H13657

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

DESCRIPTIVE REPORT

Type of Survey:	Navigable Area
Registry Number:	H13657

LOCALITY

State(s):	Rhode Island
General Locality:	Rhode Island Sound
Sub-locality:	East of Scarborough Hill

2022

CHIEF OF PARTY
John R. Bean

LIBRARY & ARCHIVES

Date:

U.S. DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

REGISTRY NUMBER:

HYDROGRAPHIC TITLE SHEET

H13657

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):	**Rhode Island**
General Locality:	**Rhode Island Sound**
Sub-Locality:	**East of Scarborough Hill**
Scale:	**7500**
Dates of Survey:	**07/13/2022 to 08/29/2022**
Instructions Dated:	**06/13/2022**
Project Number:	**OPR-B315-KR-22**
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 19N, 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 H13657

Project: OPR-B315-KR-22

Locality: Rhode Island Sound

Sublocality: East of Scarborough Hill

Scale: 1:7500

July 2022 - August 2022

Ocean Surveys

Chief of Party: John R. Bean

A. Area Surveyed

This survey provides hydrographic data for waters approaching Newport, RI. 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° 26' 41.35" N 71° 30' 13.76" W	41° 17' 35.87" N 71° 22' 7.71" 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

The following text is quoted from the Purpose and Location section of the Project Instructions:

The Approaches to Newport, RI project covers an area of 210 Square Nautical Miles (SNM), that connects Narragansett Bay, Block Island Sound, Buzzards Bay, and Vineyard Sound. This survey area serves as a major route for cargo, tanker, recreational and commercial fishing, and pleasure vessels transiting through the area.

The Ports of Davisville, Providence, and New Bedford, are some of the busiest ports in New England serving international and domestic trade. These ports support automotive transportation, seafood and other cold storage, petroleum products, and construction materials and equipment.

Commercial fishing, transportation and recreation are major activities in the area, with the Port of Galilee in Narragansett serving as the home port for many charter fishing vessels and sightseeing tours. Additionally, it serves as a major hub for year round ferry service to Block Island providing an essential transportation link to the island and the community of New Shoreham.

The Cities of Newport, Wickford, Warwick and other cities in the vicinity of the survey area are well known for their sailing and recreational boating activities. Events such as the annual Newport Regatta bring national and international recognition for the competitive sailing that takes place in the area.

The available bathymetric data in the survey area is almost all over a century old, with the most recent survey conducted in the 1930's. The bathymetric and feature data acquired as part of this project will be used to update National Ocean Service nautical charting products and services as well as support the Seabed 2030 global initiative. The survey data from this project is intended to supersede all prior survey data in the common area.

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:

Water Depth	Coverage Required
All waters in survey area	Complete Coverage (Refer to HSSD Section 5.2.2.3)

Table 2: Survey Coverage

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

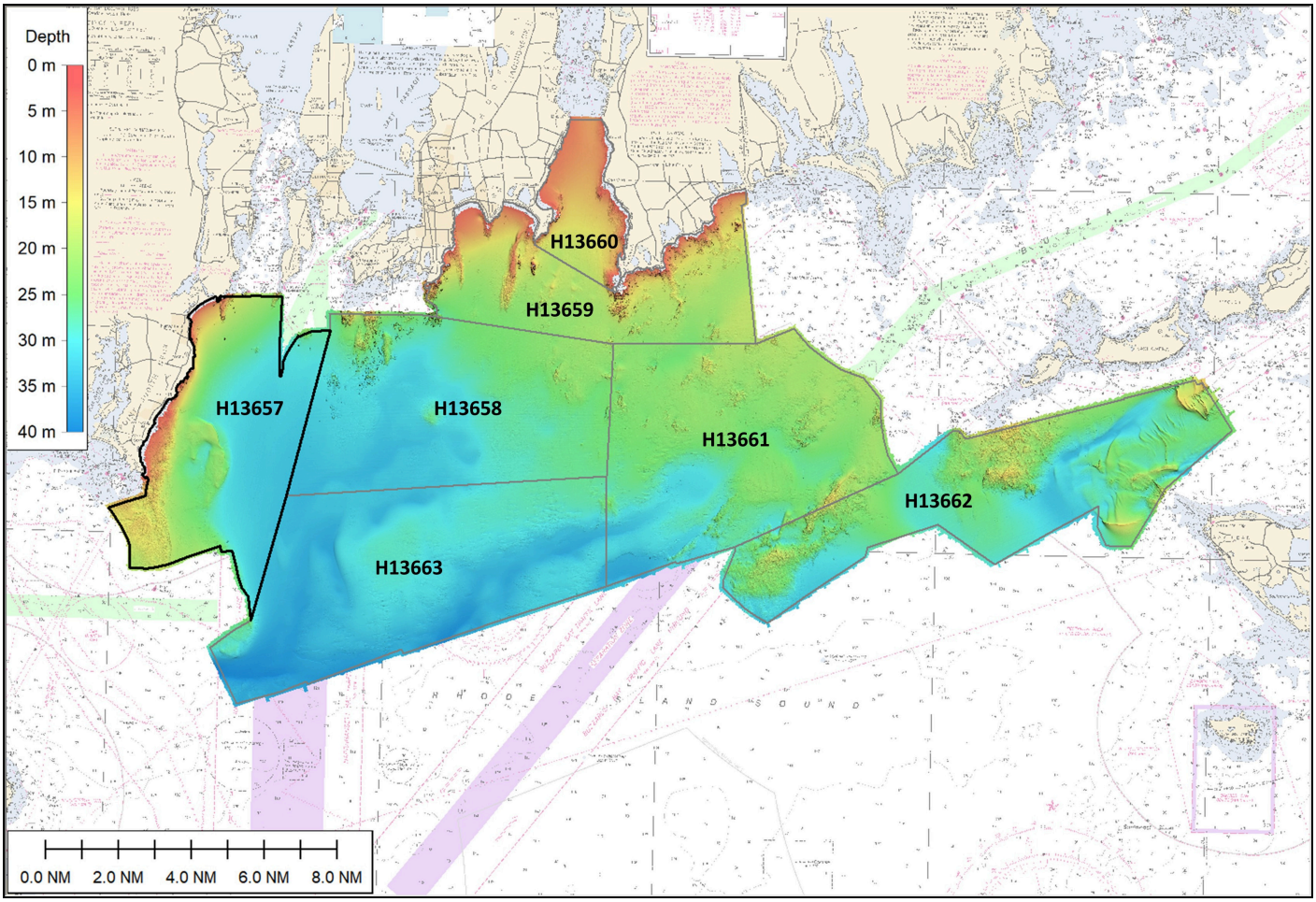


Figure 1: Survey H13657 coverage overlaid on a composite of RNCs.

A.6 Survey Statistics

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

	HULL ID	*MV Northstar Challenger*	*RV North Cove*	*Total*
LNM	**SBES Mainscheme**	0.0	0.0	0.0
	MBES Mainscheme	370.4	600.0	970.4
	Lidar Mainscheme	0.0	0.0	0.0
	SSS Mainscheme	0.0	0.0	0.0
	SBES/SSS Mainscheme	0.0	0.0	0.0
	MBES/SSS Mainscheme	0.0	0.0	0.0
	SBES/MBES Crosslines	0.0	38.6	38.6
	Lidar Crosslines	0.0	0.0	0.0
Number of Bottom Samples				4
Number Maritime Boundary Points Investigated				0
Number of DPs				0
Number of Items Investigated by Dive Ops				0
Total SNM				28.89

Table 3: Hydrographic Survey Statistics

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

Survey Dates	Day of the Year
07/13/2022	194

Survey Dates	Day of the Year
07/14/2022	195
07/15/2022	196
07/16/2022	197
07/17/2022	198
07/18/2022	199
07/20/2022	201
07/21/2022	202
07/23/2022	204
07/27/2022	208
07/28/2022	209
07/29/2022	210
07/30/2022	211
07/31/2022	212
08/01/2022	213
08/03/2022	215
08/04/2022	216
08/10/2022	222
08/12/2022	224
08/13/2022	225
08/15/2022	227
08/18/2022	230
08/19/2022	231
08/23/2022	235
08/24/2022	236
08/25/2022	237
08/27/2022	239
08/28/2022	240
08/29/2022	241

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:

Hull ID	***MV Northstar Challenger***	***RV North Cove***
LOA	28.0 meters	11.1 meters
Draft	2.6 meters	0.8 meters

Table 5: Vessels Used

Figure 2: MV Northstar Challenger configured for survey operations.

Figure 3: RV North Cove configured for survey operations.

B.1.2 Equipment

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

Manufacturer	Model	Type
Teledyne RESON	SeaBat T50-R	MBES
Applanix	POS MV 320 v5	Positioning and Attitude System
Trimble	NetR9	Positioning System
AML Oceanographic	AML-3 LGR	Conductivity, Temperature, and Depth Sensor
AML Oceanographic	MVP30-350	Conductivity, Temperature, and Depth Sensor
AML Oceanographic	Micro SV-Xchange	Sound Speed System
Velodyne LiDAR	VLP-16	Lidar System

Table 6: Major Systems Used

B.2 Quality Control

B.2.1 Crosslines

Crossline mileage in Survey H13657 totaled 4.0% of the mainscheme survey miles. Agreement between crosslines and mainscheme bathymetry was very good, with a mean difference of 0.01m. Most discrepancies were found in outer beam data on the edge of crosslines, primarily in deeper water. Differences near shore were found in rocky areas.

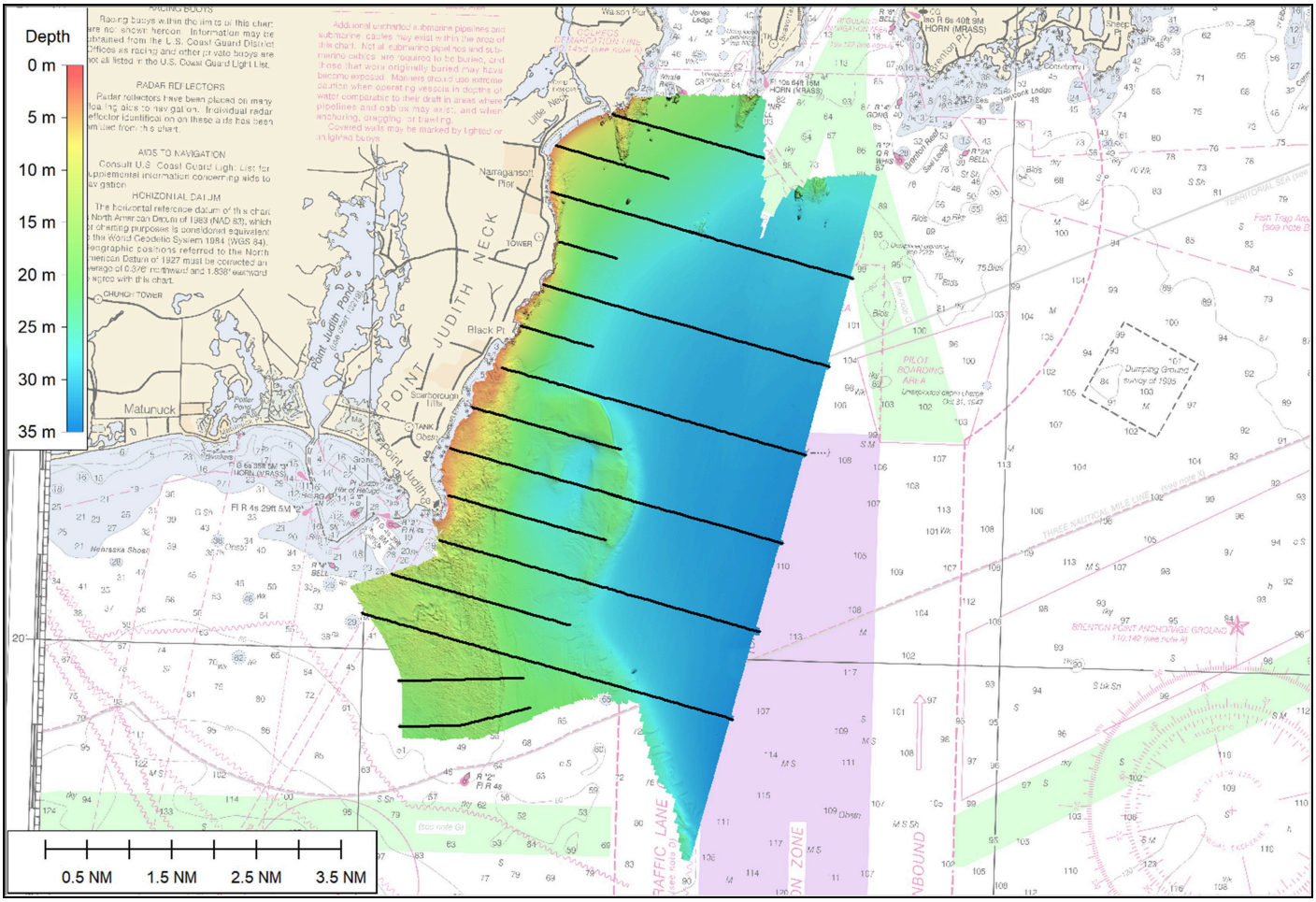
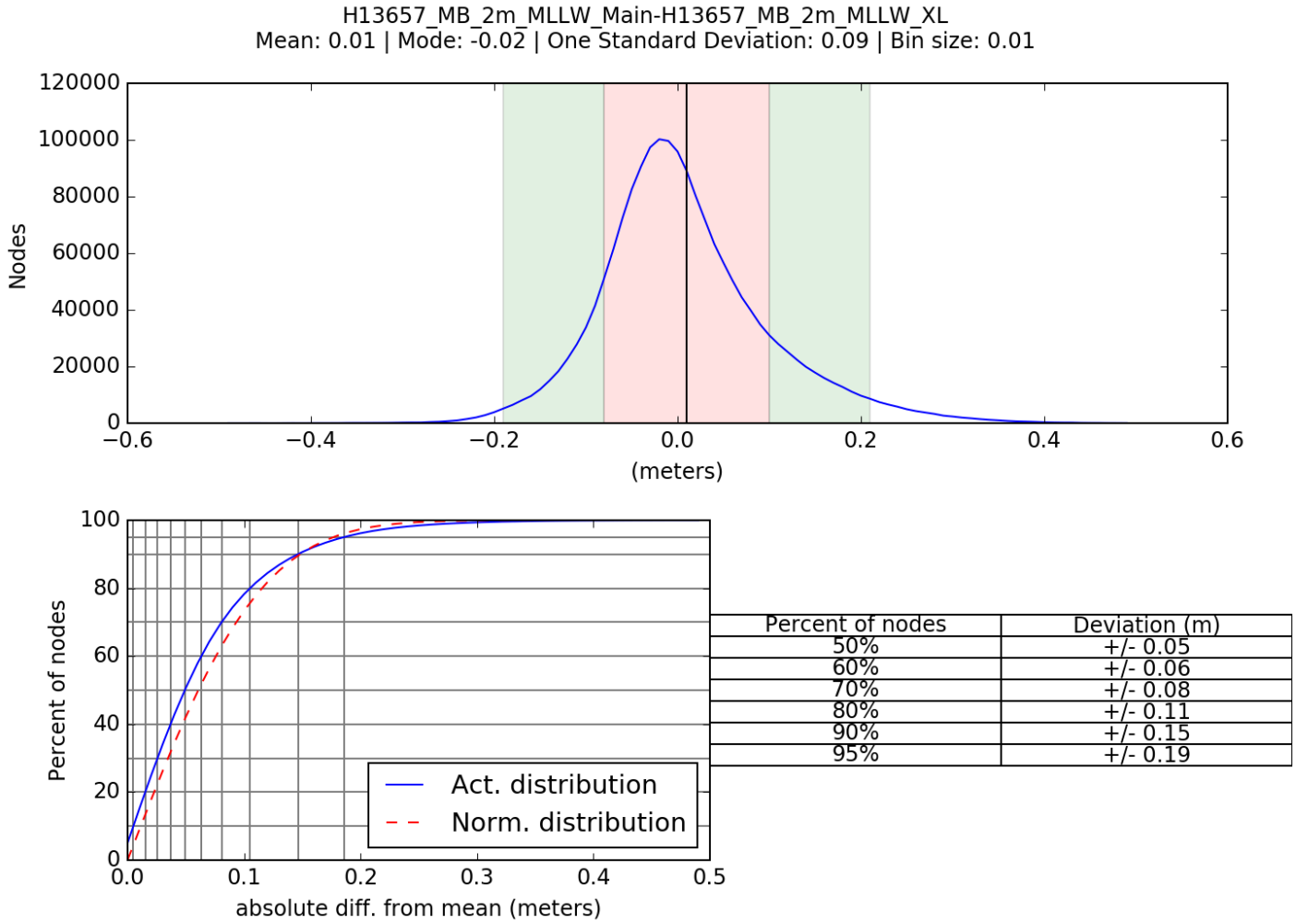


Figure 4: H13657 crossline tracks overlaid on a coverage surface.



Percent of nodes	Deviation (m)
50%	+/- 0.05
60%	+/- 0.06
70%	+/- 0.08
80%	+/- 0.11
90%	+/- 0.15
95%	+/- 0.19

Figure 5: Depth differences between H13657 mainscheme and crossline data.

B.2.2 Uncertainty

The following survey specific parameters were used for this survey:

Method	Measured	Zoning
ERS via VDATUM	0.0 meters	0.104 meters

Table 7: Survey Specific Tide TPU Values.

Hull ID	Measured - CTD	Measured - MVP	Measured - XBT	Surface
MV Northstar Challenger	N/A	2 meters/second	N/A	1 meters/second
RV North 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 specifications. Two surfaces (1m resolution for depths under 20m and 2m resolution for depths 18m to 40m) 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 passed the uncertainty check, with 100% of nodes meeting the uncertainty standards.

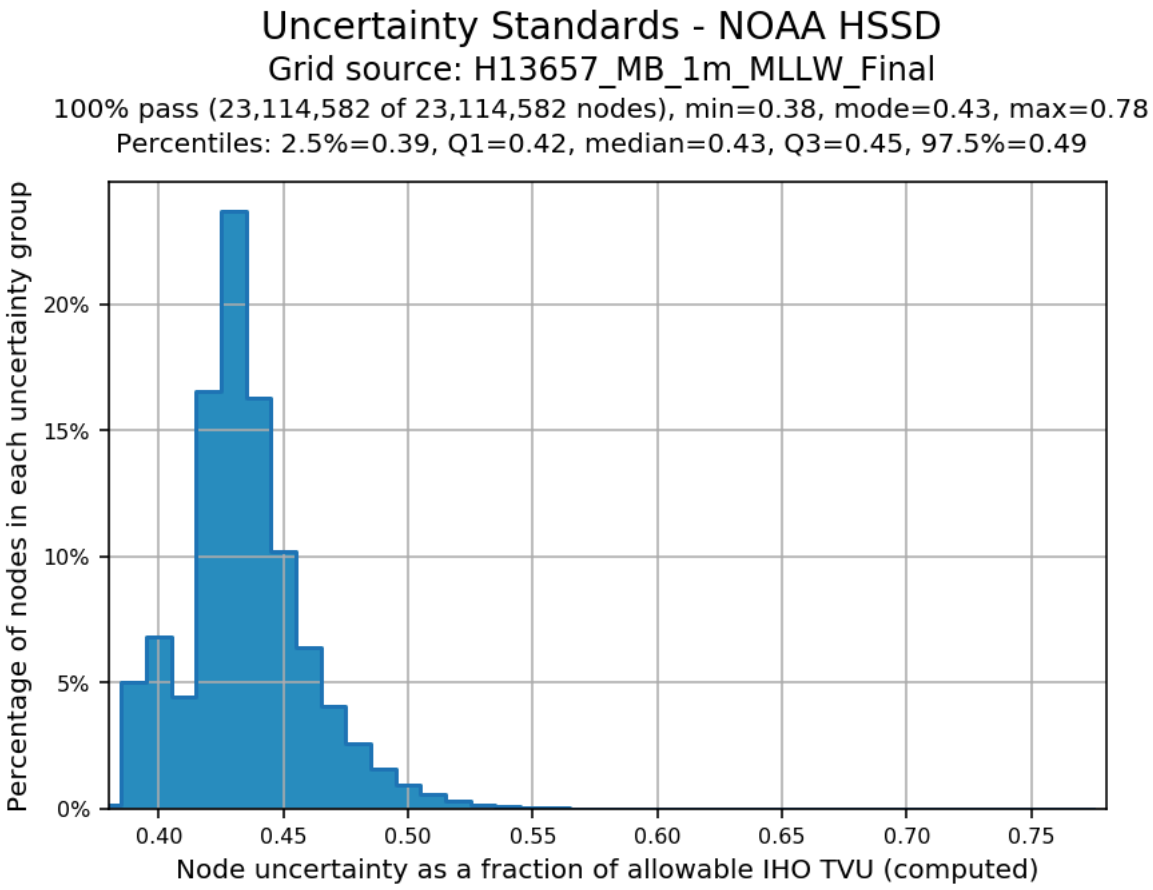


Figure 6: H13657 MBES 1m surface uncertainty standards.

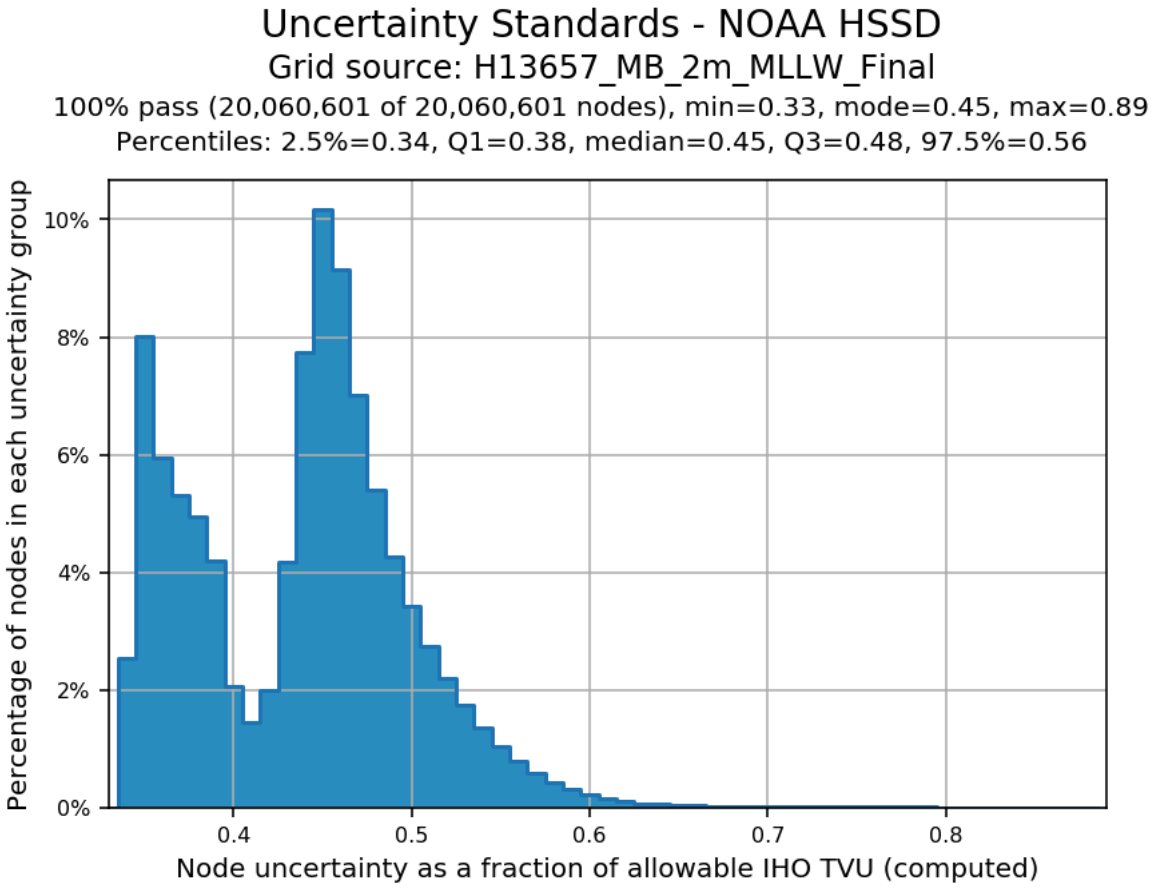


Figure 7: H13657 MBES 2m surface uncertainty standards.

B.2.3 Junctions

Survey H13657 junctions with 3 prior surveys and 2 contemporary surveys.

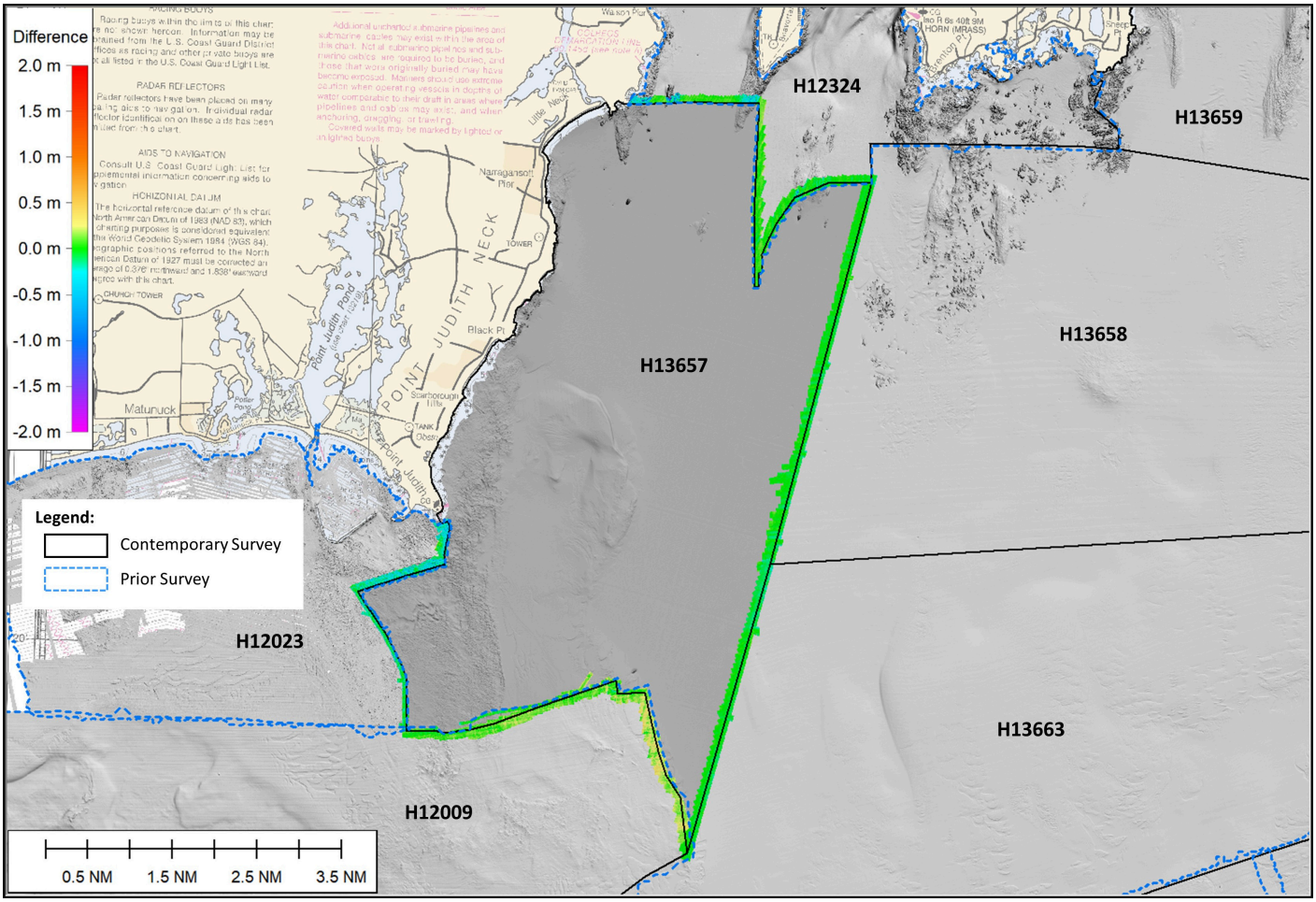


Figure 8: Survey H13657 junction map with junction area depth differences.

The following junctions were made with this survey:

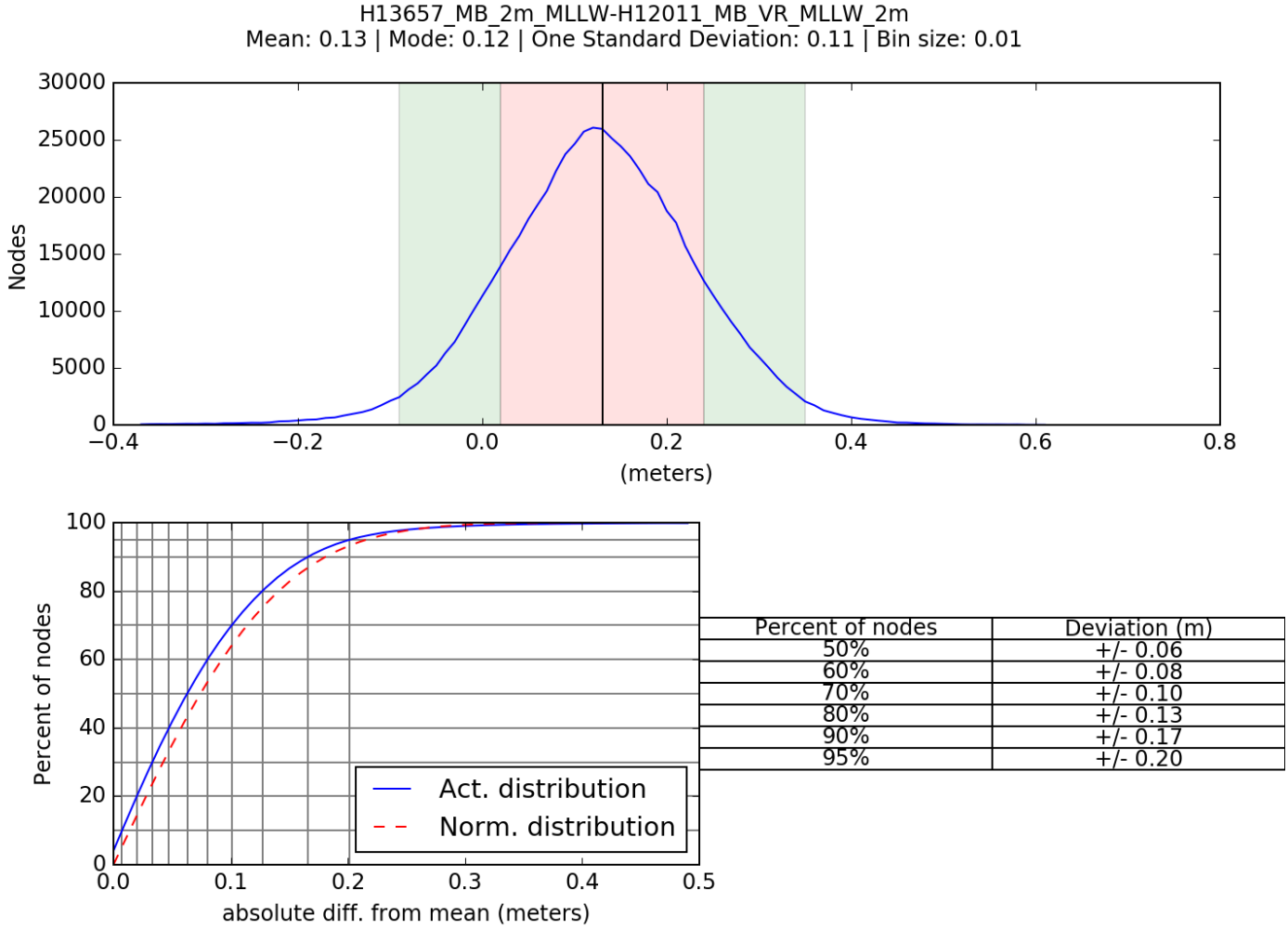
Registry Number	Scale	Year	Field Unit	Relative Location
H12011	1:20000	2009	Thomas Jefferson	W
H12023	1:20000	2009	Thomas Jefferson	W
H12324	1:10000	2011	NRT5	NW
H13658	1:10000	2022	Ocean Surveys, Inc.	E
H13663	1:40000	2022	Ocean Surveys, Inc.	SE

Table 9: Junctioning Surveys

H12011

Surveys H13657 and H12011 share a border of approximately 9.5km in length that follows the southern end of Survey H13657. The junction is L-shaped with a north-south section and an east-west section of about equal lengths. The north-south section of the junction loosely follows the edge of a drop off in the bathymetry, and the discrepancies between the two surveys are greatest along this edge. The shoaler east-west section of the junction area has better agreement between Survey H13657 and H12011.

The mean depth difference between the two surveys was 0.13m. The junction comparison from the HydrOffice "Compare Grids" tool calculated that 99.5+% of comparison nodes were within the allowable error fraction.



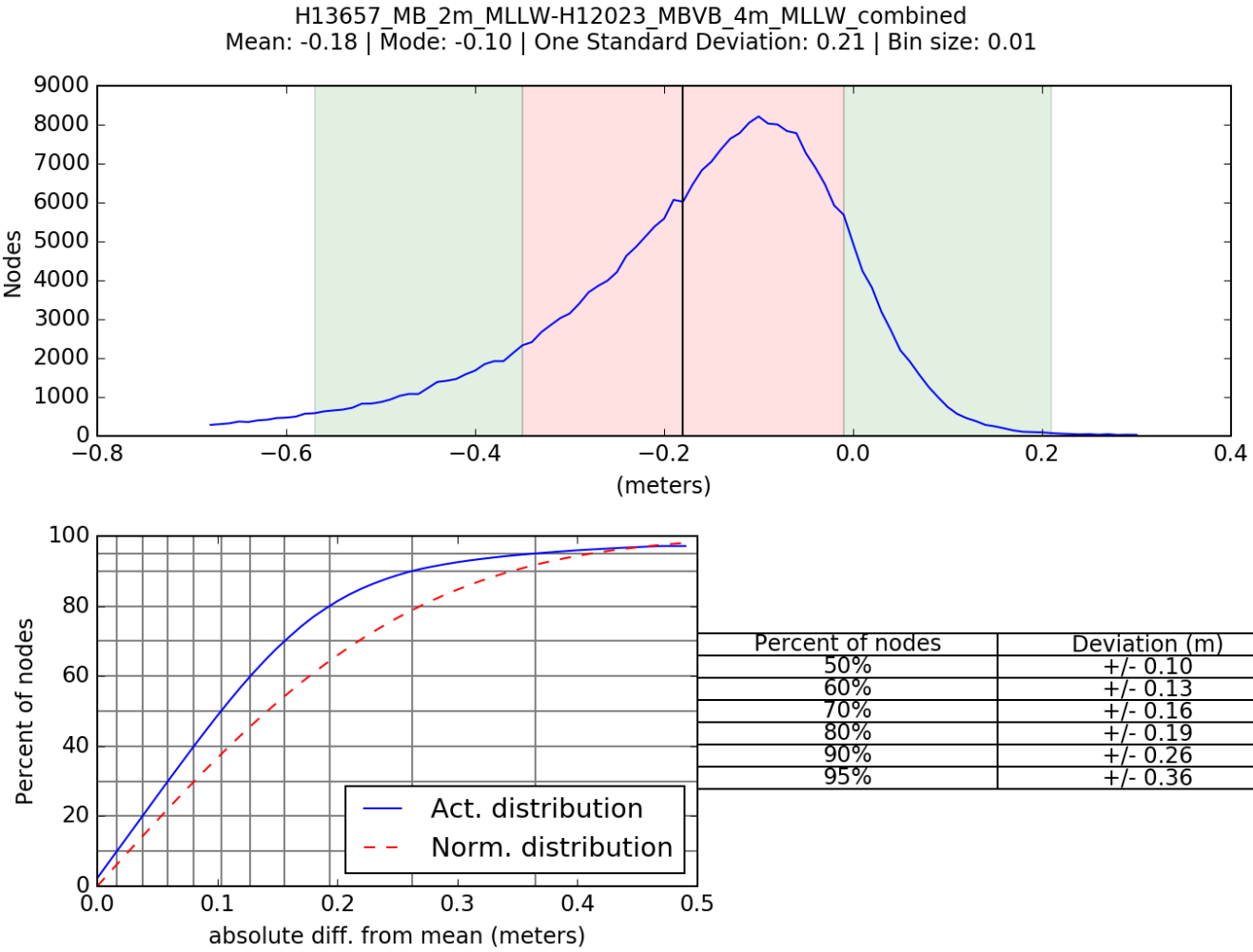
Percent of nodes	Deviation (m)
50%	+/- 0.06
60%	+/- 0.08
70%	+/- 0.10
80%	+/- 0.13
90%	+/- 0.17
95%	+/- 0.20

Figure 9: Depth differences between Surveys H13657 and H12011.

H12023

The border between Surveys H13657 and H12023 is approximately 6.3km long and runs along the southwestern edge of Survey H13657.

The mean depth difference between the two surveys was 0.18m with most discrepancies found in rocky areas closer to shore, in the northern end of the junction area. The survey junction comparison from the HydrOffice "Compare Grids" tool calculated that 98% of comparison nodes were within the allowable error fraction.



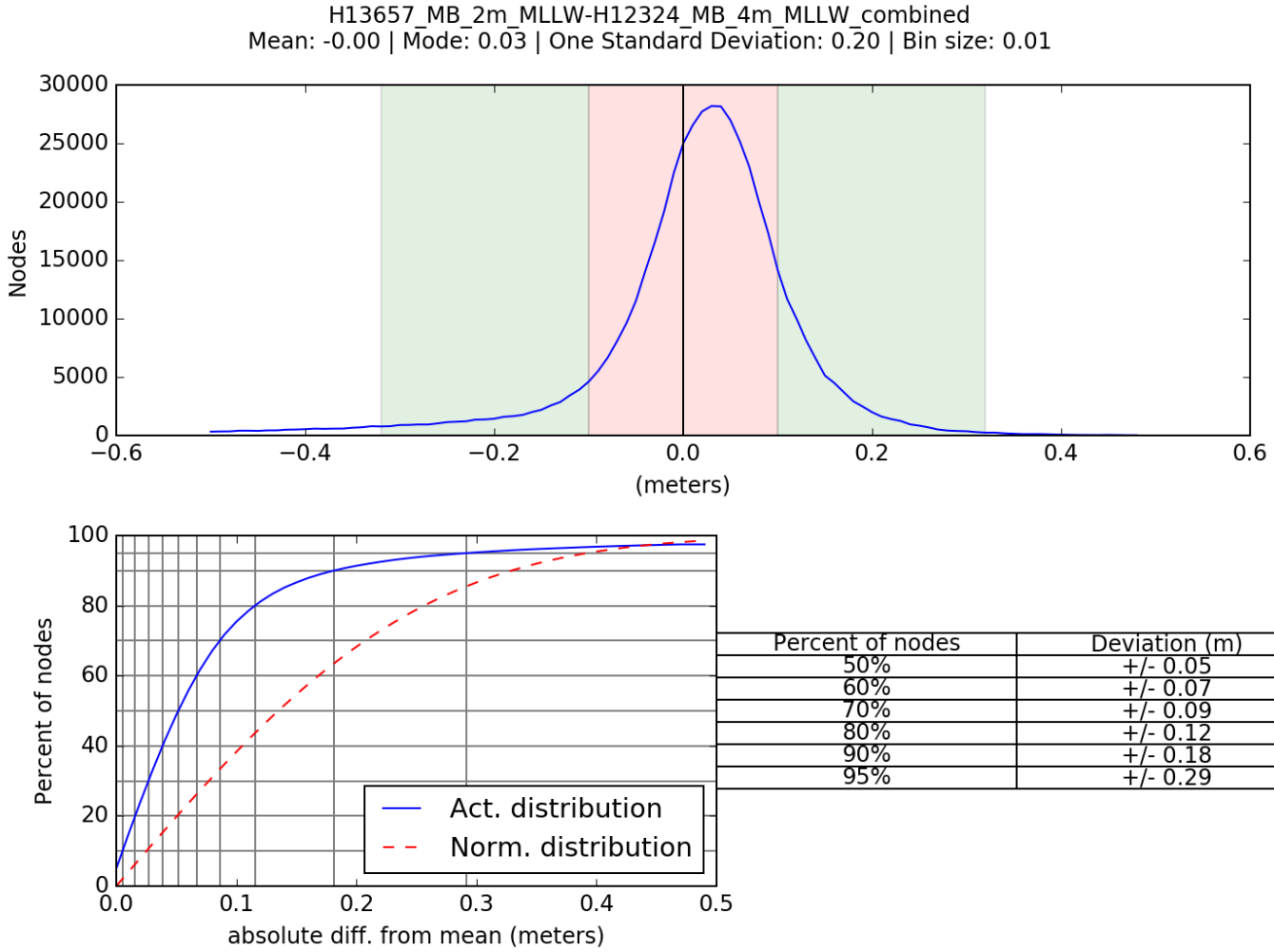
Percent of nodes	Deviation (m)
50%	+/- 0.10
60%	+/- 0.13
70%	+/- 0.16
80%	+/- 0.19
90%	+/- 0.26
95%	+/- 0.36

Figure 10: Depth differences between Surveys H13657 and H12023.

H12324

The border between Surveys H13657 and H12324 is approximately 10.9km long and follows the northern limit of Survey H13657.

The mean depth difference between the two surveys was 0.00m with most discrepancies found across distinct shoal rock areas. The survey junction comparison from the HydrOffice "Compare Grids" tool calculated that 99% of comparison nodes were within the allowable error fraction.



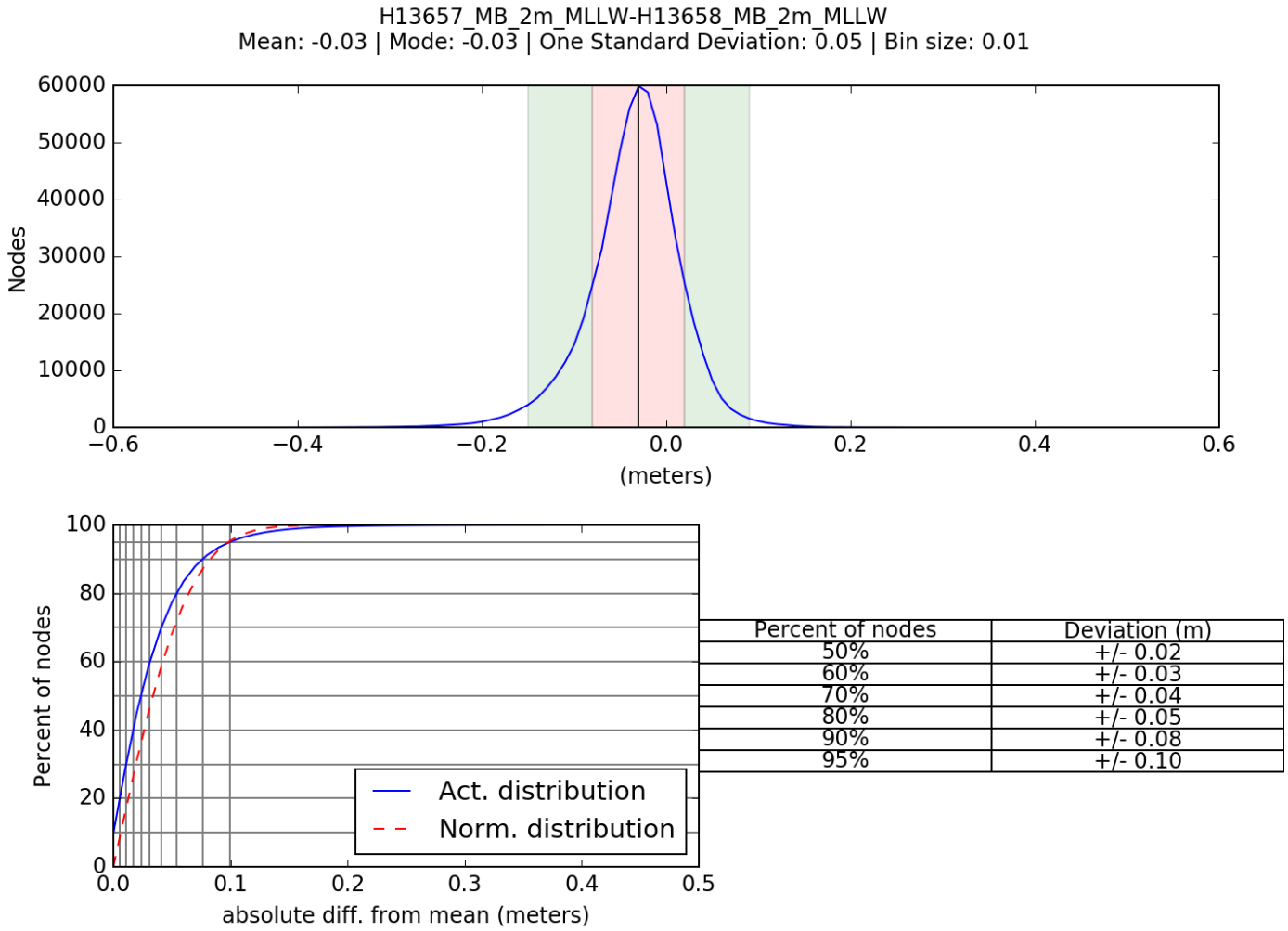
Percent of nodes	Deviation (m)
50%	+/- 0.05
60%	+/- 0.07
70%	+/- 0.09
80%	+/- 0.12
90%	+/- 0.18
95%	+/- 0.29

Figure 11: Depth differences between Surveys H13657 and H12324.

H13658

The border between Surveys H13657 and H13658 is approximately 9.0km long and follows the northern part of Survey H13657's eastern edge.

The mean depth difference between the two surveys was 0.03m with no geographic pattern to the discrepancies. The survey junction comparison from the HydrOffice "Compare Grids" tool calculated that 99.5+% of comparison nodes were within the allowable error fraction.



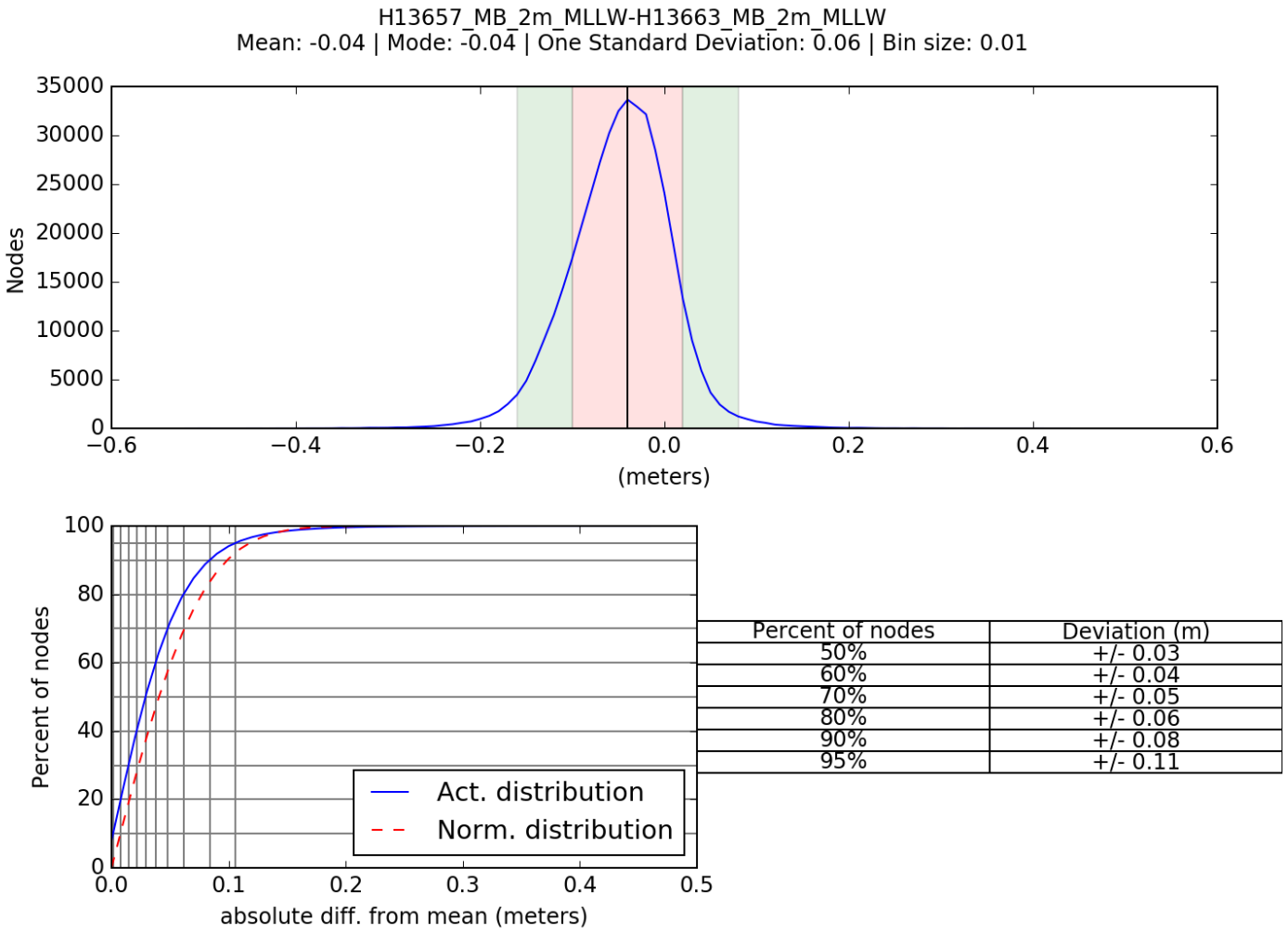
Percent of nodes	Deviation (m)
50%	+/- 0.02
60%	+/- 0.03
70%	+/- 0.04
80%	+/- 0.05
90%	+/- 0.08
95%	+/- 0.10

Figure 12: Depth differences between Surveys H13657 and H13658.

H13663

The border between Surveys H13657 and H13663 is approximately 7.0km long and follows the southern part of Survey H13657's eastern edge.

The mean depth difference between the two surveys was 0.04m with no geographic pattern to the discrepancies. The survey junction comparison from the HydrOffice "Compare Grids" tool calculated that 99.5+% of comparison nodes were within the allowable error fraction.



Percent of nodes	Deviation (m)
50%	+/- 0.03
60%	+/- 0.04
70%	+/- 0.05
80%	+/- 0.06
90%	+/- 0.08
95%	+/- 0.11

Figure 13: Depth differences between Surveys H13657 and H13663.

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: MVP casts were taken at intervals of approximately 20 minutes on the MV Northstar Challenger. AML-3 casts were taken approximately every 1-2 hours on the RV North Cove.

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 (>2m/s change) between the profile reading at the draft of the transducer and the Micro-X.

OSI submitted sound speed data in NetCDF format to the National Centers for Environmental Information (NCEI) on February 10, 2023 via the SN2 tool.

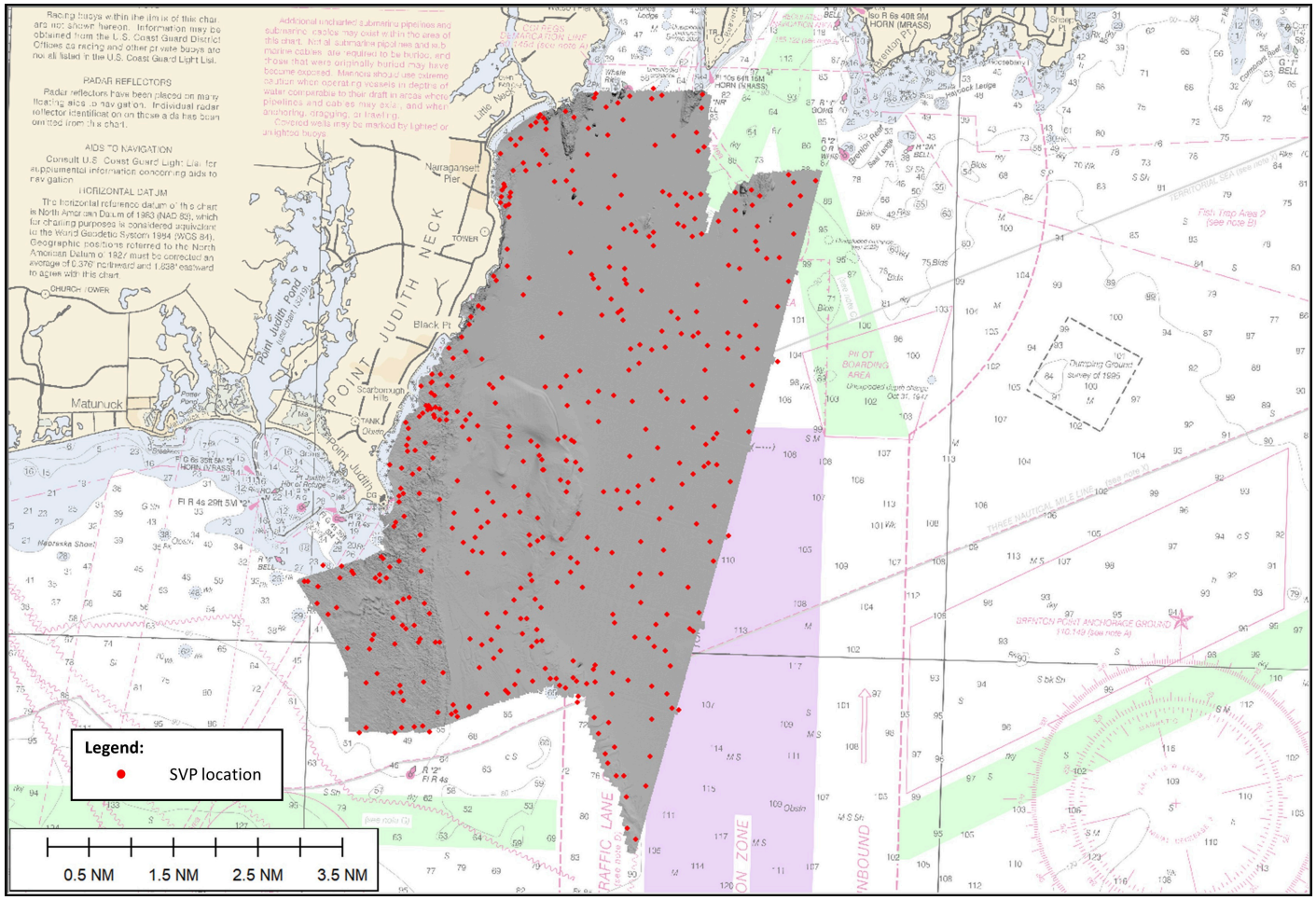


Figure 14: Sound speed casts in Survey H13657.

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. This calls for 100% bathymetric bottom coverage with multibeam sonars, and complete coverage multibeam developments of features. 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 verify that the grid nodes met the density coverage requirements, with 99.5+% of the nodes meeting the requirement.

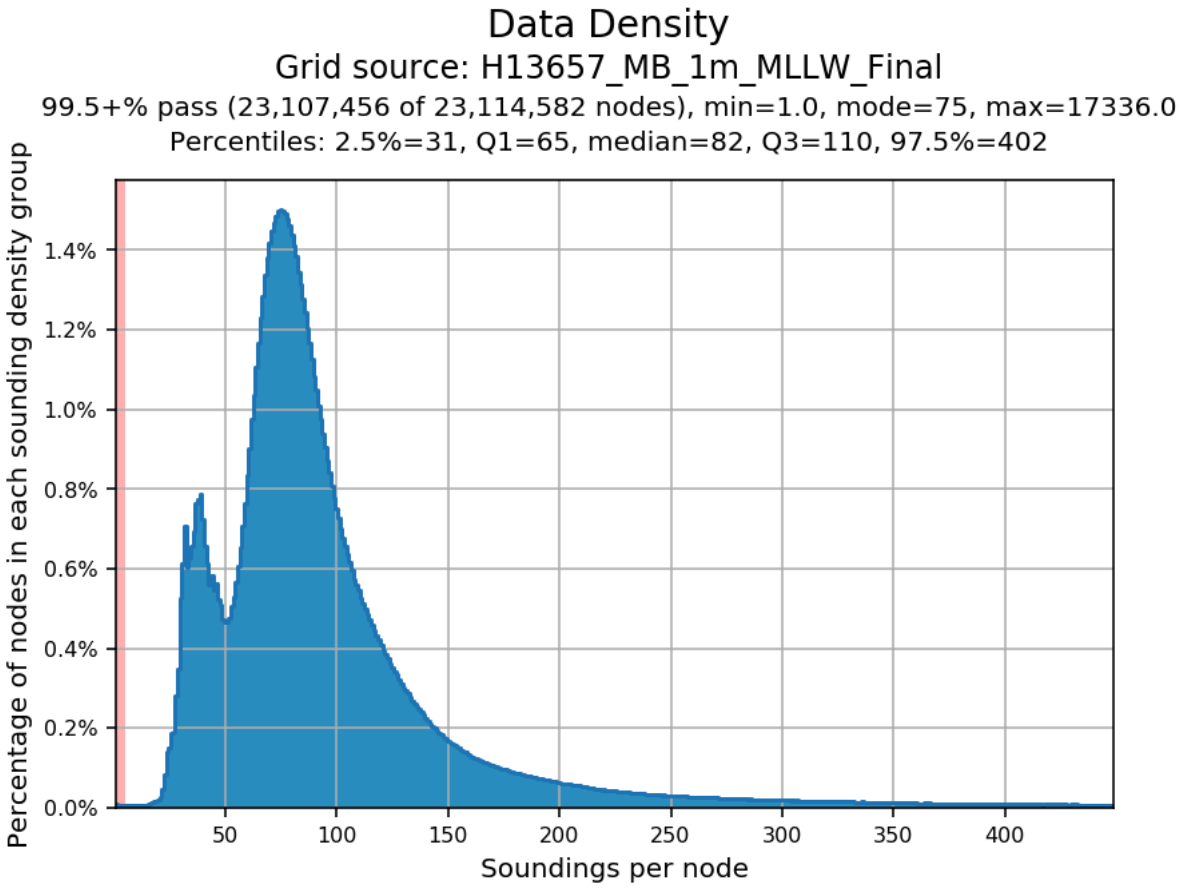


Figure 15: H13657 MBES 1m surface data density statistics.

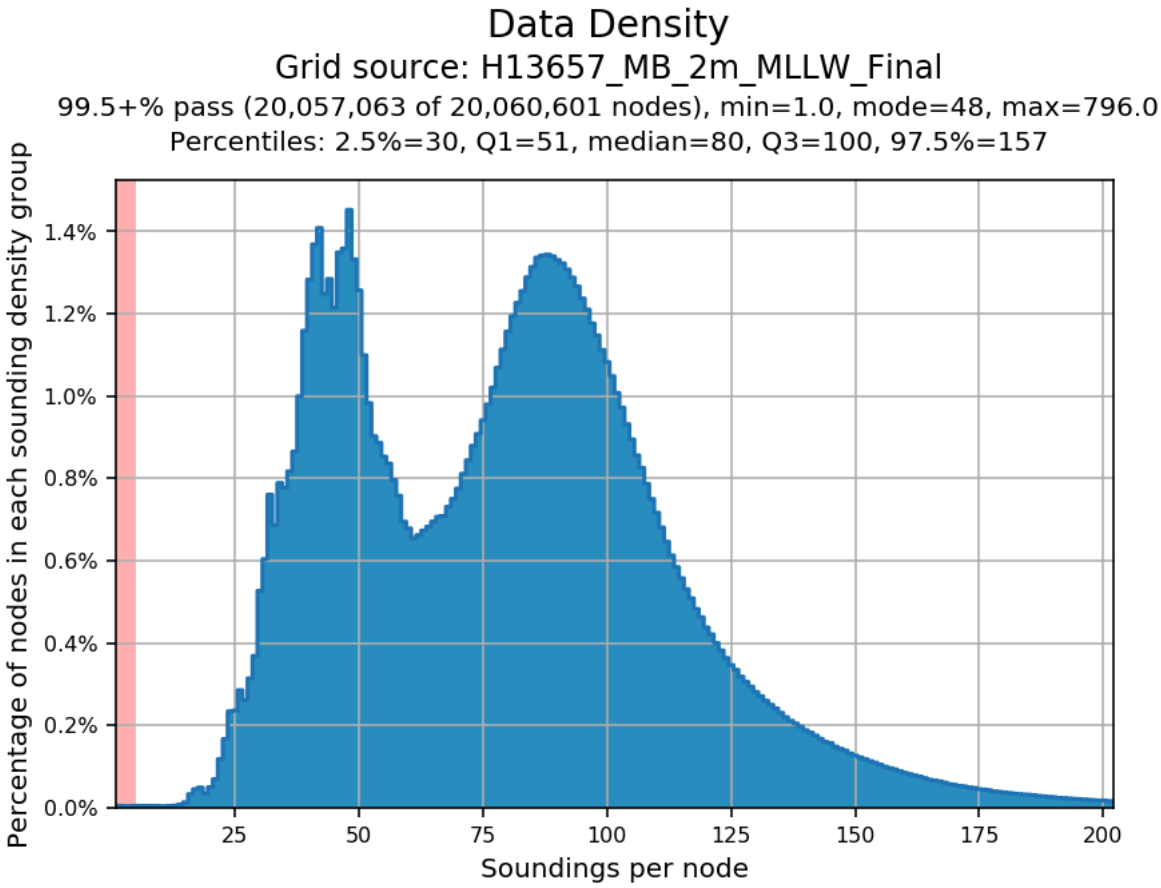


Figure 16: H13657 MBES 2m surface data density statistics.

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

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

B.5 Data Processing

B.5.1 Primary Data Processing Software

The following Feature Object Catalog was used: NOAA Profile Version 2022.

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
H13657_MB_1m_MLLW_Final.csar	CARIS Raster Surface (CUBE)	1 meters	0.357 meters - 20.0 meters	NOAA_1m	Complete MBES
H13657_MB_2m_MLLW_Final.csar	CARIS Raster Surface (CUBE)	2 meters	18.0 meters - 34.693 meters	NOAA_2m	Complete MBES
H13657_MB_1m_MLLW.csar	CARIS Raster Surface (CUBE)	1 meters	0.357 meters - 34.748 meters	NOAA_1m	Complete MBES
H13657_MB_2m_MLLW.csar	CARIS Raster Surface (CUBE)	2 meters	0.357 meters - 34.693 meters	NOAA_2m	Complete MBES
H13657_MBAB_2m_400kHz_1of1.tif	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-B315-KR-22_VDATUM_Coverage_100m_NAD83-MHW_geoid12b.csar OPR-B315-KR-22_VDATUM_Coverage_100m_NAD83-MLLW_geoid12b.csar

Table 11: ERS method and SEP file

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 19.

The following PPK methods were used for horizontal control:

- Smart Base

The following CORS Stations were used for horizontal control:

HVCR Site ID	Base Station ID
DARTMOUTH	MADA
U OF RI COOP	URIL
MANT NANTUCKET	MANT
FALMOUTH	MAFA
MAWR WRENTHAM	MAWR
RIVERHEAD	NYRH
PLYMOUTH	MAPL
NEW YORK WAAS 1	ZNY1

Table 12: CORS Base Stations

The following user installed stations were used for horizontal control:

HVCR Site ID	Base Station ID
Ocean Surveys Sachuset (Second) Beach	OSSB

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 ENCs, which cover the survey area:

ENC	Scale	Edition	Update Application Date	Issue Date
US4MA23M	1:80000	43	02/02/2022	12/28/2022
US5PVDAB	1:20000	2	08/25/2022	08/25/2022
US5PVDBB	1:10000	2	09/12/2022	09/12/2022
US5PVDBC	1:20000	2	08/24/2022	08/24/2022
US5PVDCC	1:20000	3	12/09/2022	12/09/2022
US5PVDCD	1:20000	2	08/12/2022	08/12/2022
US5RI10M	1:40000	20	06/06/2022	06/06/2022
US5RI20M	1:40000	25	06/21/2022	06/21/2022

Table 14: Largest Scale ENCs

D.1.2 Shoal and Hazardous Features

A rock outcrop that was notably shoaler than charted depths was submitted as a DTON for Survey H13657. It has since been added to the chart. No other hazardous shoals or features were surveyed.

D.1.3 Charted Features

Charted features in Survey H13657 included 19 land areas, 38 obstructions, 13 seabed areas, 177 rocks, and 7 wrecks. The majority of the charted features were inshore of the NALL and not investigated. The investigated obstructions were primarily found to be rocks and were represented in the bathymetry grid, along with the charted rocks. Of the charted wrecks, 4 were surveyed near their charted position, 2 were disproved, and 1 was inshore of the NALL.

D.1.4 Uncharted Features

29 new features exist, see H13657 Final Feature File.

D.1.5 Channels

No channels exist within the survey limits.

D.2 Additional Results

D.2.1 Aids to Navigation

ATONS within Survey H13657 were found to be on station and watching properly.

D.2.2 Maritime Boundary Points

No Maritime Boundary Points were assigned for this survey.

D.2.3 Bottom Samples

Survey H13657 had 4 bottom samples assigned, 3 of which had sand as the primary constituent and 1 was primarily mud.

D.2.4 Overhead Features

No overhead features exist for this survey.

D.2.5 Submarine Features

A submarine cable charted as multiple segments and 2 short sewer pipes were assigned in Survey H13657. The sewer pipe positions are visible as linear features in the MB surface, however the pipes do not appear exposed and are therefore not included in a Non-DTON Seeps and Pipeline Report. The cable was not exposed in the survey area.

D.2.6 Platforms

No platforms exist for this survey.

D.2.7 Ferry Routes and Terminals

A seasonal ferry between Newport, RI and Block Island, RI passes through Survey H13657, as does a seasonal ferry between North Kingstown, RI and Martha's Vineyard, MA. No ferry terminals are within the survey limits. Ferry routes were not investigated by the field crew.

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

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.

Approver Name	Approver Title	Approval Date	Signature
John R. Bean	Chief of Party	02/23/2023	
David T. Somers	Data Processing Manager	02/23/2023	

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	Continuously Operating Reference Station
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
ERTDM	Ellipsoidally Referenced Tidal Datum Model
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

Acronym	Definition
HSSD	Hydrographic Survey Specifications and Deliverables
HSTB	Hydrographic Systems Technology Branch
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	Linear Nautical Miles
MBAB	Multibeam Echosounder Acoustic Backscatter
MCD	Marine Chart Division
MHW	Mean High Water
MLLW	Mean Lower Low Water
NAD 83	North American Datum of 1983
NALL	Navigable Area Limit Line
NTM	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
RNC	Raster Navigational Chart
RTK	Real Time Kinematic
RTX	Real Time Extended
SBES	Singlebeam Echosounder
SBET	Smooth Best Estimate and Trajectory
SNM	Square Nautical Miles
SSS	Side Scan Sonar
SSSAB	Side Scan Sonar Acoustic Backscatter
ST	Survey Technician
SVP	Sound Velocity Profiler
TCARI	Tidal Constituent And Residual Interpolation
TPU	Total Propagated Uncertainty
USACE	United States Army Corps of Engineers
USCG	United States Coast Guard
UTM	Universal Transverse Mercator
XO	Executive Officer
ZDF	Zone Definition File