H12865

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: H12865

LOCALITY

State: Alaska

General Locality: West of Prince of Wales Island

Sub-locality: Vicinity of Nichols Islands

2016

CHIEF OF PARTY
CDR Mark Van Waes, 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		**H12865**

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:	**Vicinity of Nichols Islands**
Scale:	**1: 20,000**
Dates of Survey:	**05/07/2016 to 06/11/2016**
Instructions Dated:	**03/28/2016**
Project Number:	**OPR-O190-RA-16**
Field Unit:	**NOAA Ship *Rainier***
Chief of Party:	**CDR Mark Van Waes, 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:	***fathoms 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 Envitronmental 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 H12865

Project: OPR-O190-FA-16

Locality: West of Prince of Wales Island

Sublocality: Vicinity of Nichols Islands

Scale: 1:20000

May 2016 - June 2016

NOAA Ship *Fairweather*

Chief of Party: CDR Mark Van Waes, NOAA

A. Area Surveyed

The survey area is located along the West coast of Prince of Wales Island, within the sub-locality of Nichols Islands.

A.1 Survey Limits

Data were acquired within the following survey limits:

Northwest Limit	Southeast Limit
55° 12' 38.38" N 133° 6' 44.11" W	55° 5' 8.32" N 132° 56' 19.87" W

Table 1: Survey Limits

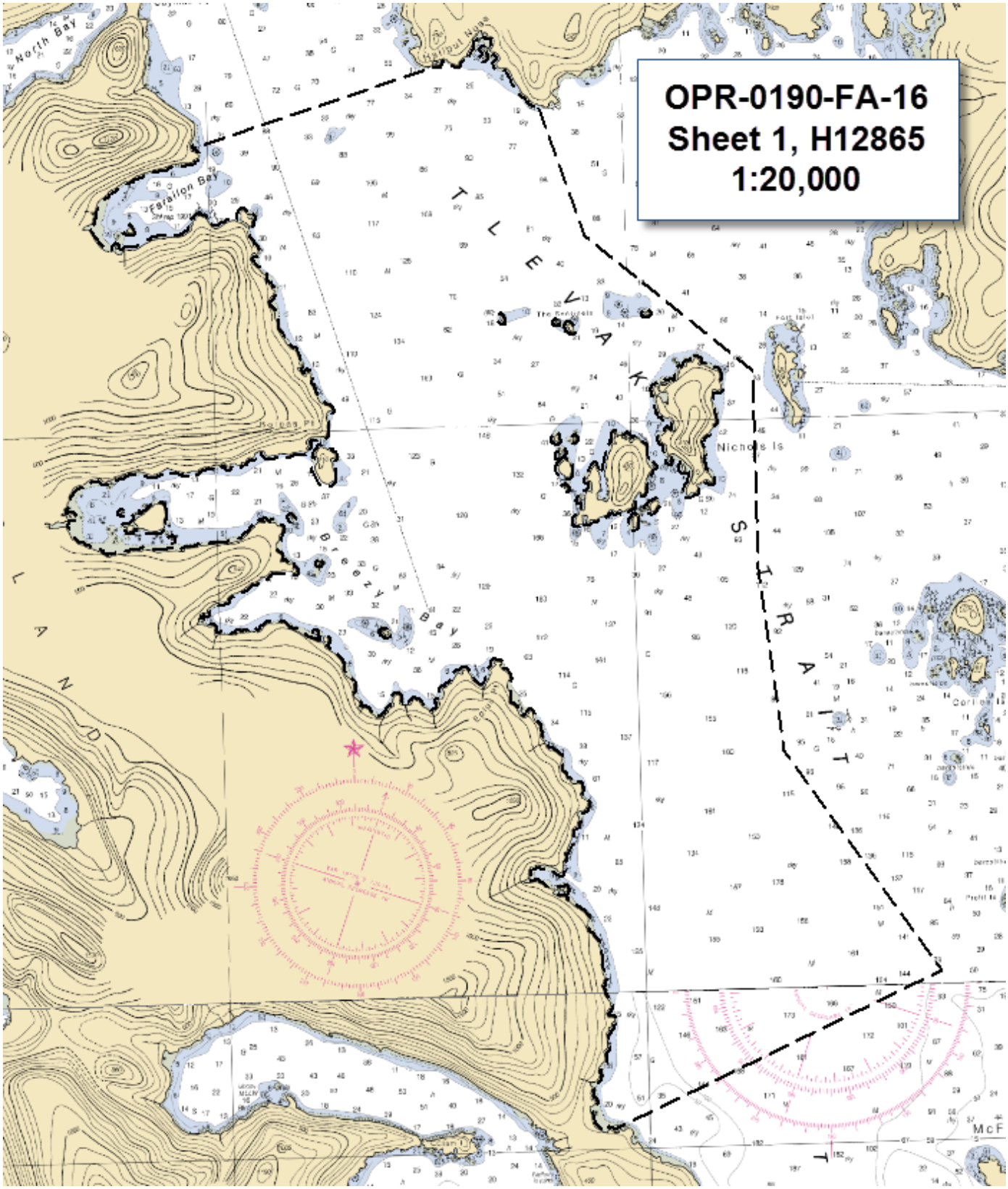


Figure 1: H12865 sheet limits.

Data for survey H12865 were acquired to the survey limits in accordance with the requirements in the Project Instructions and the NOS Hydrographic Surveys Specifications and Deliverables (HSSD) dated March 2016, as shown in Figure 1. In all areas where the 4-meter depth contour or the sheet limits were not met, the Navigable Area Limit Line (NALL) was defined as the inshore limit of bathymetry due to the risks of maneuvering the survey vessel in close proximity to the steep and rocky shoreline.

A.2 Survey Purpose

The purpose of this project is to provide contemporary surveys to update National Ocean Service (NOS) nautical charting products. Survey areas will address 16 SNM of navigationally significant waters in accordance with the National Hydrographic Survey Priorities, 2012 Edition.

A.3 Survey Quality

The entire survey is adequate to supersede previous data.

Data acquired in H12865 meet multibeam echo sounder (MBES) coverage requirements for complete coverage, as required by the HSSD. This includes crosslines (see Section B.2.1), NOAA allowable uncertainty (see Section B.2.10), and density requirements (see Section B.2.11). Additional compliance statistics can be found in the Standards and Compliance Review located in the Separates Folder.

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	Complete coverage MB with backscatter (Section 5.2.2.3) or Set Line Spacing at 100 meters (Section 5.2.2.4).
Greater than 8 meters water depth	Complete Coverage MBES with Backscatter. Refer to HSSD Section 5.2.2.3

The entirety of H12865 was acquired with complete coverage MBES with backscatter, meeting the requirements listed above and in the HSSD. See Figure 2 for an overview of coverage.

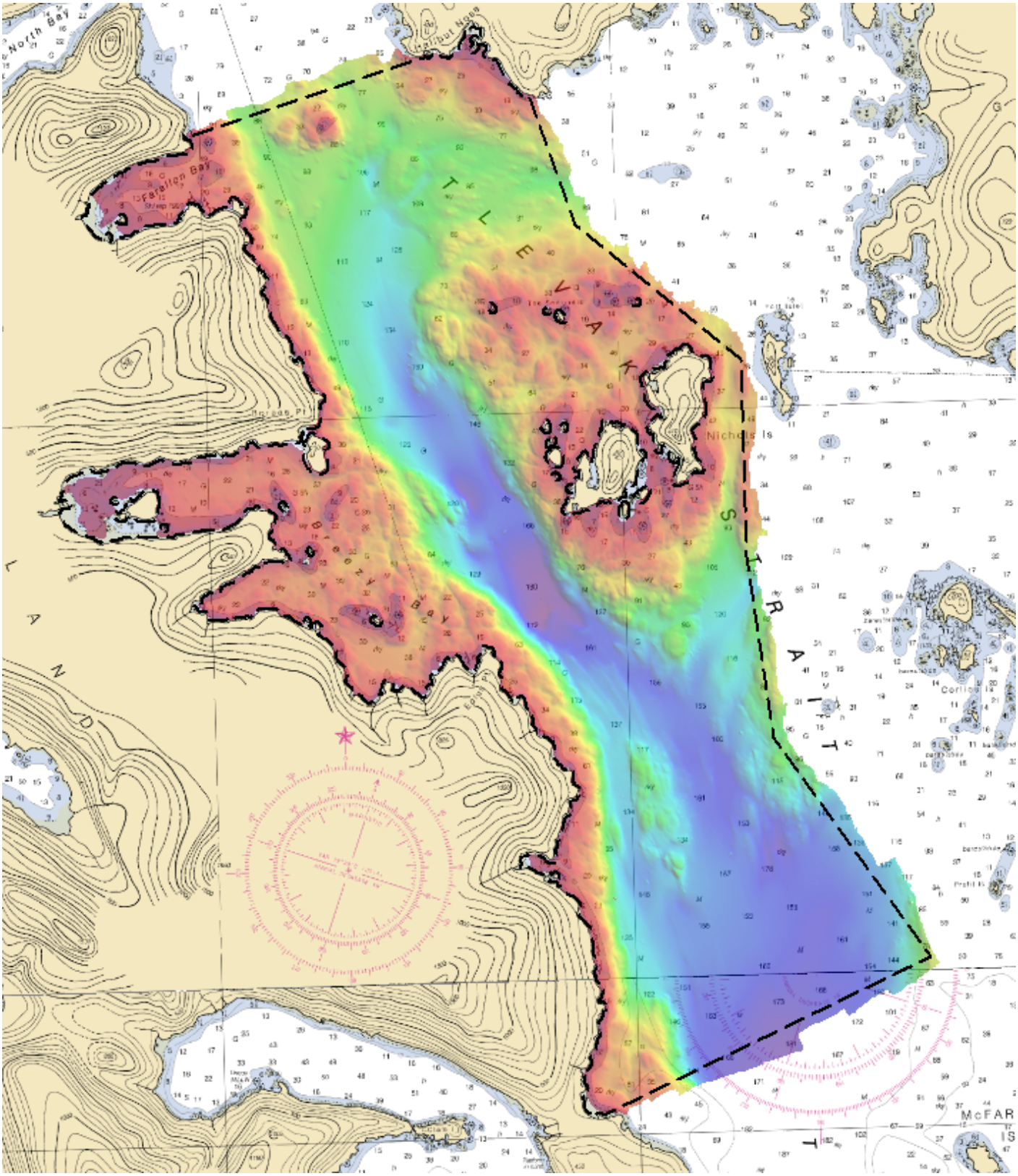


Figure 2: H12865 survey coverage.

A.5 Survey Statistics

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

	HULL ID	*S220*	*2805*	*2806*	*2807*	*2808*	*Total*
LNM	**SBES Mainscheme**	0	0	0	0	0	0
	MBES Mainscheme	39.04	118.54	42.91	43.93	53.05	297.47
	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	1	24.91	1	1	1	28.91
	Lidar Crosslines	0	0	0	0	0	0
Number of Bottom Samples							9
Number Maritime Boundary Points Investigated							0
Number of DPs							26
Number of Items Investigated by Dive Ops							1
Total SNM							18.93

Table 2: Hydrographic Survey Statistics

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

Survey Dates	Day of the Year
05/10/2016	131
05/14/2016	135
05/15/2016	136
05/17/2016	138
05/18/2016	139
05/25/2016	146
05/27/2016	148
06/09/2016	161
06/11/2016	163

Table 3: Dates of Hydrography

B. Data Acquisition and Processing

B.1 Equipment and Vessels

Refer to the OPR-O190-FA-16 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 SV1	MBES
Seabird	19plus	Conductivity, Temperature, and Depth Sensor
Reson	SVP70	Sound Speed System
Reson	SVP71	Sound Speed System
Rolls Royce	MVP200	Conductivity, Temperature, and Depth Sensor
Applanix	POS/MV V4	Positioning and Attitude System

Table 5: Major Systems Used

B.2 Quality Control

B.2.1 Crosslines

Crosslines acquired for this survey totaled 9.72% of mainscheme acquisition.

Crosslines were collected, processed and compared in accordance with Section 5.2.4.3 of the HSSD. To evaluate crosslines, a 16-meter CUBE surface using strictly mainscheme lines, and a 16-meter CUBE surface using strictly crosslines were created. From these two surfaces, a difference surface (mainscheme - crosslines = difference surface) was generated at a 16-meter resolution (Figure 3), and is submitted in the Separates II Digital Data folder. Statistics show the mean difference between the depths derived from mainscheme and crosslines was 0.21 meters (with mainscheme being deeper) with 95% of nodes falling within +/- 2.33 meters (Figure 4). For the respective depths, the difference surface was compared to the allowable NOAA accuracy standards (Figure 5). In total, 94.35% of the depth differences between H12880 mainscheme and crossline data are within allowable NOAA uncertainties (Figure 6).

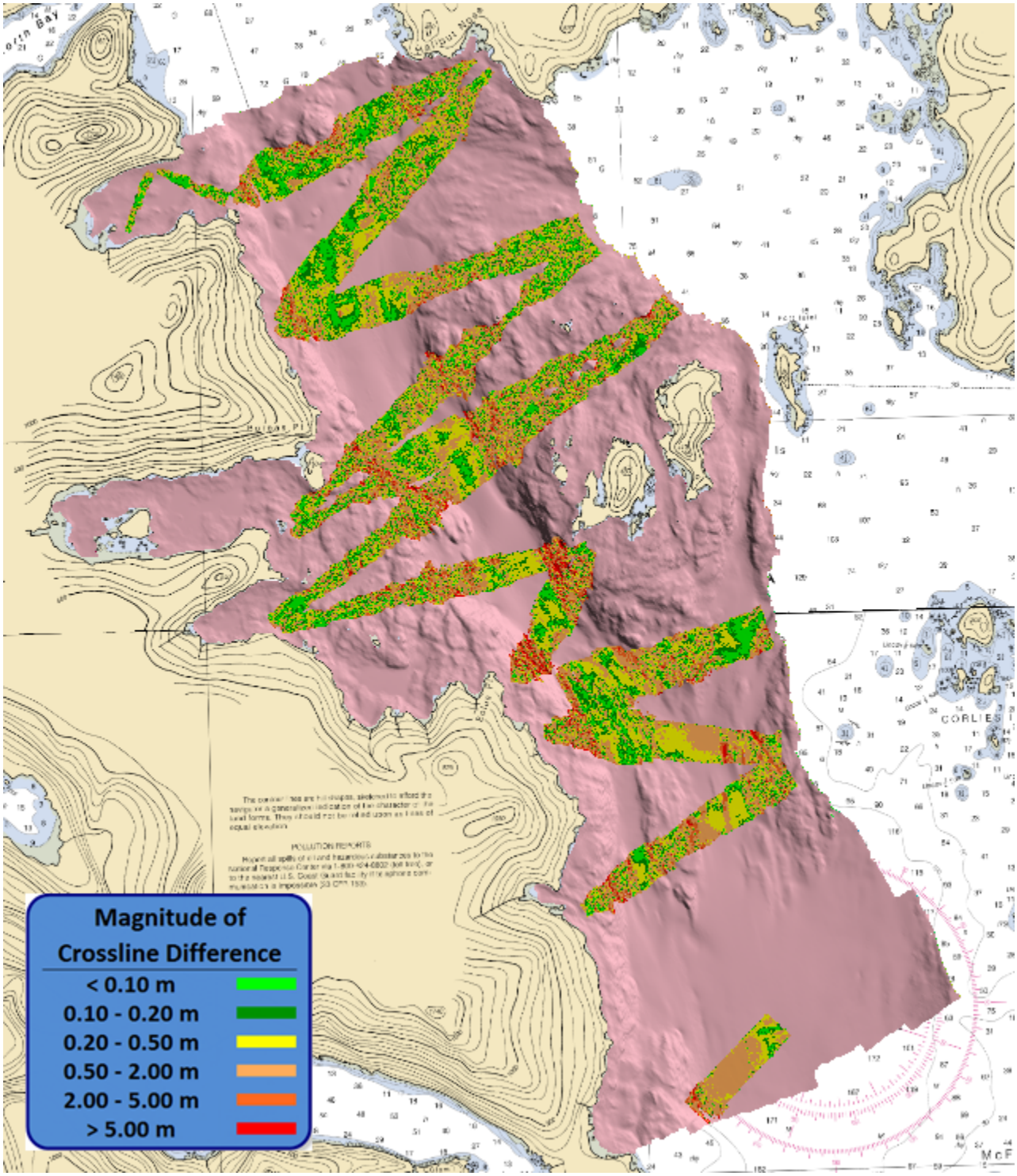
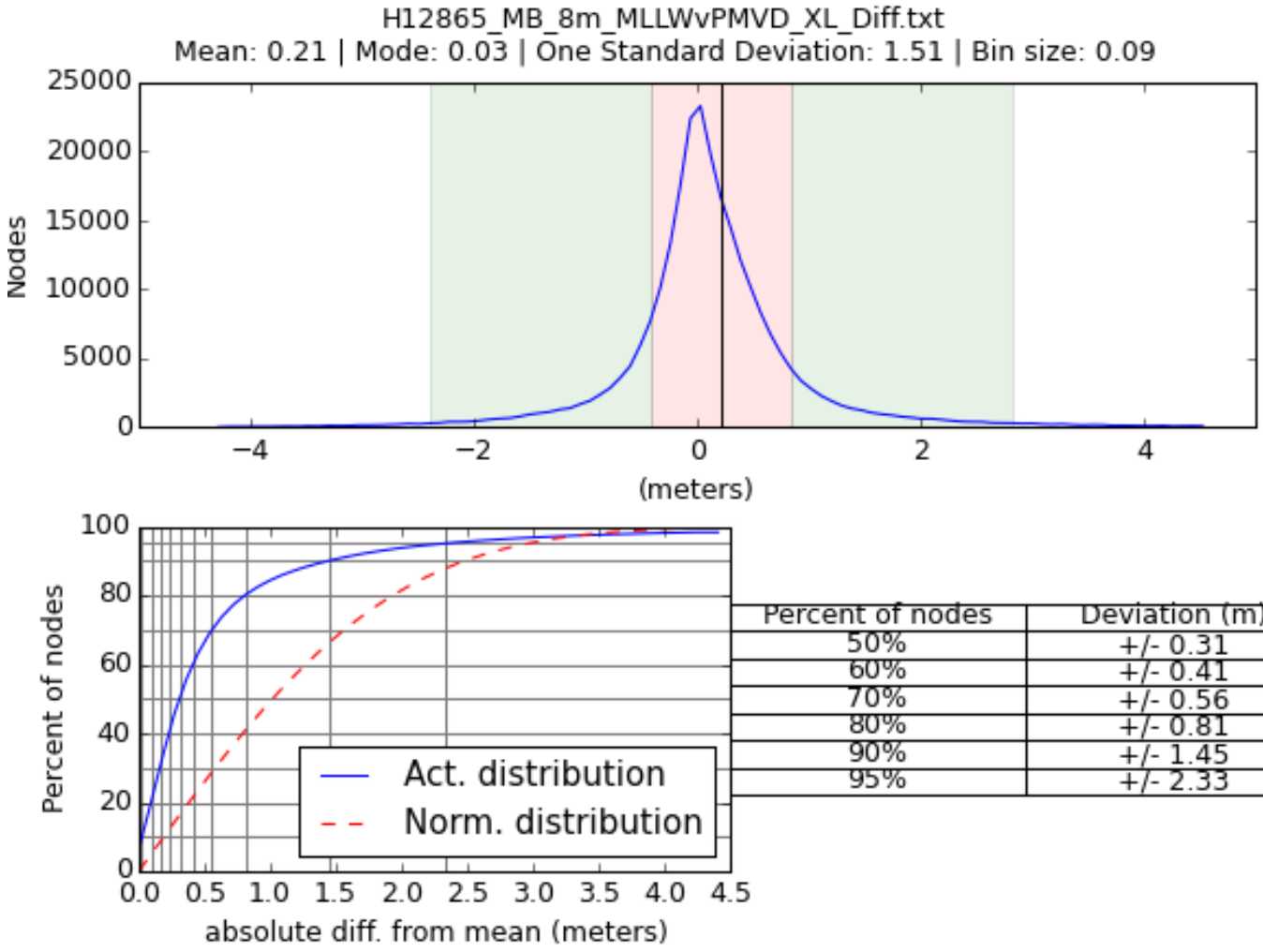


Figure 3: Overview of H12865 crosslines.



Percent of nodes	Deviation (m)
50%	+/- 0.31
60%	+/- 0.41
70%	+/- 0.56
80%	+/- 0.81
90%	+/- 1.45
95%	+/- 2.33

Figure 4: H12865 crossline and mainscheme difference statistics.

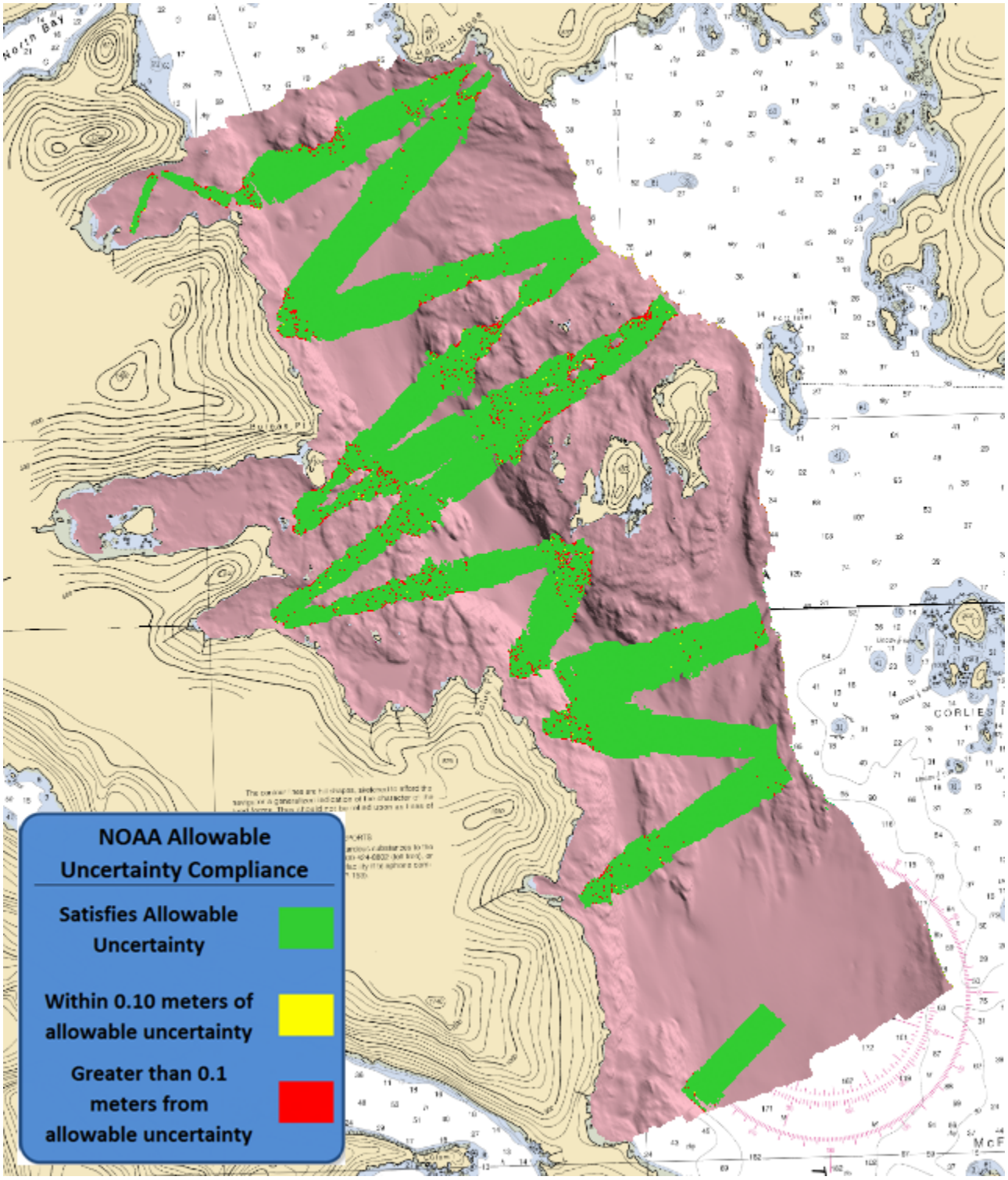
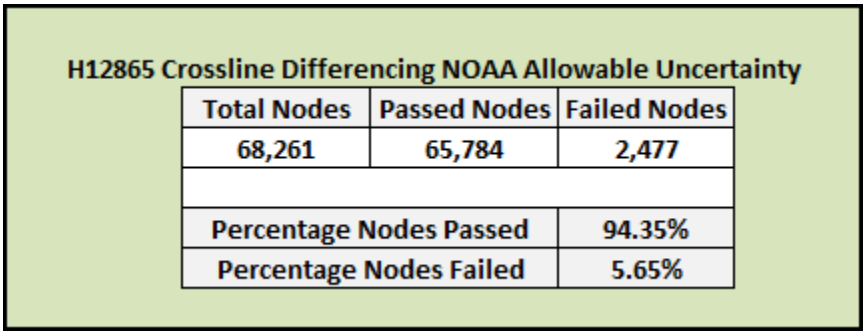


Figure 5: Depth differences between H12865 mainscheme and crossline data as compared to NOAA allowable uncertainty standard for the associated depths.



H12865 Crossline Differencing NOAA Allowable Uncertainty

Total Nodes	Passed Nodes	Failed Nodes
68,261	65,784	2,477
Percentage Nodes Passed		94.35%
Percentage Nodes Failed		5.65%

Figure 6: H12865 crossline surface statistics showing percentage of nodes meeting NOAA allowable uncertainty.

B.2.2 Uncertainty

The following survey specific parameters were used for this survey:

Measured	Zoning	Method
0 meters	0.02 meters	ERS via PMVD
0 meters	0.097 meters	Discrete Zoning
0 meters	0 meters	TCARI

Table 6: Survey Specific Tide TPU Values.

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

Table 7: Survey Specific Sound Speed TPU Values.

In addition to the usual a priori estimates of uncertainty provided via device models for vessel motion, discrete zoning tides, ERZT, and PMVD, real-time and post-processed uncertainty sources were also incorporated into the depth estimates of survey H12865. Real-time uncertainties were provided via EM710 and Reson 7125 MBES data, Applanix Delayed Heave RMS, and TCARI tides. Following post-processing of vessel motion, real time uncertainties of vessel roll, pitch, gyro and navigation were applied in CARIS

HIPS and SIPS via a Smoothed Best Estimate of Trajectory (SBET) RMS file generated in Applanix POSPac.

B.2.3 Junctions

H12865 junctions with two adjacent surveys from this project H12880, H12881, and one survey from project OPR-O190-FA-15: H12744 as shown in Figure 7. Data overlap between all surveys was achieved. These areas of overlap between surveys were reviewed with CARIS HIPS and SIPS by surface differencing (at equal resolutions) to assess surface agreement. The multibeam data were also examined in CARIS Subset Editor for consistency and agreement. The junctions with H12865 are generally within the NOAA allowable uncertainty in their areas of overlap. For all junctions with H12865, a negative difference indicates H12865 was deeper, and a positive difference indicates H12865 was shoaler.

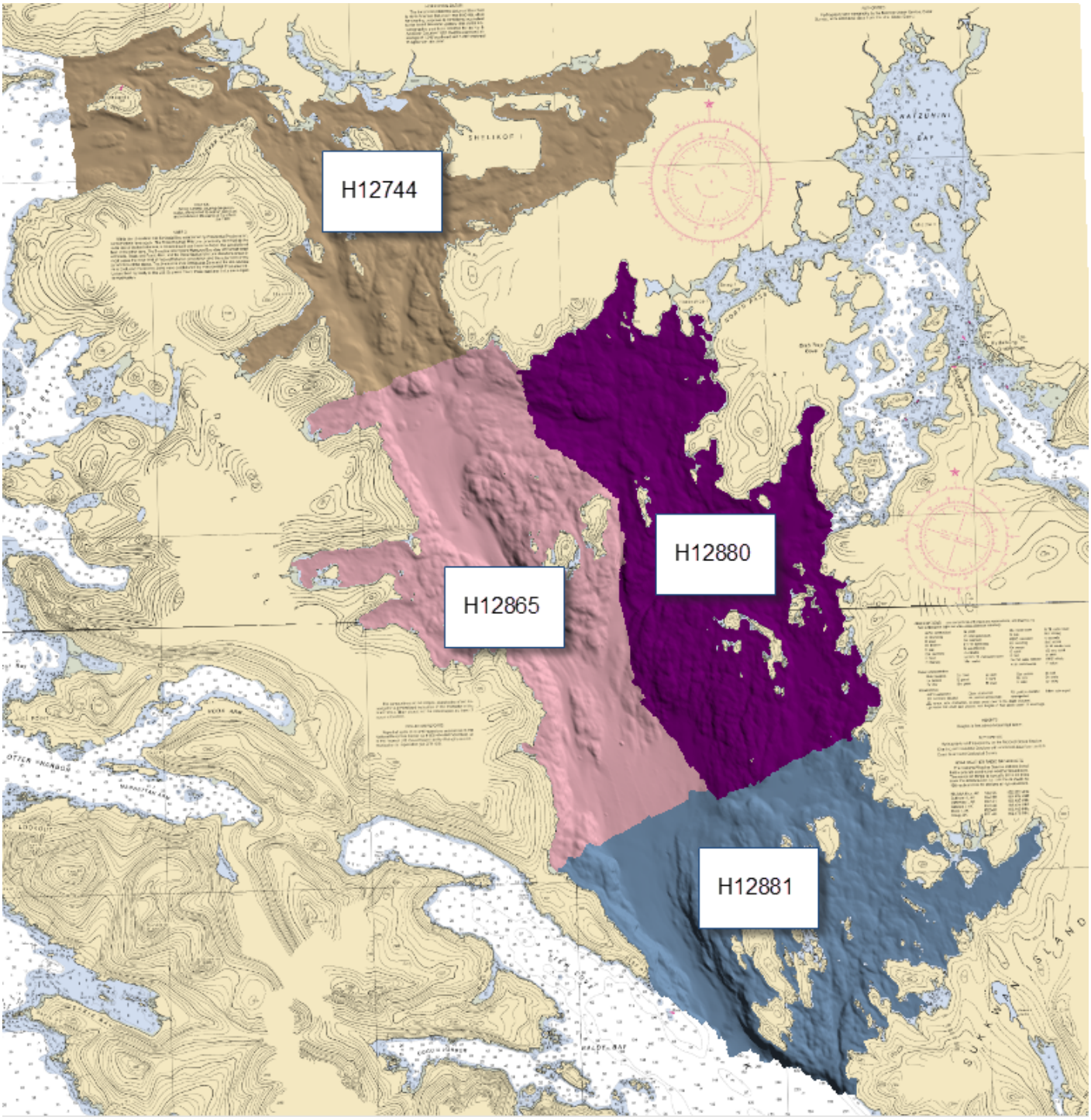


Figure 7: Overview of H12865 junction surveys.

The following junctions were made with this survey:

Registry Number	Scale	Year	Field Unit	Relative Location
H12744	1:20000	2015	NOAA Ship FAIRWEATHER	N
H12880	1:20000	2016	NOAA Ship FAIRWEATHER	E
H12881	1:20000	2016	NOAA Ship FAIRWEATHER	S

Table 8: Junctioning Surveys

H12744

Surface differencing in CARIS HIPS and SIPS was used to assess junction agreement between the 8 meter combined surface from H12865 and the 8 meter combined surface from H12744. The statistical analysis of the difference surface shows a mean of -0.82 meters with 95% of all nodes having a maximum deviation of +/- 2.35 meters, as seen in Figure 9. A detailed graphical overview can be seen in Figure 8. In addition, a comparison surface was created between the difference surface and the NOAA allowable uncertainty (See Figure 10). It was found that 95.88% of nodes are within allowable NOAA uncertainty (Figure 11).

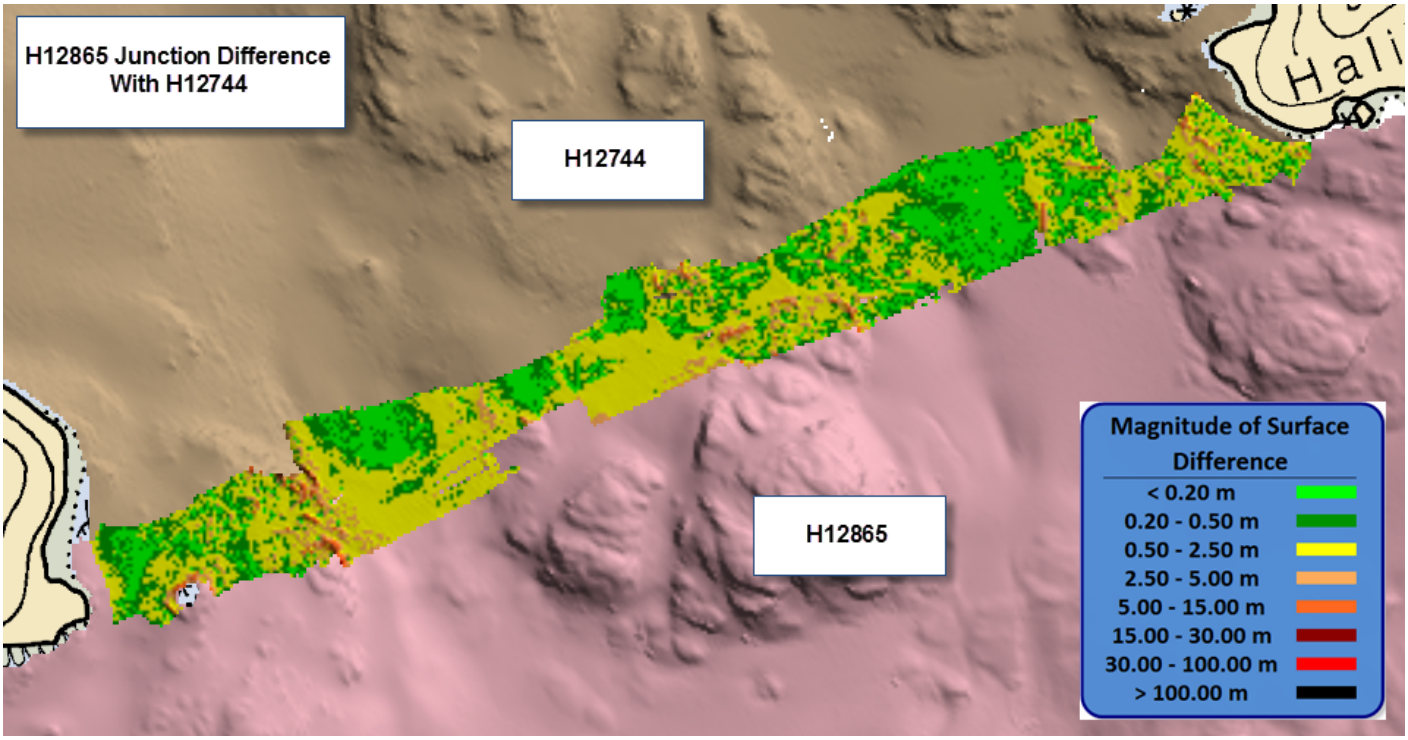
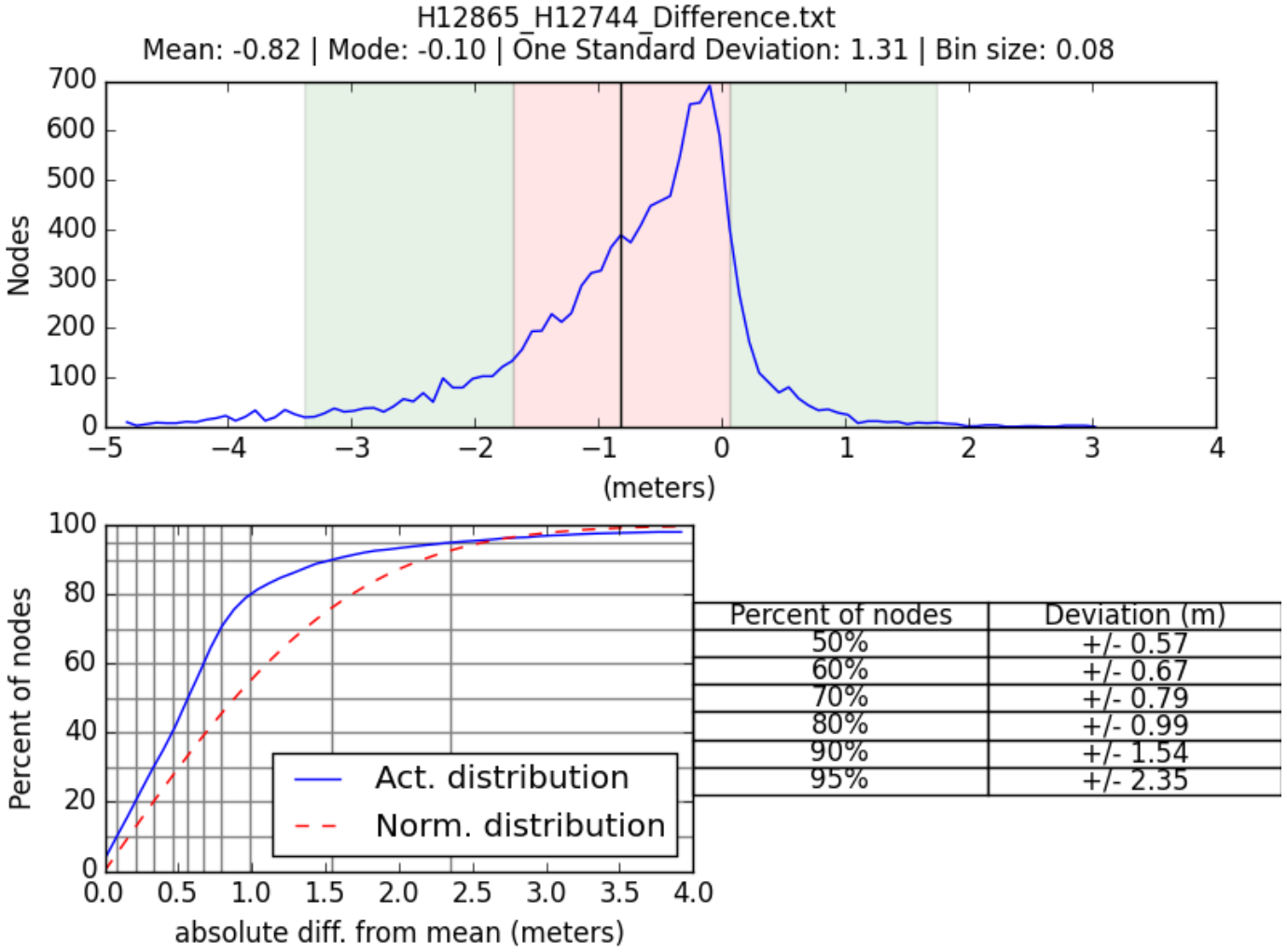


Figure 8: Junctioning surveys H12865 and H12744 with difference surface. Greatest differences are indicated in black and red and occur in rocky/steep areas.



Percent of nodes	Deviation (m)
50%	+/- 0.57
60%	+/- 0.67
70%	+/- 0.79
80%	+/- 0.99
90%	+/- 1.54
95%	+/- 2.35

Figure 9: Statistical output of difference surface for H12865 and H12744.

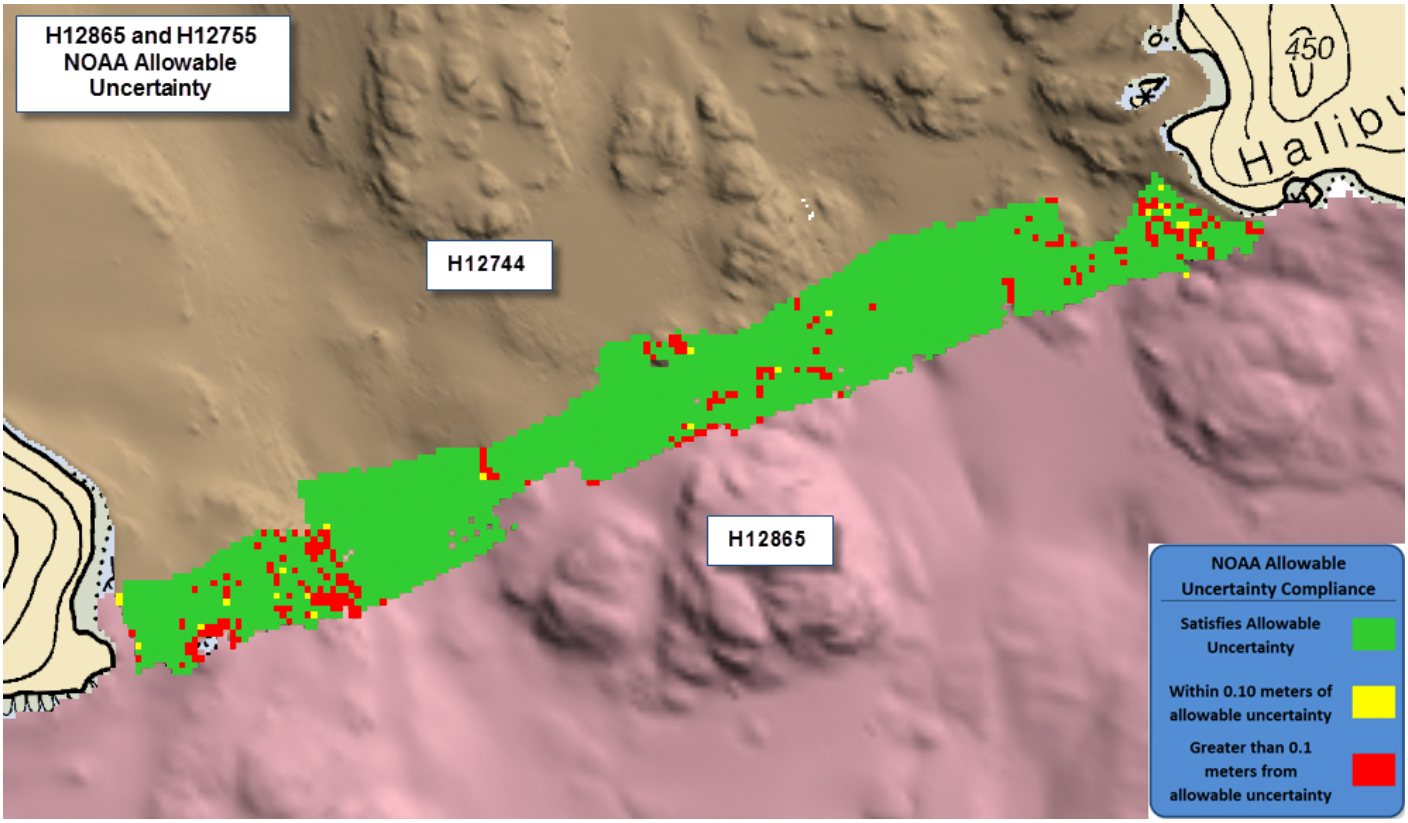


Figure 10: H12865 junction with H12744 NOAA allowable uncertainty.

H12865 & H12744 NOAA Allowable Uncertainty

Total Nodes	Passed Nodes	Failed Nodes
11,465	11,462	3
Percentage Nodes Passed: 95.88%		
Percentage Nodes Failed: 4.12%		

Figure 11: H12865 junction with H12744 NOAA allowable uncertainty statistics.

H12880

Surface differencing in CARIS HIPS and SIPS was used to assess junction agreement between the 16 meter combined surface from H12865 and the 16 meter combined surface from H12880. The statistical analysis of the difference surface shows a mean of 0.28 meters with 95% of all nodes having a maximum deviation of +/- 2.62 meters, as seen in Figure 13. A detailed graphical overview can be seen in Figure 12. In addition, a comparison surface was created between the difference surface and the NOAA allowable uncertainty (See Figure 14). It was found that 98.70% of nodes are within allowable NOAA uncertainty (Figure 15).

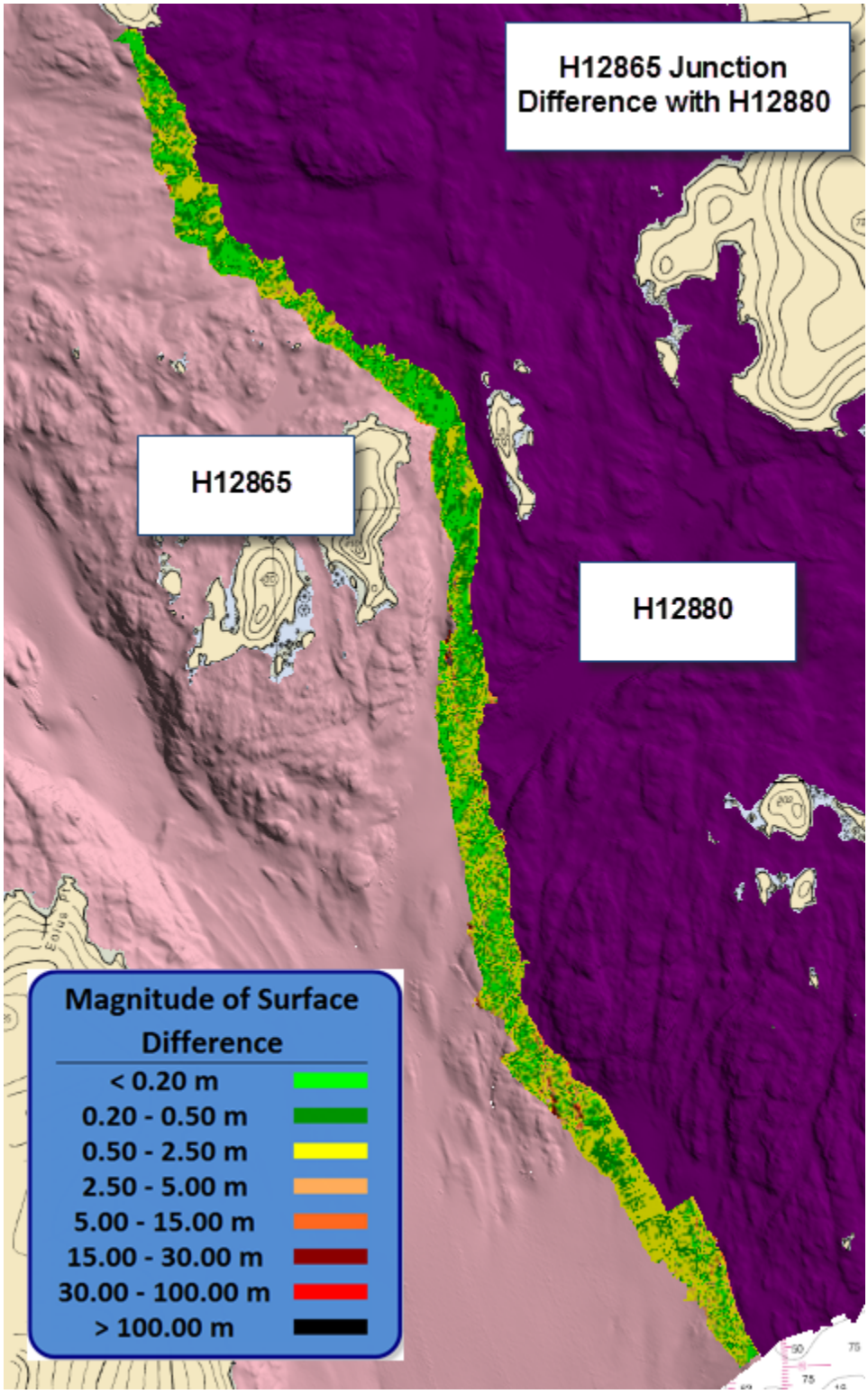
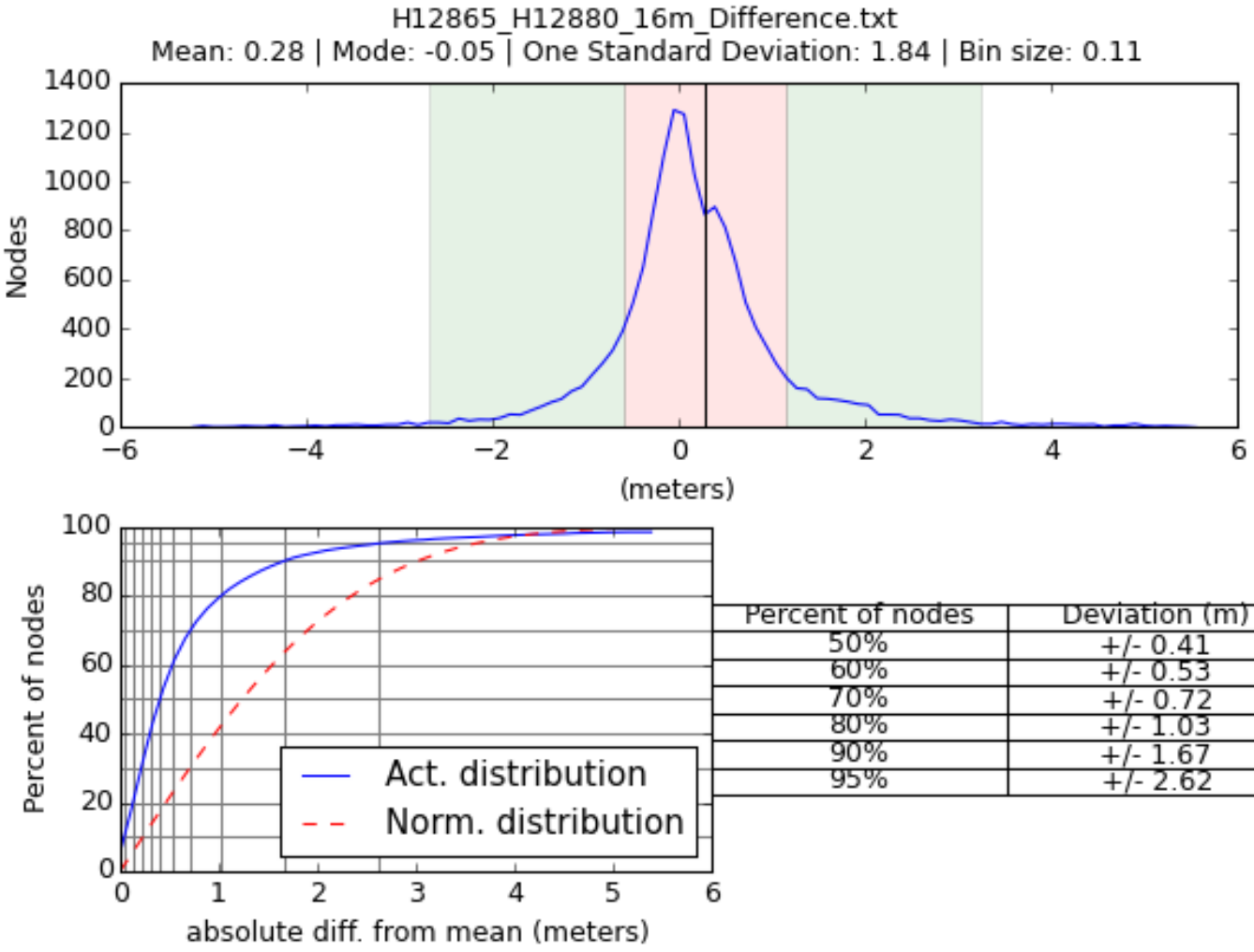


Figure 12: Junctioning surveys H12865 and H12880 with difference surface. Greatest differences are indicated in black and red and occur in rocky/steep areas.



Percent of nodes	Deviation (m)
50%	+/- 0.41
60%	+/- 0.53
70%	+/- 0.72
80%	+/- 1.03
90%	+/- 1.67
95%	+/- 2.62

Figure 13: Statistical output of difference surface for H12865 and H12880.

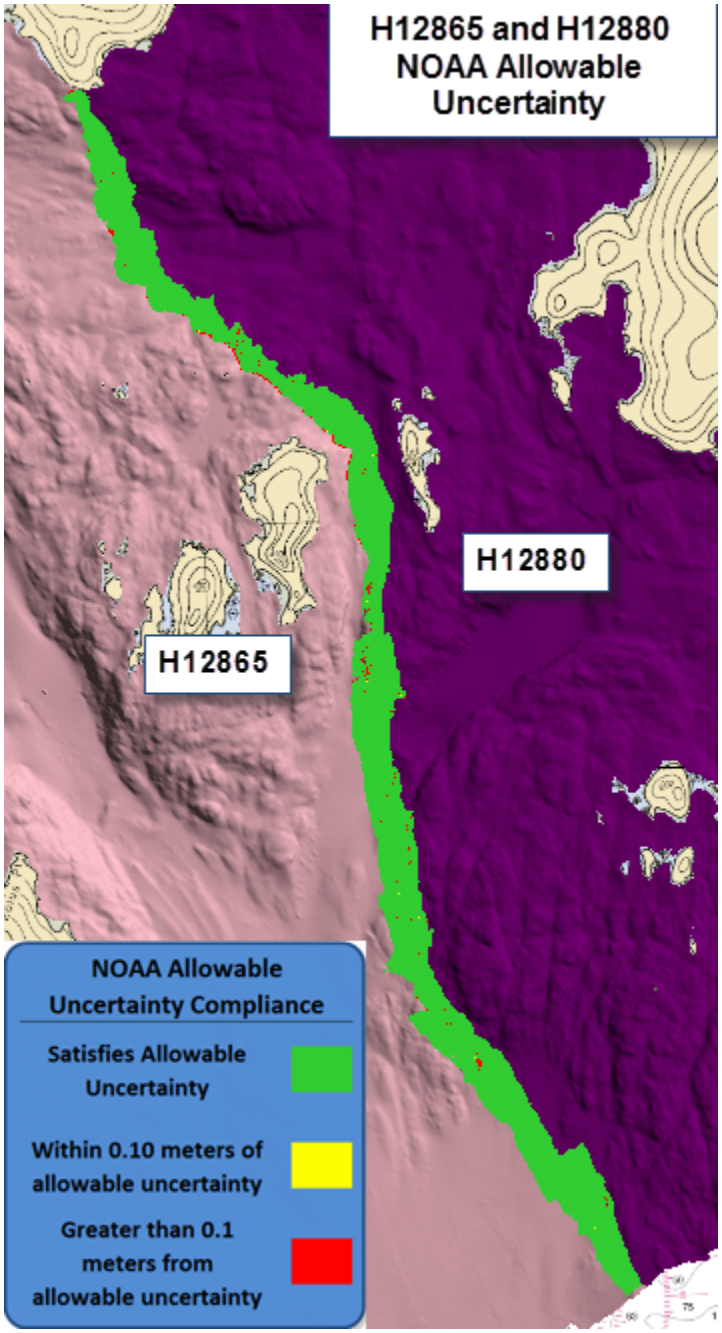
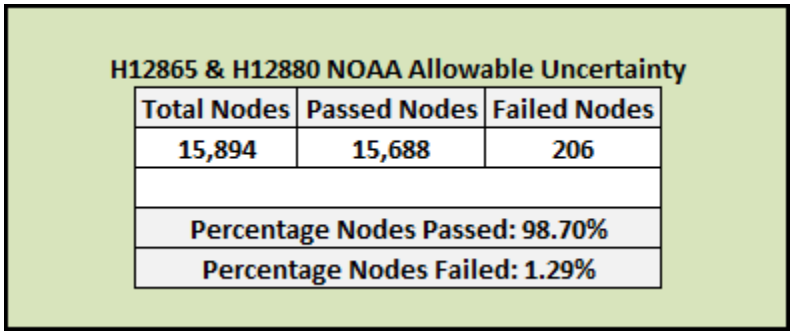


Figure 14: H12865 junction with H12880 NOAA allowable uncertainty.



H12865 & H12880 NOAA Allowable Uncertainty

Total Nodes	Passed Nodes	Failed Nodes
15,894	15,688	206
Percentage Nodes Passed: 98.70%		
Percentage Nodes Failed: 1.29%		

Figure 15: H12865 junction with H12880 NOAA allowable uncertainty statistics.

H12881

Surface differencing in CARIS HIPS and SIPS was used to assess junction agreement between the 16 meter combined surface from H12865 and the 16 meter combined surface from H12881. The statistical analysis of the difference surface shows a mean of 0.26 meters with 95% of all nodes having a maximum deviation of +/- 1.76 meters, as seen in Figure 17. A detailed graphical overview can be seen in Figure 16. In addition, a comparison surface was created between the difference surface and the NOAA allowable uncertainty (See Figure 18). It was found that 99.32% of nodes were within allowable NOAA uncertainty (Figure 19).

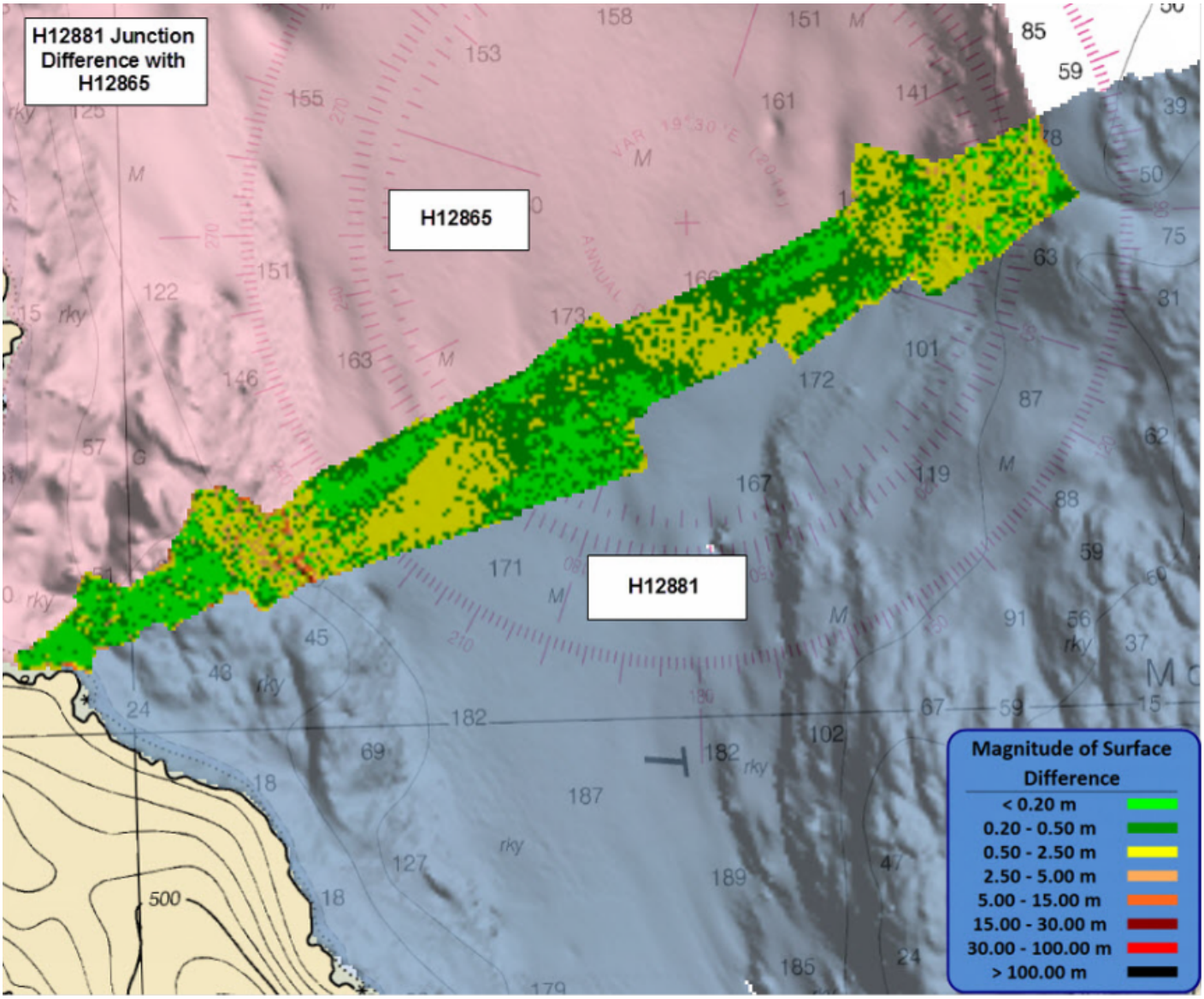
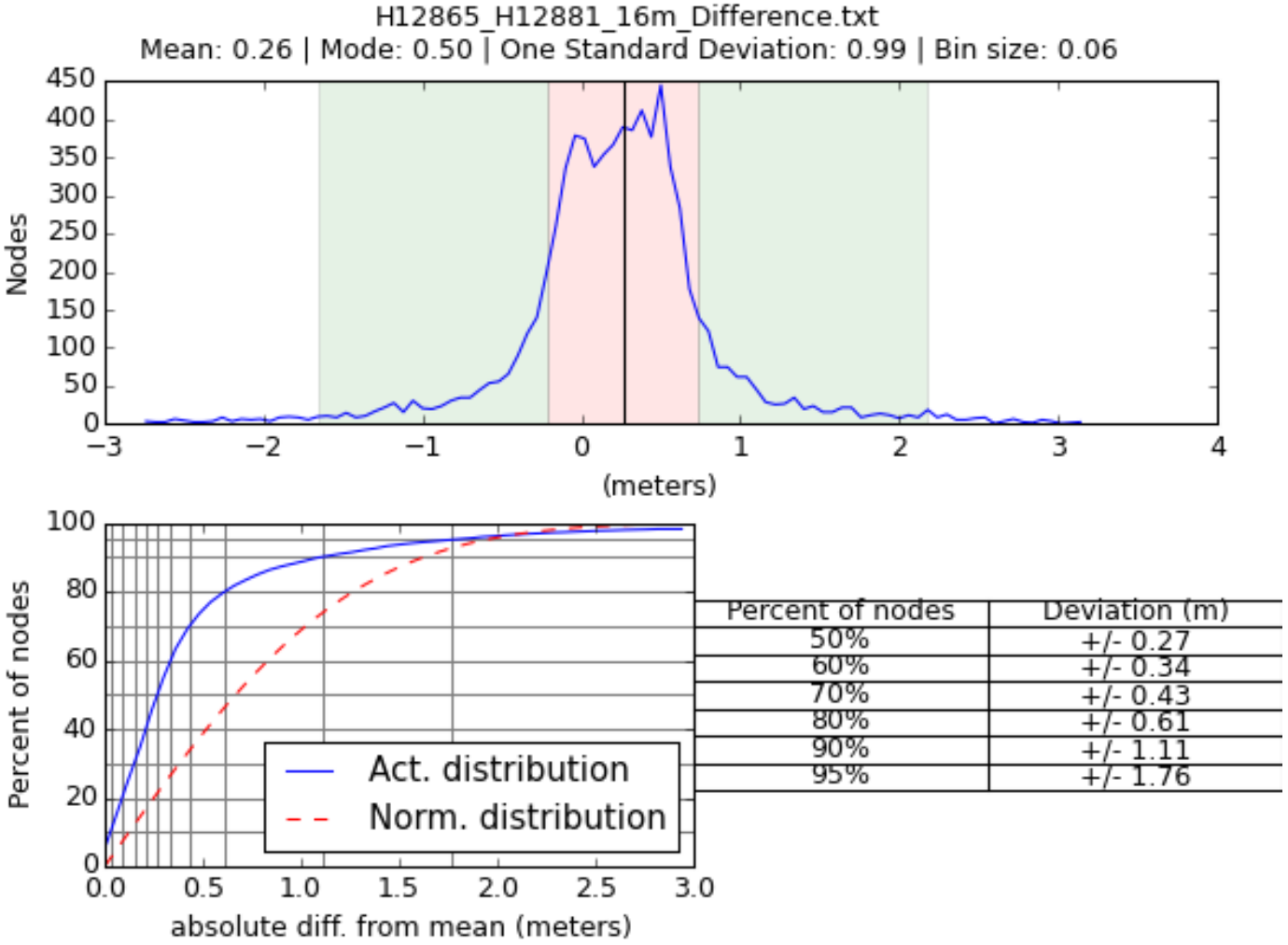


Figure 16: Junctioning surveys H12865 and H12881 with difference surface. Greatest differences are indicated in black and red and occur in rocky/steep areas.



Percent of nodes	Deviation (m)
50%	+/- 0.27
60%	+/- 0.34
70%	+/- 0.43
80%	+/- 0.61
90%	+/- 1.11
95%	+/- 1.76

Figure 17: Statistical output of difference surface for H12865 and H12881.

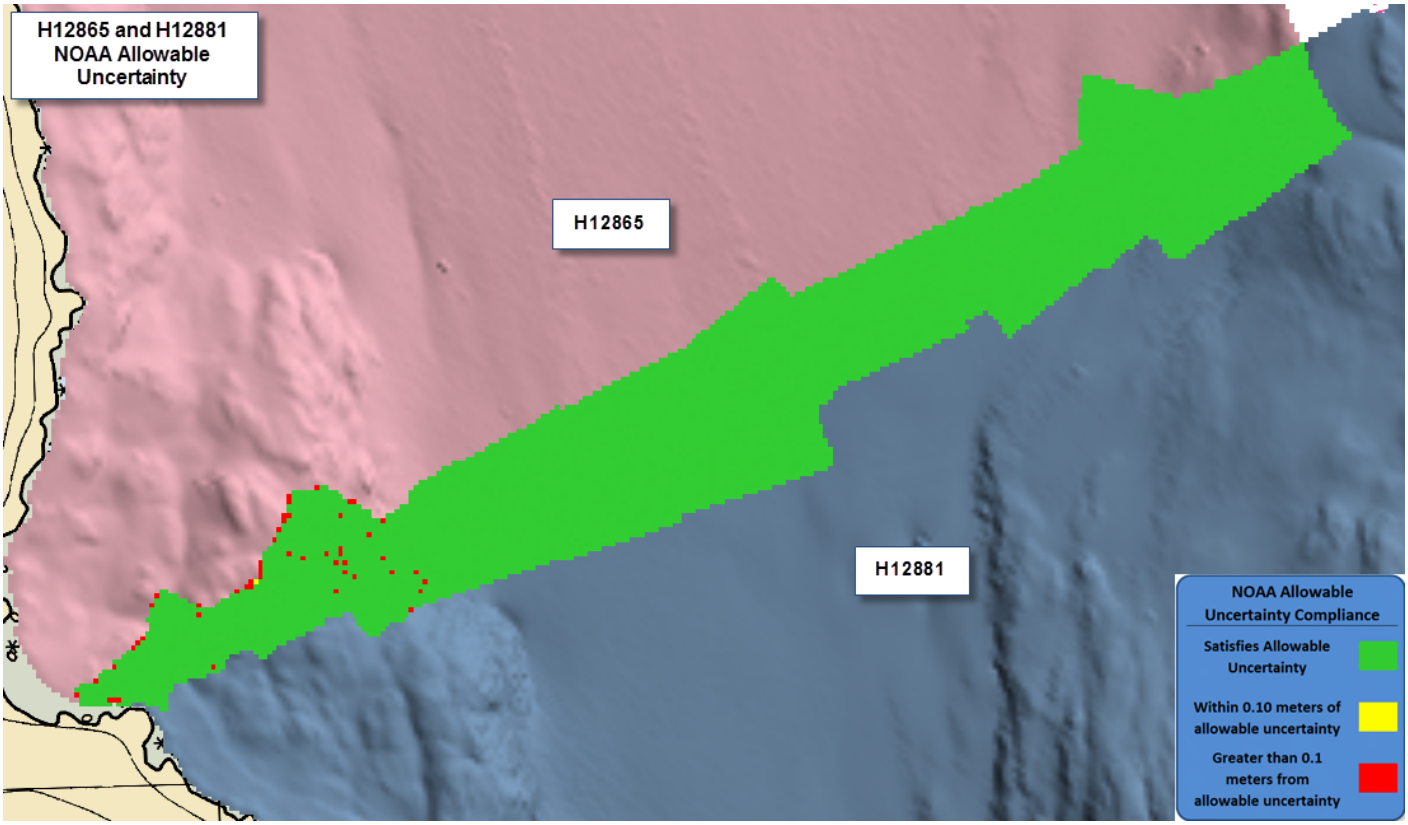


Figure 18: H12865 junction with H12881 NOAA allowable uncertainty.

H12865 & H12881 NOAA Allowable Uncertainty

Total Nodes	Passed Nodes	Failed Nodes
7,547	7,496	51
Percentage Nodes Passed: 99.32%		
Percentage Nodes Failed: 0.01%		

Figure 19: H12865 junction with H12881 NOAA allowable uncertainty statistics.

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

There were no conditions or deficiencies that affected equipment operational effectiveness.

B.2.6 Factors Affecting Soundings

There were no other factors that affected corrections to soundings.

B.2.7 Sound Speed Methods

Sound Speed Cast Frequency: 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 influx 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 approximately every 15 minutes as recommend by Pydro CastTime, a software tool that determines optimum cast frequency based on observed sound speed variations. Detailed Sound Speed methods are described in the DAPR.

B.2.8 Coverage Equipment and Methods

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

B.2.9 Holidays

H12865 data were reviewed in CARIS HIPS and SIPS for holidays in accordance with Section 5.2.2.3 of the 2016 HSSD. Seventy eight apparent holidays which meet the 3 by 3 node definition were identified via Pydro QC Tools Holiday Finder function. This tool automatically scans finalized surfaces for holidays as defined in the HSSD. All flagged areas by Holiday Finder were examined and all apparent holidays were determined to be from areas where an adjoining surface covered the gap (e.g., a holiday in the 2m finalized surface was covered by the 1m finalized surface due to the area being shoaler than the depth range for the 2m surface), as seen in Figure 20.

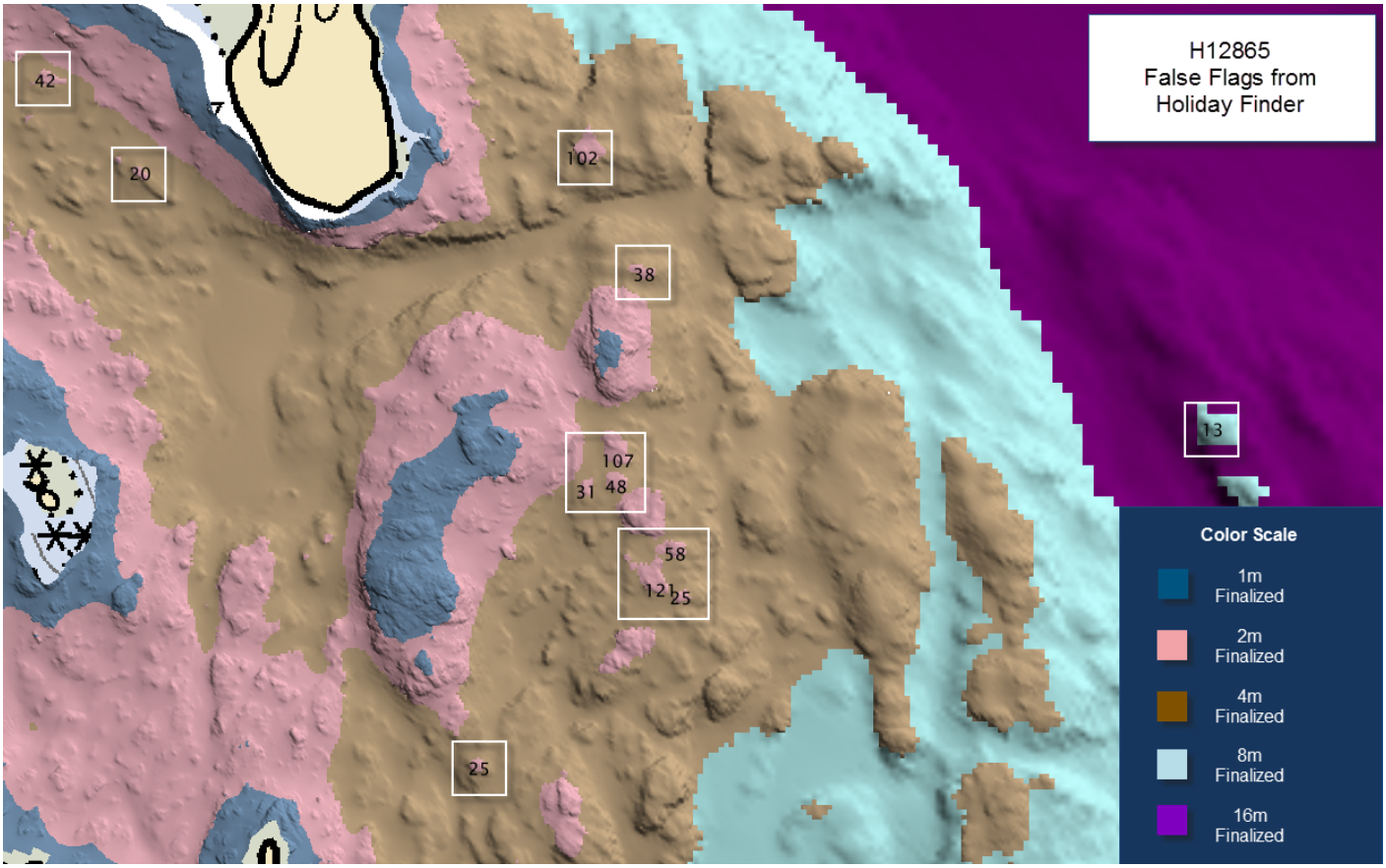


Figure 20: H12865 apparent holidays in coverage. The numbers in black indicate the number of nodes identified as data gaps.

B.2.10 NOAA Allowable Uncertainty

To verify that all data meets the accuracy specifications as stated in HSSD Section 5.1.3, a child layer titled “NOAA_Allowable_1” was created for each of the 1-meter, 2-meter, 4-meter, and 8-meter (72-100m) and "NOAA_Allowable_2" for the 8-meter (100-160m) and 16-m finalized surfaces using the equations stated in Section C. 2.1 of the DAPR. These surfaces were then analyzed using the Pydro QC Tools Grid QA feature to determine what percentage of each surface meets specifications. Figure 21 shows an overview of the NOAA Allowable Uncertainty layers for all surfaces. Figure 22 shows the corresponding statistics for each individual surface. Overall, 99.43% of nodes with all surfaces meet or exceed NOAA Allowable Uncertainty specifications for H12865. For individual graphs per surface of density requirements, see the Standards and Compliance Review located in Appendix II.

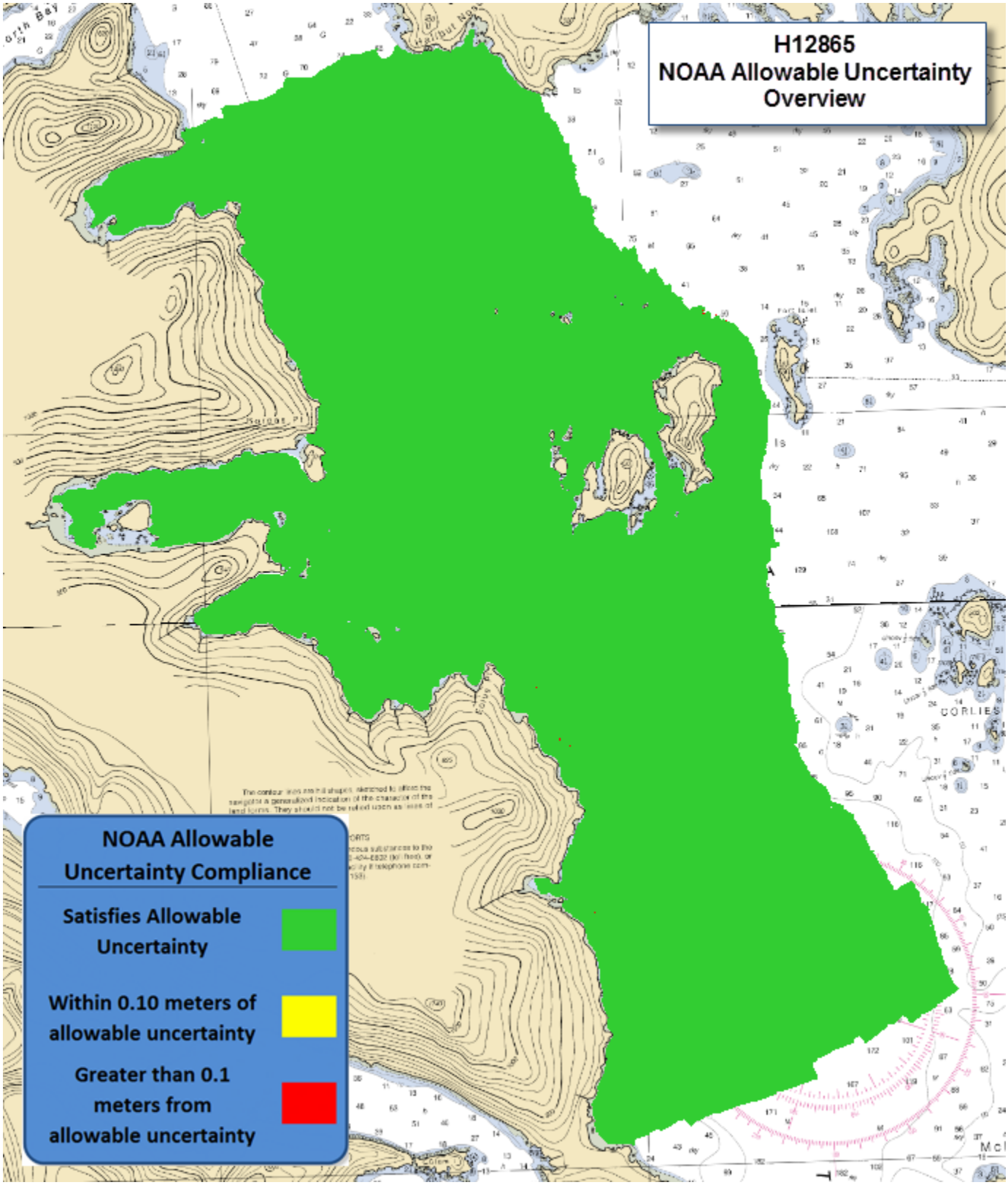


Figure 21: H12865 NOAA allowable uncertainty overview.

H12865 NOAA Allowable Uncertainty

	Total Nodes	Passed Nodes	Percent Pass
1m	6,153,243	6,122,477	99.50%
2m	2,759,608	2,745,810	99.50%
4m	916,917	907,748	99.00%
8m	317,838	314,660	99.00%
16m	127,655	126,378	99.00%

Total Nodes	10,275,261
Total Nodes Pass	10,217,073
Total Percent Pass	99.43%

Figure 22: H12865 NOAA allowable uncertainty statistics.

B.2.11 Density

Finalized surfaces were analyzed using the Pydro QC Tools Grid QA feature and the results are shown in Figure 24 below. Density requirements for H12865 were achieved with at least 99.50% of finalized surface nodes containing five or more soundings as required by HSSD Section 5.2.2.3. The few 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 as shown in Figure 23. For individual graphs (per surface) of density requirements, see the Standards and Compliance Review located in Appendix II.

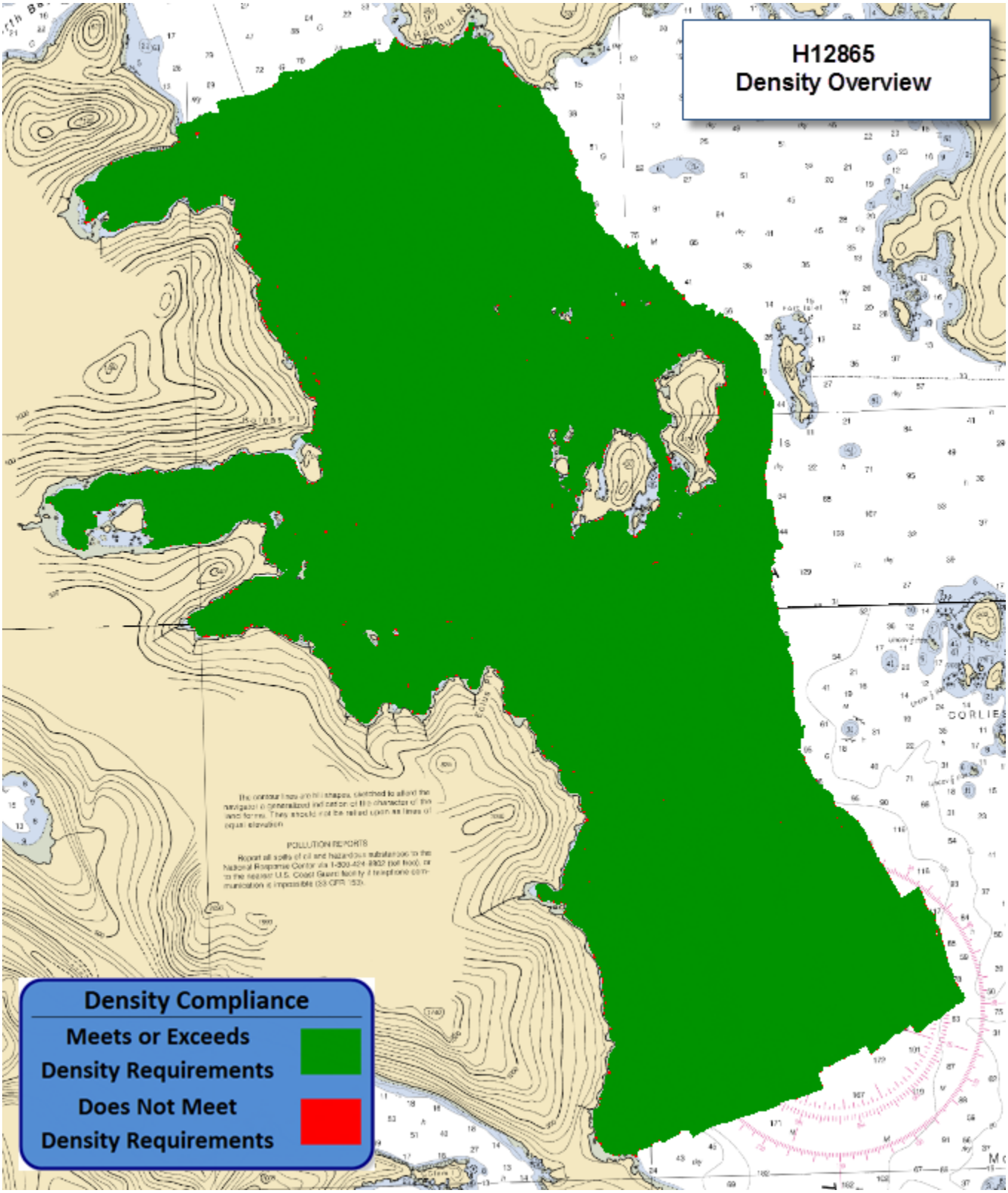


Figure 23: H12865 density overview.

H12865 Density Statistics

	Total Nodes	Passed Nodes	Percent Pass
1m	6,141,532	6,110,824	99.50%
2m	2,770,149	2,756,298	99.50%
4m	921,265	916,659	99.50%
8m	318,897	317,303	99.50%
16m	127,994	127,354	99.50%

Total Nodes	10,279,837
Total Nodes Pass	10,228,438
Total Percent Pass	99.50%

Figure 24: H12865 density compliance statistics.

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 data were logged as .7k files for Reson 7125 data. Kongsberg EM710 stores the backscatter data in the .all file. The data have been sent to the Pacific Hydrographic Branch for processing. One line per vessel per day of acquisition was processed by the field unit for quality control.

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 and SIPS	HIPS 9.1

Table 9: Primary bathymetric data processing software

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

Manufacturer	Name	Version
Fledermaus	FMGT	7.5.3

Table 10: Primary imagery data processing software

The following Feature Object Catalog was used: NOAA Profile Version 5.4

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
H12865_MB_1m_MLLW	CUBE	1 meters	-	NOAA_1m	Complete MBES
H12865_MB_2m_MLLW	CUBE	2 meters	-	NOAA_2m	Complete MBES
H12865_MB_4m_MLLW	CUBE	4 meters	-	NOAA_4m	Complete MBES
H12865_MB_8m_MLLW	CUBE	8 meters	-	NOAA_8m	Complete MBES
H12865_MB_16m_MLLW	CUBE	16 meters	-	NOAA_16m	Complete MBES
H12865_MB_1m_MLLW_Final	CUBE	1 meters	0 meters - 26 meters	NOAA_1m	Complete MBES
H12865_MB_2m_MLLW_Final	CUBE	2 meters	18 meters - 52 meters	NOAA_2m	Complete MBES
H12865_MB_4m_MLLW_Final	CUBE	4 meters	36 meters - 104 meters	NOAA_4m	Complete MBES

Surface Name	Surface Type	Resolution	Depth Range	Surface Parameter	Purpose
H12865_MB_8m_MLLW_Final	CUBE	8 meters	72 meters - 208 meters	NOAA_8m	Complete MBES
H12865_MB_16m_MLLW_Final	CUBE	16 meters	144 meters - 416 meters	NOAA_16m	Complete MBES

Table 11: Submitted Surfaces

The NOAA CUBE parameters mandated in the HSSD were used for the creation of all CUBE surfaces in Survey H12865. 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.

Flier Finder v3, part of the QC Tools package within Pydro, was used to assist the search for spurious soundings following gross cleaning. Flier Finder was run multiple times for each surface, reducing the flier height value for each consecutive run. This allowed Flier Finder to very accurately and quickly identify gross fliers, but as the flier height was reduced the effectiveness of the tool diminished. With smaller heights, Flier Finder began to incorrectly flag dynamic aspects of the seafloor such as steep drop offs and rocky areas as fliers resulting in hundreds of false positives. At this point, the hydrographer ceased using the tool and returned to manual cleaning for these dynamic regions of seafloor.

In order to prevent visual data gaps between the finalized surfaces, the 1, 2, 4, 8, and 16 meter surface depths were extended for greater overlap between the surfaces. The surfaces and depth ranges are listed in Table 11. All 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 extended ranges.

As a minimal percentage by area of H12865 met the depth threshold for the 32 meter depth range, a waiver to extend the 16 meter surface depth range and not submit a 32 meter surface was granted from the Hydrographic Survey Division Operations Branch, and is located in Appendix II. All data within the extended 16 meter surface meets the coverage requirements as defined by the HSSD. This waiver also covers the extension of all grids per the methods described in the previous paragraph.

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 are noted in the H12865 Data Log spreadsheet. All data logs are submitted digitally in the Separates I folder.

B.5.4 Designated Soundings

H12865 contains eight designated sounding in accordance with HSSD Section 5.2.1.2.3. Seven designated soundings represent DTONs (see Section D.1.6), and the remaining one designated sounding was selected to accurately represent the seafloor. The designated sounding is in a rocky area where the CUBE surface did not accurately depict the true seafloor. Figure 25 shows an overview of the survey area and the location of the designated soundings.

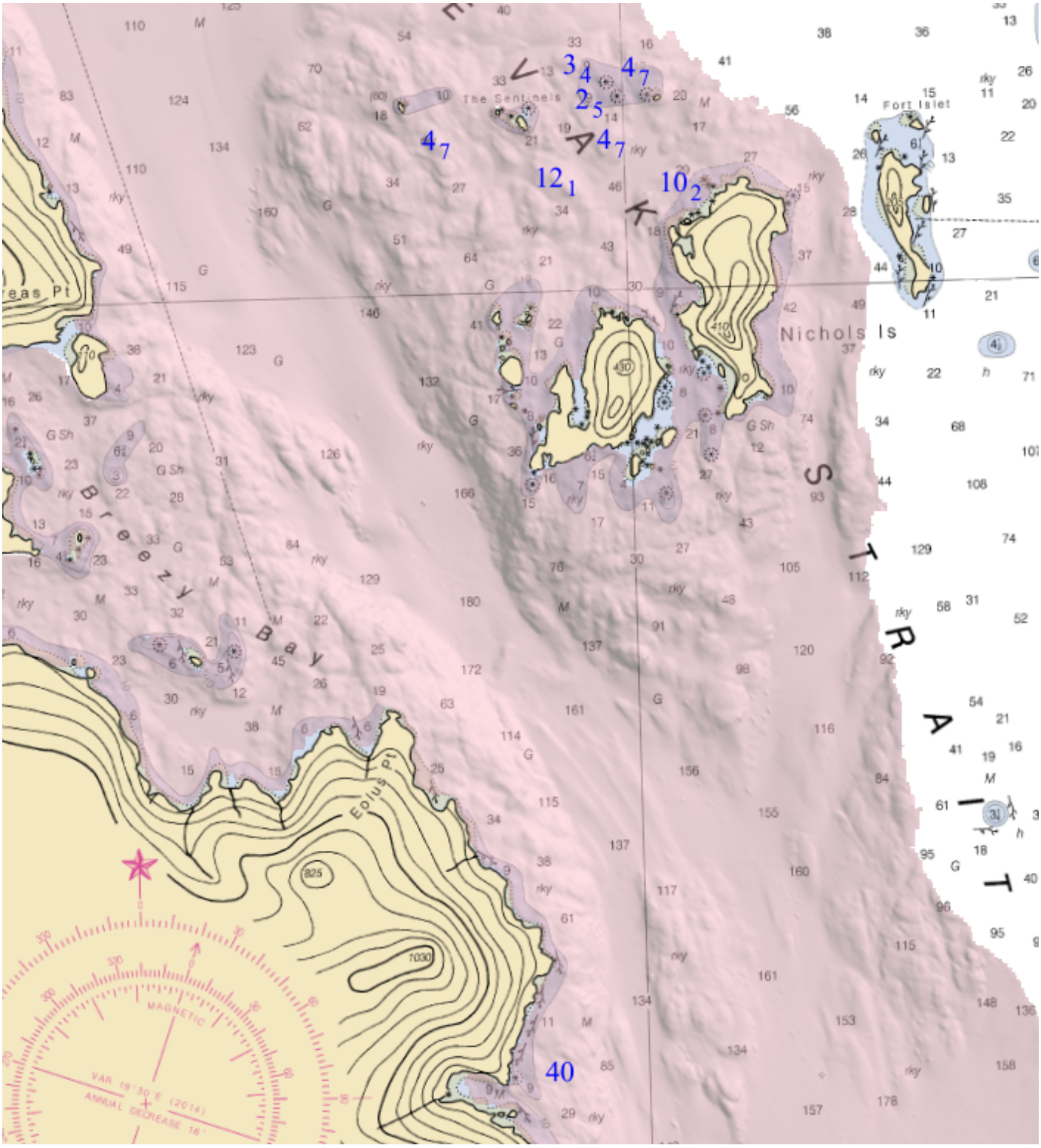


Figure 25: Overview of designated soundings in H12865

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.

Traditional Methods Used:

Discrete Zoning TCARI

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

Station Name	Station ID
Port Alexander, AK	9451054
Ketchikan, AK	9450460

Table 12: NWLON Tide Stations

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

Station Name	Station ID
Entrance to Windy Cove	9450251
Dunbar Inlet Tide Buoy	945BBBB

Table 13: Subordinate Tide Stations

File Name	Status
9451054.tid	Final Approved

Table 14: Water Level Files (.tid)

File Name	Status
OPRO190CORP.zdf	Preliminary
O190FA2016.tc	Final

Table 15: Tide Correctors (.zdf or .tc)

A request for final approved tides was sent to N/OPS1 on 06/12/2016. The final tide note was received on 09/07/2016.

Initial reduction of acquired data to MLLW was accomplished via traditional tidal means using the discrete zoning provided by HSD-OPS. Following the successful application of SBETs and computation of an Ellipsoidally Referenced Zone Tide (ERZT) separation model, ERS methods were used for reducing data to MLLW. After final tides were received, the final Tidal Constituent and Residual Interpolation (TCARI) grids were applied to the data and used for reducing features to MLLW.

ERS Methods Used:

ERS via Poor Mans VDATUM

Ellipsoid to Chart Datum Separation File:

O190FA2016CORP_PMVDERZT_UTM-WGS84-8N_WGS84-MLLW_100m.csar

C.2 Horizontal Control

The horizontal datum for this project is World Geodetic System of 1984 (WGS84).

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 and Single Base Positioning methods described in the DAPR. Smoothed 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 H12865 POSPAC Processing Logs spreadsheet located in the Separates folder. See also the OPR-O190-FA-16 Horizontal and Vertical Control Report (HVCR), submitted under a separate cover.

Hydrographic Technical Directive (HTD) 2016-3, which revises the horizontal datum requirement to NAD83, was released after acquisition was completed for OPR-O190-FA-16. The field unit conferred with HSD-OPS and determined no waiver was required to maintain WGS84 as the datum for submission. This correspondence has been included in Appendix II.

The following user installed stations were used for horizontal control:

HVCR Site ID	Base Station ID
9677	Larson

Table 16: User Installed Base Stations

Differential correctors from the U.S. Coast Guard beacon at Annette Island (323 kHz) and Level Island (295kHz) 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
Annette Island, AK (323 kHz)
Level Island, AK (295kHz)

Table 17: USCG DGPS Stations

D. Results and Recommendations

D.1 Chart Comparison

A comparison was performed between survey H12865 and charts 17407 and 17408 as well as ENC US5AK4DM, and US5AK4EM using CARIS HIPS and SIPS sounding and contour layers derived from the 16m combined surface. The contours and soundings were overlaid on the charts to assess differences between the surveyed soundings and charted depths. ENCs were compared to a 16m combined grid by extracting all soundings from the chart and creating a TIN which was differenced to the combined surface.

All data from H12865 should supersede charted data. In general, surveyed soundings do not agree with the majority of charted depths. A full discussion of the disagreements follows below.

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	07/19/2016	07/26/2016
17408	1:40000	9	12/2014	07/19/2016	07/26/2016

Table 18: Largest Scale Raster Charts

17407

The charted soundings and contours of Chart 17407 are identical to those found on ENC US5AK4DM. As such, all discussions regarding comparisons between surveyed soundings and charted depths are covered under the ENC US5AK4DM discussion below.

17408

The charted soundings and contours of Chart 17408 are identical to those found on ENC US5AK4EM. As such, all discussions regarding comparisons between surveyed soundings and charted depths are covered under the ENC US5AK4EM discussion below.

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	2	05/12/2015	05/12/2015	NO
US5AK4EM	1:40000	1	05/14/2015	05/14/2015	NO

Table 19: Largest Scale ENCs

US5AK4DM

The ENCs for this survey area were derived from the RNCs and therefore match for comparisons. The chart comparison between survey H12865 and ENC US5AK4DM showed large areas of disagreement. A difference surface was created from the H12865 16m combined surface and a 16m TIN created from the soundings on ENC US5AK4DM and US5AK4EM (Figure 26). The image below shows that the majority of the ENC is deeper than the surveyed soundings from H12865. Overall, 95% of nodes have a difference of +\- 45.91 meters when compared to the charted depths, as seen in Figure 27.

Contours from H12865 are in a general agreement with charted contours on ENC US5AK4DM with the exception of the missing 20 fathom, 50 fathom and 100 fathom contours. See Figures 28, 29, and 30 for examples. These contours are present in US5AK4EM and simply do not extend north into US5AK4DM. The Hydrographer recommends adding these contours to ENC US5AK4DM as to provide continuity to the mariner.

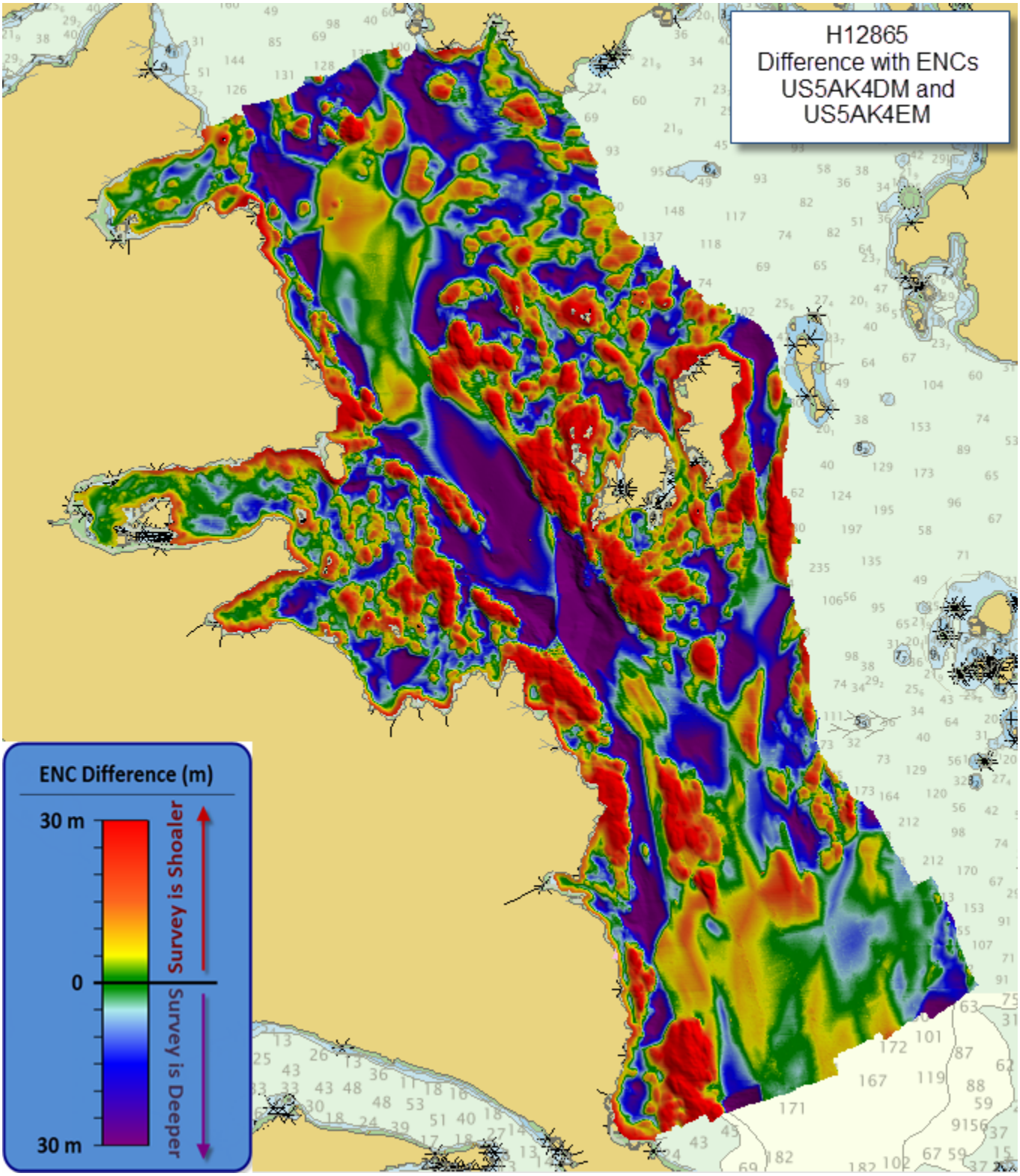
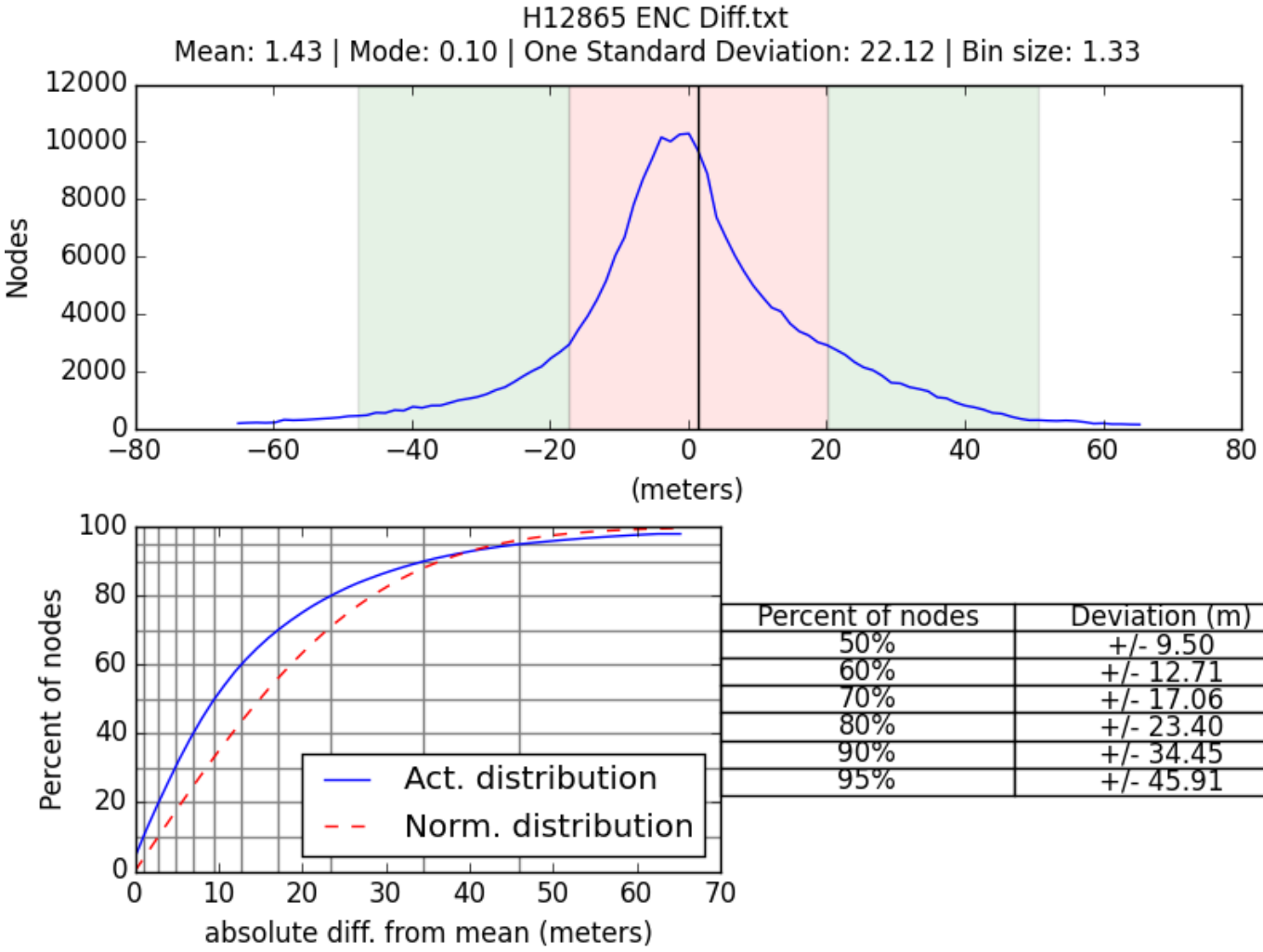


Figure 26: H12865 surface difference to US5AK4DM and US5AK4EM.



Percent of nodes	Deviation (m)
50%	+/- 9.50
60%	+/- 12.71
70%	+/- 17.06
80%	+/- 23.40
90%	+/- 34.45
95%	+/- 45.91

Figure 27: H12865 ENC difference comparison statistics.

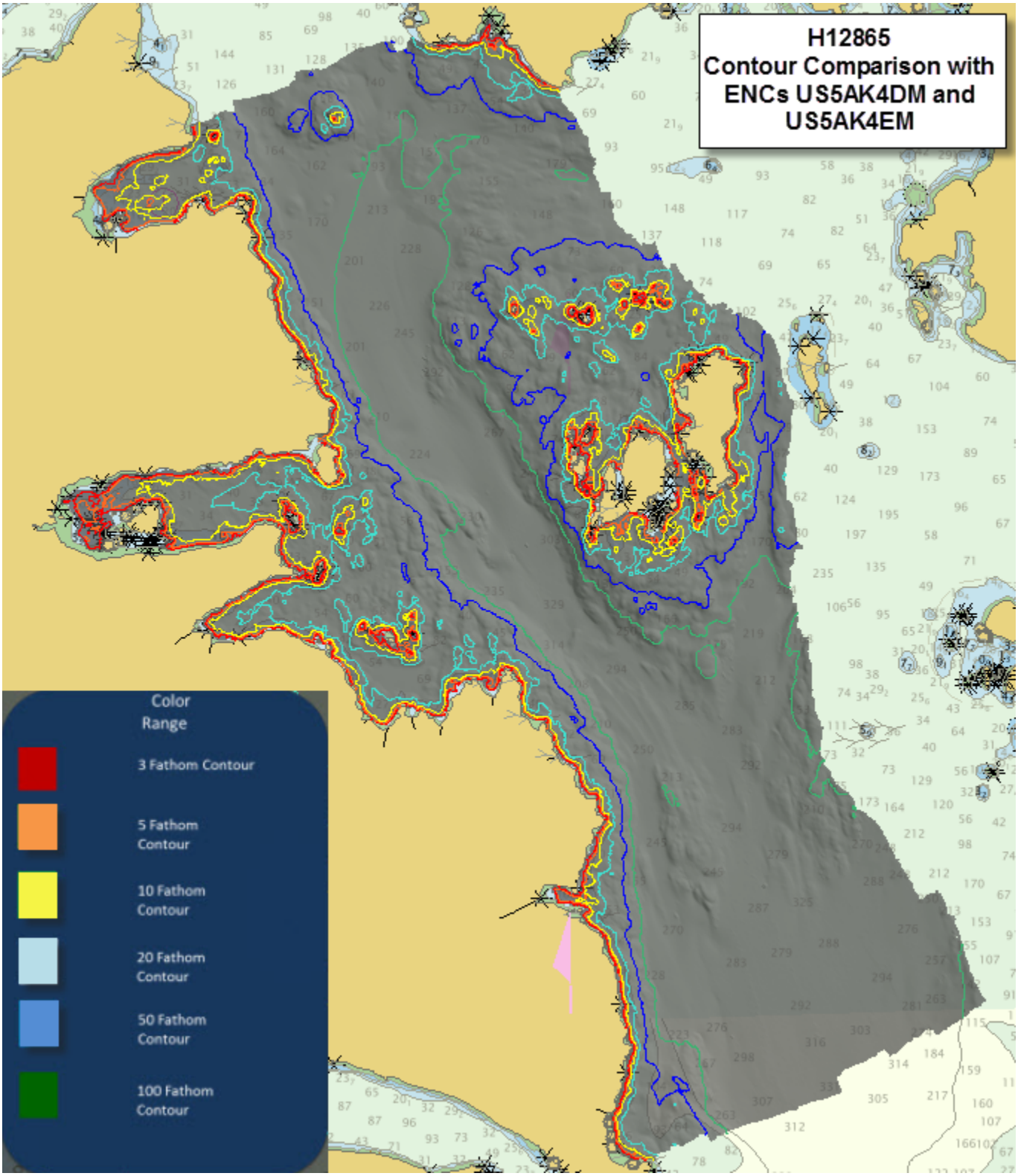


Figure 28: H12865 surveyed contour overview with ENCs US5AK4DM and US5AK4EM.

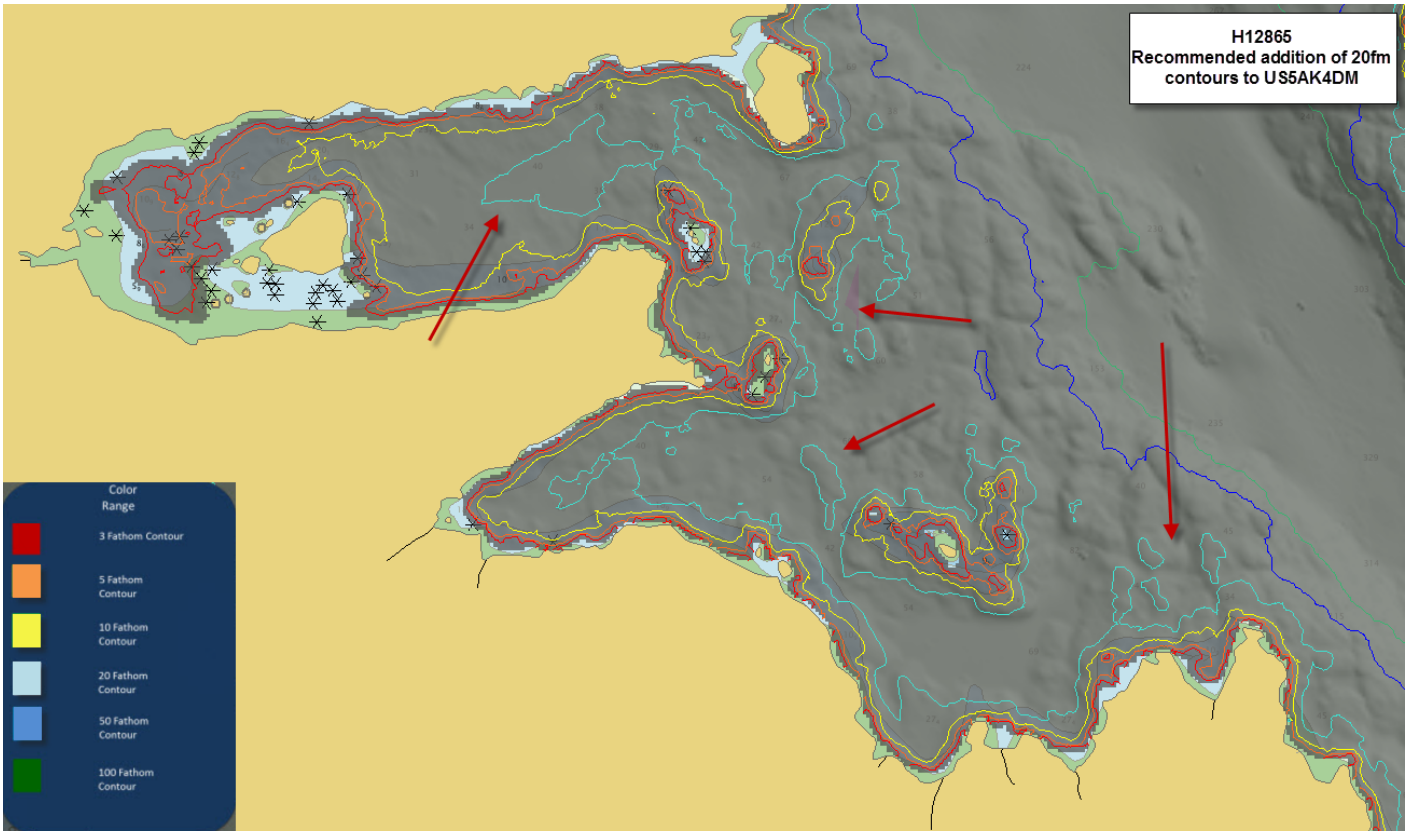


Figure 29: H12865 proposed addition of 20fm contour to US5AK4DM in Breezy Bay.

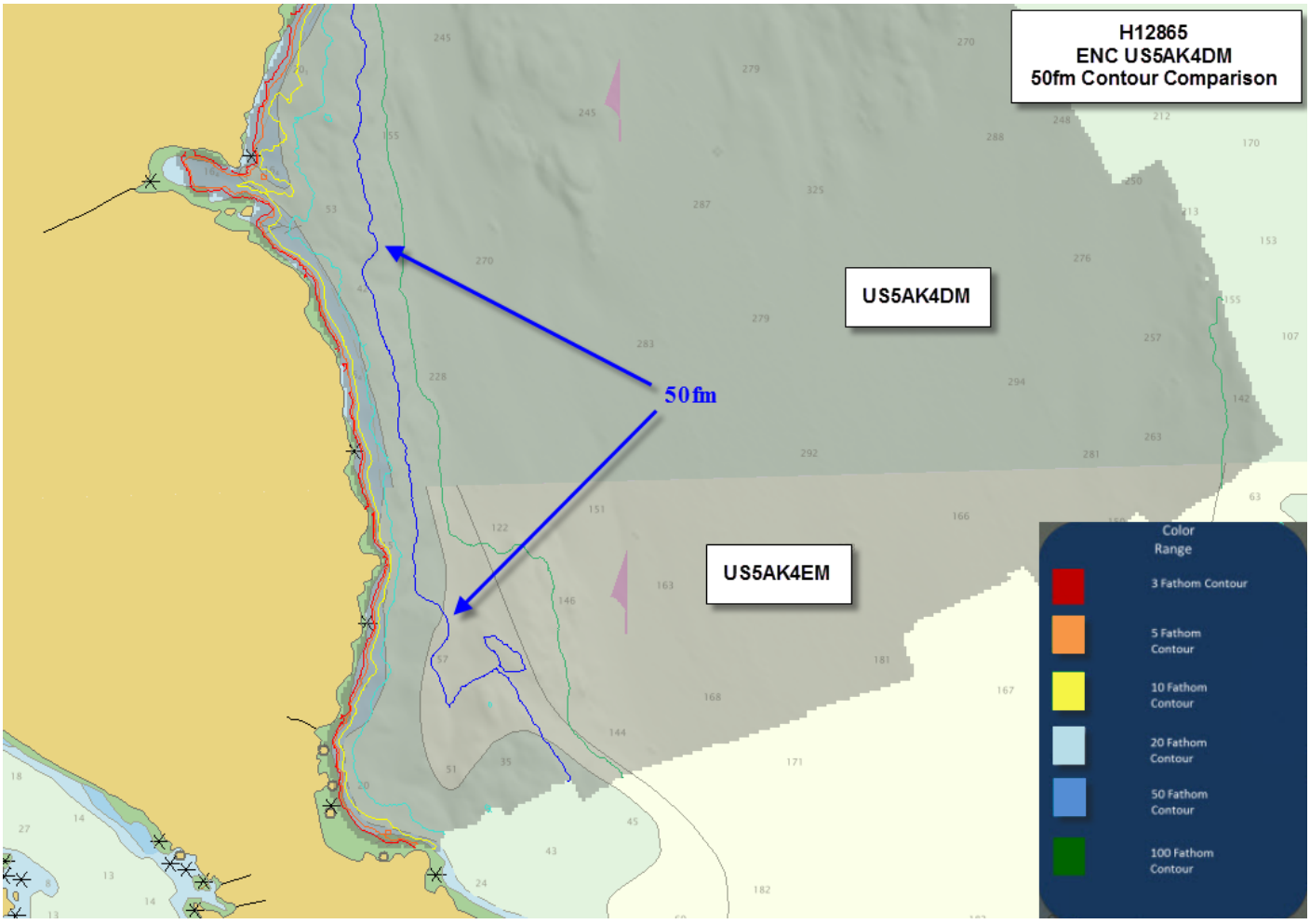


Figure 30: H12865 recommended update of 50fm contour.

US5AK4EM

As discussed under ENC US5AK4DM and shown in Figure 26 above, while individual soundings may match within 1-2fm, the overall chart comparison between survey H12865 and ENC US5AK4EM showed large and varying areas of disagreement.

Contours from H12865 are in a general agreement with charted contours on ENC US5AK4EM as shown in Figure 31. The largest differences are the lack of accuracy in the the 20 fathom and 50 fathom charted contours. The Hydrographer recommends updating these contours to ENC US5AK4EM as to provide additional information to the mariner.

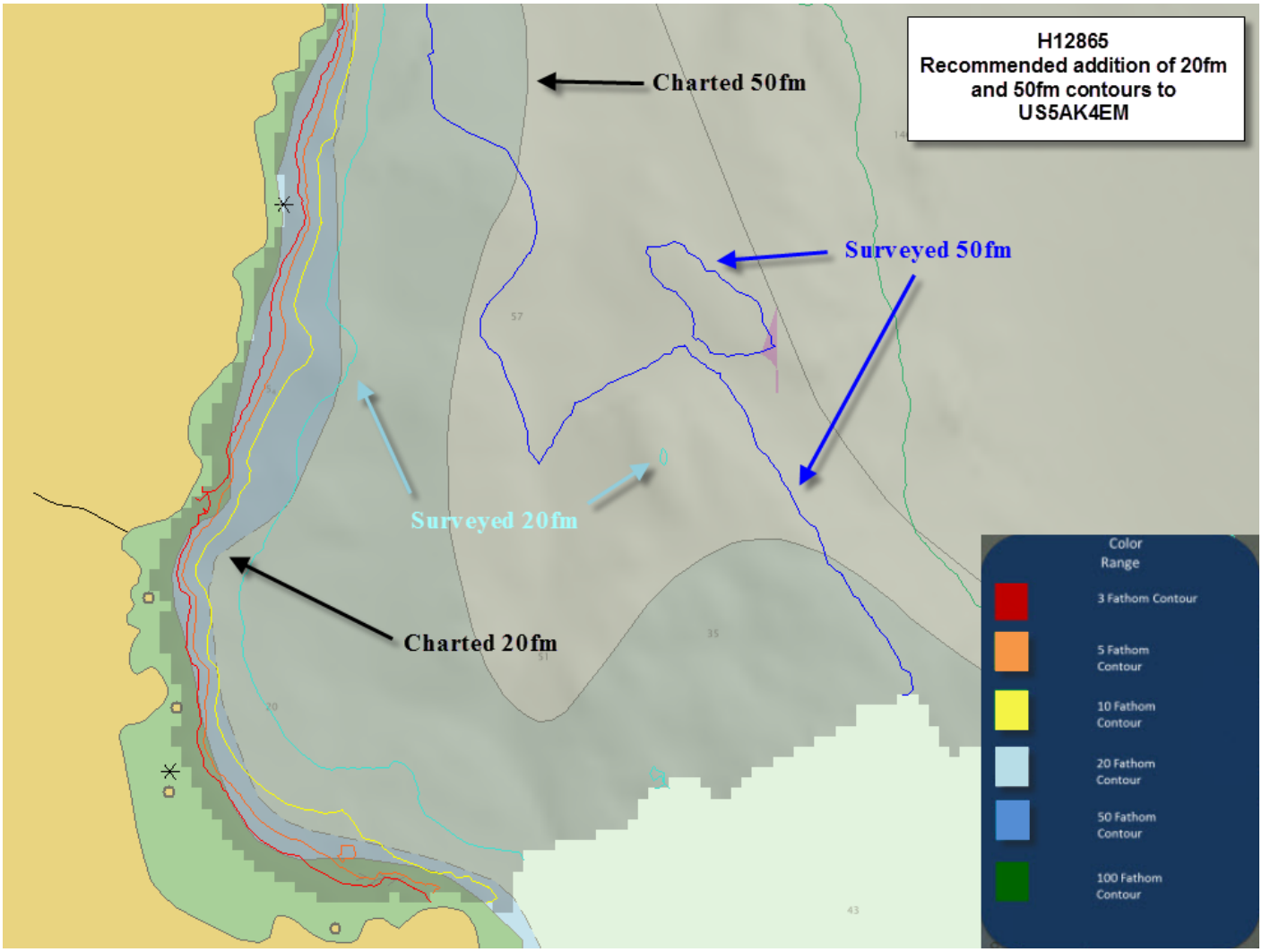


Figure 31: H12865 proposed update of 20fm and 50fm contour to US5AK4EM north of Reef Point.

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 H12865_Final_Feature_File.

D.1.5 Uncharted Features

Survey H12865 has 69 new features that are addressed in the H12865_Final_Feature_File.

D.1.6 Dangers to Navigation

The following DTON reports were submitted:

DTON Report Name	Date Submitted
H12865 DTON Report	2016-09-26

Table 20: DTON Reports

Seven Dangers to Navigation (DTONs) were found within the limits of survey H12865, and were reported to the Marine Chart Division on September 26, 2016. All seven Dangers to Navigation exist in the vicinity of The Sentinels and northern Nichols Island. This area was poorly charted and numerous shoals were discovered near significantly deeper charted depths as shown in Figure 32. The Danger to Navigation Report is included in Appendix II of this report.

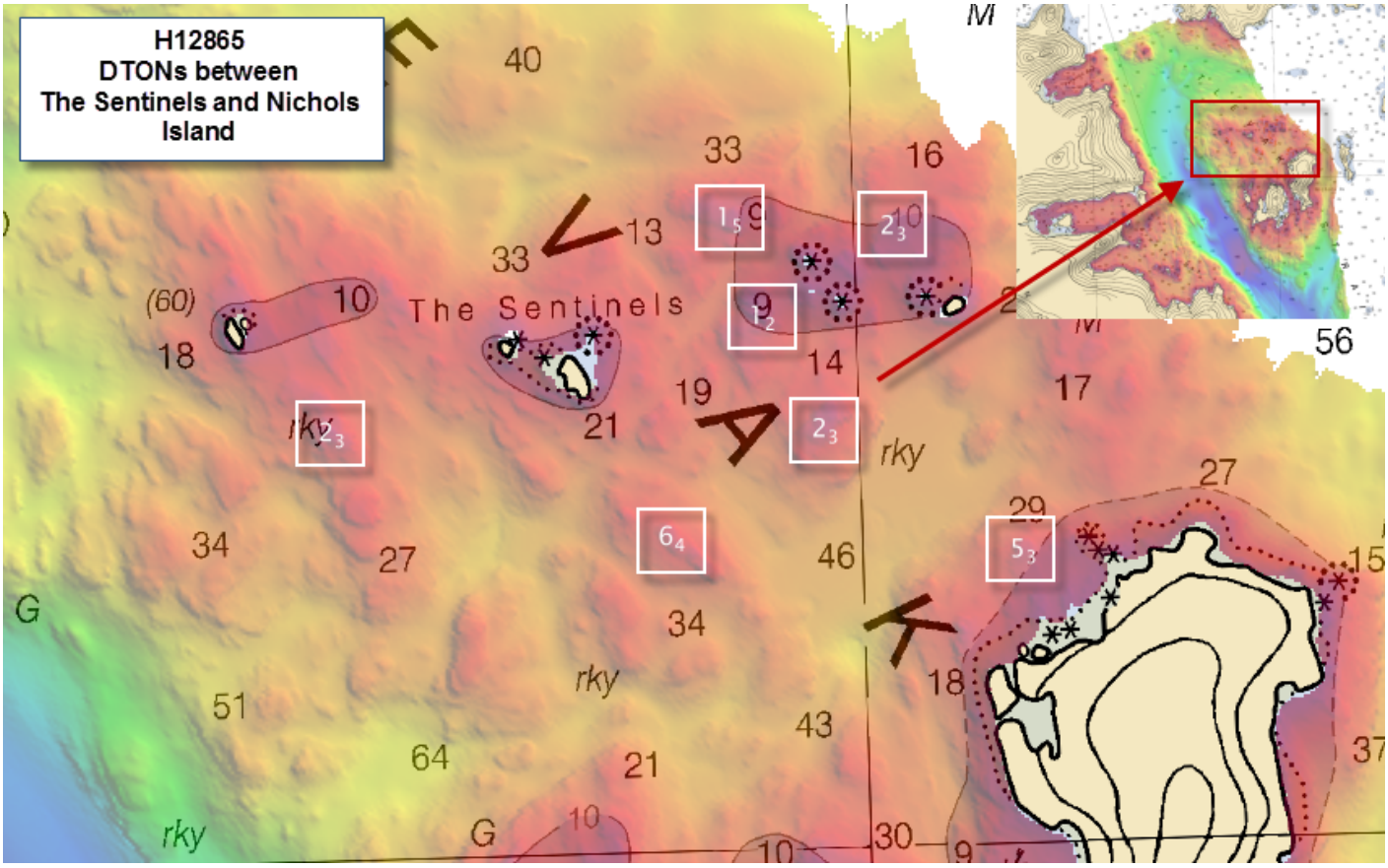


Figure 32: H12865 Chart 17407 location of DTONS.

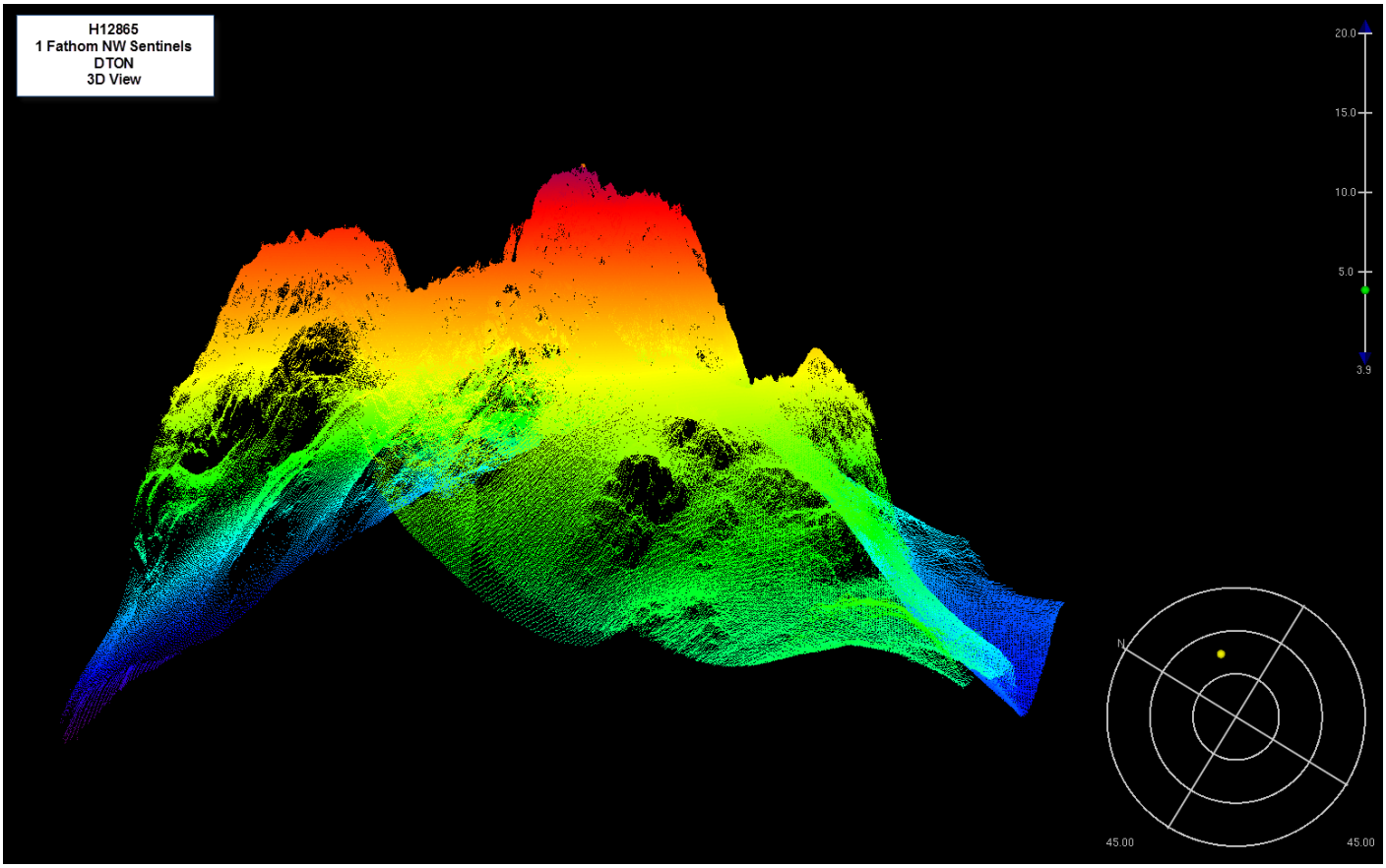


Figure 33: H12865 1.8fm DTON 3D subset view.

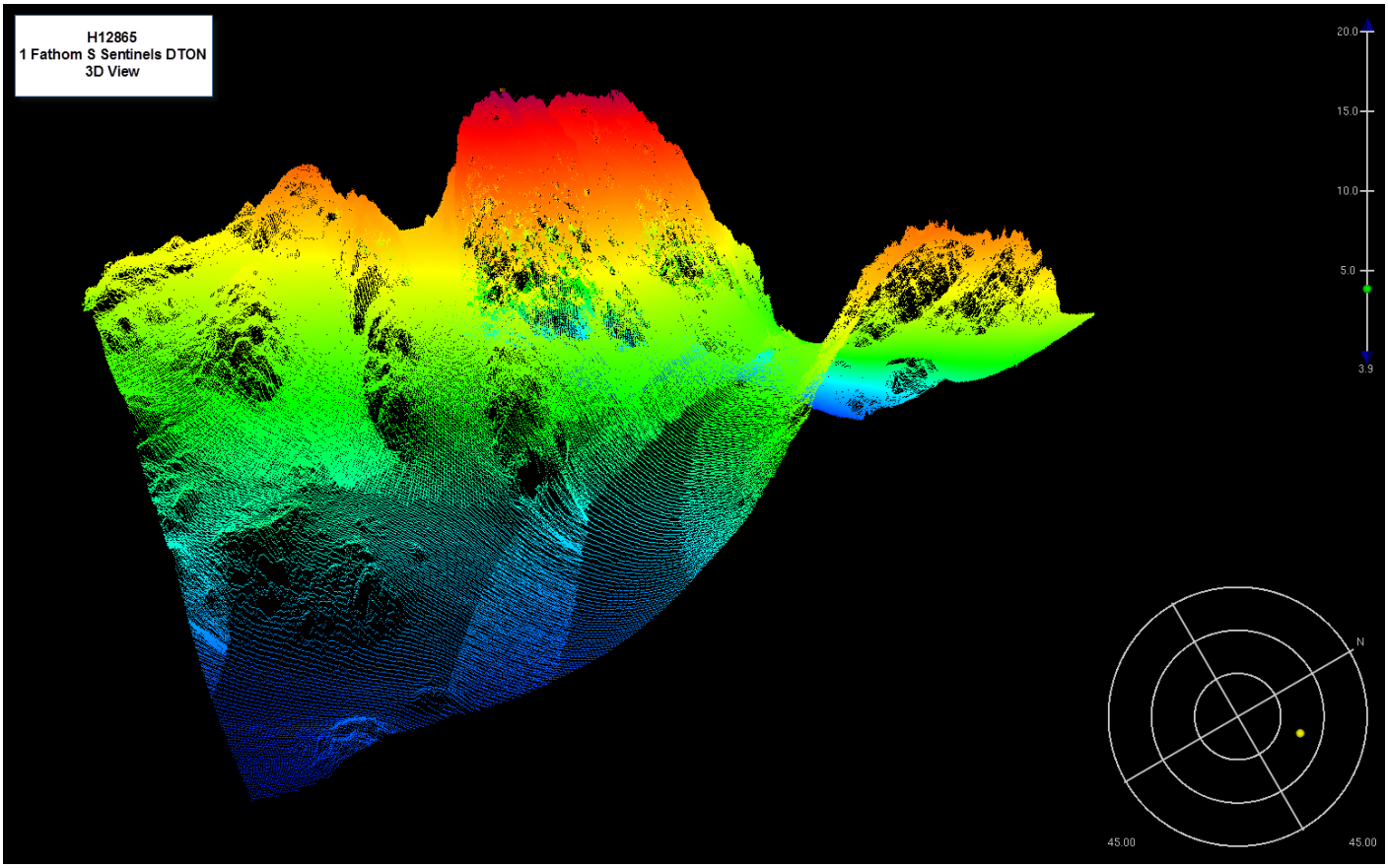


Figure 34: H12865 1.4fm DTON 3D subset view.

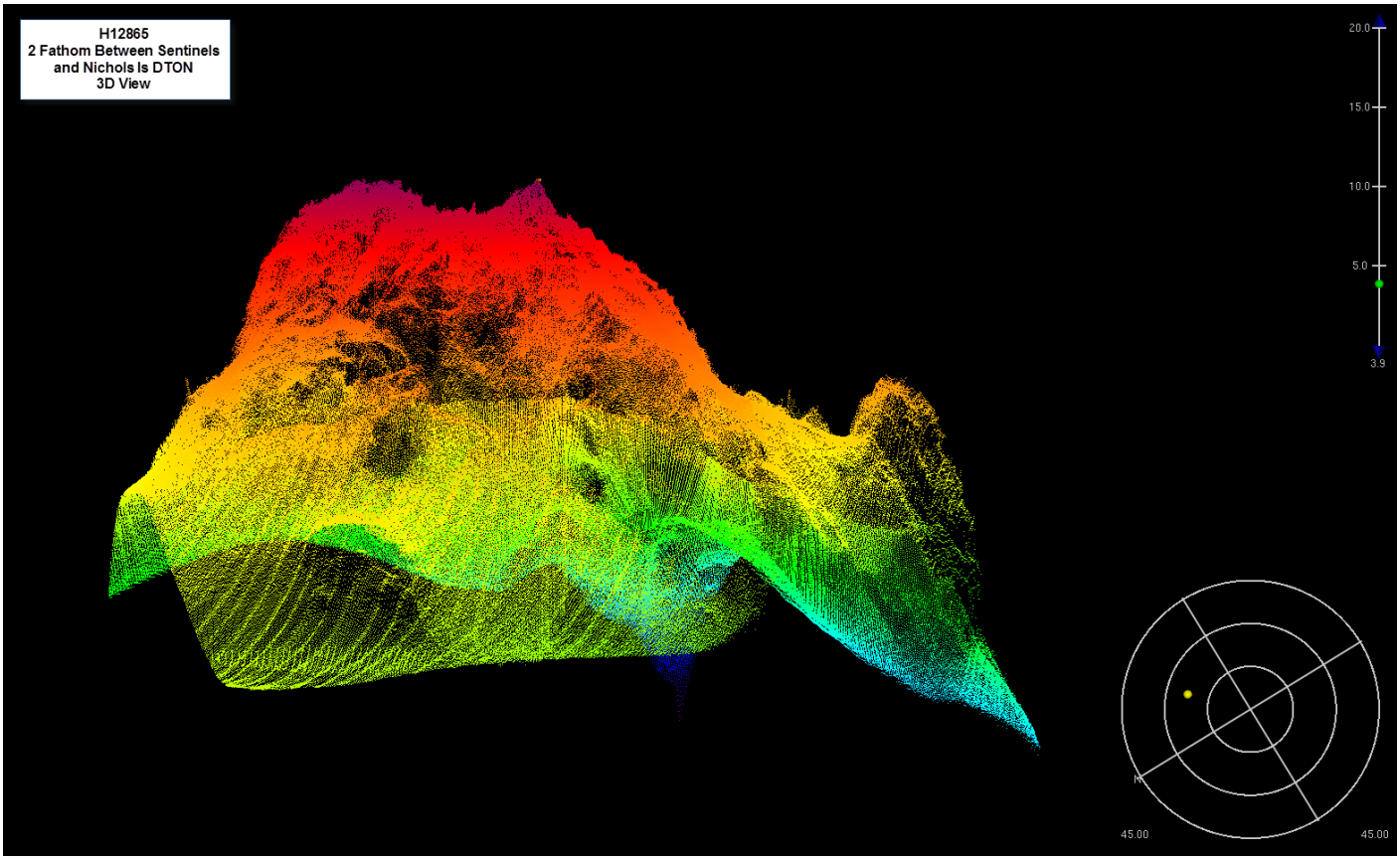


Figure 35: H12865 2.6fm DTON 3D subset view.

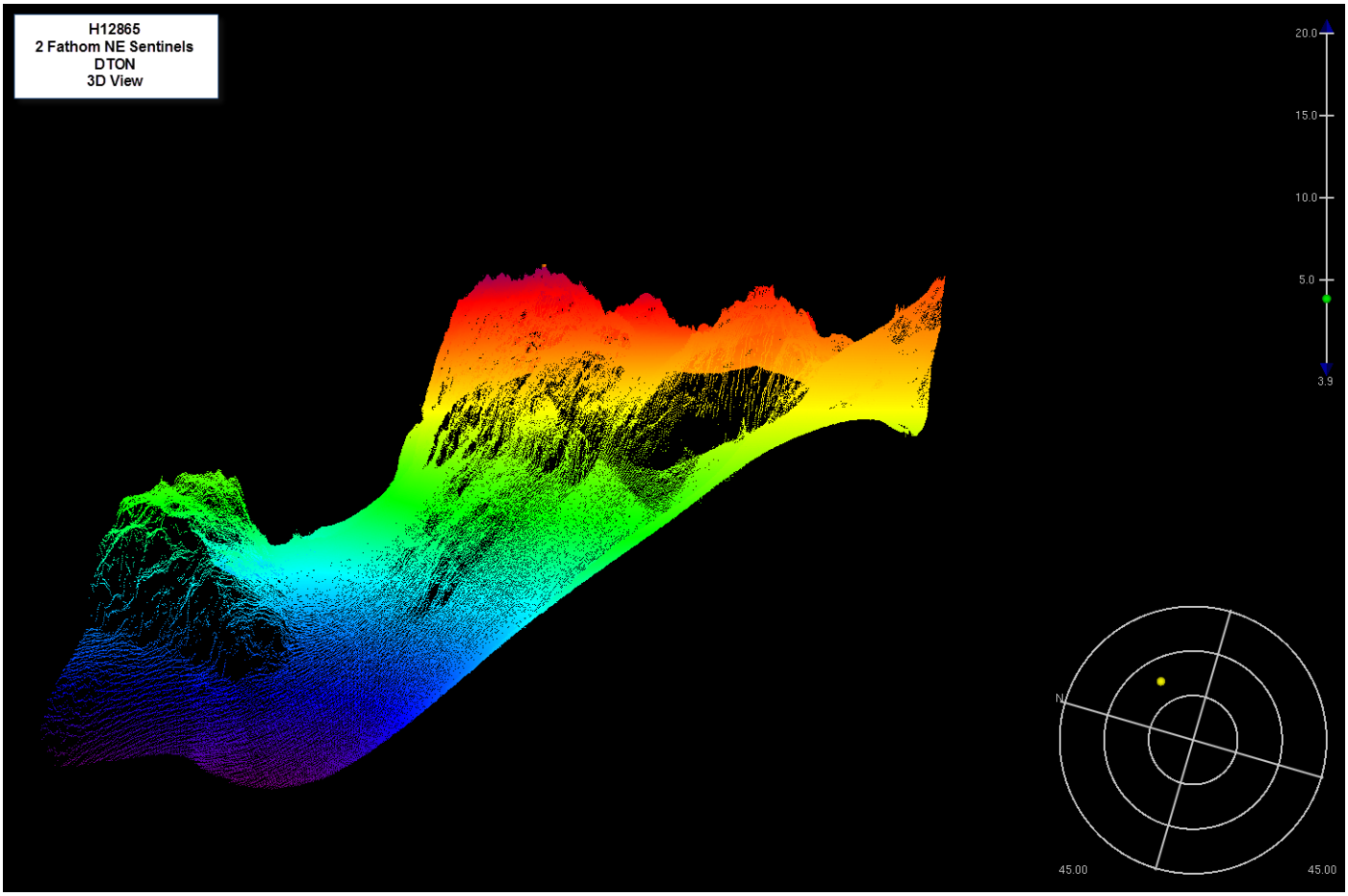


Figure 36: H12865 2.6fm DTON 3D subset view.

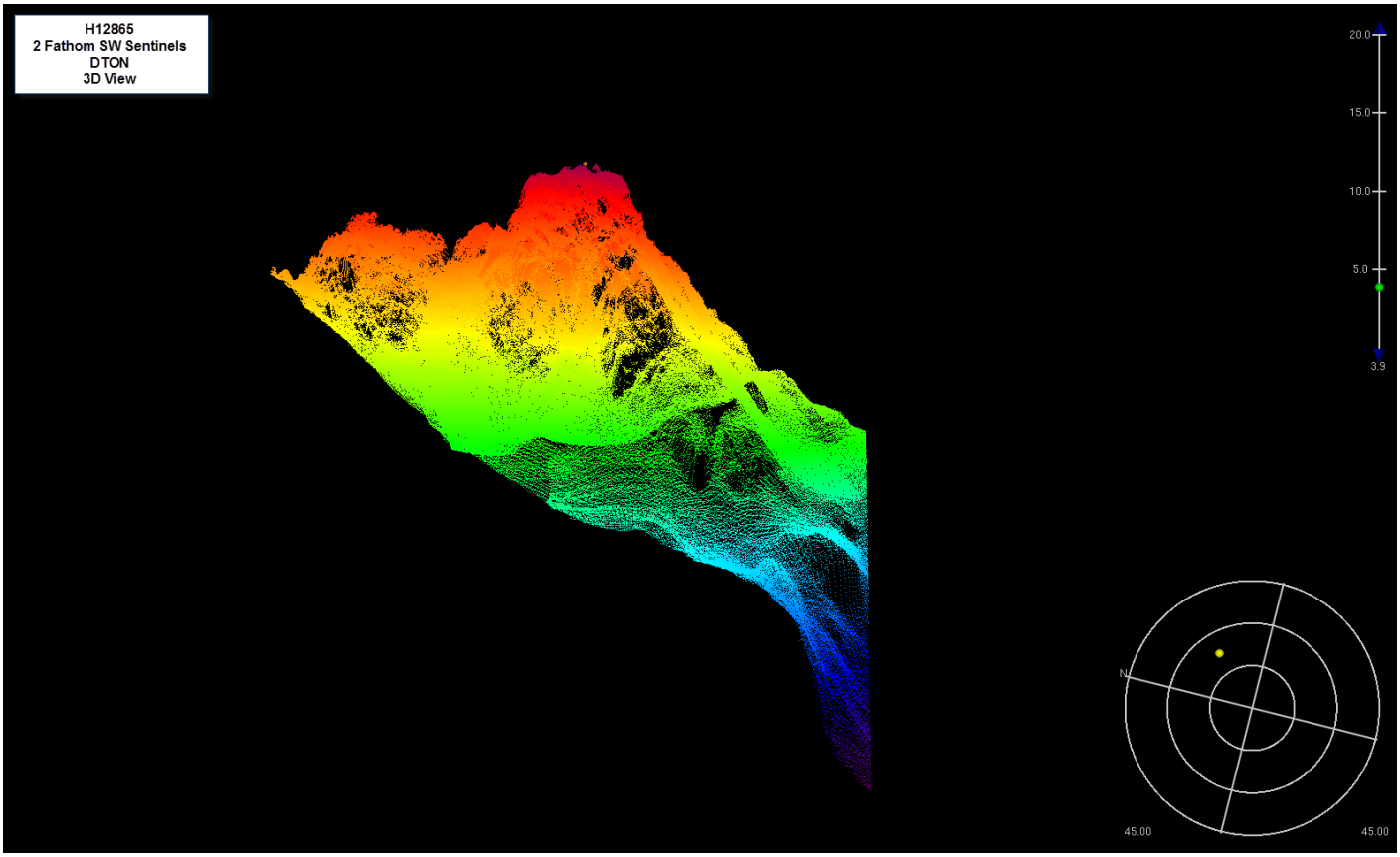


Figure 37: H12865 2.6fm DTON 3D subset view.

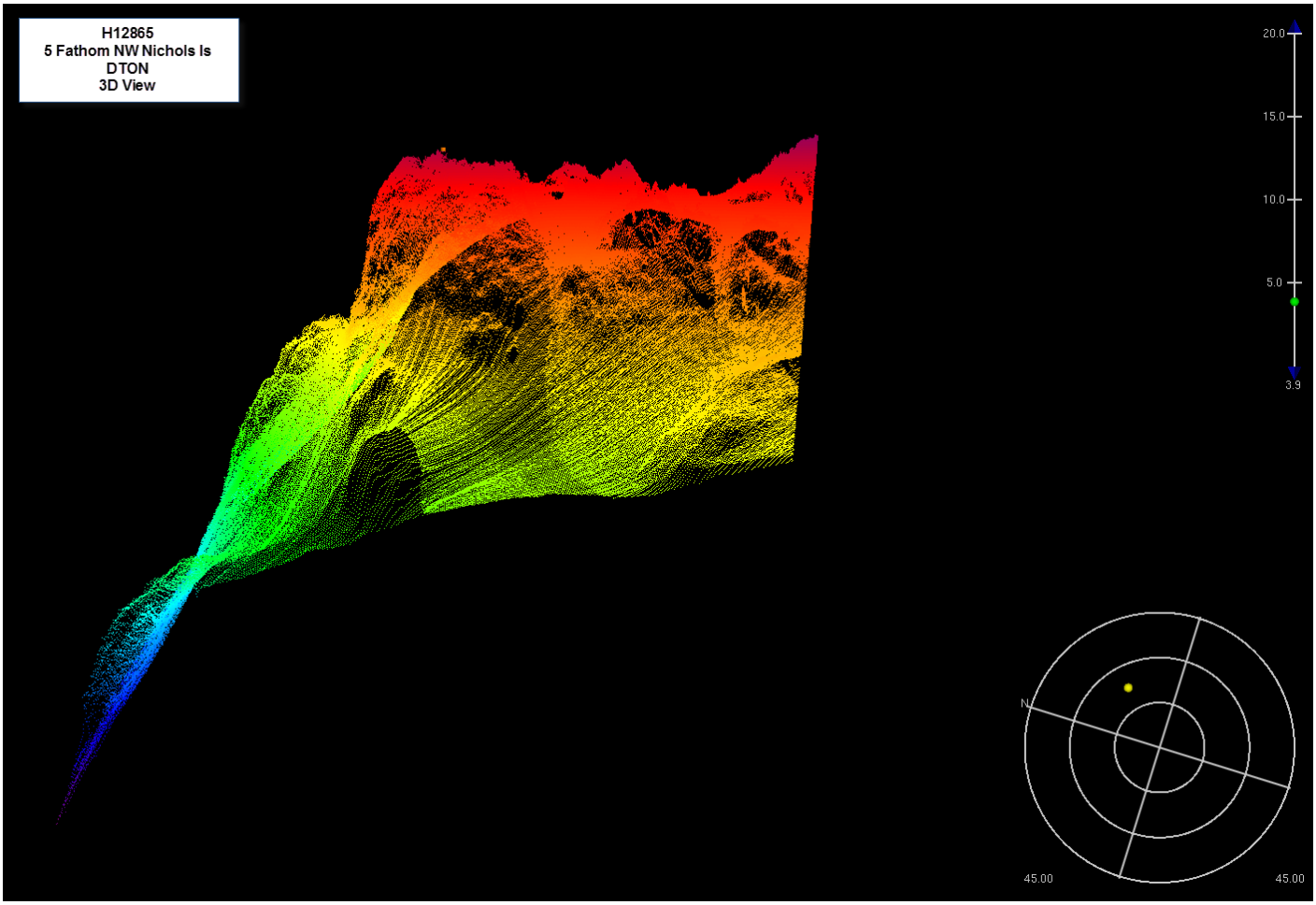


Figure 38: H12865 5.6fm DTON 3D subset view.

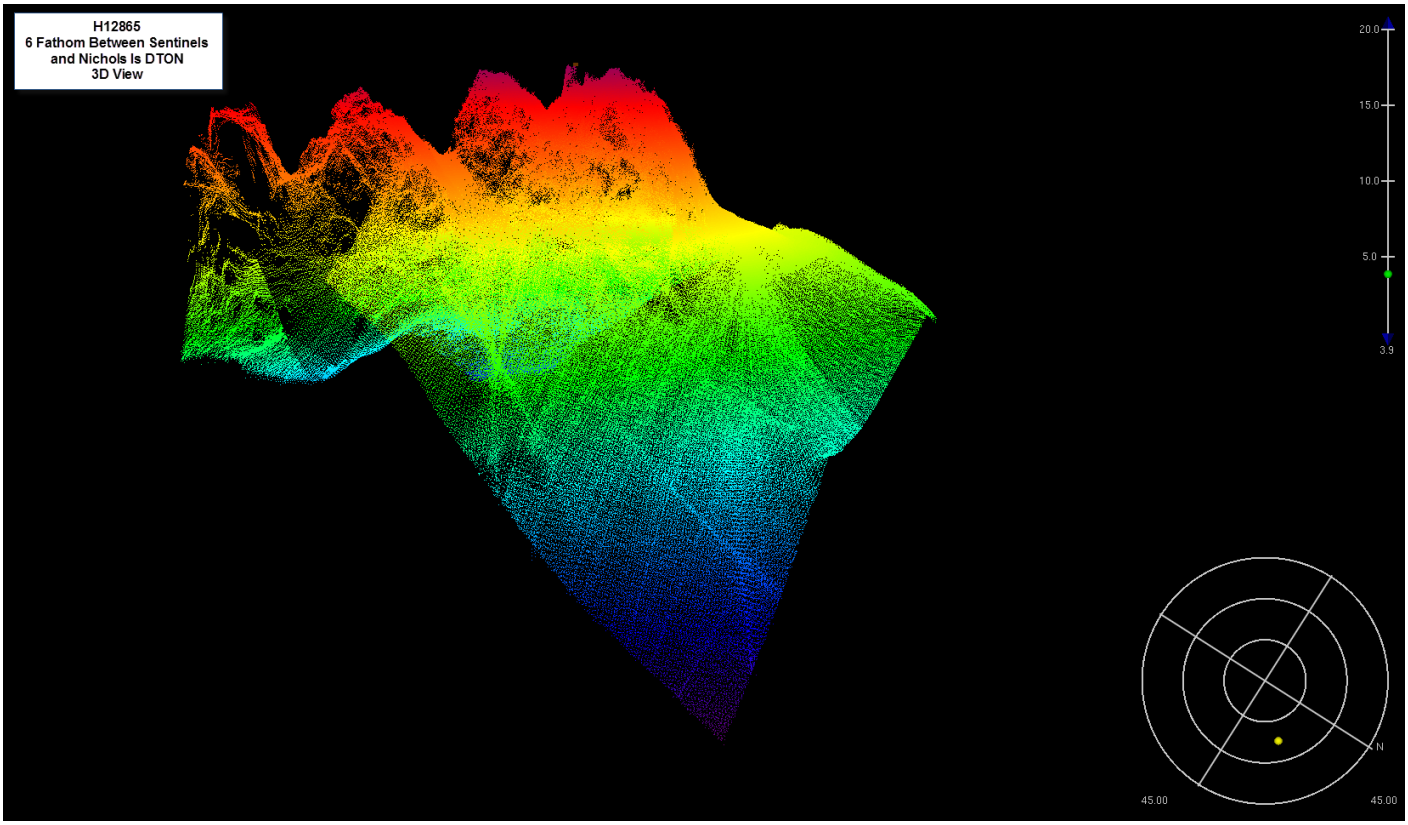


Figure 39: H12865 6.6fm DTON 3D subset view.

D.1.7 Shoal and Hazardous Features

No shoals or potentially hazardous features exist for this survey other than those addressed in the Dangers to Navigation section above.

D.1.8 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.1.9 Bottom Samples

Nine bottom samples were acquired in accordance with the Project Instructions for survey H12865. All bottom samples were entered in the H12865 Final Feature File. See figure 40 for bottom sample locations.

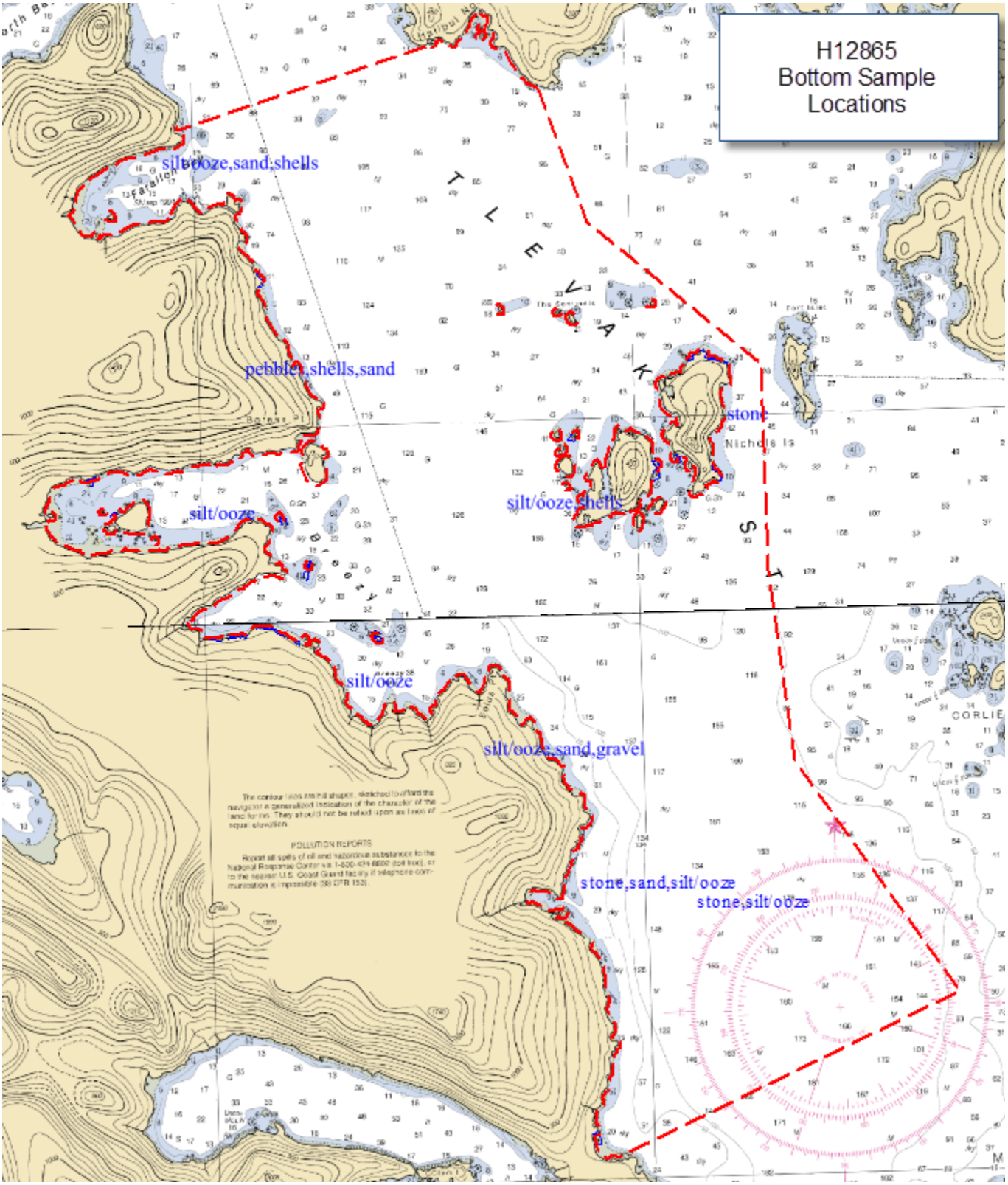


Figure 40: H12865 bottom sample locations

D.2 Additional Results

D.2.1 Shoreline

Fairweather personnel conducted limited shoreline verification and reconnaissance, utilizing traditional shoreline methods, at times near predicted negative or low tides within the survey limits. Annotations, information, and diagrams collected on DP forms and boat sheets during field operations are scanned and included in the Separates I Detached Positions folder. Shoreline verification procedures for survey H12865 conform to those detailed in the DAPR.

D.2.2 Prior Surveys

No prior survey comparisons exist for this survey.

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 meet or exceed 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	2016-09-30
Horizontal and Vertical Control Report	2016-09-30
Coast Pilot Report	2016-09-30
Tides and Water Levels Package	2016-07-15

Approver Name	Approver Title	Approval Date	Signature
CDR Mark Van Waes, NOAA	Chief of Party	09/30/2016	
LT Bart Buesseller, NOAA	Field Operations Officer	09/30/2016	 Digitally signed by BUESSELER.BART.OWEN.1396600559 Date: 2016.09.30 09:11:03 -08'00'
HCST Douglas Bravo	Chief Survey Technician	09/30/2016	 2016.09.30 09:10:13 -08'00'
ENS Tyler Fifield, NOAA	Sheet Manager	09/30/2016	FIFIELD.TYLER.P.1502767573 2016.09.30 08:57:15 -08'00'

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

PROVISIONAL TIDE NOTE FOR HYDROGRAPHIC SURVEY

DATE : September 6th, 2016

HYDROGRAPHIC BRANCH: Pacific
HYDROGRAPHIC PROJECT: OPR-O190-FA-2016
HYDROGRAPHIC SHEET: H12865

LOCALITY: Southwest Alaska Coast, Vicinity of Nicols Islands
TIME PERIOD: May 9th, 2016 – June 11th, 2016

TIDE STATION USED: 945-0460 Ketchican, AK
Lat. 55° 20.0’ N Long. 131° 37.5' W
PLANE OF REFERENCE (MEAN LOWER LOW WATER): 0.000 meters
HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 4.433 meters

TIDE STATION USED: 945-0251 Entrance to Windy Cove, AK
Lat. 55° 2.1’ N Long. 133° 1.4' W
PLANE OF REFERENCE (MEAN LOWER LOW WATER): 0.000 meters
HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 3.704 meters
REMARKS: RECOMMENDED GRID

Please use the TCARI grid "O190FA2016.tc" as the final grid for project OPR-O190-FA-2016, Registry No. H12865, during the time period between May 9th and June 11th, 2016.
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).

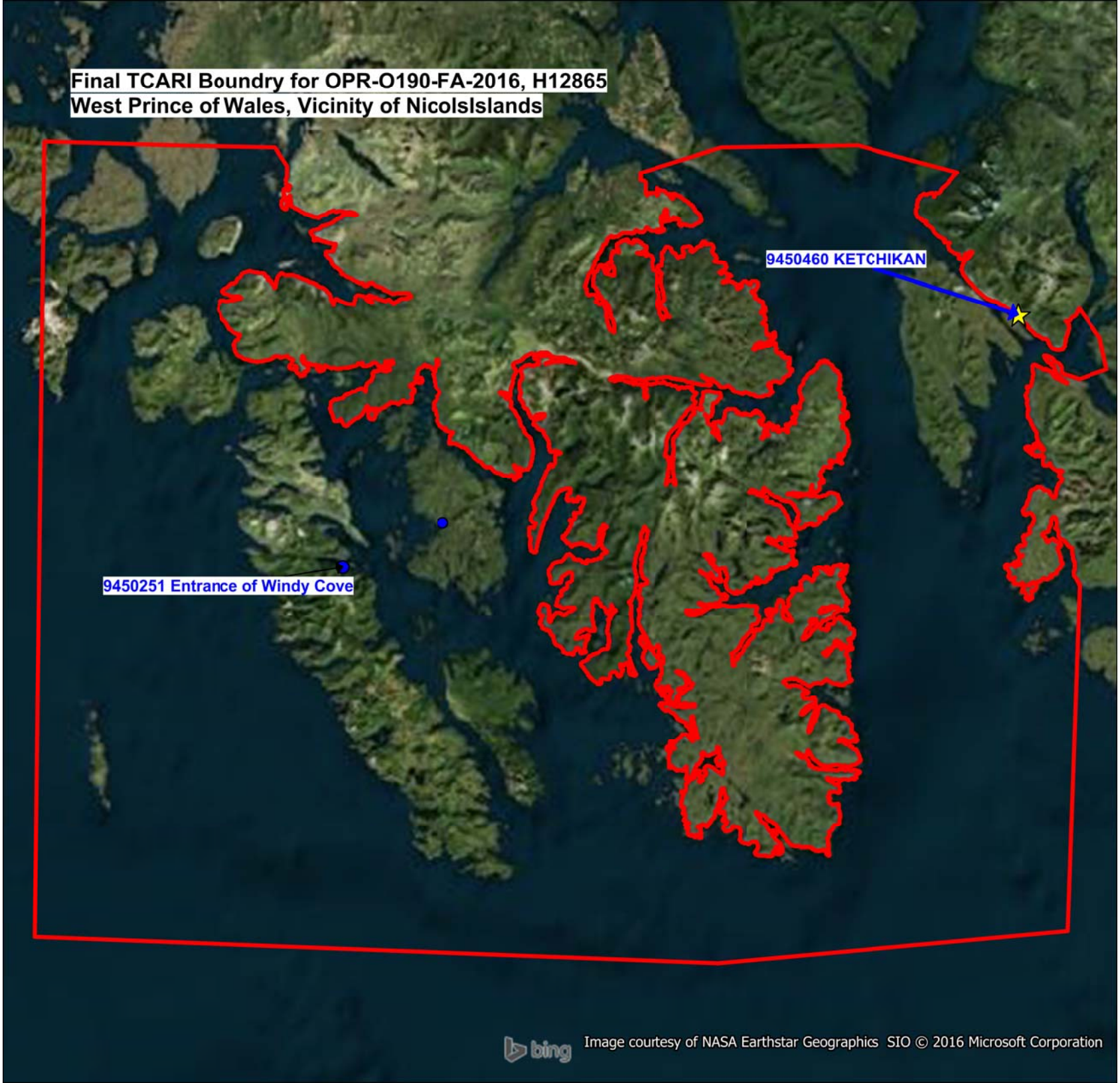
Note 2: Annual leveling for Ketchican, AK (945-0460) was not completed in the past year. A review of the verified leveling records from June 2006 – May 2015 shows the tide station benchmark network to be stable within an allowable 0.009 m tolerance. This Tide Note may be used as the final stability verification for survey OPR-O190-FA-2016, H12880. CO-OPS will immediately provide a revised Tide Note should subsequent leveling records indicate any benchmark network stability movement beyond the allowable 0.009 m tolerance.

Note 3: Survey tracklines fall outside of the TCARI boundaries in some areas due to inaccurate shoreline. TCARI will extrapolate the tide corrector to cover these soundings.

HOVIS.GERALD.THOMAS.JR.1365860250

Digitally signed by HOVIS.GERALD.THOMAS.JR.1365860250
DN: c=US, o=U.S. Government, ou=DoD, ou=PKI, ou=OTHER, cn=HOVIS.GERALD.THOMAS.JR.1365860250
Date: 2016.09.07 09:06:40 -04'00'

CHIEF, PRODUCTS AND SERVICES BRANCH


Final TCARI Boundry for OPR-O190-FA-2016, H12865
West Prince of Wales, Vicinity of NicolsIslands
9450460 KETCHIKAN
9450251 Entrance of Windy Cove
bing
Image courtesy of NASA Earthstar Geographics SIO © 2016 Microsoft Corporation

Clinton Marcus - NOAA Federal <clinton.r.marcus@noaa.gov>

OPR-O190-FA-16 Modified Finalized Depth Ranges

2 messages

FA OPS <ops.fairweather@noaa.gov> Mon, Jun 13, 2016 at 11:25 AM
To: Kathryn Pridgen - NOAA Federal <Kathryn.Pridgen@noaa.gov>
Cc: CO Fairweather <CO.Fairweather@noaa.gov>, CST Fairweather <ChiefST.Fairweather@noaa.gov>, Matthew Sharr <matthew.sharr@noaa.gov>, Tyler Fifield <tyler.p.fifield@noaa.gov>, Clint Marcus <Clinton.R.Marcus@noaa.gov>, Michael Gonsalves <Michael.Gonsalves@noaa.gov>

Good Morning Katy,

We've been seeing some gridding issues with our surfaces on O190 West Prince of Wales due to the steep and dynamic nature of the seafloor. What we're getting is when finalized, there are apparent coverage gaps where the surfaces meet (0-20 overlaps with 18-40, for example). This same issue was observed during last year's West Prince of Wales survey, and we resolved this issue by extending our shoaler surface deeper to cover these gaps. As per one of our DR's from last season:

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. ... 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. -H12742 DR

With that in mind we would like to request permission to adjust the depth ranges of our finalized surfaces to cover these gaps between surfaces. The depth ranges we propose are:

1m: 0 - 26m
2m: 18-52m
4m: 36-104m
8m: 72-208m
16m: 144-416m
32m: (unchanged)

We would also like to request that provided data meets specs, that we absorb all 32m coverage areas (depths over 320 meters) into the 16 meter surface. The 32m coverage areas are minimal in this project, and eliminating the requirement to submit this surface would save time and processing effort for the us in the field.

These are in line with our 2015 modifications, and based on initial evaluations onboard we fully expect to meet NOAA density and uncertainty requirements, even at these extended ranges.

Please let me know if you have any questions. Thanks!

Very Respectfully,

LTJG Bart Buesseler, NOAA

--
Operations Officer
NOAA Ship Fairweather
1010 Stedman Street
Ketchikan, Alaska 99901

Cell: 907.254.2842

Iridium: 808.659.0054
OPS.Fairweather@noaa.gov

Kathryn Pridgen - NOAA Federal <kathryn.pridgen@noaa.gov> Wed, Jun 15, 2016 at 7:15 AM
To: FA OPS <ops.fairweather@noaa.gov>
Cc: CO Fairweather <CO.Fairweather@noaa.gov>, CST Fairweather <ChiefST.Fairweather@noaa.gov>, Matthew Sharr <matthew.sharr@noaa.gov>, Tyler Fifield <tyler.p.fifield@noaa.gov>, Clint Marcus <Clinton.R.Marcus@noaa.gov>, Michael Gonsalves <Michael.Gonsalves@noaa.gov>

Due to the dynamic nature of the seafloor, a waiver for the extension of depth ranges and no requirement to submit a 16 meter surface has been granted from the Hydrographic Survey Division Operations Branch on June 15, 2016 for the West Prince of Wales Project, OPR-O190-FA-16. As such an adjustment of depth ranges for the finalized surfaces is also necessary and that the 32m coverage area will be included in the 16m surface and is all approved via the waiver.

Katy

Kathryn Pridgen
Physical Scientist
NOAA-HSD OPS
301-713-2702 ext 178
kathryn.pridgen@noaa.gov
[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

August 1, 2016

MEMORANDUM FOR: Commander Mark Van Waes, NOAA
Commanding Officer, NOAA Ship *Fairweather*

FROM: Lieutenant Commander Michael Gonsalves, NOAA
HSD Operations Branch, Chief

SUBJECT: Vertical Datum Transformation Technique
OPR-O190-FA-16,
West Prince of Wales, AK

Hydrographic surveys H12865, H12880, H12881, H12882 for OPR-O190-FA-16 West Prince of Wales are approved for vertical reduction to chart datum, Mean Lower Low Water (MLLW), using the NOAA ellipsoidally-referenced zoned tides (ERZT) model.

Approval of ERZT, in lieu of the NOAA Center for Operational Oceanographic Products and Services (CO-OPS) discrete tidal zoning package as per the Project Instructions, is based on your recommendation and the review of comparison results you included in your attached email from June 3, 2016.

The results of the data analysis show that ellipsoidally referenced survey (ERS) techniques with ERZT used as the vertical datum reducer meet or exceed horizontal and vertical specifications for hydrographic surveys.

The comparison techniques used in the analysis are in line with the procedures outlined in the NOS Hydrographic Surveys Specifications and Deliverables document.

You shall include a description of your ERS processing procedures and the comparisons you conducted between ERS and traditional tides in the appropriate Descriptive Report (DR), Horizontal and Vertical Control Report and/or Data Acquisition and Processing Report. As appropriate in the DR, document specific vessel day(s) or line(s) that have not been processed using ERS techniques as the vertical reducer to MLLW where discrete zoning provides better results and/or where vertical uncertainties of your post processed vertical positional data are inaccurate.

Include this memo in the supplemental correspondence Appendix of the DR.

H12865 DTON Report

Registry Number: H12865
State: Alaska
Locality: West Prince of Wales Island
Sub-locality: Vicinity of Nichols Islands
Project Number: OPR-O190-FA-16
Survey Dates: 05/09/2016 - 06/11/2016

Charts Affected

Number	Edition	Date	Scale (RNC)	RNC Correction(s)*
17407	16th	12/01/2014	1:40,000 (17407_1)	USCG LNM: 11/24/2015 (8/16/2016) CHS NTM: None (7/29/2016) NGA NTM: None (8/20/2016)
17400	18th	09/01/2013	1:229,376 (17400_1)	USCG LNM: 5/10/2016 (8/16/2016) CHS NTM: 6/24/2011 (7/29/2016) NGA NTM: 6/27/2009 (8/20/2016)
16016	22nd	08/01/2012	1:969,756 (16016_1)	USCG LNM: 3/15/2016 (8/16/2016) CHS NTM: 10/26/2012 (7/29/2016) NGA NTM: 6/27/2009 (8/20/2016)
531	25th	07/01/2015	1:2,100,000 (531_1)	USCG LNM: 9/13/2016 (9/13/2016) CHS NTM: 2/27/2015 (7/29/2016) NGA NTM: 10/4/2014 (8/20/2016)
500	10th	12/01/2015	1:3,500,000 (500_1)	USCG LNM: 3/15/2016 (8/16/2016) CHS NTM: 6/24/2011 (7/29/2016) NGA NTM: 10/20/2012 (8/20/2016)
501	13th	06/01/2009	1:3,500,000 (501_1)	USCG LNM: 8/16/2016 (8/16/2016) CHS NTM: 10/26/2012 (6/24/2016) NGA NTM: 10/4/2014 (8/20/2016)
530	35th	12/01/2015	1:4,860,700 (530_1)	USCG LNM: 8/16/2016 (8/16/2016) CHS NTM: 6/24/2011 (6/24/2016) NGA NTM: 10/4/2014 (8/20/2016)
50	9th	12/01/2015	1:10,000,000 (50_1)	USCG LNM: 7/26/2016 (8/16/2016) CHS NTM: 10/26/2012 (6/24/2016) NGA NTM: 10/26/2013 (8/20/2016)

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

Features

No.	Name	Feature Type	Survey Depth	Survey Latitude	Survey Longitude
1.1	Southwest Sentinels 2 Fathom Sounding	Shoal	4.80 m	55° 10' 35.5" N	133° 01' 16.5" W
1.2	Between Sentinels and Nichols 6 Fathom Sounding	Shoal	12.13 m	55° 10' 26.1" N	133° 00' 27.4" W
1.3	Northwest Sentinels 1 Fathom Sounding	Shoal	3.42 m	55° 10' 52.5" N	133° 00' 17.7" W
1.4	Southwest Sentinels 1 Fathom Sounding	Shoal	2.57 m	55° 10' 44.3" N	133° 00' 13.3" W
1.5	Between Sentinels and Nichols 2 Fathom Sounding	Shoal	4.76 m	55° 10' 34.7" N	133° 00' 04.7" W
1.6	Northeast Sentinels 2 Fathom Sounding	Shoal	4.79 m	55° 10' 51.5" N	132° 59' 54.0" W
1.7	Northeast Nichols Is 5 Fathom Sounding	Shoal	10.28 m	55° 10' 24.3" N	132° 59' 36.3" W

1 - Dangers To Navigation

1.1) Southwest Sentinels 2 Fathom Sounding

DANGER TO NAVIGATION

Survey Summary

Survey Position:	55° 10' 35.5" N, 133° 01' 16.5" W
Least Depth:	4.80 m (= 15.74 ft = 2.623 fm = 2 fm 3.74 ft)
TPU (±1.96σ):	**THU (TPEh)** [None] ; **TVU (TPEv)** [None]
Timestamp:	2016-163.00:00:00.000 (06/11/2016)
Dataset:	H12865_DTONs.000
FOID:	0_ 0000000211 00001(FFFE000000D30001/1)
Charts Affected:	17407_1, 17400_1, 16016_1, 531_1, 500_1, 501_1, 530_1, 50_1

Remarks:

A shoal area with a least depth of 2 fathoms 3 feet (4.80 meters) was ensonified in Tlevak Strait in the vicinity of The Sentinels. The sounding adjacent to a "rky" bottom type symbol located to the southwest of The Sentinels. Closest charted sounding is 27 fathoms.

Hydrographer Recommendations

Chart sounding as surveyed

Arithmetically-Rounded Depth (Unit-wise Affected Charts):

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

2fm 4ft (531_1)

4.8m (500_1, 501_1, 50_1)

S-57 Data

Geo object 1:	Sounding (SOUNDG)
Attributes:	QUASOU - 6:least depth known
	SORDAT - 20160611
	SORIND - US,US,graph,H12865
	TECSOU - 3:found by multi-beam

Feature Images

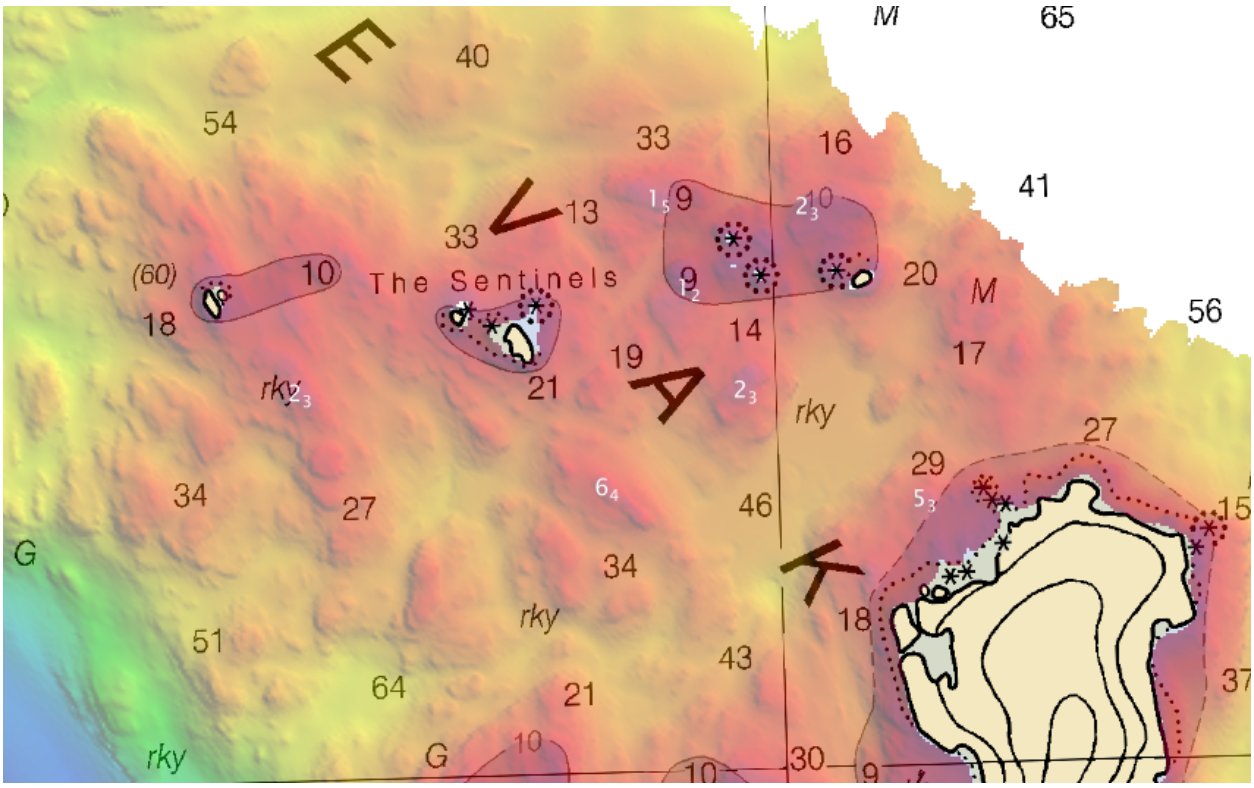


Figure 1.1.1

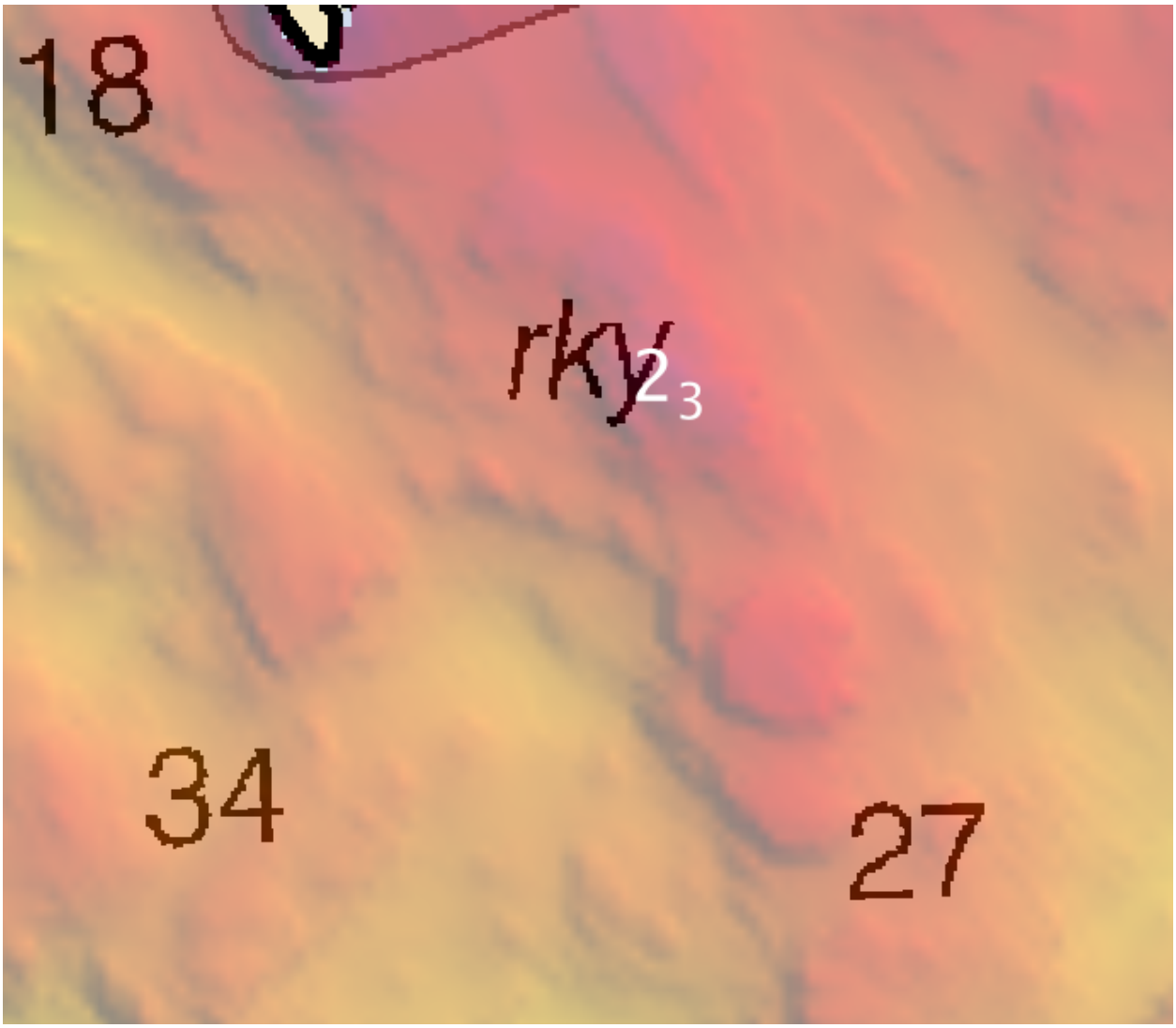


Figure 1.1.2

1.2) Between Sentinels and Nichols 6 Fathom Sounding

DANGER TO NAVIGATION

Survey Summary

Survey Position:	55° 10' 26.1" N, 133° 00' 27.4" W
Least Depth:	12.13 m (= 39.78 ft = 6.631 fm = 6 fm 3.78 ft)
TPU (±1.96σ):	**THU (TPEh)** [None] ; **TVU (TPEv)** [None]
Timestamp:	2016-163.00:00:00.000 (06/11/2016)
Dataset:	H12865_DTONs.000
FOID:	0_ 0000000210 00001(FFFE000000D20001/1)
Charts Affected:	17407_1, 17400_1, 16016_1, 531_1, 500_1, 501_1, 530_1, 50_1

Remarks:

A shoal area with a least depth of 6 fathoms 4 feet (12.13 meters) was ensonified in Tlevak Strait in the vicinity of The Sentinels. The sounding is adjacent to a 34 fathom sounding, equidistant between The Sentinels and Nichols Islands.

Hydrographer Recommendations

Chart sounding as surveyed

Arithmetically-Rounded Depth (Unit-wise Affected Charts):

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

6fm 4ft (531_1)

12.1m (500_1, 501_1, 50_1)

S-57 Data

Geo object 1:	Sounding (SOUNDG)
Attributes:	QUASOU - 6:least depth known
	SORDAT - 20160611
	SORIND - US,US,graph,H12865
	TECSOU - 3:found by multi-beam

Feature Images

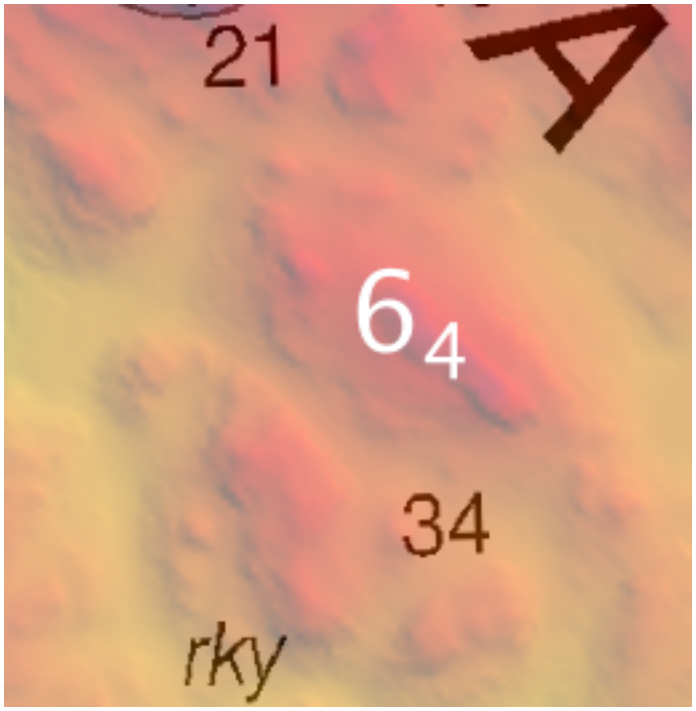


Figure 1.2.1

1.3) Northwest Sentinels 1 Fathom Sounding

DANGER TO NAVIGATION

Survey Summary

Survey Position:	55° 10' 52.5" N, 133° 00' 17.7" W
Least Depth:	3.42 m (= 11.23 ft = 1.871 fm = 1 fm 5.23 ft)
TPU (±1.96σ):	**THU (TPEh)** [None] ; **TVU (TPEv)** [None]
Timestamp:	2016-163.00:00:00.000 (06/11/2016)
Dataset:	H12865_DTONs.000
FOID:	0_ 0000000207 00001(FFFE000000CF0001/1)
Charts Affected:	17407_1, 17400_1, 16016_1, 531_1, 500_1, 501_1, 530_1, 50_1

Remarks:

A shoal area with a least depth of 1 fathom 5 feet (3.42 meters) was ensonified in Tlevak Strait in the vicinity of The Sentinels. The sounding is adjacent to a charted 9 fathom sounding in the northeast portion of The Sentinels.

Hydrographer Recommendations

Chart sounding as surveyed

Arithmetically-Rounded Depth (Unit-wise Affected Charts):

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

1fm 5ft (531_1)

3.4m (500_1, 501_1, 50_1)

S-57 Data

Geo object 1:	Sounding (SOUNDG)
Attributes:	QUASOU - 6:least depth known
	SORDAT - 20160611
	SORIND - US,US,graph,H12865
	TECSOU - 3:found by multi-beam

Feature Images

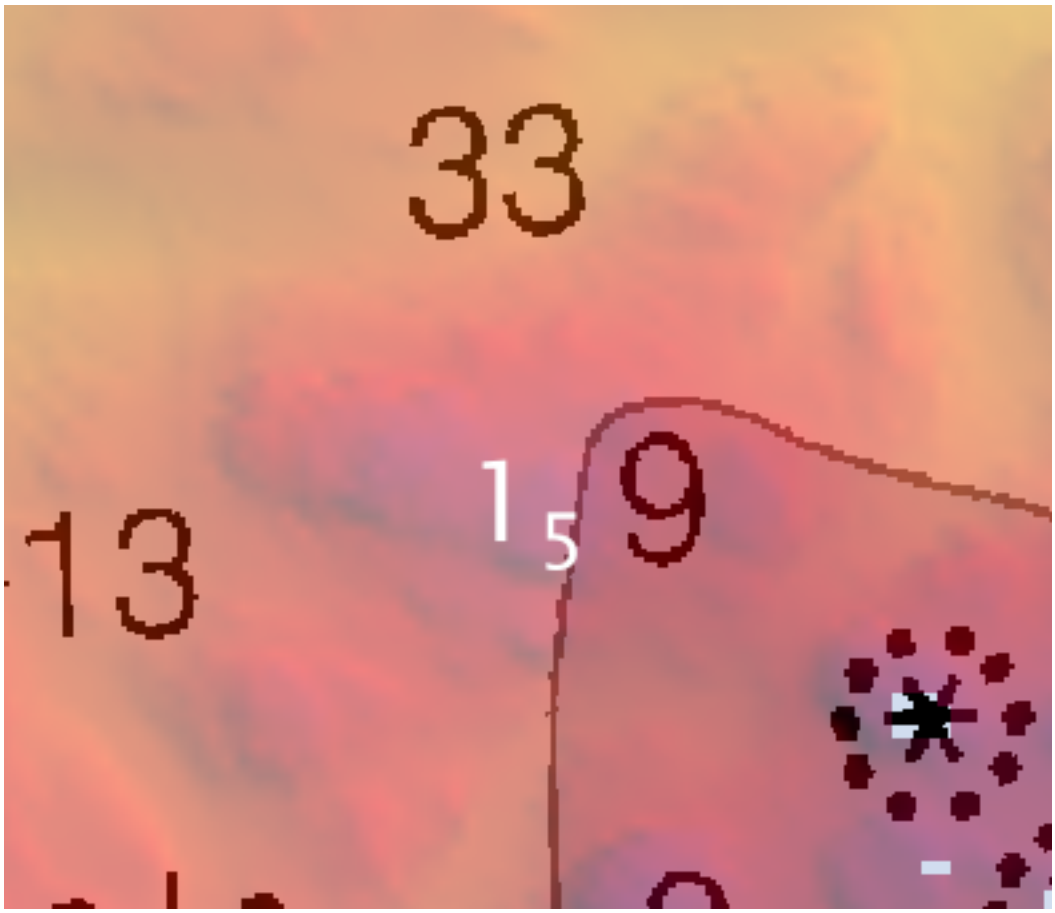


Figure 1.3.1

1.4) Southwest Sentinels 1 Fathom Sounding

DANGER TO NAVIGATION

Survey Summary

Survey Position:	55° 10' 44.3" N, 133° 00' 13.3" W
Least Depth:	2.57 m (= 8.42 ft = 1.403 fm = 1 fm 2.42 ft)
TPU (±1.96σ):	**THU (TPEh)** [None] ; **TVU (TPEv)** [None]
Timestamp:	2016-163.00:00:00.000 (06/11/2016)
Dataset:	H12865_DTONs.000
FOID:	0_ 0000000208 00001(FFFE000000D00001/1)
Charts Affected:	17407_1, 17400_1, 16016_1, 531_1, 500_1, 501_1, 530_1, 50_1

Remarks:

A shoal area with a least depth of 1 fathom 2 feet (2.57 meters) was ensonified in Tlevak Strait in the vicinity of The Sentinels. The sounding is within the southwestern portion of the 10 fathom contour in the northeast portion of The Sentinels.

Hydrographer Recommendations

Chart sounding as surveyed

Arithmetically-Rounded Depth (Unit-wise Affected Charts):

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

1fm 2ft (531_1)

2.6m (500_1, 501_1, 50_1)

S-57 Data

Geo object 1:	Sounding (SOUNDG)
Attributes:	QUASOU - 6:least depth known
	SORDAT - 20160611
	SORIND - US,US,graph,H12865
	TECSOU - 3:found by multi-beam

Feature Images

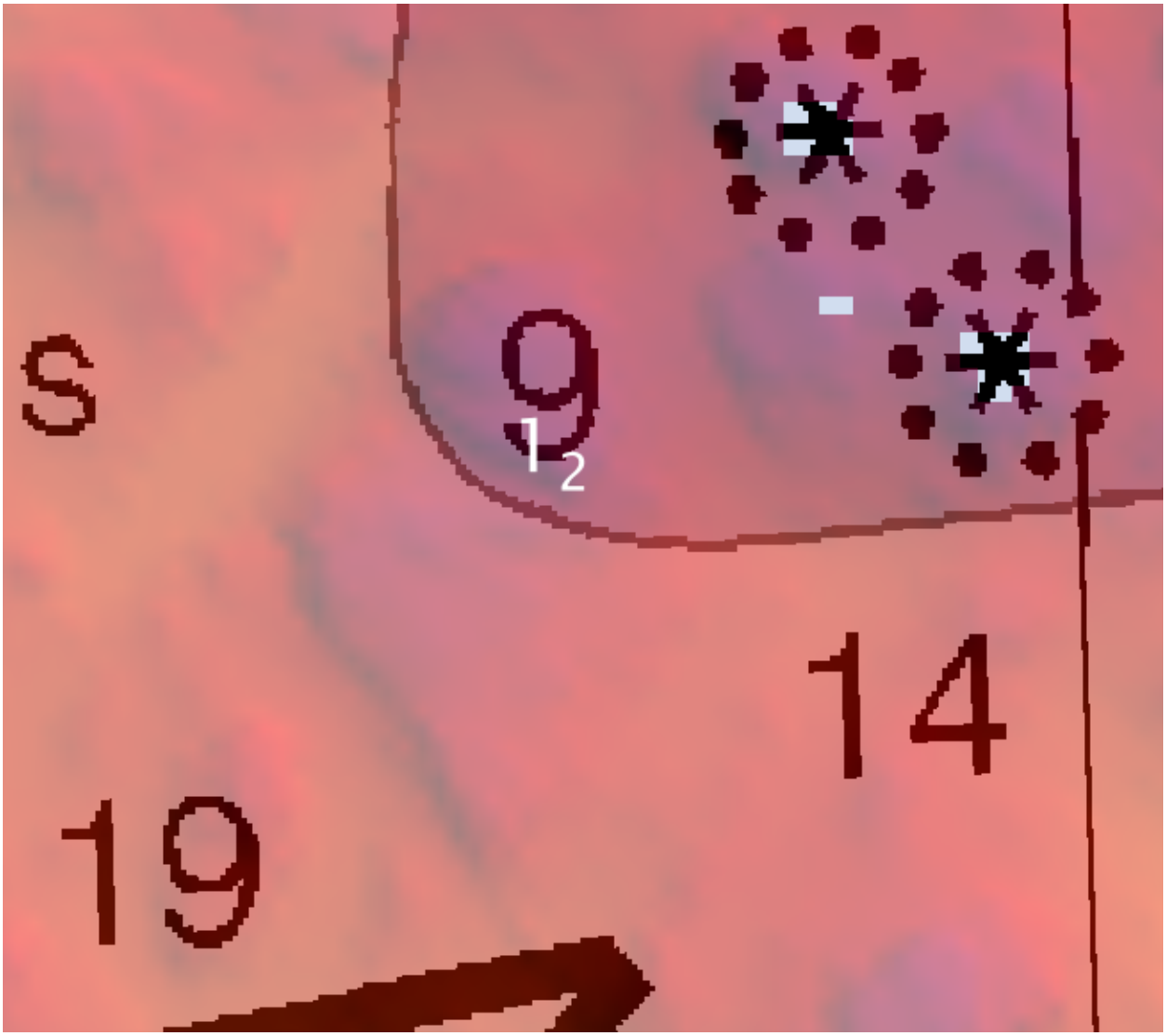


Figure 1.4.1

1.5) Between Sentinels and Nichols 2 Fathom Sounding

DANGER TO NAVIGATION

Survey Summary

Survey Position:	55° 10' 34.7" N, 133° 00' 04.7" W
Least Depth:	4.76 m (= 15.60 ft = 2.601 fm = 2 fm 3.60 ft)
TPU (±1.96σ):	**THU (TPEh)** [None] ; **TVU (TPEv)** [None]
Timestamp:	2016-163.00:00:00.000 (06/11/2016)
Dataset:	H12865_DTONs.000
FOID:	0_ 0000000212 00001(FFFE000000D40001/1)
Charts Affected:	17407_1, 17400_1, 16016_1, 531_1, 500_1, 501_1, 530_1, 50_1

Remarks:

A shoal area with a least depth of 2 fathoms 3 feet (4.76 meters) was ensonified in Tlevak Strait in the vicinity of The Sentinels. The sounding is south of the easternmost rock cluster within The Sentinels and is directly south of a charted 14 fathom sounding.

Hydrographer Recommendations

Chart sounding as surveyed

Arithmetically-Rounded Depth (Unit-wise Affected Charts):

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

2fm 4ft (531_1)

4.8m (500_1, 501_1, 50_1)

S-57 Data

Geo object 1:	Sounding (SOUNDG)
Attributes:	QUASOU - 6:least depth known
	SORDAT - 20160611
	SORIND - US,US,graph,H12865
	TECSOU - 3:found by multi-beam

Feature Images

Figure 1.5.1

1.6) Northeast Sentinels 2 Fathom Sounding

DANGER TO NAVIGATION

Survey Summary

Survey Position:	55° 10' 51.5" N, 132° 59' 54.0" W
Least Depth:	4.79 m (= 15.73 ft = 2.622 fm = 2 fm 3.73 ft)
TPU (±1.96σ):	**THU (TPEh)** [None] ; **TVU (TPEv)** [None]
Timestamp:	2016-163.00:00:00.000 (06/11/2016)
Dataset:	H12865_DTONs.000
FOID:	0_ 0000000209 00001(FFFE000000D10001/1)
Charts Affected:	17407_1, 17400_1, 16016_1, 531_1, 500_1, 501_1, 530_1, 50_1

Remarks:

A shoal area with a least depth of 2 fathoms 3 feet (4.79 meters) was ensonified in Tlevak Strait in the vicinity of The Sentinels. The sounding is within the 10 fathom contour in the northeast portion of The Sentinels.

Hydrographer Recommendations

Chart sounding as surveyed

Arithmetically-Rounded Depth (Unit-wise Affected Charts):

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

2fm 4ft (531_1)

4.8m (500_1, 501_1, 50_1)

S-57 Data

Geo object 1:	Sounding (SOUNDG)
Attributes:	QUASOU - 6:least depth known
	SORDAT - 20160611
	SORIND - US,US,graph,H12865
	TECSOU - 3:found by multi-beam

Feature Images

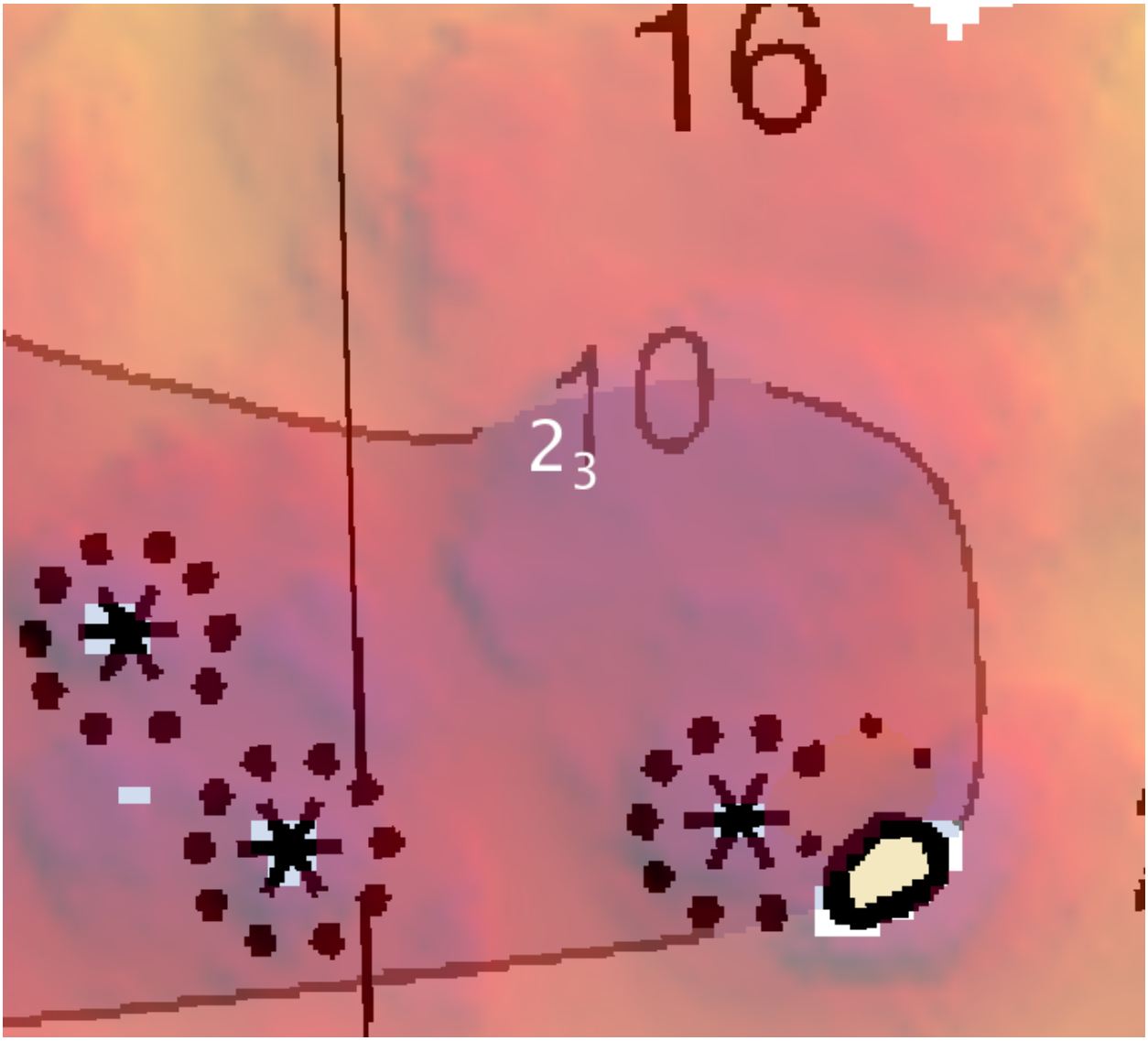


Figure 1.6.1

1.7) Northeast Nichols Is 5 Fathom Sounding

DANGER TO NAVIGATION

Survey Summary

Survey Position:	55° 10' 24.3" N, 132° 59' 36.3" W
Least Depth:	10.28 m (= 33.72 ft = 5.620 fm = 5 fm 3.72 ft)
TPU (±1.96σ):	**THU (TPEh)** [None] ; **TVU (TPEv)** [None]
Timestamp:	2016-163.00:00:00.000 (06/11/2016)
Dataset:	H12865_DTONs.000
FOID:	0_ 0000000213 00001(FFFE000000D50001/1)
Charts Affected:	17407_1, 17400_1, 16016_1, 531_1, 500_1, 501_1, 530_1, 50_1

Remarks:

A shoal area with a least depth of 5 fathoms 3 feet (10.28 meters) was ensonified in Tlevak Strait in the vicinity of The Sentinels. The sounding is directly outside of the 10 fathom contour on the northwestern side of the eastern Nichols Island.

Hydrographer Recommendations

Chart sounding as surveyed

Arithmetically-Rounded Depth (Unit-wise Affected Charts):

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

5fm 4ft (531_1)

10.3m (500_1, 501_1, 50_1)

S-57 Data

Geo object 1:	Sounding (SOUNDG)
Attributes:	QUASOU - 6:least depth known
	SORDAT - 20160611
	SORIND - US,US,graph,H12865
	TECSOU - 3:found by multi-beam

Feature Images

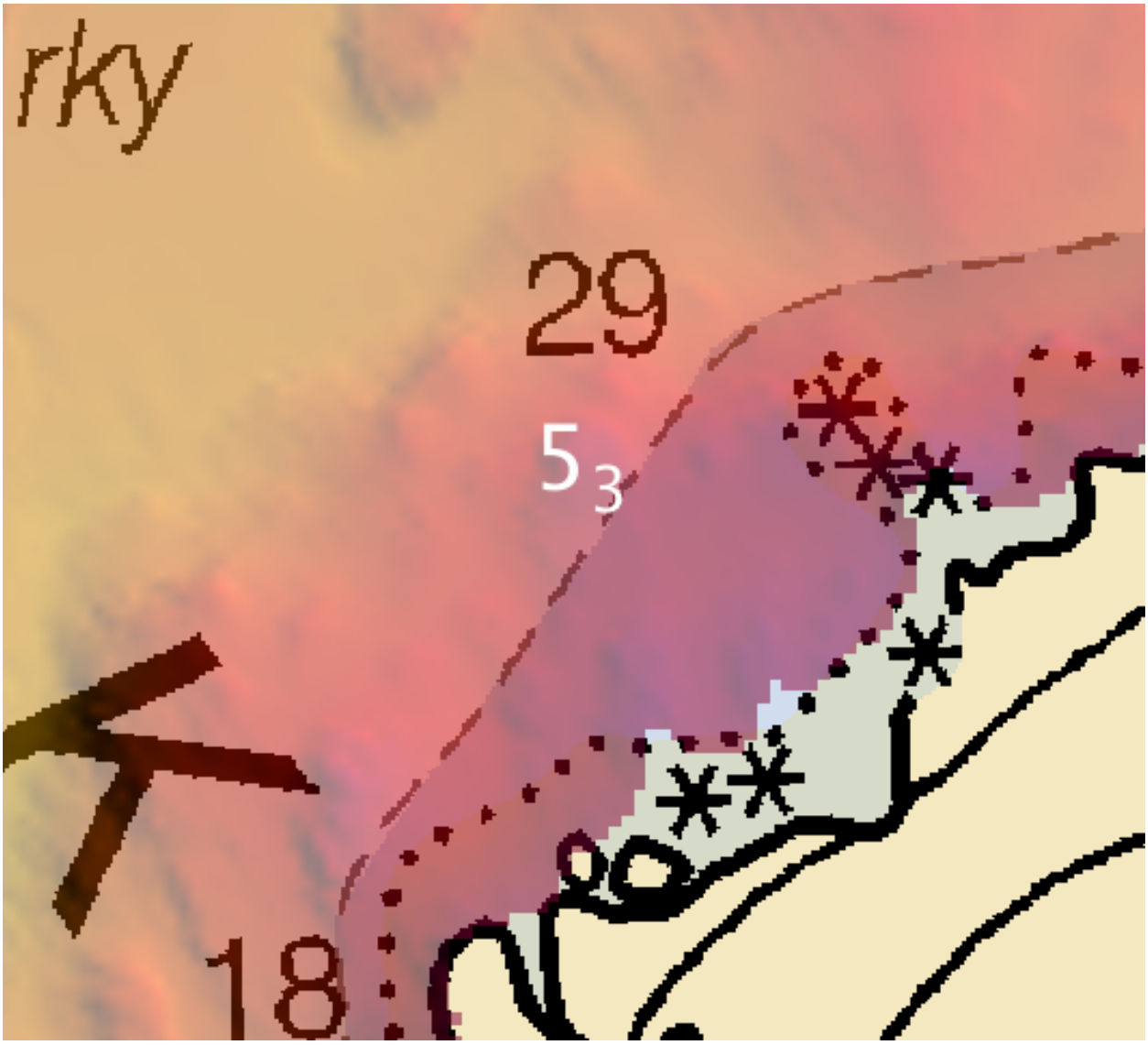


Figure 1.7.1

APPROVAL PAGE

H12865

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 NCEI for archive

- H12865 _DR.pdf
- Collection of depth varied resolution BAGS
- Processed survey data and records
- H12865 _GeoImage.pdf

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

Digitally signed by ORTIZ FLORES.FERNANDO.1381291665
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Date: 2017.07.24 10:25:59 -07'00'

Approved:_____

Fernando Ortiz
Physical Scientist, Pacific Hydrographic Branch

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

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: 2017.07.24 10:11:51 -07'00'

Approved:_____

Pete Holmberg
Cartographic Team Lead, Pacific Hydrographic Branch