H12473

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

DESCRIPTIVE REPORT

Type of Survey:	Navigable Area
Registry Number:	H12473

LOCALITY

State(s):	Alaska
General Locality:	Shumagin Islands
Sub-locality:	Vicinity of Simeonof Harbor

2012

CHIEF OF PARTY
Richard T. Brennan, CDR/NOAA

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Date:

U.S. DEPARTMENT OF COMMERCE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION	REGISTRY NUMBER:
HYDROGRAPHIC TITLE SHEET	**H12473**

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):	**Alaska**
General Locality:	**Shumagin Islands**
Sub-Locality:	**Vicinity of Simeonof Harbor**
Scale:	**40000**
Dates of Survey:	**08/12/2012 to 09/30/2012**
Instructions Dated:	**05/16/2012**
Project Number:	**OPR-P183-RA-12**
Field Unit:	**NOAA Ship *Rainier***
Chief of Party:	**Richard T. Brennan, CDR/NOAA**
Soundings by:	**Multibeam Echosounder**
Imagery by:	
Verification by:	**Pacific Hydrographic Branch**
Soundings Acquired in:	**meters at Mean Lower Low Water**

Remarks:

Horizontal Coordinate System: UTM Zone 4N. The purpose of this survey is to provide contemporary survey to update National Ocean Service (NOS) charts. All separates are filed with the hydrographic data. Revisions and notes in red were generated during office processing. The processing branch concurs with all information and recommendations in the DR unless otherwise noted. Page numbering may be interrupted or non-sequential. All pertinent records for this survey, including the Descriptive Report, are archived at the National Geophysical Data Center (NGDC) and can be retrieved via http://www.ngdc.noaa.gov/. Compilation units is Meters at MLLW.

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Descriptive Report to Accompany Survey H12473

Project: OPR-P183-RA-12

Locality: Shumagin Islands

Sublocality: Vicinity of Simeonof Harbor

Scale: 1:40000

August 2012 - September 2012

NOAA Ship *Rainier*

Chief of Party: Richard T. Brennan, CDR/NOAA

A. Area Surveyed

The project area is referred to as Sheet 2: Vicinity of Simeonof Harbor within the project instructions. The area surveyed is in the waters west of Simeonof Island, the eastern-most island of the Shumigan Islands, approximately 48 nautical miles southeast of Sand Point, AK.

A.1 Survey Limits

Data were acquired within the following survey limits:

Northwest Limit	Southeast Limit
54° 49" 15.04' N 159° 30" 23.89' W	54° 49" 34.21' N 159° 17" 41.82' W

Table 1: Survey Limits

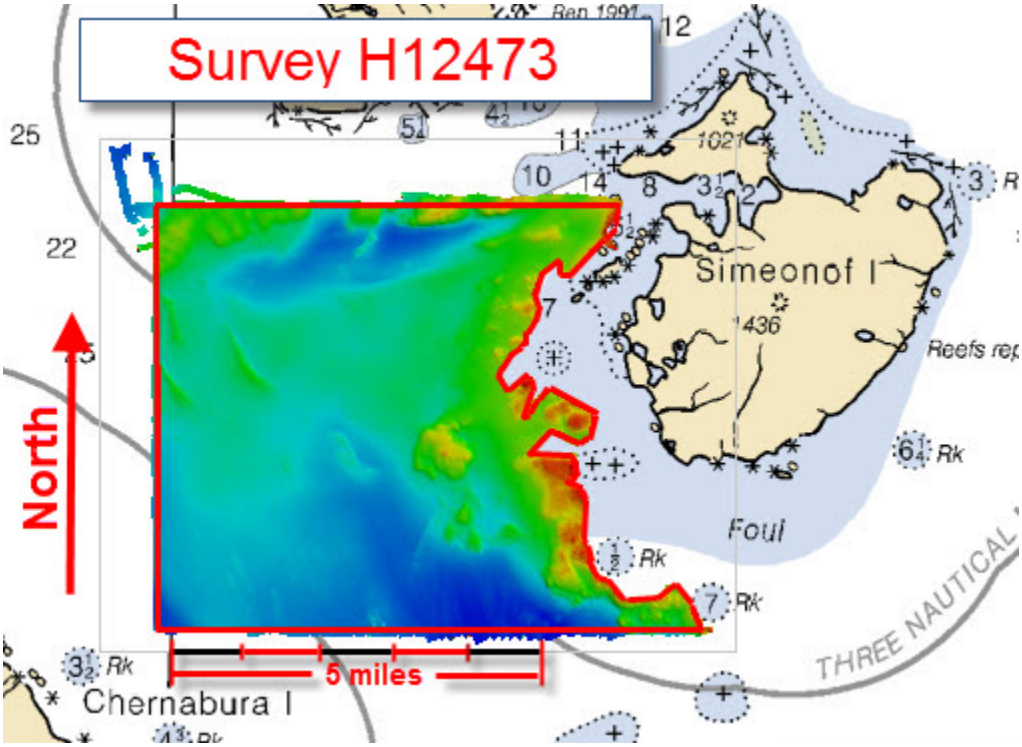


Figure 1: H12473 survey limits.

Survey Limits were acquired in accordance with the requirements in the Project Instructions and the HSSD.

A.2 Survey Purpose

This project was conducted in support of NOAA's Office of Coast Survey to provide contemporary hydrographic data in order to update the nautical charting products and reduce the survey backlog within the area. The need for nautical chart updates is due to an increasing number of passenger vessels, tour vessels and large fishing fleets in the area. In addition, the data would be used to create DTM maps in support of efficiencies in longline and pot fisheries, while minimizing habitat disruption.

A.3 Survey Quality

The entire survey is adequate to supersede previous data.

Data acquired on survey H12473 met complete multibeam coverage requirements, including the 5 soundings per node data density requirements outlined in section 5.2.2.2 of the HSSDM, in 99.9% of the nodes.

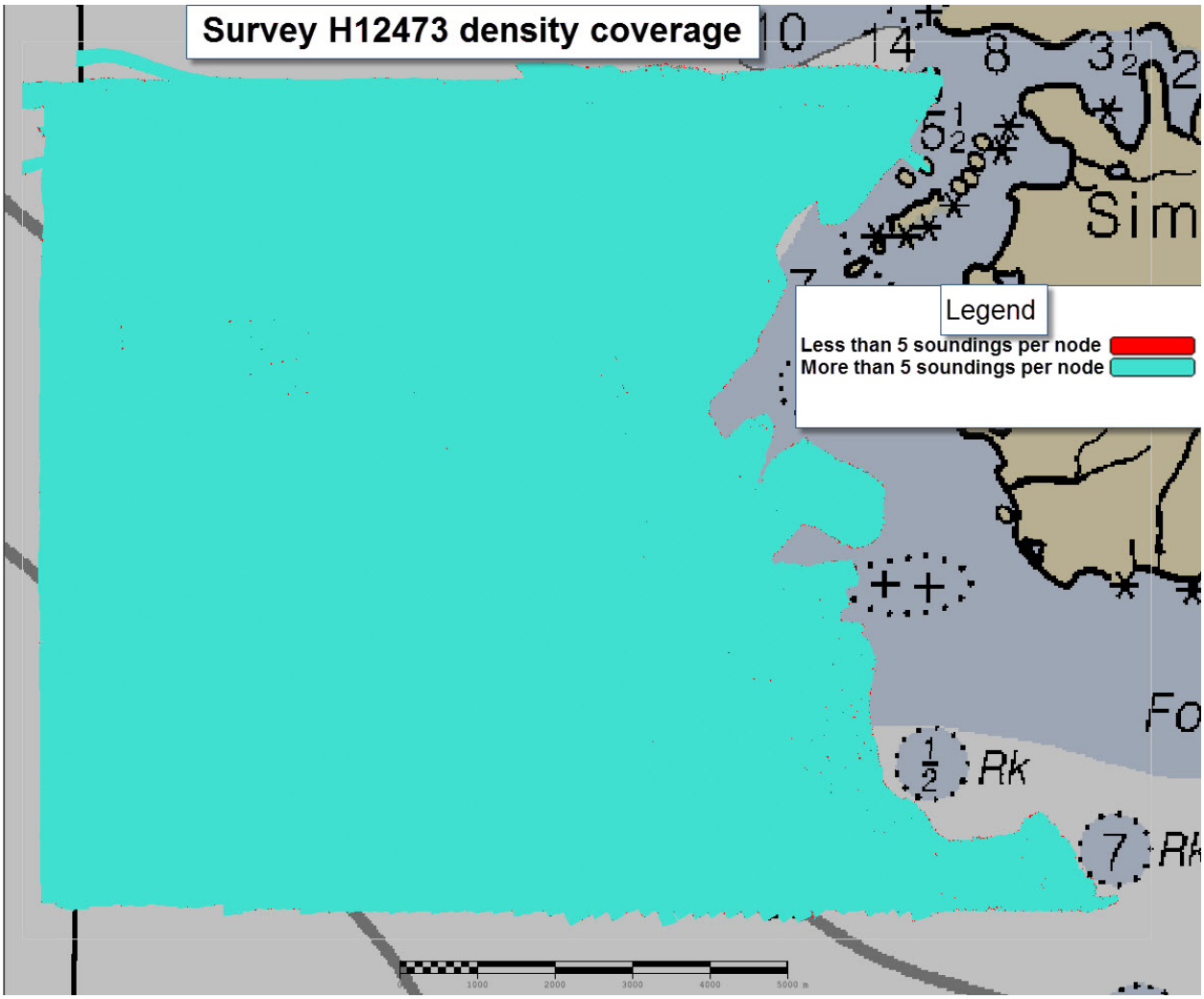


Figure 2: Survey H12473 data density.

Resolution	Depth range	Number of nodes	Fewer than five soundings per node	Percent of nodes with greater than five soundings per node
1m	0 - 20m	2,025,796	8,715	99.6%
2m	18 - 40m	11,372,924	11,473	99.9%
4m	36 - 80m	5,581,291	1,519	100.0%
	TOTAL:	18,980,011	21,707	**99.9%**
	TOTAL (by area):	136,818,148	78,911	**99.9%**

Figure 3: Summary table showing the percentage of nodes satisfying the 5 sounding density requirements, sub-divided by the appropriate depth ranges. Note: The final row has a unit of square meters, and sums the number of different resolution nodes into a common unit of area.

A.4 Survey Coverage

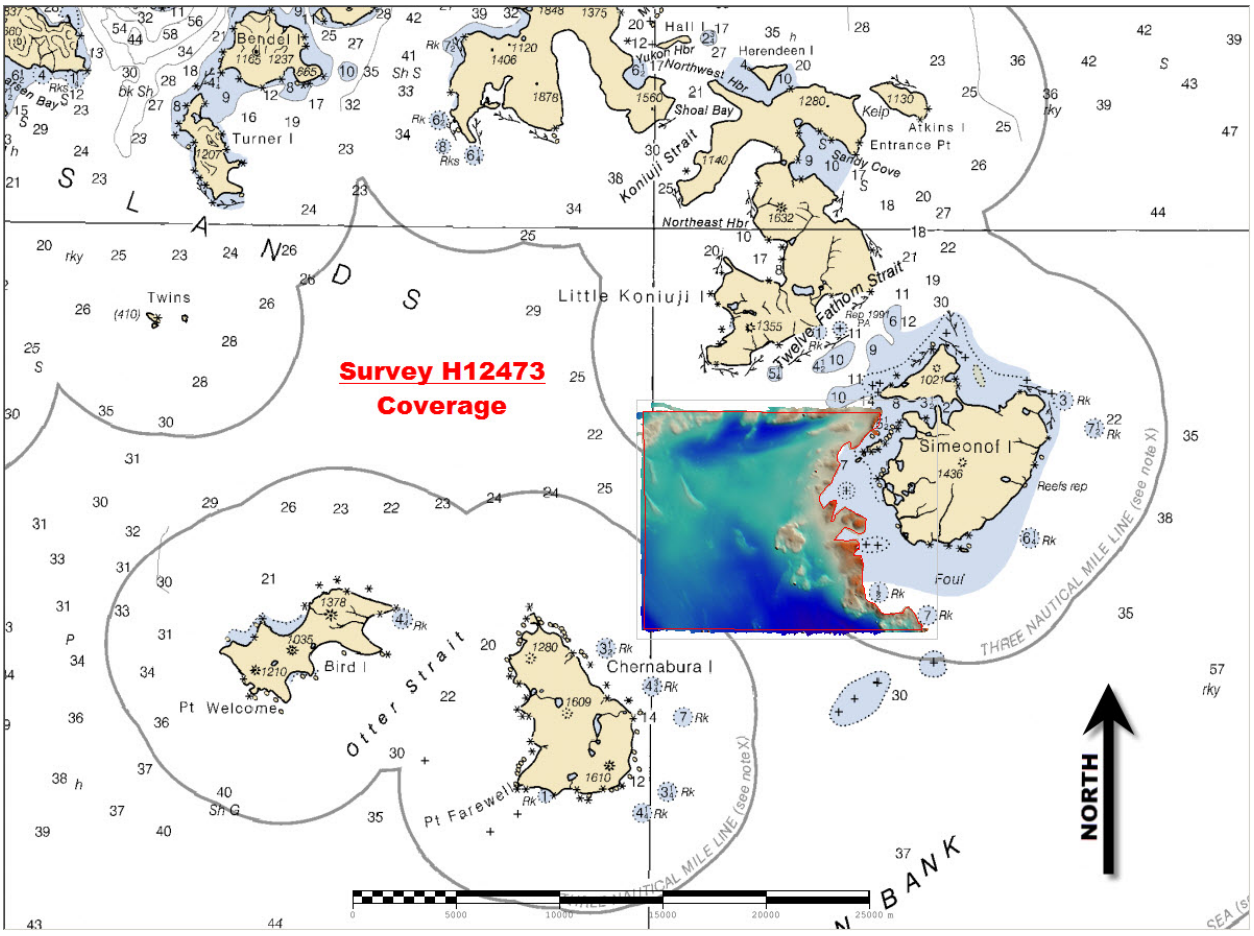


Figure 4: Survey H12473 coverage.

Complete multibeam echo sounder (MBES) coverage was achieved within the limits of hydrography as defined in the Project Instructions with three exceptions. Three small areas due: to the shallow nature of the seafloor; thick bands of kelp; and safety concerns, a small area (measuring 175 by 575 meters) in the northeast section of the survey, and two areas in the central eastern section (measuring 250 by 135 meters and 130 by 50 meters). These areas were unsafe to approach and are represented in the H12473 Final Feature File.

One holiday exists for survey H12473, located at 54-53-06.1N 159-27-10.5W and measures 80 by 40 meters in 40 meters of water. No navigationally significant items were found; additionally, the least depths were represented.

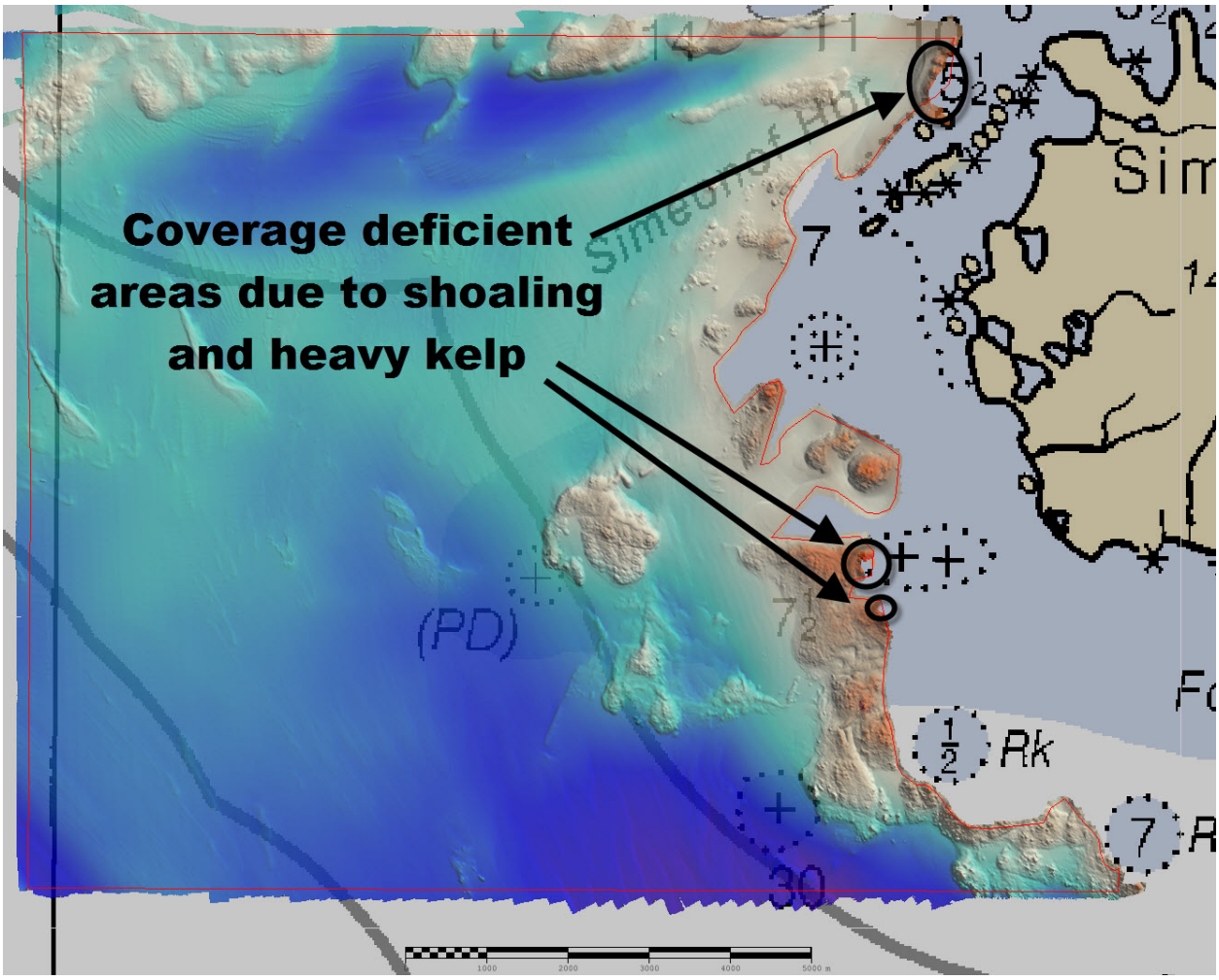


Figure 5: Survey H12473 coverage deficiencies.

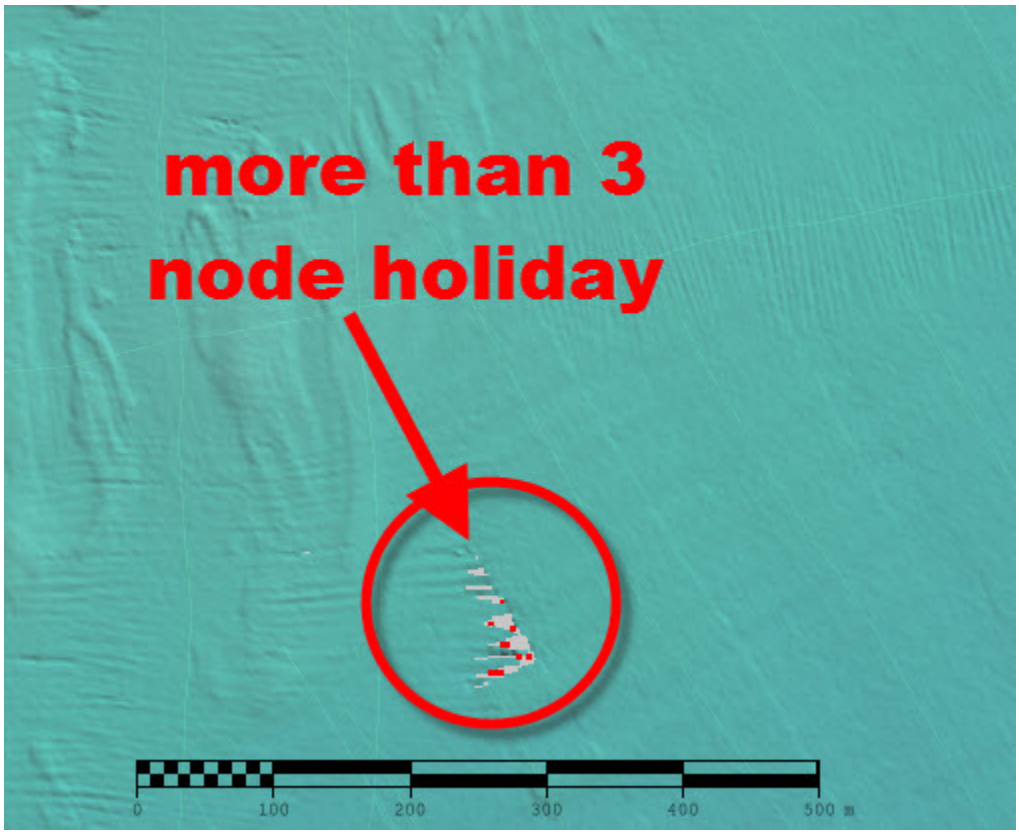


Figure 6: Holiday located at 54-53-06.1N 159-27-10.5W in 40 meters of water, deemed non-navigationally significant.

The nearshore areas where coverage deficiencies are noted were determined to be foul areas during shoreline investigation. The offshore holiday shows no signs of shoaling and will not impact sounding selection and distribution at chart scale.

A.5 Survey Statistics

The following table lists the mainscheme and crossline acquisition mileage for this survey:

	Vessel	***S-221***	***2801***	***2802***	***2803***	***2804***	***Total***
LNM	**SBES Mainscheme**	0	0	0	0	0	0
	MBES Mainscheme	325.1	80.9	59.2	31.6	94.0	590.8
	Lidar Mainscheme	0	0	0	0	0	0
	SSS Mainscheme	0	0	0	0	0	0
	SBES/MBES Combo Mainscheme	0	0	0	0	0	0
	SBES/SSS Combo Mainscheme	0	0	0	0	0	0
	MBES/SSS Combo Mainscheme	0	0	0	0	0	0
	SBES/MBES Combo Crosslines	0	0	0	0	28.8	28.8
	Lidar Crosslines	0	0	0	0	0	0
Number of Bottom Samples							6
Number AWOIS Items Investigated							1
Number Maritime Boundary Points Investigated							0
Number of DPs							0
Number of Items Items Investigated by Dive Ops							0
Total Number of SNM							33.68

Table 2: Hydrographic Survey Statistics

The following table lists the specific dates of data acquisition for this survey:

Survey Dates	Julian Day Number
08/12/2012	225
08/28/2012	241
08/29/2012	242
09/09/2012	253
09/13/2012	257
09/15/2012	259
09/26/2012	270
09/29/2012	273
09/30/2012	274

Table 3: Dates of Hydrography

B. Data Acquisition and Processing

B.1 Equipment and Vessels

Refer to the Data Acquisition and Processing Report (DAPR) for a complete description of data acquisition and processing systems, survey vessels, quality control procedures and data processing methods. Additional information to supplement sounding and survey data, and any deviations from the DAPR are discussed in the following sections.

B.1.1 Vessels

The following vessels were used for data acquisition during this survey:

Hull ID	*S221*	*2801*	*2802*	*2803*	*2804*
LOA	231 feet	28 feet	28 feet	28 feet	28 feet
Draft	16.5 feet	3.5 feet	3.5 feet	3.5 feet	3.5 feet

Table 4: Vessels Used

B.1.2 Equipment

The following major systems were used for data acquisition during this survey:

Manufacturer	Model	Type
Reson	SeaBat 7125	MBES
Applanix	POS MV V4	Positioning and Attitude System
Applanix	POS MV V5	Positioning and Attitude System
Reson	SVP70	Sound Speed System
Reson	SVP71	Sound Speed System
Kongsberg	EM710	MBES
Rolls Royce-Odim-Brooke Ocean	Moving Vessel Profiler 30	Conductivity, Temperature and Depth Sensor
Rolls Royce-Odim-Brooke Ocean	Moving Vessel Profiler 200	Conductivity, Temperature and Depth Sensor
Seabird	SBE 19 plus	Conductivity, Temperature and Depth Sensor

Table 5: Major Systems Used

B.2 Quality Control

B.2.1 Crosslines

Crosslines, acquired for this survey, totalled 4.8% of mainscheme acquisition.

Multibeam echosounder crosslines totaled 28.79 nautical miles comprising 4.8% of the mainscheme MBES hydrography. Mainscheme bathymetry was visually compared to the crossline nadir beams in CARIS Subset Editor for consistency and agreement. In addition the Hydrographer created a 2-meter CUBE surface using strictly the mainscheme lines, and a second separate 2-meter CUBE surface using only crosslines. A difference surface was then generated in CARIS (Figure 7), and descriptive statistics were then compiled in excel. (Figure 8). The average difference between the depths derived from mainscheme and crosslines was -0.03 meters (mainscheme being deeper) with a standard deviation of 0.12 meters.

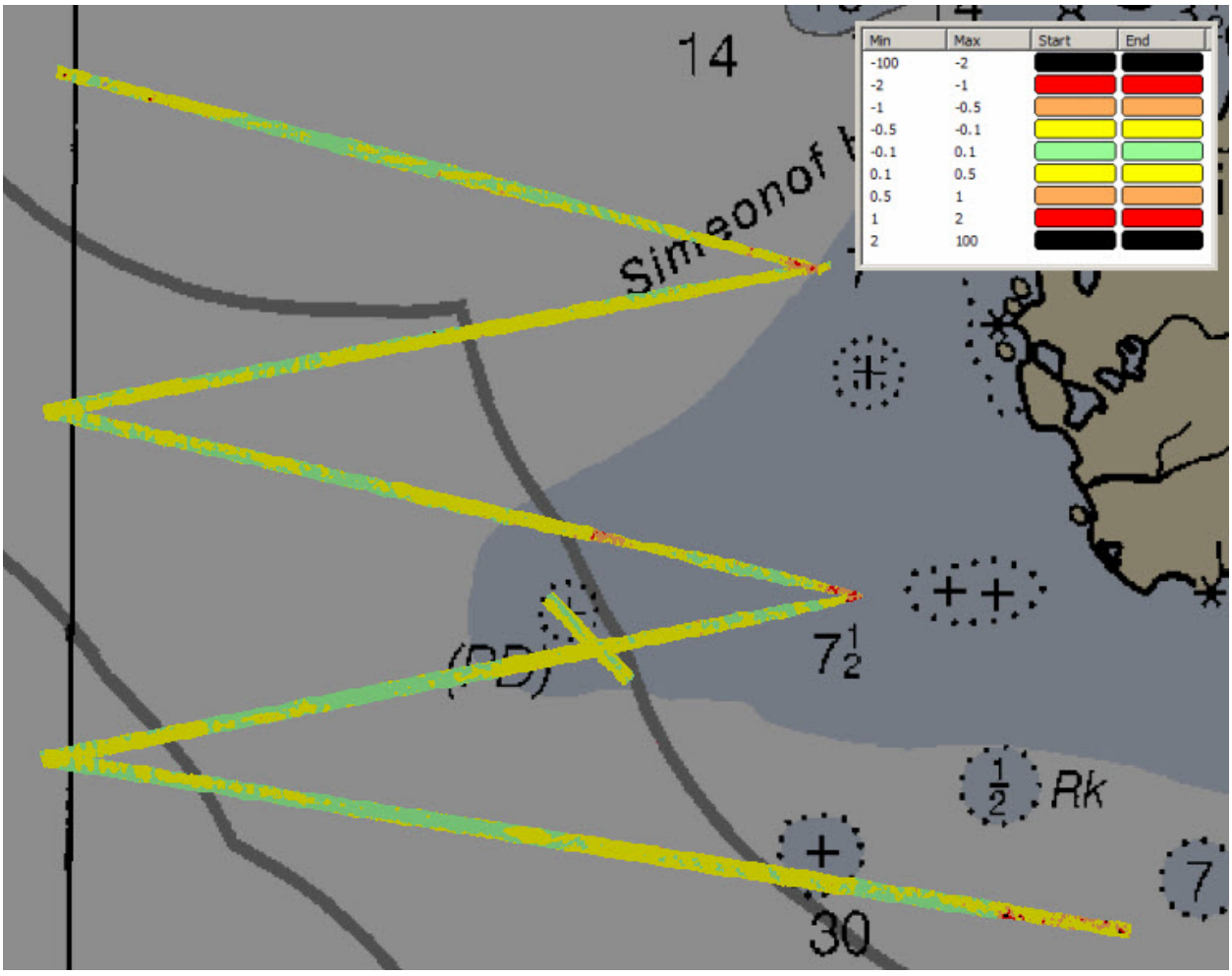


Figure 7: Survey H12473 crossline comparison at a 2-meter resolution surface, differences in meters.

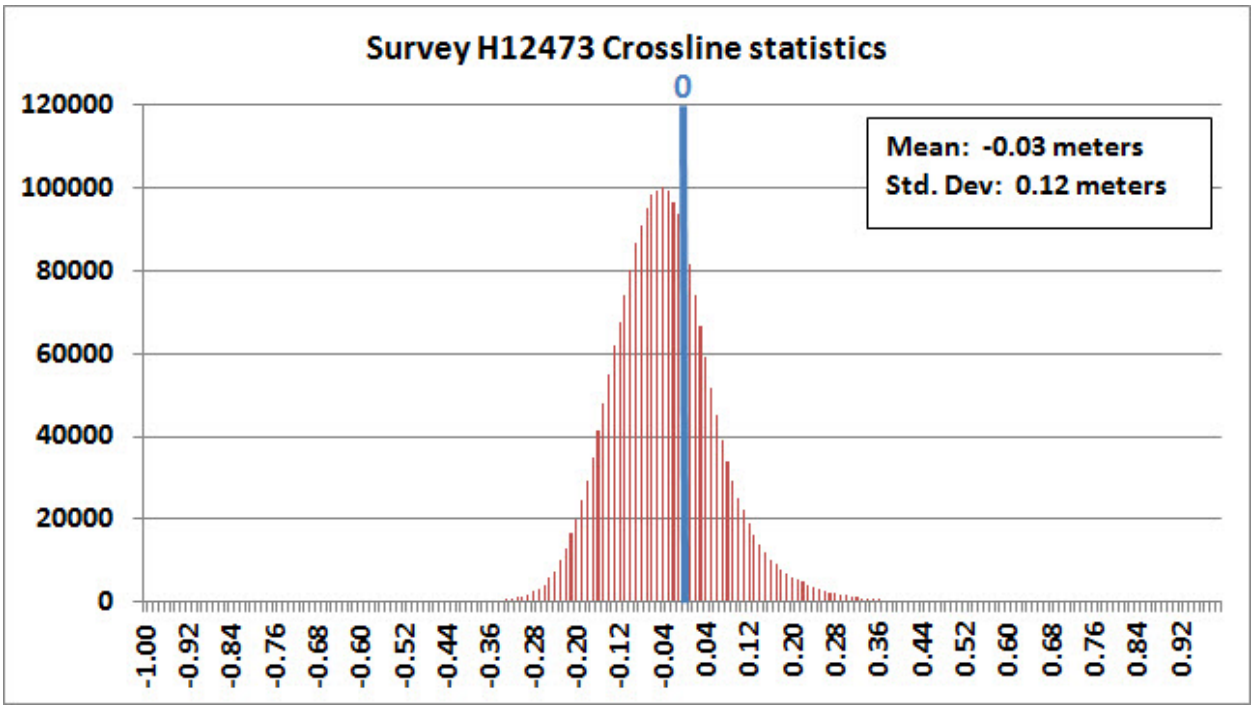


Figure 8: Survey H12473 crossline-to-mainscheme difference surface statistics in meters.

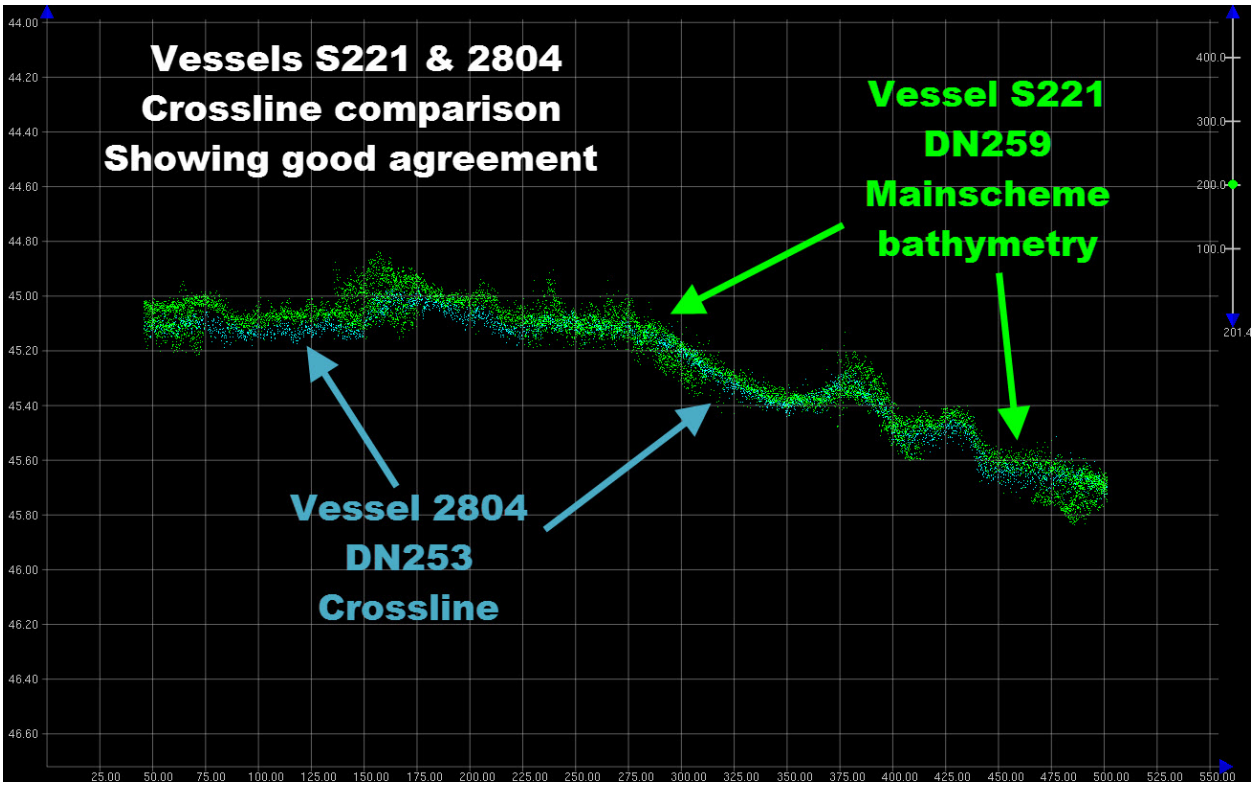


Figure 9: Vessels S221 & 2804 on survey H12473 comparing crossline and mainscheme bathymetry.

B.2.2 Uncertainty

The following survey specific parameters were used for this survey:

Measured	Zoning
0 meters	0.065 meters

Table 6: Survey Specific Tide TPU Values

Hull ID	Measured - CTD	Measured - MVP	Surface
S221	1 meters/second	1 meters/second	0.05 meters/second
2801	3 meters/second		0.15 meters/second
2802	3 meters/second		0.15 meters/second
2803	3 meters/second		0.15 meters/second
2804	3 meters/second	3 meters/second	0.15 meters/second

Table 7: Survey Specific Sound Speed TPU Values

Uncertainty values of submitted, finalized grids were calculated in CARIS using the "Greater of the Two" of among total propagated uncertainty and standard deviation (scaled to 95%). To visualize the locations in which accuracy requirements were met for each finalized surface, a custom "IHOness" layer was created, based on the difference between calculated uncertainty of the nodes and the allowable IHO uncertainty (Figure 10). To quantify the extent to which accuracy requirements were met, the preceding "IHOness" layers were queried within CARIS and then analyzed in Excel. Overall, 100.0% of survey H12473 met the accuracy requirements stated in the HSSDM.

Post-processed uncertainties of the survey vessels' position and attitude were produced using Applanix POSPac processing software (in addition to improved estimates of the position and attitude values themselves). For RAINIER (S221) only position uncertainties were applied, while the launches updated both position and attitude uncertainties.

Figure 10: Survey H12473 IHO uncertainty. Green nodes pass and red nodes fail IHO Order 1 compliance.

Resolution (m)	Depth range (m)	IHO Order	Number of nodes	Nodes satisfying IHO accuracy	Percent nodes satisfying IHO accuracy
4	36 - 80	Order 1a	5,580,795	5,580,708	100.0%
2	18-40	Order 1a	10,622,336	10,622,315	100.0%
1	0-20	Order 1a	2,025,011	2,024,975	100.0%
		TOTAL:	18,228,142	18,227,998	100.0%
		TOTAL (by area):	769,122,224	769,119,488	100.0%

Figure 11: Summary table showing the percentage of nodes satisfying the indicated IHO uncertainty level, sub-divided by the appropriate depth ranges.

B.2.3 Junctions

Three junction comparisons were completed for survey H12473 (Figure 12). Two junctioning surveys (H12472, H12475) were acquired concurrently with this survey. The remaining junctioning survey, H12103, is a lidar survey completed in 2009 by Fugro LADS. Depth comparisons were performed using the CARIS difference surface (at the 4-meter resolution), from which descriptive statistics were generated. For the contemporary surveys, multibeam data was also examined in CARIS Subset Editor, along with the cursor Tool Tip for consistency and agreement.

The following junctions were made with this survey:

Registry Number	Scale	Year	Field Unit	Relative Location
H12472	1:40000	2012	NOAA Ship RAINIER	N
H12475	1:40000	2012	NOAA Ship RAINIER	SE
H12103	1:10000	2009	Fugro LADS	E

Table 8: Junctioning Surveys

H12472

Survey H12472 was acquired concurrently with survey H12473 during project OPR-P183-RA-12. On average there is 150 meters of overlap between the two surveys which spans the entire length of the junction (Figure 13). Difference surface analysis showed depth differences averaging -0.09 meters, making survey H12473 shoaler, with a standard deviation of 0.15 meters (Figure 14).

The junctioning overlap contained a rocky feature with significant relief which was used to compare the two surveys. The feature located at 54-55-17.410N 159-22.12.350W shows an agreement of soundings over the shoalest point with a difference of 0.01 meters (Figure 15).

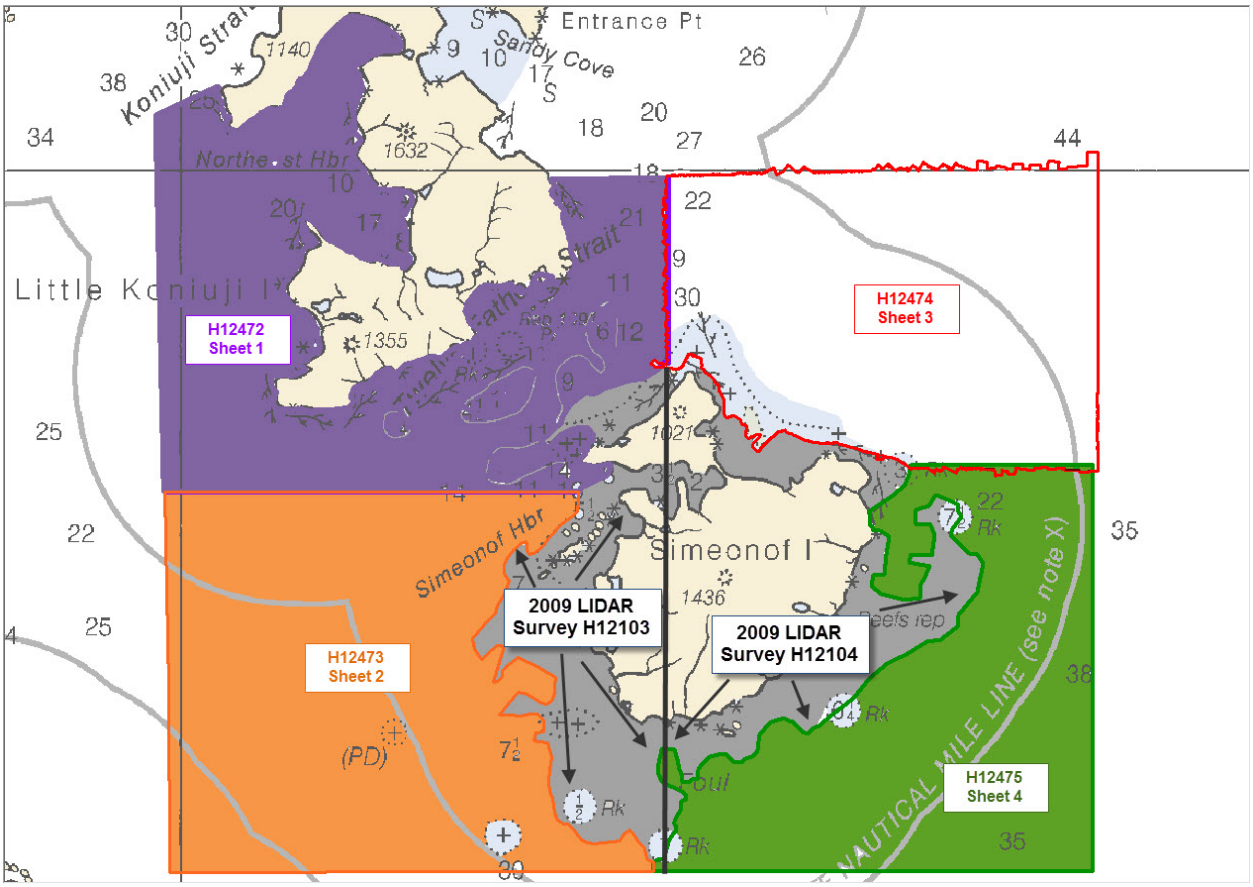


Figure 12: Survey H12473 junction locations.

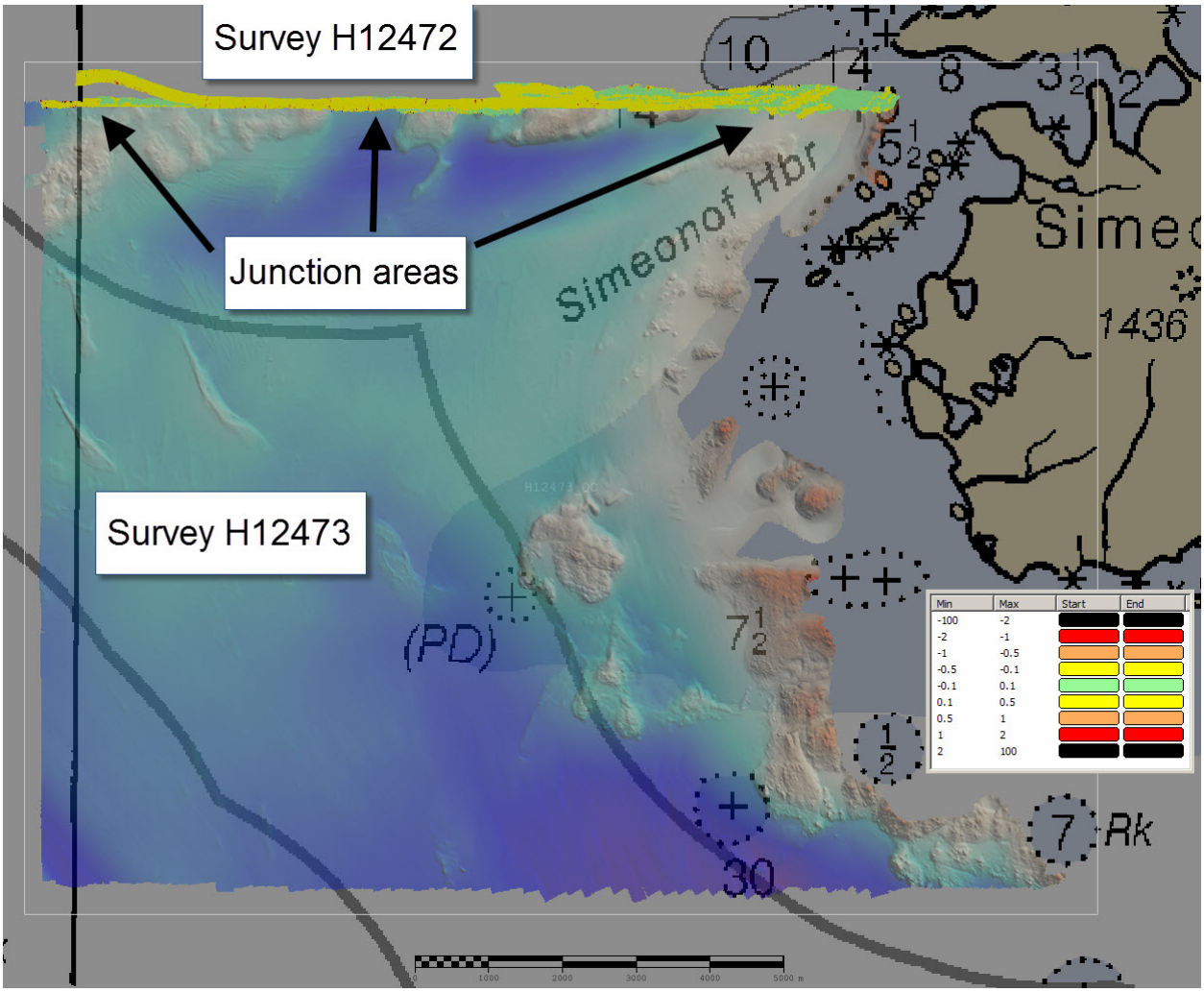


Figure 13: Survey H12473 and junction H12472 difference surface in meters.

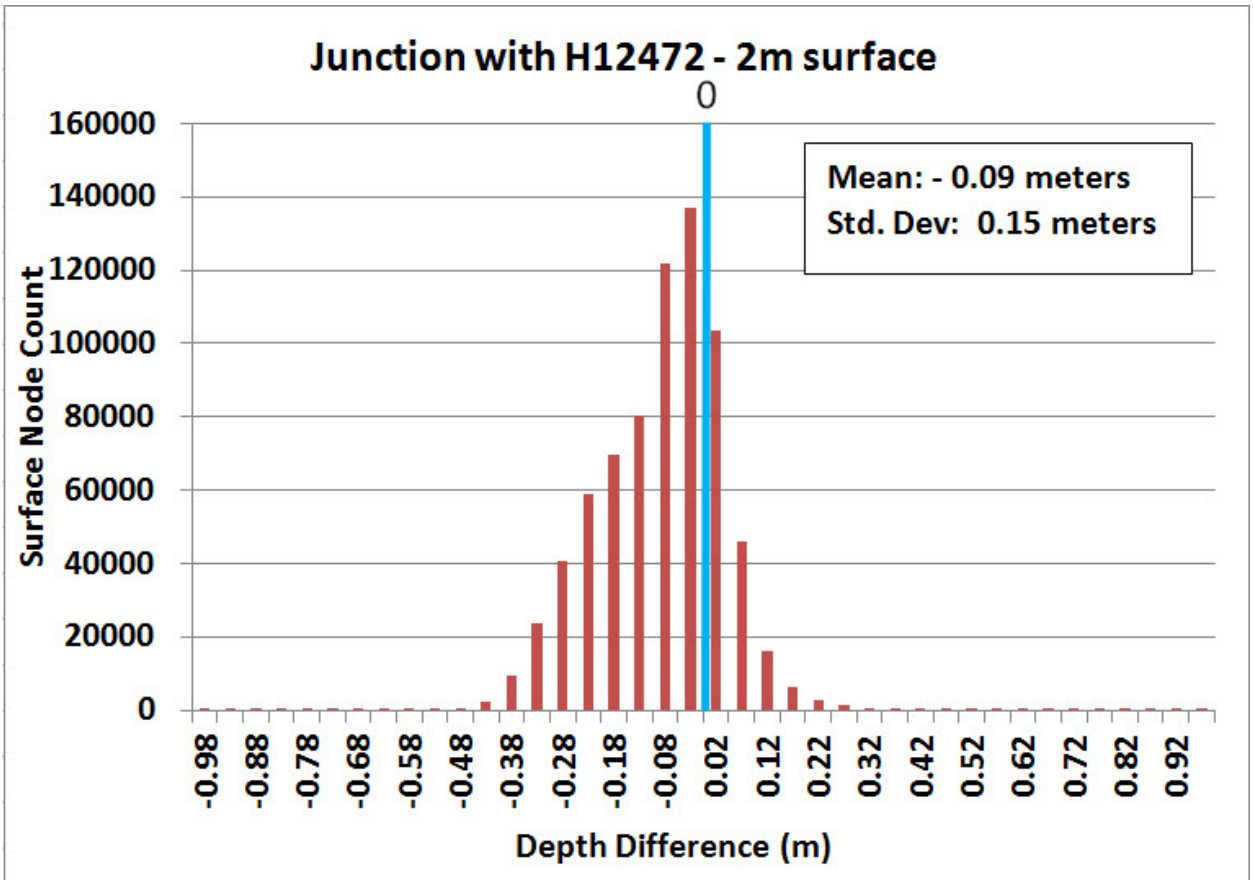


Figure 14: Survey H12473 and junction H12472 difference surface statistics in meters.

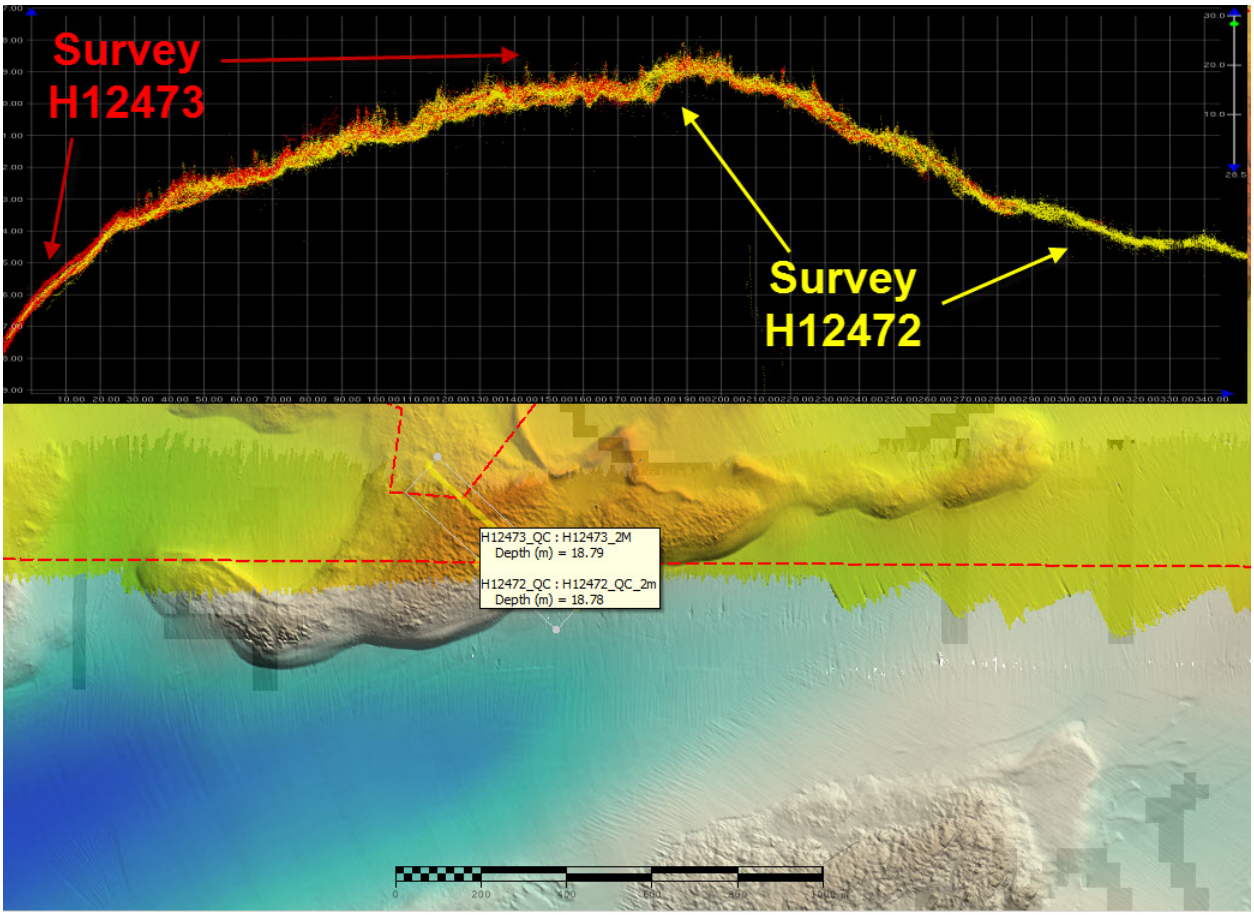


Figure 15: Survey H12473 and H12472 sounding comparison over feature contained in both.

H12475

Survey H12475 was acquired concurrently with survey H12473 during project OPR-P183-RA-12. On average there is 120 meters width of overlap between the two surveys for a length of 400 meters (Figure 16 and 17). Depth differences in the areas of overlap averaged -0.04 meters, making survey H12473 shoaler, with a standard deviation of 0.49 meters (Figure 20).

The junctioning overlap contained a rock feature located at 54-49-36.157N 159-17-27.892W showing an agreement of soundings over the shoalest point within 0.03 meters (Figure 19).

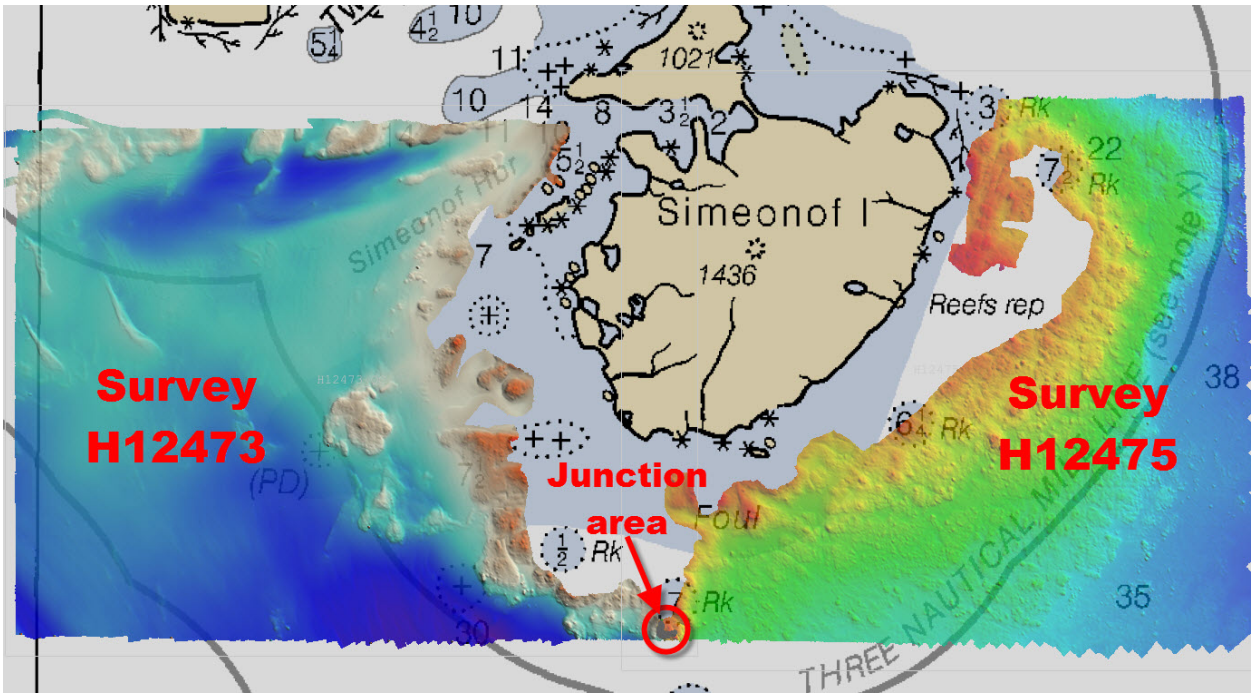


Figure 16: Survey H12473 and H12475 junction location.

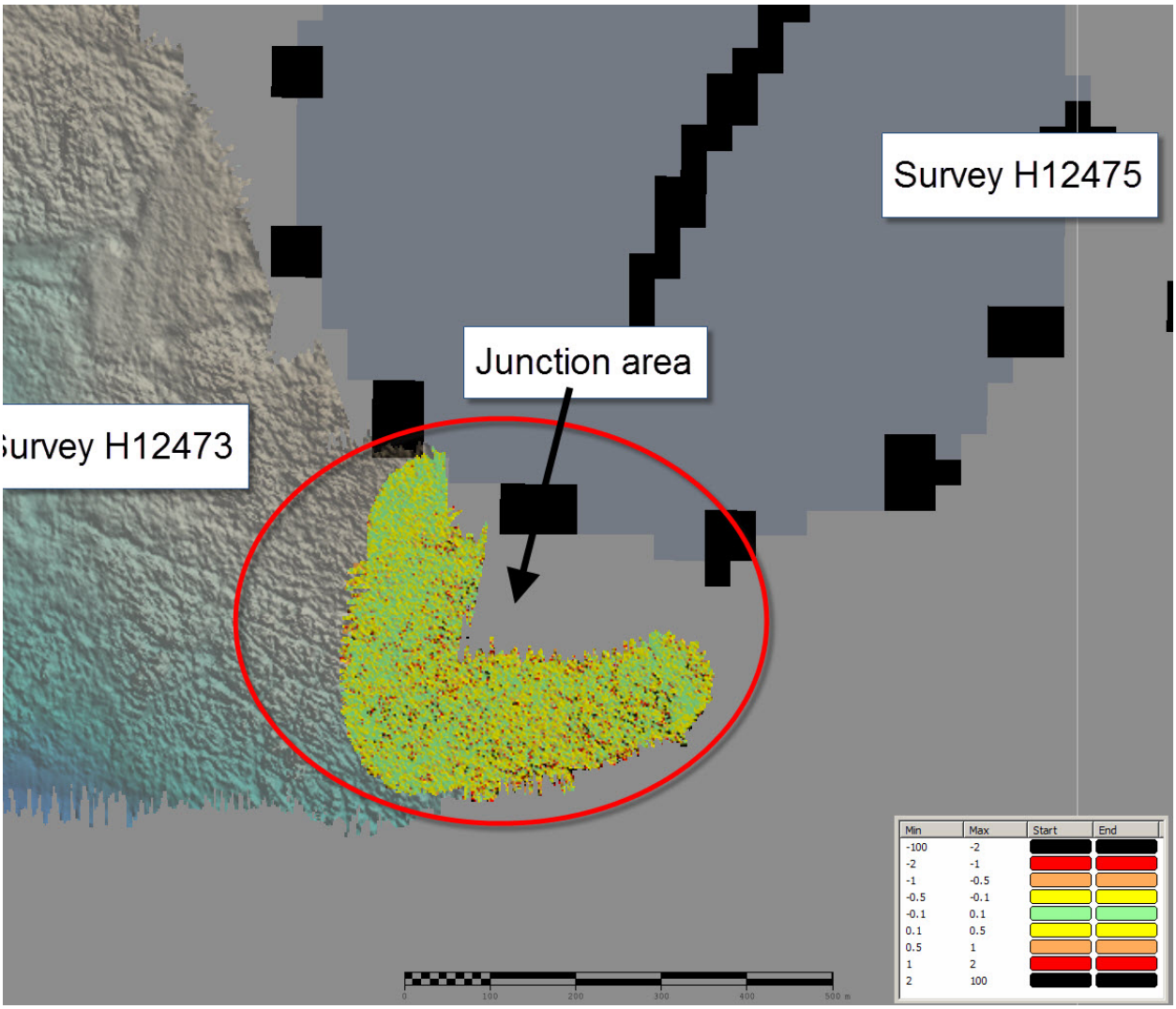


Figure 17: Survey H12473 and junction H12475 difference surface comparison in meters.

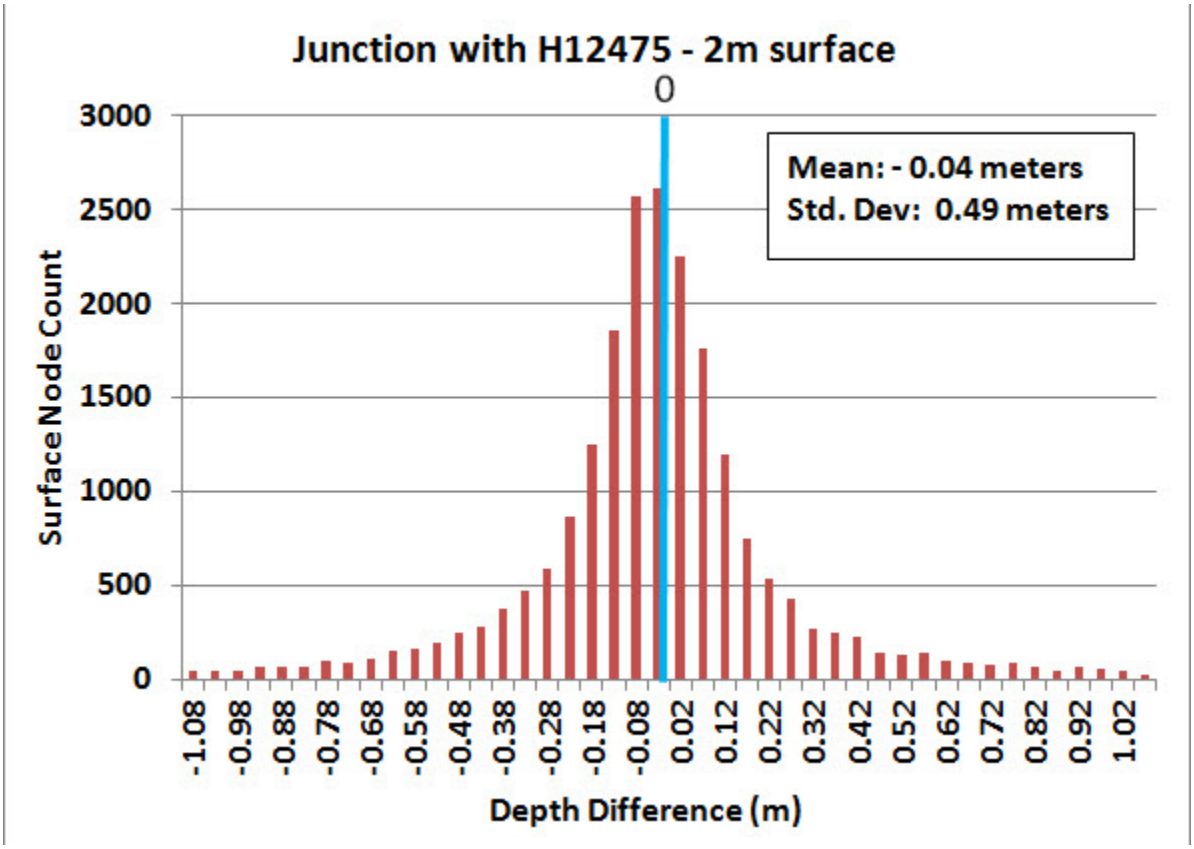


Figure 18: Survey H12473 and junction H12475 difference surface statistics in meters.

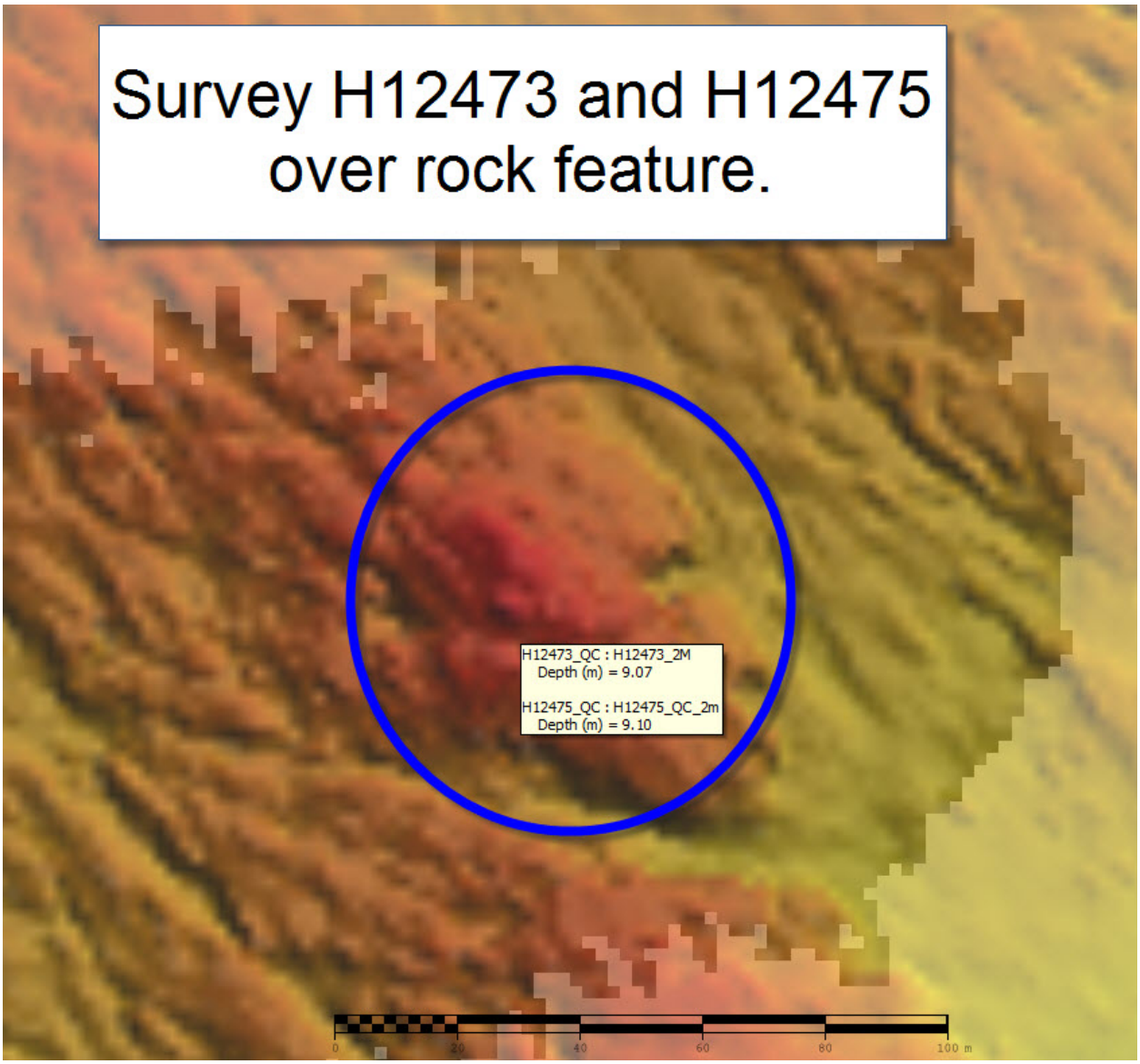


Figure 19: Survey H12473 and junction H12475 showing agreement within 0.03 meter over rock.

H12103

Survey H12103 was a lidar survey completed in 2009 by Fugro LADS. The average distance of overlap, which varies widely throughout the length of the survey, is approximately 200 meters (Figure 21). In accordance with the H12103 Descriptive Report, the lidar shoal layer was used in the difference surface. Depth differences in the areas of overlap averaged -0.01 meters, making survey H12473 shoaler, with a standard deviation of 0.35 meters. (Figure 21).

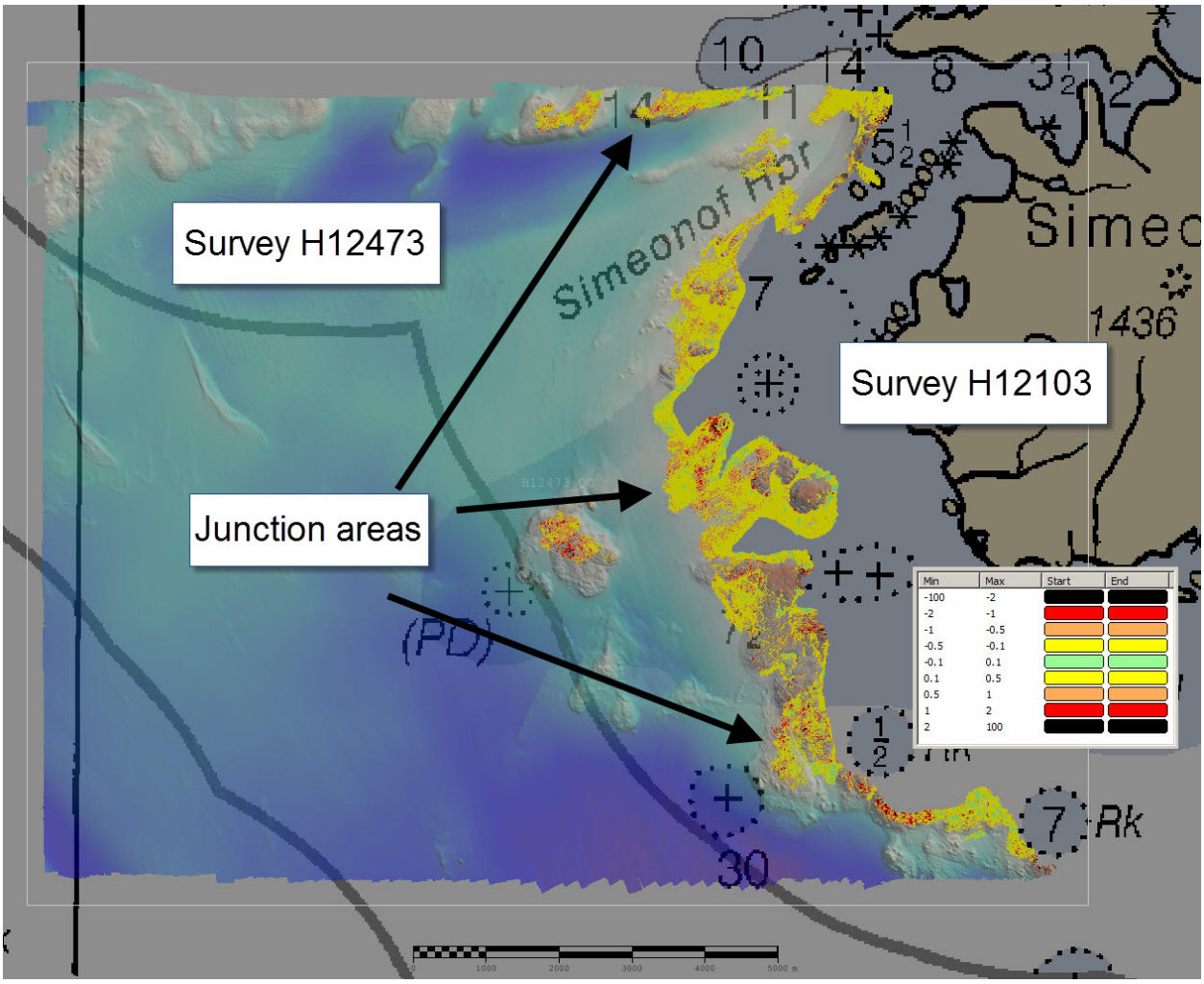


Figure 20: Survey H12473 and junction H12103 using the shoal layer difference surface in meters.

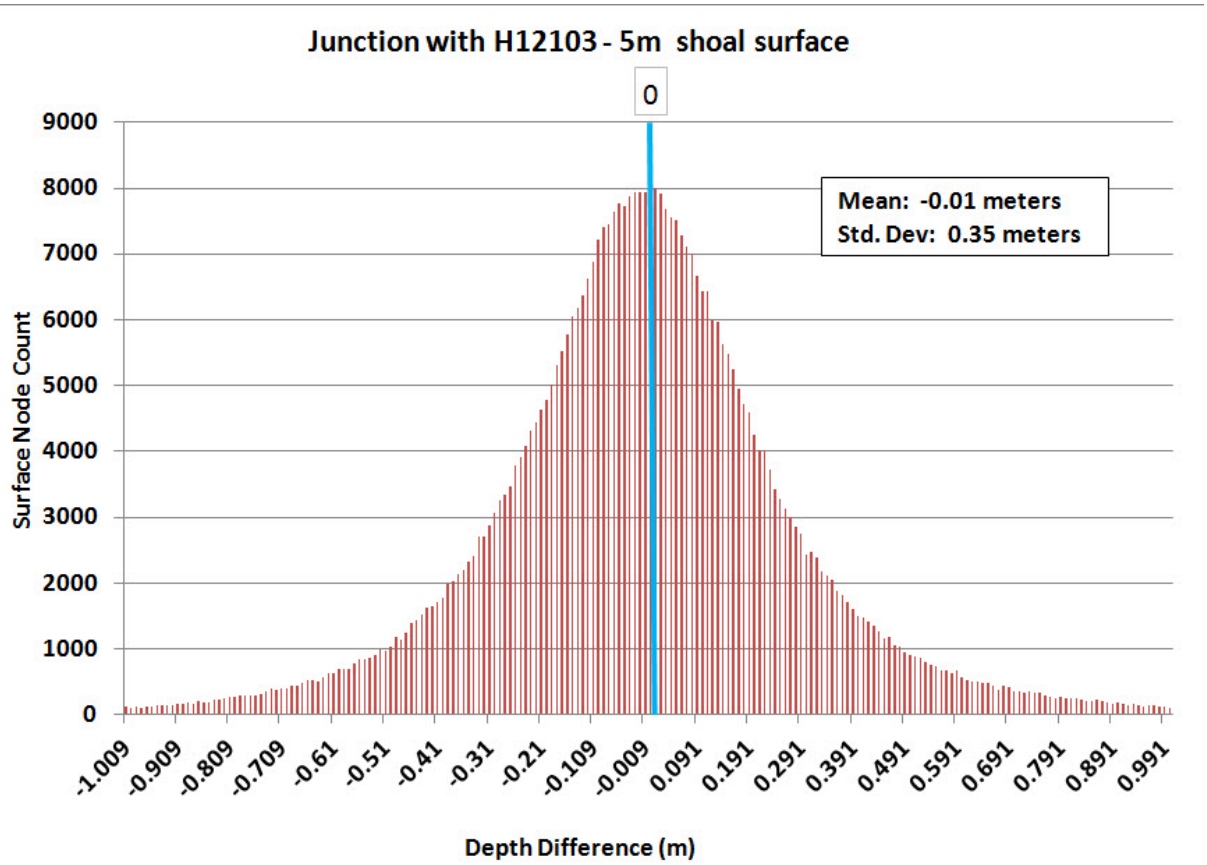


Figure 21: Survey H12473 and junction H12103 difference surface statistics in meters.

Although the bathymetry and features do not directly junction with H12473, features and depths from 2009 LIDAR survey H12104 are recommended for charting in the area inshore of the northeast corner of H12473.

B.2.4 Sonar QC Checks

Sonar system quality control checks were conducted as detailed in the quality control section of the DAPR.

B.2.5 Equipment Effectiveness

Kongsberg Data Artifact

During the 2012 Hydrographic Survey Readiness Review, an artifact was identified in bathymetric data acquired with the RAINIER's (S221) Kongsberg EM710. This heave-like artifact amplifies with vessel dynamics; in particular, as the magnitude of the ship's pitch and heave increases (e.g. in heavy weather), so too does the magnitude of the depth errors. Figure 22 shows an example not acquired on survey H12473, of an overhead view of two survey lines acquired in similar depths (~90 meters) on different days. On the left, data was acquired in a more dynamic regime (8 foot seas), while the right was acquired on a calmer day (4 foot seas) -- both lines are gridded at a 4-meter resolution with equivalent vertical exaggerations. The survey

lines of Figure 22 are shown in CARIS Subset view in Figure 23. Figure 23 demonstrates the characteristic undulation of the nadir pings of the ship's system, when in heavy seas. By way of contrast, Figure 23 (bottom), acquired in a less dynamic environment, is nearly free of the artifact. While not a absolute rule, every 1-degree of vessel pitch leads to about 0.1 meters of vertical bias. Representatives from Kongsberg, Applanix and CARIS have been contacted with regard to this problem, and ship's personnel are actively investigating a remedy to this issue; however, at the time of this writing, the artifact still persists. Note that Figures 22 and 23 are not of data acquired during survey H12473, but serve as a pictorial representation. The artifact seen on survey H12473 had an error on a magnitude of approximately 0.05 meters.

To mitigate problems associated with this artifact, ship's acquisition was only conducted in a sea state that was commensurate with minimizing vessel dynamics. It is in the opinion of the Hydrographer that all data is acquired by the kongsberg EM710 for survey H12473 is adequate to supersede the chart.

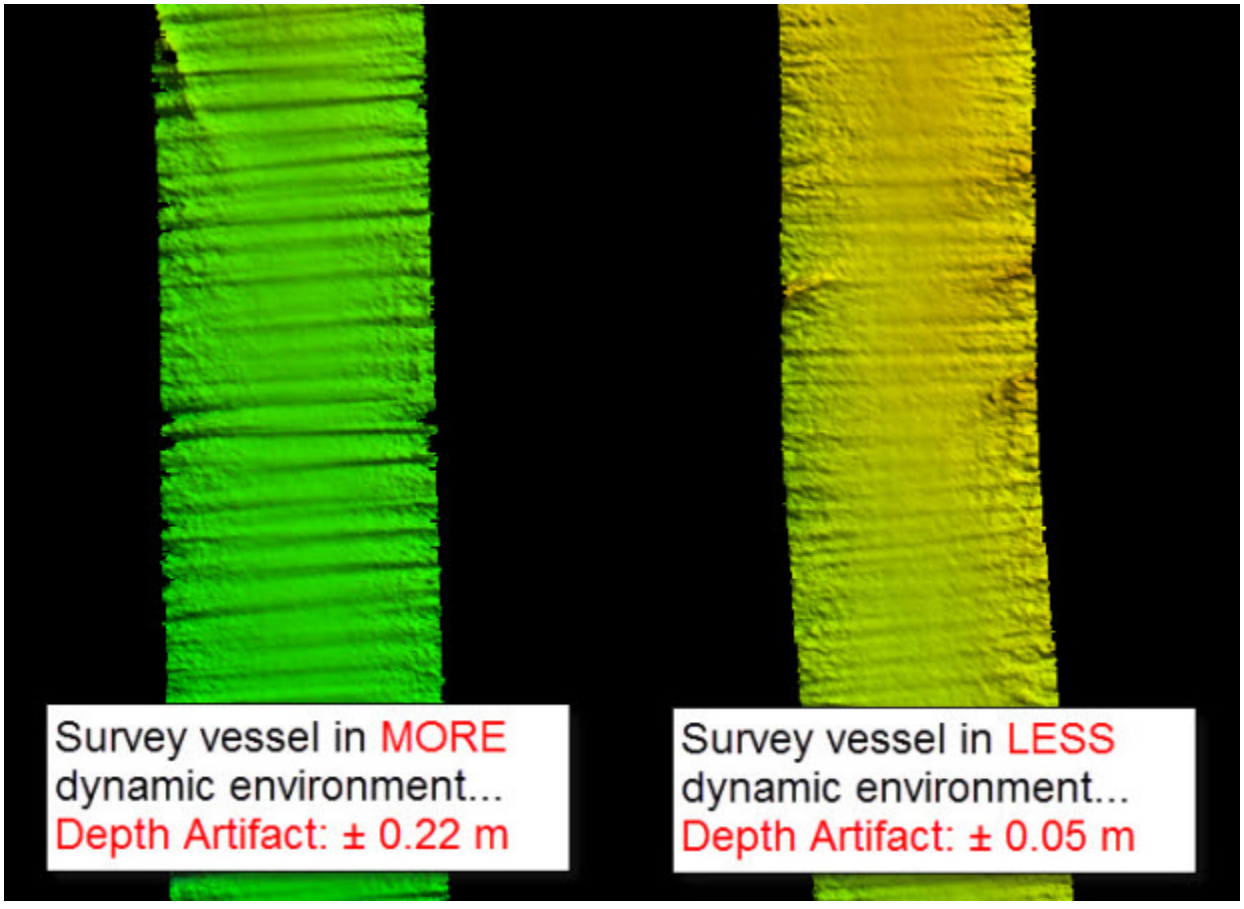


Figure 22: Overhead view of two survey lines, acquired on different days, using the Rainier's Kongsberg EM710. Data acquired in heavier seas (left) displayed a characteristic undulation in the gridded sea floor, while calmer days (right) yielded a smoother representation of the bottom.

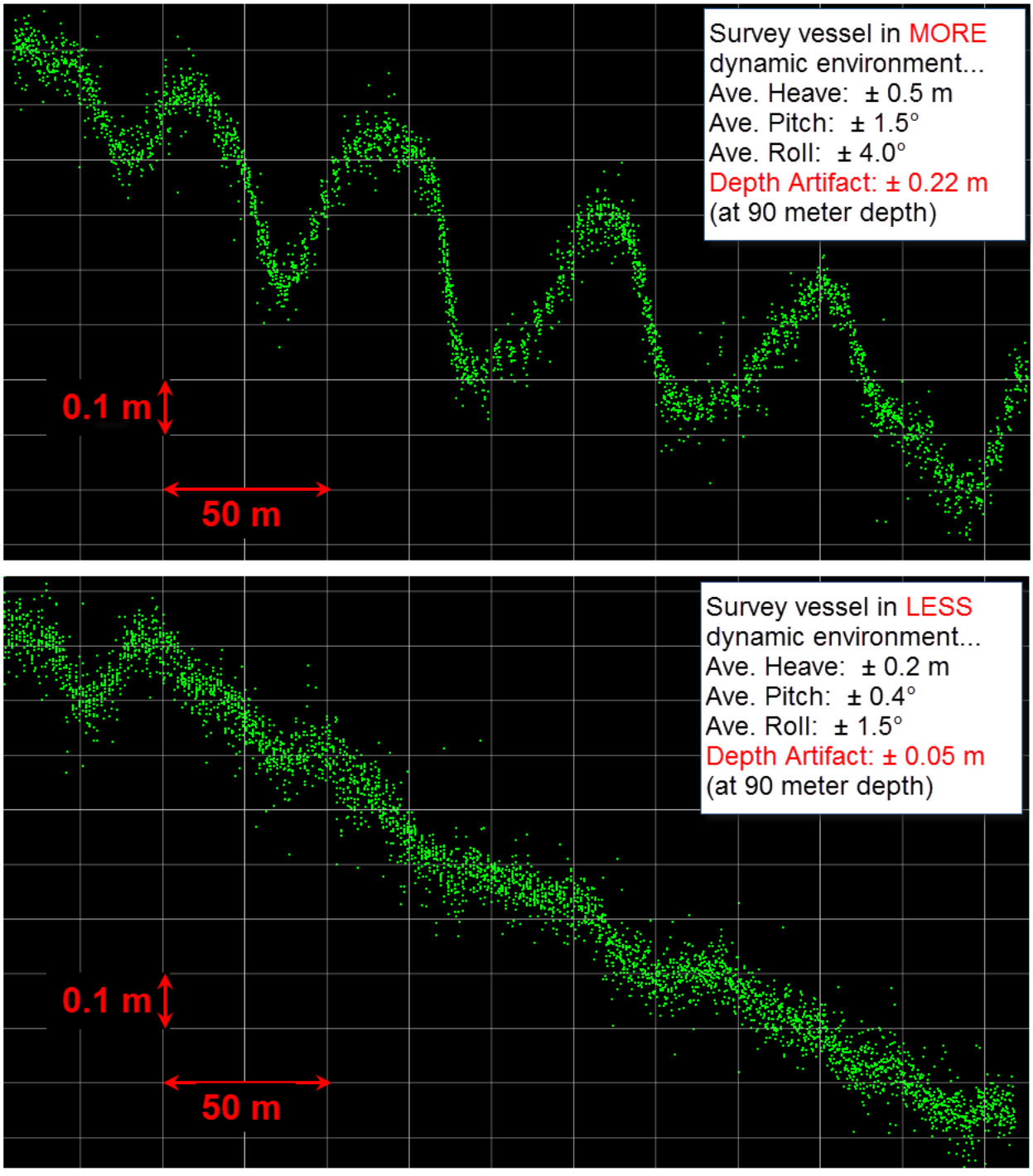


Figure 23: Cross section view of data acquired using the Rainier's Kongsberg EM710, over a smooth sea floor, on both dynamic (top) and calm (bottom) sea states. Notice that with increased vessel dynamics, there is an increased artifact in the processed depths.

Sound Speed Artifacts

Several sound speed casts collected by the ship were not applied to data because of anomalous salinity profiles (Figure 24). The conductivity cell ultimately failed entirely on DN273. Casts where the salinity was

significantly less than the historic ranges were rejected. Even with the removal, the master concatenated SV file covers the survey area both temporally and spatially, (Figure 25).

In areas where there was still a "slight smile or frown" in the sounding data, the Hydrographer rejected the outermost beams obviously in error in an attempt to best represent the seafloor via the CUBE surface. This technique eliminated many, but not every sound speed-related artifact (Figure 26).

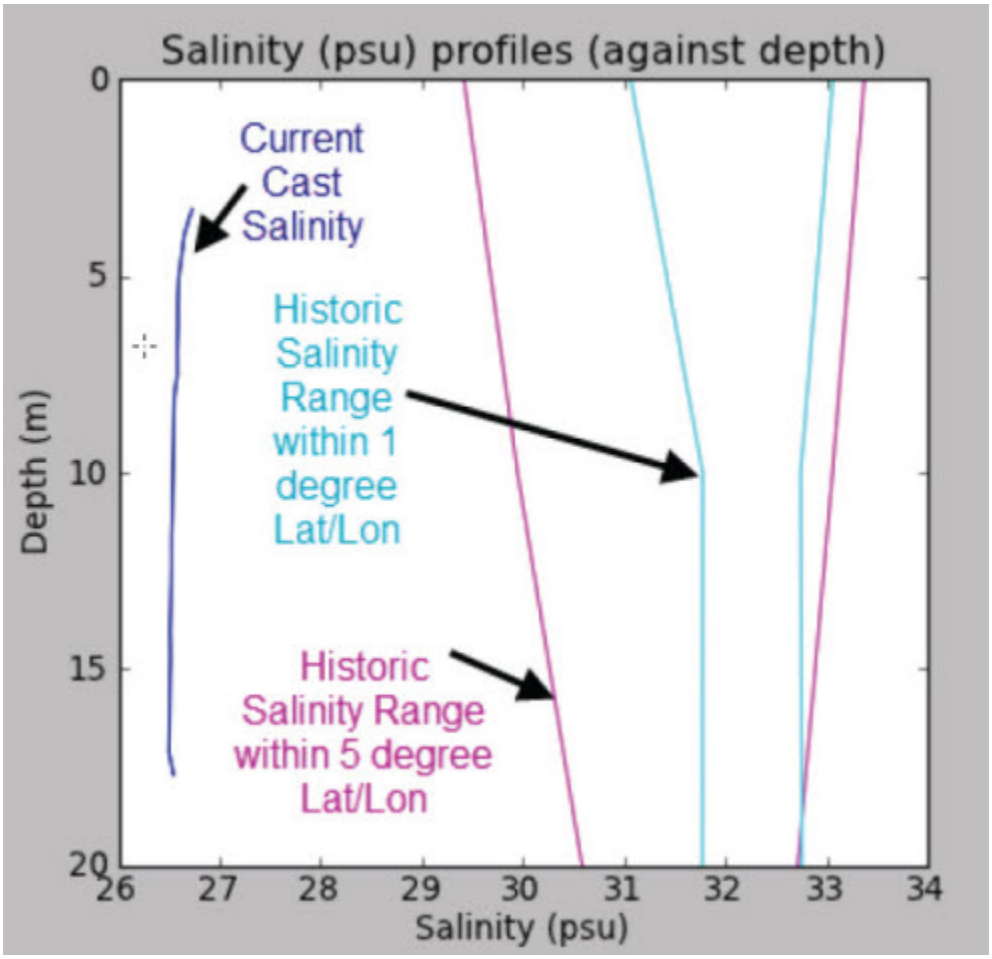


Figure 24: H12473 representative inaccurate salinity profile.

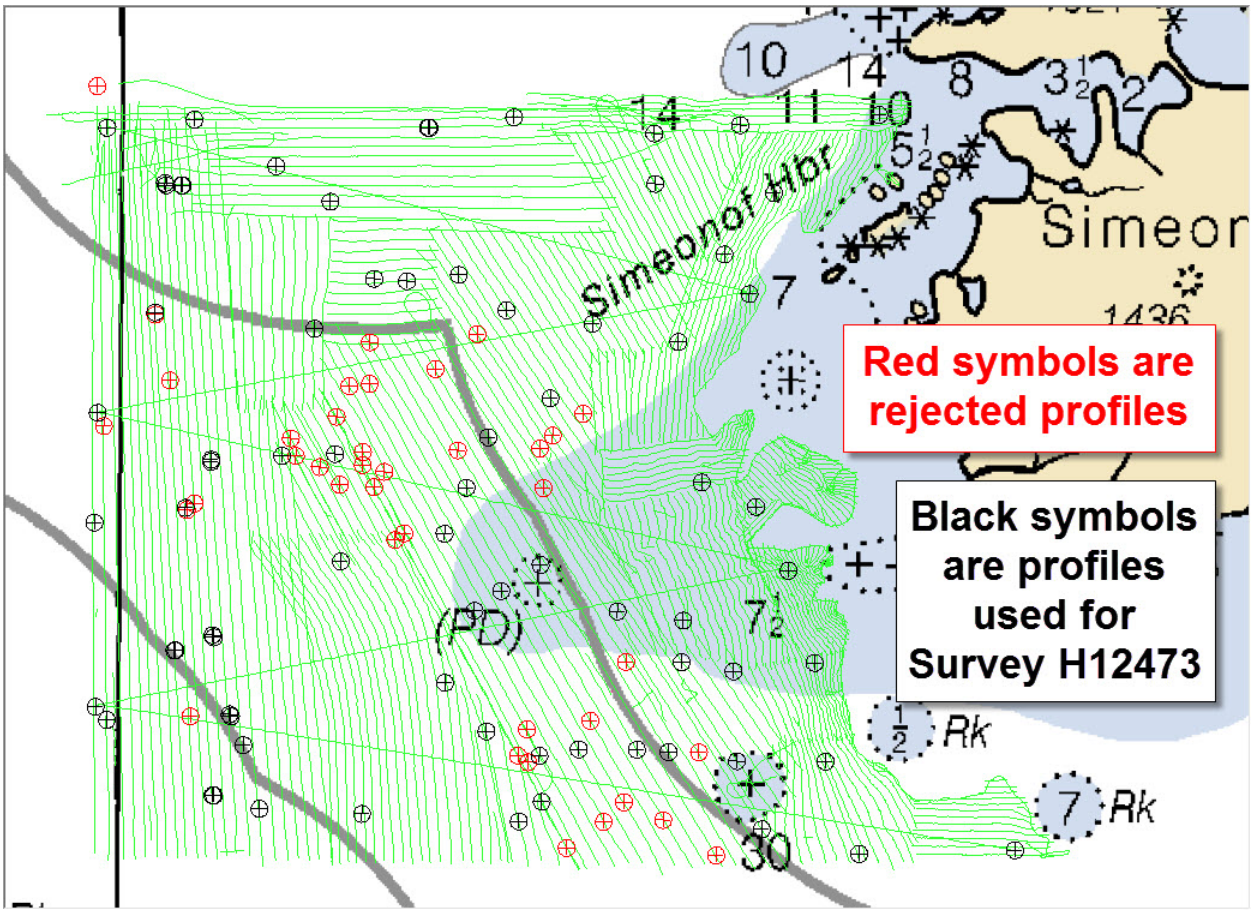


Figure 25: Sound speed profile locations for survey H12473 depicting total profiles versus those submitted for survey compilation.

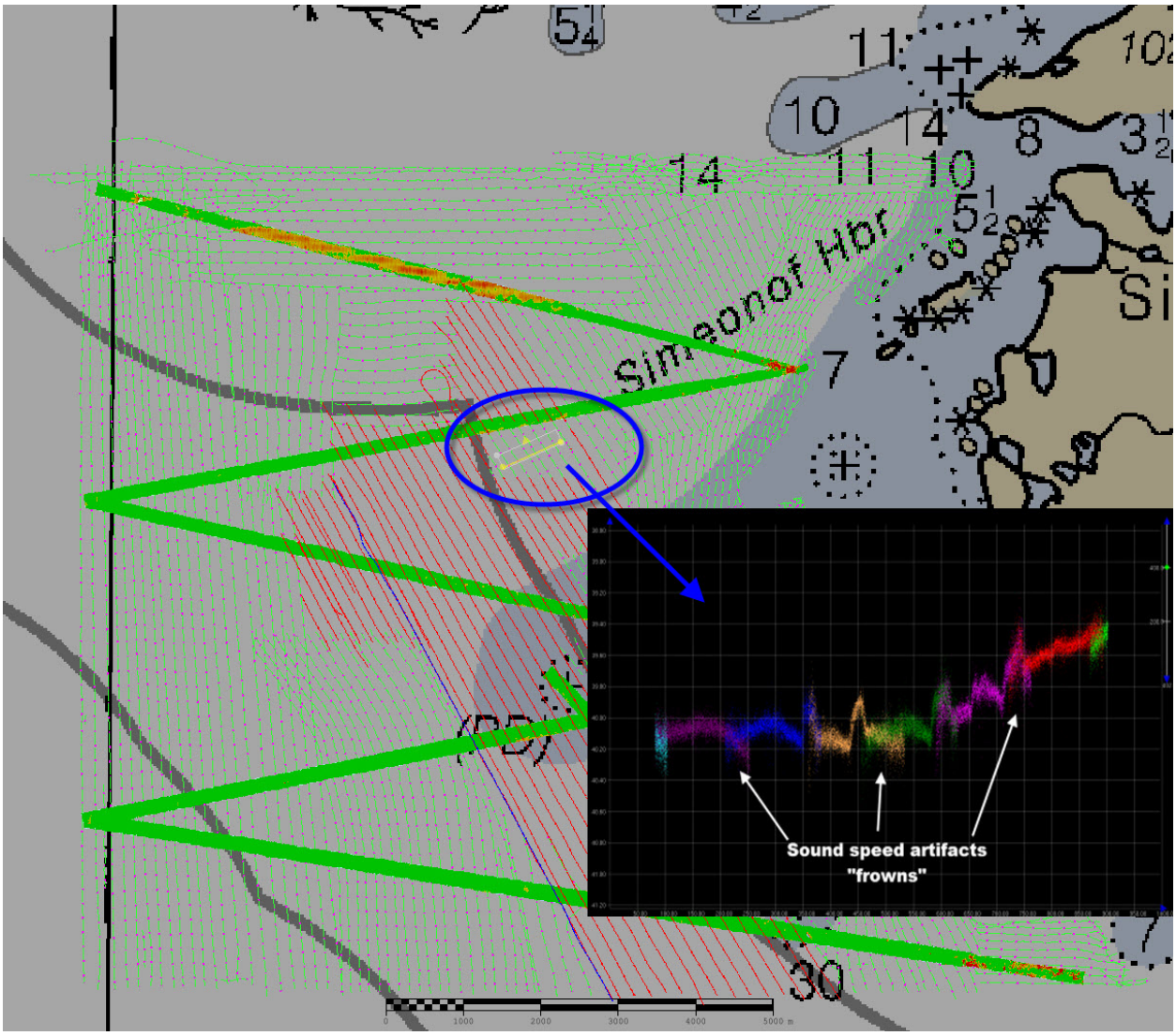


Figure 26: Example of sound speed artifact in survey H12473.

After processing the data to mitigate the sound speed errors, the data is adequate for charting.

Application of SBET Data

Smoothed Best Estimate Trajectory (SBET) and Root Mean Square (RMS) data were applied to all H12473 survey lines with the following exceptions: Vessel S221 DN257, Lines 0004 and 0040 did not load PPK data due to SBET time extents not overlapping with lines; Vessel 2804 DN225 lines 2804_2012RA2251925,2804_RA2251927, and 2804_2012RA2251954 lines did not load PPK data because it did not exist for these lines. Finally, Vessel 2803, Line 2803_2012RA2572349, did not load RMS data due to the extreme short length (2 meters) of the line. The affected data was examined in CARIS Subset Editor with no artifacts present among overlapping lines.

The failure loading the SBET and RMS data to the lines in question did not negatively affect the data and the data is adequate for charting.

B.2.6 Factors Affecting Soundings

Inconsistent Waterline Measurement for RAINIER on DN259

On DN259, data acquired after 1700 UTC with the RAINIER's EM710 exhibited a vertical shift of ~0.25 meters (relative to both data acquired prior to 17:00 and crossline data from other vessels) (Figure 27). Prior to 1700, four survey launches were deployed necessitating a re-measurement of the RAINIER's waterline. The recorded waterline changed from -0.300 to -0.465 meters. A 0.16 meter change in the waterline is not unprecedented with the deployment of all the small boats; however, -0.465 meters is on the edge of the historic values. In light of the observed vertical shift in the data, it is possible that the ship was not stationary while the waterline was re-measured, causing a confounding of the waterline with the dynamic draft. As such, the measured waterline value, -0.465 meters, was replaced with the value measured three days prior (DN256 - with all four launches also deployed), -0.122 meters. With the updated waterline, the vertical offset was removed (Figure 28).

All depth estimates meet the accuracy requirements set forth in the HSSDM.

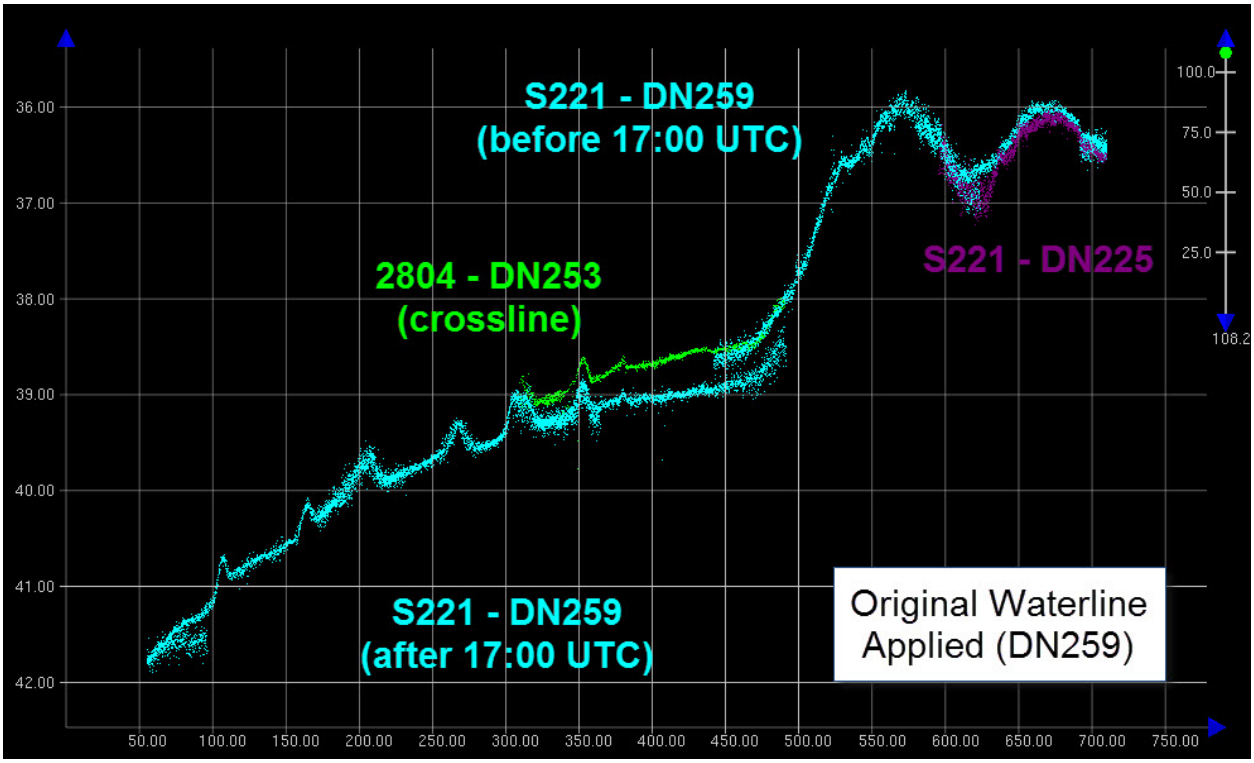


Figure 27: Cross section of multibeam data shown prior to adjusting the ship's irregular waterline measurement taken on DN259.

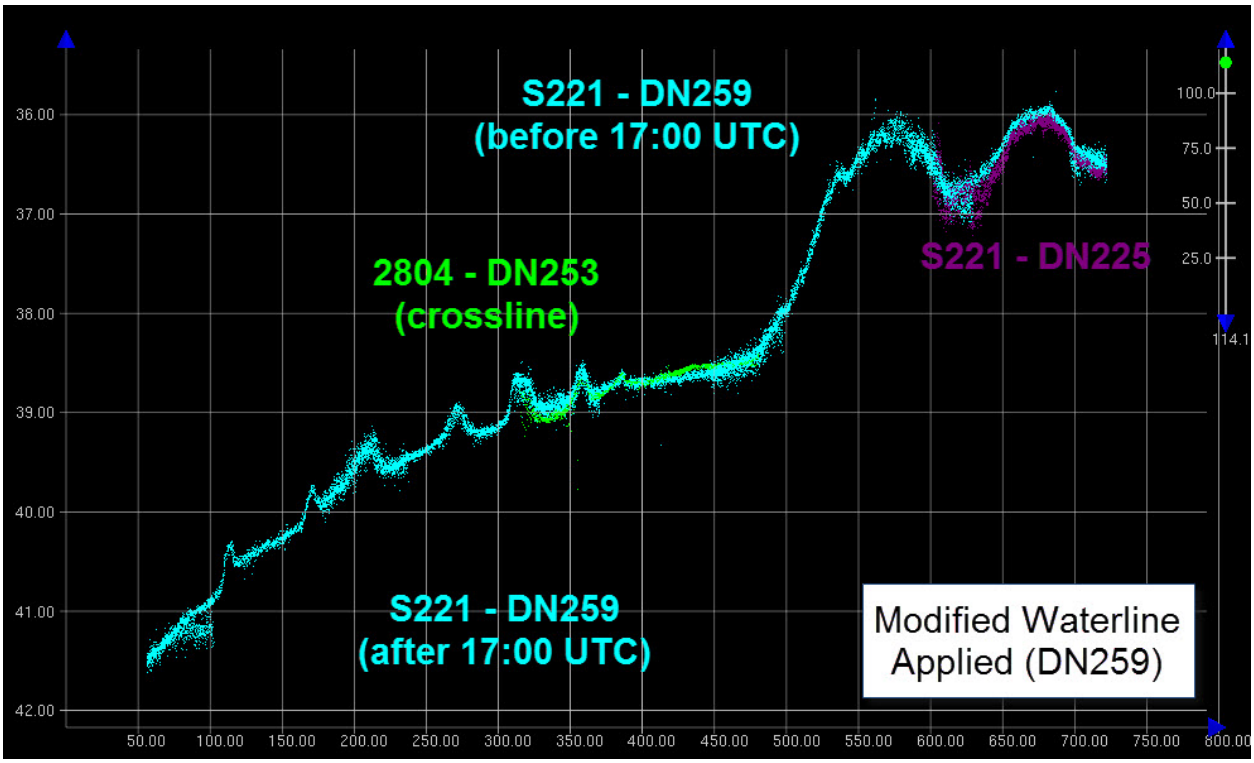


Figure 28: Cross section of multibeam data shown after adjusting the ship's waterline measurement taken on DN259 to match that of DN256.

B.2.7 Sound Speed Methods

Sound Speed Cast Frequency: Sound speed profiles were measured in accordance with the HSSDM 2012. On survey launches, casts were taken with a Seabird SBE19 plus, or the MVP 30 at least once every 4 hours while acquiring data. Sound speed profiles were acquired on RAINIER using the MVP 200 approximately every 15 minutes with efforts made to evenly distribute the casts throughout the survey area. All CTD and MVP casts were collected into one survey wide concatenated file and applied to multibeam data in CARIS using nearest in distance within a time of 4 hours.

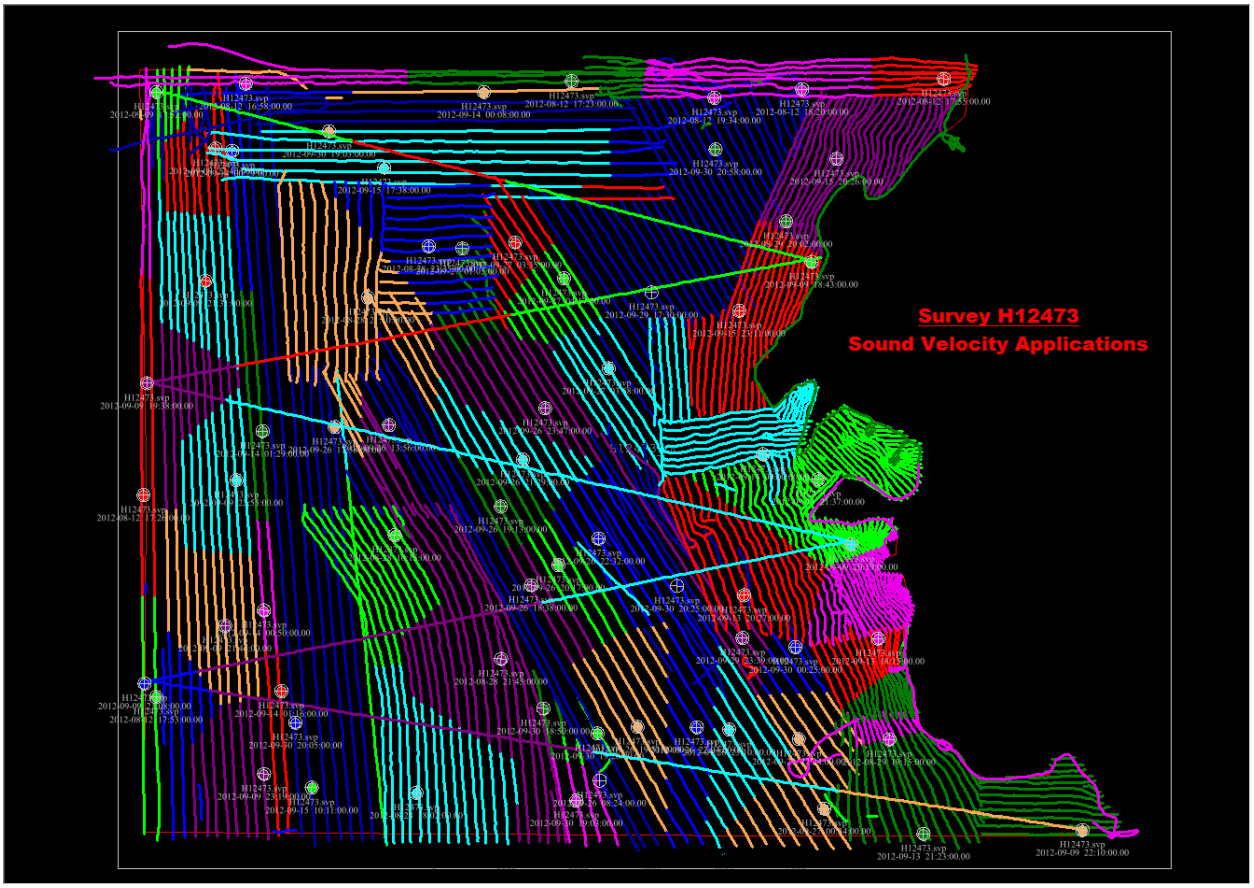


Figure 29: Distribution and Application of all sound speed profiles used in survey H12473.

B.2.8 Coverage Equipment and Methods

All equipment and survey methods were used as detailed in the DAPR.

B.3 Echo Sounding Corrections

B.3.1 Corrections to Echo Soundings

A Kongsberg Seapath 330+ positioning and attitude system was installed on RAINIER and integrated into the acquisition system on DN260 to troubleshoot the Kongsberg data artifacts discussed in section B.2.5.1 of this report. Because the SIS operating system recorded data from multiple sensors, converting the Kongsberg .ALL files in CARIS HIPS and SIPS on DN270, DN273 and DN274 for survey H12473 differs from the RAINIER 2012 DAPR. To convert the raw data files using only the Applanix POS M/V system, the appropriate positioning and attitude sources must be selected (Figure 30). The same vessel file (S221.Simrad-EM710.hvf) is used for all EM710 data acquired on survey H12473.

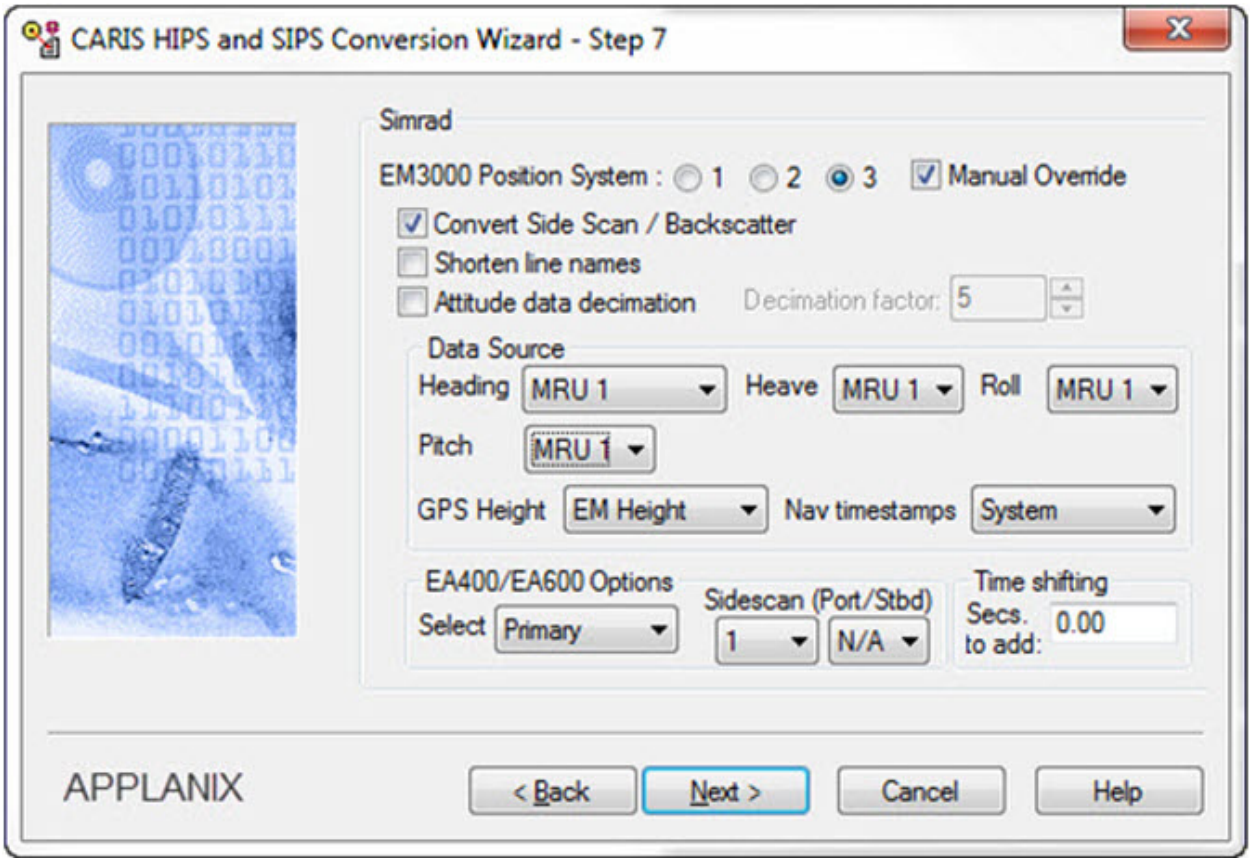


Figure 30: Conversion settings for EM710 data acquired after DN260 on survey H12473 to utilize the Applanix POS M/V.

B.3.2 Calibrations

All sounding systems were calibrated as detailed in the DAPR.

B.4 Backscatter

Backscatter data was acquired with all systems, but was not processed by RAINIER personnel. However, periodic spot checks were performed to ensure backscatter quality. Backscatter was logged as .ALL files (Kongsberg) or 7k files (Reson) and submitted to NGDC.

B.5 Data Processing

B.5.1 Software Updates

There were no software configuration changes after the DAPR was submitted.

The following Feature Object Catalog was used: NOAA Profile.

There were no software configuration changes after the DAPR was submitted.

B.5.2 Surfaces

The following surfaces and/or BAGs were submitted to the Processing Branch:

Surface Name	Surface Type	Resolution	Depth Range	Surface Parameter	Purpose
H12473_1M	CUBE	1 meters	0 meters - 80 meters	NOAA_1m	Complete MBES
H12473_2M	CUBE	2 meters	0 meters - 80 meters	NOAA_2m	Complete MBES
H12473_4M	CUBE	4 meters	0 meters - 80 meters	NOAA_4m	Complete MBES
H12473_1M_Final	CUBE	1 meters	0 meters - 20 meters	NOAA_1m	Complete MBES
H12473_2M_Final	CUBE	2 meters	18 meters - 40 meters	NOAA_2m	Complete MBES
H12473_4M_Final	CUBE	4 meters	36 meters - 80 meters	NOAA_4m	Complete MBES
H12473_Combined_finalized	CUBE	4 meters	0 meters - 80 meters	NOAA_4m	Complete MBES

Table 9: Submitted Surfaces

C. Vertical and Horizontal Control

The vertical datum for this project is Mean Lower Low Water (MLLW). The operating National Water Level Observation Network (NWLON) primary tide station in Sand Point, AK (9459450), served as control for datum determination and as a source for water level reducers for survey H12473. A complete description of the vertical and horizontal control for this survey can be found in the accompanying OPR-P183-RA-12 Horizontal and Vertical Control Report (HVCR), submitted under separate cover.

C.1 Vertical Control

The vertical datum for this project is Mean Lower Low Water.

Standard Vertical Control Methods Used:

Discrete Zoning

The following National Water Level Observation Network (NWLON) stations served as datum control for this survey:

Station Name	Station ID
Sand Point, Alaska	945-9450

Table 10: NWLON Tide Stations

File Name	Status
9459450.tid	Final Approved

Table 11: Water Level Files (.tid)

File Name	Status
P183RA2012CORP.zdf	Final

Table 12: Tide Correctors (.zdf or .tc)

A request for final approved tides was sent to N/OPS1 on 10/01/2012. The final tide note was received on 10/18/2012.

See attached tide note dated October 9, 2012.

C.2 Horizontal Control

The horizontal datum for this project is North American Datum of 1983 (NAD83).

The projection used for this project is UTM-4N.

The following PPK methods were used for horizontal control:

Single Base

In conjunction with this project, a GPS base station was established by RAINIER personnel in the vicinity of Simeonof Harbor near the northwest end of Simeonof Island. Vessel kinematic data (POS files) were post-processed with Applanix POSPac and POSGNSS software using Single Base processing methods described in the DAPR. SBET and associated error (RMS) data was applied to all survey lines with the exception of those described in Section B.2.5.1 - Application of SBET Data. Further, in the case of S221, only GPS height and Navigation data were post-processed (real-time attitude was retained).

Vessels 2802, 2804 and S221 acquired data on DN225 prior to base station installation. Precise Point Positioning (PPP) correction was applied to this data only.

The particular DGPS beacon used during this survey was variable. The USCG DGPS stations at Kodiak (313 kHz), and Cold Bay (289 kHz) Alaska were used for initial horizontal control depending on which provided the best signal reception at the time of acquisition. Refer to H12473 processing and acquisition logs for details.

The following DGPS Stations were used for horizontal control:

DGPS Stations
Cold Bay Alaska (289 kHz)
Kodiak Alaska (313 kHz)

Table 13: USCG DGPS Stations

D. Results and Recommendations

D.1 Chart Comparison

D.1.1 Raster Charts

The following are the largest scale raster charts, which cover the survey area:

Chart	Scale	Edition	Edition Date	LNM Date	NM Date
16540	1:300000	13	10/2010	10/16/2012	10/27/2012

Table 14: Largest Scale Raster Charts

16540

Chart comparison procedures were followed as outlined in section 4.5.1.2 of the FPM and section 8.1.4-D.1 of the HSSDM, utilizing CARIS HIPS and SIPS and CARIS Notebook.

The majority of the area of survey H12473 was previously unsurveyed and devoid of charted depths or contours except for the northeastern section going into Simeonof Harbor. There are four soundings total charted within survey H12473.

A charted 14-fathom sounding at 54-55-12 N 159-22-58W was found to be 6 fathoms deeper at the center of the charted sounding. An 11-fathom sounding located at 54-55-14N 159-20-57W was found to be deeper than depicted by more than 5 fathoms. A 7 1/2 fathom sounding charted at 54-51-24N 159-21-23W was found to be more than 15 fathoms deeper (Figure 31). A charted 30-fathom sounding at 54-49-36N 159-21-25W was found to agree well with the current survey H12473 within a half fathom. The Hydrographer recommends that survey H12473 supersede charted depths and positions.

The 10-fathom contour on chart 16450 did not compare well with survey H12473. The current survey found depths exceeding ten fathoms throughout most of the charted ten fathom area. The hydrographer recommends using depths from survey H12473 and H12103 to define the ten fathom contour (Figure 31).

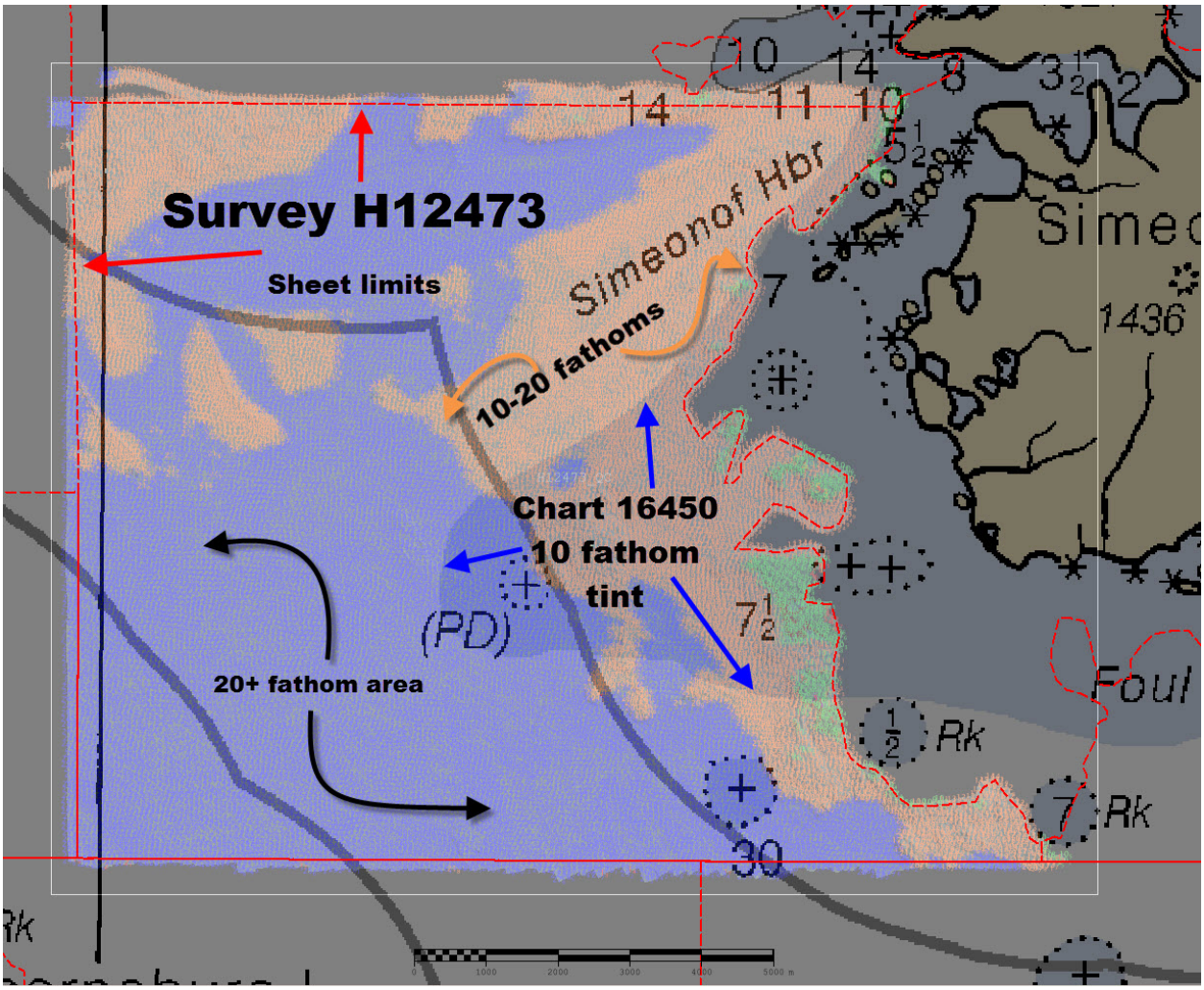


Figure 31: Discrepancy between the charted (16450) 10 fathom contour and the surveyed depths of H12473.

D.1.2 Electronic Navigational Charts

The following are the largest scale ENCs, which cover the survey area:

ENC	Scale	Edition	Update Application Date	Issue Date	Preliminary?
US3AK50M	1:300000	17	06/29/2011	06/29/2011	NO

Table 15: Largest Scale ENCs

US3AK50M

ENC US3AK50M coincides with raster 16450. The depths and contours on the ENC match the raster, and the comparison between survey H12473 and the ENC is equivalent to the preceding comparison with Chart 16450.

There are cases where the ENC soundings display 1 foot shoaler than the RNC soundings. All charted soundings will be updated with the new surveyed depths.

D.1.3 AWOIS Items

One AWOIS item is located within the survey limits of H12473, which was charted as an obstruction with a position doubtful (PD). AWOIS feature #54096 was not located in its assigned search radius of 500 meters, (Figure 32).

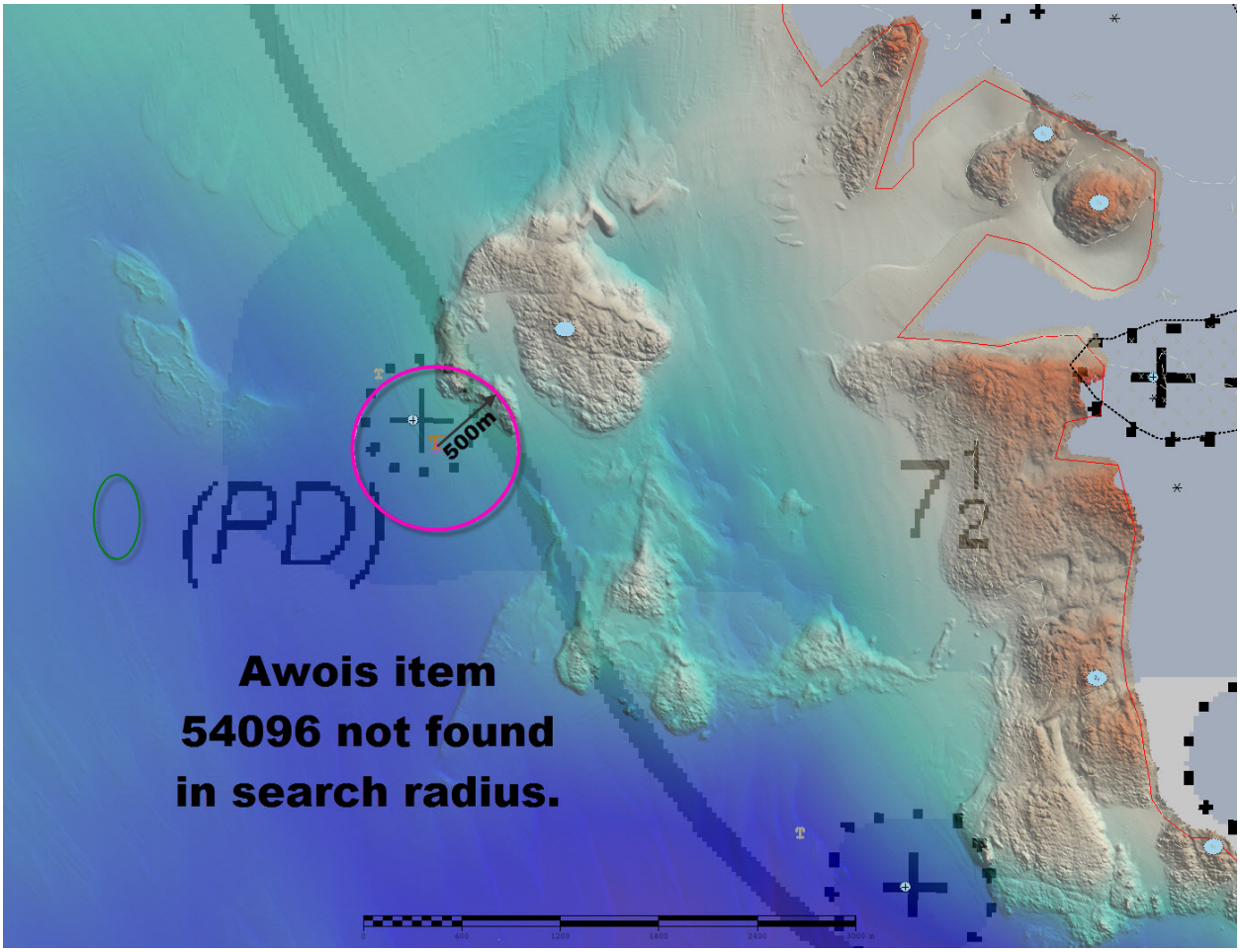


Figure 32: AWOIS item #54096, charted as a submerged rock, was not found within the assigned 500 meter search radius. A submerged feature was located approximately 1 kilometer northeast of charted feature.
The submerged rock PD was disproved and it has been recommended that it be removed from the chart.

D.1.4 Maritime Boundary Points

No Maritime Boundary Points were assigned for this survey.

D.1.5 Charted Features

One obstruction with a position doubtful (PD) is located within the survey limits of H12473. Refer to section D.1.3 of this report.

The charted PD feature is depicted as a submerged rock, not an obstruction.

D.1.6 Uncharted Features

No uncharted features exist for this survey.

D.1.7 Dangers to Navigation

No Danger to Navigation Reports were submitted for this survey.

There were no DTONs found during H12473, however, there were 2 DTONs identified during 2009 LIDAR survey H12103 that junctions with this survey. The DTONs reported from H12103 have been applied to the charts. See attached H12103 DTON report.

D.1.8 Shoal and Hazardous Features

No shoals or potentially hazardous features exist for this survey.

D.1.9 Channels

No channels exist for this survey. There are no designated anchorages, precautionary areas, safety fairways, traffic separation schemes, pilot boarding areas, or channel and range lines within the survey limits.

D.1.10 Bottom Samples

Six of the seven assigned bottom samples were collected for survey H12473 using a small traditional clamshell sampler and a small Ponar sampler. This sheet had no previously charted bottom characteristics. The common characteristic of the samples examined were sand and shells. Only one sample, #2, (Figure 33) failed to produce any measurable material to determine the bottom characteristics. All bottom samples have been included in H12473 Final Features.hob file.

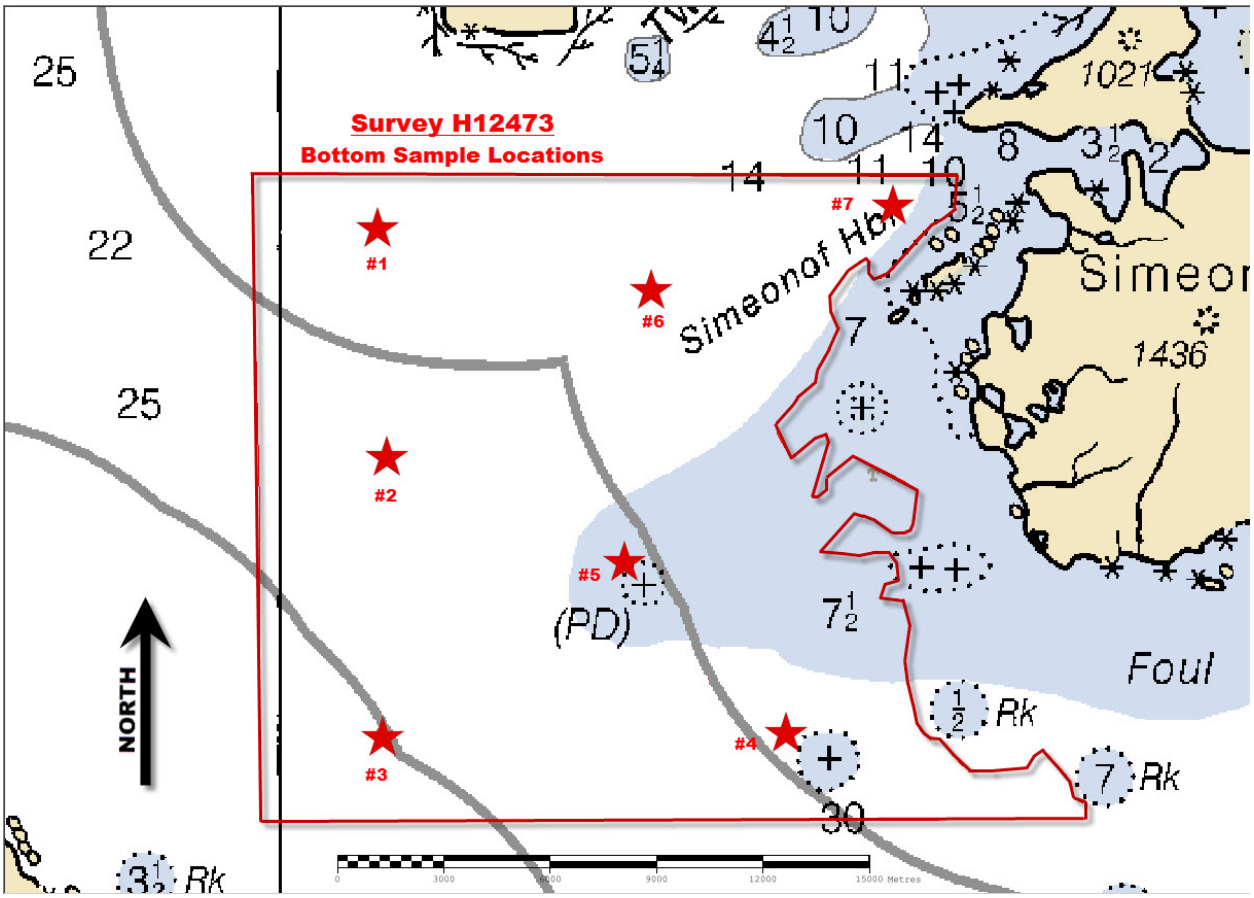


Figure 33: Survey H12473 bottom sample locations.

D.2 Additional Results

D.2.1 Shoreline

All assigned features with the exception of one lidar investigation feature (which was inshore of the NALL), were addressed as required with S-57 attribution and recorded in the H12473 Final Feature File to best represent the features at chart scale. As part of survey H12473, 2 features were specifically designated as lidar investigation items. (using BUAARE objects). For clarity, the BUAARE objects are maintained in a separate layer "H12473_Lidar_Investigations.hob" and submitted as reference.

D.2.2 Prior Surveys

No prior survey comparisons exist for this survey.

D.2.3 Aids to Navigation

Aids to navigation (ATONs) do not exist for this survey.

D.2.4 Overhead Features

Overhead features do not exist for this survey.

D.2.5 Submarine Features

Submarine features do not exist for this survey.

D.2.6 Ferry Routes and Terminals

No ferry routes or terminals exist for this survey.

D.2.7 Platforms

No platforms exist for this survey.

D.2.8 Significant Features

No significant features exist for this survey.

D.2.9 Construction and Dredging

There is no present or planned construction or dredging within the survey limits.

D.2.10 New Survey Recommendations

No new surveys or further investigations are recommended for this area.

D.2.11 New Inset Recommendations

No new insets are recommended for this area.

E. Approval Sheet

As Chief of Party, Field operations for this hydrographic survey were conducted under my direct supervision, with frequent personal checks of progress and adequacy. I have reviewed the attached survey data and reports.

All field sheets, this Descriptive Report, and all accompanying records and data are approved. All records are forwarded for final review and processing to the Processing Branch.

The survey data meets or exceeds requirements as set forth in the NOS Hydrographic Surveys and Specifications Deliverables Manual, Field Procedures Manual, Standing and Letter Instructions, and all HSD Technical Directives. These data are adequate to supersede charted data in their common areas. This survey is complete and no additional work is required with the exception of deficiencies noted in the Descriptive Report.

Approver Name	Approver Title	Approval Date	Signature
Richard T. Brennan, CDR/NOAA	Chief of Party	03/27/2013	Richard T. Brennan 2013.04.18 17:27:20 -07'00'
Michael O. Gonsalves, LT/NOAA	Field Operations Officer	03/27/2013	Michael O. Gonsalves 2013.03.28 06:14:27 -07'00'
James B. Jacobson	Chief Survey Technician	03/27/2013	James Jacobson I have reviewed this document 2013.03.28 07:47:16 -07'00'
Todd A. Walsh	Sheet Manager	03/27/2013	Digitally signed by Todd A. Walsh Date: 2013.03.28 08:52:32 -04'00'

F. Table of Acronyms

Acronym	Definition
AHB	Atlantic Hydrographic Branch
AST	Assistant Survey Technician
ATON	Aid to Navigation
AWOIS	Automated Wreck and Obstruction Information System
BAG	Bathymetric Attributed Grid
BASE	Bathymetry Associated with Statistical Error
CO	Commanding Officer
CO-OPS	Center for Operational Products and Services
CORS	Continually Operating Reference Staiton
CTD	Conductivity Temperature Depth
CEF	Chart Evaluation File
CSF	Composite Source File
CST	Chief Survey Technician
CUBE	Combined Uncertainty and Bathymetry Estimator
DAPR	Data Acquisition and Processing Report
DGPS	Differential Global Positioning System
DP	Detached Position
DR	Descriptive Report
DTON	Danger to Navigation
ENC	Electronic Navigational Chart
ERS	Ellipsoidal Referenced Survey
ERZT	Ellipsoidally Referenced Zoned Tides
FFF	Final Feature File
FOO	Field Operations Officer
FPM	Field Procedures Manual
GAMS	GPS Azimuth Measurement Subsystem
GC	Geographic Cell
GPS	Global Positioning System
HIPS	Hydrographic Information Processing System
HSD	Hydrographic Surveys Division
HSSD	Hydrographic Survey Specifications and Deliverables

Acronym	Definition
HSTP	Hydrographic Systems Technology Programs
HSX	Hypack Hysweep File Format
HTD	Hydrographic Surveys Technical Directive
HVCR	Horizontal and Vertical Control Report
HVF	HIPS Vessel File
IHO	International Hydrographic Organization
IMU	Inertial Motion Unit
ITRF	International Terrestrial Reference Frame
LNM	Local Notice to Mariners
LNM	Linear Nautical Miles
MCD	Marine Chart Division
MHW	Mean High Water
MLLW	Mean Lower Low Water
NAD 83	North American Datum of 1983
NAIP	National Agriculture and Imagery Program
NALL	Navigable Area Limit Line
NM	Notice to Mariners
NMEA	National Marine Electronics Association
NOAA	National Oceanic and Atmospheric Administration
NOS	National Ocean Service
NRT	Navigation Response Team
NSD	Navigation Services Division
OCS	Office of Coast Survey
OMAO	Office of Marine and Aviation Operations (NOAA)
OPS	Operations Branch
MBES	Multibeam Echosounder
NWLON	National Water Level Observation Network
PDBS	Phase Differencing Bathymetric Sonar
PHB	Pacific Hydrographic Branch
POS/MV	Position and Orientation System for Marine Vessels
PPK	Post Processed Kinematic
PPP	Precise Point Positioning
PPS	Pulse per second

Acronym	Definition
PRF	Project Reference File
PS	Physical Scientist
PST	Physical Science Technician
RNC	Raster Navigational Chart
RTK	Real Time Kinematic
SBES	Singlebeam Echosounder
SBET	Smooth Best Estimate and Trajectory
SNM	Square Nautical Miles
SSS	Side Scan Sonar
ST	Survey Technician
SVP	Sound Velocity Profiler
TCARI	Tidal Constituent And Residual Interpolation
TPU	Total Porpagated Error
TPU	Topside Processing Unit
USACE	United States Army Corps of Engineers
USCG	United Stated Coast Guard
UTM	Universal Transverse Mercator
XO	Executive Officer
ZDA	Global Positiong System timing message
ZDF	Zone Definition File

UNITED STATES DEPARMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Ocean Service
Silver Spring, Maryland 20910

TIDE NOTE FOR HYDROGRAPHIC SURVEY

DATE : October 9, 2012

HYDROGRAPHIC BRANCH: Pacific
HYDROGRAPHIC PROJECT: OPR-P183-RA-2012
HYDROGRAPHIC SHEET: H12473

LOCALITY: Vicinity of Simeonof Harbor, Shumagin Islands, AK
TIME PERIOD: August 12 - September 30, 2012

TIDE STATION USED: 945-9450 Sand Point, AK
Lat. 55° 20.2'N Long. 160° 30.1' W
PLANE OF REFERENCE (MEAN LOWER LOW WATER): 0.000 meters
HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 1.988 meters

REMARKS: RECOMMENDED ZONING

Preliminary zoning is accepted as the final zoning for project OPR-P183-RA-2012, H12473, during the time period between August 12 - September 30, 2012.

Please use the zoning file P183RA2012CORP submitted with the project instructions for OPR-P183-RA-2012. Zones SWA193 and SWA204 are the applicable zones for H12473.

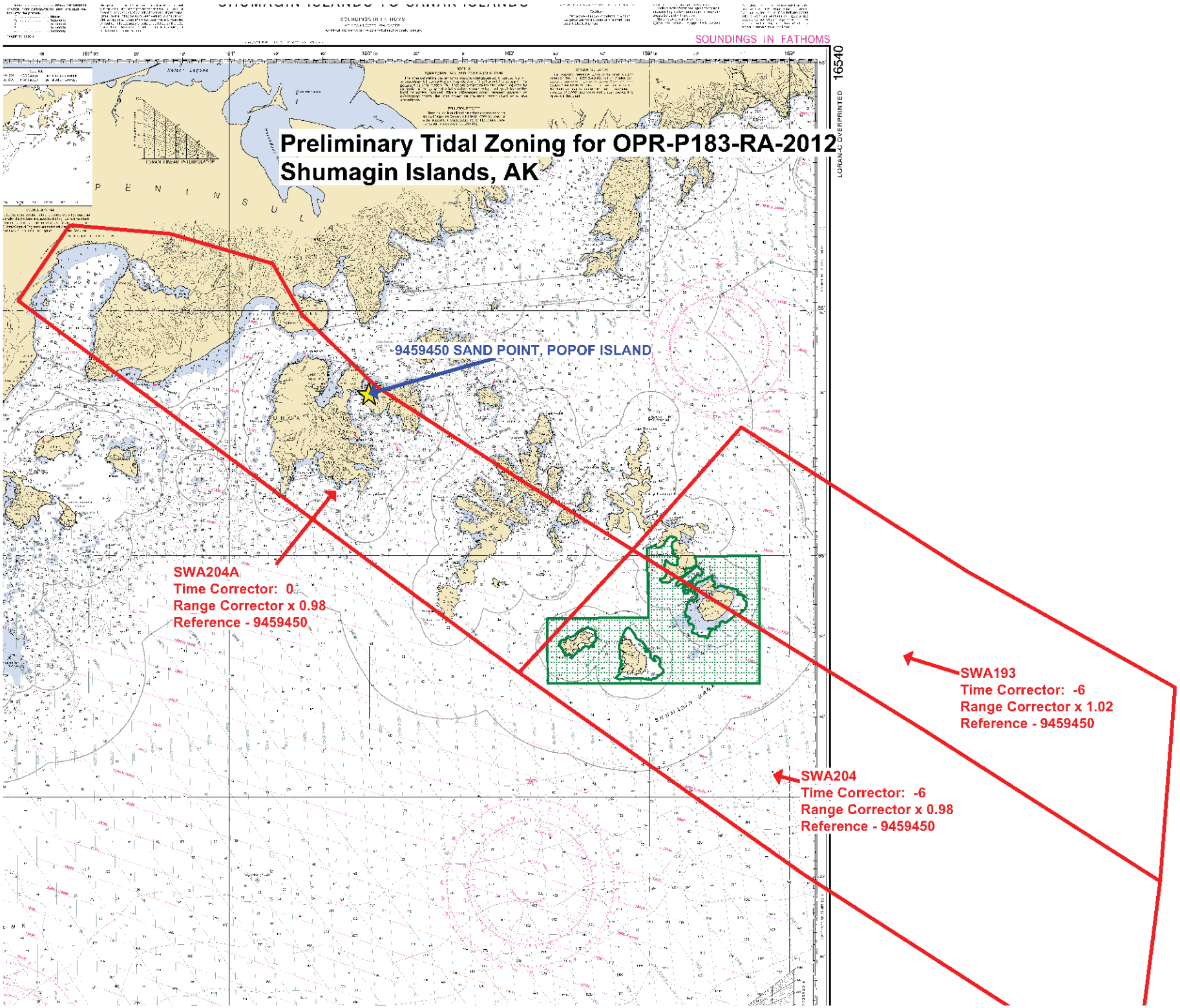
Refer to attachments for zoning information.

Note 1: Provided time series data are tabulated in metric units (meters), relative to MLLW and on Greenwich Mean Time on the 1983-2001 National Tidal Datum Epoch (NTDE).

HOVIS.GERALD.THOMAS.1365860250

Digitally signed by HOVIS.GERALD.THOMAS.1365860250
DN: c=US, o=U.S. Government, ou=DoD, ou=PKI, ou=OTHER, cn=HOVIS.GERALD.THOMAS.1365860250
Date: 2012.10.18 08:29:25 -04'00'

CHIEF, PRODUCTS AND SERVICES BRANCH


SOUNDINGS IN FATHOMS
16540
LORAN-C OVERPRINTED
Preliminary Tidal Zoning for OPR-P183-RA-2012
Shumagin Islands, AK
9459450 SAND POINT, POPOF ISLAND
SWA204A
Time Corrector: 0
Range Corrector x 0.98
Reference - 9459450
SWA193
Time Corrector: -6
Range Corrector x 1.02
Reference - 9459450
SWA204
Time Corrector: -6
Range Corrector x 0.98
Reference - 9459450

H12473 Feature Report

Registry Number: H12473
State: Washington
Locality: Shumagin Islands
Sub-locality: Vicinity of Simeonof Harbor
Project Number: OPR-P183-RA-12
Survey Dates: 08/12/2012 - 09/30/2012

Charts Affected

Number	Edition	Date	Scale (RNC)	RNC Correction(s)*
16540	13th	10/01/2010	1:300,000 (16540_1)	USCG LNM: 9/4/2012 (1/15/2013) CHS NTM: None (10/26/2012) NGA NTM: 1/21/2006 (1/26/2013)
16011	37th	11/01/2007	1:1,023,188 (16011_1)	[L]NTM: ?
16006	35th	04/01/2008	1:1,534,076 (16006_1)	[L]NTM: ?
500	8th	06/01/2003	1:3,500,000 (500_1)	[L]NTM: ?
530	32nd	06/01/2007	1:4,860,700 (530_1)	[L]NTM: ?
50	6th	06/01/2003	1:10,000,000 (50_1)	[L]NTM: ?

* Correction(s) - *source: last correction applied (last correction reviewed--"cleared date")*

Features

Feature Type	Survey Depth	Survey Latitude	Survey Longitude
Rock	[None]	54° 51' 37.8" N	159° 24' 28.4" W

1 - Charted Features

1.1) 54096

Survey Summary

Survey Position:	54° 51' 37.8" N, 159° 24' 28.4" W
Least Depth:	[None]
TPU (±1.96σ):	**THU (TPEh)** [None] ; **TVU (TPEv)** [None]
Timestamp:	1989-063.00:00:00.000 (03/04/1989)
Dataset:	H12473_Feature_Report_office.000
FOID:	US 0000000142 00001(02260000008E0001)
Charts Affected:	16540_1, 16011_1, 16006_1, 500_1, 530_1, 50_1

Remarks:

UWTROC/remrks: AWOIS 54096 Charted rock not found by MBES

Hydrographer Recommendations

Delete

S-57 Data

Geo object 1:	Underwater rock / awash rock (UWTROC)
Attributes:	NATSUR - 9:rock
	QUASOU - 6:least depth known
	SORDAT - 19890304
	SORIND - US,US,graph, Chart 16450
	WATLEV - 3:always under water/submerged

Office Notes:

Concur.

APPENDIX I – DANGERS TO NAVIGATION

DTONS Submitted to PHB

I.1.1 Danger to Navigation Report

Hydrographic Survey Registry Number: H12103

State: Alaska

Locality: Vicinity of Shumagin Islands

Sub-locality: West of Simeonof Island

Project Number: OPR-P183-KRL-09

Survey Dates: June – August, 2009

Depths are in meters and reduced to Mean Lower Low Water using final verified tides. Drying heights are in meters relative to MLLW. Islets are related to MHW. Positions are based on the NAD83 horizontal datum. All times and dates are relative to UTC.

Number	Edition	Date	Scale
US3AK50M	12th	12/1/2009	1:300,000

The following items were found during hydrographic survey operations:

No.	Feature	Depth (m)	Latitude (N)	Longitude (W)	Time, Date, Year	Investigate
1	Rk	8.5	54° 56' 25.57"	159° 22' 33.92"	22:21:53, July 15, 2009	Yes
2	Rk	9.8	54° 56' 16.29"	159° 24' 32.40"	22:14:19, July 15, 2009	Yes
3	Rk Awash	0.4	54° 53' 11.55"	159° 21' 08.76"	18:13:45, June 23, 2009	No
4	Rk	1.1	54° 50' 33.11"	159° 19' 40.78"	04:41:31, July 16, 2009	Yes
5	Rk	1.9	54° 57' 18.05"	159° 22' 25.32"	21:44:21, July 25, 2009	No

COMMENTS: Final verified tides have been applied from the Sand Point tide gauge (9459450). The shoals were found using LIDAR. DTON items 1 through 4 were submitted during data collection from the field. DTON item 5 was submitted upon the completion of product compilation from the Biloxi MS office.

Questions concerning this report should be directed to the Survey Manager, Mr. Scott Ramsay, in the Fugro LADS Inc. office in Biloxi MS. at (228) 594 6800.

DTONS Submitted to MCD

I.1.2 Danger to Navigation Report (Submitted during field operations)

Danger to Navigation Report for Lidar Survey H12103

Registry Number: H12103
State: Alaska
Locality: Vicinity of Shumagin Islands
Sub-locality: West of Simeonof Island
Project Number: OPR-P183-KRL-09
Survey Dates: June 13, 2009 - August 11,2009

Charts Affected

Number	Edition	Date	Scale (RNC)	RNC Correction(s)*
16540	12th	01/01/2005	1:300,000 (16540_1)	USCG LNM: 02/24/2009 (07/21/2009) NGA NTM: 01/21/2006 (08/01/2009)
16013	30th	07/01/2006	1:969,761 (16013_1)	[L]NTM: ?
16011	37th	11/01/2007	1:1,023,188 (16011_1)	[L]NTM: ?
16006	35th	04/01/2008	1:1,534,076 (16006_1)	[L]NTM: ?
500	8th	06/01/2003	1:3,500,000 (500_1)	[L]NTM: ?
530	32nd	06/01/2007	1:4,860,700 (530_1)	[L]NTM: ?
50	6th	06/01/2003	1:10,000,000 (50_1)	[L]NTM: ?

* Correction(s) - *source: last correction applied (last correction reviewed--"cleared date")*

Features

No.	Feature Type	Survey Depth	Survey Latitude	Survey Longitude
1.1	Shoal	8.50 m	54° 56' 25.6" N	159° 22' 33.9" W
1.2	Shoal	9.80 m	54° 56' 16.3" N	159° 24' 32.4" W
1.3	Rock	0.40 m	54° 53' 11.6" N	159° 21' 08.8" W
1.4	Rock	1.10 m	54° 50' 33.1" N	159° 19' 40.8" W

Generated by Pydro v9.6 (r2698) on Wed Aug 26 20:44:32 2009 [UTC]

1 - Danger To Navigation

1.1) GP No. - 1 from H12103_Pydro.xls

DANGER TO NAVIGATION

Survey Summary

Survey Position:	54° 56' 25.6" N, 159° 22' 33.9" W
Least Depth:	8.50 m (= 27.89 ft = 4.648 fm = 4 fm 3.89 ft)
TPU (±1.96σ):	**THU (TPEh)** [None] ; **TVU (TPEv)** [None]
Timestamp:	2009-196.22:21:53.000 (07/15/2009)
GP Dataset:	H12103_Pydro.xls
GP No.:	1
Charts Affected:	16540_1, 16011_1, 16006_1, 500_1, 530_1, 50_1

Remarks:

This sounding was found during Lidar hydrographic survey operation by Fugro LADS Inc. Depth was reduced to Mean Lower Low Water using preliminary tides from the King Cove tide gauge (9459881). Least depth determination by field investigation is recommended for this feature. The S-57 attribute QUASOU is set to '3' for doubtful sounding.

Hydrographer Recommendations

Chart as surveyed.

Cartographically-Rounded Depth (Affected Charts):

4 ½fm (16540_1, 16011_1, 16006_1, 530_1)

8.5m (500_1, 50_1)

S-57 Data

Geo object 1:	Sounding (SOUNDG)
Attributes:	QUASOU - 3:doubtful sounding
	SORDAT - 20090811
	SORIND - US,US,nsurf,H12103
	TECSOU - 7:found by laser
	VERDAT - 12:Mean lower low water

1.2) GP No. - 2 from H12103_Pydro.xls

DANGER TO NAVIGATION

Survey Summary

Survey Position:	54° 56' 16.3" N, 159° 24' 32.4" W
Least Depth:	9.80 m (= 32.15 ft = 5.359 fm = 5 fm 2.15 ft)
TPU (±1.96σ):	**THU (TPEh)** [None] ; **TVU (TPEv)** [None]
Timestamp:	2009-196.22:14:19.000 (07/15/2009)
GP Dataset:	H12103_Pydro.xls
GP No.:	2
Charts Affected:	16540_1, 16011_1, 16006_1, 500_1, 530_1, 50_1

Remarks:

This sounding was found during Lidar hydrographic survey operation by Fugro LADS Inc. Depth was reduced to Mean Lower Low Water using preliminary tides from the King Cove tide gauge (9459881). Least depth determination by field investigation is recommended for this feature. The S-57 attribute QUASOU is set to '3' for doubtful sounding.

Hydrographer Recommendations

Chart as surveyed.

Cartographically-Rounded Depth (Affected Charts):

5 ¼fm (16540_1, 16011_1, 16006_1, 530_1)

9.8m (500_1, 50_1)

S-57 Data

Geo object 1:	Sounding (SOUNDG)
Attributes:	QUASOU - 3:doubtful sounding
	SORDAT - 20090811
	SORIND - US,US,nsurf,H12103
	TECSOU - 7:found by laser
	VERDAT - 12:Mean lower low water

1.3) GP No. - 3 from H12103_Pydro.xls

DANGER TO NAVIGATION

Survey Summary

Survey Position:	54° 53' 11.6" N, 159° 21' 08.8" W
Least Depth:	0.40 m (= 1.31 ft = 0.219 fm = 0 fm 1.31 ft)
TPU (±1.96σ):	**THU (TPEh)** [None] ; **TVU (TPEv)** [None]
Timestamp:	2009-174.18:13:45.000 (06/23/2009)
GP Dataset:	H12103_Pydro.xls
GP No.:	3
Charts Affected:	16540_1, 16011_1, 16006_1, 500_1, 530_1, 50_1

Remarks:

This feature was found during Lidar hydrographic survey operation by Fugro LADS Inc. Depth was reduced to Mean Lower Low Water using preliminary tides from the King Cove tide gauge (9459881).

Hydrographer Recommendations

Chart as surveyed.

Cartographically-Rounded Depth (Affected Charts):

0 ¼fm (16540_1, 16011_1, 16006_1, 530_1)

.4m (500_1, 50_1)

S-57 Data

Geo object 1:	Underwater rock / awash rock (UWTROC)
Attributes:	SORDAT - 20090811
	SORIND - US,US,nsurf,H12103
	TECSOU - 7:found by laser
	VALSOU - 0.4 m
	VERDAT - 12:Mean lower low water
	WATLEV - 5:awash

1.4) GP No. - 4 from H12103_Pydro.xls

DANGER TO NAVIGATION

Survey Summary

Survey Position:	54° 50' 33.1" N, 159° 19' 40.8" W
Least Depth:	1.10 m (= 3.61 ft = 0.601 fm = 0 fm 3.61 ft)
TPU (±1.96σ):	**THU (TPEh)** [None] ; **TVU (TPEv)** [None]
Timestamp:	2009-197.04:41:31.000 (07/16/2009)
GP Dataset:	H12103_Pydro.xls
GP No.:	4
Charts Affected:	16540_1, 16013_1, 16011_1, 16006_1, 500_1, 530_1, 50_1

Remarks:

is feature was found during Lidar hydrographic survey operation by Fugro LADS Inc. Depth was reduced to Mean Lower Low Water using preliminary tides from the King Cove tide gauge (9459881). Least depth determination by field investigation is recommended for this feature. The S-57 attribute QUASOU is set to '3' for doubtful sounding.

Hydrographer Recommendations

Chart as surveyed.

Cartographically-Rounded Depth (Affected Charts):

0 ½fm (16540_1, 16013_1, 16011_1, 16006_1, 530_1)

1.1m (500_1, 50_1)

S-57 Data

Geo object 1:	Underwater rock / awash rock (UWTROC)
Attributes:	QUASOU - 3:doubtful sounding
	SORDAT - 20090811
	SORIND - US,US,nsurf,H12104
	TECSOU - 7:found by laser
	VALSOU - 1.1 m
	VERDAT - 12:Mean lower low water
	WATLEV - 3:always under water/submerged

DTONS Submitted to MCD

I.1.3 Danger to Navigation Report (Submitted following field operations)

Dton Report for Lidary Survey H12103

Registry Number: H12103
State: Alaska
Locality: Shumagin Bank
Sub-locality: West of Simeonof Island
Project Number: OPR-P183-KRL-09
Survey Dates: 6/12/2009 - 8/11/2009

Charts Affected

Number	Edition	Date	Scale (RNC)	RNC Correction(s)*
16540	12th	01/01/2005	1:300,000 (16540_1)	USCG LNM: 02/24/2009 (12/08/2009) CHS NTM: None (09/25/2009) NGA NTM: 01/21/2006 (12/19/2009)
16011	37th	11/01/2007	1:1,023,188 (16011_1)	[L]NTM: ?
16006	35th	04/01/2008	1:1,534,076 (16006_1)	[L]NTM: ?
500	8th	06/01/2003	1:3,500,000 (500_1)	[L]NTM: ?
530	32nd	06/01/2007	1:4,860,700 (530_1)	[L]NTM: ?
50	6th	06/01/2003	1:10,000,000 (50_1)	[L]NTM: ?

* Correction(s) - *source: last correction applied (last correction reviewed--"cleared date")*

Features

Feature Type	Survey Depth	Survey Latitude	Survey Longitude
Rock	1.90 m	54° 57' 18.1" N	159° 22' 25.3" W

Generated by Pydro v9.10 (r2735) on Wed Jan 20 20:00:30 2010 [UTC]

1 - Danger To Navigation

1.1) GP No. - 5 from H12103_Dton_Pydro.xls

DANGER TO NAVIGATION

Survey Summary

Survey Position:	54° 57' 18.1" N, 159° 22' 25.3" W
Least Depth:	1.90 m (= 6.23 ft = 1.039 fm = 1 fm 0.23 ft)
TPU (±1.96σ):	**THU (TPEh)** [None] ; **TVU (TPEv)** [None]
Timestamp:	2009-206.21:44:21.000 (07/25/2009)
GP Dataset:	H12103_Dton_Pydro.xls
GP No.:	5
Charts Affected:	16540_1, 16011_1, 16006_1, 500_1, 530_1, 50_1

Remarks:

This feature was found during Lidar hydrographic survey operation. Depth was reduced to Mean Lower Low Water using verified tides from Sand Point tide gauge (9459450).

Feature Correlation

Address	Feature	Range	Azimuth	Status
H12103_Dton_Pydro.xls	5	0.00	000.0	Primary

Hydrographer Recommendations

Chart as surveyed.

Cartographically-Rounded Depth (Affected Charts):

1fm (16540_1, 16011_1, 16006_1, 530_1)

1.9m (500_1, 50_1)

S-57 Data

Geo object 1:	Underwater rock / awash rock (UWTROC)
Attributes:	SORDAT - 20090811
	SORIND - US,US,nsurf,H12103
	TECSOU - 7:found by laser
	VALSOU - 1.9 m

VERDAT - 12:Mean lower low water

WATLEV - 3:always under water/submerged

APPROVAL PAGE

H12473

Data meet or exceed current specifications as certified by the OCS survey acceptance review process. Descriptive Report and survey data except where noted are adequate to supersede prior surveys and nautical charts in the common area.

The following products will be sent to NGDC for archive

- H12473_DR.pdf
- Collection of depth varied resolution BAGS
- Processed survey data and records
- H12473_GeoImage.pdf

The survey evaluation and verification has been conducted according current OCS Specifications.

Digitally signed by HOLMBERG.PETER.SCOTT.1365886101
DN: c=US, o=U.S. Government, ou=DoD, ou=PKI, ou=OTHER, cn=HOLMBERG.PETER.SCOTT.1365886101
Date: 2014.07.11 13:10:46 -07'00'

Approved:_____

Peter Holmberg
Cartographic Team Lead, Pacific Hydrographic Branch

The survey has been approved for dissemination and usage of updating NOAA's suite of nautical charts.

Benjamin K. Evans
2014.07.11 13:44:28 -07'00'

Approved:_____

LCDR Benjamin K. Evans, NOAA
Chief, Pacific Hydrographic Branch