H13835

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

DESCRIPTIVE REPORT

Type of Survey:	Navigable Area
Registry Number:	H13835

LOCALITY

State(s):	Alabama
General Locality:	Mobile Bay, AL
Sub-locality:	North Portion of Mobile Bay to Sizemore Landing

2023

CHIEF OF PARTY
Jonathan L. Dasler, PE, PLS, CH

LIBRARY & ARCHIVES

Date:

U.S. DEPARTMENT OF COMMERCE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION	REGISTRY NUMBER:
HYDROGRAPHIC TITLE SHEET	**H13835**

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):	**Alabama**
General Locality:	**Mobile Bay, AL**
Sub-Locality:	**North Portion of Mobile Bay to Sizemore Landing**
Scale:	**20000**
Dates of Survey:	**09/19/2023 to 01/15/2024**
Instructions Dated:	**07/26/2023**
Project Number:	**OPR-J325-KR-23**
Field Unit:	**David Evans and Associates, Inc.**
Chief of Party:	**Jonathan L. Dasler, PE, PLS, CH**
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 16N, 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 H13835

Project: OPR-J325-KR-23

Locality: Mobile Bay, AL

Sublocality: North Portion of Mobile Bay to Sizemore Landing

Scale: 1:20000

September 2023 - January 2024

David Evans and Associates, Inc.

Chief of Party: Jonathan L. Dasler, PE, PLS, CH

A. Area Surveyed

David Evans and Associates, Inc. (DEA) conducted a hydrographic survey of the assigned area in the vicinity of Mobile Bay, AL. Survey H13835 was conducted in accordance with the Statement of Work and Hydrographic Survey Project Instructions dated July 26, 2023.

The Hydrographic Survey Project Instructions reference the National Ocean Service (NOS) Hydrographic Survey Specifications and Deliverables Manual (HSSD) (March 2022) as the technical requirements for this project.

A.1 Survey Limits

Data were acquired within the following survey limits:

Northwest Limit	Southeast Limit
30° 53' 5.11" N 88° 1' 1.06" W	30° 38' 53.78" N 87° 53' 35.01" W

Table 1: Survey Limits

Survey limits were surveyed in accordance with the requirements in the Project Instructions and the HSSD. The assigned survey areas are outlined in Figure 1.

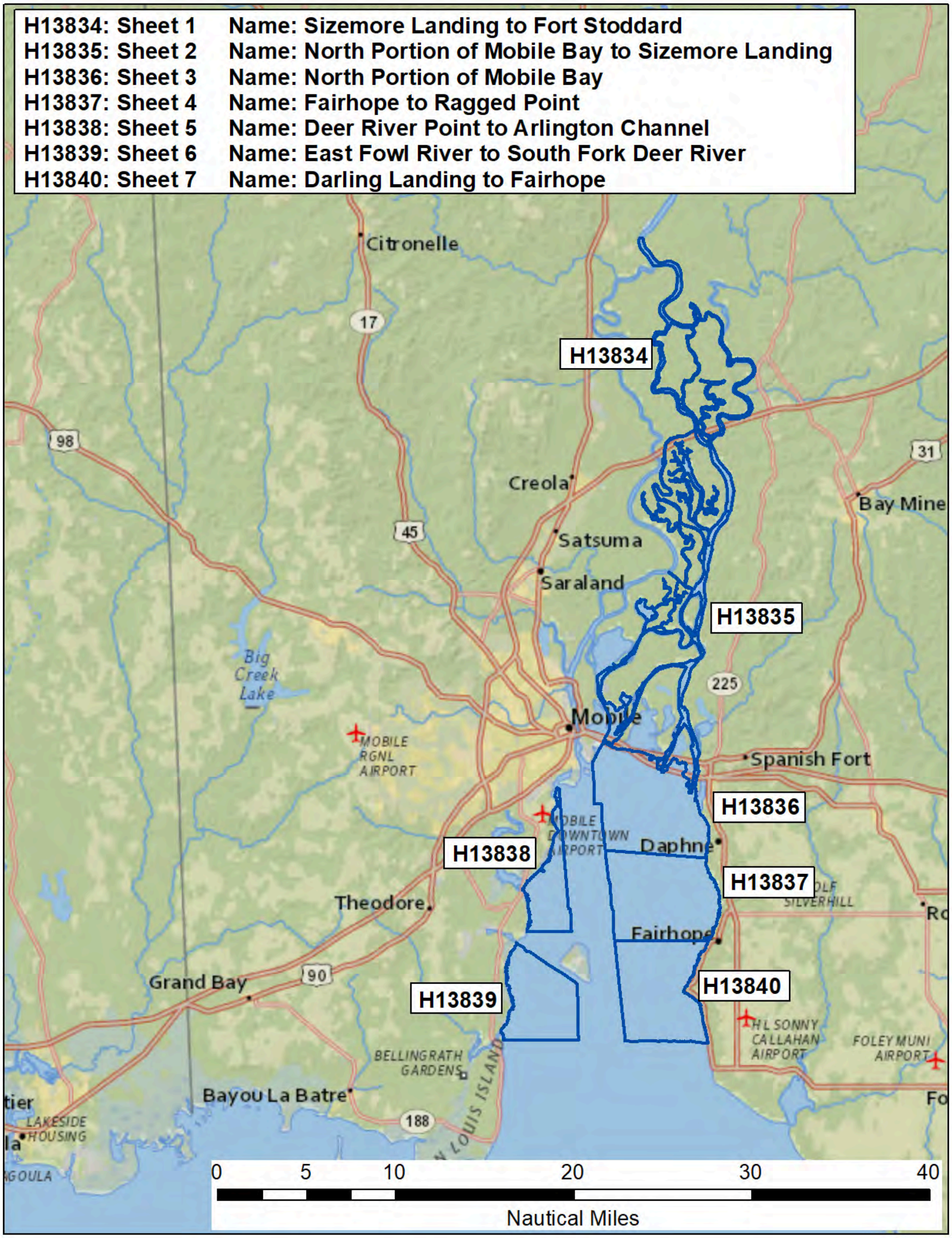


Figure 1: OPR-J325-KR-23 Assigned Survey Areas

A.2 Survey Purpose

The purpose of this survey, defined in the Project Instructions, is as follows: "This project will provide modern bathymetric data for Mobile Bay and the Tensaw River. The project area was identified as a high priority area for NOAA's National Water Center, and is a statistically significant hot spot within the 2018 hydrographic health model, a risk model that Coast Survey uses for evaluating priorities based upon navigational risks and the necessary quality of data to support modern traffic. Prior surveys in the area are from 2007, and there have been significant changes to the bay and its water circulation with the last several years of storm events. In addition, the Port of Mobile handles in excess of 55 million tons of international and domestic cargo delivering $85 billion in economic value to the state of Alabama each year (1).

Conducting a modern bathymetric survey in this area will identify hazards and changes to the seafloor, update NOAA National Ocean Survey (NOS) charts and products, and provide forecasters at NOAA's National Water Center with bathymetric data for critical hydrodynamic modeling necessary to understand the timing and impact of rapid river stage increases and decreases, the duration of high water, inundation or drought. Survey data from this project is intended to supersede all prior survey data in the common area."

(1) https://www.alports.com/economic-impact/

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
Sheet 2	Complete Coverage (Refer to HSSD Section 5.2.2.3).
Sheets 1 and 2	The requirement for acquiring crosslines is waived for the river sheets.

Table 2: Survey Coverage

Complete Coverage using 100% multibeam echosounder (MBES) coverage was obtained over the entire survey area. Backscatter was logged during all multibeam acquisition. This coverage type follows Option A of the Complete Coverage requirement specified in Section 5.2.2.3 of the HSSD. In all cases, the inshore limit of hydrography was the Navigable Area Limit Line (NALL) as defined in Section 1.3.2 of the HSSD, with the exception that the Project Instructions defined the use of the surveyed 2-meter depth contour instead of the surveyed 3.5-meter contour as listed in the HSSD.

Survey coverage for feature disprovals followed disproval radii size determination based on the largest scale charts published at the time of the disproval evaluation. Several new gridded ENCs were issued during the survey to replace older legacy ENCs as part of the NOAA rescheming process. According to Office of Coast Survey (OCS) guidance, features outside the 2-meter NALL were investigated and ensonified as much as was safe to do so. For features in which the disproval radius was seaward and shoreward of the NALL, the radius became the sheet boundary and limit of safe navigation. Additional details can be found in Appendix II - Supplemental Survey Records & Correspondence.

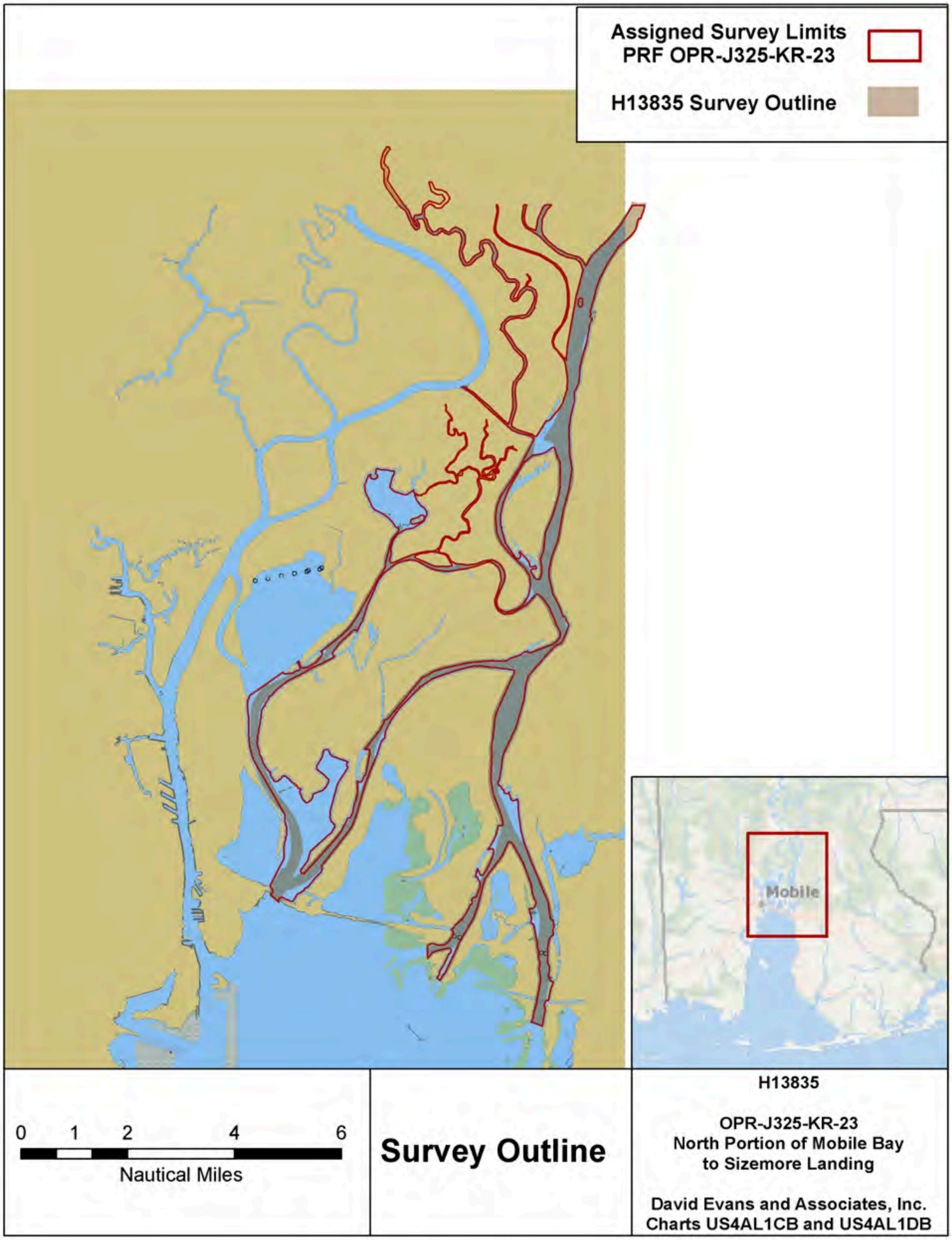


Figure 2: H13835 Survey Outline

A.6 Survey Statistics

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

	HULL ID	*William R Broughton*	*Total*
LNM	**SBES Mainscheme**	0.0	0.0
	MBES Mainscheme	742.08	742.08
	Lidar Mainscheme	0.0	0.0
	SSS Mainscheme	0.0	0.0
	SBES/SSS Mainscheme	0.0	0.0
	MBES/SSS Mainscheme	0.0	0.0
	SBES/MBES Crosslines	31.92	31.92
	Lidar Crosslines	0.0	0.0
Number of Bottom Samples			0
Number Maritime Boundary Points Investigated			0
Number of DPs			0
Number of Items Investigated by Dive Ops			0
Total SNM			7.26

Table 3: Hydrographic Survey Statistics

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

Survey Dates	Day of the Year
09/19/2023	262
09/20/2023	263
09/21/2023	264
09/22/2023	265
09/23/2023	266
09/24/2023	267
09/25/2023	268
09/26/2023	269
09/27/2023	270
09/28/2023	271
09/30/2023	273
10/01/2023	274
10/02/2023	275
10/03/2023	276
10/04/2023	277
10/05/2023	278
10/06/2023	279
10/07/2023	280
10/08/2023	281
10/09/2023	282
10/10/2023	283
10/11/2023	284
10/12/2023	285
10/13/2023	286
10/14/2023	287
10/15/2023	288
10/22/2023	295
10/23/2023	296
10/24/2023	297
11/14/2023	318
11/15/2023	319

Survey Dates	Day of the Year
01/10/2024	10
01/11/2024	11
01/13/2024	13
01/14/2024	14
01/15/2024	15

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	***William R Broughton***
LOA	24.0 feet
Draft	2.0 feet

Table 5: Vessels Used

Figure 3: William R Broughton

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
AML Oceanographic	Micro SV-Xchange	Sound Speed System
AML Oceanographic	SmartX	Conductivity, Temperature, and Depth Sensor

Table 6: Major Systems Used

The Teledyne RESON SeaBat T50-R was used in a dual head configuration with the sonars rotated outward 15 degrees.

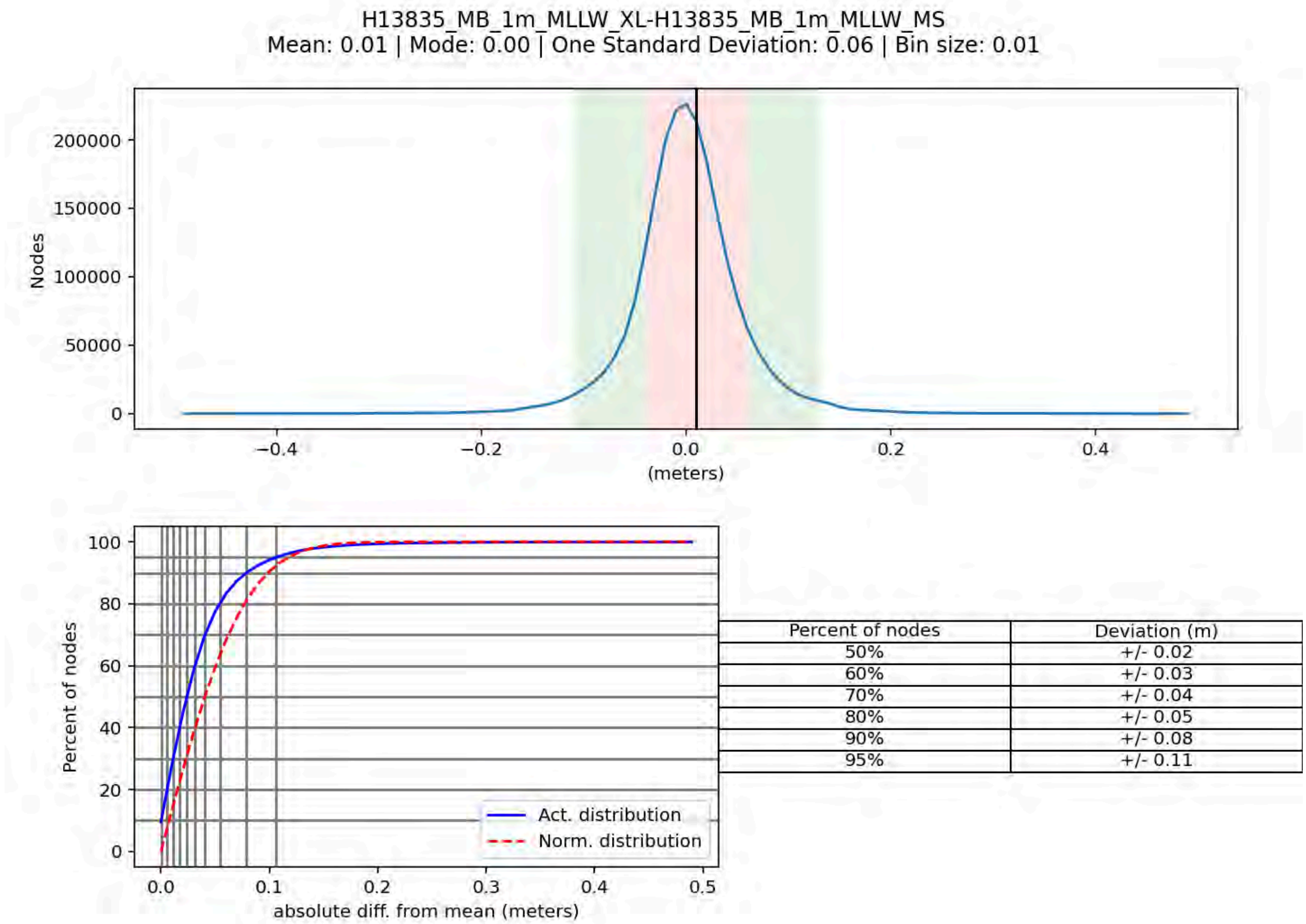
B.2 Quality Control

B.2.1 Crosslines

Although a waiver was issued in the Project Instructions, multibeam crosslines were run across 4.30% of the entire survey area to provide a varied spatial and temporal distribution for analysis of internal consistency within the survey data.

Crossline analysis was performed using the CARIS Hydrographic Information Processing System (HIPS) Quality Control (QC) Report tool, which compares crossline data to a gridded surface and reports results by beam number. Crosslines were compared to a 1-meter Combined Uncertainty and Bathymetry Estimator (CUBE) surface encompassing mainscheme, fill, and investigation data for the entire survey area.

DEA performed an additional crossline analysis using the NOAA Pydro Compare Grids tool to analyze the differences between gridded mainscheme depths and gridded crossline depths. Input grids were 1-meter resolution CUBE surfaces of mainscheme and crossline depths. Results from the crossline-to-mainscheme difference analysis are depicted in Figure 4, with units represented in meters.



Percent of nodes	Deviation (m)
50%	+/- 0.02
60%	+/- 0.03
70%	+/- 0.04
80%	+/- 0.05
90%	+/- 0.08
95%	+/- 0.11

Figure 4: H13835 Crossline Difference

B.2.2 Uncertainty

The following survey specific parameters were used for this survey:

Method	Measured	Zoning
ERS via VDATUM	0.05 meters	0.1 meters

Table 7: Survey Specific Tide TPU Values.

Hull ID	Measured - CTD	Measured - MVP	Measured - XBT	Surface
Broughton	1.0 meters/second	n/a meters/second	n/a meters/second	0.5 meters/second

Table 8: Survey Specific Sound Speed TPU Values.

Additional discussion of these parameters is included in the DAPR.

During surface finalization in HIPS, the "Uncertainty" option was selected, where uncertainty values from the source surface are applied to the finalized surface uncertainty. This method, which incorporates grid uncertainties computed during the TPU process, was deemed to better reflect actual grid uncertainty when compared to the option to use standard deviation values scaled to 95% confidence interval.

To determine if the surface grid nodes met the International Hydrographic Organization (IHO) Order 1a specification, a ratio of the final node uncertainty to the allowable uncertainty at that depth was established. As a percentage, this value represents the amount of error budget utilized by the Total Vertical Uncertainty (TVU) at each node. Values greater than 100% indicate nodes exceeding the allowable IHO uncertainty. The resulting calculated TVU values of all nodes in the submitted finalized surface are shown in Figures 5 and 6.

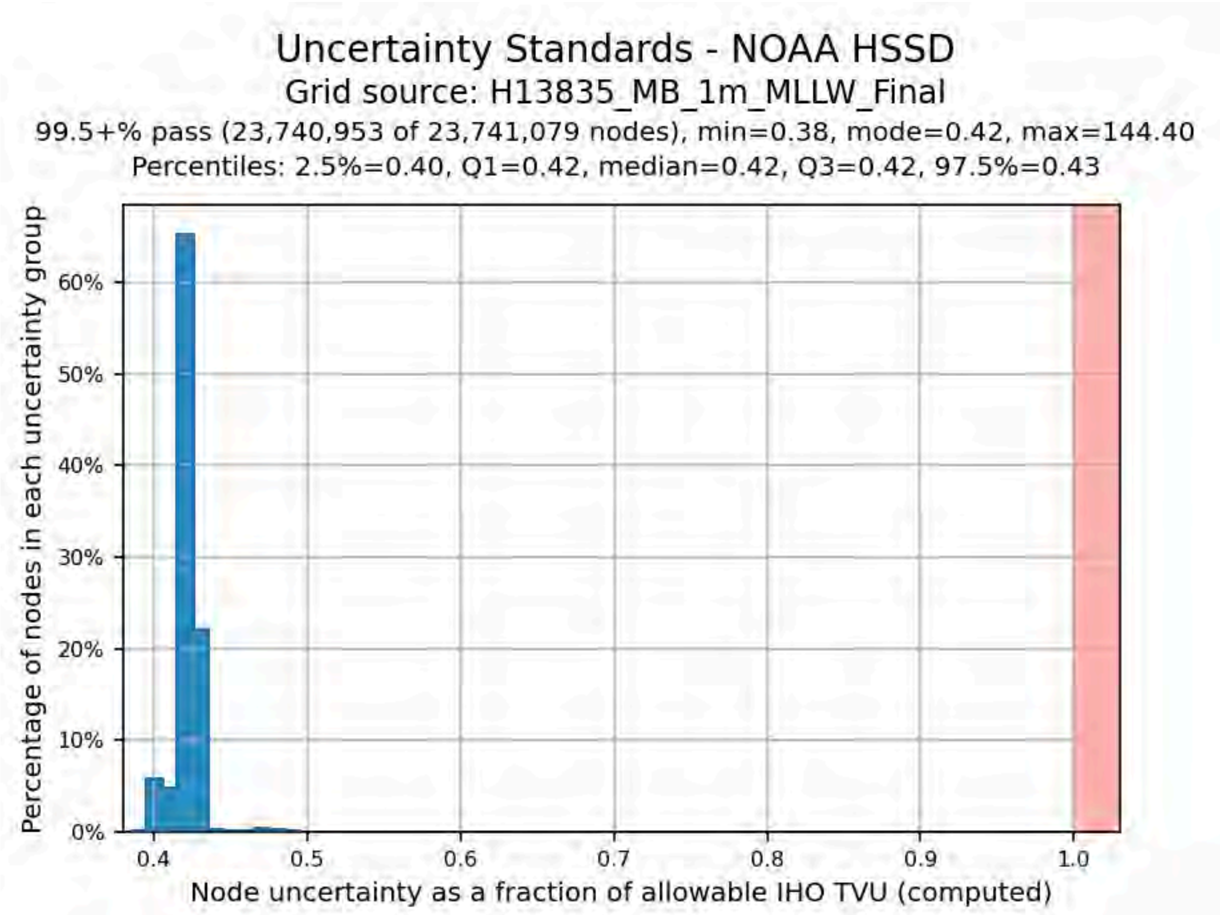


Figure 5: Node TVU Statistics - 1 meter, Finalized

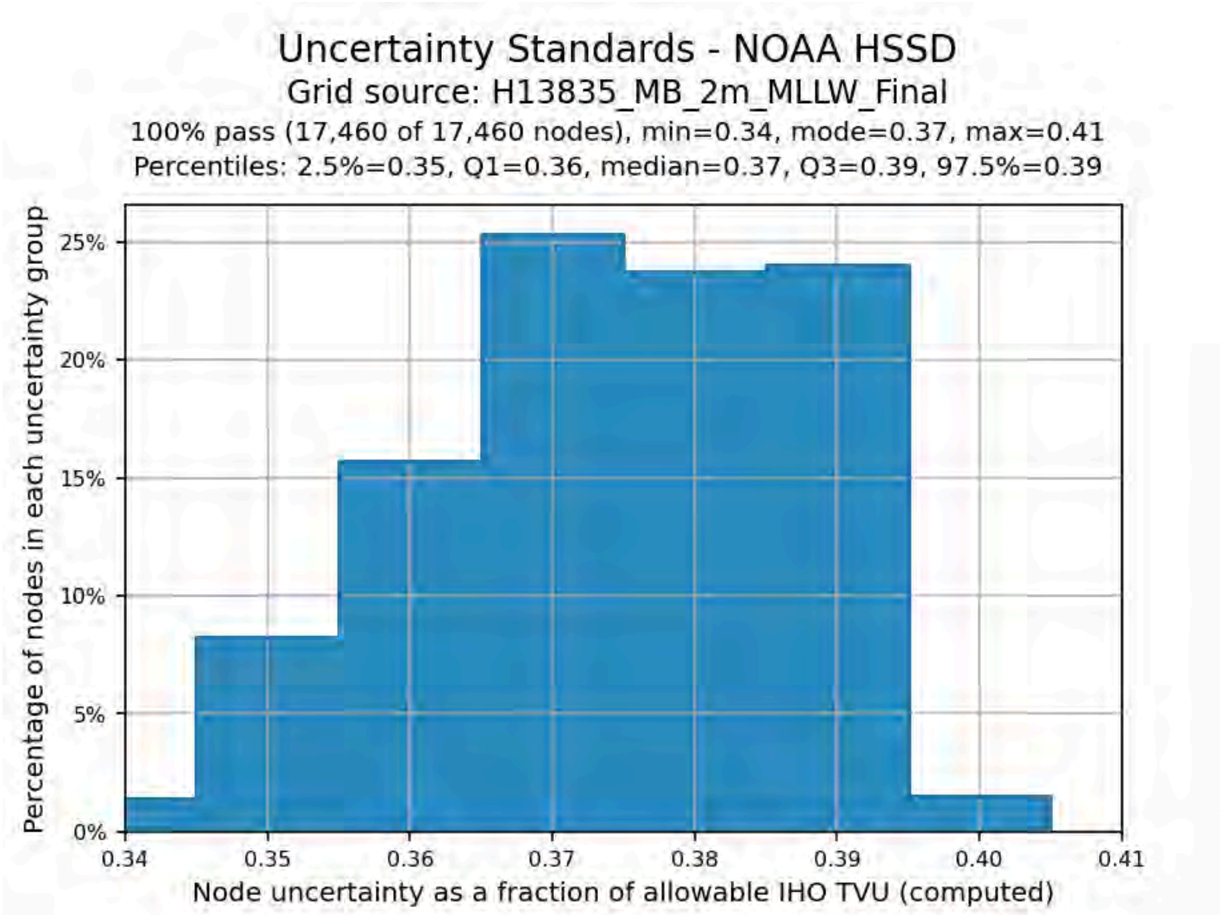


Figure 6: Node TVU Statistics - 2 meter, Finalized

B.2.3 Junctions

Survey H13835 has junctions with current surveys H13834 and H13836. Figure 7 depicts H13835 and the junctioning surveys.

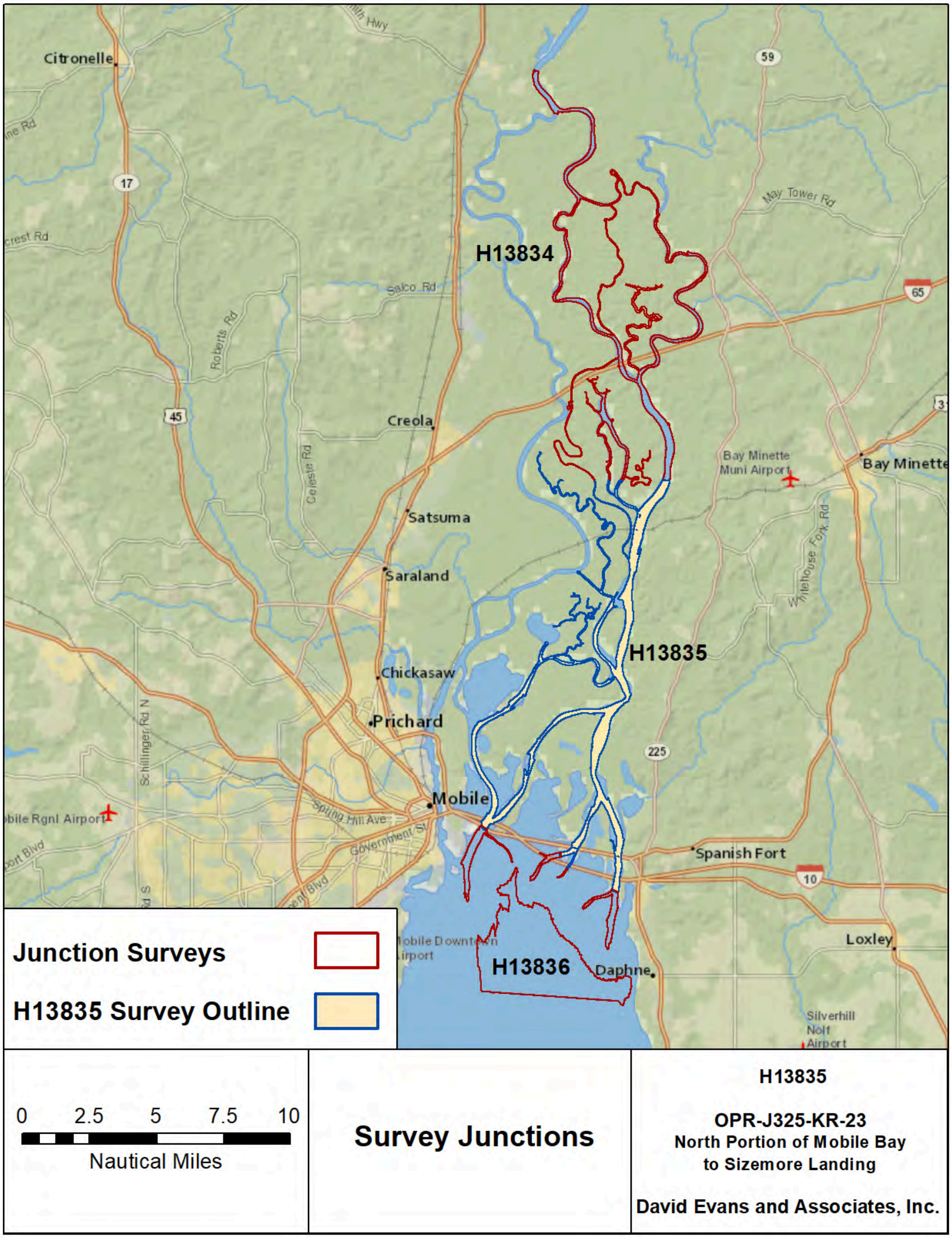


Figure 7: Survey Junctions with Registry Number H13835

The following junctions were made with this survey:

Registry Number	Scale	Year	Field Unit	Relative Location
H13834	1:20000	2023	David Evans and Associates, Inc.	N
H13836	1:5000	2023	David Evans and Associates, Inc.	S

Table 9: Junctioning Surveys

H13834

The mean difference between H13835 and H13834 is 0 centimeters, shown in Figure 8.

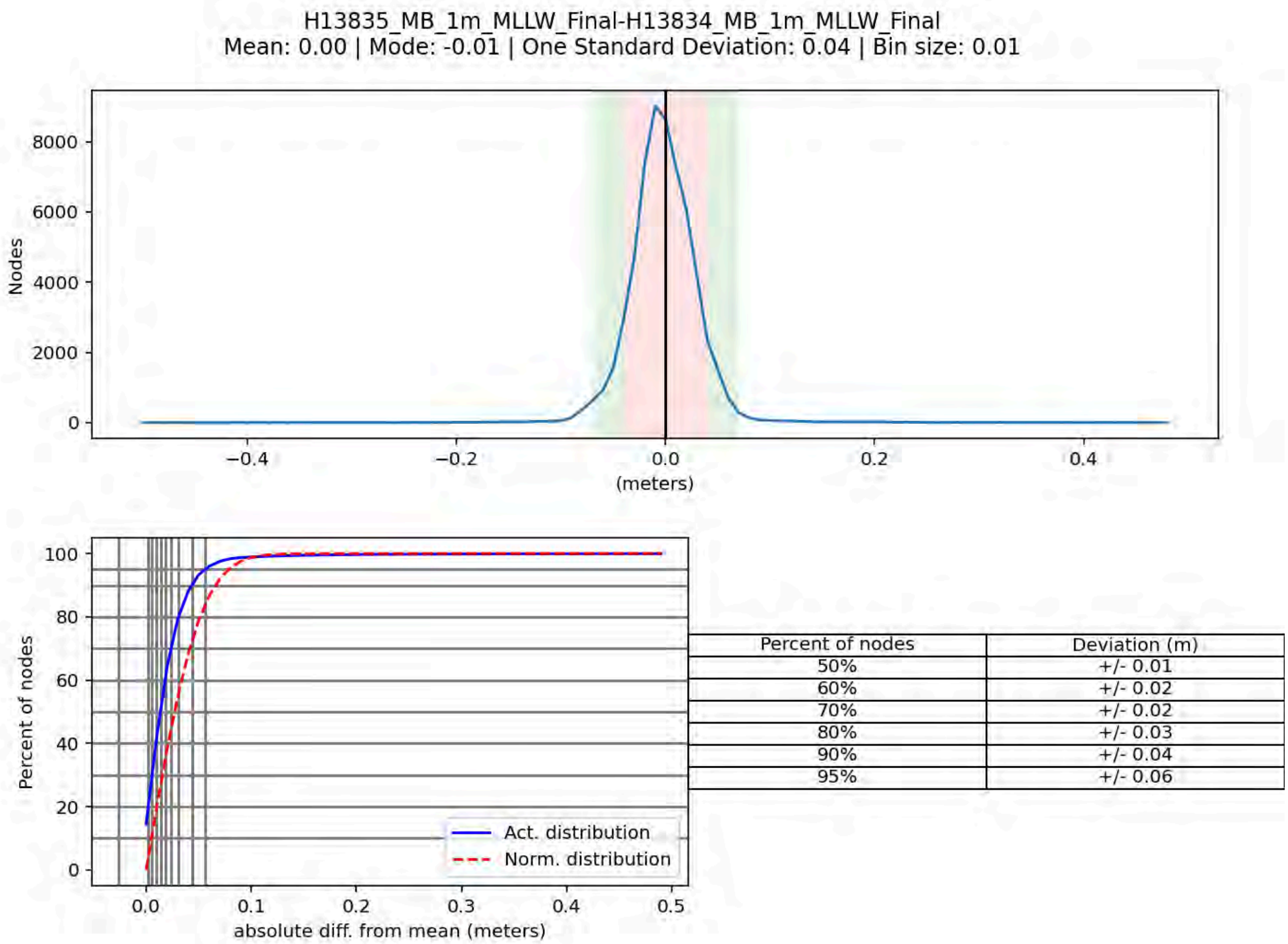
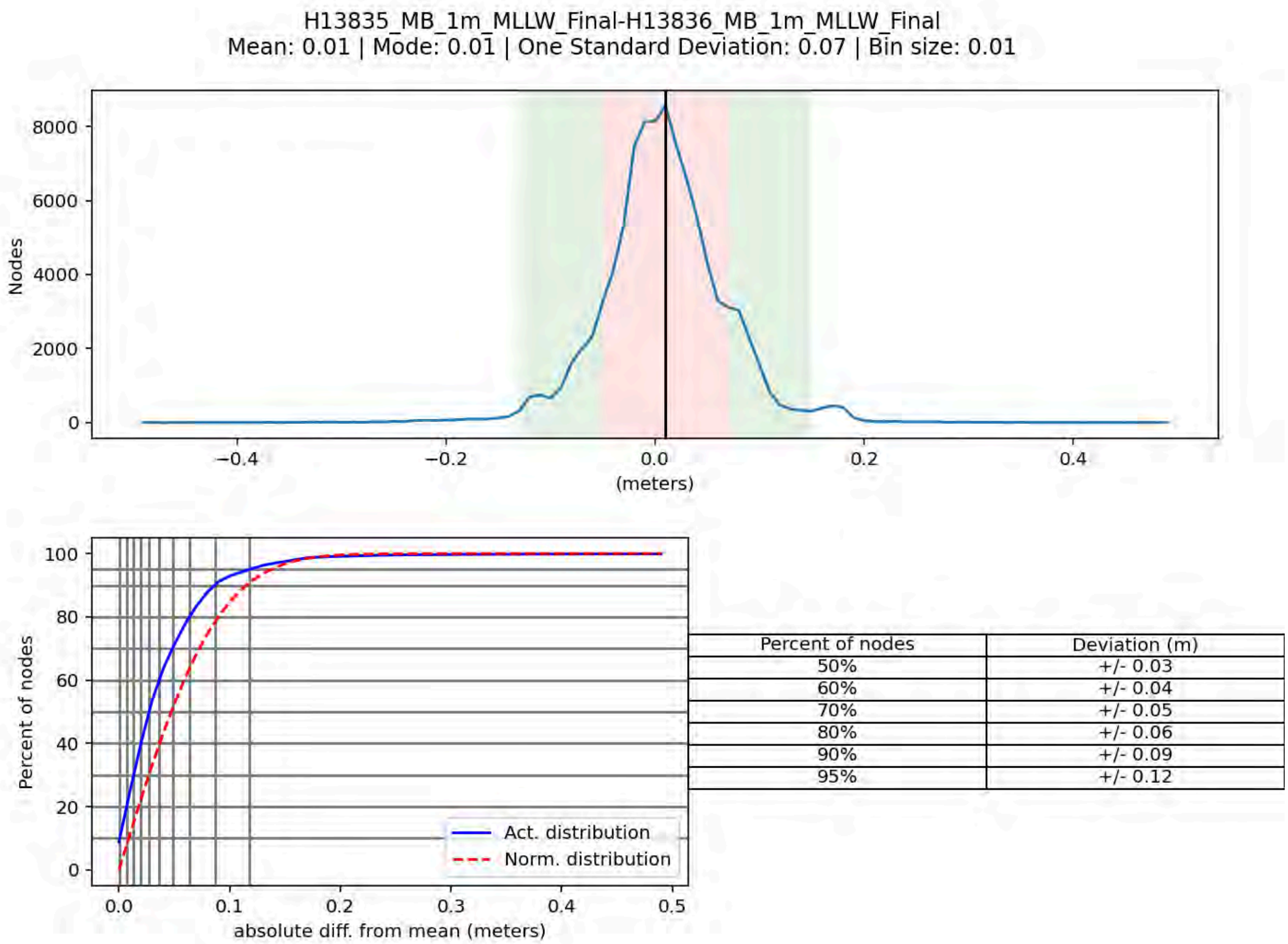


Figure 8: Distribution summary plot of survey H13835 1-meter vs H13834 1-meter

<u>H13836</u>

The mean difference between H13835 and H13836 is 1 centimeter, shown in Figure 9.



Percent of nodes	Deviation (m)
50%	+/- 0.03
60%	+/- 0.04
70%	+/- 0.05
80%	+/- 0.06
90%	+/- 0.09
95%	+/- 0.12

Figure 9: Distribution summary plot of survey H13835 1-meter vs H13836 1-meter

B.2.4 Sonar QC Checks

Multibeam data were reviewed at multiple levels of data processing, including CARIS HIPS conversion, subset editing, and analysis of anomalies revealed in CUBE surfaces.

B.2.5 Equipment Effectiveness

Single-Head MBES Sonar

On October 7, 2023 (DN280), the starboard sonar receiver was removed and sent to Teledyne for repairs. The Broughton ran DN280 with only the port sonar, and on October 8th, 2023 (DN281), the survey crew swapped the receiver from the port side to the starboard side and surveyed with only the starboard sonar. All days using single-head configuration were processed in CARIS using a separate HVF, OPR-J325-KR-23_BR_SingleT50.hvf

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: 60-minute intervals

For H13835 survey operations, casts were distributed both temporally and spatially based on observed changes in sound speed profiles. Casts were taken less frequently than the rest of the project, at 60-minute intervals rather than 30-minute intervals due to the consistency of the sound speed profiles within the survey area. Sound speed readings were applied in CARIS HIPS using the "nearest in distance within time" option with a two-hour interval.

All sound speed profiles were acquired within 500 meters of the survey limits.

B.2.8 Coverage Equipment and Methods

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

B.2.9 Density

The sounding density requirement of 95% of all nodes, populated with at least five soundings per node, was verified by analyzing the density layer of the finalized surface. Surface results are stated in Figures 10 and 11.

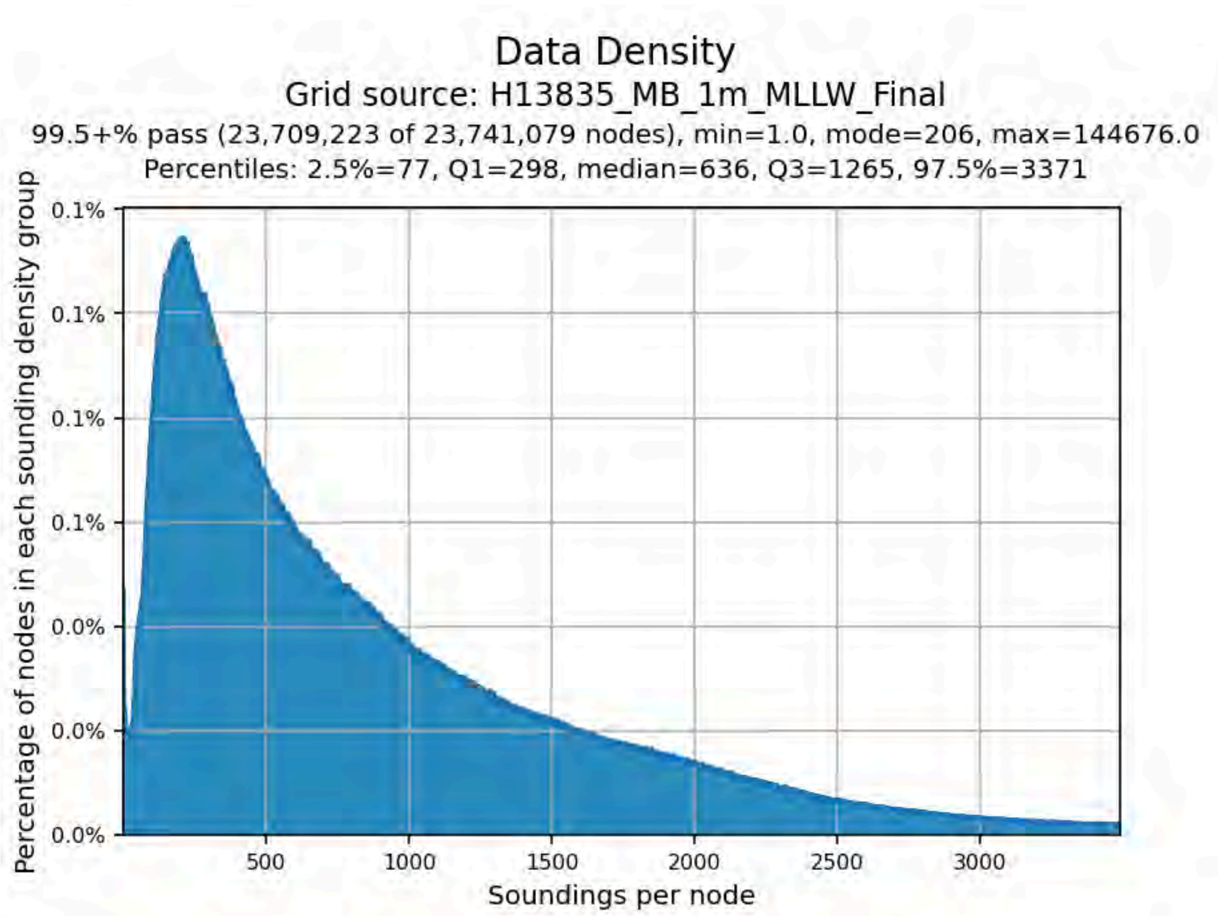


Figure 10: Node Density Statistics - 1 meter, Finalized

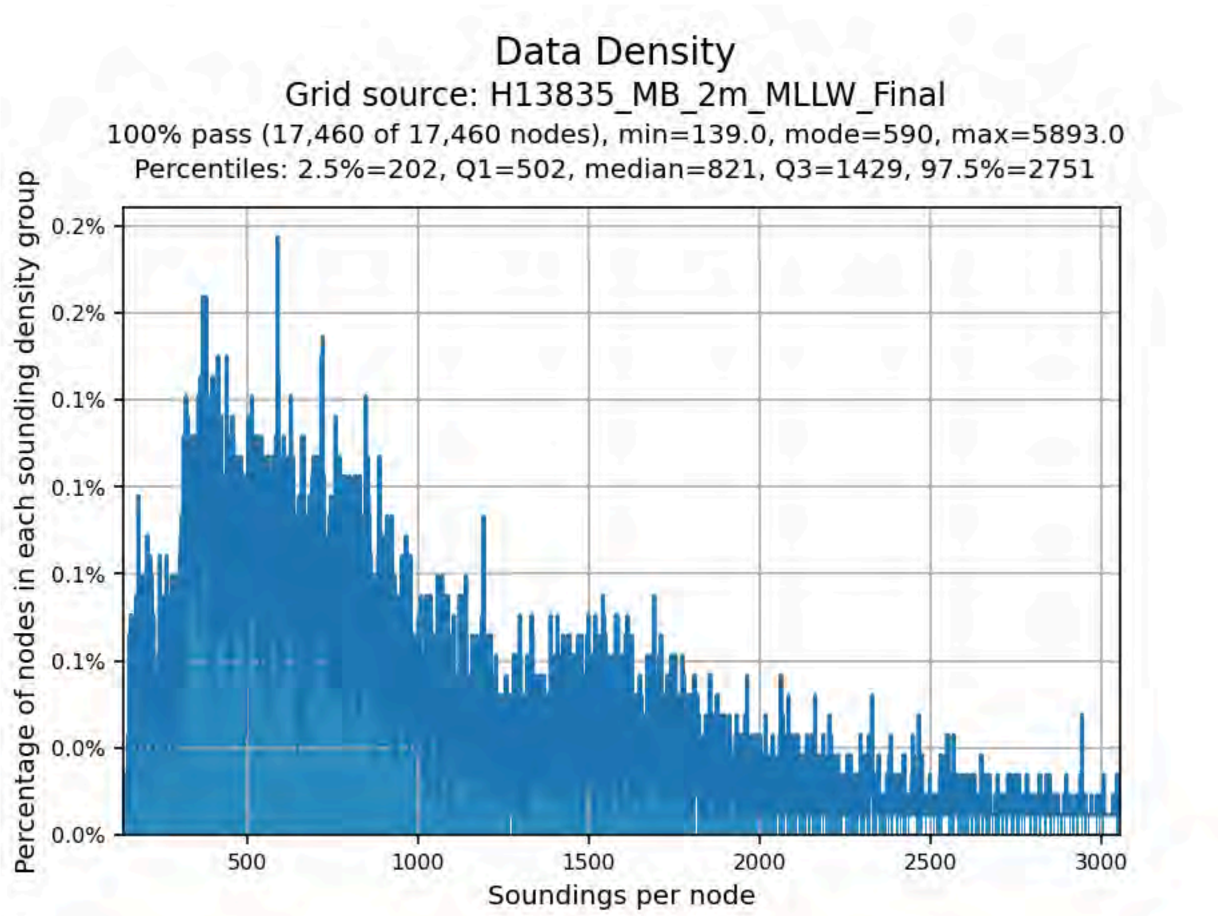


Figure 11: Node Density Statistics - 2 meter, Finalized

B.3 Echo Sounding Corrections

B.3.1 Corrections to Echo Soundings

Data reduction procedures for survey H13835 are detailed in the DAPR.

B.3.2 Calibrations

All sounding systems were calibrated as detailed in the DAPR.

B.4 Backscatter

Multibeam time series backscatter data (RESON 7058 normalized backscatter datagram) were logged in HYPACK 7K format and are included with the H13835 raw digital deliverables. Backscatter data were referenced to processed multibeam bathymetric data and processed in QPS FMGT. A 2-meter backscatter mosaic is included with the H13835 processed deliverables. A GSF export containing the final bathymetry and backscatter with edits retains the original file names of the raw data files but with the postfix "_merged."

Backscatter processing for H13835 was particularly intensive because of the number of acquired MBES lines and quantity of data. There were several areas where backscatter did not process properly during the initial processing run on the entire sheet. These areas were reprocessed separately in a new FMGT project and the resultant mosaic was then combined with the mosaic that was created during the initial processing pass.

There were two lines that did not process (2024BR0132203, 2024BR0142203). It was determined that the 7k files did not contain valid backscatter datagrams. In both cases, the lines in question did not affect the overall coverage of the mosaic.

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	11.4.14
CARIS	HIPS and SIPS	11.4.29 (Only for surface finalization)

Table 10: Primary bathymetric data processing software

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

Manufacturer	Name	Version
QPS	FMGT	7.11.1

Table 11: Primary imagery data processing software

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

A detailed listing of all data processing software is included in the OPR-J325-KR-23 DAPR.

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
H13835_MB_1m_MLLW.csar	CARIS Raster Surface (CUBE)	1 meters	-0.56 meters - 31.396 meters	NOAA_1m	Complete MBES
H13835_MB_1m_MLLW_Final.csar	Finalized CARIS Raster Surface (CUBE)	1 meters	0.001 meters - 20.0 meters	NOAA_1m	Complete MBES
H13835_MB_2m_MLLW.csar	CARIS Raster Surface (CUBE)	2 meters	-0.501 meters - 31.34 meters	NOAA_2m	Complete MBES
H13835_MB_2m_MLLW_Final.csar	Finalized CARIS Raster Surface (CUBE)	2 meters	18.0 meters - 31.34 meters	NOAA_2m	Complete MBES
H13835_MB_2m_NAVD88.tiff	CARIS Raster Surface (CUBE)	2 meters	-0.338 meters - 31.528 meters	NOAA_2m	Complete MBES
H13835_MB_2m_NAVD88_Interpolated.tiff	CARIS Raster Surface (CUBE)	2 meters	-0.338 meters - 31.528 meters	NOAA_2m	Complete MBES
H13835_MBAB_2m_BR_400kHz_1of1.tiff	MB Backscatter Mosaic	2 meters	0.0 meters - 0.0 meters	N/A	Complete MBES

Table 12: Submitted Surfaces

Bathymetric grids were created relative to Mean Lower Low Water (MLLW) in CUBE format using Complete Coverage resolution requirements as specified in the HSSD. Grid resolution for the backscatter mosaic was determined by the HSSD frequency-dependent resolution requirement.

In addition to the standard gridded data products prescribed in the HSSD, the survey deliverables also include grids and interpolated grids in geotiff format relative to NAVD88 for NOAA's National Water Center as required by the OPR-J325-KR-23 Project Instructions.

To create the 2-meter NAVD88 grid, CARIS HIPS was used to initially create a 2-meter CUBE surface relative to MLLW (using the NOAA_2m CUBE grid parameters file). After creation, the grid was then transformed from MLLW to NAVD88 using CARIS Base Editor. The transformation utilized a shift file containing elevations corresponding to the difference between MLLW to NAVD88 as determined from the MLLW and NAVD88 separation models provided with the OPR-J325-KR-23 project files. After the NAVD88 transformation, an interpolated version of the grid was created where gaps in the data coverage were filled to create a seamless digital elevation model (DEM) of the survey area. The interpolated 2-meter grid was generated from a triangulated irregular network (TIN) using the natural neighbor method in CARIS BASE Editor. The TIN was constrained to prevent interpolation shoreward of survey coverage using long edge controls and by applying a polygon mask.

C. Vertical and Horizontal Control

A summary of the horizontal and vertical control for this survey follows.

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-J325-KR-23_MobileBay-TensawRiver_2023-06-26_NAD83-MLLW_PtCloud_1sigma10cm.csar OPR-J325-KR-23_NAD83(2011)-NAVD88(GEOID18)_1sigma7cm.csar OPR-J325-KR-23_MobileBay-TensawRiver_2023-06-26_NAD83-MHW_PtCloud_1sigma10cm.csar

Table 13: ERS method and SEP file

In addition to the standard gridded data products relative to MLLW prescribed in the HSSD, the survey deliverables also include grids and interpolated grids in geotiff format relative to NAVD88 for NOAA's National Water Center as required by the OPR-J325-KR-23 Project Instructions. The NAD83(2011) to NAVD88(GEOID18) separation file listed in Table 13 was used to generate the Water Center grids. The mean high water (MHW) separation model listed in Table 13 was used to determine the appropriate water level effect (WATLEV) attribution for features included in the Final Feature File (FFF) and when applicable was used to determine height attribution for any features that are always dry.

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 16.

RTK

The NAD83 to MLLW separation model listed in Table 13 was provided with the Project Instructions and used for sounding correction within the assigned survey area. Real-time navigation for all MBES survey lines were overwritten with post-processed navigation solutions in SBET format. Additional discussion on post-processing methods and survey control is included in the DAPR.

D. Results and Recommendations

D.1 Chart Comparison

The chart comparison was performed by comparing H13835 survey depths to a digital surface generated from Band 4 and Band 5 electronic navigational charts (ENCs) covering most of the survey area. A 2-meter product surface was generated from a triangular irregular network (TIN) created from the ENC's soundings, depth contours, and depth features. Any part of the TIN Model that extended into a charted un-surveyed area was removed from the interpolated product surface. An additional 2-meter HIPS product surface was generated from the 1-meter CUBE surface.

The chart comparison was conducted by creating and reviewing a difference surface using the ENC surface and survey surface as inputs. The chart comparison also included a review of all assigned charted features within the survey area. The results of the comparison are detailed below.

The relevant chart used during the comparison was reviewed to check that all United States Coast Guard (USCG) Local Notice to Mariners issued during survey acquisition, and impacting survey area, were applied and addressed by this survey.

The ENCs used in the chart comparisons are listed in Table 14. Figures 12 through 15 show the magnitude of differences along the comparison area.

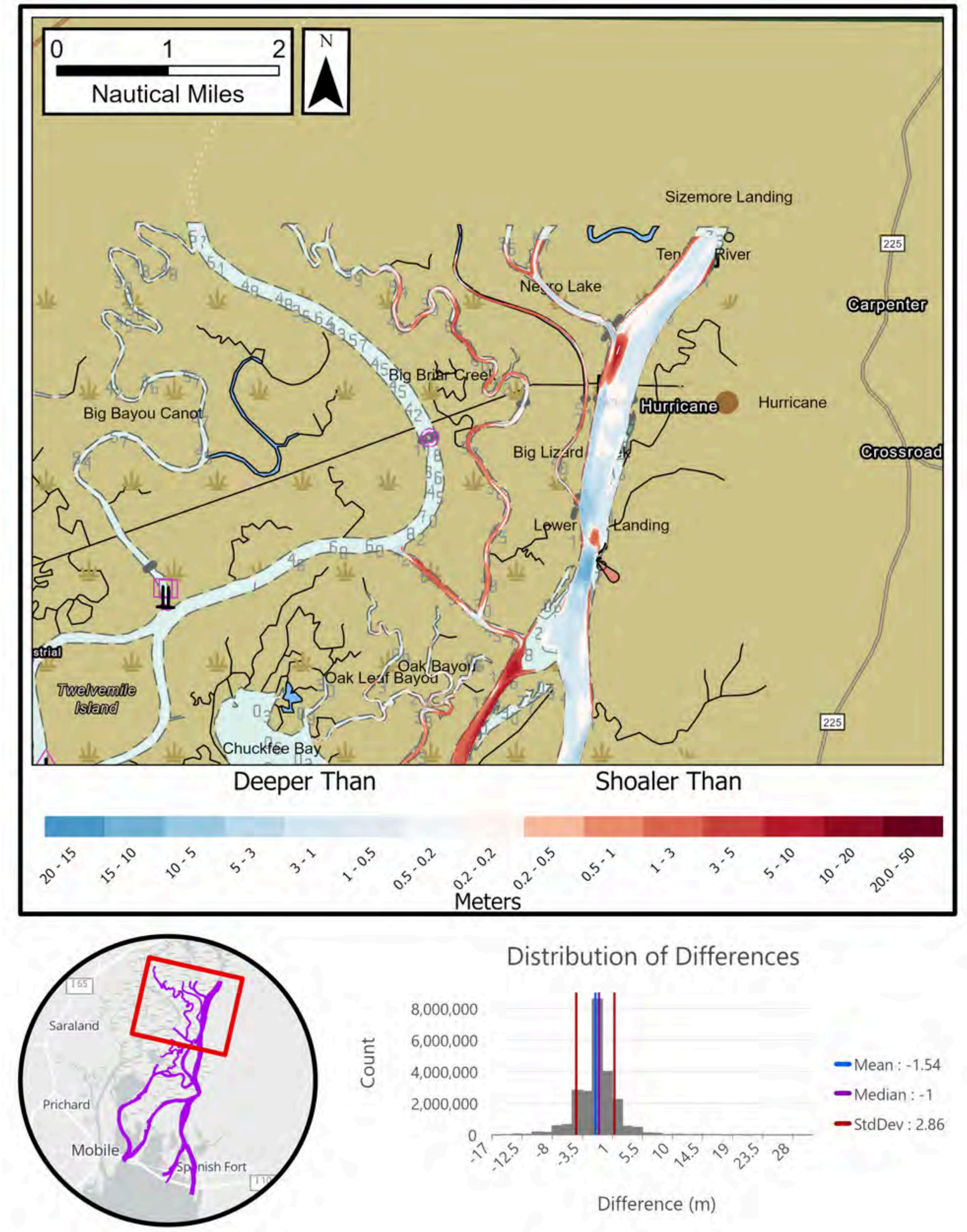


Figure 12: Depth Difference Between H13835 (North) and Band 4 ENCs

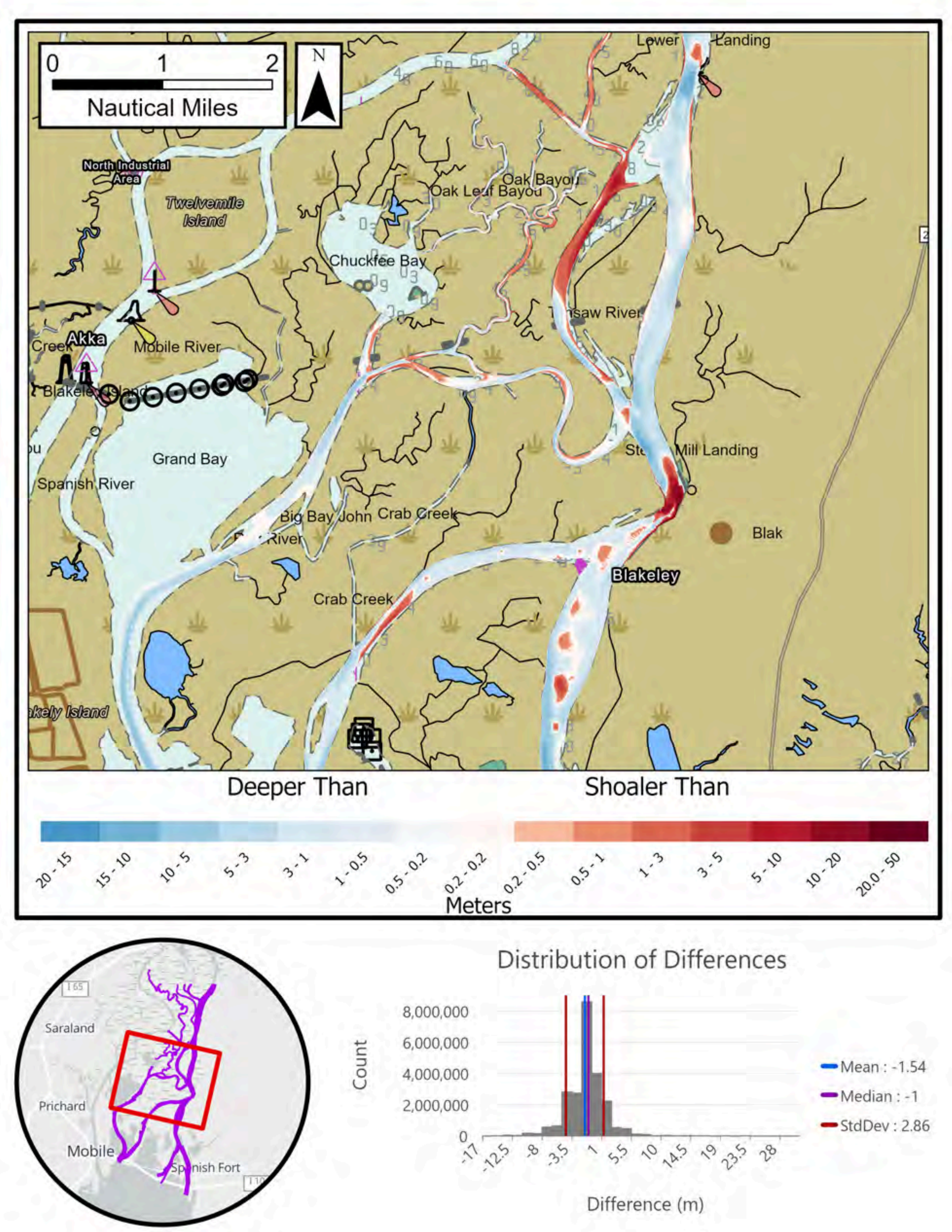


Figure 13: Depth Difference Between H13835 (Central) and Band 4 ENCs

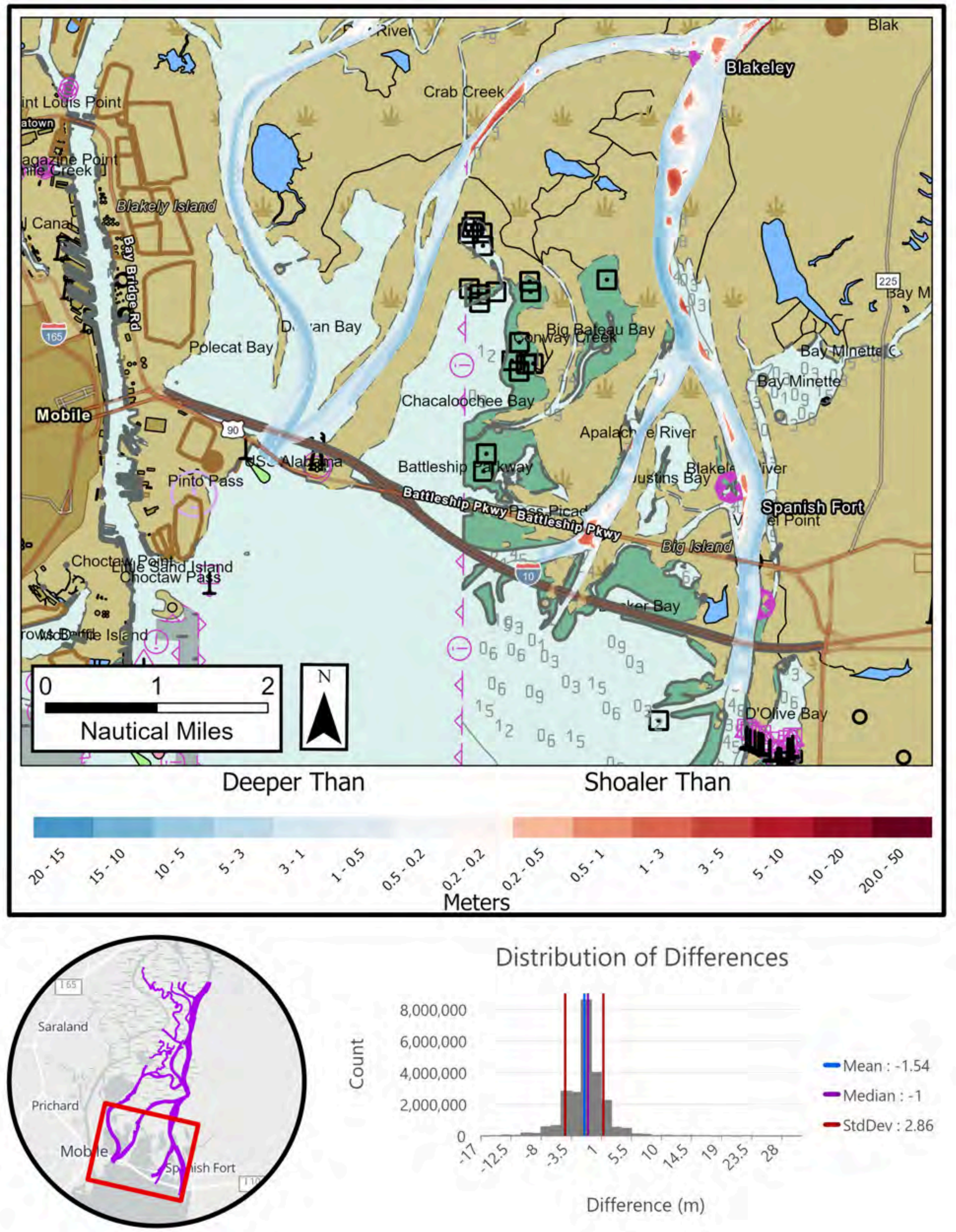


Figure 14: Depth Difference Between H13835 (South) and Band 4 ENCs

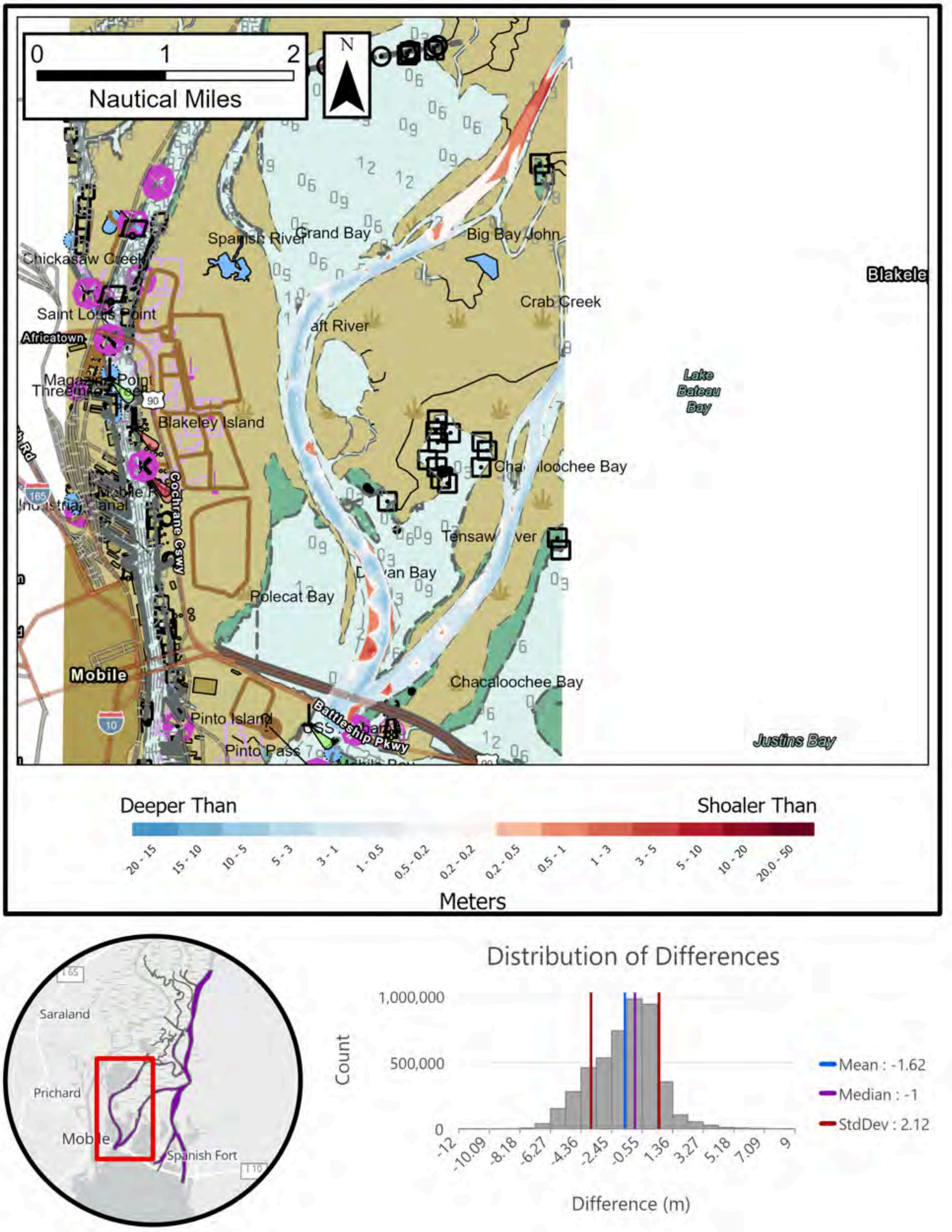


Figure 15: Depth Difference Between H13835 and Band 5 ENCs

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
US4AL1DB	1:40000	1	11/08/2023	11/08/2023
US4AL1DC	1:40000	1	11/08/2023	11/08/2023
US5MOBIF	1:10000	2	05/08/2024	05/08/2024
US5MOBJF	1:10000	2	05/08/2024	05/08/2024

Table 14: Largest Scale ENCs

D.1.2 Shoal and Hazardous Features

Two Danger to Navigation (DtoN) reports were submitted for this survey.

-H13835 DtoN 01, submitted November 10, 2023, reported an uncharted obstruction in the Apalachee River.
-H13835 DtoN 02, submitted November 10, 2023, reported an uncharted obstruction in the Raft River.

The hydrographer recommends updating the charts to depict the DtoNs as portrayed in the FFF.

Shoaling was observed in multiple locations in H13835. In the following three figures, charted soundings are shown in deep red (large sounding size) and surveyed soundings are shown in black (small sounding size). Areas where surveyed soundings are shoaler than charted are shaded in reds and areas where surveyed soundings are deeper than charted are shaded in blues.

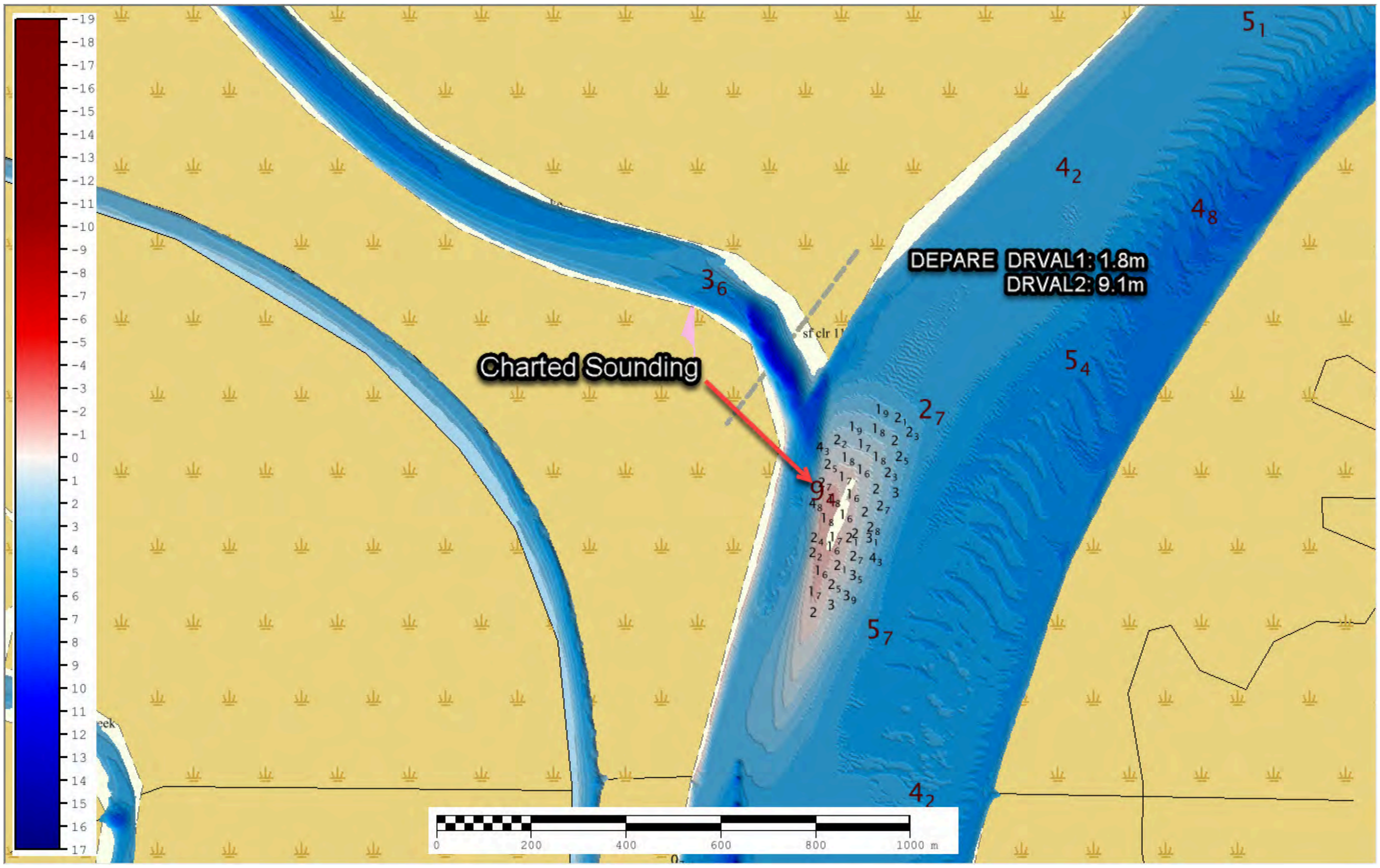


Figure 16: Shoaling observed at the confluence of Negro Lake and the Tensaw River. Surveyed depths approximately 7.8 meters shoaler than charted.

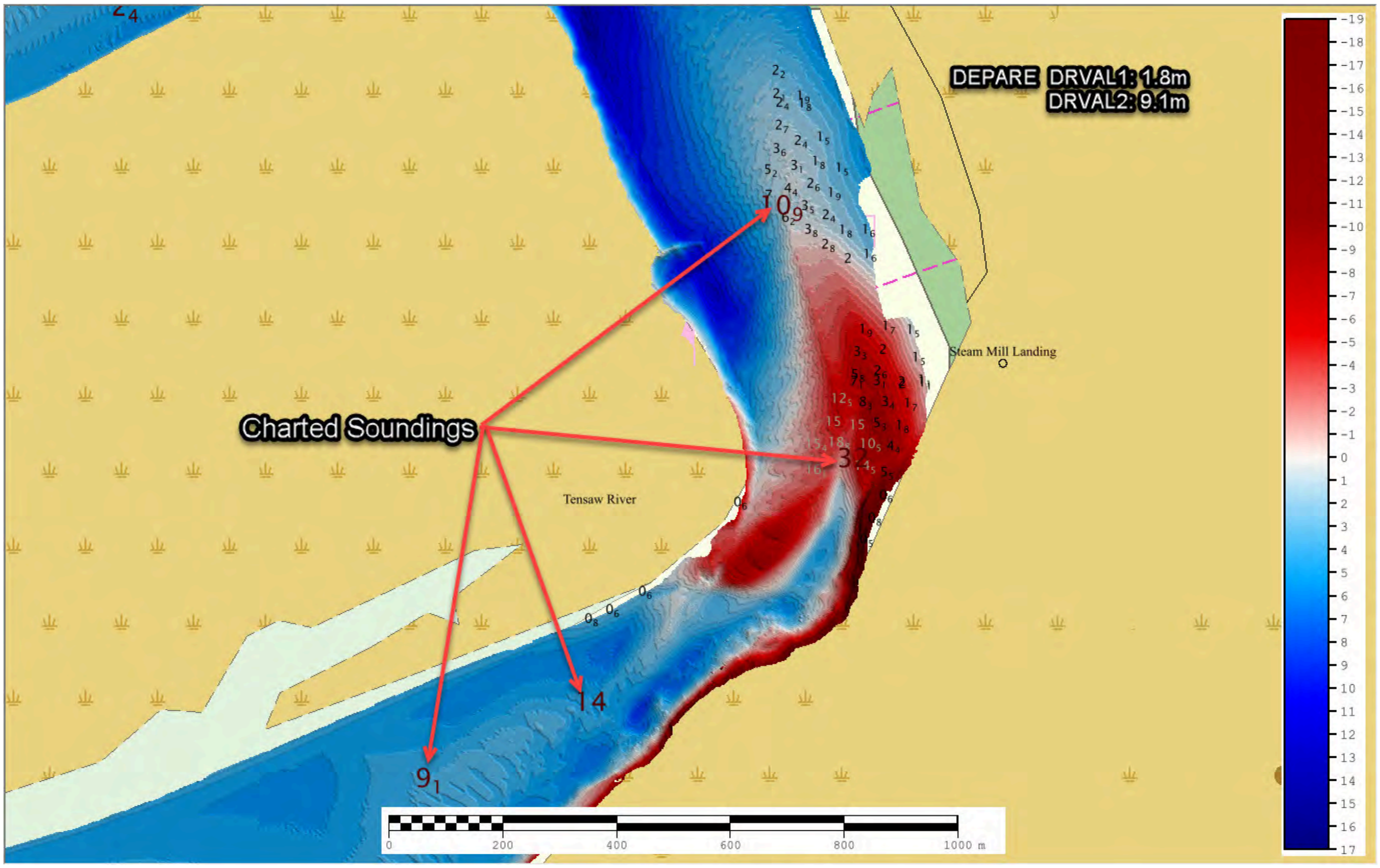


Figure 17: Shoaling observed in the vicinity of Steam Mill Landing.
Surveyed depths approximately 30 meters shoaler than charted.

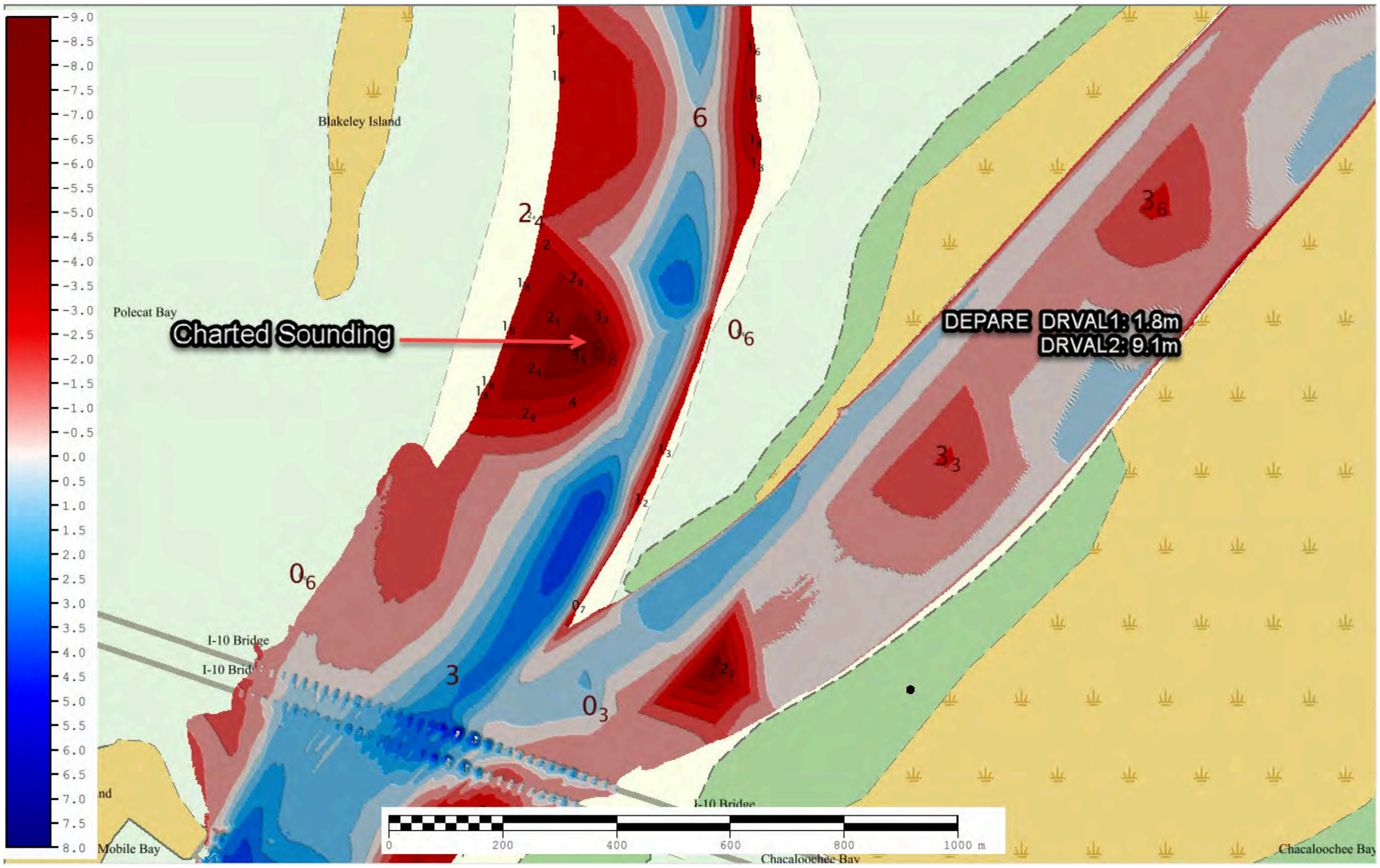


Figure 18: Shoaling observed east of Blakeley Island.
Surveyed depths approximately 6 meters shoaler than charted.

D.1.3 Charted Features

All assigned features included in the project Composite Source File (CSF) are included in the FFF with remarks and recommendations. Some assigned features located inshore of the NALL, or that could not be fully disproved because of their proximity to the NALL, were not addressed by the survey.

All disproved features have been included in the FFF with a description of "Delete." All new features have been included in the FFF with the surveyed feature depicted and a description of "New." Charted features that have had an attribute updated but position retained have been included in the FFF with a description of "Update."

D.1.4 Uncharted Features

All uncharted features are portrayed in the FFF as surveyed and attributed with the description of "New." Refer to the FFF for additional information.

The river banks within the survey area were vegetated with baring trees, submerged trees and stumps, and other brush which created hazardous conditions during survey operations and complicated MBES data processing and feature portrayal. Due to these issues, some features along the shoreline were not investigated with a perpendicular pass. In many of the areas the field party was unable to determine the least depth of submerged features or survey to the 2-meter inshore limit.

Foul areas have been used in the FFF to define expanses of river banks with a mix of baring and submerged trees, or other areas where the field party was unable to determine the least depth of features within the area. Foul ground areas were used to define the surveyed least depth of navigable areas containing submerged vegetation or stumps.

Isolated baring trees that were surveyed in the channel of the river have been depicted in the FFF as VEGATN point features. Because isolated VEGATN features do not have visible symbology, OBSTRN features have been collocated with each VEGATN feature.

The H13835_Notes_for_Reviewer.hob file submitted with the survey deliverables includes additional details to help processing branch staff interpret and review the FFF.

Hydrographic Survey Division and Atlantic Hydrographic Branch staff were consulted about these issues through email and via web meetings. Copies of email correspondence are included in Appendix II.

D.1.5 Channels

No channels exist within the survey limits.

D.2 Additional Results

D.2.1 Aids to Navigation

One Aid to Navigation (AtoN), Lower Hall Landing Dock Light, charted within the survey area was not observed visually. The AtoN was reported to the USCG as missing using the Navigation Center Online Discrepancy Report Form. A copy of the discrepancy report is included in Appendix II.

D.2.2 Maritime Boundary Points

No maritime boundary points were assigned for this survey.

D.2.3 Bottom Samples

No bottom samples were required for this survey.

D.2.4 Overhead Features

The ENC covering the survey area includes the Interstate 10 bridges over the Apalachee River, the Apalachee River Crossing, and the Blakeley River Crossing; the Interstate 65 bridges over the Tensaw River, Big Briar Creek, and Big Lizard Creek; and the Highway 90/98 bridge (Admiral Raphael Semmes Bridge) over the Tensaw River, Polecat Bay, and Blakeley River. Charted vertical and horizontal clearances for the Highway 90/98 bridge were not obtained or verified as part of this survey. There are no charted clearances for the I-10 or I-65 bridges. The bridges were all visually confirmed as required by investigation requirements in the OPR-J325-KR-23 CSF.

There are also several overhead cables and powerlines charted in the ENC. The overhead cable charted northwest of the Hurricane Train bridge and the overhead cable at the mouth of Big Lizard Creek were not observed during survey operations.

D.2.5 Submarine Features

The FFF includes two unburied and uncharted cables that were identified within the survey area. One just south of the HW 98 bridge over Blakeley River. A CABLE sign was observed on the north side of the HW 98 bridge during survey operations. The second was observed south of the CSX Transportation Railroad Bridge over the Tensaw River. Both cables were reported to HSD via email and forwarded to the Central Gulf Coast Navigation Manager.

The FFF also includes sections of an unburied pipeline (pipeline ID 301-8-L) that were identified within the survey area in Big Lizard Creek and the Tensaw River and reported to the Alabama Public Service Commission, Gas Pipeline Safety Section.

Correspondence related to the reporting of the cables and pipelines is included in Appendix II.

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

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.

Report Name	Report Date Sent
Data Acquisition and Processing Report	2024-05-01

Approver Name	Approver Title	Approval Date	Signature
Jonathan L. Dasler, PE, PLS, CH	NSPS-THSOA Certified Hydrographer, Chief of Party	08/14/2024	Digitally signed by Jonathan L. Dasler, PE, PLS, CH Date: 2024.08.14 09:11:12 -07'00'
Jason Creech, CH	NSPS-THSOA Certified Hydrographer, Charting Manager / Project Manager	08/14/2024	Digitally signed by Jason Creech, CH Date: 2024.08.14 09:11:32 -07'00'
James Guilford, CH(A)	NSPS-THSOA Certified Hydrographer, Lead Hydrographer	08/14/2024	Digitally signed by James Guilford Date: 2024.08.14 09:11:52 -07'00'
Jason Dorfman, CH	NSPS-THSOA Certified Hydrographer, Lead Hydrographer	08/14/2024	Digitally signed by Jason Dorfman Date: 2024.08.14 09:12:18 -07'00'
Sam Werner	Data Processing Manager	08/14/2024	Digitally signed by Sam Werner Date: 2024.08.14 09:12:57 -07'00'

F. Table of Acronyms

Acronym	Definition
AHB	Atlantic Hydrographic Branch
AST	Assistant Survey Technician
ATON	Aid to Navigation
AWOIS	Automated Wreck and Obstruction Information System
BAG	Bathymetric Attributed Grid
BASE	Bathymetry Associated with Statistical Error
CO	Commanding Officer
CO-OPS	Center for Operational Products and Services
CORS	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