

H13492

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

**DESCRIPTIVE REPORT**

Type of Survey: Navigable Area

Registry Number: H13492

**LOCALITY**

State(s): Alaska

General Locality: North Coast Kodiak Island

Sub-locality: Marmot Strait

**2021**

CHIEF OF PARTY  
Olivia A. Hauser, CDR/NOAA

LIBRARY & ARCHIVES

Date:

**HYDROGRAPHIC TITLE SHEET**

**H13492**

**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: **North Coast Kodiak Island**

Sub-Locality: **Marmot Strait**

Scale: **40000**

Dates of Survey: **08/21/2021 to 08/28/2021**

Instructions Dated: **06/07/2021**

Project Number: **OPR-P336-RA-21**

Field Unit: **NOAA Ship *Rainier***

Chief of Party: **Olivia A. Hauser, 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:**

*Any revisions to the Descriptive Report (DR) applied during office processing are shown in red italic text. The DR is maintained as a field unit product, therefore all information and recommendations within this report are considered preliminary unless otherwise noted. The final disposition of survey data is represented in the NOAA nautical chart products. All pertinent records for this survey are archived at the National Centers for Environmental Information (NCEI) and can be retrieved via <https://www.ncei.noaa.gov/>. Products created during office processing were generated in NAD83 UTM 5N, MLLW. All references to other horizontal or vertical datums in this report are applicable to the processed hydrographic data provided by the field unit.*

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## Descriptive Report to Accompany Survey H13492

Project: OPR-P336-RA-21

Locality: North Coast Kodiak Island

Sublocality: Marmot Strait

Scale: 1:40000

August 2021 - August 2021

**NOAA Ship *Rainier***

Chief of Party: Olivia A. Hauser, CDR/NOAA

### A. Area Surveyed

This survey is referred to as H13492, "Marmot Strait" (sheet 1) within the Project Instructions. The originally assigned survey area was limited to the passage between Afognak and Marmot Islands. However, H13492 was expanded to include data initially acquired for survey H13493, Izhut Bay.

#### A.1 Survey Limits

Data were acquired within the following survey limits:

Northwest Limit	Southeast Limit
58° 24' 14.71" N 152° 17' 7.61" W	58° 7' 30.57" N 151° 55' 19.46" W

*Table 1: Survey Limits*

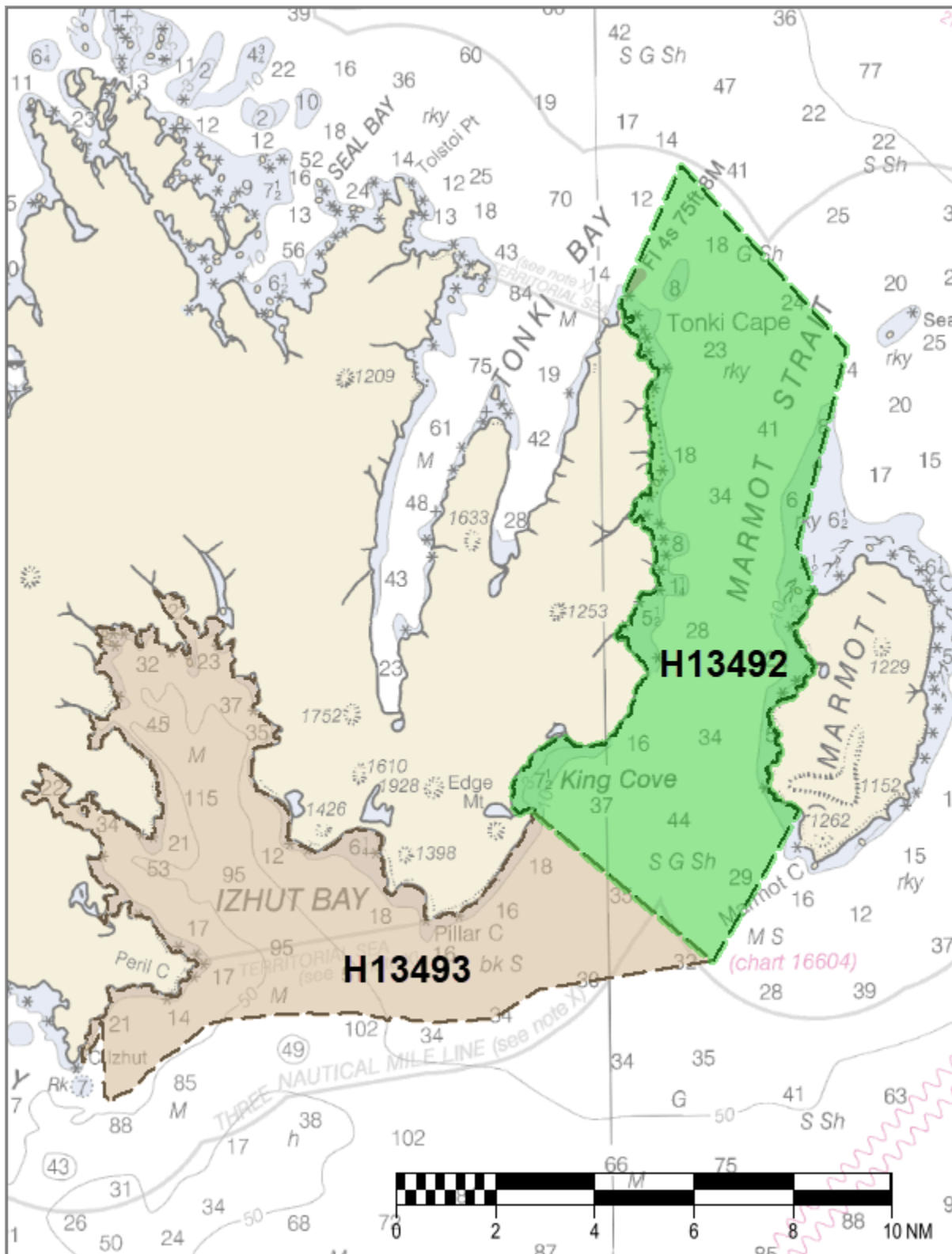


Figure 1: H13492 / H13493 originally assigned survey areas (Chart 16580).

Due to circumstances related to the COVID-19 pandemic, we were unable to complete survey acquisition within the entire assigned H13492 / H13493 areas. With approval from the Project and Navigation Managers, we prioritized the center of Marmot Strait and its eastern shore as the focus of our operations. Unfortunately, a deteriorating COVID-19 situation onboard prevented completion of this priority area or any additional H13493 coverage. The Project Manager advised us to combine H13492 / H13493 data into one survey (H13492) for submission. For further information, see Supplemental Records delivered with this report.

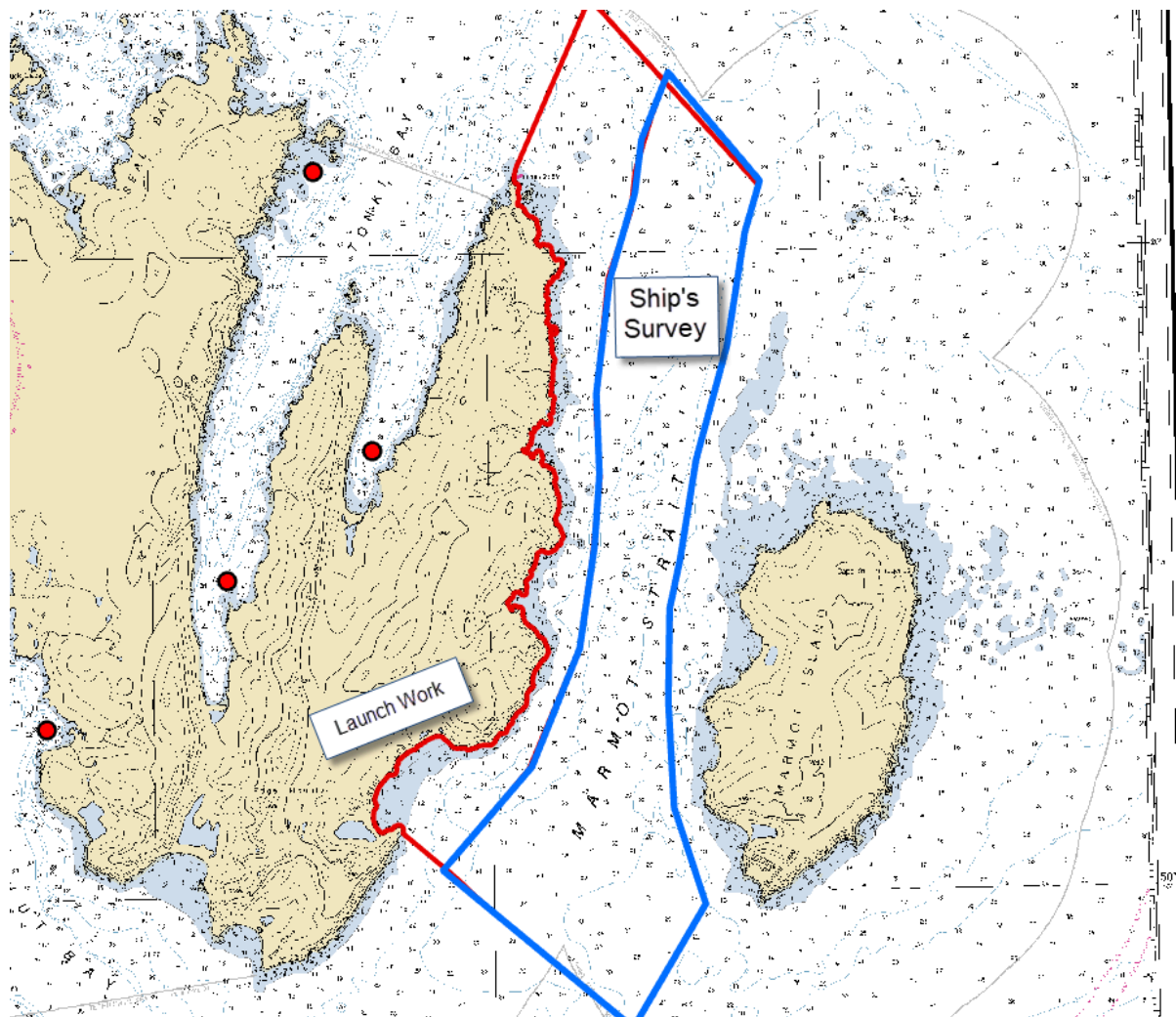


Figure 2: H13492 priority area as approved by Project Manager.

## A.2 Survey Purpose

The coastal waters around the northeastern end of the Kodiak Archipelago are identified as an area with a high need for modern hydrographic charting. The area is utilized by commercial and recreational fishing. It is transited by the Alaska Marine Highway System and commerce which is critical to the City of Kodiak



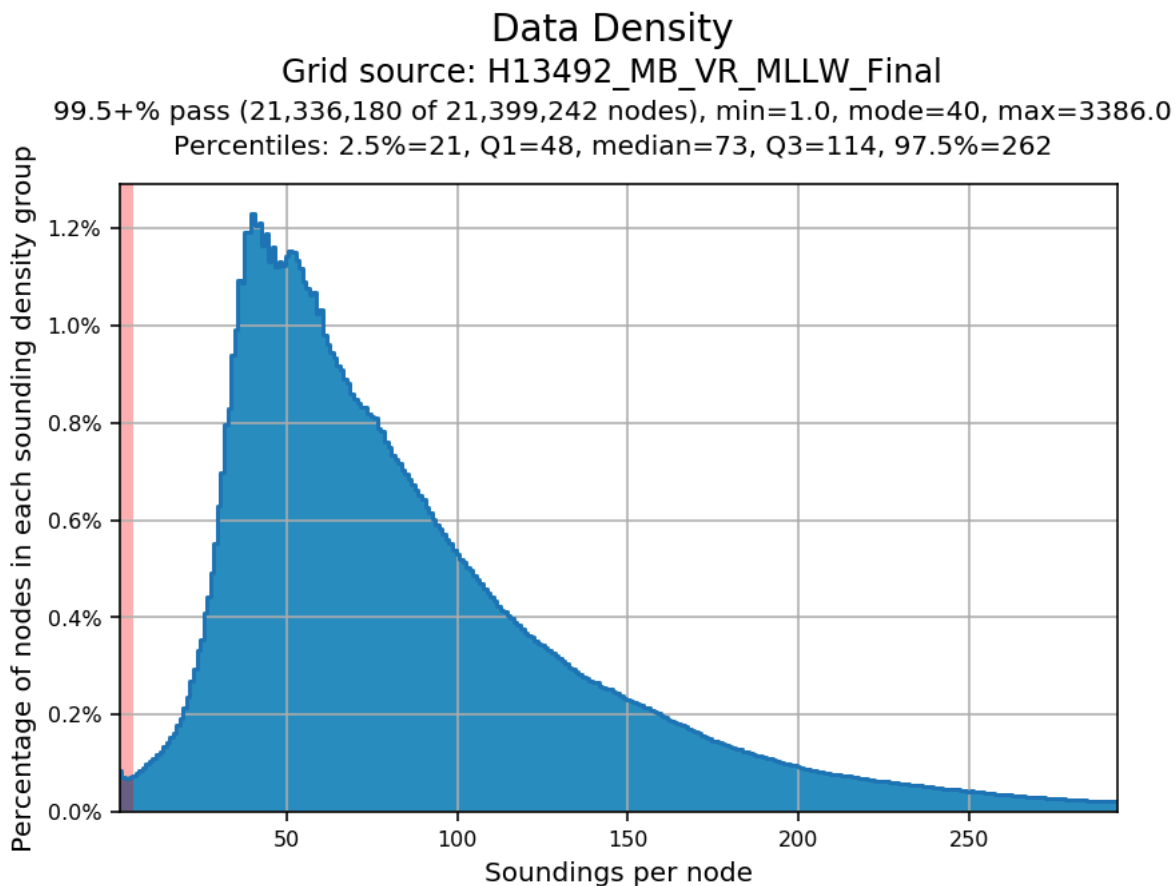
and the US Coast Guard Base Kodiak. In spite of being an area with numerous bays, islands, islets, reefs and pinnacles, this coastal area from Shuyak Island to Izhut Bay has not been surveyed since the 1930s.

This modern hydrographic survey will address gaps in the Seabed 2030 project, provide critical data to update National Ocean Service (NOS) nautical charting products, identify hazards and improve maritime safety. Data from this survey are intended to supersede all prior data in the common area.

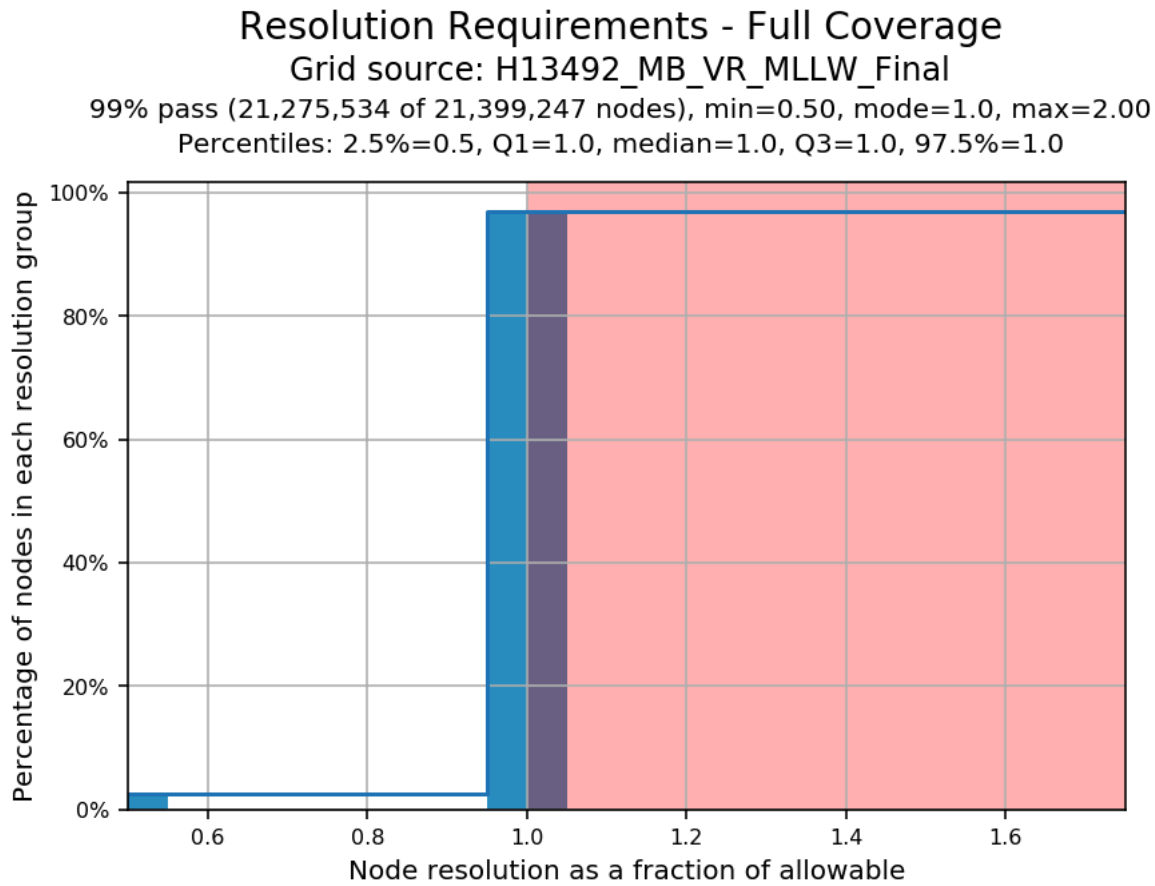
### A.3 Survey Quality

The entire survey is adequate to supersede previous data.

Pydro QC Tools (v.3.4.7) Grid QA was used to analyze H13492 multibeam echosounder (MBES) data density. The submitted H13492 finalized variable-resolution (VR) surface met HSSD density and full coverage requirements as shown in the plots below.



*Figure 3: Pydro derived plot showing HSSD density compliance of H13492 finalized variable-resolution MBES data.*



*Figure 4: Pydro derived plot showing HSSD full coverage compliance of H13492 finalized variable-resolution MBES data.*

### 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 3.5 meters water depth	Complete Coverage (Refer to HSSD Section 5.2.2.3)

*Table 2: Survey Coverage*

Due to ramifications from the COVID-19 pandemic, we were unable to complete the entire H13492 assigned survey area. We completed the central region of Marmot Strait where AIS data shows the highest level of vessel traffic occurs, and inshore to the safe limit of navigation along the east side of Afognak Island; this plan was approved by the Project Manager. H13492 nearshore survey operations were restricted by extensive kelp, as was the case during 1932 U.S. Coast and Geodetic Survey 5256 when, according to its Descriptive Report, "...the kelp was so heavy that it was impossible to penetrate with a launch..."

Pydro QC Tools (v3.4.7) Holiday finder (v4) was used to identify gaps in MBES coverage. The program identified 73 holidays, the majority of which were small and located on or near the most inshore extents of coverage where kelp or acoustic shadows caused the gaps in coverage. Some gaps in coverage, especially those in offshore areas that might otherwise have been addressed, were not, due to schedule disruptions caused by the COVID-19 pandemic .

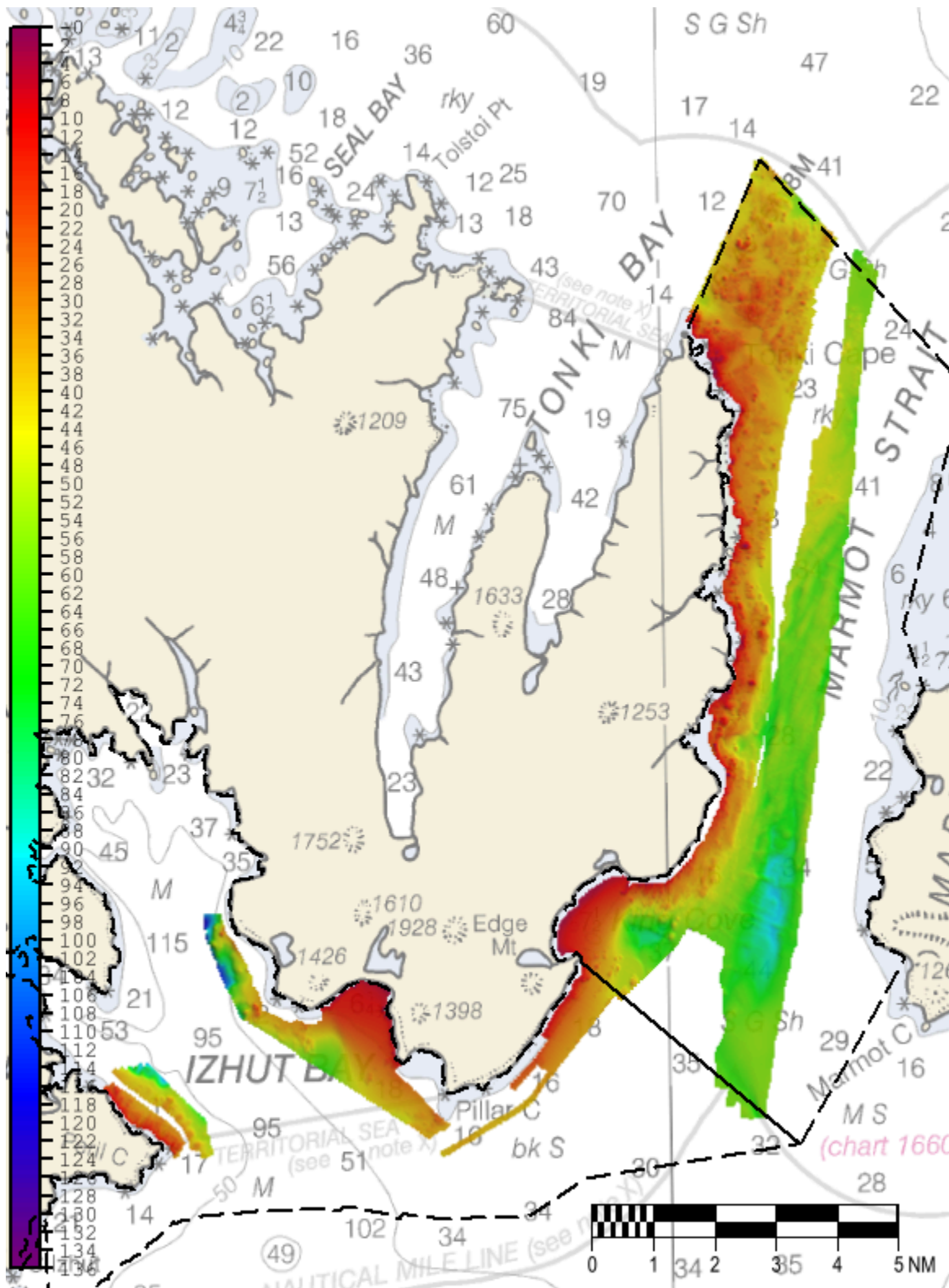


Figure 5: Combined H13492 / H13493 coverage submitted as H13492.

## A.6 Survey Statistics

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

	<b>HULL ID</b>	<i>S221</i>	<i>2801</i>	<i>2802</i>	<i>2803</i>	<i>Total</i>
<b>LNM</b>	<b>SBES Mainscheme</b>	0	0	0	0	0
	<b>MBES Mainscheme</b>	99.71	192.38	27.71	184.79	504.59
	<b>Lidar Mainscheme</b>	0	0	0	0	0
	<b>SSS Mainscheme</b>	0	0	0	0	0
	<b>SBES/SSS Mainscheme</b>	0	0	0	0	0
	<b>MBES/SSS Mainscheme</b>	0	0	0	0	0
	<b>SBES/MBES Crosslines</b>	0	0	0	0	0
	<b>Lidar Crosslines</b>	0	0	0	0	0
<b>Number of Bottom Samples</b>						0
<b>Number Maritime Boundary Points Investigated</b>						0
<b>Number of DPs</b>						14
<b>Number of Items Investigated by Dive Ops</b>						0
<b>Total SNM</b>						32.06

*Table 3: Hydrographic Survey Statistics*

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

<b>Survey Dates</b>	<b>Day of the Year</b>
08/21/2021	233
08/22/2021	234
08/23/2021	235
08/24/2021	236
08/25/2021	237
08/26/2021	238
08/27/2021	239
08/28/2021	240

*Table 4: Dates of Hydrography*

*Last survey date is 08/28/2021 based on survey trackline data in the H13492 CARIS HIPS project. Survey end date also updated on the Hydrographic Title Sheet (Page 2).*

## **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:

<b>Hull ID</b>	<b>S221</b>	<b>2801</b>	<b>2802</b>	<b>2803</b>
<b>LOA</b>	70.4 meters	8.8 meters	8.8 meters	8.8 meters
<b>Draft</b>	4.7 meters	1.1 meters	1.1 meters	1.1 meters

*Table 5: Vessels Used*





*Figure 6: NOAA Ship RAINIER with survey launches onboard.*

All data for H13492 were acquired by NOAA Ship RAINIER and survey launches 2801, 2802 and 2803. The vessels acquired depth soundings, backscatter imagery and sound speed profiles.

### **B.1.2 Equipment**

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

<b>Manufacturer</b>	<b>Model</b>	<b>Type</b>
Applanix	POS MV 320 v5	Positioning and Attitude System
Kongsberg Maritime	EM 710	MBES
Kongsberg Maritime	EM 2040	MBES
ODIM Brooke Ocean	MVP200	Sound Speed System
Sea-Bird Scientific	SBE 19plus	Conductivity, Temperature, and Depth Sensor
Teledyne RESON	SVP 70	Sound Speed System

*Table 6: Major Systems Used*

## B.2 Quality Control

### B.2.1 Crosslines

Due to COVID-19 induced constraints discussed elsewhere in this report, no crossline data were acquired for this survey.

### B.2.2 Uncertainty

The following survey specific parameters were used for this survey:

Method	Measured	Zoning
ERS via ERTDM	0 meters	0.14 meters

*Table 7: Survey Specific Tide TPU Values.*

Hull ID	Measured - CTD	Measured - MVP	Measured - XBT	Surface
S221	N/A	1 meters/second	N/A	0.05 meters/second
2801,2802,2803	3 meters/second	N/A	N/A	0.05 meters/second

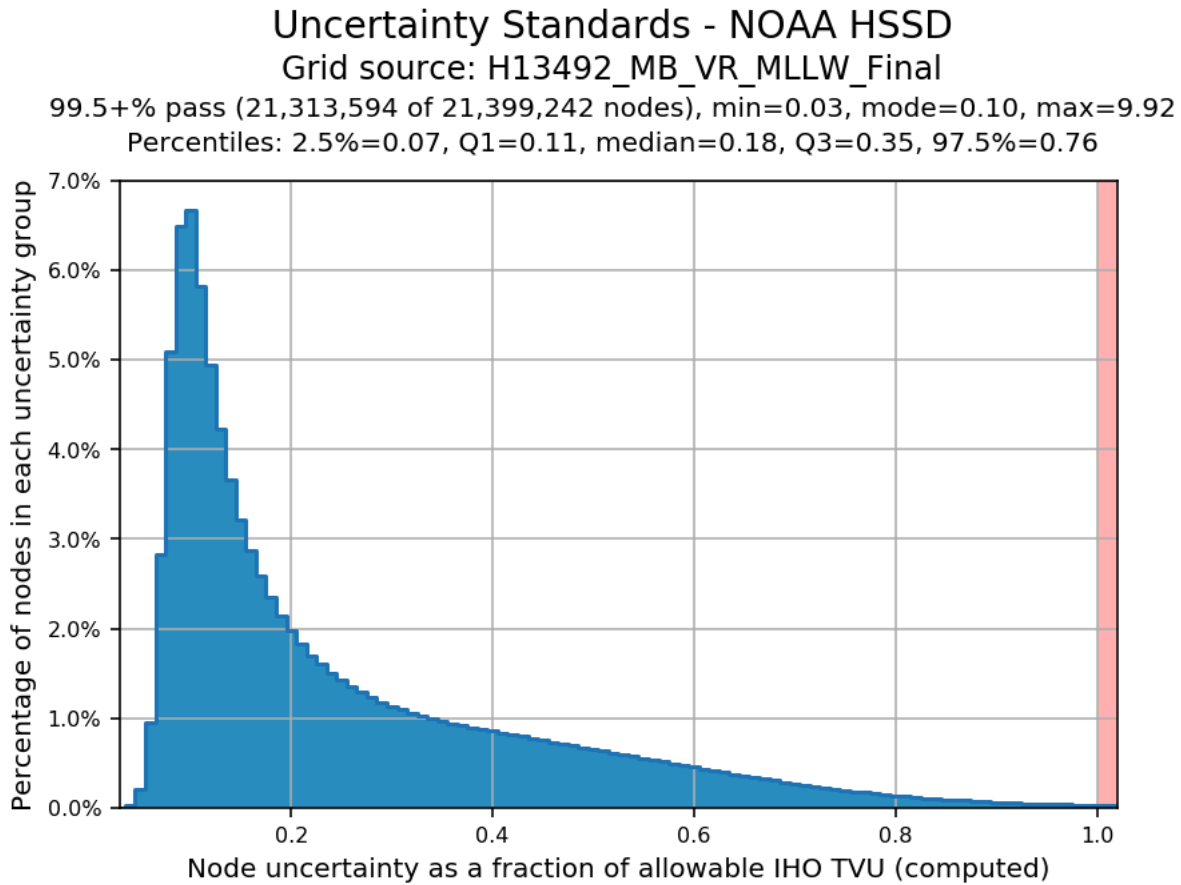
*Table 8: Survey Specific Sound Speed TPU Values.*

Total Propagated Uncertainty (TPU) values for survey H13492 were derived from a combination of fixed values for equipment and vessel characteristics, as well as from field assigned values for sound speed uncertainties. Tidal uncertainty was provided in metadata for the NOAA vertical datum transformation model used for this survey.

In addition to the usual a priori estimates of uncertainty, real-time and post-processed uncertainty sources were also incorporated into the depth estimates of this survey. Real-time uncertainties for position, navigation, attitude, and vessel motion data from Applanix POS MV were applied during acquisition and initially in post-processing. POSpac SBET and RMS files were later applied in CARIS HIPS to supersede POS MV uncertainties associated with GPS height and position.

Uncertainty values of the submitted finalized grids were calculated in Caris using "Greater of the Two" of uncertainty and standard deviation (scaled to 95%). Grid QA v6 within Pydro QC Tools was used to analyze H13492 TVU compliance. H13492 met HSSD requirements in 99.5+% percent of grid nodes, as shown in the histogram plot below.





*Figure 7: Pydro derived plot showing TVU compliance of H13492 finalized multi-resolution MBES data.*

### **B.2.3 Junctions**

H13492 junctions with four contemporary surveys from the same project, OPR-P336-RA-21 (see figure below). Survey data were acquired on one of these four surveys, H13493, which was subsequently combined with H13492, therefore no junction comparison was performed.

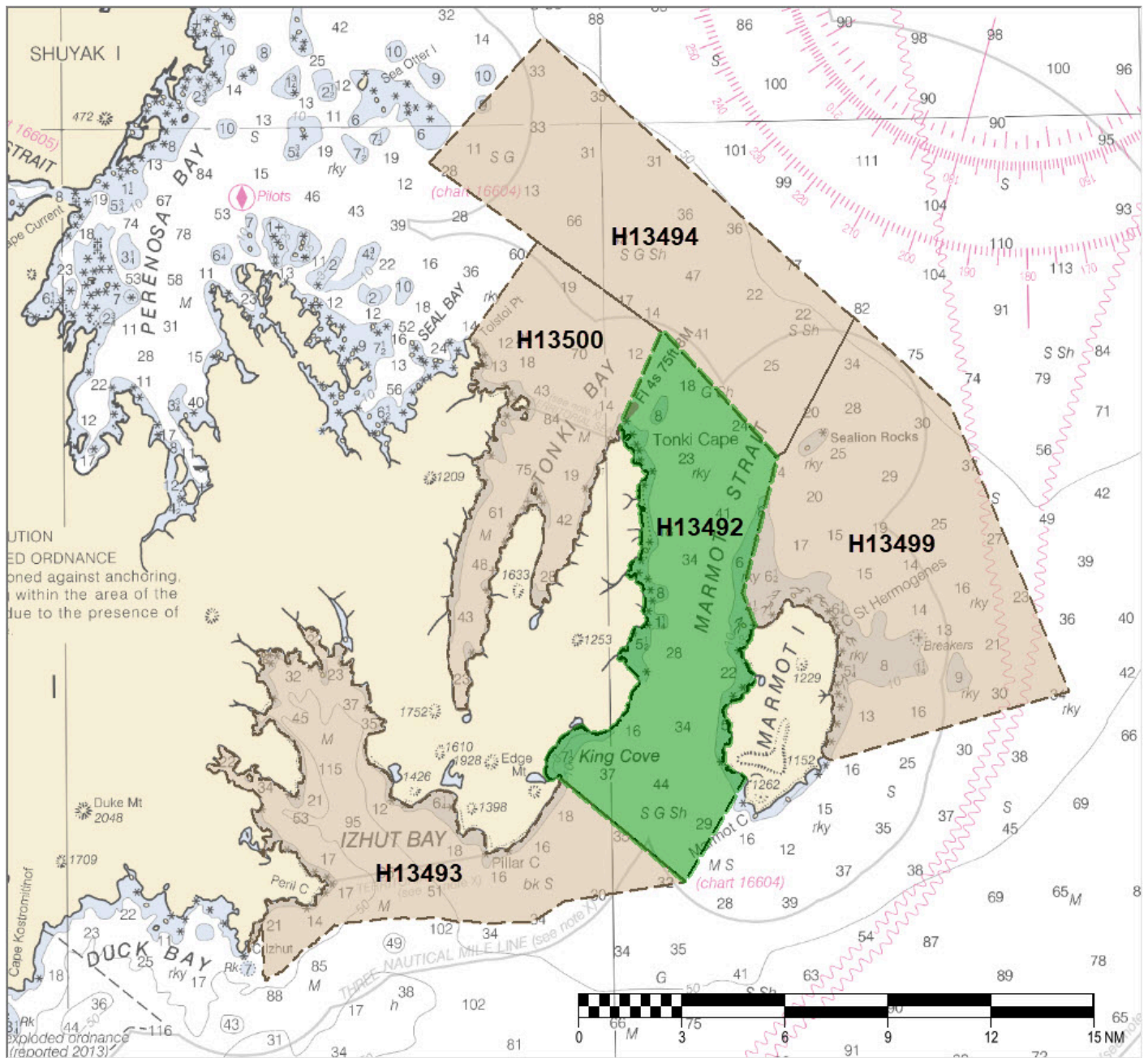


Figure 8: H13492 junction surveys (Chart 16580).

There are no contemporary surveys that junction with this survey.

### 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**

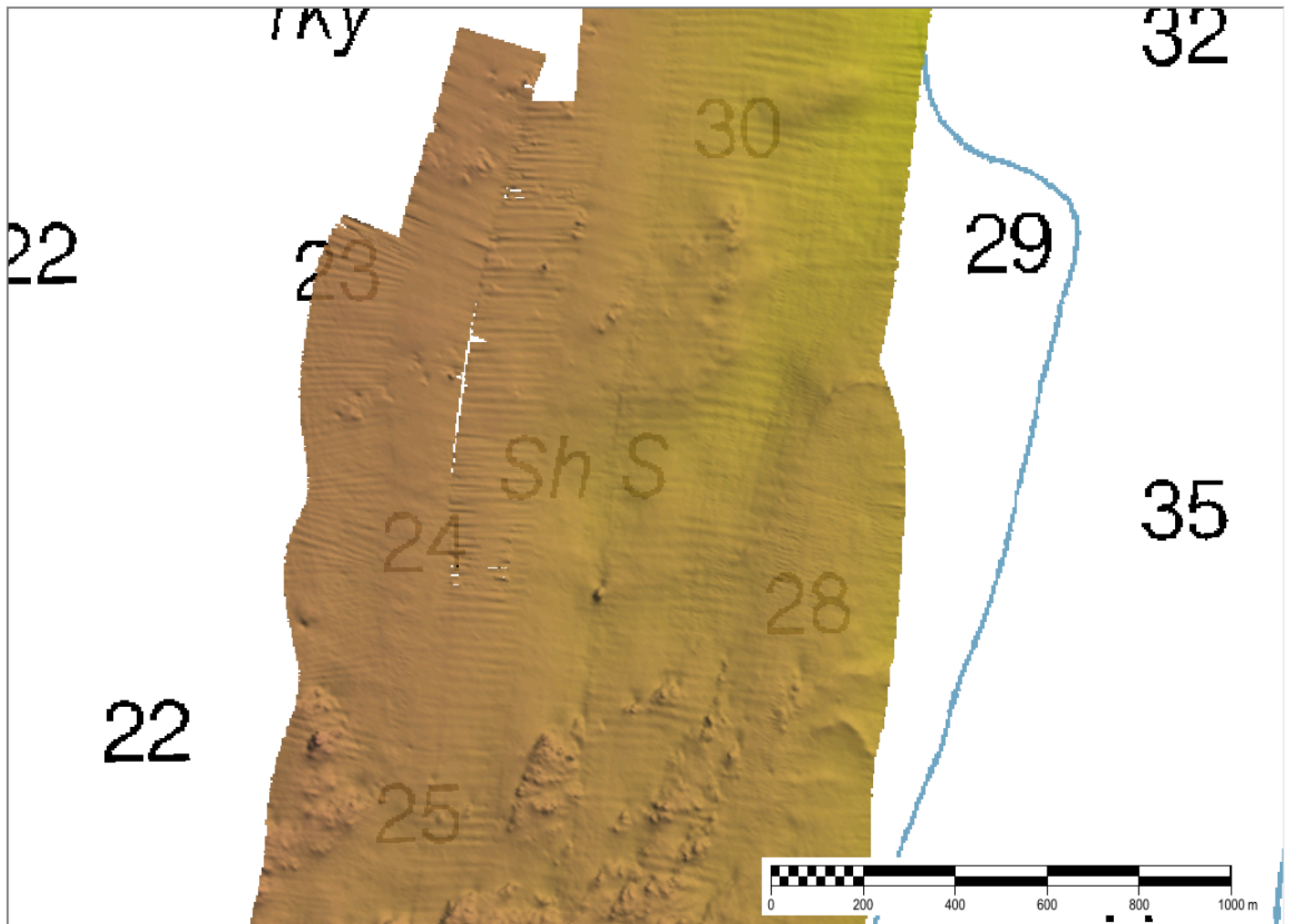
#### Delayed Heave Application

Delayed heave failed to load on line 0003\_20210824\_214716\_2801\_300A\_236. Our current ERS processing work flow overwrites delayed heave data, therefore the absence of heave on this line had no adverse effect. The line shows good agreement with adjacent data.

### **B.2.6 Factors Affecting Soundings**

#### Suboptimal sea state / sound speed correction

Some H13492 MBES data were affected by adverse sea state and suboptimal sound speed correction as illustrated in the figure below. The conditions were encountered during ship (S221) survey operations in the northern part of Marmot Strait. We reviewed the affected data in subset editor and determined the offsets of up to approximately 0.2 meters, meet HSSD charting standards.



*Figure 9: Example area of H13492 MBES data affected by adverse sea state and suboptimal sound speed correction (vertical exaggeration = 10).*

### **B.2.7 Sound Speed Methods**

Sound Speed Cast Frequency: Fifty seven sound speed profiles ("casts") were acquired for this survey at discrete locations within the survey area at least once every four hours, when significant changes to surface sound speed were observed, or when shifting survey operations to a new area. All sound speed profiles were concatenated into a master file and applied to H13492 MBES data using the "Nearest distance within Time" (4 hours) profile selection method.

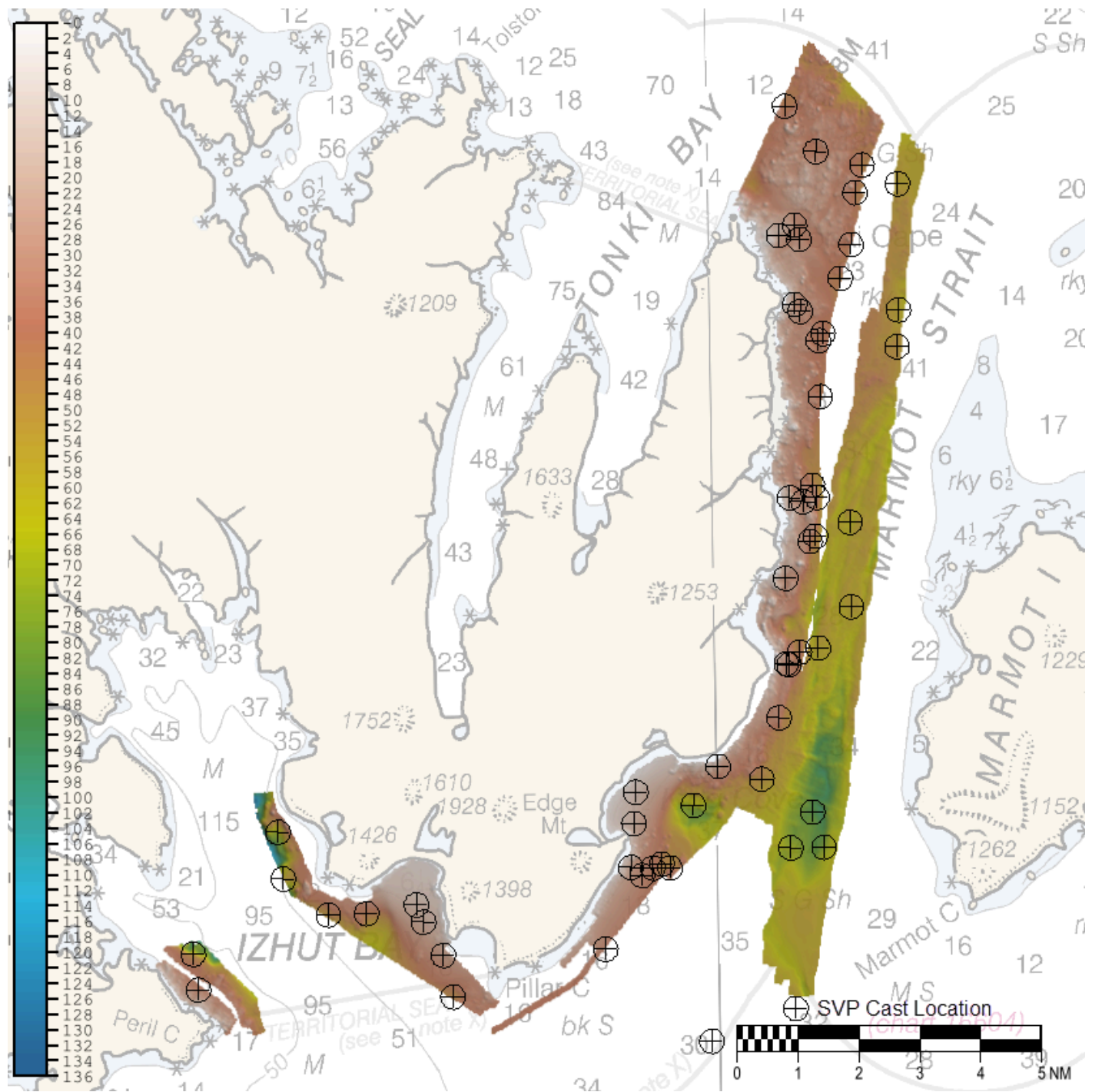


Figure 10: H13492 sound speed cast locations.

**B.2.8 Coverage Equipment and Methods**

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

## **B.3 Echo Sounding Corrections**

### **B.3.1 Corrections to Echo Soundings**

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 acquired as .ALL files logged during MBES operations and subsequently processed by RAINIER personnel. The .GSF files created during processing and backscatter mosaic data has been delivered with this report. Backscatter processing procedures are described in the DAPR.



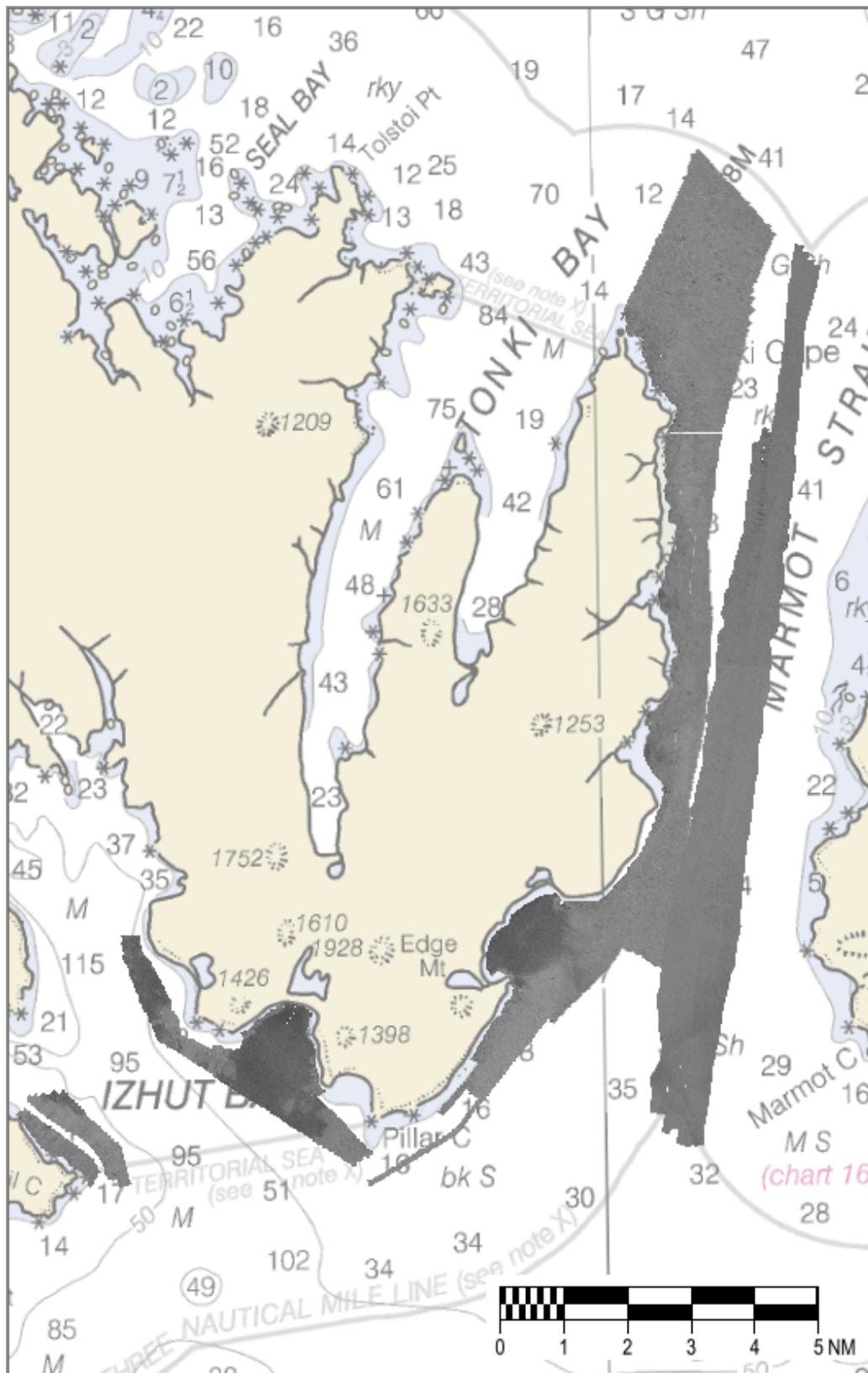


Figure 11: Overview mosaic of H13492 multibeam acoustic backscatter coverage.

## 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	11.3.15

*Table 9: Primary bathymetric data processing software*

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

Manufacturer	Name	Version
QPS	FMGT	7.9.4

*Table 10: Primary imagery data processing software*

The following Feature Object Catalog was used: NOAA Profile Version 2021.

### 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
H13492_MB_VR_MLLW	CARIS VR Surface (CUBE)	Variable Resolution	0 meters - 134.5 meters	NOAA_VR	Complete MBES
H13492_MB_VR_MLLW_Final	CARIS VR Surface (CUBE)	Variable Resolution	-0.3 meters - 134.5 meters	NOAA_VR	Complete MBES

*Table 11: Submitted Surfaces*

Submitted H13492 surfaces were generated using NOAA recommended parameters for depth-based (Ranges) Caris variable-resolution bathymetric grids.



Pydro Flier finder (v8) with default settings was used as a quality control check on submitted H13492 surfaces. After several iterations of data cleaning and running the tool, the program identified 23 potential fliers in the submitted surfaces. Subset analysis of the remaining potential fliers revealed them to be "false positives," a result of the dynamic seafloor making up some of the survey area. Flier finder was also used with the Noisy Edges option enabled with a resulting 6,599 potential fliers identified. This egregious number of potential fliers was identified by the program even after careful, meticulous surface edge cleaning. These results suggest that Flier finder with the Noisy Edges option enabled is not a reliable tool for assessing the quality of survey data and should not be used.

## 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.

#### ERS Datum Transformation

The following ellipsoid-to-chart vertical datum transformation was used:

Method	Ellipsoid to Chart Datum Separation File
ERS via ERTDM	OPR-P336-RA-21_ERTDM21_NAD83-MLLW.csar OPR-P336-RA-21_ERTDM21_NAD83-MHW.csar

*Table 12: ERS method and SEP file*

All submitted H13492 survey data were vertically referenced to the ellipsoid. An Ellipsoidal-Referenced Tidal Datum Model (ERTDM) was used for referencing H13492 data to MLLW and MHW.

### C.2 Horizontal Control

The horizontal datum for this project is North American Datum of 1983 (NAD 83).

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

### RTK

Precise Positioning-Real time Extended (PP-RTX) processing methods were used in Applanix POSPac MMS (v8.5) software for post-processing horizontal correction of submitted H13492 MBES data.

### WAAS

The Wide Area Augmentation System (WAAS) was used for real-time horizontal control during data acquisition.

## **D. Results and Recommendations**

### **D.1 Chart Comparison**

#### Shoreline Feature Verification

Due to time and personnel constraints imposed by the COVID-19 pandemic, shoreline feature verification was not fully conducted for this survey. Where possible, we used the Composite Source File (CSF) provided by NOAA HSD Operations Branch to address assigned features with S-57 attribution and record them in the H13492 Final Feature File (FFF) submitted with this report. This file includes new features found in the field as well as recommendations to update, retain or delete assigned features. Features that were not addressed are attributed as such and the reason stated.

#### **D.1.1 Electronic Navigational Charts**

The following are the largest scale ENC's, which cover the survey area:

<b>ENC</b>	<b>Scale</b>	<b>Edition</b>	<b>Update Application Date</b>	<b>Issue Date</b>
US4AK5TM	1:78000	7	03/01/2018	03/01/2018

*Table 13: Largest Scale ENC's*

#### **D.1.2 Shoal and Hazardous Features**

This survey identified two Dangers to Navigation. They were submitted to the Marine Chart Division and have been applied to NOAA charting products. Details regarding the two DTONs are included the H13492

Final Feature File (FFF) and in Supplemental Records, submitted with this report. See image below for comparison of Chart 16604 before and after one H13492 DTONs was applied.

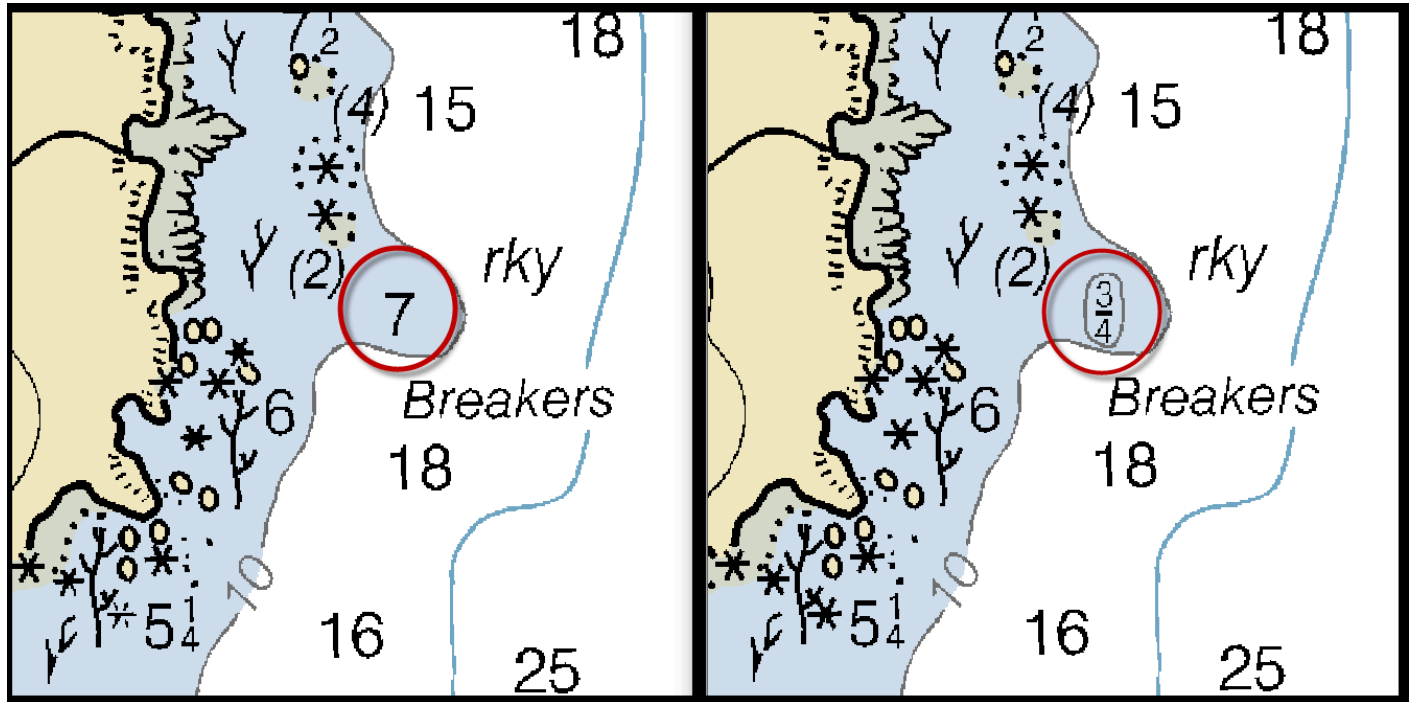


Figure 12: Chart 16604 before (left) and after (right) H13492 reported DTON was applied.

### D.1.3 Charted Features

H13492 MBES coverage was acquired over a rock enclosed within a charted danger line approximately 3 nautical miles north of King Cove; the least depth was determined to be -0.28 meters (see figure below).

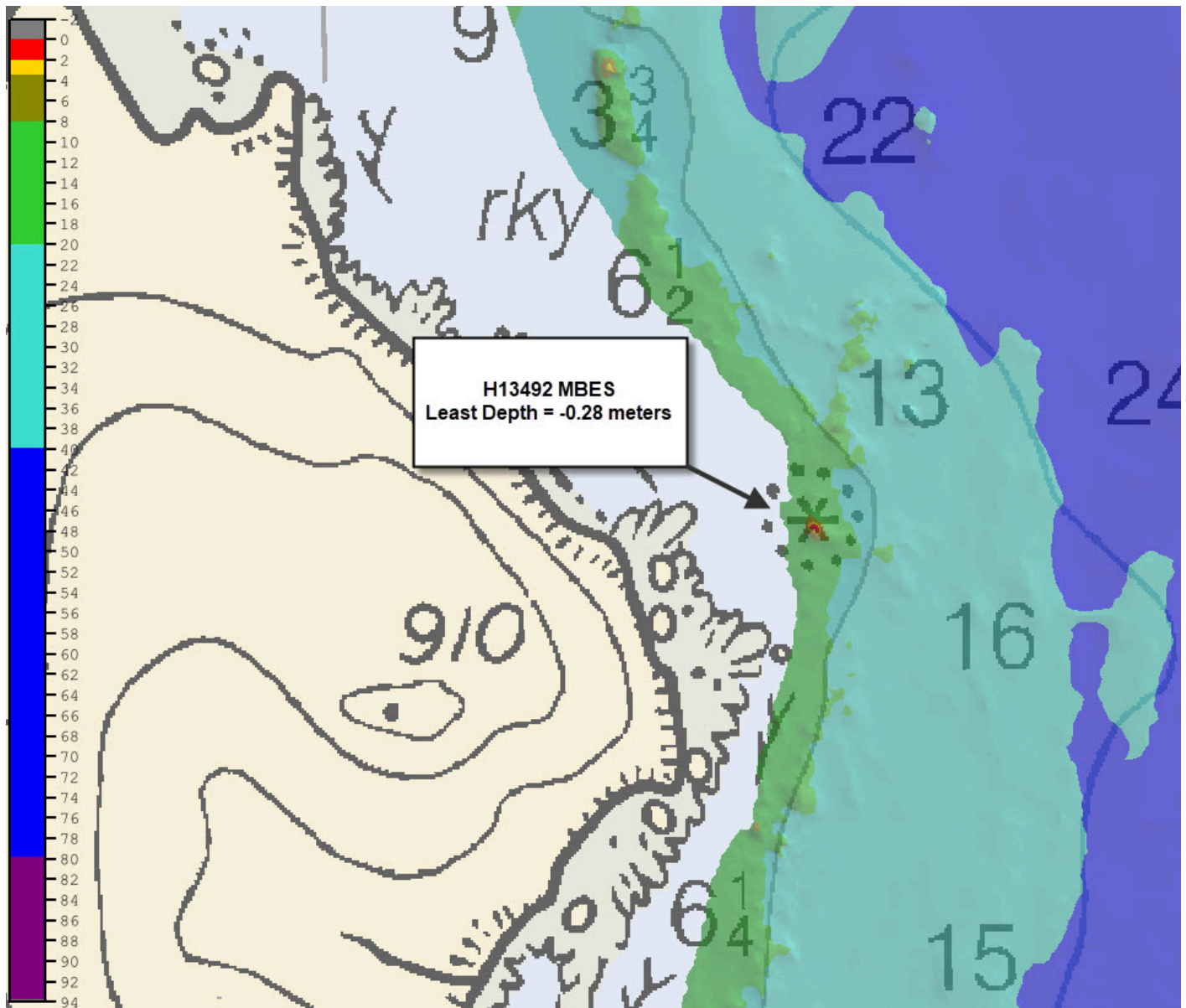


Figure 13: H13492 MBES coverage over rock charted (16604) within a danger line. Least depth -0.28 meters.

#### D.1.4 Uncharted Features

Refer to section D.1.2 of this report regarding H13492 Dangers to Navigation.

### **D.1.5 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.2 Additional Results**

### **D.2.1 Aids to Navigation**

The Tonki Cape Light, a skeleton tower with red and white diamond-shaped daymark, was observed in the field and appeared to be serving its intended purpose.



*Figure 14: Tonki Cape Light*

**D.2.2 Maritime Boundary Points**

No Maritime Boundary Points were assigned for this survey.

**D.2.3 Bottom Samples**

Bottom samples were assigned for this survey, but were not acquired due to time constraints as explained elsewhere in this report.

**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 Platforms**

No platforms exist for this survey.

**D.2.7 Ferry Routes and Terminals**

No ferry routes or terminals exist for this survey.

**D.2.8 Abnormal Seafloor or Environmental Conditions**

No abnormal seafloor or environmental conditions 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 Recommendations**

We recommend that the remainder of the originally assigned H13492 and H13493 survey areas be completed.

**D.2.11 ENC Scale Recommendations**

No new ENC scales are recommended for this area.

## E. Approval Sheet

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

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

The survey data meets or exceeds requirements as set forth in the NOS Hydrographic Surveys Specifications and Deliverables, 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
Olivia A. Hauser, CDR/NOAA	Chief of Party	10/14/2021	 HAUSER.OLIVIA.ANN.1 275636009 2021.10.20 08:00:27 -07'00'
Dylan A. Kosten, LT/NOAA	Field Operations Officer	10/14/2021	 Digitally signed by KOSTEN.DYLAN.ANDREW.1 504527405 Date: 2021.10.20 11:40:55 -07'00'
James B. Jacobson	Chief Survey Technician	10/14/2021	 JACOBSON.JAMES.BRYAN.12 69664017 I have reviewed this document 2021.10.20 08:04:43 -07'00'
Joan M. Bonilla-Pagan	Sheet Manager	10/14/2021	
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## F. Table of Acronyms

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

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

<b>Acronym</b>	<b>Definition</b>
<b>PRF</b>	Project Reference File
<b>PS</b>	Physical Scientist
<b>RNC</b>	Raster Navigational Chart
<b>RTK</b>	Real Time Kinematic
<b>RTX</b>	Real Time Extended
<b>SBES</b>	Singlebeam Echosounder
<b>SBET</b>	Smooth Best Estimate and Trajectory
<b>SNM</b>	Square Nautical Miles
<b>SSS</b>	Side Scan Sonar
<b>SSSAB</b>	Side Scan Sonar Acoustic Backscatter
<b>ST</b>	Survey Technician
<b>SVP</b>	Sound Velocity Profiler
<b>TCARI</b>	Tidal Constituent And Residual Interpolation
<b>TPU</b>	Total Propagated Uncertainty
<b>USACE</b>	United States Army Corps of Engineers
<b>USCG</b>	United States Coast Guard
<b>UTM</b>	Universal Transverse Mercator
<b>XO</b>	Executive Officer
<b>ZDF</b>	Zone Definition File