

H13157

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

DESCRIPTIVE REPORT

Type of Survey: Navigable Area

Registry Number: H13157

LOCALITY

State(s): Florida

General Locality: Northwest Gulf of Mexico

Sub-locality: Cape San Blas

2019

CHIEF OF PARTY
Dean R. Moyles

LIBRARY & ARCHIVES

Date:

HYDROGRAPHIC TITLE SHEET

H13157

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: **Cape San Blas**

Scale: **20000**

Dates of Survey: **12/24/2018 to 05/07/2019**

Instructions Dated: **02/25/2019**

Project Number: **OPR-J359-KR-18**

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

Chief of Party: **Dean R. Moyles**

Soundings by: **Multibeam Echo Sounder**

Imagery by: **Multibeam Echo Sounder Backscatter**

Verification by: **Atlantic Hydrographic Branch**

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

Remarks:

Any revisions to the Descriptive Report (DR) applied during office processing are shown in red italic text. The DR is maintained as a field unit product, therefore all information and recommendations within this report are considered preliminary unless otherwise noted. The final disposition of survey data is represented in the NOAA nautical chart products. All pertinent records for this survey are archived at the National Centers for Environmental Information (NCEI) and can be retrieved via <https://www.ncei.noaa.gov/>. Products created during office processing were generated in NAD83 UTM 16N, Mean Lower Low Water. 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 H13157

Project: OPR-J359-KR-18
 Locality: Northwest Gulf of Mexico
 Sublocality: Cape San Blas
 Scale: 1:20000
 December 2018 - May 2019
Fugro USA Marine, Inc.
 Chief of Party: Dean R. Moyles

A. Area Surveyed

Survey H13157 (Table 1) is located along the length of Cape San Blas, FL and covers the extents of Cape San Blas Shoal to approximately 9.6 nautical miles south of the Saint Joseph Peninsula (Figure 1). The M/V Pelagos and M/V MacGinitie acquired full coverage multibeam echosounder (MBES) and multibeam echosounder acoustic backscatter within the assigned survey limits from 24 December 2018 to 7 May 2019.

A.1 Survey Limits

Data were acquired within the following survey limits:

Northwest Limit	Southeast Limit
29° 49' 13.39" N 85° 29' 4.84" W	29° 30' 6.29" N 85° 17' 41.02" W

Table 1: Survey Limits

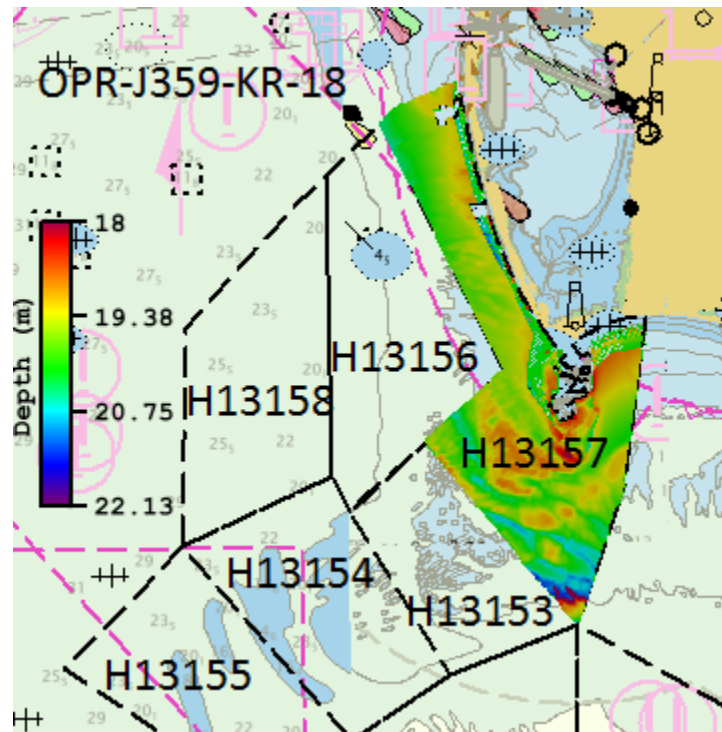


Figure 1: Survey H13157 location relative to overall sheet limits of OPR-J359-KR-18

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

A.2 Survey Purpose

The Vicinity of Apalachicola project will provide contemporary surveys to update National Ocean Service (NOS) nautical charting products. 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 323 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 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.

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 MBES with acoustic backscatter
Inshore limit to 8m water depth	Set line spacing MBES at 200m, perpendicular to contours (HSSD 2018 5.2.2.4 A)

Table 2: Survey Coverage

Survey H13157 meets survey coverage requirements as assigned in the project instructions and HSSD (Table 2 and Figures 2-3). The southeastern portion of H13157 was originally designated a section of priority area 1, H13153, however due to the arrival of Hurricane Michael acquisition was not able to be completed. The absorption of the remainder of H13153 into H13157 was agreed upon within the revised project instructions dated 2/25/2019, though new survey limits were not officially designated.

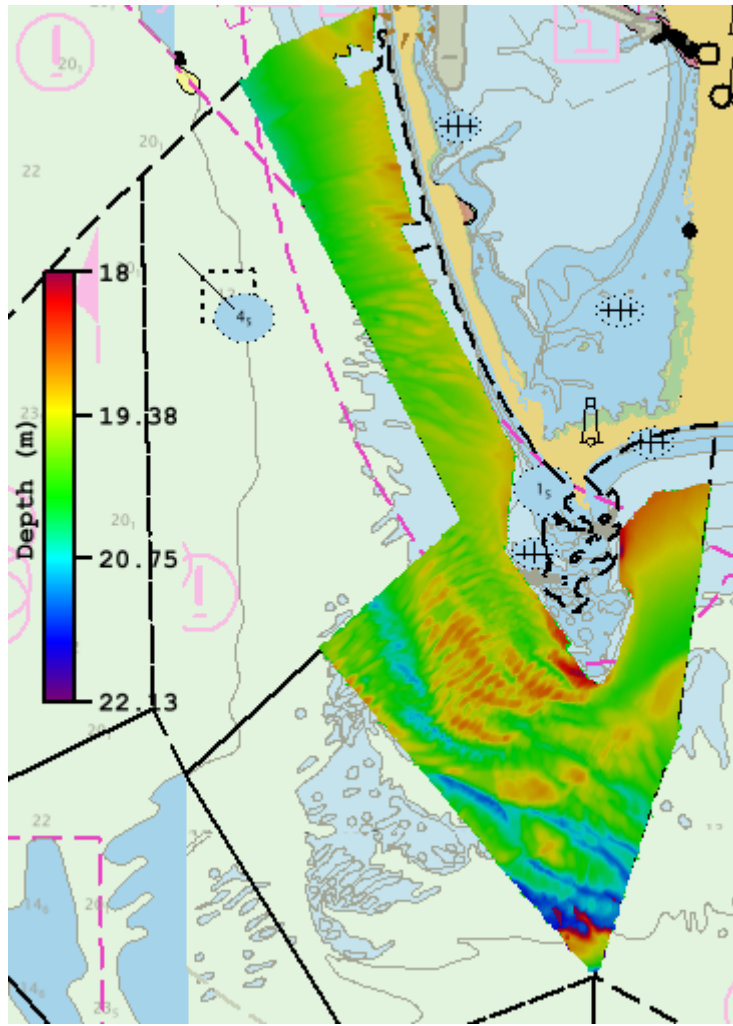


Figure 2: Survey H13157 full coverage MBES

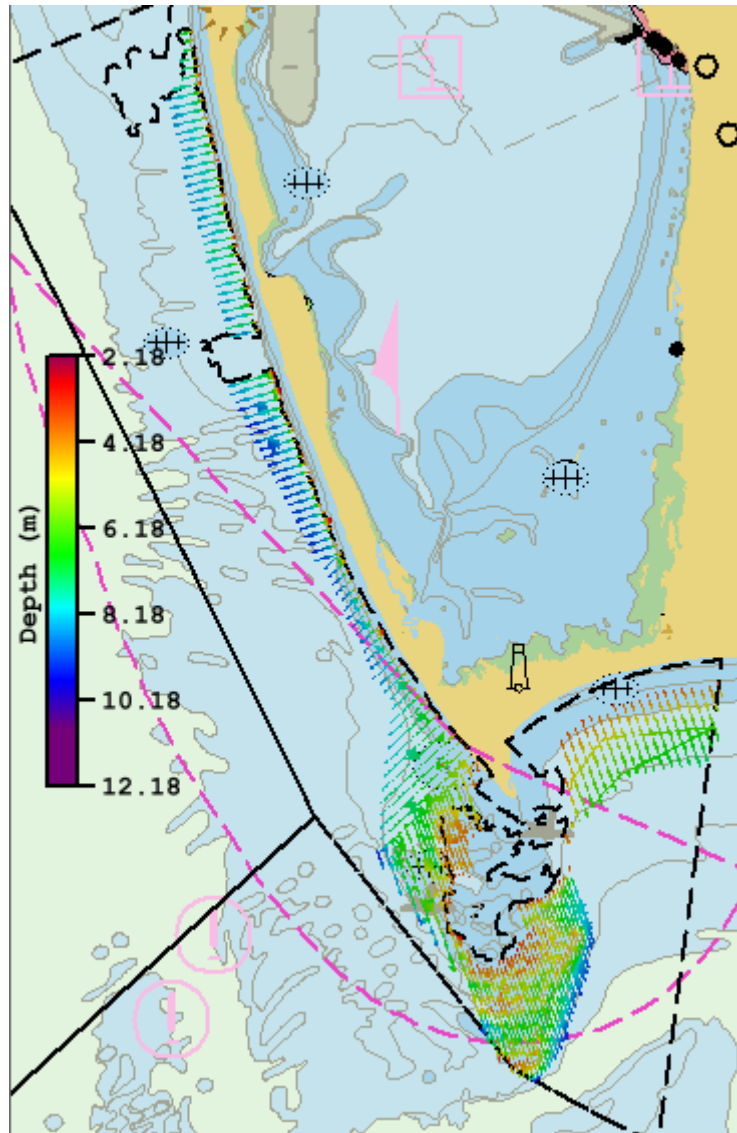


Figure 3: Survey H13157 set line MBES

A.6 Survey Statistics

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

	HULL ID	<i>M/V Pelagos</i>	<i>M/V MacGinitie</i>	<i>Total</i>
LNM	SBES Mainscheme	0	0	0
	MBES Mainscheme	2613.70	363.99	2977.69
	Lidar Mainscheme	0	0	0
	SSS Mainscheme	0	0	0
	SBES/SSS Mainscheme	0	0	0
	MBES/SSS Mainscheme	0	0	0
	SBES/MBES Crosslines	131.89	7.99	139.89
	Lidar Crosslines	0	0	0
Number of Bottom Samples				10
Number Maritime Boundary Points Investigated				0
Number of DPs				0
Number of Items Investigated by Dive Ops				0
Total SNM				63.55

Table 3: Hydrographic Survey Statistics

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

Survey Dates	Day of the Year
12/24/2018	358

Survey Dates	Day of the Year
12/25/2018	359
12/26/2018	360
12/29/2018	363
12/30/2018	364
12/31/2018	365
01/01/2019	1
01/02/2019	2
01/03/2019	3
01/06/2019	6
01/07/2019	7
01/08/2019	8
01/09/2019	9
01/10/2019	10
01/11/2019	11
01/12/2019	12
01/13/2019	13
01/14/2019	14
01/15/2019	15
01/16/2019	16
01/17/2019	17
01/18/2019	18
01/19/2019	19
01/21/2019	21
01/22/2019	22
01/25/2019	25
01/26/2019	26
01/27/2019	27
01/28/2019	28
01/29/2019	29
01/31/2019	31
02/01/2019	32
02/02/2019	33

Survey Dates	Day of the Year
02/03/2019	34
02/04/2019	35
02/05/2019	36
02/06/2019	37
02/07/2019	38
02/08/2019	39
02/10/2019	41
02/11/2019	42
02/12/2019	43
02/14/2019	45
02/15/2019	46
02/27/2019	58
02/28/2019	59
03/01/2013	60
03/02/2019	61
03/16/2019	75
03/17/2019	76
03/18/2019	77
03/20/2019	79
03/22/2019	81
03/23/2019	82
03/24/2019	83
03/25/2019	84
03/26/2019	85
03/29/2019	88
03/30/2019	89
03/31/2019	90
04/02/2019	92
04/03/2019	93
04/12/2019	102
04/27/2019	117
04/28/2019	118

Survey Dates	Day of the Year
04/30/2019	120
05/03/2019	123
05/07/2019	127

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 (Table 6), survey vessels (Table 5), 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 Pelagos</i>	<i>M/V MacGinitie</i>
LOA	34 feet	32 feet
Draft	2 feet	1.5 feet

Table 5: Vessels Used

M/V Pelagos and M/V MacGinitie acquired multibeam echosounder, acoustic backscatter, surface sound velocity, sound velocity profiles, attitude and positioning data within the survey limits of H13157. 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
Teledyne RESON	SVP 70	Sound Speed System
Applanix	POS MV 320 v4	Positioning and Attitude System
Applanix	POS MV 320 v5	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 H13157 (Figure 4) were acquired in accordance with sections 5.2.4.2 of the HSSD 2018. Of the 3,615,021 nodes compared between H13157 mainscheme MBES and MBES crosslines, 100% are within 1m difference. The mean difference is -0.25m, with a standard deviation of 0.11m (Figure 5).

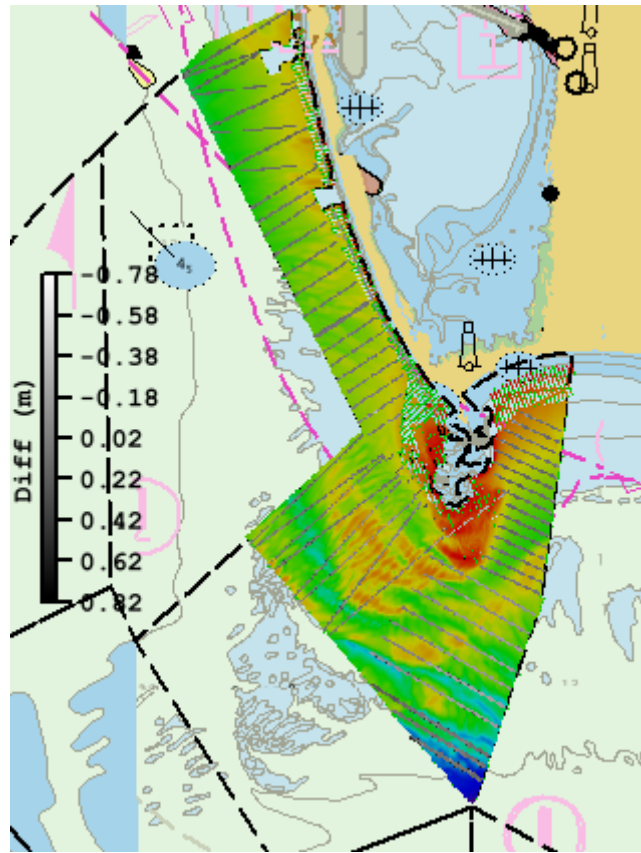


Figure 4: H13157 MBES crossline to MBES mainscheme distribution

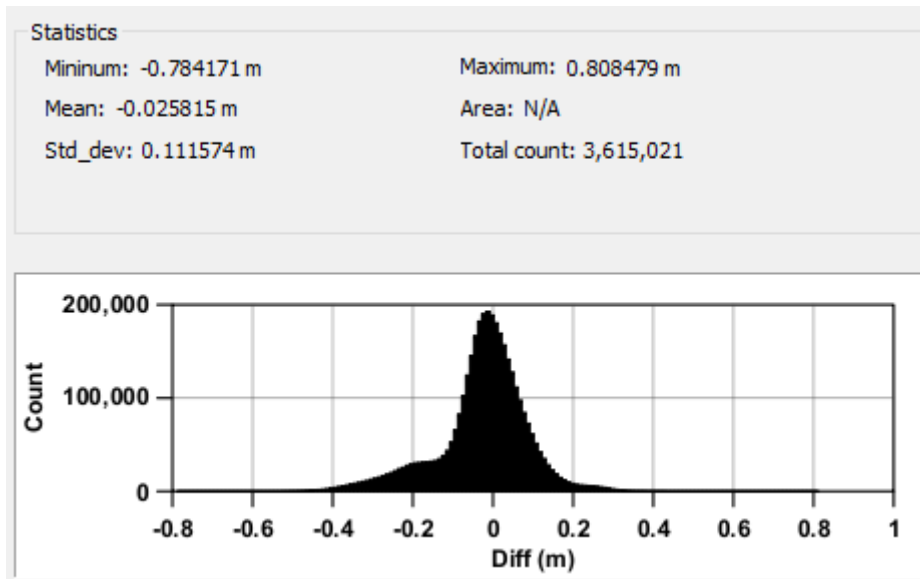


Figure 5: H13157 mainscheme MBES differenced to crossline statistical output

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
Pelagos	3.72 meters/second	N/A meters/second	N/A	0.25 meters/second
MacGinitie	2.95 meters/second	N/A meters/second	N/A	0.25 meters/second

Table 8: Survey Specific Sound Speed TPU Values.

Survey H13157 uncertainty values were evaluated both in CARIS HIPS and SIPS and via Pydro QC tools v2.7.5. Both the 1m (Figure 6), 2m (Figure 7), 4m (Figure 8), and 50cm (Figure 9) finalized grids meet uncertainty standards with 99.5% of nodes or greater exceeding requirements.

Uncertainty Standards

Grid source: H13157_MB_1m_MLLW_Final

99.5+% pass (182,604,585 of 182,604,608 nodes), min=0.54, mode=0.59, max=1.50

Percentiles: 2.5%=0.57, Q1=0.59, median=0.59, Q3=0.59, 97.5%=0.60

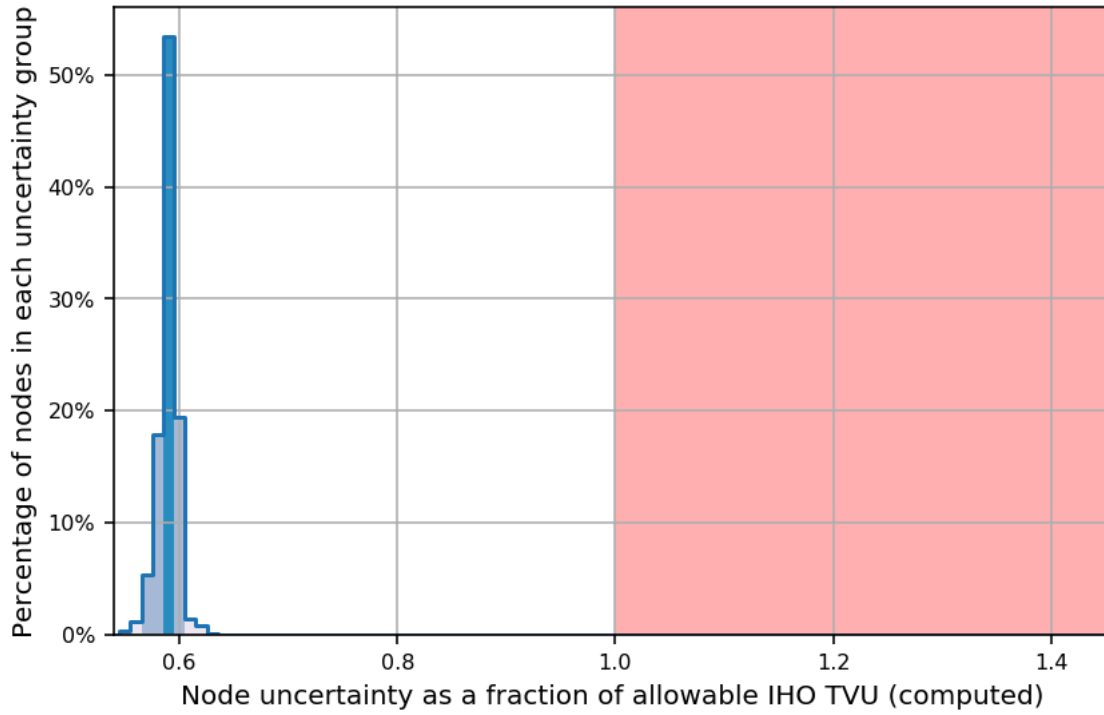


Figure 6: H13157 1m finalized grid TPU QC

Uncertainty Standards

Grid source: H13157_MB_2m_MLLW_Final

100% pass (557,525 of 557,525 nodes), min=0.53, mode=0.56, max=0.92

Percentiles: 2.5%=0.55, Q1=0.55, median=0.56, Q3=0.57, 97.5%=0.60

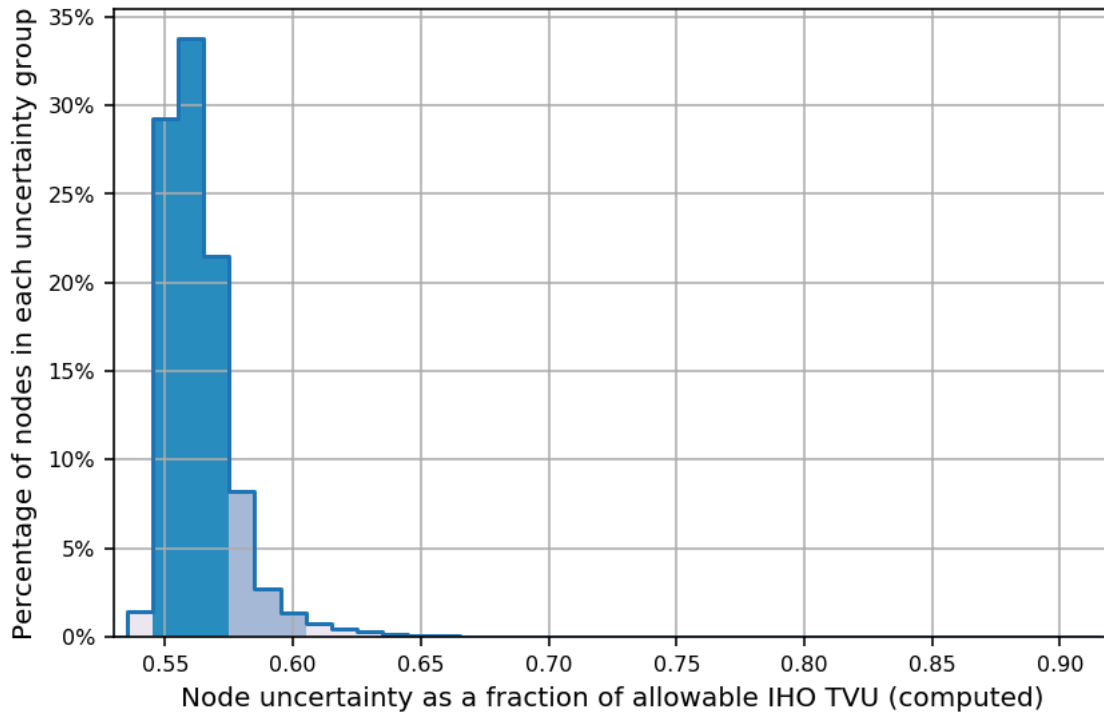


Figure 7: H13157 2m finalized grid TPU QC

Uncertainty Standards

Grid source: H13157_MB_4m_MLLW_Final

100% pass (601,028 of 601,028 nodes), min=0.59, mode=0.60, max=0.94

Percentiles: 2.5%=0.60, Q1=0.60, median=0.60, Q3=0.61, 97.5%=0.62

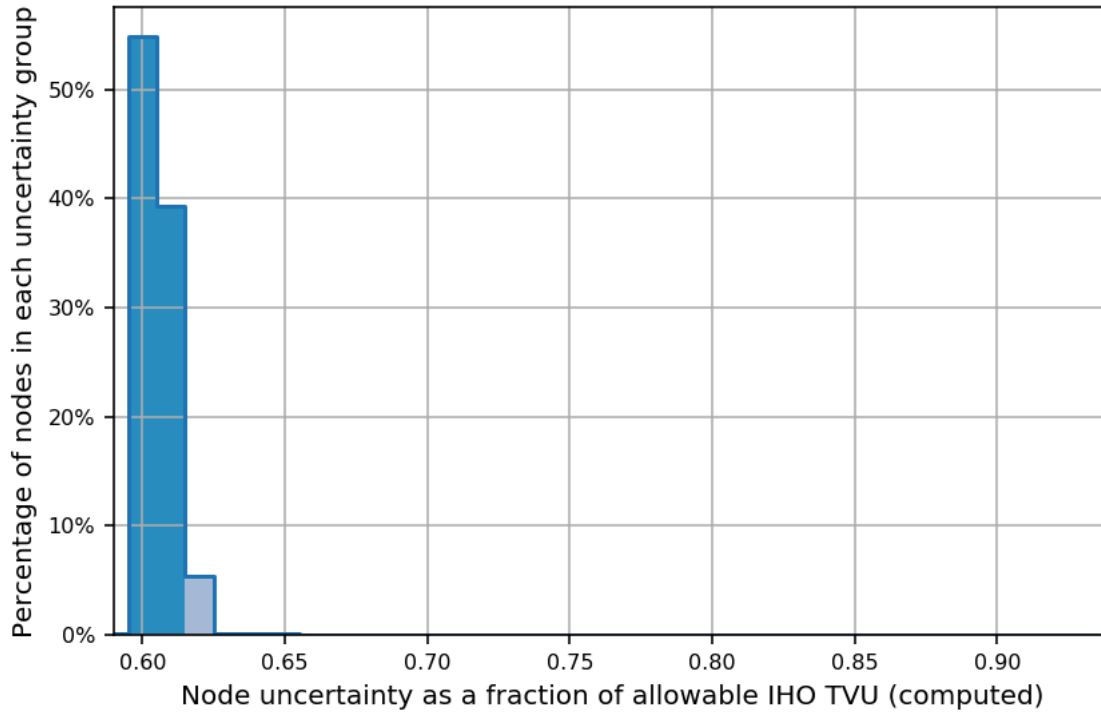


Figure 8: H13157 4m finalized grid TPU QC

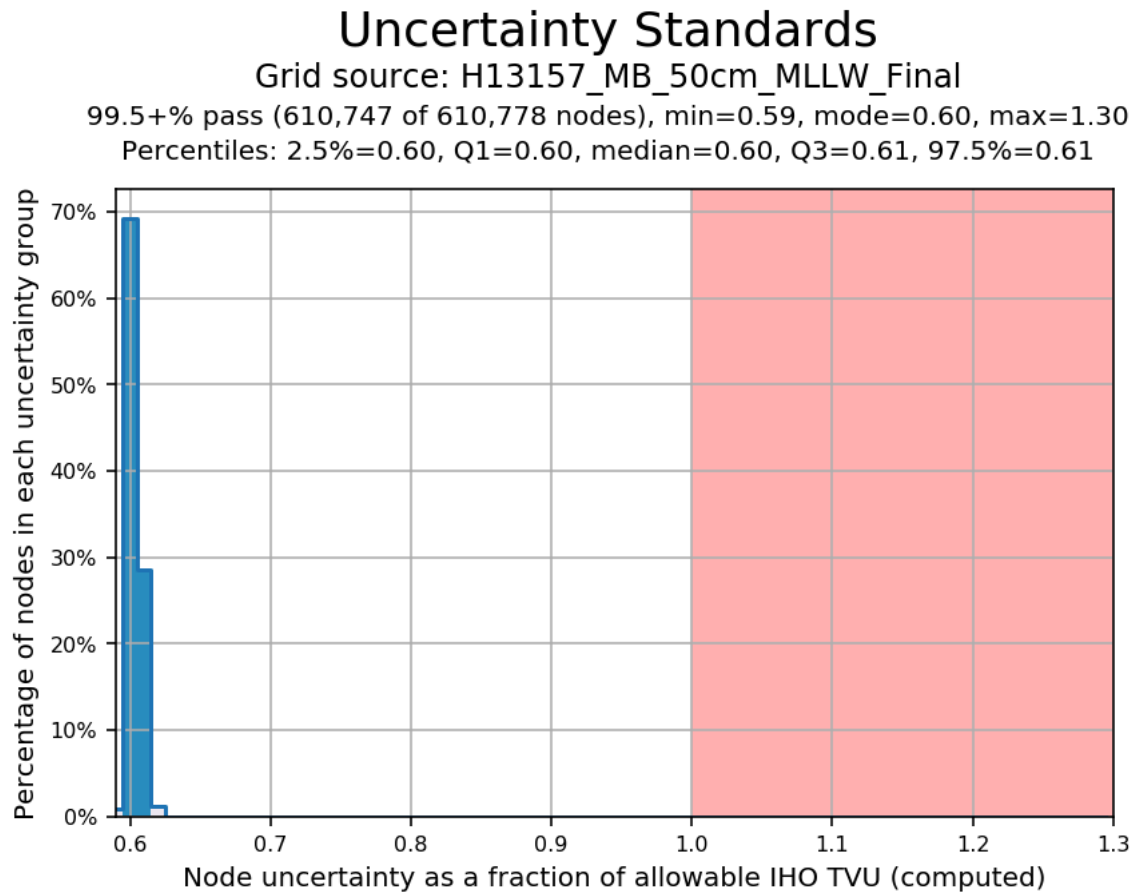


Figure 9: H13157 50cm finalized grid TPU QC

B.2.3 Junctions

Data from two contemporary junction surveys to H13157 are available at the time of this report (Figure 10). Both junction surveys, H13153 and H13156, contain data acquired by the R/V Acadiana prior to the arrival of Hurricane Michael (Table 9). Surveyed depths in the area of OPR-J359-KR-18 were effected by the storm, causing some inconsistencies when comparing soundings between data sets. Survey data were compared by running a difference surface in CARIS HIPS and SIPS on finalized 1m surfaces for each survey (Figures 11, 12, and 13).

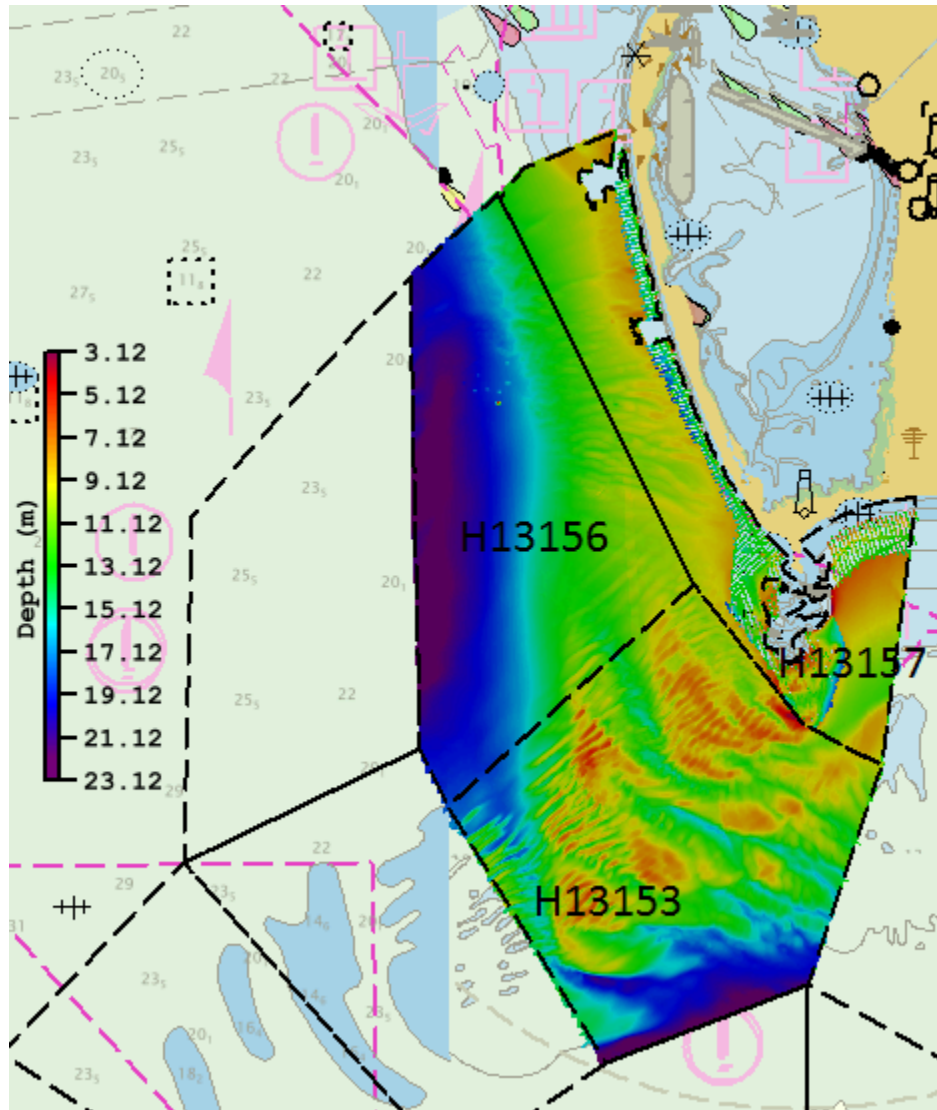


Figure 10: Junction surveys to H13157: H13153 and H13156

The following junctions were made with this survey:

Registry Number	Scale	Year	Field Unit	Relative Location
H13153	1:40000	2018	R/V Acadiana	SW
H13156	1:40000	2018	R/V Acadiana	W
H13156	1:40000	2018	M/V Pelagos	W

Table 9: Junctioning Surveys

H13153

Of 2,462,125 nodes differenced between survey H13157 and H13153, the majority agree within 1m. The minimum difference is -2.24m, the maximum difference is 4.04m with a mean of 0.12m and a standard deviation of 0.39m.

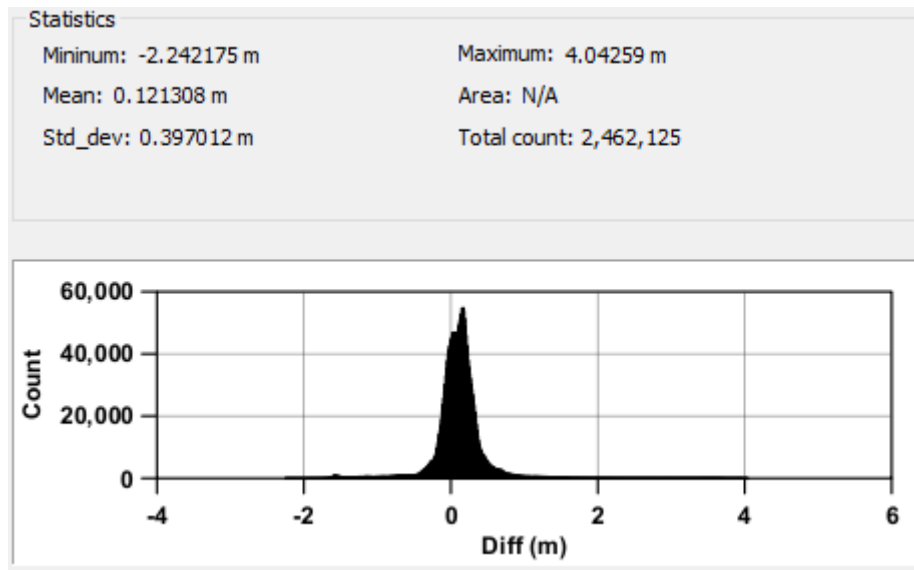


Figure 11: Survey H13157 differenced to Survey H13153

H13156

Of 1,642,031 nodes differenced between survey H13157 and H13156 (R/V Acadiana), the majority agree within 1m. The minimum difference is -0.75m, the maximum difference is 2.14m with a mean difference of 0.13m and a standard deviation of 0.13m.

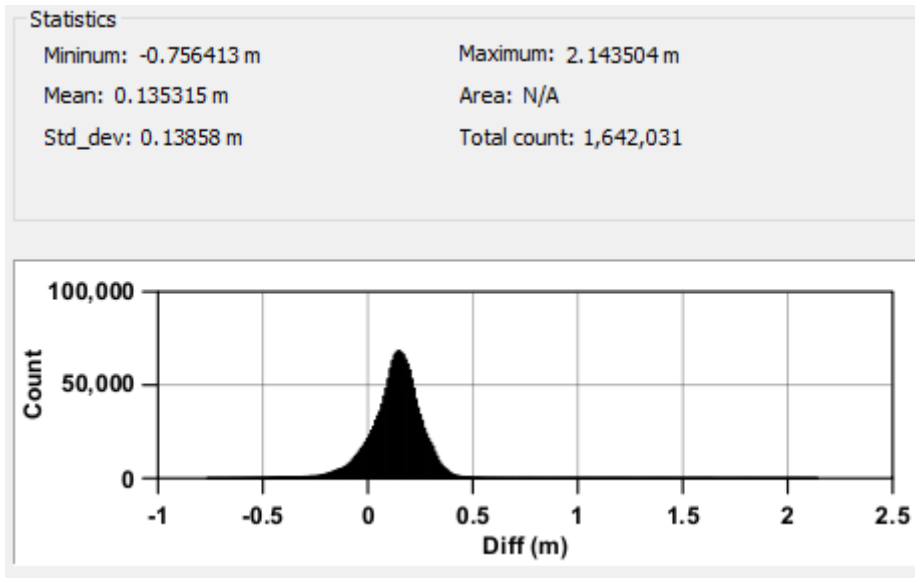


Figure 12: Survey H13157 differenced to Survey H13156 (R/V Acadiana)

H13156

Of 1,308,996 nodes differenced between survey H13157 and H13156 (M/V Pelagos), 100% agree within 1m. The minimum difference is -0.55m, the maximum difference is 0.59m with a mean difference difference of 0.01m and a standard deviation of 0.08m.

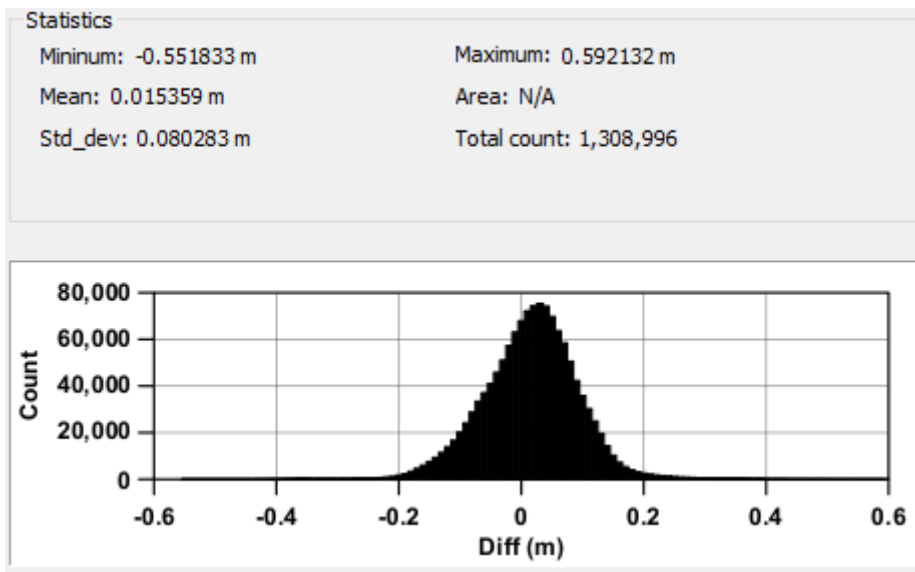


Figure 13: Survey H13157 differenced to Survey H13156 (M/V Pelagos)

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 every two hours from the M/V Pelagos and M/V MacGintie using an AML Sound Velocity & Pressure (SV&P) sensor (Figure 14).

Refer to the DAPR for additional information.

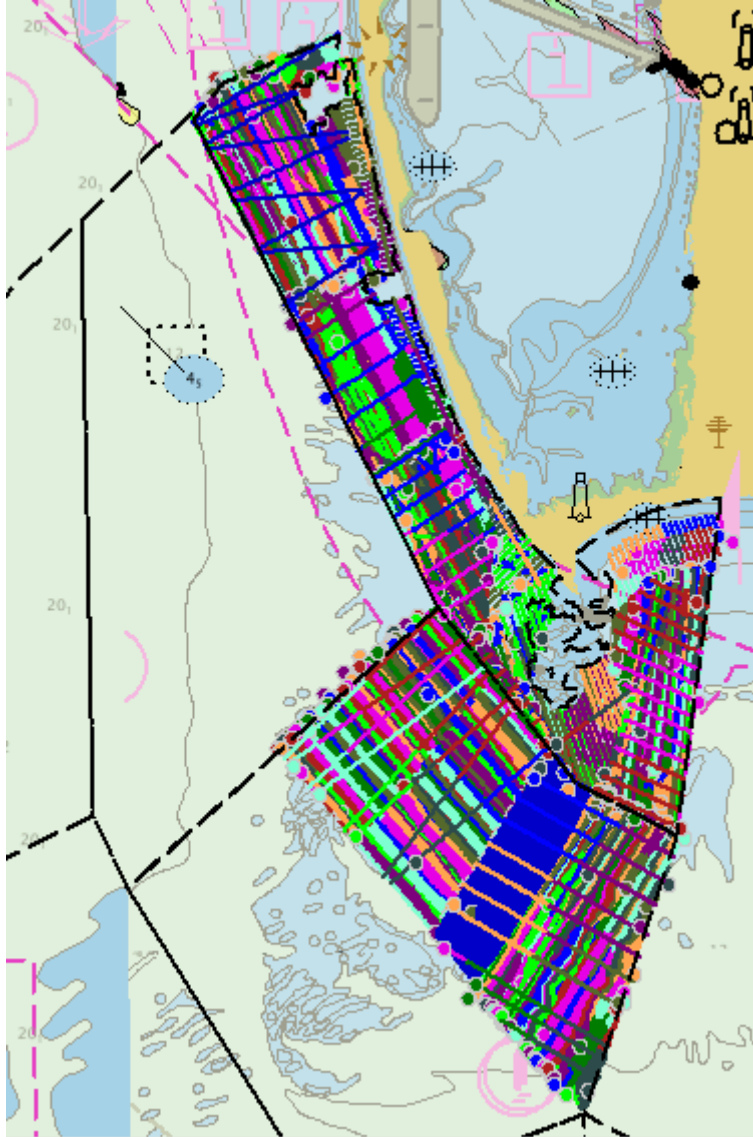


Figure 14: Temporal and geographic distribution of SVP casts within survey H13157

B.2.8 Coverage Equipment and Methods

Multibeam echosounder data collected by both the M/V MacGinitie and M/V Pelagos in the areas of H13157 greater than 8m were collected for the purpose of full multibeam coverage of the seafloor.

Between 3.6m and 8m water depth, set line spacing MBES data were acquired as assigned in the Project Instructions and per HSSD 2018 Section 5.2.2.4 Option A. Set lines were run at regular 200m intervals perpendicular to the contour; these data were gridded to 4m resolution per HSSD 2018 5.2.2.4. Along the southern portion of Cape San Blas Shoals, set line spacing density was increased to 100m to better ensonify the shoal.

In areas where investigation of charted soundings were required and charted features were developed for chart updating purposes, data were gridded to 50cm.

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.

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	HIPS & SIPS	9.1.9

Table 10: Primary bathymetric data processing software

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

Manufacturer	Name	Version
QPS	FMGT	7.8.7

Table 11: Primary imagery data processing software

The following Feature Object Catalog was used: NOAA Extended Attribute Files V5_7.

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
H13157_MB_1m_MLLW	CARIS Raster Surface (CUBE)	1 meters	3.12 meters - 22.13 meters	CMC 1m	Complete MBES
H13157_MB_1m_MLLW_Final	CARIS Raster Surface (CUBE)	1 meters	3.12 meters - 20 meters	CMC 1m	Complete MBES
H13157_MB_2m_MLLW	CARIS Raster Surface (CUBE)	2 meters	3.11 meters - 22.13 meters	CMC 2m	Complete MBES
H13157_MB_2m_MLLW_Final	CARIS Raster Surface (CUBE)	2 meters	18 meters - 22.13 meters	CMC 2m	Complete MBES
H13157_MB_4m_MLLW	CARIS Raster Surface (CUBE)	4 meters	2.18 meters - 10.90 meters	CMC 4m	MBES TracklineSBES Set Line Spacing
H13157_MB_4m_MLLW_Final	CARIS Raster Surface (CUBE)	4 meters	2.18 meters - 10.90 meters	CMC_4m	MBES TracklineSBES Set Line Spacing
H13157_MB_50cm_MLLW	CARIS Raster Surface (CUBE)	0.5 meters	3.61 meters - 12.60 meters	CMC 0.5m	Object Detection

Surface Name	Surface Type	Resolution	Depth Range	Surface Parameter	Purpose
H13157_MB_50cm_MLLW_Final	CARIS Raster Surface (CUBE)	0.5 meters	3.61 meters - 12.60 meters	CMC 0.5m	Object Detection
57_MBAB_1m_400kHz	MB Backscatter Mosaic	1 meters	0 meters - 0 meters	N/A	Complete MBES
H13157_MBAB_2m_400kHz	MB Backscatter Mosaic	2 meters	0 N/A - 0 N/A	N/A	Complete MBES

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	J359_Buffer1mi_xyNAD83-MLLW_geoid12b.csar

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.

D. Results and Recommendations

D.1 Chart Comparison

A selected sounding set was made from the finalized 1m, 2m, 4m, and 50cm grids with the following characteristics: shoal biased; 1 to 10,000mm at map scale; defined radius of 5. An overall sounding selection was created from charted soundings from ENC's US5FL64M, US5FL63M, US4FL68M, and US4FL60M. The surveyed soundings and charted soundings were then compared with a minimum threshold of 1m survey soundings shoal to charted soundings using the Chart Review feature within Pydro QC tools (Figures 15 and 16). Surveyed soundings deeper than charted soundings were not analyzed.

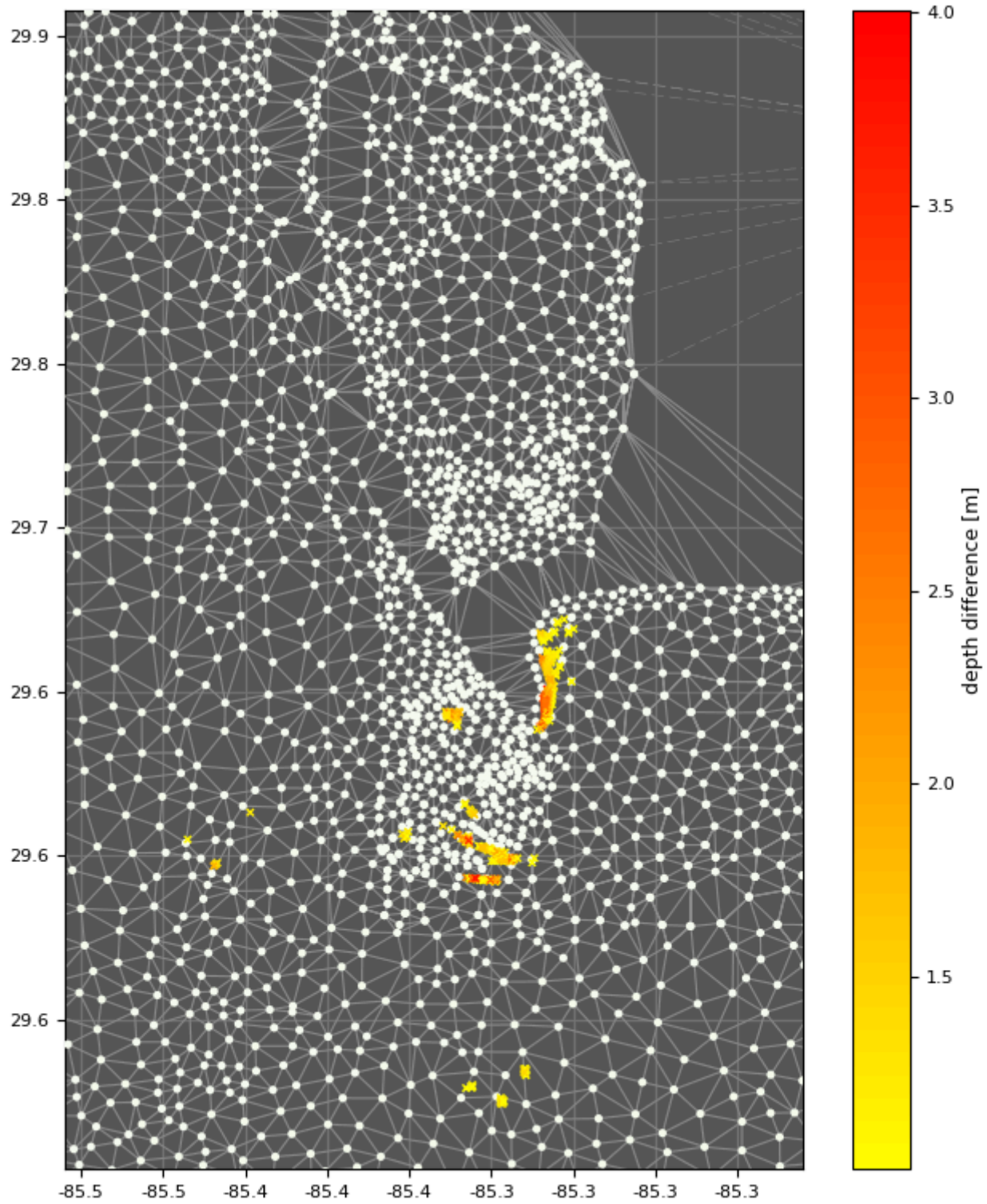


Figure 15: QC tools output instances of survey H13157 soundings shoal to charted soundings >1m.

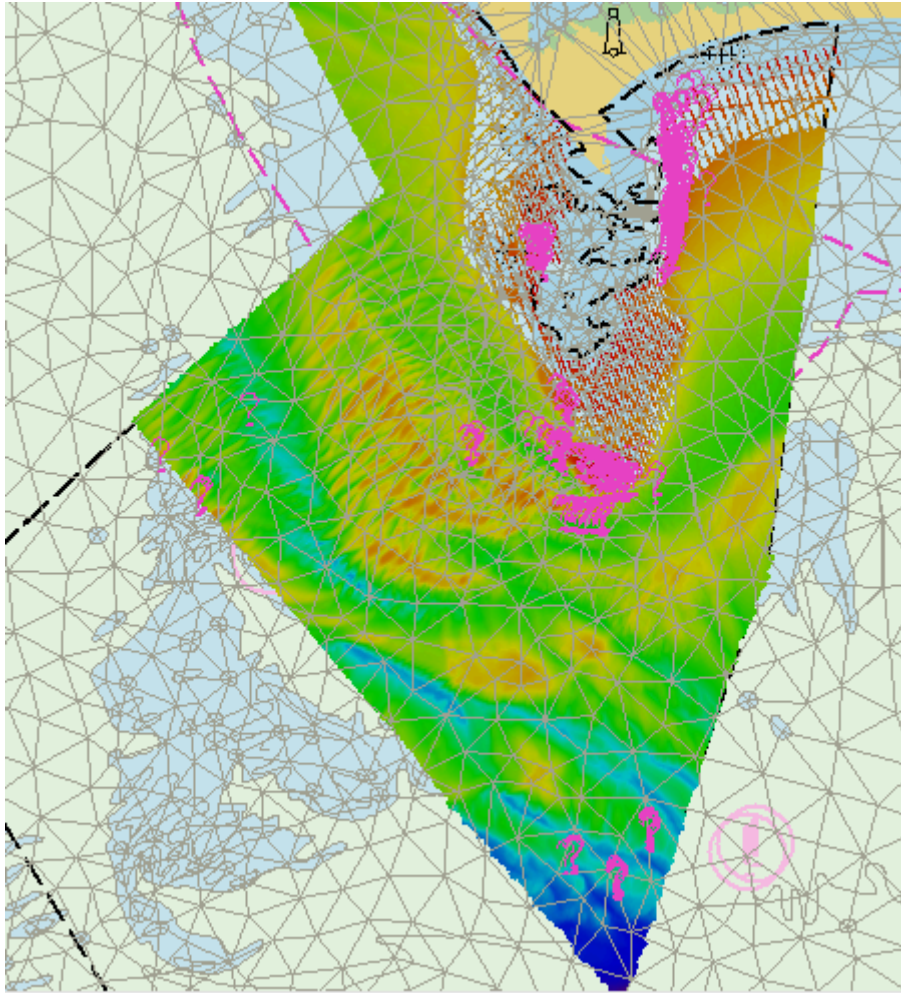


Figure 16: QC tools output instances of surveyed soundings shoal to charted soundings >1m over survey H13157 area with ENC soundings TIN.

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
US5FL63M	1:40000	35	05/16/2019	05/16/2019
US5FL64M	1:40000	19	03/12/2019	04/24/2013
US4FL60M	1:80000	24	03/01/2019	05/09/2019
US4FL68M	1:80000	16	03/12/2019	05/10/2019

Table 14: Largest Scale ENC's

D.1.2 Shoal and Hazardous Features

Cape San Blas Shoals is an area characterized by large, migrating sand waves. Two AtoNs demarcate the eastern and western extents. The areas of significant change, upwards of 4m shoal to depths charted, occur on the southern and eastern sides of the shoal in the general vicinities of 29-35-48.790303N 085-21-05.933710W and 29-39-11.759339N 085-20-23.799037W.

D.1.3 Charted Features

A total of 8 features were assigned for investigation within Survey H13157: 5 wrecks, 1 obstruction, and 2 Aids to Navigation (AtoNs) denoting the outer limits of Cape San Blas Shoal. For full details, refer to the final feature file submitted with this report.

D.1.4 Uncharted Features

Two additional features were noted within the area of Survey H13157 while data acquisition was in progress:

The first, is a floating dredge pipe with submerged anchor lines connected to large steel anchor balls ashore located in the vicinity of 29-42-32.488702N 085-23-39.095293W. A contract to provide beach renourishment for Cape San Blas was scheduled to begin in early October 2018 but was interrupted by the arrival of Hurricane Michael. This piece of equipment remained on station through the whole of H13157 acquisition and was submitted (and rejected) as a DtoN. It is often unlit at night, and could potentially pose a hazard. For further discussion, refer to Appendix II submitted with this report.

The second uncharted feature noted is the beached wreck of the fishing trawler "Donna Kay". According to local knowledge, this vessel washed inshore of Cape San Blas Shoal prior to Hurricane Michael. The storm then pushed the vessel farther onto the beach, and there it remains in the vicinity of 29-39-57.942000N 085-21-00.21600W. The entire hull is exposed at high tide and the rudder shaft is visible, though mostly buried in the sand. For full details, refer to the final feature file submitted with this report.

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

Two AtoNs demarcate the eastern and western extents of Cape San Blas Shoals. At the time of data acquisition of Survey H13157, both are on station and serving their intended purpose.

D.2.2 Maritime Boundary Points

No Maritime Boundary Points were assigned for this survey.

D.2.3 Bottom Samples

A total of 10 bottom samples were acquired within the sheet limits of survey H13157 per appendix H of the HSSD 2018. For a complete description of findings, refer to the final feature file submitted with this report.

D.2.4 Overhead Features

No overhead features exist for this survey.

D.2.5 Submarine Features

An offshore dredge pipe is connected to large steel anchor balls ashore located in the vicinity of 29-42-32.488702N 085-23-39.095293W. A submerged section of pipe is notable in multibeam surface H1315_MB_1m_MLLW_Final. A contract to provide beach renourishment for Cape San Blas was scheduled to begin in early October 2018 but was interrupted by the arrival of Hurricane Michael. This piece of equipment is not meant to be permanent but remained on station through the whole of H13157 acquisition and was submitted (and rejected) as a DtoN. It is often unlit at night, and could potentially pose a hazard. For further discussion, refer to Appendix II submitted with this report.

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

Cape San Blas Shoal is characterized by both large sandwaves and migrating shoals.

D.2.9 Construction and Dredging

A beach renourishment contract was scheduled to begin along Cape San Blas and the Saint Joseph Peninsula in October 2018. Hurricane Michael prevented the contract from being carried out. For further discussion, refer to Appendix II submitted with this report.

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 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
Dean R. Moyles	Chief of Party	06/07/2019	Dean Moyles <small>Digitally signed by Dean Moyles Date: 2019.06.12 12:08:29 -02'30'</small>

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