H13175

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

# DESCRIPTIVE REPORT

| | |
|---|---|
| Type of Survey: | Navigable Area |
| Registry Number: | H13175 |

## LOCALITY

| | |
|---|---|
| State(s): | Florida |
| General Locality: | Approaches to Tampa Bay, FL |
| Sub-locality: | 18 NM West of Passage Key |

**2019**

CHIEF OF PARTY
Scott Melancon

LIBRARY & ARCHIVES

Date:

| U.S. DEPARTMENT OF COMMERCE<br>NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION | REGISTRY NUMBER: |
|---|---|
| **HYDROGRAPHIC TITLE SHEET** | **H13175** |

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): | **Florida** |
| General Locality: | **Approaches to Tampa Bay, FL** |
| Sub-Locality: | **18 NM West of Passage Key** |
| Scale: | **20000** |
| Dates of Survey: | **11/08/2018 to 06/18/2019** |
| Instructions Dated: | **07/17/2018** |
| Project Number: | **OPR-J317-KR-18** |
| Field Unit: | **Oceaneering International, Inc.** |
| Chief of Party: | **Scott Melancon** |
| Soundings by: | **Multibeam Echo Sounder** |
| Imagery by: | **Side Scan Sonar** |
| 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 HYPERLINK "http://www.ncei.noaa.gov/" https://www.ncei.noaa.gov/. Products created during office processing were generated in NAD83 UTM 17N, 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 H13175

Project: OPR-J317-KR-18

Locality: Approaches to Tampa Bay, FL

Sublocality: 18 NM West of Passage Key

Scale: 1:20000

November 2018 - June 2019

**Oceaneering International, Inc.**

Chief of Party: Scott Melancon

# A. Area Surveyed

The survey area is located 18 NM West of Passage Key, in the general locality of the Approaches to Tampa Bay, Florida.

## A.1 Survey Limits

Data were acquired within the following survey limits:

| Northwest Limit | Southeast Limit |
|---|---|
| 27° 35' 12.49" N<br>83° 13' 38.14" W | 27° 30' 26.62" N<br>83° 3' 12.07" W |

*Table 1: Survey Limits*

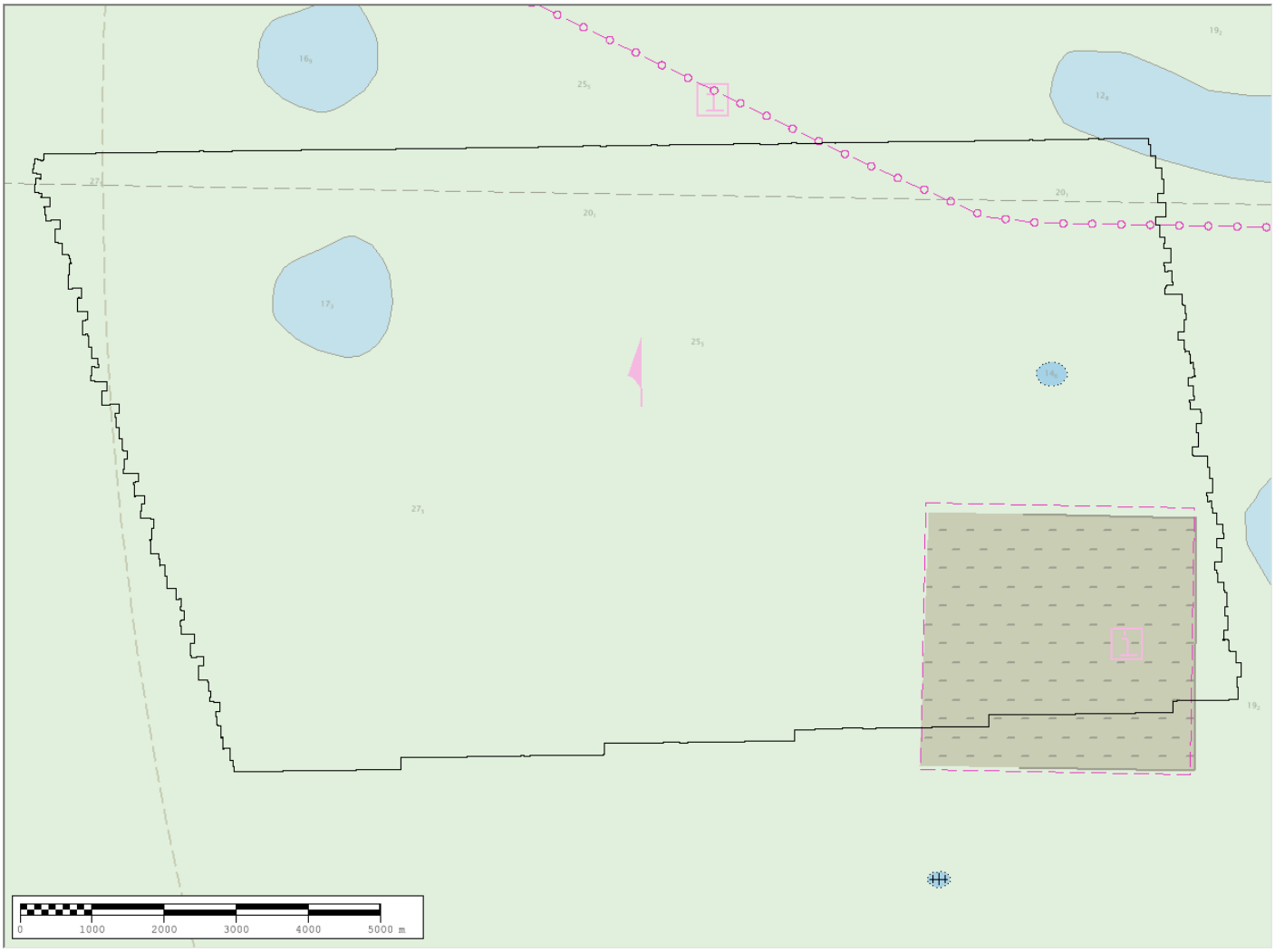


*Figure 1: H13175 Survey Limits*

Survey limits were acquired in accordance with the requirements in the Project Instructions and the HSSD (2018).

## A.2 Survey Purpose

The purpose of the project is to provide contemporary surveys to update the National Ocean Service nautical charting products to support an increase in vessel traffic into Tampa Bay, Florida. There is a lack of modern data in the area, which is subject to strong storm events that have the potential to cause shoaling.

## 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 the survey area (Except Sheet 4) | Complete Coverage |
| All waters in the survey area | Report significant shoaling via weekly progress reports. PM/COR may adjust prioritization based on observed shoaling. |
| All waters in the survey area | Acquire backscatter data during all multibeam data acquisition |

*Table 2: Survey Coverage*

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

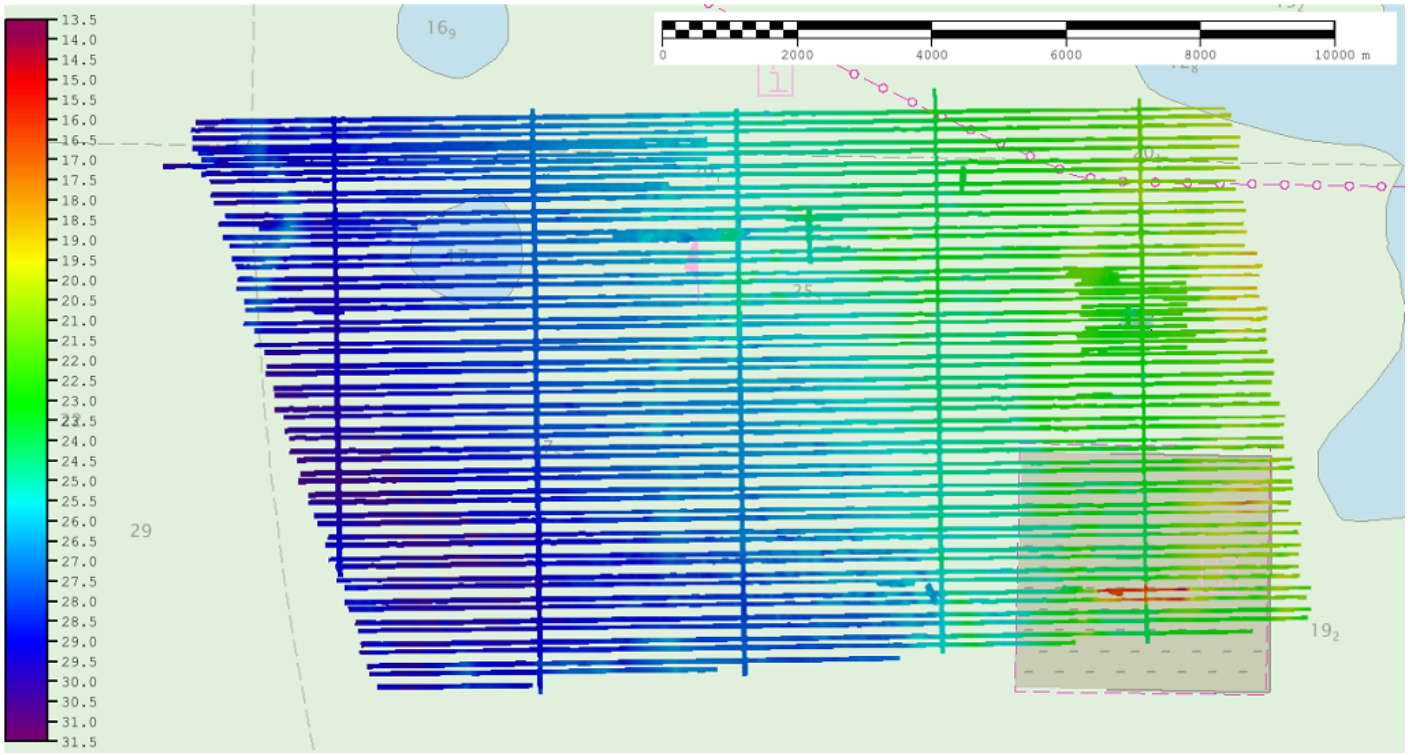


*Figure 2: H13175 Survey Coverage*

## A.5 Survey Statistics

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

| | HULL ID | *1237094* | *Total* |
|---|---|---|---|
| **LNM** | **SBES Mainscheme** | 0 | 0 |
| | **MBES Mainscheme** | 0 | 0 |
| | **Lidar Mainscheme** | 0 | 0 |
| | **SSS Mainscheme** | 0 | 0 |
| | **SBES/SSS Mainscheme** | 0 | 0 |
| | **MBES/SSS Mainscheme** | 416.4 | 416.4 |
| | **SBES/MBES Crosslines** | 21.9 | 21.9 |
| | **Lidar Crosslines** | 0 | 0 |
| **Number of Bottom Samples** | | | 4 |
| **Number Maritime Boundary Points Investigated** | | | 0 |
| **Number of DPs** | | | 11 |
| **Number of Items Investigated by Dive Ops** | | | 0 |
| **Total SNM** | | | 35.79 |

*Table 3: Hydrographic Survey Statistics*

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

| Survey Dates | Day of the Year |
|---|---|
| 11/08/2018 | 312 |
| 05/30/2019 | 150 |
| 05/31/2019 | 151 |
| 06/01/2019 | 152 |
| 06/02/2019 | 153 |
| 06/03/2019 | 154 |
| 06/04/2019 | 155 |
| 06/18/2019 | 169 |

*Table 4: Dates of Hydrography*

It was observed that there were several unit options for nautical miles within the CARIS program. However, 'area' only had one option for the nautical mile units as Square Int. Nautical Miles. To be consistent, Int. Nautical Miles was used as the unit for the LNM shown in Table 3. Detached Positions (DP) include CTD casts and lead line comparisons conducted within survey bounds, but not bottom samples because there is a separate entry for those.

***LNM of MBES/SSS Mainscheme lines is actually 443.41.***
***Total SNM for the survey is 35.85.***

# 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** | ***1237094*** |
|---|---|
| **LOA** | 40.84 meters |
| **Draft** | 1.98 meters |

*Table 5: Vessels Used*

The R/V Sea Scout (Hull ID 1237094) was used as the survey platform for all data acquisition within H13175.

### B.1.2 Equipment

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

| Manufacturer | Model | Type |
|---|---|---|
| Kongsberg Maritime | EM2040C | MBES |
| Klein Marine Systems | System 5000V2 | SSS |
| C-Nav | 3050 | Positioning System |
| Teledyne TSS | Meridian Surveyor | Gyrocompass |
| Teledyne TSS | DMS05 | Attitude System |
| Sea-Bird Scientific | SBE19 | Conductivity, Temperature, and Depth Sensor |
| Sea-Bird Scientific | SBE19plus | Conductivity, Temperature, and Depth Sensor |
| YSI | 600-BCR-C-T | Conductivity, Temperature, and Depth Sensor |

*Table 6: Major Systems Used*

## B.2 Quality Control

### B.2.1 Crosslines

Multibeam/single beam echo sounder/side scan sonar crosslines acquired for this survey totaled 5.26% of mainscheme acquisition.

Crosslines were run generally perpendicular to mainscheme lines in order for quality control statistics to be generated after completion of mainscheme survey lines. The total crossline mileage was 416.4 nautical miles and total mainline mileage was 21.9 nautical miles. Multibeam fill-ins, if collected, were included in the total mainline mileage. Side scan sonar rerun lines for which MBES was also acquired and investigations, if collected, were not included.

Separate 1-meter mainline and crossline Combined Uncertainty and Bathymetric Estimator (CUBE) surfaces were generated and the surface difference tool within CARIS HIPS was used to evaluate crossline and mainscheme line agreement. The mainline surface was used as Input A and the crossline surface as Input B. Statistical information about the difference surface was generated using the Compute Statistics tool

(Figure 3). The analysis shows that greater than 99% of depth difference values are between -0.22 and 0.28 meters. This is well within the maximum allowable Total Vertical Uncertainty (TVU) for the depths of the comparison area of the mainline surface (13.59 - 31.61 meters), which ranges from ±0.530 to ±0.647 meters. It is evident from the histogram (Figure 3) that no depth difference values exceed the maximum allowable TVU.

The crossline surface, mainline surface, difference surface and exported ASCII file of histogram results are located in Separates\II_Digital_Data\Crossline_Comparison.

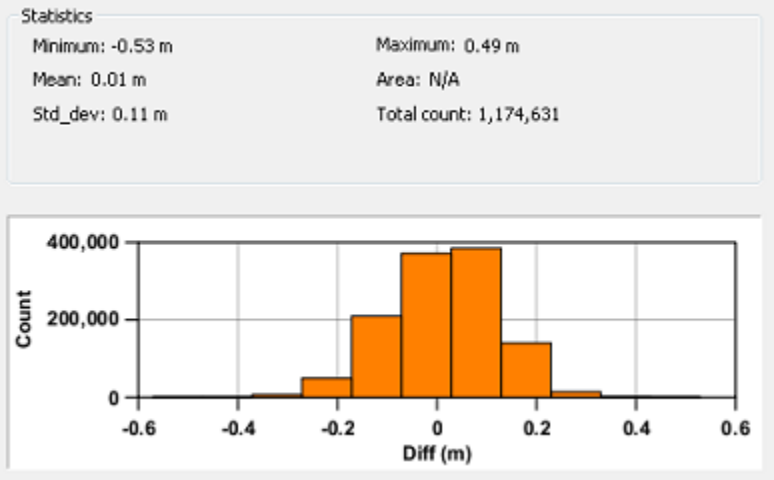


*Figure 3: H13175 crossline comparison statistics and histogram output from CARIS compute statistics tool.*

### B.2.2 Uncertainty

The following survey specific parameters were used for this survey:

| Method | Measured | Zoning |
|---|---|---|
| ERS via VDATUM | 0.1 meters | 0.131 meters |

*Table 7: Survey Specific Tide TPU Values.*

| Hull ID | Measured - CTD | Measured - MVP | Surface |
|---|---|---|---|
| 1237094 | 2 meters/second | n/a meters/second | 0.8 meters/second |

*Table 8: Survey Specific Sound Speed TPU Values.*

The Total Propagated Uncertainty (TPU) for each sounding was computed within CARIS, the MBES data processing software. The vessel file stores static values of the estimated uncertainties associated with each individual sensor. The Compute TPU dialog contains placeholders for the user to specify tidal and sound speed uncertainty, as well as whether the sources of uncertainty are static (come from the vessel file) or were collected in real-time. This particular survey contains all static uncertainty sources. The above uncertainty estimates are combined with a DeviceModels.xml that contains individual sonar model characteristics to calculate the total TPU.

Currently there is no entry for static vertical uncertainty associated with a positioning system or the separation model within CARIS. The workaround is to enter these values in the Tide Measured and Zoning entry locations. Internal verification indicates the C-Nav™ 3050 systems have a vertical uncertainty of ~20 cm at the 95% confidence level. The 95% confidence level is expressed as 1.96 standard deviations from the mean. CARIS entries of uncertainty are assumed to be 1-sigma (one standard deviation from the mean) and this value of 20 cm is divided by 1.96 for a value of 10 cm to enter into CARIS. The 1-sigma VDATUM Maximum Combined Uncertainty (MCU) value for the separation model (13.1 cm) is provided in the project instructions.

An Uncertainty child layer is generated during the bathymetric surface creation process that shows the uncertainty at each node of the surface. HydrOffice QCTools was used to analyze the uncertainty of all un-finalized and finalized grids. It was observed that all uncertainty values are within specifications for all un-finalized surfaces (Figures 4-5) but the finalized surfaces contain less than 0.1% of values that do not meet specifications (Figures 6-7). Review indicates that this is due to the finalization parameter where the uncertainty is defined as the greater of either the standard deviation or uncertainty for a particular node. The majority of nodes that do not meet specifications for the H13175_MB_1m_MLLW_Final surface are either associated with features or on the outer edges of the swath. The majority of nodes that do not meet specifications for the H13175_MB_2m_MLLW_Final surface are located on the edges of the swath; spot checking these areas indicates pings that, in general, do not contribute substantially to the surface depth value as reviewed in subset editor with the reference surface loaded but appear to still contribute to the overall standard deviation.

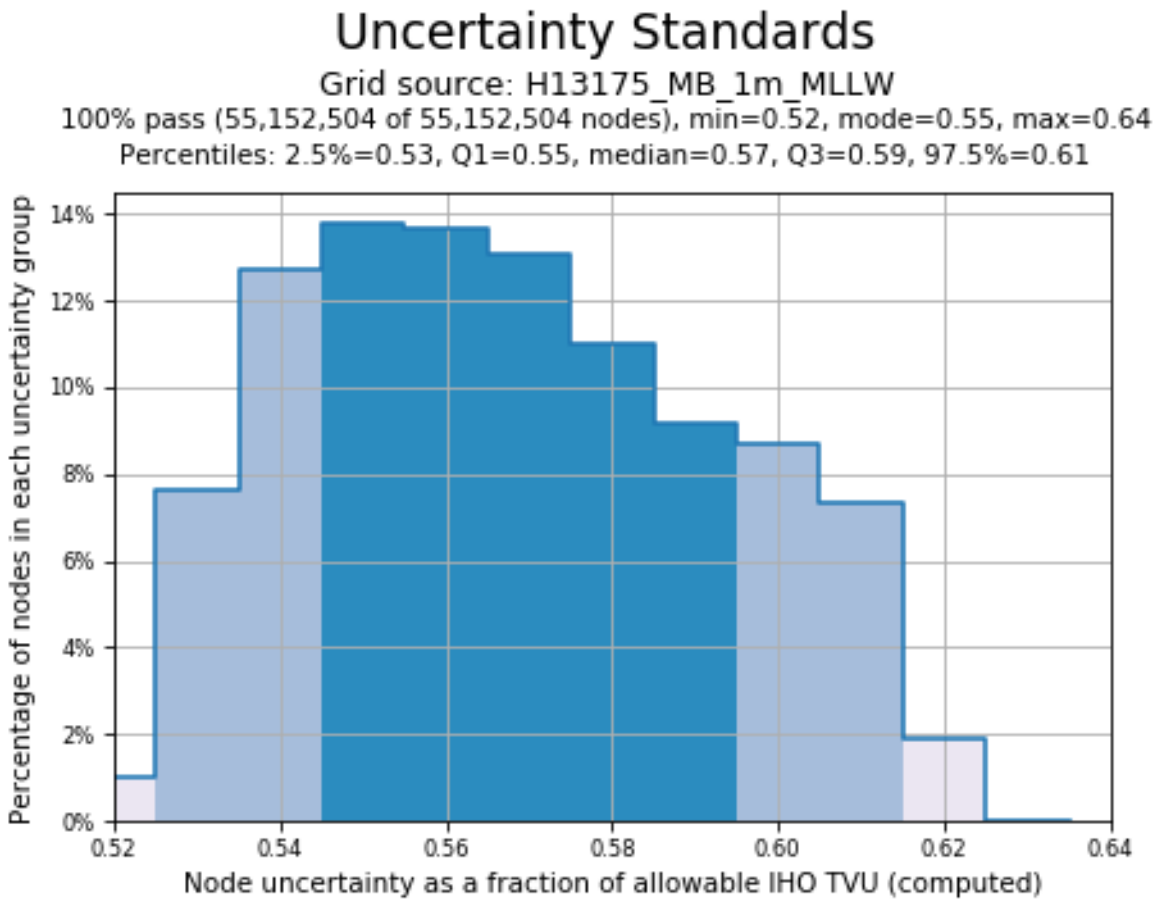


*Figure 4: Uncertainty QA output from HydrOffice QCTools for surface H13175_MB_1m_MLLW.*

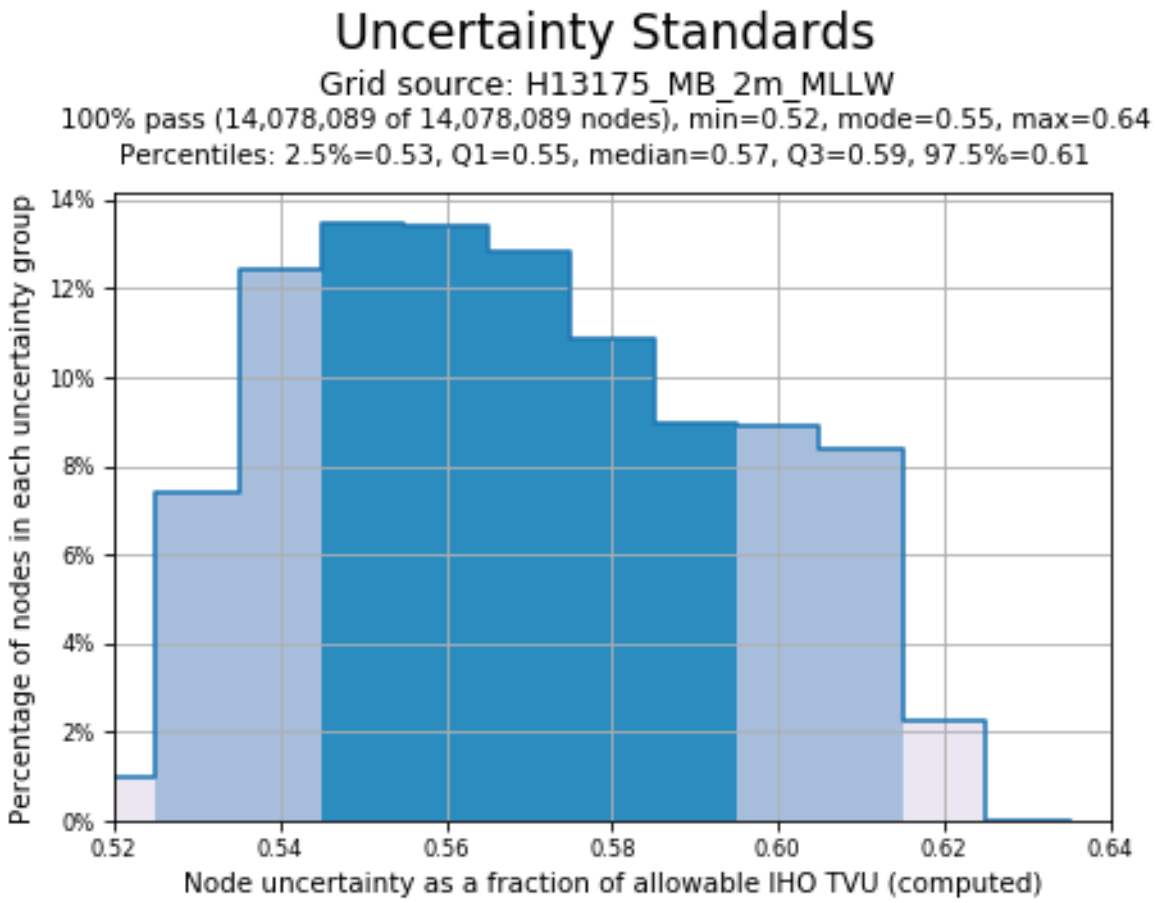


*Figure 5: Uncertainty QA output from HydrOffice QCTools for surface H13175_MB_2m_MLLW.*

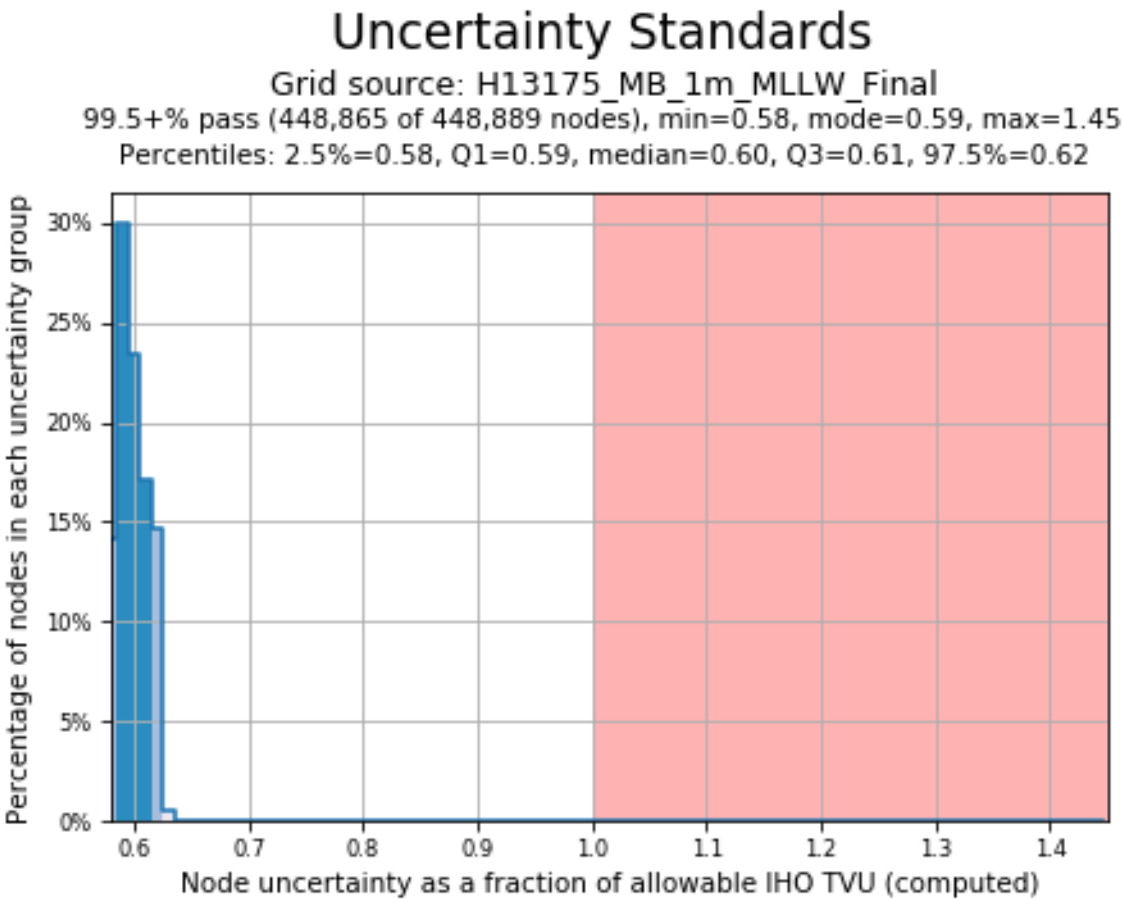


*Figure 6: Uncertainty QA output from HydrOffice QCTools for surface H13175_MB_1m_MLLW_Final.*

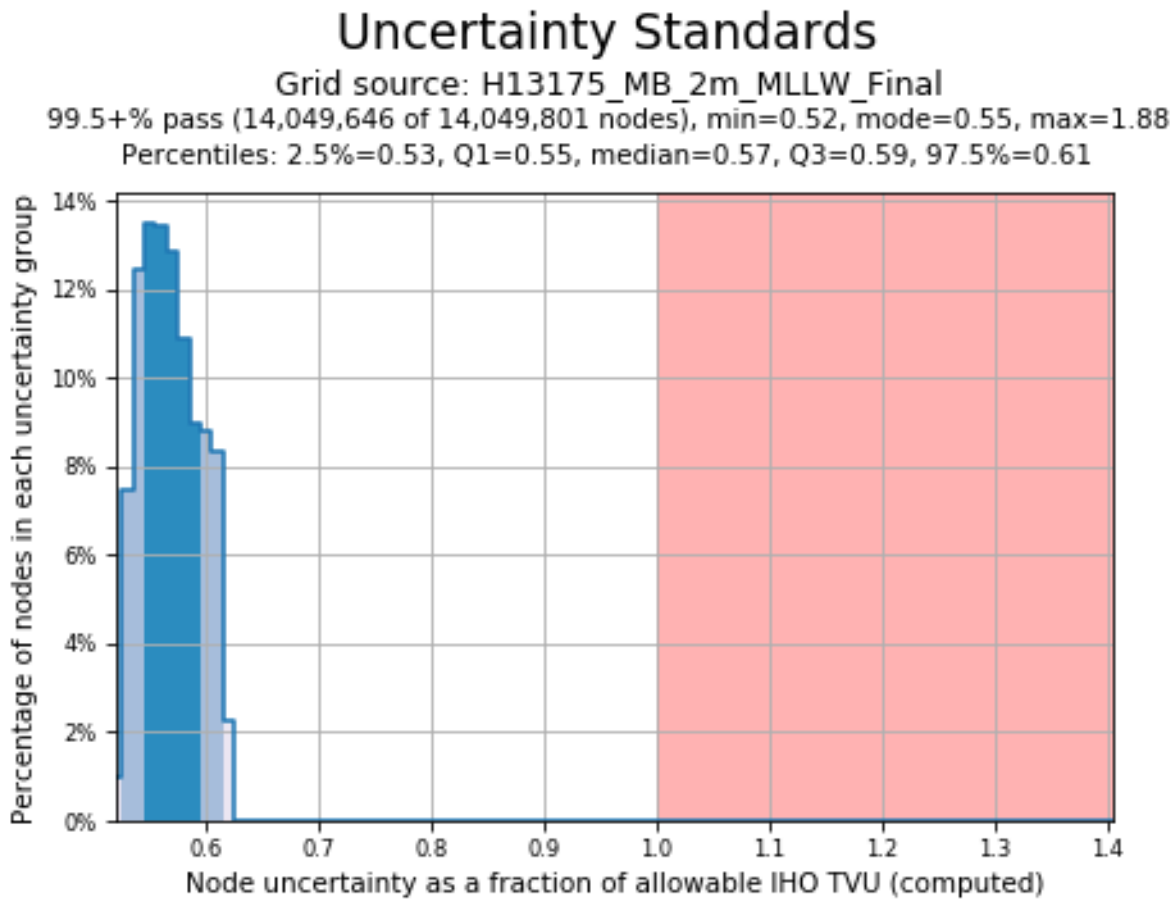


*Figure 7: Uncertainty QA output from HydrOffice QCTools for surface H13175_MB_2m_MLLW_Final.*

### B.2.3 Junctions

Survey H13175 junctions with three contemporary surveys: H13174, H13176, and H13178 (Figure 8). Survey area H13178 was either not complete or partially complete at the time of this reporting and will be addressed in that Descriptive Report. Difference surfaces between the depth layers of H13175 and H13176, and H13175 and H13174, were generated and evaluated for difference values greater than 2^0.5 * TVU, as outlined in the HSSD (2018).

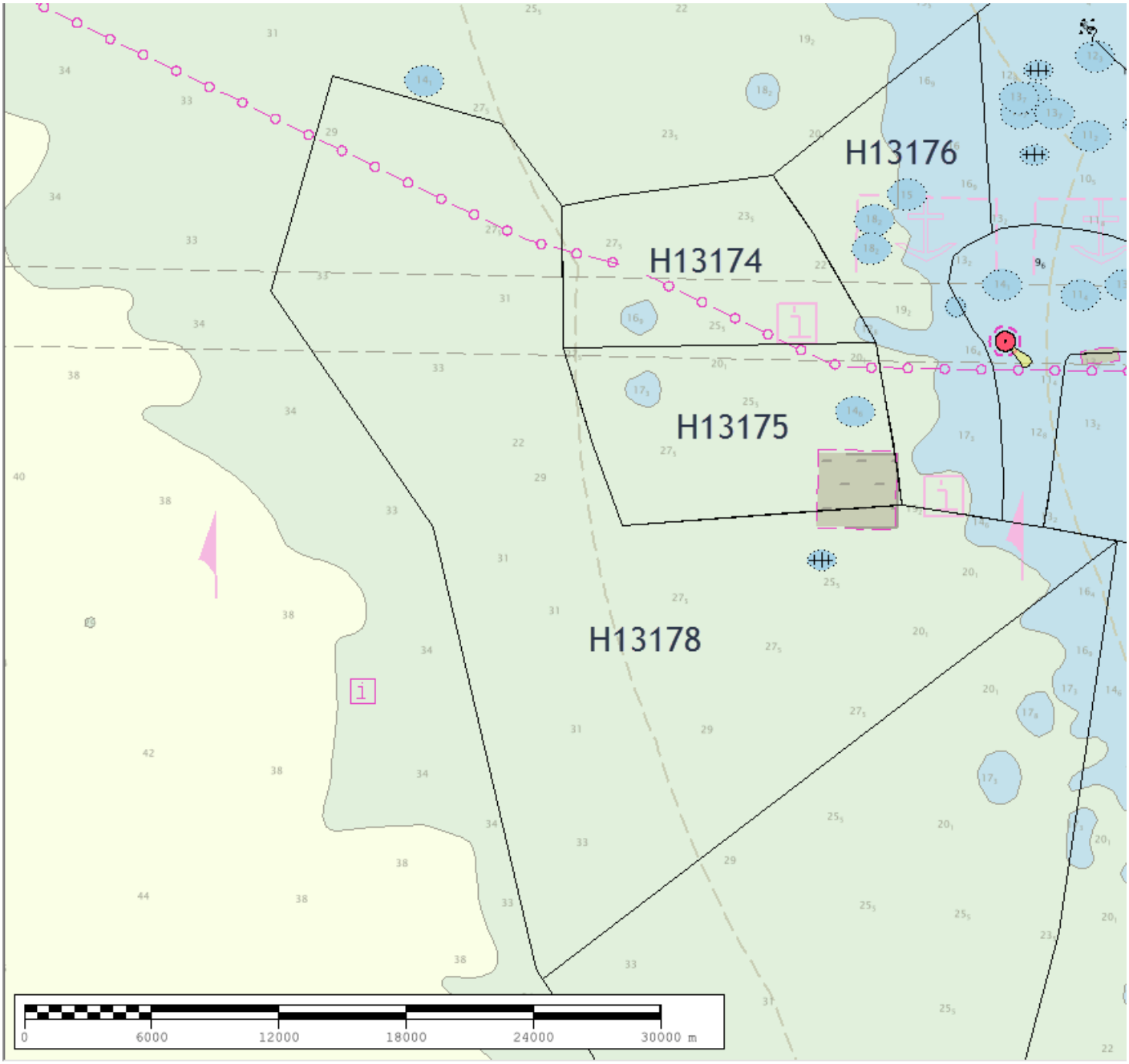


*Figure 8: H13175 Survey Junctions*

The following junctions were made with this survey:

| Registry Number | Scale | Year | Field Unit | Relative Location |
|---|---|---|---|---|
| H13174 | 1:20000 | 2018 | Oceaneering | N |
| H13176 | 1:20000 | 2018 | Oceaneering | E |
| H13178 | 1:40000 | 2018 | Oceaneering | SW |

*Table 9: Junctioning Surveys*

H13174

Sheet H13175 junctions with H13174 to the north. The overlap consists of mainlines and crosslines that extend into the adjoining sheet. A difference surface was generated between the two surveys with H13175_MB_1m_MLLW as Input A and H13174_MB_1m_MLLW as Input B. The difference surface indicates data from H13175 and H13174 agree well (Figure 9), with greater than 99% of the difference values between -0.23 and 0.17 meters.

The minimum depth for the H13175_MB_1m_MLLW surface is 13.59 meters with a TVU of ±0.530 meters and 2^0.5 * TVU of ±0.750 meters. Depth difference values greater than 2^0.5 * TVU would need to at least exceed ±0.750 meters. No depth difference values between H13715 and H13174 exceed ±0.750 meters.

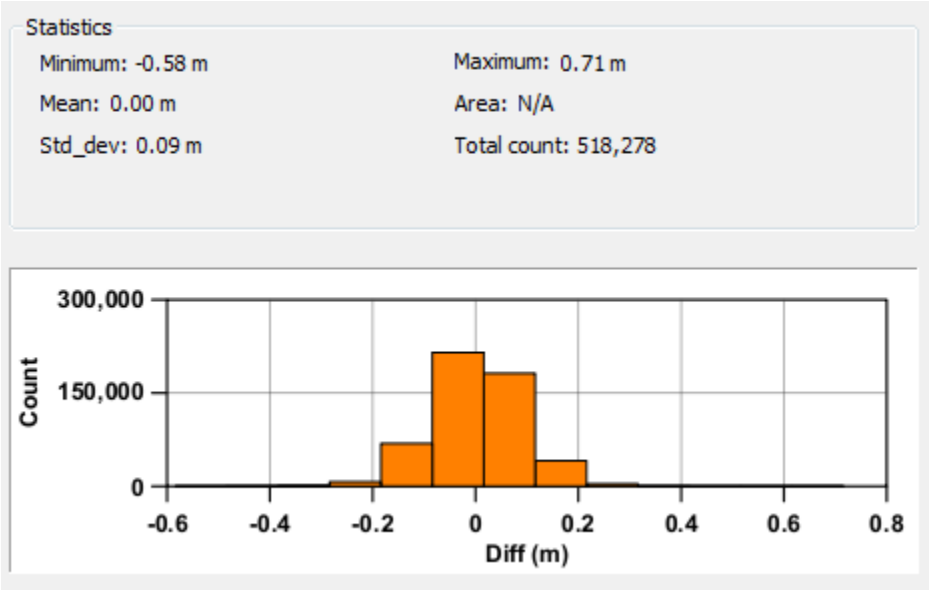


*Figure 9: Histogram of depth difference values between overlapping data of H13175 and H13174.*

H13176

Sheet H13175 junctions with H13176 to the east. The overlap consists of mainlines and crosslines that extend into the adjoining sheet. A difference surface was generated between the two surveys with H13175_MB_1m_MLLW as Input A and H13176_MB_1m_MLLW as Input B. The difference surface indicates data from H13175 and H13176 agree well (Figure 10), with greater than 99% of the difference values between -0.23 and 0.17 meters.

The minimum depth for the H13175_MB_1m_MLLW surface is 13.59 meters with a TVU of ±0.530 meters and 2^0.5 * TVU of ±0.750 meters. Depth difference values greater than 2^0.5 * TVU would need to at least exceed ±0.750 meters. No depth difference values between H13715 and H13176 exceed ±0.750 meters.

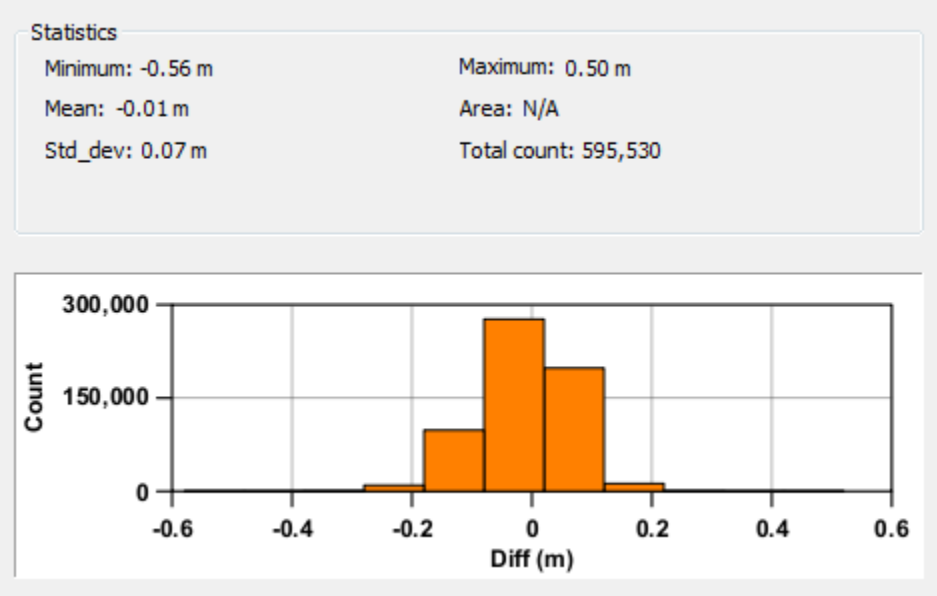


*Figure 10: Histogram of depth difference values between overlapping data of H13175 and H13176.*

H13178

The survey junction between H13175 and H13178 will be addressed in the Descriptive Report for H13178.

### 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

Sonar Settings

If necessary, the angle of the multibeam sonars were modified in order to moderate the effects of factors such as increased sea state or to increase coverage; any changes are documented in the acquisition logs. Data were collected with a single EM2040C MBES transducer in a dual head configuration after confirming coverage over SSS nadir.

### B.2.6 Factors Affecting Soundings

Enviromental Factors

Weather, sea state, thermoclines, and fish/marine life were all temporary factors that affected the data periodically throughout the duration of the survey. These are noted in the acquisition and processing logs and reruns were collected when necessary.

### B.2.7 Sound Speed Methods

Sound Speed Cast Frequency: Sound Speed Casts were taken twice per day and more often as necessary.

Sea-Bird Scientific SBE19 and SBE19plus Conductivity, Temperature, and Depth (CTD) sensors were used for speed of sound measurements through the water column. The water column sound speed profiles were applied in Kongsberg's Seafloor Information System (SIS) MBES control software to correct the multibeam data in real-time. Endeco YSI sondes were used to determine the sound speed at the transducers. Sound speed data are located in Separates\II_Digital_Data\Sound_Speed_Data_Summary.

### B.2.8 Coverage Equipment and Methods

Mainline coverage within the survey area consisted of Complete Coverage (100% side scan sonar with concurrent multibeam data) acquisition. 200% SSS data were collected over assigned feature disprovals. Complete coverage MBES data were collected over potentially significant contacts. Bathymetric data were acquired with a Kongsberg EM2040C multibeam echo sounder, and side scan sonar acoustic imagery data were collected with a Klein 5000 V2 system.

### B.2.9 Density

HydrOffice QCTools was used to analyze the density of all finalized surfaces. The density of all finalized surfaces meet the density requirements for which at least 95% of all nodes on the surface shall be populated with at least 5 soundings (Figures 11-12).

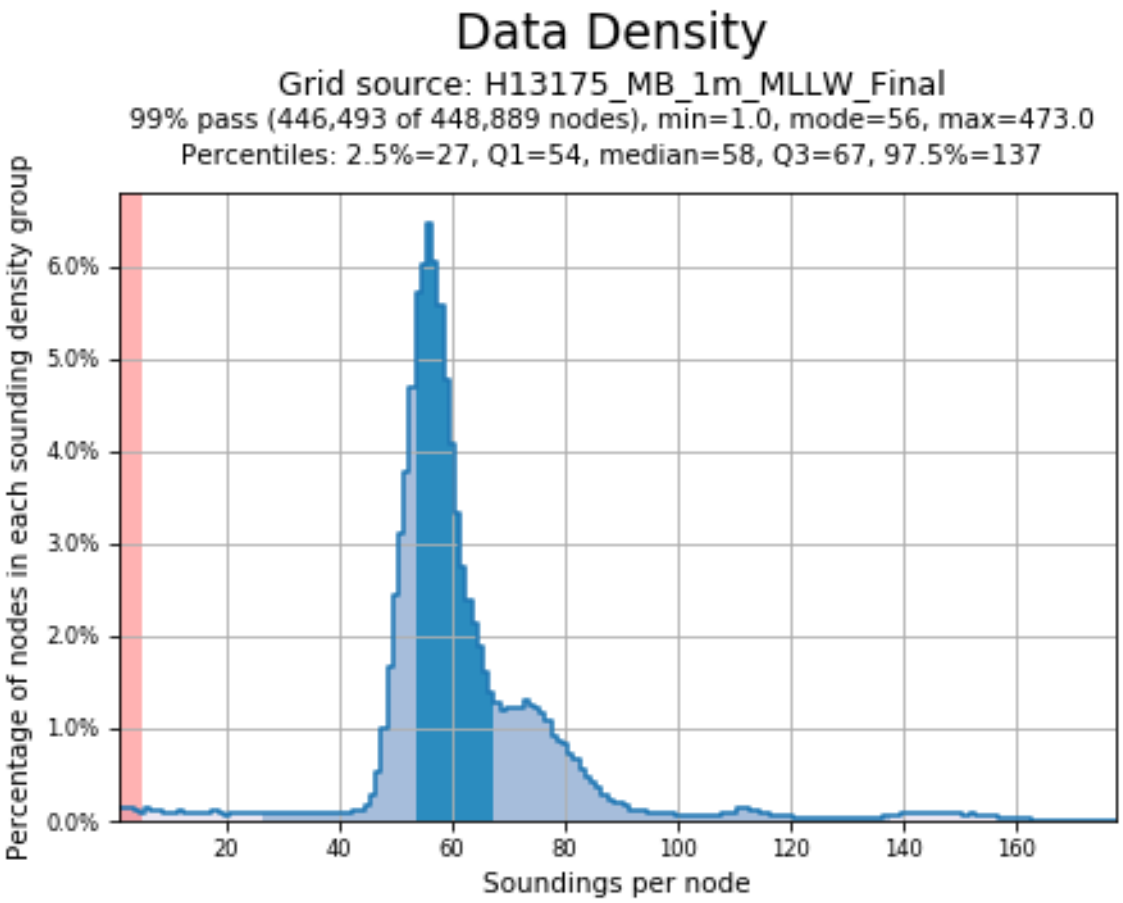


*Figure 11: Statistical information about the density child layer of the H13175_MB_1m_MLLW_Final surface generated from HydrOffice QCTools.*

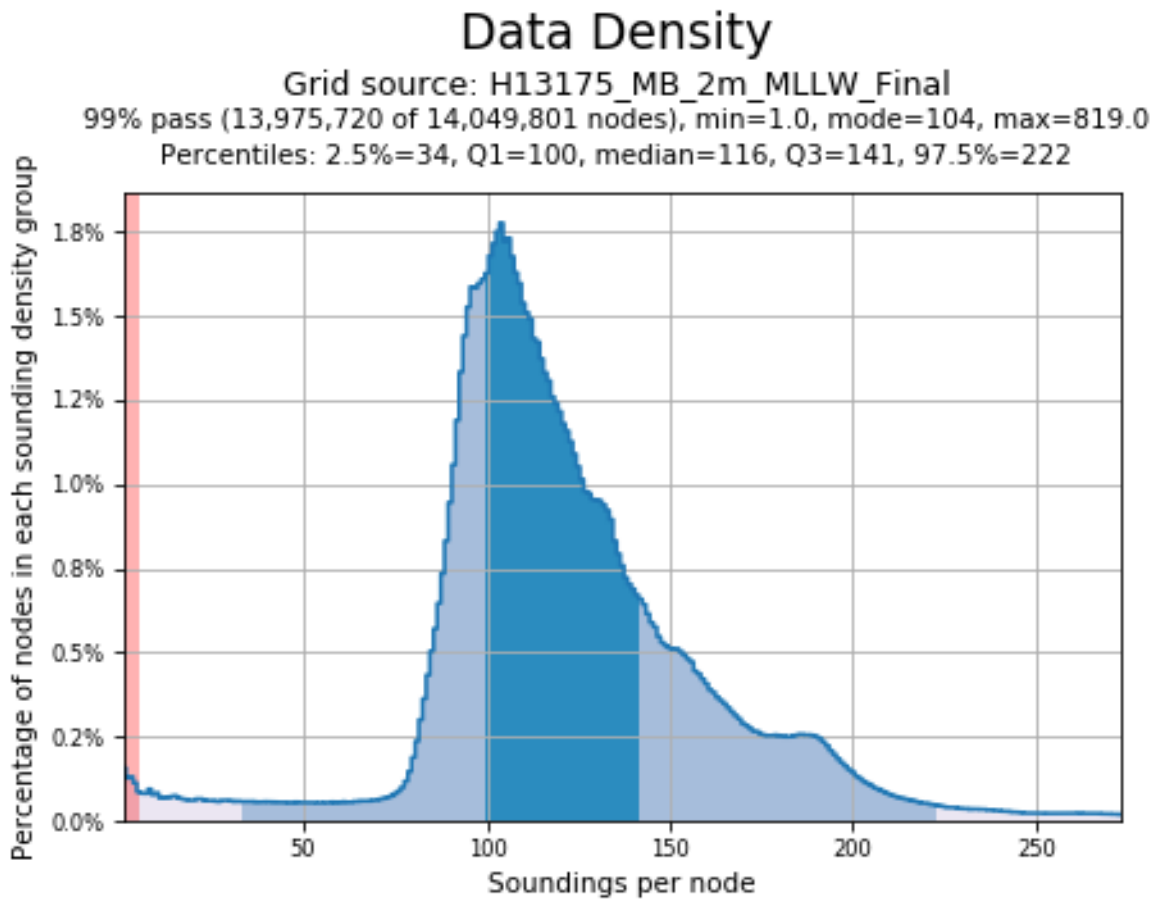


*Figure 12: Statistical information about the density child layer of the H13175_MB_2m_MLLW_Final surface generated from HydrOffice QCTools.*

### B.2.10 Holidays

The complete coverage bathymetric surface was reviewed visually; no along-track gaps were observed. Full coverage MBES data were acquired over all potentially significant contacts and visually inspected for coverage; no gaps in coverage were observed. ArcGIS was used as an independent check on the 100% and 200% coverage mosaics to identify gaps using a combination of the 'reclassify' and 'raster to polygon' tools. No holidays in either mosaic were observed.

## 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. Backscatter was logged within each raw Kongsberg EM file.

## 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 |
|---|---|---|
| Teledyne | CARIS | 10.4 |

*Table 10: Primary bathymetric data processing software*

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

| Manufacturer | Name | Version |
|---|---|---|
| Chesapeake Technology | SonarWiz | V6005.0025 |

*Table 11: Primary imagery data processing software*

The following Feature Object Catalog was used: NOAA Profile V_5_8.

### 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 |
|---|---|---|---|---|---|
| H13175_MB_1m_MLLW | CARIS Raster Surface (CUBE) | 1 meters | 13.59 meters - 31.61 meters | NOAA_1m | Complete MBES |

| Surface Name | Surface Type | Resolution | Depth Range | Surface Parameter | Purpose |
|---|---|---|---|---|---|
| H13175_MB_1m_MLLW_Final | CARIS Raster Surface (CUBE) | 1 meters | 13.05 meters - 20.00 meters | NOAA_1m | Complete MBES |
| H13175_MB_2m_MLLW | CARIS Raster Surface (CUBE) | 2 meters | 13.81 meters - 31.37 meters | NOAA_2m | Complete MBES |
| H13175_MB_2m_MLLW_Final | CARIS Raster Surface (CUBE) | 2 meters | 18.00 meters - 31.37 meters | NOAA_2m | Complete MBES |
| H13175_SSSAB_1m_455kHz_1of2 | SSS Mosaic | 1 meters | - | N/A | 100% SSS |
| H13175_SSSAB_1m_455kHz_2of2 | SSS Mosaic | 1 meters | - | N/A | 200% SSS |

*Table 12: Submitted Surfaces*

### B.5.3 MBES Data Processing and Review

The data were filtered using a surface filter set to reject data greater than 1-meter away from the CUBE surface. The data were reviewed for additional outliers (fliers) using the standard deviation and depth layers. Higher standard deviation is generally associated with bathymetric features, contacts and/or areas of bathymetric change. Noise can also be identified by high standard deviation. The Detect Fliers utility within HydrOffice QCTools was used as an additional quality control tool to evaluate the surface for fliers. Identified fliers were manually rejected. All investigations, contacts and features were manually reviewed.

Final checks of the H13175_MB_1m_MLLW_Final and H13175_MB_2m_MLLW_Final surfaces were conducted using HydrOffice QCTools 2 v2.7.0 Detect Fliers utility with the default parameters selected. The results indicate 51 and 16 nodes flagged as potential fliers for the H13175_MB_1m_MLLW_Final and H13175_MB_2m_MLLW_Final surfaces, respectively. Thirty-seven out of the 51 flagged fliers for the H13175_MB_1m_MLLW_Final surface were flagged as type #5 (isolated nodes). These appear to be due to the finalization depth-range parameter (0 to 20 meters), which introduces isolated nodes. The remaining 14 potential fliers were flagged as type #6 (edge fliers). These are located within the charted dumping area and appear associated with features and bottom change along the surface edges. The 16 potential fliers for the H13175_MB_2m_MLLW_Final surface were all flagged as type #6 (edge fliers). Five of these are associated with the Gulfstream Natural Gas System pipeline and the remaining 11 are associated with bottom features along the edges of the surface; several located within the charted dumping area may be at least in part due to the depth-range parameter set during finalization.

### B.5.4 Fixed File Path

During post-processing, ASCII navigation files (time, lat, lon, GPS height) were imported into CARIS with an associated .info file, which contains information on the contents and formatting of the ASCII navigation files.

When projects processed in the above manner were copied from a network location to external or internal drives or from internal to external drives it was observed that the path of the *.info file remained fixed to the original path name. Upon opening the copied project, the CARIS program asked to update the navigation folder, but not the *.info file. Keeping the info file in with the ASCII navigation did not appear to change this. Certain editors such as navigation editor or swath editor could not be opened within CARIS and the lines became locked.

The workaround is to recreate the exact folder structure of the original project on the internal or external drive. However, it is recognized that this is an issue for submission because files are placed in the appropriate submission folders without regard for how the projects were originally set up. A request was logged with CARIS support and the information sent to the development team. Information from CARIS support indicates that the Check Project process was not checking for an *.info file when using an ASCII file for auxiliary navigation. CARIS correspondence indicates that this has been fixed so that the check process will look for *.info missing files, enabling users to update their location using the Reset Raw Data Location dialog box. This fix should be available in both versions 10.4.10 and 11.1.0. Due to licensing limitations this has not been tested in-house and the workaround to maintain original path names and drive letters was used. The original path for this project is: N:\noaa\2018-OPR-J317-KR-18_193519-TampaBay\Sheets\H13175-Sheet6\Geo\Software_Projects\CARIS\H12175. It is recognized that the registry number was incorrect when setting up the CARIS project, therefore the fixed file path takes this into account.

# C. Vertical and Horizontal Control

Additional information discussing the vertical or horizontal control for this survey can be found in the accompanying HVCR.

## C.1 Vertical Control

The vertical datum for this project is Mean Lower Low Water.

ERS Methods Used:

ERS via VDATUM

Ellipsoid to Chart Datum Separation File:

TampaBay_EC_poly_xyNAD83-MLLW_geoid12b

### C.2 Horizontal Control

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

The projection used for this project is Projected UTM 17.

The positioning systems aboard the vessels utilize Oceaneering C-Nav systems which deliver Precise Point Positioning (PPP). The C-Nav GPS recieve corrections through the C-Nav Subscription Services.

# D. Results and Recommendations

## D.1 Chart Comparison

A combination of sounding selection layers and user-defined color/depth ranges were used to compare surveyed soundings to charted depths using tools within the CARIS MBES data processing software. The sounding selection layer was generated from a finalized surface of the H13175_MB_2m_MLLW surface with no z-value restrictions using a shoal biased, single-defined radius of 300 meters. This provided sufficient soundings across the survey area with which to compare charted depths and contours. A user-defined color map was generated to match the contour intervals present on the charts (Figure 13).

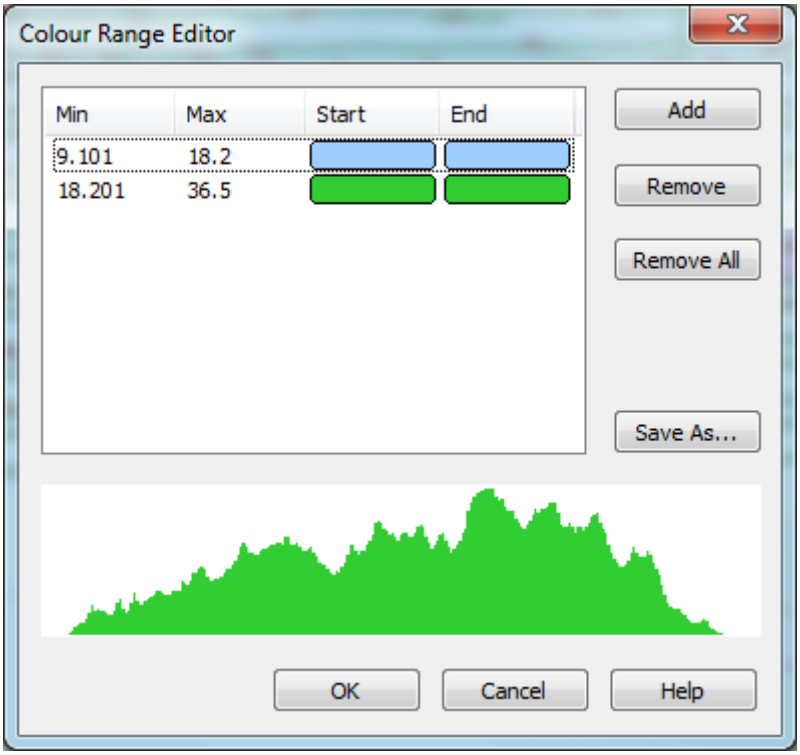


*Figure 13: Color range used to compare H13175 surveyed soundings to charted depths.*

### 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 | Preliminary? |
|---|---|---|---|---|---|
| US5FL11M | 1:40000 | 47 | 03/11/2019 | 06/04/2019 | NO |
| US3GC07M | 1:350000 | 34 | 03/11/2019 | 05/08/2019 | NO |

*Table 13: Largest Scale ENCs*

US5FL11M

NOAA Local Notice to Mariners (LNM) were reviewed for Chart: 11415, Current Edition: 13, Print Date: Nov. /2018, Tampa Bay Entrance; Manatee River Extension subsequent to the date of the Project Instructions and before the end of the survey. The last LNM reviewed was LNM 22/19, 7th Dist to Change

Egmont Channel Lighted Buoy 4 posted on 6/13/2019. No LNM were issued within the survey area subsequent to the date of the Project Instructions and before the end of the survey.

US5FL11M overlaps with H13175 on the east side of the survey area. While surveyed soundings generally agree with charted depths to within ± 0.5 meters, there are a few notable differences with regard to a charted dumping area located in the southeast part of the sheet. Field correspondence indicates the dumping area is active and surveyed soundings indicate substantially shallower depths than currently charted. The green circles in Figure 14 point out the shallowest surveyed depths in this area, with least depths in those areas being 17.4 (±0.33 m TVU) and 13.05 (±0.33 m TVU) meters, compared to charted depths of 21 to 24 meters.

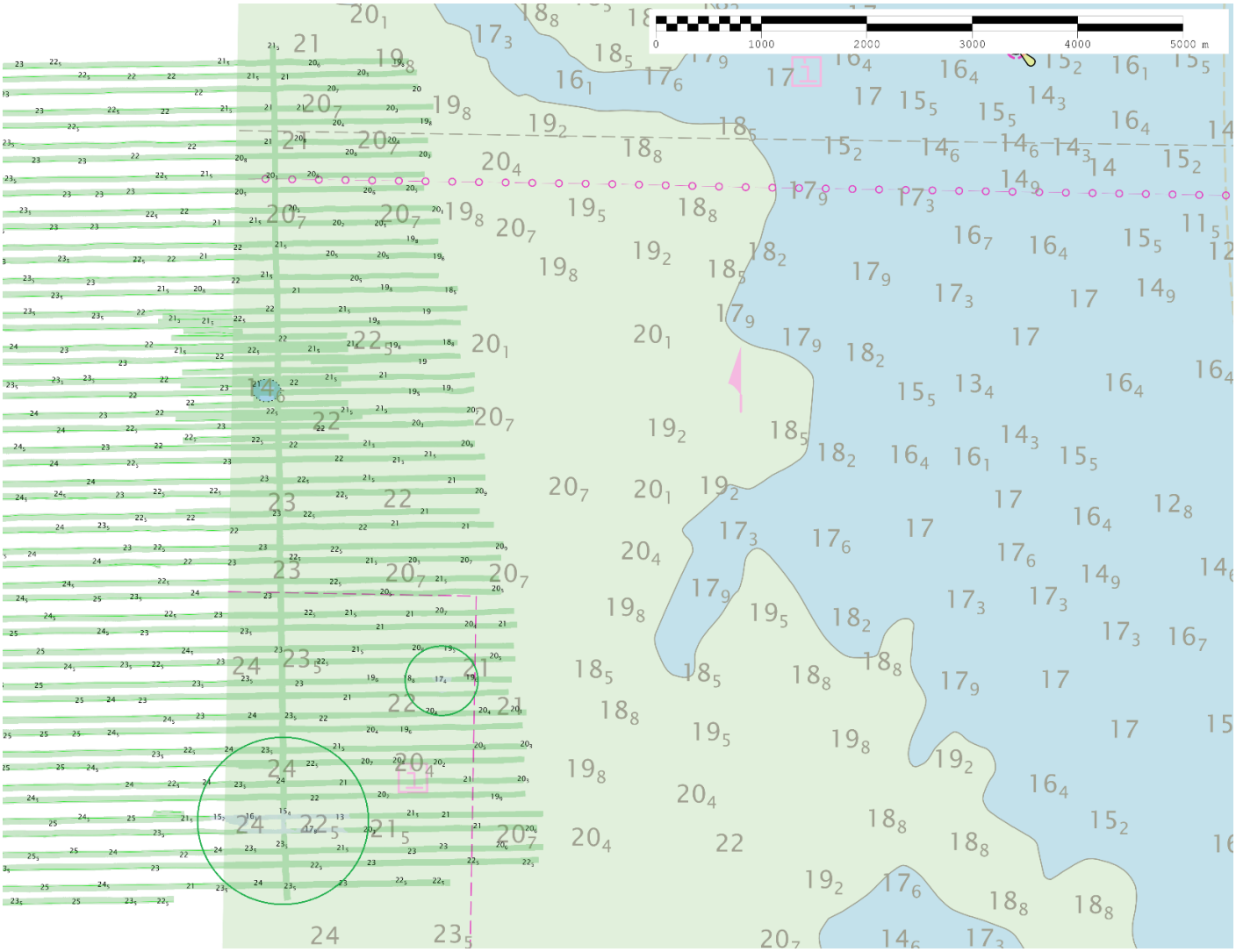


*Figure 14: Comparison of H13175 surveyed soundings to chart US5FL11M.*

US3GC07M

NOAA Local Notice to Mariners (LNM) for Chart: 11420, Current Edition: 32, Print Date: Oct. /2018, Havana to Tampa Bay were reviewed subsequent to the date of the Project Instructions and before the end of the survey. The last LNM reviewed was LNM 14/19, 7th Dist to Delete Fort Jefferson Buoy B posted on 4/25/2019. No LNM were issued within the survey area subsequent to the date of the Project Instructions and before the end of the survey.

US3GC07M covers the entire bounds of survey H13175. Due to the scale of chart US3GC07M, charted depthss are sparser than on USF5L11M. Review of the selected sounding layer and bathymetric surface indicates a few discrepancies with the chart. Survey data in the vicinity of the 20.1-meter charted depth (blue circle in Figure 15) indicate surveyed soundings are nearly 6 meters deeper than the charted depth. In addition, there was no evidence from survey data of shallow depths within the charted 9.10 to 18.2-meter isolated depth range area, with the shallowest surveyed soundings being 27.5 meters compared to the charted 17.3-meter depth. Also, there is a charted dumping ground in the southeast portion of the survey area and field correspondence indicates active dumping in this area. Most recent survey data indicate a least depth of 13.05 meters ±0.33 m TVU (green circle in Figure 15) compared to the nearest charted depth of 19.2 meters.

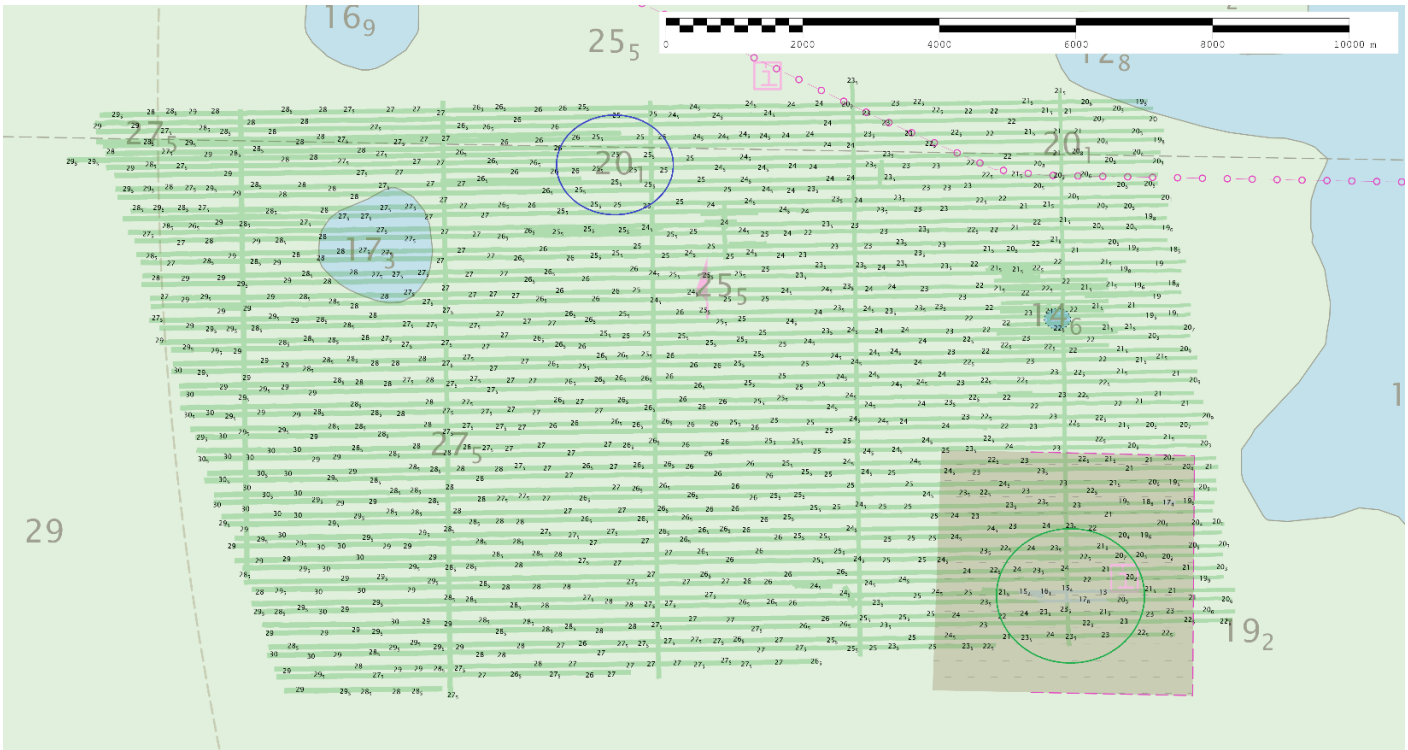


*Figure 15: Comparison of H13175 surveyed soundings to chart US3GC07M.*

### D.1.2 Maritime Boundary Points

No Maritime Boundary Points were assigned for this survey.

### D.1.3 Charted Features

Prior to commencing survey operations, the Composite Source File indicated one charted wreck, three adjacent or overlapping dumping grounds in the southeast portion of the survey area, two sections of the Gulfstream Natural Gas System pipeline and a portion of the safety fairway leading up to Egmont Channel within survey bounds. The dumping grounds are located also only partially within the survey bounds. Refer to the Final Feature File for additional information regarding all assigned, charted features.

### D.1.4 Uncharted Features

An additional seven features were added to the Final Feature File that were not addressed as Dangers to Navigation due to factors such as surrounding charted depths and features. Refer to the Final Feature File for additional information. Contacts observed within the multibeam data that were less than 1-meter in height were often 'Examined' to show that they had been reviewed; these remain 'Examined' in the CARIS project.

### D.1.5 Shoal and Hazardous Features

There were no Danger to Navigation Reports submitted for this survey. Survey data indicate substantially shallower than charted depths within the dumping area; refer to the chart comparison sections and section D.2.9 for additional information.

### D.1.6 Channels

No channels exist for this survey. There are no designated anchorages, precautionary areas, traffic separation schemes, pilot boarding areas, or channel and range lines within the survey limits. A small portion of a safety fairway is present within survey limits along the very northern boundary. Two charted depths on US3GC07M fall within the fairway area and within survey bounds. Surveyed soundings are deeper than the western charted depth by ~1 meter and deeper than the eastern charted depth of at least 1.5 meters. Surveyed soundings generally agree with charted depths on US5FL11M to the east within 50 cm.

### D.1.7 Bottom Samples

Four bottom samples were acquired within the bounds of H13175 in accordance with positions in the Project Reference File. Refer to the Final Feature File for additional information.

## D.2 Additional Results

### D.2.1 Shoreline

Shoreline was not assigned in the Hydrographic Survey Project Instructions or Statement of Work for this particular Sheet.

### D.2.2 Prior Surveys

No prior survey comparisons exist for this survey.

### D.2.3 Aids to Navigation

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

### D.2.4 Overhead Features

No overhead features exist for this survey.

### D.2.5 Submarine Features

Two sections of the 'Gulfstream Natural Gas System' pipeline extend northwest to east through the northeastern portion of the survey area. Two potential exposures were identified along the pipeline and submitted to BSEE as per the HSSD (2018). Survey data also indicate trench features as well as pipeline coverings at some points along the pipeline. Surveyed soundings indicate shallower depths than surrounding surveyed soundings particularly at the pipeline coverings. Coverings, exposures and trench features have been 'Examined' in the CARIS project. Survey data indicate the pipeline position is southeast of the currently charted position for the western section of pipeline referenced in the CSF (Figure 16). Refer to the Supplemental Survey Records and Correspondence, surfaces and Final Feature File for additional information.

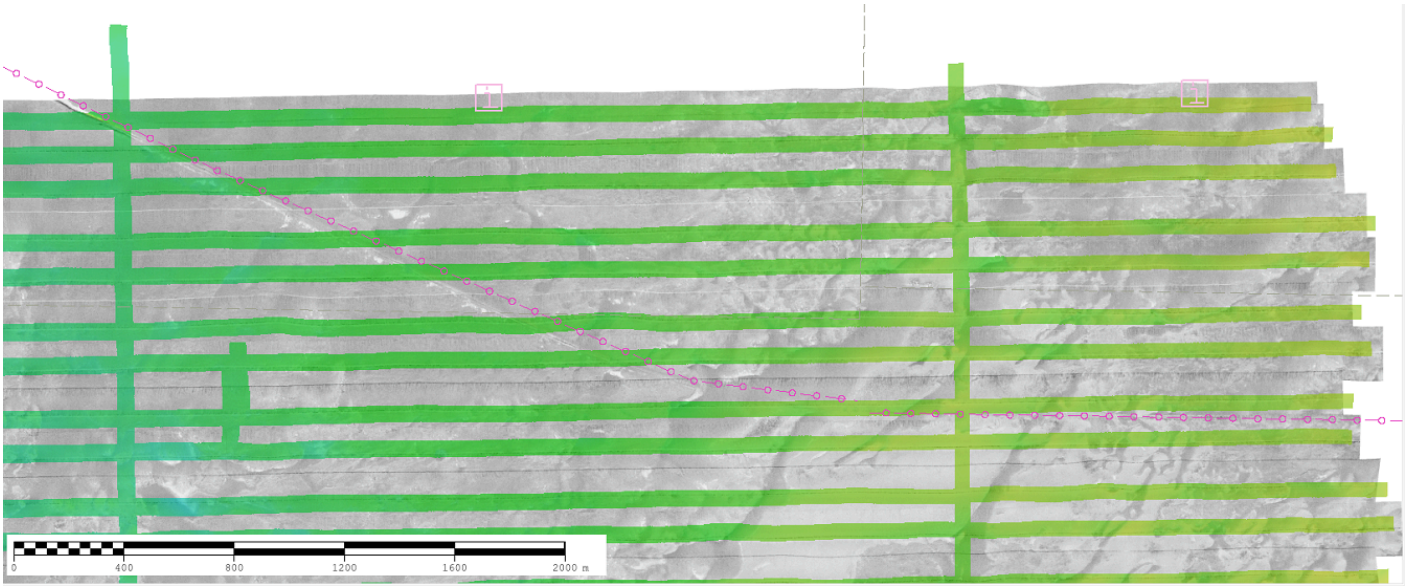


*Figure 16: H13175 MBES and SSS data overlain with pipeline position from the CSF.*

### 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 and/or Environmental Conditions

One abnormal, square debris area feature was identified within survey bounds. This feature, shown in Figure 17, has been included in the Final Feature File.

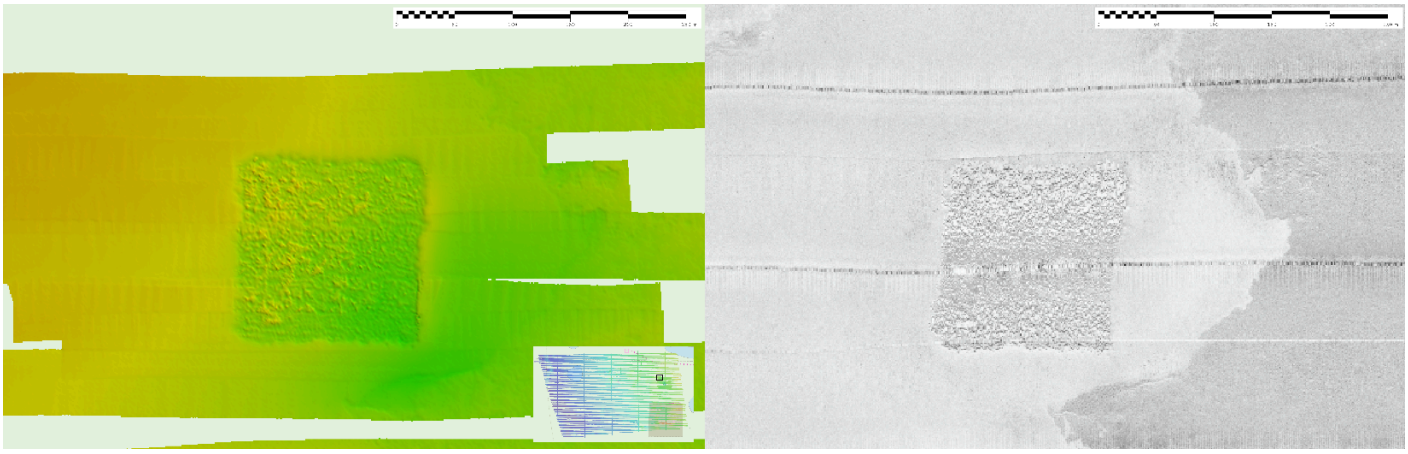

*Figure 17: H13175 SSS and MBES data showing anomalous feature*

### D.2.9 Construction and Dredging

Three overlapping dumping areas are present in the southeast portion of the survey area. Field correspondence indicates active dumping in this area and surveyed soundings indicate substantially shallower depths than currently charted. The CSF indicates two of the three dumping areas are disused and while most of the shallow depth area falls within the dumping area not labeled as disused, a portion does fall into portions of the dumping areas labeled as disused. Surveyed soundings indicate a least depth of 13.05 meters (±0.33 m TVU) inside the dumping grounds as compared to the shallowest charted depth of 20.4 meters on chart US5FL11M. Figure 18 shows surveyed depths (black) compared to charted depths (gray). Refer to the Final Feature File for additional information.

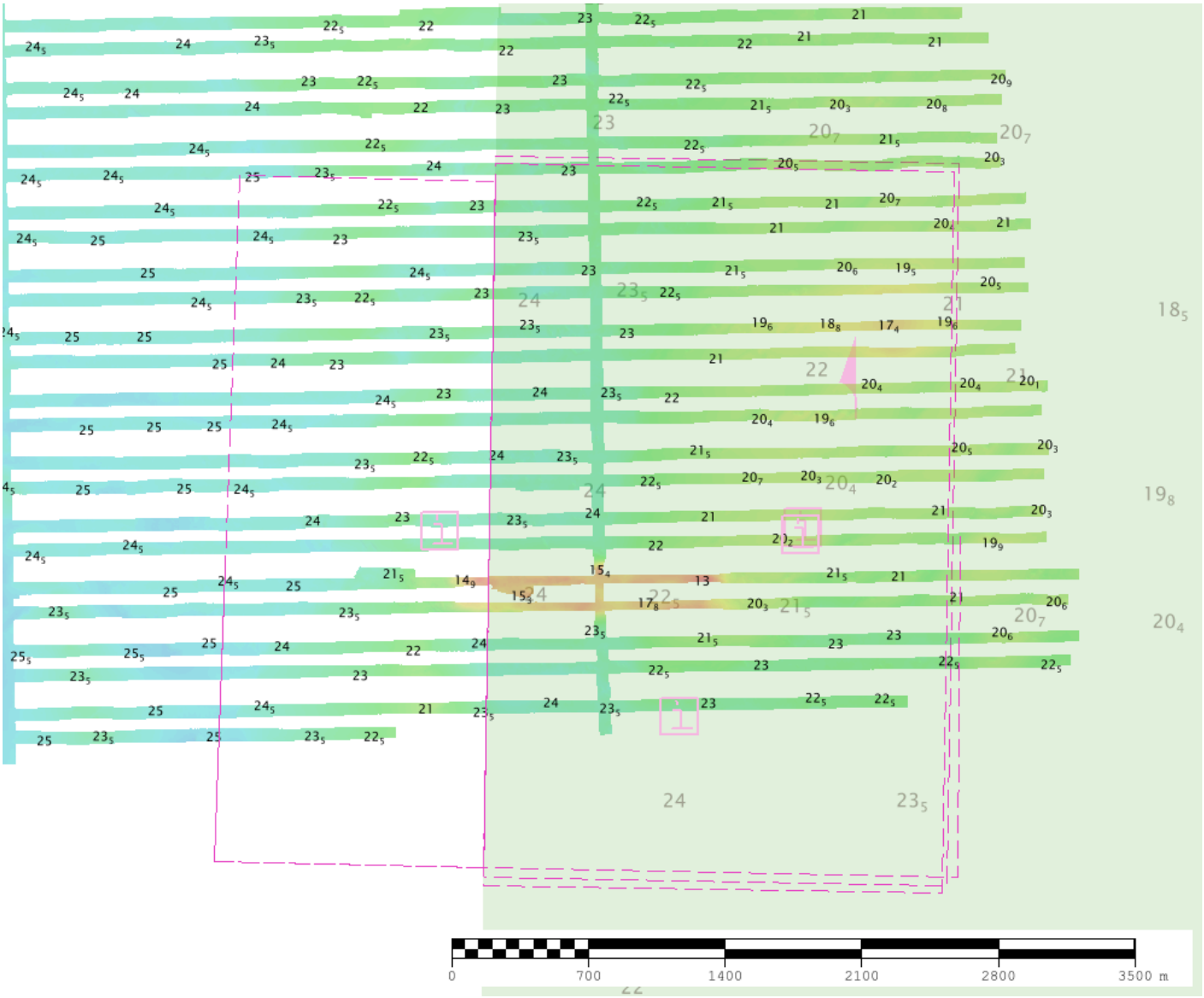


*Figure 18: Comparison of H13175 surveyed soundings and charted depths with in charted dumping ground.*

### D.2.10 New Survey Recommendation

It is recommended to survey the dumping area if it ever becomes discontinued in order to verify the depths in the area.

### D.2.11 Inset Recommendation

No new insets 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.

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 meet or exceed requirements as set forth in the NOS Hydrographic Surveys Specifications and Deliverables, Statement of Work and Project Instructions. 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 |
|---|---|
| Horizontal and Vertical Control Report | 2019-03-11 |
| Data Acquisition and Processing Report | 2019-06-28 |

| Approver Name | Approver Title | Approval Date | Signature |
|---|---|---|---|
| Scott Melancon | Chief of Party | 07/16/2019 | Scott Melancon Digitally signed by Scott Melancon DN: cn=Scott Melancon, o, ou, email=smelancon@oceaneering.com, c=US Date: 2019.07.18 10:15:59 -05'00' |
| John Baker | Senior Survey Technician | 07/16/2019 | |
| Nicole Galloway | Geoscientist | 07/16/2019 | |

# 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** | Continually Operating Reference Staiton |
| **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 |
| **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 |
| **HSSD** | Hydrographic Survey Specifications and Deliverables |

| Acronym | Definition |
|---|---|
| **HSTP** | Hydrographic Systems Technology Programs |
| **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 |
| **NAIP** | National Agriculture and Imagery Program |
| **NALL** | Navigable Area Limit Line |
| **NM** | 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 |
| **PST** | Physical Science Technician |
| **RNC** | Raster Navigational Chart |
| **RTK** | Real Time Kinematic |
| **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 |
| **TPE** | Total Propagated Error |
| **TPU** | Topside Processing Unit |
| **USACE** | United States Army Corps of Engineers |
| **USCG** | United Stated Coast Guard |
| **UTM** | Universal Transverse Mercator |
| **XO** | Executive Officer |
| **ZDA** | Global Positiong System timing message |
| **ZDF** | Zone Definition File |

**ABSTRACT OF TIMES OF HYDROGRAPHY**
**R/V Sea Scout**

Project: OPR-J317-KR-18 Registry No.: H13175
Contractor Name: Oceaneering International, Inc.
Date: June 2019
Sheet Number: 6
Inclusive Dates: November 8, 2018 - June 18, 2019
Field Work is Complete

Time (UTC)

| Julian Day | Start | End | Year |
|---|---|---|---|
| 312 | 0135 | 0310 | 2018 |
| 150 | 2322 | 2400 | 2019 |
| 151 | 0000 | 2400 | 2019 |
| 152 | 0000 | 2400 | 2019 |
| 153 | 0000 | 2400 | 2019 |
| 154 | 0000 | 2400 | 2019 |
| 155 | 0000 | 0403 | 2019 |
| 169 | 0817 | 0958 | 2019 |

| Marine Mammal Observer Training List | |
|---|---|
| **Name** | **Date** |
| Tara Levy | 9/22/2018 |
| Barry Banks | 9/22/2018 |
| Tracy McMillan | 9/22/2018 |
| Steven Bellot | 9/22/2018 |
| Brad Daigle | 9/22/2018 |
| Faith Scheel | 9/22/2018 |
| John Ringle | 10/8/2018 |
| Sean Stokes | 9/20/2018 |
| Daniel Schaeffer | 10/8/2018 |
| Abel Trevino | 10/8/2018 |
| Ralph Morris | 10/22/2018 |
| Grace Smythe | 11/4/2018 |
| John Baker | 8/10/2018 |
| Jim Wade | 8/10/2018 |
| Ryan Houghton | 8/10/2018 |

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**Galloway, Nicole <ngalloway@oceaneering.com>**

# OPR-J317-KR-18 Coast Pilot Review

1 message

**Galloway, Nicole** <ngalloway@oceaneering.com> Mon, Apr 22, 2019 at 1:33 PM
To: OCS.NDB@noaa.gov, Coast.Pilot@noaa.gov
Cc: Meredith Payne - NOAA Federal <meredith.payne@noaa.gov>, Kathryn Pridgen - NOAA Federal <kathryn.pridgen@noaa.gov>, Scott Melancon <smelancon@oceaneering.com>

Good afternoon,

Please see attached Coast Pilot Review Report for Project OPR-J317-KR-18. Note that no changes were made as of the submission of deliverables for Sheets 1 and 2 of this project. There were no specific investigation items for OPR-J317-KR-18 with regard to the Coast Pilot and only one minor suggestion is addressed in this submission. We will continue to review the Coast Pilot information for the duration of the project will let you know if any updates are found.

Thank-you,
Nikki

--
Best regards,

**Nicole Galloway**
Geoscientist
Direct (+1) 337 761 6872
Mobile (+1) 603 978 7211
ngalloway@oceaneering.com
2155 Steppingstone Square | Chesapeake, VA | USA, Tel (+1)757 985 3714 | oceaneering.com



**OPR-J317-KR-18_Coast Pilot Review Report.pdf**
1183K

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**Galloway, Nicole <ngalloway@oceaneering.com>**

# OPR-J317-KR-18 H13175 (Sheet 6) Final Survey Outline

3 messages

**Galloway, Nicole** <ngalloway@oceaneering.com> Fri, Jun 21, 2019 at 2:11 PM
To: survey.outlines@noaa.gov
Cc: Meredith Payne - NOAA Federal <meredith.payne@noaa.gov>, Kathryn Pridgen - NOAA Federal <kathryn.pridgen@noaa.gov>, Scott Melancon <smelancon@oceaneering.com>

Good afternoon,

Attached is the final survey outline for H13175 (Sheet 6) of OPR-J317-KR-18 in S-57 format.
Please let us know if you have any questions.

Thank-you,
Nikki
--
Best regards,

**Nicole Galloway**
Geoscientist
Direct (+1) 337 761 6872
Mobile (+1) 603 978 7211
ngalloway@oceaneering.com

2155 Steppingstone Square | Chesapeake, VA | USA, Tel (+1)757 985 3714 | oceaneering.com



**H13175_Final_Survey_Outline.000**
35K

**Brian Mohr - NOAA Federal** <brian.mohr@noaa.gov> Fri, Jun 21, 2019 at 2:26 PM
To: "Galloway, Nicole" <ngalloway@oceaneering.com>

Thank you Nikki, I'll get H13175 updated in SURDEX shortly.

Brian Mohr
Data Manager
Hydrographic Surveys Division
brian.mohr@noaa.gov
[Quoted text hidden]

**Galloway, Nicole** <ngalloway@oceaneering.com> Fri, Jun 21, 2019 at 2:31 PM
To: Brian Mohr - NOAA Federal <brian.mohr@noaa.gov>

Thank-you!
[Quoted text hidden]

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Galloway, Nicole <ngalloway@oceaneering.com>

# OPR-J317-KR-18 H13175 (Sheet 6) Spoil Area

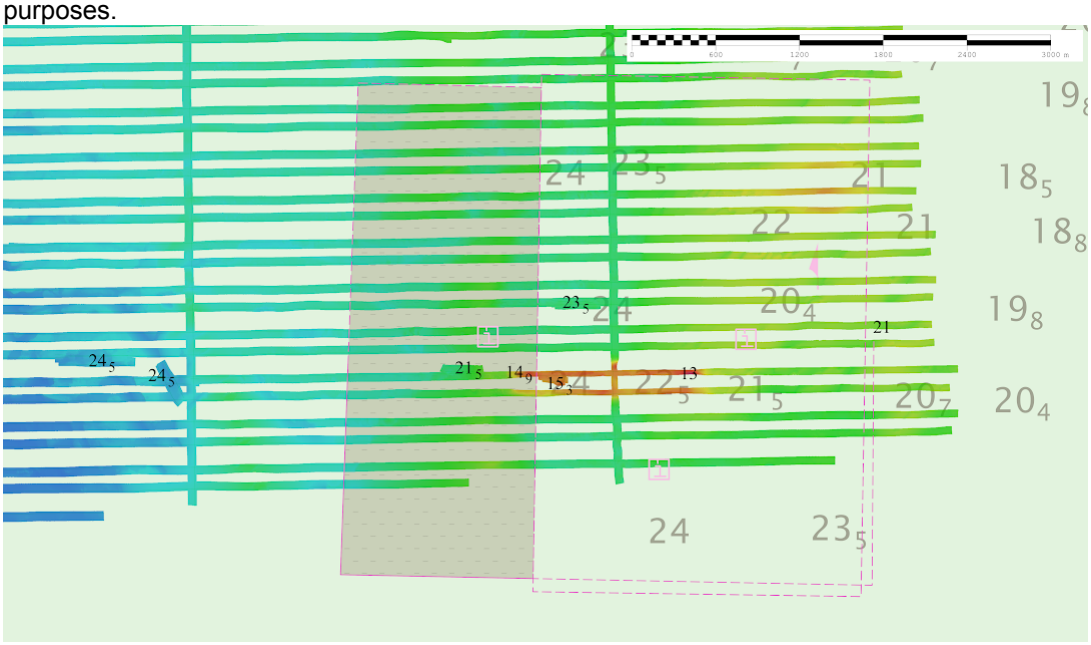
1 message

**Galloway, Nicole** <ngalloway@oceaneering.com> Tue, Jun 25, 2019 at 10:15 AM
To: Meredith Payne - NOAA Federal <meredith.payne@noaa.gov>, Kathryn Pridgen - NOAA Federal <kathryn.pridgen@noaa.gov>
Cc: Scott Melancon <smelancon@oceaneering.com>

Good morning,

Within the southeast corner of the H13175 (Sheet 6) survey area the CSF file indicates three overlapping spoil areas, two of which are noted as disused. Survey data indicate substantially shallower depths in this area than currently charted and while generally within the charted spoil area that is not denoted as disused, some shallow depths do fall within the spoil area that is denoted as disused. Field correspondence indicates this area has been allocated for dumping operations during survey operations.

Please see below. Black soundings from H13175 survey data. Grey soundings from chart and enlarged for viewing purposes.




Thank-you,
Nikki
--
Best regards,

**Nicole Galloway**
Geoscientist
Direct (+1) 337 761 6872
Mobile (+1) 603 978 7211
ngalloway@oceaneering.com
2155 Steppingstone Square | Chesapeake, VA | USA, Tel (+1)757 985 3714 | oceaneering.com

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**Galloway, Nicole <ngalloway@oceaneering.com>**

# H13175: Potential Pipeline Exposures 1 - 2

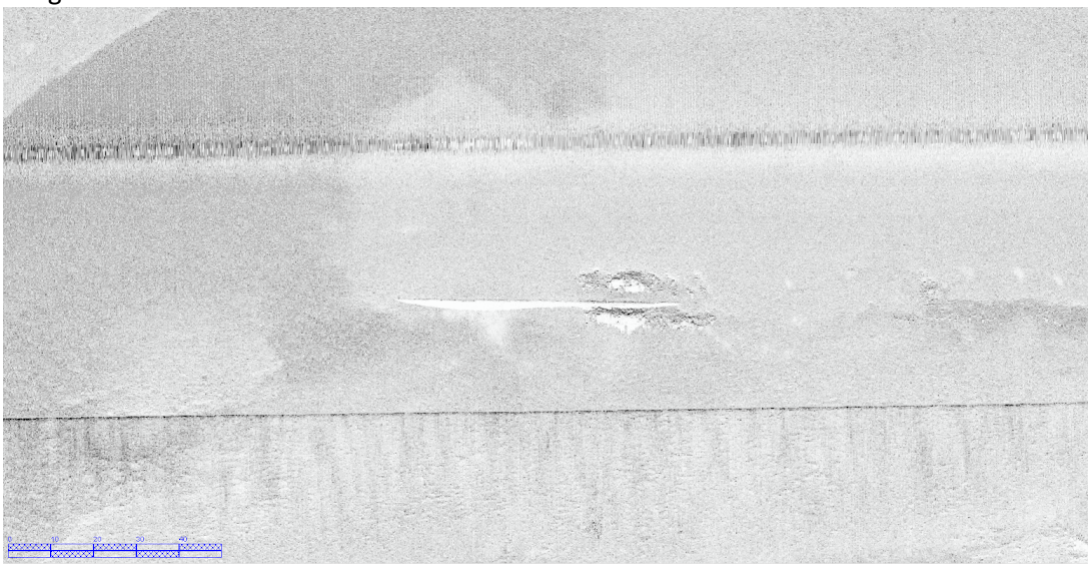
1 message

**Galloway, Nicole** <ngalloway@oceaneering.com> Wed, Jul 10, 2019 at 11:23 AM
To: pipelines@bsee.gov
Cc: Meredith Payne - NOAA Federal <meredith.payne@noaa.gov>, Kathryn Pridgen - NOAA Federal <kathryn.pridgen@noaa.gov>, Scott Melancon <smelancon@oceaneering.com>

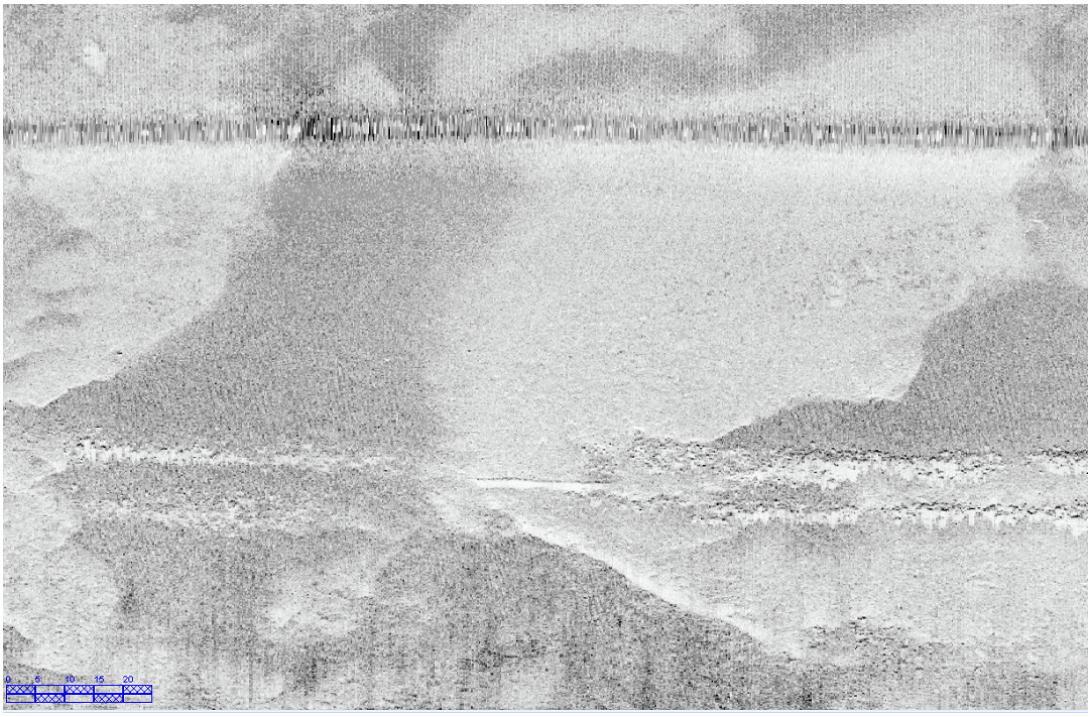
Good morning,

A NOAA Contractor surveying in the Gulf of Mexico has discovered two potential pipeline exposures along the charted supply pipe for the Gulf Stream Natural Gas System. Please see below for additional information.

Exposure 1
Location (lat/lon): (27° 34.57441' / -083° 04.99254')
Furthest Distance from charted feature: 3.5 meters
Date: 05/31/2019
Time: 10:42:42
Depth: 21 m (partial MBES coverage)
Image:



Exposure 2
Location (lat/lon): (27° 34.57528' / -083° 04.57415')
Furthest Distance from charted feature: 4.0 meters
Date: 05/31/2019
Time: 10:46:38
Depth: 20.8 m (no direct MBES coverage)
Image:



--
Best regards,

**Nicole Galloway**
Geoscientist
Direct (+1) 337 761 6872
Mobile (+1) 603 978 7211
ngalloway@oceaneering.com
2155 Steppingstone Square | Chesapeake, VA | USA, Tel (+1)757 985 3714 | oceaneering.com

OCEANEERING

**Galloway, Nicole <ngalloway@oceaneering.com>**

# [Send2NCEI] data submission confirmation for Reference ID: KLL8JG

1 message

**NODC.DataOfficer@noaa.gov** <NODC.DataOfficer@noaa.gov> Thu, Jul 11, 2019 at 12:45 PM
To: ngalloway@oceaneering.com

Dear Nicole Galloway,

Thank you for submitting your data collection, titled "Sound Speed (CTD) collected from R/V Sea Scout in Approaches to Tampa, FL from 2019-05-30 to 2019-06-18", to the NOAA National Centers for Environmental Information (NCEI). Your submission package has been assigned Reference ID: KLL8JG. After reviewing your data and metadata, NCEI will update you about the archival status of your submission package.

You will be notified if NCEI creates an archival information package (accession) of your data, including the unique identifier for that archival information package (the NCEI Accession number). When your data are archived, NCEI keeps an exact copy of the data and metadata you sent and will develop necessary tracking and discovery metadata. In addition, NCEI may create additional versions to ensure your data are preserved for long-term access.

Upon completion of these archival ingest actions, NCEI will publish your data online (including a copy of your original files). You will receive another email once your submission package (Reference ID: KLL8JG) is published for global access. In addition, NCEI may include all or part of your data into one or more product databases, such as the World Ocean Database.

If you have any questions about NCEI archival processes, please contact NODC.DataOfficer@noaa.gov. Also, if at any time you wish to update your submission package, please send an e-mail to NODC.DataOfficer@noaa.gov with your request. Please remember to include your submission package Reference ID.

Thank you again for choosing to archive your data with the National Centers for Environmental Information (NCEI).

NCEI Data Officer Team
NOAA National Centers for Environmental Information
NOAA/NESDIS
1315 East-West Highway
Silver Spring, MD 20910
USA

APPROVAL PAGE

H13175

Data meet or exceed current specifications as certified by the OCS survey acceptance review process. Descriptive Report and survey data except where noted are adequate to supersede prior surveys and nautical charts in the common area.

The following products will be sent to NCEI for archive

- Descriptive Report
- Data Acquisition and Processing Report
- Collection of Bathymetric Attributed Grids (BAGs)
- Processed survey data and records
- Geospatial PDF of survey products
- Collection of backscatter mosaics

The survey evaluation and verification have been conducted according to current OCS specifications, and the survey has been approved for dissemination and usage of updating NOAA's suite of nautical charts.

Approved: Meghan Megovern 2020.10.28 11:10:39 -04'00'

**Commander Meghan McGovern, NOAA**
Chief, Atlantic Hydrographic Branch