

**H13507**

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

**DESCRIPTIVE REPORT**

Type of Survey: Navigable Area

Registry Number: H13507

**LOCALITY**

State(s): Maryland

General Locality: Central Chesapeake Bay

Sub-locality: 2NM West of Poplar Island

**2021**

CHIEF OF PARTY  
Matthew J. Jaskoski, CDR/NOAA

LIBRARY & ARCHIVES

Date:

**HYDROGRAPHIC TITLE SHEET**

**H13507**

**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): **Maryland**

General Locality: **Central Chesapeake Bay**

Sub-Locality: **2NM West of Poplar Island**

Scale: **20000**

Dates of Survey: **05/16/2021 to 06/25/2021**

Instructions Dated: **05/14/2021**

Project Number: **OPR-E349-TJ-21**

Field Unit: **NOAA Ship *Thomas Jefferson***

Chief of Party: **Matthew J. Jaskoski, CDR/NOAA**

Soundings by: **Multibeam Echo Sounder**

Imagery by: **Side Scan Sonar Multibeam Echo Sounder Backscatter**

Verification by: **Atlantic Hydrographic Branch**

Soundings Acquired in: **meters at Mean Lower Low Water**

**Remarks:**

*Any revisions to the Descriptive Report (DR) applied during office processing are shown in red italic text. The DR is maintained as a field unit product, therefore all information and recommendations within this report are considered preliminary unless otherwise noted. The final disposition of survey data is represented in the NOAA nautical chart products. All pertinent records for this survey are archived at the National Centers for Environmental Information (NCEI) and can be retrieved via <https://www.ncei.noaa.gov/>. Products created during office processing were generated in NAD83 UTM 18N, MLLW. All references to other horizontal or vertical datums in this report are applicable to the processed hydrographic data provided by the field unit.*

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## Descriptive Report to Accompany Survey H13507

Project: OPR-E349-TJ-21

Locality: Central Chesapeake Bay

Sublocality: 2NM West of Poplar Island

Scale: 1:20000

May 2021 - June 2021

**NOAA Ship *Thomas Jefferson***

Chief of Party: Matthew J. Jaskoski, CDR/NOAA

### A. Area Surveyed

Survey H13507, located in Central Chesapeake Bay 2NM West of Poplar Island, was conducted in accordance with coverage requirements set forth in the Project Instructions OPR-E349-TJ-21.

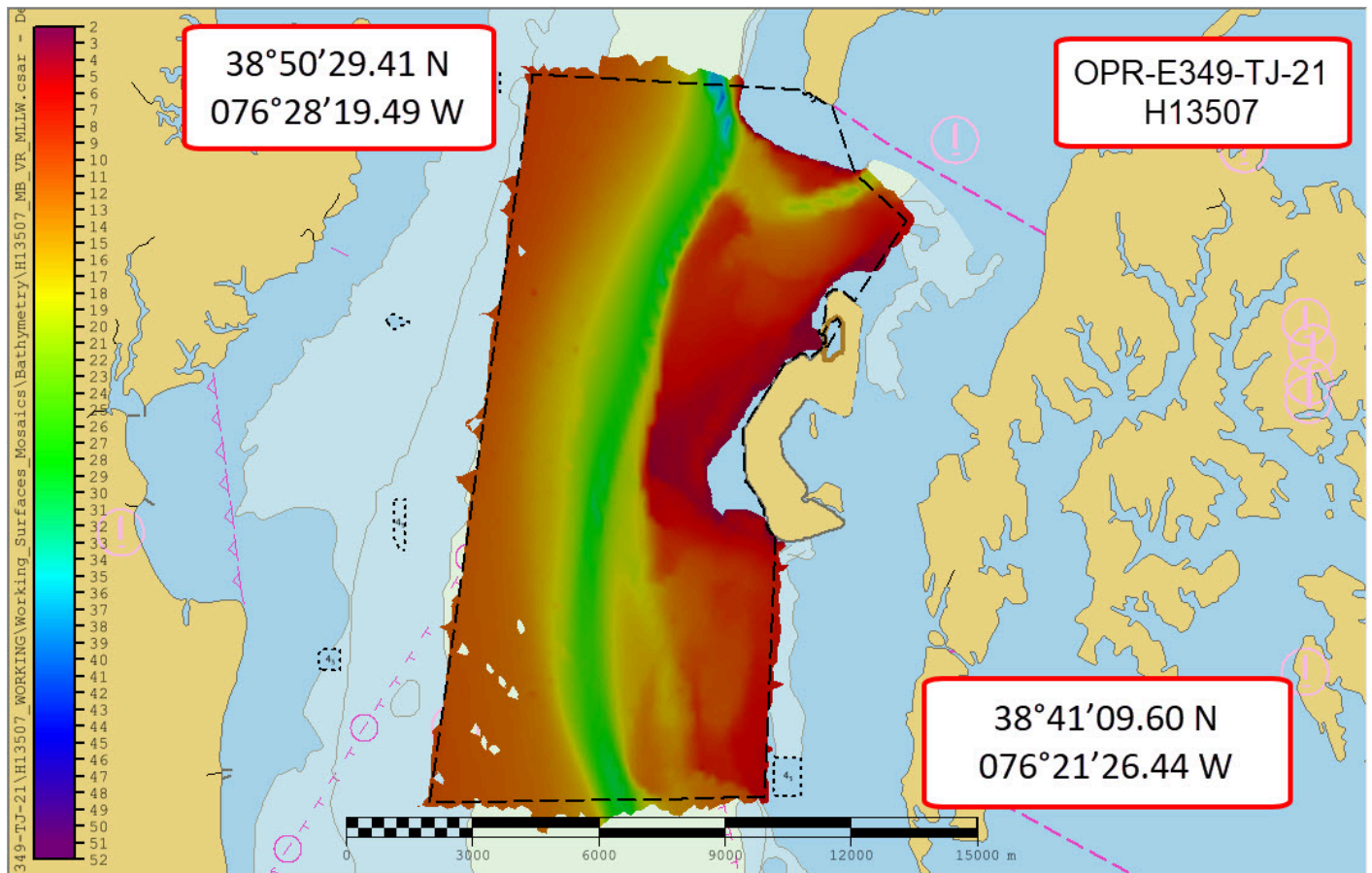
#### A.1 Survey Limits

Data were acquired within the following survey limits:

| Northwest Limit                      | Southeast Limit                    |
|--------------------------------------|------------------------------------|
| 38° 50' 29.41" N<br>76° 28' 19.49" W | 38° 41' 9.6" N<br>76° 21' 26.44" W |

*Table 1: Survey Limits*

Survey data were acquired in accordance with the requirements set forth by the Project Instructions (PI) and the Hydrographic Surveys Specification and Deliverables (HSSD) dated April 2021 (Figure 1).



*Figure 1: Survey layout for H13507, plotted over ENC's US5MD13M and US5MD16M. Black outline represents the survey limits set forth by the project instructions.*

## A.2 Survey Purpose

The Chesapeake Bay is the largest estuary in North America and heavily trafficked by commercial and recreational vessels as tourism, fishing, and marine commerce are economically vital for the region\*. This project area encompasses approximately 38 SNM of central Chesapeake Bay. In addition to fishing and tourism traffic, commercial vessels transit through the project area to reach the Port of Baltimore, which is ranked as a top 15 port in container and tonnage, and a top 10 port for dry bulk\*\*.

The majority of the prior data in the project area spans from the 1880s to the 1940s. The bathymetric data vintage coupled with numerous storms and hurricanes having potentially changed the seabed over the last century raises a need to survey the area. This data from this project will provide modern bathymetry for updating National Ocean Service nautical charting products improving the safety of maritime traffic and commerce as well as supporting the Seabed 2030 global mapping initiative.

\*<https://www.cbf.org/issues/what-we-have-to-lose/economic-importance-of-the-bay/index.html>

\*\*<https://explore.dot.gov/#/views/PortProfiles2020/HomeDashboard>

### A.3 Survey Quality

The entire survey is adequate to supersede previous data.

Data acquired for H13507 meets multibeam echo sounder (MBES) coverage combined with 100% Side Scan Sonar (SSS) coverage requirements for complete coverage as required by the 2021 HSSD. This includes crosslines (see section B.2.1), NOAA allowable uncertainty (see section B.2.10), and density requirements (see section B.2.11).

### 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)   |
| All waters in survey area | Acquire backscatter data during all multibeam data acquisition (Refer to 2021 HSSD Section 6.2) |

*Table 2: Survey Coverage*

Survey coverage is in accordance with requirements listed in Table 2 and in the 2021 HSSD. Coverage requirements were met with a combination of 100% complete coverage MBES coverage and 100% SSS with concurrent MBES coverage (Figure 2). Complete coverage MBES or complete coverage SSS was used to fill areas of SSS data coverage gaps. See sections B.2.6 and B.5.2 for more information.

Coverage was acquired to the inshore limit of hydrography, the Navigable Area Limit Line (NALL). Areas where survey coverage did not reach the 3.5-meter depth contour, nor the assigned sheet limits, were due to the survey vessel reaching the extent of safe navigation as shown in the figures below. These areas are characterized as being near shore, subject to dangerous wave action or other hazards. Due to time constraints, two MBES holidays were not able to be collected (Figure 3). After inspection of surrounding areas, these holidays do not appear to be navigationally significant.

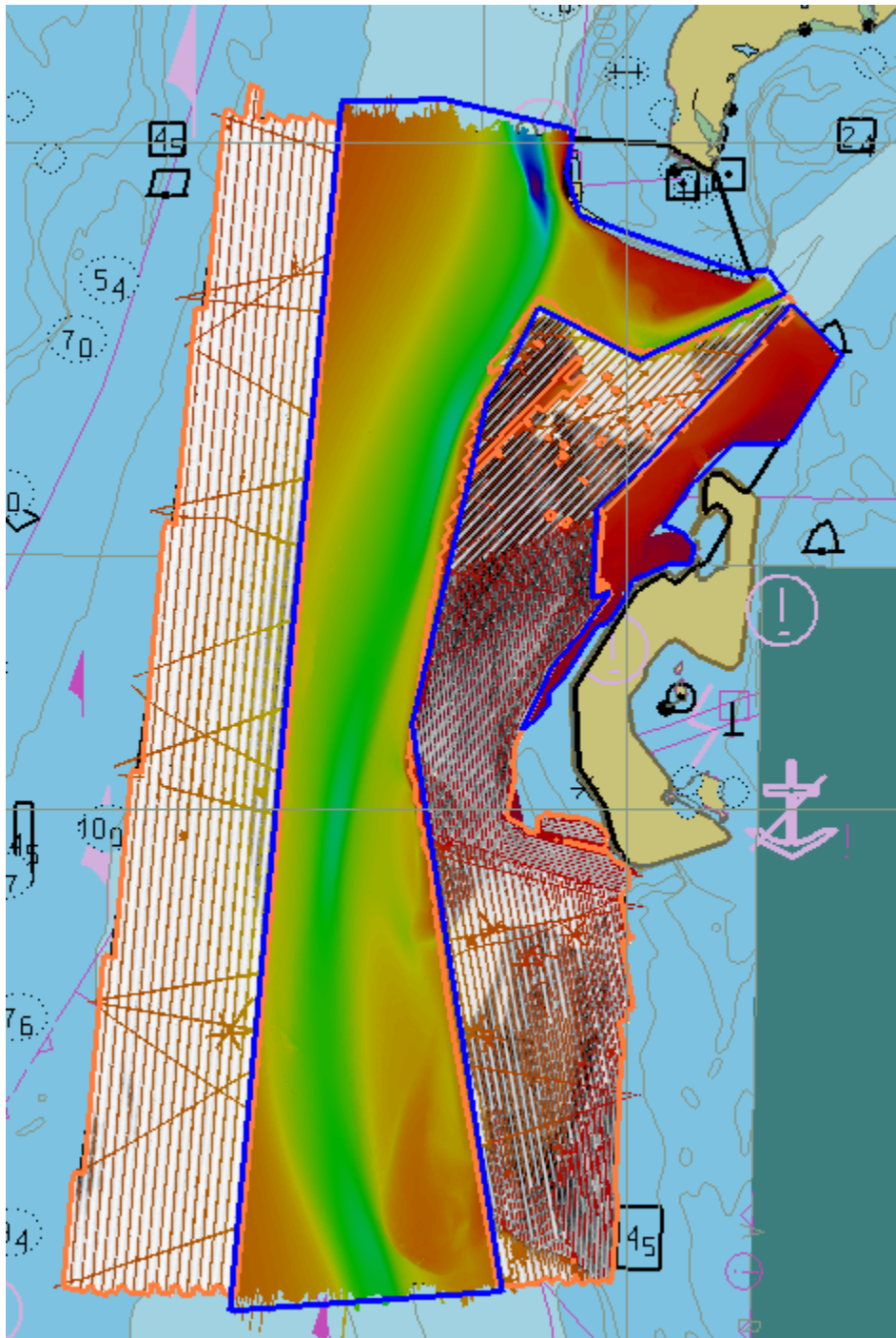
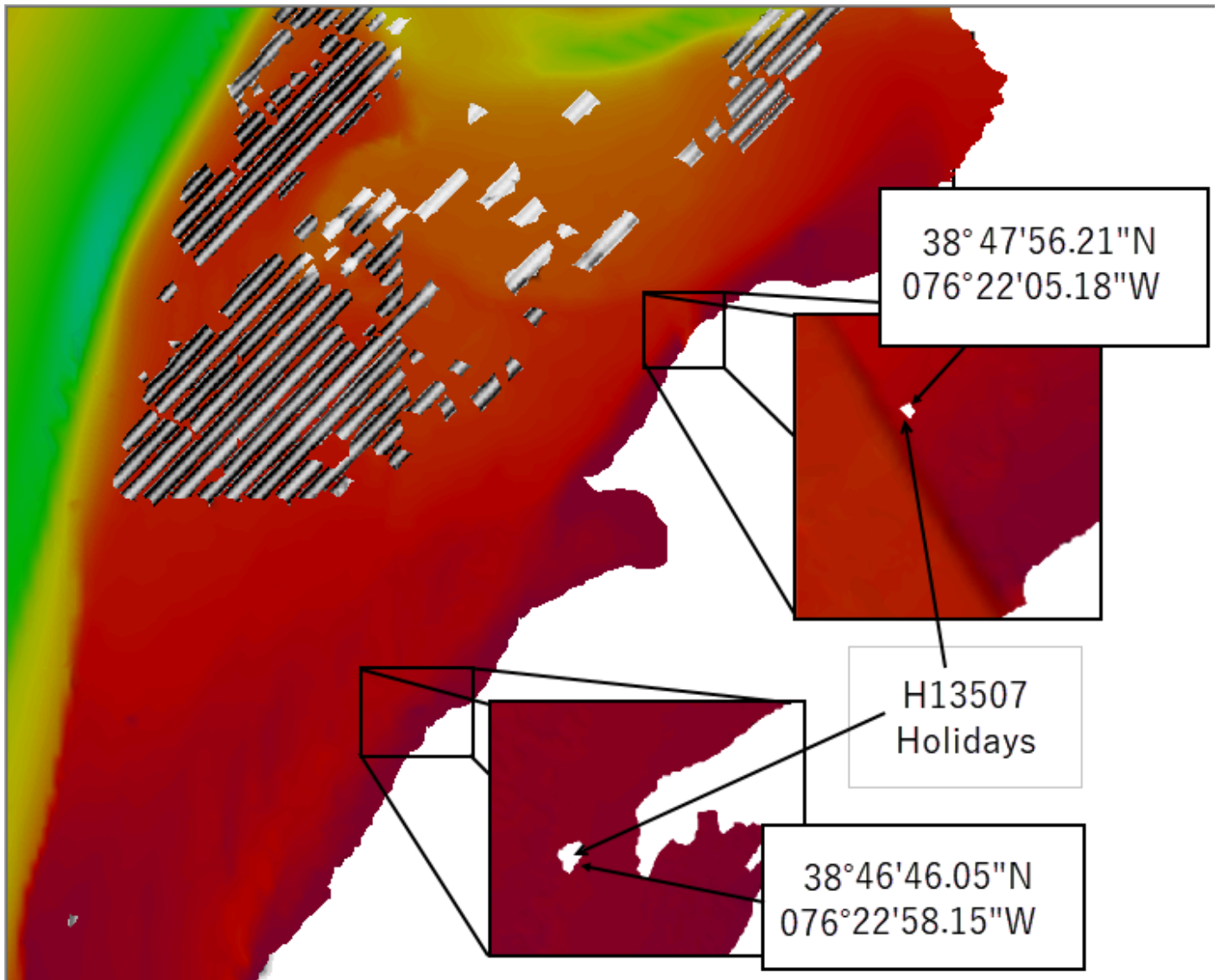


Figure 2: Coverage types used to meet complete coverage specifications. Areas of complete coverage MBES are outlined in blue and areas of complete coverage SSS with concurrent MBES outlined in orange.



*Figure 3: Locations of H13507 holidays.*

## A.6 Survey Statistics

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

|   | <b>HULL ID</b>              | <i>2903</i> | <i>2904</i> | <i>S222</i> | <i>Total</i> |
|---|-----------------------------|-------------|-------------|-------------|--------------|
| <b>LNM</b>  | <b>SBES Mainscheme</b>      | 0           | 0           | 0           | 0            |
|   | <b>MBES Mainscheme</b>      | 418.55      | 529.84      | 396.83      | 1708.11      |
|   | <b>Lidar Mainscheme</b>     | 0           | 0           | 0           | 0            |
|   | <b>SSS Mainscheme</b>       | 0           | 0           | 0           | 0            |
|   | <b>SBES/SSS Mainscheme</b>  | 0           | 0           | 0           | 0            |
|   | <b>MBES/SSS Mainscheme</b>  | 0           | 396.83      | 0           | 396.83       |
|   | <b>SBES/MBES Crosslines</b> | 44.40       | 22.64       | 0           | 67.04        |
|   | <b>Lidar Crosslines</b>     | 0           | 0           | 0           | 0            |
| <b>Number of Bottom Samples</b>                     |                             |             |             | 4           |              |
| <b>Number Maritime Boundary Points Investigated</b> |                             |             |             | 0           |              |
| <b>Number of DPs</b>                                |                             |             |             | 0           |              |
| <b>Number of Items Investigated by Dive Ops</b>     |                             |             |             | 0           |              |
| <b>Total SNM</b>                                    |                             |             |             | 37.88       |              |

*Table 3: Hydrographic Survey Statistics*

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

| <b>Survey Dates</b> | <b>Day of the Year</b> |
|---------------------|------------------------|
| 05/16/2021          | 136                    |
| 05/17/2021          | 137                    |

| <b>Survey Dates</b> | <b>Day of the Year</b> |
|---------------------|------------------------|
| 05/18/2021          | 138                    |
| 05/19/2021          | 139                    |
| 05/20/2021          | 140                    |
| 05/21/2021          | 141                    |
| 05/25/2021          | 145                    |
| 05/26/2021          | 146                    |
| 05/27/2021          | 147                    |
| 06/15/2021          | 166                    |
| 06/16/2021          | 167                    |
| 06/17/2021          | 168                    |
| 06/18/2021          | 169                    |
| 06/23/2021          | 174                    |
| 06/24/2021          | 175                    |
| 06/25/2021          | 176                    |

*Table 4: Dates of Hydrography*

## **B. Data Acquisition and Processing**

### **B.1 Equipment and Vessels**

Refer to the Data Acquisition and Processing Report (DAPR) for a complete description of data acquisition and processing systems, survey vessels, quality control procedures and data processing methods. Additional information to supplement sounding and survey data, and any deviations from the DAPR are discussed in the following sections.

#### **B.1.1 Vessels**

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

| <b>Hull ID</b> | <b>2903</b> | <b>2904</b> | <b>S222</b> |
|----------------|-------------|-------------|-------------|
| <b>LOA</b>     | 8.5 meters  | 8.5 meters  | 63.4 meters |
| <b>Draft</b>   | 1.2 meters  | 1.2 meters  | 4.6 meters  |

*Table 5: Vessels Used*





*Figure 4: NOAA ship Thomas Jefferson (S222)*





*Figure 5: Thomas Jefferson Launch 2903*





*Figure 6: Thomas Jefferson Launch 2904*

## B.1.2 Equipment

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

| <b>Manufacturer</b> | <b>Model</b>  | <b>Type</b>                                    |
|---------------------|---------------|--|
| Kongsberg Maritime  | EM 2040       | MBES   |
| EdgeTech            | 4200          | SSS  |
| Applanix            | POS MV 320 v5 | Positioning and Attitude System                |
| Sea-Bird Scientific | SBE 19plus V2 | Conductivity, Temperature,<br>and Depth Sensor |
| Valeport            | Thru-Hull SVS | Sound Speed System                             |
| Teledyne RESON      | SVP 70        | Sound Speed System                             |

*Table 6: Major Systems Used*

Vessel configurations, equipment operations, data acquisition, and processing were consistent with specifications described in the DAPR.

## B.2 Quality Control

### B.2.1 Crosslines

Hydrographic Survey Launch 2903 collected 67.04 linear nautical miles of MBES crosslines or 3.93% of mainscheme MBES data. Crossline data did not meet the 4% specification set by 2021 HSSD due to operational time constraints. A single resolution Combined Uncertainty and Bathymetry Estimator (CUBE) surface of mainscheme data at the 1m resolution and a single resolution CUBE surface at the 1m resolution of crossline data were differenced - the resulting mean was 0.04m with a standard deviation of 0.05m (Figures 7 and 8). Visual inspection of the difference surface indicated no systematic issues.

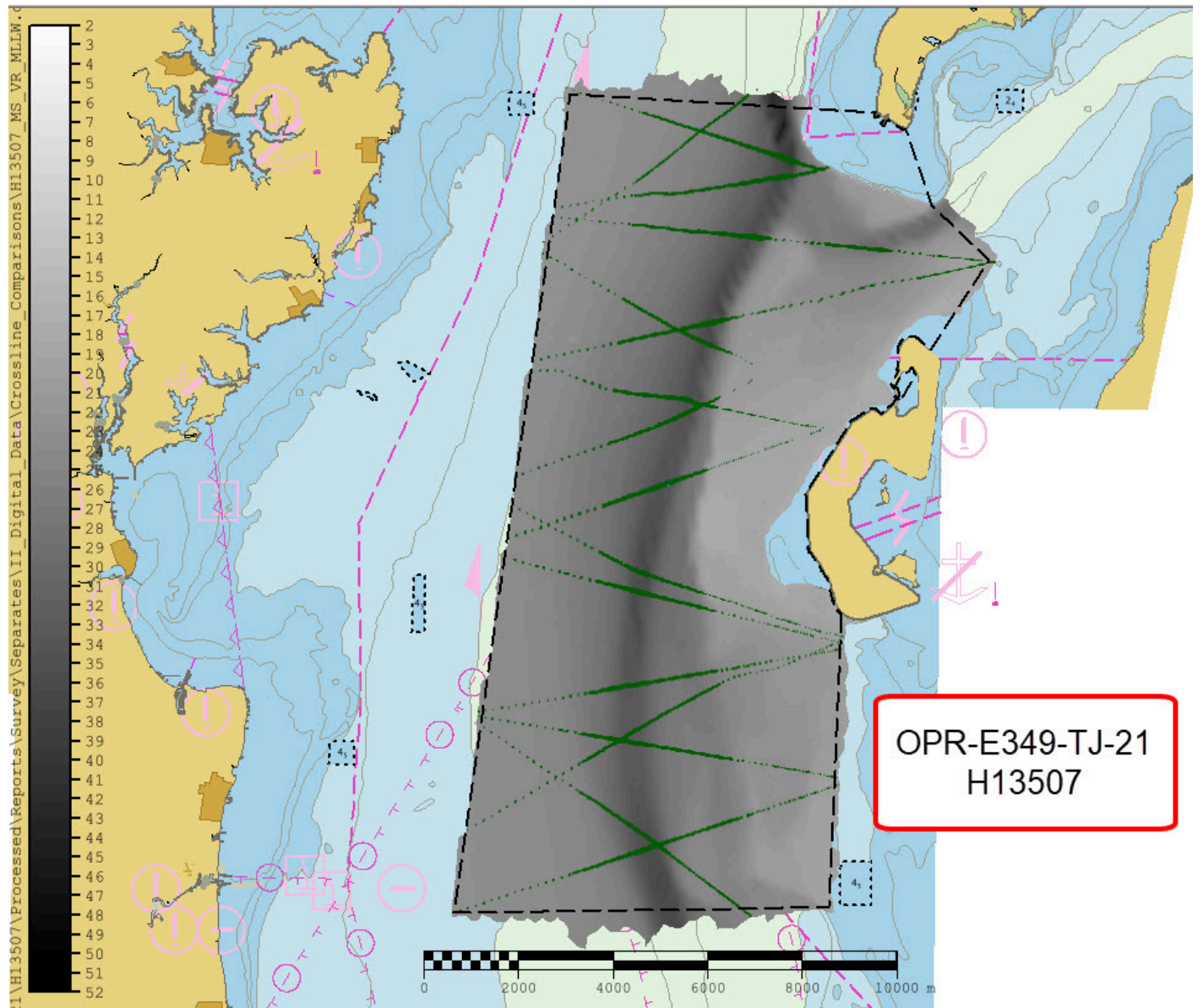


Figure 7: H13507 MBES crossline data, shown in color, overlaid on mainscheme data, shown in greyscale.

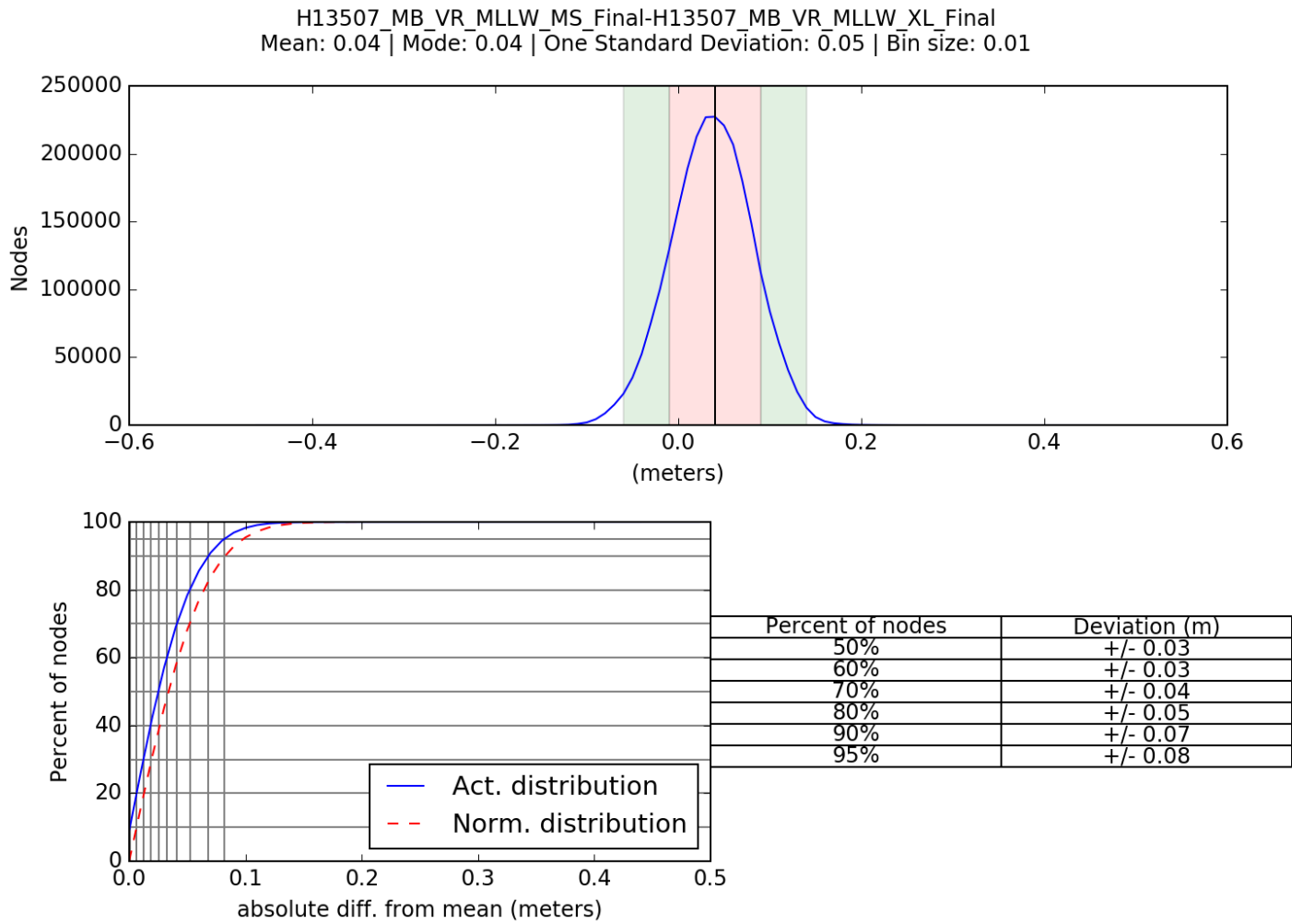


Figure 8: H13507 crossline/mainscheme comparison statistics.

### B.2.2 Uncertainty

The following survey specific parameters were used for this survey:

| Method         | Measured     | Zoning      |
|----------------|--------------|-------------|
| ERS via VDATUM | 0.092 meters | 0.00 meters |

Table 7: Survey Specific Tide TPU Values.



| Hull ID | Measured - CTD  | Measured - MVP | Measured - XBT | Surface           |
|---------|-----------------|----------------|----------------|-------------------|
| 2903    | 4 meters/second | N/A            | N/A            | 0.2 meters/second |
| 2904    | 4 meters/second | N/A            | N/A            | 0.2 meters/second |
| S222    | 4 meters/second | N/A            | N/A            | 0.2 meters/second |

Table 8: Survey Specific Sound Speed TPU Values.

The bathymetric surface's uncertainty layer is compliant with 2021 HSSD uncertainty standards. Over 99.5% of all nodes pass uncertainty standards (Figure 9).

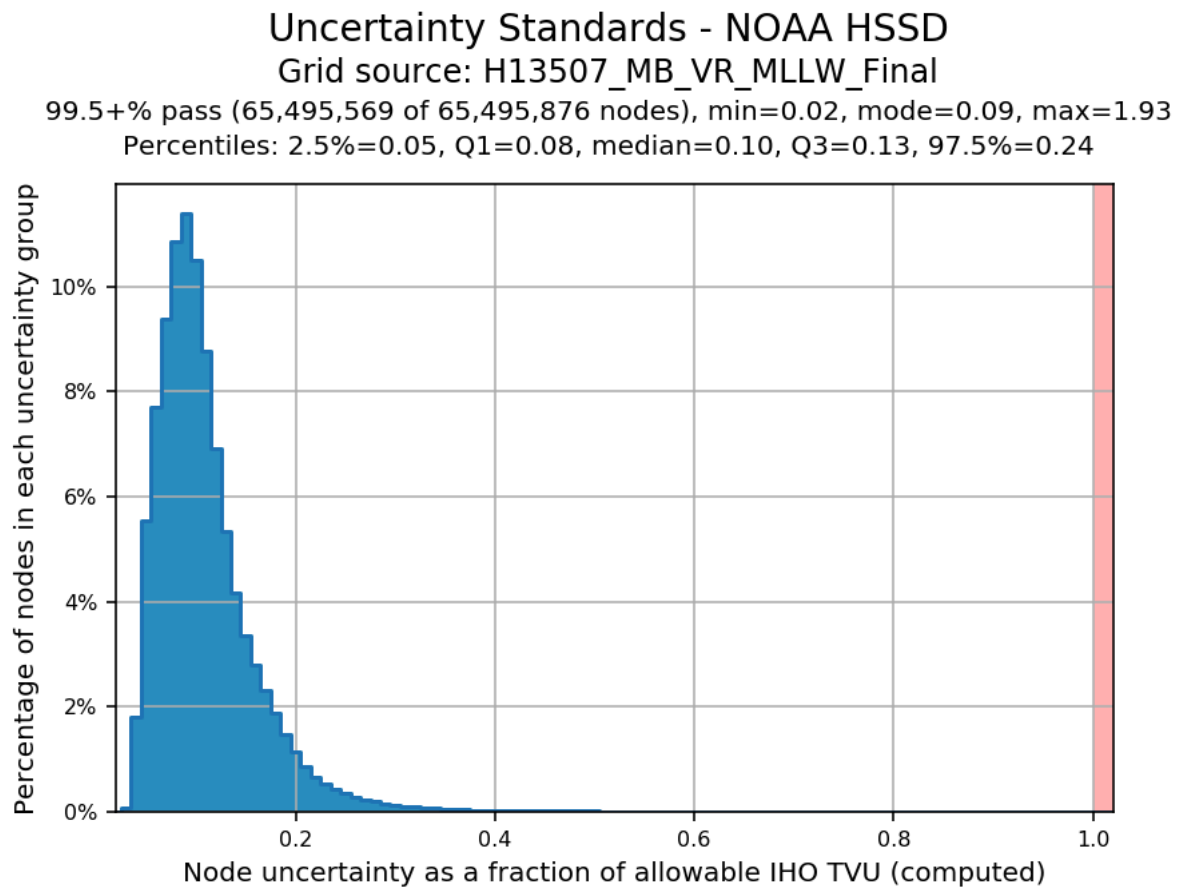


Figure 9: H13507 uncertainty standards.

### **B.2.3 Junctions**

Sheet H13507 junctions with sheets H13508 and H13510 within project OPR-E349-TJ-21. Reference H13508 and H13510 descriptive reports for further information.

There are no contemporary surveys that junction with this survey.

### **B.2.4 Sonar QC Checks**

Sonar system quality control checks were conducted as detailed in the quality control section of the DAPR.

### **B.2.5 Equipment Effectiveness**

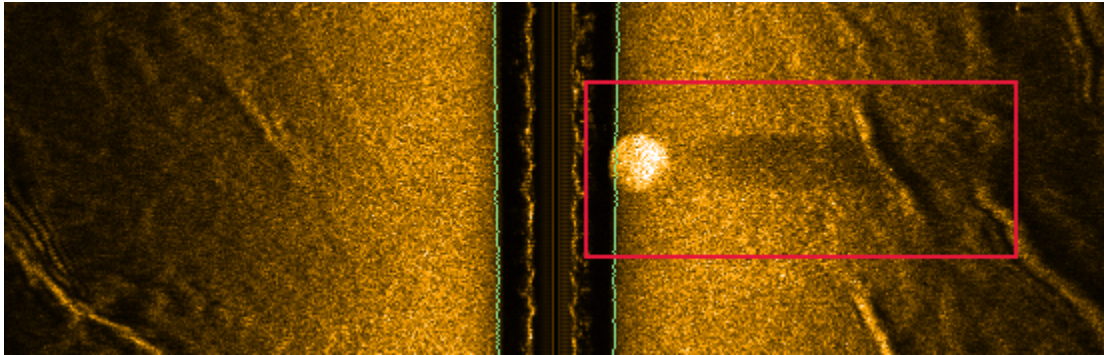
There were no conditions or deficiencies that affected equipment operational effectiveness.

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

#### Schools of fish obscuring side scan data

Many large schools of fish were encountered throughout survey H13507. Some schools were dense enough to create large acoustic shadows that obscured parts of the seafloor and prevent the detection of significant features (Figure 10). These severe instances were rejected from the SSS data, creating data gaps in the mosaic. The gaps were then re-acquired using either complete coverage SSS or complete coverage MBES. However, due to time constraints data was not acquired over every encounter with fish schools.

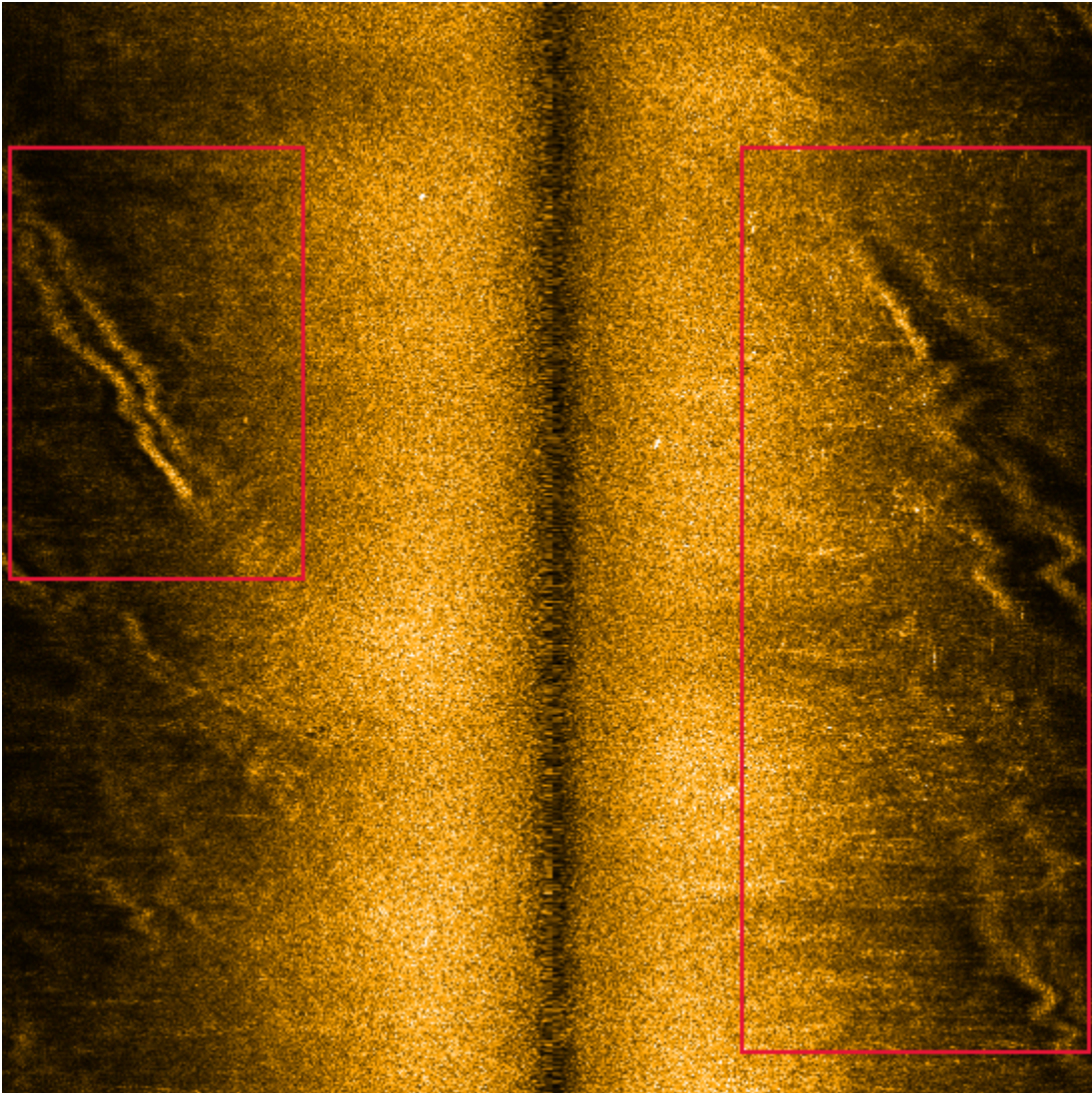




*Figure 10: An example of fish school that was seen throughout H13507.*

#### Refraction in SSS data

H13507 was located in an area that frequently exhibits intense density stratification. This layering greatly affects sound speed and results in refraction that can be observed in the SSS imagery (Figure 11). The side scan towfish are hull-mounted on HSLs 2903 and 2904 and cannot be lowered below the pycnocline. Refraction was observed on both vessels on numerous days, particularly in the shallower eastern sections of the sheet. Severe instances of refraction were rejected from the SSS data, resulting in data gaps in the mosaic. The gaps were then re-acquired using either complete coverage SSS or complete coverage MBES.



*Figure 11: An example of refraction that was observed throughout H13507.*

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

Sound Speed Cast Frequency: Static casts were conducted from S222, 2903 and 2904 at least every 4 hours using a Seabird SBE 19+ CTD in accordance with 2021 HSSD specifications. Variations in surface sound speed were monitored during acquisition to assess appropriate cast frequency.

A total of 122 sound speed profiles were collected within the survey limits of H13507 and display good spatial diversity (Figure 12). An additional 11 measurements were collected outside the data extents and were included in the master file for processing. These 11 additional profiles provide data representative of the conditions found within the survey area and are appropriate for use. All sound speed profile data were

concatenated into a master file for the sheet. MBES data were corrected by applying profiles nearest in distance in time (4 hours) using this master file.

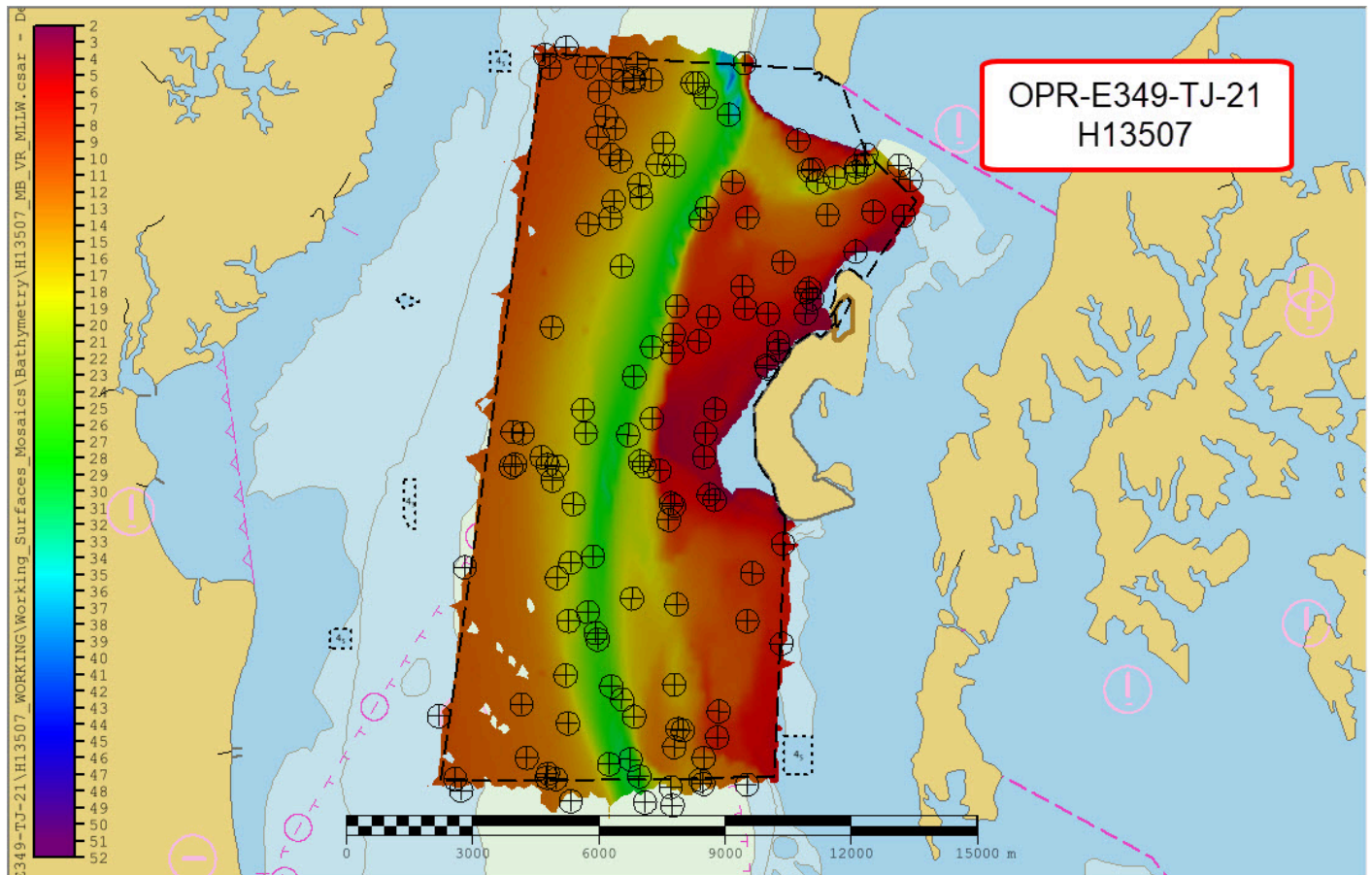


Figure 12: Overview of all SVP casts taken on H13507.

## B.2.8 Coverage Equipment and Methods

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

## B.3 Echo Sounding Corrections

### B.3.1 Corrections to Echo Soundings

All data reduction procedures conform to those detailed in the DAPR.



### B.3.2 Calibrations

All sounding systems were calibrated as detailed in the DAPR.

### B.4 Backscatter

All equipment and survey methods were used as detailed in the DAPR. Raw MBES backscatter was flagged as part of the .all file from the Kongsberg EM2040 systems. Backscatter was processed in QPS Fledermaus GeoCoder Toolbox (FMGT) software, and the exported geotiffs are include in the final processed data submission package (Figure 13). Backscatter holidays are present and co-located with MBES holidays (Figure 3).

There are noticeable changes in backscatter intensity in areas where MBES data was collected using HSL 2903 on days 137,145,167, and 168 (Figure 14). No cause for the changes of intensity have been found.

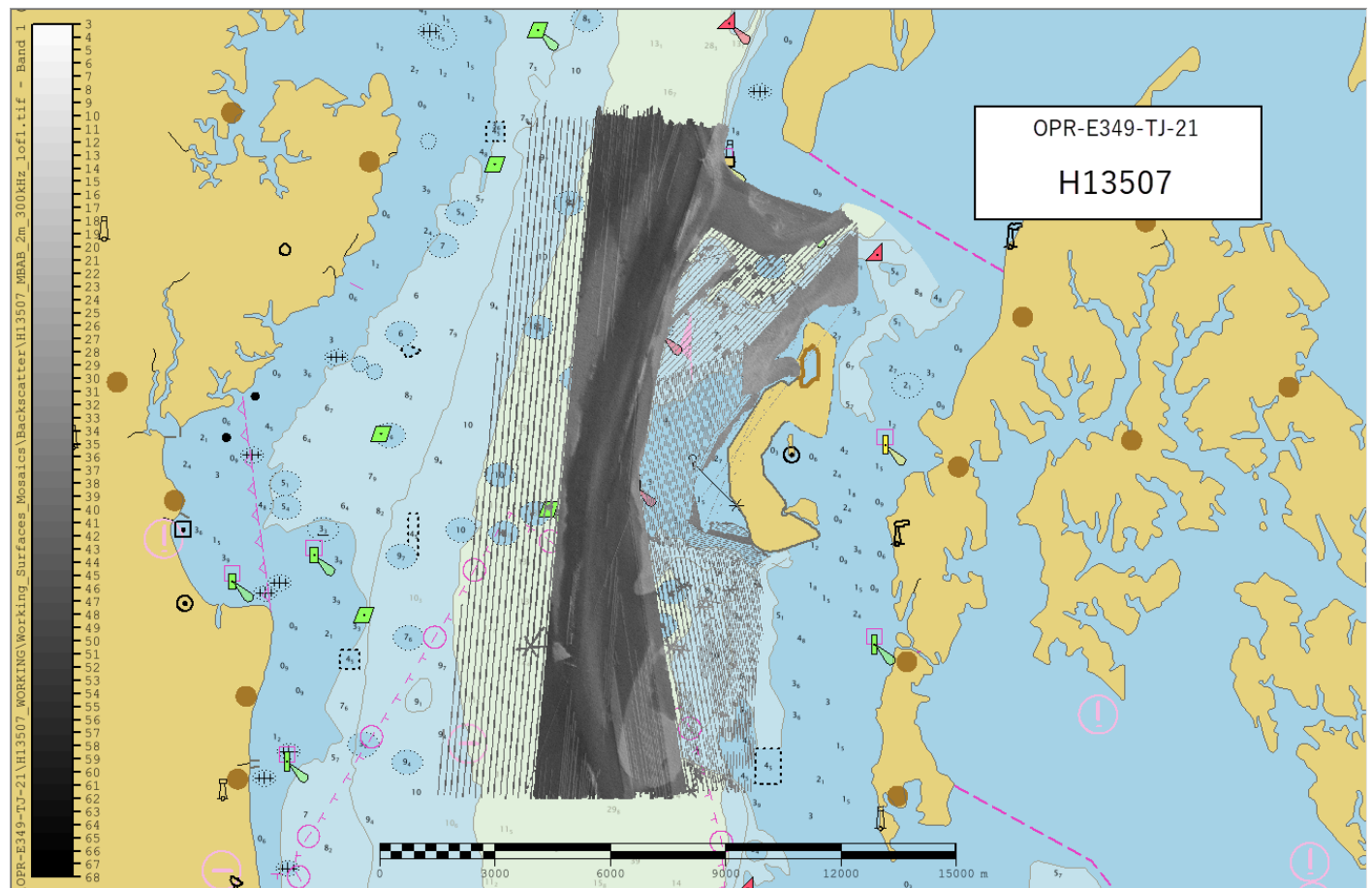


Figure 13: H13507 combined 300kHz backscatter mosaic.

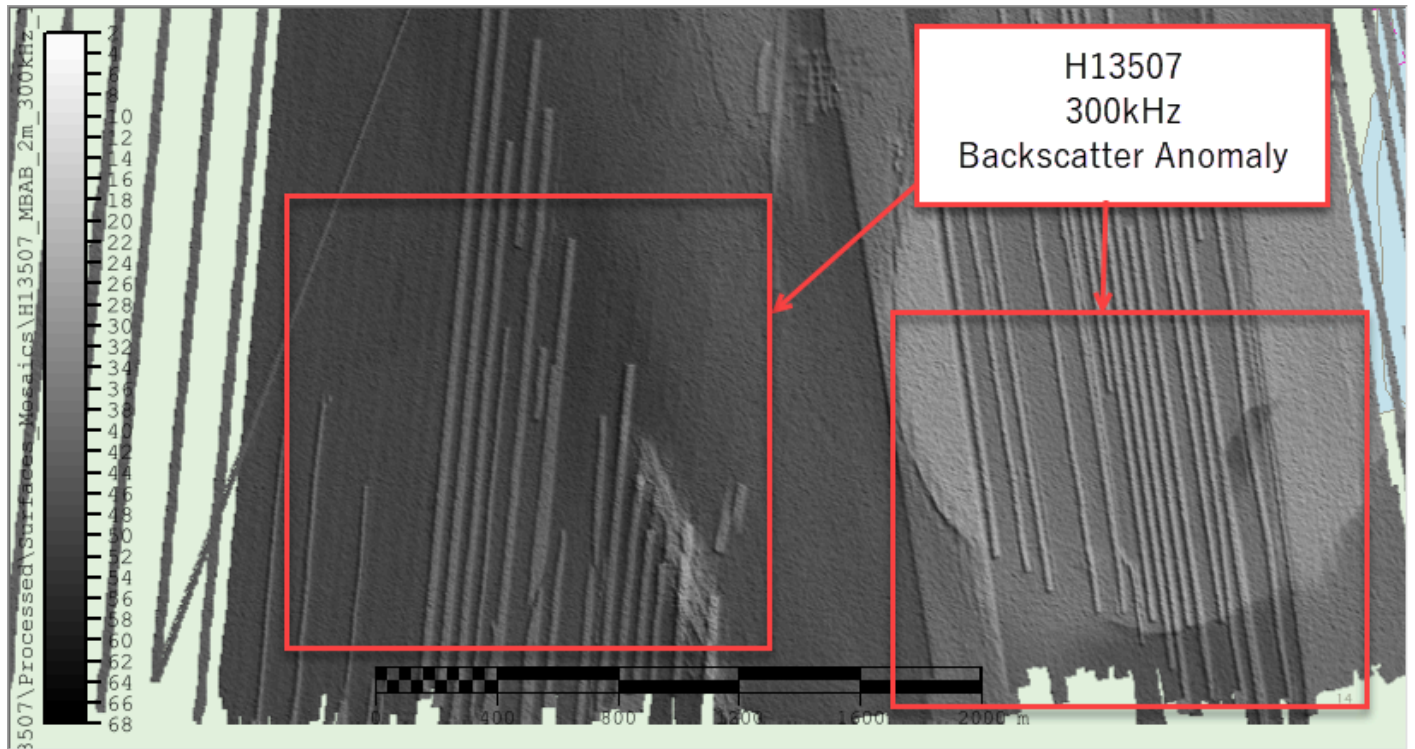


Figure 14: H13507 backscatter anomaly.

## B.5 Data Processing

### B.5.1 Primary Data Processing Software

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

### B.5.2 Surfaces

The following surfaces and/or BAGs were submitted to the Processing Branch:

| Surface Name           | Surface Type            | Resolution          | Depth Range              | Surface Parameter | Purpose       |
|------------------------|-------------------------|---------------------|--------------------------|-------------------|---------------|
| H13507_MB_VR_MLLW.csar | CARIS VR Surface (CUBE) | Variable Resolution | 2.2 meters - 51.0 meters | NOAA_VR           | Complete MBES |

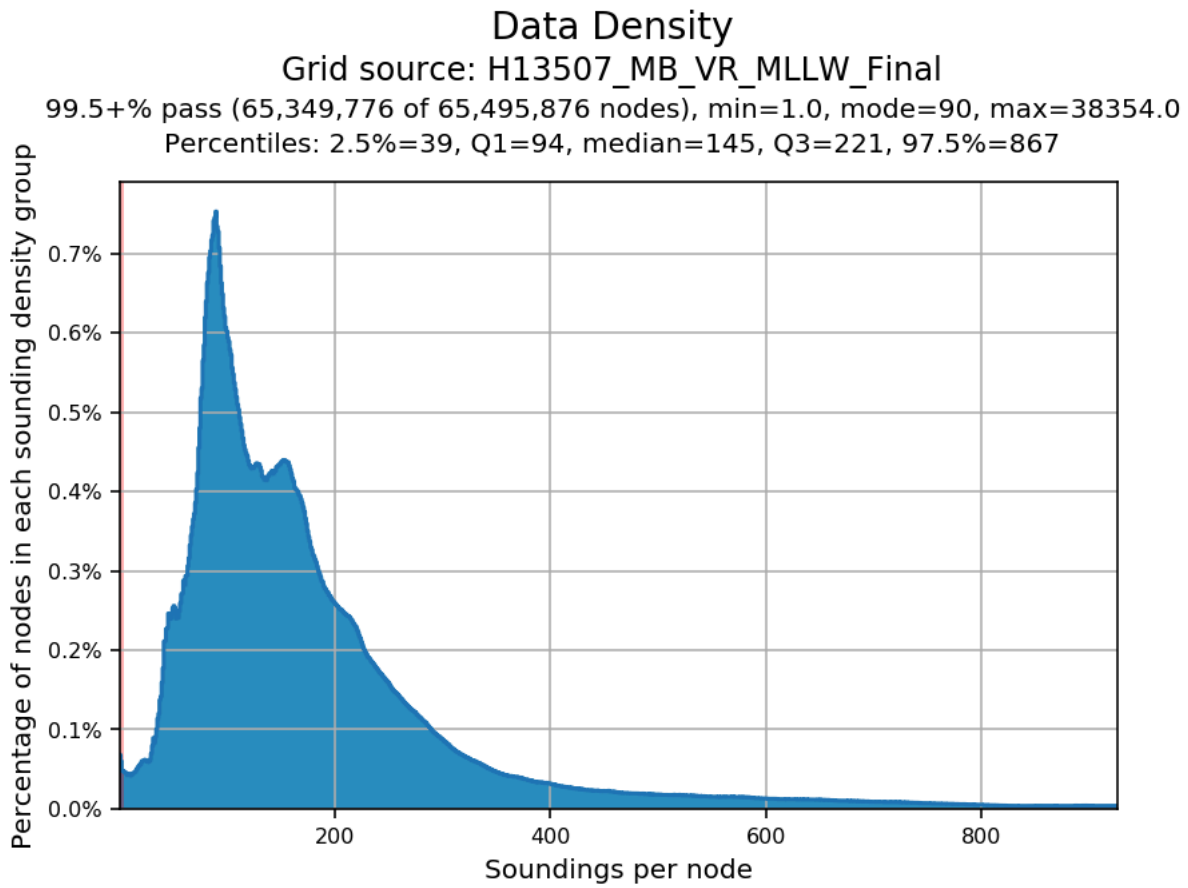
| Surface Name                   | Surface Type            | Resolution          | Depth Range              | Surface Parameter | Purpose       |
|--------------------------------|-------------------------|---------------------|--------------------------|-------------------|---------------|
| H13507_MB_VR_MLLW_Final.csar   | CARIS VR Surface (CUBE) | Variable Resolution | 2.2 meters - 51.0 meters | NOAA_VR           | Complete MBES |
| H13057_MBAB_2m_300kHz_1of3.tif | MB Backscatter Mosaic   | 2 meters            | -                        | N/A               | Complete MBES |
| H13057_MBAB_2m_300kHz_2of3.tif | MB Backscatter Mosaic   | 2 meters            | -                        | N/A               | Complete MBES |
| H13057_MBAB_2m_300kHz_3of3.tif | MB Backscatter Mosaic   | 2 meters            | -                        | N/A               | Complete MBES |
| H13507_SSSAB_1m_600kHz_1of1    | SSS Mosaic              | 1 meters            | -                        | N/A               | 100% SSS      |

*Table 9: Submitted Surfaces*

Complete coverage requirements were met by 100% SSS coverage with concurrent MBES and 100% complete coverage MBES as specified under section 5.2.2.2 of the 2021 HSSD. All bathymetric grids for H13507 meet density requirements per the 2021 HSSD (Figure 15).

Two holidays are present in the submitted MBES surface (see section A.4). Multiple holidays exist in the SSS mosaic that were created by the rejection of poor quality data (see Section B.2.6). These holidays were re-acquired using complete coverage MBES to meet complete coverage requirements as specified in the in the 2021 HSSD (Figure 16).

After multiple rounds of surface cleaning, 44 filers remain as detected by NOAA's QC Tool Flier Finder available in the Pydro XL-19 suite. Upon further inspection, these flagged grid nodes are considered to be accurate representations of the sea floor and have been retained in the submitted surfaces.



*Figure 15: H13507 data density standards.*

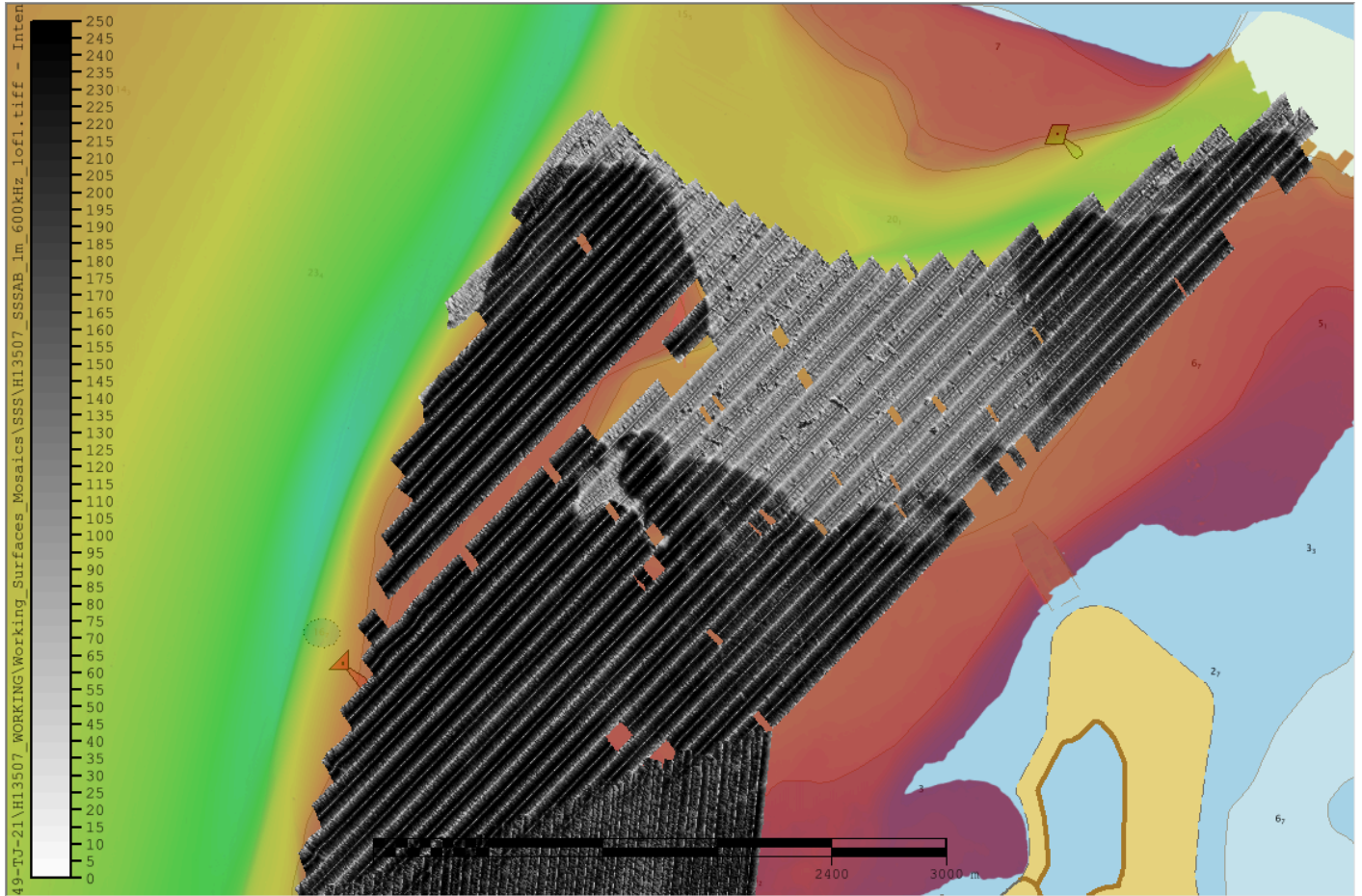


Figure 16: H13507 SSS mosaic holidays that were covered using 100% complete coverage MBES.

## C. Vertical and Horizontal Control

Field installed tide and GPS stations were not utilized for this survey. There is no HVCR report included with the submission of H13507.



## 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-E349-TJ-21_NAD83_VDatum_MLLW_A       |

*Table 10: ERS method and SEP file*

All soundings submitted for H13507 are reduced to MLLW using VDatum techniques as outlined in the DAPR.

## 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 18.

The following PPK methods were used for horizontal control:

- RTX

Trimble-RTX service was used with an Applanix POS MVv5 GNSS\_INS system to obtain highly accurate ellipsoidally referenced position data to meet ERS specifications for H13507 MBES data from vessels HSL 2903, HSL 2904, and S222.

### WAAS

The Wide Area Augmentation System (WAAS) was used for real-time horizontal control during data acquisition on vessels HSL 2903, HSL 2904, and S222.

## D. Results and Recommendations

### D.1 Chart Comparison

A chart comparison was conducted between survey H13507 and Electronic Navigational Charts (ENC) US5MD13M and US5MD16M in accordance with methods outlined in the DAPR. With the exception

of two dredged areas (see section D.2.9) all soundings and contours from acquired data and ENC's are in agreement. All data from H13507 are recommended to supersede charted data.

### D.1.1 Electronic Navigational Charts

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

| ENC      | Scale   | Edition | Update Application Date | Issue Date |
|----------|---------|---------|-------------------------|------------|
| US5MD13M | 1:40000 | 29      | 08/13/2021              | 10/19/2020 |
| US5MD16M | 1:40000 | 29      | 03/24/2021              | 03/24/2021 |

*Table 11: Largest Scale ENC's*

### D.1.2 Shoal and Hazardous Features

No shoals or potentially hazardous features exist for this survey.

### D.1.3 Charted Features

A total of 37 charted features were assigned. One feature was deemed appropriate for deletion, 11 features were deemed appropriate for updating, and 15 features were deemed appropriate to be retained as charted. 11 features were not investigated due to their location within the NALL. Reference the final feature file included with the submission of this project for further information.

### D.1.4 Uncharted Features

There are 24 designated soundings included in the submission of H13507. These designated soundings are attributed appropriately in the final feature file. Due to the gridding of variable resolution surfaces, there are 7 designated soundings where the node is not created directly onto the sounding. These seven features meet the standards set forth in section 5.2.1.2.3 and 7.4 of the 2021 HSSD.

A total of 13 uncharted features were identified and investigated using 100% complete coverage MBES and 100% SSS with concurrent MBES coverage. None of the features were considered dangerous to navigation. Reference the final feature file included with the submission of this project for further information.

### **D.1.5 Channels**

No channels exist for this survey. There are no designated anchorages, precautionary areas, safety fairways, traffic separation schemes, pilot boarding areas, or channel and range lines within the survey limits.

## **D.2 Additional Results**

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

Five aids to navigation (AtoN) were investigated while conducting H13507. All AToNs were confirmed to be on station and serving their intended purpose. Reference the Final Feature File for further information.

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

No Maritime Boundary Points were assigned for this survey.

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

A total of four bottom samples were collected, investigated and are included in the Final Feature File. See Figure 17 for a generalized view of H13507 bottom sample locations.

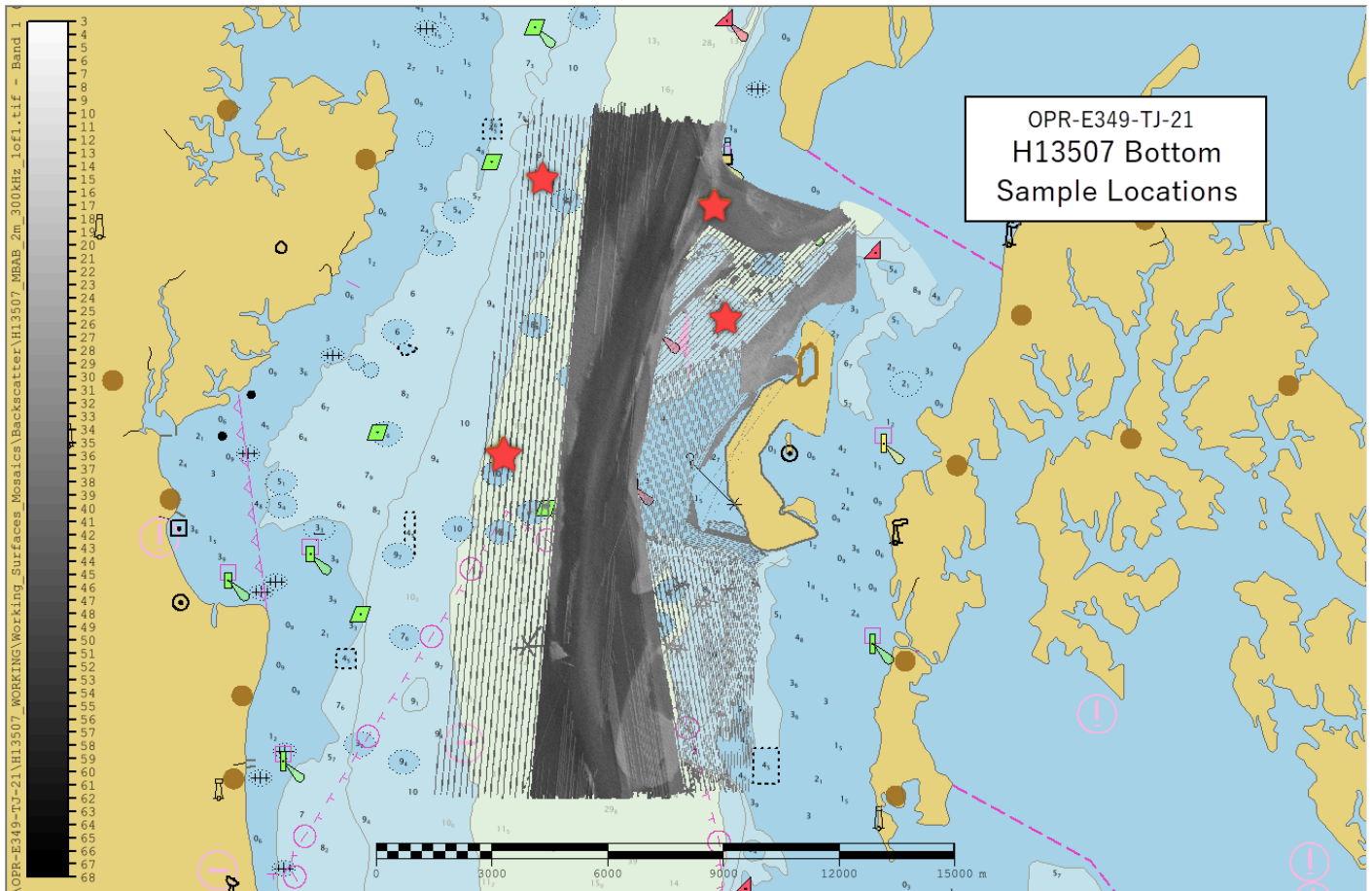


Figure 17: H13507 bottom sample locations (stars) over the backscatter mosaic.

#### D.2.4 Overhead Features

No overhead features exist for this survey.

#### D.2.5 Submarine Features

No submarine features exist for this survey.

#### D.2.6 Platforms

No platforms exist for this survey.

**D.2.7 Ferry Routes and Terminals**

No ferry routes or terminals exist for this survey.

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

No abnormal seafloor or environmental conditions exist for this survey.

**D.2.9 Construction and Dredging**

Two areas of dredging were identified on the north eastern part of sheet H13507 (Figure 18). These areas are deeper and vary from the charted bathymetric contours. They are a result of an ongoing Army Corps of Engineers project on Poplar Island. No DTOns were identified in these areas.

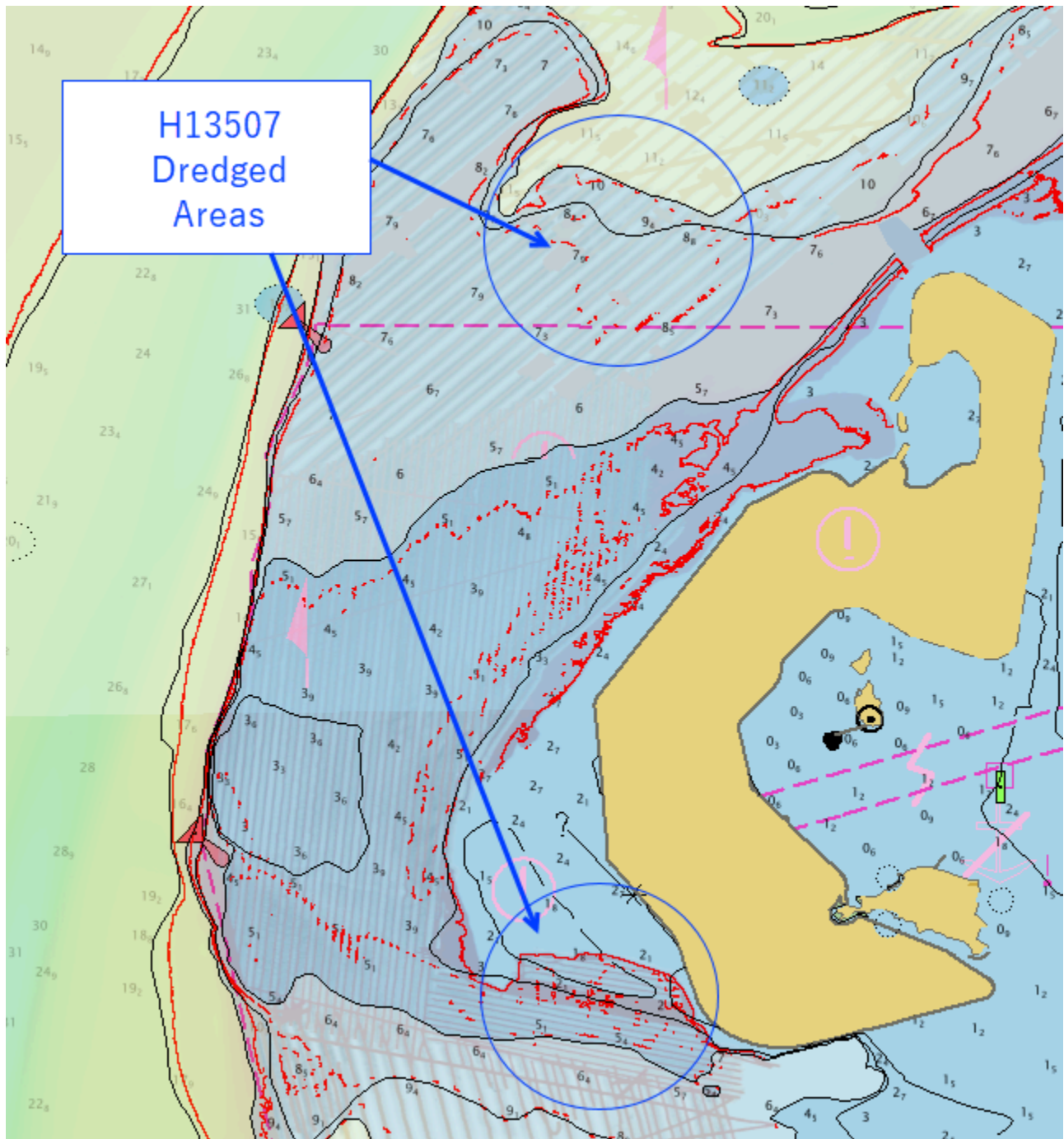


Figure 18: Dredged areas on sheet H13507. The charted contours are shown in black and the observed contours are shown in red.

#### 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  |
|----------------------------------|---------------------------------------|---------------|--|
| Matthew J. Jaskoski,<br>CDR/NOAA | Commanding Officer/<br>Chief of Party | 01/05/2022    | <br>JASKOSKI.MATTHEW.J<br>ACOB.1275636262<br>2022.01.20 12:54:42<br>-05'00' |
| Michelle M.<br>Levano, LT/NOAA   | Field Operations Officer              | 01/05/2022    | LEVANO.MICH<br>ELLE.MARIE.15<br>16645888<br>Digitally signed by<br>LEVANO.MICHELLE.MARI<br>E.1516645888<br>Date: 2022.01.20 11:08:33<br>-05'00'                |
| Erin Cziraki                     | Chief Survey Technician               | 01/05/2022    | CZIRAKI.ERIN.K<br>AYE.155001533<br>8<br>Digitally signed by<br>CZIRAKI.ERIN.KAYE.155001<br>5338<br>Date: 2022.01.18 11:46:51<br>-05'00'                        |
| Chloe Arboleda                   | Sheet Manager                         | 01/05/2022    | ARBOLEDA.CHLOE<br>ELIZABETH.B.1550<br>062760<br>Digitally signed by<br>ARBOLEDA.CHLOE<br>ELIZABETH.B.1550062760<br>Date: 2022.01.18 10:30:28<br>-05'00'        |



## F. Table of Acronyms

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

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