H12743

NOAA Form 76-35A

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

DESCRIPTIVE REPORT

Type of Survey:	Navigable Area
Registry Number:	H12743

LOCALITY

State:	Alaska
General Locality:	West of Prince of Wales Island
Sub-locality:	San Adrian Island to Diver Point

2015

CHIEF OF PARTY
CDR David J Zezula, NOAA

LIBRARY & ARCHIVES

Date:

NOAA FORM 77-28 (11-72)	U.S. DEPARTMENT OF COMMERCE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION	REGISTRY NUMBER:
HYDROGRAPHIC TITLE SHEET		**H12743**

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:	**Alaska**
General Locality:	**West of Prince of Wales Island**
Sub-Locality:	**San Adrian Island to Diver Point**
Scale:	**1: 20,000**
Dates of Survey:	**09/24/2015 to 11/08/2015**
Instructions Dated:	**03/02/2015**
Project Number:	**OPR-O190-FA-15**
Field Unit:	**NOAA Ship *Rainier***
Chief of Party:	**CDR David J Zezula, NOAA**
Soundings by:	**Multibeam Echo Sounder**
Imagery by:	**Multibeam Echo Sounder Backscatter**
Verification by:	**Pacific Hydrographic Branch**
Soundings Acquired in:	**meters at Mean Lower Low Water**
H-Cell Compilation Units:	***meters at Mean Lower Low Water***

Remarks:

The purpose of this survey is to provide contemporary surveys to update National Ocean Service (NOS) nautical charts. All separates are filed with the hydrographic data. Any revisions to the Descriptive Report (DR) generated during office processing are shown in bold red italic text. The processing branch maintains the DR as a field unit product, therefore, all information and recommendations within the body of the DR are considered preliminary unless otherwise noted. The final disposition of surveyed features is represented in the OCS nautical chart update products. All pertinent records for this survey, including the DR, are archived at the National Centers for Environmental Information (NCEI) and can be retrieved via http://www.ncei.noaa.gov/.

Table of Contents

List of Tables

List of Figures

Descriptive Report to Accompany Survey H12743

Project: OPR-O190-FA-15

Locality: West Prince of Wales

Sublocality: San Adrian Island to Diver Point

Scale: 1:20000

September 2015 - November 2015

NOAA Ship *Fairweather*

Chief of Party: CDR David J Zezula, NOAA

A. Area Surveyed

The survey area is located in West Prince of Wales, AK, within the sub-locality between San Adrian Island to Diver Point.

A.1 Survey Limits

Data were acquired within the following survey limits:

Northwest Limit	Southeast Limit
55° 19' 49.33" N 133° 18' 17.56" W	55° 12' 53" N 133° 13' 24.39" W

Table 1: Survey Limits

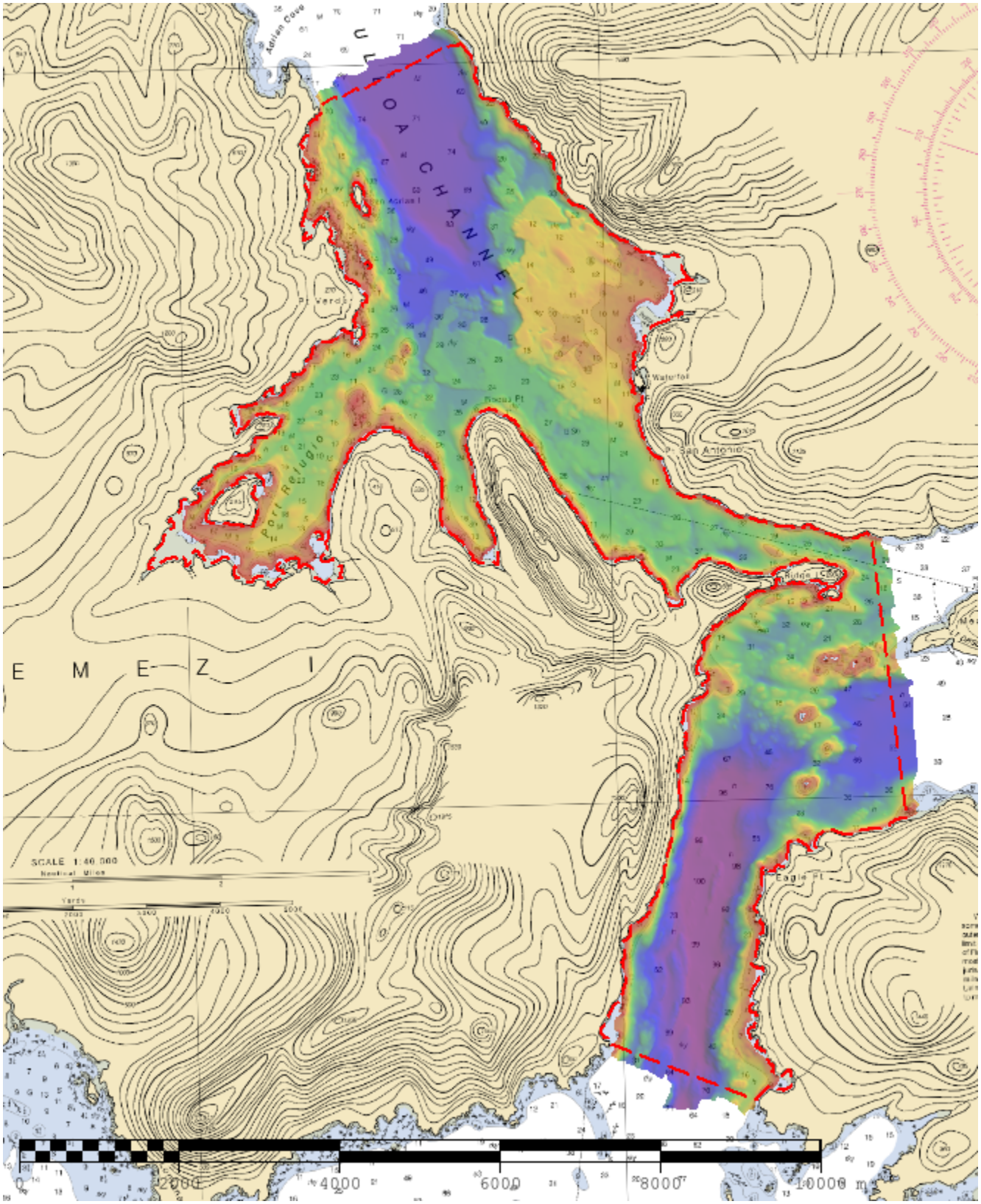


Figure 1: H12743 Survey Limits

Survey limits were acquired in accordance with the requirements in the Project Instructions and the 2014 Hydrographic Surveys Specifications and Deliverables (HSSD).

A.2 Survey Purpose

The purpose of this project is to provide contemporary surveys to update National Ocean Service (NOS) nautical charting products. This area is considered navigationally significant.

A.3 Survey Quality

The entire survey is adequate to supersede previous data.

Data acquired in H12743 meets multibeam echo sounder (MBES) coverage requirements for complete coverage, as required by the 2014 Hydrographic Surveys Specifications and Deliverables (HSSD). This includes NOAA allowable uncertainty (see Section B.2.2), density requirements (see Section B.2.9), and crosslines (see Section B.2.1).

A.4 Survey Coverage

The following table lists the coverage requirements for this survey as assigned in the project instructions:

Water Depth	Coverage Required
Inshore limit to 8 meters water depth	Either complete MBES coverage with backscatter, or set line spacing SBES/MBES (100m spacing in restricted areas and around rocky points, 200m along open coasts)
Greater than 8 meters water depth	Complete MBES with backscatter

The entirety of H12743 was completed with complete MBES coverage with backscatter meeting the requirements listed above and in the HSSD, see Figure 2 for the survey outline. Some areas were not surveyed to the 4 meter inshore limit of hydrography as required by the Project Instructions due to the risk of maneuvering the survey vessel in the proximity of rocky and steep shoreline or surface debris. See Figure 3.

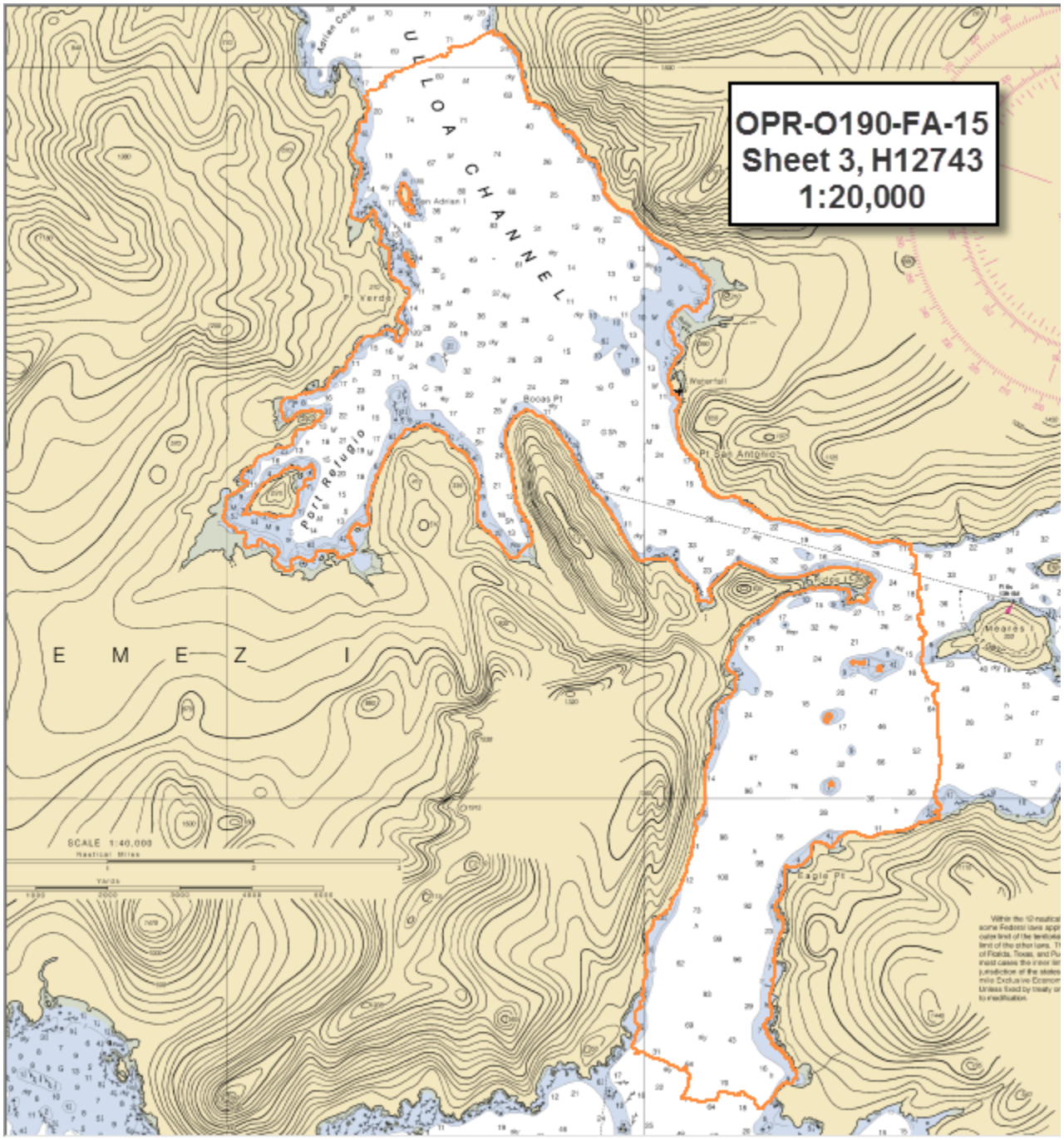


Figure 2: H12743 Survey Outline

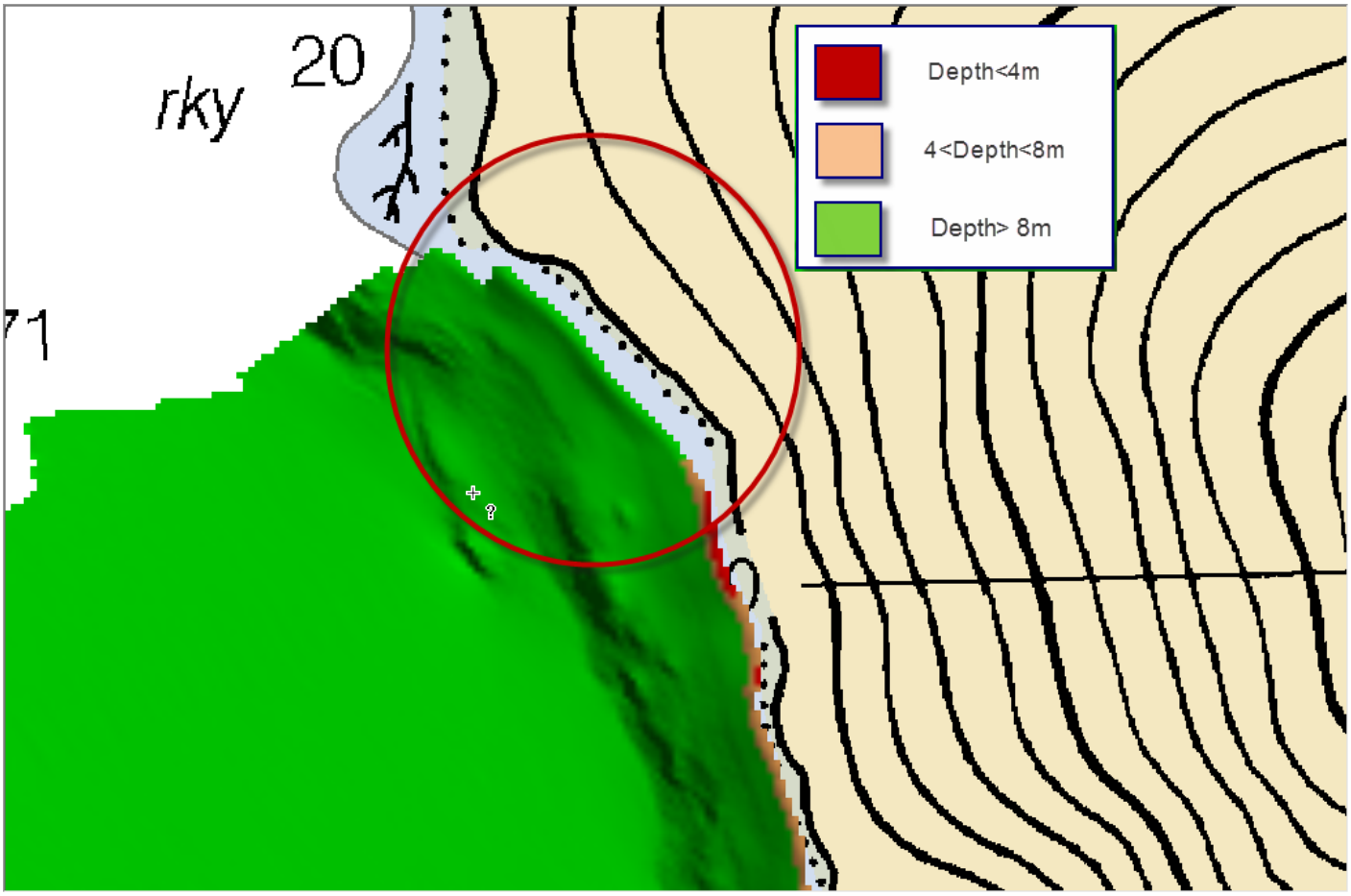


Figure 3: H12743 Example of an area not acquired to the 4m Depth Contour

A.5 Survey Statistics

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

	HULL ID	*FA 2805*	*FA 2806*	*FA 2807*	*FA 2808*	*S220*	*Total*
LNM	**SBES Mainscheme**	0	0	0	0	0	0
	MBES Mainscheme	131.01	18.66	48.85	80.49	8.49	287.5
	Lidar Mainscheme	0	0	0	0	0	0
	SSS Mainscheme	0	0	0	0	0	0
	SBES/SSS Mainscheme	0	0	0	0	0	0
	MBES/SSS Mainscheme	0	0	0	0	0	0
	SBES/MBES Crosslines	0	16.21	0	0	0	16.21
	Lidar Crosslines	0	0	0	0	0	0
Number of Bottom Samples							12
Number Maritime Boundary Points Investigated							0
Number of DPs							10
Number of Items Investigated by Dive Ops							0
Total SNM							10.57

Table 2: Hydrographic Survey Statistics

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

Survey Dates	Day of the Year
09/24/2015	267
09/26/2015	269

Survey Dates	Day of the Year
09/27/2015	270
09/28/2015	271
10/09/2015	282
10/11/2015	284
10/12/2015	285
10/13/2015	286
10/14/2015	287
10/20/2015	293
10/28/2015	301
11/04/2015	308
11/08/2015	312

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	*S220*	*2805*	*2806*	*2807*	*2808*
LOA	70.4 meters	8.64 meters	8.64 meters	8.64 meters	8.64 meters
Draft	4.7 meters	1.12 meters	1.12 meters	1.12 meters	1.12 meters

Table 4: Vessels Used

B.1.2 Equipment

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

Manufacturer	Model	Type
Kongsberg	EM710	MBES
RESON	7125	MBES
Applanix	POS/MV V4	Positioning and Attitude System
Rolls Royce	MVP 200	Conductivity, Temperature, and Depth Sensor
RESON	SVP70	Sound Speed System
RESON	SVP 71	Sound Speed System
SeaBird	SBE 19plus	Conductivity, Temperature, and Depth Sensor

Table 5: Major Systems Used

B.2 Quality Control

B.2.1 Crosslines

Crosslines acquired for this survey totaled 5.64% of mainscheme acquisition.

Crosslines were collected, processed and compared in accordance with section 5.2.4.3 of the HSSD. All crosslines were filtered 45 degrees from nadir on the port and starboard sides with the exception of 2015X_2691843 whose outer beams are accepted to augment coverage and prevent a holiday (see Figure 4).

To evaluate crosslines, an 8-meter CUBE surface using strictly mainscheme lines, and an 8-meter CUBE surface using strictly crosslines were created. From these two surfaces, a difference surface (mainscheme - crosslines = difference surface) was generated at an 8-meter resolution (Figure 5), and is submitted in the Separates II Digital Data folder. Statistics show the mean difference between the depths derived from mainscheme and crosslines was 0.12 meters (mainscheme being deeper/shoaler) with a 95% of nodes falling within 1.37 meters (Figure 6). For the respective depths, the difference surface was compared to the allowable NOAA accuracy standards (Figure 7). In total, 97% of the depth differences between H12743 mainscheme and crossline data are within allowable NOAA accuracies (Figure 8).

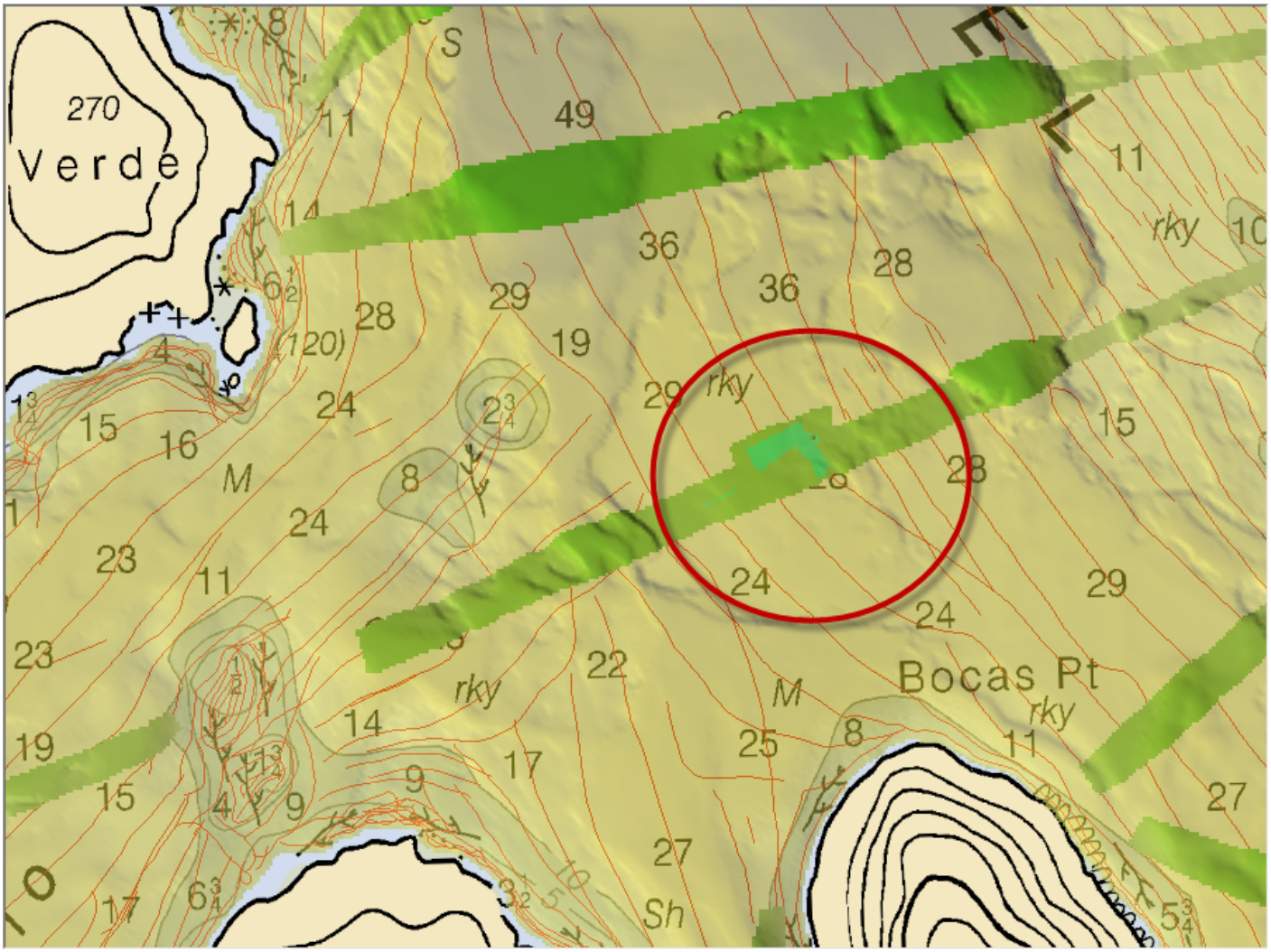


Figure 4: H12743 Holiday Covered Using Crossline Data

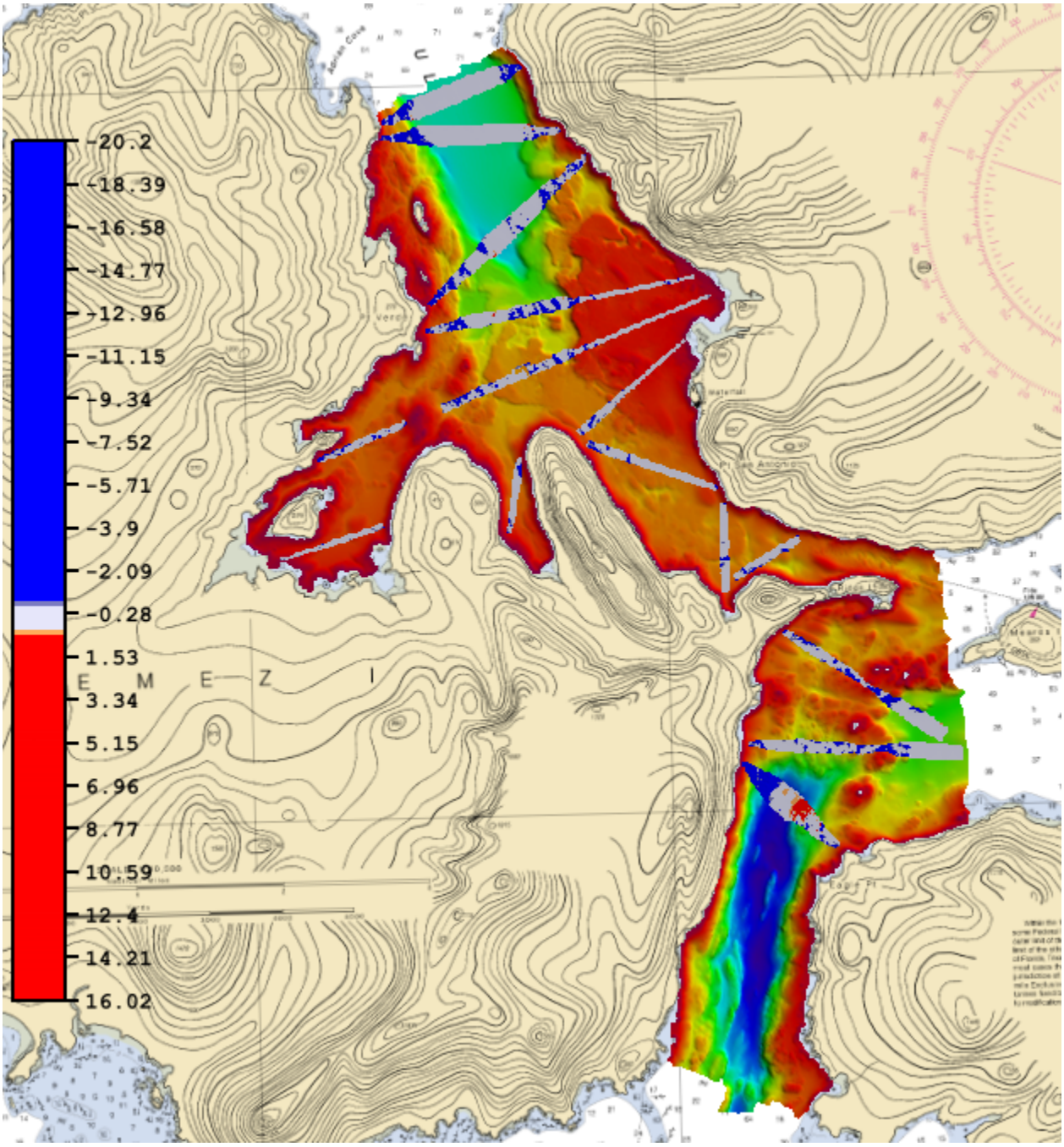
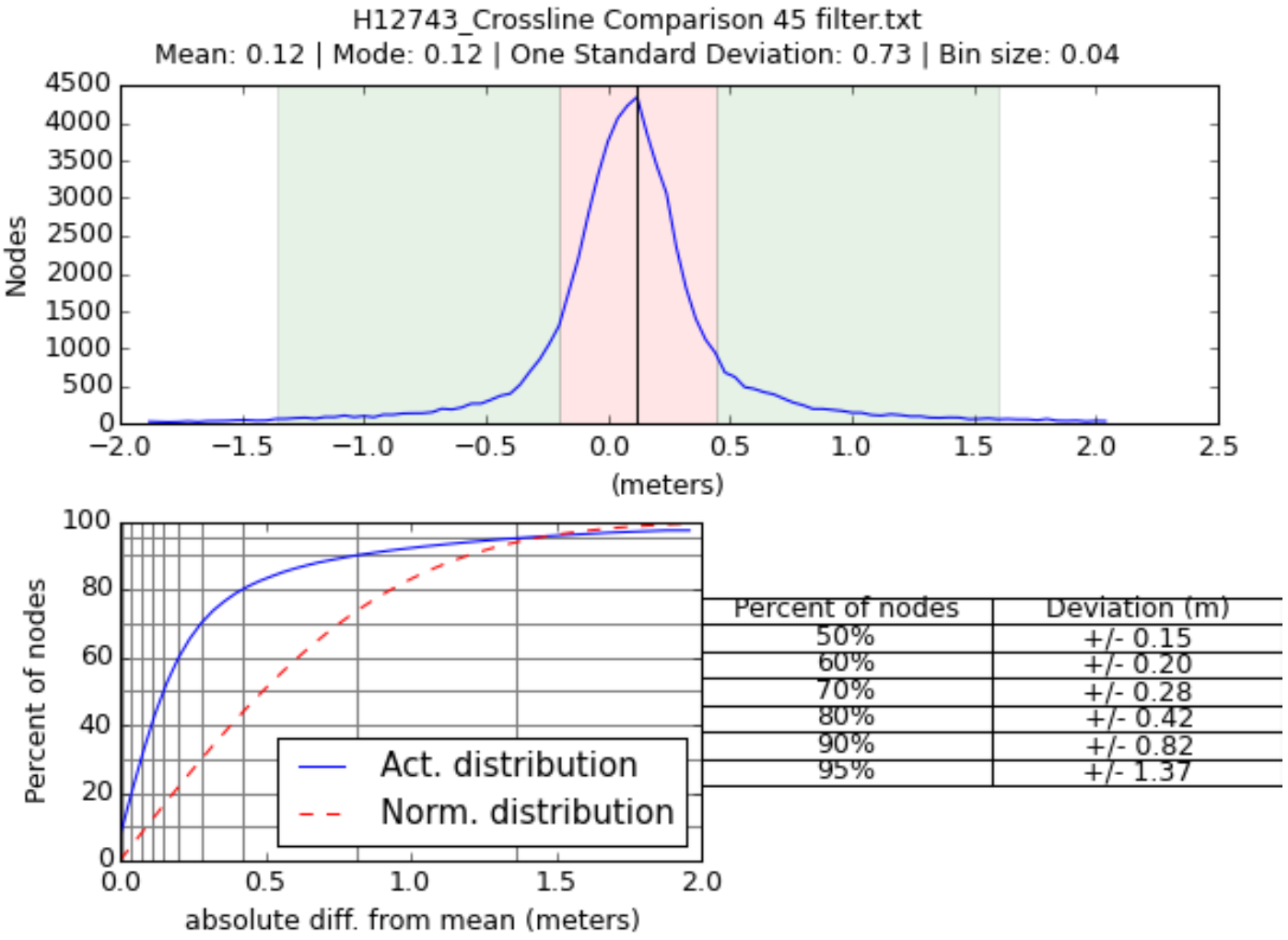


Figure 5: H12743 Mainscheme and Crossline Difference Surface



Percent of nodes	Deviation (m)
50%	+/- 0.15
60%	+/- 0.20
70%	+/- 0.28
80%	+/- 0.42
90%	+/- 0.82
95%	+/- 1.37

Figure 6: H12743 Mainscheme and Crossline Difference Statistics

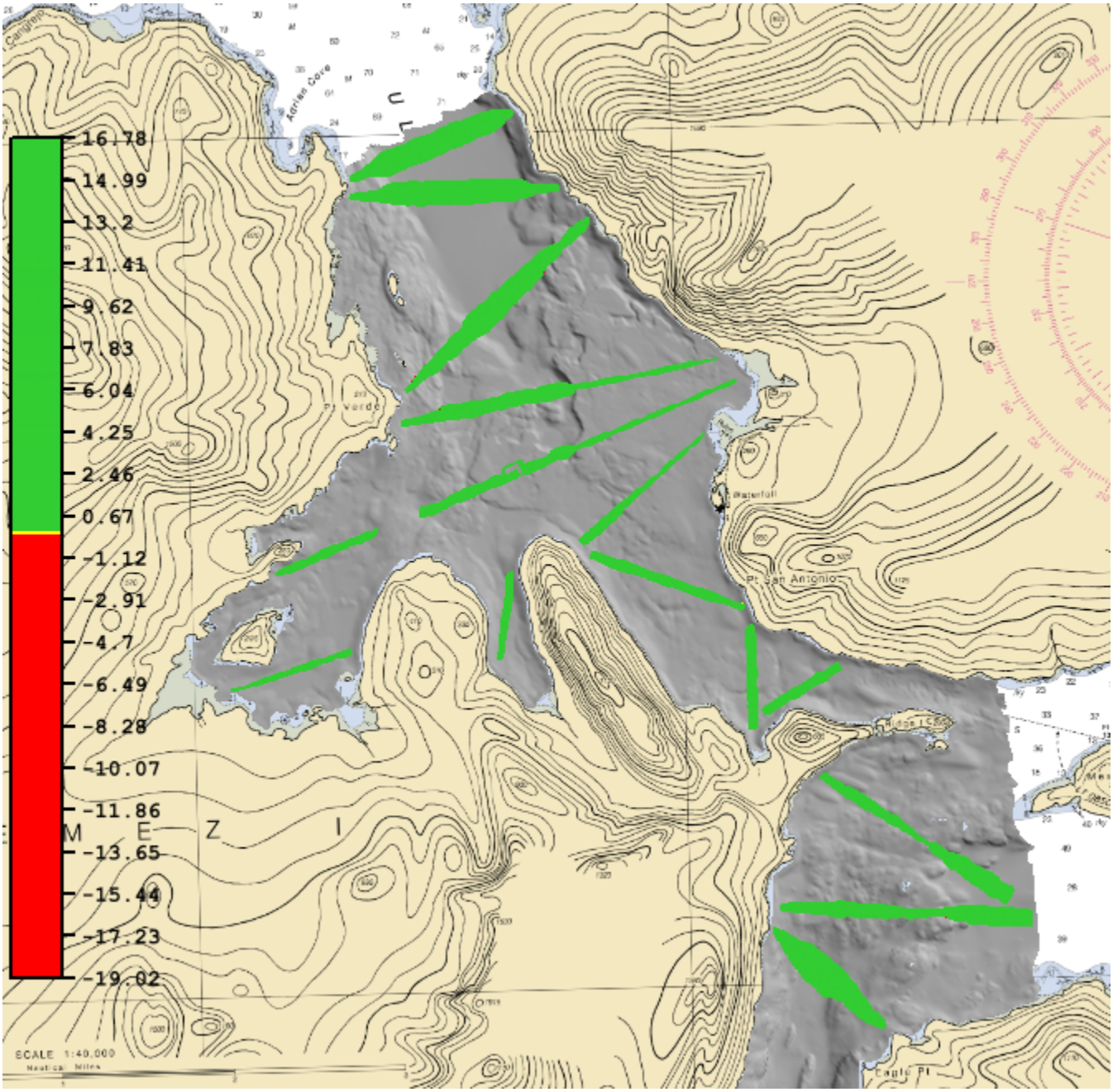


Figure 7: H12743 Crossline Difference VS. Allowable NOAA Uncertainty

Crossline NOAA Allowable Uncertainty		
Total Nodes	Passed Nodes	Failed Nodes
62141	60023	2118
	Percentage Failed	3%
	Percentage Passed	97%

Figure 8: H12743 Crossline Difference VS. Allowable NOAA Uncertainty Statistics

B.2.2 Uncertainty

The following survey specific parameters were used for this survey:

Measured	Zoning	Method
0 meters	0.25 meters	TCARI
0 meters	0 meters	TCARI

Table 6: Survey Specific Tide TPU Values

Hull ID	Measured - CTD	Measured - MVP	Surface
2805	2 meters/second		0.5 meters/second
2806	2 meters/second		0.5 meters/second
2807	2 meters/second		0.5 meters/second
2808	2 meters/second		0.5 meters/second
S220		1 meters/second	0.5 meters/second

Table 7: Survey Specific Sound Speed TPU Values

In addition to the usual a priori estimates of uncertainty, some real-time and post-processed uncertainty sources were also incorporated into the depth estimates of survey H12743. Real-time uncertainties from both the EM710 and Reson 7125 data were recorded and applied in post-processing. Tidal uncertainties are calculated by the TCARI grid and are applied during post-processing. Applanix TrueHeave files are recorded on all survey vessels, which includes an estimate of the heave uncertainty, and are applied during post-processing. Finally, the post-processed uncertainties associated with vessel roll, pitch, gyro and navigation are applied in CARIS HIPS and SIPS via an SBET RMS file generated in POSPac.

B.2.3 Junctions

The areas of overlap between surveys were reviewed with CARIS HIPS and SIPS by surface differencing the 8 meter combined surface for H12742, H12744 and 16 meter combined surfaces for surveys H12292 to assess surface agreement. The junction agreement is generally within the total allowable vertical uncertainty in their common areas and depths for all surfaces. Data overlap between all surveys was achieved. See Figure 9 for all areas of overlap.

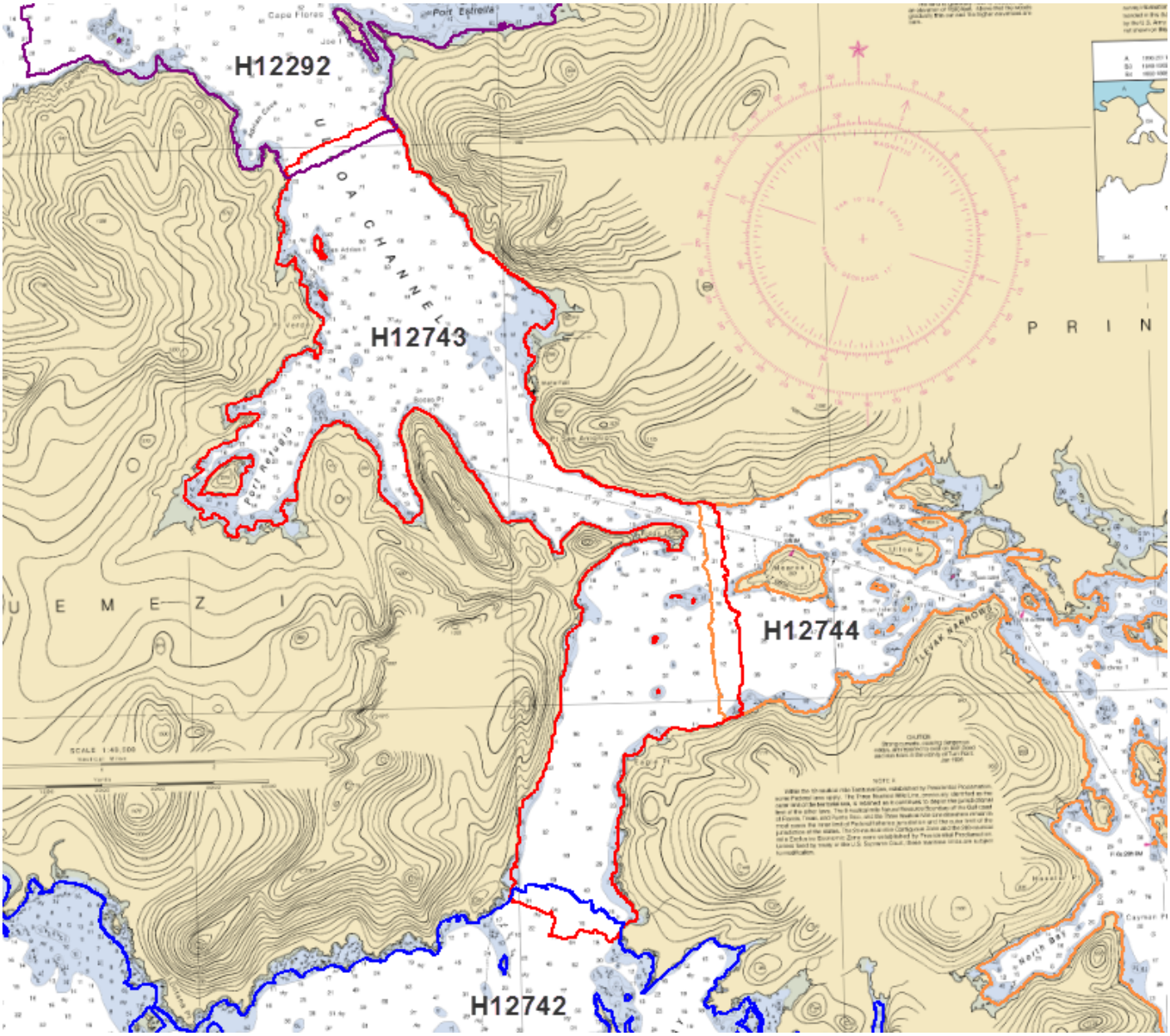


Figure 9: Junction between H12743 and H12742, H12744, and H12292

The following junctions were made with this survey:

Registry Number	Scale	Year	Field Unit	Relative Location
H12292	1:20000	2011	NOAA Ship RAINIER	N
H12742	1:20000	2015	NOAA Ship FAIRWEATHER	S
H12744	1:20000	2015	NOAA Ship FAIRWEATHER	E

Table 8: Junctioning Surveys

H12292

Surface differencing in CARIS HIPS and SIPS was used to assess junction agreement between the 8 meter combined surfaces from H12743 and the 16 meter combined surface from H12292. The statistical analysis of the difference surface shows a mean of -1.00 meters with 95% of all nodes having a maximum deviation of +/- 3.37 meters, as seen in Figure 11. A detailed graphical overview can be seen in Figure 10. In addition, a comparison surface was created between the difference surface and the allowable NOAA uncertainty (See Figures 12 and 13). It was found that 75% of nodes are within allowable NOAA uncertainty. The largest differences are located along steep inclines and rocky areas near shore and are most likely attributed to differences in tidal data and horizontal positioning.

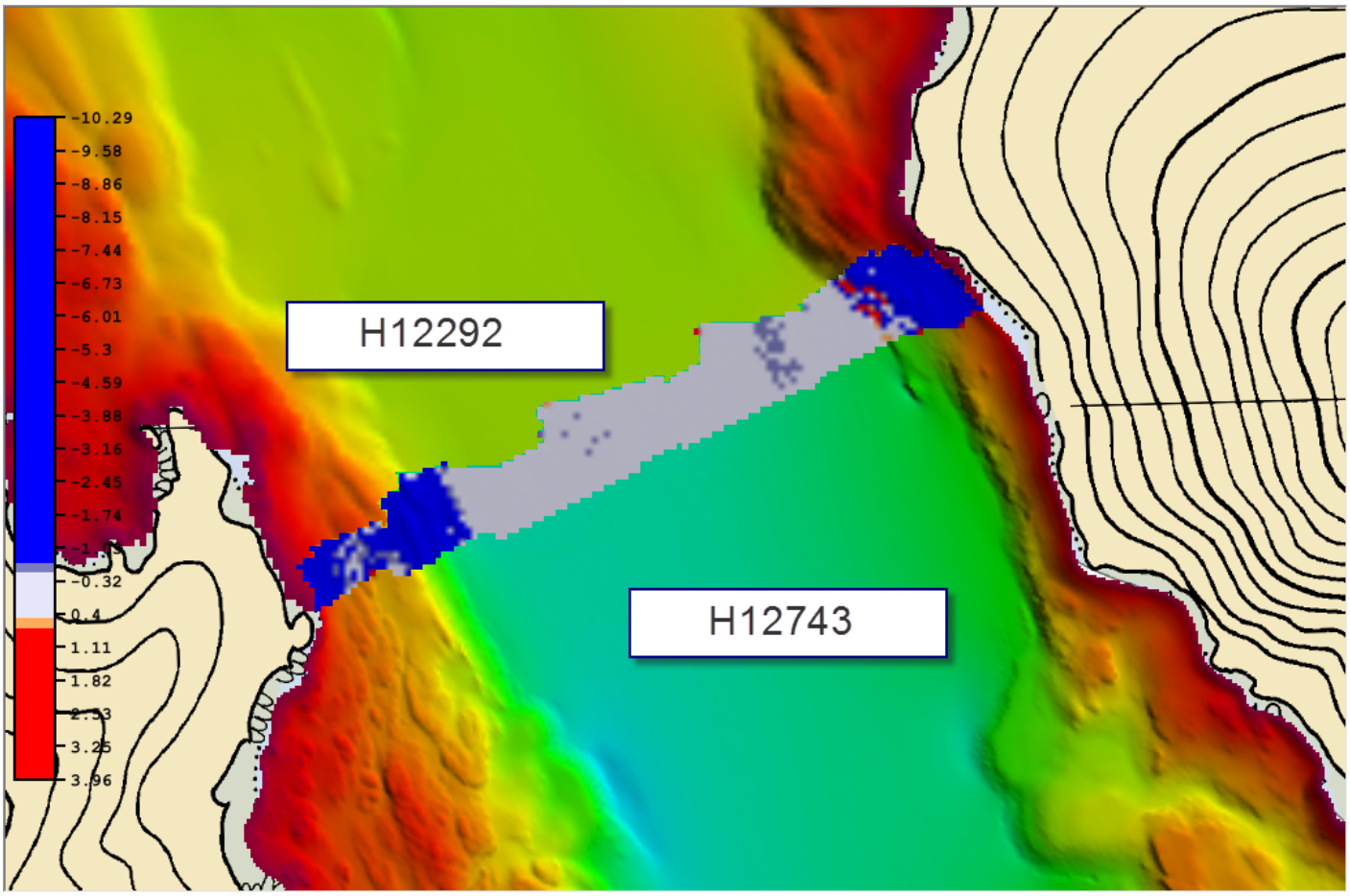
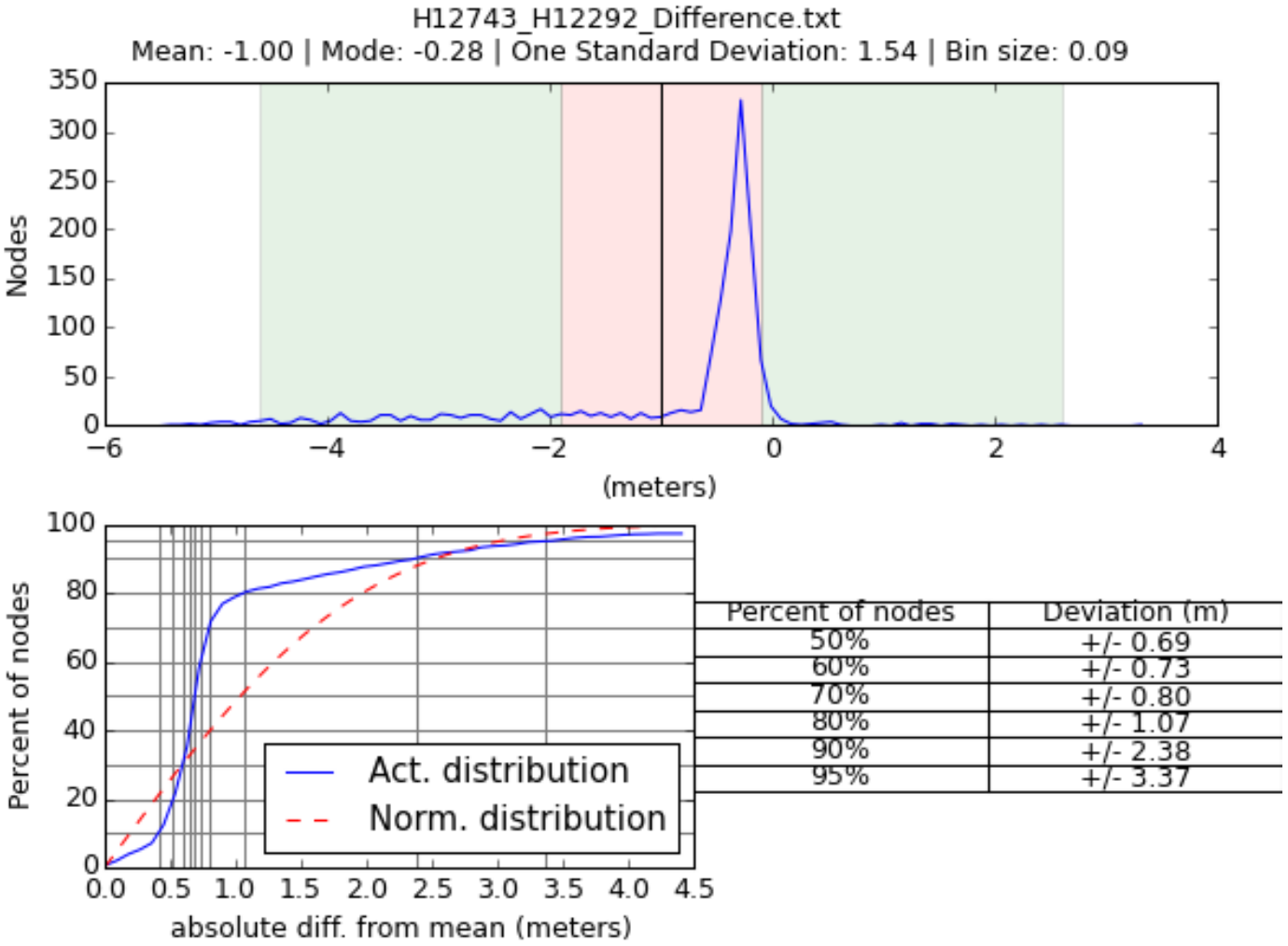


Figure 10: Junction Between H12743 and H12292



Percent of nodes	Deviation (m)
50%	+/- 0.69
60%	+/- 0.73
70%	+/- 0.80
80%	+/- 1.07
90%	+/- 2.38
95%	+/- 3.37

Figure 11: Difference Statistics Between H12743 and H12292

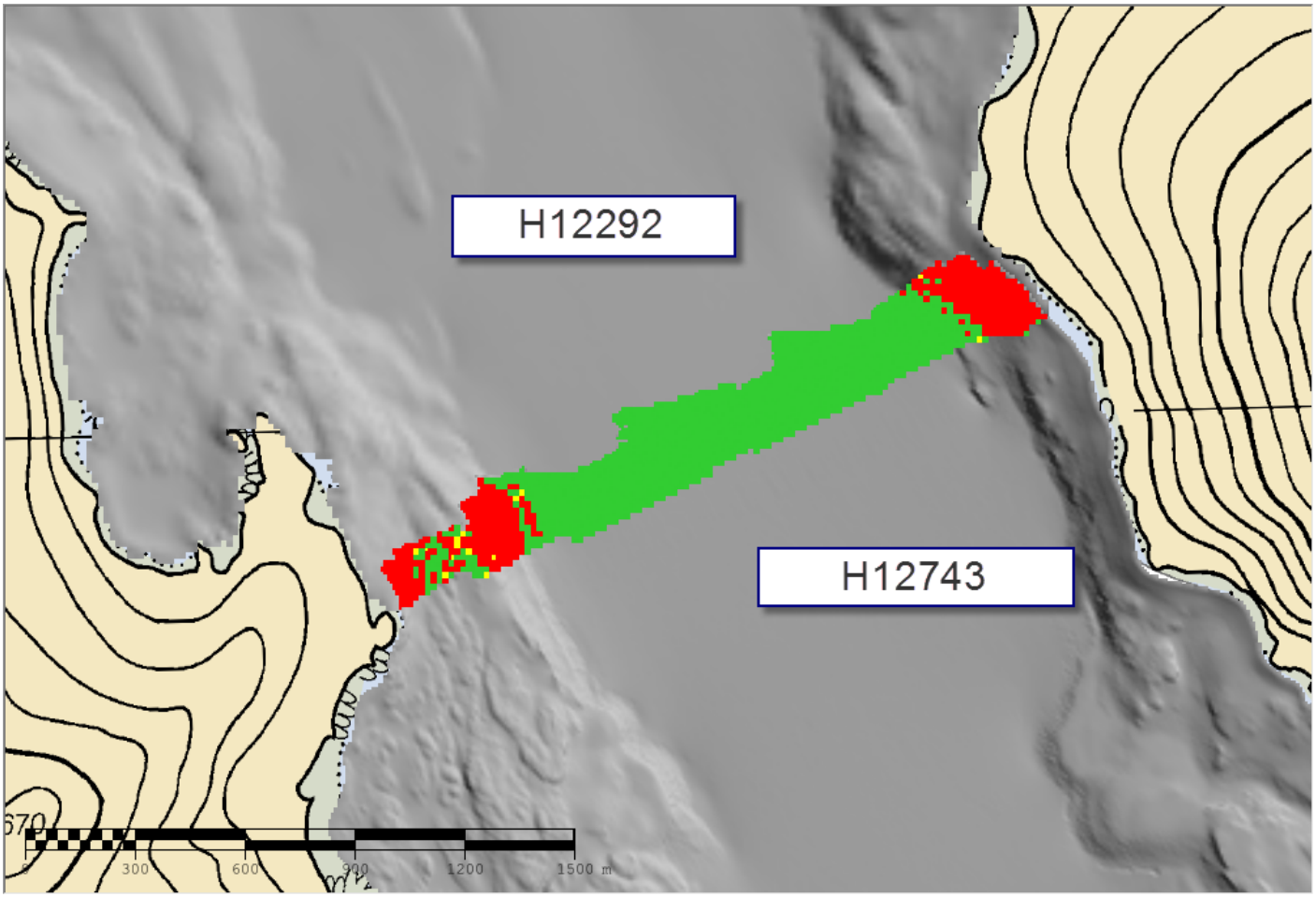


Figure 12: Junction H12743/ H12292 VS. Allowable NOAA Uncertainty Surface

Junction H12743/ 12292 NOAA Allowable Uncertainty			
Total Nodes	Passed Nodes	Failed Nodes	
6075	4504	1571	
	Percentage Failed	26%	
	Percentage Passed	74%	

Figure 13: Junction H12743/ H12292 VS. Allowable NOAA Uncertainty Statistics

H12742

Surface differencing in CARIS HIPS and SIPS was used to assess junction agreement between the 8 meter combined surfaces from H12743 and the 8 meter combined surface from H12742. The statistical analysis of the difference surface shows a mean of -0.08 meters with 95% of all nodes having a maximum deviation of +/- 2.48 meters, as seen in Figure 15. A detailed graphical overview can be seen in Figure 14. In addition, a comparison surface was created between the difference surface and the allowable NOAA uncertainty (See Figure 16). It was found that 92% of nodes are within allowable NOAA uncertainty. The largest differences are located along steep inclines.

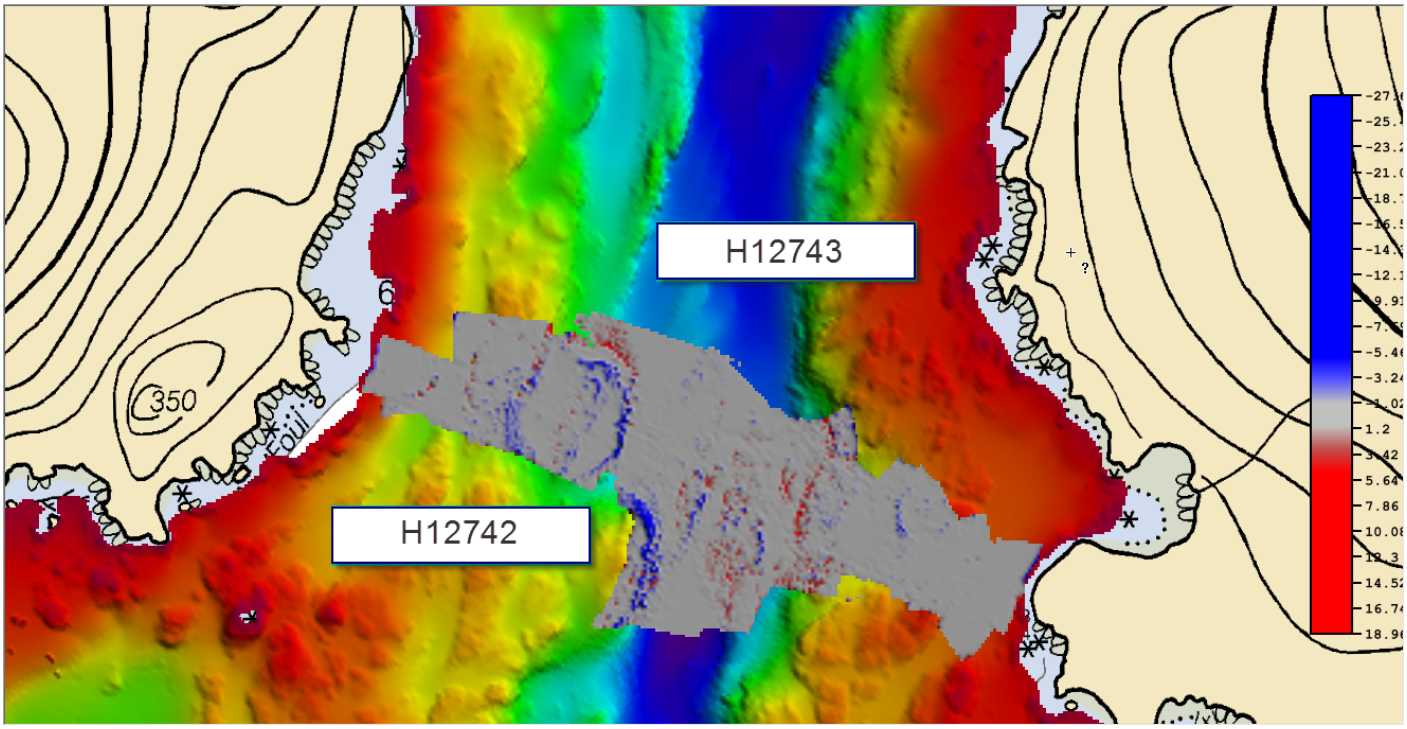
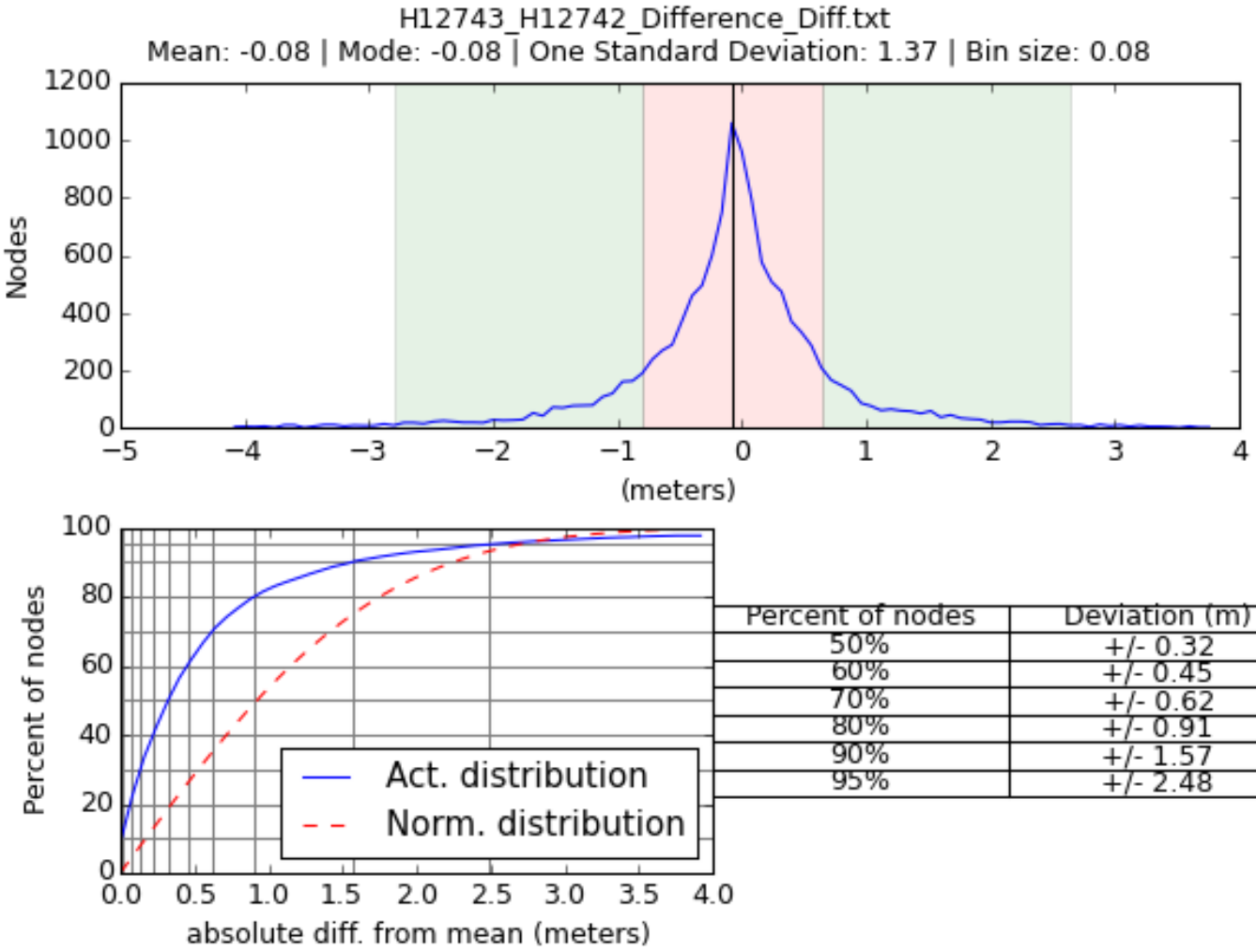


Figure 14: Junction H12743 and H12742



Percent of nodes	Deviation (m)
50%	+/- 0.32
60%	+/- 0.45
70%	+/- 0.62
80%	+/- 0.91
90%	+/- 1.57
95%	+/- 2.48

Figure 15: Difference Statistics Between H12743 and H12742

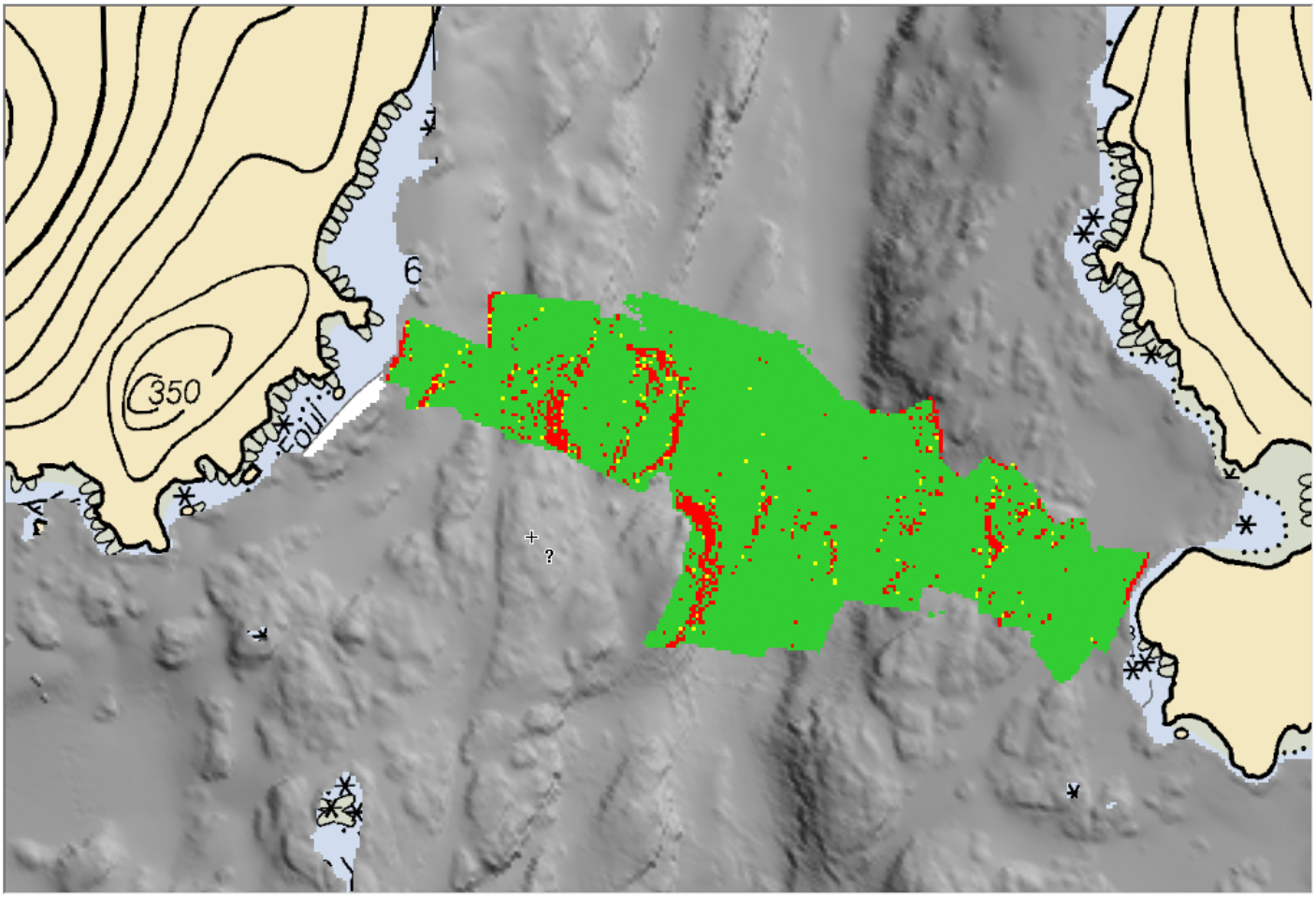


Figure 16: Junction H12743/ H12742 VS. Allowable NOAA Uncertainty Surface

H12744

Surface differencing in CARIS HIPS and SIPS was used to assess junction agreement between the 8 meter combined surfaces from H12743 and the 8 meter combined surface from H12744. The statistical analysis of the difference surface shows a mean of 0.04 meters with 95% of all nodes have a maximum deviation of +/- 0.84 meters, as seen in Figure 18. A detailed graphical overview can be seen in Figure 17. The largest differences are located along rocky areas near shore and to the west of Meares Island. Given these statistics, the junction analysis between H12743 and H12744 shows as strong correlation.

In addition, a comparison surface was created between the difference surface and the allowable NOAA uncertainty. It was found that 99% of nodes are within allowable NOAA uncertainty. The largest differences are located along steep inclines and rocky areas near shore and are most likely attributed to differences in tidal data and horizontal positioning.

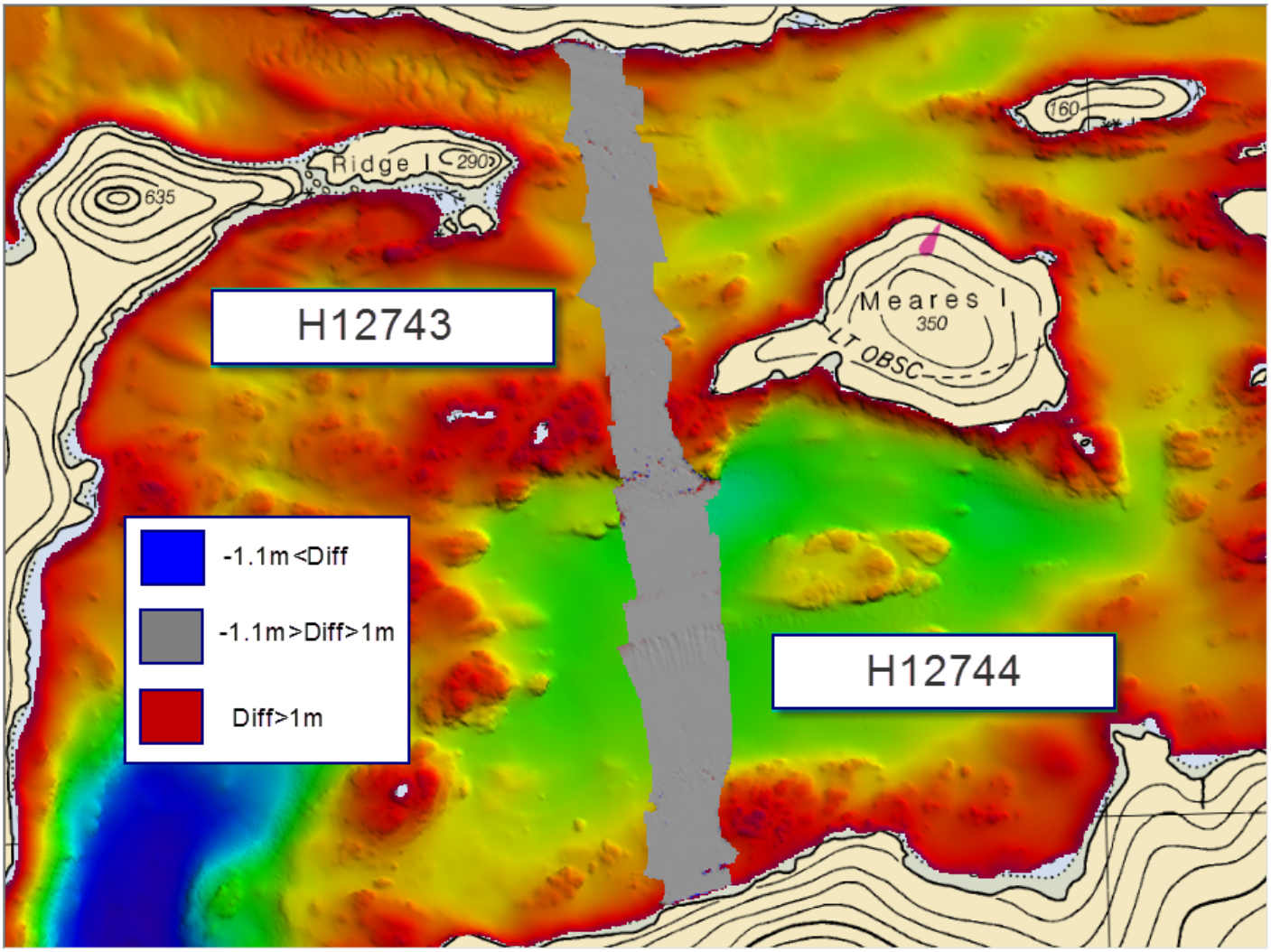
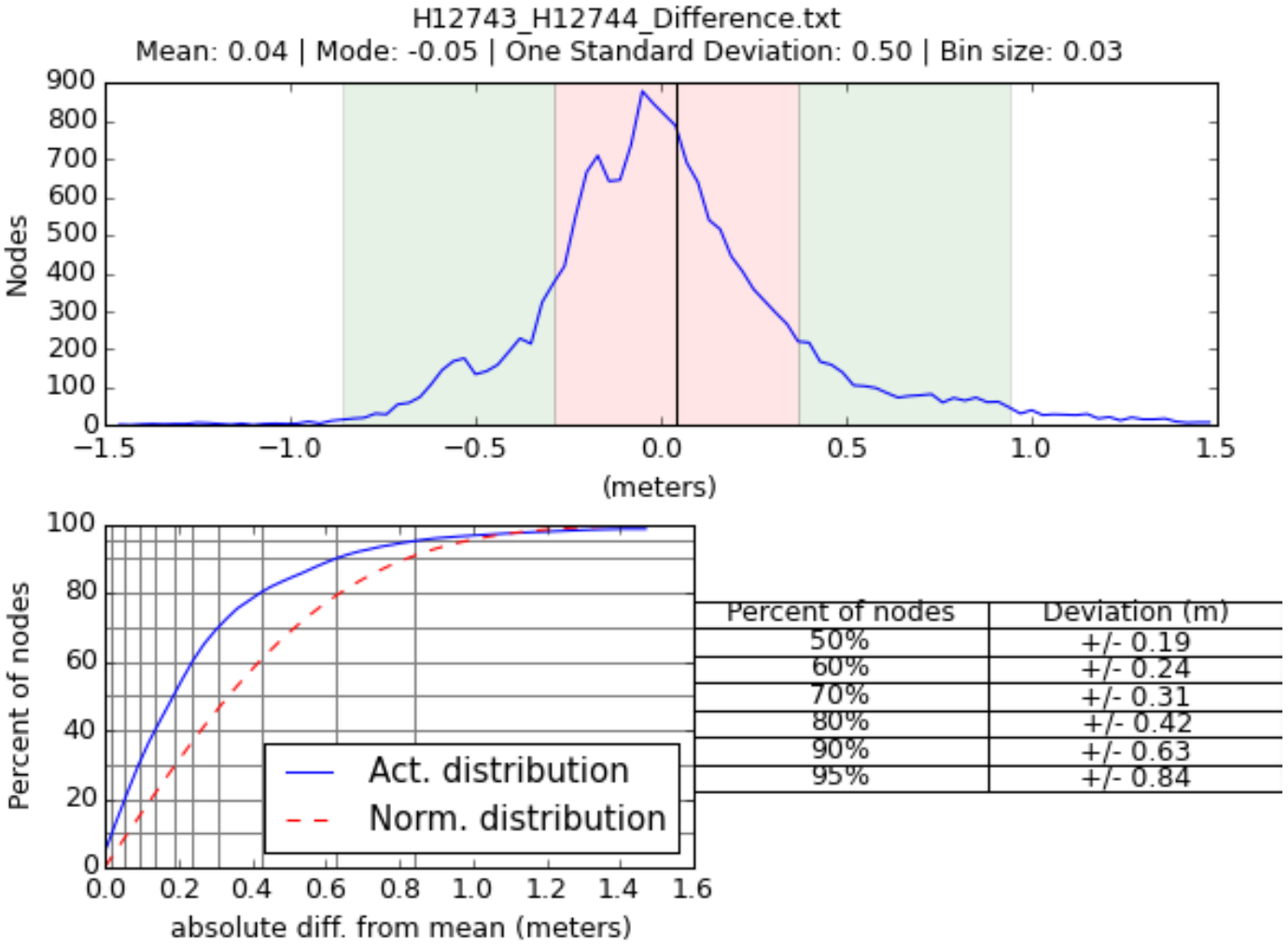


Figure 17: Junction Between H12743 and H12744



Percent of nodes	Deviation (m)
50%	+/- 0.19
60%	+/- 0.24
70%	+/- 0.31
80%	+/- 0.42
90%	+/- 0.63
95%	+/- 0.84

Figure 18: Difference Statistics Between H12743 and H12744

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

Operational Survey Depths Exceeded for RESON 7125

During survey acquisition on H12743, Launch 2805 ran north- south lines in the Ulloa Channel in the northern half of H12743. The depth in this area, reaching approximately 140 meters, would normally be acquired using the EM710 sonar on S220 but was not due to the confined space of this channel. These depths exceeded the capabilities of the RESON 7125 MBES aboard Launch 2805 while in the low frequency (200 kHz) mode. This caused excessive noise in the data, which resulted in the CUBE surface misrepresenting

the seafloor (Figure 19). Where the noise was present the hydrographer rejected these spurious soundings in order to accurately reflect the true seafloor. The resulting cleaned data is sufficient to supersede charted data.

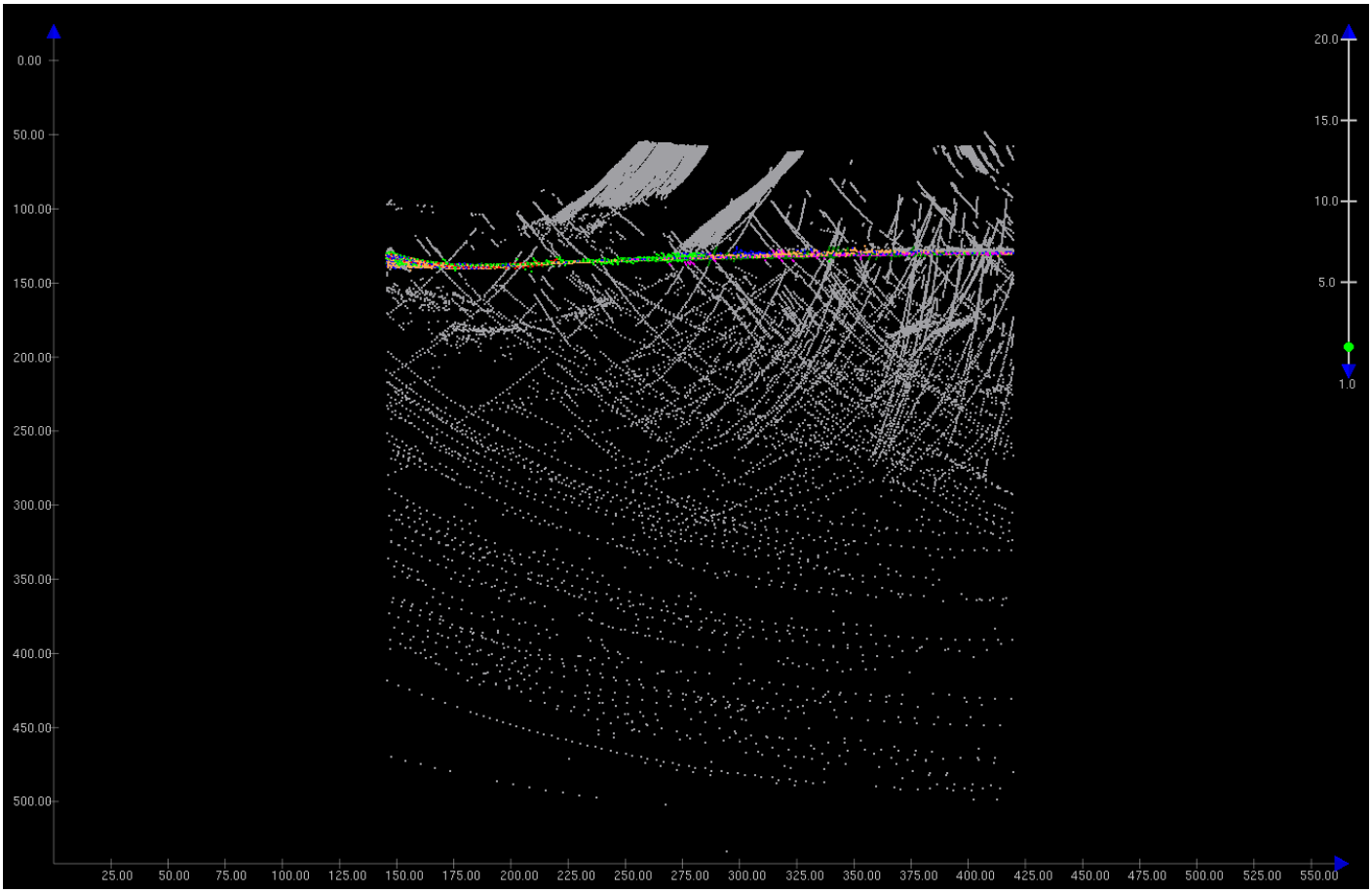


Figure 19: H1273 Noise Rejected in Area Exceeding RESON 7125 (200 kHz) Effectiveness

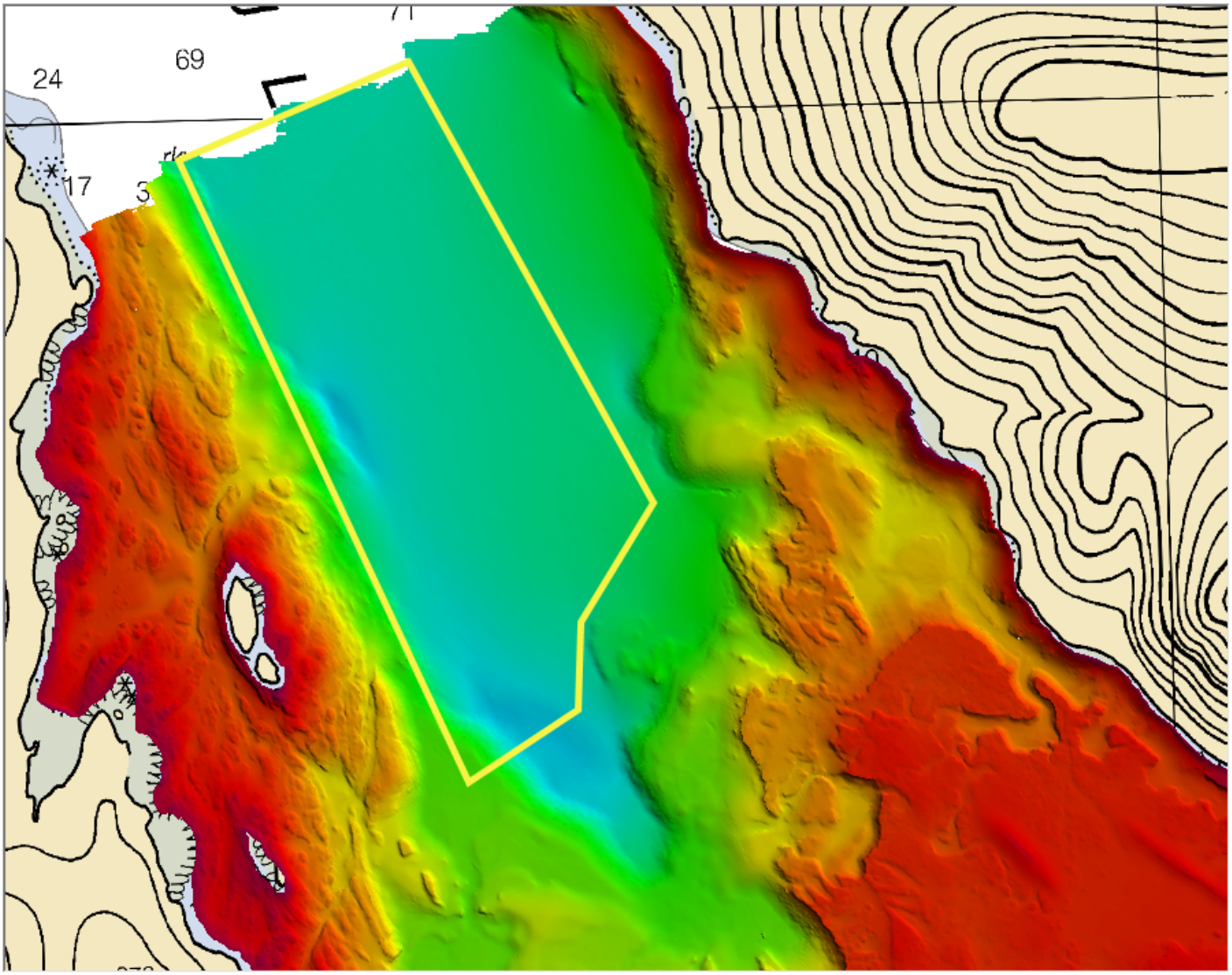


Figure 20: H12743 Area Exceeding RESON 7125 200khz Effectiveness

B.2.6 Factors Affecting Soundings

Sea Grass and Kelp

Kelp and sea grass were present throughout the survey area and at times, indistinguishable from the seafloor. In areas where they were distinguishable, the soundings on the vegetation were rejected to enable more accurate representation of the true seafloor. In some areas, dense kelp and debris created and unsafe situation which halted acquisition.

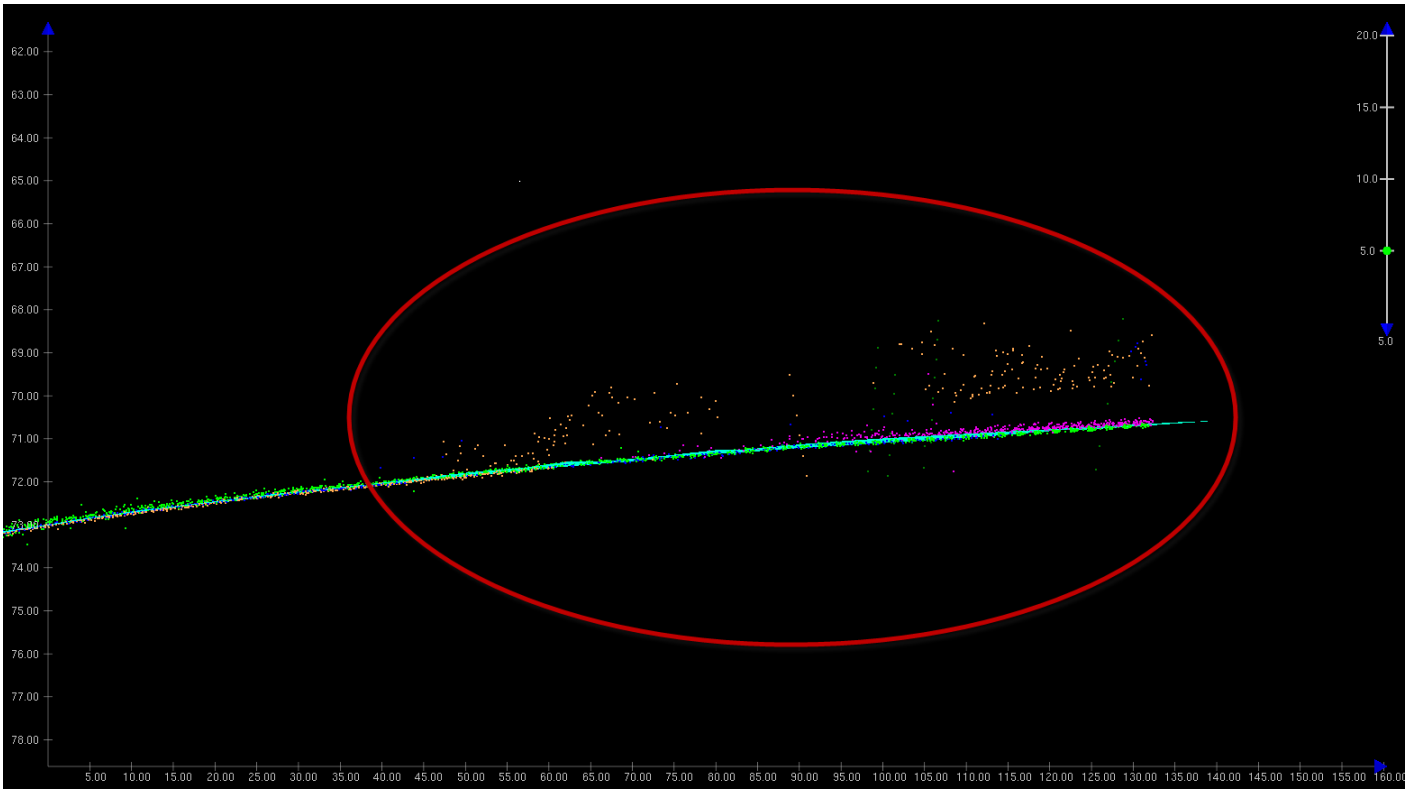


Figure 21: H12743 Example of Sea Grass in the Soundings. (5x vertical exaggeration)

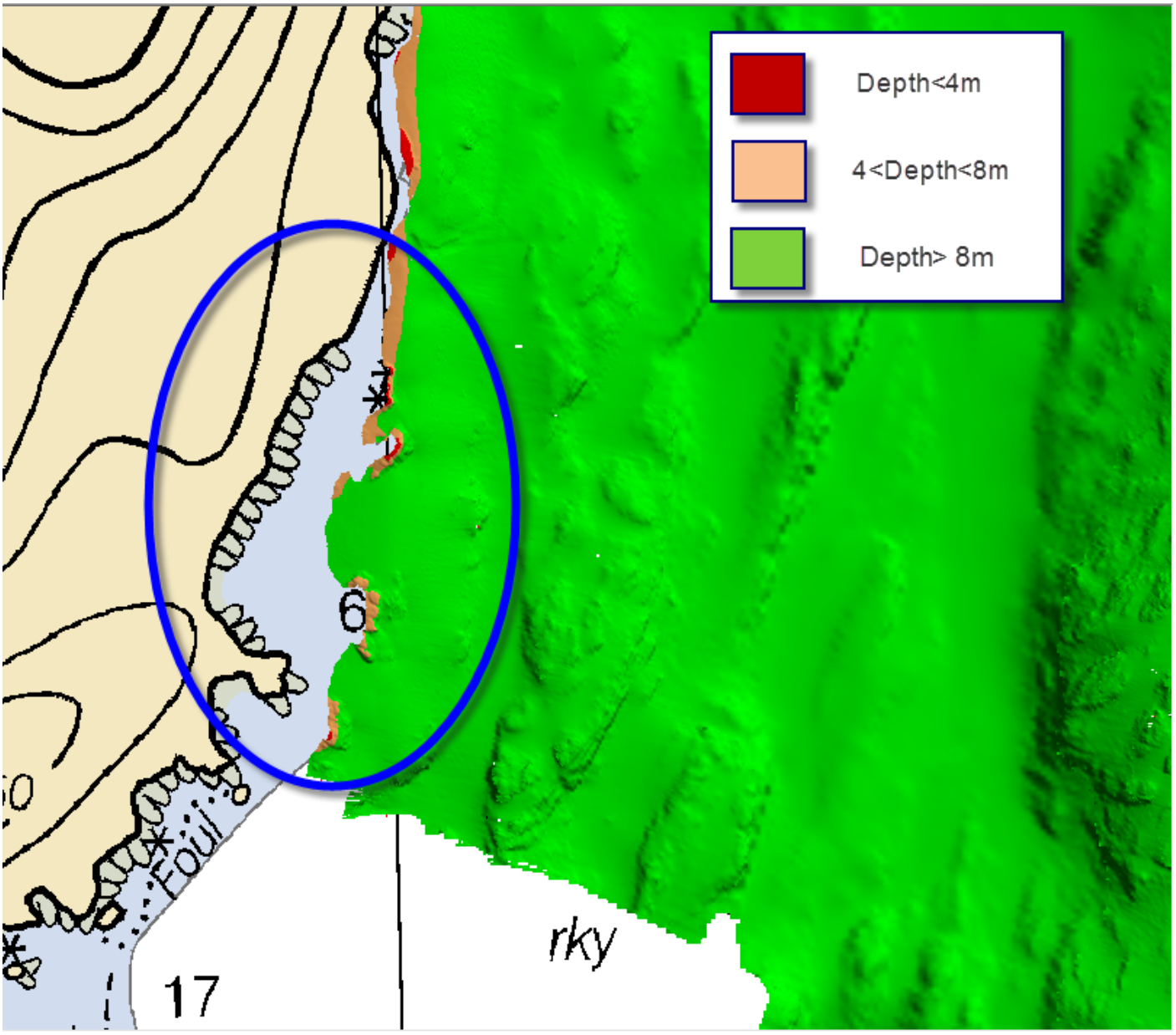


Figure 22: H12743 Sheet Limit not met due to Kelp and Debris

Sea State

During acquisition on survey H12743, the survey launches experienced periods of high sea-state due to weather causing excessive pitching and rolling. The result of the pitching were periods of blow-outs in the surface sound speed as air pockets passed under the transducer. Excessive quick rolls caused blow-outs due to launch attitude as the IMU attempted to keep up with the launch's movements. Because of the sea state, data acquired with Launch 2806 on day number 282 displayed excessive blowouts and beam spreading. To ensure higher data quality, on day number 293, Launch 2805 reacquired the areas covered by Launch 2806 on day number 282. All data lines for Launch 2806, day number 282 were rejected with exception of lines to cover holidays and to meet the required inshore limit. This Launch 2806, day number 282 accepted data meets HSSD requirements, and corroborates well with other launch data.

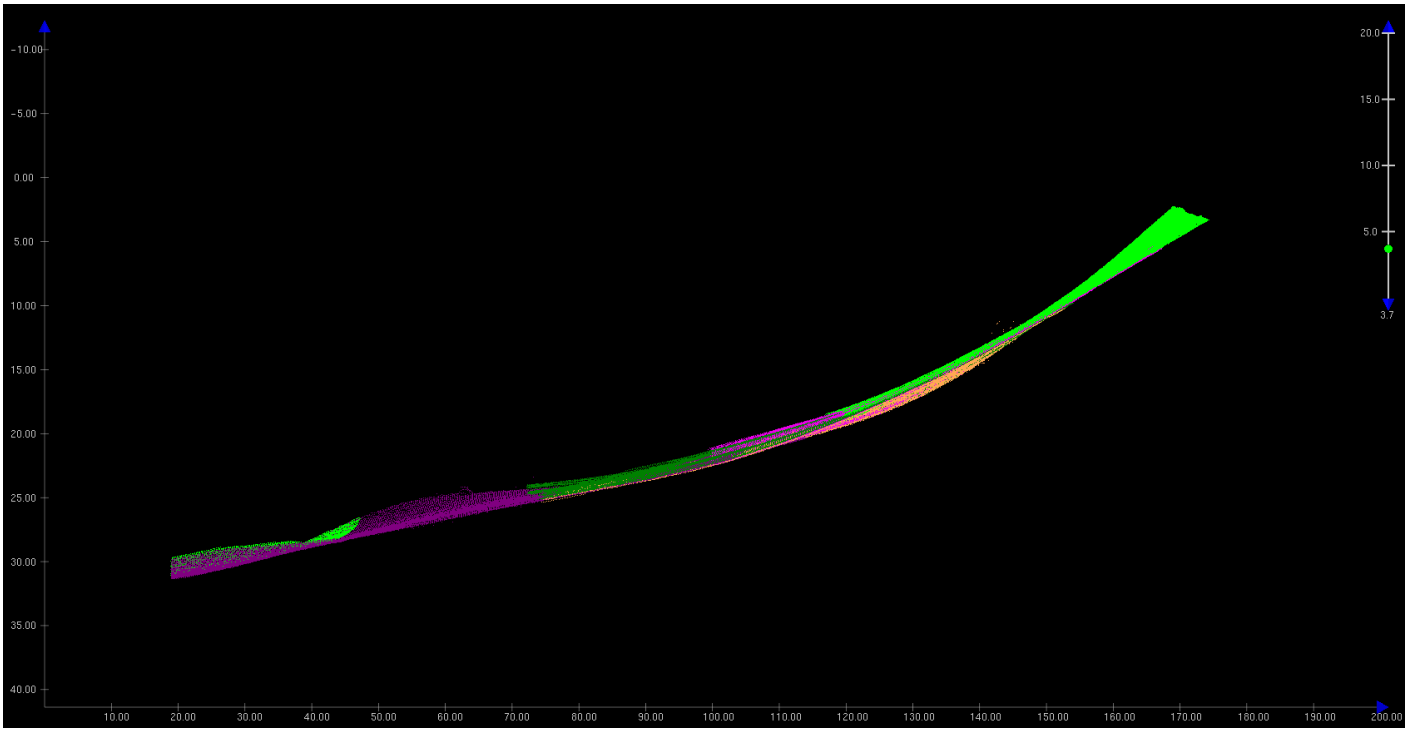


Figure 23: H12743 Example of Reacquired and Cleaned Data From 2806 DN282 and 2805 DN293

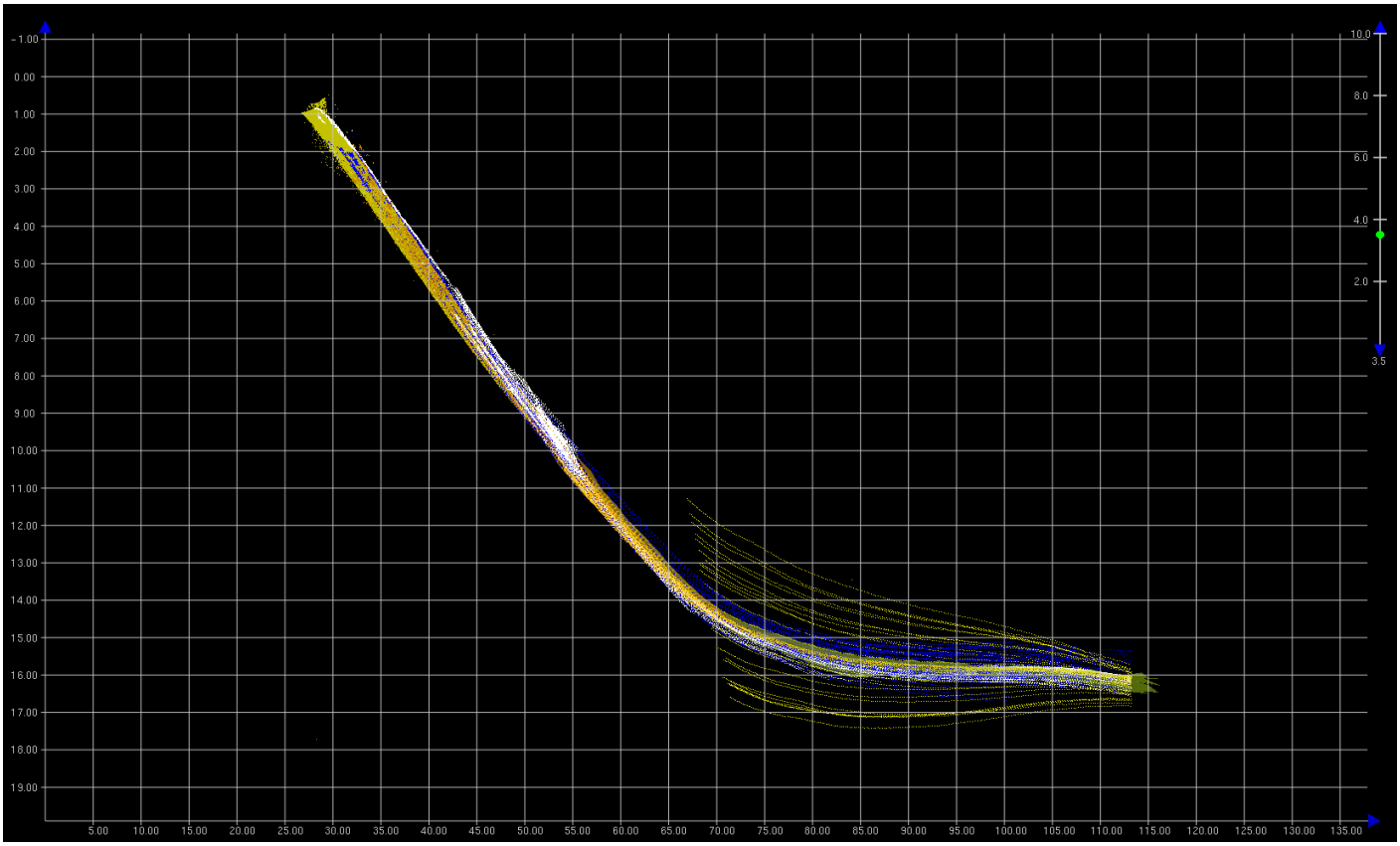


Figure 24: H12743 Example of 2806 DN 282 Sea State Effects

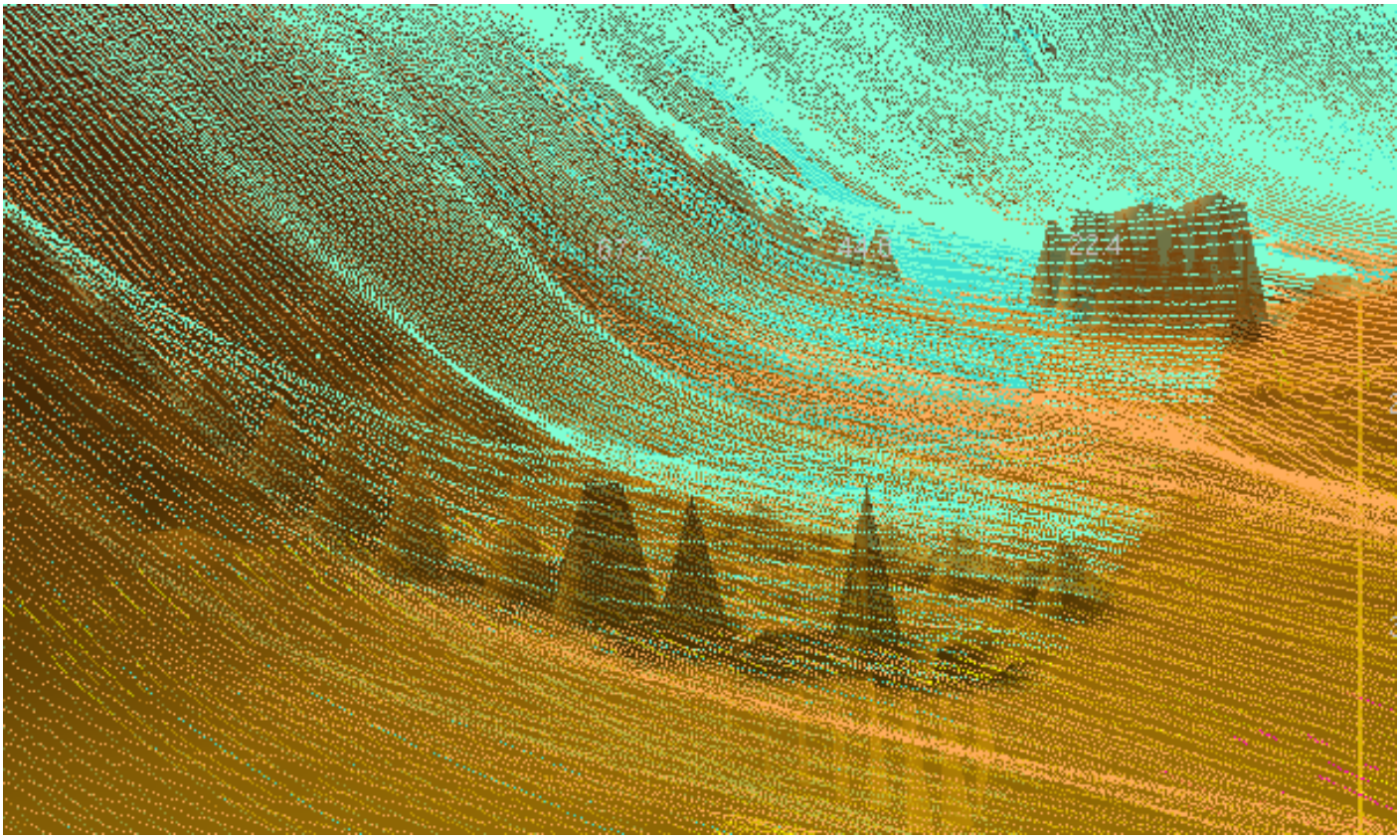


Figure 25: H12743 Outter Beam Spreading 2806 DN 282

Launch 2806, DN 282 contains data that exceeds allowable vertical error budgets for depth. Where this occurs, it does not meet HSSD requirements and does not corroborate well with other launch data. Data has been manually edited to remove the affected soundings which exceed total vertical error tolerances.

Vertical Offset

Occasional offsets between survey lines are present in the data. Figures 26 and 27 below show one example of this type of offset north of Waterfall Resort. These offsets do not exceed 0.3 meters and meet HSSD specification This same offset occurs a few other times on DN 301 for multiple boats pointing to an issue with the tides as the cause. The hydrographer recommends survey data supersede charted soundings and contours.

In high current areas such as Port Refugio and the southern half of Ulloa Channel, some dynamic draft offsets are present in the data. These offsets are small, usually less than 13 centimeters, and do not negatively impact the data in these areas. Due to the low speed of near shore surveying, these vertical offsets can be attributed to varying strong currents throughout the boat days.

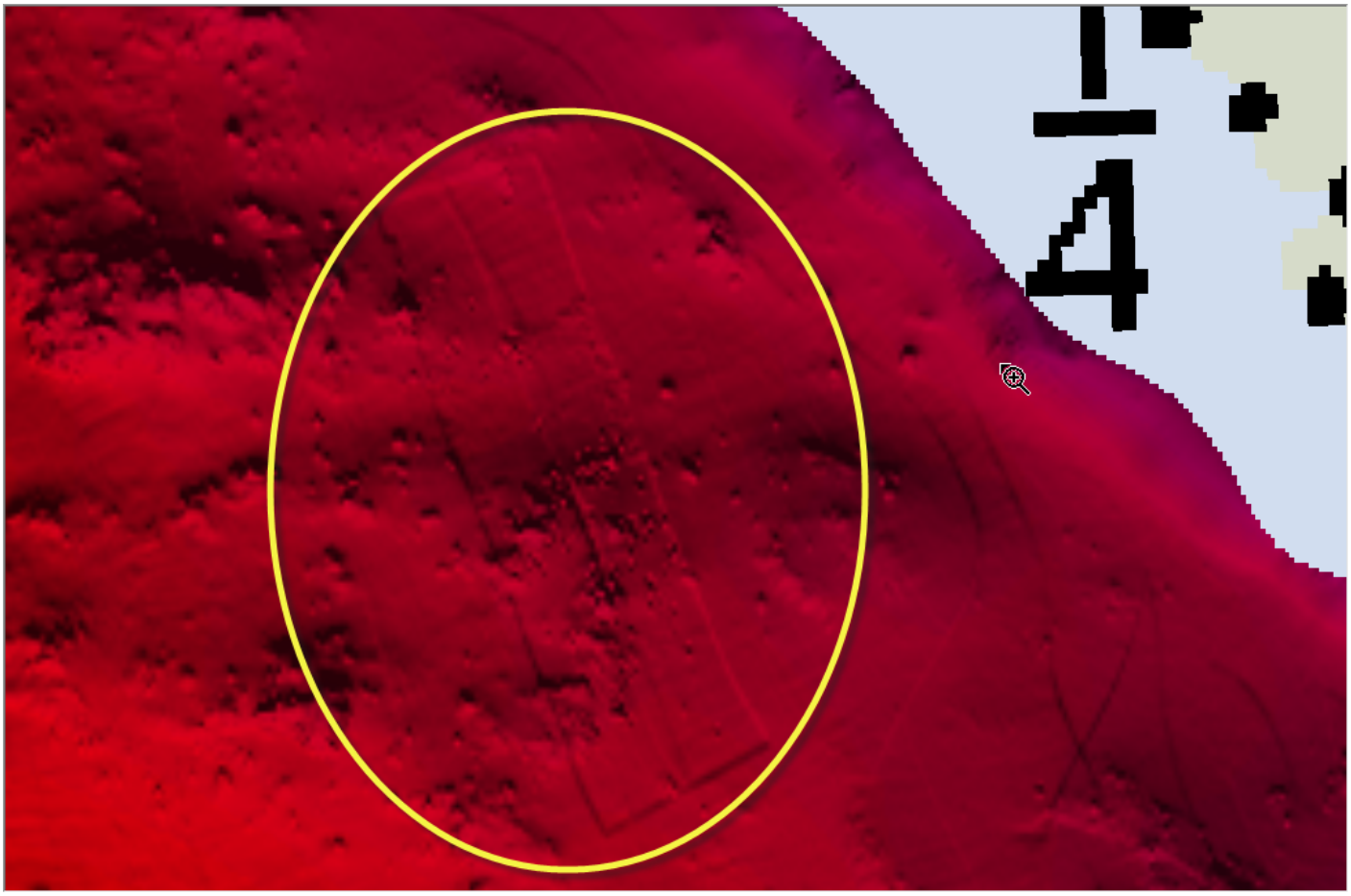


Figure 26: H12743 Graphical Overview of Vertical offset North of Waterfall Resort (8x vertical exaggeration)

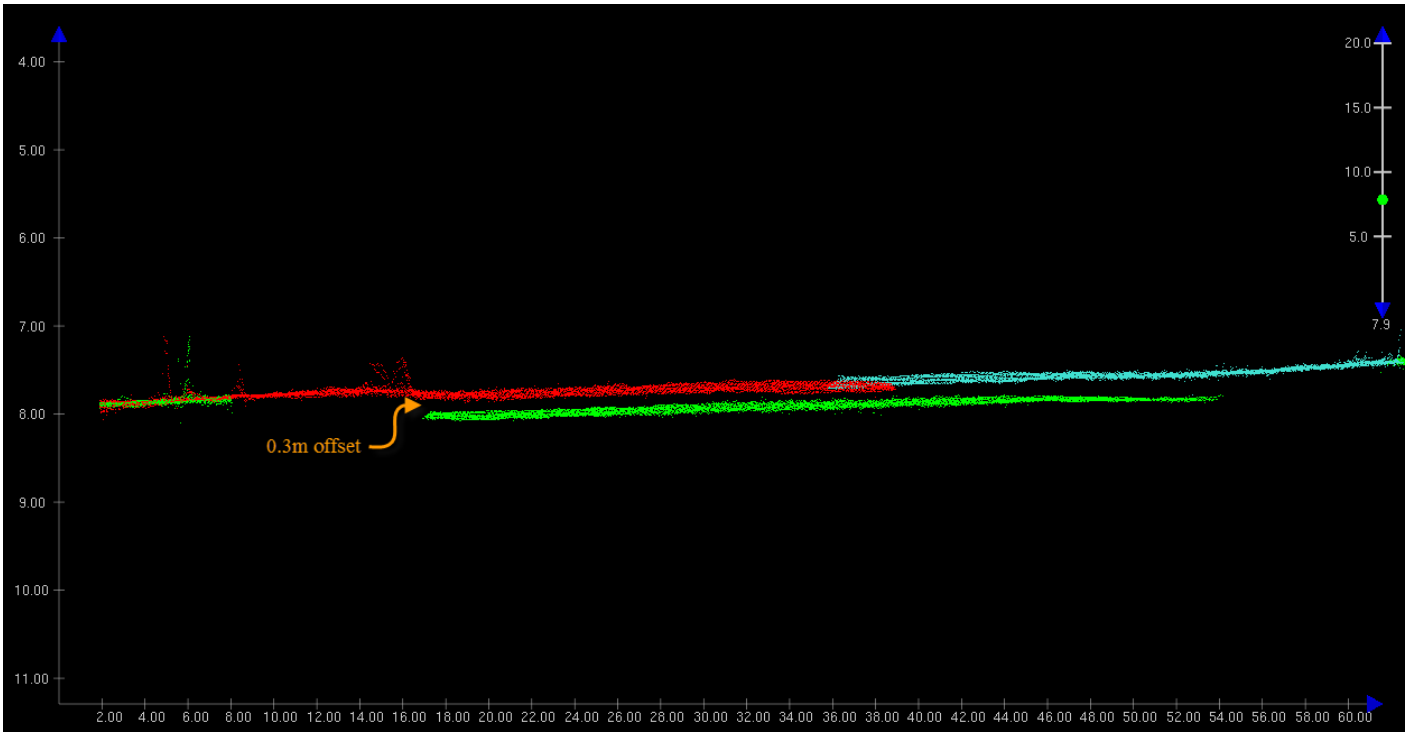


Figure 27: H12743 Subset view Vertical Offset North of Waterfall Resort

B.2.7 Sound Speed Methods

Sound Speed Cast Frequency: Casts were conducted at a minimum of at least one per every 4 hours during launch acquisition. Casts were conducted more often in areas where the input of freshwater had an effect on the speed of sound in the water column and when there was a change in surface sound velocity greater than two meters per second. MVP casts on S220 were conducted with one cast per line.

B.2.8 Coverage Equipment and Methods

All equipment and survey methods are detailed in the DAPR.

B.2.9 IHO Compliance

Uncertainty values of submitted finalized grids were calculated in CARIS HIPS and SIPS using the "Greater of the Two" of uncertainty and standard deviation (scaled to 95%). To visualize the locations in which accuracy requirements were met for each finalized surface, a custom predicted NOAA-compliance layer was created, based on the difference between calculated uncertainty of the nodes and the allowable NOAA uncertainty (Figure 28). To quantify the extent to which accuracy requirements were met, the preceding predicted NOAA compliance layers were queried within Pydro, which produced descriptive statistics for examination (Figures 30-33). Overall 99.95% of nodes of H12743 met the accuracy requirements stated in the HSSD.

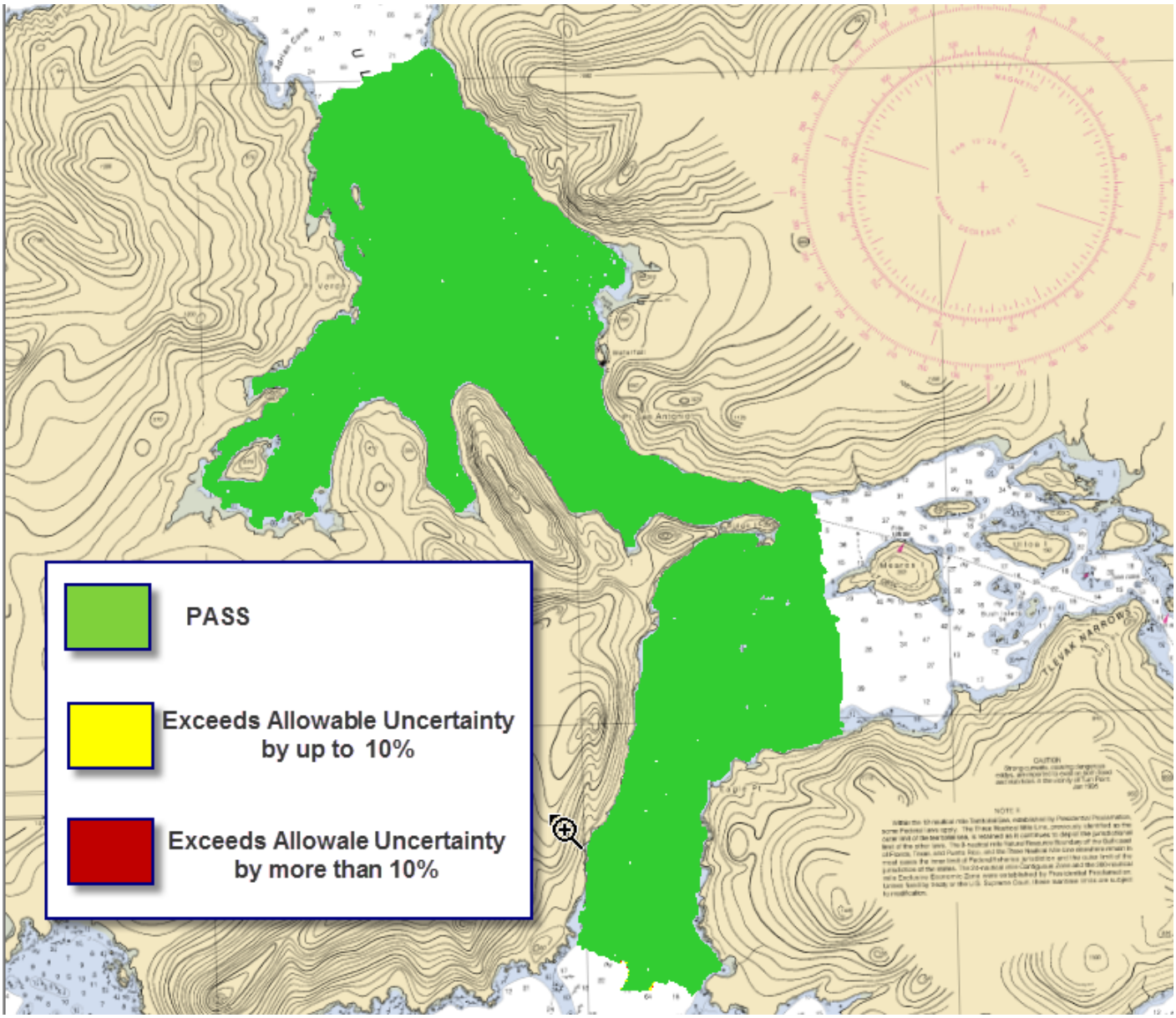


Figure 28: H12743 IHO Uncertainty Compliance Overview

H12743 IHO Uncertainty Statistics			
	Nodes Pass	Nodes Total	Percent Pass
1m	8977147	8980225	99.90%
2m	4254715	4256482	99.90%
3m	995240	996761	99.80%
4m	158735	158916	99.90%
	Total Nodes Pass	Total Nodes	Total Percent Pass
	14385837	14392384	99.95%

Figure 29: H12743 IHO Uncertainty Statistics

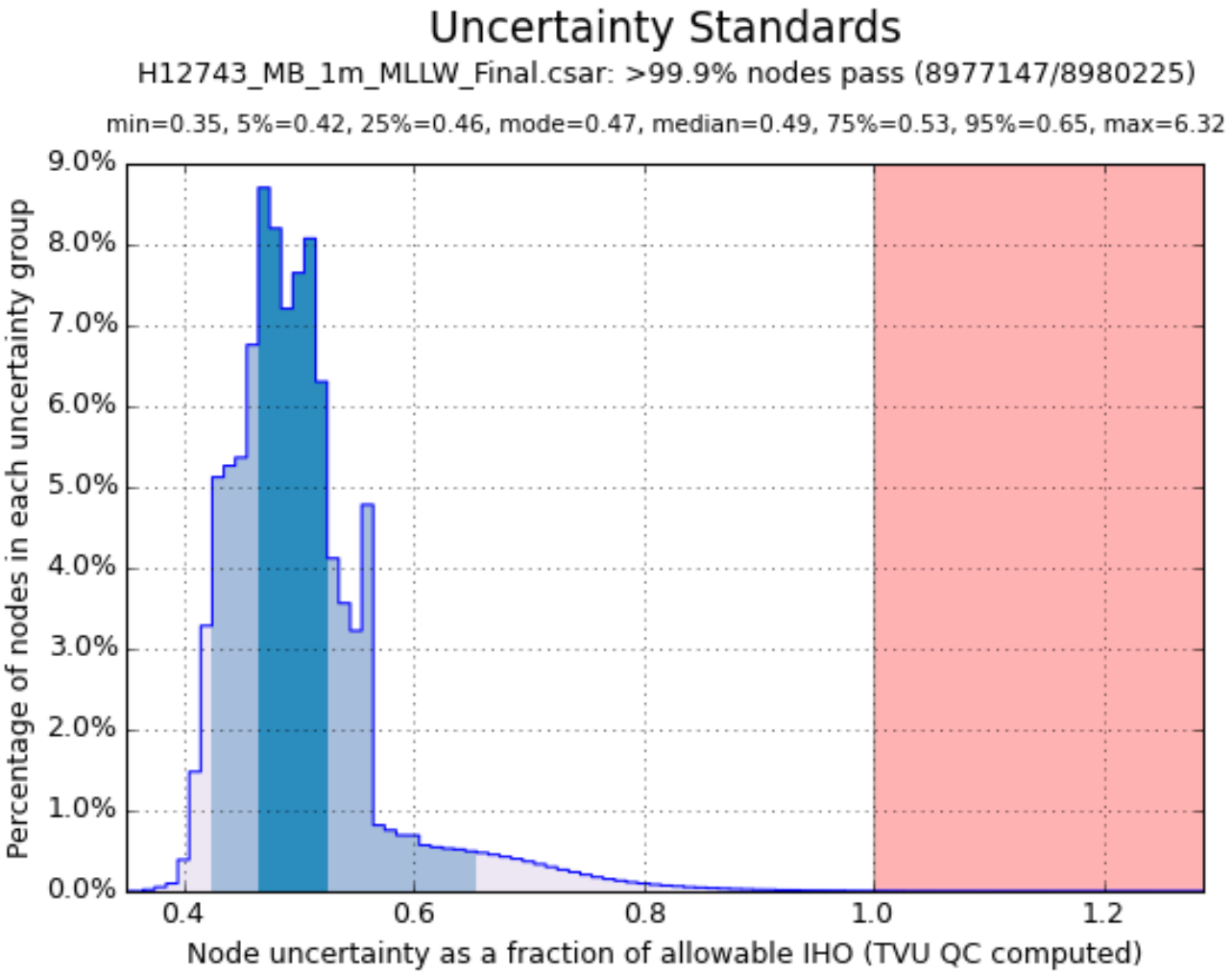


Figure 30: H12743 1 Meter Surface IHO Uncertainty Statistics

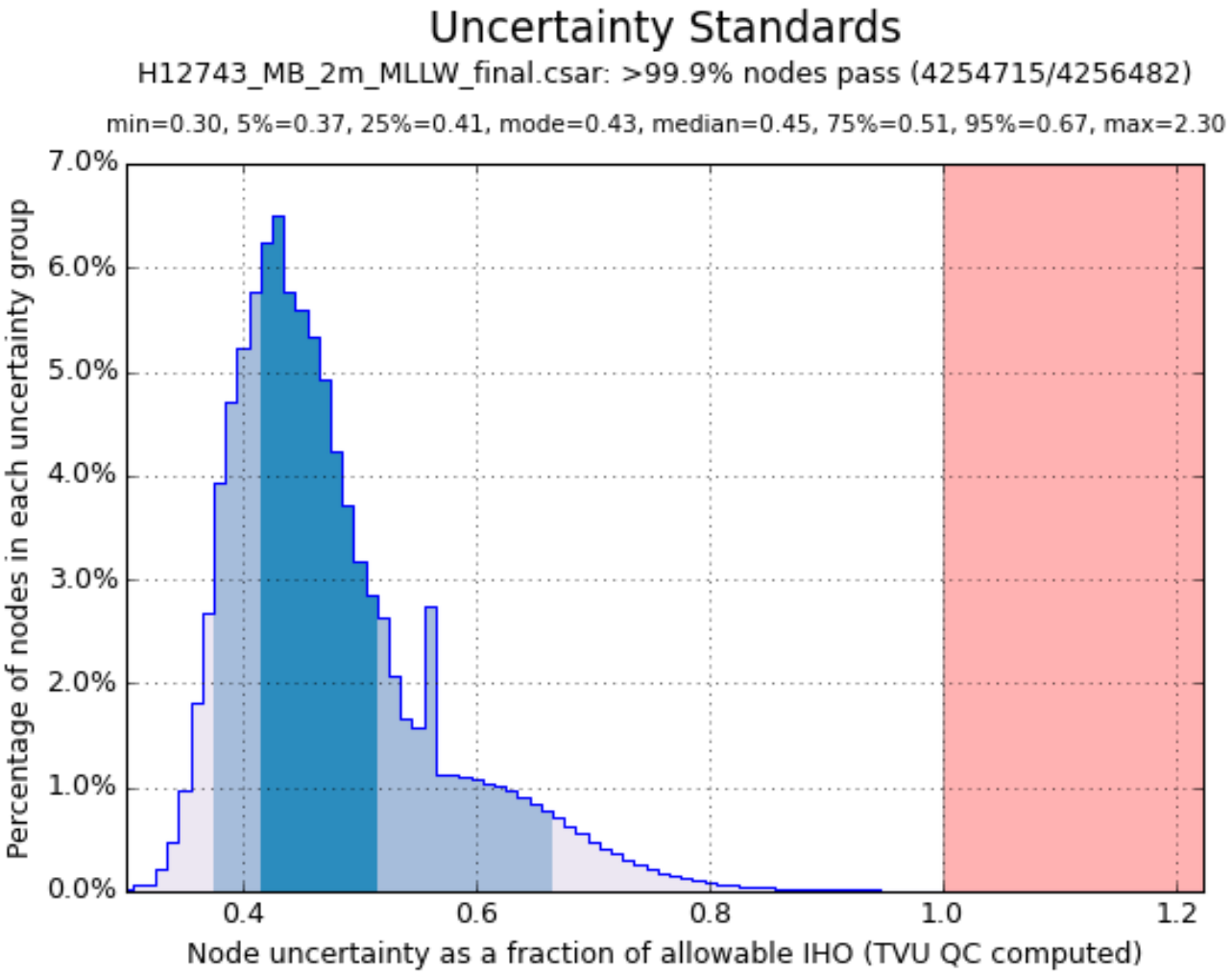


Figure 31: H12743 2 Meter Surface IHO Uncertainty Statistics

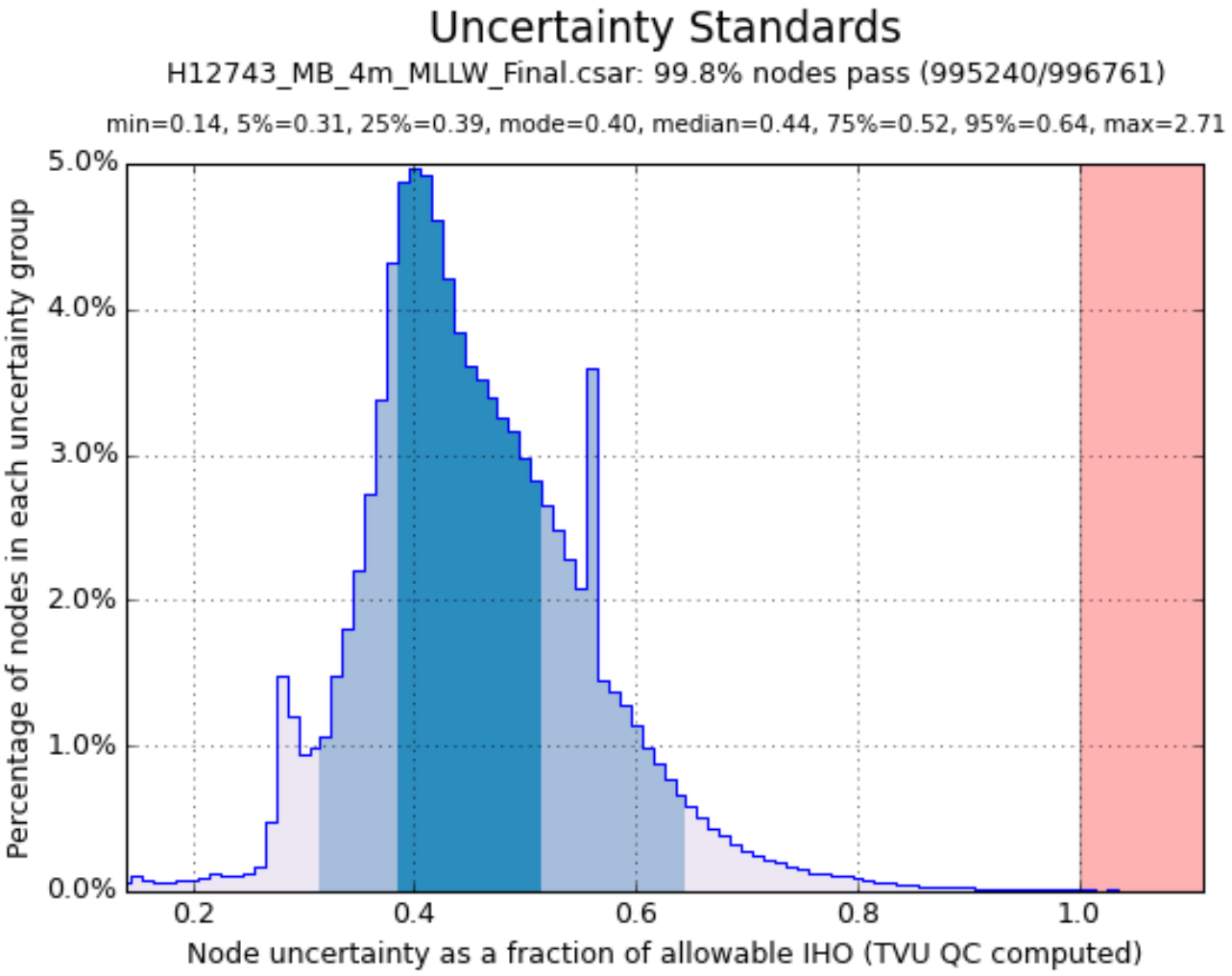


Figure 32: H12743 4 Meter Surface IHO Uncertainty Statistics

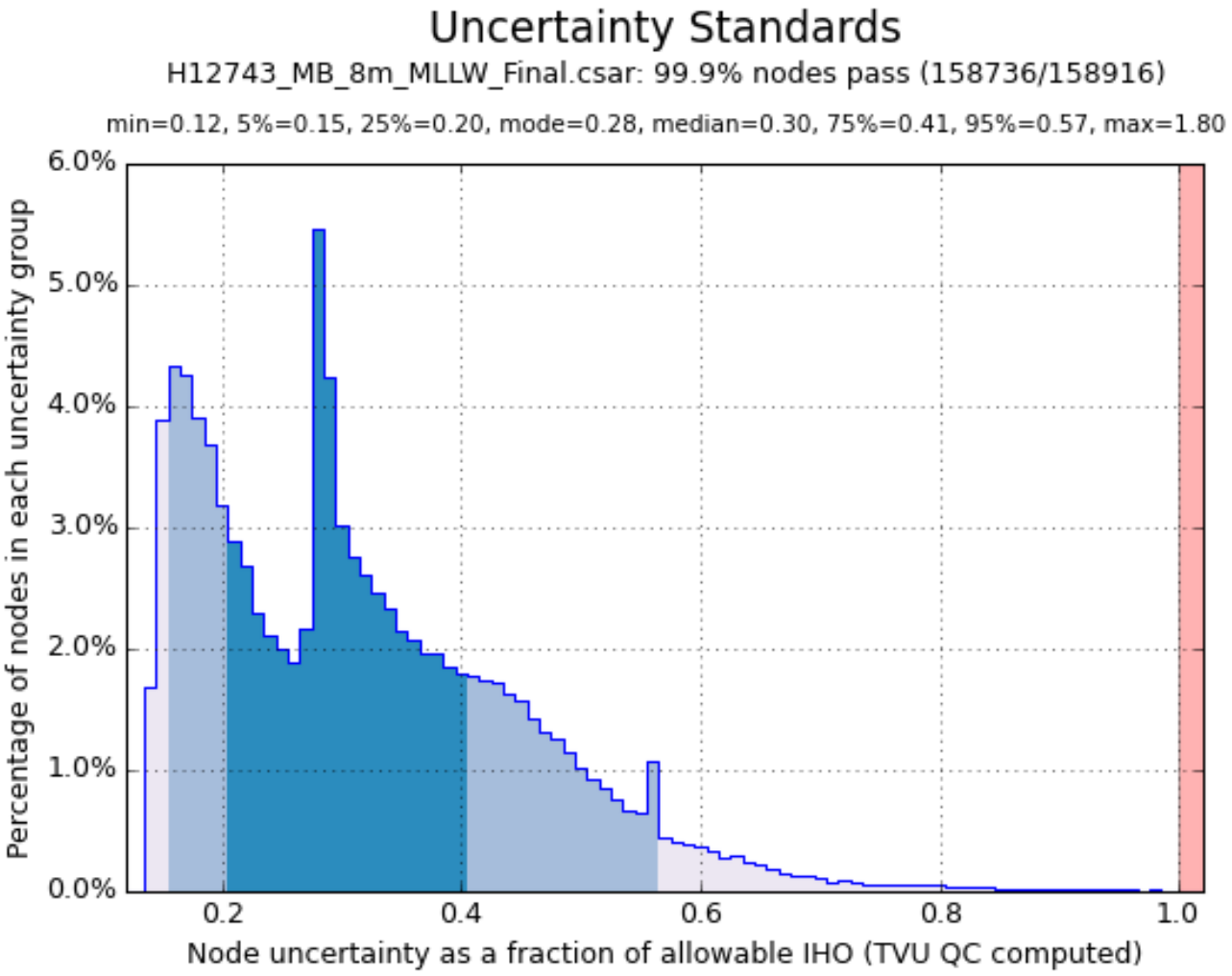


Figure 33: H12743 8 Meter Surface IHO Uncertainty Statistics

B.2.10 Density Compliance

Data acquired in H12743 exceeds the five soundings per node data density requirements in section 5.2.2.2 of the HSSD for complete coverage MBES with backscatter. In order to extract descriptive statistics of the data density achievements, the finalized surfaces were analyzed within Pydro and summarized into a table (Figure 35). Overall, the required data density was achieved in 99.6% of the nodes (Figure 34). The vast majority of nodes that did not meet density requirements are due to sparse data in the outer beams, especially near steep slopes and rocky areas where acoustic shadowing occurred, and at the edges of the survey limits.

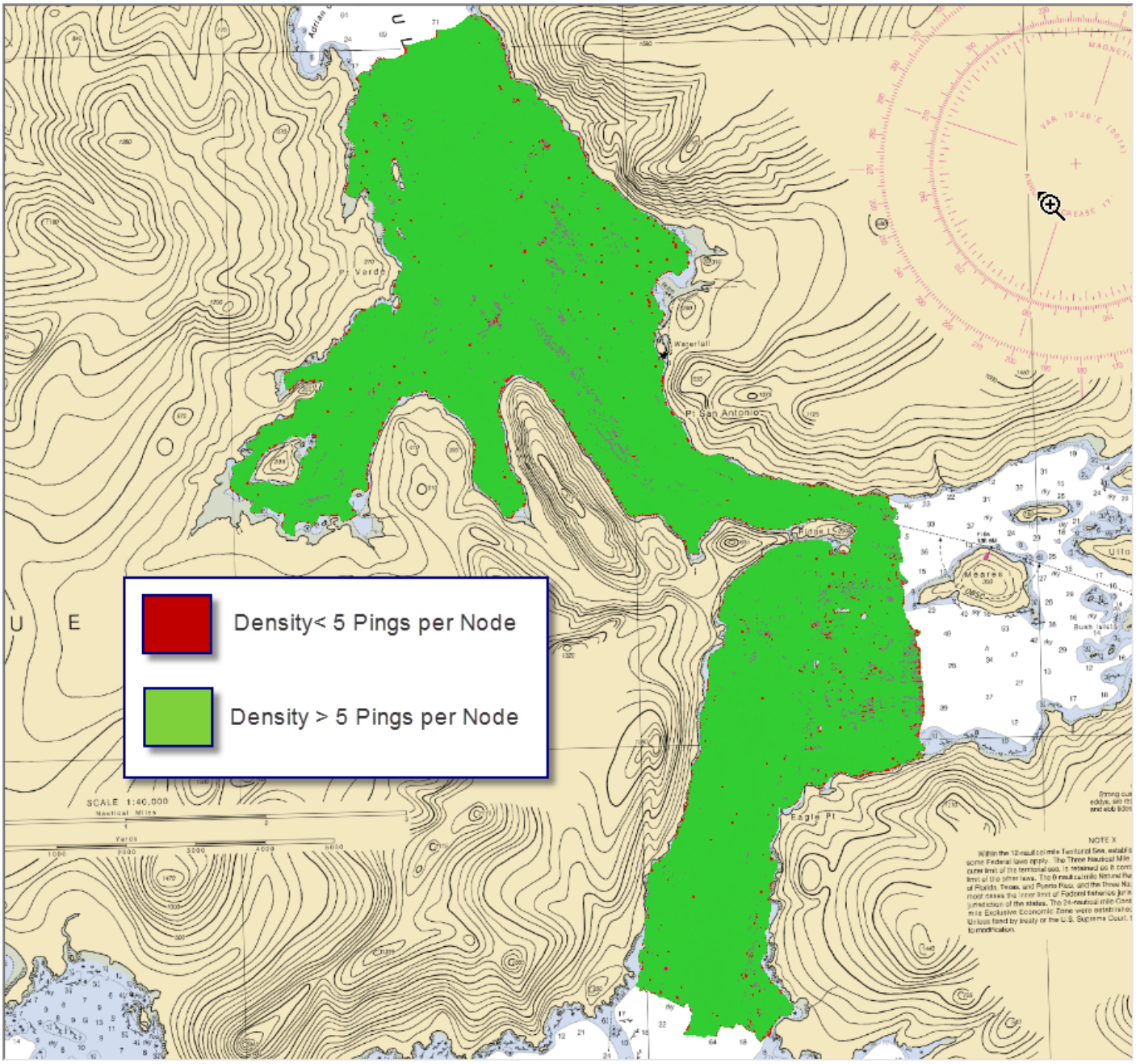


Figure 34: H12743 Density Overview

H12743 Density Statistics			
	Nodes Pass	Nodes Total	Percent Pass
1m	8946167	8980225	99.60%
2m	4246954	4256482	99.80%
4m	995277	996761	99.90%
8m	158777	158916	99.90%
	Total Node Pass	Total Nodes	Total Percent Pass
	14347175	14392384	99.69%

Figure 35: H12743 Density Statistics

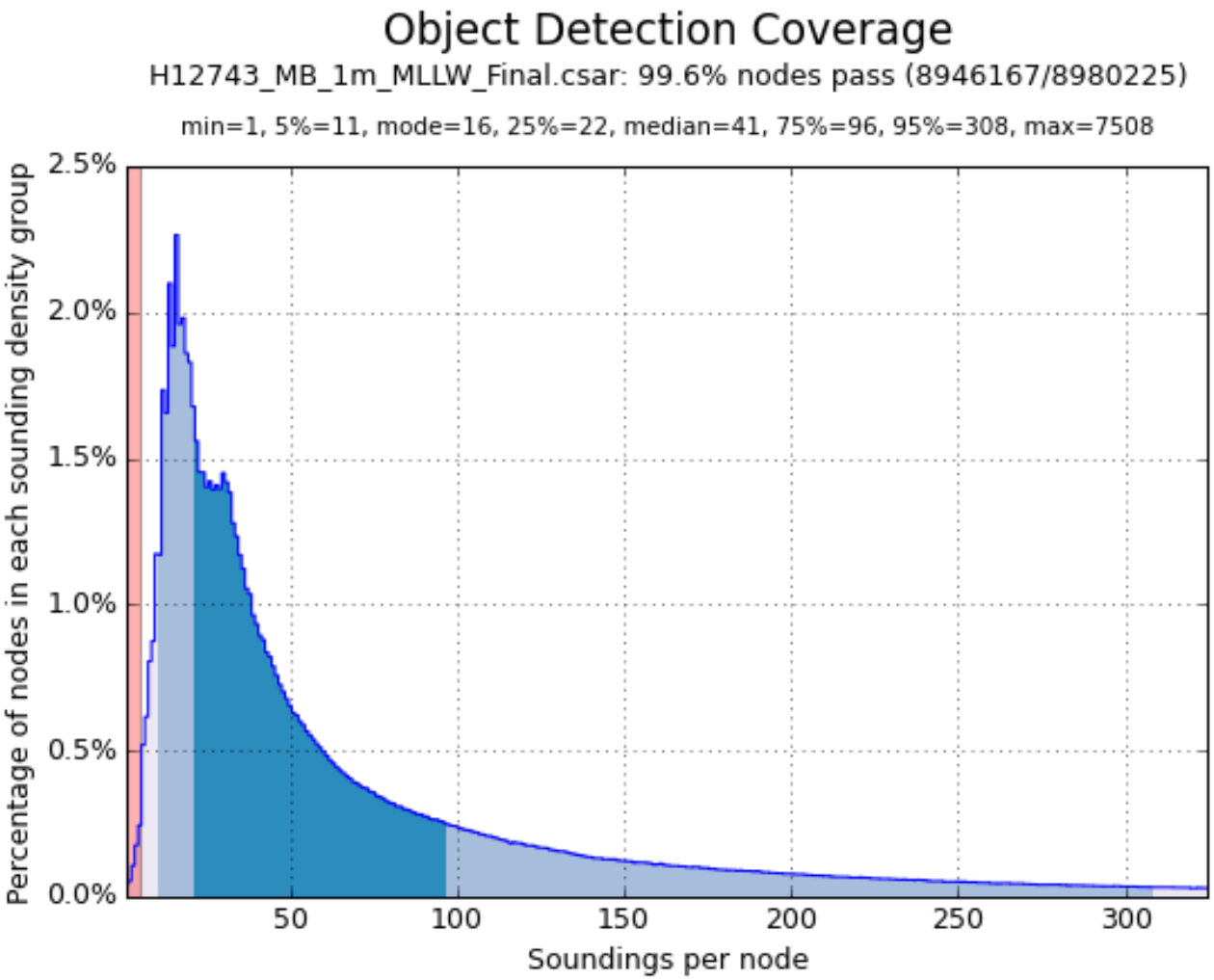


Figure 36: H12743 1 Meter Surface Density Statistics

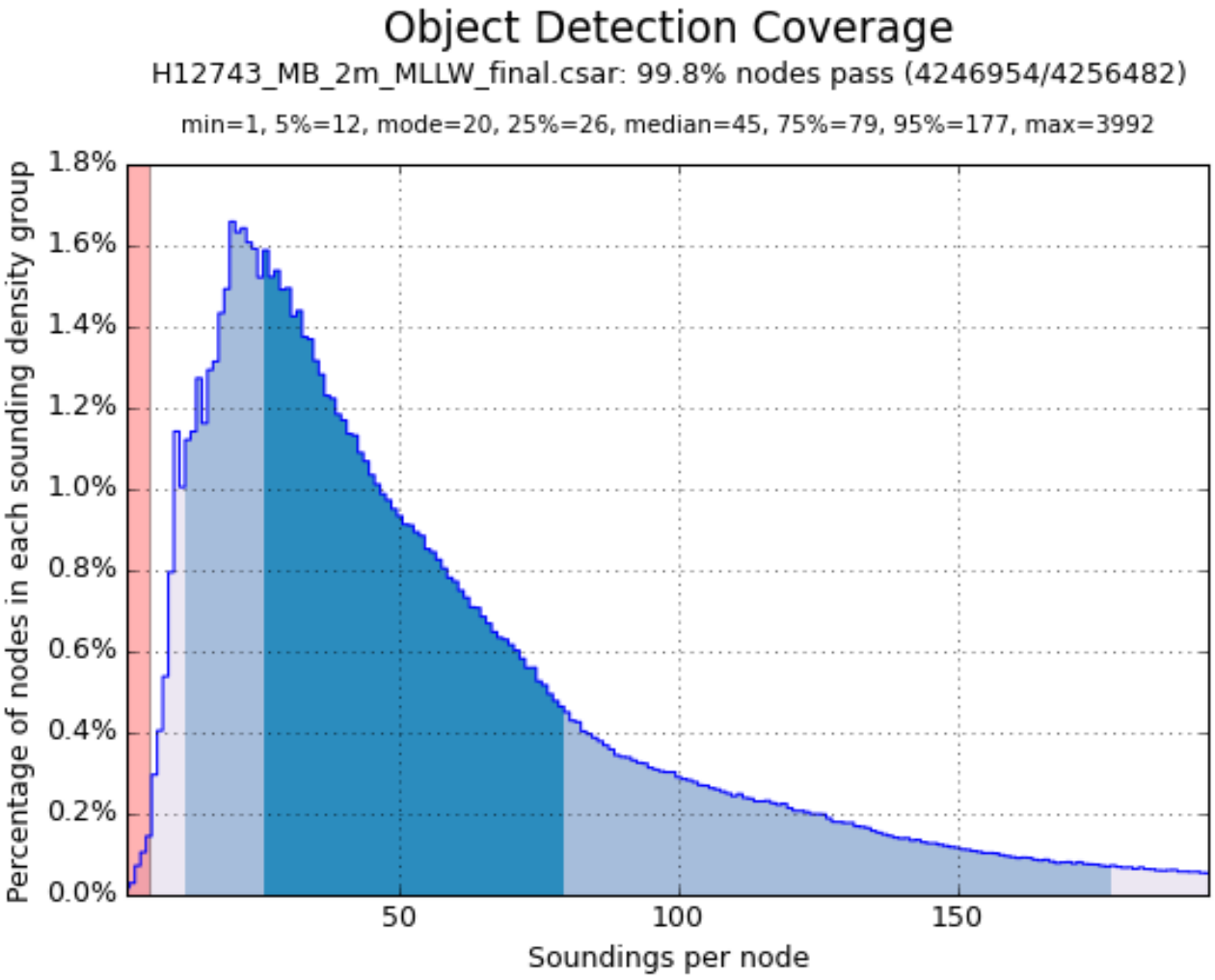


Figure 37: H12743 2 Meter Surface Density Statistics

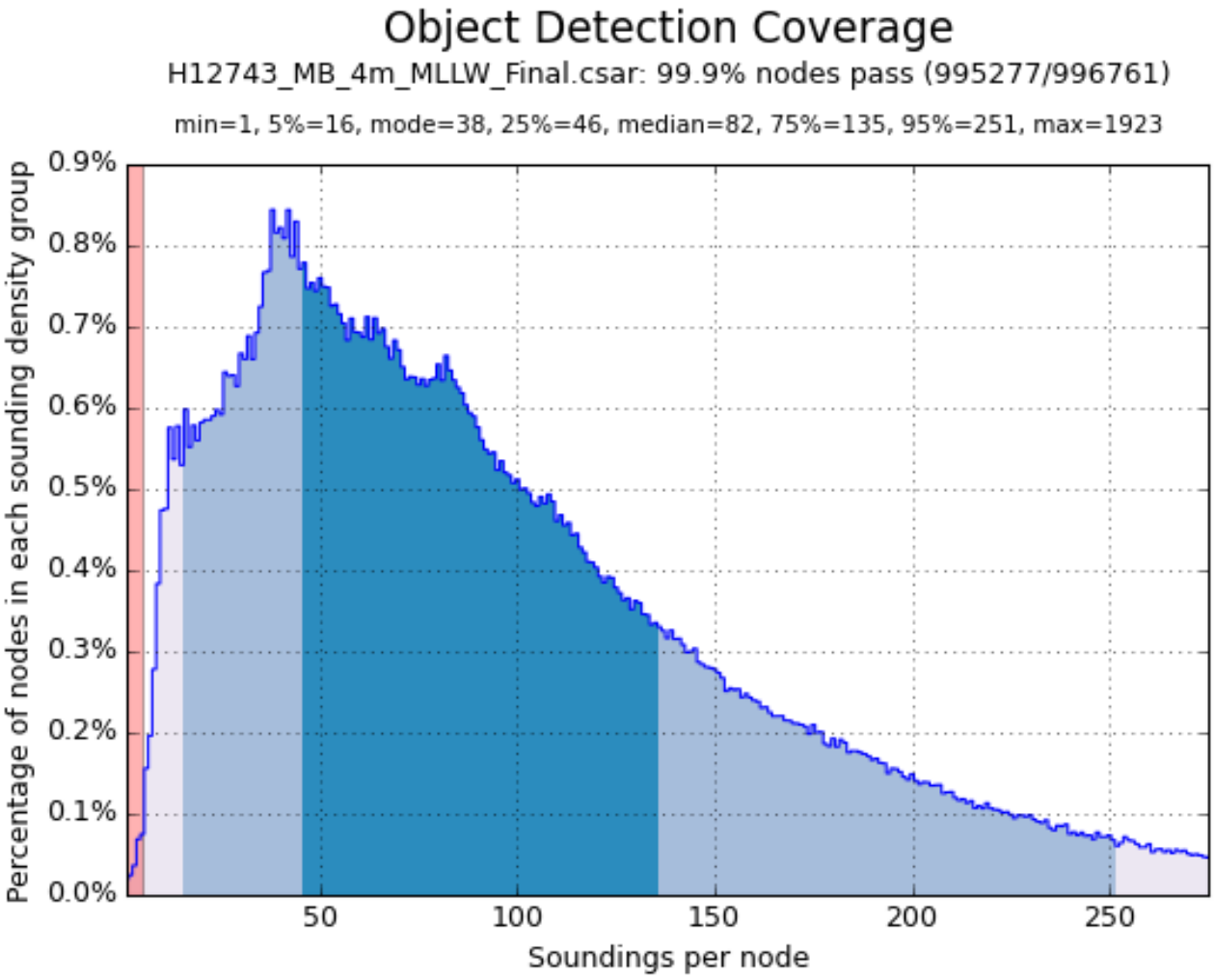


Figure 38: H12743 4 Meter Surface Density Statistics

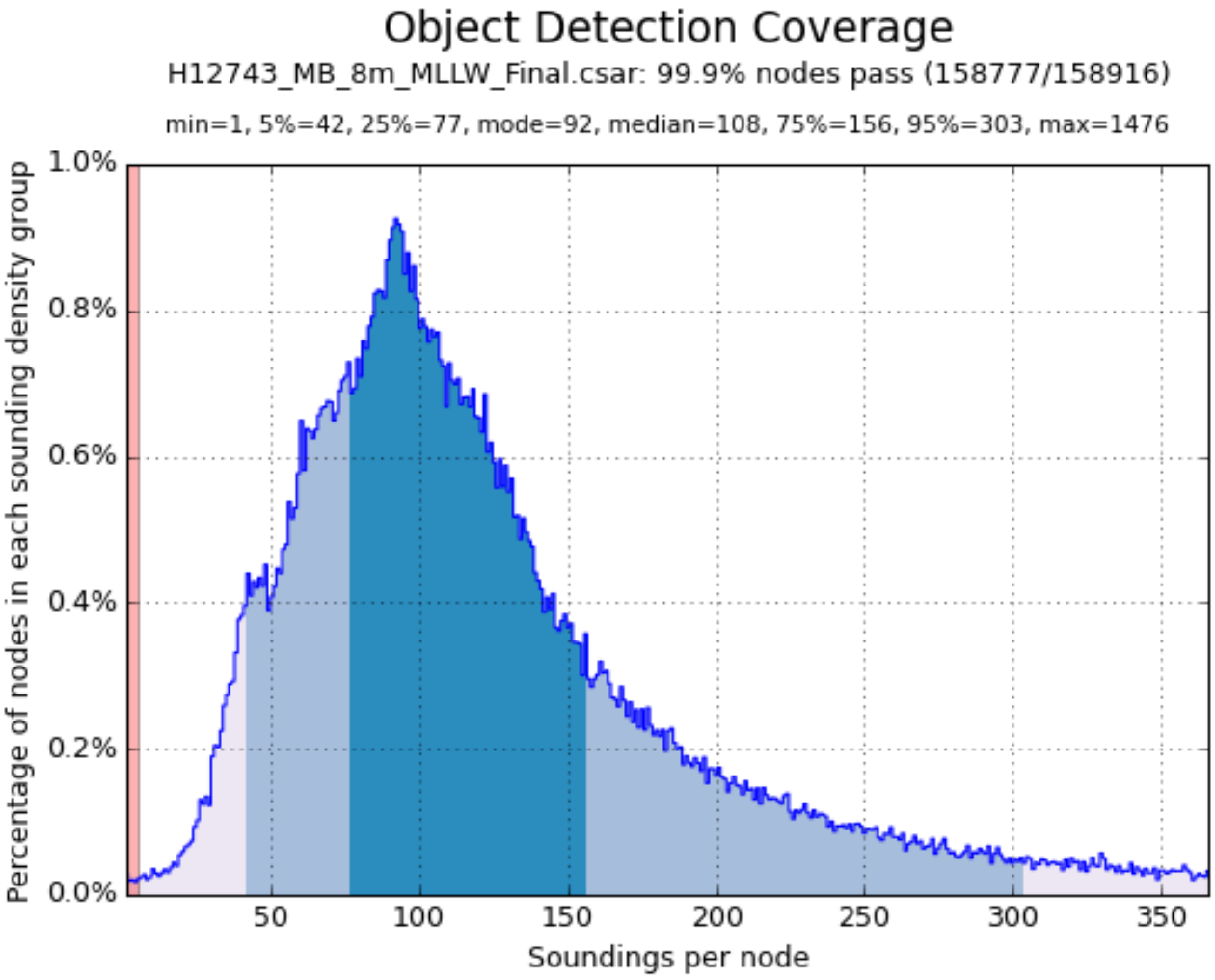


Figure 39: H12743 8 Meter Surface Density Statistics

B.2.11 Holiday Assessment

Data gaps and holidays are present in H12743 due to the following factors:

1. Unsafe Navigation near Shoal and Foul Areas
2. Kelp
3. Acoustic Shadows in Rocky Areas or Areas of Steep Slope

For information about data gaps due to foul and kelp areas, refer to section B.2.6: Sea Grass and Kelp.

Figure 40 shows an overview on the west coast of H12743 where the least depth of a feature was unable to be attained due to safety ie. safe maneuverability of survey vessel.

The least depths of features are represented by H12743, with the exception of the examples below in Figure 41. The tops of these rocks were not obtained either due to kelp, the lack of a high tide window, or both.

Figure 42 shows an example of an acoustic shadow where the sonar beams went over the edge of a steep slope, but did not capture the face of the slope. These data gaps are not usually seen in the surface, but can be seen when using the subset editor in CARIS HIPS and SIPS.

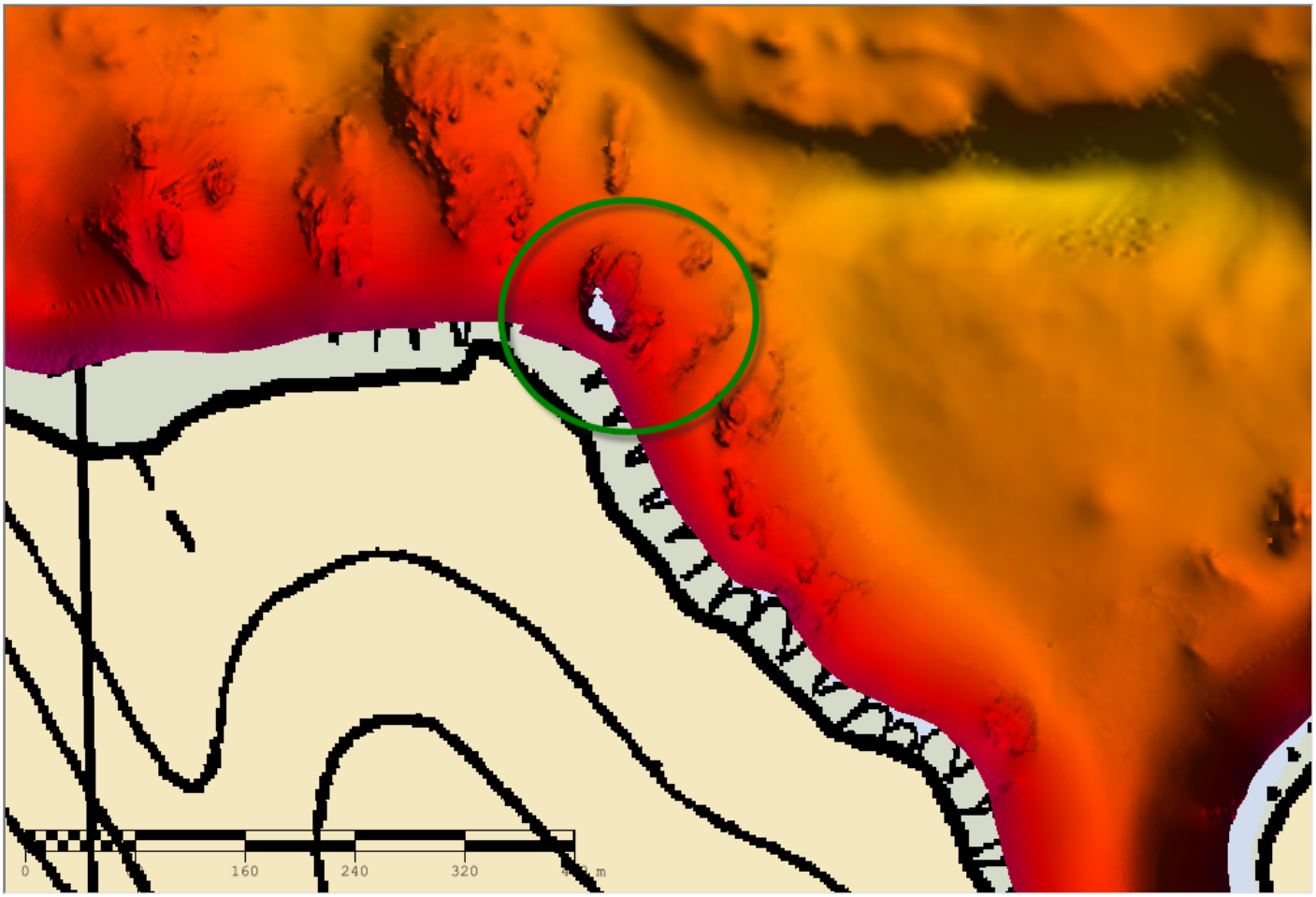


Figure 40: H12743 Graphical Overview of Holiday Due to Unsafe Navigation in Ulloa Channel.

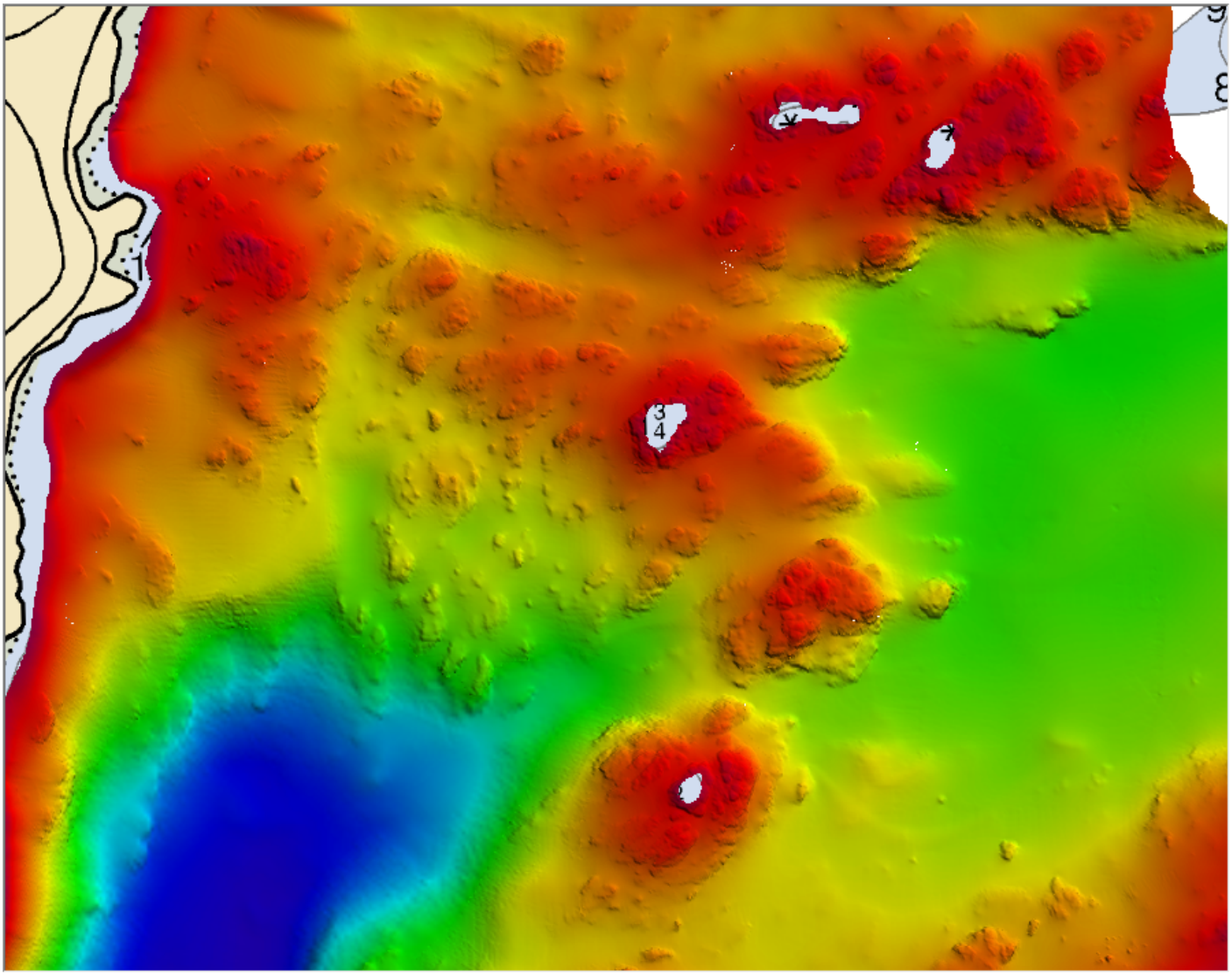


Figure 41: H12743 Graphical Overview of Holidays Due to Kelp and Shoal soundings in Meares Pass

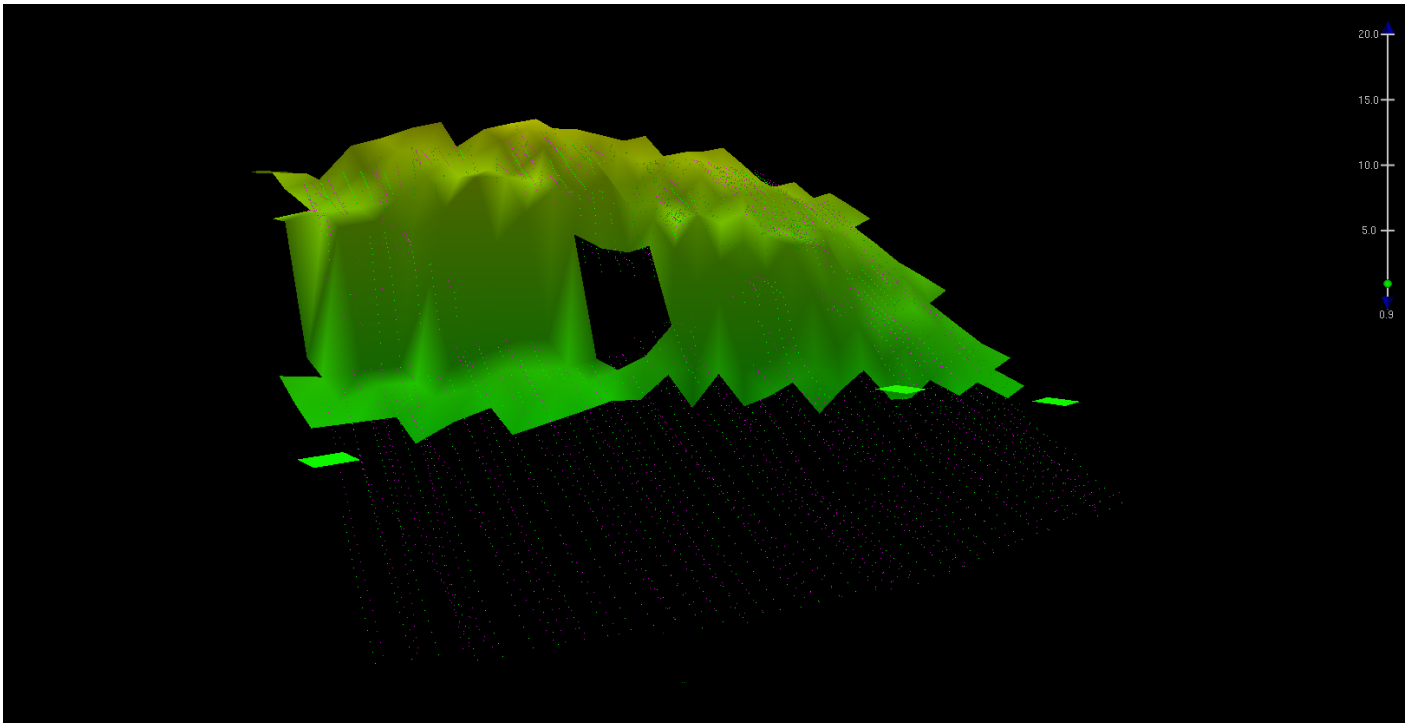


Figure 42: Typical Holiday as seen throughout H12743 due to Acoustic Shadowing

B.3 Echo Sounding Corrections

B.3.1 Corrections to Echo Soundings

All data reduction procedures conform to those detailed in the DAPR.

B.3.2 Calibrations

All sounding systems were calibrated as detailed in the DAPR.

B.4 Backscatter

Raw Backscatter was logged as .7k file for Reson 7125 data and logged as .all for the Kongsberg EM710. The data was submitted directly to NCEI (National Center for Environmental Information) to be archived, and to PHB where the data will be processed. One line per day of backscatter was processed in the field by the field unit for quality control. Backscatter was not collected on 2806 during DN 282 due to operator error.

B.5 Data Processing

B.5.1 Primary Data Processing Software

The following software program was the primary program used for bathymetric data processing:

Manufacturer	Name	Version
Caris	HIPS/SIPS	9.0

Table 9: Primary bathymetric data processing software

The following Feature Object Catalog was used: NOAA Profile V_5_3_3

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
H12743_MB_1m_MLLW	CUBE	1 meters	-	NOAA_1m	Complete MBES
H12743_MB_2m_MLLW	CUBE	2 meters	-	NOAA_2m	Complete MBES
H12743_MB_4m_MLLW	CUBE	4 meters	-	NOAA_4m	Complete MBES
H12743_MB_8m_MLLW	CUBE	8 meters	-	NOAA_8m	Complete MBES
H12743_MB_1m_MLLW_Final	CUBE	1 meters	0 meters - 26 meters	NOAA_1m	Complete MBES
H12743_MB_2m_MLLW_Final	CUBE	2 meters	18 meters - 52 meters	NOAA_2m	Complete MBES
H12743_MB_4m_MLLW_Final	CUBE	4 meters	36 meters - 104 meters	NOAA_4m	Complete MBES
H12743_MB_8m_MLLW_Final	CUBE	8 meters	72 meters - 320 meters	NOAA_8m	Complete MBES
H12743_MB_8m_Combined	CUBE	8 meters	-	NOAA_8m	Complete MBES

Table 10: Submitted Surfaces

The NOAA CUBE parameters mandated in the HSSD dated May 2014 were used for the creation of all CUBE surfaces in Survey H12743. The surfaces have been reviewed where noisy data, or "fliers," are incorporated into the gridded solutions causing the surface to be shoaler or deeper than the true sea floor.

Where these spurious soundings cause the gridded surface to be shoaler or deeper than the reliably measured seabed by greater than the maximum allowable Total Vertical Uncertainty at that depth, the noisy data have been rejected and the surface recomputed.

In order to prevent visual data gaps between the finalized surfaces, the 1, 2, 4, and 8 meter surface depths were extended for greater overlap between the surfaces. The surfaces and depth ranges are listed in Table 10. The 8 meter surface depth was extended to include 16 meter surface depth requirements as the area covered by the 16 meters surface was small. A waiver for the extension of depth ranges and no requirement to submit a 16 meter surface was granted from the Hydrographic Survey Division Operations Branch and is located in Appendix II. The 1, 2, and 4 meter finalized surface depth ranges were extended deeper by 6 times the surface resolution. To determine how much to expand the depth range by, the largest gap in coverage that could be found was measured in CARIS HIPS and SIPS subset editor. The distance of the gap was divided by the resolution of the surface that would cover the gap to determine how many multiples of that resolution it would take to cover that gap. This number was then multiplied by 2 to ensure that all gaps would be covered resulting in the extension of the surfaces by 6 times their resolution. All surfaces still meet the density and NOAA uncertainty requirements for their expanded ranges.

The Flier Finder tool in Pydro Explorer was used to search for additional noise spikes after gross cleaning. Flier finder was performed several time on each surface each time reducing the flier height. Flier finder was useful with large flier heights, but as the height was reduced the effectiveness of the tool diminished. With smaller heights, flier finder began to flag steep drop offs and the edges of surfaces that occurred on slopes resulting in hundreds of false positives. At this point, the hydrographer determined that the remainder of the fliers found were false positives and no further flier cleaning was required.

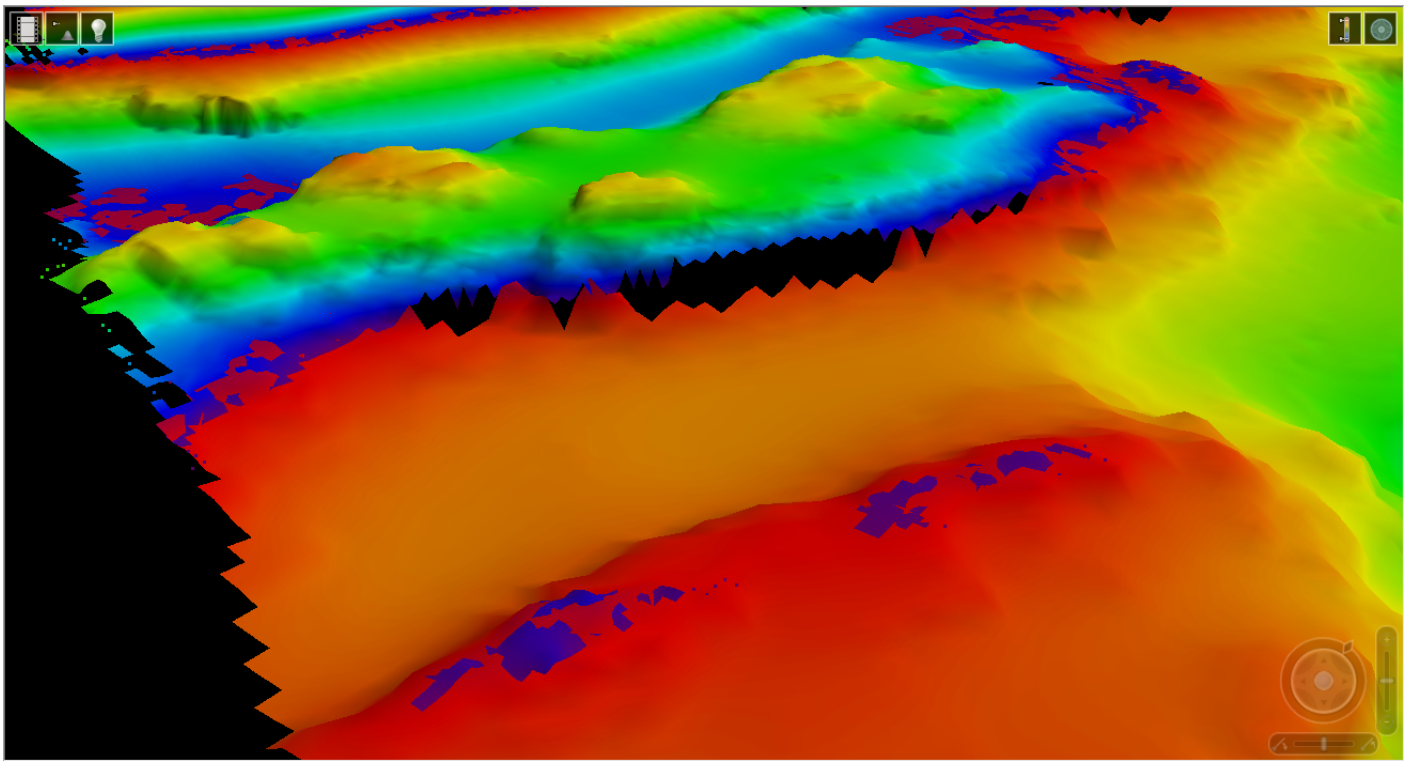


Figure 43: H12743 Example of Apparent Gap in Coverage

B.5.3 Data Logs

Data acquisition and processing notes are included in the acquisition and processing logs, and additional processing such as final tide and sound velocity application is noted in the H12743 Data Log spreadsheet. All data logs are submitted digitally in the Separates I folder.

B.5.4 Critical Soundings

Designation of soundings followed procedures as outlined in section 5.2.1.2 of the HSSD.

Survey H12743 contains 70 designated soundings. Four designated soundings are used to represent DTONs (see section D.1.6 for more information), and the other 66 designated soundings are used to accurately represent the sea-floor. Designated soundings were primarily found in rocky areas of the seafloor, especially north of Waterfall Resort.

B.5.5 CARIS Automatic Beam Disabling

During conversion of the EM710 data in CARIS HIPS and SIPS some soundings were rejected due to the disable beams settings in the Kongsberg EM710. See Figure 44 below where beam disabling was present due to the steep slope of the seafloor. Disabled beams were not re-accepted and there was no effect on the density in this area.

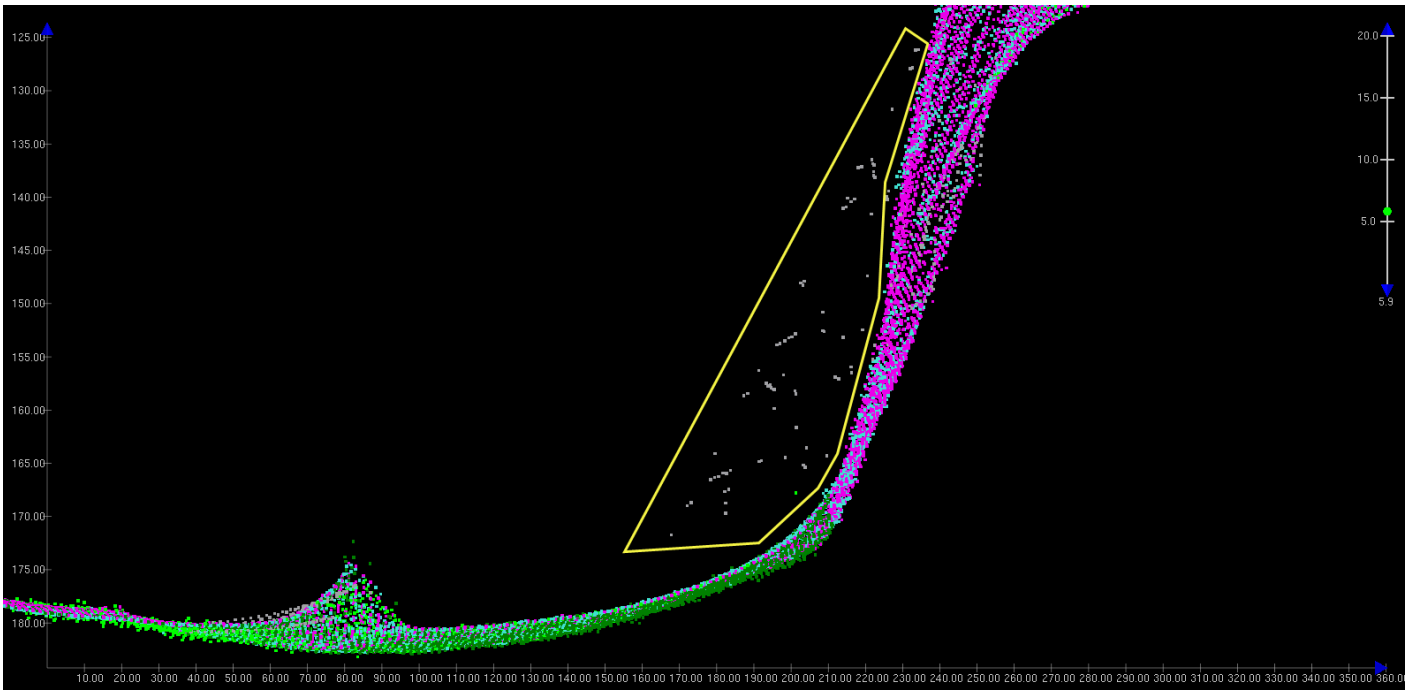


Figure 44: H12743 Subset Showing Rejected Soundings due to Disabled Beams

B.5.6 Inconsistent Number of HSX, 7k, RAW Files

Because of numerous Hypack software crashes during acquisition on survey H12743 there are a number of days that have a contrasting number of data files between the .HSX and .7k file types. Additionally, 57 HDCS lines were removed from the project after conversion due to the poor data on day number 282 for Launch 2806. (See section B.2.6, "Sea State" above for more information.) Also on Launch 2806 day 282, snippets were not logged resulting in zero .7k files for that boat day. Refer to H12743_Data_Log, submitted in the H12743 Separates folder for detailed accounting of all data files.

C. Vertical and Horizontal Control

Additional information discussing the vertical or horizontal control for this survey can be found in the accompanying HVCR.

C.1 Vertical Control

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

Standard Vertical Control Methods Used:

Discrete ZoningTCARI

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

Station Name	Station ID
Sitka, AK	9451600
Port Alexander, AK	9451054

Table 11: NWLON Tide Stations

The following subordinate water level stations were established for this survey:

Station Name	Station ID
Block Island, AK	9450406

Table 12: Subordinate Tide Stations

There was no Water Level file associated with this survey.

File Name	Status
O190FA2015_Final.tc	Final
O190FA2015CORP.zdf	Preliminary

Table 13: Tide Correctors (.zdf or .tc)

A request for final approved tides was sent to N/OPS1 on 01/25/2016. The final tide note was received on 03/11/2016.

The preliminary zoning was deemed to not be efficient to determine an accurate vertical uncertainty due to data gaps caused by faulty equipment at Block Island 9450406. A final Tidal Constituents and Residual Interpolation (TCARI) grid was issued in order to provide a better uncertainty value for OPR-O190-FA-15. Due to a sensor stability issue at Block Island, AK 9450406, the harmonic constituents and tidal datums from this station are not included in the TCARI solution.

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 Zone 8 North.

The following PPK methods were used for horizontal control:

Single Base

Vessel kinematic data were post-processed using Applanix POSPac processing software with SingleBase positioning methods as described in the DAPR. Smooth Best Estimate of Trajectory (SBET) and associated error (RMS) data were applied to all MBES data in CARIS HIPS.

For further details regarding the processing and quality control checks performed see the H12743 POSPAC Processing Logs spreadsheet located in the SBET folder with the GNSS data. See also the OPR-O190-FA-15 Horizontal and Vertical Control Report, submitted under separate cover.

The following user installed stations were used for horizontal control:

HVCR Site ID	Base Station ID
9677	Waterfall

Table 14: User Installed Base Stations

Differential correctors from the U.S. Coast Guard beacon at Gustavus (288kHz) and Annette Island (323 kHz) were used during real-time, and were the sole method of positioning of detached positions (DP) and bottom samples..

The following DGPS Stations were used for horizontal control:

DGPS Stations
Gustavus, AK (288kHz)
Annette Island, AK (323 kHz)

Table 15: USCG DGPS Stations

D. Results and Recommendations

D.1 Chart Comparison

A comparison was performed between survey H12743 and chart 17407 as well as ENC chart US5AK4DM using CARIS HIPS and SIPS sounding and contour layers derived from the 8-m combined surface. The contours and soundings were overlaid on the chart to assess differences between the surveyed and charted data. All data from H12743 should supersede charted data. In general, there are large discrepancies between all charts and ENC and the survey derived soundings; significant updating of these charts will be necessary.

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
17407	1:40000	16	12/2014	01/10/2015	12/30/2014

Table 16: Largest Scale Raster Charts

17407

A majority of the surveyed soundings of H12743 agree with the charted soundings of chart 17407 within one or two fathoms. Discrepancies do occur, however, and are described below. In nearly every case, the survey derived soundings are shoaler where a discrepancy occurs. In the deep sections of H12743, particularly in Ulloa Channel, there are differences between the chart and the survey soundings between 5-10 fathoms shoaler, see Figure 45 for an example. In shallower areas, such as north of Waterfall Resort or in Port Refugio, some survey found soundings can be found 3-6 fathoms shoaler than charted soundings (see Figure 46).

The generated 5 and 10 fathom contours from the survey are generally further inshore compared to the charted 5 and 10 fathom contours. Additionally, the survey generated contours around ridges and rocky areas have changed significantly in some areas, see Figures 47 and 48 for examples. In the southern portion of Meares Pass, a 100 fathom contour has been included to show the extended depth range in this area.

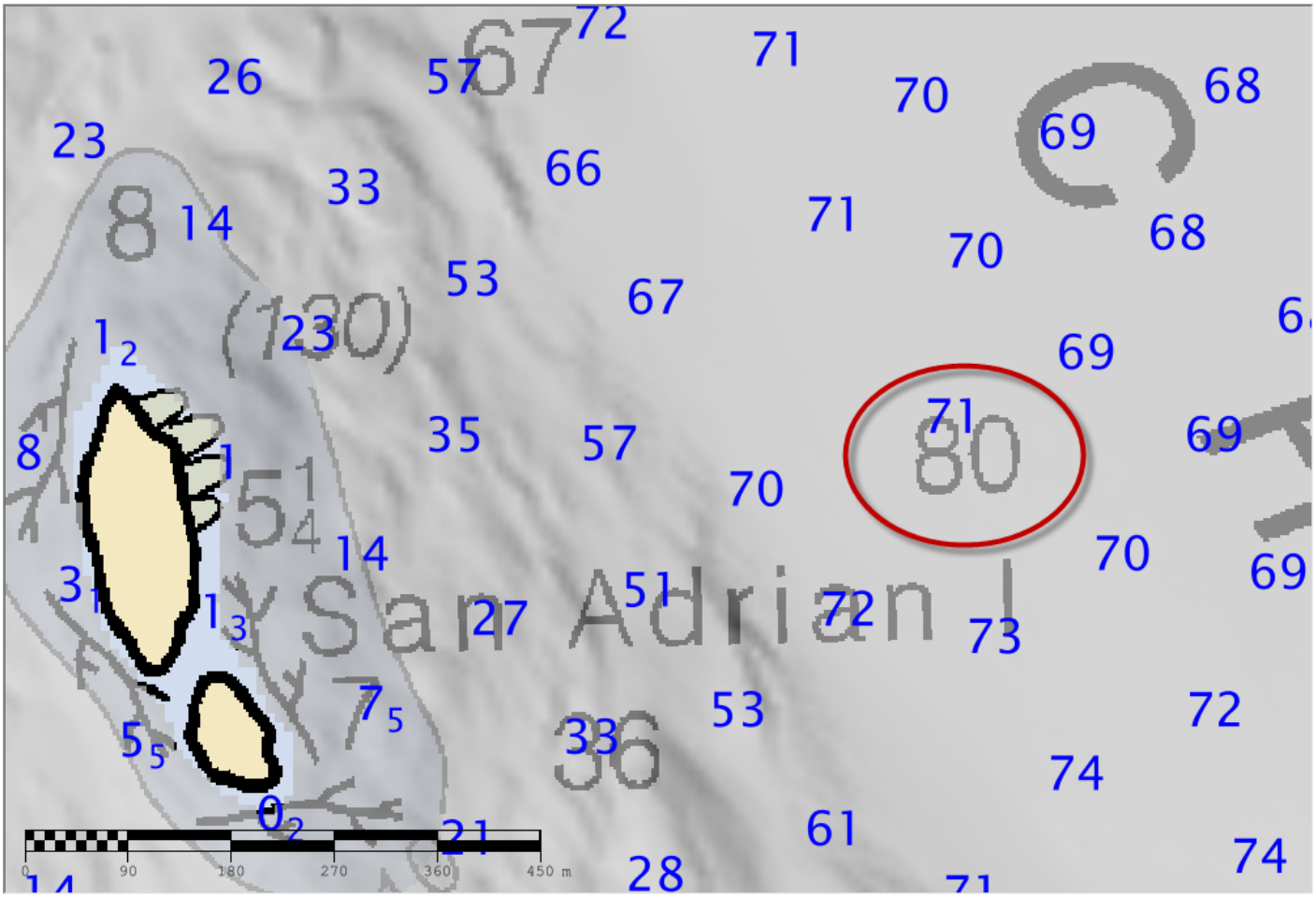


Figure 45: Disagreement Between Charted Depths (17407) and Surveyed Soundings East of San Adrian Island.

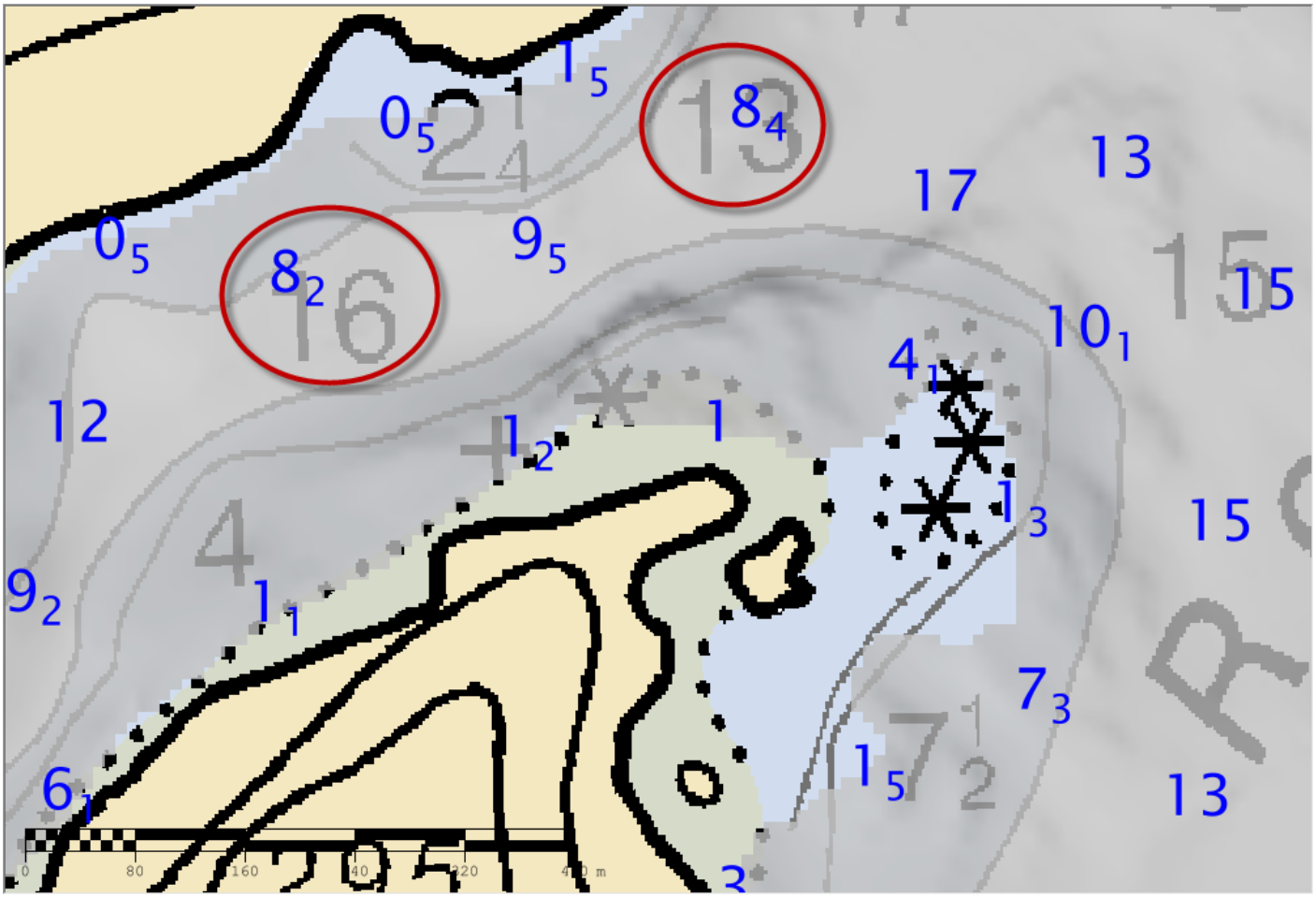


Figure 46: Disagreement Between Charted depths (17407) and Surveyed Soundings in Port Refugio.

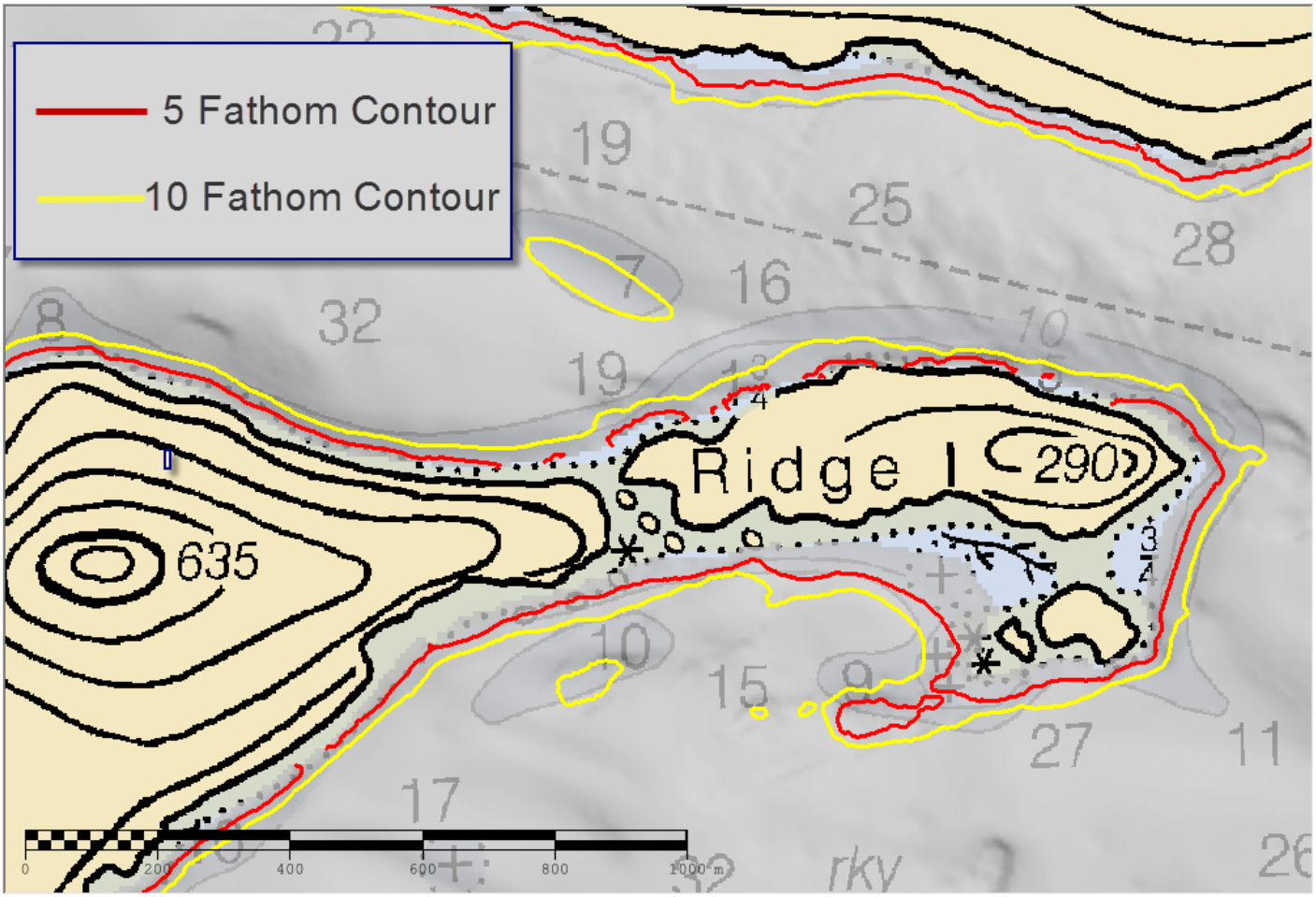


Figure 47: Disagreement Between Charted Contours (17407) and Surveyed Contours near Ridge Island.

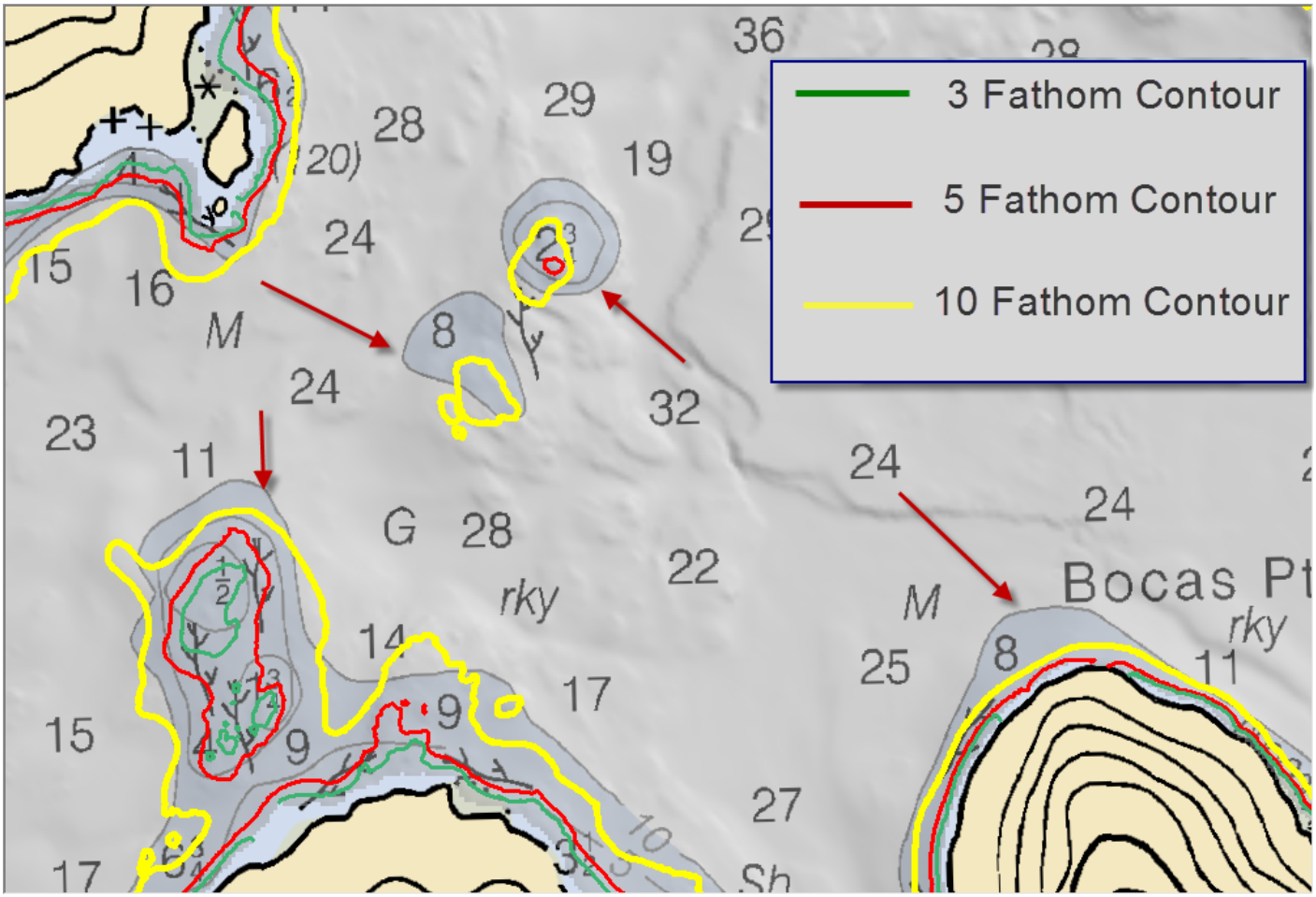


Figure 48: Disagreement Between Charted Contours (17407) and Surveyed Contours near Bocas Point.

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?
US5AK4DM	1:40000	1	03/31/2014	12/17/2014	NO

Table 17: Largest Scale ENCs

US5AK4DM

In general, a majority of the surveyed soundings of H12743 agree with the charted soundings of ENC US5AK4DM within one to three fathoms except where described below. In the deeper sections of the

survey, particularly in Ulloa Channel, there are several differences between charted and surveyed soundings ranging from 3 to 11 fathoms, see Figure 50 for an example. In shoaler areas of the survey, such as north of Waterfall Resort, the soundings agree within 5 fathoms, but are shoaler when there is a difference. Near the entrance of Port Refugio, there are several areas where the survey soundings are 10 fathoms or more deeper than charted (see Figure 49).

The charted contours on US5AK4DM closely approximate that survey generated contours, usually within 100 meters. The boarder contours around rocky areas and ridges differ from the charted contours by up to 400 meters in some cases. This is most noticeable differences occur north of Waterfall Resort, near the entrance of Port Refugio, and the ridges west of Meares Island. A 100 fathom contour line was created to show the extended depth range in Meares Pass. (See Figures 51-53)

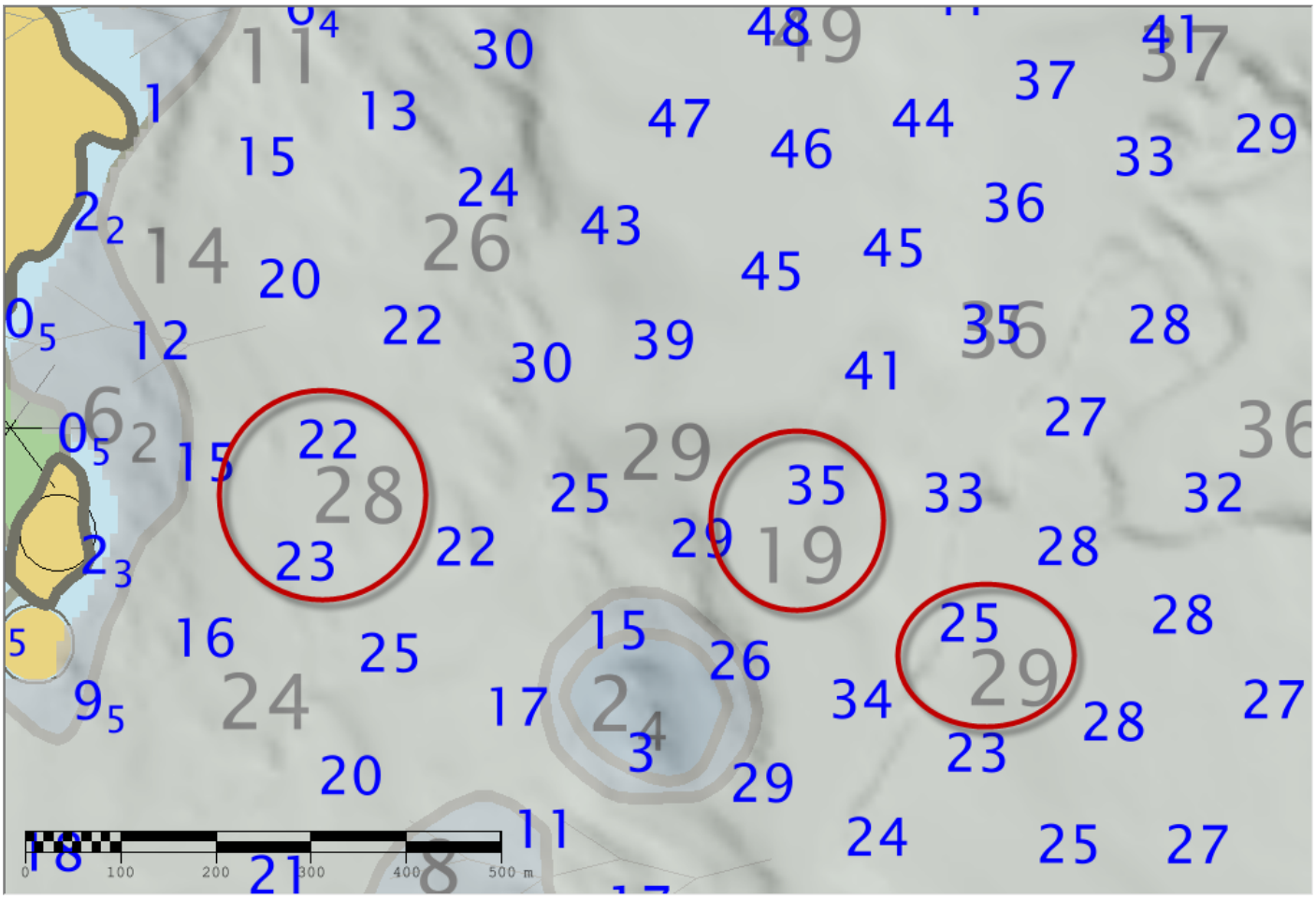


Figure 49: Disagreement Between Charted Depths (US5AK4DM) and Surveyed Soundings near the Entrance of Port Refugio.

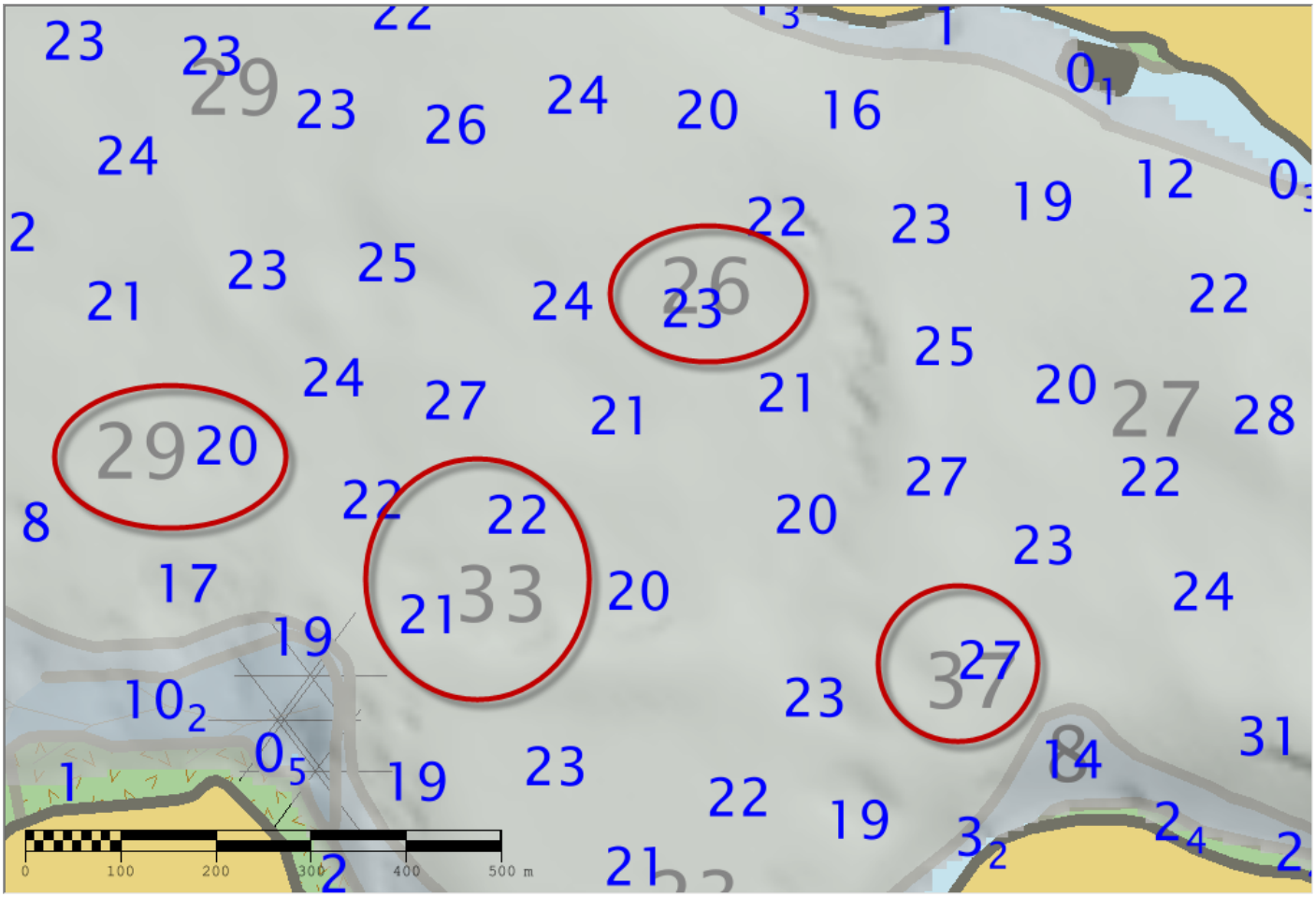


Figure 50: Disagreement Between Charted Depths (US5AK4DM) and Surveyed Soundings in the Southern area of Ulloa Channel

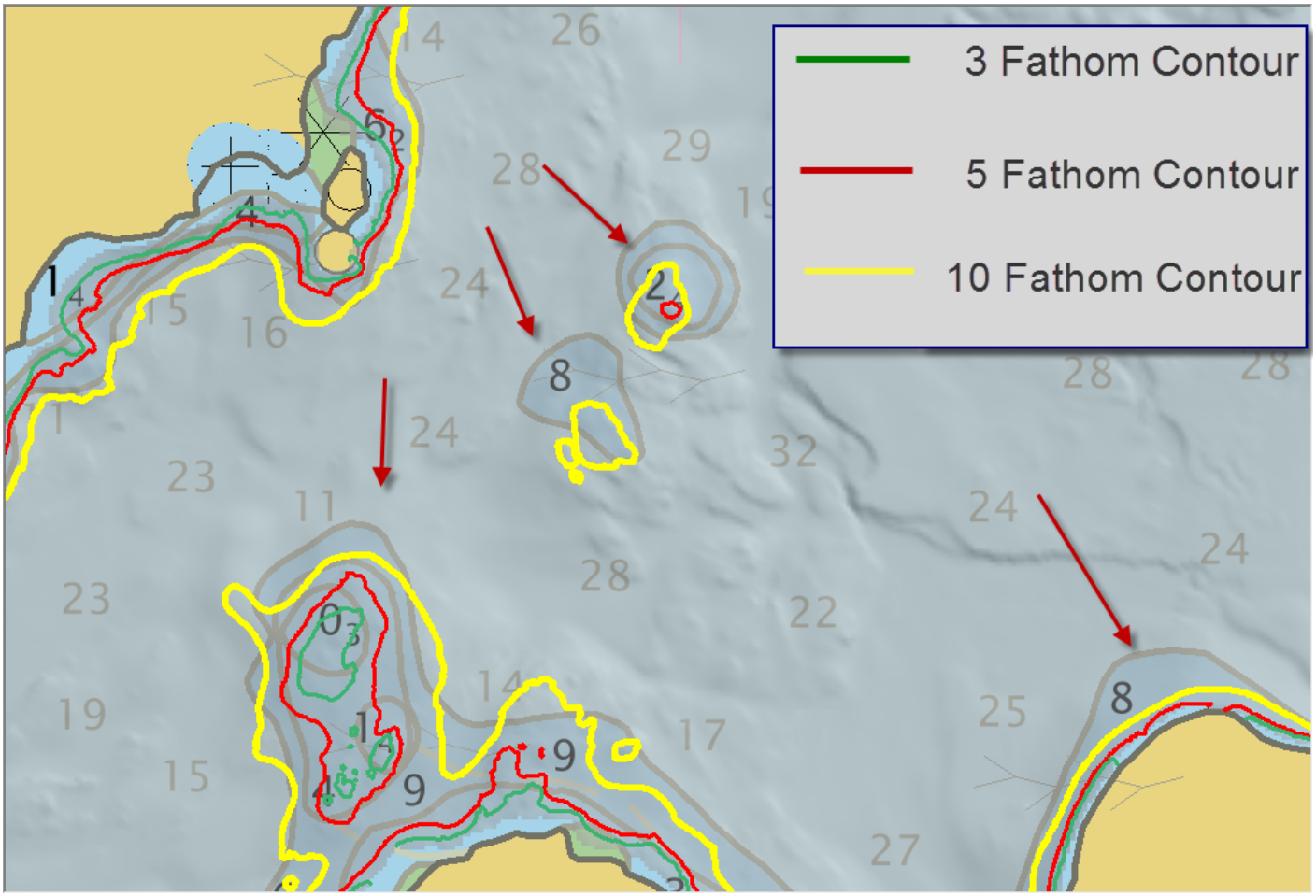


Figure 51: Disagreement Between Charted Contours (US5AK4DM) and Surveyed Contours in Port Refugio

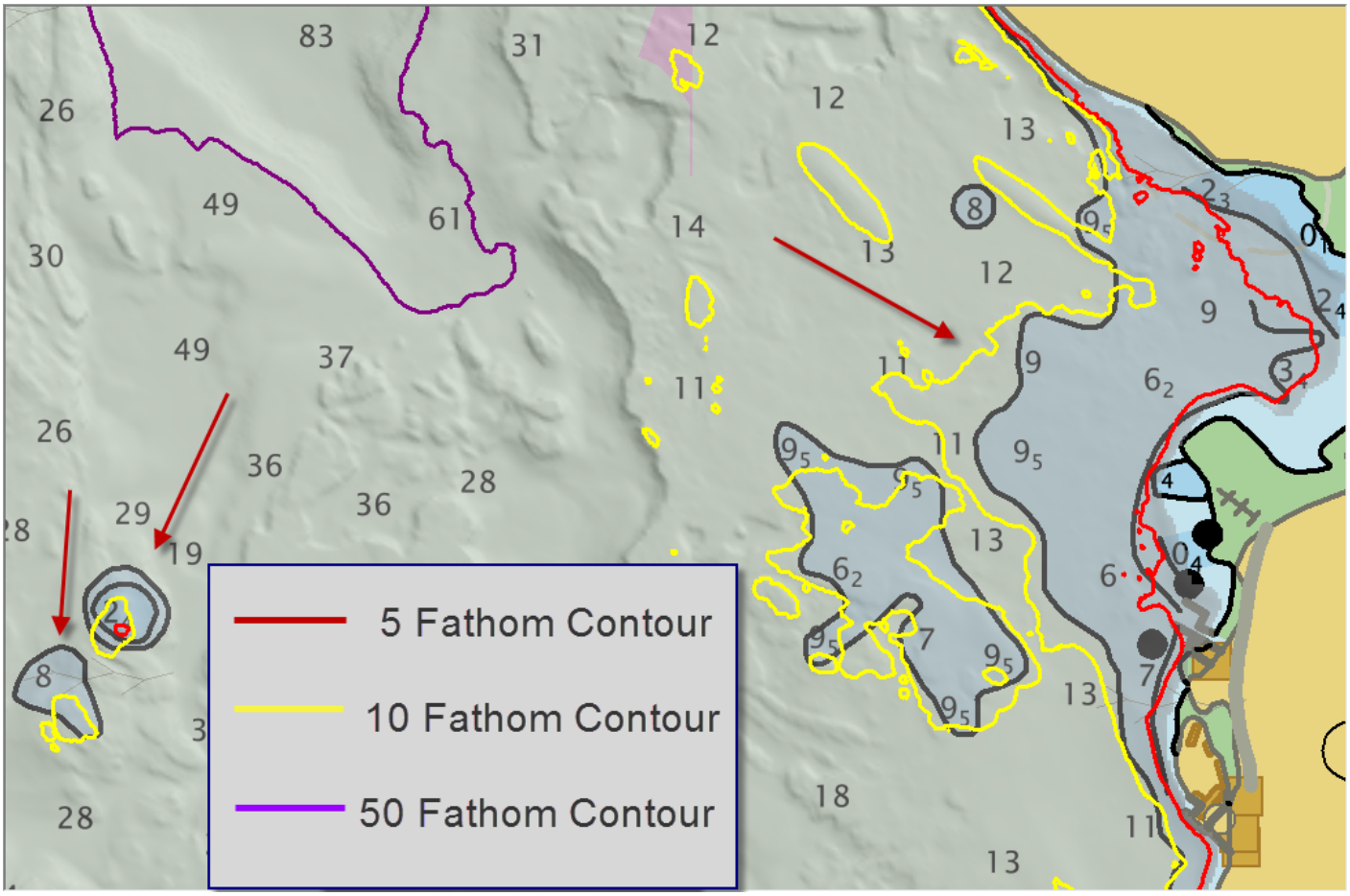


Figure 52: Disagreement Between Charted Contours (US5AK4DM) and Surveyed Contours in Ulloa Channel.

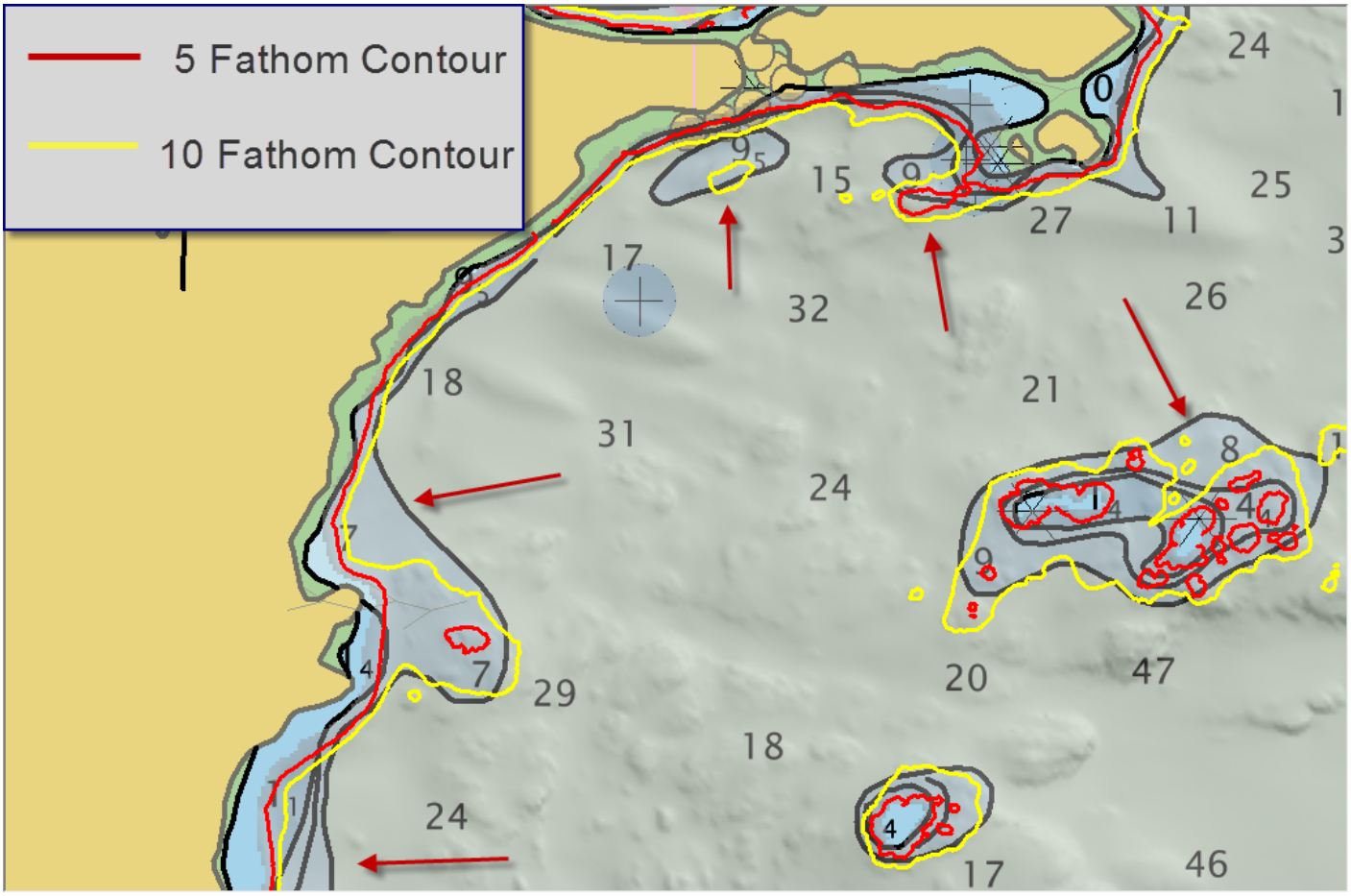


Figure 53: Disagreement Between Charted Contours (US5AK4DM) and Surveyed Contours in Meares Pass.

D.1.3 Maritime Boundary Points

No Maritime Boundary Points were assigned for this survey.

D.1.4 Charted Features

All assigned features were addressed and are included in the H12743_Final_Feature_File.

D.1.5 Uncharted Features

Survey H12743 has 18 new features that are addressed in the H12743_Final_Feature_File. Four of these features are the DTONs described in section D.1.6. Seventeen new uncharted piles and two new uncharted dolphins were found in the area of Waterfall Resort. One pile feature in the final feature file is described as the northern most pile in a row of eleven. These rows are immediately north of Waterfall Resort's southern most pier as charted (See Figure 54). An new obstruction was attributed north of Waterfall Resort where two cylindrical objects are submerged next to each other (See Figure 55). A new anchorage area was attributed in Port Refugio where locals suggest for anchoring and S220 confirmed to be good holding bottom. This

new anchorage was also added to the H12743 Coast Pilot updates. Two weed/ kelp areas were attributed in the Survey H12743 in the northern reaches of Meares Pass. Also, a new rock feature was attributed in the southern end of Ulloa Channel south west of Pt San Antonio. More information can be found in the detached position forms located in Separates_ I Acquisition & Processing Logs or the Final Feature File.

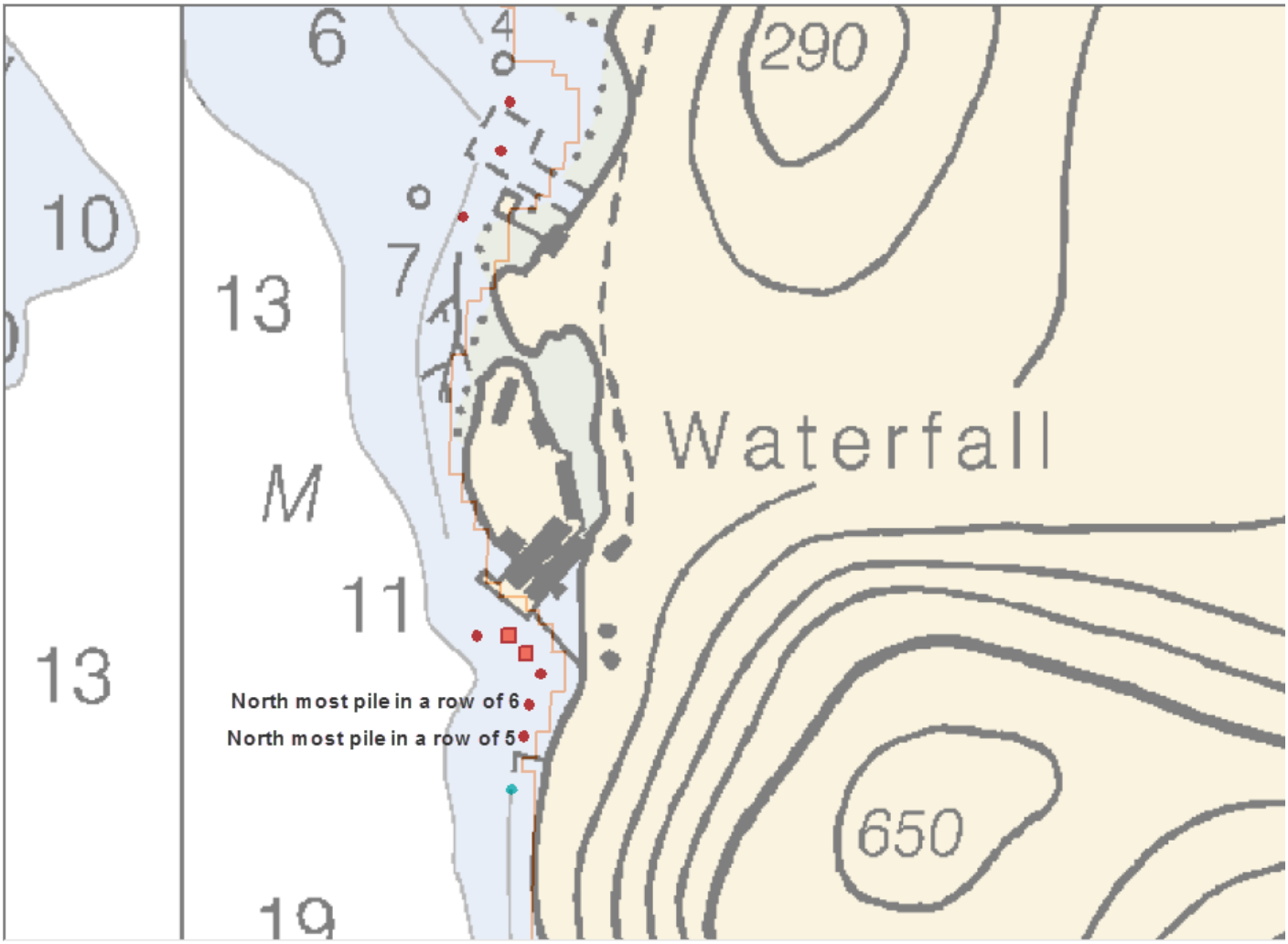


Figure 54: H12743 Uncharted Piles and Dolphins (highlighted) near Waterfall Resort

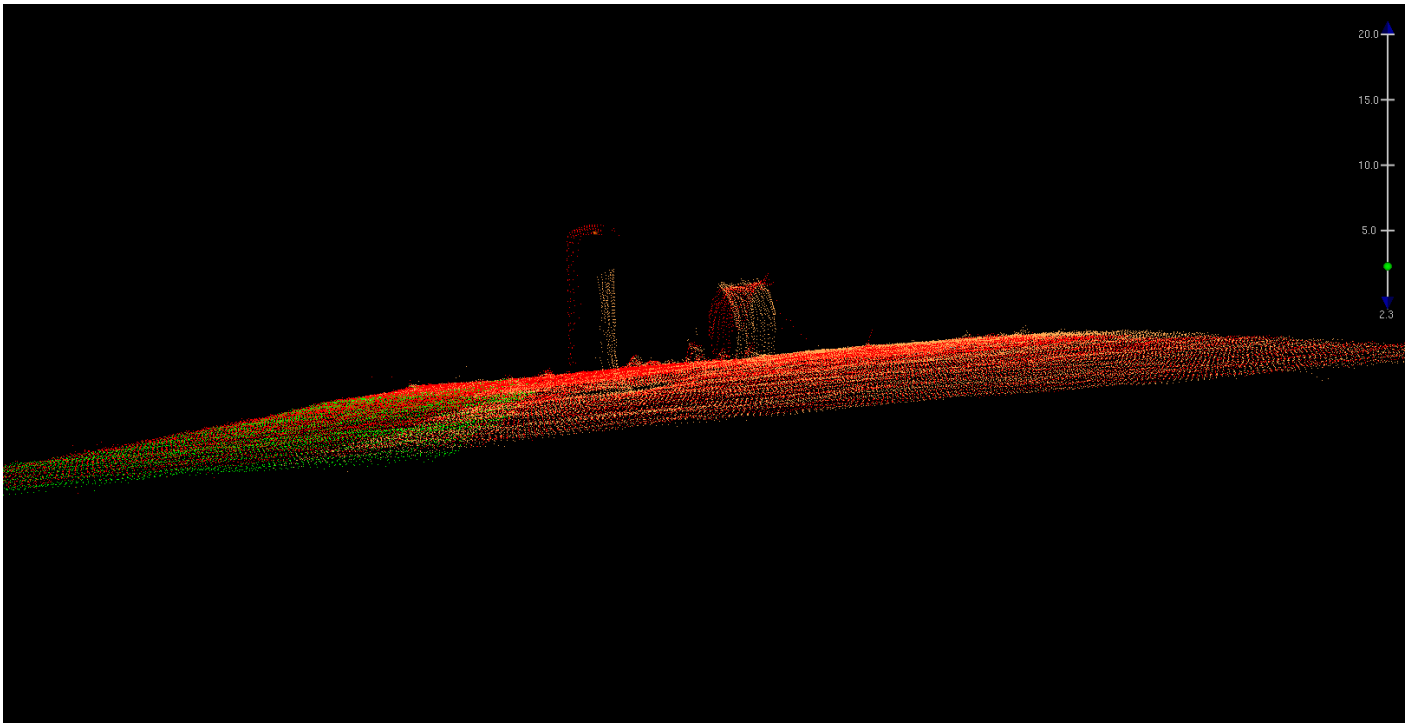


Figure 55: New Obstructions North of Waterfall Resort

D.1.6 Dangers to Navigation

The following DTON reports were submitted:

DTON Report Name	Date Submitted
H12743 Danger to Navigation Report	2015-11-10

Table 18: DTON Reports

Four Dangers to Navigation were found within the limits of Survey H12743, and were all reported to the Marine Chart Division on 10 November 2015. These DTONs have been placed on the most recent version of the Chart 17407. The Danger to Navigation Reports are included in Appendix III of this report.

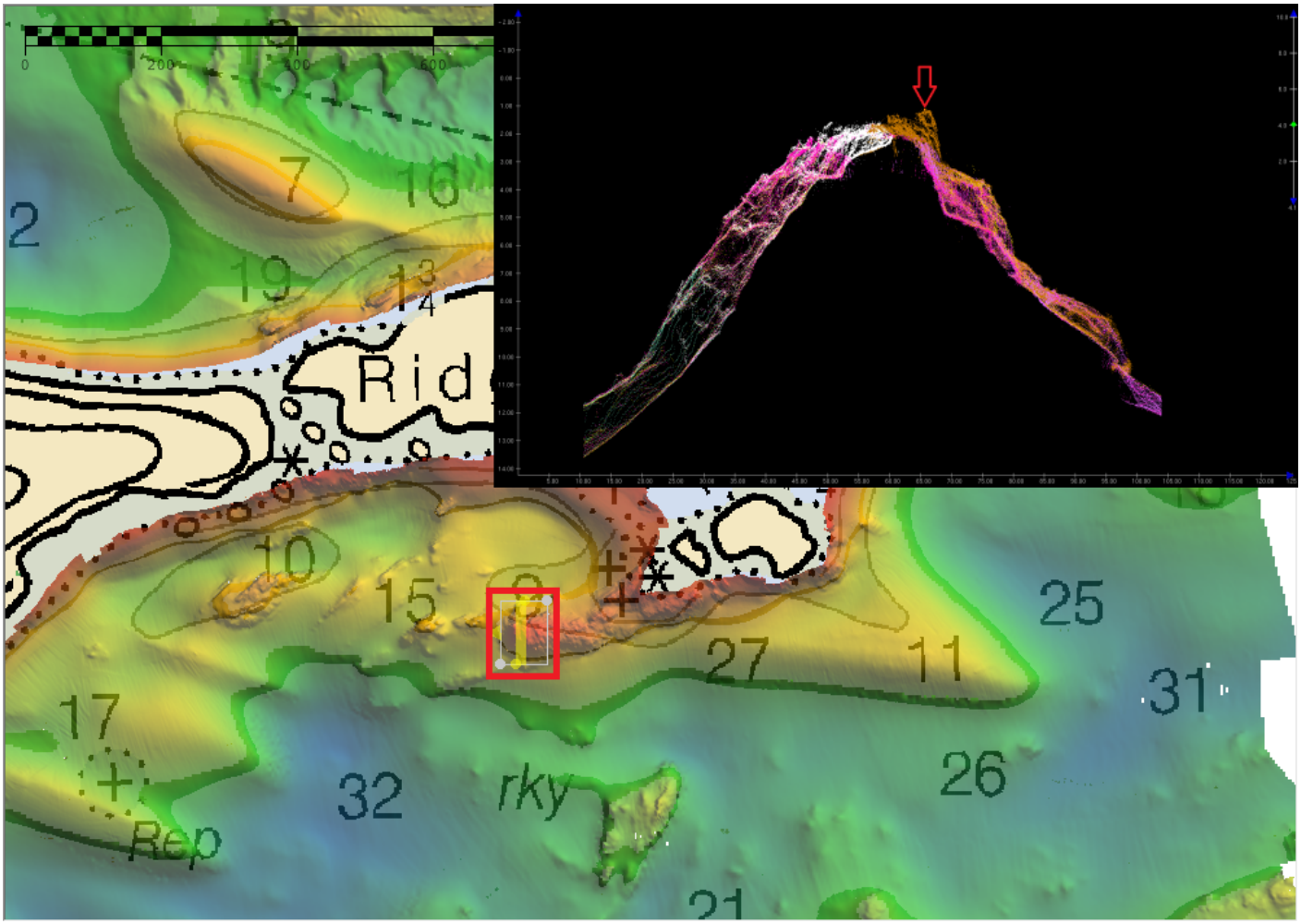


Figure 56: H12743 DTON 1 Ridge Island

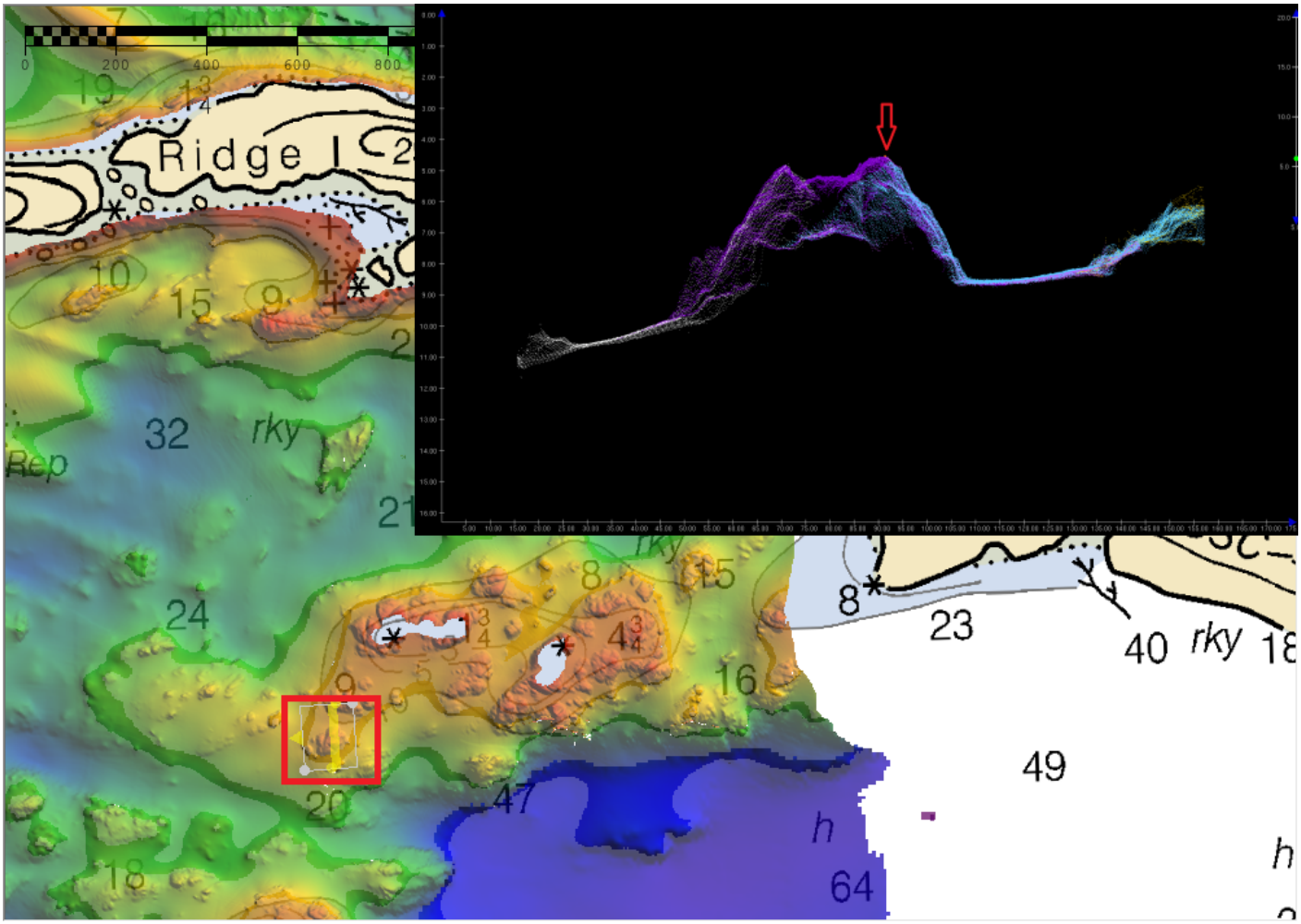


Figure 57: H12743 DTON 2 Meares Pass

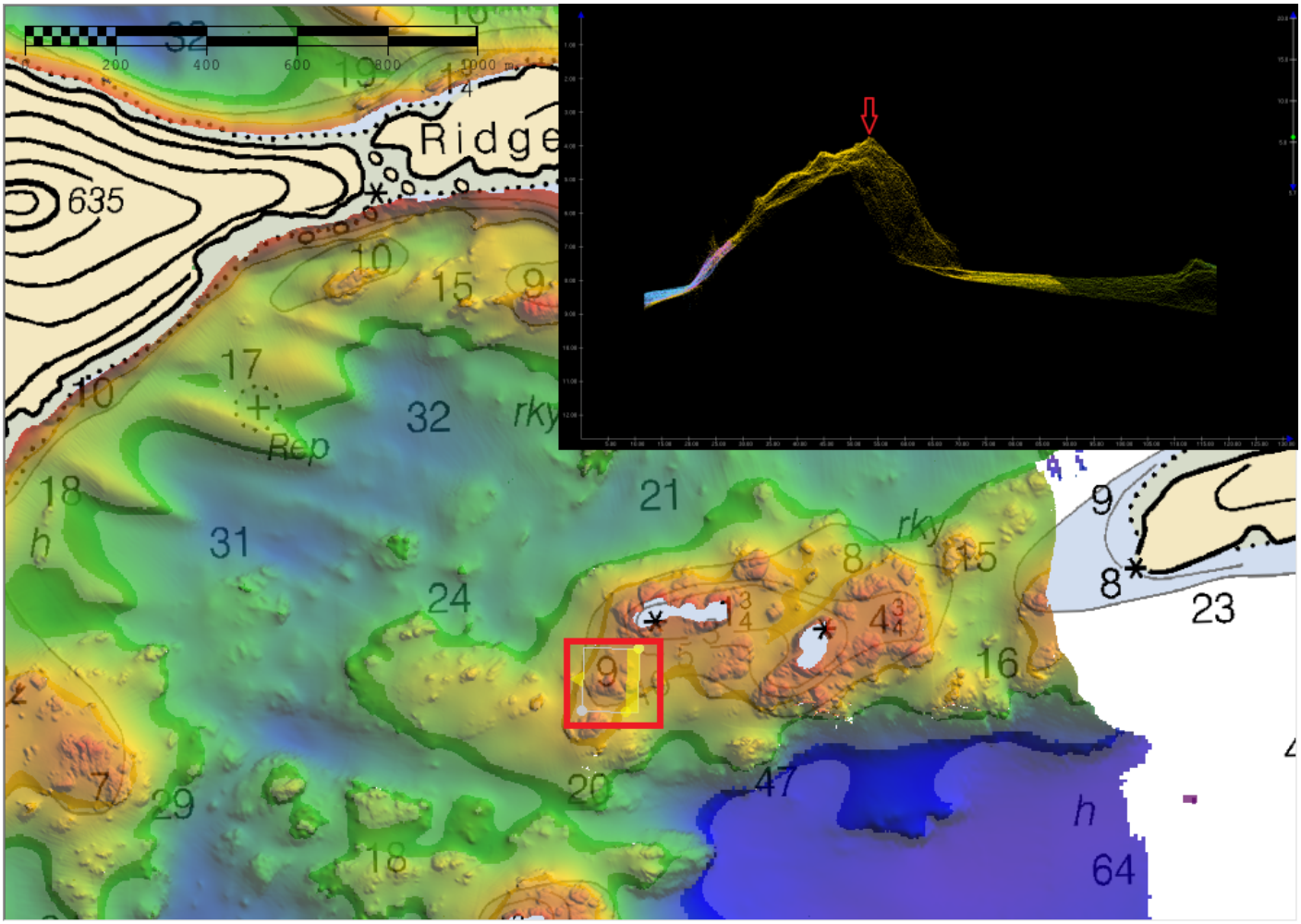


Figure 58: H12743 DTON 3 Meares Pass

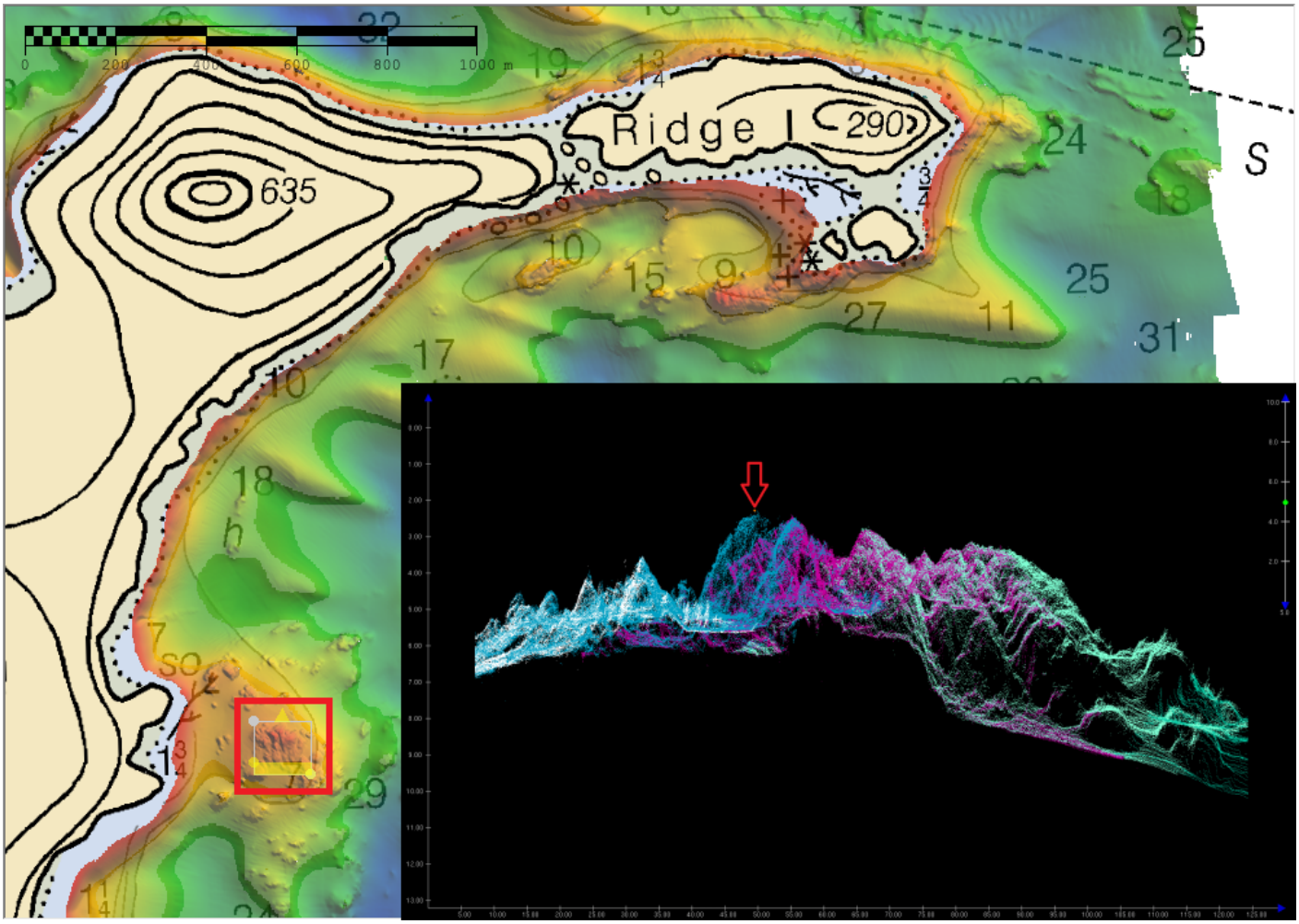


Figure 59: H12743 DTON 4 West Meares Pass

D.1.7 Shoal and Hazardous Features

No shoals or potentially hazardous features exist for this survey.

D.1.8 Channels

No maintained 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.1.9 Bottom Samples

Twelve bottom samples were acquired in accordance with the Project Instructions for survey H12743. All bottom samples were entered in the H12743 Final Feature File.

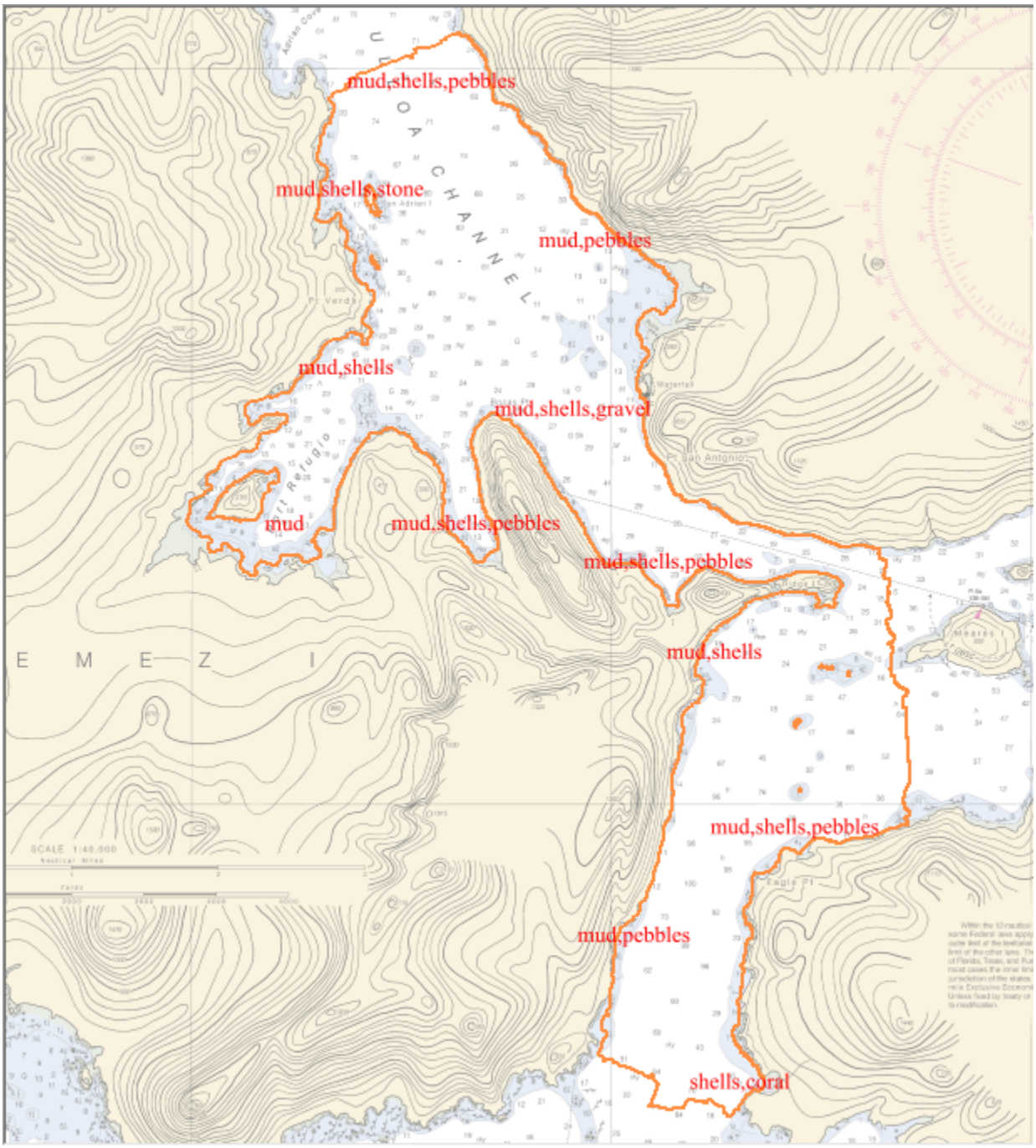


Figure 60: H12743 Bottom Samples

D.2 Additional Results

D.2.1 Shoreline

FAIRWEATHER personnel conducted limited shoreline verification and reconnaissance at times near predicted negative or low tides within the survey limits. Due to the lack of day time low tide windows

while FAIRWEATHER was at the survey location, specific shore line acquisition and verification did not occur. Hydrographers were supplied with shore line specific boat sheets so that features could be confirmed to exist visually or lines could be run to develop submerged features at high tide by MBES. These boat sheets are located in the Separates I_Acquisition & Processing Logs folder. Annotations, information, and diagrams collected on DP forms and boat sheets during field operations are scanned and included in the digital Separates I_ Acquisition & Processing Logs folder.

D.2.2 Prior Surveys

Prior survey comparisons exist for this survey, but were not investigated.

D.2.3 Aids to Navigation

No Aids to navigation (ATONs) exist for this survey.

D.2.4 Overhead Features

No overhead features exist for this survey.

D.2.5 Submarine Features

No submarine features 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

No present or planned construction or dredging exist within the survey limits.

D.2.10 New Survey Recommendation

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

D.2.11 Inset Recommendation

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, 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.

Report Name	Report Date Sent
Data Acquisition and Processing Report	2016-04-21
Horizontal and Vertical Control Report	2016-05-05
Tides and Water Levels Package	2015-11-20
Coast Pilot Report	2016-05-03

Approver Name	Approver Title	Approval Date	Signature
CDR David J. Zezula, NOAA	Chief of Party	05/14/2016	ZEZULA.DAVID.J.1097241836 2016.05.17 08:31:04 -08'00'
LT Matthew Forney, NOAA	Field Operations Officer	05/14/2016	Digitally signed by FORNEY.MATTHEW.MICHAEL.1365213409 Date: 2016.05.17 05:04:32 -08'00'
HCST Douglas Bravo	Chief Survey Technician	05/14/2016	Douglas Bravo 2016.05.17 00:57:01 -08'00'
ENS Patrick Debroisse, NOAA	Sheet Manager	05/14/2016	DEBROISSE.PATRICK.JOSEPH.1501248670 2016.05.17 01:40:32 -07'00'

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
TPE	Total Propagated 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 : February 29, 2016

HYDROGRAPHIC BRANCH: Pacific
HYDROGRAPHIC PROJECT: OPR-O190-FA-2015
HYDROGRAPHIC SHEET: H12743

LOCALITY: San Adrian Island to Diver Point, South Prince of Wales, AK
TIME PERIOD: September 24 - November 08, 2015

TIDE STATION USED: 945-1054 Port Alexander, AK
Lat.56° 14.8′ N Long. 134° 38.8' W
PLANE OF REFERENCE (MEAN LOWER LOW WATER): 0.000 meters
HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 3.070 meters

REMARKS: RECOMMENDED GRID

Please use the TCARI grid "O190FA2015_Final.tc" as the final grid for project OPR-O190-FA-2015, Registry No. H12741, during the time period between September 24 and November 08, 2015.

Refer to attachments for grid information.

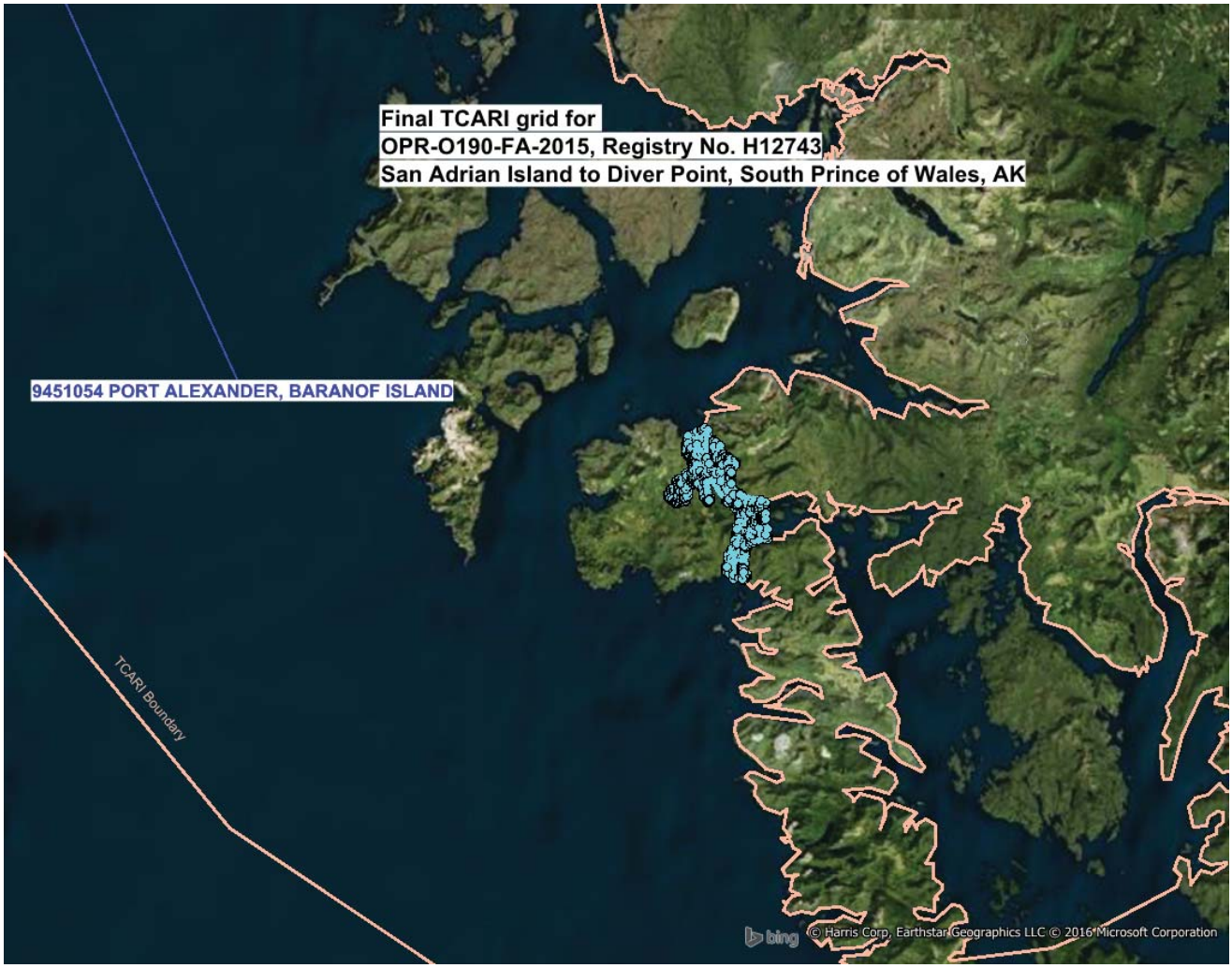
Note 1: Provided time series data are tabulated in metric units (meters), relative to MLLW and on Greenwich Mean Time on the 1983-2001 National Tidal Datum Epoch (NTDE).

Note 2: Due to a sensor stability issue at Block Island, AK 9450406, the harmonic constituents and tidal datums from this station are not included in the TCARI solution. It should be noted that the TCARI error model underestimates the error in the area around Block Island.

MICHALSKI.MICHAEL.PAUL.1280465174

Digitally signed by MICHALSKI.MICHAEL.PAUL.1280465174
DN: c=US, o=U.S. Government, ou=DoD, ou=PKI, ou=OTHER, cn=MICHALSKI.MICHAEL.PAUL.1280465174
Date: 2016.03.11 15:23:59 -05'00'

CHIEF, PRODUCTS AND SERVICES BRANCH


Final TCARI grid for
OPR-O190-FA-2015, Registry No. H12743
San Adrian Island to Diver Point, South Prince of Wales, AK
9451054 PORT ALEXANDER, BARANOF ISLAND
TCARI Boundary
bing
© Harris Corp, Earthstar Geographics LLC © 2016 Microsoft Corporation

Patrick Debroisse - NOAA Federal <patrick.j.debroisse@noaa.gov>

OPR-O190-FA-15 Prince Of Wales Modified Depth Ranges (H12742, H12743, H12744)

2 messages

Douglas Bravo - NOAA Federal <ChiefST.fairweather@noaa.gov> Sun, May 8, 2016 at 9:49 AM
To: Michael Gonsalves - NOAA Federal <Michael.Gonsalves@noaa.gov>
Cc: Matthew Forney - NOAA Federal <Matthew.Forney@noaa.gov>, _NOS OCS HSD OPS <HSD.OPS@noaa.gov>, _OMAO MOP OPS Fairweather <OPS.Fairweather@noaa.gov>, "ChiefST.Fairweather" <ChiefST.Fairweather@noaa.gov>, Patrick Debroisse - NOAA Federal <Patrick.J.Debroisse@noaa.gov>, Megan Greenaway - NOAA Federal <Megan.Greenaway@noaa.gov>, Charles Wilkins - NOAA Federal <Charles.E.Wilkins@noaa.gov>, Corey Allen - NOAA Federal <Corey.Allen@noaa.gov>, Grant Froelich - NOAA Federal <Grant.Froelich@noaa.gov>, John Doroba - NOAA Federal <John.Doroba@noaa.gov>, Martha Herzog - NOAA Federal <martha.herzog@noaa.gov>, "co. fairweather" <CO.Fairweather@noaa.gov>

Mike,

Fairweather would like to request permission to adjust the depth ranges of the higher resolution surfaces (1m, 2m, and 4m) deeper to cover gaps in their junctions caused by steep slopes.

1m	0-26m
2m	18-56m
4m	36-104m

All surfaces still meet the NOAA density and uncertainty requirements for their expanded ranges.

Douglas Bravo
Chief Survey Technician
NOAA Ship Fairweather (S-220)
1010 Stedman St
Ketchikan, AK 99901
Ship Cell: 907-254-2842
Iridium: 808-659-0054
Cell: 360-4501622
ChiefST.Fairweather@noaa.gov

On Thu, Nov 12, 2015 at 11:35 AM, Matthew Forney - NOAA Federal <Matthew.Forney@noaa.gov> wrote:

> Thanks Megan,
>
> We will ensure that the 16m areas meet the 8m Density and uncertainty requirements.
>
> V/R,
> Matt
>
> LT Matthew Forney
> Operations Officer
> NOAA Ship *Fairweather*
> 1010 Stedman Street
> Ketchikan, Alaska 99901

Cell: 907-254-2842
Iridium: 808-659-0054
Personal Cell: 513-235-5328

On Thu, Nov 12, 2015 at 10:52 AM, Megan Greenaway - NOAA Federal <megan.greenaway@noaa.gov> wrote:

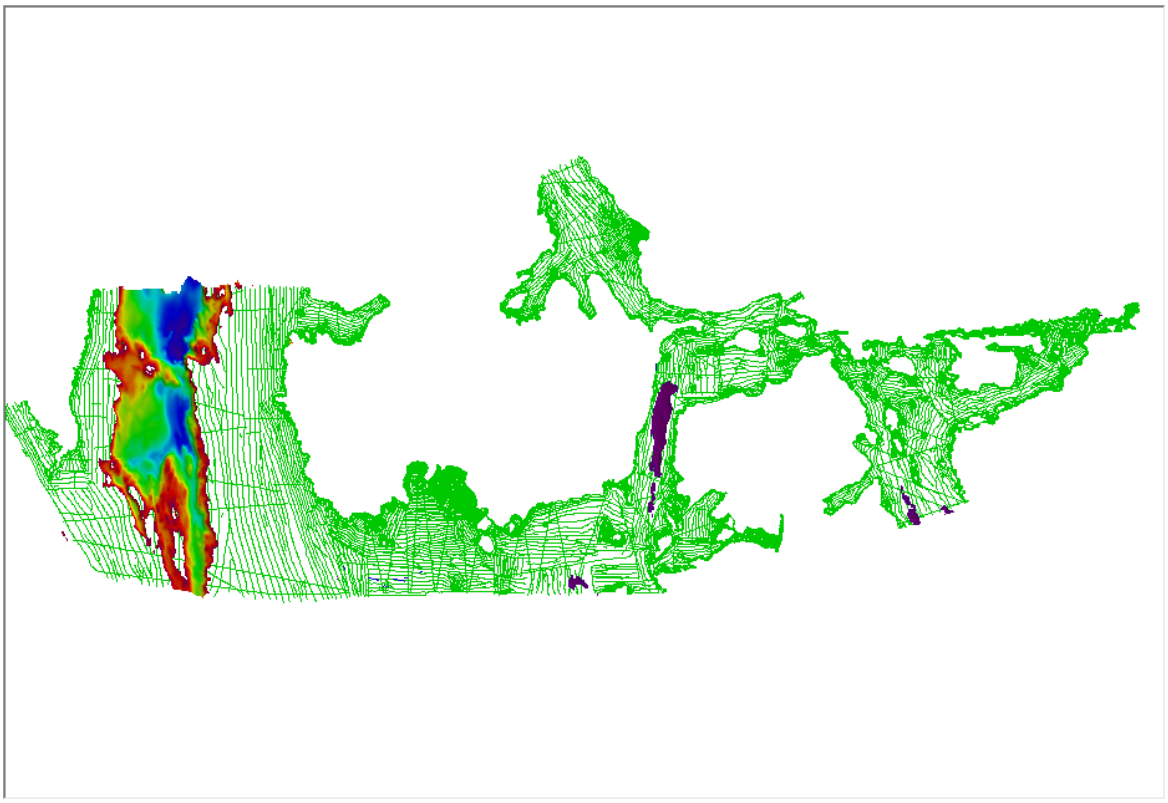
Matt,
Are you certain you can meet the 8m density and uncertainty requirements for those depths? If so, HSD OPS and PHB will grant the waiver to include the areas mentioned below (on sheets 2, 3, & 4 (H12742, H12743, & H12744) in the 8m depth range surface rather than a 16m depth range surface.

If not, then you must create the 16m resolution surface.
Megan

On Wed, Nov 11, 2015 at 4:22 PM, Matthew Forney - NOAA Federal <matthew.forney@noaa.gov> wrote:

Good Afternoon Megan,

We are requesting permission to waive the requirement for a 16m resolution surface on Sheets 2, 3, & 4 (H12742, H12743, & H12744, Respectively). Due to the very small area present in the respective sheet limits, we would like to include those areas within the 8m depth range. The deepest part is within all three of these surveys is about 185m. On sheet 1 (H12741), we would like to retain the 16m surface requirement. See the attached graphic depicting the areas discussed above. The rainbow color is the 16m from Sheet 1 which we want to keep, and the areas of purple are the areas that we would like to include in the 8m surface.



Please do not hesitate to contact me with any questions or concerns. In addition, please respond to this email with a ya or nay so we can include it in our correspondence for the affected sheets.

I appreciate your consideration on this matter.

V/R,
Matt

LT Matthew Forney
Operations Officer
NOAA Ship *Fairweather*
1010 Stedman Street
Ketchikan, Alaska 99901

Cell: 907-254-2842
Iridium: 808-659-0054
Personal Cell: 513-235-5328

--

Megan Greenaway - NOAA Federal <megan.greenaway@noaa.gov> Mon, May 9, 2016 at 10:04 AM
To: Douglas Bravo - NOAA Federal <ChiefST.fairweather@noaa.gov>
Cc: Michael Gonsalves - NOAA Federal <Michael.Gonsalves@noaa.gov>, Matthew Forney - NOAA Federal <Matthew.Forney@noaa.gov>, _NOS OCS HSD OPS <HSD.OPS@noaa.gov>, _OMAO MOP OPS Fairweather <OPS.Fairweather@noaa.gov>, Patrick Debroisse - NOAA Federal <Patrick.J.Debroisse@noaa.gov>, Charles Wilkins - NOAA Federal <Charles.E.Wilkins@noaa.gov>, Corey Allen - NOAA Federal <Corey.Allen@noaa.gov>, Grant Froelich - NOAA Federal <Grant.Froelich@noaa.gov>, John Doroba - NOAA Federal <John.Doroba@noaa.gov>, Martha Herzog - NOAA Federal <martha.herzog@noaa.gov>, "co. fairweather" <CO.Fairweather@noaa.gov>

FA,
HSD OPS approves and will grant the FA permission to adjust the depth ranges as described below for OPR-O190-FA 15. Please include this email correspondence in the project correspondence folder.
Megan
[Quoted text hidden]

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SERVICE
Office of Coast Survey
Silver Spring, Maryland 20910-3282

November 19, 2015 HTD 2015-04

MEMORANDUM FOR: Distribution

FROM: Captain Eric W. Berkowitz , NOAA
Chief, Hydrographic Surveys Division

SUBJECT: Hydrographic Technical Directive 2015-04

TITLE: Revision of Feature Flagging Guidance in 2015 HSSD

EFFECTIVE DATE: November 19, 2015

SECTION 1. PURPOSE

This policy change permits field units to flag line and area objects using the NOAA S-57 Extended Attribute *descrp* = "Update" when extents are redefined by bathymetry, e.g. ledges, reefs, or foul areas. The current HSSD requirement is to flag modified features as "Delete", and create a "New" feature with modified geometry. Use of the "update" flag in place of the current practice of duplicating features to create separate "delete" and "new" features will reduce the number of objects in the Final Feature File and simplifies comunicating changes to charted area and line features.

SECTION 2. POLICY

This HTD modifies the direction in the "NOAA Mandatory and Conditional Attribution" table on page 142 of Section 8.2 of the 2015 HSSD. Under this revised policy, field units are permitted to flag line and area features as "Update" when geometric extents have been redefined by bathymetry. Extensive changes to line and area features by means of flaging a feature as "Delete" and creating a "New" feature in its place is still permissible.

The decision to update an existing feature rather than flag the original "Delete" and create a new feature in its place should be driven by the extent of the proposed change to the feature and is left to the the discretion of the hydrographer.

The usage of the Remarks field shall be used to communicate intent. For example, a revised ledge remarks could read:

Update: "Extents of charted ledge revised per bathymetry"
Delete: "Charted ledge disproved"
New: "New ledge"

Note that this HTD does not affect the treatment of point features. Point features with a new position shall continue to be addressed using the "New/Delete" method as prescribed in the HSSD.

SECTION 3. RESPONSIBILITIES

HSD Operations Branch to maintain HTD until change has been reviewed during the 2016 HSSD update cycle.

SECTION 4. GENERAL

(Not applicable)

SECTION 5. EFFECT ON OTHER ISSUANCES

This Directive revises section 8.2 'S-57 Format Features Deliverables' of the April 2015 NOS Hydrographic Surveys Specifications and Deliverables.

Please contact Katrina Wyllie (katrina.wyllie@noaa.gov), HSD Operations Branch, with any questions or comments concerning this Directive.

Distribution:
(1) Hydrographic Surveys Division
(2) NOAA Ship *Rainier*
(3) NOAA Ship *Fairweather*
(4) NOAA Ship *Thomas Jefferson*
(5) NOAA Ship *Ferdinand Hassler*
(6) Chief, Navigation Services Division
(7) C&C Technologies
(8) David Evans and Associates
(9) eTrac
(10) Fugro
(11) Leidos
(12) Ocean Surveys
(13) TerraSond
(14) Williamson and Associates

H12743 Danger to Navigation Report

Registry Number: H12743
State: Alaska
Locality: South Prince of Wales
Sub-locality: San Adrian Island to Diver Point
Project Number: OPR-O190-FA-15
Survey Dates: 20150924 - 20151104

Charts Affected

Number	Edition	Date	Scale (RNC)	RNC Correction(s)*
17407	15th	11/01/2003	1:40,000 (17407_1)	[L]NTM: ?
17400	17th	03/01/2007	1:229,376 (17400_1)	[L]NTM: ?
16016	21st	10/01/2007	1:969,756 (16016_1)	[L]NTM: ?
531	24th	07/01/2007	1:2,100,000 (531_1)	[L]NTM: ?
500	8th	06/01/2003	1:3,500,000 (500_1)	[L]NTM: ?
501	12th	11/01/2002	1:3,500,000 (501_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	AWOIS Item
1.1	Rock	1.96 m	55° 16' 18.1" N	133° 12' 44.2" W	---
1.2	Rock	8.21 m	55° 15' 48.6" N	133° 12' 37.6" W	---
1.3	Rock	6.79 m	55° 15' 51.1" N	133° 12' 35.6" W	---
1.4	Rock	4.10 m	55° 15' 47.5" N	133° 13' 42.0" W	---

1 - Dangers To Navigation

1.1) 167/167

DANGER TO NAVIGATION

Survey Summary

Survey Position:	55° 16' 18.1" N, 133° 12' 44.2" W
Least Depth:	1.96 m (= 6.43 ft = 1.072 fm = 1 fm 0.43 ft)
TPU (±1.96σ):	**THU (TPEh)** ±0.981 m ; **TVU (TPEv)** ±0.515 m
Timestamp:	2015-285.19:48:14.340 (10/12/2015)
Survey Line:	h12743 / fa_2807_400khz_7125_512bms_2015 / 2015-285 / 2015m_2851948
Profile/Beam:	167/167
Charts Affected:	17407_1, 17400_1, 16016_1, 531_1, 500_1, 501_1, 530_1, 50_1

Remarks:

Predicted water levels applied

Feature Correlation

Source	Feature	Range	Azimuth	Status
2015m_2851948	167/167	0.00	000.0	Primary

Hydrographer Recommendations

Chart rock using survey soundings.

Cartographically-Rounded Depth (Affected Charts):

1fm (17407_1, 17400_1, 16016_1, 530_1)

1fm 0ft (531_1)

1.9m (500_1, 501_1, 50_1)

S-57 Data

Geo object 1:	Underwater rock / awash rock (UWTROC)
Attributes:	EXPSOU - 2:shoaler than range of depth of the surrounding depth area
	QUASOU - 6:least depth known
	SORDAT - 20151104
	SORIND - US,US,graph,H12743

TECSOU - 3:found by multi-beam

VALSOU - 1.960 m

WATLEV - 3:always under water/submerged

Feature Images

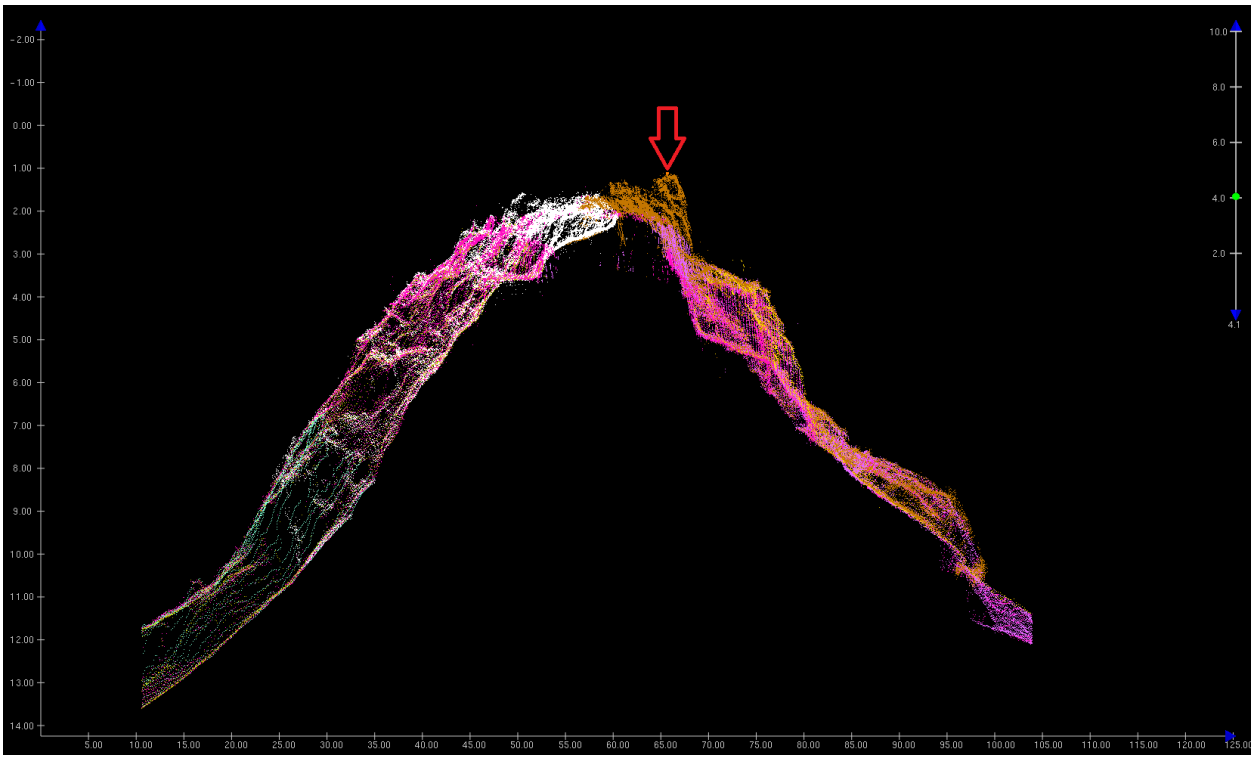


Figure 1.1.1

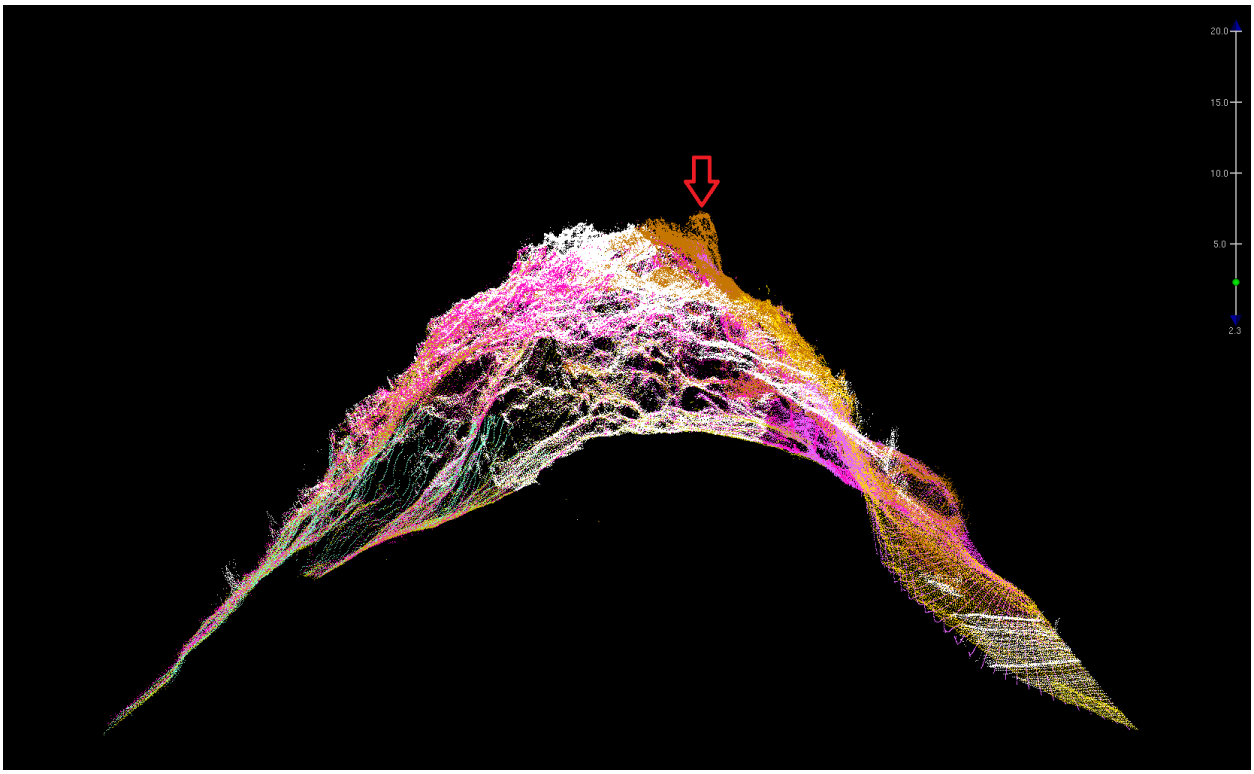


Figure 1.1.2

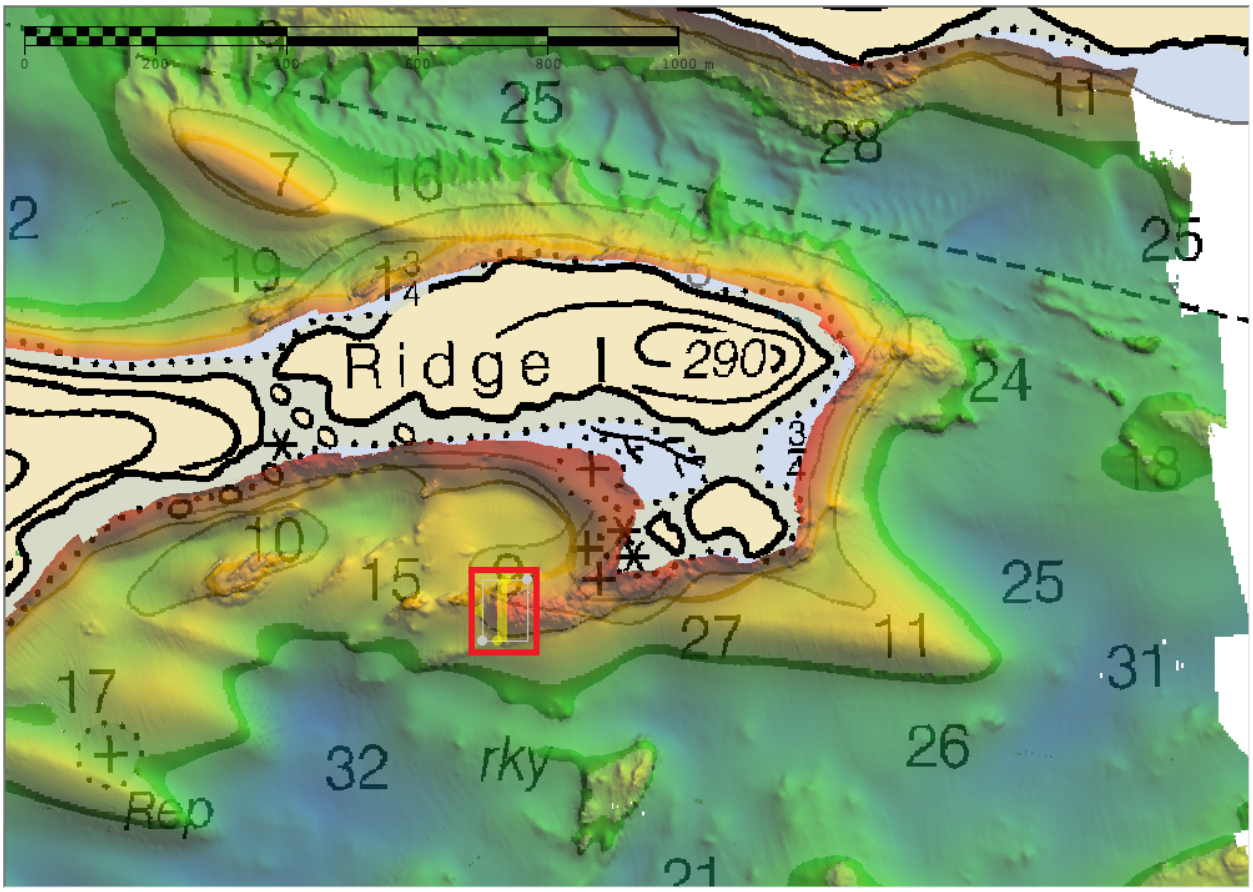

0
200
400
600
800
1000 m
25
28
11
7
16
2
25
19
13
4
Ridge I
290
24
18
10
15
25
27
11
31
17
32
rky
26
Rep
21

Figure 1.1.3

1.2) 96/506

DANGER TO NAVIGATION

Survey Summary

Survey Position:	55° 15' 48.6" N, 133° 12' 37.6" W
Least Depth:	8.21 m (= 26.92 ft = 4.487 fm = 4 fm 2.92 ft)
TPU (±1.96σ):	**THU (TPEh)** ±0.990 m ; **TVU (TPEv)** ±0.523 m
Timestamp:	2015-286.17:53:49.027 (10/13/2015)
Survey Line:	h12743 / fa_2807_400khz_7125_512bms_2015 / 2015-286 / 2015m_2861753
Profile/Beam:	96/506
Charts Affected:	17407_1, 17400_1, 16016_1, 531_1, 500_1, 501_1, 530_1, 50_1

Remarks:

Predicted water levels applied

Feature Correlation

Source	Feature	Range	Azimuth	Status
2015m_2861753	96/506	0.00	000.0	Primary

Hydrographer Recommendations

Chart rock using survey soundings.

Cartographically-Rounded Depth (Affected Charts):

4 ½fm (17407_1, 17400_1, 16016_1, 530_1)

4fm 3ft (531_1)

8.2m (500_1, 501_1, 50_1)

S-57 Data

Geo object 1:	Underwater rock / awash rock (UWTROC)
Attributes:	EXPSOU - 2:shoaler than range of depth of the surrounding depth area
	QUASOU - 6:least depth known
	SORDAT - 20151104
	SORIND - US,US,graph,H12743

TECSOU - 3:found by multi-beam

VALSOU - 8.205 m

WATLEV - 3:always under water/submerged

Feature Images

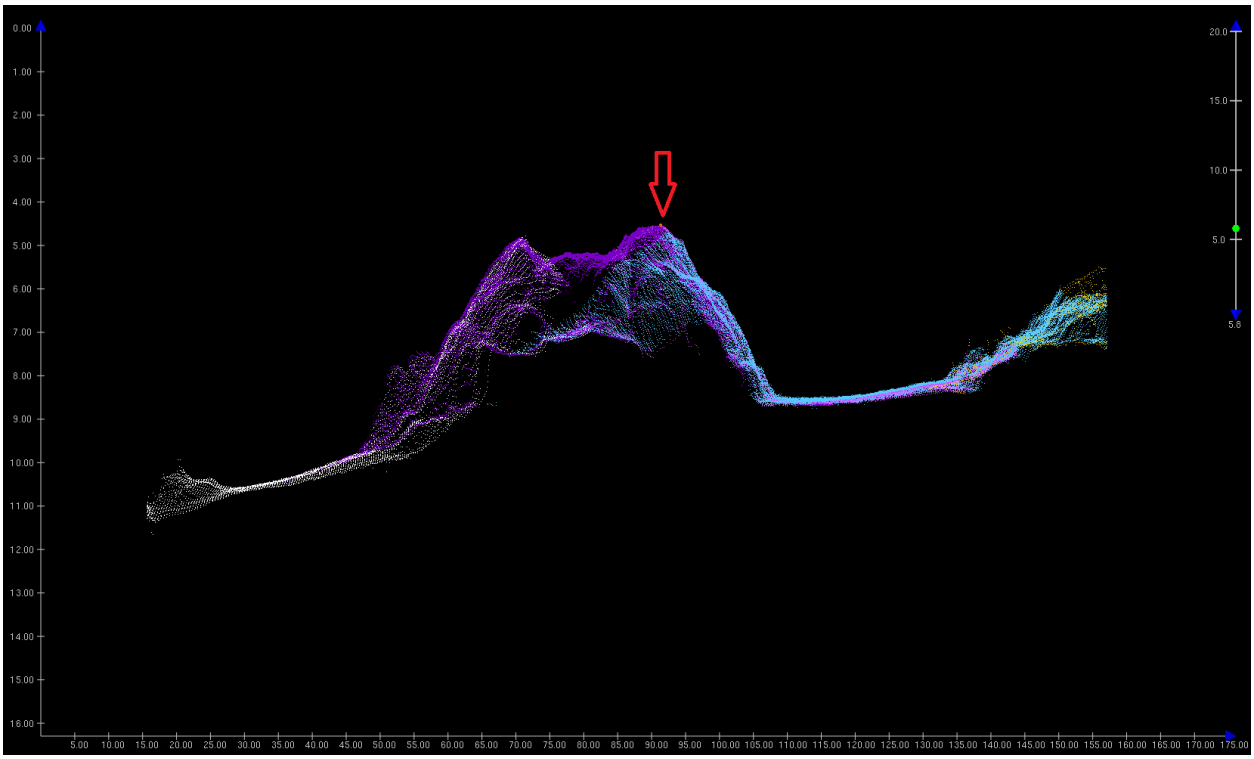


Figure 1.2.1

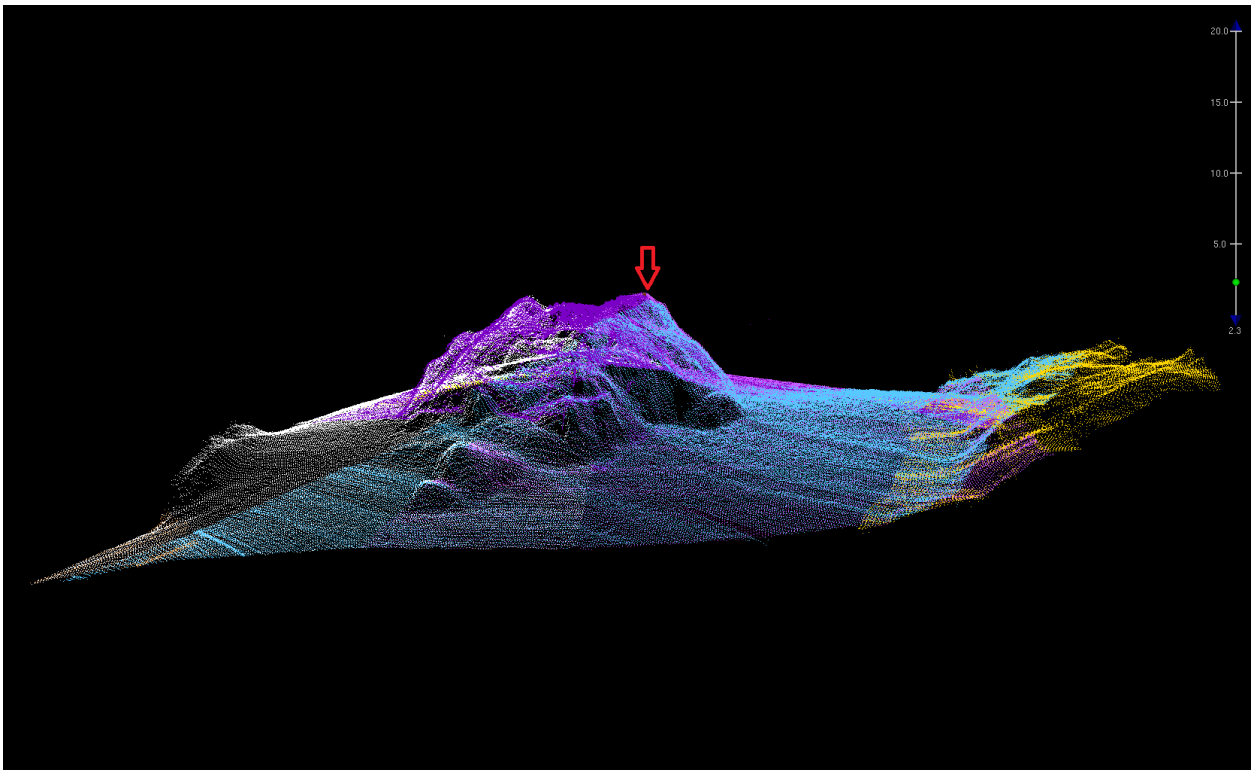


Figure 1.2.2

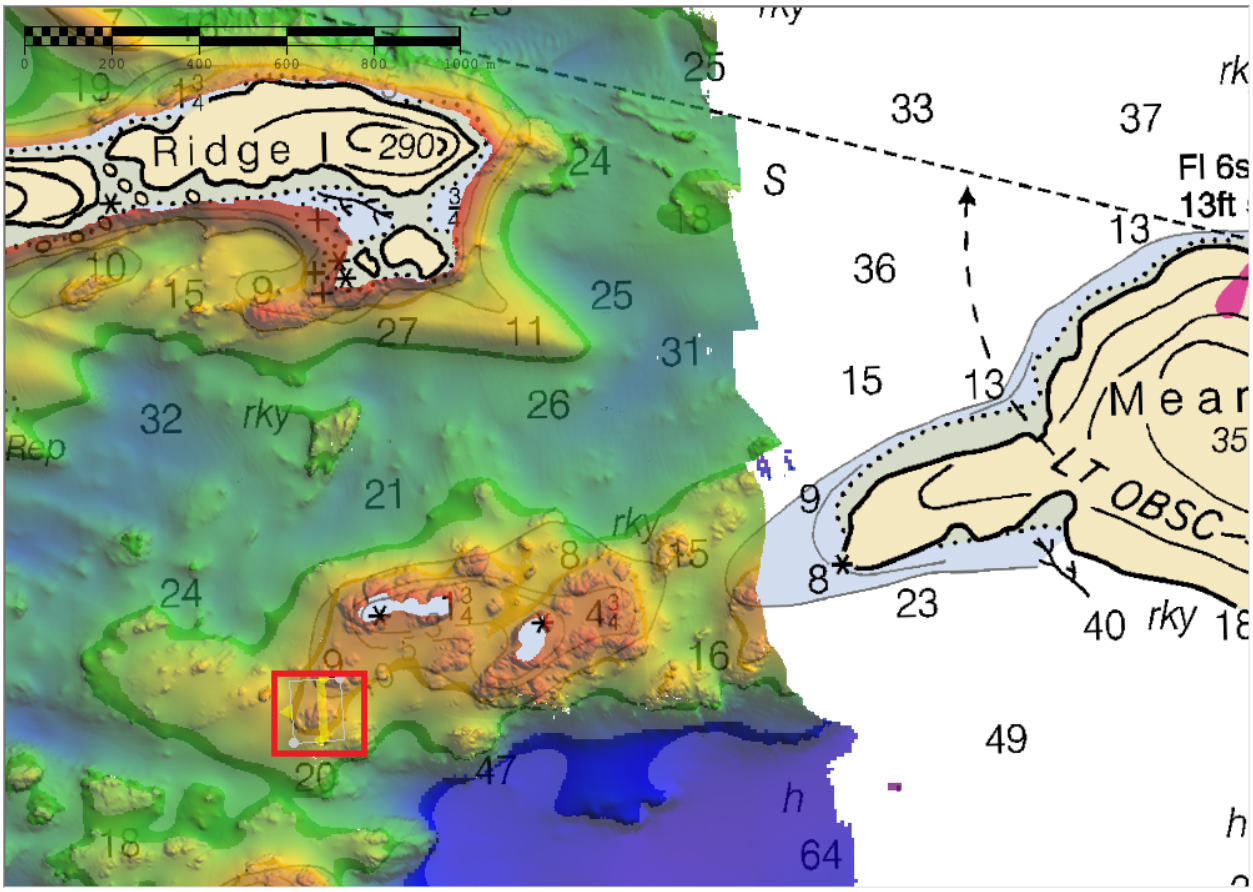


Figure 1.2.3

1.3) 365/121

DANGER TO NAVIGATION

Survey Summary

Survey Position:	55° 15' 51.1" N, 133° 12' 35.6" W
Least Depth:	6.79 m (= 22.28 ft = 3.713 fm = 3 fm 4.28 ft)
TPU (±1.96σ):	**THU (TPEh)** ±0.982 m ; **TVU (TPEv)** ±0.531 m
Timestamp:	2015-271.20:34:23.774 (09/28/2015)
Survey Line:	h12743 / fa_2805_200khz_7125_256bms_2015 / 2015-271 / 2015m_2712033
Profile/Beam:	365/121
Charts Affected:	17407_1, 17400_1, 16016_1, 531_1, 500_1, 501_1, 530_1, 50_1

Remarks:

Predicted water levels applied

Feature Correlation

Source	Feature	Range	Azimuth	Status
2015m_2712033	365/121	0.00	000.0	Primary

Hydrographer Recommendations

Chart rock using survey soundings.

Cartographically-Rounded Depth (Affected Charts):

3 ¾fm (17407_1, 17400_1, 16016_1, 530_1)

3fm 4ft (531_1)

6.8m (500_1, 501_1, 50_1)

S-57 Data

Geo object 1:	Underwater rock / awash rock (UWTROC)
Attributes:	EXPSOU - 2:shoaler than range of depth of the surrounding depth area
	QUASOU - 6:least depth known
	SORDAT - 20151104
	SORIND - US,US,graph,H12743

TECSOU - 3:found by multi-beam

VALSOU - 6.791 m

WATLEV - 3:always under water/submerged

Feature Images

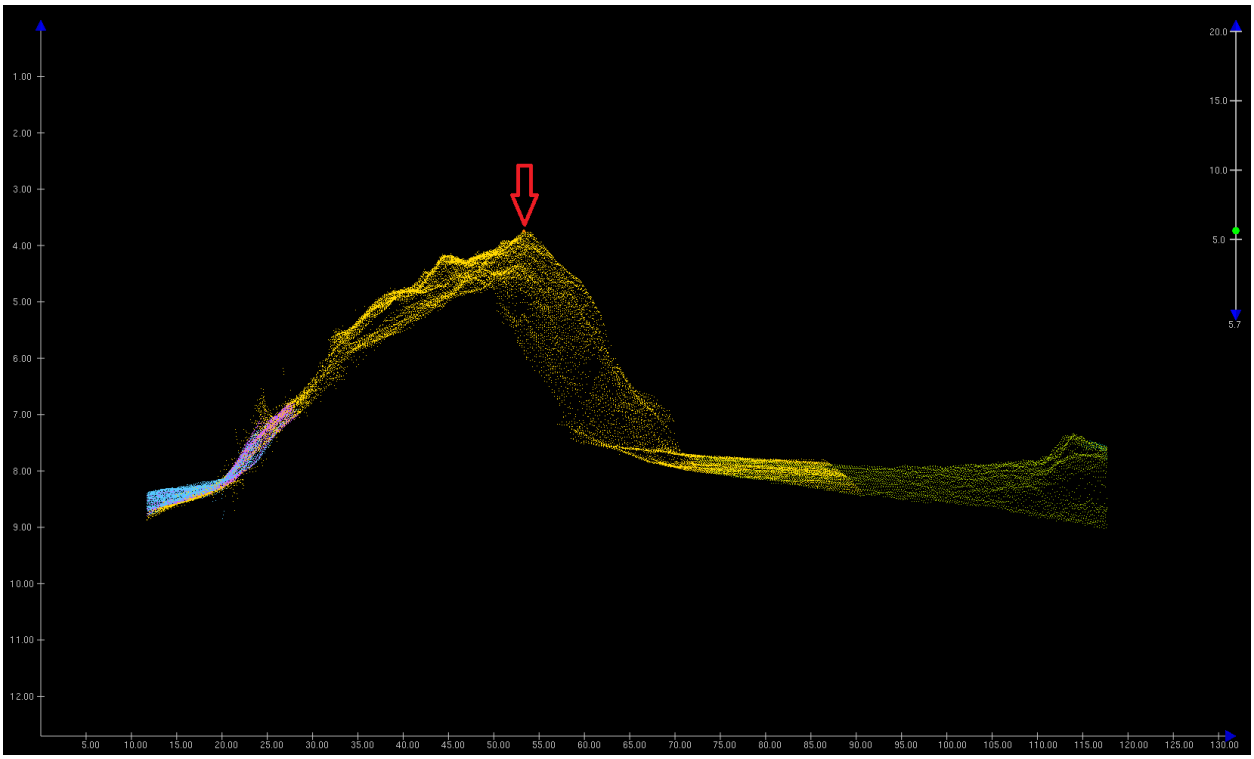


Figure 1.3.1

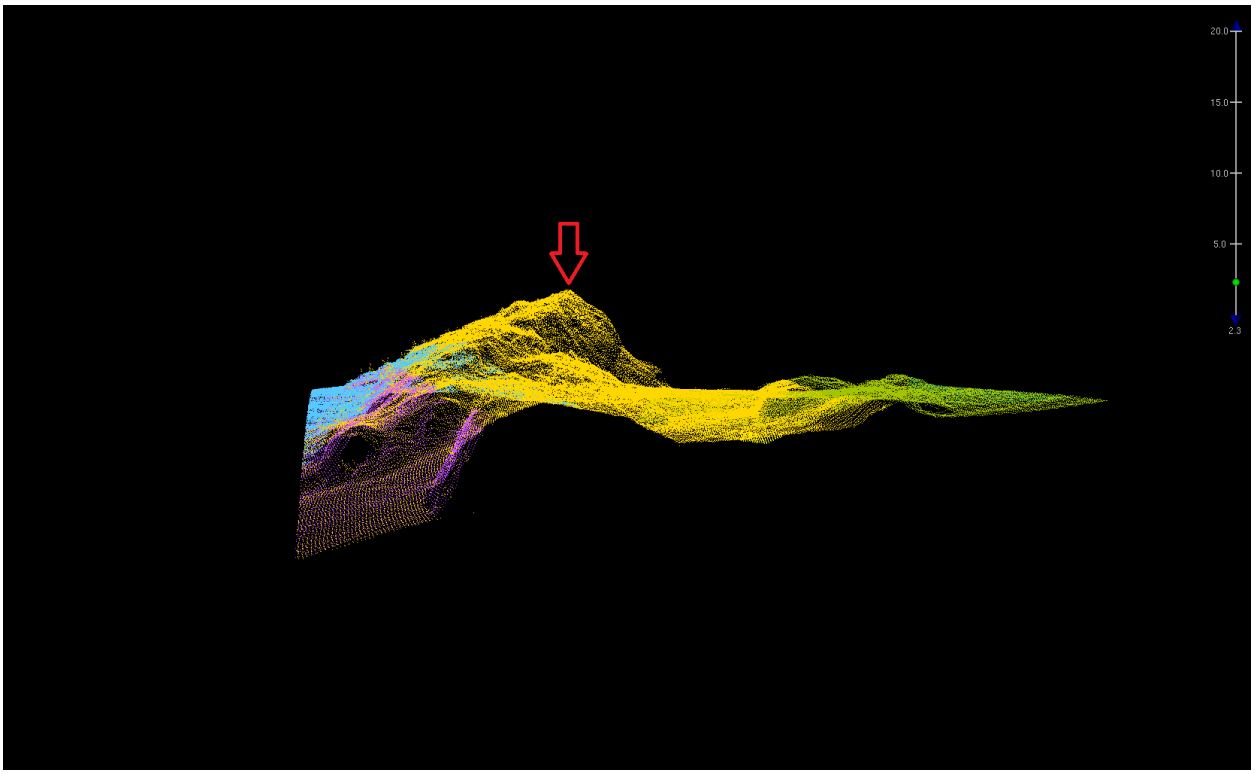


Figure 1.3.2

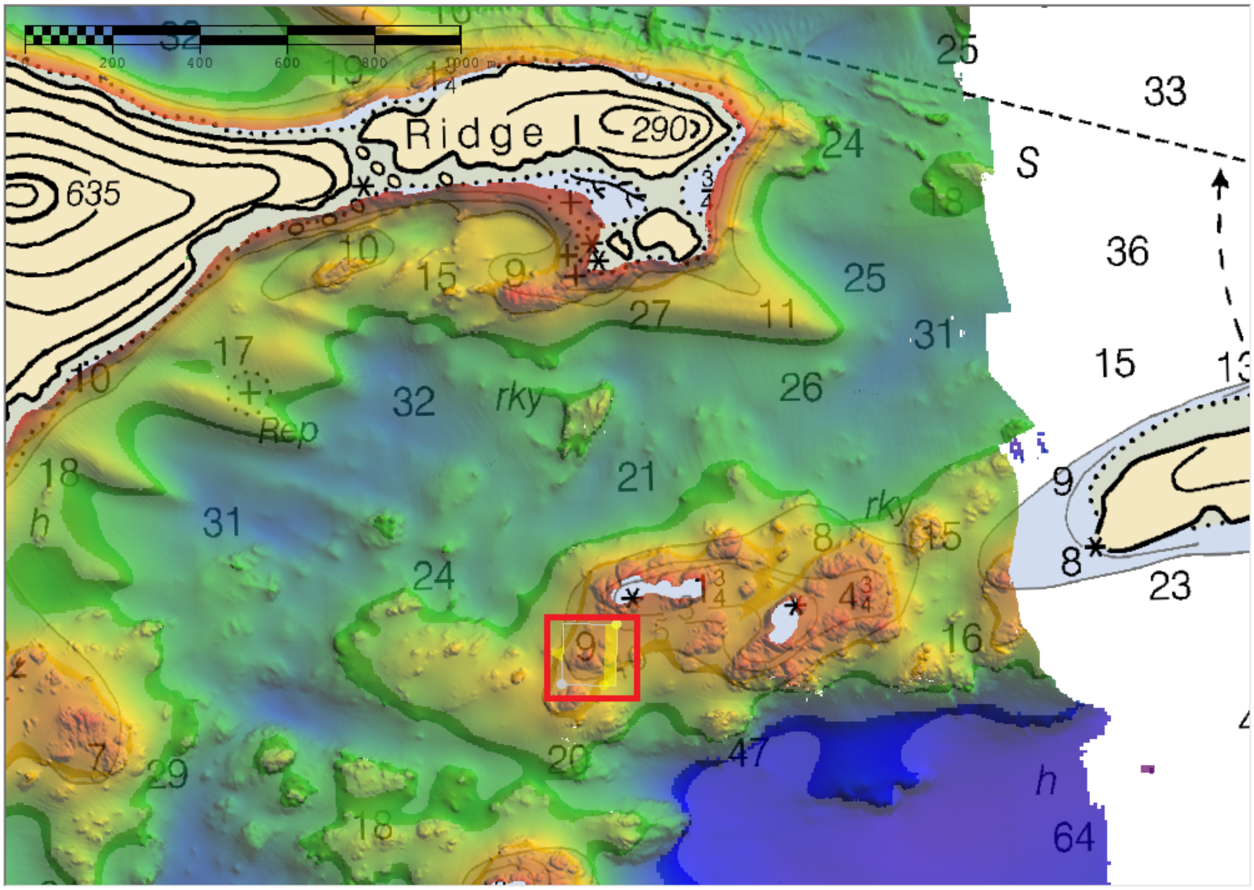


Figure 1.3.3

1.4) 260/444

DANGER TO NAVIGATION

Survey Summary

Survey Position:	55° 15' 47.5" N, 133° 13' 42.0" W
Least Depth:	4.10 m (= 13.44 ft = 2.240 fm = 2 fm 1.44 ft)
TPU (±1.96σ):	**THU (TPEh)** ±0.984 m ; **TVU (TPEv)** ±0.517 m
Timestamp:	2015-285.22:19:11.098 (10/12/2015)
Survey Line:	h12743 / fa_2807_400khz_7125_512bms_2015 / 2015-285 / 2015m_2852218
Profile/Beam:	260/444
Charts Affected:	17407_1, 17400_1, 16016_1, 531_1, 500_1, 501_1, 530_1, 50_1

Remarks:

Predicted water levels applied

Feature Correlation

Source	Feature	Range	Azimuth	Status
2015m_2852218	260/444	0.00	000.0	Primary

Hydrographer Recommendations

Chart rock using survey soundings.

Cartographically-Rounded Depth (Affected Charts):

2 ¼fm (17407_1, 17400_1, 16016_1, 530_1)

2fm 1ft (531_1)

4.1m (500_1, 501_1, 50_1)

S-57 Data

Geo object 1:	Underwater rock / awash rock (UWTROC)
Attributes:	EXPSOU - 2:shoaler than range of depth of the surrounding depth area
	QUASOU - 6:least depth known
	SORDAT - 20151104
	SORIND - US,US,graph,H12743

TECSOU - 3:found by multi-beam

VALSOU - 4.097 m

WATLEV - 3:always under water/submerged

Feature Images

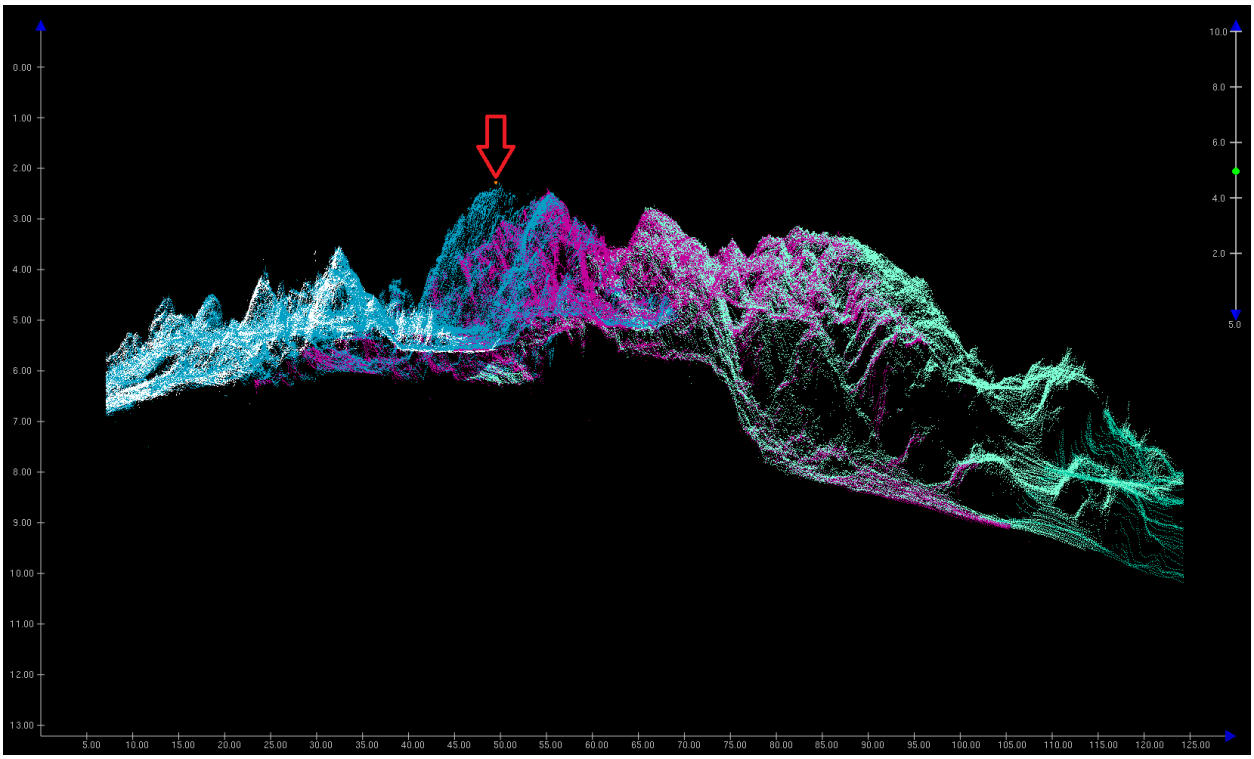


Figure 1.4.1

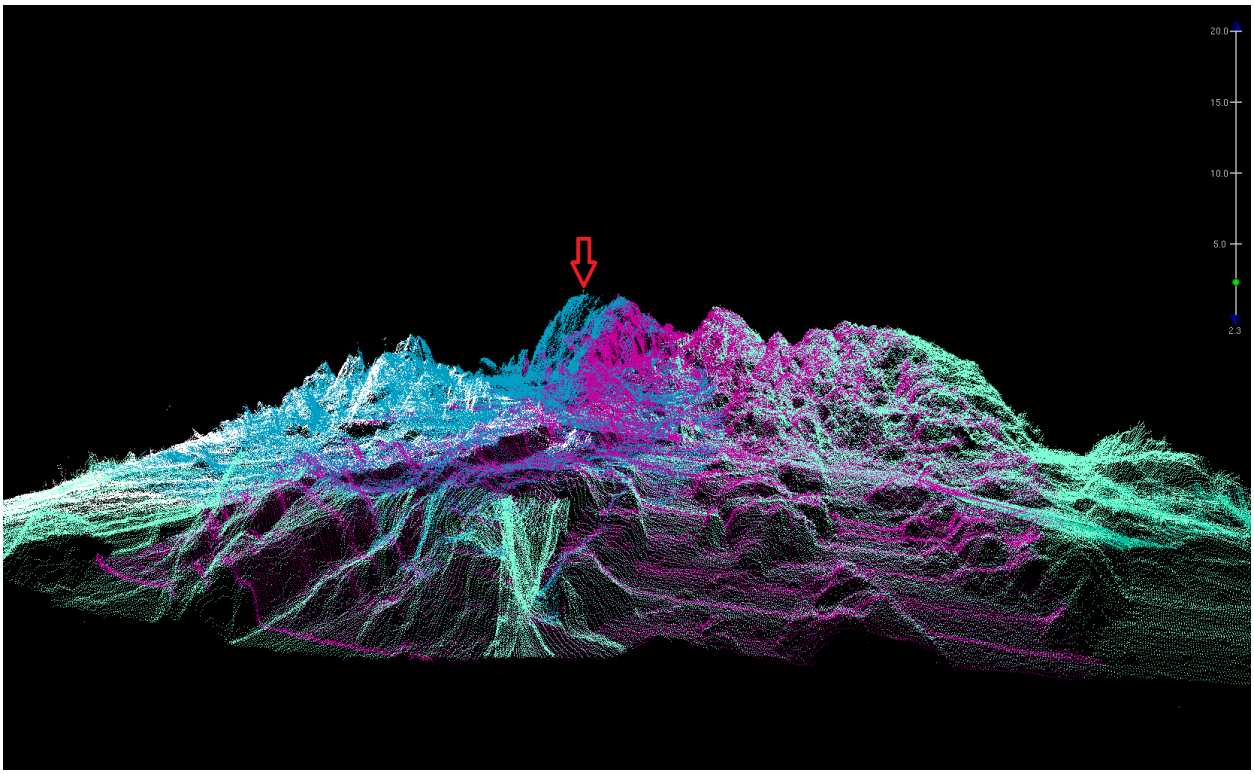


Figure 1.4.2

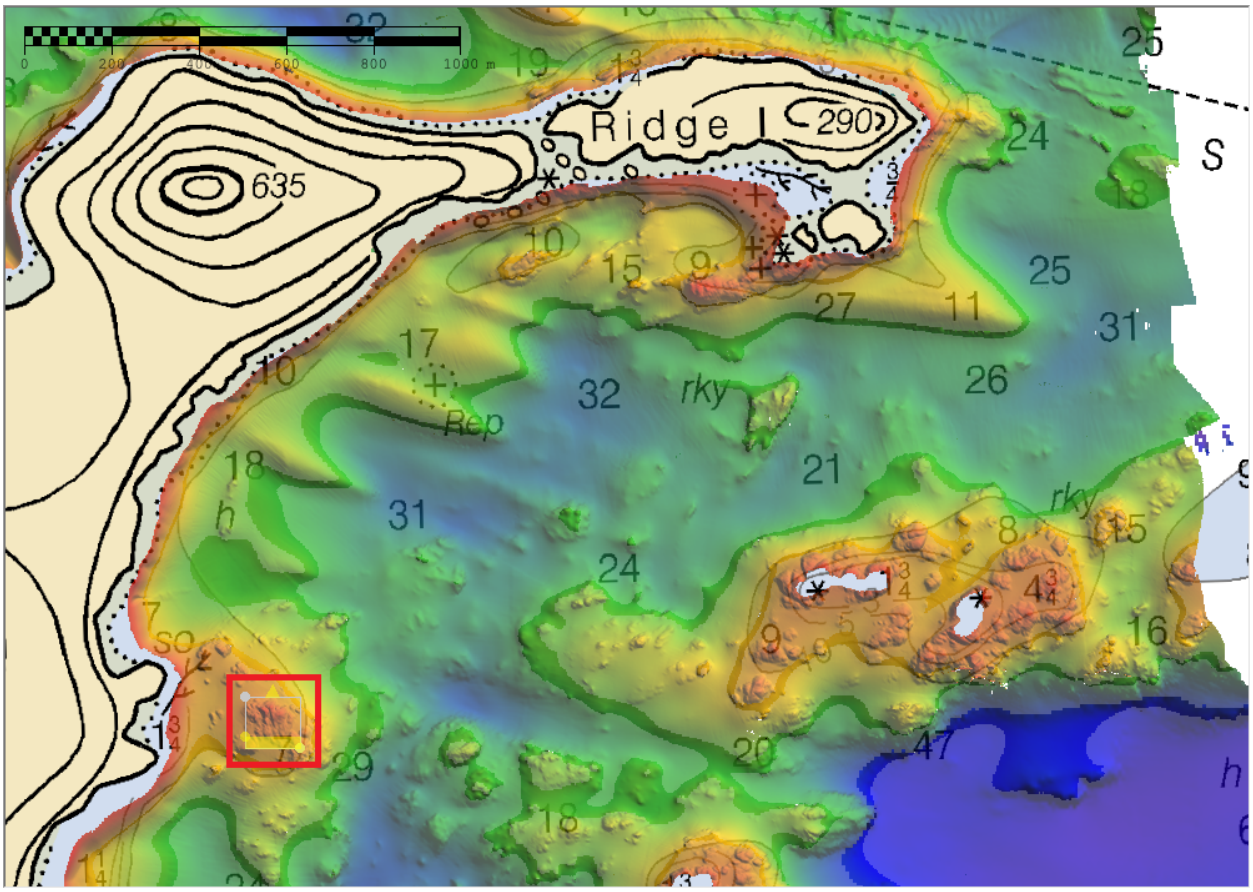


Figure 1.4.3

APPROVAL PAGE

H12743

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

- H12743_DR.pdf
- Collection of depth varied resolution BAGS
- Processed survey data and records
- H12743_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: 2017.03.06 14:04:43 -08'00'

Approved:_____

Pete Holmberg
Cartographic Team Lead, Pacific Hydrographic Branch

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

Digitally signed by EVANS.BENJAMIN.K.1237217094
Date: 2017.03.06 21:09:52 -05'00'

Approved:_____

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