

**H13931**

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

**DESCRIPTIVE REPORT**

Type of Survey: Navigable Area

Registry Number: H13931

**LOCALITY**

State(s): New York

General Locality: Long Island Sound

Sub-locality: Oregon Hills to Rocky Point

**2024**

CHIEF OF PARTY  
John R. Bean

LIBRARY & ARCHIVES

Date:

**HYDROGRAPHIC TITLE SHEET**

**H13931**

**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): **New York**

General Locality: **Long Island Sound**

Sub-Locality: **Oregon Hills to Rocky Point**

Scale: **10000**

Dates of Survey: **06/26/2024 to 09/27/2024**

Instructions Dated: **05/06/2024**

Project Number: **OPR-B342-KR-24**

Field Unit: **Ocean Surveys**

Chief of Party: **John R. Bean**

Soundings by: **Multibeam Echo Sounder**

Imagery by: **Multibeam Echo Sounder Backscatter**

Verification by: **Atlantic 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 18N, 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 H13931

Project: OPR-B342-KR-24

Locality: Long Island Sound

Sublocality: Oregon Hills to Rocky Point

Scale: 1:10000

June 2024 - September 2024

**Ocean Surveys**

Chief of Party: John R. Bean

### A. Area Surveyed

This survey provides hydrographic data for waters in Long Island Sound, NY. The general locations of the survey limits are presented in Table 1.

#### A.1 Survey Limits

Data were acquired within the following survey limits:

Northwest Limit	Southeast Limit
41° 1' 15.2" N 72° 33' 34.4" W	41° 9' 14.79" N 72° 21' 7.25" W

*Table 1: Survey Limits*

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

#### A.2 Survey Purpose

High resolution bathymetry and backscatter acquired in this survey will help with the identification of existing geologic and benthic characteristics for hazard and habitat mapping. The data will support management decisions regarding the effects of potential energy infrastructure projects and mitigation opportunities, including the Offshore Wind Cable Corridor Constraints Assessment being conducted by the New York State Energy Research Development Authority (NYSERDA).

This effort was made possible through a partnership with NOAA and the State of Connecticut Department of Energy and Environmental Protection (CTDEEP) through the FY24 Brennan Matching Fund and Long

Island Sound Research and Restoration Fund / Long Island Sound Cable Fund (LISCF). The members of the LISCF steering committee include representatives from CTDEEP, US EPA Regions 1 & 2 through the Long Island Sound Study, the New York Department of Environmental Conservation and Department of State, and both CT and NY Sea Grant offices. The efforts of this partnership will support habitat identification, resource management, and navigation of these important waterways.

Data from this project will supersede all prior survey data, providing modern hydrographic survey data for this area and updating the local charting products.

### **A.3 Survey Quality**

The entire survey is adequate to supersede previous data.

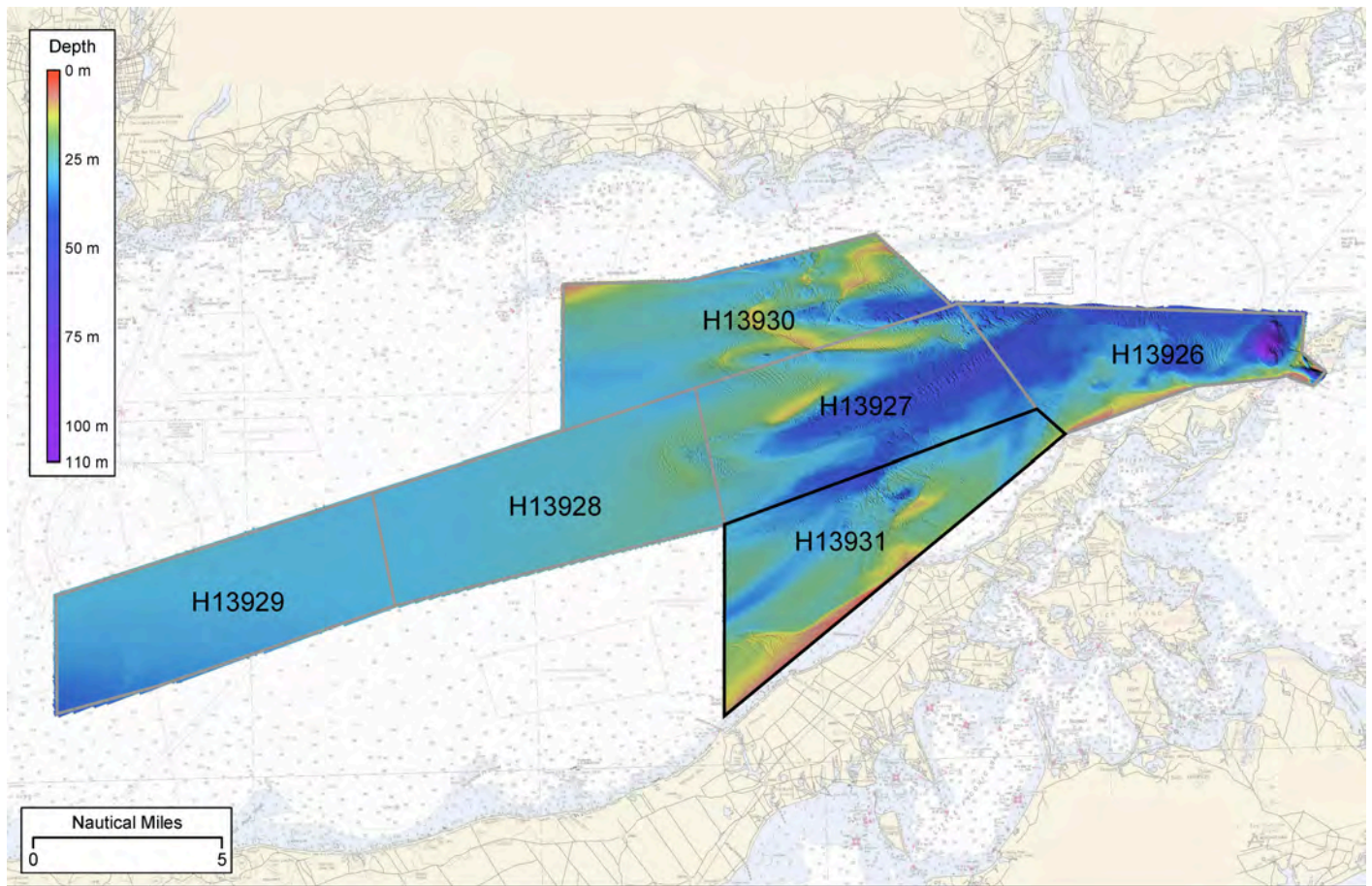
### **A.4 Survey Coverage**

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

<b>Water Depth</b>	<b>Coverage Required</b>
All waters in survey area	Complete Coverage (Refer to HSSD Section 5.2.2.3 Option A). Prioritize backscatter quality.

*Table 2: Survey Coverage*

Survey coverage was in accordance with the requirements listed above and in the HSSD.



*Figure 1: Project OPR-B342-KR-24 coverage with H13931 emphasized.*

## A.6 Survey Statistics

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

	<b>HULL ID</b>	<i>RV North Cove</i>	<i>RV South Cove</i>	<i>Total</i>
<b>LNM</b>	<b>SBES Mainscheme</b>	0.0	0.0	0.0
	<b>MBES Mainscheme</b>	194.0	718.9	912.9
	<b>Lidar Mainscheme</b>	0.0	0.0	0.0
	<b>SSS Mainscheme</b>	0.0	0.0	0.0
	<b>SBES/SSS Mainscheme</b>	0.0	0.0	0.0
	<b>MBES/SSS Mainscheme</b>	0.0	0.0	0.0
	<b>SBES/MBES Crosslines</b>	0.0	44.9	44.9
	<b>Lidar Crosslines</b>	0.0	0.0	0.0
<b>Number of Bottom Samples</b>				3
<b>Number Maritime Boundary Points Investigated</b>				0
<b>Number of DPs</b>				0
<b>Number of Items Investigated by Dive Ops</b>				0
<b>Total SNM</b>				28.1

*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>
06/26/2024	178

<b>Survey Dates</b>	<b>Day of the Year</b>
06/27/2024	179
06/28/2024	180
06/29/2024	181
07/03/2024	185
07/04/2024	186
07/05/2024	187
07/06/2024	188
07/07/2024	189
07/13/2024	195
07/14/2024	196
07/15/2024	197
07/16/2024	198
07/17/2024	199
07/18/2024	200
07/19/2024	201
09/16/2024	260
09/17/2024	261
09/27/2024	271

*Table 4: 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:

<b>Hull ID</b>	<b><i>RV North Cove</i></b>	<b><i>RV South Cove</i></b>
<b>LOA</b>	11.1 meters	9.4 meters
<b>Draft</b>	0.8 meters	0.8 meters

*Table 5: Vessels Used*



*Figure 2: RV North Cove configured for survey operations.*



*Figure 3: RV South Cove configured for survey operations.*

### **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>
Teledyne RESON	SeaBat T50-R	MBES
Applanix	POS MV 320 v5	Positioning and Attitude System
Trimble	NetR9	Positioning System
AML Oceanographic	Micro SV-Xchange	Sound Speed System
AML Oceanographic	AML-3 LGR	Conductivity, Temperature, and Depth Sensor

*Table 6: Major Systems Used*

## B.2 Quality Control

### B.2.1 Crosslines

Crossline mileage in H13931 totaled 4.9% of the mainscheme survey miles. Agreement between crosslines and mainscheme bathymetry was very good, with a mean difference of 0.03m in the 2m resolution surface. Multiple surfaces of different depth ranges were submitted for this survey, but 77% of the survey area had water depths in the range specified for a 2m resolution surface and so the crossline comparison was done on a full surface at that resolution.

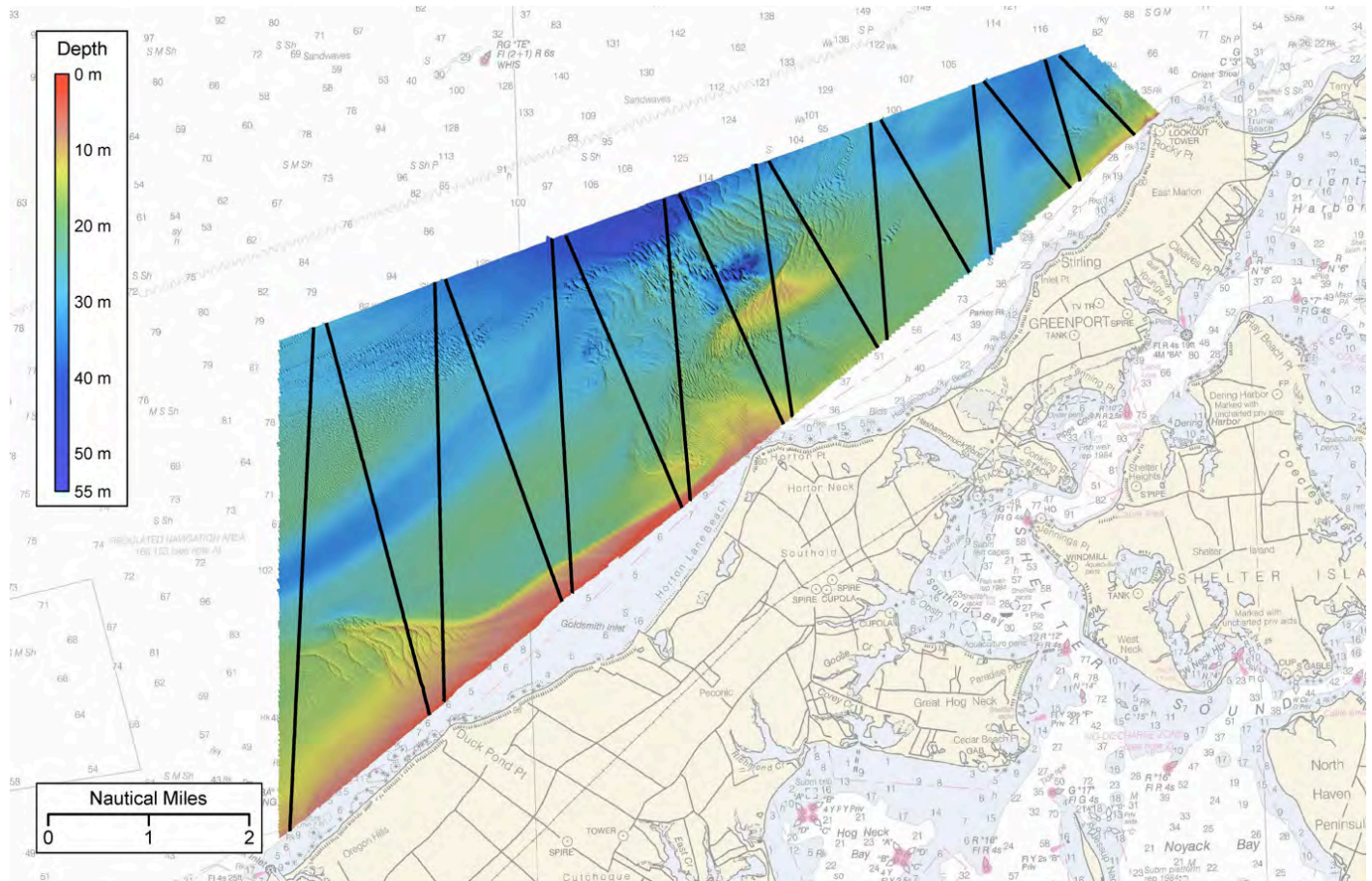


Figure 4: Crossline tracks overlaid on a coverage surface.

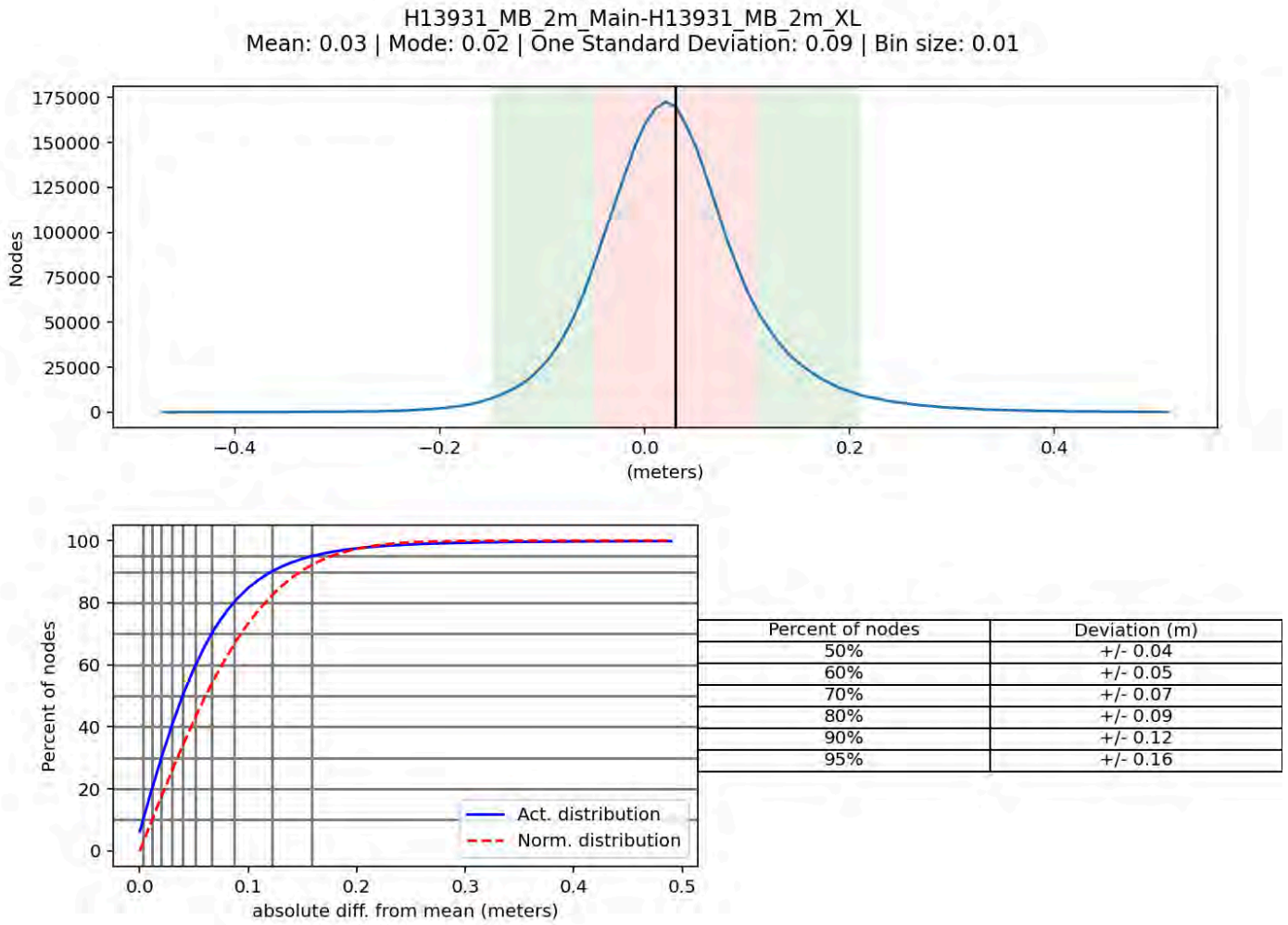


Figure 5: Depth differences between mainscheme and crossline data.

### B.2.2 Uncertainty

The following survey specific parameters were used for this survey:

Method	Measured	Zoning
ERS via VDATUM	N/A	7.91 centimeters

Table 7: Survey Specific Tide TPU Values.

Hull ID	Measured - CTD	Measured - MVP	Measured - XBT	Surface
RV North Cove	2 meters/second	N/A	N/A	1 meters/second
RV South Cove	2 meters/second	N/A	N/A	1 meters/second

Table 8: Survey Specific Sound Speed TPU Values.

The HydrOffice "QC Tools" application was used to calculate TVU QC, determined by a ratio of uncertainty to the allowable error per NOAA and IHO specification. A set of surfaces covering different water depth ranges were finalized in CARIS HIPS using the "uncertainty" option to select the combination of a priori and realtime uncertainty estimates as the surface TVU source. The surfaces all passed the uncertainty check, with 99.5+% or 100% of nodes meeting the uncertainty standards. Results are shown from the 2m surface only, which covers 72% of the survey area.

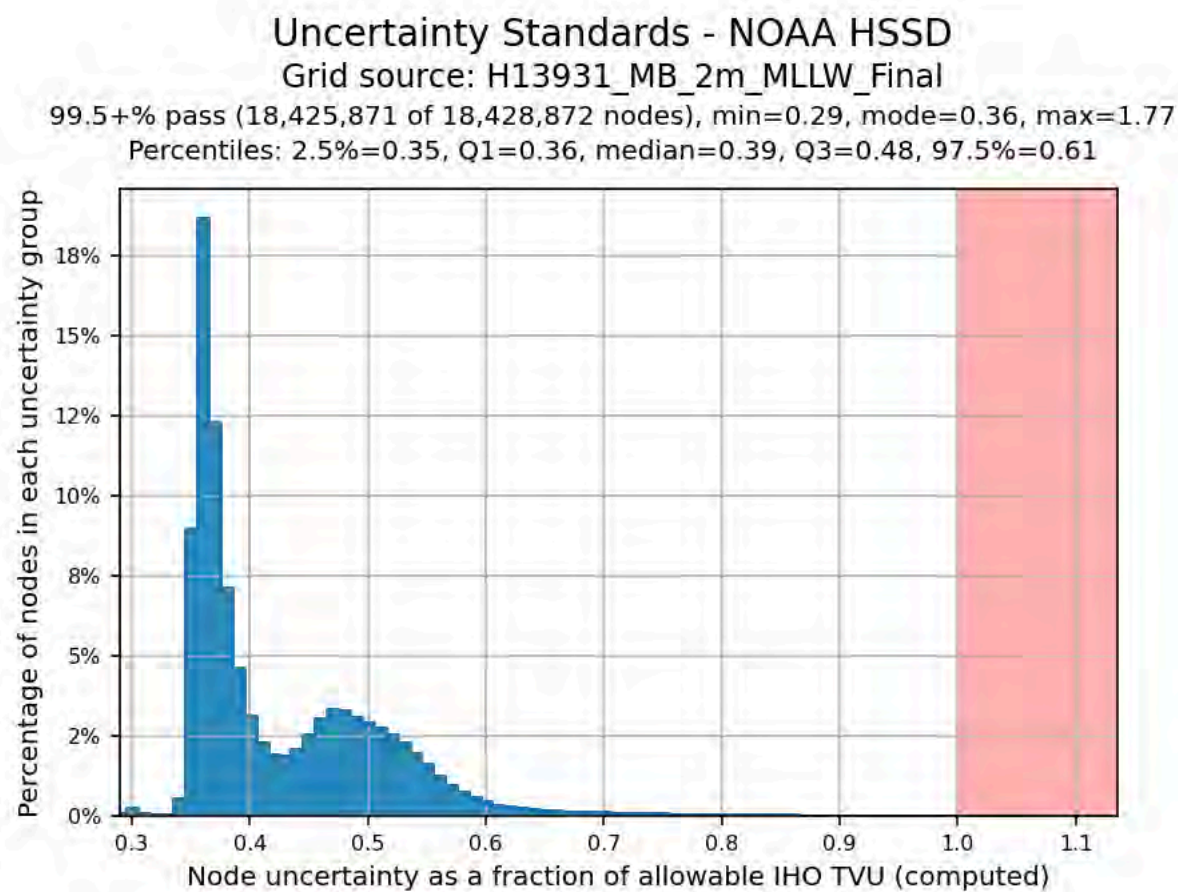


Figure 6: Uncertainty standards, 2m resolution surface.

**B.2.3 Junctions**

No prior junctions were assigned for Project OPR-B342-KR-24. Two current surveys junction with the northern and eastern borders of H13931.

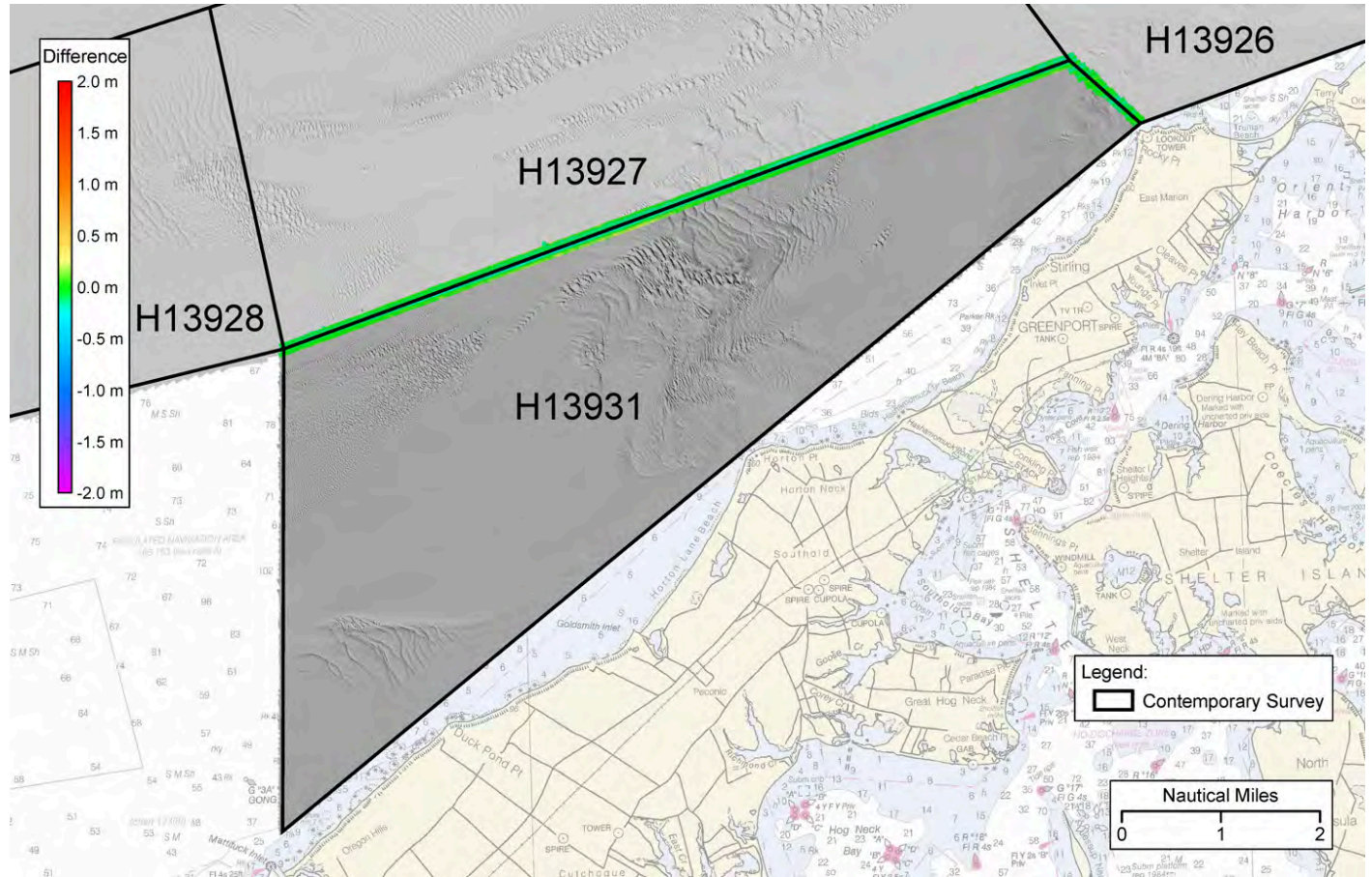


Figure 7: H13931 junction map with junction area depth differences.

The following junctions were made with this survey:

Registry Number	Scale	Year	Field Unit	Relative Location
H13926	1:10000	2024	OSI	NE
H13927	1:10000	2024	OSI	N

Table 9: Junctioning Surveys

H13926

This junction is discussed in the H13926 DR.

H13927

This junction is discussed in the H13927 DR.

**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**Sound Speed Variation

Sound speed variations were observed throughout the survey area, correlating to factors including the tide, weather, water depth, and bathymetric features, such as slopes or sand waves. In data processing, sound speed profiles that did not adequately reflect the surrounding water mass were identified and removed, edited, or replaced. Sound speed casts were primarily applied using the CARIS HIPS "Nearest in Distance within Time" method, therefore, removing a profile collected on a steep slope would allow deeper and shoaler casts on either side to be applied instead. Casts that were empirically found to represent a large water zone were added at additional locations within that zone to ensure proper corrections given the cast selection options available in the CARIS sound speed tools. Bathymetry, uncertainty, and standard deviation surfaces were used to direct editing and determine the accuracy of sound speed cast selection.

## B.2.7 Sound Speed Methods

Sound Speed Cast Frequency: RV North Cove and RV South Cove acquired AML3 casts at intervals of approximately 60 minutes.

Hydrographers acquired more frequent sound speed profiles if high variability was noted in the surface sound speed from the AML Micro-X installed on the head of the transducer, or when the surface sound speed comparison threshold was exceeded ( $>2\text{m/s}$  change) between the profile reading at the draft of the transducer and the Micro-X.

OSI submitted a data package titled "SOUND VELOCITY collected from RV North Cove, RV South Cove, and RV West Cove II in North Atlantic Ocean, Long Island Sound from 2024-06-20 to 2024-09-27" in NetCDF format to the National Centers for Environmental Information (NCEI) on October 22, 2024.

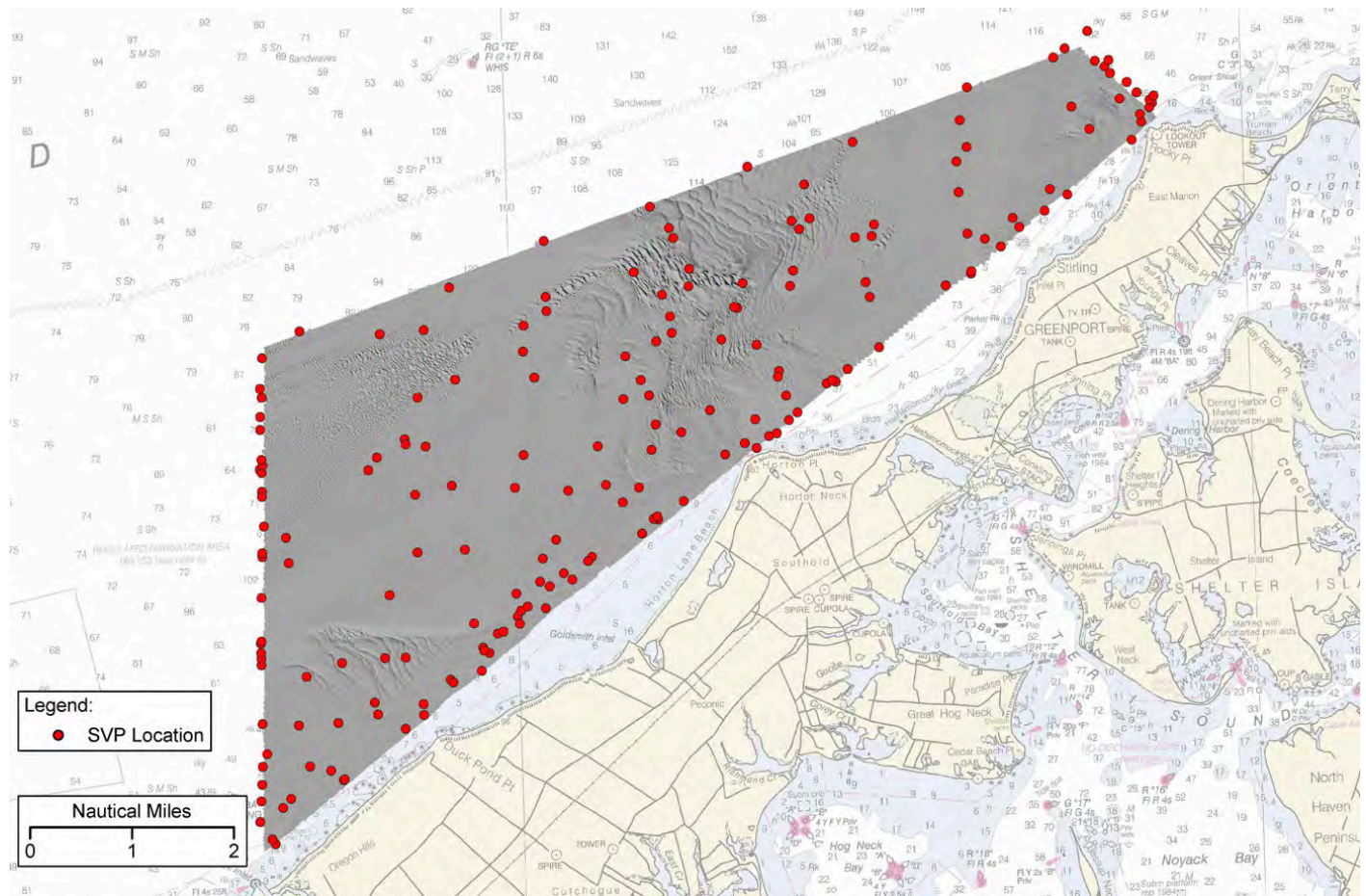


Figure 8: H13931 sound speed cast locations.

### B.2.8 Coverage Equipment and Methods

This survey was conducted to achieve Complete Coverage with multibeam, as specified in HSSD 5.2.2.3, Option A. The survey methods used to meet coverage requirements did not deviate from those described in the DAPR.

The HydrOffice "QC Tools" application was used to calculate TVU QC, determined by a ratio of uncertainty to the allowable error per NOAA and IHO specification. A set of surfaces covering different water depth ranges were finalized in CARIS HIPS using the "uncertainty" option to select the combination of a priori and realtime uncertainty estimates as the surface TVU source. The surfaces all passed the uncertainty check, with 99.5+% or 100% of nodes meeting the uncertainty standards. Results are shown from the 2m surface only, which covers 77% of the survey area.

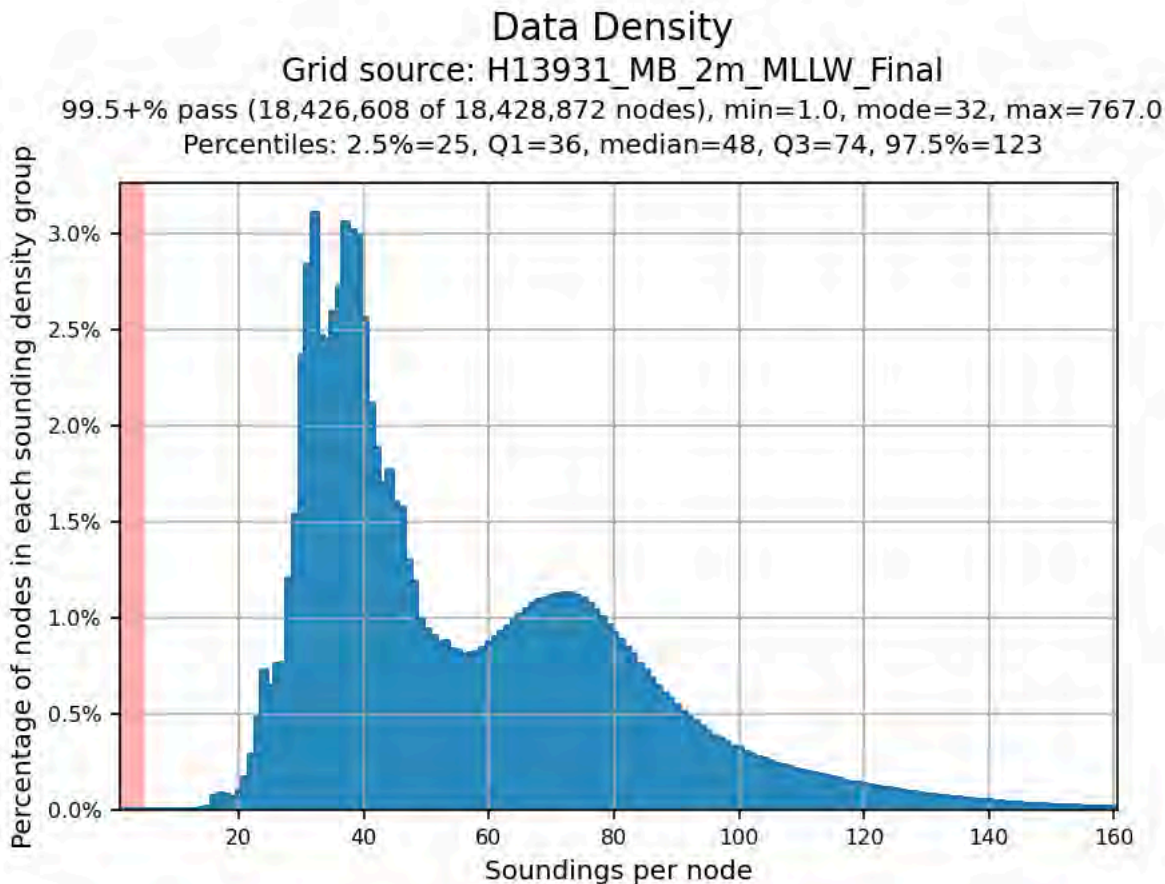


Figure 9: Data density, 2m resolution surface.

## **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**

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

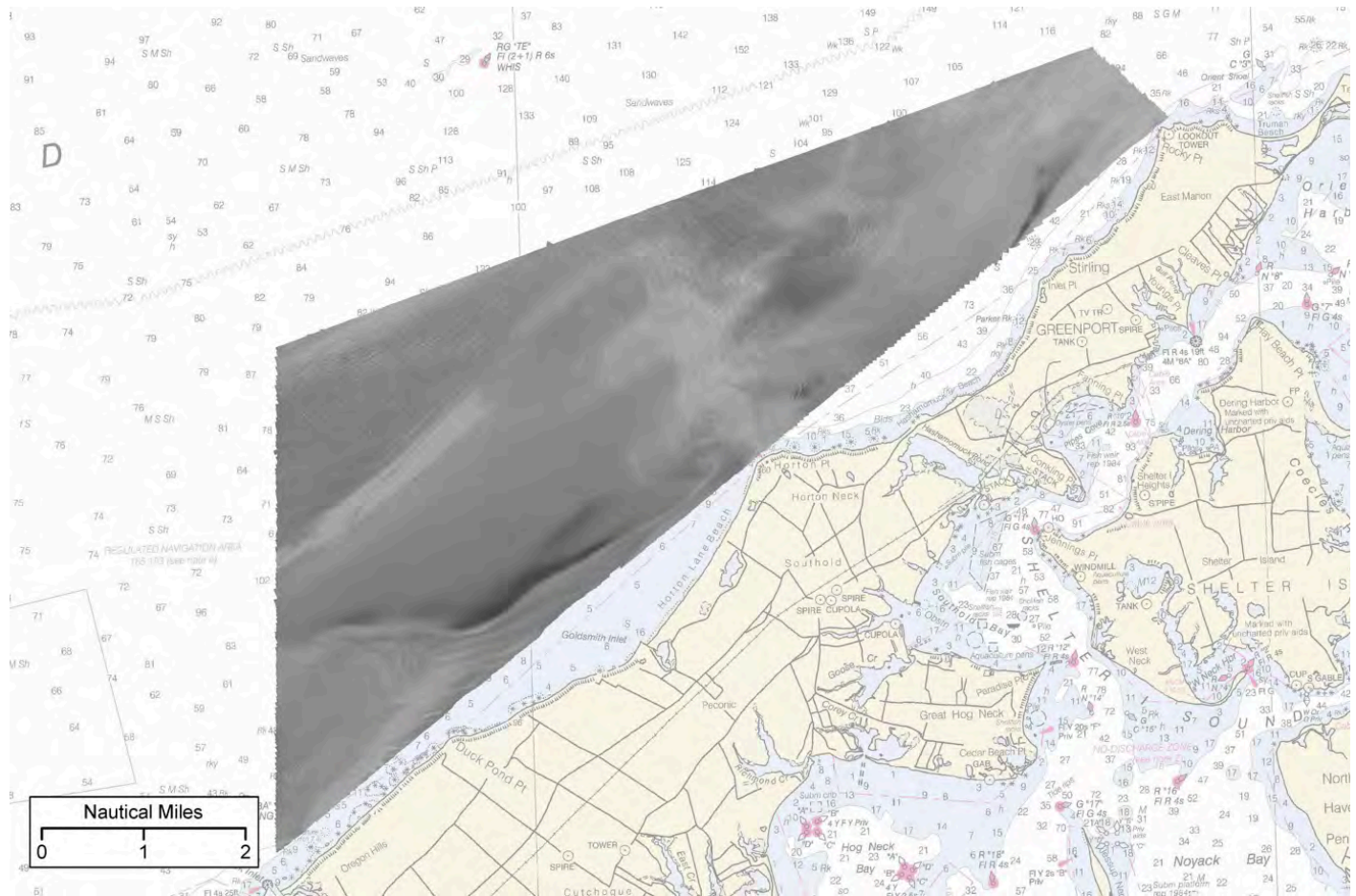


Figure 10: H13931 multibeam backscatter mosaic.

## B.5 Data Processing

### B.5.1 Primary Data Processing Software

The following Feature Object Catalog was used: NOAA Profile Version 2023.

### 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
H13931_MB_1m_MLLW_1of3_Final	CARIS Raster Surface (CUBE)	1 meters	0.8 meters - 20.0 meters	NOAA_1m	Complete MBES
H13931_MB_2m_MLLW_2of3_Final	CARIS Raster Surface (CUBE)	2 meters	18.0 meters - 40.0 meters	NOAA_2m	Complete MBES
H13931_MB_4m_MLLW_3of3_Final	CARIS Raster Surface (CUBE)	4 meters	36.0 meters - 52.0 meters	NOAA_4m	Complete MBES
H13931_MB_1m_MLLW_1of3	CARIS Raster Surface (CUBE)	1 meters	0.8 meters - 52.1 meters	NOAA_1m	Complete MBES
H13931_MB_2m_MLLW_2of3	CARIS Raster Surface (CUBE)	2 meters	1.1 meters - 52.0 meters	NOAA_2m	Complete MBES
H13931_MB_4m_MLLW_3of3	CARIS Raster Surface (CUBE)	4 meters	2.2 meters - 52.0 meters	NOAA_4m	Complete MBES
H13931_MBAB_2m_400kHz_1of1	MB Backscatter Mosaic	2 meters	-	N/A	Processed Backscatter

Table 10: Submitted Surfaces

## 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 VDATUM	OPR-B342-KR-24_100m_NAD83_2011- MLLW_geoid18.csar

*Table 11: ERS method and SEP file*

## C.2 Horizontal Control

The horizontal datum for this project is North American Datum 1983 (2011).

The projection used for this project is Universal Transverse Mercator (UTM) Zone 18.

The following PPK methods were used for horizontal control:

- Smart Base

The following CORS Stations were used for horizontal control:

<b>HVCR Site ID</b>	<b>Base Station ID</b>
DARIEN	CTDA
GROTON	CTGR
GUILFORD	CTGU
MANSFIELD	CTMA
PAQUETTE	CTNE
FALMOUTH	MAFA
MARTHASVINRD	MAMV
NANTUCKET	MANT
ASSATEAGUE	MDAI
RIVERHEAD	NYRH
U OF RI COOP	URIL
NEW YORK WAAS 1	ZNY1

*Table 12: CORS Base Stations*

The following user installed stations were used for horizontal control:

<b>HVCR Site ID</b>	<b>Base Station ID</b>
Ocean Surveys Connecticut	OSCT

*Table 13: User Installed Base Stations*

## **D. Results and Recommendations**

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

### D.1.1 Electronic Navigational Charts

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

ENC	Scale	Edition	Update Application Date	Issue Date
US5NY2FD	1:20000	2	01/31/2022	08/22/2024
US5NY2GD	1:20000	2	05/13/2021	05/13/2021
US5NY2GE	1:20000	2	05/13/2021	05/13/2021
US5NY2GF	1:20000	2	01/12/2022	03/01/2023
US5NY2HD	1:20000	2	12/06/2021	12/06/2021
US5NY2HE	1:20000	2	12/06/2021	12/06/2021
US5NY2HF	1:20000	2	01/12/2022	01/12/2022
US5NY2HG	1:20000	2	02/25/2022	09/09/2024

Table 14: Largest Scale ENC's

### D.1.2 Shoal and Hazardous Features

No shoals or potentially hazardous features exist for this survey.

### D.1.3 Charted Features

Charted features assigned in H13930 included 15 rocks, 1 obstruction, and 4 sand wave locations. The obstruction was present, as were all of the rocks. Sand waves were observed at all charted positions, but only some were of potential navigational significance. New area features are included for the recommended sand wave charting.

### D.1.4 Uncharted Features

New sand wave area features are included in the FFF. No other new features were found.

### D.1.5 Channels

No channels exist within the survey limits.

## **D.2 Additional Results**

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

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

### **D.2.2 Maritime Boundary Points**

No Maritime Boundary Points were assigned for this survey.

### **D.2.3 Bottom Samples**

Bottom sample locations for this project were selected based on the processed backscatter. Survey H13931 had 3 locations sampled, the primary constituents of which were coarse sand, silt, and medium sand. See the FFF for details and photos.

### **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**

Sand waves were observed in parts of H13931. Areas of potential navigational significance are included in the FFF.

**D.2.9 Construction and Dredging**

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

**D.2.10 New Survey Recommendations**

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

**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.

<b>Approver Name</b>	<b>Approver Title</b>	<b>Approval Date</b>	<b>Signature</b>
John R. Bean	Chief of Party	12/06/2024	Digitally signed by John R. Bean
David T. Somers	Data Processing Manager	12/06/2024	Digitally signed by David T. Somers

## 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