

H13360

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

DESCRIPTIVE REPORT

Type of Survey: Navigable Area

Registry Number: H13360

LOCALITY

State(s): Florida

General Locality: Northwest Gulf of Mexico

Sub-locality: Indian Pass to West Pass

2020

CHIEF OF PARTY
Allison C Stone

LIBRARY & ARCHIVES

Date:

HYDROGRAPHIC TITLE SHEET

H13360

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: **Northwest Gulf of Mexico**

Sub-Locality: **Indian Pass to West Pass**

Scale: **20000**

Dates of Survey: **07/27/2020 to 10/15/2020**

Instructions Dated: **03/25/2020**

Project Number: **OPR-J359-KR-20**

Field Unit: **Fugro USA Marine, Inc.**

Chief of Party: **Allison C Stone**

Soundings by: **Multibeam Echo Sounder (MBES)**

Imagery by: **Multibeam Acoustic Backscatter (MBAB)**

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

A. Area Surveyed	1
A.1 Survey Limits.....	2
A.2 Survey Purpose.....	3
A.3 Survey Quality.....	3
A.4 Survey Coverage.....	3
A.6 Survey Statistics.....	7
B. Data Acquisition and Processing	10
B.1 Equipment and Vessels.....	10
B.1.1 Vessels.....	10
B.1.2 Equipment.....	13
B.2 Quality Control.....	13
B.2.1 Crosslines.....	13
B.2.2 Uncertainty.....	16
B.2.3 Junctions.....	18
B.2.4 Sonar QC Checks.....	23
B.2.5 Equipment Effectiveness.....	23
B.2.6 Factors Affecting Soundings.....	23
B.2.7 Sound Speed Methods.....	24
B.2.8 Coverage Equipment and Methods.....	24
B.3 Echo Sounding Corrections.....	24
B.3.1 Corrections to Echo Soundings.....	24
B.3.2 Calibrations.....	24
B.4 Backscatter.....	24
B.5 Data Processing.....	24
B.5.1 Primary Data Processing Software.....	24
B.5.2 Surfaces.....	25
C. Vertical and Horizontal Control	26
C.1 Vertical Control.....	26
C.2 Horizontal Control.....	26
D. Results and Recommendations	26
D.1 Chart Comparison.....	26
D.1.1 Electronic Navigational Charts.....	29
D.1.2 Shoal and Hazardous Features.....	29
D.1.3 Charted Features.....	29
D.1.4 Uncharted Features.....	29
D.1.5 Channels.....	30
D.2 Additional Results.....	30
D.2.1 Aids to Navigation.....	30
D.2.2 Maritime Boundary Points.....	31
D.2.3 Bottom Samples.....	31
D.2.4 Overhead Features.....	31
D.2.5 Submarine Features.....	31
D.2.6 Platforms.....	31

D.2.7 Ferry Routes and Terminals.....	31
D.2.8 Abnormal Seafloor or Environmental Conditions.....	31
D.2.9 Construction and Dredging.....	31
D.2.10 New Survey Recommendations.....	32
D.2.11 ENC Scale Recommendations.....	32
E. Approval Sheet.....	33
F. Table of Acronyms.....	34

List of Tables

Table 1: Survey Limits.....	2
Table 2: Survey Coverage.....	4
Table 3: Hydrographic Survey Statistics.....	8
Table 4: Dates of Hydrography.....	9
Table 5: Vessels Used.....	10
Table 6: Major Systems Used.....	13
Table 7: Survey Specific Tide TPU Values.....	16
Table 8: Survey Specific Sound Speed TPU Values.....	16
Table 9: Junctioning Surveys.....	19
Table 10: Primary bathymetric data processing software.....	25
Table 11: Primary imagery data processing software.....	25
Table 12: Submitted Surfaces.....	25
Table 13: ERS method and SEP file.....	26
Table 14: Largest Scale ENCs.....	29

List of Figures

Figure 1: Survey H13360 relative to overall sheet limits of OPR-J359-KR-20.....	2
Figure 2: West Pass ODMBES holiday in the vicinity of 29-37-59.7995N 085-05-42.5677W.....	4
Figure 3: Survey H13360 mixed coverage (ODMBES and Set Line Spacing MBES).....	5
Figure 4: Survey H13360 50cm grid resolution ODMBES density QC.....	6
Figure 5: Survey H13360 4m grid resolution Set Line MBES density QC.....	7
Figure 6: M/V Koach Kline.....	10
Figure 7: M/V Pelagos.....	11
Figure 8: USV Blue Shadow.....	12
Figure 9: H13360 MBES mainscheme and MBES crossline distribution.....	14
Figure 10: H13360 Set Line MBES mainscheme 4m resolution MBES grid differenced from Set Line 4m resolution MBES grid crosslines statistical output.....	15
Figure 11: H13360 ODMBES mainscheme 50cm resolution MBES grid differenced from 50cm resolution ODMBES grid crosslines statistical output.....	16
Figure 12: H13360 50cm finalized grid TPU QC.....	17
Figure 13: H13360 4m finalized grid TPU QC.....	18
Figure 14: Junction surveys to H13360.....	19
Figure 15: Survey H13360 junction with Survey H13157.....	20

Figure 16: Survey H13360 junction with Survey H13289..... 21
Figure 17: Survey H13360 junction with Survey H13286..... 22
Figure 18: Survey H13360 junction with Survey H13359..... 23
Figure 19: Pydro QC Tools chart review output of surveyed soundings shoal to charted soundings..... 27
Figure 20: Pydro QC Tools output of survey H13360 areas of shoaling 1ft to 3ft highlighted in red..... 28
Figure 21: Pydro QC Tools output of survey H13360 areas of shoaling greater than 4ft located..... 28
Figure 22: Potential wreck located within Set Line MBES within survey H13361..... 30

Descriptive Report to Accompany Survey H13360

Project: OPR-J359-KR-20

Locality: Northwest Gulf of Mexico

Sublocality: Indian Pass to West Pass

Scale: 1:20000

July 2020 - October 2020

Fugro USA Marine, Inc.

Chief of Party: Allison C Stone

A. Area Surveyed

Survey H13360 (Table 1) covers the approach from Indian Pass to West Pass and partial acquisition of priority area 7, which encompasses North Cape St. George (Figure 1). The M/V Koach Kline acquired 400m-spaced Set Line MBES, Object Detection MBES (ODMBES), and Multibeam Echosounder Acoustic Backscatter (MBAB) within the assigned survey limits of H13360 from 31 July 2020 to 2 September 2020. M/V Koach Kline, in tandem with the USV Blue Shadow (aka FAS-901), acquired 400m-spaced Set Line MBES within the assigned sheet limits of H13361 27 July 2020. M/V Pelagos acquired ODMBES infill within the assigned survey limits of H13360 8 October 2020 to 15 October 2020. M/V Pelagos also acquired Set Line MBES within the assigned sheet limits of H13361 from 5 August 2020 to 7 August 2020.

Due to contract mileage being met prior to the completion of acquisition H13360, additional 400m-spaced Set Line MBES data acquired within the survey limits of H13361 will be included with the submission of H13360. All data within this descriptive report shall be referenced to the relevant assigned survey registry number. Data acquisition of Set Line MBES data within the survey limits of H13361 is incomplete and does not meet HSSD requirements, so were included in the 4m resolution grid of Set Line spacing data for H13360.

Assigned bottom samples within H13361 were fully acquired and will be included in the Final Feature File (FFF) submitted as "H13360_FFF", but will maintain the Source Indication attribute designator "US,US,graph,H13361". Any potential features within the data acquired within the limits of H13361 will not be addressed, as least depths were not verified via ODMBES developments. Documentation of this decision between the NOAA COR and the Marine Hydrographic Manager for Fugro can be located in Appendix II submitted with this report.

A.1 Survey Limits

Data were acquired within the following survey limits:

Northwest Limit	Southeast Limit
29° 40' 58.88" N 85° 17' 58.09" W	29° 31' 0.09" N 84° 42' 54.02" W

Table 1: Survey Limits

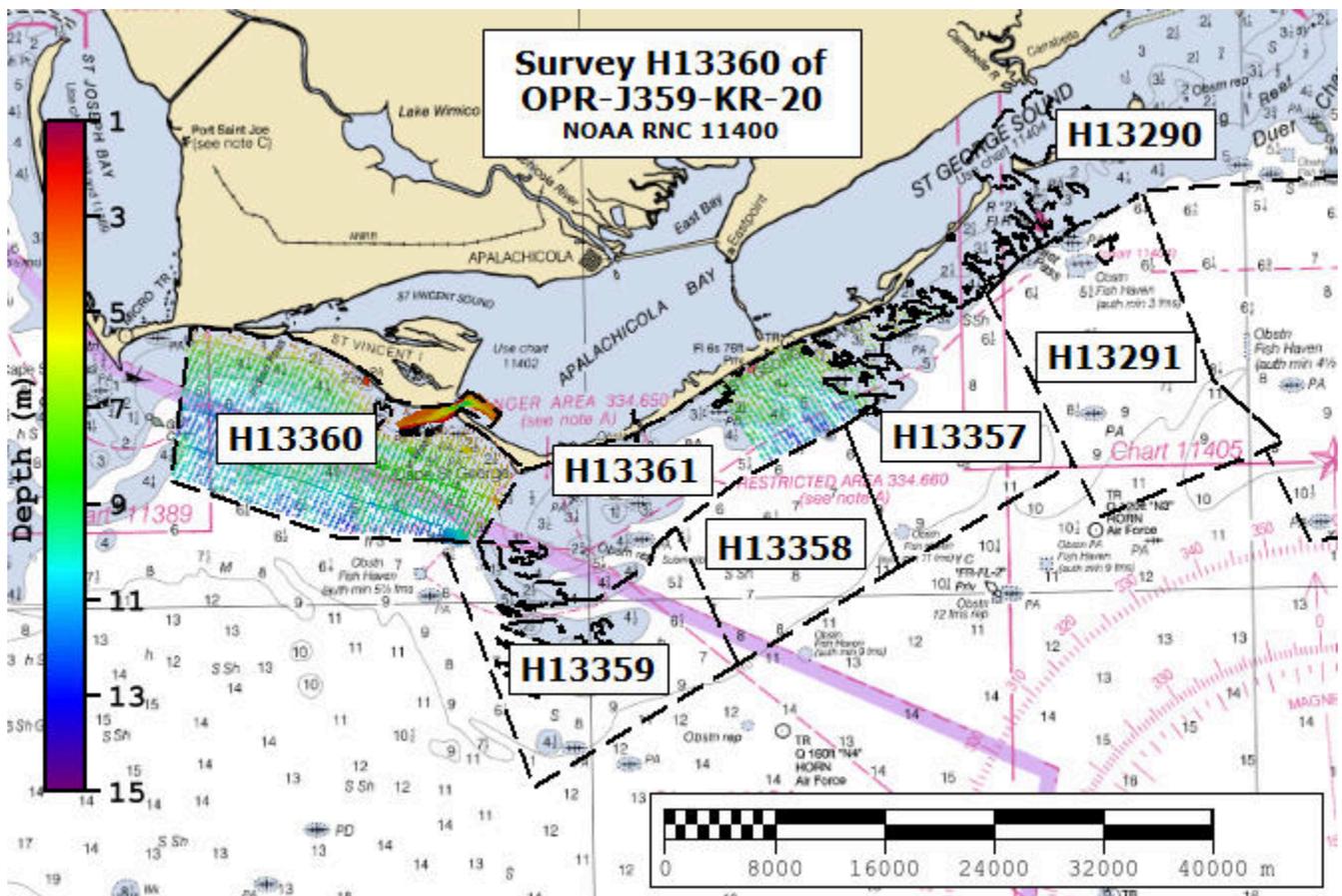


Figure 1: Survey H13360 relative to overall sheet limits of OPR-J359-KR-20

Due to the nature of mixed coverage assigned within H13360, areas appear to have missing or no coverage. However, data was acquired to the 3.5m limit or is covered by NOAA LIDAR. No quantifiable LIDAR data formats were provided to Fugro by NOAA for statistical analysis. It was suggested by the COR that the imagery be assessed visually to determine if shoals from LIDAR imagery have altered between survey dates. Refer to Section B.2.3 of this report for further information.

Additional Set Line MBES data acquired within the survey limits of H13361 are included within the submission for survey H13360. The combined area of the two data sets totals 97.11 Square Nautical Miles (SNM): H13360 area totals 75.17 SNM, H13361 area totals 21.94 SNM. For further detail, refer to the correspondence submitted within Appendix II of this report.

A.2 Survey Purpose

The Offshore Apalachicola project will provide contemporary surveys to update National Ocean Service (NOS) nautical charting products and services. It is offshore of Apalachicola Bay and Joseph Bay, FL. The survey will provide updated bathymetry and feature data to address concerns of migrating shoals, thus reducing the risk to navigation within the project area.

The Apalachicola Surveys delineate the western extent of the Big Bend Mapping project, a Florida Coastal Mapping Program (FCMaP) priority. This multi-year, multi-agency mapping project will fill in an area in which only 2% of the seafloor is mapped to modern standards. Improving the understanding of the bathymetry, geomorphology, bio-diversity and distribution of habitats in this region will support Floridian fisheries, coastal modeling, and resource management.

The project will cover approximately 430 square nautical miles of high priority survey area identified in the latest iteration of NOAA HSD's risk-based prioritization model. Data from this project will supersede all prior survey data by providing modern hydrographic survey data for this area and updating the local charting products.

A.3 Survey Quality

The entire survey is adequate to supersede previous data.

ODMBES and 400m-spaced Set Line MBES (Table 2 and Figures 2-5) were achieved within the survey limits of H13360.

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 limits	400m Set Line Spacing MBES, perpendicular to contours (HSSD 2019 5.2.2.4-Option A); Object Detection Coverage on all features (HSSD 5.2.2.2)
ALL anchorage areas as assigned in Project Reference File	Object Detection Coverage (HSSD 5.2.2.2)

Table 2: Survey Coverage

One small holiday exists within the submitted surfaces "H13360_MB_50cm_MLLW" and "H13360_MB_50cm_MLLW_Final". This holiday occurs in the vicinity of 29-37-59.7995N 085-05-42.5677W (Figure 2). The surrounding data shows no indication of abnormal shoaling, dangers, or features that could be present or anomalous.

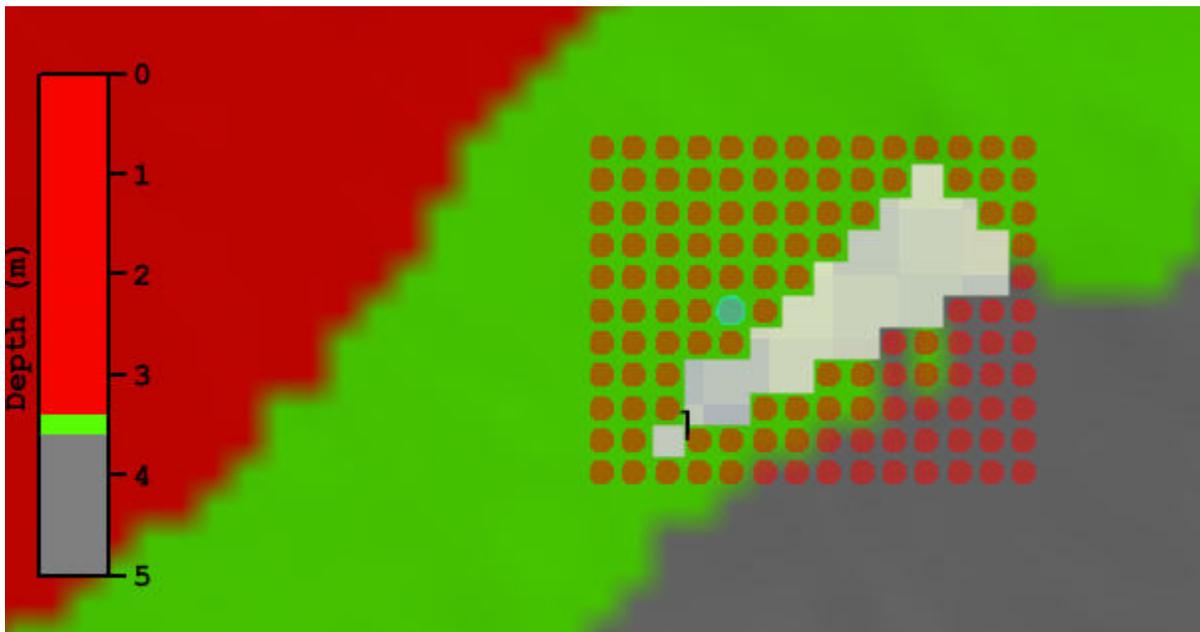


Figure 2: West Pass ODMBES holiday in the vicinity of 29-37-59.7995N 085-05-42.5677W

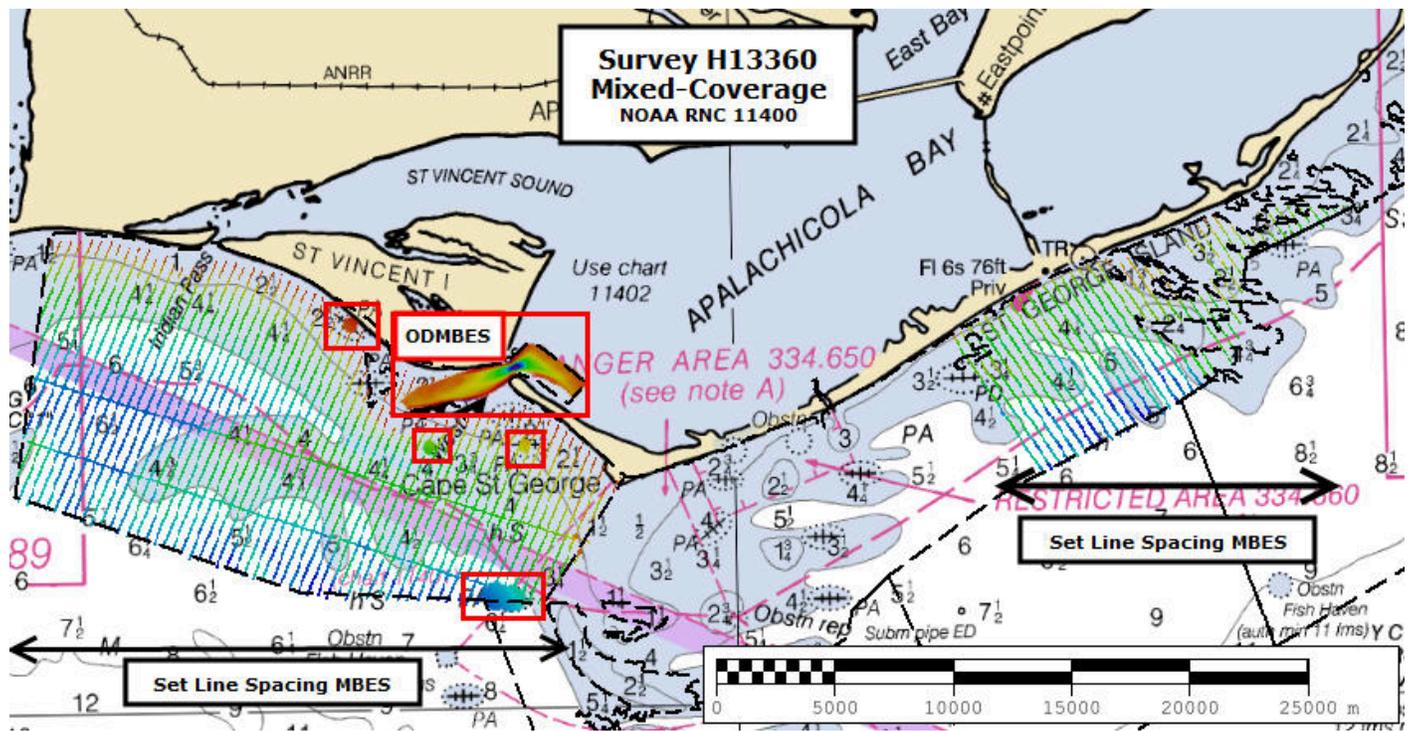


Figure 3: Survey H13360 mixed coverage (ODMBES and Set Line Spacing MBES)

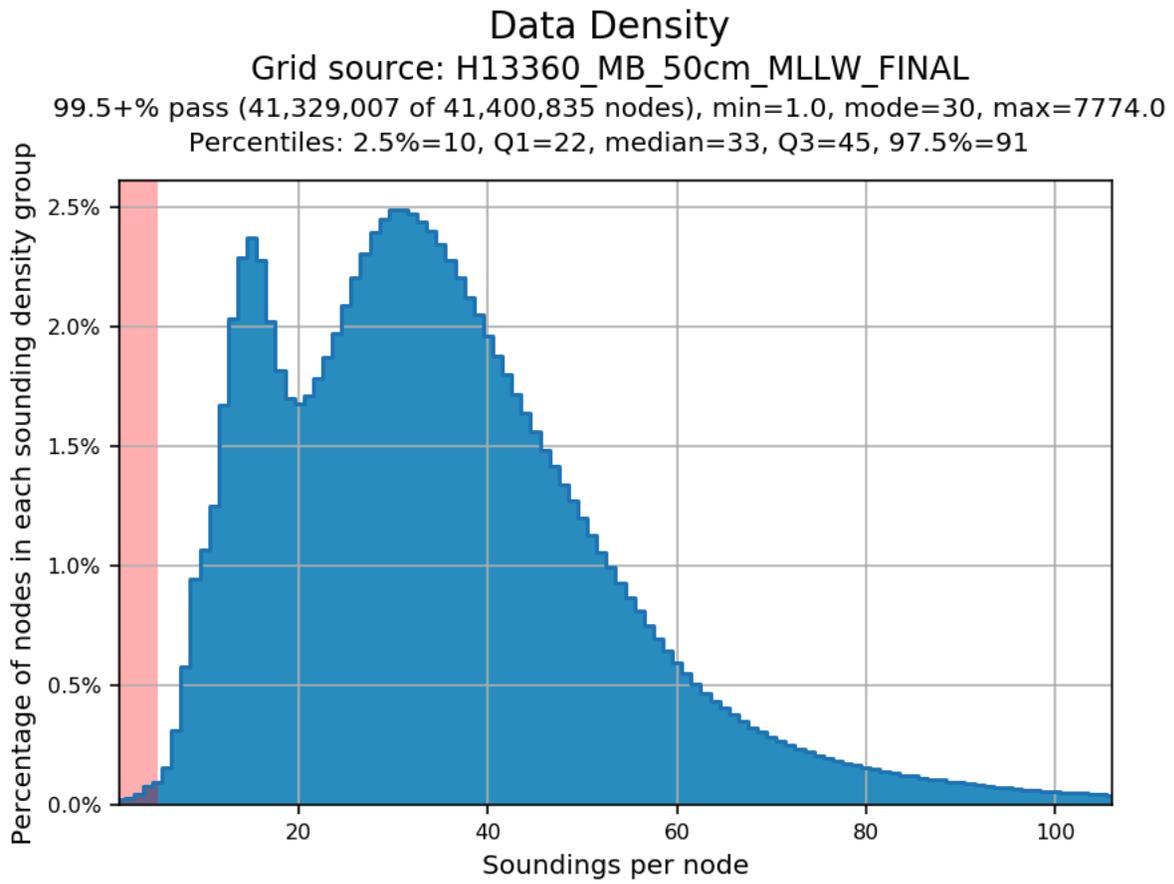


Figure 4: Survey H13360 50cm grid resolution ODMBES density QC

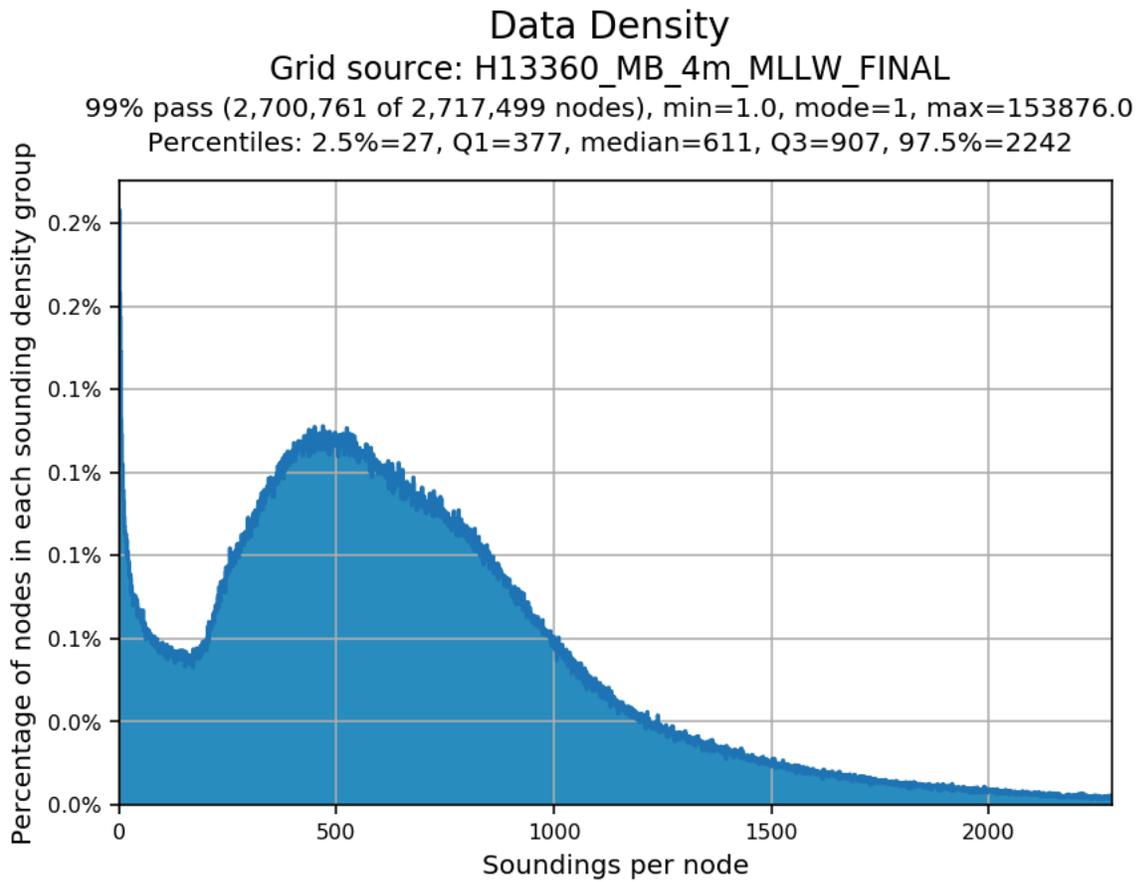


Figure 5: Survey H13360 4m grid resolution Set Line MBES density QC

A.6 Survey Statistics

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

	HULL ID	<i>M/V Koach Kline</i>	<i>M/V Pelagos</i>	<i>Blue Shadow (aka FAS-901)</i>	<i>Total</i>
LNM	SBES Mainscheme	0.0	0.0	0.0	0.0
	MBES Mainscheme	778.55	87.19	8.89	874.63
	Lidar Mainscheme	0.0	0.0	0.0	0.0
	SSS Mainscheme	0.0	0.0	0.0	0.0
	SBES/SSS Mainscheme	0.0	0.0	0.0	0.0
	MBES/SSS Mainscheme	0.0	0.0	0.0	0.0
	SBES/MBES Crosslines	43.07	0.0	0.0	43.07
	Lidar Crosslines	0.0	0.0	0.0	0.0
Number of Bottom Samples				23	
Number Maritime Boundary Points Investigated				0	
Number of DPs				0	
Number of Items Investigated by Dive Ops				0	
Total SNM				97.11	

Table 3: Hydrographic Survey Statistics

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

Survey Dates	Day of the Year
07/27/2020	209
07/31/2020	213
08/01/2020	214
08/02/2020	215
08/03/2020	216
08/04/2020	217
08/05/2020	218
08/06/2020	219
08/07/2020	220
08/08/2020	221
08/09/2020	222
08/10/2020	223
08/11/2020	224
08/12/2020	225
08/13/2020	226
08/14/2020	227
08/15/2020	228
08/16/2020	229
08/17/2020	230
08/18/2020	231
08/19/2020	232
08/20/2020	233
08/21/2020	234
08/28/2020	241
08/30/2020	243
09/01/2020	245
09/02/2020	246
10/08/2020	282
10/11/2020	285
10/15/2020	289

Table 4: Dates of Hydrography

B. Data Acquisition and Processing

B.1 Equipment and Vessels

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

B.1.1 Vessels

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

Hull ID	<i>M/V Koach Kline</i>	<i>M/V Pelagos</i>	<i>USV Blue Shadow (FAS-901)</i>
LOA	32.0 feet	34.0 feet	8.85 meters
Draft	1.5 feet	2.0 feet	2.02 meters

Table 5: Vessels Used



Figure 6: M/V Koach Kline



Figure 7: M/V Pelagos



Figure 8: USV Blue Shadow

M/V Koach Kline (Table 5 and Figure 6), M/V Pelagos (Table 5 and Figure 7), and USV Blue Shadow (Table 5 and Figure 8) acquired MBES, MBAB, surface sound velocity, sound velocity profiles, and attitude and positioning data within the survey limits of H13360 and H13361 (Table 6). For a detailed listing of equipment used to acquire survey data, refer to the DAPR submitted with this report under Project Reports.

B.1.2 Equipment

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

Manufacturer	Model	Type
Teledyne RESON	SeaBat 7125 SV2	MBES
Kongsberg Maritime	EM 2040	MBES
Teledyne RESON	SVP 70	Sound Speed System
Valeport	Unknown	Sound Speed System
AML Oceanographic	Smart SVP	Conductivity, Temperature, and Depth Sensor
Valeport	SV&T	Conductivity, Temperature, and Depth Sensor
Applanix	POS MV 320 v5	Positioning and Attitude System
Applanix	POS MV 320 v4	Positioning and Attitude System
Kongsberg Maritime	Unknown	Positioning and Attitude System

Table 6: Major Systems Used

For a detailed listing of equipment, refer to the DAPR submitted with this report.

B.2 Quality Control

B.2.1 Crosslines

Crosslines for survey H13360 were acquired in accordance with section 5.2.4.2 of the HSSD 2019 (Figure 9). Mainscheme to crossline mileage percentage across H13360 is 4.92%. Of the 31,649 grid nodes compared between H13360 Set Line mainscheme MBES and Set Line MBES crosslines, 100% were within 50cm difference. The mean difference is 1.20cm, with a standard deviation of 6.9cm (Figure 10). Of the 3,826,336 grid nodes compared between H13360 mainscheme ODMBES and MBES crosslines, 100% were within 50cm difference. The mean difference is 0.12cm, with a standard deviation of 4.9cm (Figure 11).

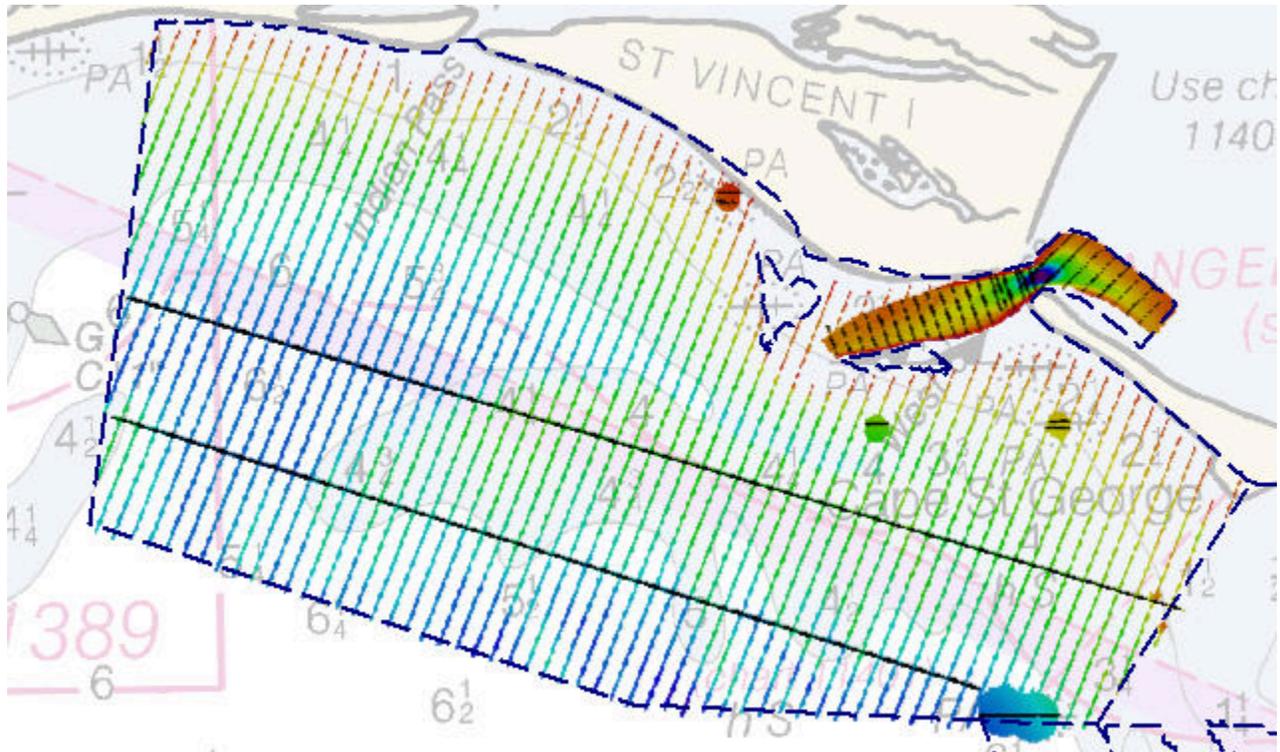


Figure 9: H13360 MBES mainscheme and MBES crossline distribution

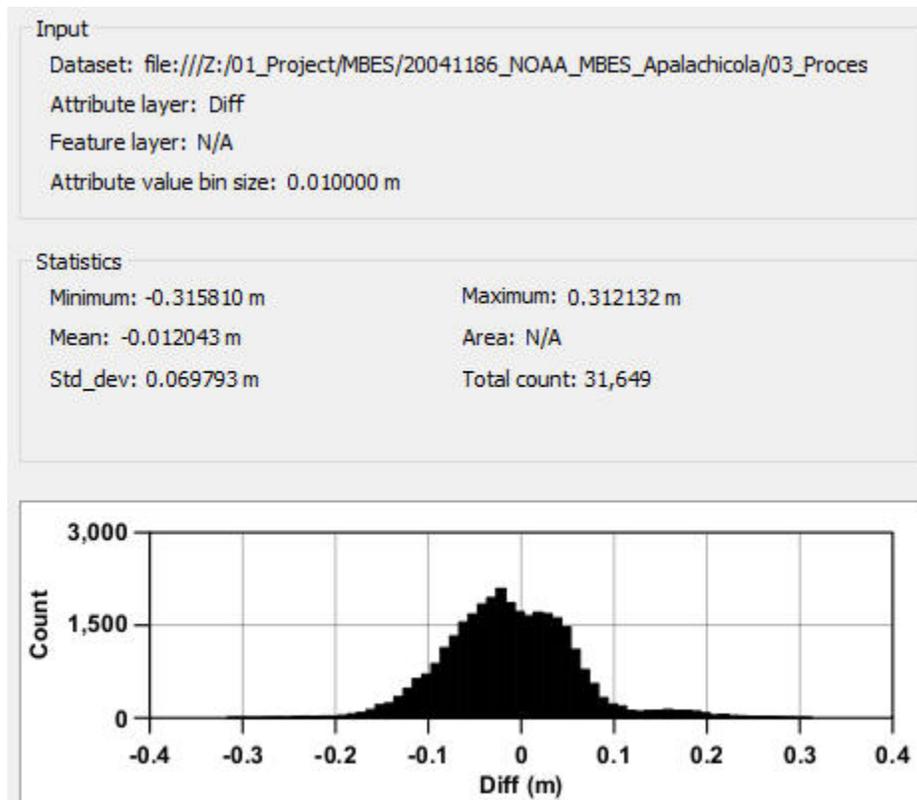


Figure 10: H13360 Set Line MBES mainscheme 4m resolution MBES grid differenced from Set Line 4m resolution MBES grid crosslines statistical output

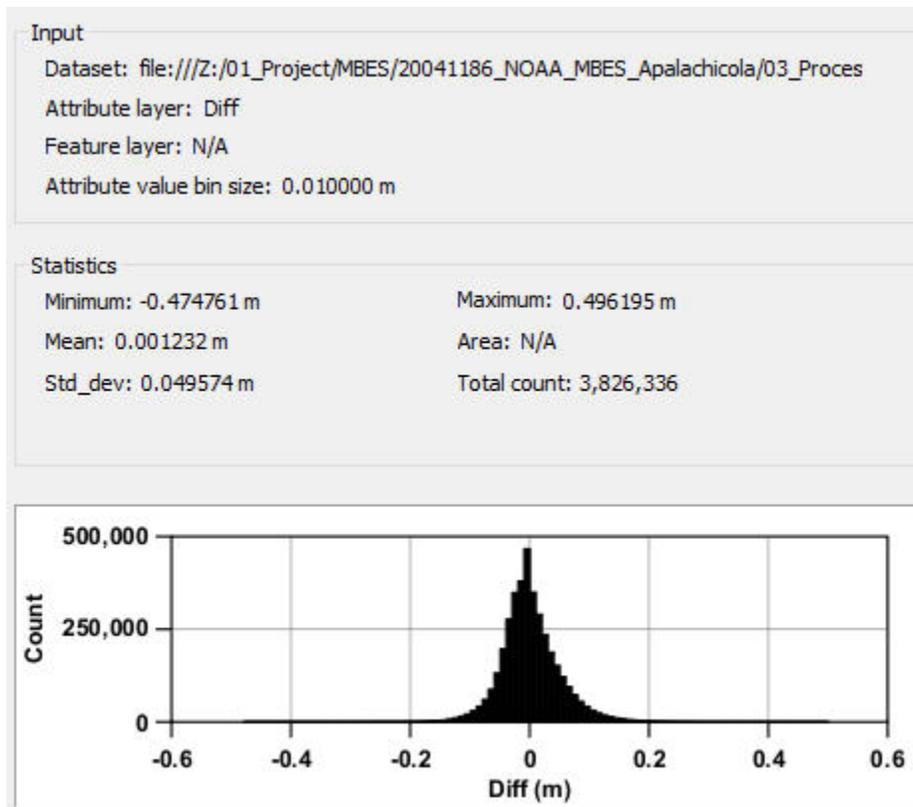


Figure 11: H13360 ODMBES mainscheme 50cm resolution MBES grid differenced from 50cm resolution ODMBES grid crosslines statistical output

B.2.2 Uncertainty

The following survey specific parameters were used for this survey:

Method	Measured	Zoning
ERS via VDATUM	0.1 meters	0.101 meters

Table 7: Survey Specific Tide TPU Values.

Hull ID	Measured - CTD	Measured - MVP	Measured - XBT	Surface
M/V Koach Kline	1.82 meters/second	N/A meters/second	N/A meters/second	0.25 meters/second
M/V Pelagos	2.623 meters/second	N/A meters/second	N/A meters/second	0.25 meters/second
USV Blue Shadow	0.121 meters/second	N/A meters/second	N/A meters/second	0.25 meters/second

Table 8: Survey Specific Sound Speed TPU Values.

Survey H13360 uncertainty values (Tables 7 and 8) were evaluated in both CARIS HIPS 11.3 and via Pydro QC Tools v3.2.10. The finalized 50cm (Figure 12) and 4m (Figure 13) bathymetric grids meet uncertainty standards with a minimum of 99.5% of nodes passing.

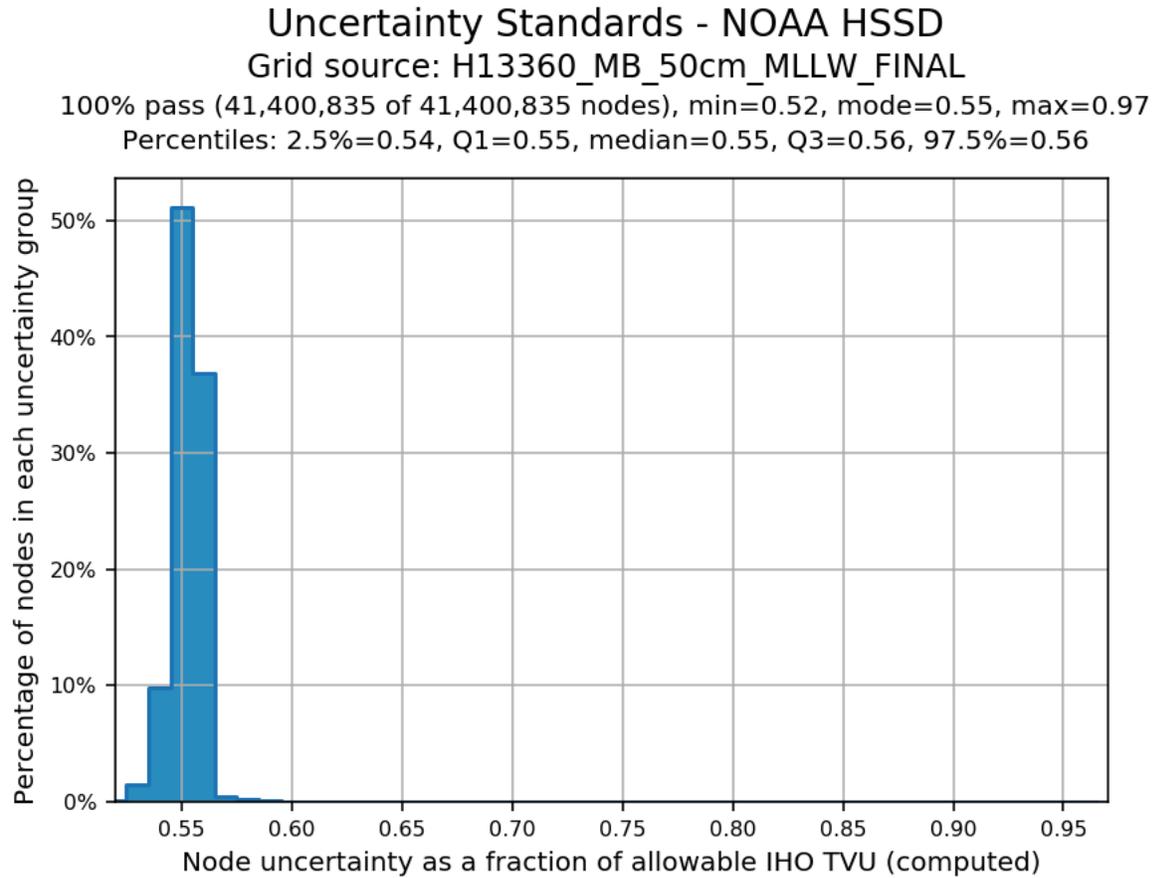


Figure 12: H13360 50cm finalized grid TPU QC

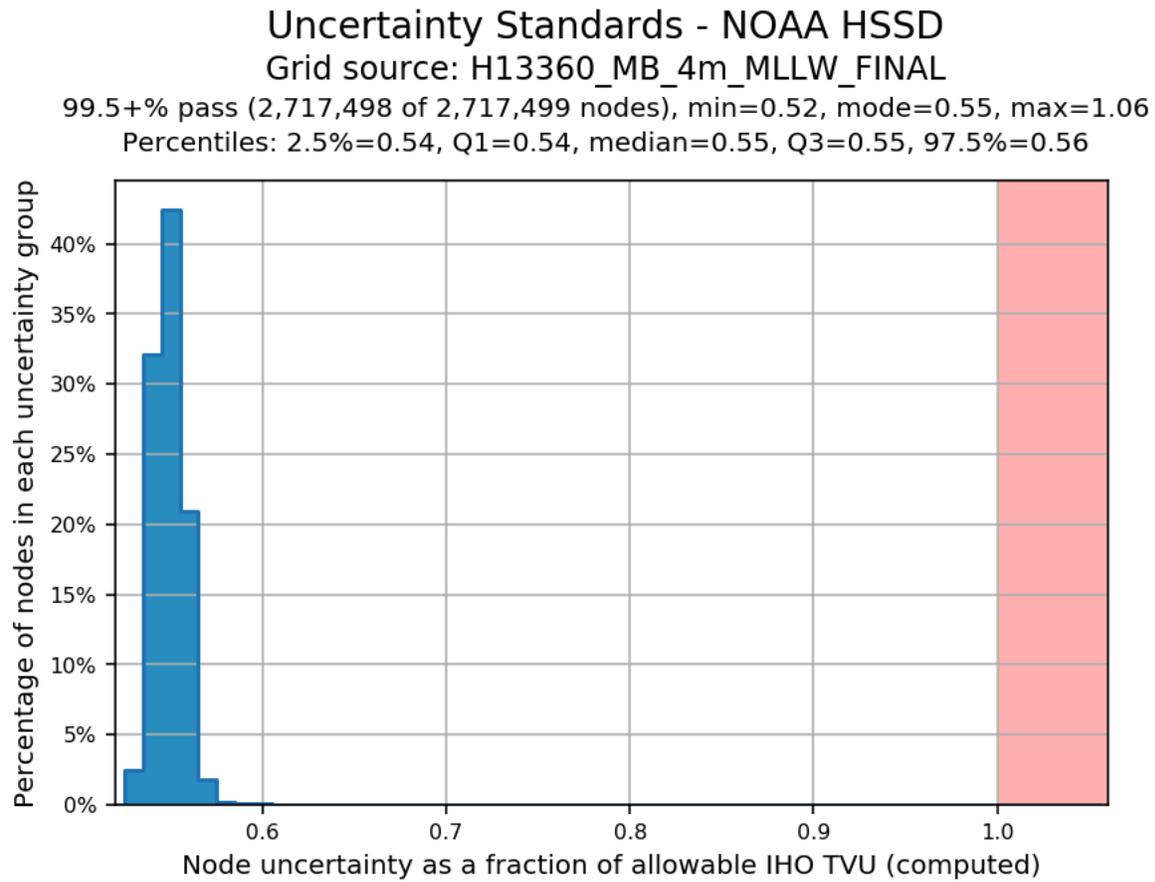


Figure 13: H13360 4m finalized grid TPU QC

B.2.3 Junctions

Four contemporary surveys are available for comparison to H13360: H13157 (2018), H13285 (2019), H13286 (2019), and H13359 (2020) (Table 9 and Figure 14). Data acquired within the sheet limits of H13361 were compared to survey data acquired in association with H13357 and H13358. Junction information for those comparisons may be found in the Descriptive Reports submitted within OR-J359-KR-20. Junction to LiDAR data was assigned in the PI, however no quantifiable data was provided; a general statement of visual assessment between data acquired within H13360 and LiDAR tif provided is included in section D.1 of this report.

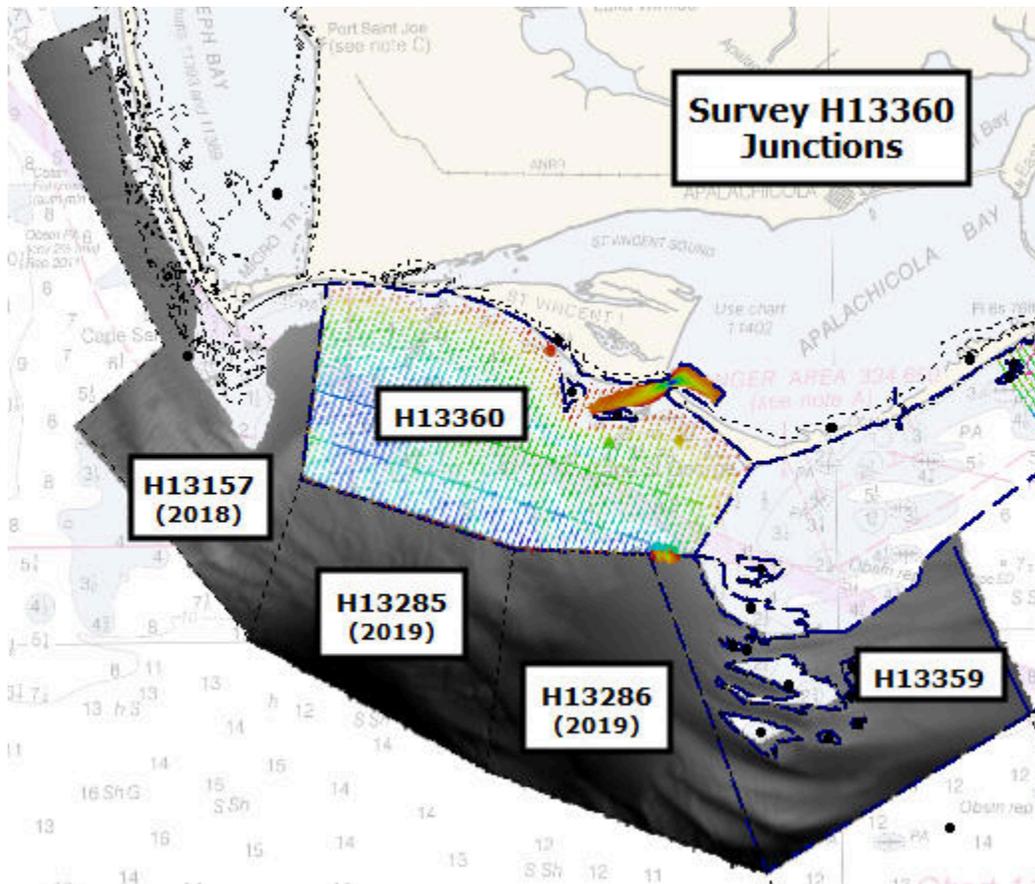


Figure 14: Junction surveys to H13360

The following junctions were made with this survey:

Registry Number	Scale	Year	Field Unit	Relative Location
H13157	1:20000	2018	Fugro USA Marine, Inc.	W
H13285	1:40000	2019	Fugro USA Marine, Inc.	S
H13286	1:40000	2019	Fugro USA Marine, Inc.	S
H13359	1:20000	2020	Fugro USA Marine, Inc.	S

Table 9: Junctioning Surveys

H13157

Survey H13157 was acquired by Fugro USA Marine, Inc. from 2018 to 2019 as a part of OPR-J359-KR-18. Of the 5,683 grid nodes compared between H13360 and H13157, 100% agree within 50cm (Figure 15).

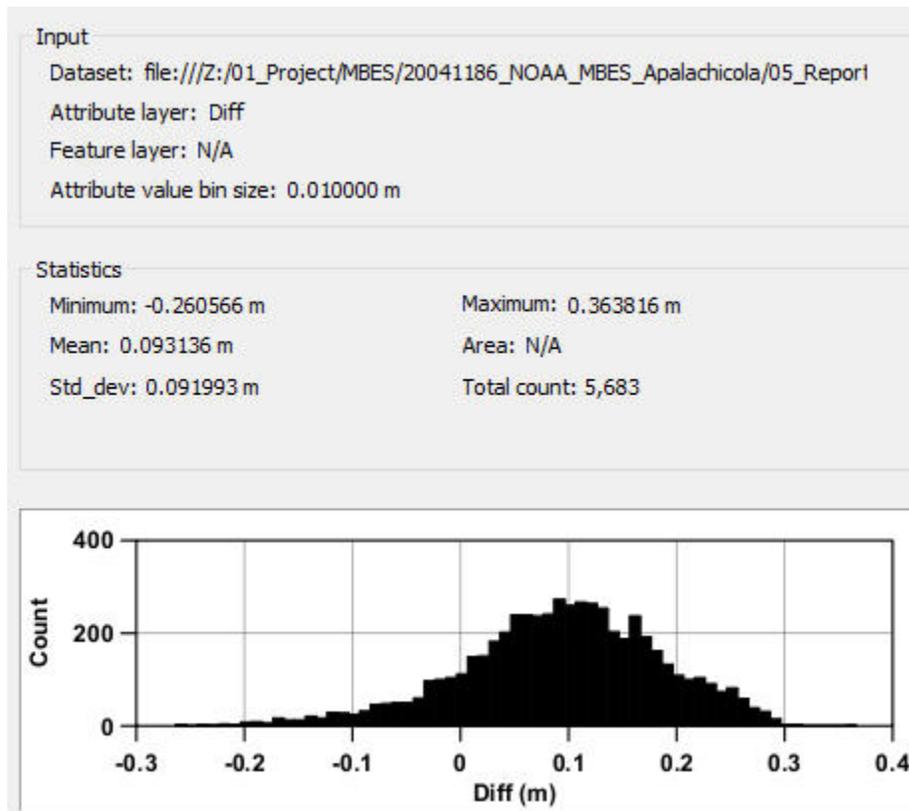


Figure 15: Survey H13360 junction with Survey H13157

H13285

Survey H13285 was acquired by Fugro USA Marine, Inc. in 2019 as a part of OPR-J359-KR-19. Of the 26,787 grid nodes compared between H13360 and H13285, 100% agree within 50cm (Figure 16).

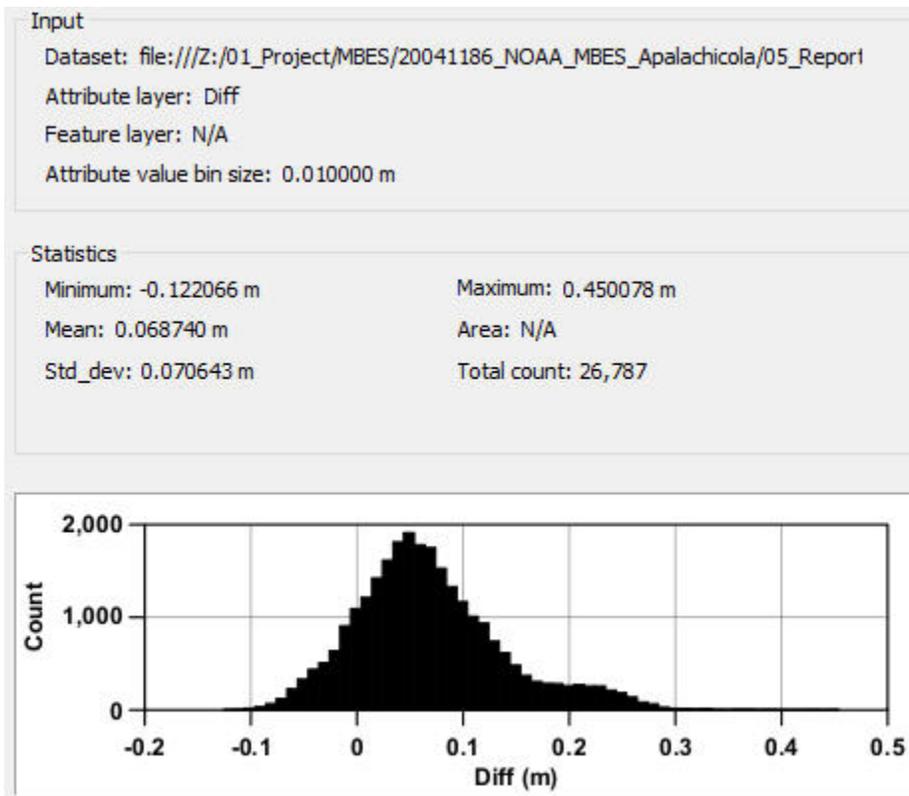


Figure 16: Survey H13360 junction with Survey H13289

H13286

Survey H13286 was acquired by Fugro USA Marine, Inc. in 2019 as a part of OPR-J359-KR-19. Of the 18,376 grid nodes compared between H13360 and H13286, 99.99% agree within 50cm (Figure 17).

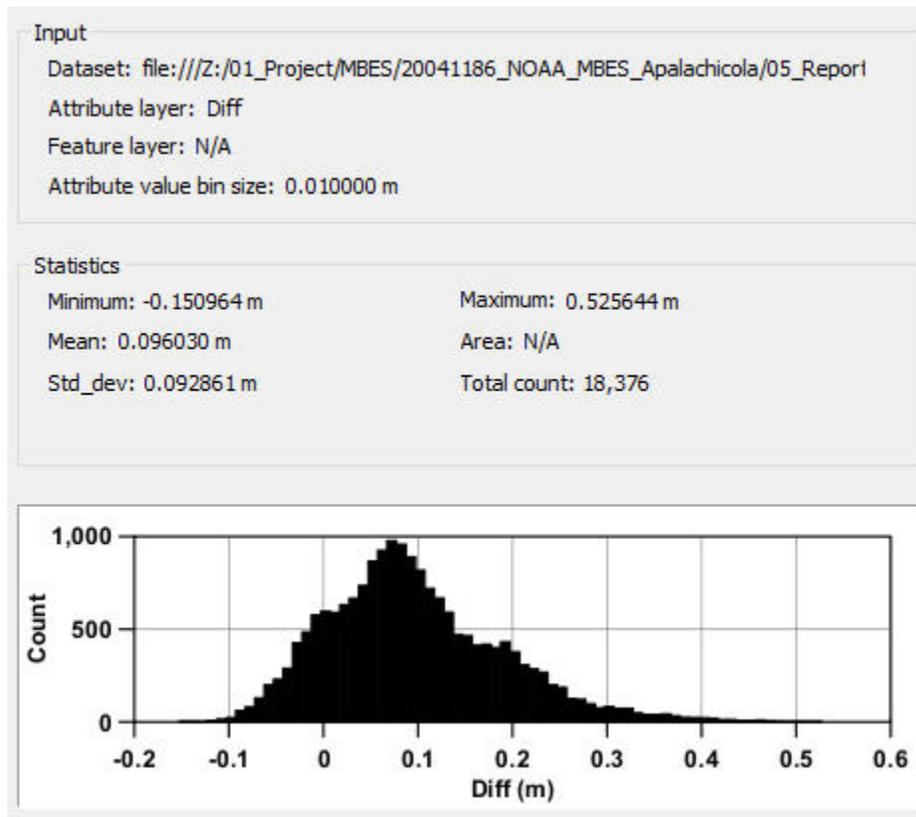


Figure 17: Survey H13360 junction with Survey H13286

H13359

Survey H13359 was acquired by Fugro USA Marine, Inc. in 2020 as a part of OPR-J359-KR-20. Of the 3,216,165 grid nodes compared between H13360 and H13359, 100% agree within 50cm (Figure 18).

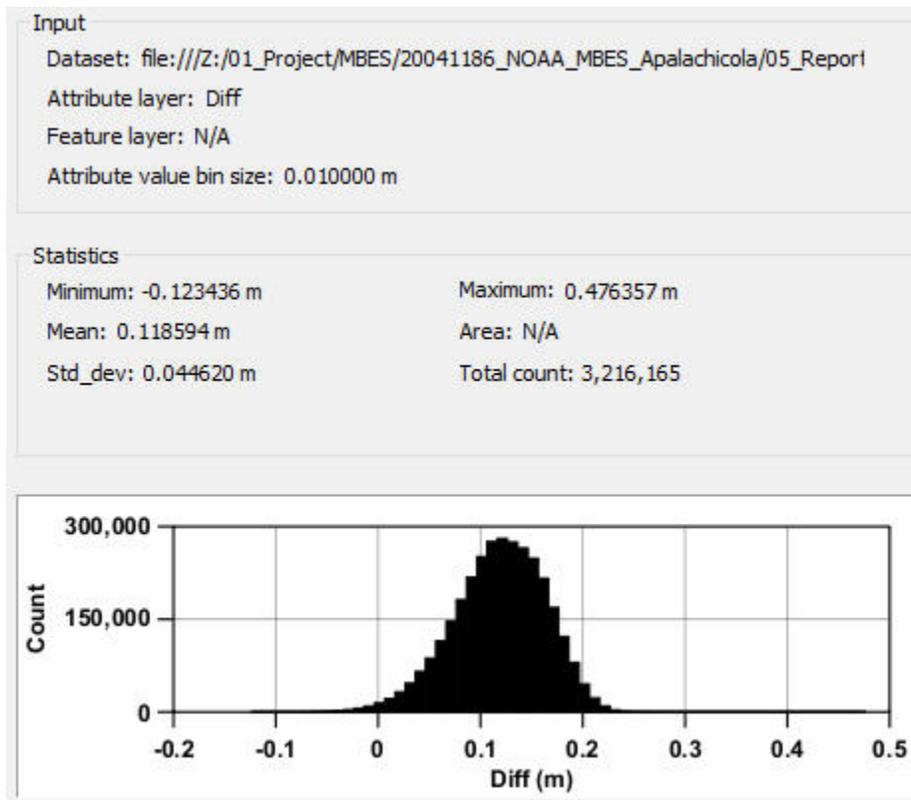


Figure 18: Survey H13360 junction with Survey H13359

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

There were no other factors that affected corrections to soundings.

B.2.7 Sound Speed Methods

Sound Speed Cast Frequency: Sound velocity profiles were acquired approximately every two hours from the M/V Koach Kline and M/V Pelagos using an AML SV&P probe. Sound velocity casts for USV Blue Shadow were acquired by M/V Koach Kline while vessels acquired simultaneously on adjacent set-lines.

Refer to the DAPR for additional information.

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

No backscatter deliverables are submitted with survey H13360. One line of data per vessel, per day was processed to ensure quality control. All equipment and survey methods utilized in the acquisition and processing of backscatter are detailed in the DAPR.

B.5 Data Processing

B.5.1 Primary Data Processing Software

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

Manufacturer	Name	Version
CARIS	HIPS and SIPS	11.4

Table 10: Primary bathymetric data processing software

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

Manufacturer	Name	Version
QPS	Fledermaus	7.9.3

Table 11: Primary imagery data processing software

The following Feature Object Catalog was used: NOAA Profile Version 2020.

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
H13360_MB_50cm_MLLW	CARIS Raster Surface (CUBE)	0.5 meters	0.88 meters - 15.99 meters	NOAA_0.5m	Object Detection
H13360_MB_50cm_MLLW_FINAL	CARIS Raster Surface (CUBE)	0.5 meters	0.88 meters - 15.99 meters	NOAA_0.5m	Object Detection
H13360_MB_4m_MLLW	CARIS Raster Surface (CUBE)	4 meters	1.37 meters - 14.48 meters	NOAA_4m	SBES Set Line Spacing
H13360_MB_4m_MLLW_FINAL	CARIS Raster Surface (CUBE)	4 meters	1.37 meters - 14.48 meters	NOAA_4m	SBES Set Line Spacing

Table 12: Submitted Surfaces

C. Vertical and Horizontal Control

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

C.1 Vertical Control

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

ERS Datum Transformation

The following ellipsoid-to-chart vertical datum transformation was used:

Method	Ellipsoid to Chart Datum Separation File
ERS via VDATUM	GeneralArea_Apalachicola_100m_NAD83-MLLW_geoid12b

Table 13: 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.

PPP

All positioning and attitude data associated with OPR-J359-KR-20 was post-processed in POSpac MMS using PP-RTX methods. For further discussion, reference the DAPR submitted with this report.

D. Results and Recommendations

D.1 Chart Comparison

A chart comparison was conducted using the Triangle Rule script within the Chart Review Tool of Pydro QC Tools. A combined s57 file of charted soundings extracted from ENC's listed in the project instructions and an s57 file of surveyed soundings were compared with the following results (Figure 19).

Survey H13360 surveyed soundings exhibit 1031 instances where surveyed soundings are shoal to charted soundings by greater than 1ft: 985 surveyed soundings are 1-3ft shoal to charted (Figure 20); 46 surveyed soundings are 4-15ft shoal to charted. The areas of significant shoaling occur within 4 relatively specific groupings in the vicinity of: 29-33-55.3000N 085-04-12.0390W, 29-37-53.7986N 085-05-51.8442W, 29-37-01.7284N 085-07-28.9795W, and 29-37-45.0937N 085-09-32.8364W (Figure 21).

At the time of this report, quantifiable LiDAR data is not available to compare to surveyed soundings from H13360. A visual comparison to the RGB tif provided shows general agreement to surveyed data trends within H13360.

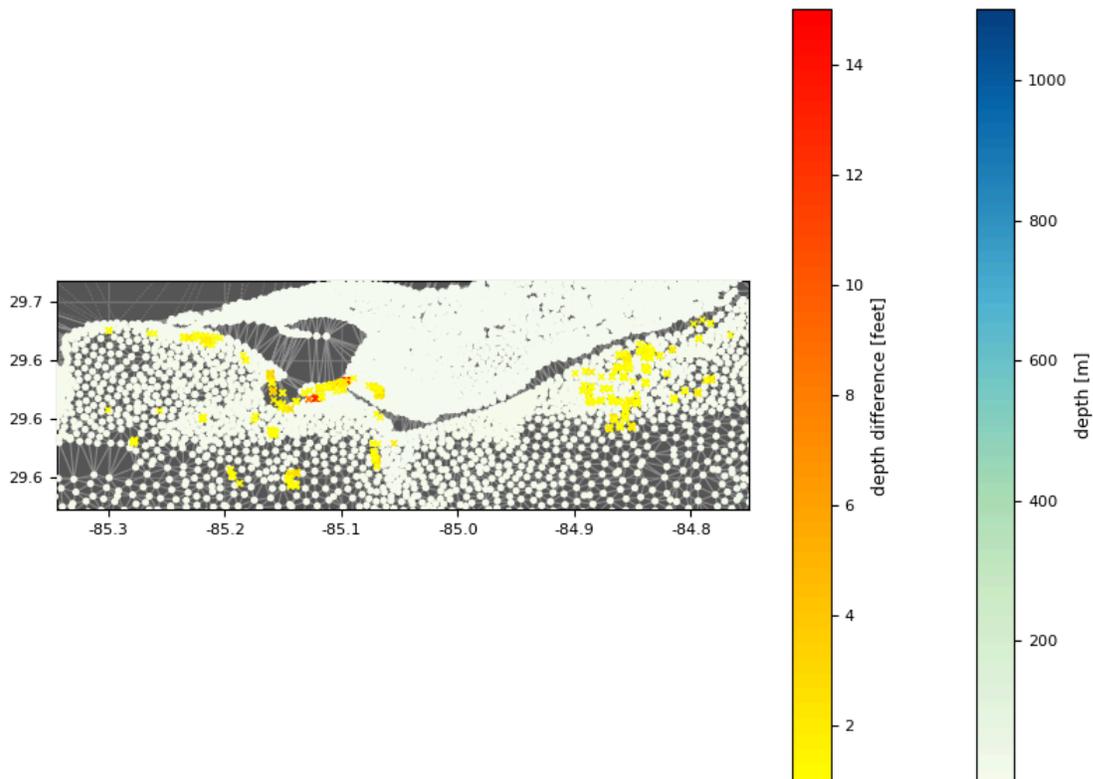


Figure 19: Pydro QC Tools chart review output of surveyed soundings shoal to charted soundings

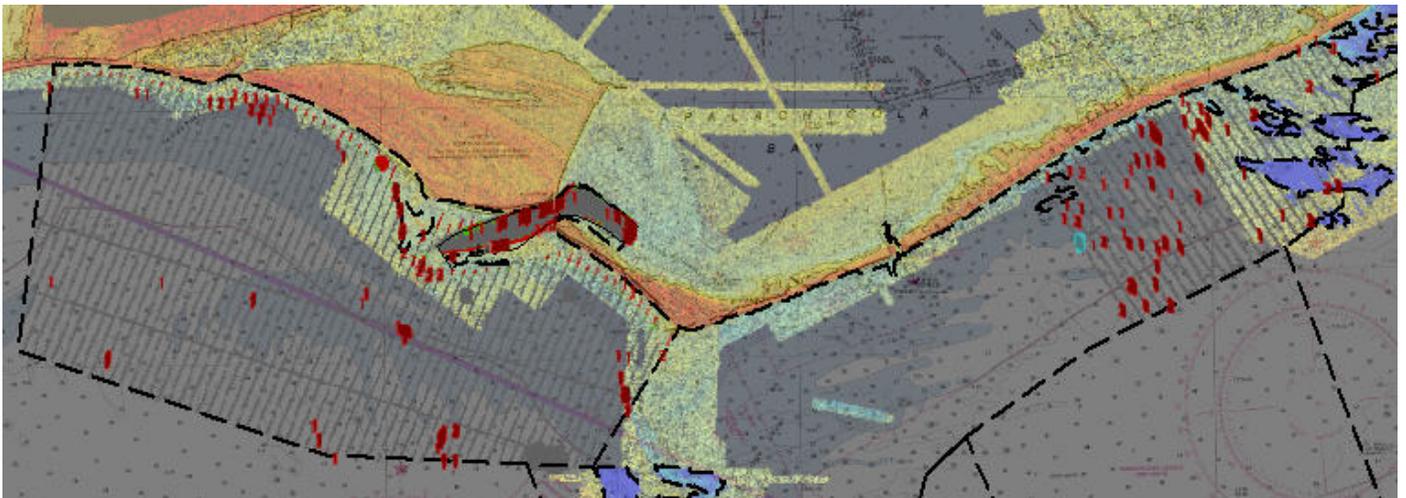


Figure 20: Pydro QC Tools output of survey H13360 areas of shoaling 1ft to 3ft highlighted in red

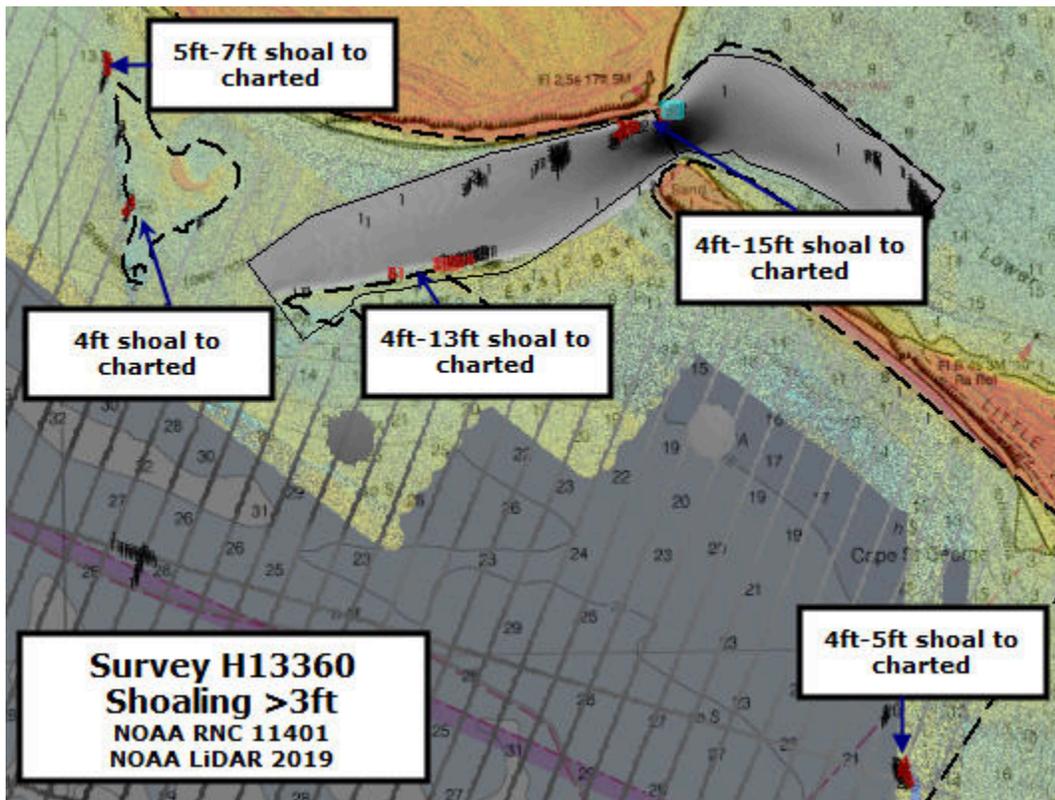


Figure 21: Pydro QC Tools output of survey H13360 areas of shoaling greater than 4ft located

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
US5FL64M	1:40000	21	05/01/2020	05/01/2020
US5FL65M	1:40000	38	04/10/2020	04/10/2020
US4FL60M	1:80000	26	12/01/2020	12/01/2020
US4FL68M	1:80000	21	11/09/2020	11/09/2020

Table 14: Largest Scale ENC's

D.1.2 Shoal and Hazardous Features

Generalized shoaling exists within the assigned boundary of survey H13360, particularly in the area of West Pass. ODMBES data within West Pass should provide adequate information necessary to update applicable charts with the most current sounding data. In general, the largest values of surveyed data being shoal to charted soundings is found in depths less than the assigned 3.5m contour; the majority of instances were not further investigated as a vessel safety precaution. The instance of shoaling located: 29-33-55.3000N 085-04-12.0390W on the southeastern sheet limit of H13360 was developed with a star pattern in attempt to amplify the understanding of shoaling in the area.

D.1.3 Charted Features

Nineteen features were assigned within the survey limits of H13360; six of the nineteen were not addressed due to depth restrictions. These six features should exist in the RSD LiDAR data not provided to the field unit. Reference the FFF associated with this survey for further detail.

D.1.4 Uncharted Features

One uncharted wreck may exist within Set Line data acquired in H13361, but is not included in the FFF as no ODMBES development was acquired. This potential feature is flagged with a designated sounding (Figure 22).

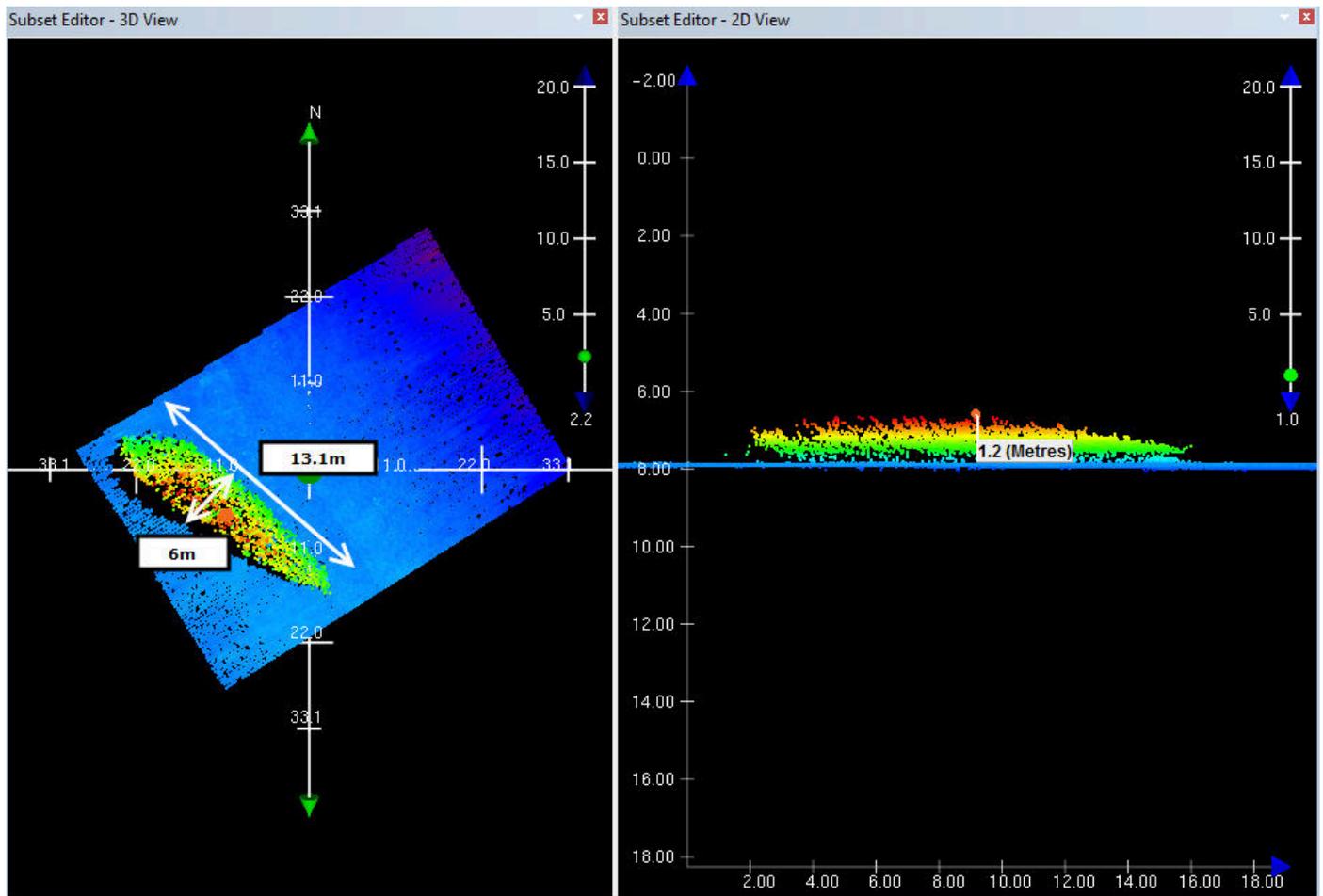


Figure 22: Potential wreck located within Set Line MBES within survey H13361

D.1.5 Channels

West Pass Channel is an unmarked channel granting entry into the southwestern portion of Apalachicola Bay from the Gulf of Mexico. The channel runs between St. Vincent Island and Little St. George Island. As assigned, West Pass was ensounded via ODMBES to either the 3.5m contour or the assigned ODMBES area extent. This channel has a chart notation designating it as being subject to extreme shoaling and being unreliable for navigation. While acquiring survey data in West Pass, the majority of vessel traffic through the pass was noted to be predominantly small (less than 25ft in length), recreational craft.

D.2 Additional Results

D.2.1 Aids to Navigation

The lighted beacon located on the easternmost shore of St. Vincent Island at the narrowest point of West Pass is currently not serving its intended purpose. Both the light and day marker are currently absent. The piling which the aforementioned items are supposed to be mounted to is positioned properly. An ATON

report was submitted to the USCG 10 December 2020. Reference the FFF associated with this survey for further detail and Appendix II of this report for correspondence records.

D.2.2 Maritime Boundary Points

No Maritime Boundary Points were assigned for this survey.

D.2.3 Bottom Samples

A total of 11 bottom samples were investigated within the survey limits of survey H13360. An additional 12 bottom samples were acquired within the survey limits of H13361 and are included in the submission of survey H13360. Reference the FFF associated with this survey for further detail.

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 and/or environmental conditions exist for this survey.

D.2.9 Construction and Dredging

No present or planned construction or dredging exist within the survey limits.

D.2.10 New Survey Recommendations

Survey H13361 must be re-assigned and acquired to completion.

D.2.11 ENC Scale Recommendations

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. 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
Allison C Stone	Chief of Party	12/10/2019	Allison C Stone  Digitally signed by Allison C Stone Date: 2020.12.14 11:39:34 -05'00'

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