H13290

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

DESCRIPTIVE REPORT

Type of Survey:	Navigable Area
Registry Number:	H13290

LOCALITY

State(s):	Florida
General Locality:	Northwest Gulf of Mexico
Sub-locality:	St. George Sound

2020

CHIEF OF PARTY
Allison C Stone

LIBRARY & ARCHIVES

Date:

U.S. DEPARTMENT OF COMMERCE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION	REGISTRY NUMBER:
HYDROGRAPHIC TITLE SHEET	**H13290**

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:	**St. George Sound**
Scale:	**5000**
Dates of Survey:	**04/26/2020 to 10/16/2020**
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.

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Descriptive Report to Accompany Survey H13290

Project: OPR-J359-KR-20

Locality: Northwest Gulf of Mexico

Sublocality: St. George Sound

Scale: 1:5000

April 2020 - October 2020

Fugro USA Marine, Inc.

Chief of Party: Allison C Stone

A. Area Surveyed

Survey H13290 (Table 1) is the approach to St. George Sound via East Pass (Figure 1). The M/V Pelagos acquired 400m-spaced Set Line MBES, Object Detection MBES (ODMBES), and Multibeam Echosounder Acoustic Backscatter (MBAB) within the assigned survey limits of H13290 from 26 April 2020 to 16 October 2020. The USV Blue Shadow (aka FAS-901), acquired ODMBES and MBAB within the assigned sheet limits of H13290 from 8 July 2020 to 13 July 2020. M/V Koach Kline acquired ODMBES and MBAB within the assigned survey limits of H13290 30 July 2020.

A.1 Survey Limits

Data were acquired within the following survey limits:

Northwest Limit	Southeast Limit
29° 49' 54.99" N 84° 42' 48.02" W	29° 43' 8.84" N 84° 35' 59.97" W

Table 1: Survey Limits

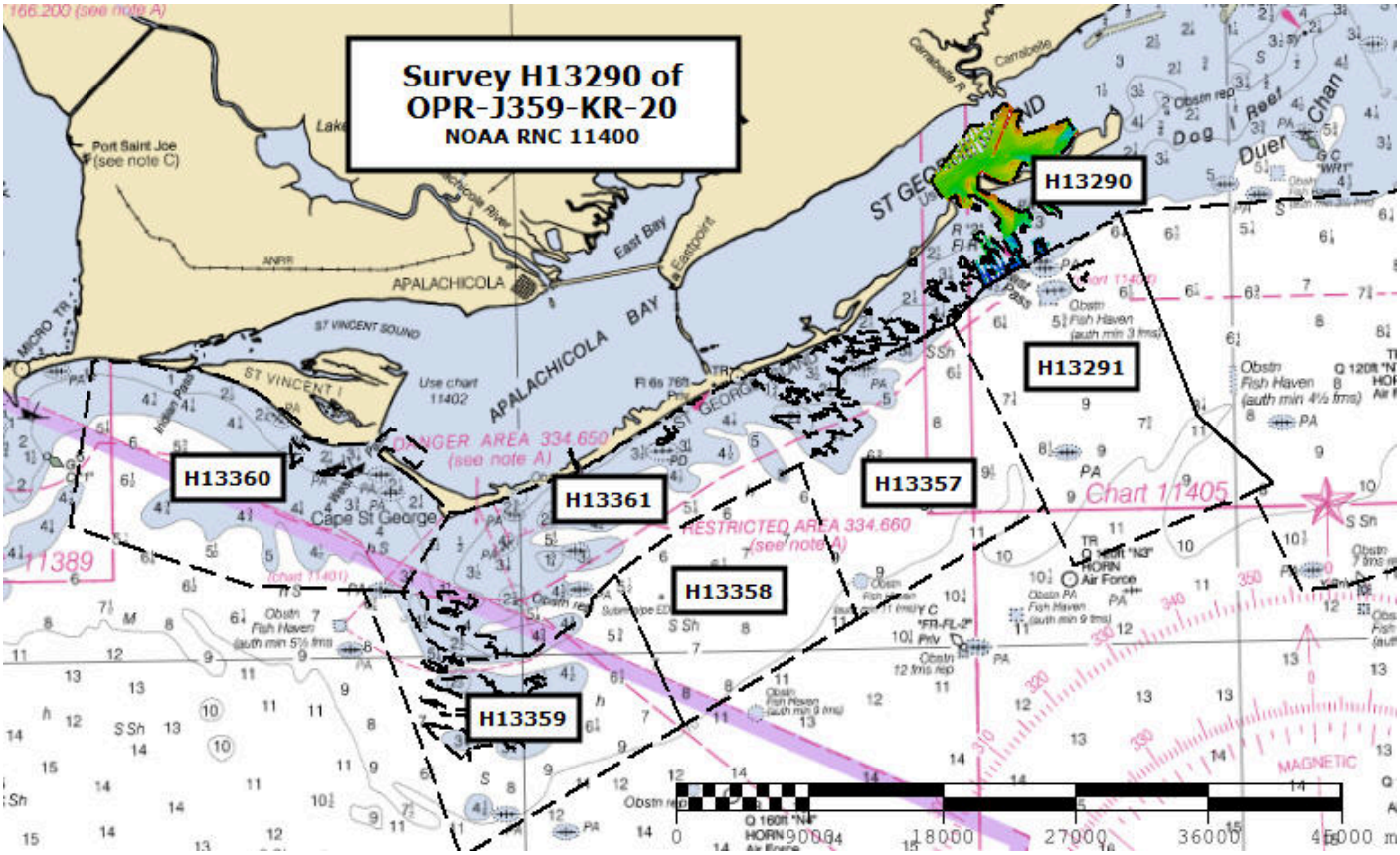

Figure 1: Survey H13290 relative to overall sheet limits of OPR-J359-KR-20

Three instances of failure to fully capture the 3.5m contour and or the ODMBES assigned area exist per the assigned Anchorage Area (ACHARE) within the Project Reference File (PRF) provided (Figures 2 and 3). The vessel was unable to safely capture the 3.5m contour in these instances. Though no quantitative LiDAR data was provided, the geo-referenced image of LiDAR coverage provided shows there should be valid data over these localized instances (Figure 4). The gaps occur in the following points along the North side of Dog Island:

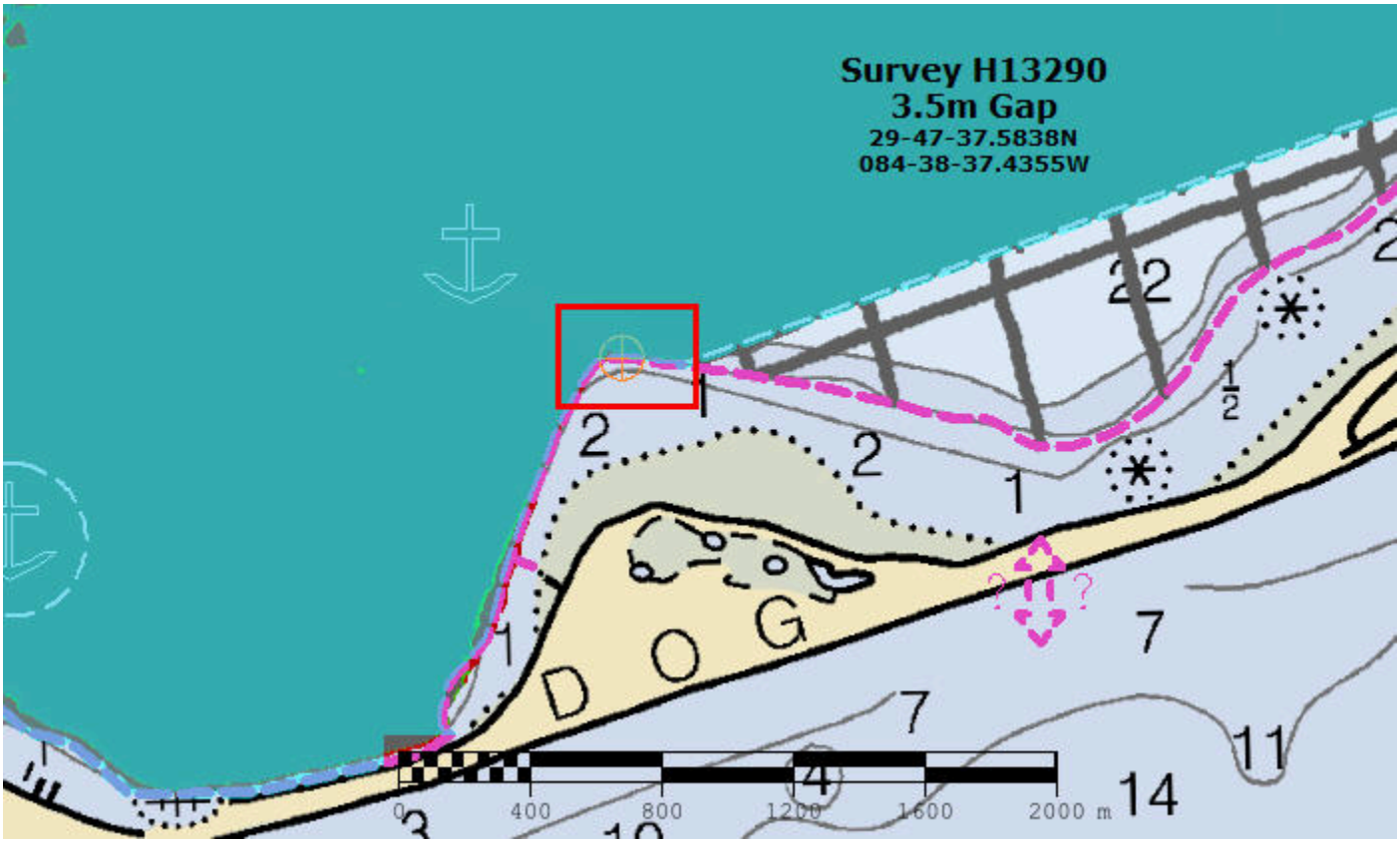

Figure 2: 3.5m contour not fully ensonified

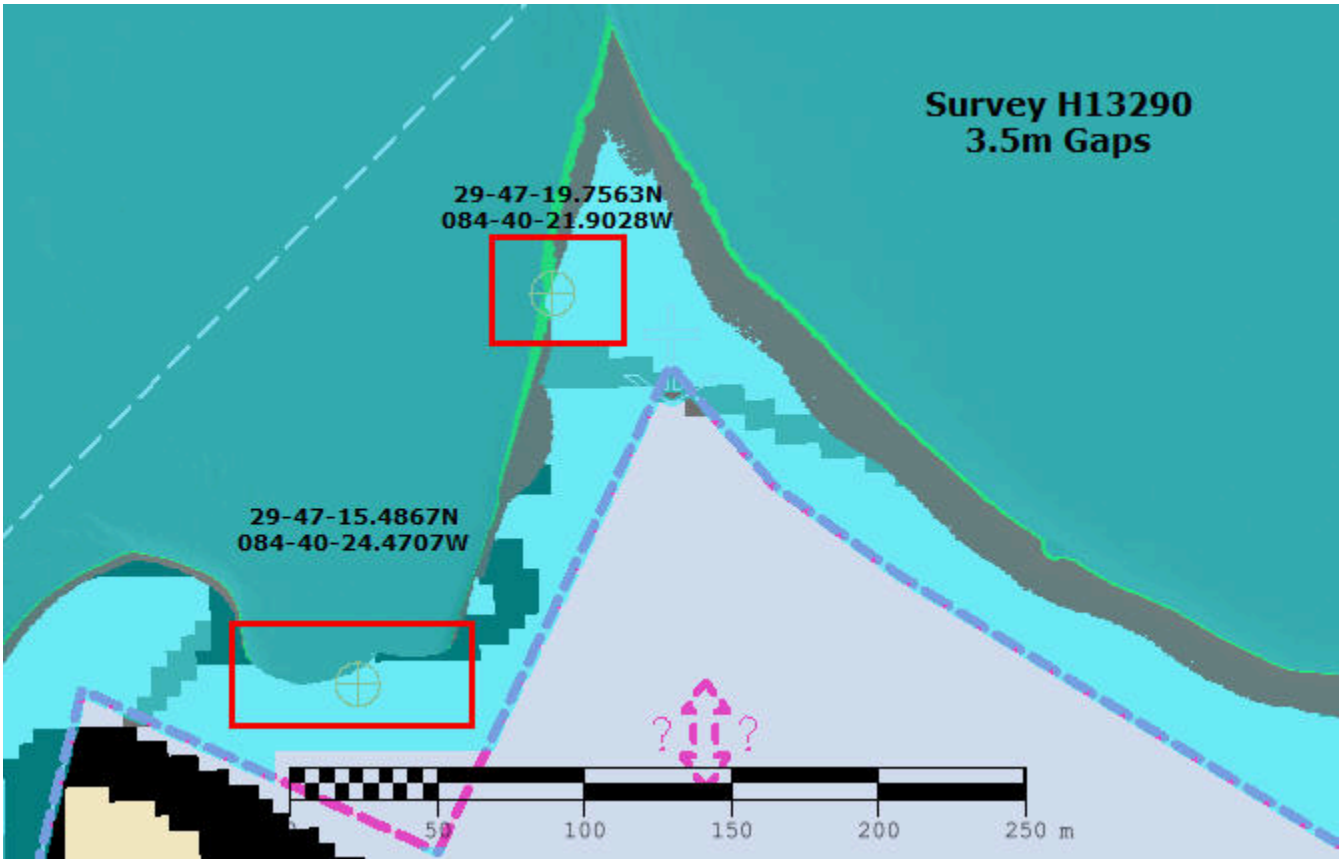

Figure 3: 3.5m contour not fully ensonified

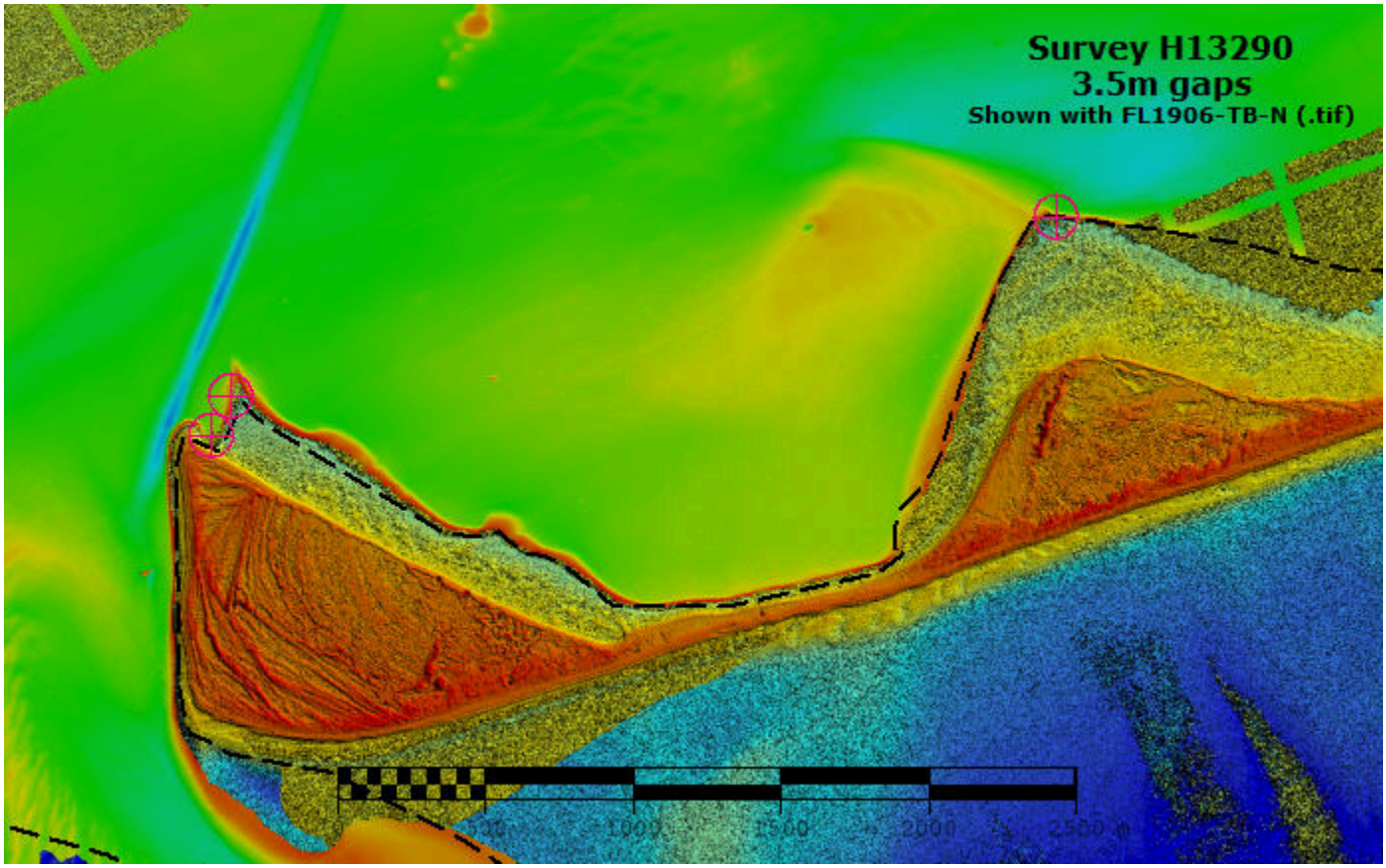

Figure 4: 3.5m contour not fully ensonified with NOAA LiDAR

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 5-7) were achieved within the survey limits of H13290.

Two separate 50cm surfaces are submitted with H13290 deliverables: H13290_50cm and H13290B_50cm.The southern section of the ODMBES-assigned area of H13290 was found to need higher than normal levels of holiday infill due to line spacing and sound velocity refraction issues. Initial acquisition of this area ran from Julian Day (JD) 117 through JD122. Infill did not commence until JD214 and ran thru JD290. Higher than normal hurricane and storm presence in the survey area resulted in significant movement of seafloor sediment, resulting in shearing of the resultant CUBE surface. After consultation with the NOAA COR, separation of the data into two separate surfaces was conceded to be the acceptable method of handling the data. For quality control inspection, the 50cm surfaces were combined in CARIS BaseEditor 5.3 and run through Pydro XL QCTools. Further information can be found in Sections B.2.6, B.5.2, and D.1 of this report.

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, perpendicuar to contours (HSSD 2019 5.2.2.4-Option A); Object Detection Area (HSSD 5.2.2.2)

Table 2: Survey Coverage

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

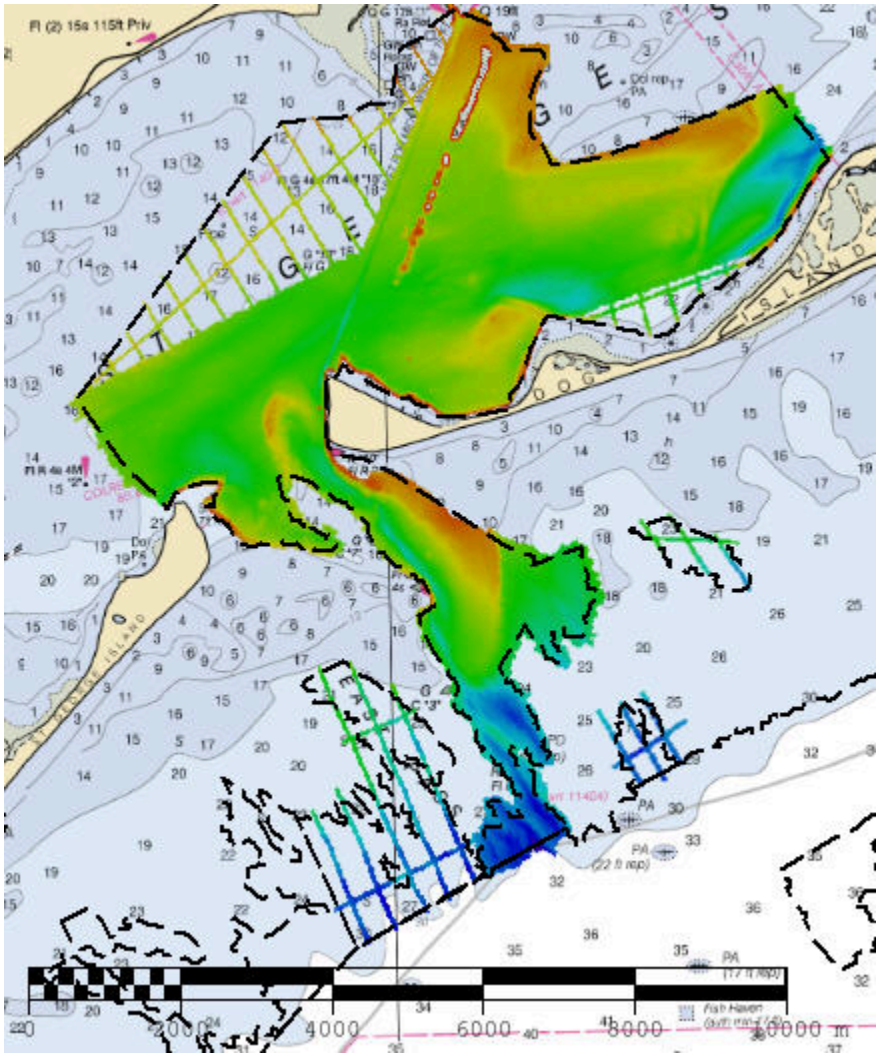

Figure 5: Survey H13290 mixed coverage (ODMBES and Set Line Spacing MBES)

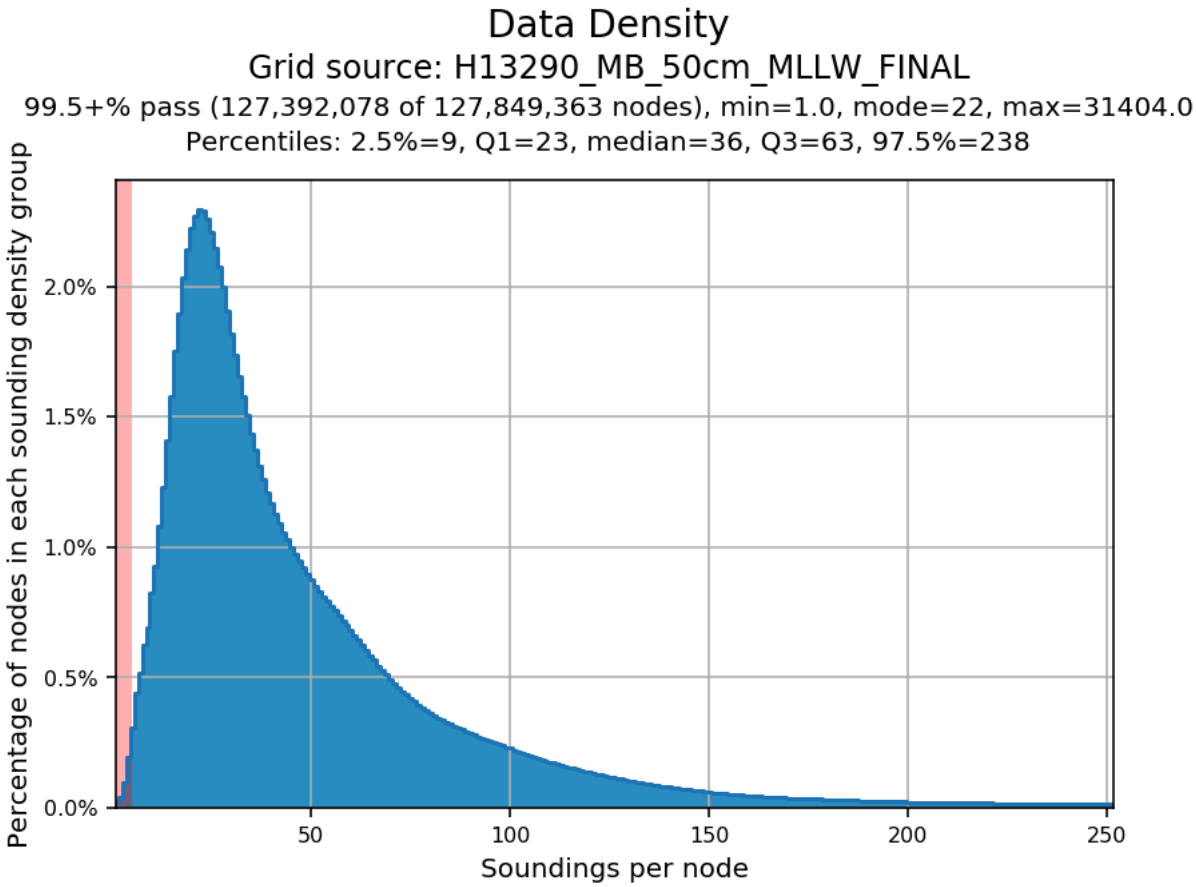

Figure 6: Survey H13290 combined 50cm grid resolution ODMBES density QC

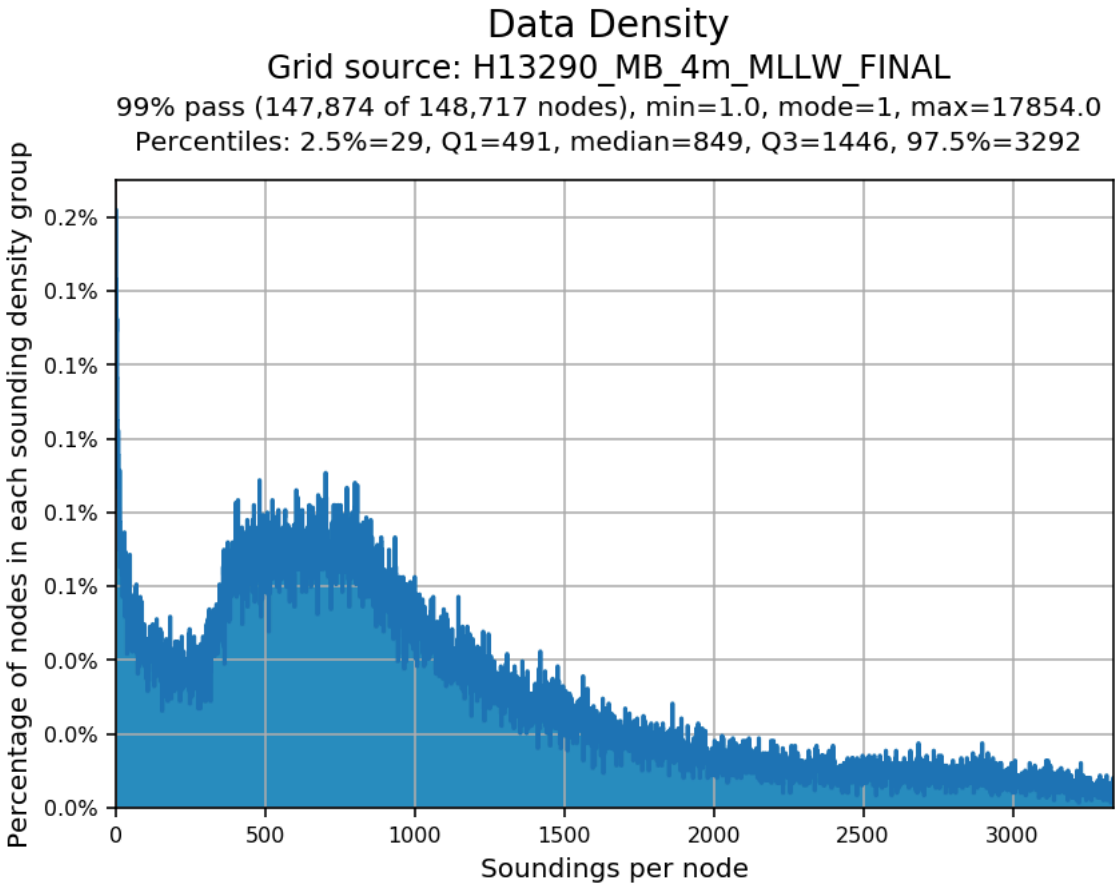

Figure 7: Survey H13290 4m grid resolution Set Line MBES density QC

A.6 Survey Statistics

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

	HULL ID	*M/V Koach Kline*	*M/V Pelagos*	*Blue Shadow (aka FAS-901)*	*Total*
LNM	**SBES Mainscheme**	0.0	0.0	0.0	0.0
	MBES Mainscheme	28.89	1047.41	52.02	1128.33
	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	0.0	25.48	13.69	39.18
	Lidar Crosslines	0.0	0.0	0.0	0.0
Number of Bottom Samples					5
Number Maritime Boundary Points Investigated					0
Number of DPs					0
Number of Items Investigated by Dive Ops					0
Total SNM					13.86

Table 3: Hydrographic Survey Statistics

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

Survey Dates	Day of the Year
04/26/2020	117
04/27/2020	118
04/28/2020	119
04/29/2020	120
04/30/2020	121
05/01/2020	122
05/02/2020	123
05/05/2020	126
05/06/2020	127
05/07/2020	128
05/08/2020	129
05/09/2020	130
05/10/2020	131
05/12/2020	133
05/13/2020	134
05/15/2020	136
05/25/2020	146
05/26/2020	147
06/01/2020	153
06/03/2020	155
06/05/2020	157
06/08/2020	160
06/09/2020	161
06/13/2020	165
06/24/2020	176
06/28/2020	180
07/06/2020	188
07/08/2020	190
07/09/2020	191
07/10/2020	192
07/11/2020	193
07/12/2020	194

Survey Dates	Day of the Year
07/13/2020	195
07/25/2020	207
07/30/2020	212
08/01/2020	214
08/02/2020	215
08/03/2020	216
08/04/2020	217
08/05/2020	218
08/22/2020	235
08/23/2020	236
08/27/2020	240
08/28/2020	241
09/07/2020	251
09/09/2020	253
09/19/2020	263
09/20/2020	264
09/22/2020	266
09/23/2020	267
10/01/2020	275
10/02/2020	276
10/14/2020	288
10/16/2020	290

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	*M/V Koach Kline*	*M/V Pelagos*	*USV Blue Shadow (FAS-901)*
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 8: M/V Koach Kline

Figure 9: M/V Pelagos

Figure 10: USV Blue Shadow

M/V Koach Kline (Table 5 and Figure 8), M/V Pelagos (Table 5 and Figure 9), and USV Blue Shadow (Table 5 and Figure 10) acquired MBES, MBAB, surface sound velocity, sound velocity profiles, and attitude and positioning data within the survey limits of H13290 (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 H13290 were not acquired in accordance with section 5.2.4.2 of the HSSD 2019 (Figure 11); mainscheme to crossline mileage percentage across H13290 is 3.47%. Of the 4,606 grid nodes compared between H13290 Set Line mainscheme MBES and Set Line MBES crosslines, 100% were within 50cm difference. The mean difference is 0.78cm, with a standard deviation of 6.7cm (Figure 12). Of the 6,787,228 grid nodes compared between H13290 mainscheme ODMBES and MBES crosslines, 99.9% were within 50cm difference. The mean difference is 2.7cm, with a standard deviation of 7.7cm (Figure 13).

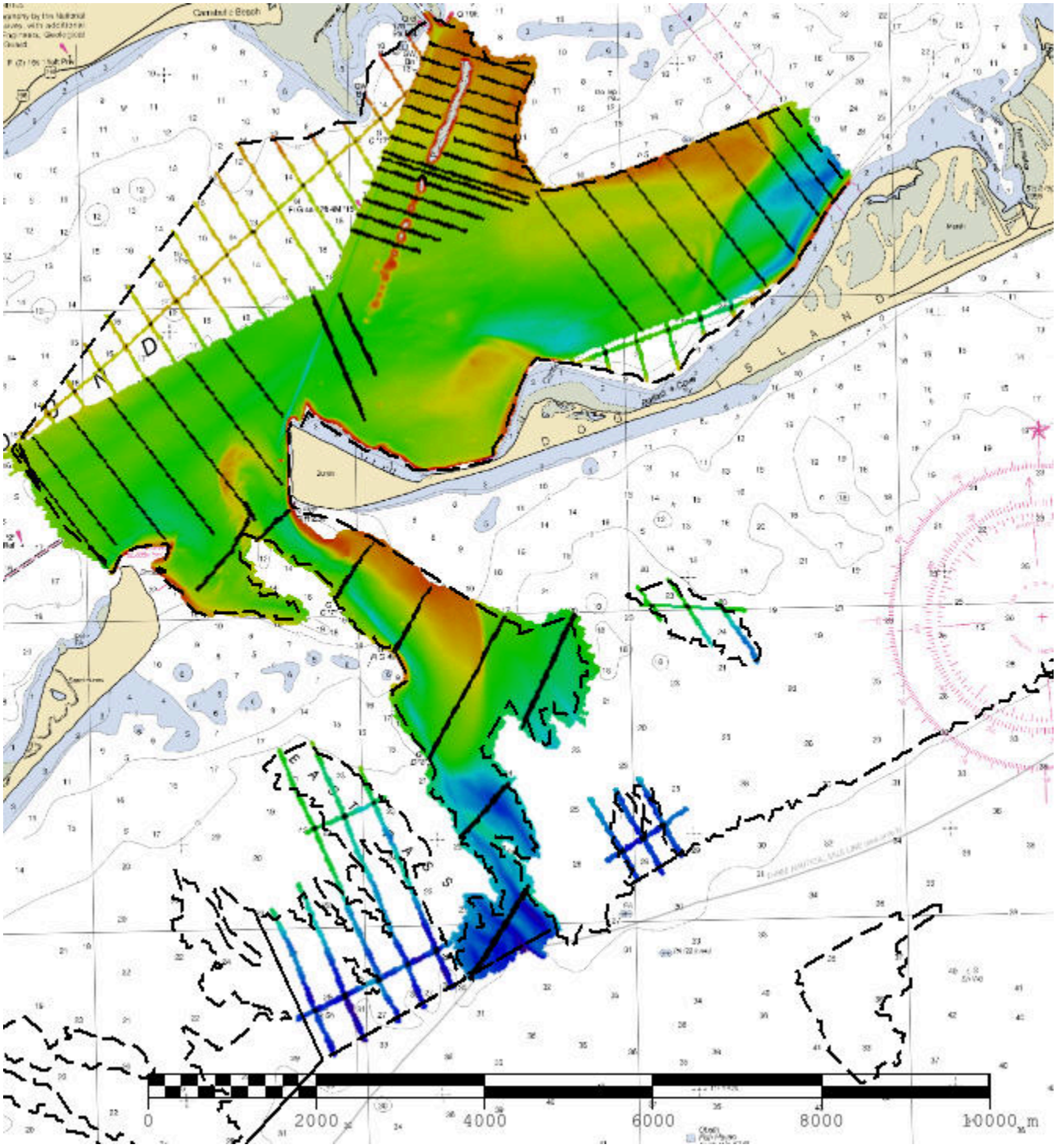

Figure 11: H13290 MBES mainscheme and MBES crossline distribution

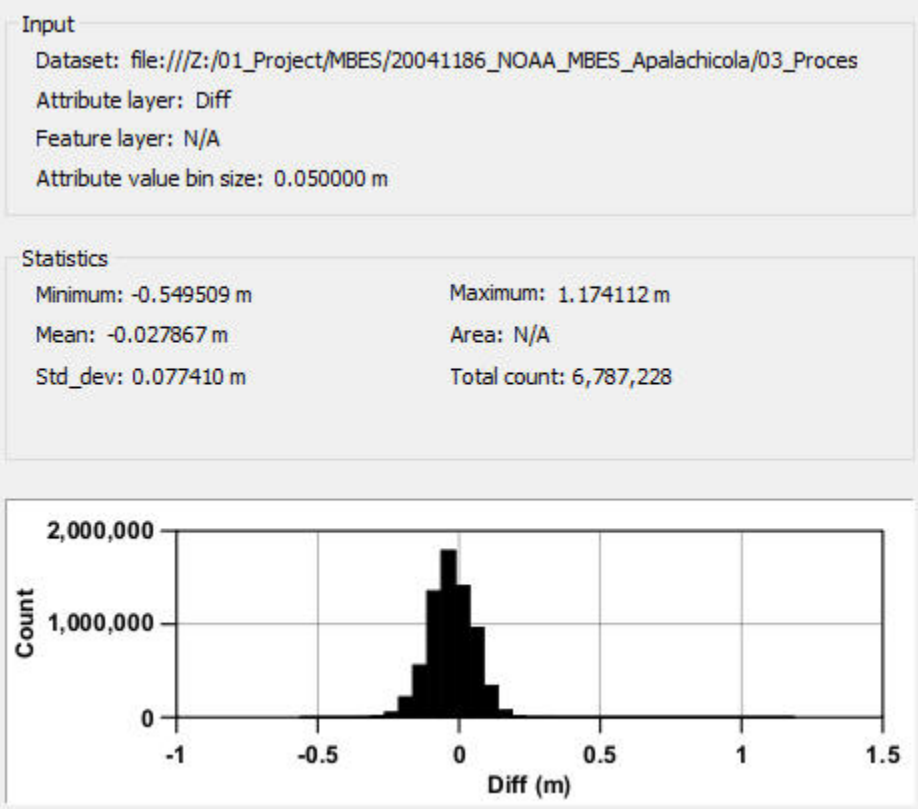

Figure 12: H13290 Set Line MBES mainscheme 4m resolution MBES grid differenced from Set Line 4m resolution MBES grid crosslines statistical output

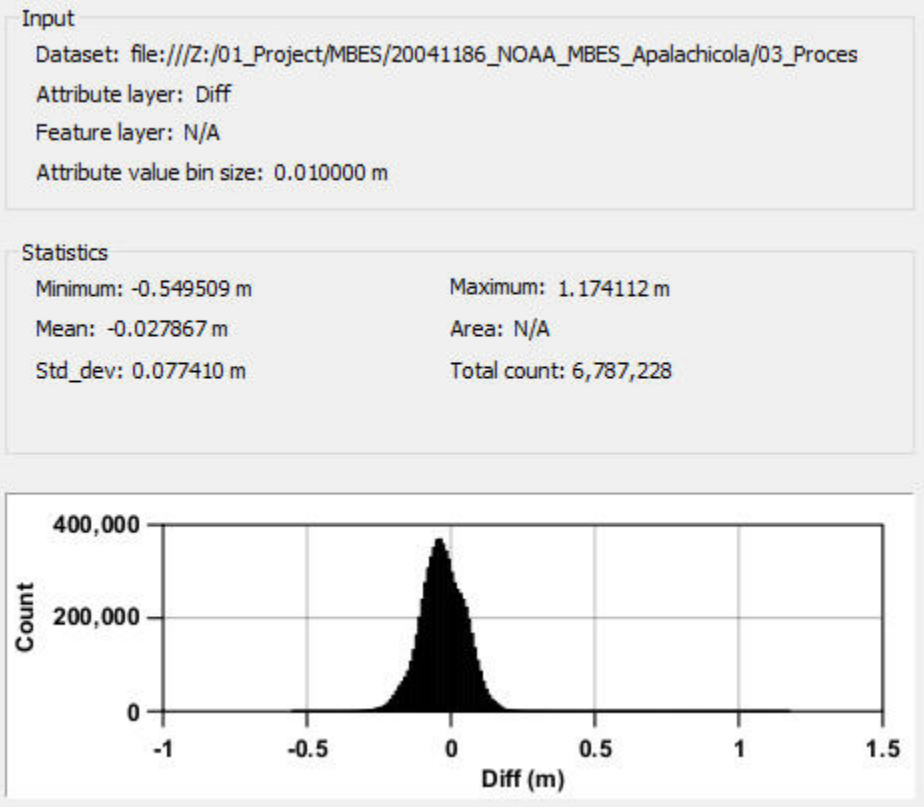

Figure 13: H13290 ODMBES mainscheme 50cm resolution MBES grid differenced from 50cm resolution ODMBES grid crosslines statistical output

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	1.5 meters/second	N/A meters/second	N/A meters/second	0.25 meters/second
M/V Pelagos	3.296 meters/second	N/A meters/second	N/A meters/second	0.25 meters/second
USV Blue Shadow	1.5 meters/second	N/A meters/second	N/A meters/second	0.25 meters/second

Table 8: Survey Specific Sound Speed TPU Values.

Survey H13290 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 14 and 15) and 4m (Figure 16) bathymetric grids meet uncertainty standards with a minimum of 99.5% of nodes passing.

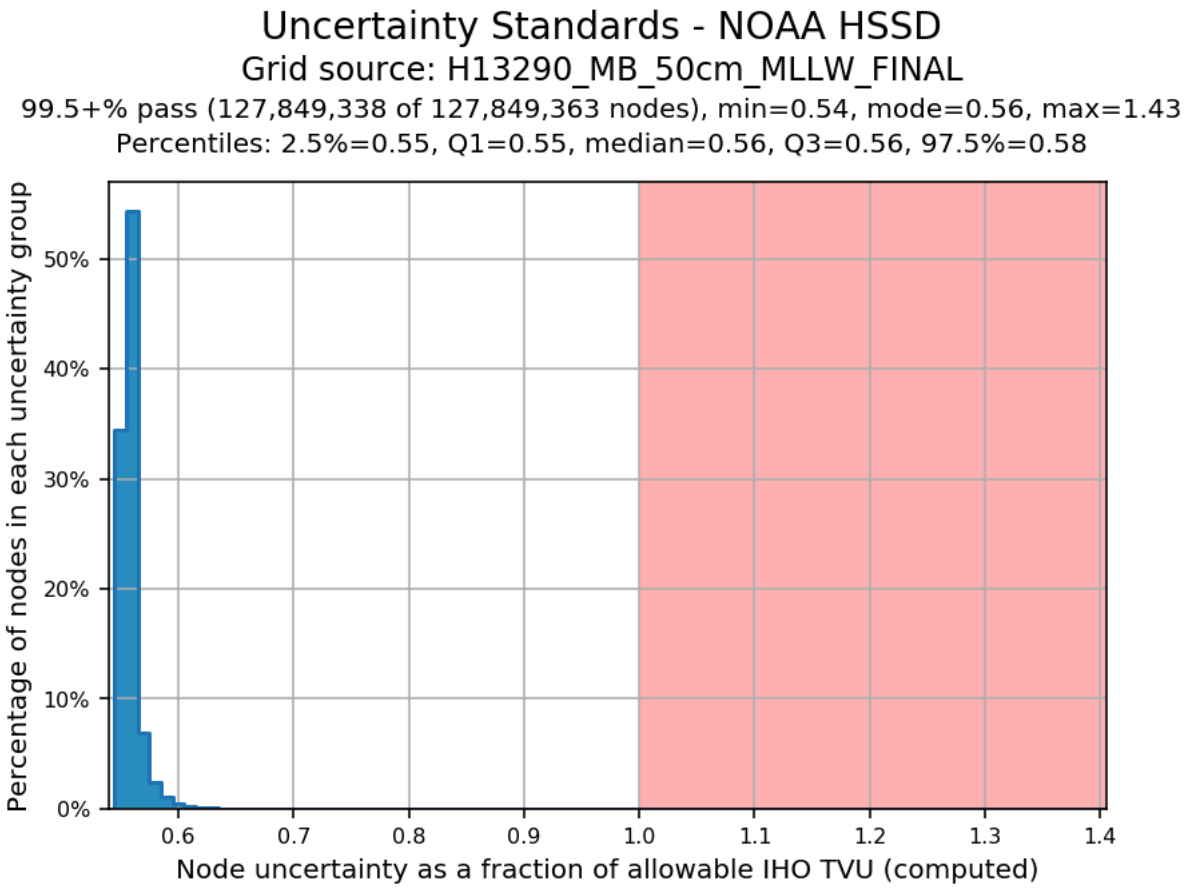

Figure 14: H13290 50cm finalized grid TPU QC

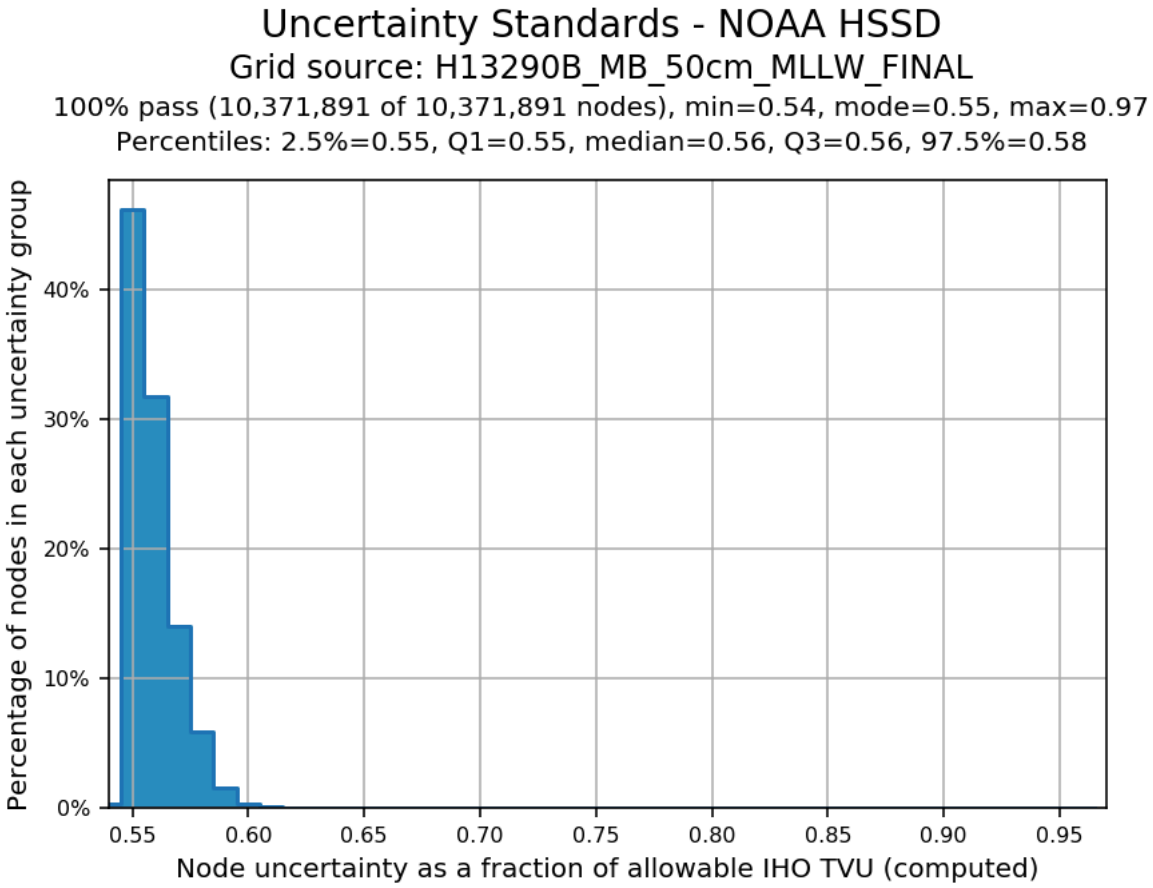

Figure 15: H13290B 50cm finalized grid TPU QC

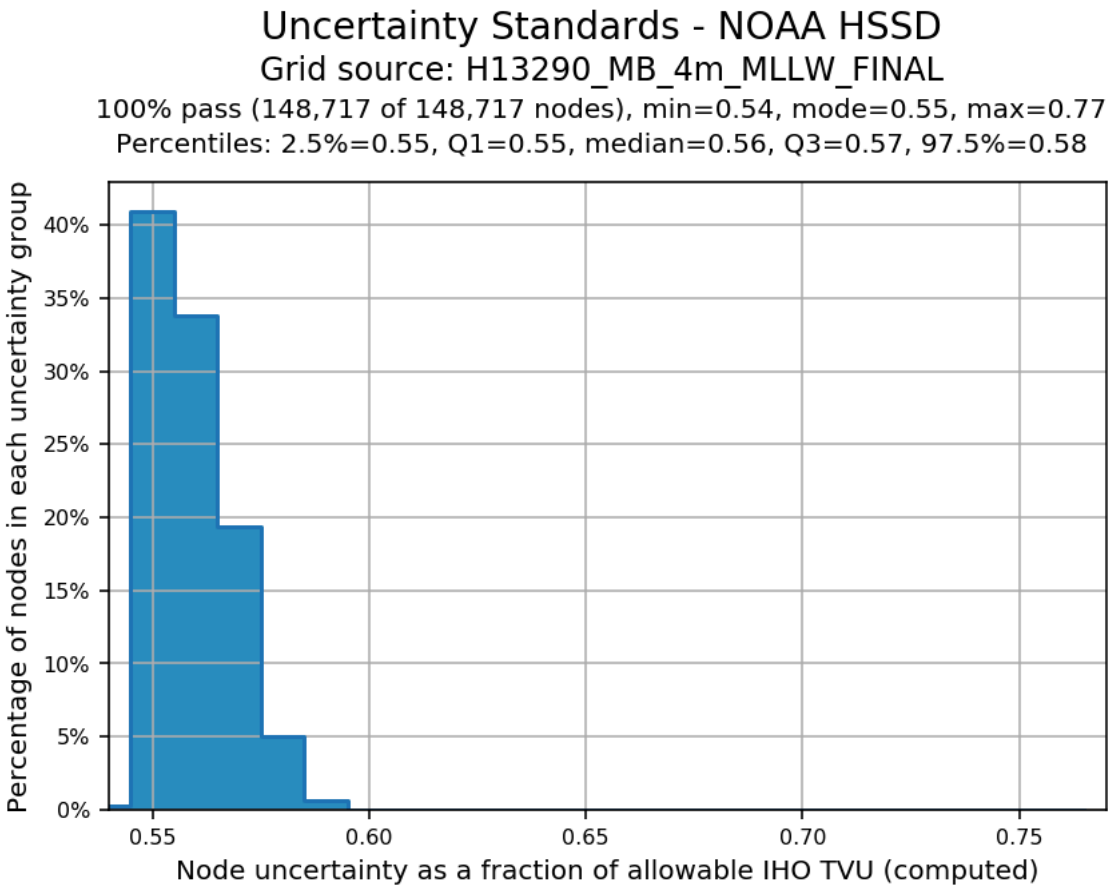

Figure 16: H13290 4m finalized grid TPU QC

B.2.3 Junctions

One contemporary survey is available for comparison to H13290: H13291(2020) (Table 9 and Figure 17). Junction to LiDAR data was assigned in the PI, however no quantifiable data was provided for comparison. A general statement of visual assessment between data acquired within H13290 and LiDAR tif provided is included in section D.1 of this report.

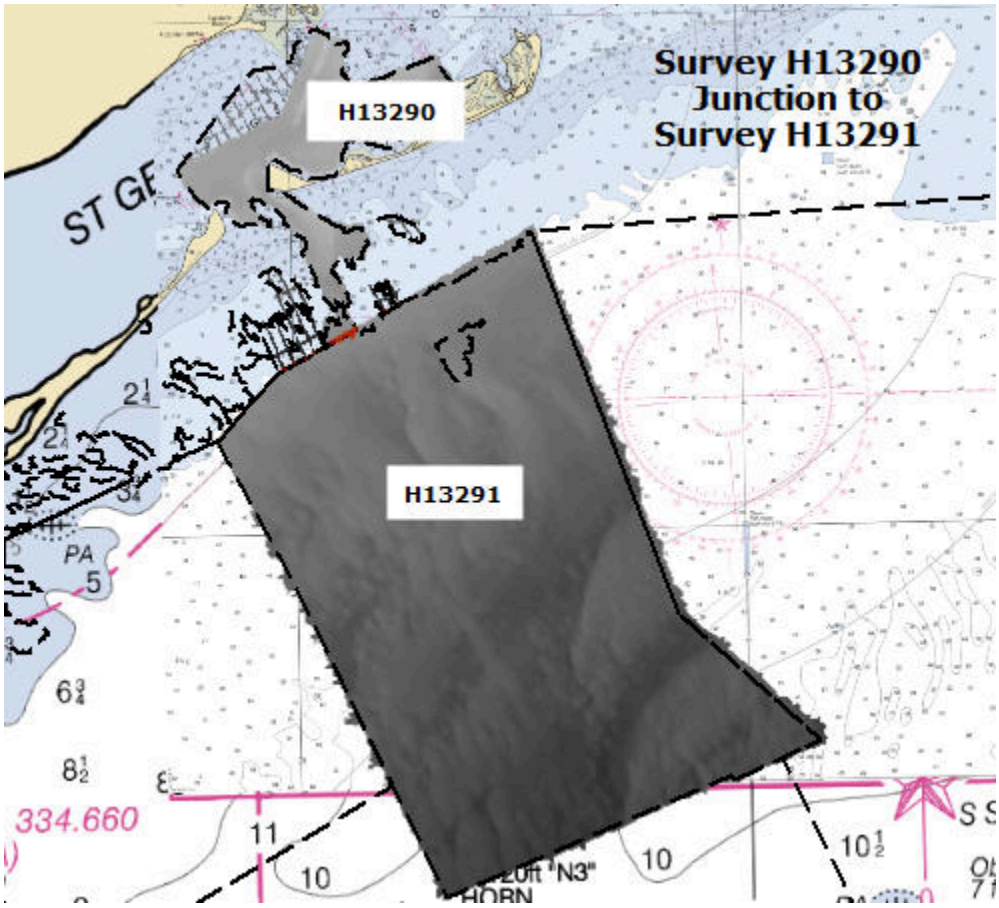

Figure 17: Survey H13290 junction to survey H13291

The following junctions were made with this survey:

Registry Number	Scale	Year	Field Unit	Relative Location
H13291	1:5000	2020	Fugro USA Marine, Inc.	S

Table 9: Junctioning Surveys

H13291

Survey H13291 was acquired by Fugro USA Marine, Inc. in 2020 as a part of OPR-J359-KR-20. Of the 241,094 grid nodes compared between H13290 and H13291, 99.9% agree within 50cm (Figure 18).

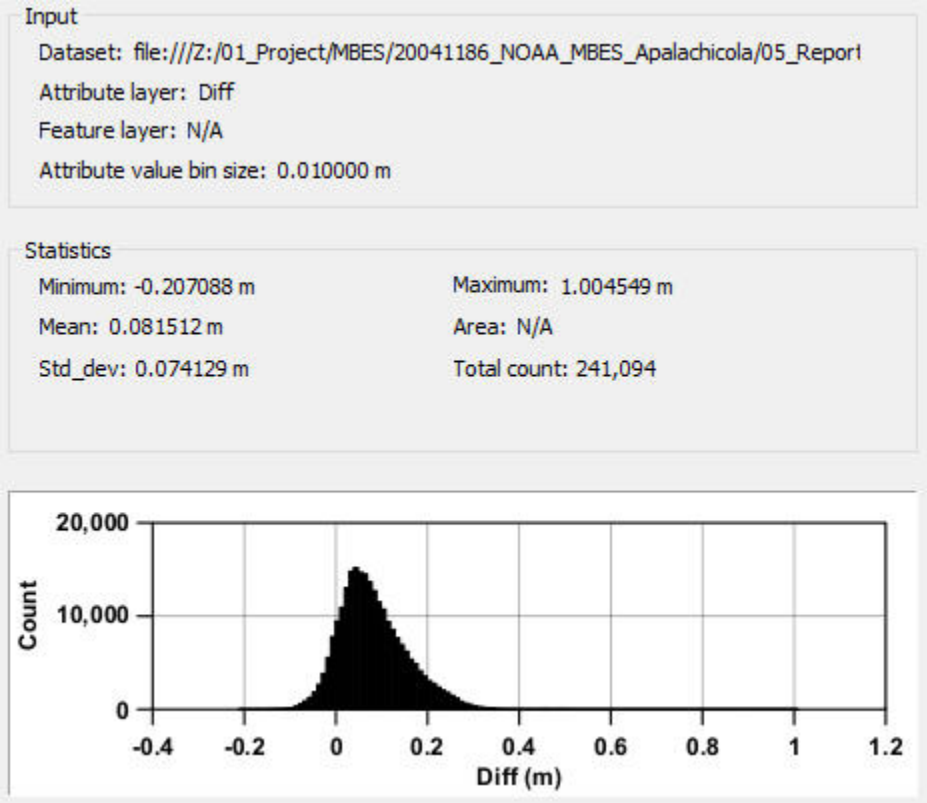

Figure 18: Survey H13290 junction with Survey H13291

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

Shifting Sand Waves

The project area of OPR-J359-KR-20 is known to encompass large, migrating sand waves. Several instances of sand wave migration is notable in the southern portion of ODMBES area of H13290. The Gulf of Mexico did experience a higher than normal number of storms during 2020 hurricane season; the shifting sand waves are likely due to increased storm activity.

Two separate 50cm surfaces are submitted with H13290 deliverables: H13290_50cm and H13290B_50cm.The southern section of the ODMBES-assigned area of H13290 was found to need higher than normal levels of holiday infill due to line spacing and sound velocity refraction issues. Initial acquisition of this area ran from JD117 through JD122. Infill did not commence until JD214 and ran thru JD290. Higher than normal hurricane and storm presence in the survey area resulted in significant movement of seafloor sediment, resulting in shearing of the resultant CUBE surface.

When combined, the surface shearing presented as data outliers, or fliers, during QC. After separating the two data sets temporally, two surfaces were created and a difference surface was created in CARIS 11.3 to determine significance of seafloor movement (Figure 19). Of the 9,926,265 soundings compared, 99.8% agree within 50cm. Though the mean heights of the sand waves do not change significantly, the mean horizontal shift is 6m (Figures 20 and 21).

After consultation with the NOAA COR, separation of the data into two separate surfaces was conceded to be the acceptable method of handling the data. For quality control inspection, the 50cm surfaces were inspected individually and combined in CARIS BaseEditor 5.3 and run through Pydro XL QCTools. The separate H13290B surface fails ODMBES density QC, as it is comprised of mostly individual lines, when assessed for density, the combined passes at 99.9%. Further information can be found in Sections B.5.2, and D.1 of this report.

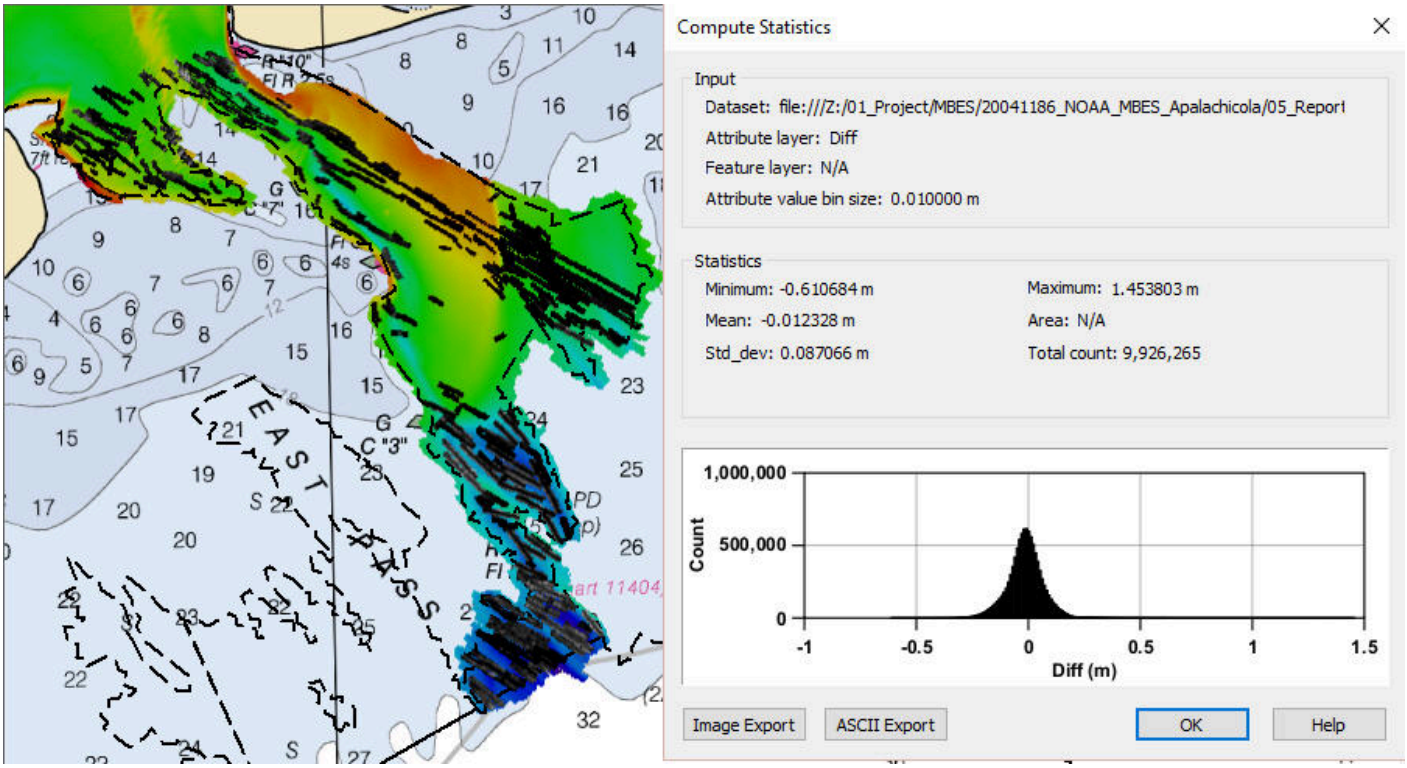

Figure 19: H13290 50cm surface differenced to H13290B 50cm surface

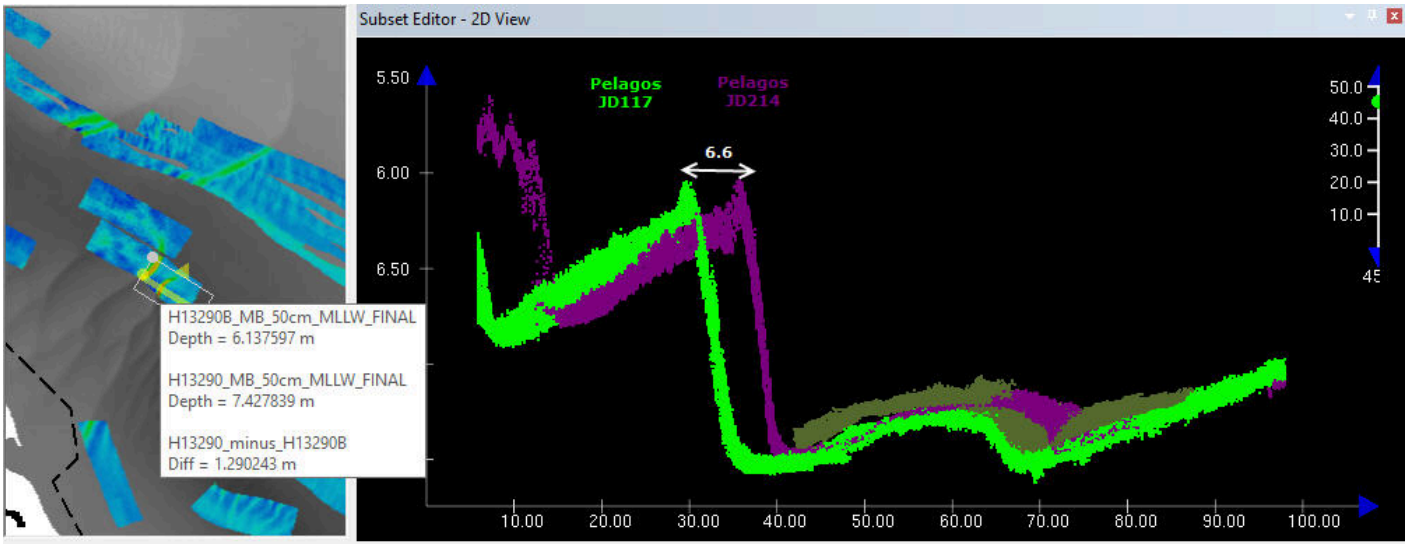

Figure 20: Sand wave shift example 29-46-16.0901N 084-40-05.3484W

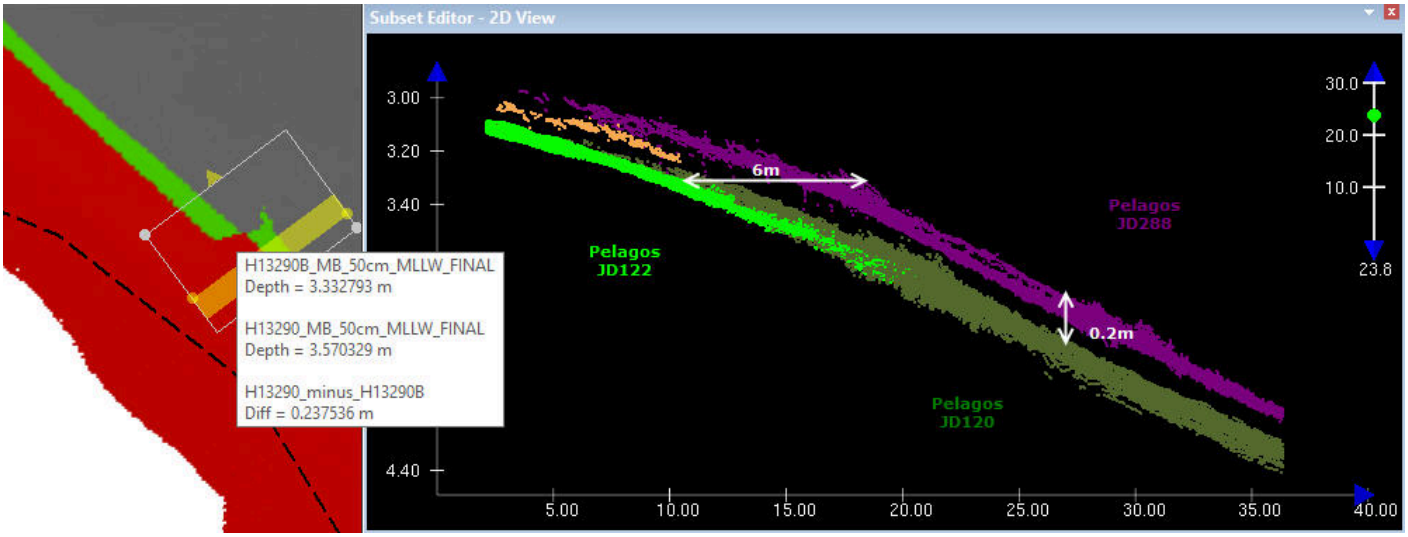

Figure 21: Sand wave shift 29-46-11.8283N 084-41-18.3911W

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 bathymetry data on adjacent 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 H13290. 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 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
H13290_MB_50cm_MLLW	CARIS Raster Surface (CUBE)	0.5 meters	1.215 meters - 10.8075 meters	NOAA_0.5m	Object Detection
H13290_MB_50cm_MLLW_FINAL	CARIS Raster Surface (CUBE)	0.5 meters	1.215 meters - 10.8075 meters	NOAA_0.5m	Object Detection
H13290B_MB_50cm_MLLW	CARIS Raster Surface (CUBE)	0.5 meters	2.5575 meters - 10.5533 meters	NOAA_0.5m	Object Detection
H13290B_MB_50cm_MLLW_FINAL	CARIS Raster Surface (CUBE)	0.5 meters	2.5575 meters - 10.5533 meters	NOAA_0.5m	Object Detection

Surface Name	Surface Type	Resolution	Depth Range	Surface Parameter	Purpose
H13290_MB_4m_MLLW	CARIS Raster Surface (CUBE)	4 meters	1.7871 meters - 10.3398 meters	NOAA_4m	SBES Set Line Spacing
H13290_MB_4m_MLLW_FINAL	CARIS Raster Surface (CUBE)	4 meters	1.7871 meters - 10.3398 meters	NOAA_4m	SBES Set Line Spacing

Table 10: 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 11: 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 ENCs listed in the project instructions and an s57 file of surveyed soundings were compared with the following results (Figure 22).

Survey H13290 surveyed soundings exhibit 2678 instances where surveyed soundings are shoal to charted soundings by greater than 1ft: 2313 surveyed soundings are 1-3ft shoal to charted (Figure 23); 216 surveyed soundings are 4-6ft shoal to charted (Figure 24); 96 surveyed soundings are 7-9ft shoal to charted (Figure 25); 53 surveyed soundings are 10-14ft shoal to charted (Figure 25). The most significant shoaling occurs on either side of the entrance of East Pass.

At the time of this report, quantifiable LiDAR data is not available to compare to surveyed soundings from H13290. A visual comparison to the RGB tif provided shows general agreement to surveyed data trends within H13290, including shoaling trends.

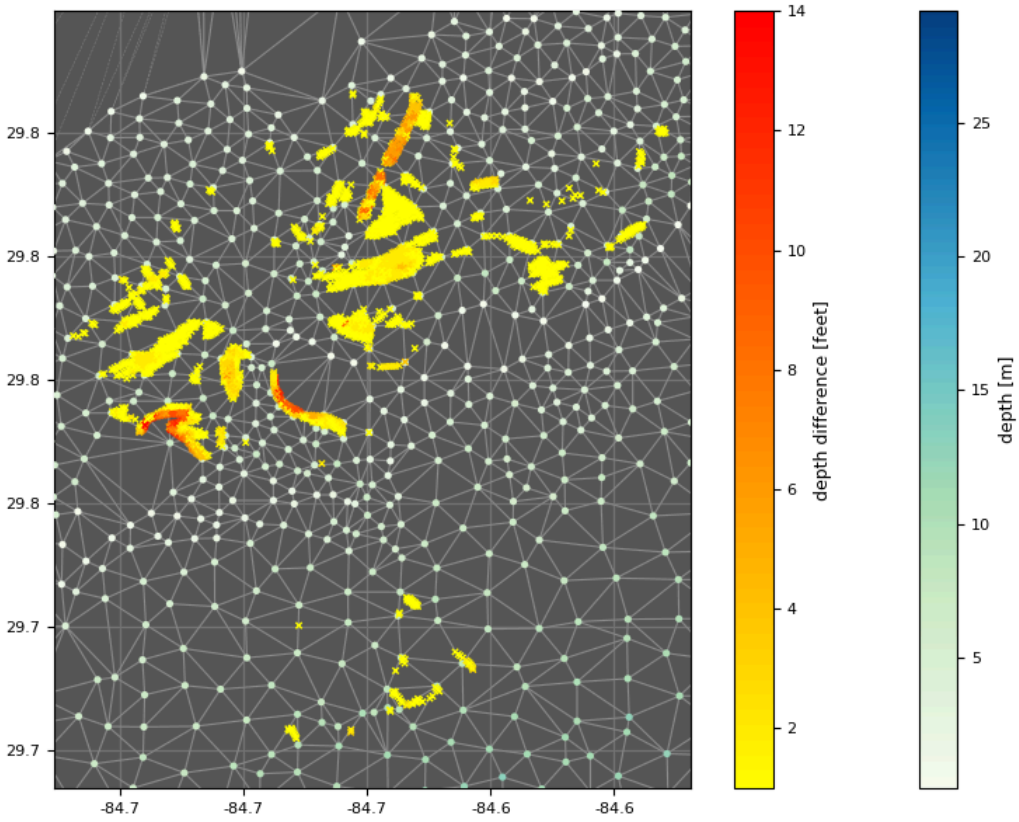

Figure 22: Pydro QC Tools chart review output of surveyed soundings shoal to charted soundings

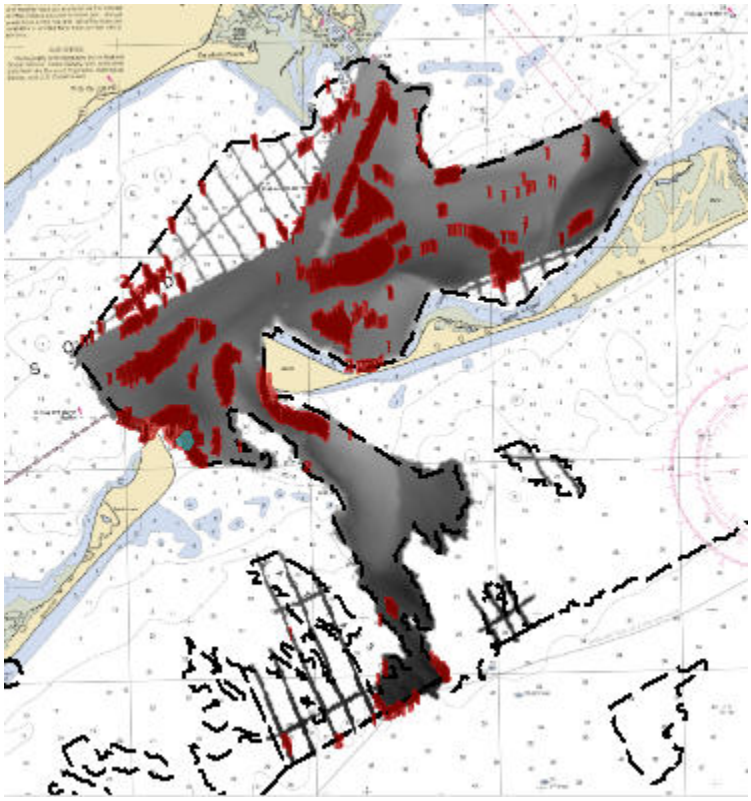

Figure 23: Pydro QC Tools output of survey H13290 areas of shoaling 1ft to 3ft highlighted in red

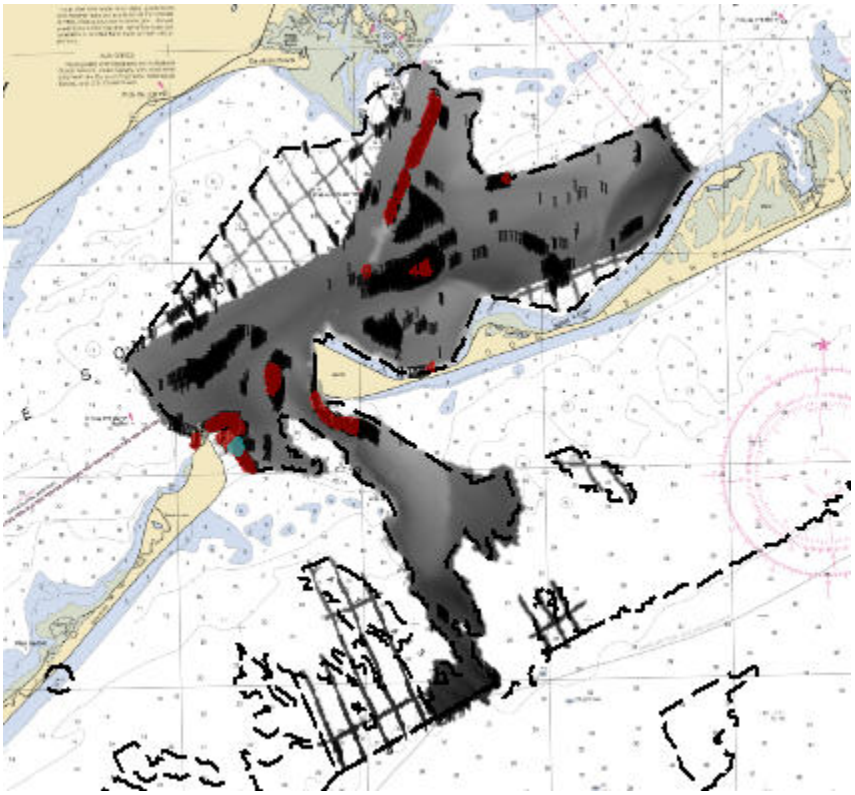

Figure 24: Pydro QC Tools output of survey H13290 areas of shoaling 4ft to 6ft highlighted in red

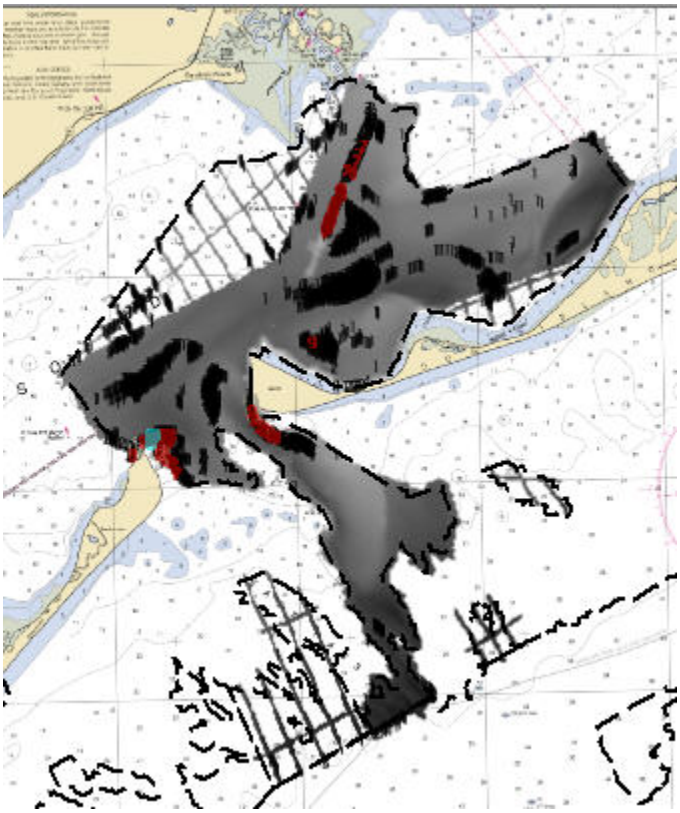

Figure 25: Pydro QC Tools output of survey H13290 areas of shoaling 7ft to 9ft highlighted in red

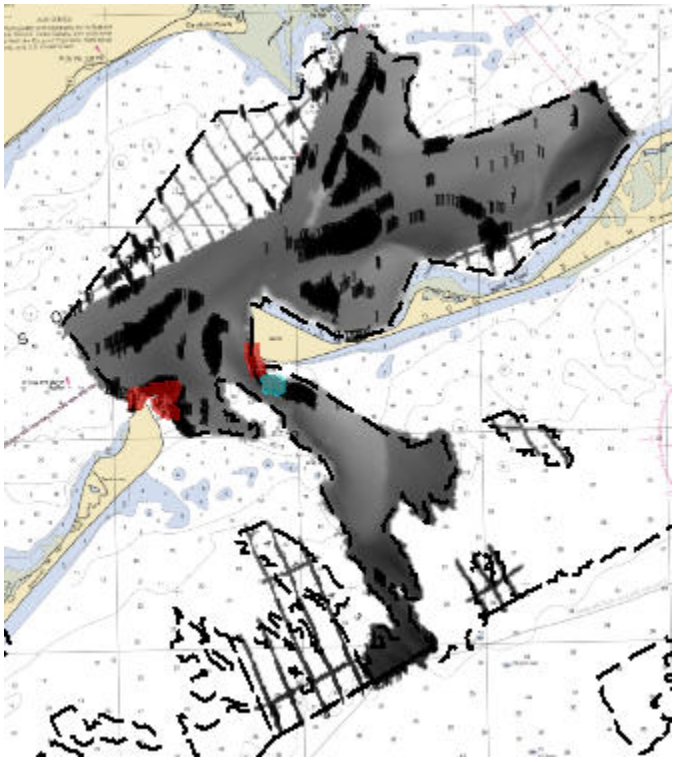

Figure 26: Pydro QC Tools output of survey H13290 areas of shoaling 10ft to 14ft highlighted in red

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
US4FL1WJ	1:40000	2	05/28/2020	05/28/2020

Table 12: Largest Scale ENCs

D.1.2 Shoal and Hazardous Features

Generalized shoaling exists within the assigned boundary of survey H13290, particularly in the entrance of East Pass. ODMBES data within East Pass should provide adequate information necessary to update applicable charts with the most current sounding data. In general, the most significant instances of surveyed data being shoal to charted depths occurs in depths less than the assigned 3.5m contour; the majority of instances were not further investigated as a vessel safety precaution.

D.1.3 Charted Features

Fifty five features were assigned within the survey limits of H13290. Reference the Final Feature File associated with this survey for further detail.

D.1.4 Uncharted Features

Eight uncharted features were investigated within the survey limits of H13290. Reference the Final Feature File associated with this survey for further detail.

D.1.5 Channels

Carrabelle Harbor Channel runs through East Pass as a marked channel granting entry into St. George Sound from the Gulf of Mexico. The channel runs between St. George Island and Dog Island. As assigned, East Pass was ensonified via ODMBES to either the 3.5m contour or the assigned ODMBES area extent. 3.3km of the Intracoastal Waterway is ensonified by ODMBES in the western portion of the survey area. Both channels are well marked and accurately portrayed on the current ENC used to execute the chart comparison in D.1 of this section.

D.2 Additional Results

D.2.1 Aids to Navigation

All assigned ATONs were investigated within H13290. Lighted buoy G"17" in the Carrabelle Harbor Channel was not located. An ATON report was submitted to the USCG 28 December 2020. Reference the Final Feature File 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 5 bottom samples were investigated within the survey limits of survey H13290. Reference the Final Feature File 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

Ferry routes and/or terminals exist for this survey, but were not investigated. The Dog Island Ferry is a privately operated Ferry service that runs between Carrabelle, FL and Dog Island.

D.2.8 Abnormal Seafloor or Environmental Conditions

The project area of OPR-J359-KR-20 is known to encompass large, migrating sand waves. Several instances of sand wave migration is notable in the southern portion of ODMBES area of H13290. The Gulf of Mexico did experience a higher than normal number of storms during 2020 hurricane season; the shifting sand waves are likely due to increased storm activity.

D.2.9 Construction and Dredging

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

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
Allison C Stone	Chief of Party	12/28/2019	Allison C Stone Digitally signed by Allison C Stone Date: 2020.12.29 13:56:18 -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