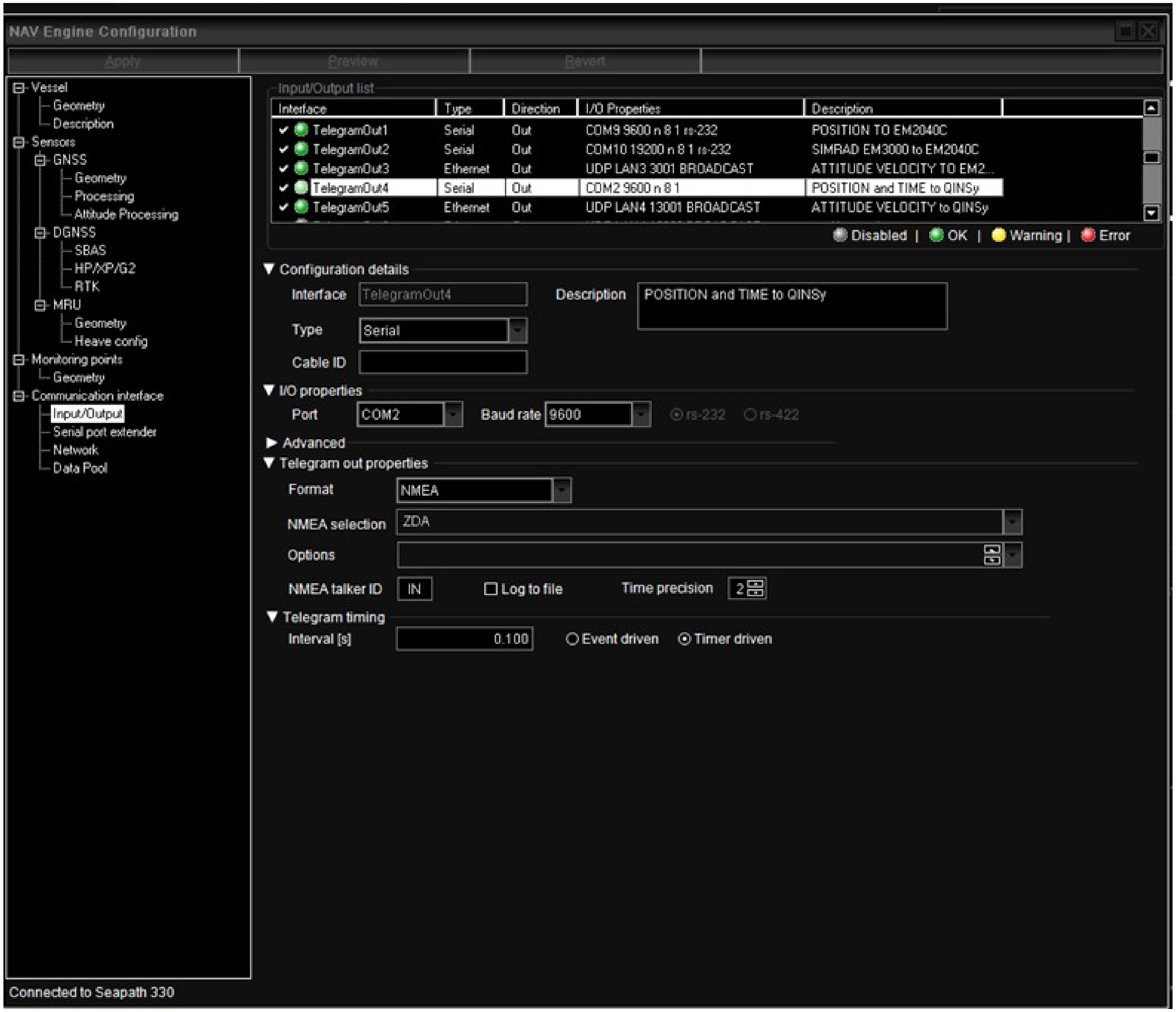

NAV Engine Configuration
Apply
Preview
Revert
Vessel
Geometry
Description
Sensors
GNSS
Geometry
Processing
Attitude Processing
DGNSS
SBAS
HP/XP/G2
RTK
MRU
Geometry
Heave config
Monitoring points
Geometry
Communication interface
Input/Output
Serial port extender
Network
Data Pool
Input/Output list
Interface
Type
Direction
I/O Properties
Description
GnssRec1 Serial In/Out GNSSA1 57600 n 8 1 Receiver #1
GnssRec2 Serial In/Out GNSSB1 57600 n 8 1 Receiver #2
MRU Serial In/Out MRU 115200 n 8 1 rs-422 IMU #1
Gyro1 Serial In COM11 9600 n 8 1 rs-232 Gyro #1
DgnssLink1 Serial In COM1 38400 n 8 1 FUGRO 3610 PORT A
Disabled | OK | Warning | Error
Configuration details
Interface MRU
Description IMU #1
Type Serial
Cable ID
I/O properties
Port MRU
Baud rate 115200
rs-232
rs-422
Advanced
Parity None
Data bits 8
Stop bits 1
Connected to Seapath 330

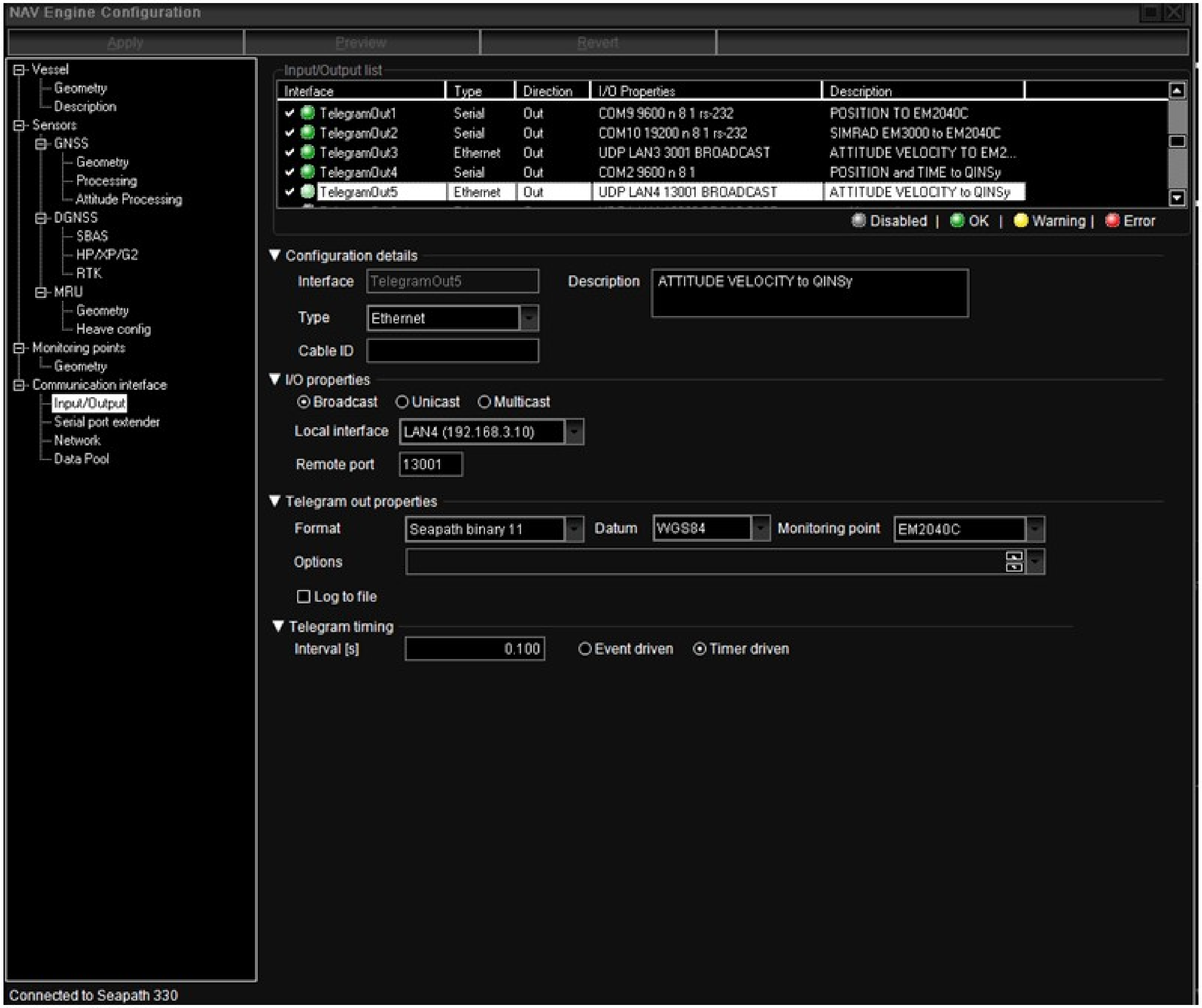

NAV Engine Configuration
Apply
Preview
Revert
Vessel
Geometry
Description
Sensors
GNSS
Geometry
Processing
Attitude Processing
DGNSS
SBAS
HP/XP/G2
RTK
MRU
Geometry
Heave config
Monitoring points
Geometry
Communication interface
Input/Output
Serial port extender
Network
Data Pool
Input/Output list
Interface
Type
Direction
I/O Properties
Description
MRU
Serial
In/Out
MRU 115200 n 8 1 rs-422
IMU #1
Gyro1
Serial
In
COM11 9600 n 8 1 rs-232
Gyro #1
DgnssLink1
Serial
In
COM1 38400 n 8 1
FUGRO 3610 PORT A
DgnssLink2
Serial
In
COM14 38400 n 8 1 rs-422
FUGRO 3610 PORT B
DgnssLink3
In
NONE
Link #3
Disabled | OK | Warning | Error
Configuration details
Interface
DgnssLink2
Description
FUGRO 3610 PORT B
Type
Serial
Cable ID
I/O properties
Port
COM14
Baud rate
38400
rs-232
rs-422
Advanced
DGNSS link properties
Interface
3510/3610 DGNSS receiver
Name
G2
Timeout [s]
60
Format
XP/G2
Connected to Seapath 330

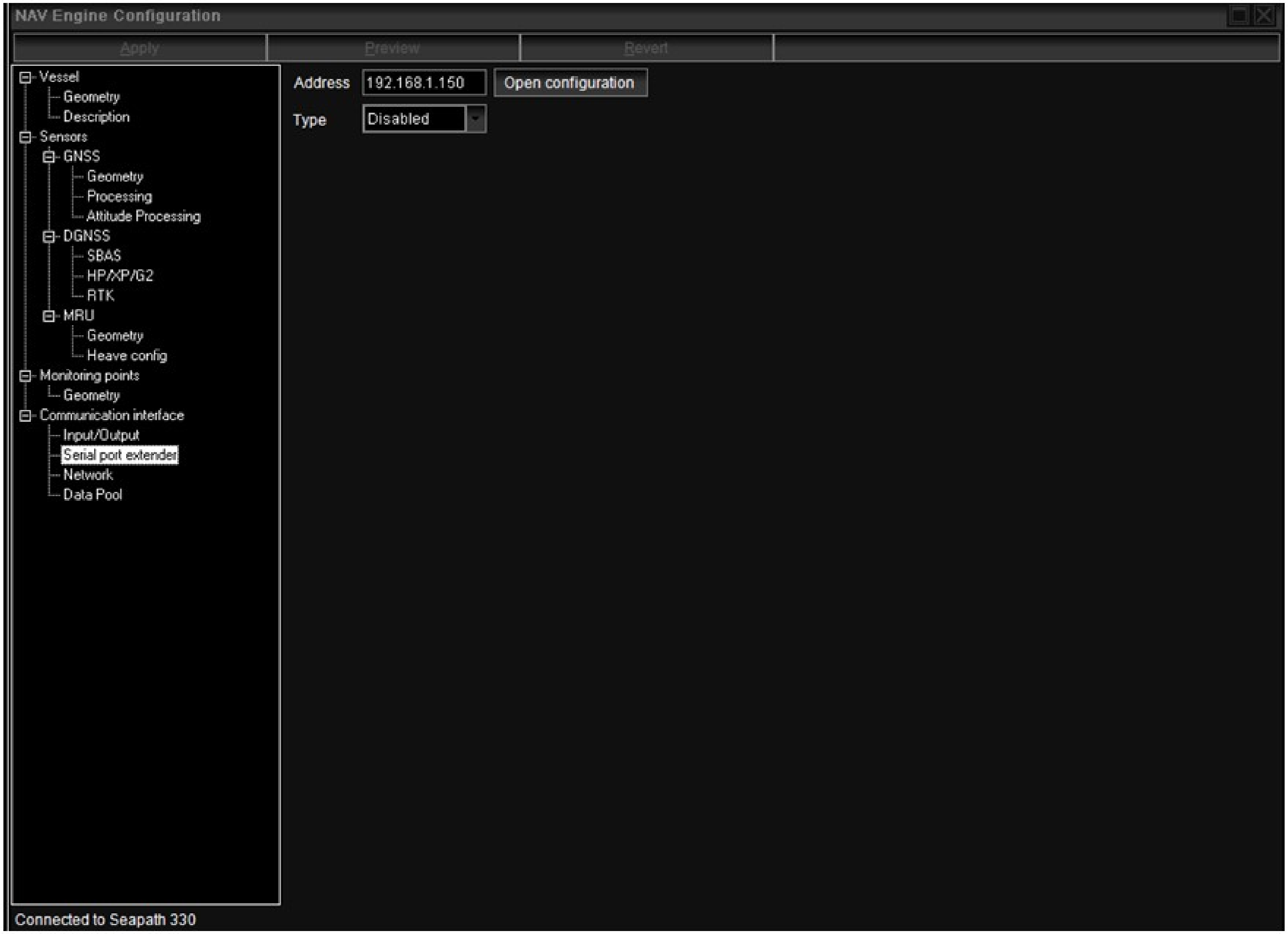

NAV Engine Configuration
Apply
Preview
Revert
Vessel
Geometry
Description
Sensors
GNSS
Geometry
Processing
Attitude Processing
DGNSS
SBAS
HP/XP/G2
RTK
MRU
Geometry
Heave config
Monitoring points
Geometry
Communication interface
Input/Output
Serial port extender
Network
Data Pool
Input/Output list
Interface | Type | Direction | I/O Properties | Description
CorrectionRadio3 NONE
CorrectionRadio4 NONE
TelegramOut1 Serial Out COM9 9600 n 8 1 rs-232 POSITION TO EM2040C
TelegramOut2 Serial Out COM10 19200 n 8 1 rs-232 SIMRAD EM3000 to EM2040C
TelegramOut3 Ethernet Out UDP LAN3 3001 BROADCAST ATTITUDE VELOCITY TO EM2...
Disabled | OK | Warning | Error
Configuration details
Interface TelegramOut1
Description POSITION TO EM2040C
Type Serial
Cable ID
I/O properties
Port COM9
Baud rate 9600
rs-232
rs-422
Advanced
Telegram out properties
Format NMEA
Datum WGS84
Monitoring point EM2040C
NMEA selection GGA ZDA HDT
Options
NMEA talker ID IN
Log to file
Time precision 2
Telegram timing
Interval [s] 1.000
Event driven
Timer driven
Connected to Seapath 330

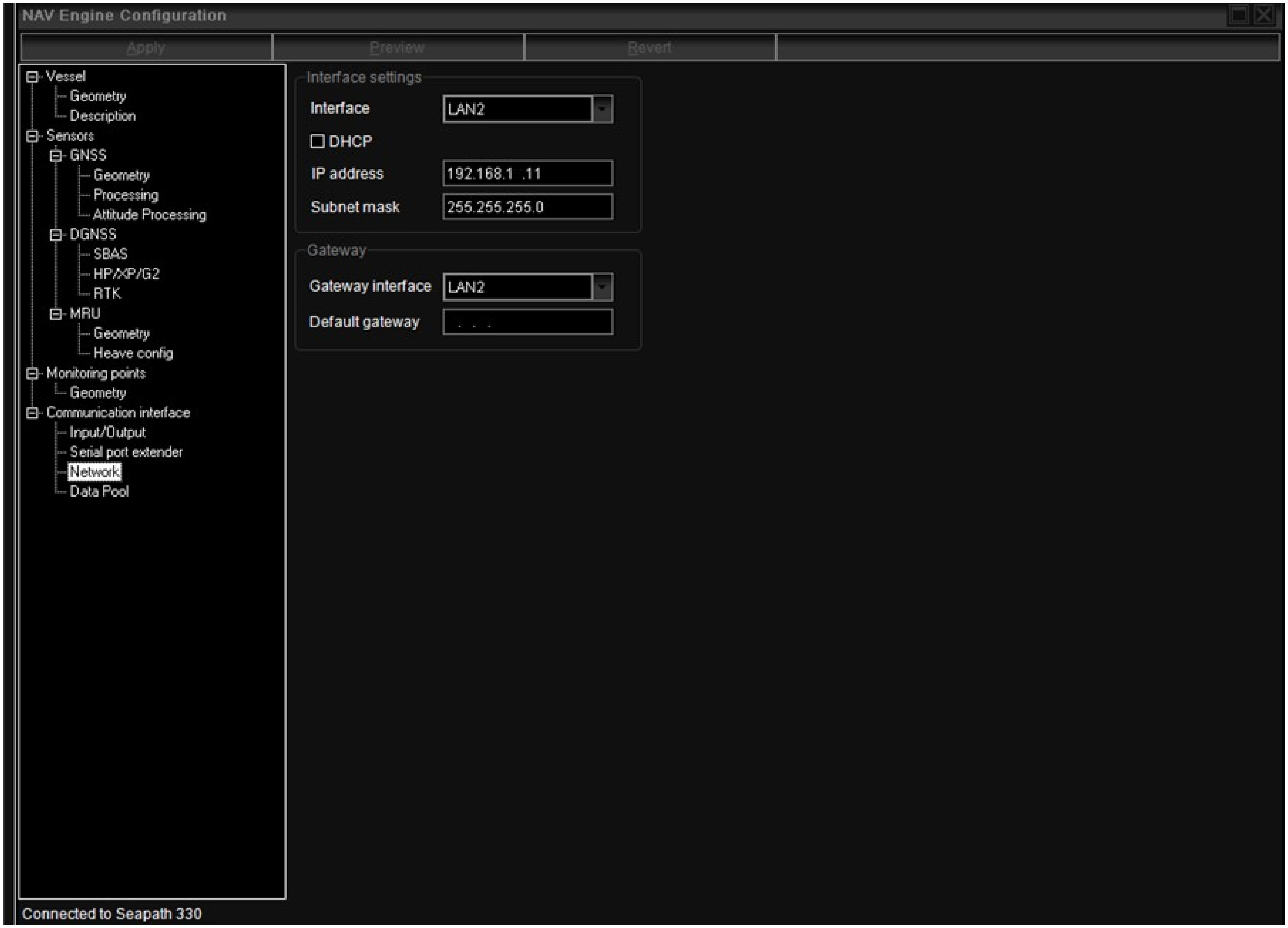

NAV Engine Configuration
Apply
Preview
Revert
Vessel
Geometry
Description
Sensors
GNSS
Geometry
Processing
Attitude Processing
DGNSS
SBAS
HP/XP/G2
RTK
MRU
Geometry
Heave config
Monitoring points
Geometry
Communication interface
Input/Output
Serial port extender
Network
Data Pool
Input/Output list
Interface
Type
Direction
I/O Properties
Description
CorrectionRadio3 NONE
CorrectionRadio4 NONE
TelegramOut1 Serial Out COM9 9600 n 8 1 rs-232 POSITION TO EM2040C
TelegramOut2 Serial Out COM10 19200 n 8 1 rs-232 SIMRAD EM3000 to EM2040C
TelegramOut3 Ethernet Out UDP LAN3 3001 BROADCAST ATTITUDE VELOCITY TO EM2...
Disabled | OK | Warning | Error
Configuration details
Interface TelegramOut2
Description SIMRAD EM3000 to EM2040C
Type Serial
Cable ID
I/O properties
Port COM10
Baud rate 19200
rs-232
rs-422
Advanced
Telegram out properties
Format Simrad EM3000/Hipap
Log to file
Monitoring point EM2040C
Options
Telegram timing
Interval [s] 0.010
Event driven
Timer driven
Connected to Seapath 330

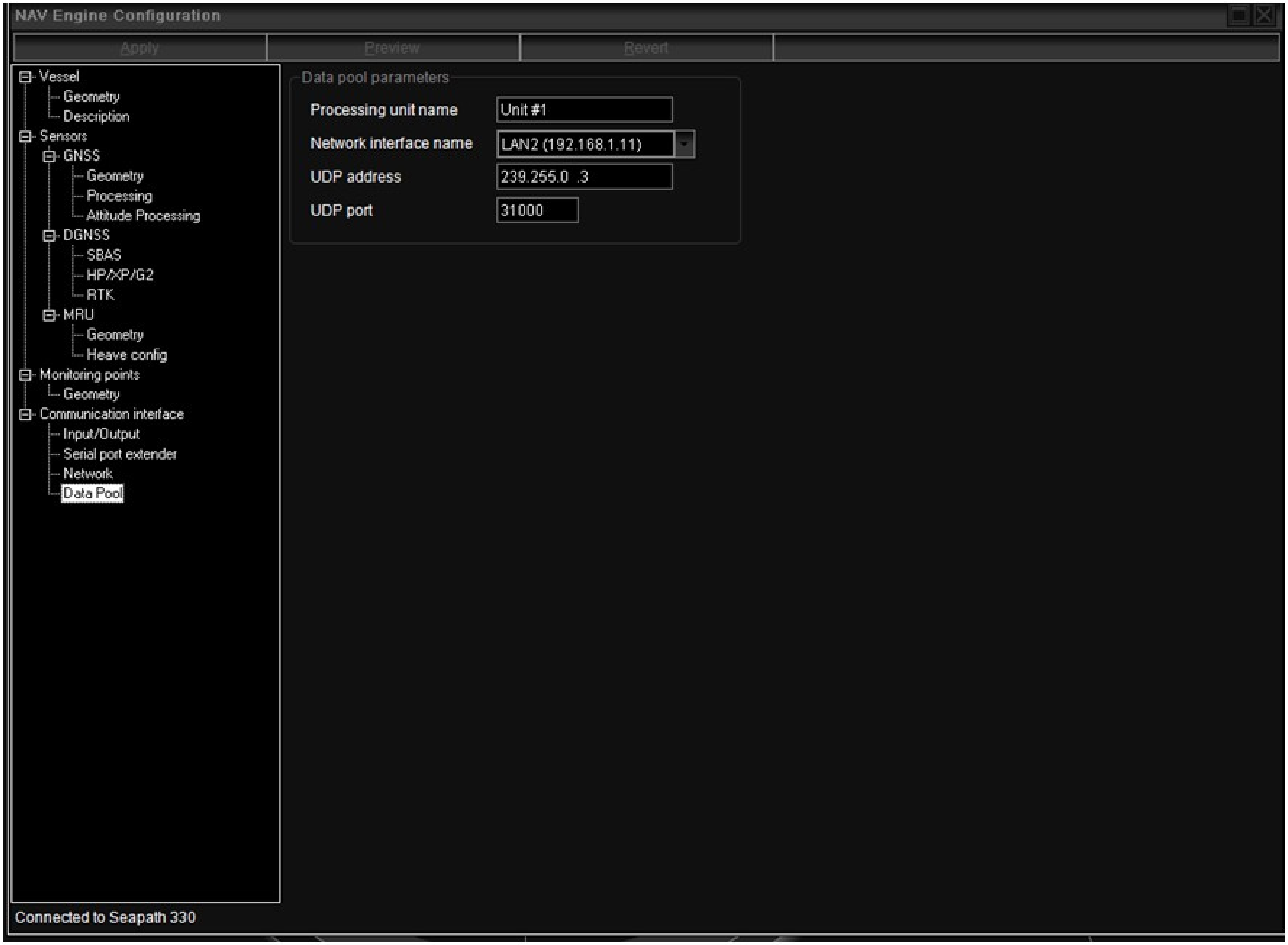

NAV Engine Configuration
Apply
Preview
Revert
Vessel
Geometry
Description
Sensors
GNSS
Geometry
Processing
Attitude Processing
DGNSS
SBAS
HP/XP/G2
RTK
MRU
Geometry
Heave config
Monitoring points
Geometry
Communication interface
Input/Output
Serial port extender
Network
Data Pool
Input/Output list
Interface
Type
Direction
I/O Properties
Description
CorrectionRadio3
NONE
CorrectionRadio4
NONE
TelegramOut1 Serial Out COM9 9600 n 8 1 rs-232 POSITION TO EM2040C
TelegramOut2 Serial Out COM10 19200 n 8 1 rs-232 SIMRAD EM3000 to EM2040C
TelegramOut3 Ethernet Out UDP LAN3 3001 BROADCAST ATTITUDE VELOCITY TO EM2...
Disabled | OK | Warning | Error
Configuration details
Interface
TelegramOut3
Description
ATTITUDE VELOCITY TO EM2040C
Type
Ethernet
Cable ID
I/O properties
Broadcast
Unicast
Multicast
Local interface
LAN3 (192.168.2.10)
Remote port
3001
Telegram out properties
Format
Seapath binary 11
Datum
WGS84
Monitoring point
EM2040C
Options
Log to file
Telegram timing
Interval [s]
0.010
Event driven
Timer driven
Connected to Seapath 330


NAV Engine Configuration
Apply
Preview
Revert
Vessel
Geometry
Description
Sensors
GNSS
Geometry
Processing
Attitude Processing
DGNSS
SBAS
HP/XP/G2
RTK
MRU
Geometry
Heave config
Monitoring points
Geometry
Communication interface
Input/Output
Serial port extender
Network
Data Pool
Input/Output list
Interface
Type
Direction
I/O Properties
Description
TelegramOut1 Serial Out COM9 9600 n 8 1 rs-232 POSITION TO EM2040C
TelegramOut2 Serial Out COM10 19200 n 8 1 rs-232 SIMRAD EM3000 to EM2040C
TelegramOut3 Ethernet Out UDP LAN3 3001 BROADCAST ATTITUDE VELOCITY TO EM2...
TelegramOut4 Serial Out COM2 9600 n 8 1 POSITION and TIME to QINSy
TelegramOut5 Ethernet Out UDP LAN4 13001 BROADCAST ATTITUDE VELOCITY to QINSy
Disabled | OK | Warning | Error
Configuration details
Interface
TelegramOut4
Description
POSITION and TIME to QINSy
Type
Serial
Cable ID
I/O properties
Port
COM2
Baud rate
9600
rs-232
rs-422
Advanced
Telegram out properties
Format
NMEA
NMEA selection
ZDA
Options
NMEA talker ID
IN
Log to file
Time precision
2
Telegram timing
Interval [s]
0.100
Event driven
Timer driven
Connected to Seapath 330


NAV Engine Configuration
Apply
Preview
Revert
Vessel
Geometry
Description
Sensors
GNSS
Geometry
Processing
Attitude Processing
DGNSS
SBAS
HP/XP/G2
RTK
MRU
Geometry
Heave config
Monitoring points
Geometry
Communication interface
Input/Output
Serial port extender
Network
Data Pool
Input/Output list
Interface
Type
Direction
I/O Properties
Description
TelegramOut1 Serial Out COM9 9600 n 8 1 rs-232 POSITION TO EM2040C
TelegramOut2 Serial Out COM10 19200 n 8 1 rs-232 SIMRAD EM3000 to EM2040C
TelegramOut3 Ethernet Out UDP LAN3 3001 BROADCAST ATTITUDE VELOCITY TO EM2...
TelegramOut4 Serial Out COM2 9600 n 8 1 POSITION and TIME to QINSy
TelegramOut5 Ethernet Out UDP LAN4 13001 BROADCAST ATTITUDE VELOCITY to QINSy
Disabled | OK | Warning | Error
Configuration details
Interface
TelegramOut5
Description
ATTITUDE VELOCITY to QINSy
Type
Ethernet
Cable ID
I/O properties
Broadcast
Unicast
Multicast
Local interface
LAN4 (192.168.3.10)
Remote port
13001
Telegram out properties
Format
Seapath binary 11
Datum
WGS84
Monitoring point
EM2040C
Options
Log to file
Telegram timing
Interval [s]
0.100
Event driven
Timer driven
Connected to Seapath 330


NAV Engine Configuration
Apply
Preview
Revert
Vessel
Geometry
Description
Sensors
GNSS
Geometry
Processing
Attitude Processing
DGNSS
SBAS
HP/XP/G2
RTK
MRU
Geometry
Heave config
Monitoring points
Geometry
Communication interface
Input/Output
Serial port extender
Network
Data Pool
Address
192.168.1.150
Open configuration
Type
Disabled
Connected to Seapath 330


NAV Engine Configuration
Apply
Preview
Revert
Vessel
Geometry
Description
Sensors
GNSS
Geometry
Processing
Attitude Processing
DGNSS
SBAS
HP/XP/G2
RTK
MRU
Geometry
Heave config
Monitoring points
Geometry
Communication interface
Input/Output
Serial port extender
Network
Data Pool
Interface settings
Interface
LAN2
DHCP
IP address
192.168.1 .11
Subnet mask
255.255.255.0
Gateway
Gateway interface
LAN2
Default gateway
Connected to Seapath 330



NAV Engine Configuration
Apply
Preview
Revert
Vessel
Geometry
Description
Sensors
GNSS
Geometry
Processing
Attitude Processing
DGNSS
SBAS
HP/XP/G2
RTK
MRU
Geometry
Heave config
Monitoring points
Geometry
Communication interface
Input/Output
Serial port extender
Network
Data Pool
Data pool parameters
Processing unit name
Unit #1
Network interface name
LAN2 (192.168.1.11)
UDP address
239.255.0 .3
UDP port
31000
Connected to Seapath 330

Appendix C – Template database settings in Qinsy (for acquisition)

Note: All template databases used for surveying in the 2020 season are identical except for EM2040C calibration offsets (e.g. pitch, roll, and heading). These differences are summarized in table 4 of report's main text.

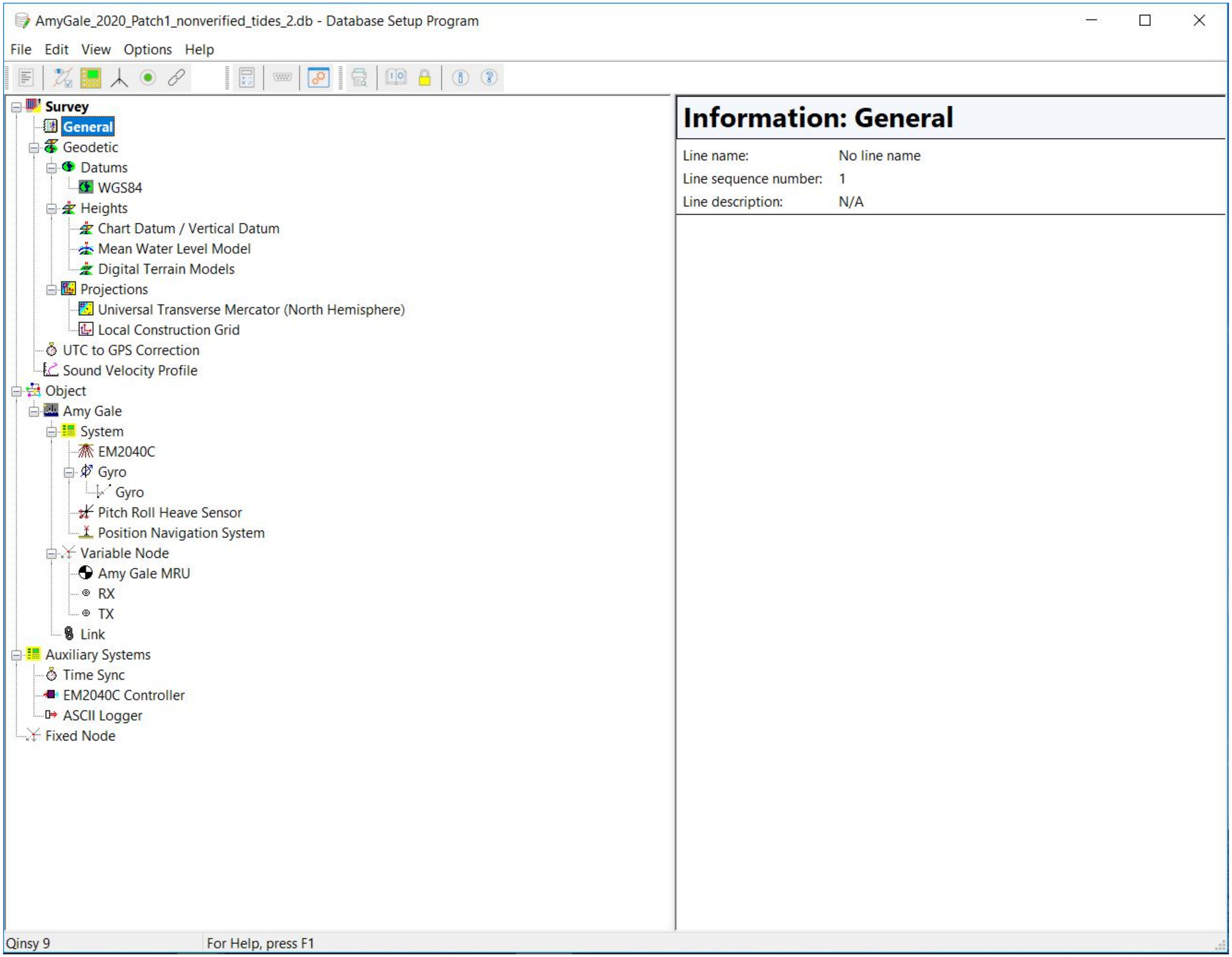
Template database name: AmyGale_2020_Patch1_nonverifiedtides_2.db

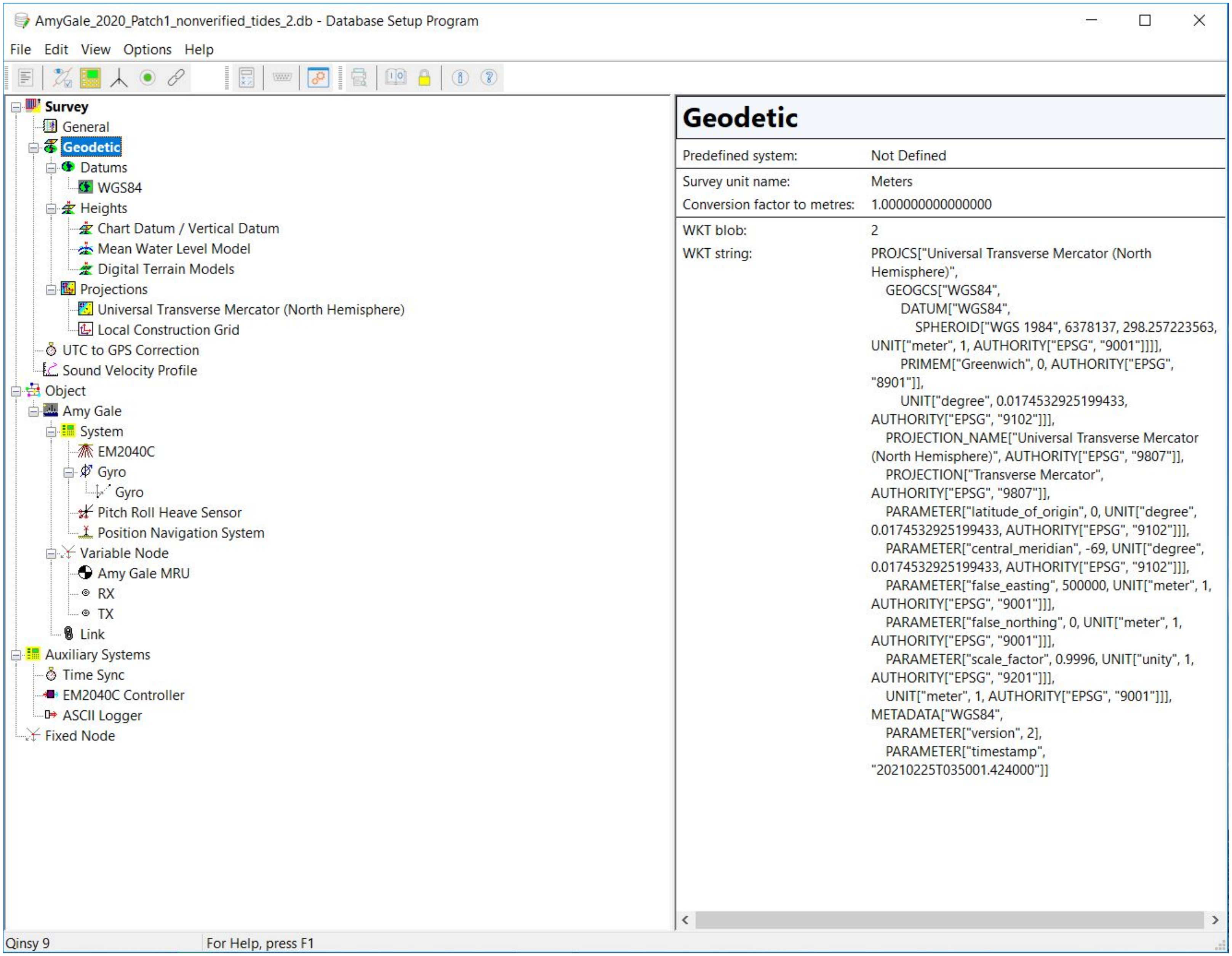
Note: Disregard template database name. Verified tide files were used to run the patch test and update EM2040C offsets, however the template name was not properly changed to reflect this.

Qinsy uses the following reference frame conventions (these differ from those used by Seapath 330):

Pitch rotation: + bow up
Roll rotation: + heeling to starboard
Heave: + upwards

X: + to starboard
Y: + towards bow
Z: + up


AmyGale_2020_Patch1_nonverified_tides_2.db - Database Setup Program
File
Edit
View
Options
Help
Survey
General
Geodetic
Datums
WGS84
Heights
Chart Datum / Vertical Datum
Mean Water Level Model
Digital Terrain Models
Projections
Universal Transverse Mercator (North Hemisphere)
Local Construction Grid
UTC to GPS Correction
Sound Velocity Profile
Object
Amy Gale
System
EM2040C
Gyro
Gyro
Pitch Roll Heave Sensor
Position Navigation System
Variable Node
Amy Gale MRU
RX
TX
Link
Auxiliary Systems
Time Sync
EM2040C Controller
ASCII Logger
Fixed Node
Information: General
Line name:
No line name
Line sequence number:
1
Line description:
N/A
Qinsy 9
For Help, press F1


AmyGale_2020_Patch1_nonverified_tides_2.db - Database Setup Program
File Edit View Options Help
Survey
General
Geodetic
Datums
WGS84
Heights
Chart Datum / Vertical Datum
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Digital Terrain Models
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Universal Transverse Mercator (North Hemisphere)
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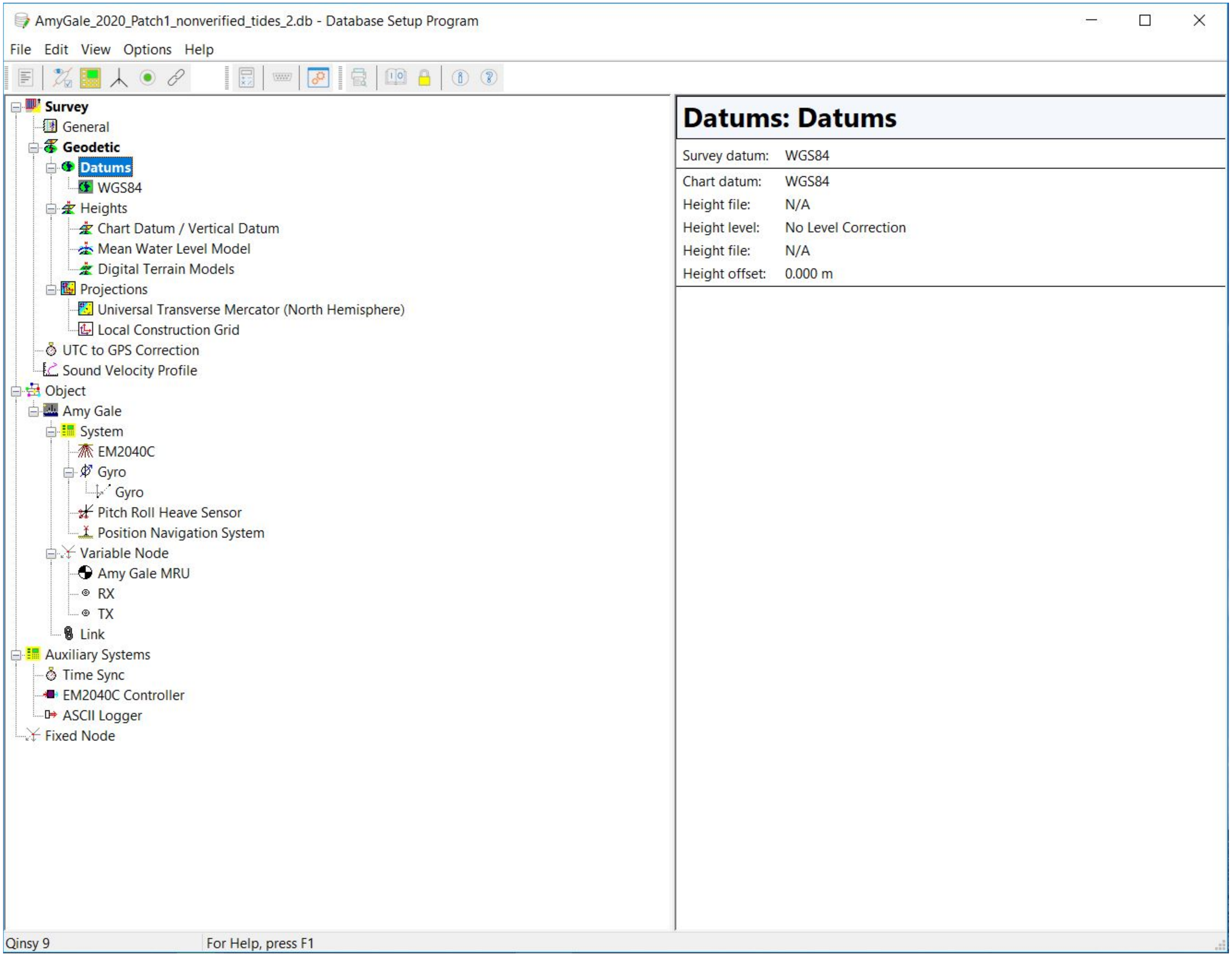
Sound Velocity Profile
Object
Amy Gale
System
EM2040C
Gyro
Gyro
Pitch Roll Heave Sensor
Position Navigation System
Variable Node
Amy Gale MRU
RX
TX
Link
Auxiliary Systems
Time Sync
EM2040C Controller
ASCII Logger
Fixed Node
Geodetic
Predefined system: Not Defined
Survey unit name: Meters
Conversion factor to metres: 1.000000000000000
WKT blob: 2
WKT string: PROJCS["Universal Transverse Mercator (North Hemisphere)",
GEOGCS["WGS84",
DATUM["WGS84",
SPHEROID["WGS 1984", 6378137, 298.257223563, UNIT["meter", 1, AUTHORITY["EPSG", "9001"]]]],
PRIMEM["Greenwich", 0, AUTHORITY["EPSG", "8901"]],
UNIT["degree", 0.0174532925199433, AUTHORITY["EPSG", "9102"]]],
PROJECTION_NAME["Universal Transverse Mercator (North Hemisphere)", AUTHORITY["EPSG", "9807"]],
PROJECTION["Transverse Mercator", AUTHORITY["EPSG", "9807"]],
PARAMETER["latitude_of_origin", 0, UNIT["degree", 0.0174532925199433, AUTHORITY["EPSG", "9102"]]],
PARAMETER["central_meridian", -69, UNIT["degree", 0.0174532925199433, AUTHORITY["EPSG", "9102"]]],
PARAMETER["false_easting", 500000, UNIT["meter", 1, AUTHORITY["EPSG", "9001"]]],
PARAMETER["false_northing", 0, UNIT["meter", 1, AUTHORITY["EPSG", "9001"]]],
PARAMETER["scale_factor", 0.9996, UNIT["unity", 1, AUTHORITY["EPSG", "9201"]]],
UNIT["meter", 1, AUTHORITY["EPSG", "9001"]]],
METADATA["WGS84",
PARAMETER["version", 2],
PARAMETER["timestamp", "20210225T035001.424000"]]
Qinsy 9
For Help, press F1


AmyGale_2020_Patch1_nonverified_tides_2.db - Database Setup Program
File Edit View Options Help
Survey
General
Geodetic
Datums
WGS84
Heights
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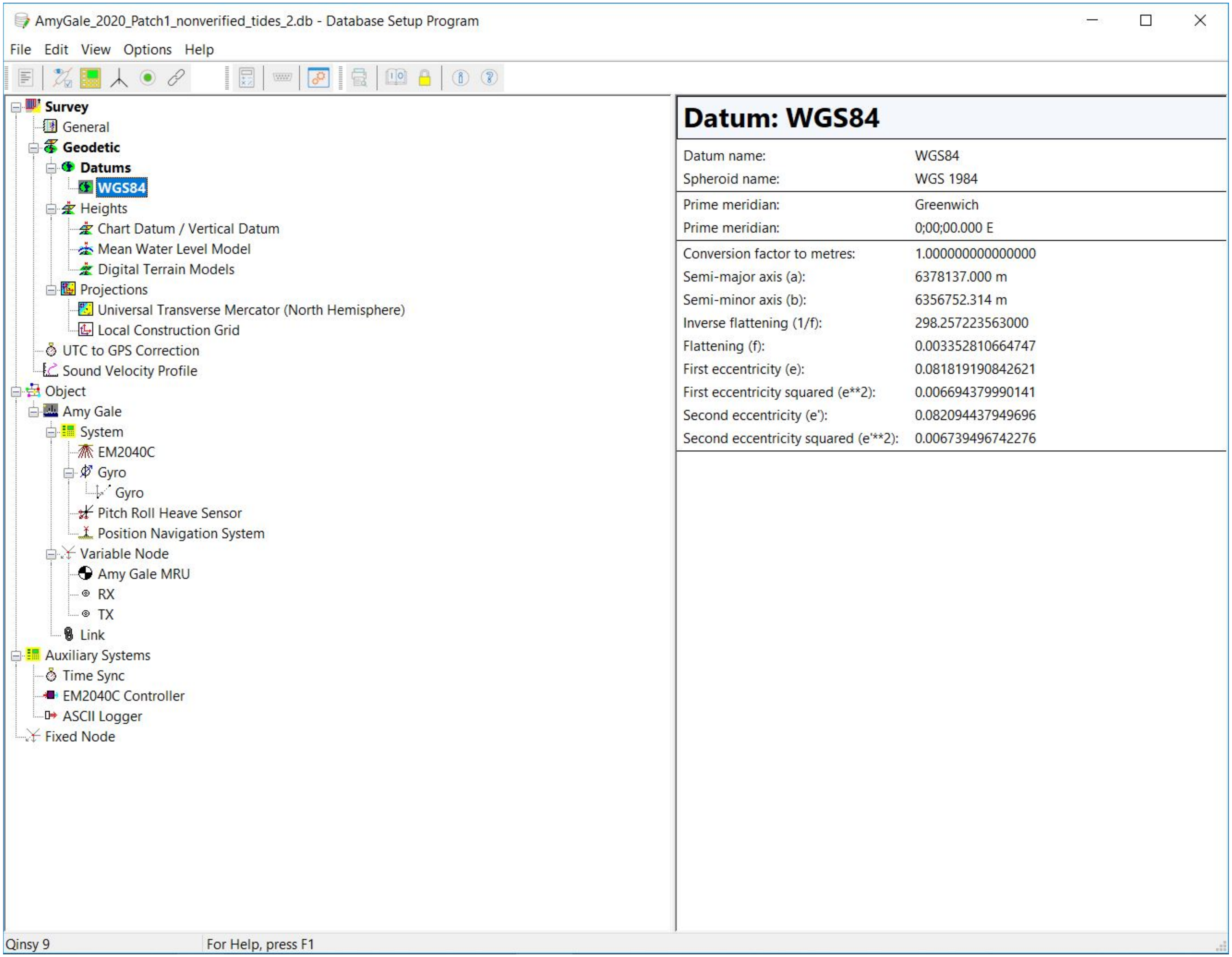
Object
Amy Gale
System
EM2040C
Gyro
Gyro
Pitch Roll Heave Sensor
Position Navigation System
Variable Node
Amy Gale MRU
RX
TX
Link
Auxiliary Systems
Time Sync
EM2040C Controller
ASCII Logger
Fixed Node
Datums: Datums
Survey datum: WGS84
Chart datum: WGS84
Height file: N/A
Height level: No Level Correction
Height file: N/A
Height offset: 0.000 m
Qinsy 9
For Help, press F1


AmyGale_2020_Patch1_nonverified_tides_2.db - Database Setup Program
File Edit View Options Help
Survey
General
Geodetic
Datums
WGS84
Heights
Chart Datum / Vertical Datum
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Object
Amy Gale
System
EM2040C
Gyro
Gyro
Pitch Roll Heave Sensor
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Variable Node
Amy Gale MRU
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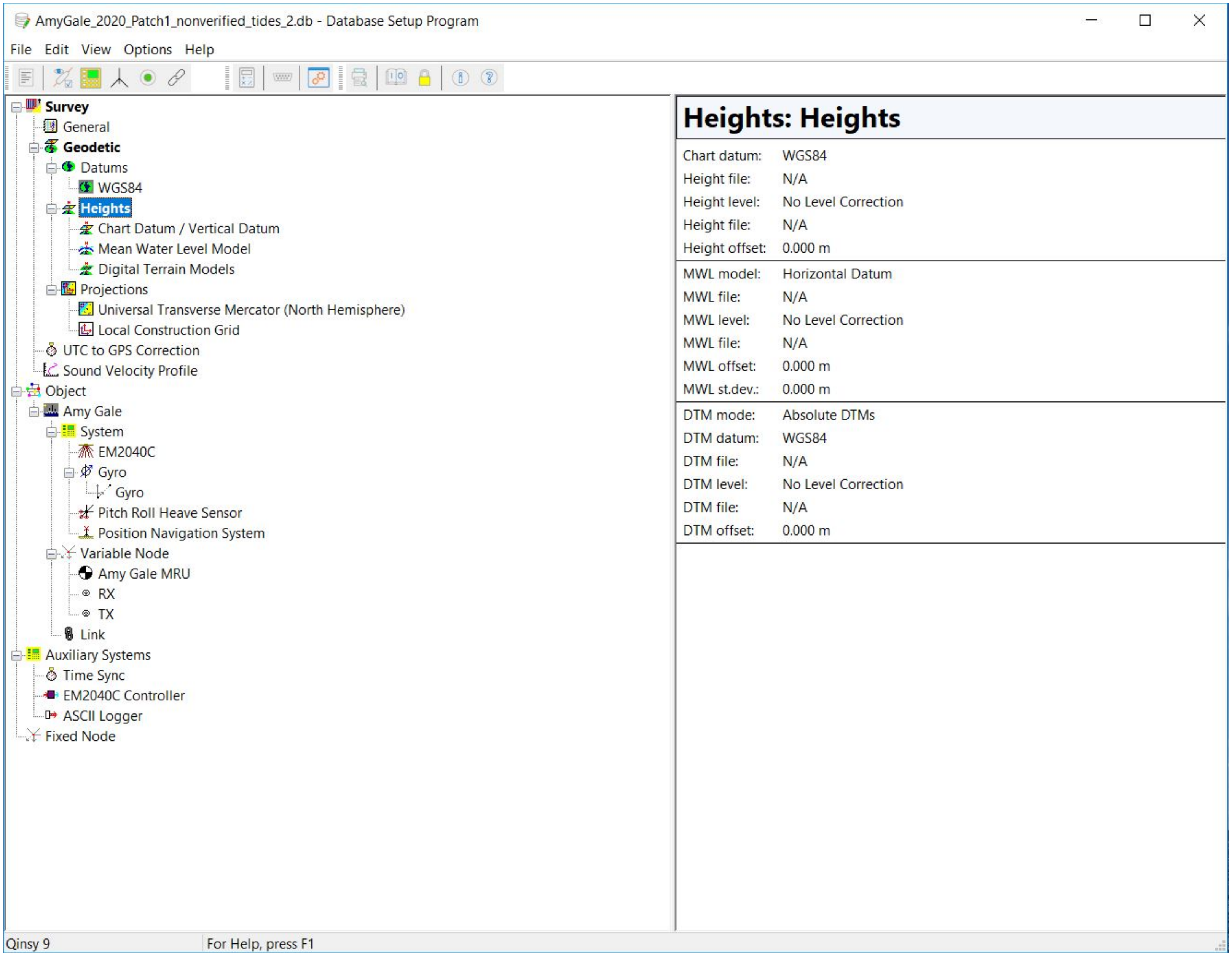
Auxiliary Systems
Time Sync
EM2040C Controller
ASCII Logger
Fixed Node
Datum: WGS84
Datum name: WGS84
Spheroid name: WGS 1984
Prime meridian: Greenwich
Prime meridian: 0;00;00.000 E
Conversion factor to metres: 1.000000000000000
Semi-major axis (a): 6378137.000 m
Semi-minor axis (b): 6356752.314 m
Inverse flattening (1/f): 298.257223563000
Flattening (f): 0.003352810664747
First eccentricity (e): 0.081819190842621
First eccentricity squared (e**2): 0.006694379990141
Second eccentricity (e'): 0.082094437949696
Second eccentricity squared (e'**2): 0.006739496742276
Qinsy 9
For Help, press F1


AmyGale_2020_Patch1_nonverified_tides_2.db - Database Setup Program
File
Edit
View
Options
Help
Survey
General
Geodetic
Datums
WGS84
Heights
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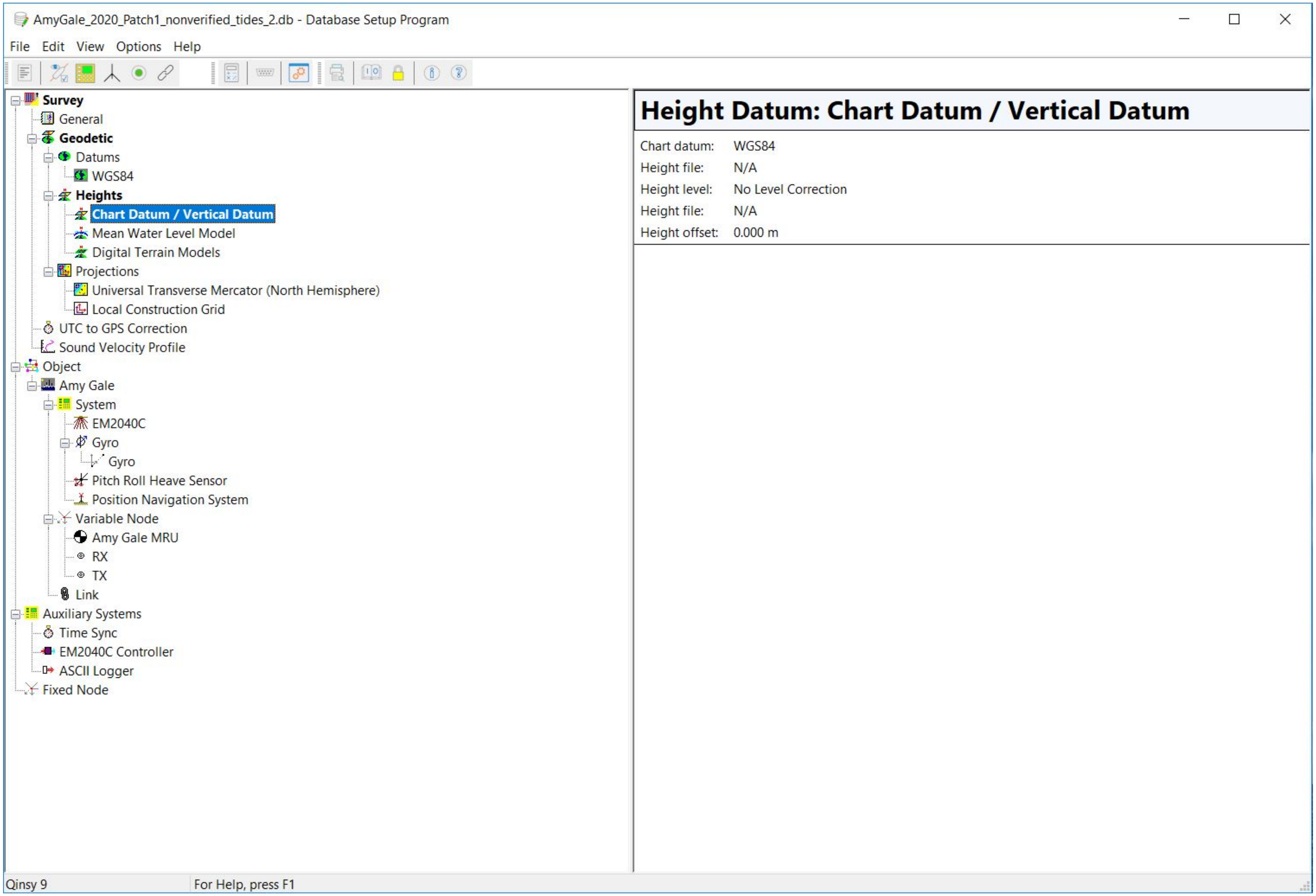
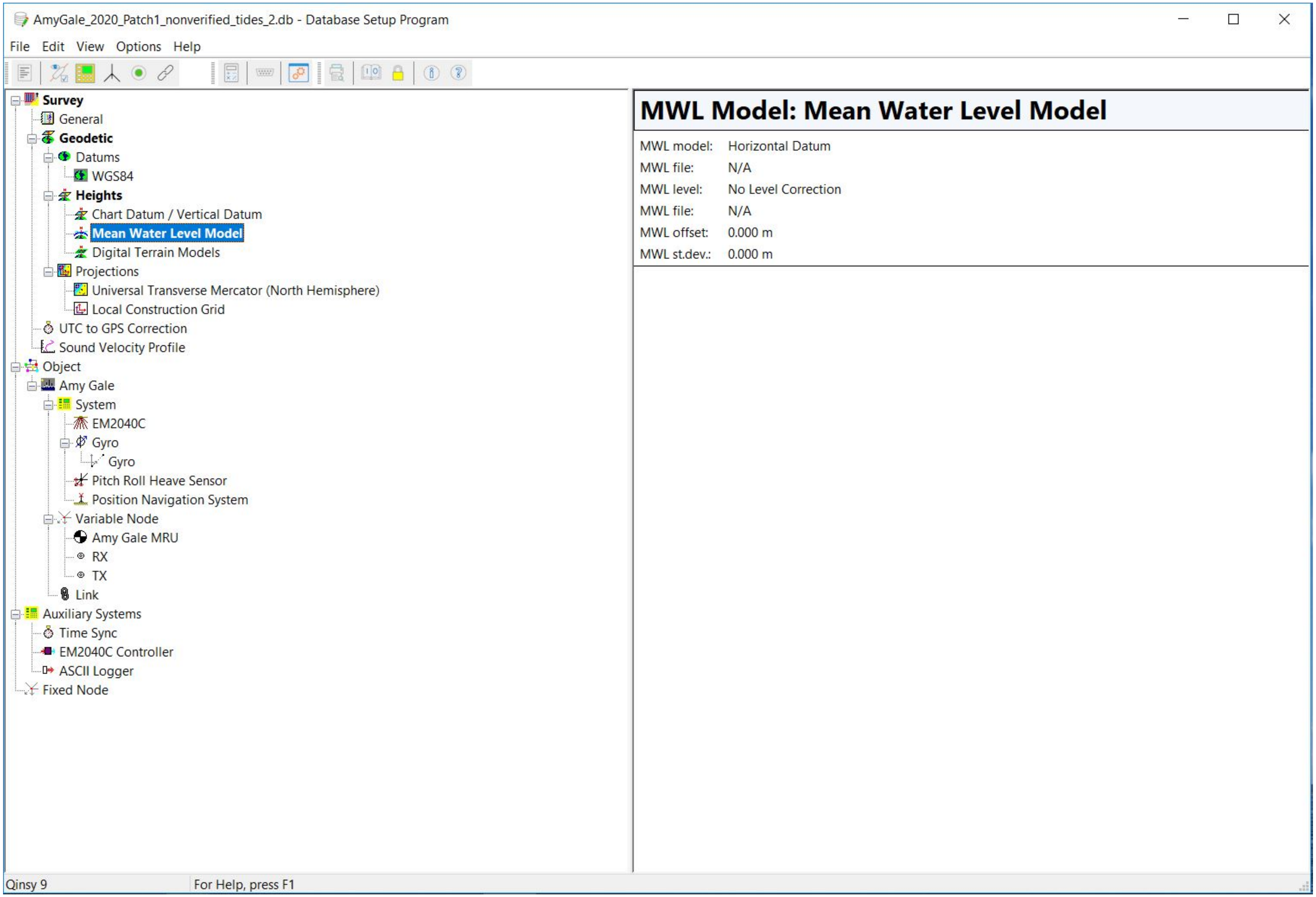
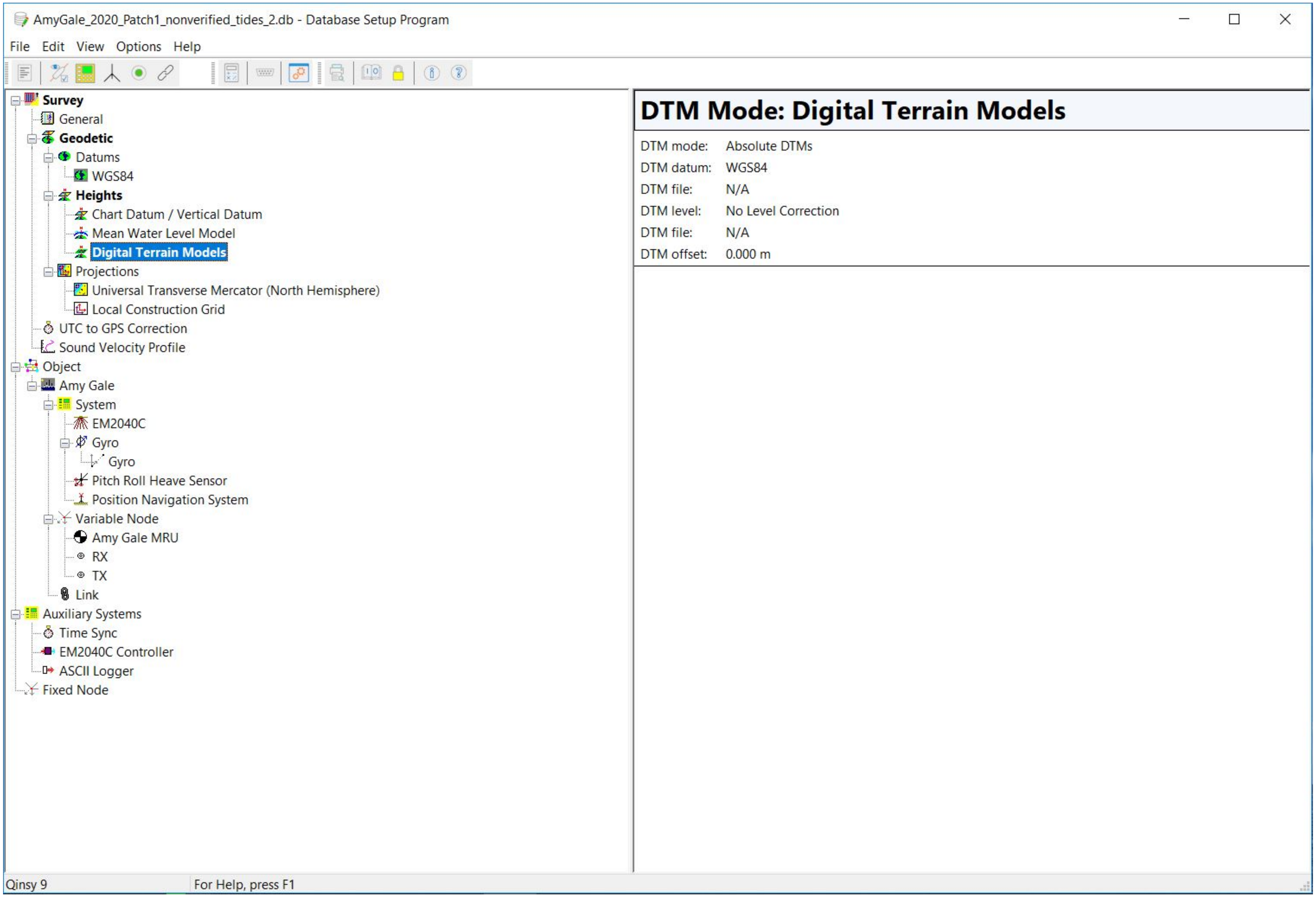
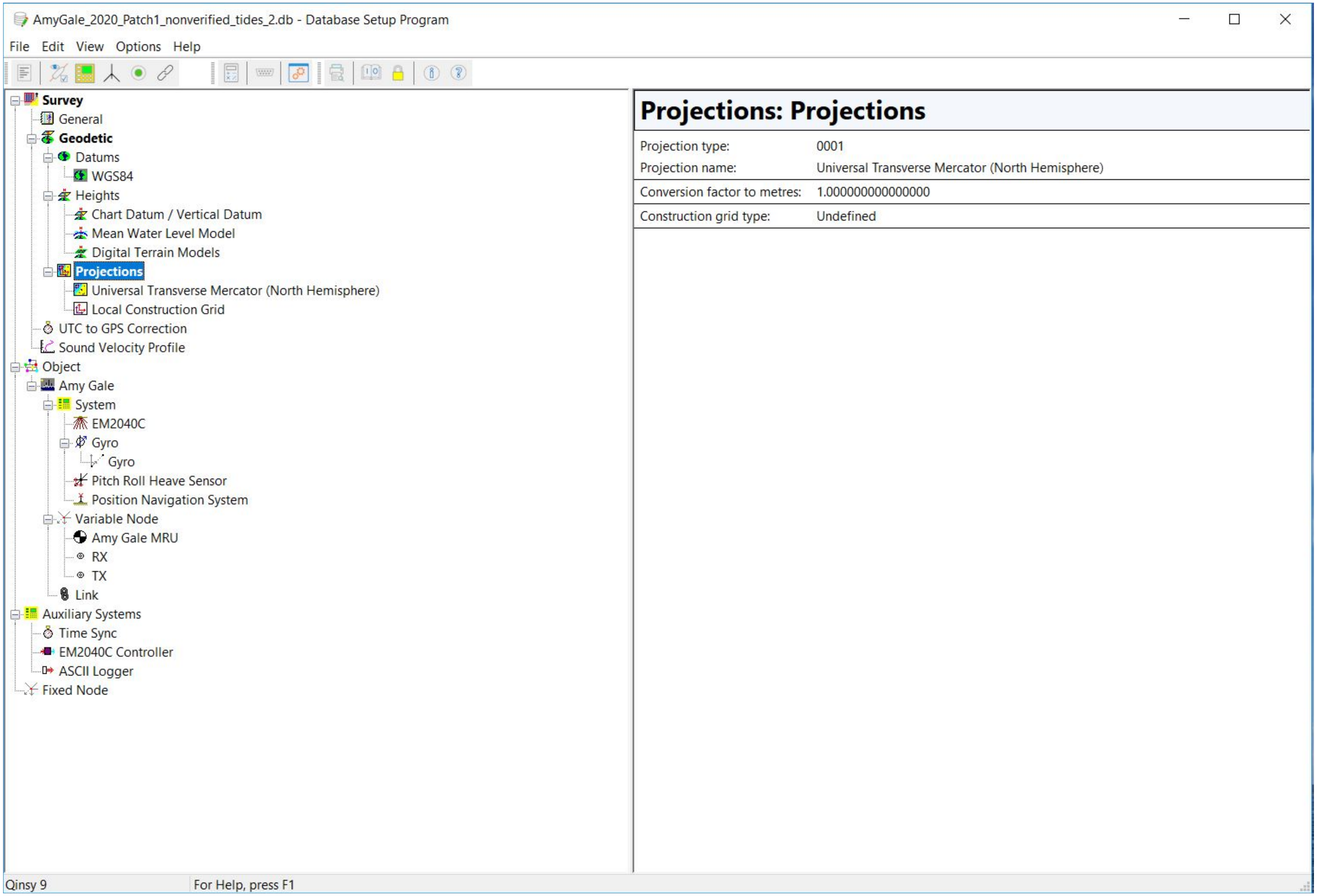
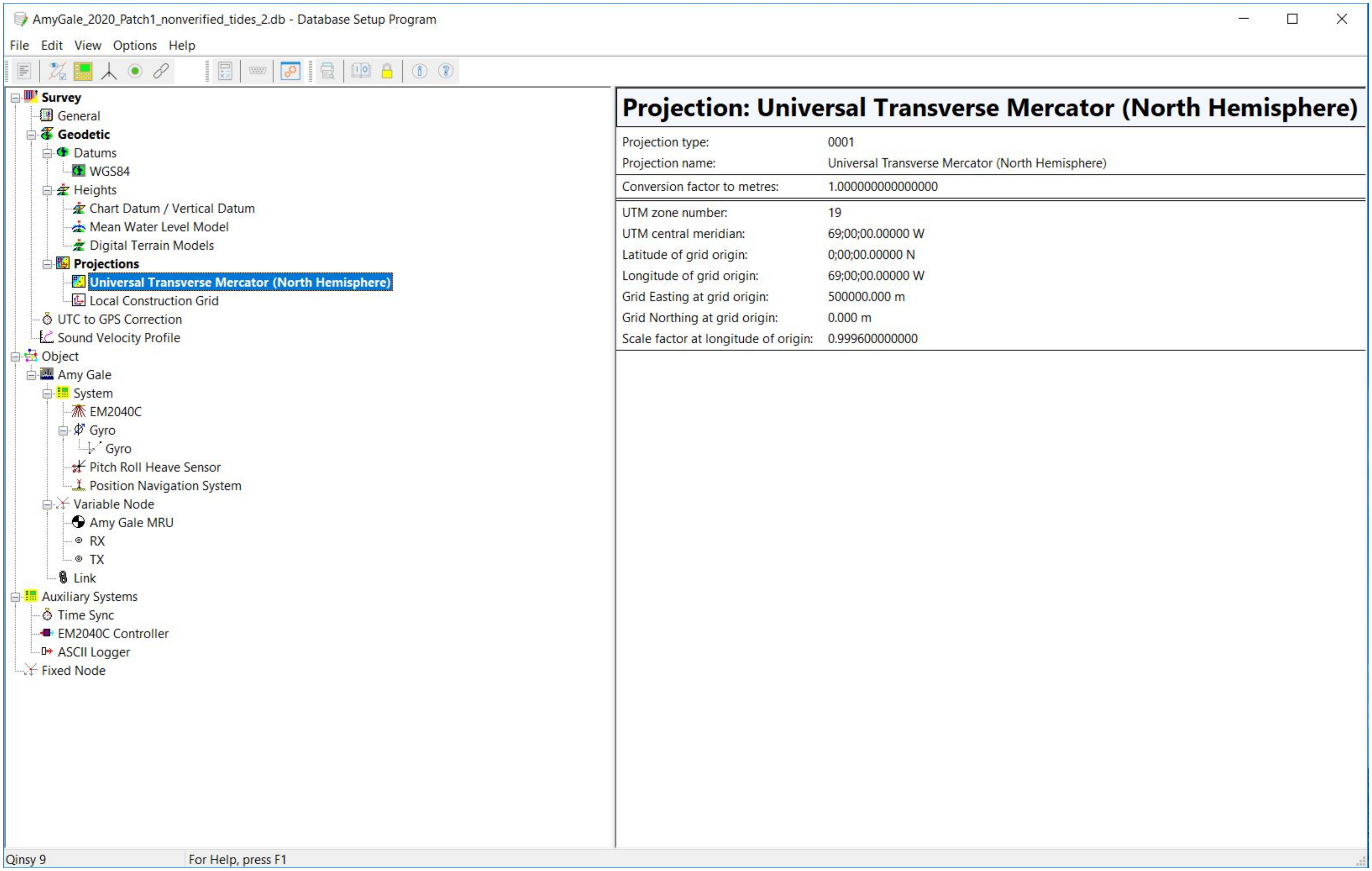
Mean Water Level Model
Digital Terrain Models
Projections
Universal Transverse Mercator (North Hemisphere)
Local Construction Grid
UTC to GPS Correction
Sound Velocity Profile
Object
Amy Gale
System
EM2040C
Gyro
Gyro
Pitch Roll Heave Sensor
Position Navigation System
Variable Node
Amy Gale MRU
RX
TX
Link
Auxiliary Systems
Time Sync
EM2040C Controller
ASCII Logger
Fixed Node
Heights: Heights
Chart datum: WGS84
Height file: N/A
Height level: No Level Correction
Height file: N/A
Height offset: 0.000 m
MWL model: Horizontal Datum
MWL file: N/A
MWL level: No Level Correction
MWL file: N/A
MWL offset: 0.000 m
MWL st.dev.: 0.000 m
DTM mode: Absolute DTMs
DTM datum: WGS84
DTM file: N/A
DTM level: No Level Correction
DTM file: N/A
DTM offset: 0.000 m
Qinsy 9
For Help, press F1

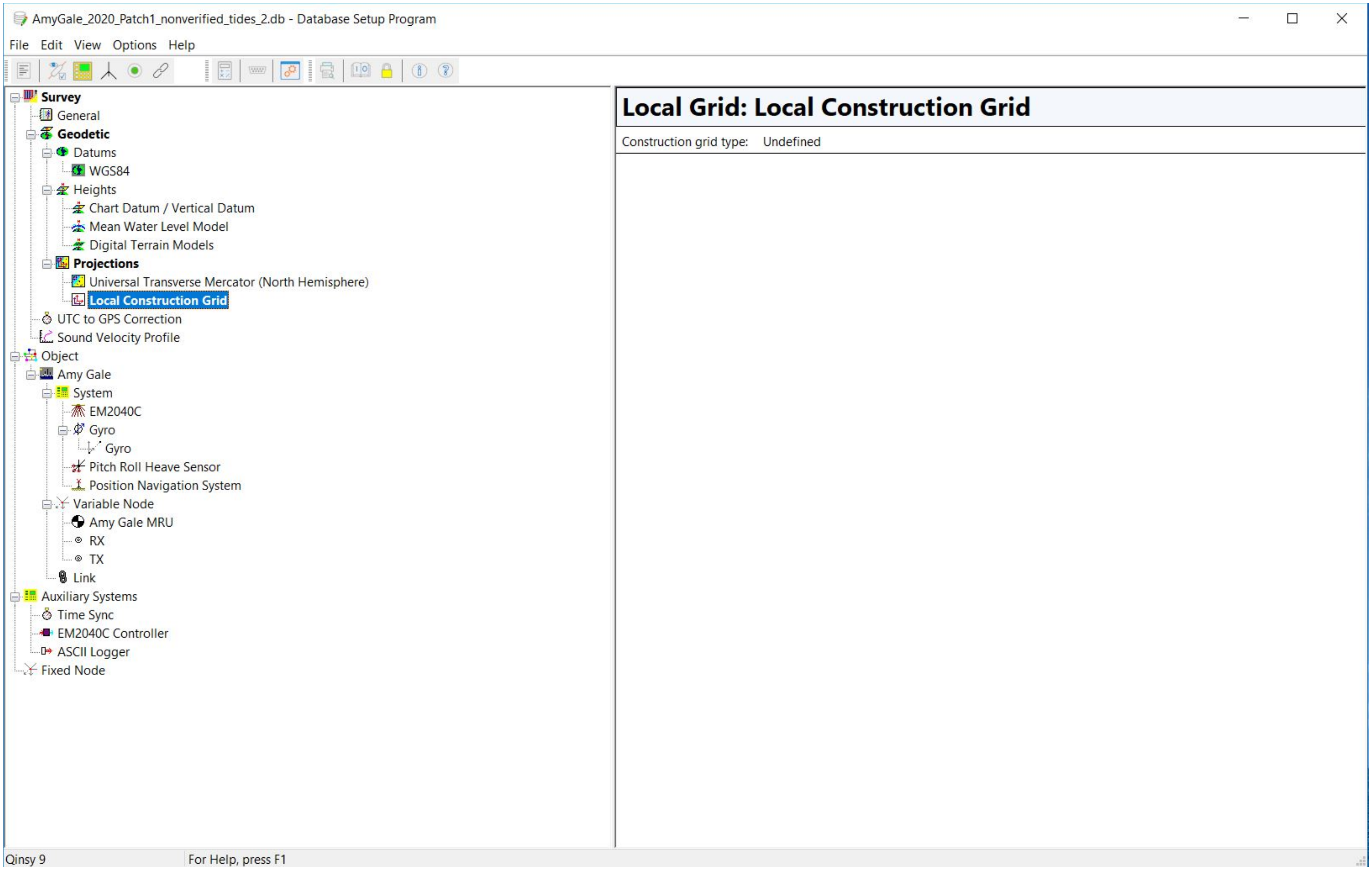

AmyGale_2020_Patch1_nonverified_tides_2.db - Database Setup Program
File Edit View Options Help
Survey
General
Geodetic
Datums
WGS84
Heights
Chart Datum / Vertical Datum
Mean Water Level Model
Digital Terrain Models
Projections
Universal Transverse Mercator (North Hemisphere)
Local Construction Grid
UTC to GPS Correction
Sound Velocity Profile
Object
Amy Gale
System
EM2040C
Gyro
Gyro
Pitch Roll Heave Sensor
Position Navigation System
Variable Node
Amy Gale MRU
RX
TX
Link
Auxiliary Systems
Time Sync
EM2040C Controller
ASCII Logger
Fixed Node
Height Datum: Chart Datum / Vertical Datum
Chart datum: WGS84
Height file: N/A
Height level: No Level Correction
Height file: N/A
Height offset: 0.000 m
Qinsy 9
For Help, press F1

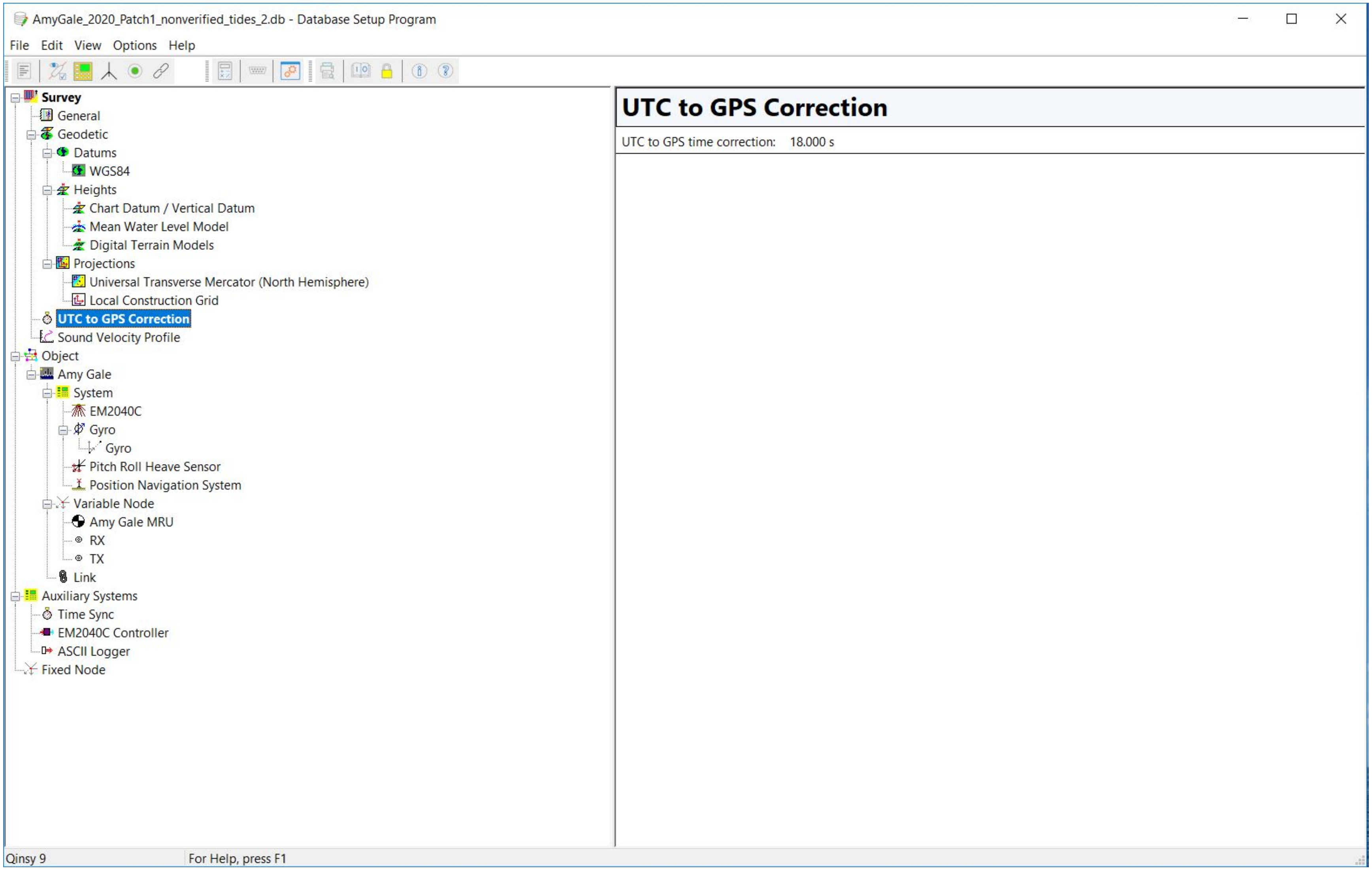

AmyGale_2020_Patch1_nonverified_tides_2.db - Database Setup Program
File Edit View Options Help
Survey
General
Geodetic
Datums
WGS84
Heights
Chart Datum / Vertical Datum
Mean Water Level Model
Digital Terrain Models
Projections
Universal Transverse Mercator (North Hemisphere)
Local Construction Grid
UTC to GPS Correction
Sound Velocity Profile
Object
Amy Gale
System
EM2040C
Gyro
Gyro
Pitch Roll Heave Sensor
Position Navigation System
Variable Node
Amy Gale MRU
RX
TX
Link
Auxiliary Systems
Time Sync
EM2040C Controller
ASCII Logger
Fixed Node
MWL Model: Mean Water Level Model
MWL model: Horizontal Datum
MWL file: N/A
MWL level: No Level Correction
MWL file: N/A
MWL offset: 0.000 m
MWL st.dev.: 0.000 m
Qinsy 9
For Help, press F1


AmyGale_2020_Patch1_nonverified_tides_2.db - Database Setup Program
File Edit View Options Help
Survey
General
Geodetic
Datums
WGS84
Heights
Chart Datum / Vertical Datum
Mean Water Level Model
Digital Terrain Models
Projections
Universal Transverse Mercator (North Hemisphere)
Local Construction Grid
UTC to GPS Correction
Sound Velocity Profile
Object
Amy Gale
System
EM2040C
Gyro
Gyro
Pitch Roll Heave Sensor
Position Navigation System
Variable Node
Amy Gale MRU
RX
TX
Link
Auxiliary Systems
Time Sync
EM2040C Controller
ASCII Logger
Fixed Node
DTM Mode: Digital Terrain Models
DTM mode: Absolute DTMs
DTM datum: WGS84
DTM file: N/A
DTM level: No Level Correction
DTM file: N/A
DTM offset: 0.000 m
Qinsy 9
For Help, press F1


AmyGale_2020_Patch1_nonverified_tides_2.db - Database Setup Program
File Edit View Options Help
Survey
General
Geodetic
Datums
WGS84
Heights
Chart Datum / Vertical Datum
Mean Water Level Model
Digital Terrain Models
Projections
Universal Transverse Mercator (North Hemisphere)
Local Construction Grid
UTC to GPS Correction
Sound Velocity Profile
Object
Amy Gale
System
EM2040C
Gyro
Gyro
Pitch Roll Heave Sensor
Position Navigation System
Variable Node
Amy Gale MRU
RX
TX
Link
Auxiliary Systems
Time Sync
EM2040C Controller
ASCII Logger
Fixed Node
Projections: Projections
Projection type: 0001
Projection name: Universal Transverse Mercator (North Hemisphere)
Conversion factor to metres: 1.000000000000000
Construction grid type: Undefined
Qinsy 9
For Help, press F1


AmyGale_2020_Patch1_nonverified_tides_2.db - Database Setup Program
File Edit View Options Help
Survey
General
Geodetic
Datums
WGS84
Heights
Chart Datum / Vertical Datum
Mean Water Level Model
Digital Terrain Models
Projections
Universal Transverse Mercator (North Hemisphere)
Local Construction Grid
UTC to GPS Correction
Sound Velocity Profile
Object
Amy Gale
System
EM2040C
Gyro
Gyro
Pitch Roll Heave Sensor
Position Navigation System
Variable Node
Amy Gale MRU
RX
TX
Link
Auxiliary Systems
Time Sync
EM2040C Controller
ASCII Logger
Fixed Node
Projection: Universal Transverse Mercator (North Hemisphere)
Projection type: 0001
Projection name: Universal Transverse Mercator (North Hemisphere)
Conversion factor to metres: 1.000000000000000
UTM zone number: 19
UTM central meridian: 69;00;00.00000 W
Latitude of grid origin: 0;00;00.00000 N
Longitude of grid origin: 69;00;00.00000 W
Grid Easting at grid origin: 500000.000 m
Grid Northing at grid origin: 0.000 m
Scale factor at longitude of origin: 0.999600000000
Qinsy 9
For Help, press F1


AmyGale_2020_Patch1_nonverified_tides_2.db - Database Setup Program
File Edit View Options Help
Survey
General
Geodetic
Datums
WGS84
Heights
Chart Datum / Vertical Datum
Mean Water Level Model
Digital Terrain Models
Projections
Universal Transverse Mercator (North Hemisphere)
Local Construction Grid
UTC to GPS Correction
Sound Velocity Profile
Object
Amy Gale
System
EM2040C
Gyro
Gyro
Pitch Roll Heave Sensor
Position Navigation System
Variable Node
Amy Gale MRU
RX
TX
Link
Auxiliary Systems
Time Sync
EM2040C Controller
ASCII Logger
Fixed Node
Local Grid: Local Construction Grid
Construction grid type: Undefined
Qinsy 9
For Help, press F1


AmyGale_2020_Patch1_nonverified_tides_2.db - Database Setup Program
File Edit View Options Help
Survey
General
Geodetic
Datums
WGS84
Heights
Chart Datum / Vertical Datum
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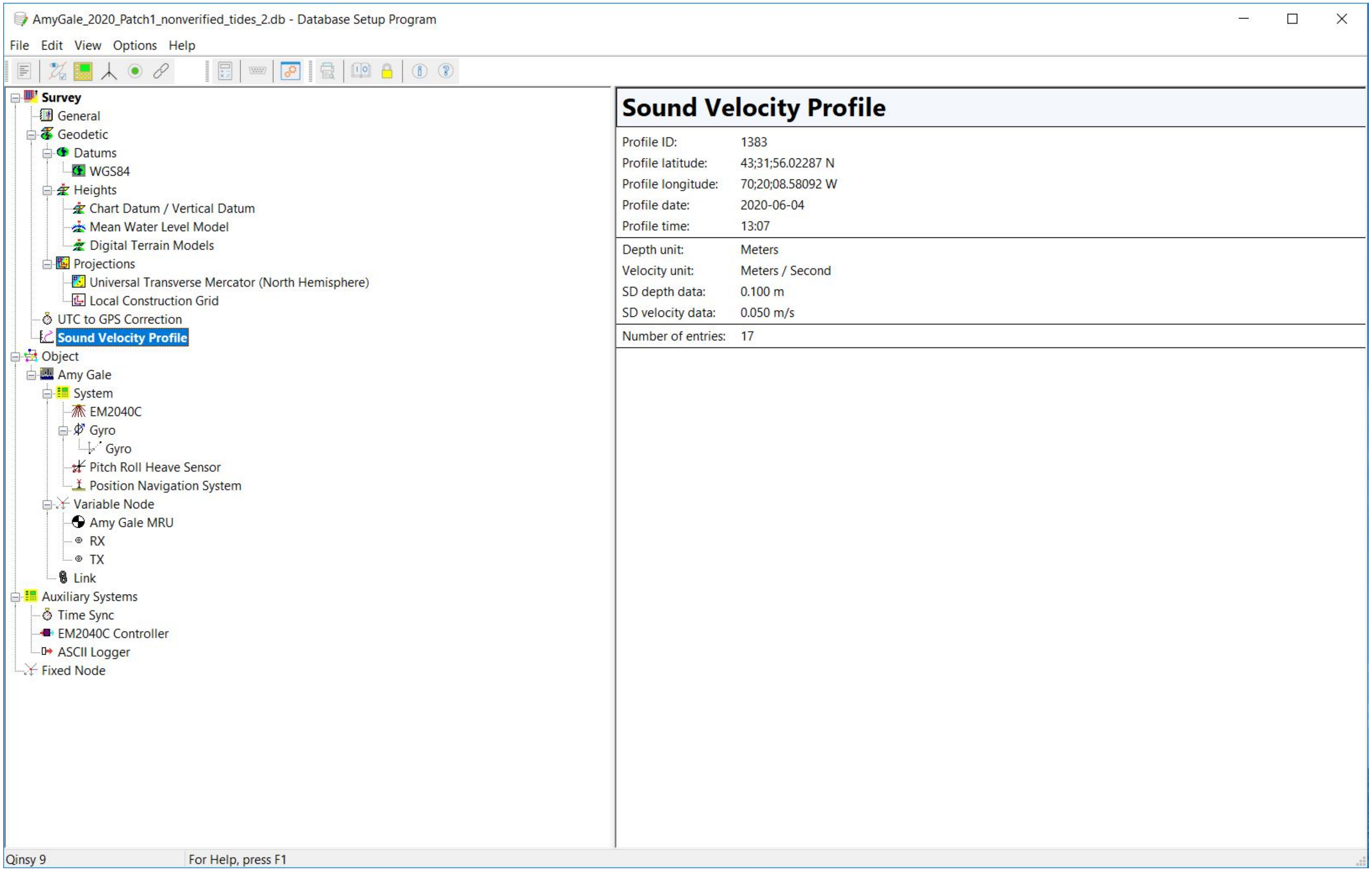
Digital Terrain Models
Projections
Universal Transverse Mercator (North Hemisphere)
Local Construction Grid
UTC to GPS Correction
Sound Velocity Profile
Object
Amy Gale
System
EM2040C
Gyro
Gyro
Pitch Roll Heave Sensor
Position Navigation System
Variable Node
Amy Gale MRU
RX
TX
Link
Auxiliary Systems
Time Sync
EM2040C Controller
ASCII Logger
Fixed Node
UTC to GPS Correction
UTC to GPS time correction: 18.000 s
Qinsy 9
For Help, press F1


AmyGale_2020_Patch1_nonverified_tides_2.db - Database Setup Program
File Edit View Options Help
Survey
General
Geodetic
Datums
WGS84
Heights
Chart Datum / Vertical Datum
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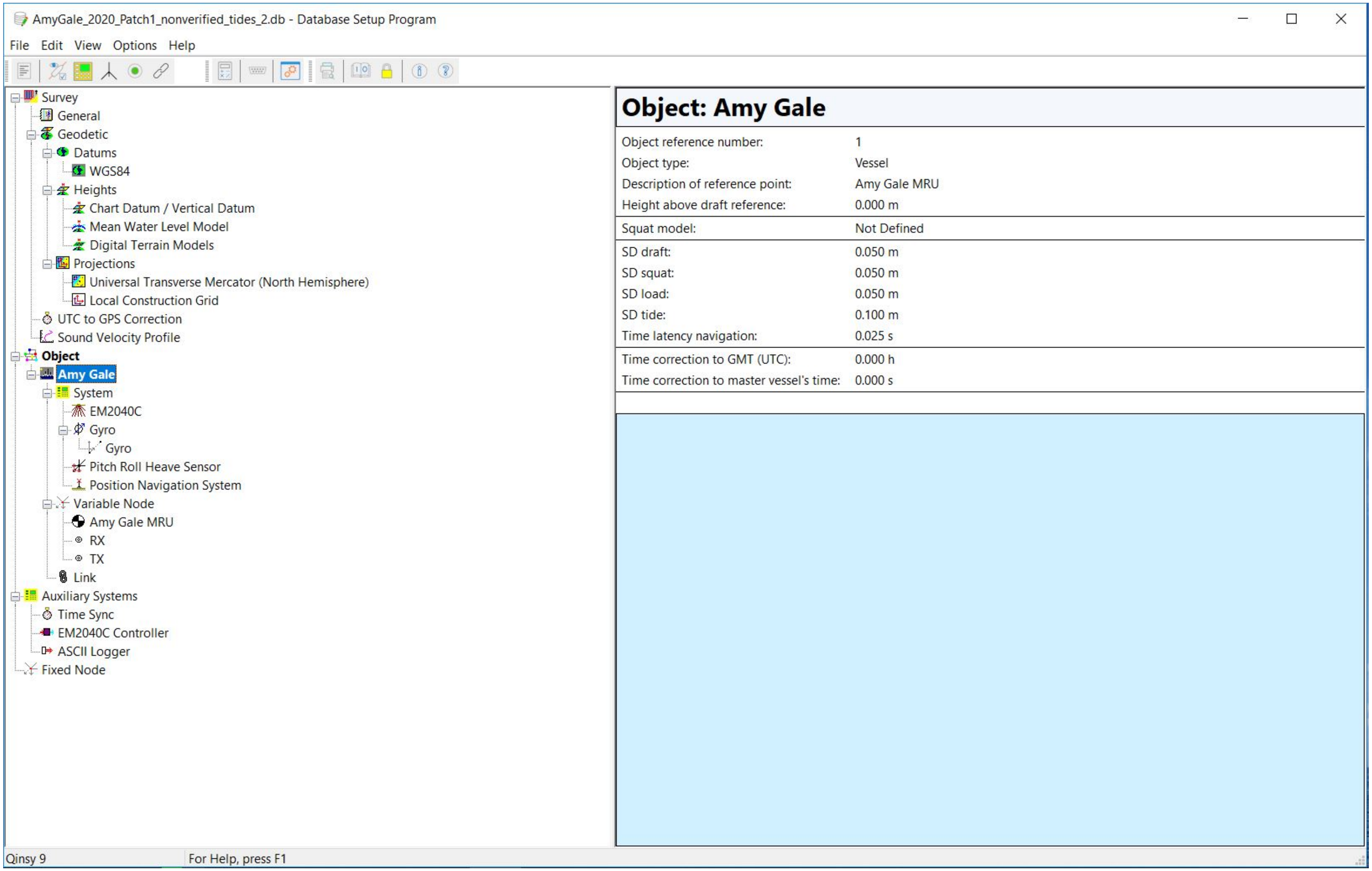
Digital Terrain Models
Projections
Universal Transverse Mercator (North Hemisphere)
Local Construction Grid
UTC to GPS Correction
Sound Velocity Profile
Object
Amy Gale
System
EM2040C
Gyro
Gyro
Pitch Roll Heave Sensor
Position Navigation System
Variable Node
Amy Gale MRU
RX
TX
Link
Auxiliary Systems
Time Sync
EM2040C Controller
ASCII Logger
Fixed Node
Sound Velocity Profile
Profile ID: 1383
Profile latitude: 43;31;56.02287 N
Profile longitude: 70;20;08.58092 W
Profile date: 2020-06-04
Profile time: 13:07
Depth unit: Meters
Velocity unit: Meters / Second
SD depth data: 0.100 m
SD velocity data: 0.050 m/s
Number of entries: 17
Qinsy 9
For Help, press F1


AmyGale_2020_Patch1_nonverified_tides_2.db - Database Setup Program
File Edit View Options Help
Survey
General
Geodetic
Datums
WGS84
Heights
Chart Datum / Vertical Datum
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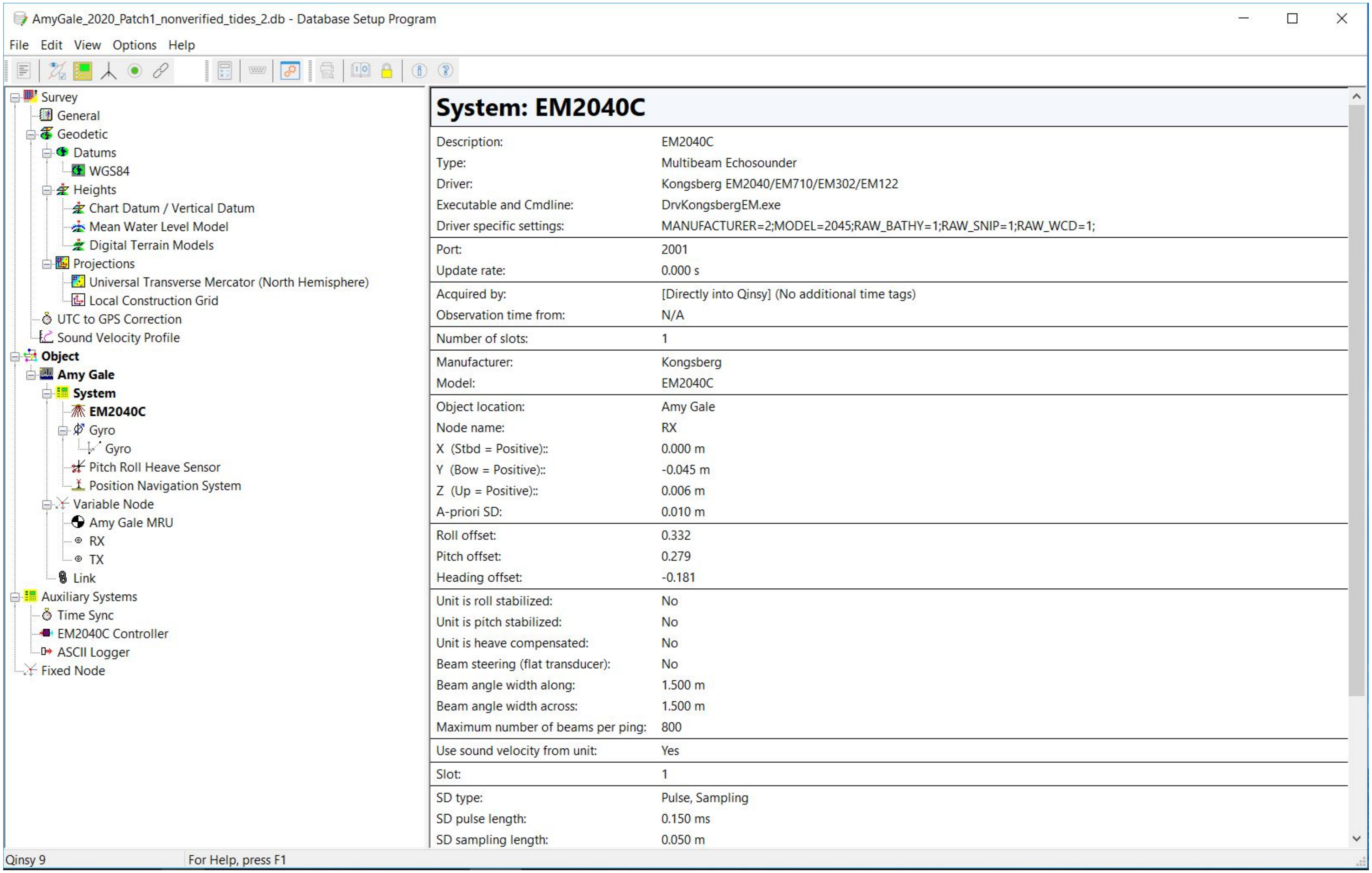
Object
Amy Gale
System
EM2040C
Gyro
Gyro
Pitch Roll Heave Sensor
Position Navigation System
Variable Node
Amy Gale MRU
RX
TX
Link
Auxiliary Systems
Time Sync
EM2040C Controller
ASCII Logger
Fixed Node
Object: Amy Gale
Object reference number: 1
Object type: Vessel
Description of reference point: Amy Gale MRU
Height above draft reference: 0.000 m
Squat model: Not Defined
SD draft: 0.050 m
SD squat: 0.050 m
SD load: 0.050 m
SD tide: 0.100 m
Time latency navigation: 0.025 s
Time correction to GMT (UTC): 0.000 h
Time correction to master vessel's time: 0.000 s
Qinsy 9
For Help, press F1


AmyGale_2020_Patch1_nonverified_tides_2.db - Database Setup Program
File Edit View Options Help
Survey
General
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Datums
WGS84
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Chart Datum / Vertical Datum
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Universal Transverse Mercator (North Hemisphere)
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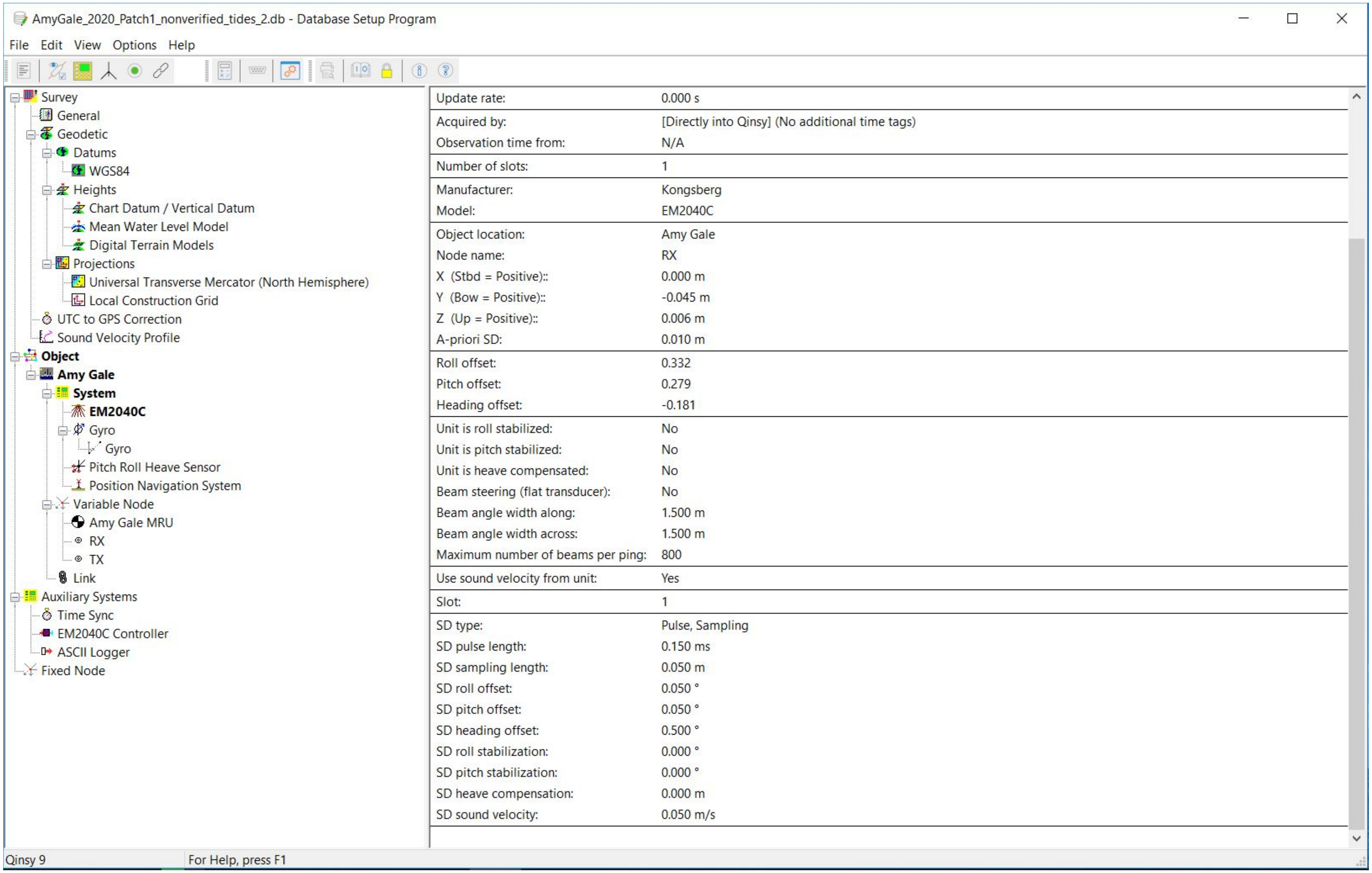
Amy Gale
System
EM2040C
Gyro
Gyro
Pitch Roll Heave Sensor
Position Navigation System
Variable Node
Amy Gale MRU
RX
TX
Link
Auxiliary Systems
Time Sync
EM2040C Controller
ASCII Logger
Fixed Node
System: EM2040C
Description: EM2040C
Type: Multibeam Echosounder
Driver: Kongsberg EM2040/EM710/EM302/EM122
Executable and Cmdline: DrvKongsbergEM.exe
Driver specific settings: MANUFACTURER=2;MODEL=2045;RAW_BATHY=1;RAW_SNIP=1;RAW_WCD=1;
Port: 2001
Update rate: 0.000 s
Acquired by: [Directly into Qinsy] (No additional time tags)
Observation time from: N/A
Number of slots: 1
Manufacturer: Kongsberg
Model: EM2040C
Object location: Amy Gale
Node name: RX
X (Stbd = Positive):: 0.000 m
Y (Bow = Positive):: -0.045 m
Z (Up = Positive):: 0.006 m
A-priori SD: 0.010 m
Roll offset: 0.332
Pitch offset: 0.279
Heading offset: -0.181
Unit is roll stabilized: No
Unit is pitch stabilized: No
Unit is heave compensated: No
Beam steering (flat transducer): No
Beam angle width along: 1.500 m
Beam angle width across: 1.500 m
Maximum number of beams per ping: 800
Use sound velocity from unit: Yes
Slot: 1
SD type: Pulse, Sampling
SD pulse length: 0.150 ms
SD sampling length: 0.050 m
Qinsy 9
For Help, press F1


AmyGale_2020_Patch1_nonverified_tides_2.db - Database Setup Program
File Edit View Options Help
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WGS84
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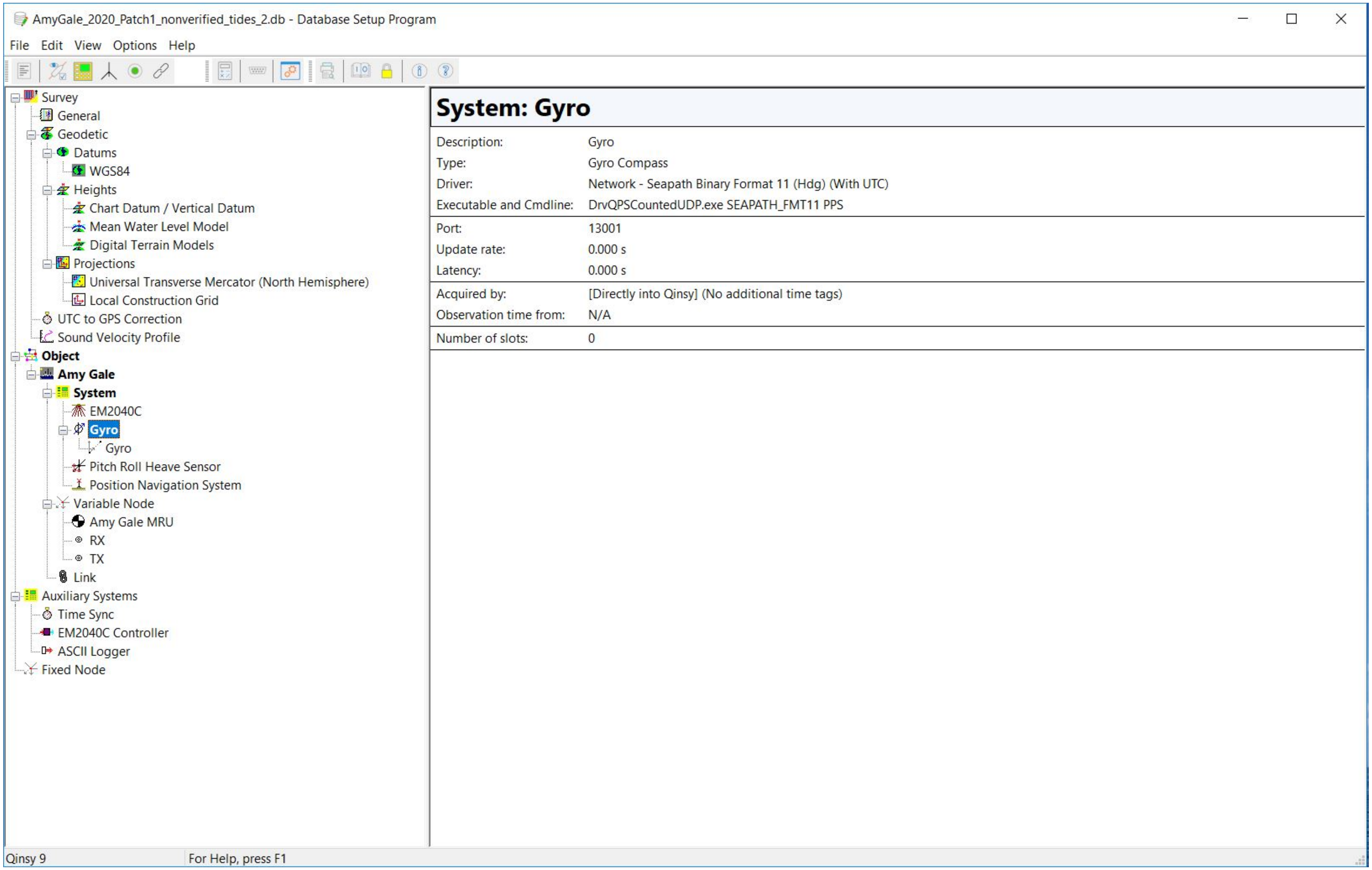
Local Construction Grid
UTC to GPS Correction
Sound Velocity Profile
Object
Amy Gale
System
EM2040C
Gyro
Gyro
Pitch Roll Heave Sensor
Position Navigation System
Variable Node
Amy Gale MRU
RX
TX
Link
Auxiliary Systems
Time Sync
EM2040C Controller
ASCII Logger
Fixed Node
Update rate: 0.000 s
Acquired by: [Directly into Qinsy] (No additional time tags)
Observation time from: N/A
Number of slots: 1
Manufacturer: Kongsberg
Model: EM2040C
Object location: Amy Gale
Node name: RX
X (Stbd = Positive):: 0.000 m
Y (Bow = Positive):: -0.045 m
Z (Up = Positive):: 0.006 m
A-priori SD: 0.010 m
Roll offset: 0.332
Pitch offset: 0.279
Heading offset: -0.181
Unit is roll stabilized: No
Unit is pitch stabilized: No
Unit is heave compensated: No
Beam steering (flat transducer): No
Beam angle width along: 1.500 m
Beam angle width across: 1.500 m
Maximum number of beams per ping: 800
Use sound velocity from unit: Yes
Slot: 1
SD type: Pulse, Sampling
SD pulse length: 0.150 ms
SD sampling length: 0.050 m
SD roll offset: 0.050 °
SD pitch offset: 0.050 °
SD heading offset: 0.500 °
SD roll stabilization: 0.000 °
SD pitch stabilization: 0.000 °
SD heave compensation: 0.000 m
SD sound velocity: 0.050 m/s
Qinsy 9
For Help, press F1


AmyGale_2020_Patch1_nonverified_tides_2.db - Database Setup Program
File Edit View Options Help
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Universal Transverse Mercator (North Hemisphere)
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Sound Velocity Profile
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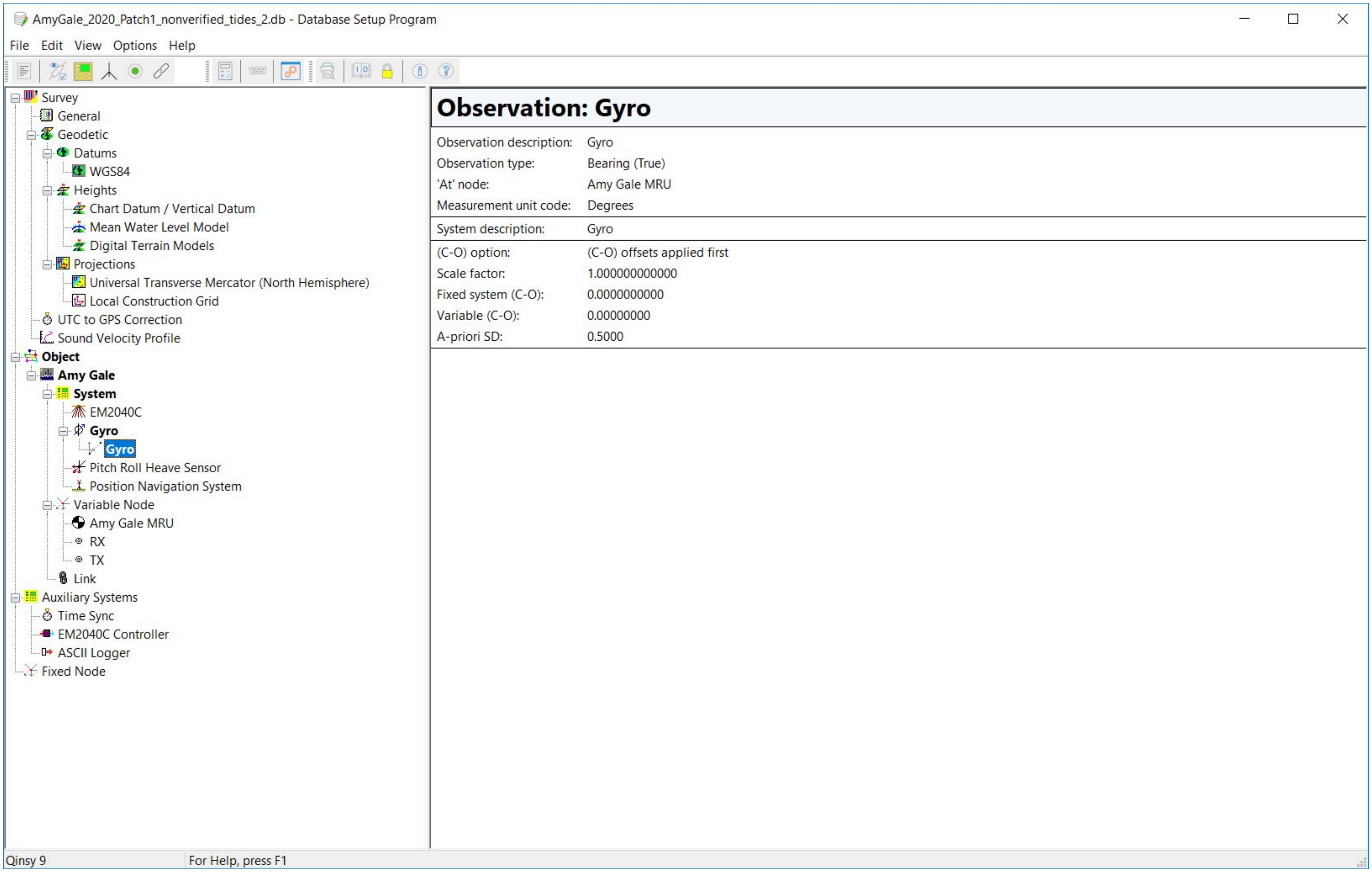
Amy Gale
System
EM2040C
Gyro
Gyro
Pitch Roll Heave Sensor
Position Navigation System
Variable Node
Amy Gale MRU
RX
TX
Link
Auxiliary Systems
Time Sync
EM2040C Controller
ASCII Logger
Fixed Node
System: Gyro
Description: Gyro
Type: Gyro Compass
Driver: Network - Seapath Binary Format 11 (Hdg) (With UTC)
Executable and Cmdline: DrvQPSCountedUDP.exe SEAPATH_FMT11 PPS
Port: 13001
Update rate: 0.000 s
Latency: 0.000 s
Acquired by: [Directly into Qinsy] (No additional time tags)
Observation time from: N/A
Number of slots: 0
Qinsy 9
For Help, press F1


AmyGale_2020_Patch1_nonverified_tides_2.db - Database Setup Program
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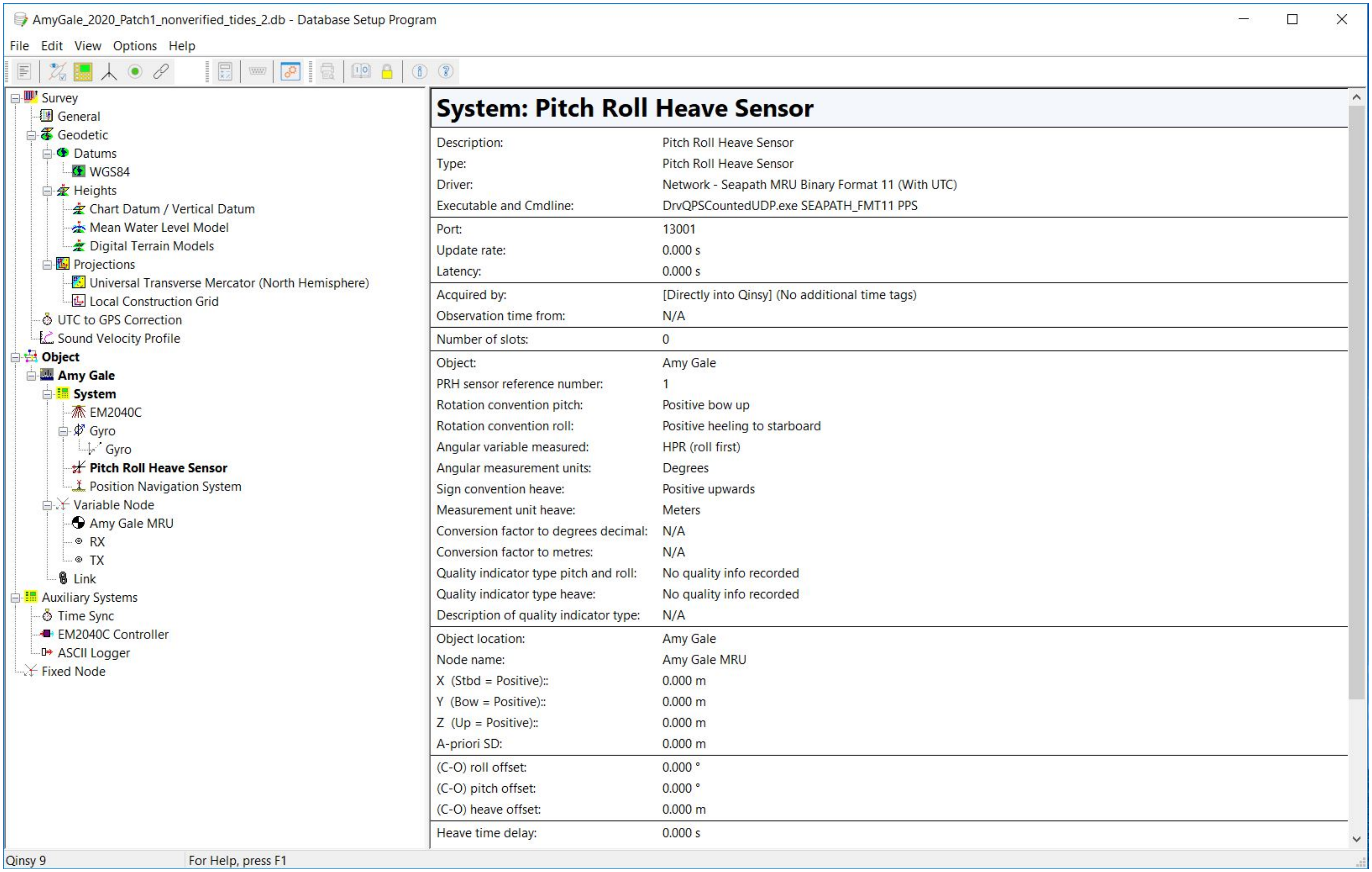
ASCII Logger
Fixed Node
Observation: Gyro
Observation description: Gyro
Observation type: Bearing (True)
'At' node: Amy Gale MRU
Measurement unit code: Degrees
System description: Gyro
(C-O) option: (C-O) offsets applied first
Scale factor: 1.000000000000
Fixed system (C-O): 0.0000000000
Variable (C-O): 0.00000000
A-priori SD: 0.5000
Qinsy 9
For Help, press F1


AmyGale_2020_Patch1_nonverified_tides_2.db - Database Setup Program
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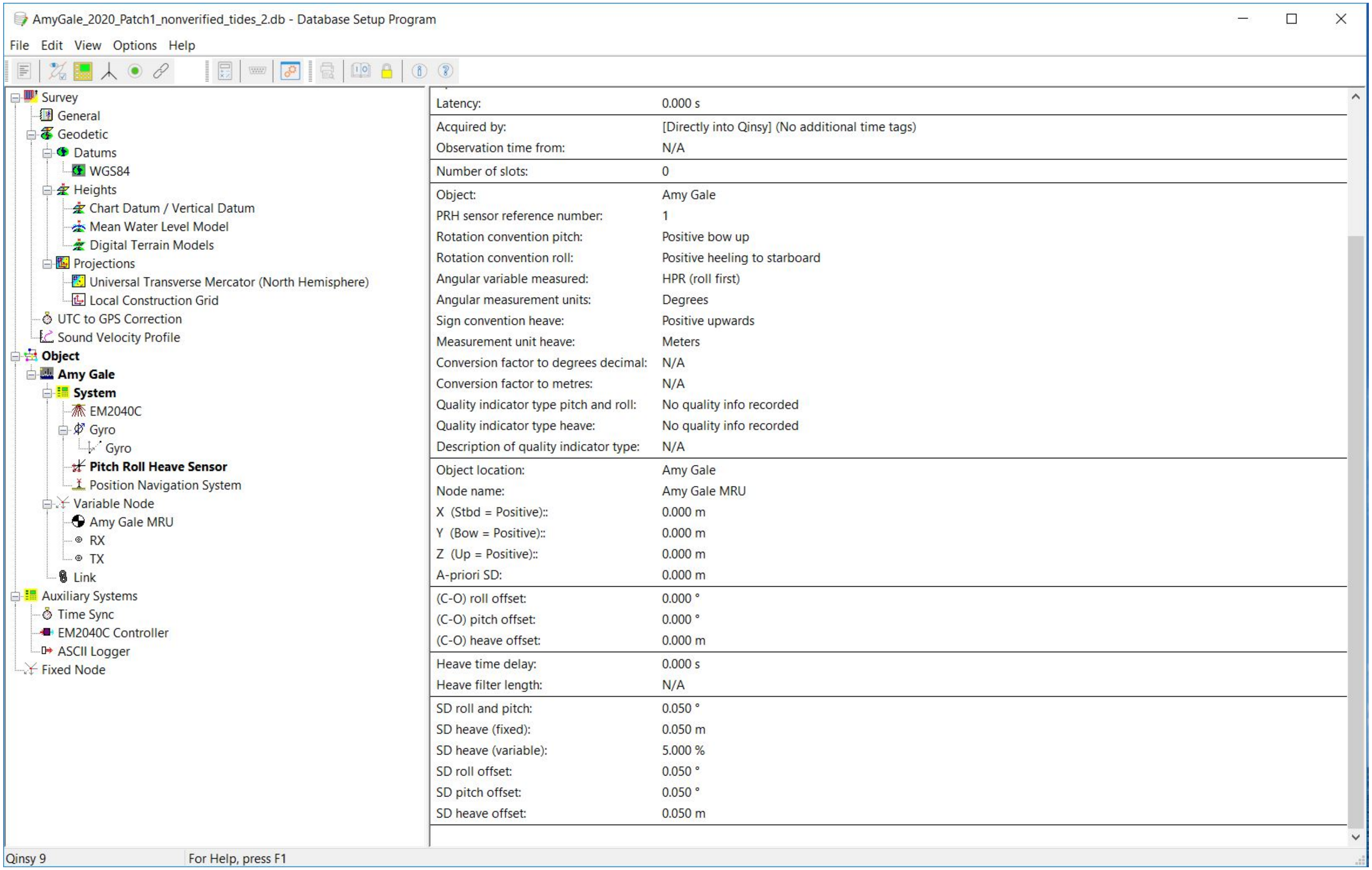
ASCII Logger
Fixed Node
System: Pitch Roll Heave Sensor
Description: Pitch Roll Heave Sensor
Type: Pitch Roll Heave Sensor
Driver: Network - Seapath MRU Binary Format 11 (With UTC)
Executable and Cmdline: DrvQPSCountedUDP.exe SEAPATH_FMT11 PPS
Port: 13001
Update rate: 0.000 s
Latency: 0.000 s
Acquired by: [Directly into Qinsy] (No additional time tags)
Observation time from: N/A
Number of slots: 0
Object: Amy Gale
PRH sensor reference number: 1
Rotation convention pitch: Positive bow up
Rotation convention roll: Positive heeling to starboard
Angular variable measured: HPR (roll first)
Angular measurement units: Degrees
Sign convention heave: Positive upwards
Measurement unit heave: Meters
Conversion factor to degrees decimal: N/A
Conversion factor to metres: N/A
Quality indicator type pitch and roll: No quality info recorded
Quality indicator type heave: No quality info recorded
Description of quality indicator type: N/A
Object location: Amy Gale
Node name: Amy Gale MRU
X (Stbd = Positive):: 0.000 m
Y (Bow = Positive):: 0.000 m
Z (Up = Positive):: 0.000 m
A-priori SD: 0.000 m
(C-O) roll offset: 0.000 °
(C-O) pitch offset: 0.000 °
(C-O) heave offset: 0.000 m
Heave time delay: 0.000 s
Qinsy 9
For Help, press F1


AmyGale_2020_Patch1_nonverified_tides_2.db - Database Setup Program
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Gyro
Gyro
Pitch Roll Heave Sensor
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Variable Node
Amy Gale MRU
RX
TX
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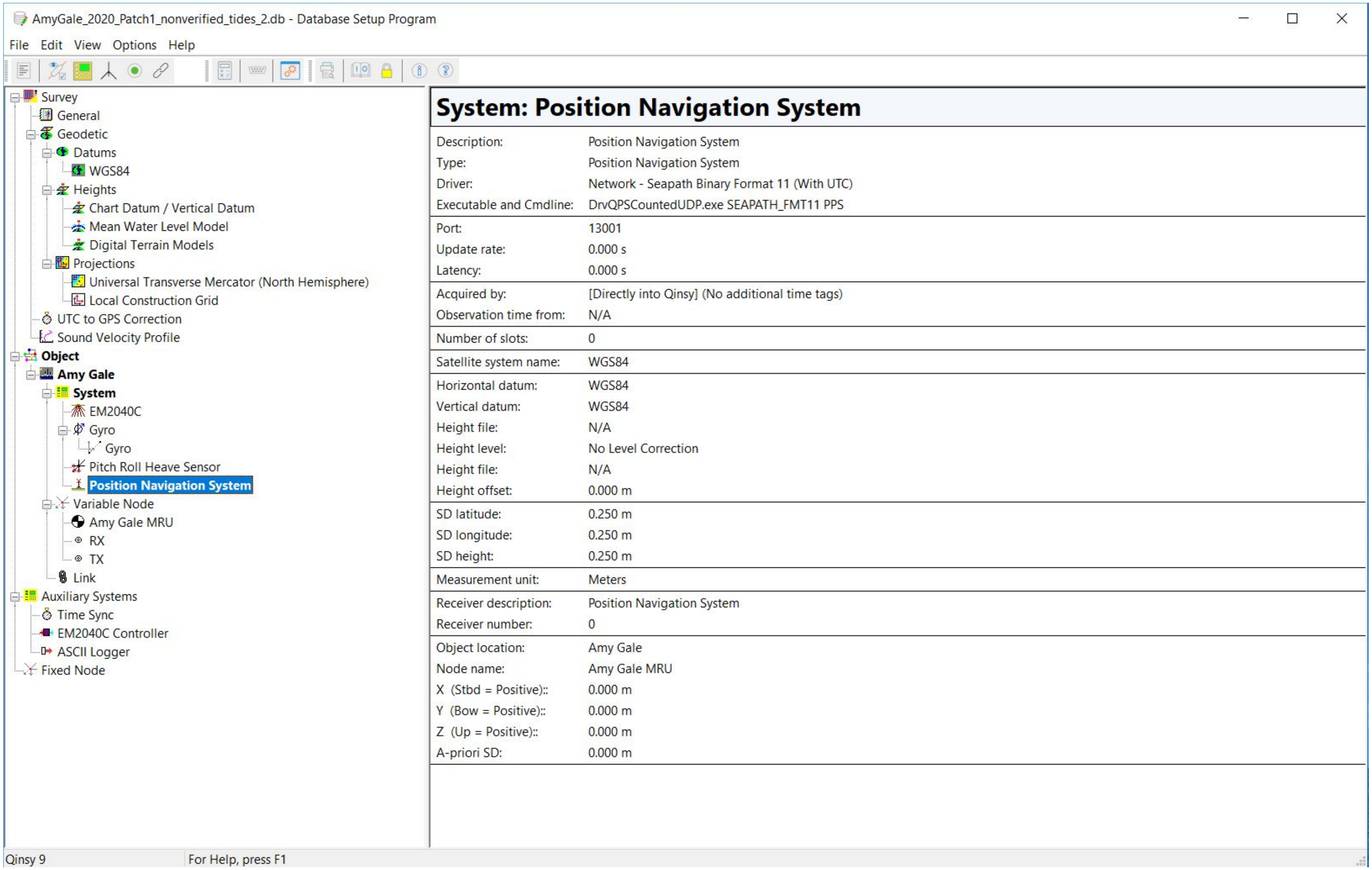
ASCII Logger
Fixed Node
Latency: 0.000 s
Acquired by: [Directly into Qinsy] (No additional time tags)
Observation time from: N/A
Number of slots: 0
Object: Amy Gale
PRH sensor reference number: 1
Rotation convention pitch: Positive bow up
Rotation convention roll: Positive heeling to starboard
Angular variable measured: HPR (roll first)
Angular measurement units: Degrees
Sign convention heave: Positive upwards
Measurement unit heave: Meters
Conversion factor to degrees decimal: N/A
Conversion factor to metres: N/A
Quality indicator type pitch and roll: No quality info recorded
Quality indicator type heave: No quality info recorded
Description of quality indicator type: N/A
Object location: Amy Gale
Node name: Amy Gale MRU
X (Stbd = Positive):: 0.000 m
Y (Bow = Positive):: 0.000 m
Z (Up = Positive):: 0.000 m
A-priori SD: 0.000 m
(C-O) roll offset: 0.000 °
(C-O) pitch offset: 0.000 °
(C-O) heave offset: 0.000 m
Heave time delay: 0.000 s
Heave filter length: N/A
SD roll and pitch: 0.050 °
SD heave (fixed): 0.050 m
SD heave (variable): 5.000 %
SD roll offset: 0.050 °
SD pitch offset: 0.050 °
SD heave offset: 0.050 m
Qinsy 9
For Help, press F1


AmyGale_2020_Patch1_nonverified_tides_2.db - Database Setup Program
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Gyro
Pitch Roll Heave Sensor
Position Navigation System
Variable Node
Amy Gale MRU
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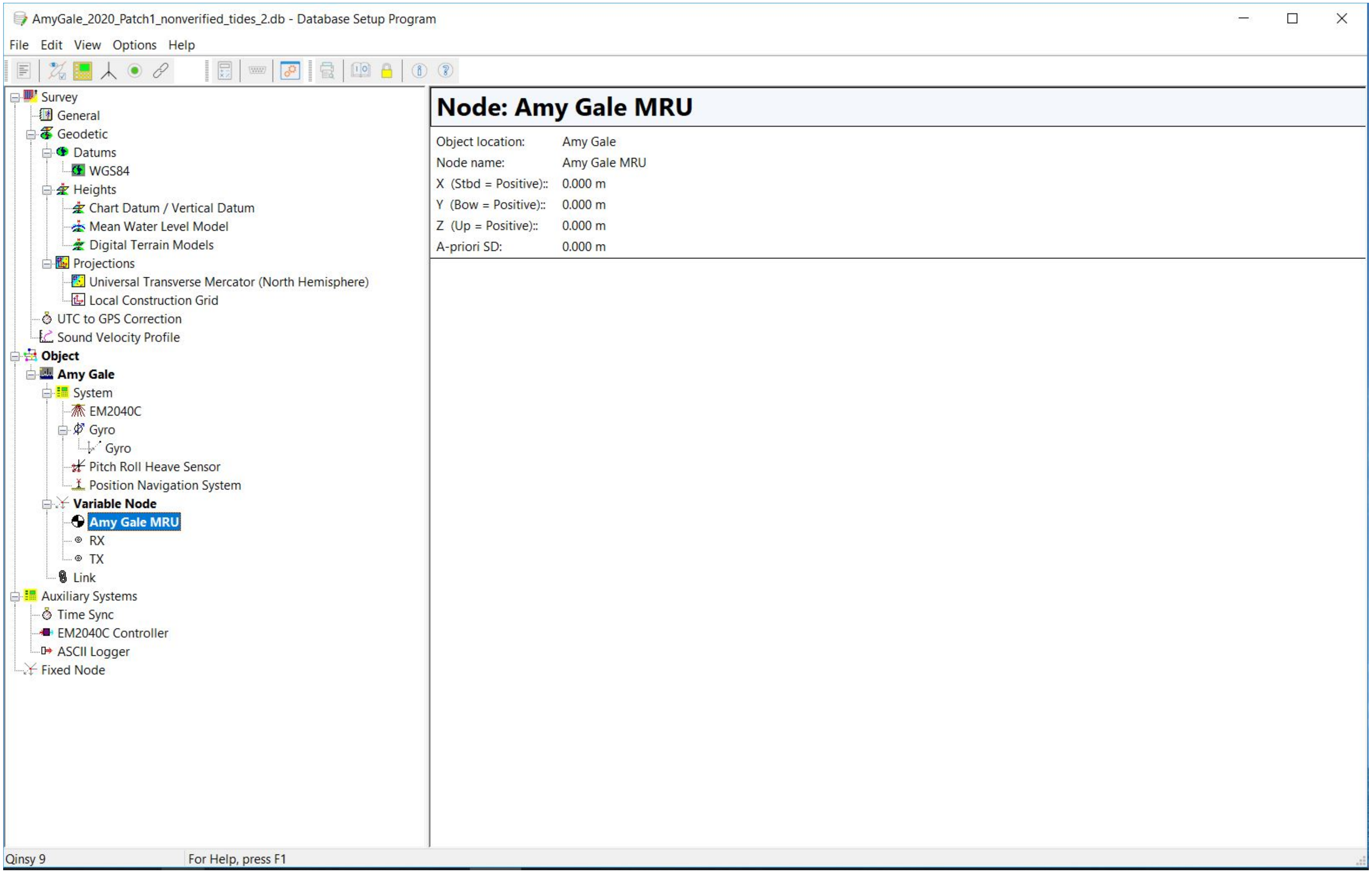
Auxiliary Systems
Time Sync
EM2040C Controller
ASCII Logger
Fixed Node
System: Position Navigation System
Description: Position Navigation System
Type: Position Navigation System
Driver: Network - Seapath Binary Format 11 (With UTC)
Executable and Cmdline: DrvQPSCountedUDP.exe SEAPATH_FMT11 PPS
Port: 13001
Update rate: 0.000 s
Latency: 0.000 s
Acquired by: [Directly into Qinsy] (No additional time tags)
Observation time from: N/A
Number of slots: 0
Satellite system name: WGS84
Horizontal datum: WGS84
Vertical datum: WGS84
Height file: N/A
Height level: No Level Correction
Height file: N/A
Height offset: 0.000 m
SD latitude: 0.250 m
SD longitude: 0.250 m
SD height: 0.250 m
Measurement unit: Meters
Receiver description: Position Navigation System
Receiver number: 0
Object location: Amy Gale
Node name: Amy Gale MRU
X (Stbd = Positive):: 0.000 m
Y (Bow = Positive):: 0.000 m
Z (Up = Positive):: 0.000 m
A-priori SD: 0.000 m
Qinsy 9
For Help, press F1


AmyGale_2020_Patch1_nonverified_tides_2.db - Database Setup Program
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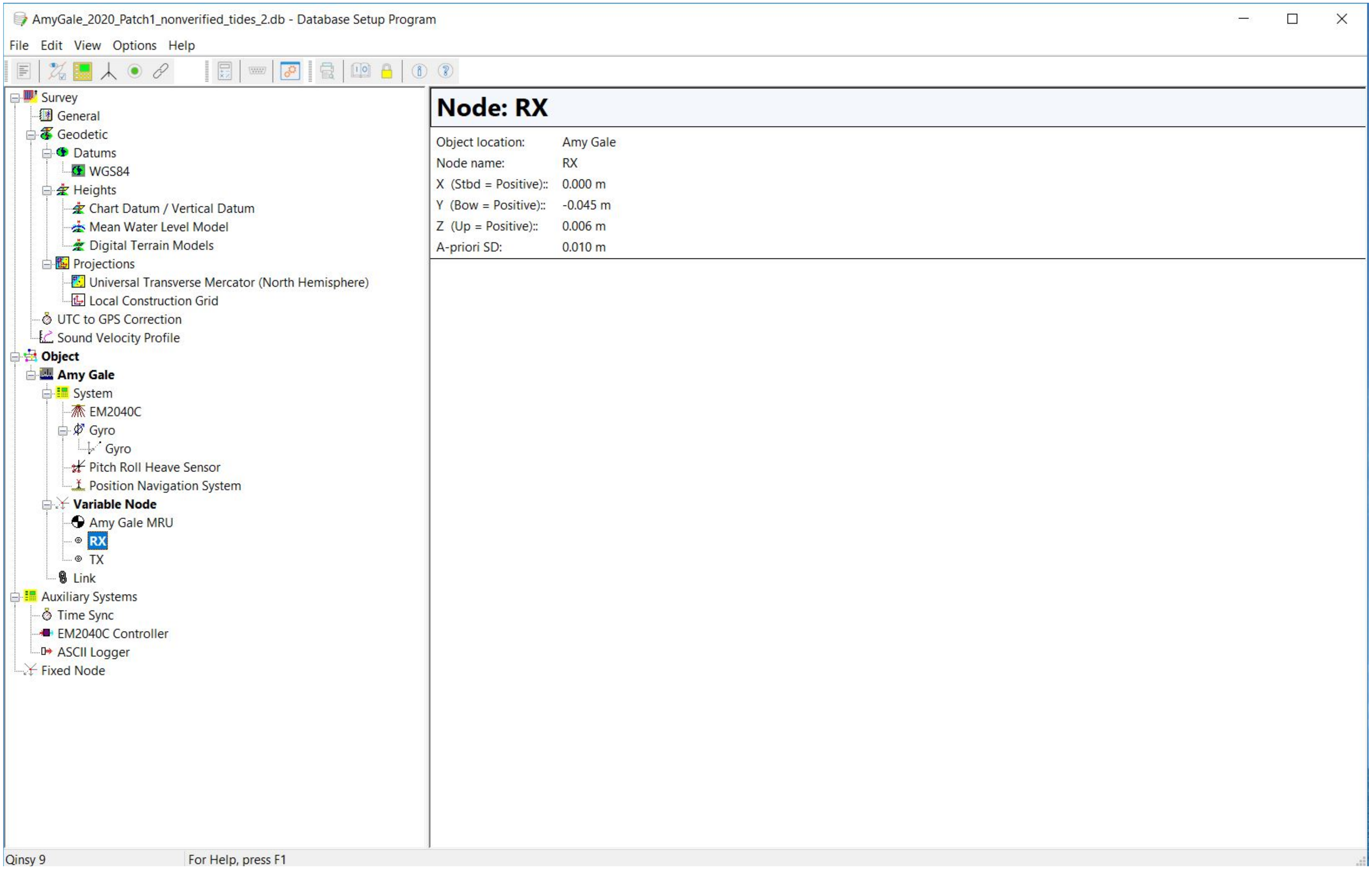
Fixed Node
Node: Amy Gale MRU
Object location: Amy Gale
Node name: Amy Gale MRU
X (Stbd = Positive):: 0.000 m
Y (Bow = Positive):: 0.000 m
Z (Up = Positive):: 0.000 m
A-priori SD: 0.000 m
Qinsy 9
For Help, press F1


AmyGale_2020_Patch1_nonverified_tides_2.db - Database Setup Program
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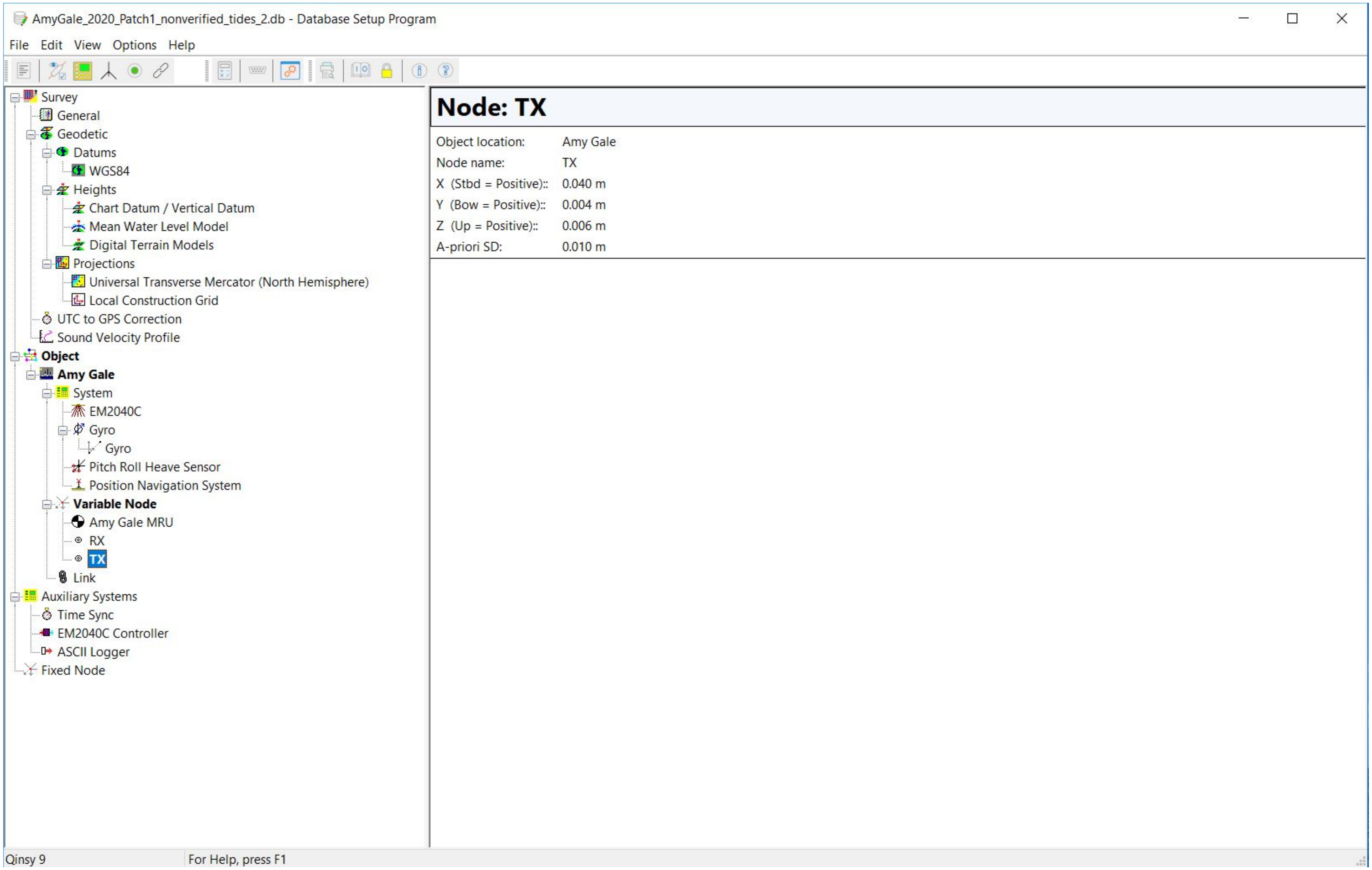
ASCII Logger
Fixed Node
Node: RX
Object location: Amy Gale
Node name: RX
X (Stbd = Positive):: 0.000 m
Y (Bow = Positive):: -0.045 m
Z (Up = Positive):: 0.006 m
A-priori SD: 0.010 m
Qinsy 9
For Help, press F1


AmyGale_2020_Patch1_nonverified_tides_2.db - Database Setup Program
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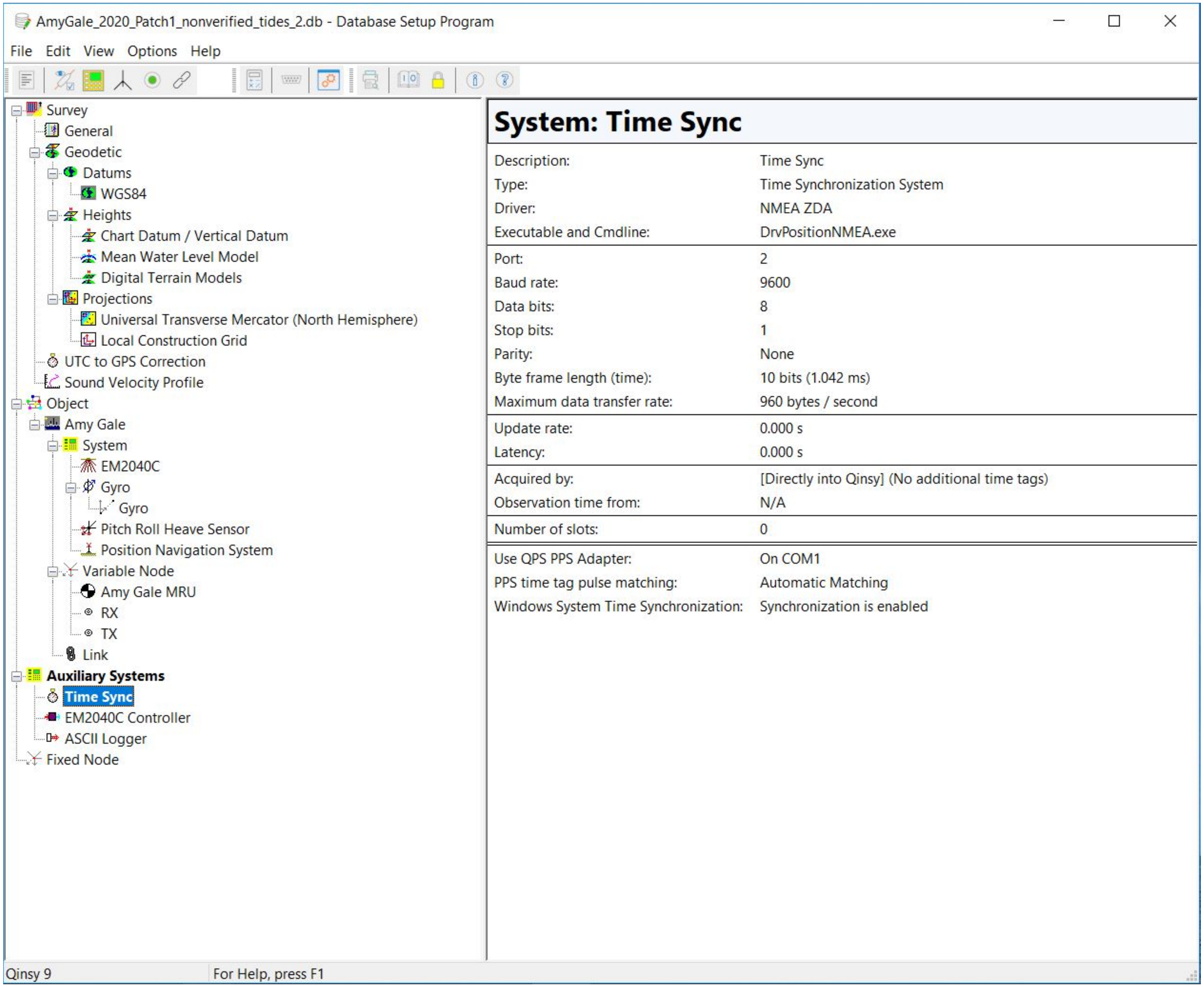
EM2040C Controller
ASCII Logger
Fixed Node
Node: TX
Object location: Amy Gale
Node name: TX
X (Stbd = Positive):: 0.040 m
Y (Bow = Positive):: 0.004 m
Z (Up = Positive):: 0.006 m
A-priori SD: 0.010 m
Qinsy 9
For Help, press F1


AmyGale_2020_Patch1_nonverified_tides_2.db - Database Setup Program
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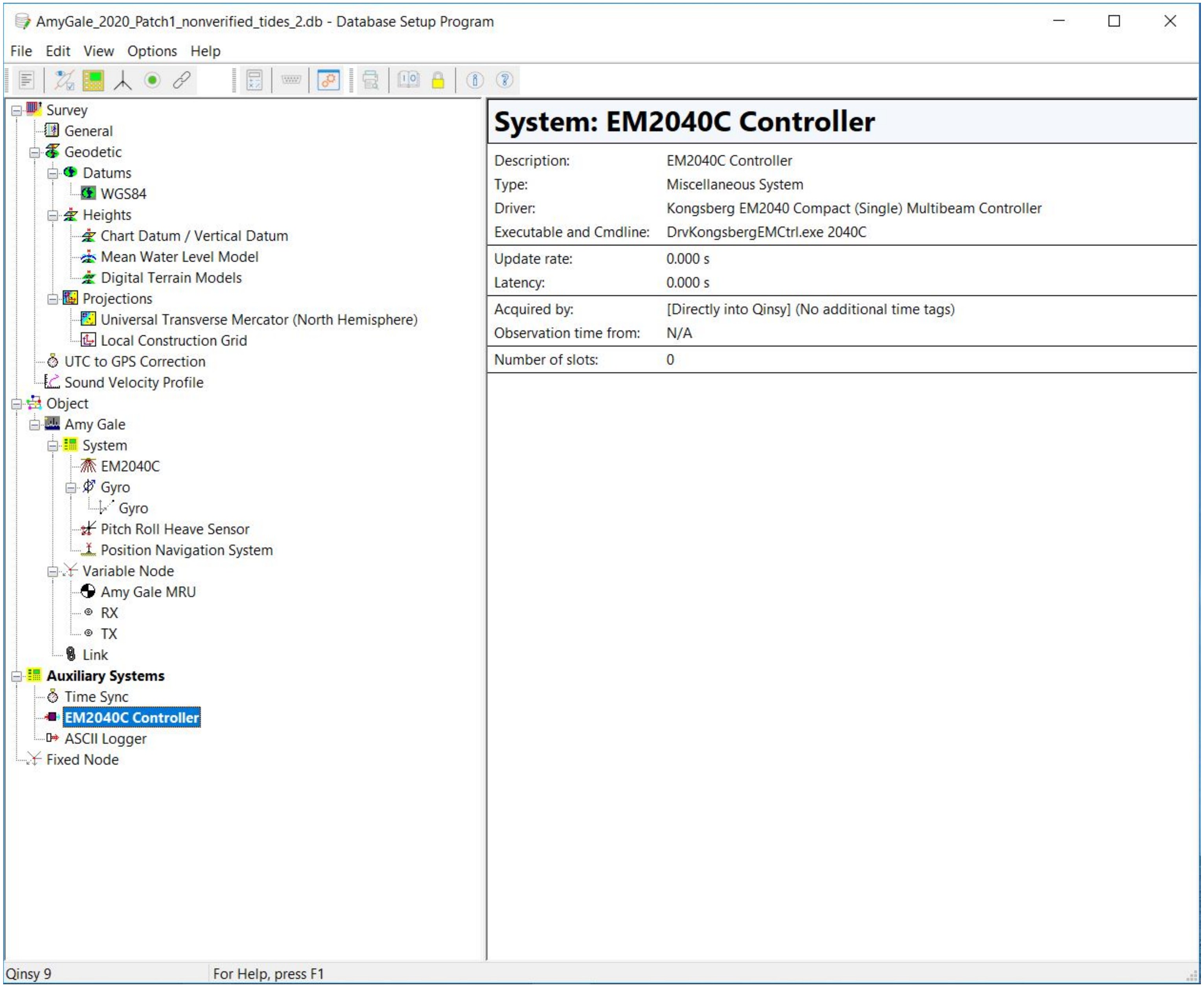
ASCII Logger
Fixed Node
System: Time Sync
Description: Time Sync
Type: Time Synchronization System
Driver: NMEA ZDA
Executable and Cmdline: DrvPositionNMEA.exe
Port: 2
Baud rate: 9600
Data bits: 8
Stop bits: 1
Parity: None
Byte frame length (time): 10 bits (1.042 ms)
Maximum data transfer rate: 960 bytes / second
Update rate: 0.000 s
Latency: 0.000 s
Acquired by: [Directly into Qinsy] (No additional time tags)
Observation time from: N/A
Number of slots: 0
Use QPS PPS Adapter: On COM1
PPS time tag pulse matching: Automatic Matching
Windows System Time Synchronization: Synchronization is enabled
Qinsy 9
For Help, press F1


AmyGale_2020_Patch1_nonverified_tides_2.db - Database Setup Program
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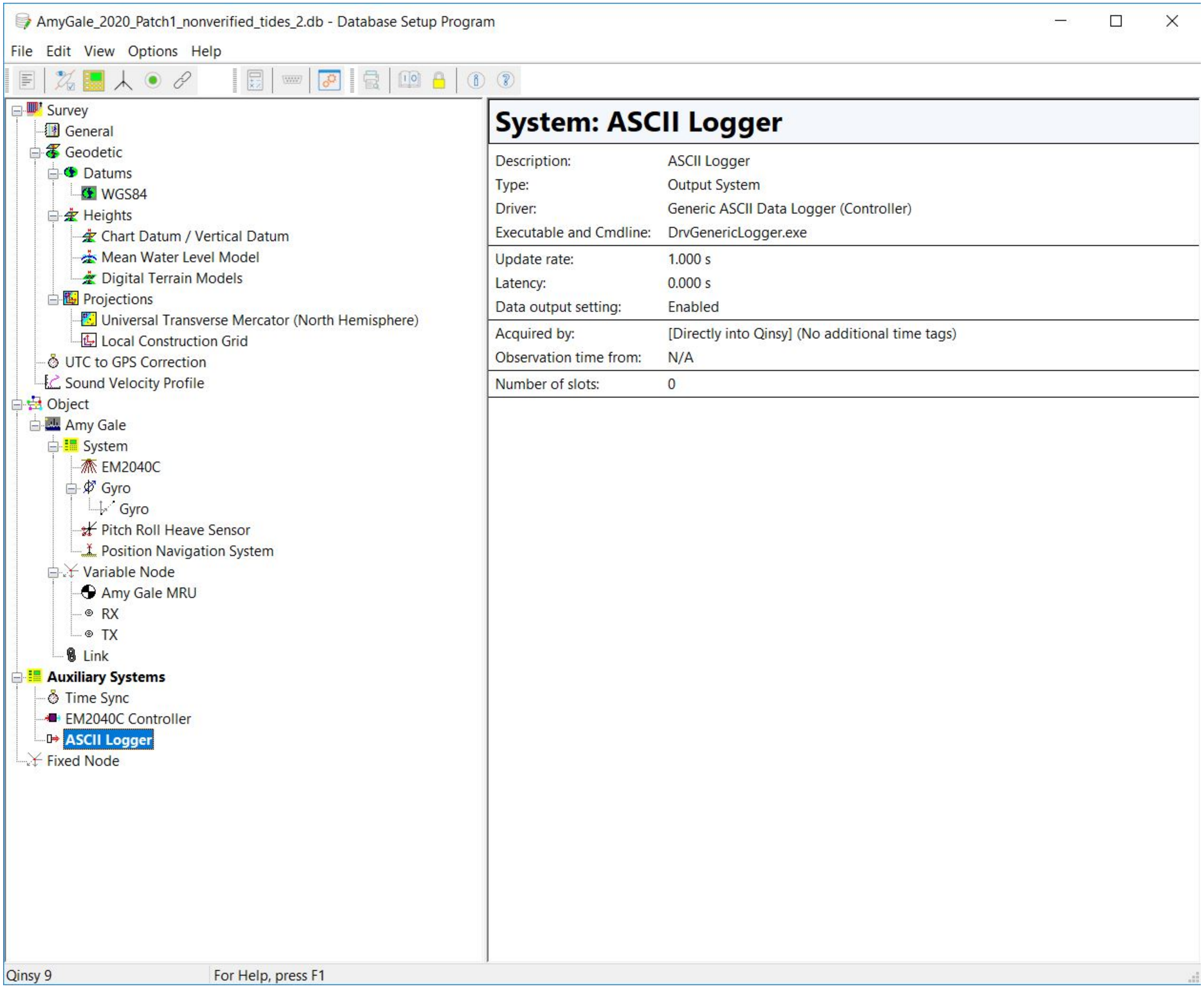
Fixed Node
System: EM2040C Controller
Description: EM2040C Controller
Type: Miscellaneous System
Driver: Kongsberg EM2040 Compact (Single) Multibeam Controller
Executable and Cmdline: DrvKongsbergEMCtrl.exe 2040C
Update rate: 0.000 s
Latency: 0.000 s
Acquired by: [Directly into Qinsy] (No additional time tags)
Observation time from: N/A
Number of slots: 0
Qinsy 9
For Help, press F1


AmyGale_2020_Patch1_nonverified_tides_2.db - Database Setup Program
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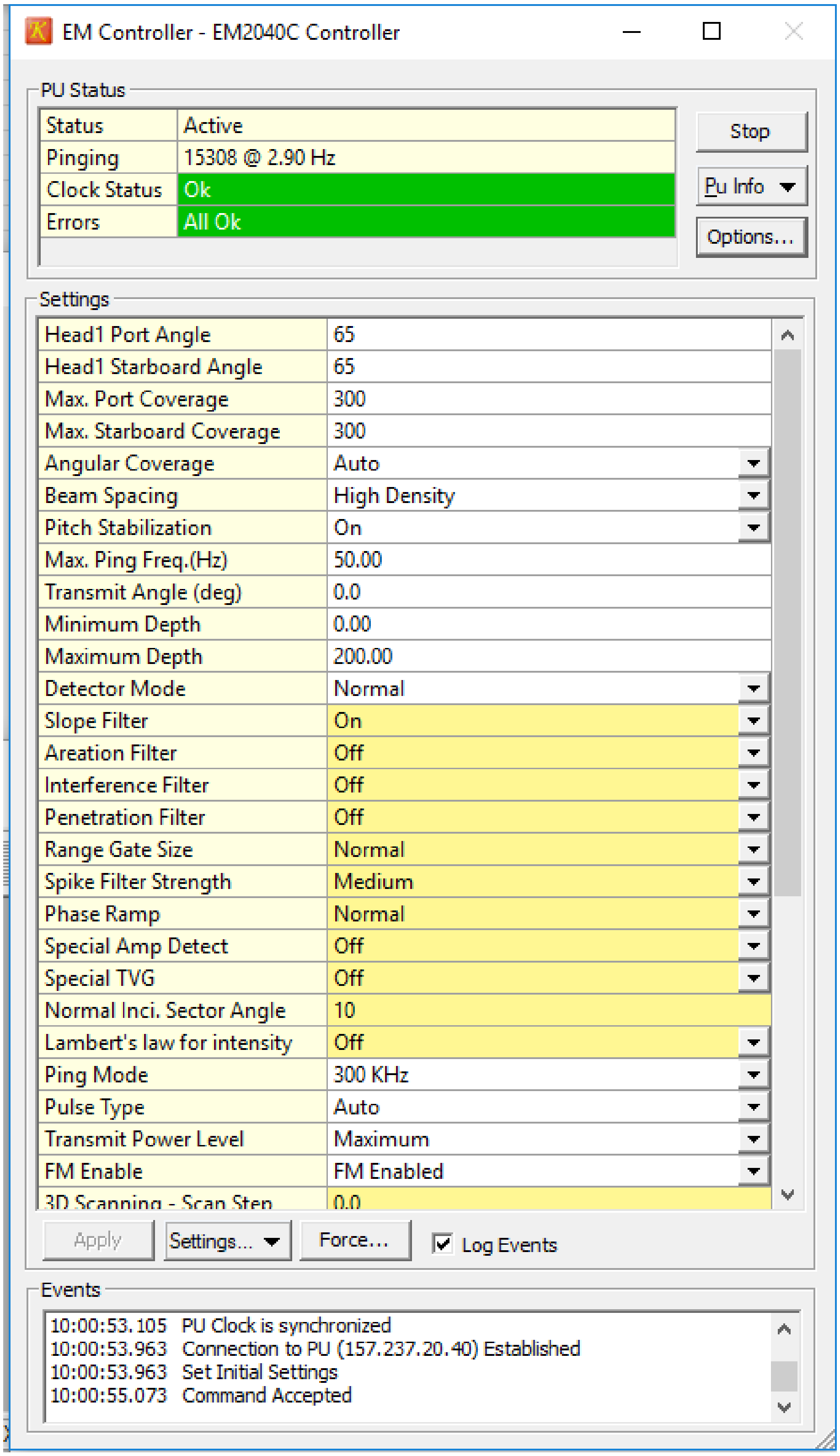
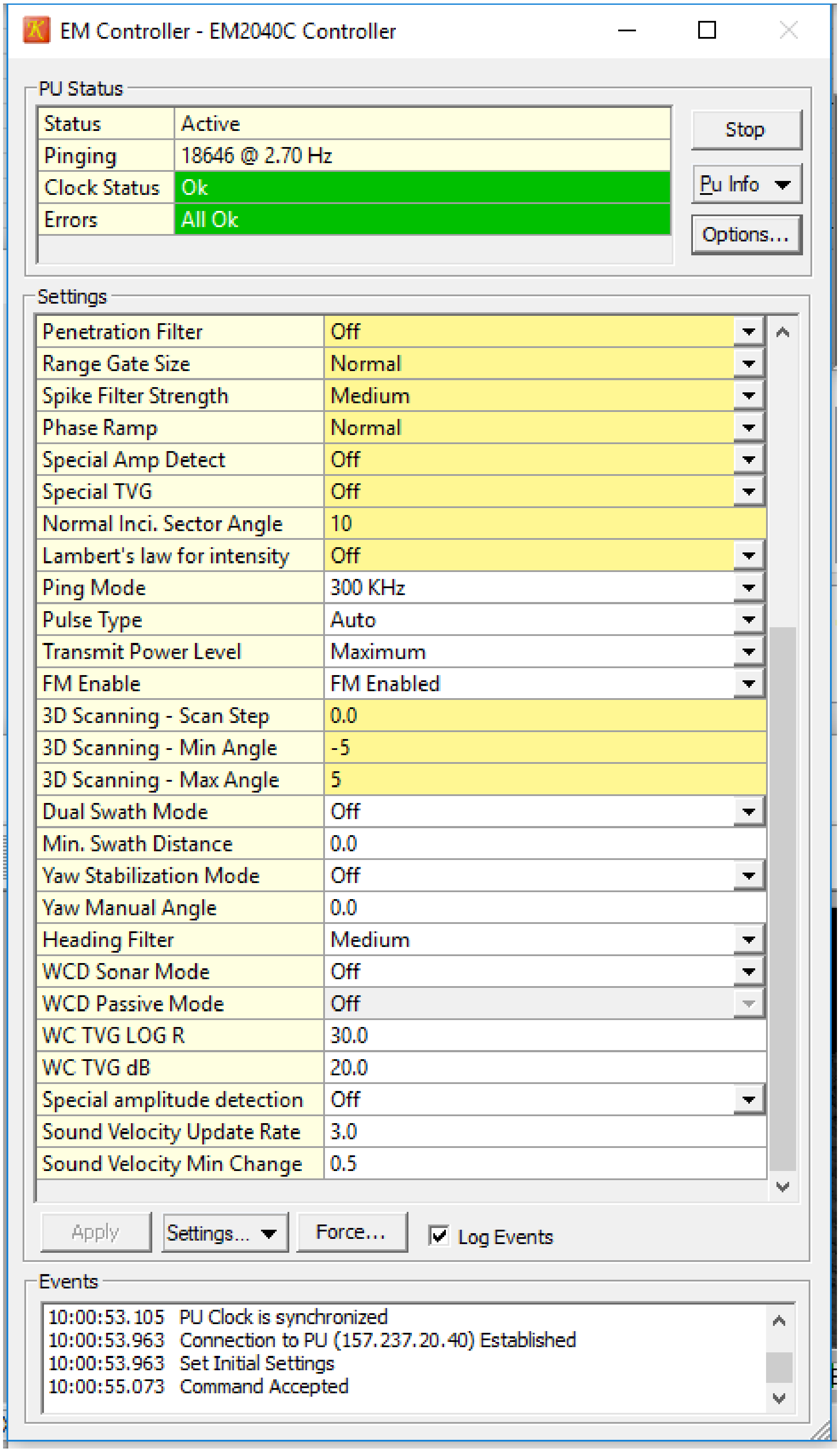
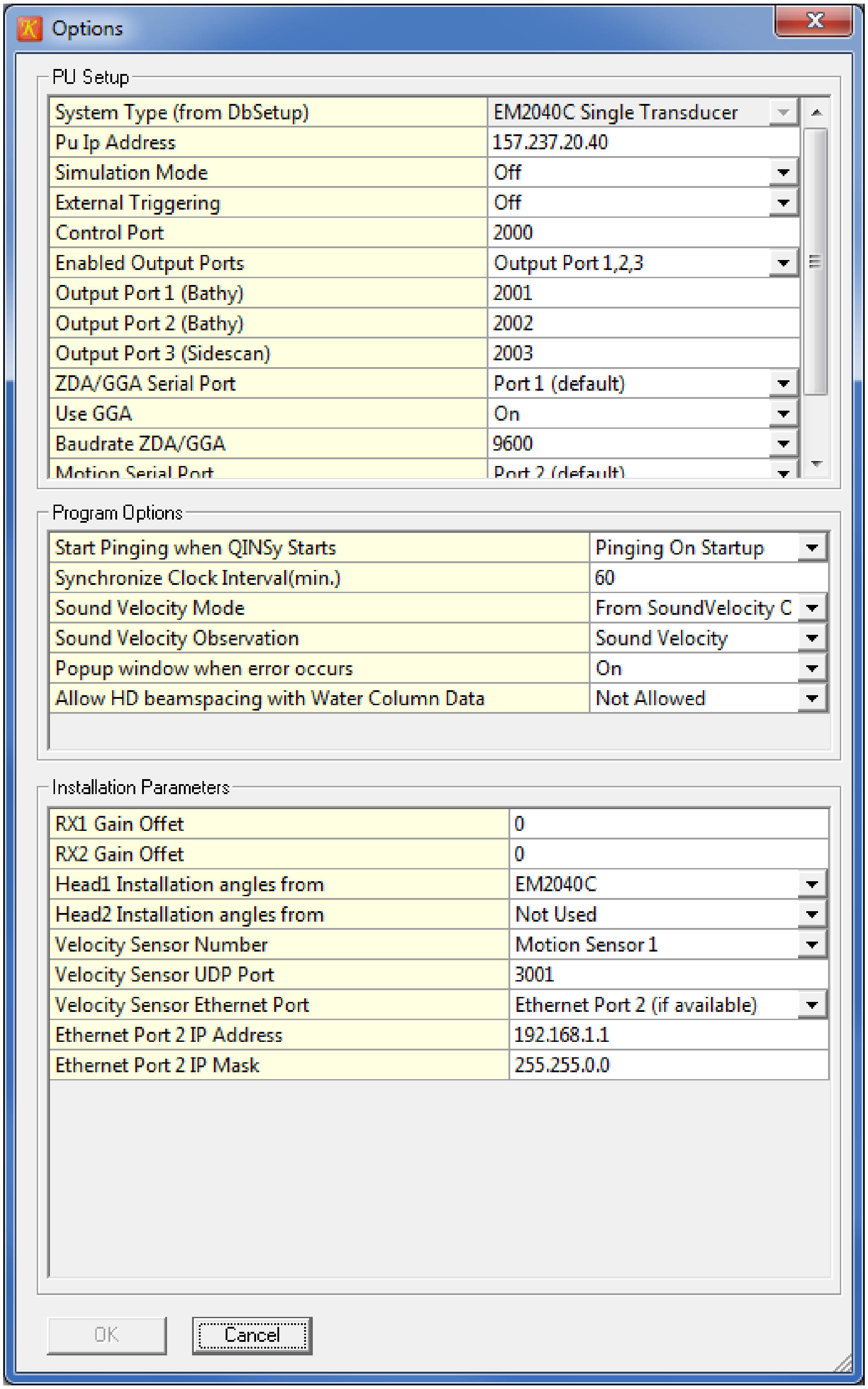
EM2040C Controller
ASCII Logger
Fixed Node
System: ASCII Logger
Description: ASCII Logger
Type: Output System
Driver: Generic ASCII Data Logger (Controller)
Executable and Cmdline: DrvGenericLogger.exe
Update rate: 1.000 s
Latency: 0.000 s
Data output setting: Enabled
Acquired by: [Directly into Qinsy] (No additional time tags)
Observation time from: N/A
Number of slots: 0
Qinsy 9
For Help, press F1

Appendix D – Configuration settings for Qinsy EM controller




EM Controller - EM2040C Controller
PU Status
Status Active
Pinging 18646 @ 2.70 Hz
Clock Status Ok
Errors All Ok
Stop
Pu Info
Options...
Settings
Penetration Filter Off
Range Gate Size Normal
Spike Filter Strength Medium
Phase Ramp Normal
Special Amp Detect Off
Special TVG Off
Normal Inci. Sector Angle 10
Lambert's law for intensity Off
Ping Mode 300 KHz
Pulse Type Auto
Transmit Power Level Maximum
FM Enable FM Enabled
3D Scanning - Scan Step 0.0
3D Scanning - Min Angle -5
3D Scanning - Max Angle 5
Dual Swath Mode Off
Min. Swath Distance 0.0
Yaw Stabilization Mode Off
Yaw Manual Angle 0.0
Heading Filter Medium
WCD Sonar Mode Off
WCD Passive Mode Off
WC TVG LOG R 30.0
WC TVG dB 20.0
Special amplitude detection Off
Sound Velocity Update Rate 3.0
Sound Velocity Min Change 0.5
Apply
Settings...
Force...
Log Events
Events
10:00:53.105 PU Clock is synchronized
10:00:53.963 Connection to PU (157.237.20.40) Established
10:00:53.963 Set Initial Settings
10:00:55.073 Command Accepted


Options
PU Setup
System Type (from DbSetup)
EM2040C Single Transducer
Pu Ip Address
157.237.20.40
Simulation Mode
Off
External Triggering
Off
Control Port
2000
Enabled Output Ports
Output Port 1,2,3
Output Port 1 (Bathy)
2001
Output Port 2 (Bathy)
2002
Output Port 3 (Sidescan)
2003
ZDA/GGA Serial Port
Port 1 (default)
Use GGA
On
Baudrate ZDA/GGA
9600
Program Options
Start Pinging when QINSy Starts
Pinging On Startup
Synchronize Clock Interval(min.)
60
Sound Velocity Mode
From SoundVelocity C
Sound Velocity Observation
Sound Velocity
Popup window when error occurs
On
Allow HD beamspacing with Water Column Data
Not Allowed
Installation Parameters
RX1 Gain Offet
0
RX2 Gain Offet
0
Head1 Installation angles from
EM2040C
Head2 Installation angles from
Not Used
Velocity Sensor Number
Motion Sensor 1
Velocity Sensor UDP Port
3001
Velocity Sensor Ethernet Port
Ethernet Port 2 (if available)
Ethernet Port 2 IP Address
192.168.1.1
Ethernet Port 2 IP Mask
255.255.0.0
OK
Cancel