H12997

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

DESCRIPTIVE REPORT

Type of Survey:	Navigable Area
Registry Number:	H12997

LOCALITY

State(s):	Alaska
General Locality:	Kodiak Island, AK
Sub-locality:	Long Island

2017

CHIEF OF PARTY
John J. Lomnicky, CDR/NOAA

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Date:

U.S. DEPARTMENT OF COMMERCE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION	REGISTRY NUMBER:
HYDROGRAPHIC TITLE SHEET	**H12997**

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

State(s):	**Alaska**
General Locality:	**Kodiak Island, AK**
Sub-Locality:	**Long Island**
Scale:	**40000**
Dates of Survey:	**04/20/2017 to 05/13/2017**
Instructions Dated:	**03/09/2017**
Project Number:	**OPR-P136-RA-17**
Field Unit:	**NOAA Ship *Rainier***
Chief of Party:	**John J. Lomnicky, CDR/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**

Remarks:

Table of Contents

List of Tables

List of Figures

Descriptive Report to Accompany Survey H12997

Project: OPR-P136-RA-17

Locality: Kodiak Island, AK

Sublocality: Long Island

Scale: 1:40000

April 2017 - May 2017

NOAA Ship *Rainier*

Chief of Party: John J. Lomnicky, CDR/NOAA

A. Area Surveyed

The survey area is referred to as "Long Island" (sheet 2) within the Project Instructions. The area encompasses approximately 7 square nautical miles between Woody Island and Long Island. Data within the assigned survey were required to meet NOAA Object Detection requirements.

A.1 Survey Limits

Data were acquired within the following survey limits:

Northwest Limit	Southeast Limit
57° 49' 1.25" N 152° 21' 41.04" W	57° 44' 22.91" N 152° 13' 34.21" W

Table 1: Survey Limits

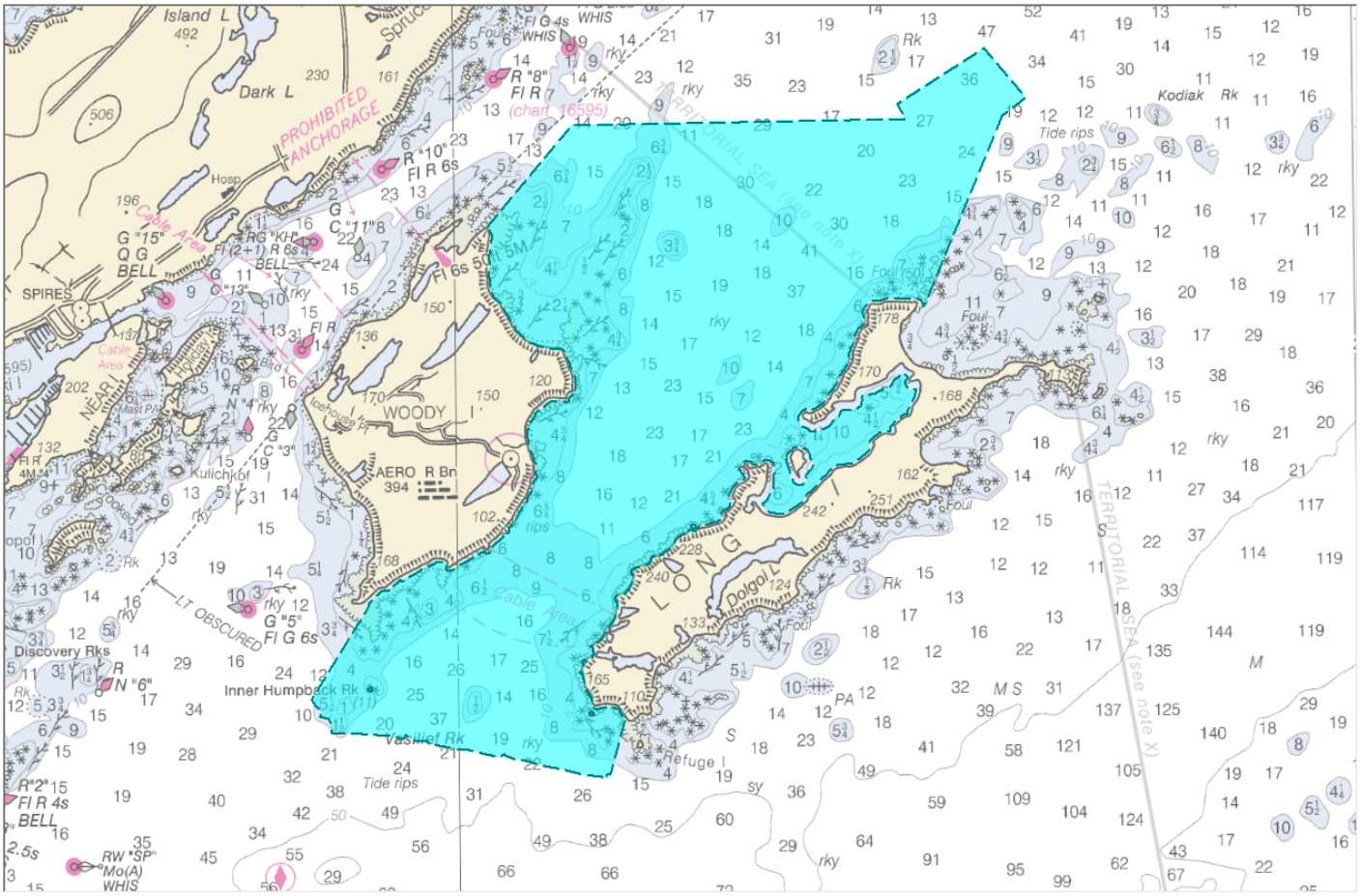


Figure 1: H12997 survey area as assigned in Project Instructions (Chart 16594)

Data were acquired within survey limits in accordance with the requirements in the Project Instructions and the HSSD unless otherwise noted in this report.

A.2 Survey Purpose

The area of Chiniak Bay supports the second busiest and third richest fisheries port in Alaska. In 2015, the Port of Kodiak was responsible for 515 million pounds of fish and $138 million dollars of product. Chiniak Bay is the gateway to Kodiak and has a survey vintage of 1933. This area has seen many groundings and near misses due to the number of dangers to navigation and submerged pinnacles that exist in this area. The navigation of this area is further complicated by the number of vessels trying to enter and exit the Port of Kodiak via a choke point located at the channel entrance buoy. In recent years a number of groundings in and around the area have occurred, the most famous being a 174 foot long Army landing craft that was outbound to deliver goods to a remote village in western AK in 2012. This survey will serve to update the nautical charts with modern data to support safe navigation.

A.3 Survey Quality

The entire survey is adequate to supersede previous data.

Data were acquired within assigned survey limits as required in the Project Instructions and HSSD unless otherwise noted in this report.

Pydro QC Tools 2 Grid QA was used to analyze H12997 object detection multibeam echosounder (MBES) data density. The submitted H12997 variable-resolution (VR) surface met HSSD density requirements.

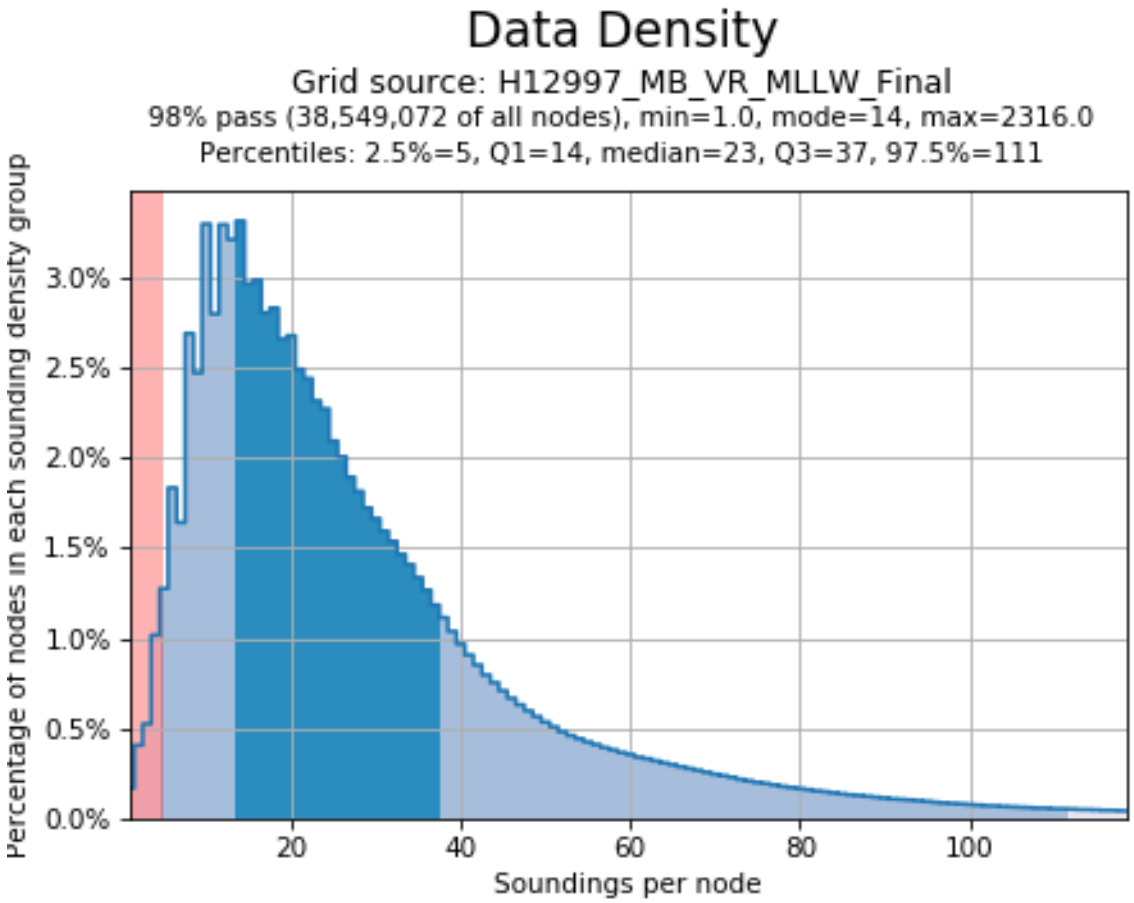


Figure 2: Pydro derived histogram plot showing HSSD object detection compliance of H12997 object detection MBES data within the VR CUBE surface.

A.4 Survey Coverage

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

Water Depth	Coverage Required
All depths within H12997	Object Detection Coverage (HSSD Section 5.2.2.2)

Complete multibeam echosounder (MBES) coverage was acquired to the inshore limit of hydrography, the Navigable Area Limit Line (NALL). In areas where survey coverage did not reach the 4-meter depth contour nor the assigned sheet limits, it was due to the survey vessel reaching the inshore extent of safe navigation as shown in the figure below. These areas were generally located very near shore, and were subject to dangerous wave action and other hazards.

Coverage did not extend to the 4 meter contour in areas that were deemed unsafe by launch personnel, which include some shoreline and rocky features (Figure 3 and 4).

One small "holiday" in survey coverage exists over Vasilief Rock, which measures approximately 1.5X0.5 meters (Figure 5). Approximately 10 small "holidays" in survey coverage exist due to acoustic shadowing on the down slopes of rocky features (Figure 6). These gaps in coverage were examined to ensure that least depths were obtained over navigationally significant features.

An additional 605 holidays were discovered in Object Detection surfaces after the field unit had left the survey area. Some of these holidays occur in the deepest part of the 0.5 meter and 1 meter surfaces, but the vast majority of them are in extreme nearshore areas (Figure 7). These holidays were caused by the effects of the sea state on vessel motion (yaw and pitch). Therefore these holidays are generally only 1 node long (along track), but 3+ nodes in the across track (Figure 8).

These holidays were likely missed during acquisition due to incorrect CUBE parameters being used for BASE surface creation in CARIS HIPS. When default CUBE parameters are chosen, the search radius and capture distances will be higher than if the NOAA Object Detection Parameter is used.

While these holiday areas do not meet Object Detection standards, they represent a small percentage of the overall survey area. Close inspection of the affected areas was conducted in CARIS HIPS Subset Editor with special attention paid to the seafloor for potential shoaling trends. The hydrographer recommends that this survey be processed and compiled to Object Detection standards.

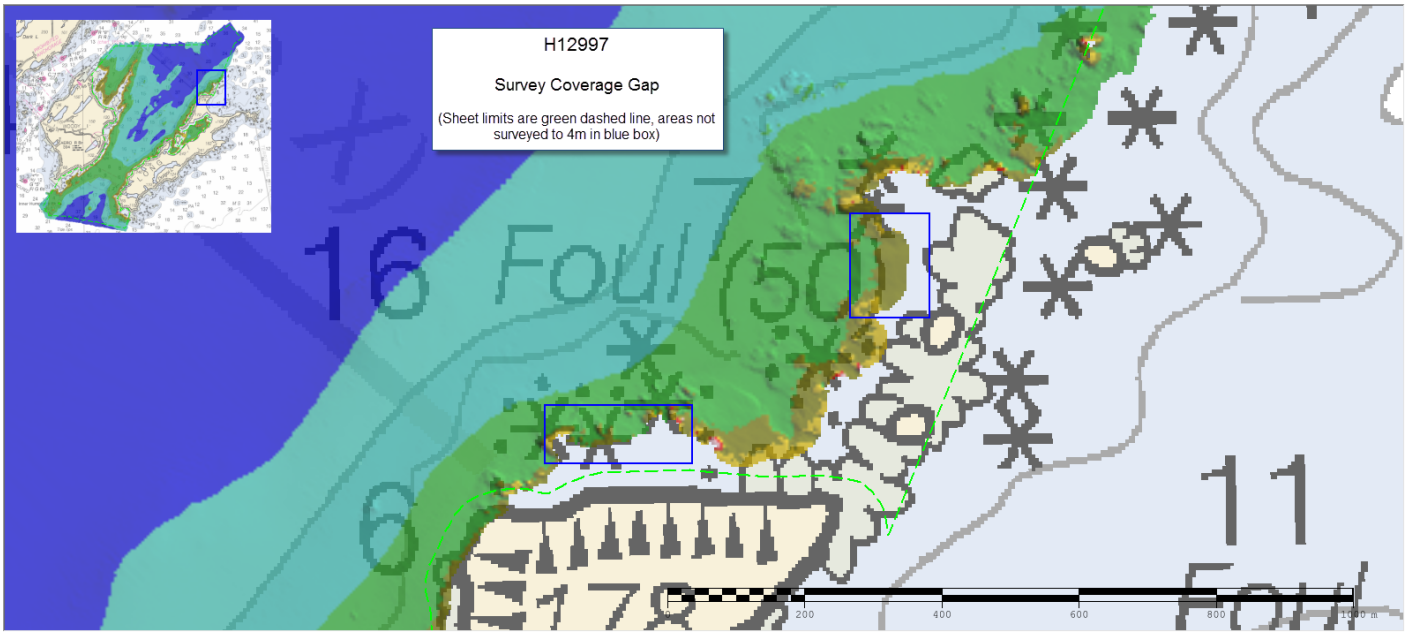


Figure 3: Northern shore of the peninsula on Long Island was not completely covered due to rocky features. The yellow surface indicates the 4 meter contour at MLLW where the NALL was met.

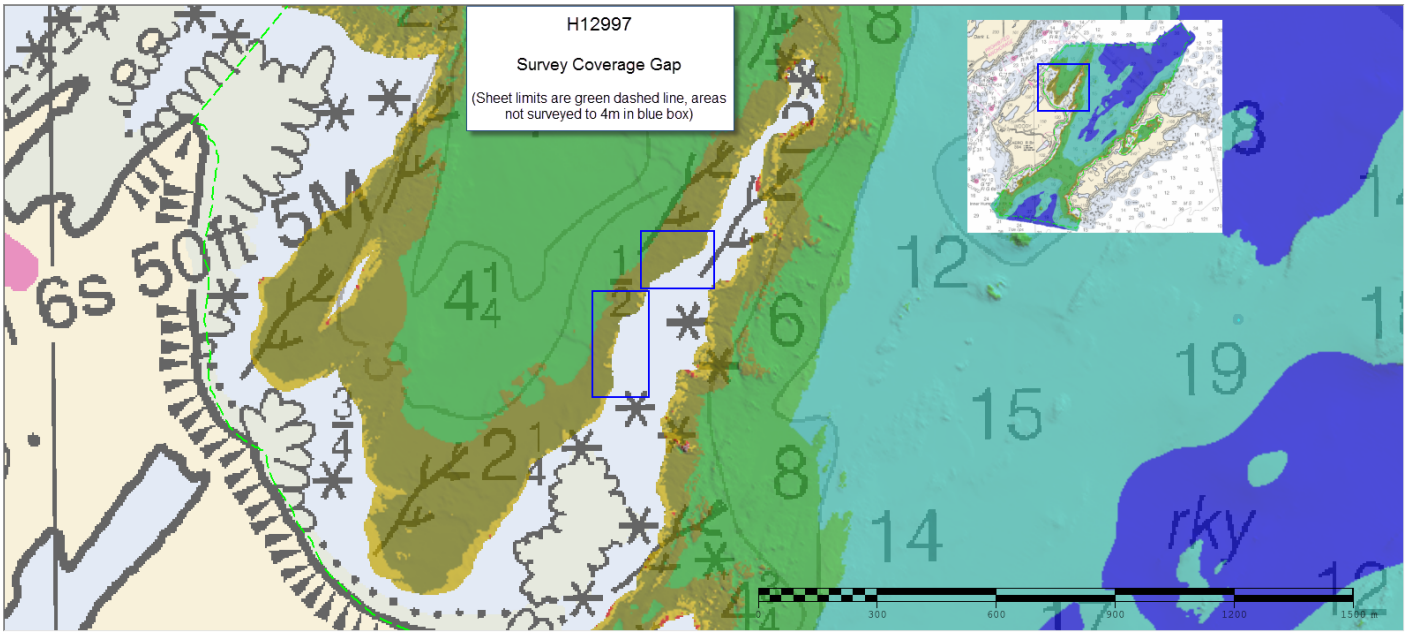


Figure 4: Complete coverage was not achieved near rocky features due to safety concerns. The yellow surface indicates the 4 meter contour at MLLW where the NALL was met.

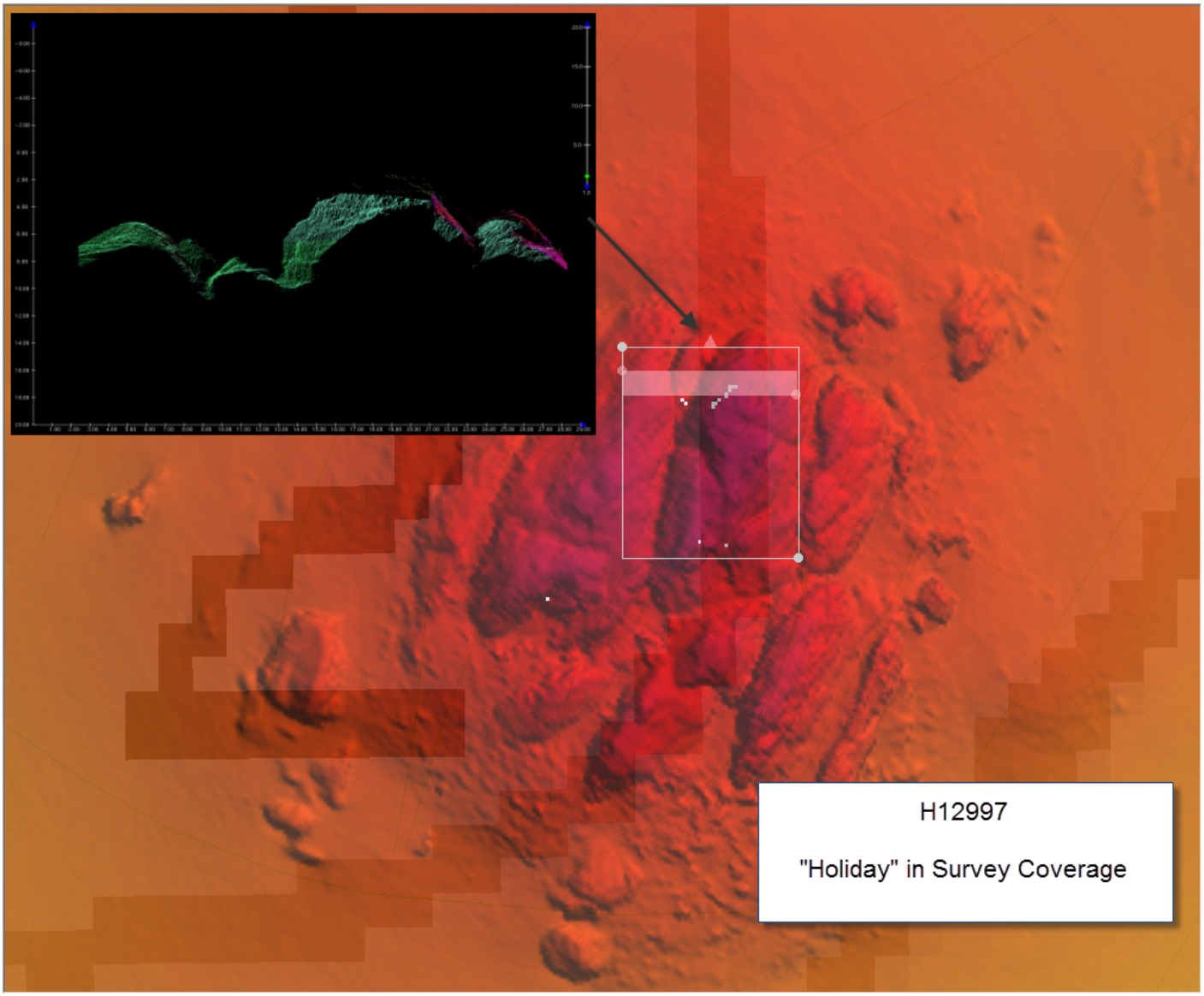


Figure 5: Subset and chart view of gap in survey coverage over Vasilief rock, note the least depth of rock was obtained.

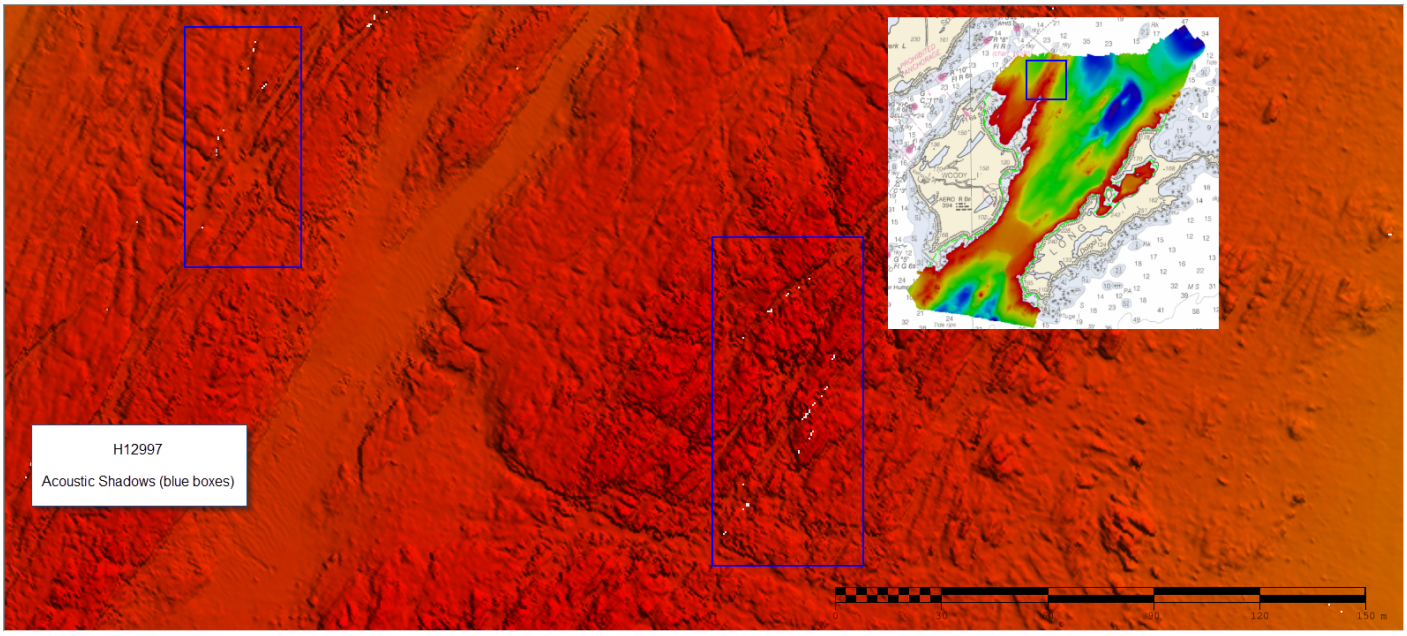


Figure 6: Chart view of acoustic shadowing due to rocky features.

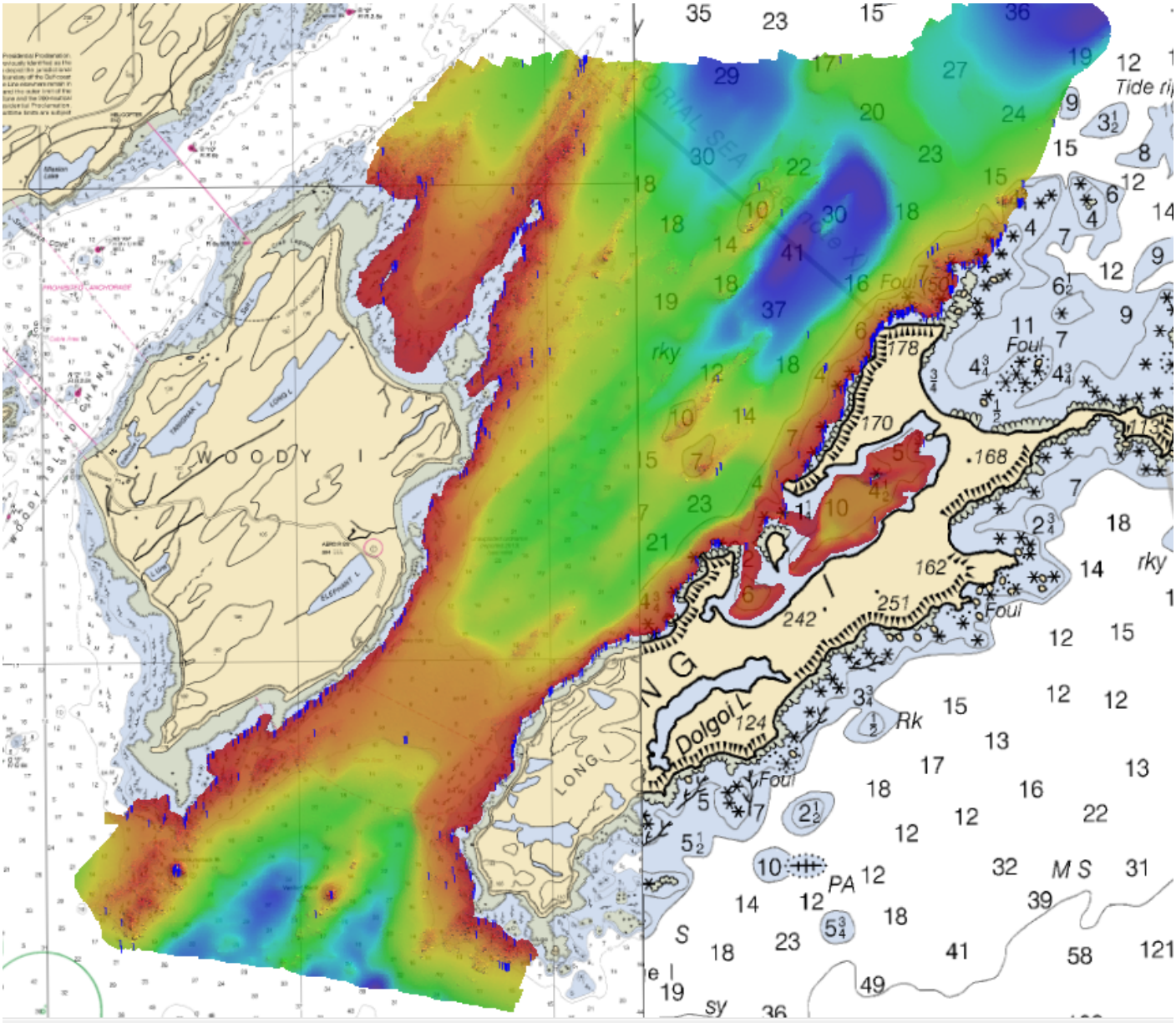


Figure 7: Blue tick marks indicate ares of holidays, mostly occurring near the shoreline.

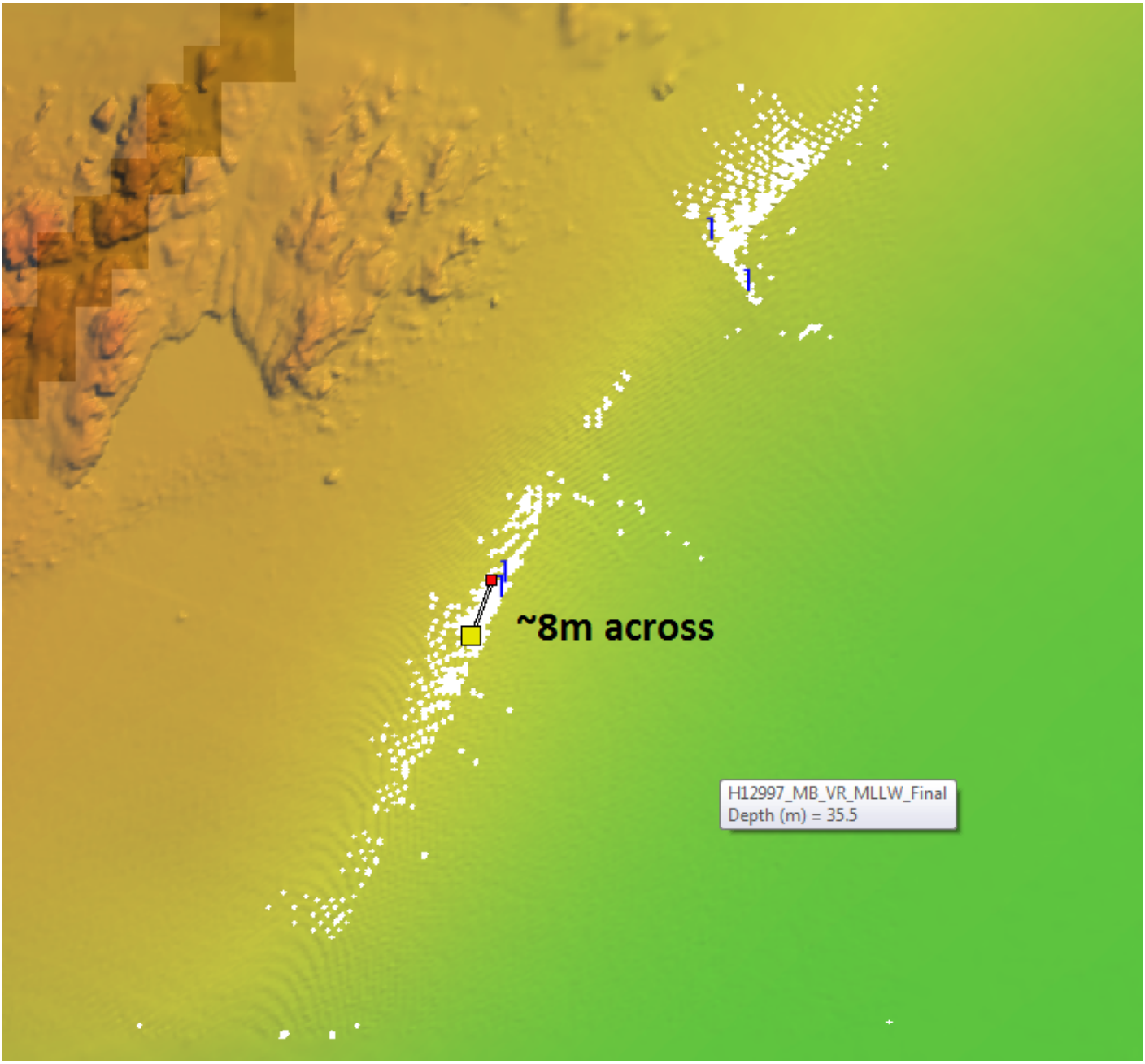


Figure 8: Example of holidays found offshore.

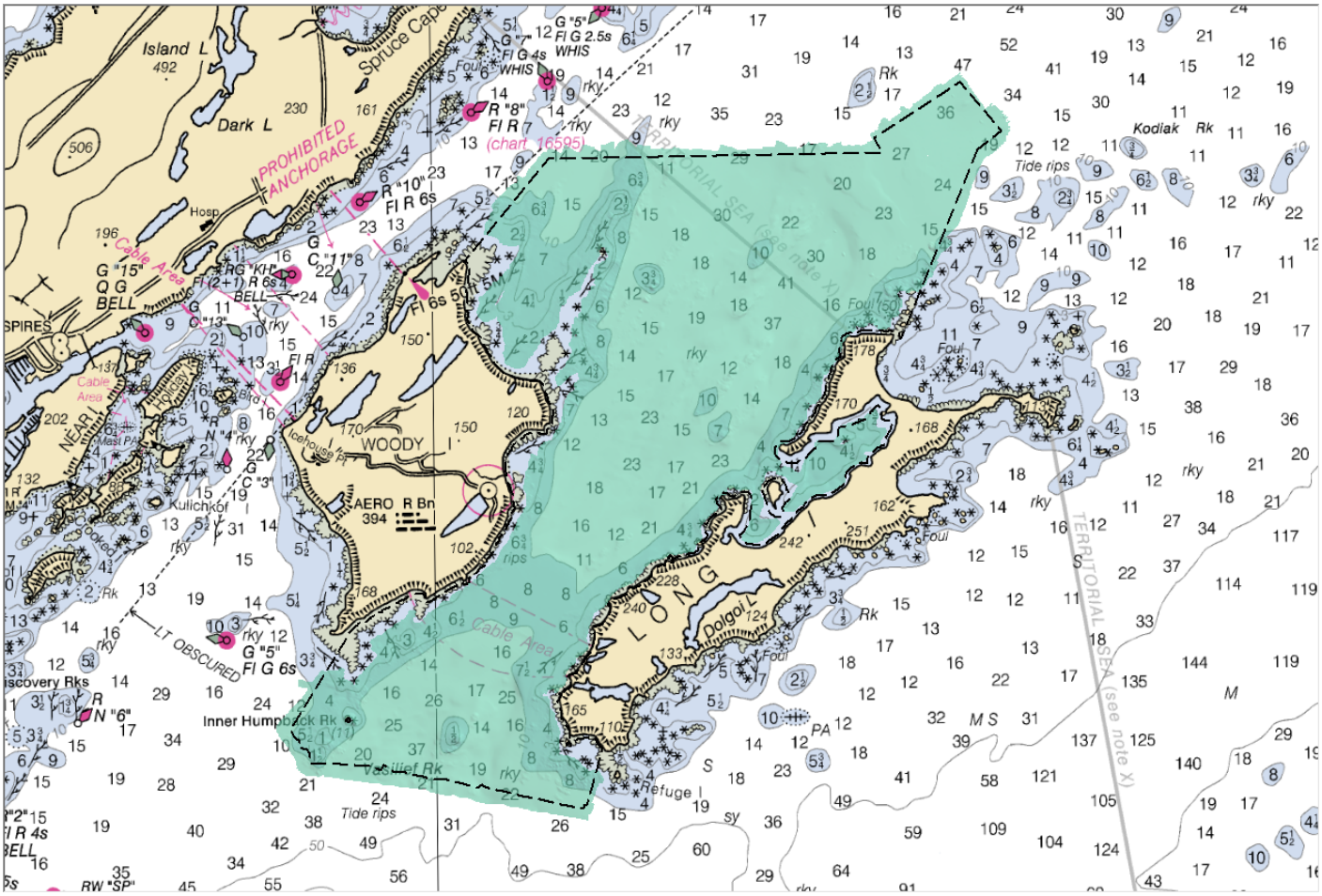


Figure 9: H12997 Achieved Survey Coverage (Chart 16594)

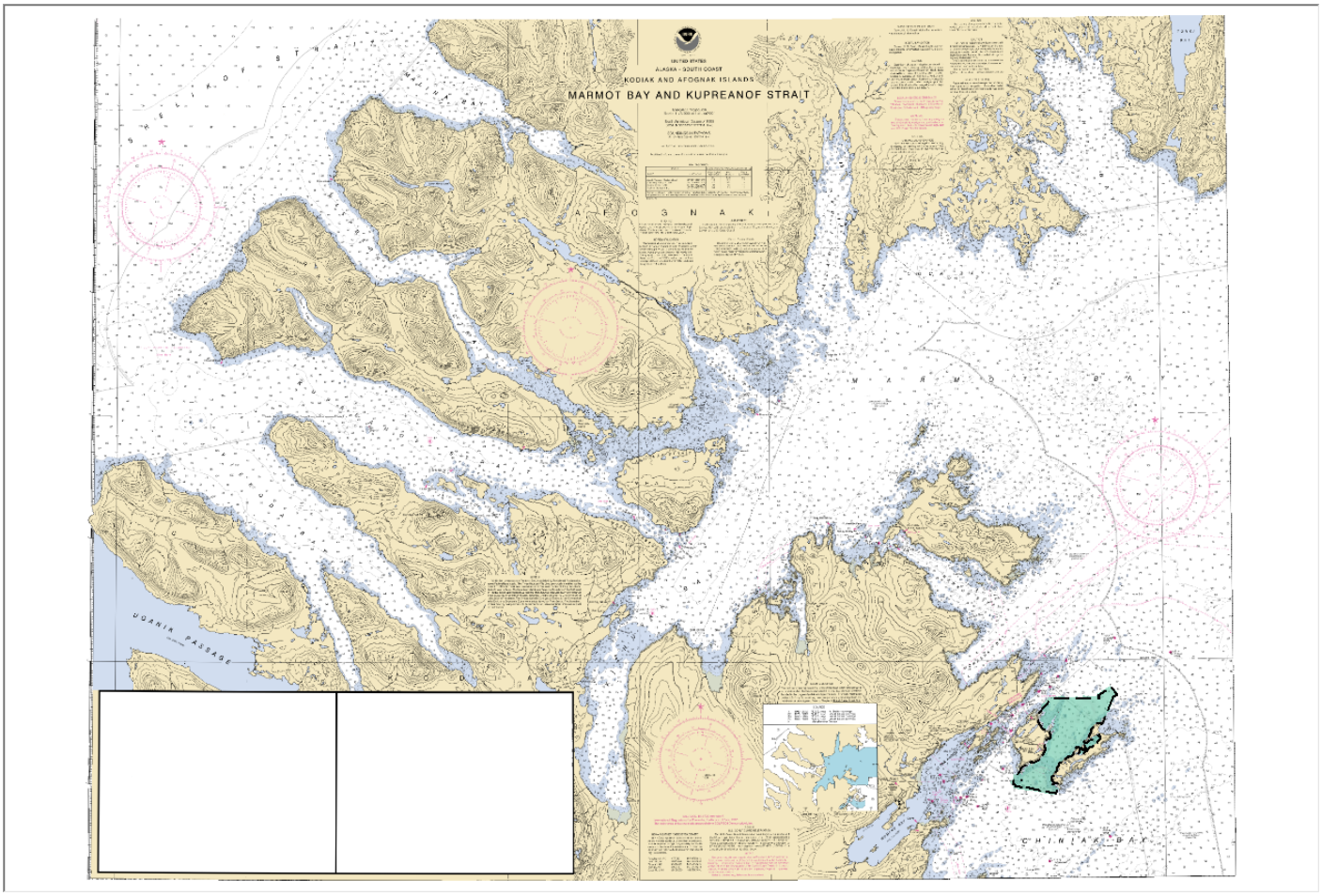


Figure 10: H12997 Geographic Context (Chart 16594)

A.5 Survey Statistics

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

	HULL ID	*2802*	*2804*	*Total*
LNM	**SBES Mainscheme**	0	0	0
	MBES Mainscheme	149.04	135.57	284.61
	Lidar Mainscheme	0	0	0
	SSS Mainscheme	0	0	0
	SBES/SSS Mainscheme	0	0	0
	MBES/SSS Mainscheme	0	0	0
	SBES/MBES Crosslines	0	11.32	11.32
	Lidar Crosslines	0	0	0
Number of Bottom Samples				3
Number Maritime Boundary Points Investigated				0
Number of DPs				116
Number of Items Investigated by Dive Ops				0
Total SNM				7.15

Table 2: Hydrographic Survey Statistics

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

Survey Dates	Day of the Year
05/13/2017	133
05/11/2017	131

Survey Dates	Day of the Year
05/04/2017	124
04/28/2017	118
04/27/2017	117
04/26/2017	116
04/25/2017	115
04/24/2017	114
04/20/2017	110

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	*2802*	*2804*	*1905*
LOA	8.8 miles	8.8 meters	5.7 meters
Draft	1.1 meters	1.1 meters	0.3 meters

Table 4: Vessels Used

All data for H12997 were acquired using survey launches 2802 and 2804 and skiff 1905. The survey launches acquired MBES depth soundings, backscatter data, and sound speed profiles. The skiff conducted shoreline verification.

B.1.2 Equipment

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

Manufacturer	Model	Type
Applanix	POS-MV V5	Positioning and Attitude System
Reson	SeaBat 7125 SV2	MBES
Reson	SVP71	Sound Speed System
Sea-Bird Electronics	SBE 19Plus SEACAT Profiler	Conductivity, Temperature, and Depth Sensor
Velodyne	VLP-16	Lidar System

Table 5: Major Systems Used

B.2 Quality Control

B.2.1 Crosslines

Crosslines acquired for this survey totaled 3.98% of mainscheme acquisition.

Multibeam crosslines were acquired by using a Reson 7125 SV2 on launches 2802 (RA-5) and 2804 (RA-6) across most but not all depth ranges, water masses, and boat days. H12997 crossline data is adequate for verifying and evaluating the internal consistency of survey data. A 1-meter CUBE surface was created using only H12997 mainscheme lines, with a second 1-meter CUBE surface was created using only crosslines (Figure 11). A difference surface was created in CARIS from which statistics were derived. For its respective depths, the difference surface was compared to IHO allowable Total Vertical Uncertainty (TVU) standards. In total, 99.4% of the depth differences between H12997 mainscheme and crossline data meet HSSD TVU standards (Figure 12). The analysis was performed on H12997 MBES data reduced to Mean Lower-Low Water (MLLW) using Ellipsoidally Referenced Zoned Tides (ERZT) methods.

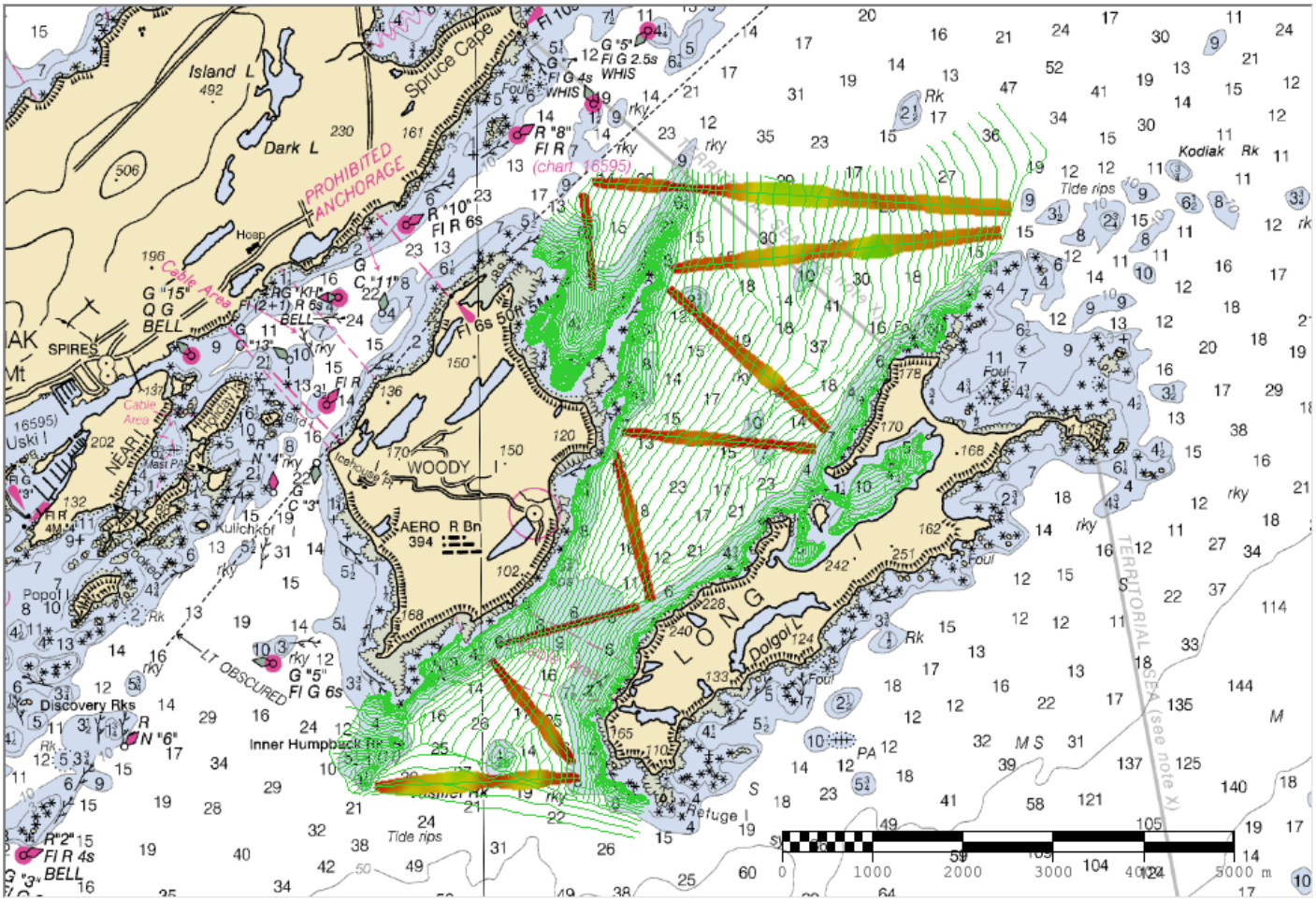


Figure 11: H12997 Crosslines

Depth range	IHO Order	Number of nodes	Nodes satisfying IHO accuracy	Percent nodes satisfying IHO accuracy
Less than 100m	Order 1	3,018,584	3,001,204	99.4%

Figure 12: Percentage of difference surface nodes between H12997 mainscheme and crosslines ERZT data that met HSSD allowable TVU standards.

B.2.2 Uncertainty

The following survey specific parameters were used for this survey:

Measured	Zoning	Method
0 meters	0.018 meters	ERS via ERZT

Table 6: Survey Specific Tide TPU Values.

Hull ID	Measured - CTD	Measured - MVP	Surface
2802, 2804	3.0 meters/second		0.15 meters/second

Table 7: Survey Specific Sound Speed TPU Values.

Total Propagated Uncertainty (TPU) values for H12997 were derived from a combination of fixed values for equipment and vessel characteristics, as well as field assigned values for sound speed uncertainties. Tidal uncertainties were accounted for by examining the created 1000-m separation model and statistically determining a measured uncertainty. The measured tide uncertainty value of 0.018 meters was entered to account for ERZT processing methods.

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 this survey. Real-time uncertainties from Reson multibeam sonars were recorded and applied during post processing. Applanix TrueHeave (POS) files, which record estimates of heave uncertainty, were also applied during post processing. The post processed uncertainties associated with vessel roll , pitch, yaw and navigation, were applied in CARIS HIPS and SIPS using SBET/RMS files generated using POSPac software.

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%). Pydro QC tools 2 were used to analyze H12997 TVU compliance; a histogram plot of the results is shown below (Figure 13).

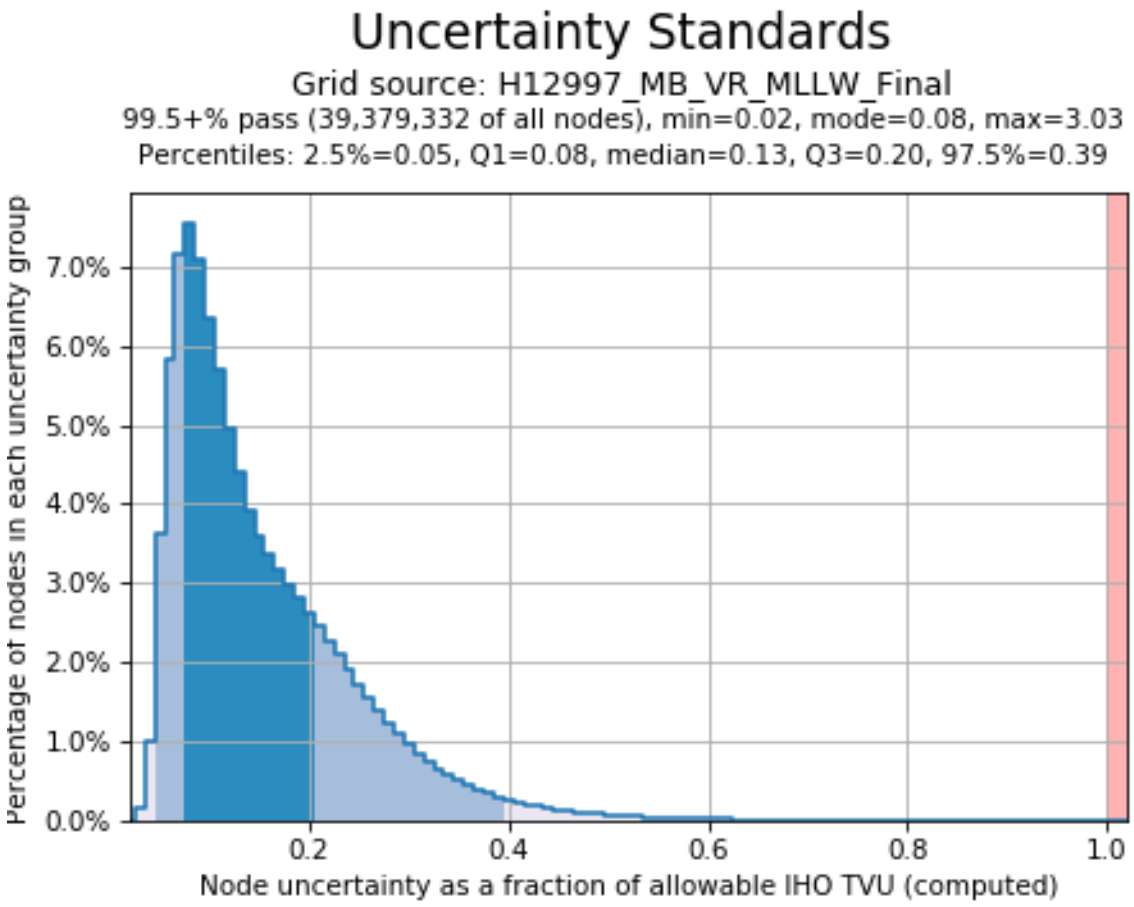


Figure 13: VR surface meets HSSD uncertainty standards.

B.2.3 Junctions

Three surveys junction with H12997 (see Table 8). Two junction analyses, for H12996 and H10913, were conducted for this Descriptive Report. See the Descriptive Report for H13003 for that junction analysis. Surveys H12996 and H13003 were acquired concurrent to H12997.

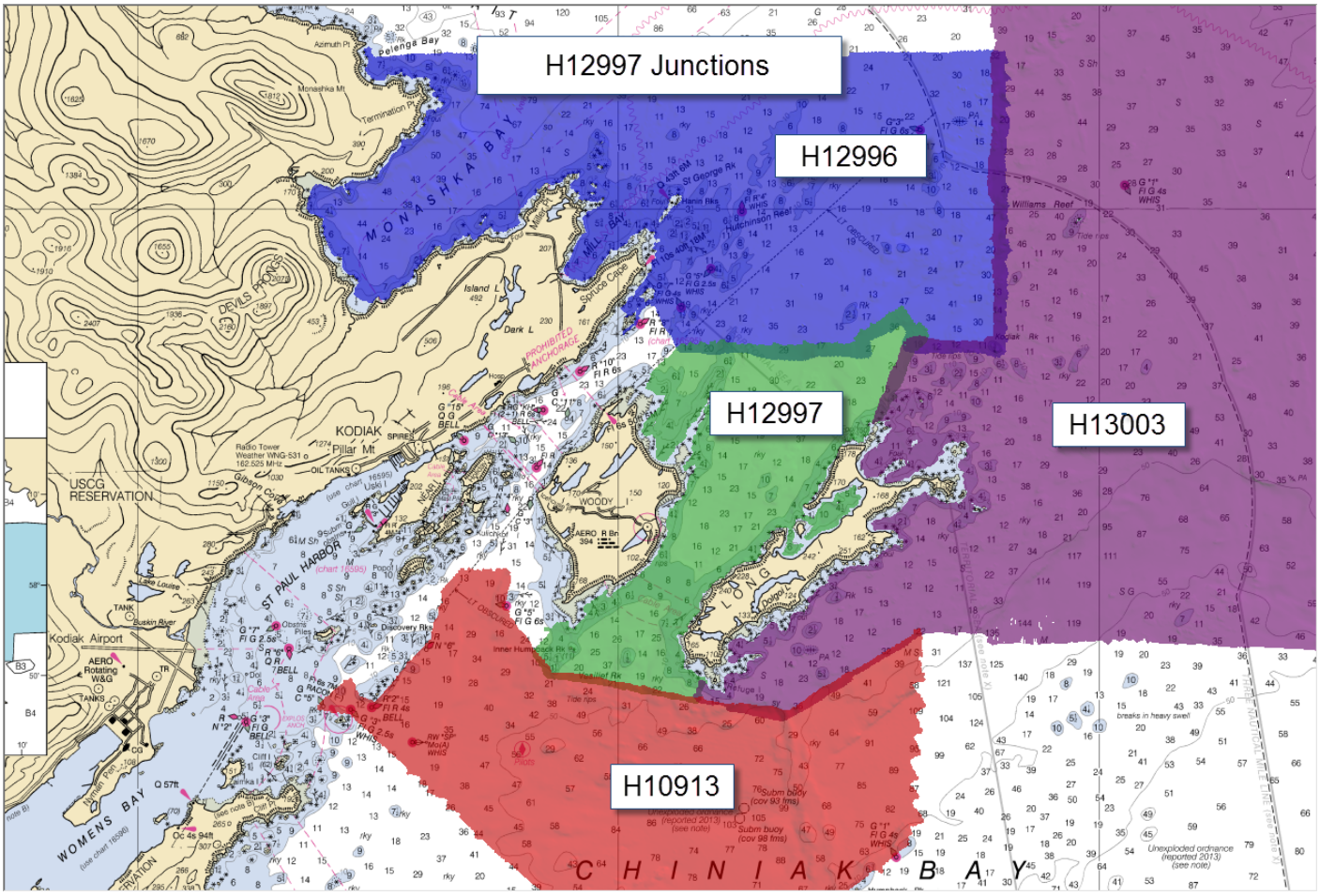


Figure 14: H12997 Junction Surveys.

The following junctions were made with this survey:

Registry Number	Scale	Year	Field Unit	Relative Location
H13003	1:40000	2017	NOAA Ship RAINIER	E
H12996	1:40000	2017	NOAA Ship RAINIER	N
H10913	1:10000	1999	NOAA Ship RAINIER	S

Table 8: Junctioning Surveys

H13003

See H13003 DR for junction analysis.

H12996

Overlap with survey H12996 was approximately 5,800 meters wide along the northern boundary of H12997 (Figure 15). Depths in the junction range from 19 to 77 meters. For the respective depths, the difference surface was compared to the allowable TVU standards specified in the HSSD. In total, 99.4% of the depth difference between H12997 and junction survey H12996 are within allowable uncertainties.

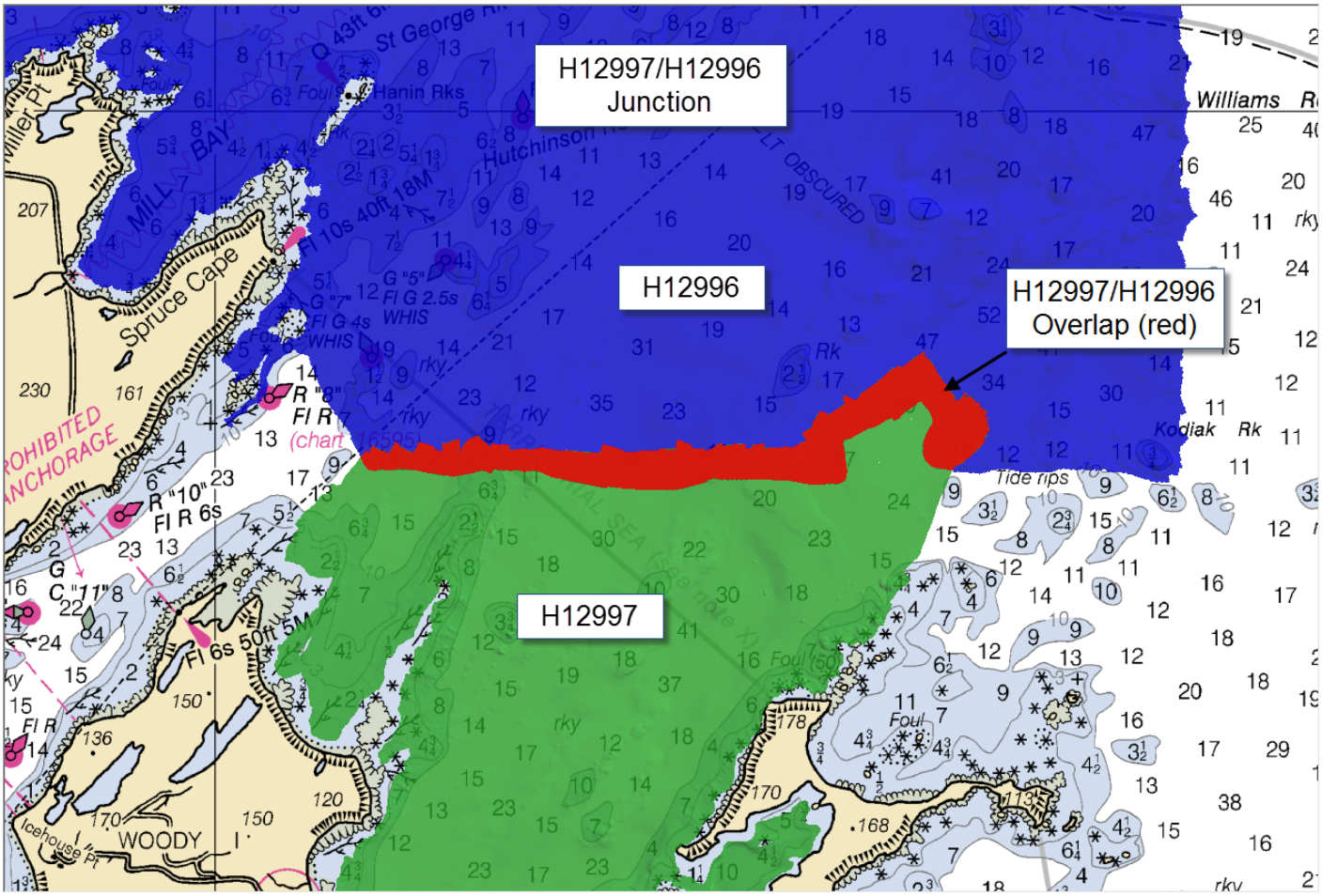


Figure 15: H12997 junction with H12996.

Depth range	IHO Order	Number of nodes	Nodes satisfying IHO accuracy	Percent nodes satisfying IHO accuracy
Less than 100m	Order 1	1,599,523	1,590,689	99.4%

Figure 16: Summary table indicating the percentage of nodes from the junction overlap that met HSSD allowable TVU standards.

H10913

Overlap with survey H10913 was approximately 3,500 meters wide along the southern boundary of H12997 (Figure 17). Depths in the junction range from 18 to 71 meters. For the respective depths, the difference surface was compared to the allowable TVU standards specified in the HSSD. In total, 97.9% of the depth difference between H12997 and junction survey H10913 are within allowable uncertainties.

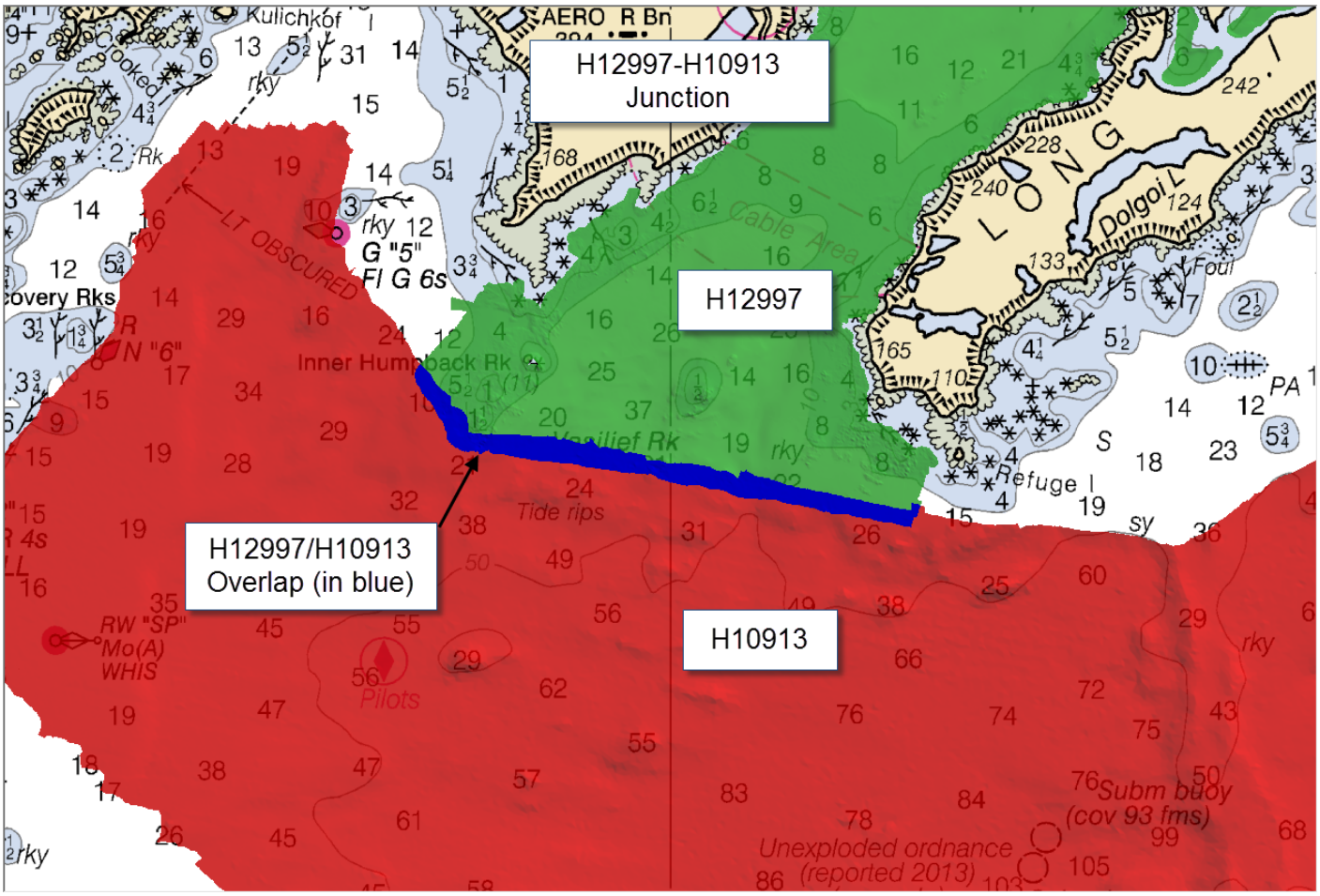


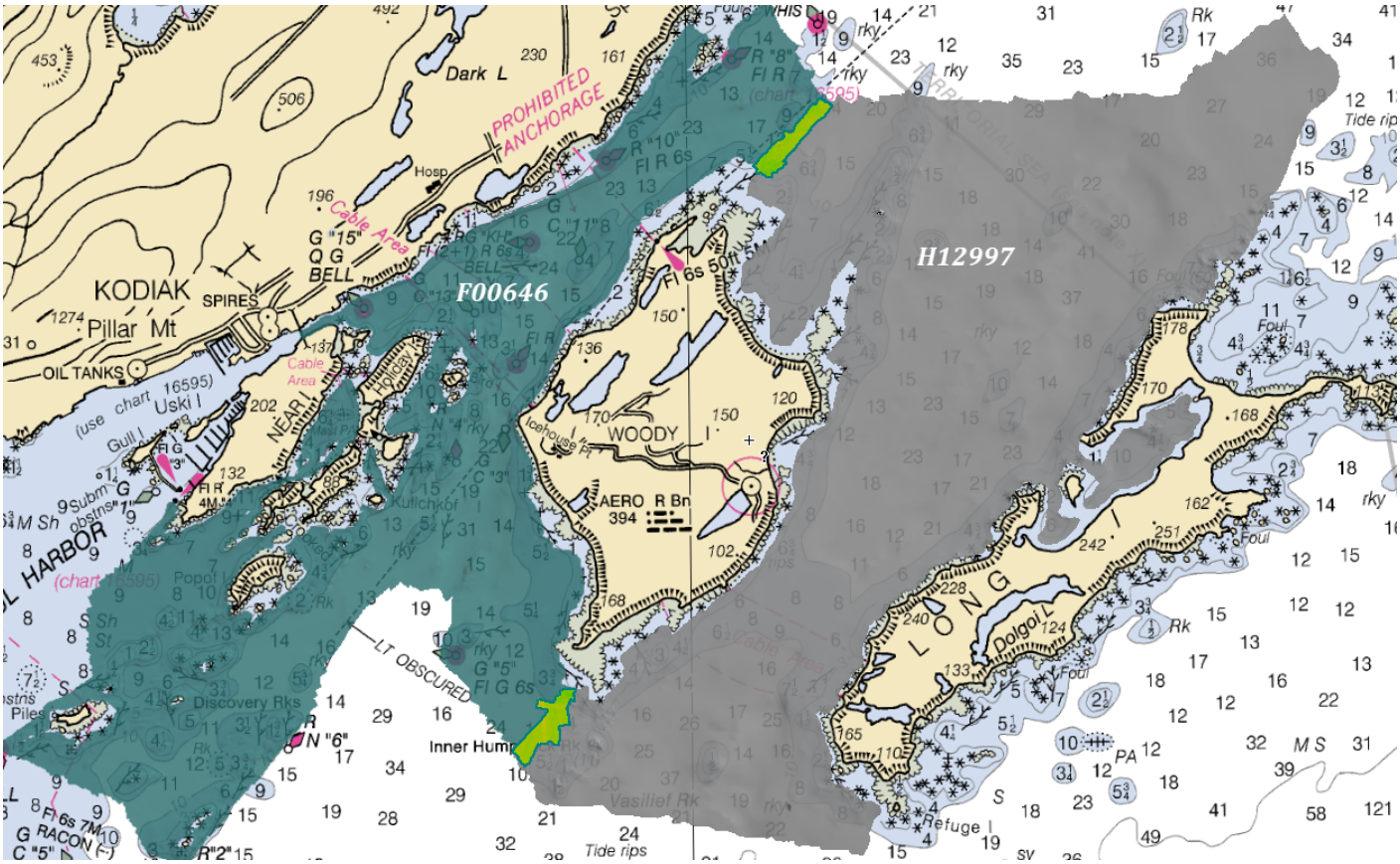
Figure 17: H12997 junction with H10913.

Depth range	IHO Order	Number of nodes	Nodes satisfying IHO accuracy	Percent nodes satisfying IHO accuracy
Less than 100m	Order 1	32,487	31,811	97.9%

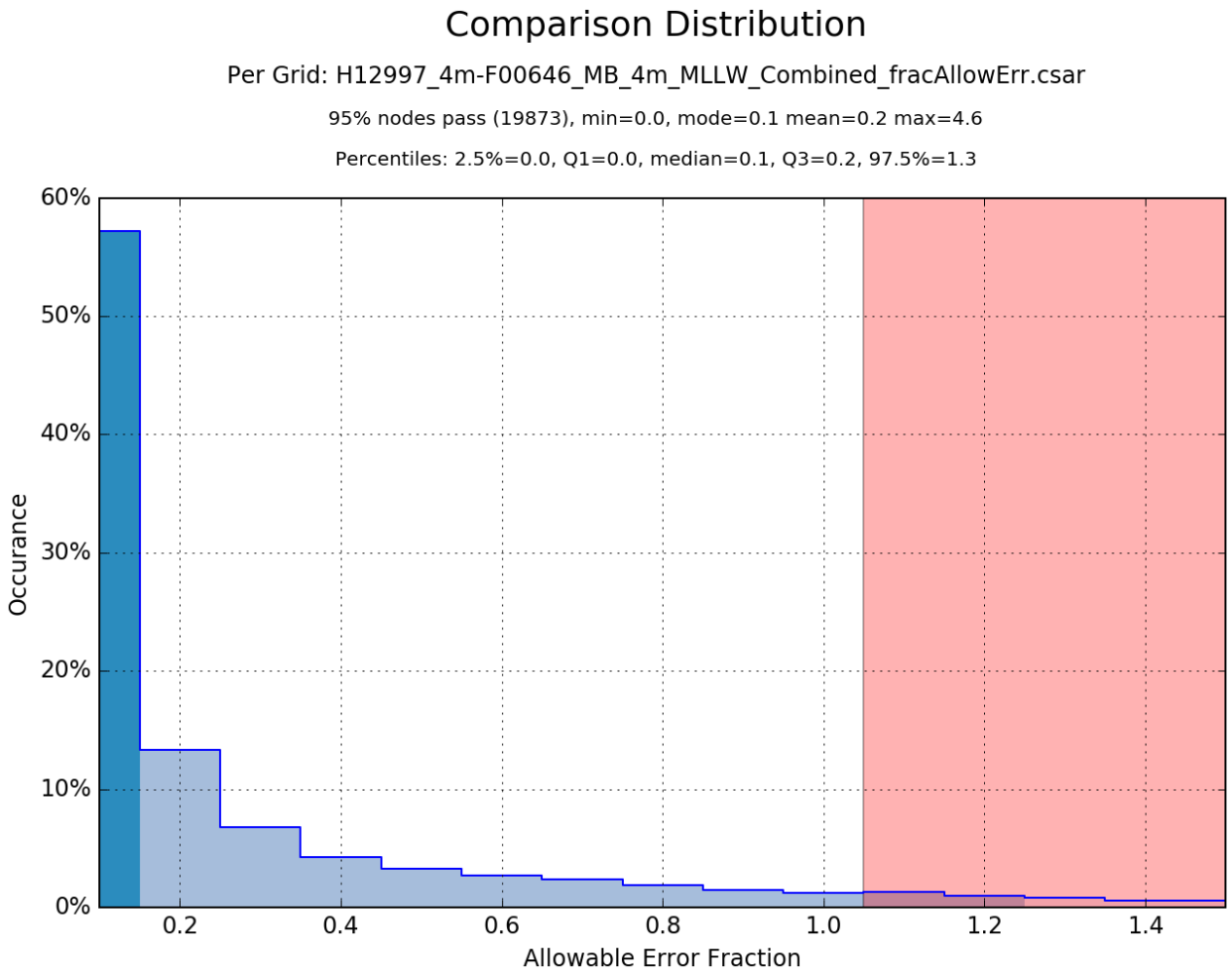
Figure 18: Summary table indicating the percentage of nodes from the junction overlap that met HSSD allowable TVU standards.

One additional junction comparison was conducted during office processing. Survey F00646 junctions with H12997 to the west and was acquired in 2014 by the Rainier with an approximate overlap 1,830 meters long and 150 meters wide. The agreement between the overlapping areas of the 4-meter combined

surface from F00646 and the 4-meter surface from H12997 were compared using the Compare Grids tool in Pydro XL. The statistical output indicates that 95% of surface nodes are within the allowable uncertainty limits.



H12997 junction with F00646.



Results from surface comparison indicating that 95% of the difference surface nodes are within allowable TVU limits

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 profiles were acquired using the SBE 19plus CTD probes at discrete locations within the survey area at least once every four hours, when significant changes in surface speed were observed, or when surveying a new area (Figure 19). 39 CTD casts were acquired and applied to H12997 MBES data using the nearest distance within time (4 hours) method.

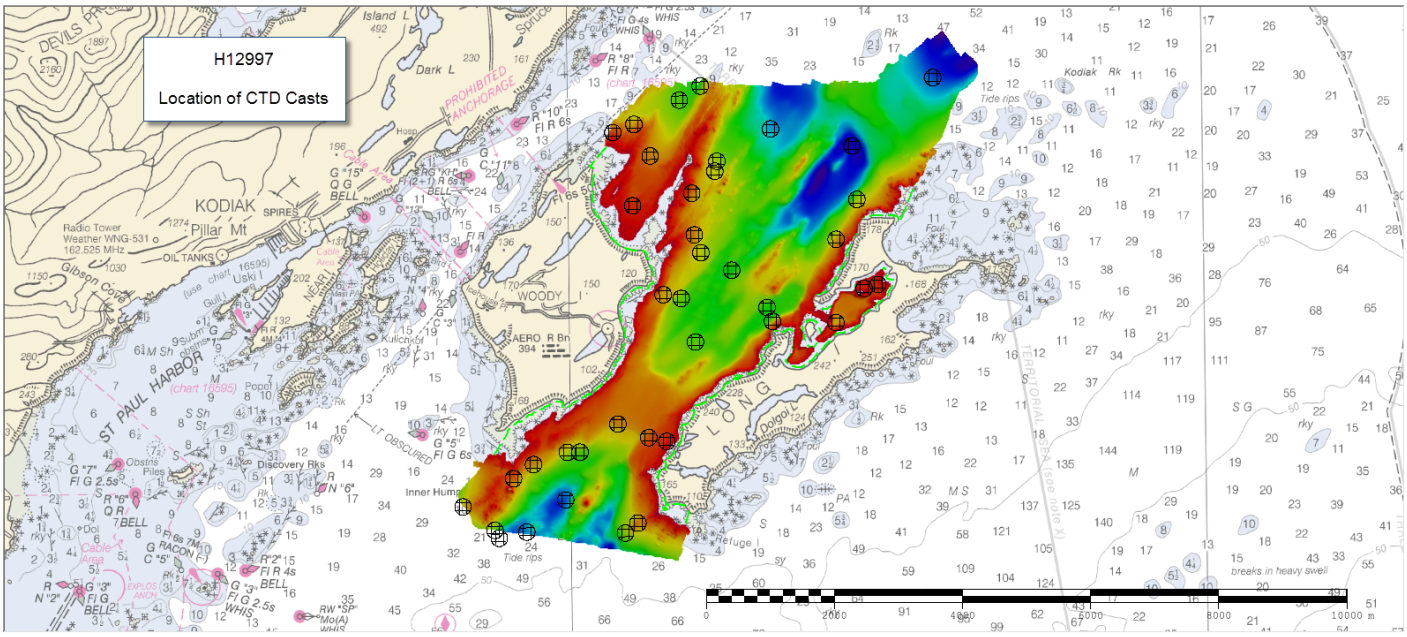


Figure 19: Location of CTD casts for H12997

B.2.8 Coverage Equipment and Methods

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

B.2.9 False Positive Fliers

Pydro QC Tools 2 identified 22 potential fliers in the submitted H12997 finalized surface; all were determined to be false positives.

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 a 7k file and has been sent to the Processing Branch. Backscatter was not processed by the field unit.

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	9.1, 10.2

Table 9: Primary bathymetric data processing software

The following Feature Object Catalog was used: NOAA Extended Attribute Files V_5_5.

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
H12997_MB_VR_MLLW	CUBE	999 meters	-0.71 meters - 80.56 meters	VR	Object Detection

Surface Name	Surface Type	Resolution	Depth Range	Surface Parameter	Purpose
H12997_MB_VR_MLLW_Final	CUBE	999 meters	-0.71 meters - 80.56 meters	VR	Object Detection

Table 10: Submitted Surfaces

Submitted object detection surfaces were generated using the recommended parameters for density-based Caris variable resolution, bathymetric grids as specified in HSTD 2017-2. The resolution values indicated in the table above are not accurate: the XML-DR schema used to generate this report does not accommodate variable resolution grids; the 999 value is obviously spurious and was entered merely as a "place holder." The XML-DR team is aware of this issue and are working to update the schema.

A total of 9 H12997 soundings were designated: 8 as DTONs, and 1 non-DTON feature for inclusion in the H12997_Final_Feature_File.

The submitted surfaces and the surfaces generated during office processing were created using the ranges-based parameters for VR surfaces, not the density-based parameters as stated above.

Four additional soundings were designated during review: 1 as a DTON and 3 on rocks. These were included in the Final Feature File for a total of 13 designated soundings.

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:

TCARI

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

Station Name	Station ID
Kodiak Island, Womens Bay	9457292

Table 11: NWLON Tide Stations

File Name	Status
H12997_TCARI_Features.tid	Final Approved

Table 12: Water Level Files (.tid)

File Name	Status
P136RA2017.tc	Final

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

A request for final approved tides was sent to N/OPS1 on 06/02/2017. The final tide note was received on 06/16/2017.

H12997 features were tide corrected using a .tid file created in Pydro using the "TCARI TID file via S-57" function then loaded in CARIS Notebook. H12997 MBES data were reduced to MLLW using ERZT processing methods.

ERS Methods Used:

ERS via ERZT

Ellipsoid to Chart Datum Separation File:

H12997_NAD83_MLLW_SEP_1000m.csar

Ellipsoidally Referenced Zone Tides (ERZT) methods were used to transform between the ellipsoid and water level data. A 1000-meter resolution separation model was computed between the ellipsoid and MLLW using real-time position measurements observed during the survey relative to the vessel water line and the TCARI tide file. "GPS tides" were then computed using the above separation model and the corrected GPS-height-to water-level data (SBET). The 1000-meter resolution separation model was generated in NAD83 as were the SBETs. Refer to the DAPR for additional information.

C.2 Horizontal Control

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

The projection used for this project is Universal Transverse Mercator (UTM) Zone 5 North.

The following PPK methods were used for horizontal control:

Smart Base
Single Base

The following user installed stations were used for horizontal control:

HVCR Site ID	Base Station ID
9715	Woody

Table 14: User Installed Base Stations

D. Results and Recommendations

D.1 Chart Comparison

Chart comparisons were made using a CARIS sounding and contour layer derived from a variable resolution CUBE surface. The contours and soundings were overlaid on the charts and compared for general agreement and to identify areas of significant change.

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
16580	1:350000	15	03/2015	02/07/2017	02/18/2017
16594	1:80000	14	01/2015	01/01/2015	01/01/2015

Table 15: Largest Scale Raster Charts

16580

H12997 data in general was with agreement with chart 16580. However, as seen in Figure 20, charted contours can be off by hundreds of meters.

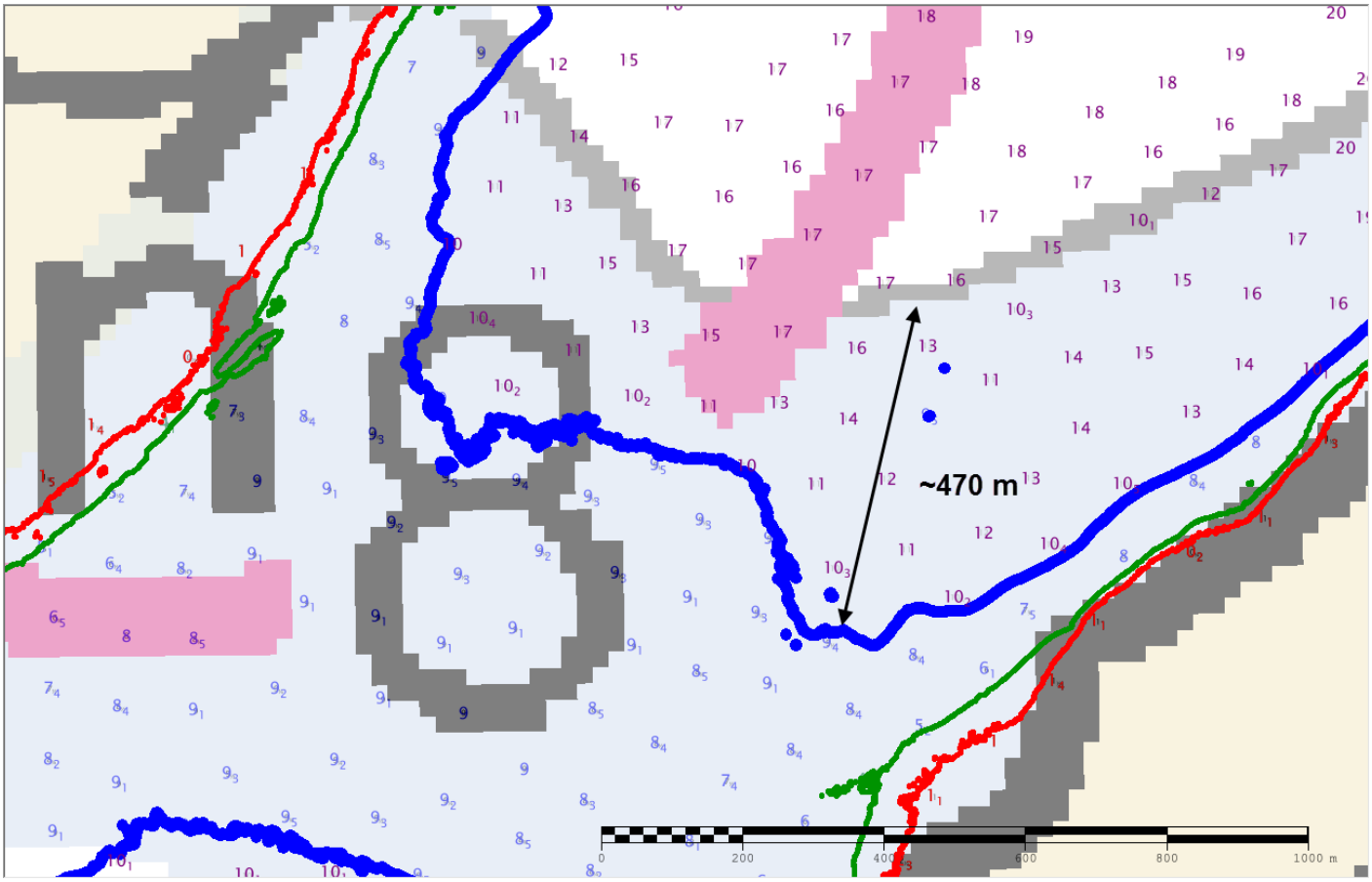


Figure 20: The 10-fathom contour marking the shoal area that extends between Woody Island and Long Island aligns poorly.

16594

In general, H12997 data was in agreement with charted contours on 16594. Charted contours had the greatest separation roughly 100 meters between the charted 10-fathom contour and H12997 10-fathom contour on the east side of the channel (Figure 21). The charted contours around Vasilief Rock were more shallow than H12997 contours (Figure 22).

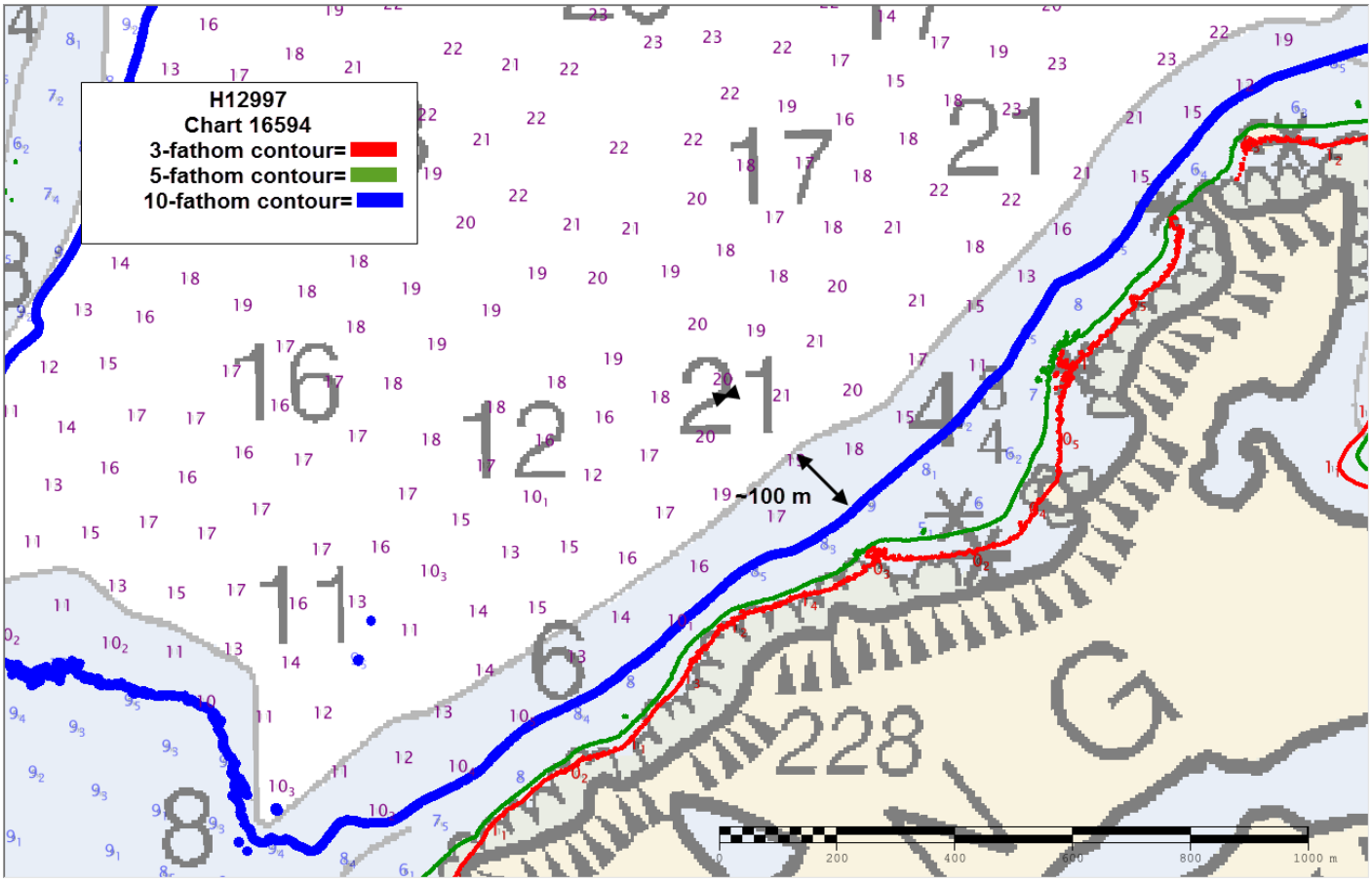


Figure 21: Variation between charted contours and H12997 contours.

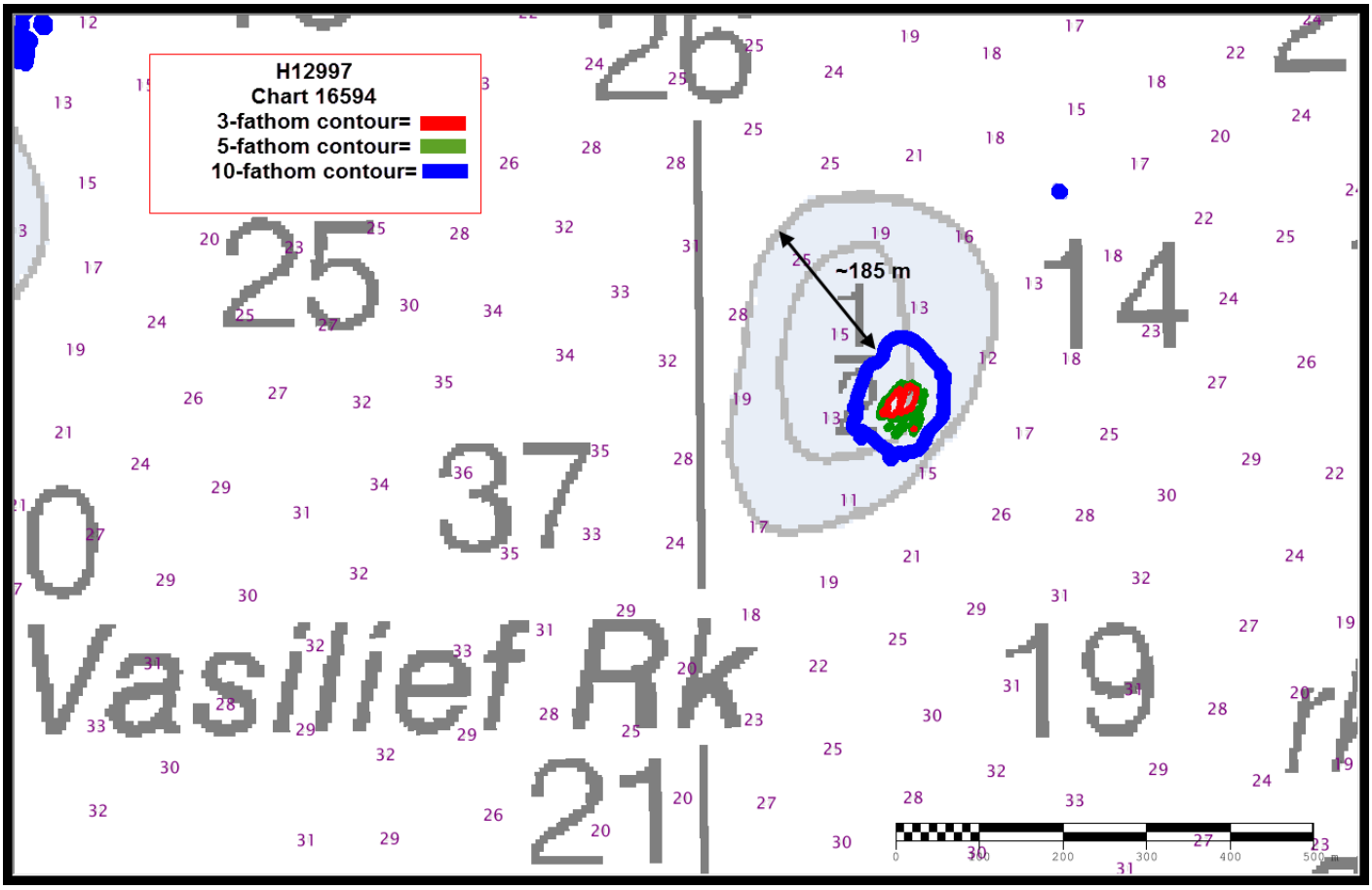


Figure 22: 10-fathom contour around Vasilief Rock is smaller than what is charted.

One additional larger scale chart covers the western and southern half of the survey. Chart 16595 (Scale 1:20,000, Ed. 1, Ed. Date 11/2012, LNM 9/1/2018, NM 9/1/2018) coincides with ENC US5AK5EM and was compared with survey data during office review. The comparison is discussed in the ENC section 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?
US4AK5PM	1:80000	9	08/24/2016	08/24/2016	NO

Table 16: Largest Scale ENCs

US4AK5PM

A comparison was made between H12997 derived contours and ENC US4AK5PM with the following results: In general, charted contours were generally in agreement with the ENC contours except for the shoal area North of Woody Island (Figure 23) and the western side of Long Island (Figure 24).

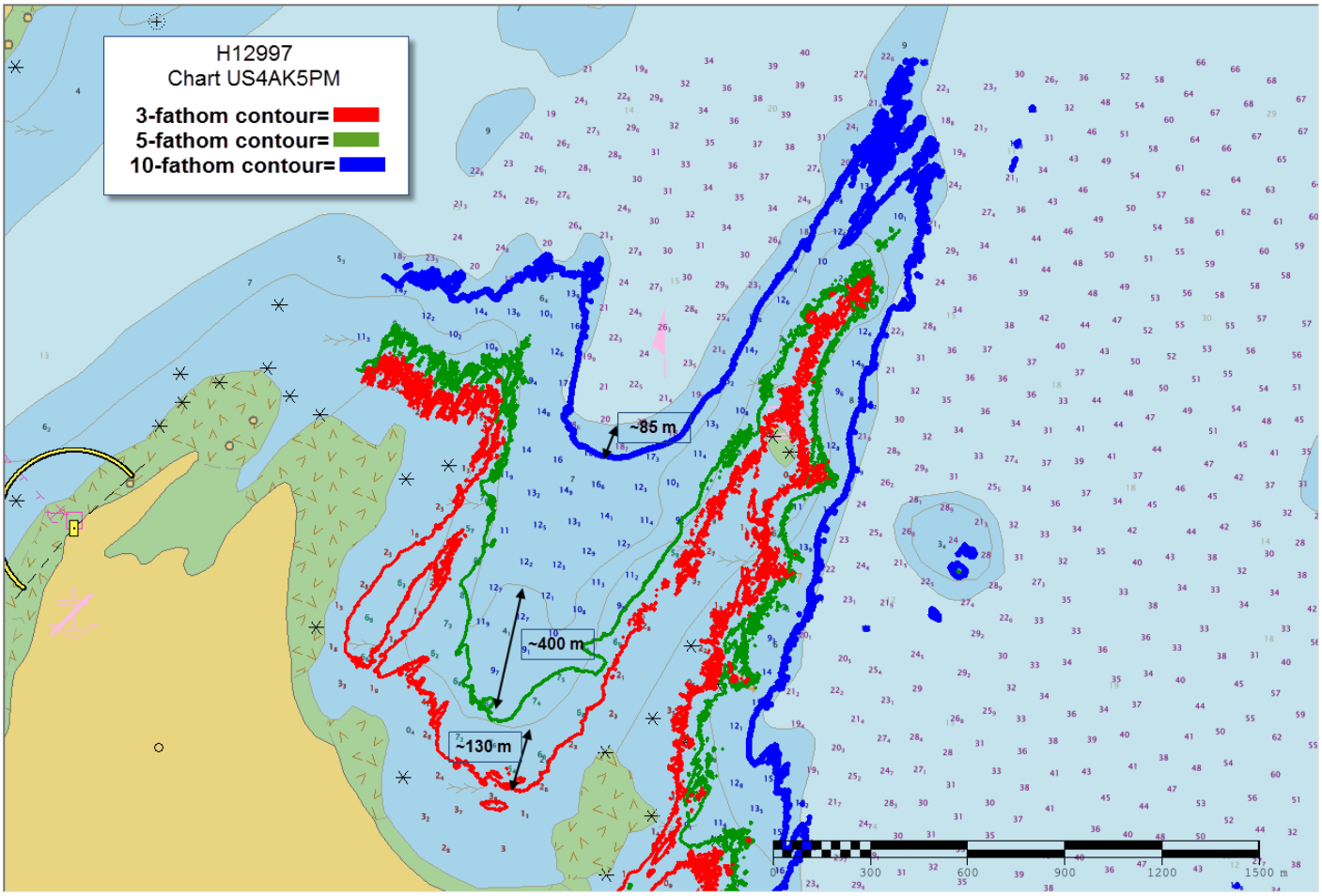


Figure 23: The 3, 5, and 10-fathom contours derived from H12997 are shoaler than charted contours.

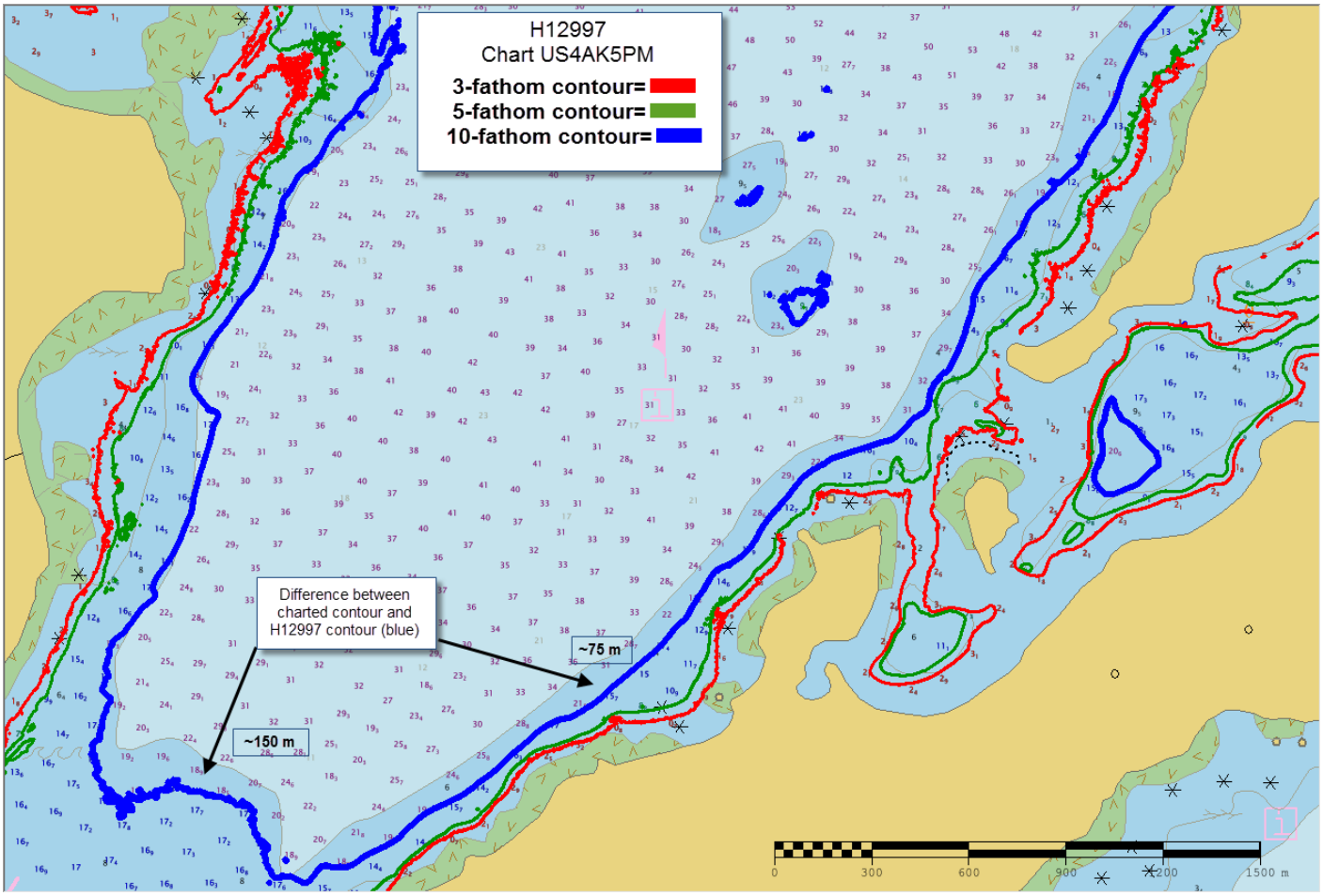
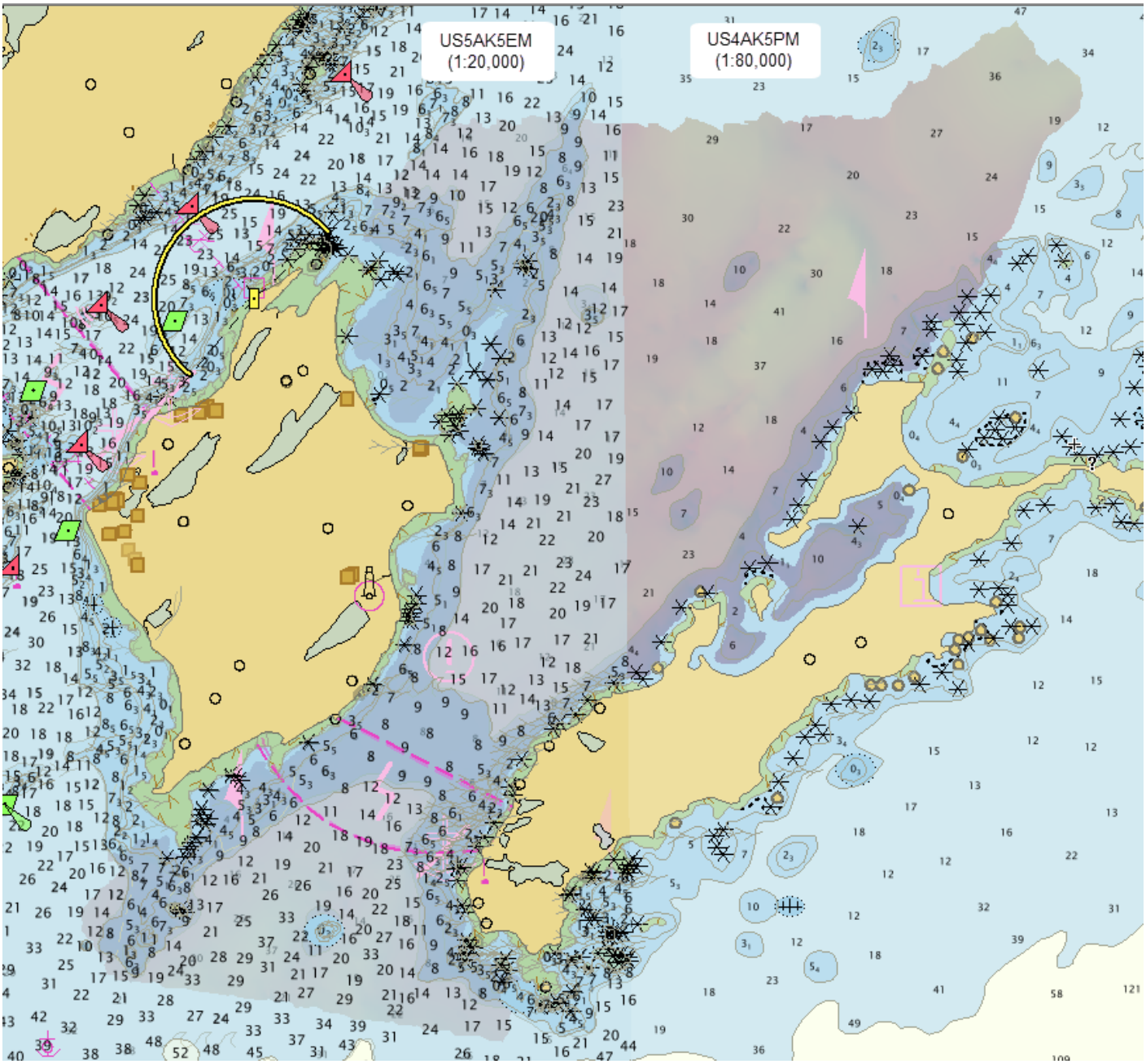
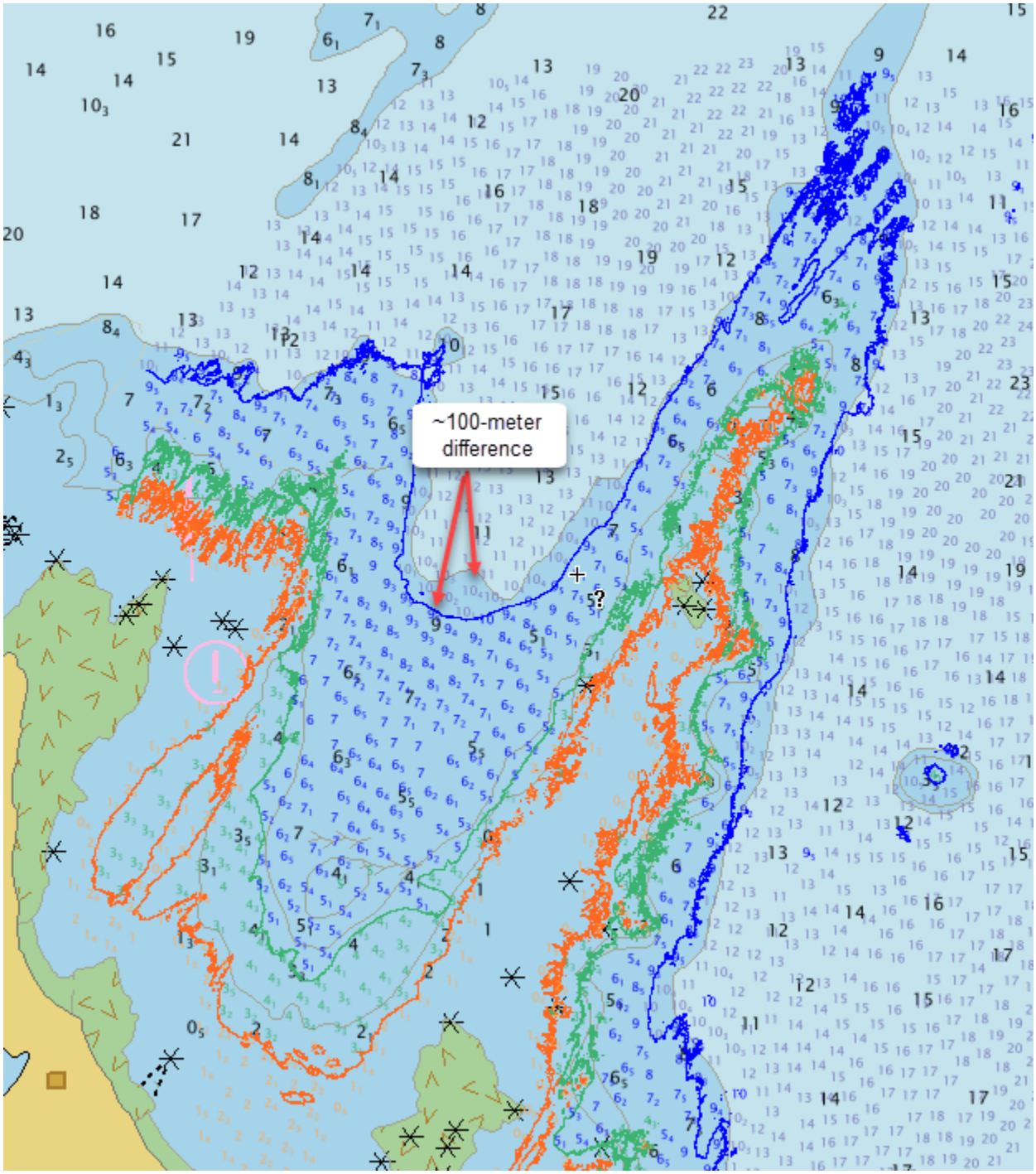


Figure 24: The 3, 5, and 10-fathom contours derived from H12997 are shoaler than charted contours.

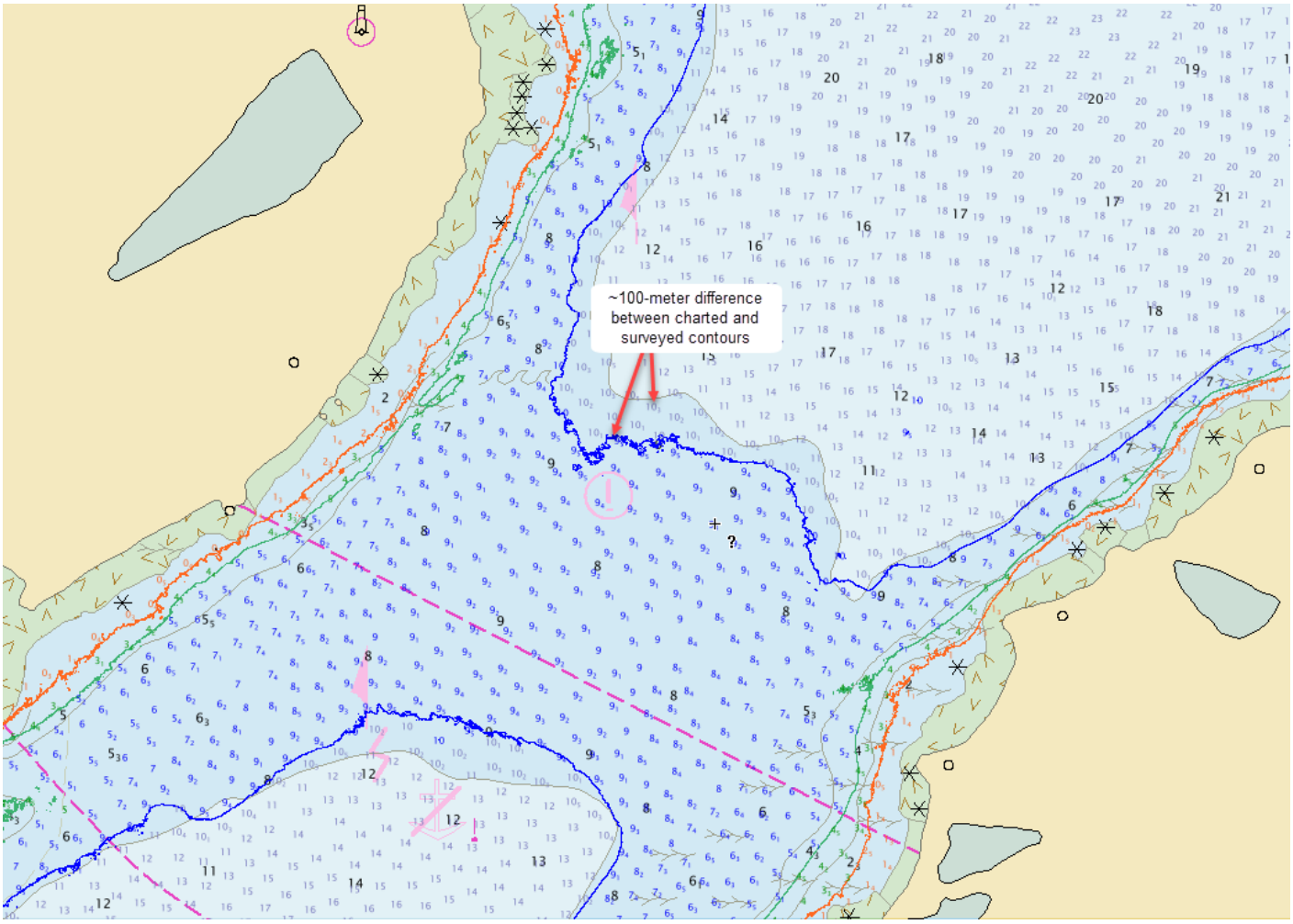
A larger scale ENC (US5AK5EM) overlaps the southern and western portions of the survey so a chart comparison with this ENC was conducted during office processing. The contours and soundings from US5AK5EM (Scale 1:20000, Edition 15, Application Date 12/4/2017, Issue Date 3/8/2018) were compared to those derived from H12997. Soundings were generally within 1 to 2 fathoms and contours closely followed charted contours with a few exceptions where the contours differed by ~100 meters.



Overview of ENC US5AK5EM and ENC US4AK5PM.



Approximate ~100-meter difference between charted and survey contours.



Approximate ~100-meter difference between charted and survey contours.

D.1.3 Maritime Boundary Points

No Maritime Boundary Points were assigned for this survey.

D.1.4 Charted Features

No charted features exist for this survey.

D.1.5 Uncharted Features

No uncharted features exist for this survey.

D.1.6 Dangers to Navigation

Danger to Navigation Reports are included in Appendix II of this report.

D.1.7 Shoal and Hazardous Features

Features of navigational significance are discussed in the chart comparison sections above or are included in the H12997 Final Feature File submitted with this report.

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

Three bottom samples were investigated for this survey; the results are included in the H12997 Final Feature File submitted with this Report.

D.2 Additional Results

D.2.1 Shoreline

Limited shoreline verification was conducted in accordance with applicable sections of NOAA HSSD and FPM using the Project Reference File (PRF) and Composite Source File (CSF) provided with the Project Instructions. In the field, all assigned features that were safe to approach, were addressed as required with S-57 attribution and recorded in the H12997_Final_Feature_File (FFF) to best represent the features at chart scale. This file also includes new features found in the field as well as recommendations to update, retain or delete assigned features.

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

A charted (16594, 16595) cable area extends through the H12997 survey area from Woody Island to Long Island; no evidence cables was identified in H12997 MBES data.

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

One wreck was found within the survey area; its position and other information is included in the H12997 Final Feature File submitted with this report. There are no other significant features in the H12997 survey area that were not discussed elsewhere in this report.

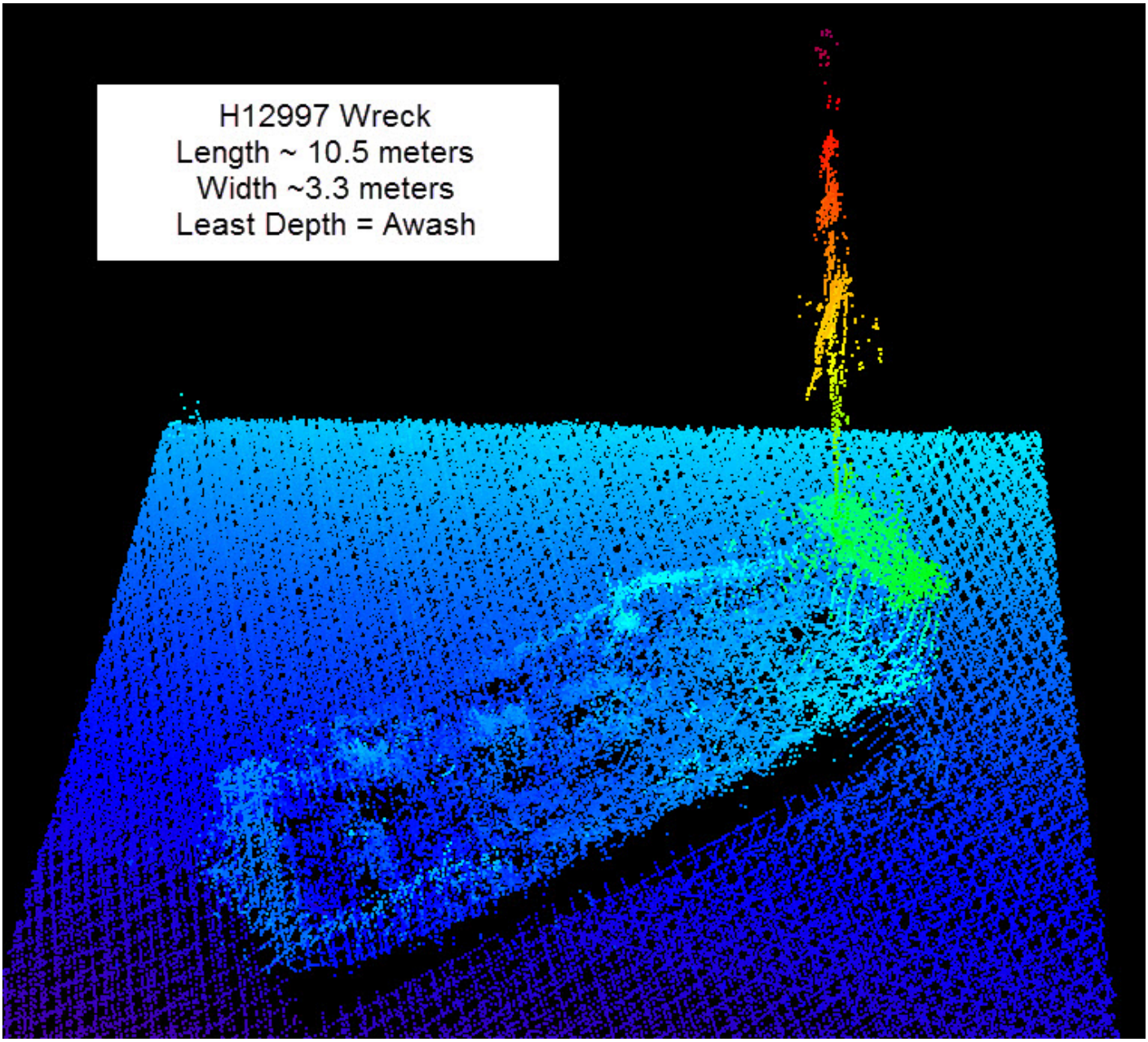


Figure 25: H12997 wreck.

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.

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

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.

Approver Name	Approver Title	Approval Date	Signature
John J. Lomnicky, CDR/NOAA	Commanding Officer, NOAA Ship Rainier	03/06/2018	Digitally signed by EVANS.BENJAMIN.K.1237217094 Date: 2018.03.09 16:18:01 -08'00'
Scott E. Broo, LT/NOAA	Field Operations Officer, NOAA Ship Rainier	03/06/2018	BROO.SCOTT.EDWARD.1396599976 2018.03.07 22:12:03 -08'00'
James B. Jacobson	Chief Survey Technician, NOAA Ship Rainier	03/06/2018	JACOBSON.JAMES.BRYAN.1269664017 I have reviewed this document 2018.03.06 12:16:31 -08'00'
Jennifer S. Kraus, ENS/NOAA	Sheet Manager	03/06/2018	BROO.SCOTT.EDWARD.1396599976 Digitally signed by BROO.SCOTT.EDWARD.1396599976 DN: c=US, o=U.S. Government, ou=DoD, ou=PKI, ou=NOAA, cn=BROO.SCOTT.EDWARD.1396599976 Date: 2018.03.10 23:57:02 -08'00'

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

TIDE NOTE FOR HYDROGRAPHIC SURVEY

DATE : June 16, 2017

HYDROGRAPHIC BRANCH: Pacific
HYDROGRAPHIC PROJECT: OPR-P136-RA-17
HYDROGRAPHIC SHEET: H12997

LOCALITY: Long Island, Kodiak Island, AK
TIME PERIOD: April 20 - May 14, 2017

TIDE STATION USED: 9457292 Kodiak Island, AK
Lat. 57° 43.8'N Long. 152° 30.8' W
PLANE OF REFERENCE (MEAN LOWER LOW WATER): 0.000 meters
HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 2.400 meters

REMARKS: RECOMMENDED GRID

Please use the TCARI grid "P136RA2017.tc" as the final grid for project OPR-P136-RA-17, H12997, during the time period between April 20 and May 14, 2017.

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).

HOVIS.GERALD.THOMAS.JR.1365860250

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DN: c=US, o=U.S. Government, ou=DoD, ou=PKI, ou=OTHER, cn=HOVIS.GERALD.THOMAS.JR.1365860250
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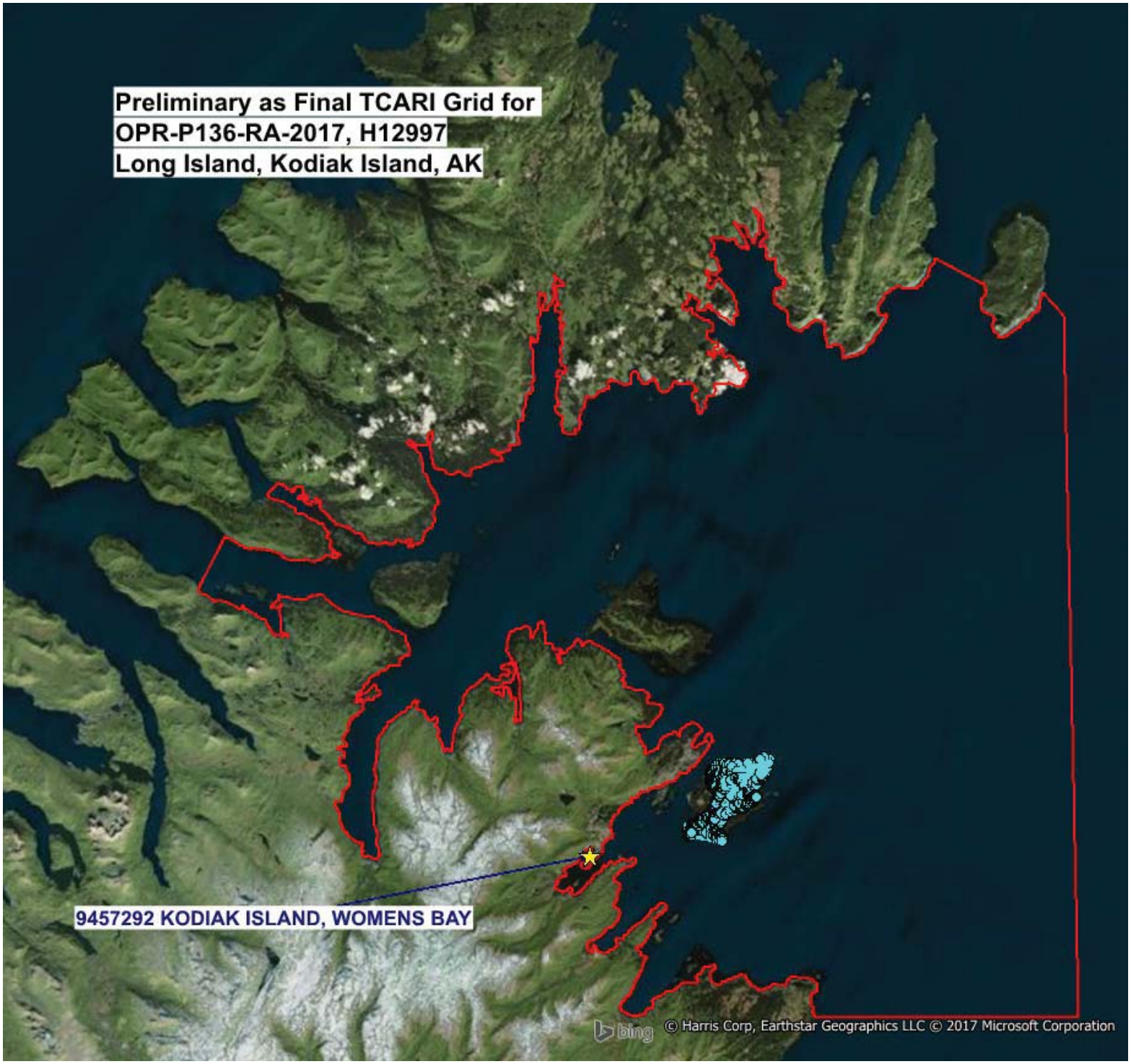
CHIEF, PRODUCTS AND SERVICES BRANCH


Preliminary as Final TCARI Grid for
OPR-P136-RA-2017, H12997
Long Island, Kodiak Island, AK
9457292 KODIAK ISLAND, WOMENS BAY
bing
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APPROVAL PAGE

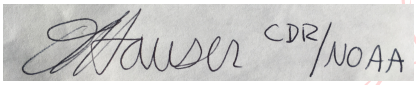
H12997

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

- Descriptive Report
- Collection of Bathymetric Attributed Grids (BAGs)
- Collection of backscatter mosaics
- Processed survey data and records
- Bottom samples
- GeoPDF of survey products

The survey evaluation and verification has been conducted according current OCS Specifications, and the survey has been approved for dissemination and usage of updating NOAA's suite of nautical charts.

Approved:  HAUSER.OLIVIA.A.1275636009
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Commander Olivia Hauser, NOAA
Chief, Pacific Hydrographic Branch