H13488

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

# DESCRIPTIVE REPORT

| | |
|---|---|
| Type of Survey: | Navigable Area |
| Registry Number: | H13488 |

## LOCALITY

| | |
|---|---|
| State(s): | Mississippi |
| General Locality: | Approaches to Pascagoula, Louisiana, Mississippi, and Alabama |
| Sub-locality: | Horn Island Pass and Approach |

**2021**

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

LIBRARY & ARCHIVES

Date:

| U.S. DEPARTMENT OF COMMERCE<br>NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION | REGISTRY NUMBER: |
|---|---|
| **HYDROGRAPHIC TITLE SHEET** | **H13488** |

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): | **Mississippi** |
| General Locality: | **Approaches to Pascagoula, Louisiana, Mississippi, and Alabama** |
| Sub-Locality: | **Horn Island Pass and Approach** |
| Scale: | **10000** |
| Dates of Survey: | **07/20/2021 to 10/13/2021** |
| Instructions Dated: | **04/27/2021** |
| Project Number: | **OPR-J315-KR-21** |
| 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.***

# Table of Contents

# List of Tables



# List of Figures

# Descriptive Report to Accompany Survey H13488

Project: OPR-J315-KR-21

Locality: Approaches to Pascagoula, Louisiana, Mississippi, and Alabama

Sublocality: Horn Island Pass and Approach

Scale: 1:10000

July 2021 - October 2021

**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 Mississippi. Survey H13488 was conducted in accordance with the Statement of Work and Hydrographic Survey Project Instructions dated April 27, 2021.

The Hydrographic Survey Project Instructions reference the National Ocean Service (NOS) Hydrographic Surveys Specifications and Deliverables Manual (HSSD) (April 2021) as the technical requirements for this project.

## A.1 Survey Limits

Data were acquired within the following survey limits:

| Northwest Limit | Southeast Limit |
|---|---|
| 30° 12' 13.36" N<br>88° 36' 25.73" W | 30° 4' 34.36" N<br>88° 17' 26.75" 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.

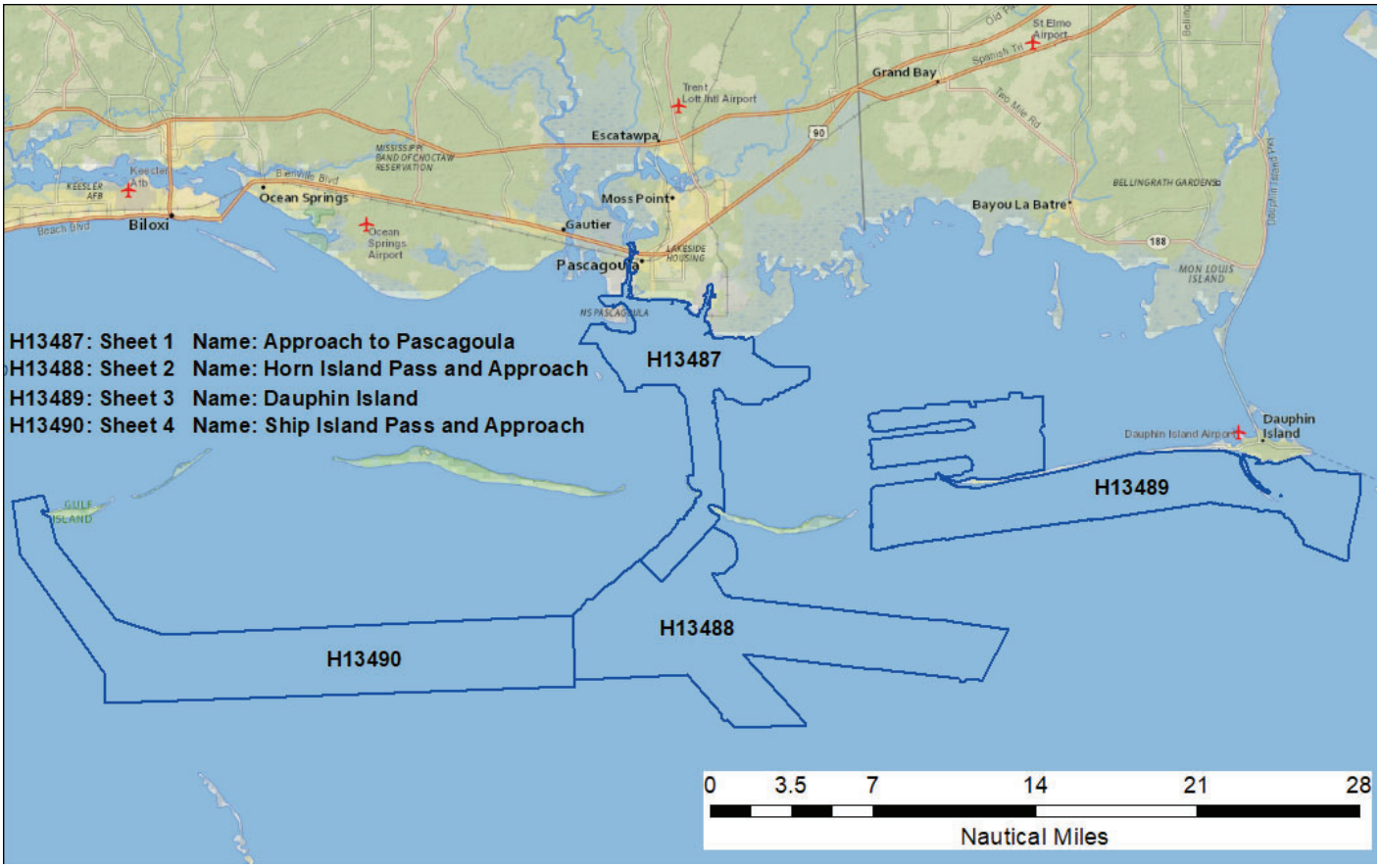



*Figure 1: OPR-J315-KR-21 Assigned Survey Areas*

## A.2 Survey Purpose

The purpose of this survey, defined in the Project Instructions, is as follows: “The Port of Pascagoula, Mississippi is ranked as the 25th busiest by total tons of commerce in the US (1). This proposed survey area covers approximately 189 square nautical miles of the approaches to Pascagoula and Gulfport as well as sections of the Intercoastal Waterway (ICW) between Louisiana and Alabama. The region has been affected by several recent hurricanes so it is expected that modern hydrographic techniques will find significant changes to the seabed since the most recent surveys. Survey data from this project are intended to supersede all prior survey data in the common area."

(1) The U.S. Coastal and Inland Navigation System 2019 Transportation Facts & Information, Navigation and Civil Works Decision Support Center, USACE

## 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 | Acquire backscatter data during all multibeam data acquisition (Refer to HSSD Section 6.2). |
| All waters in survey area | Complete Coverage (Refer to HSSD Section 5.2.2.3). |

*Table 2: Survey Coverage*

Complete Coverage was obtained over the survey area in depths greater than 3.5 meters relative to chart datum using 100% multibeam echosounder (MBES) and backscatter. This coverage type follows Option A of the Complete Coverage requirement specified in Section 5.2.2.3 of the 2021 HSSD.

Figure 2 depicts the H13488 survey outline.

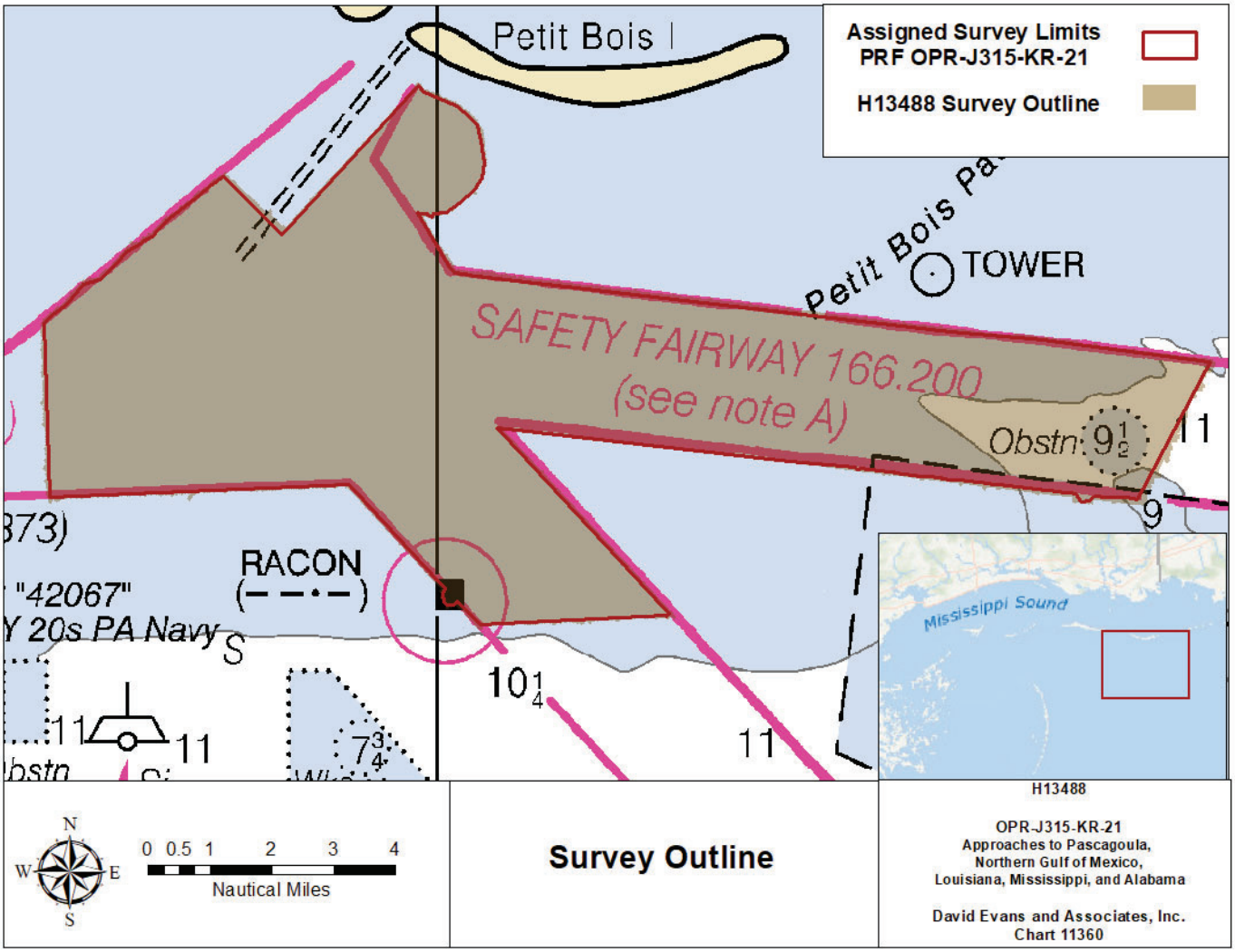



*Figure 2: H13488 Survey Outline*

## A.6 Survey Statistics

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

| | HULL ID | *S/V Blake* | *Total* |
|---|---|---|---|
| **LNM** | **SBES Mainscheme** | 0 | 0 |
| | **MBES Mainscheme** | 1879.01 | 1879.01 |
| | **Lidar Mainscheme** | 0 | 0 |
| | **SSS Mainscheme** | 0 | 0 |
| | **SBES/SSS Mainscheme** | 0 | 0 |
| | **MBES/SSS Mainscheme** | 0 | 0 |
| | **SBES/MBES Crosslines** | 90.38 | 90.38 |
| | **Lidar Crosslines** | 0 | 0 |
| **Number of Bottom Samples** | | | 16 |
| **Number Maritime Boundary Points Investigated** | | | 0 |
| **Number of DPs** | | | 0 |
| **Number of Items Investigated by Dive Ops** | | | 0 |
| **Total SNM** | | | 52.32 |

*Table 3: Hydrographic Survey Statistics*

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

| Survey Dates | Day of the Year |
|---|---|
| 07/20/2021 | 201 |

| Survey Dates | Day of the Year |
|---|---|
| 07/21/2021 | 202 |
| 07/22/2021 | 203 |
| 07/25/2021 | 206 |
| 07/26/2021 | 207 |
| 07/27/2021 | 208 |
| 07/28/2021 | 209 |
| 07/29/2021 | 210 |
| 08/03/2021 | 215 |
| 08/04/2021 | 216 |
| 08/05/2021 | 217 |
| 08/06/2021 | 218 |
| 08/07/2021 | 219 |
| 08/08/2021 | 220 |
| 08/09/2021 | 221 |
| 08/11/2021 | 223 |
| 08/12/2021 | 224 |
| 08/13/2021 | 225 |
| 08/15/2021 | 227 |
| 10/06/2021 | 279 |
| 10/13/2021 | 286 |

*Table 4: Dates of Hydrography*

# B. Data Acquisition and Processing

## B.1 Equipment and Vessels

The OPR-J315-KR-21 Data Acquisition and Processing Report (DAPR), submitted with this survey, details equipment and vessel information as well as data acquisition and processing procedures. There were no vessel or equipment configurations used during data acquisition that deviated from those described in the DAPR.

The S/V Blake is an 82-foot aluminum catamaran with a 27-foot beam and a draft of 4.5 feet (Figure 3).

### B.1.1 Vessels

The following vessels were used for data acquisition during this survey:

| Hull ID | *S/V Blake* |
|---|---|
| **LOA** | 82 feet |
| **Draft** | 4.5 feet |

*Table 5: Vessels Used*


*Figure 3: S/V Blake*

### 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 | MicroX SV | Sound Speed System |
| AML Oceanographic | MVP30-350 | Sound Speed System |

*Table 6: Major Systems Used*

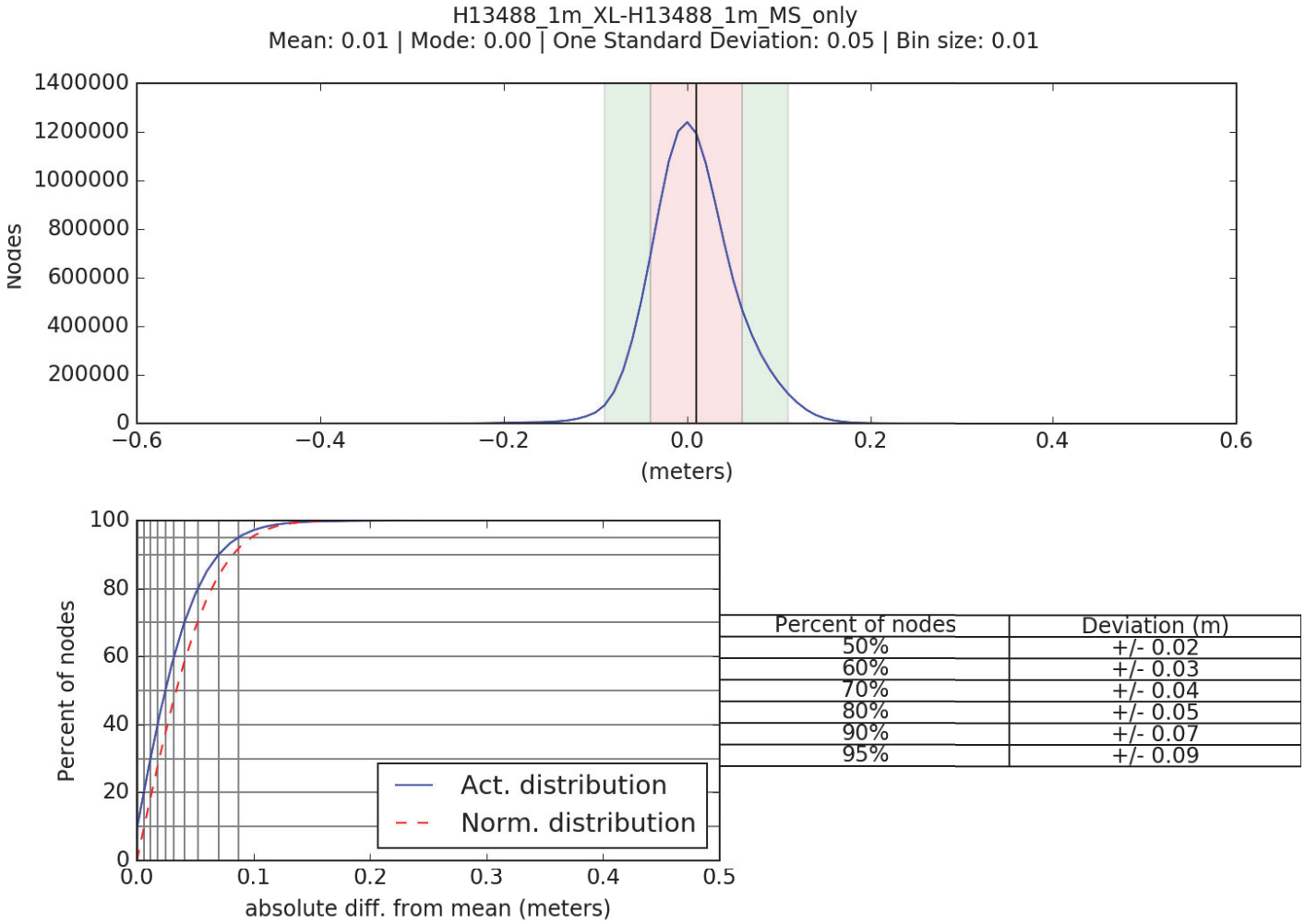
## B.2 Quality Control

### B.2.1 Crosslines

Multibeam crosslines were run across 4.81% 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 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 Combined Uncertainty and Bathymetry Estimator (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% | +/- 0.07 |
| 95% | +/- 0.09 |

*Figure 4: H13488 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 | 0.152 meters |

*Table 7: Survey Specific Tide TPU Values.*

| Hull ID | Measured - CTD | Measured - MVP | Measured - XBT | Surface |
|---|---|---|---|---|
| S/V Blake | n/a meters/second | 1.0 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. The S/V Blake used an AML MVP30-350 with integrated Micro SVP&T to acquire sound speed measurements. The measurement uncertainty for these sensors is listed in the Moving Vessel Profiler (MVP) column in Table 8.

During surface finalization in HIPS, the "Greater of the two values" option was selected, where the calculated uncertainty from Total Propagated Uncertainty (TPU) is compared to the standard deviation of the soundings influencing the node, and where the greater value is assigned as the final uncertainty of the node. The uncertainty of the finalized surfaces increased for nodes that had a standard deviation greater than TPU.

To determine if the surface grid nodes met International Hydrographic Organization (IHO) Order 1a specification, a ratio of the final node uncertainty to the allowable uncertainty at that depth was determined. 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 surfaces are shown in Figures 5 and 6.

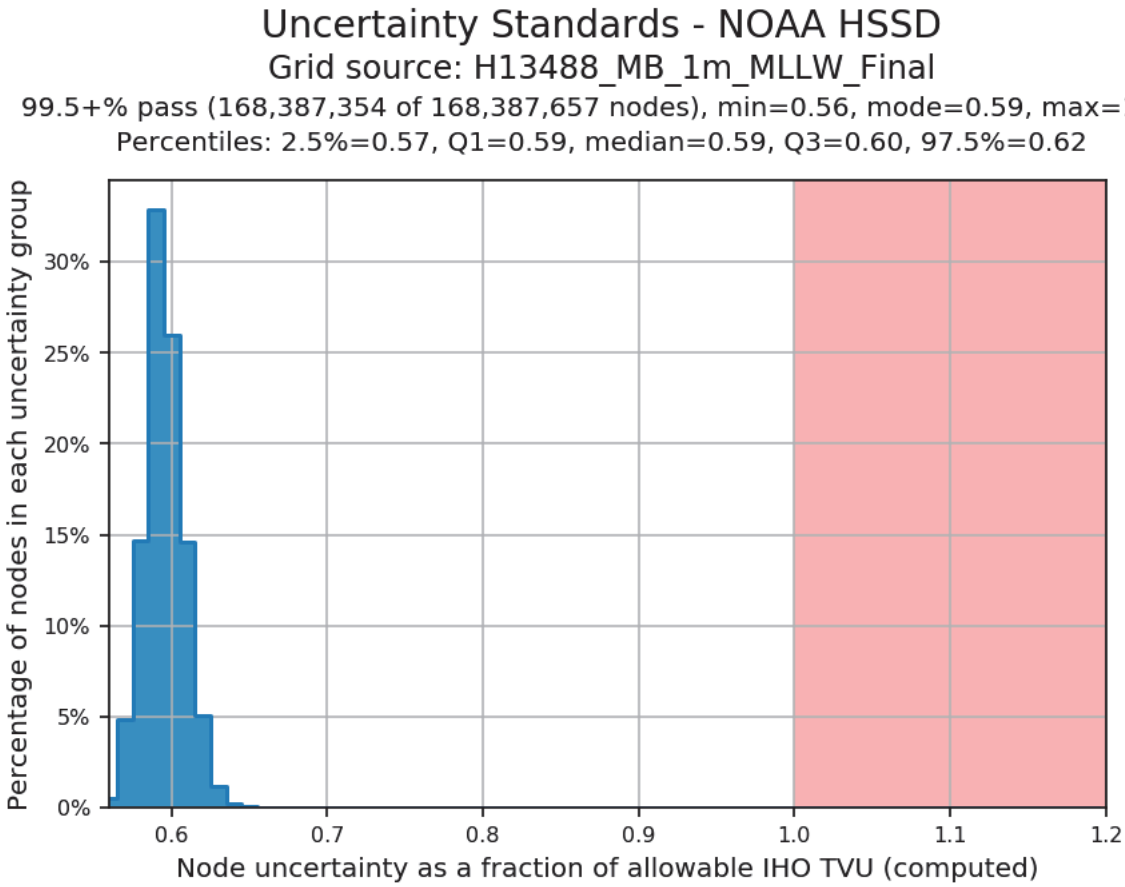



*Figure 5: Node TVU Statistics - 1 meter, Finalized*

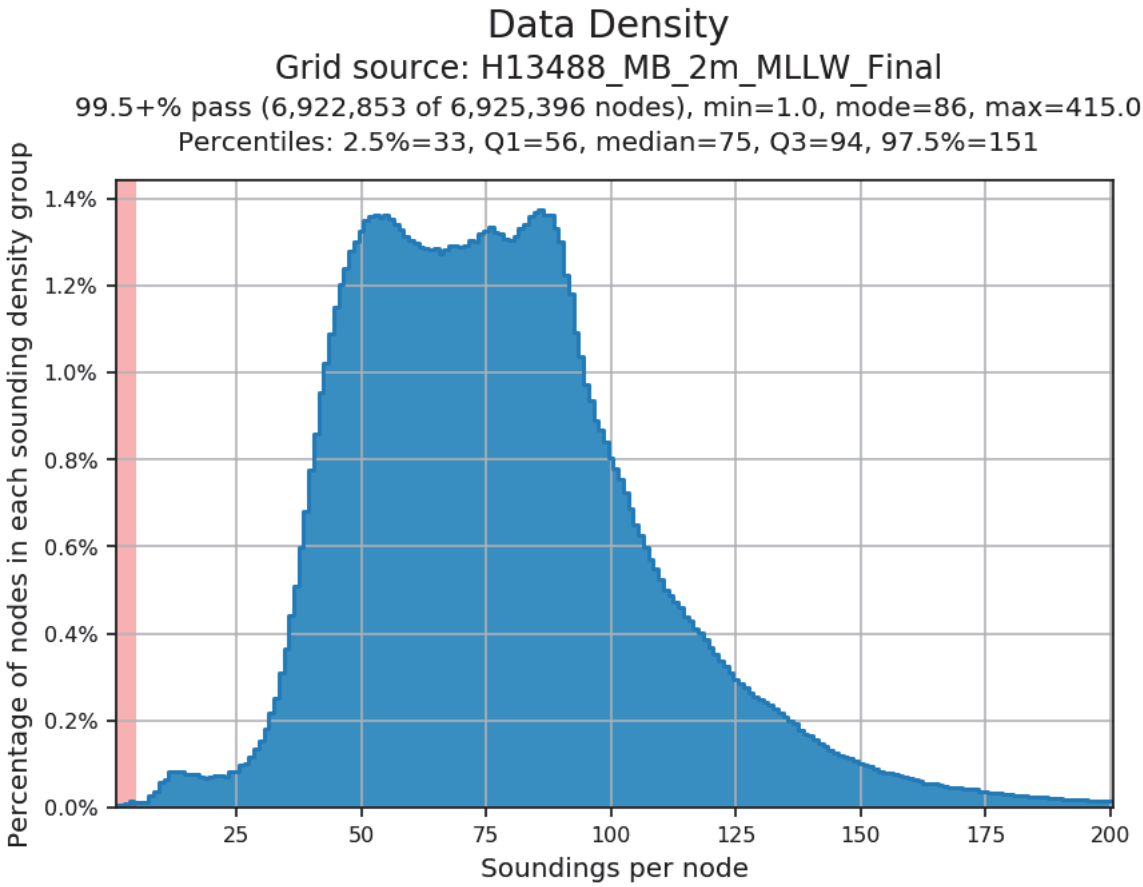



*Figure 6: Node TVU Statistics - 2 meter, Finalized*

### B.2.3 Junctions

Survey H13488 junctions with current surveys H13487 and H13490, and prior contemporary surveys H12356, H13065, and H13066. Figure 7 depicts H13488 and the junctioning surveys.

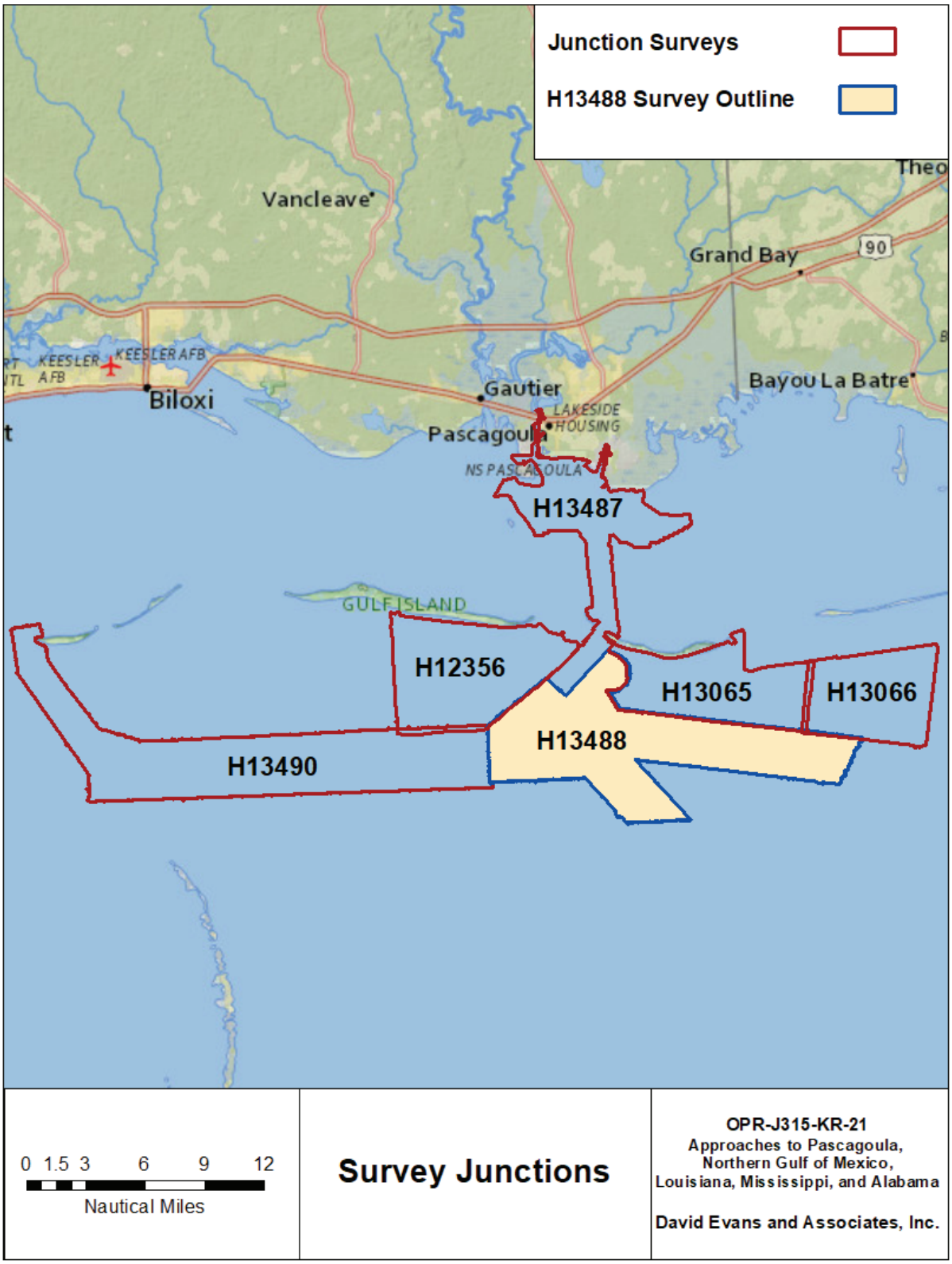



*Figure 7: Survey Junctions with Registry Number H13488*

The following junctions were made with this survey:

| Registry Number | Scale | Year | Field Unit | Relative Location |
|---|---|---|---|---|
| H13487 | 1:10000 | 2021 | David Evans and Associates, Inc. | N |
| H13490 | 1:20000 | 2021 | David Evans and Associates, Inc. | W |
| H12356 | 1:20000 | 2011 | David Evans and Associates, Inc. | N |
| H13065 | 1:20000 | 2017 | David Evans and Associates, Inc. | N |
| H13066 | 1:20000 | 2017 | David Evans and Associates, Inc. | N |

*Table 9: Junctioning Surveys*

H13487

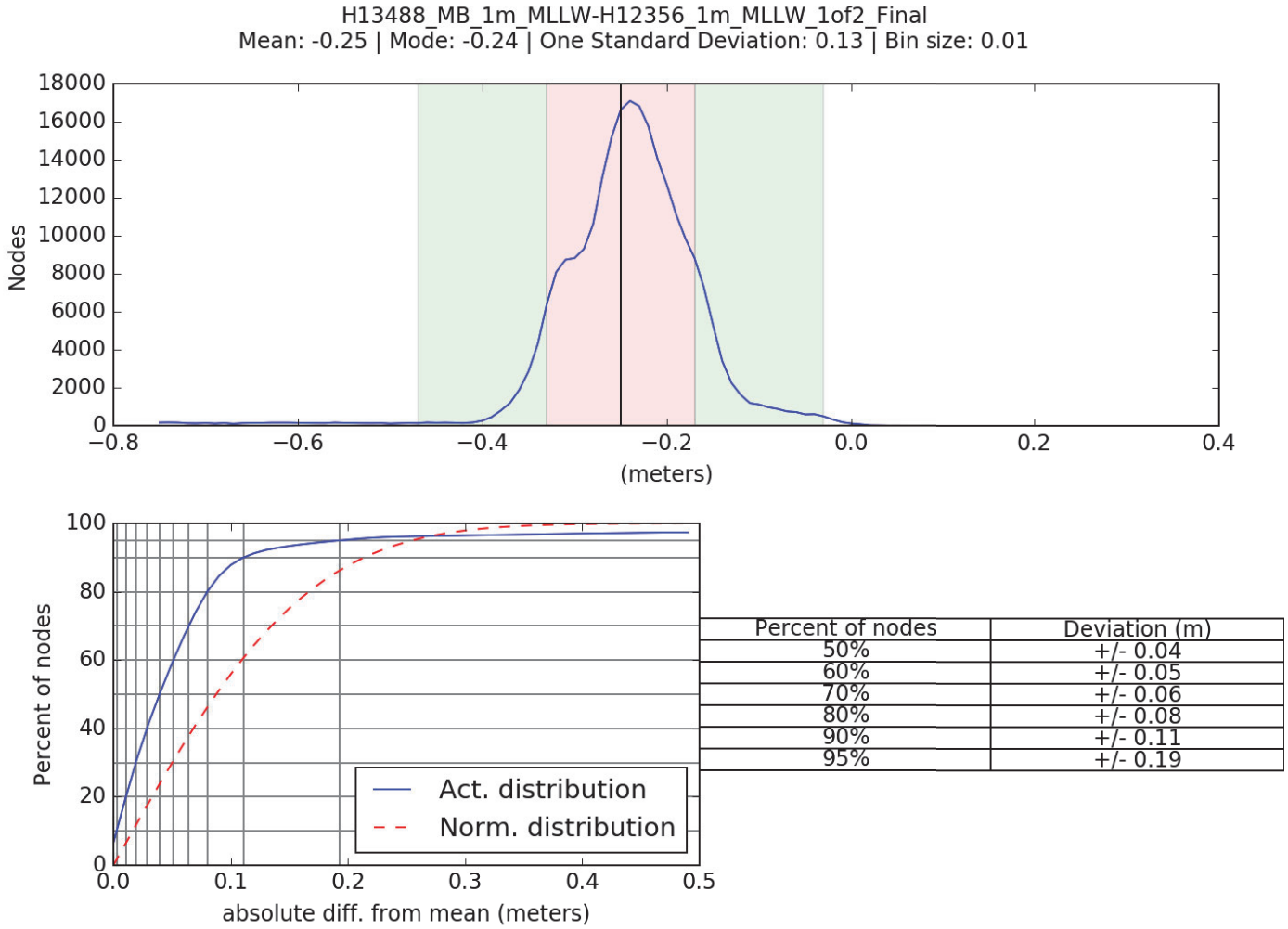
At the time of writing, data from survey H13487 was still being processed. The Descriptive Report for H13487 will include the junction analysis with H13488.

H13490

At the time of writing, data from survey H13490 was still being processed. The Descriptive Report for H13490 will include the junction analysis with H13488.

H12356

The mean difference between H13488 and H12356 survey depths is 25 centimeters (H13488 deeper than H12356), shown in Figure 8. GPS Tides computed for prior survey H12356 used a VDatum-based Mean Lower Low Water (MLLW) separation model that has a mean separation difference of 10 centimeters over the area of junction overlap. Removing the model differences from the analysis would improve the junction comparison between surveys H12356 and H13488 to 15 centimeters. In addition, GPS Tides for survey H12356 were computed from a post-processed single base navigation solution where survey H13488 was post-processed using Real Time Extended (RTX) methods. Single base processing relied on Global Navigation Satellite System (GNSS) data from a temporary base station (HORN) installed on Horn Island in support of the prior survey.

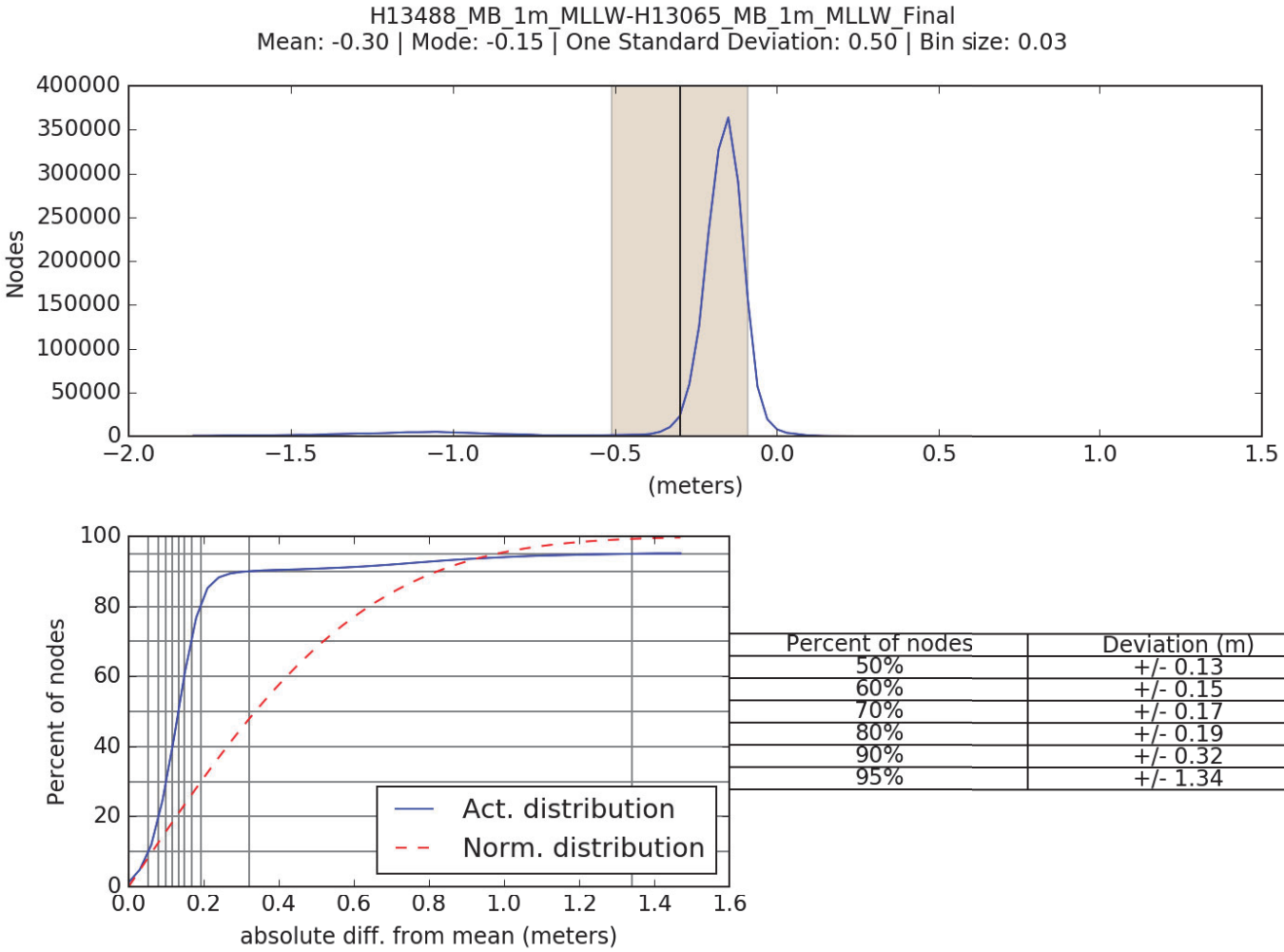



| Percent of nodes | Deviation (m) |
|---|---|
| 50% | +/- 0.04 |
| 60% | +/- 0.05 |
| 70% | +/- 0.06 |
| 80% | +/- 0.08 |
| 90% | +/- 0.11 |
| 95% | +/- 0.19 |

*Figure 8: Distribution Summary Plot of Survey H13488 1-meter vs H12356 1-meter*

H13065

The mean difference between H13488 and H13065 survey depths is 30 centimeters (H13488 deeper than H13065), shown in Figure 9. The area of junction overlap between the survey includes a large area of sand waves, which also encompasses several Outer Continental Shelf borrow sites. Restricting the junction analysis to the western side of the survey area, away from the sediment borrow sites, results in a mean difference of 14 centimeters. See Section D.2.9 for additional discussion on the Outer Continental Shelf Borrow Sites. Survey H13488 was reduced to MLLW using Tidal Constituent and Residual Interpolation (TCARI), incorporating water levels from National Water Level Observation Network (NWLON) stations at Dauphin Island, Alabama (8735180), Pascagoula NOAA Lab, Mississippi (8741533), and Bay Waveland (8747437).

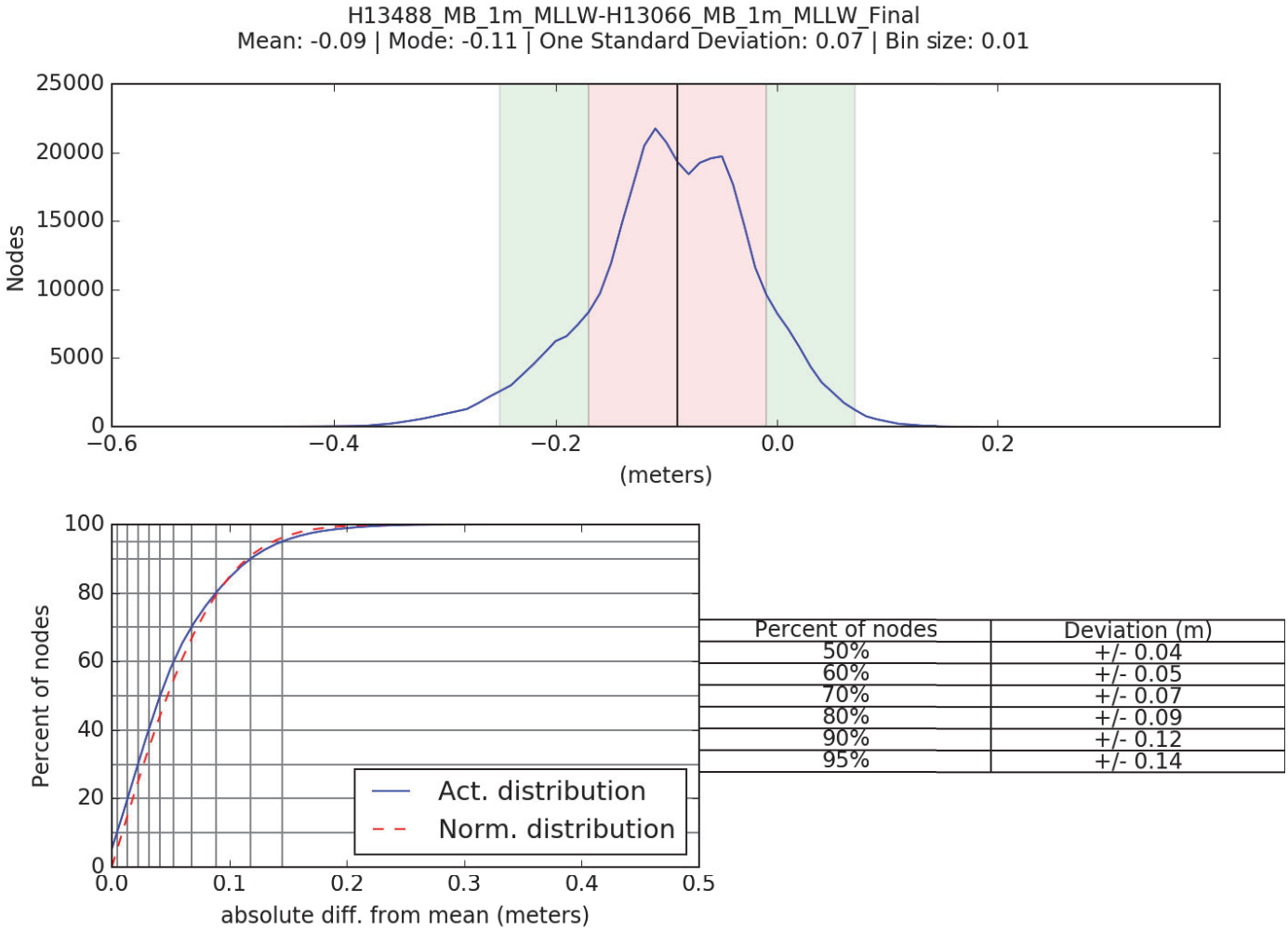



| Percent of nodes | Deviation (m) |
|---|---|
| 50% | +/- 0.13 |
| 60% | +/- 0.15 |
| 70% | +/- 0.17 |
| 80% | +/- 0.19 |
| 90% | +/- 0.32 |
| 95% | +/- 1.34 |

*Figure 9: Distribution Summary Plot of Survey H13488 1-meter vs H13065 1-meter*

H13066

The mean difference between H13488 and H13066 survey depths is 9 centimeters (H13488 deeper than H13066), shown in Figure 10.




| Percent of nodes | Deviation (m) |
|---|---|
| 50% | +/- 0.04 |
| 60% | +/- 0.05 |
| 70% | +/- 0.07 |
| 80% | +/- 0.09 |
| 90% | +/- 0.12 |
| 95% | +/- 0.14 |

*Figure 10: Distribution Summary Plot of Survey H13488 1-meter vs H13066 1-meter*

### B.2.4 Sonar QC Checks

Quality control is discussed in detail in Section B of the DAPR.

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

Real-Time Heave

The following lines were processed with real-time heave due to logging errors during acquisition that resulted in no delayed heave file being recorded:
2021BL2200010
2021BL2200019
2021BL2200027
2021BL2200033

### 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: Approximately 20-minute intervals

For H13488 survey operations, casts were distributed both temporally and spatially based on observed changes in sound speed profiles. Sound speed readings were applied in CARIS HIPS using the nearest in distance within a two-hour interval.

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

During H13488 survey operations, the S/V Blake occasionally acquired the first cast of the day after starting multibeam data acquisition. In all cases, the first cast of the day was acquired within five minutes of the first sonar ping of the day. This issue occurred on the following days:
July 22, 2021 (DN203)
July 26, 2021 (DN207)
July 27, 2021 (DN208)
July 28, 2021 (DN209)
July 29, 2021 (DN210)
August 7, 2021 (DN219)

### B.2.8 Coverage Equipment and Methods

Survey speeds were maintained to meet or exceed along-track sounding density requirements.

Multibeam data were thoroughly reviewed for holidays and areas of poor-quality coverage due to biomass, vessel wakes, or other factors.

### 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. Individual surface results are stated in Figures 11 and 12.

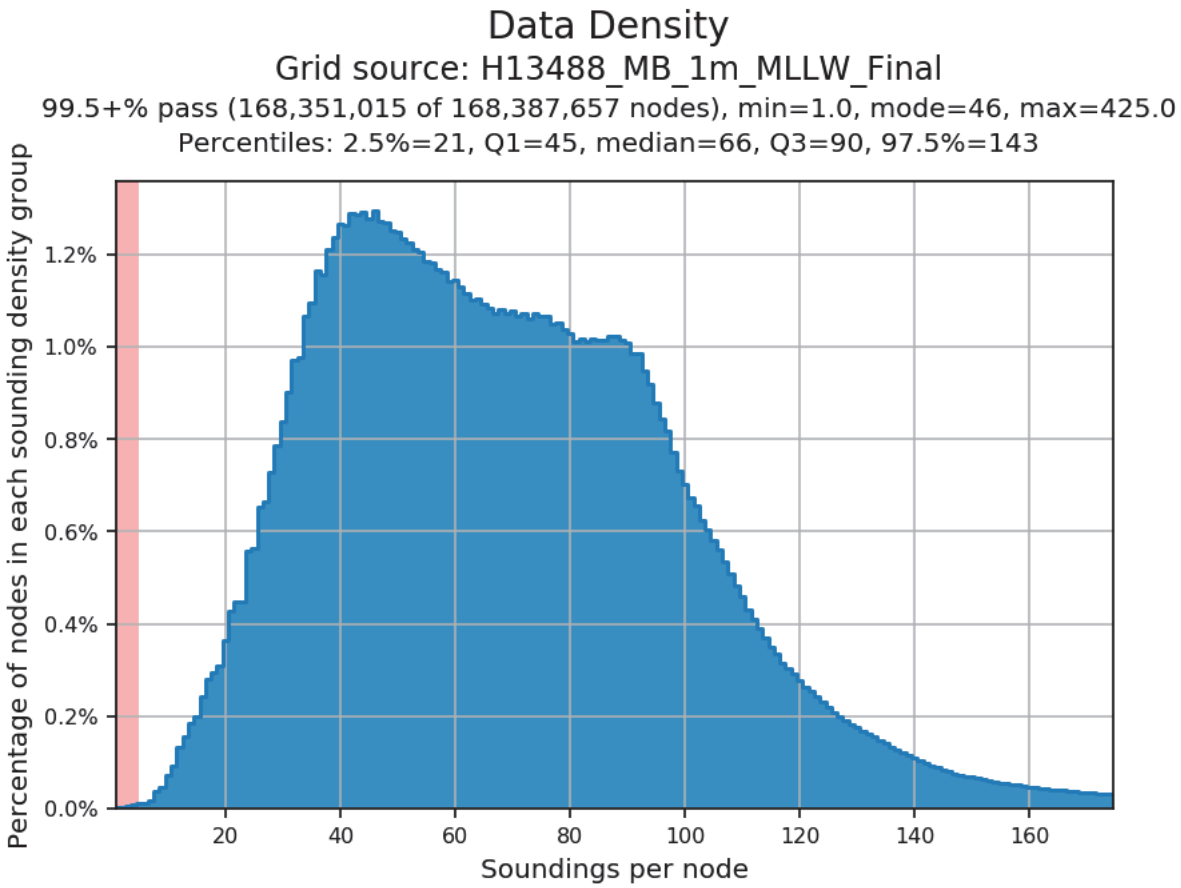



*Figure 11: Node Density Statistics - 1 meters, Finalized*

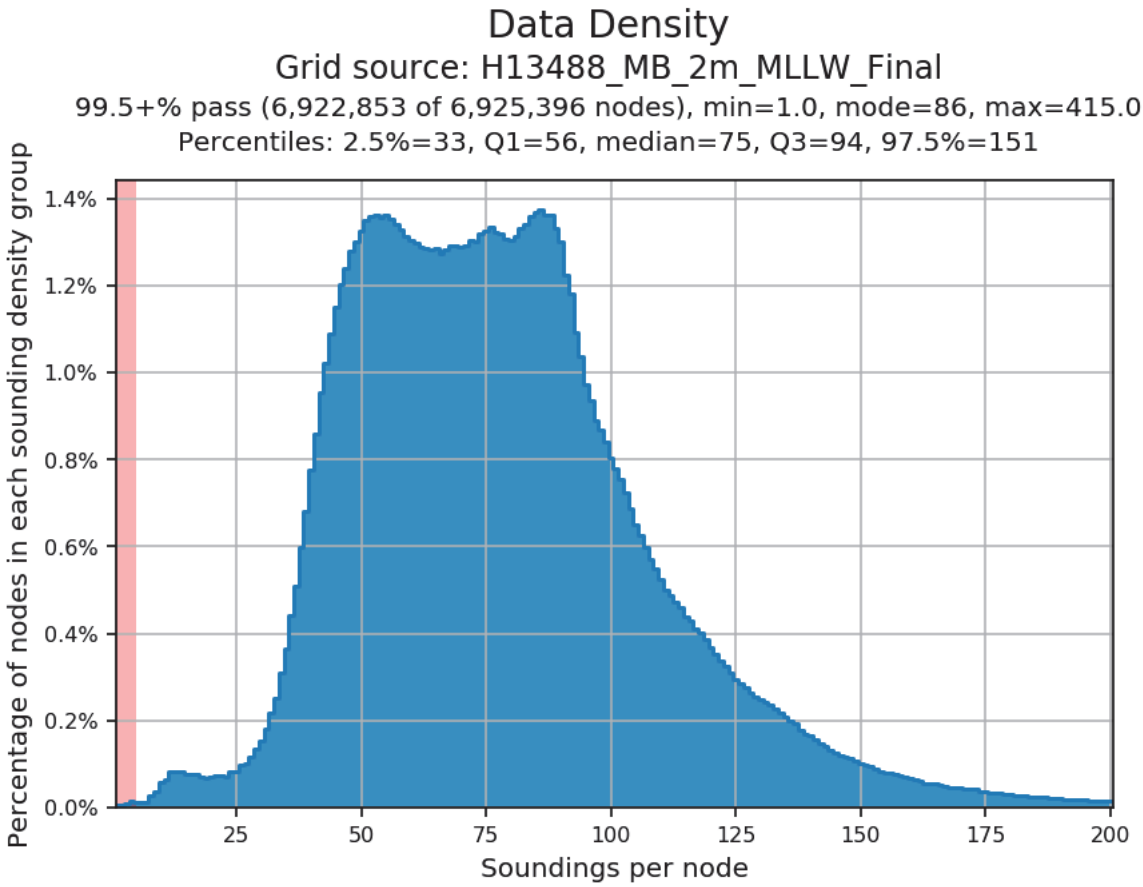



*Figure 12: Node Density Statistics - 2 meters, Finalized*

## B.3 Echo Sounding Corrections

### B.3.1 Corrections to Echo Soundings

Data reduction procedures for survey H13488 are detailed in the DAPR.

### B.3.2 Calibrations

All sounding systems were calibrated as detailed in the DAPR.

## B.4 Backscatter

Multibeam backscatter was logged in HYPACK 7K format and included with the H13488 digital deliverables. Data were processed periodically in CARIS HIPS to evaluate backscatter quality, but the processed data is not included with the deliverables. For data management purposes, the names of multibeam crosslines have been appended with the suffix _XL. This change was made to HIPS files only. The original file names of raw data files (HYPACK HSX and 7K) have been retained.

## B.5 Data Processing

### B.5.1 Primary Data Processing Software

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

| Manufacturer | Name | Version |
|---|---|---|
| CARIS | HIPS/SIPS | 11.3.8 |

*Table 10: Primary bathymetric data processing software*

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

A detailed listing of all data processing software is included in the OPR-J315-KR-21 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 |
|---|---|---|---|---|---|
| H13488_MB_1m_MLLW.csar | CARIS Raster Surface (CUBE) | 1 meters | 6.985 meters - 21.924 meters | NOAA_1m | Complete MBES |
| H13488_MB_1m_MLLW_Final.csar | Finalized CARIS Raster Surface (CUBE) | 1 meters | 6.985 meters - 20.000 meters | NOAA_1m | Complete MBES |
| H13488_MB_2m_MLLW.csar | CARIS Raster Surface (CUBE) | 2 meters | 6.989 meters - 21.903 meters | NOAA_2m | Complete MBES |

| Surface Name | Surface Type | Resolution | Depth Range | Surface Parameter | Purpose |
|---|---|---|---|---|---|
| H13488_MB_2m_MLLW_Final.csar | Finalized CARIS Raster Surface (CUBE) | 2 meters | 18.000 meters - 21.903 meters | NOAA_2m | Complete MBES |

*Table 11: Submitted Surfaces*

Bathymetric grids were created relative to MLLW in CUBE format using Complete Coverage resolution requirements as specified in the HSSD.

# C. Vertical and Horizontal Control

A summary of the horizontal and vertical control for survey H13488 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-J315-KR-21_100m_NAD83_2011-MLLW.csar |

*Table 12: 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 16.

The following PPK methods were used for horizontal control:

- RTX

The separation model listed in Table 12 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 Smooth Best Estimate of Trajectory (SBET) format. Post-processed solutions were generated using Applanix POSPac MMS using the Trimble CenterPoint RTX option, which relies on precise satellite orbit and timing information to create centimeter-level positioning and elevation without the use of traditional local base stations. Information on survey control is detailed in the DAPR.

# D. Results and Recommendations

## D.1 Chart Comparison

The chart comparison was performed by comparing H13488 survey depths to a digital surface generated from the band 4 and band 5 electronic navigational charts (ENCs) covering the survey area. A 5-meter product surface was generated from a triangular irregular network (TIN) created from the ENC's soundings, depth contours, and depth features. An additional 5-meter HIPS product surface of the entire survey area 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 charts used during the comparison were reviewed to check that all United States Coast Guard (USCG) Local Notice to Mariners (LNMs) issued during survey acquisition, and impacting the survey area, were applied and addressed by this survey.

The ENCs used in the chart comparison are listed in Table 13. Figures 13 through 16 show the magnitude of differences along the comparison area. Sand borrow site areas are the regular-shaped deeper areas apparent in Figures 14 and 15.

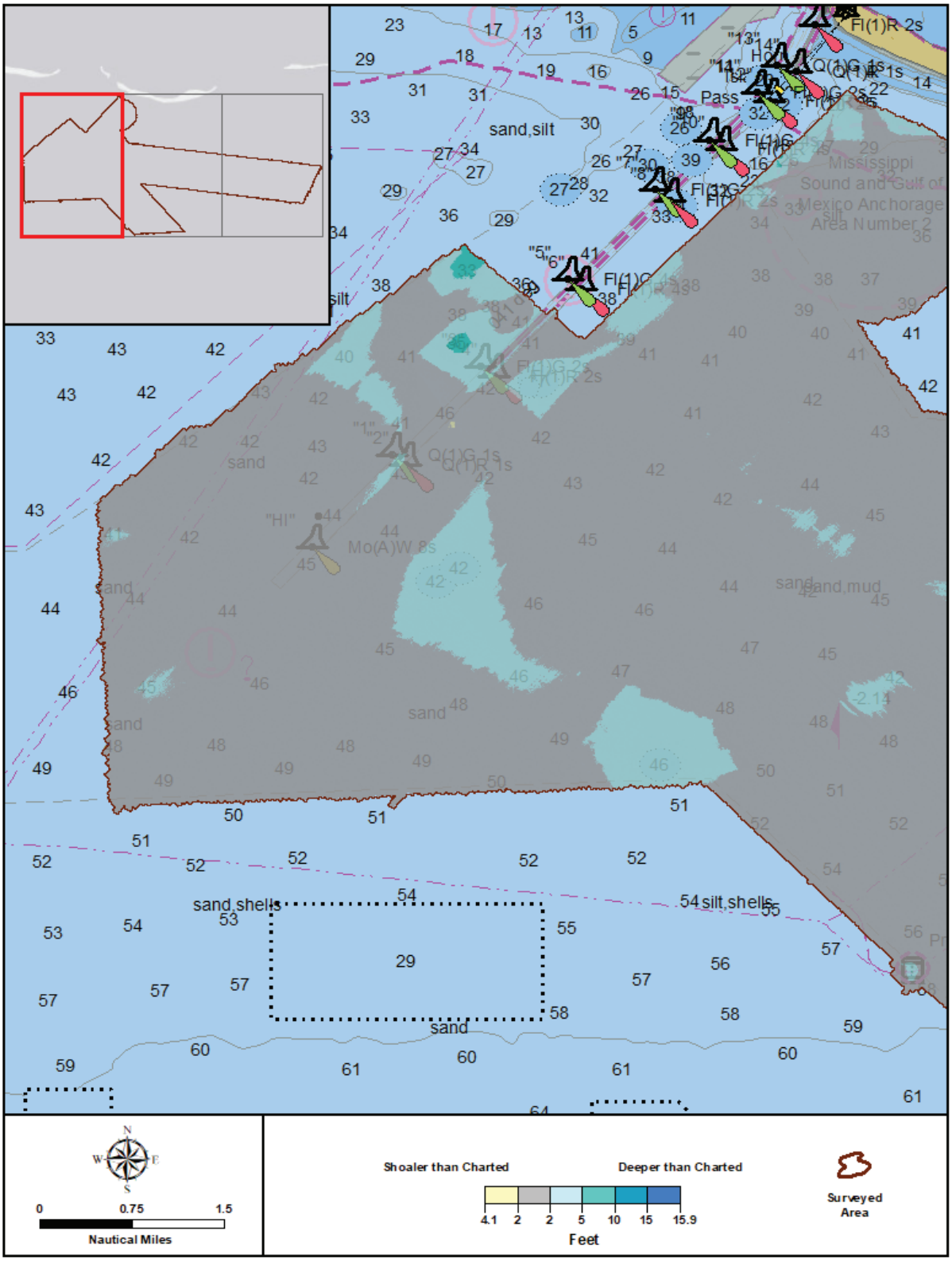



*Figure 13: Depth Difference Between H13488 and US4MS12M Area 1 of 3.*

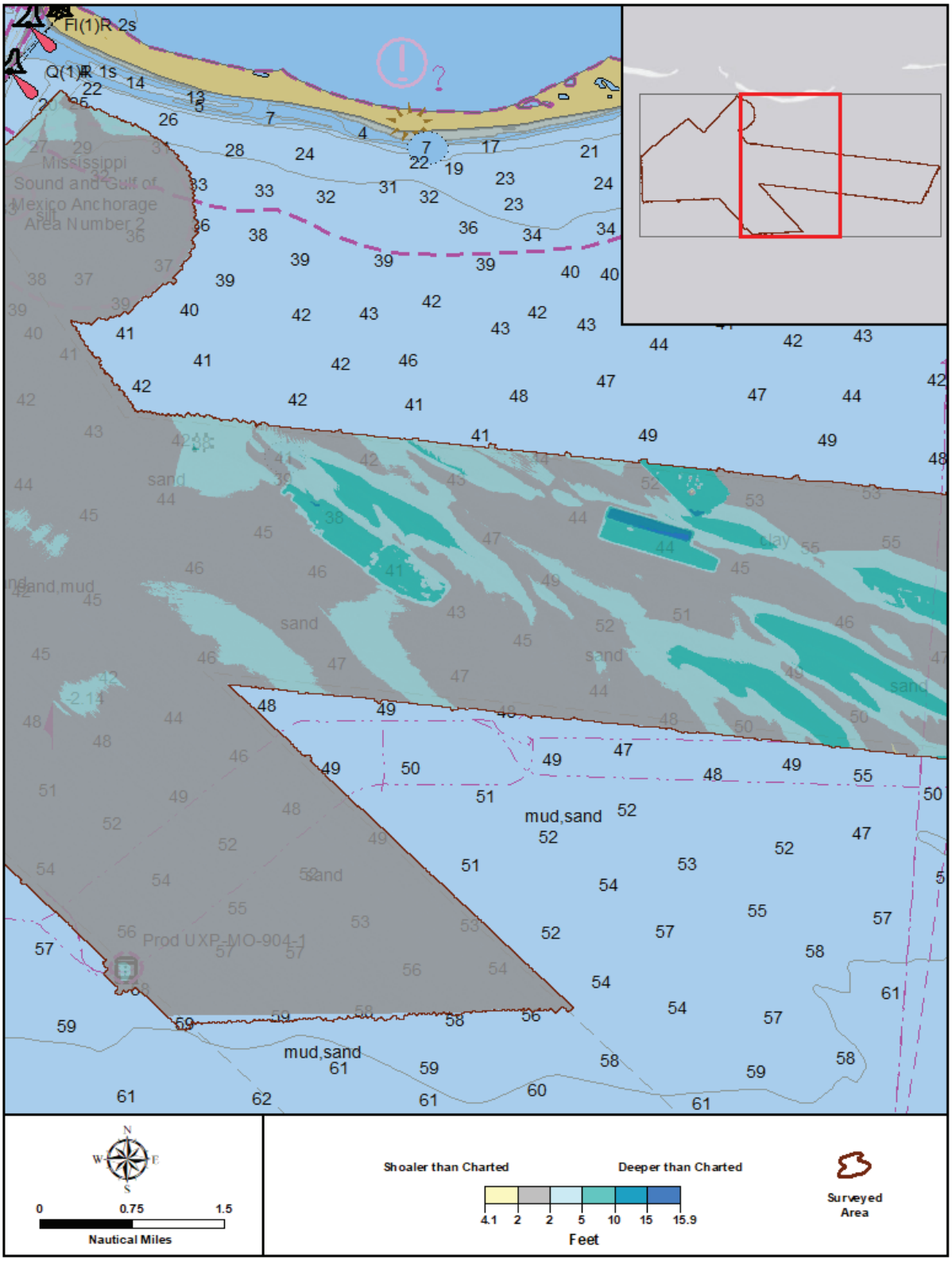



*Figure 14: Depth Difference Between H13488 and US4MS12M Area 2 of 3.*

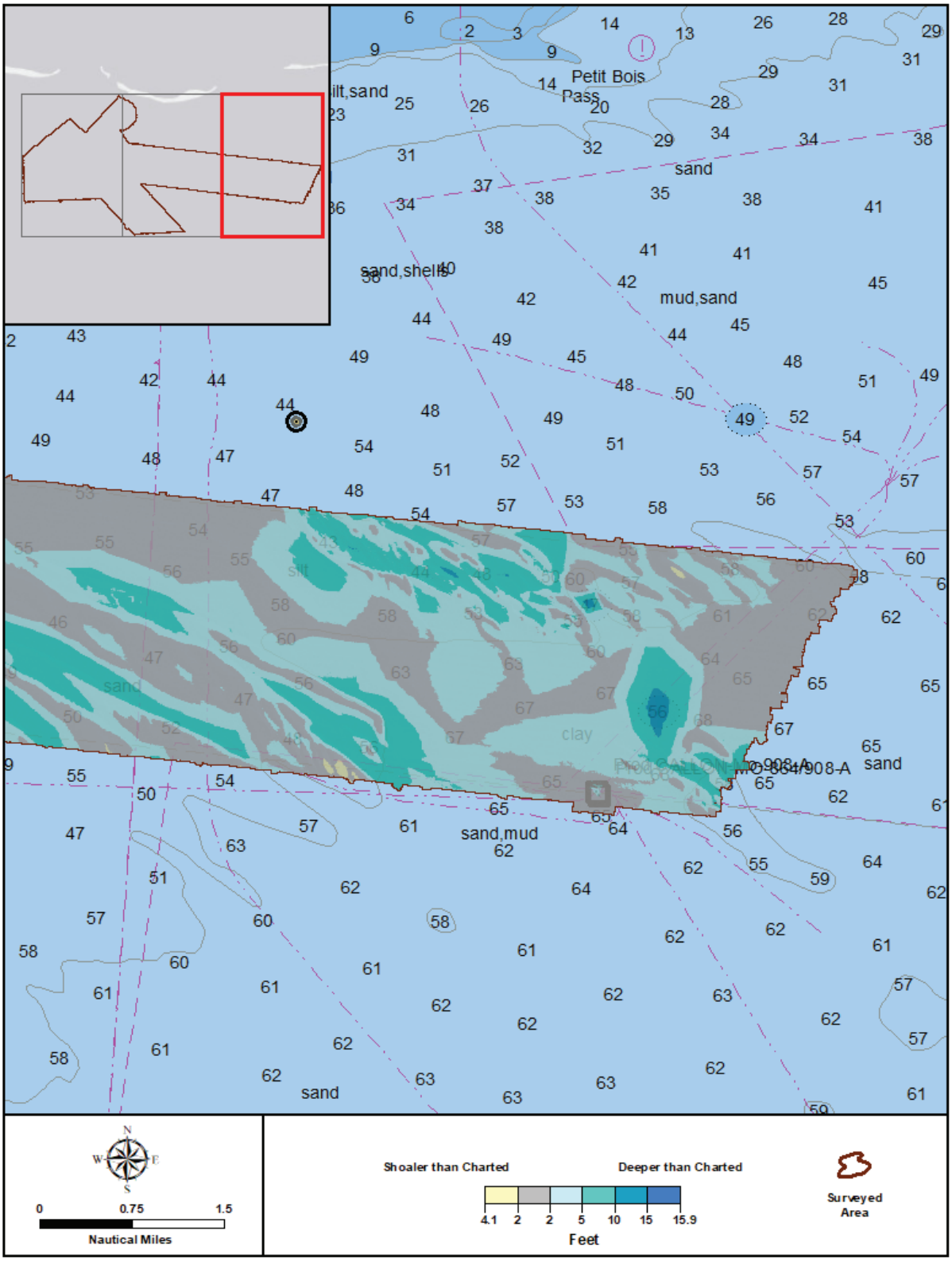



*Figure 15: Depth Difference Between H13488 and US4MS12M Area 3 of 3.*

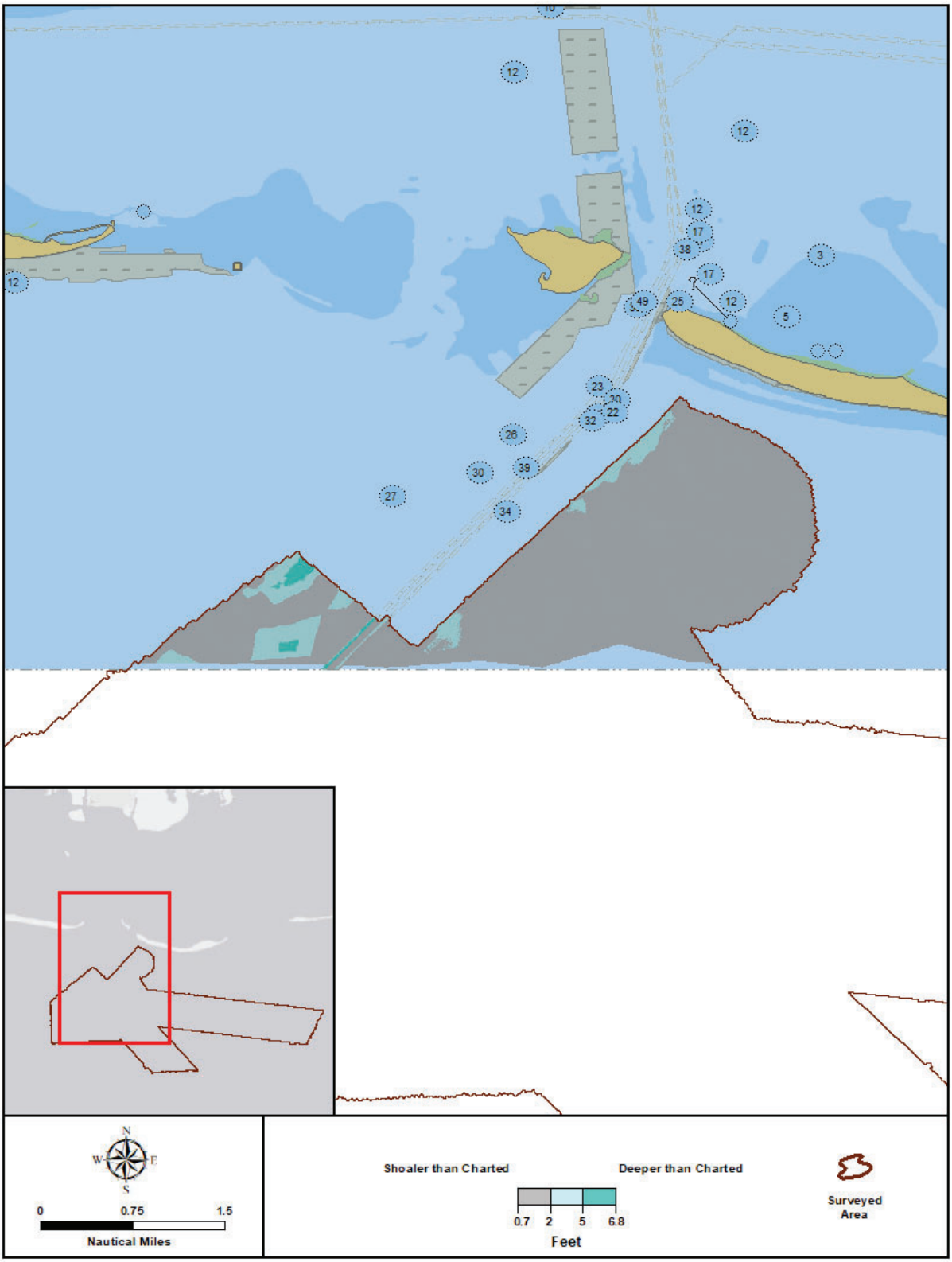



*Figure 16: Depth Difference Between H13488 and US5MS22M.*

### 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 |
|---|---|---|---|---|
| US5MS22M | 1:20000 | 50 | 09/21/2021 | 09/21/2021 |
| US4MS12M | 1:80000 | 45 | 10/14/2020 | 10/14/2020 |

*Table 13: Largest Scale ENCs*

### D.1.2 Shoal and Hazardous Features

No shoals or potentially hazardous features exist for this survey.

### D.1.3 Charted Features

Numerous charted features exist within the limits of Sheet H13488. All assigned features included in the project Composite Source File (CSF) have been addressed by the survey and are included in the Final Feature File (FFF).

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."

### D.1.4 Uncharted Features

No uncharted features exist for this survey.

### D.1.5 Channels

The southern end of the Pascagoula Bar Channel is charted within the survey area. No survey depths within the channel were found to be shoaler than charted.

There are no charted precautionary areas, traffic separation schemes, pilot boarding areas, or channel and range lines within the survey limits.

The survey area encompasses the Horn Island Pass to Mobile Ship Channel Safety Fairway, the Horn Island Pass to Mobile Ship Channel Safety Fairway, and the Pascagoula Safety Fairway (33 CFR 166.200). An Explosive Anchorage Area (33 CFR 110.194b) is also charted within the survey area. No new obstructions or dangers were located within the fairways or the charted anchorage. The hydrographer recommends

encoding the name of safety fairways in the ENCs. Safety fairway names are included in the Code of Federal Regulations (CFR).

The northern end of the survey area extends into the charted Restricted Area surrounding the Gulf Islands National Seashore (GUIS).

## D.2 Additional Results

### D.2.1 Aids to Navigation

All Aids to Navigation (AtoNs) charted within the survey were found to be on station and serving their intended purpose.

### D.2.2 Maritime Boundary Points

No Maritime Boundary Points were assigned for this survey.

### D.2.3 Bottom Samples

Sixteen bottom samples were acquired on October 13, 2021 (DN286). The bottom sampling plan followed suggested sample locations included in the provided Project Reference File (PRF). Minor adjustments were made to the recommended sampling locations with approval from the Contracting Officer's Representative (COR). Correspondence is included in Appendix II - Supplemental Survey Records & Correspondence of this report.

### D.2.4 Overhead Features

No overhead features exist for this survey.

### D.2.5 Submarine Features

There are 19 submerged pipelines and one submarine cable charted in the survey area. One section of potentially exposed pipeline was reported following HSSD 1.7.1 and 1.7.3. Correspondence related to this reporting is included in Appendix II. The item has also been included in the FFF as an obstruction.

### D.2.6 Platforms

There are three offshore platforms within the survey area. Holidays are present in the bathymetric surface under and surrounding the platforms where it was not possible to obtain valid multibeam coverage. See the H13488 FFF for more details.

### 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 and/or environmental conditions exist for this survey.

### D.2.9 Construction and Dredging

Multiple Outer Continental Shelf Borrow Sites are located within the H13488 survey area. Material has been sourced from these sites to fill “Camille Cut” on Ship Island as part of the United States Army Corps of Engineers (USACE) Mississippi Coastal Improvements Program (MsCIP) Comprehensive Barrier Island Restoration. Evidence of dredging is visible in the bathymetric surface shown in Figure 17.

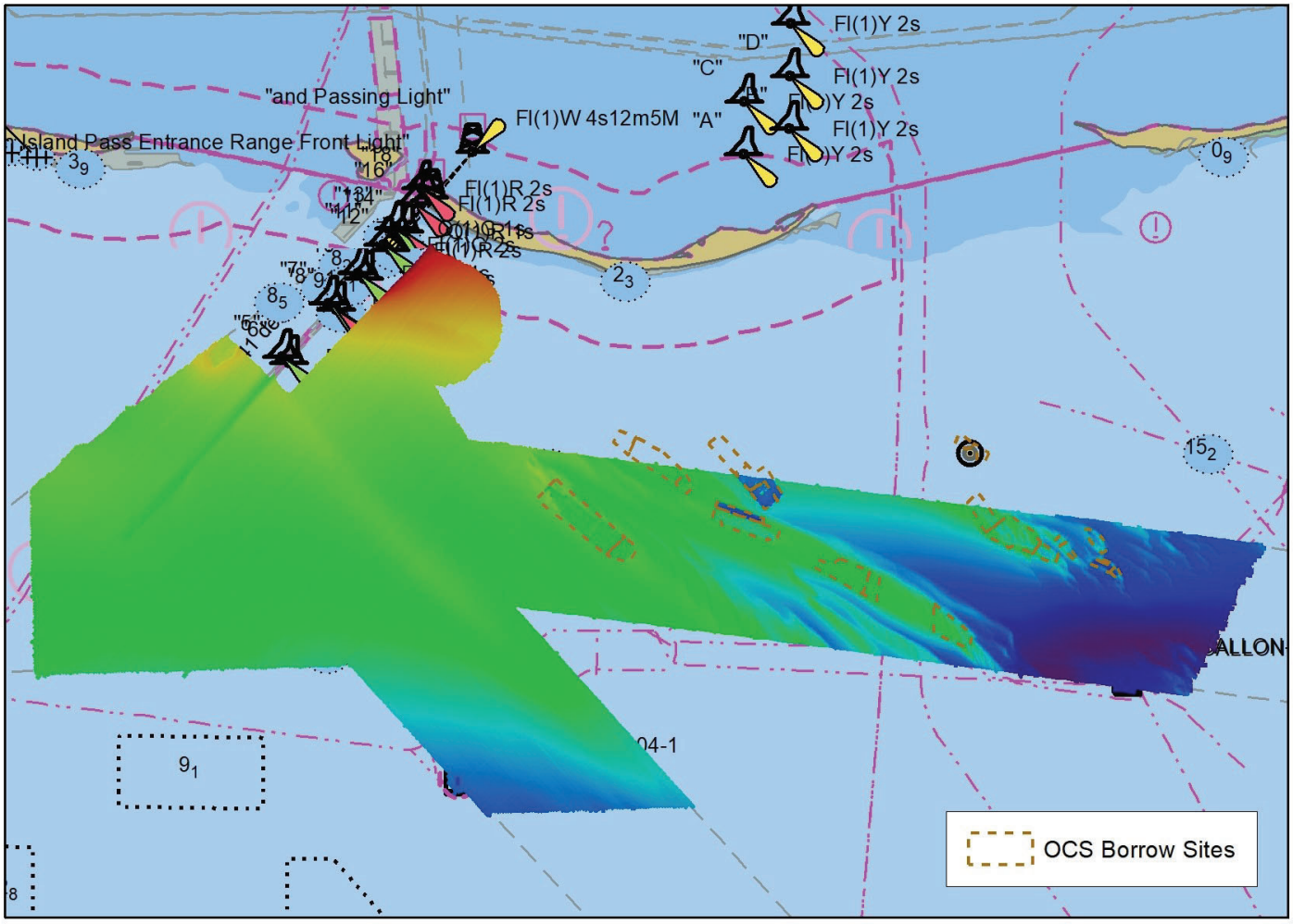



*Figure 17: Outer Continental Shelf Borrow Site Polygons in the Vicinity of the H13488 Survey Area*

### D.2.10 New Survey Recommendations

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

### D.2.11 ENC Scale Recommendations

According to the National Charting Plan, the ENCs covering the survey area are slated to be reschemed to include new Band 2 through Band 5 cells based on a gridded production scheme. The hydrographer has no ENC scale recommendations for the 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 and Specifications 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.

| Report Name | Report Date Sent |
|---|---|
| Data Acquisition and Processing Report | 2021-12-09 |

| Approver Name | Approver Title | Approval Date | Signature |
|---|---|---|---|
| Jonathan L. Dasler, PE, PLS, CH | NSPS-THSOA Certified Hydrographer, Chief of Party | 01/05/2022 | Digitally signed by Jonathan L. Dasler, PE, PLS, CH Date: 2022.01.05 12:39:09 -08'00' |
| Jason Creech, CH | NSPS-THSOA Certified Hydrographer, Charting Manager / Project Manager | 01/05/2022 | Digitally signed by Jason Creech Date: 2022.01.05 12:41:59 -08'00' |
| James Guilford | IHO Cat-A Hydrographer, Lead Hydrographer | 01/05/2022 | Digitally signed by James Guilford Date: 2022.01.05 12:44:12 -08'00' |
| Michael Redmayne | IHO Cat-A Hydrographer, Lead Hydrographer | 01/05/2022 | Digitally signed by Michael Redmayne Date: 2022.01.05 12:48:58 -08'00' |

# 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 |