H12955

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

DESCRIPTIVE REPORT

Type of Survey:	Basic Hydrographic Survey
Registry Number:	H12955

LOCALITY

State(s):	Mississippi
General Locality:	Southeastern Vicinity of the Chandeleur Islands
Sub-locality:	8 NM E of Chandeleur Islands

2016

CHIEF OF PARTY
Jonathan L. Dasler, PE, PLS, CH

LIBRARY & ARCHIVES

Date:

U.S. DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

REGISTRY NUMBER:

HYDROGRAPHIC TITLE SHEET

H12955

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):	**Mississippi**
General Locality:	**Southeastern Vicinity of the Chandeleur Islands**
Sub-Locality:	**8 NM E of Chandeleur Islands**
Scale:	**40000**
Dates of Survey:	**09/11/2016 to 11/18/2016**
Instructions Dated:	**07/15/2016**
Project Number:	**OPR-J311-KR-16**
Field Unit:	**David Evans and Associates, Inc.**
Chief of Party:	**Jonathan L. Dasler, PE, PLS, CH**
Soundings by:	**Reson 7125 SV2**
Imagery by:	**EdgeTech 4200-HF**
Verification by:	**Atlantic Hydrographic Branch**
Soundings Acquired in:	**meters at Mean Lower Low Water**

Remarks:

NAD83, UTM Zone 16 North, Meters, Times are UTC. The purpose of this contract is to provide NOAA with modern, accurate hydrographic survey data with which to update nautical charts of the assigned area.

The purpose of this survey is to provide contemporary surveys to update National Ocean Service (NOS) nautical charts. All separates are filed with the hydrographic data. Any revisions to the Descriptive Report (DR) generated during office processing are shown in bold red italic text. The processing branch maintains the DR as a field unit product, therefore, all information and recommendations within the body of the DR are considered preliminary unless otherwise noted. The final disposition of surveyed features is represented in the OCS nautical chart update products. All pertinent records for this survey, including the DR, are archived at the National Centers for Environmental Information (NCEI) and can be retrieved via https://www.ncei.noaa.gov/.

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Descriptive Report to Accompany Survey H12955

Project: OPR-J311-KR-16

Locality: Southeastern Vicinity of the Chandeleur Islands

Sublocality: 8 NM E of Chandeleur Islands

Scale: 1:40000

September 2016 - November 2016

David Evans and Associates, Inc.

Chief of Party: Jonathan L. Dasler, PE, PLS, CH

A. Area Surveyed

David Evans and Associates, Inc. (DEA) conducted a hydrographic survey of the assigned area in the Gulf of Mexico, east of the Chandeleur Islands. Survey H12955 was conducted in accordance with the Statement of Work (July 15, 2016) and Hydrographic Survey Project Instructions (July 15, 2016).

The Hydrographic Survey Project Instructions reference the National Ocean Service (NOS) Hydrographic Surveys Specifications and Deliverables Manual (HSSD), 2016 as the technical requirements for this project.

A.1 Survey Limits

Data were acquired within the following survey limits:

Northwest Limit	Southeast Limit
29° 58' 54.9" N 88° 43' 10.26" W	29° 46' 36.29" N 88° 38' 45.42" W

Table 1: Survey Limits

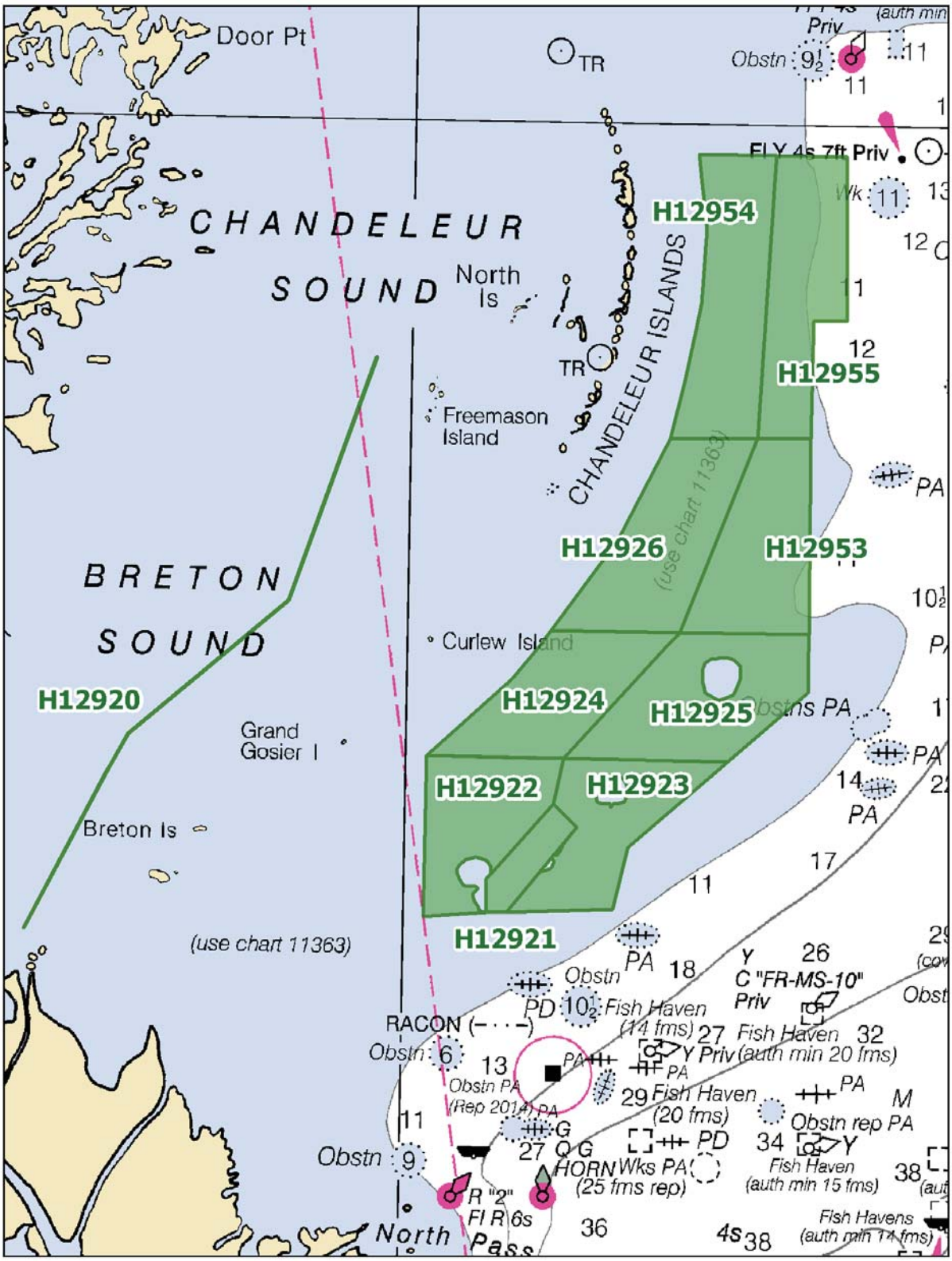


Figure 1: OPR-J311-KR-16 Assigned Survey Areas

Survey Limits were surveyed in accordance with the requirements in the Project Instructions and the HSSD.

A.2 Survey Purpose

The purpose of this project is to provide contemporary surveys to update National Ocean Service (NOS) nautical charting products. This project includes two survey areas totaling 263 SNM of which 226 SNM are classified as emerging critical areas, 32 SNM as priority two areas and 2 SNM as priority three as identified in the 2012 NOAA Hydrographic Survey Priorities. The first area is a narrow corridor located to the west of the Chandeleur Islands and extends from Baptiste Collette, LA towards Gulfport, MS. This corridor will serve as an alternate traffic route during the August 2016 closure of the INHC Lock in New Orleans. The second area, located to the east of the Chandeleur Islands, is a heavily trafficked area and encompasses approximately 262 SNM with multiple oil platforms and well heads.

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 Sheet Numbers	All MBES acquisition requires backscatter acquisition (refer to HSSD Section 6.2)
Sheet Number 3 - 10	Complete Coverage (refer to HSSD Section 5.2.2.3)

Complete coverage was obtained over the survey area using 100% side scan sonar coverage with concurrent multibeam echosounder (MBES) and backscatter. This coverage type follows Option B of the Complete Coverage requirement specified in Section 5.2.2.3 of the 2016 HSSD. Significant side scan sonar contacts were developed with multibeam sonar at complete coverage resolution as required by the coverage classification. Complete coverage multibeam was obtained within the search radii (160 meters for charted features labeled with PA and 80 meters for charted features without a PA label) for all feature disapprovals. Survey coverage was obtained within the survey area depicted in the Project Reference File (PRF) OPR-J311-KR-16_PRF.000.

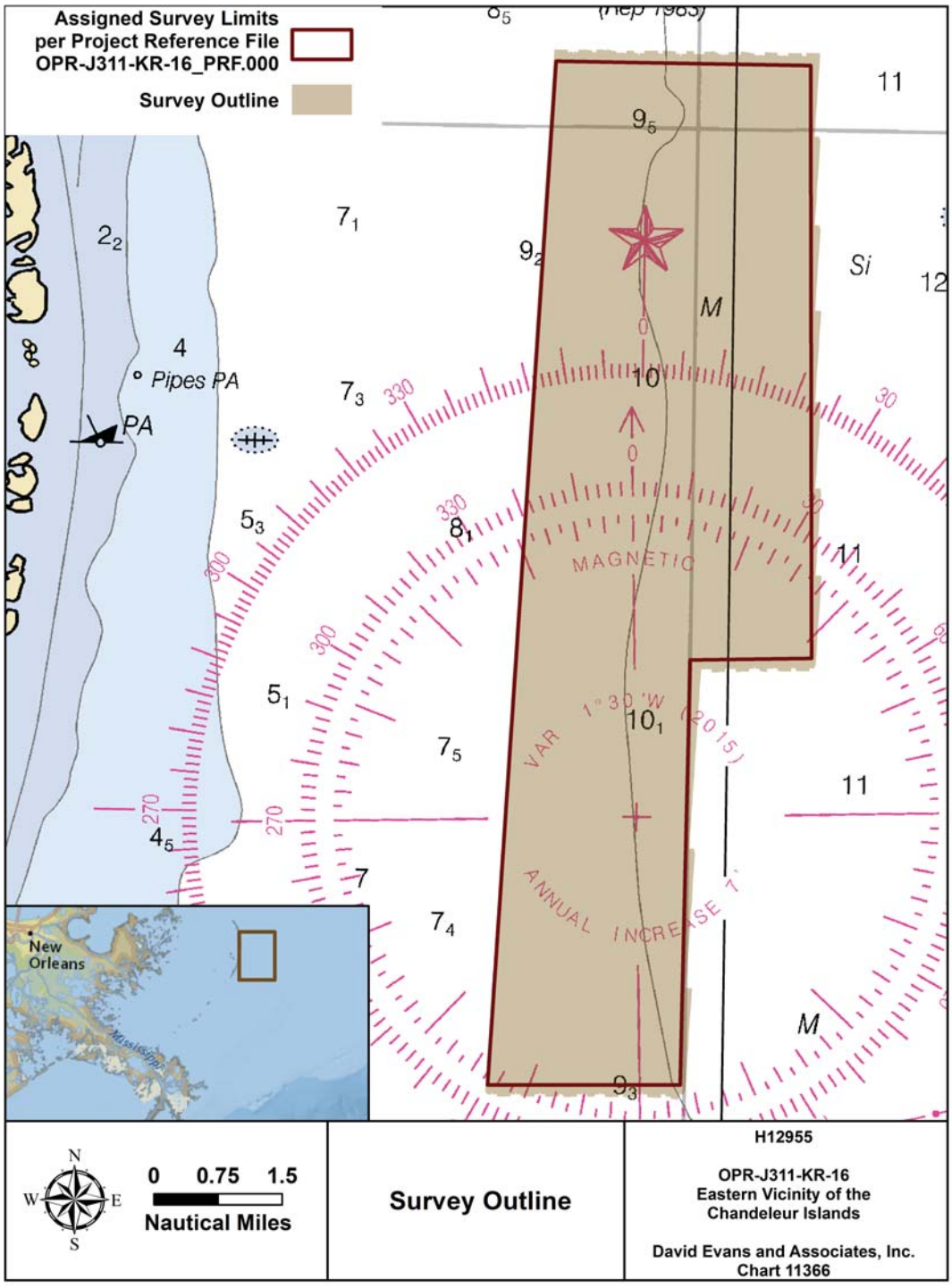


Figure 2: H12955 Survey Outline

A.5 Survey Statistics

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

	HULL ID	*S/V Blake*	*Total*
LNM	**SBES Mainscheme**	0.0	0
	MBES Mainscheme	11.3	11.3
	Lidar Mainscheme	0.0	0
	SSS Mainscheme	23.3	23.3
	SBES/SSS Mainscheme	0.0	0
	MBES/SSS Mainscheme	504.2	504.2
	SBES/MBES Crosslines	21.6	21.6
	Lidar Crosslines	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			35.22

Table 2: Hydrographic Survey Statistics

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

Survey Dates	Day of the Year
09/11/2016	255
09/12/2016	256
09/13/2016	257
09/14/2016	258
09/15/2016	259
09/16/2016	260
09/19/2016	263
11/16/2016	321
11/18/2016	323

Table 3: Dates of Hydrography

B. Data Acquisition and Processing

B.1 Equipment and Vessels

The OPR-J311-KR-16 Data Acquisition and Processing Report (DAPR), previously submitted with survey H12920, details equipment and vessel information as well as data acquisition and processing procedures. There were no vessel or equipment configurations used during data acquisition that deviated from those described in the DAPR.

B.1.1 Vessels

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

Hull ID	***S/V Blake***
LOA	83 feet
Draft	4.5 feet

Table 4: Vessels Used

Figure 3: S/V Blake

B.1.2 Equipment

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

Manufacturer	Model	Type
Reson	7125 SV2	MBES
Edgetech	4200-HF	SSS
Applanix	POS/MV 320 v5	Positioning & Attitude
Rolls Royce	MVP30-350 with AML MVP X	Primary Sound Speed Profiler
AML	Micro SV Xchange	Surface Sound Speed
Sea-Bird Electronics	SEACAT SBE 19-03 CTD	Secondary Sound Speed Profiler
Trimble	SPS351	DGPS/Beacon Receiver

Table 5: Major Systems Used

An equipment malfunction prevented use of the MVP30-350 during part of the day on November 18, 2016 (DN 323). The SEACAT CTD was used in its place to acquire the profile at 10:25:00.

B.2 Quality Control

B.2.1 Crosslines

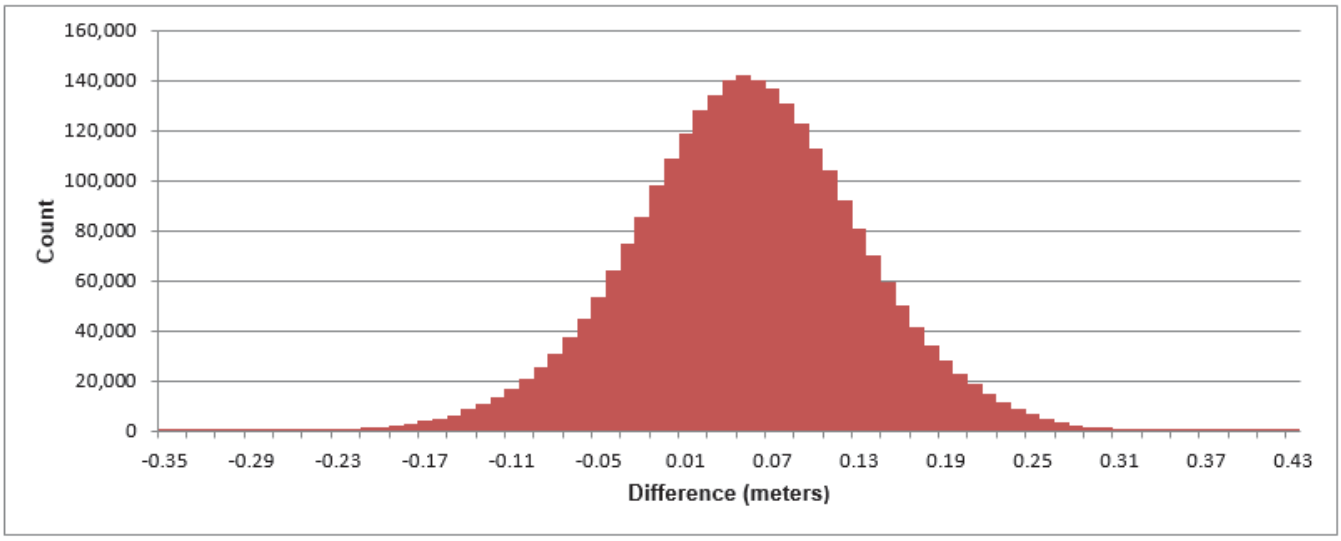
Crosslines acquired for this survey totaled 4.19% of mainscheme acquisition.

Crosslines were run across the entire survey area in order to provide a varied spatial and temporal distribution for analysis of internal consistency within the survey data.

Crossline analysis was performed using the CARIS Hydrographic Information Processing System (HIPS) Quality Control (QC) Report tool, which compares crossline data to a gridded surface and reports results by beam number. Crosslines were compared to a 1-meter CUBE surface encompassing mainscheme, fill, and investigation data for the entire survey area. The QC Report tabular output and plot are included in Separate II. The results of the analysis meet the requirements as stated in the 2016 HSSD.

Additional crossline analysis was performed by computing a 1-meter CUBE surface from the crossline data. The surface was then differenced from a 1-meter surface comprised of all mainscheme, fill, and investigation data. The resultant difference surface was exported using the Base Surface to ASCII function and statistics were compiled on the ASCII data.

Results from the crossline to mainscheme difference analysis are depicted in Figure 4. The primary contributors to the largest differences (20 to 43 centimeters) are discrete tide zoning, sound speed artifacts, minor horizontal offsets in the vicinity of a steep slope, and vessel motion resulting from heavy seas. The horizontal offsets observed in the data are well within HSSD requirements and the expected accuracy of the DGPS positioning system.



Mean:	0.051 m	Standard Deviation:	0.080 m
Minimum:	-0.356 m	Bin size:	0.01 m
Maximum:	0.434 m	Number of Nodes:	2,691,235

Figure 4: H12955 Crossline Differences

B.2.2 Uncertainty

The following survey specific parameters were used for this survey:

Measured	Zoning	Method
0.00 meters	0.112 meters	Discrete

Table 6: Survey Specific Tide TPU Values

Hull ID	Measured - CTD	Measured - MVP	Surface
S/V Blake	1.0 meters/second	1.0 meters/second	0.5 meters/second

Table 7: Survey Specific Sound Speed TPU Values

Additional discussion of these parameters is included in the DAPR.

During surface finalization in HIPS, the "Greater of the two values" option was selected, where the calculated uncertainty from total propagated uncertainty (TPU) is compared to the standard deviation of the soundings influencing the node, and where the greater value is assigned as the final uncertainty of the node. The uncertainty of the finalized surfaces increased for nodes where the standard deviation of the node was greater than the total propagated uncertainty.

The resulting calculated uncertainty values of all nodes in the finalized 1-meter Complete Coverage multibeam surface range from 0.24 meters to 0.83 meters with a standard deviation of 0.015 meters.

To determine if surface grid nodes met International Hydrographic Organization (IHO) Order 1 specification, a ratio of the final node uncertainty to the allowable uncertainty at that depth was determined. As a percentage, this value represents the amount of error budget utilized by the uncertainty value at each node. Values greater than 100% indicate nodes exceeding the allowable IHO uncertainty.

For the 1-meter Complete Coverage multibeam surface, the allowable uncertainty utilized ranges from 42% to 151%. The mean allowable uncertainty for the surface is 45% with a standard deviation of 0.027.

Nodes that were reported out of specification were coincident with two new features found during the survey. All uncertainty values were within allowable specification prior to surface finalization when the standard deviation was incorporated into the solution where it was greater than the node uncertainty.

B.2.3 Junctions

Survey H12955 junctions with surveys H12529, H12530, H12471, H12926, H12953, and H12954.

The Bathymetric Attributed Grid (BAG) for surveys H12529, H12530, and H12471 were downloaded from NOAA's National Centers for Environmental Information (NCEI) website for comparison with H12955.

The finalized H12955 surface was compared to each junction survey by generating a difference surface with CARIS HIPS.

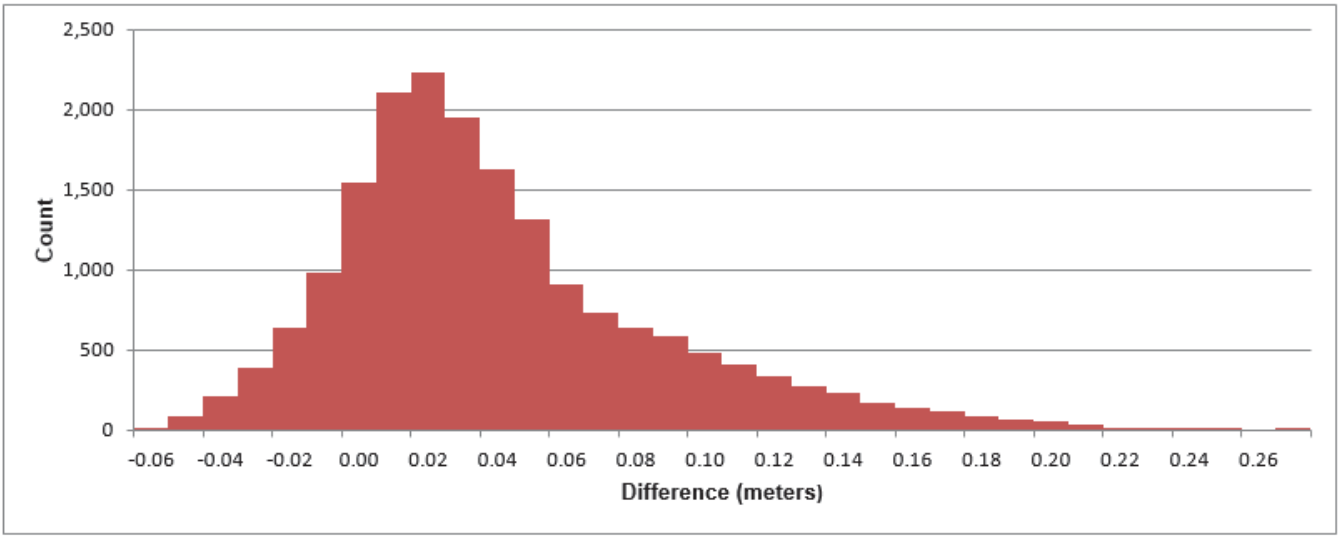
The following junctions were made with this survey:

Registry Number	Scale	Year	Field Unit	Relative Location
H12471	1:40000	2013	David Evans and Associates, Inc.	N
H12529	1:40000	2013	David Evans and Associates, Inc.	N
H12530	1:40000	2013	David Evans and Associates, Inc.	E
H12926	1:40000	2016	David Evans and Associates, Inc.	S
H12953	1:40000	2016	David Evans and Associates, Inc.	S
H12954	1:40000	2016	David Evans and Associates, Inc.	W

Table 8: Junctioning Surveys

H12471

Descriptive statistics from the junction comparison with H12929 are presented in Figure 5. The surveys agree well, with minimum and maximum differences representative of surveys impacted by refraction and inaccuracies in discrete zoning methods. Prior survey H12471 used zoning correctors from the NWLON gauge Pascagoula NOAA Lab, MS (8741533) while survey H12954 was controlled from the NWLON gauge Dauphin Island (8735180).

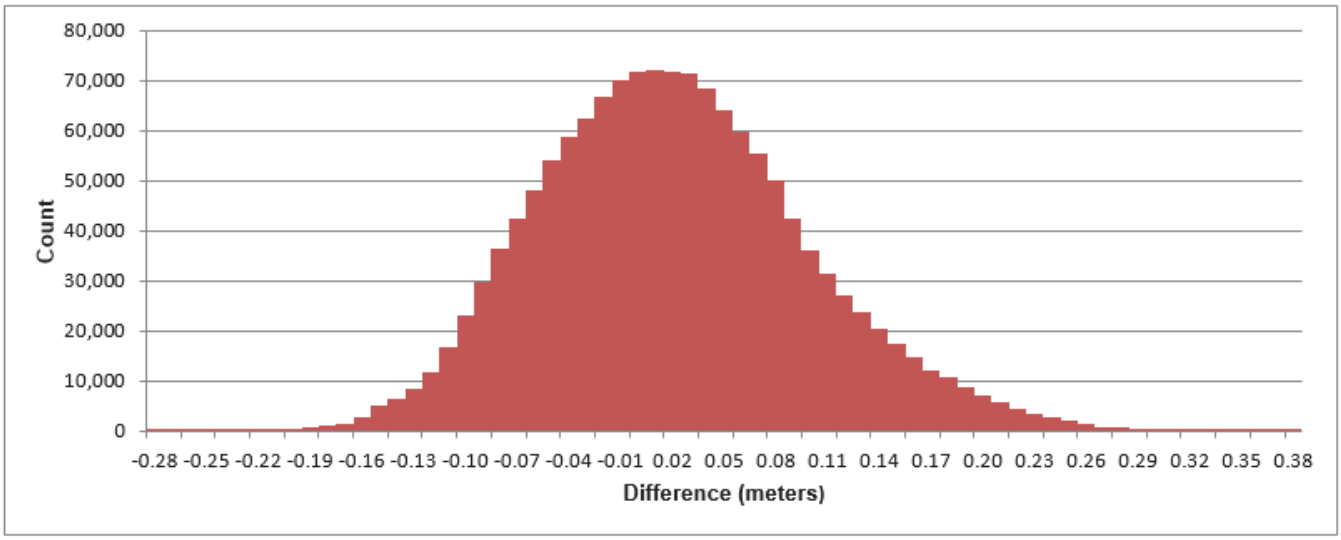


Mean:	0.039 m	Standard Deviation:	0.047 m
Minimum:	-0.063 m	Bin size:	0.01 m
Maximum:	0.271 m	Number of Nodes:	18,377

Figure 5: Junction results between H12955 1-meter and H12471 4-meter bathy grids

H12529

Descriptive statistics from the junction comparison with H12929 are presented in Figure 6. The surveys agree well, with minimum and maximum differences representative of surveys impacted by refraction and inaccuracies in discrete zoning methods. Prior survey H12529 used zoning correctors from the NWLON gauge Pascagoula NOAA Lab, MS (8741533) while survey H12954 was controlled from the NWLON gauge Dauphin Island (8735180).

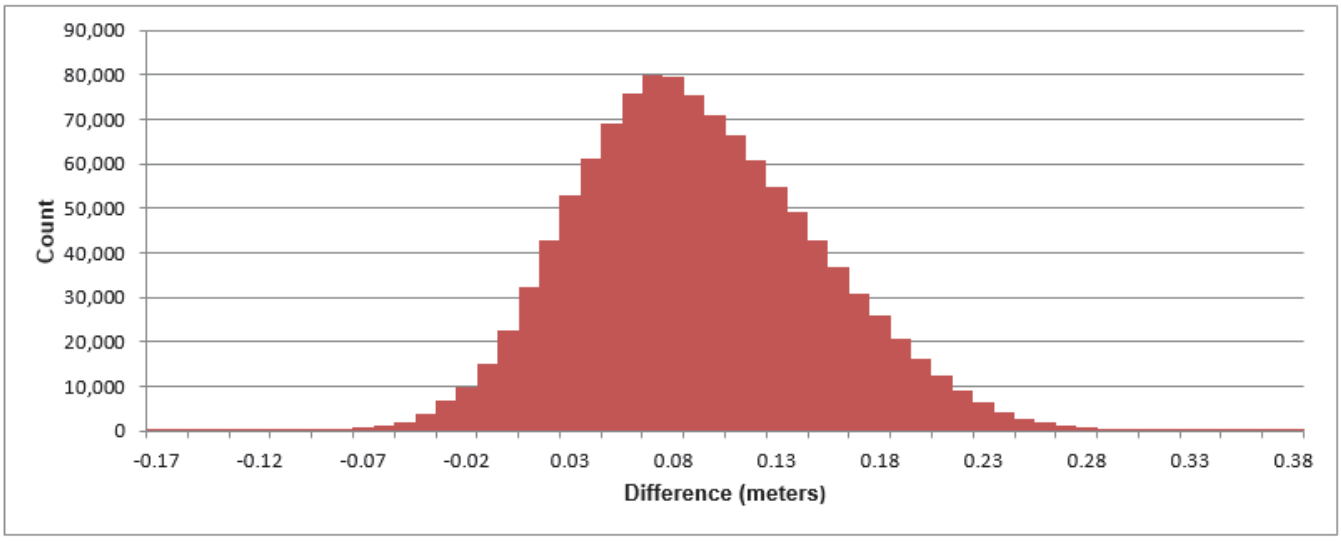


Mean:	0.017 m	Standard Deviation:	0.078 m
Minimum:	-0.286 m	Bin size:	0.01 m
Maximum:	0.380 m	Number of Nodes:	1,406,780

Figure 6: Junction results between H12955 1-meter and H12529 4-meter bathy grids

H12530

Descriptive statistics from the junction comparison with H12929 are presented in Figure 7. The surveys agree well, with minimum and maximum differences representative of surveys impacted by refraction and inaccuracies in discrete zoning methods. Prior survey H12530 used zoning correctors from the NWLON gauge Pascagoula NOAA Lab, MS (8741533) while survey H12954 was controlled from the NWLON gauge Dauphin Island (8735180).

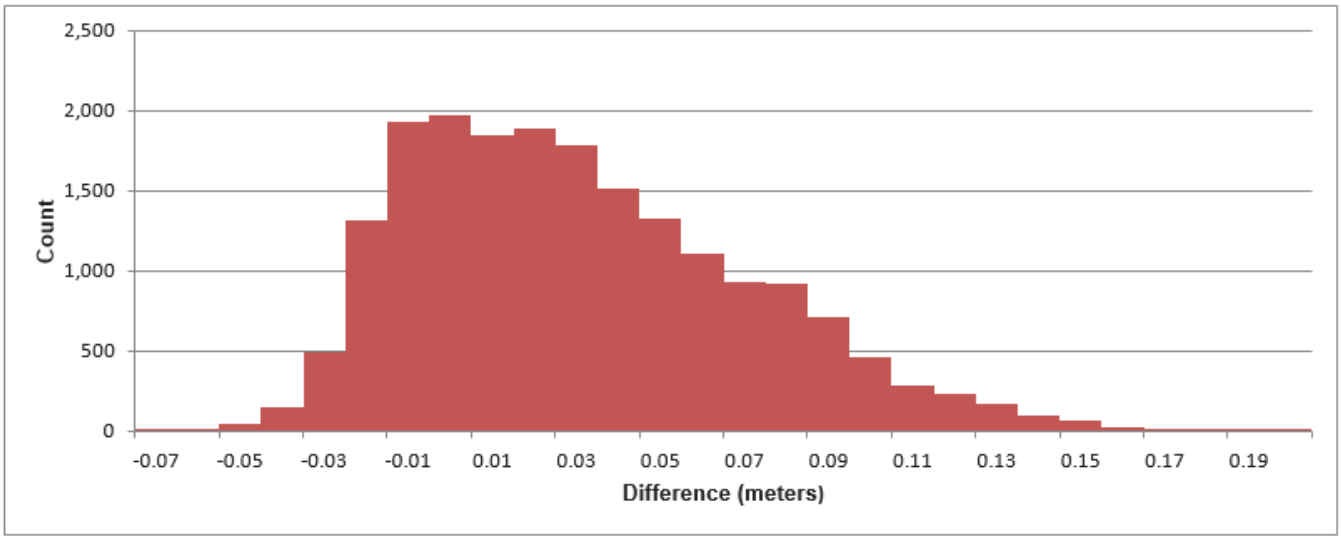


Mean:	0.091 m	Standard Deviation:	0.059 m
Minimum:	-0.173 m	Bin size:	0.01 m
Maximum:	0.382 m	Number of Nodes:	1,149,655

Figure 7: Junction results between H12955 1-meter and H12530 1-meter bathy grids

H12926

Descriptive statistics from the junction comparison with H12926, which was also part of the OPR-J311-KR-16 survey project, are presented in Figure 8. The surveys agree well, with minimum and maximum differences representative of surveys impacted by refraction and inaccuracies in discrete zoning methods.

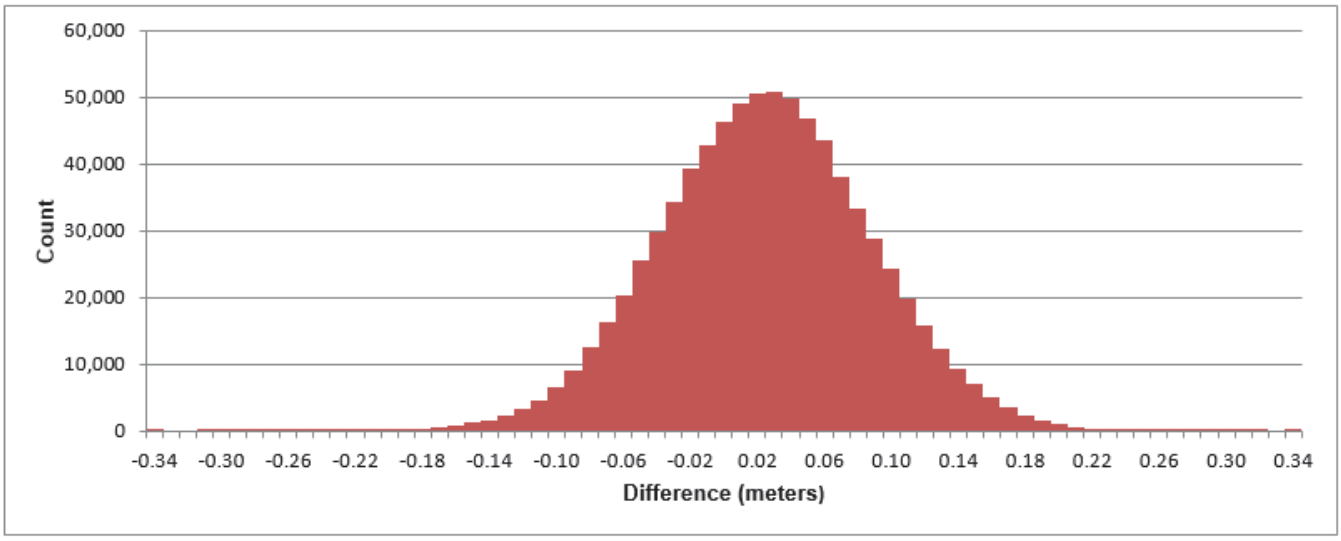


Mean:	0.030 m	Standard Deviation:	0.040 m
Minimum:	-0.071 m	Bin size:	0.01 m
Maximum:	0.199 m	Number of Nodes:	19,300

Figure 8: Junction results between H12955 1-meter and H12926 1-meter bathy grids

H12953

Descriptive statistics from the junction comparison with H12953, which was also part of the OPR-J311-KR-16 survey project, are presented in Figure 9. The surveys agree well, with minimum and maximum differences representative of surveys impacted by refraction and inaccuracies in discrete zoning methods.

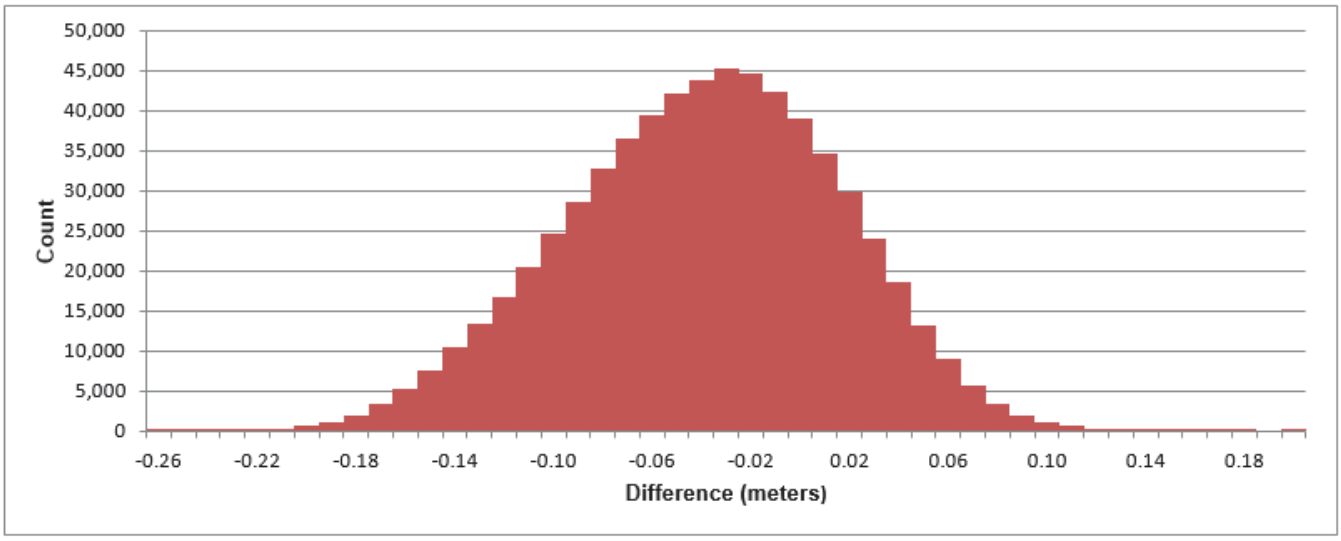


Mean:	0.026 m	Standard Deviation:	0.063 m
Minimum:	-0.342 m	Bin size:	0.01 m
Maximum:	0.344 m	Number of Nodes:	793,721

Figure 9: Junction results between H12955 1-meter and H12953 1-meter bathy grids

H12954

Descriptive statistics from the junction comparison with H12954, which was also part of the OPR-J311-KR-16 survey project, are presented in Figure 10. The surveys agree well, with minimum and maximum differences representative of surveys impacted by refraction and inaccuracies in discrete zoning methods.



Mean:	-0.035 m	Standard Deviation:	0.055 m
Minimum:	-0.257 m	Bin size:	0.01 m
Maximum:	0.205 m	Number of Nodes:	642,956

Figure 10: Junction results between H12955 1-meter and H12954 1-meter bathy grids

B.2.4 Sonar QC Checks

Quality control is discussed in detail in Section B of the DAPR. Results from weekly position checks and weekly multibeam bar checks are included in Separate I Acquisition and Processing Logs of this report. Sound speed checks can be found in Separate II Sound Speed Data Summary of this report.

Multibeam data were reviewed at multiple levels of data processing including: CARIS HIPS conversion, subset editing, and analysis of anomalies revealed in CUBE surfaces.

B.2.5 Equipment Effectiveness

Differential Correction Outages

The differential correction signal received by the POS/MV 320 (primary positioning system) experienced several outages during acquisition on September 12, 2016 (DN256). These outages were detected because of alarms preconfigured in the acquisition system which would notify the hydrographic crew that the signal from the differential beacon had been lost. Data acquired without differential corrections were rejected using the 'Break Interpolation' option in the HIPS navigation editor and the resulting holidays were filled on a later date.

Portions of the following lines were rejected due to differential correction outages:

2016BL2560045
2016BL2560227
2016BL2561332

B.2.6 Factors Affecting Soundings

Sound speed and motion artifacts

Data artifacts, which appear to be related to sound speed, are visible in the raw survey data in some areas. The presence and magnitude of the artifacts correlate to vessel motion, but no latencies were observed in sonar and attitude timing when artifacts were present. The hydrographer believes that internal waves below the surface resulted in a tilted (non-horizontal) stratification of sound speed. This scenario can cause artifacts like those observed in the survey data due to errors in ray tracing lengths and angles which cannot be accounted for with standard ray tracing algorithms. Data artifacts were magnified by an increased sea state at time of acquisition on September 14 and 15, 2016 (DN258 and DN259). A 65-degree swath filter was applied to the multibeam data from these days to remove the largest of the artifacts from the outer ranges of the sonar swath though some motion and sound speed artifacts, which do not exceed HSSD requirments, are still visible in the final bathymetric surface.

Tide and sound speed artifacts

In addition to the artifacts described above, occasional sound speed and discrete zoning artifacts approaching 20 centimeters in total magnitude are present in the survey data. Though these issues impacted some soundings, all data meet requirements outlined in the HSSD.

Biomass in Water Column

A high volume of biomass (likely jellyfish as reported by the field party from visual observation) was present in the water column and observed in the sounding record from September 14, 2016 through September 16, 2016 (DN258 - DN260). At times, sounding rejection was required to remove soundings on the biomass when impacting the CUBE surface. An example of the biomass' impact of the sounding data is depicted in Figure 11.

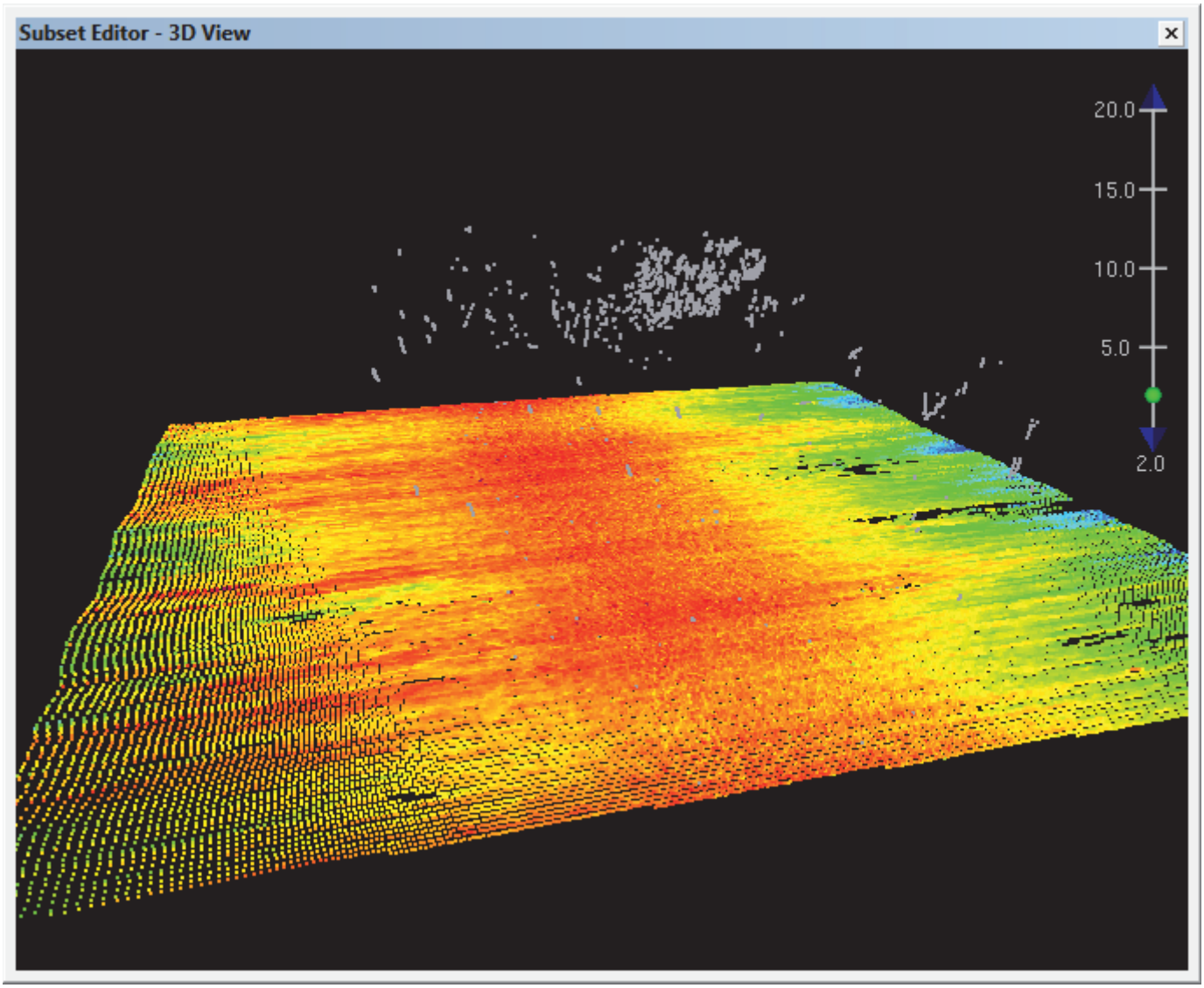


Figure 11: CARIS HIPS 3D View of Rejected Biomass

B.2.7 Sound Speed Methods

Sound Speed Cast Frequency: Approximately 15-minute intervals.

Approximate 30-minute intervals on November 18, 2016 (DN 323).

A Rolls Royce Moving Vessel Profiler (MVP) was the primary instrument used to acquire sound speed readings during multibeam operations. MVP sound speed readings were measured at approximately 15-minute intervals during survey operations.

Due to a malfunction with the MVP, some casts acquired on November 18, 2016 (DN 323) were collected with the secondary sound speed profiler. These profiles were acquired at approximate 30-minute intervals during the last four hours of acquisition.

Additional discussion of sound speed methods can be found in the DAPR.

B.2.8 Coverage Equipment and Methods

Survey speeds were maintained to meet or exceed along-track sounding density and side scan sonar ensonification requirements.

Side scan mosaics were thoroughly reviewed for holidays and areas of poor quality coverage due to biomass, vessel wakes, or other factors. A fill plan was created in order to acquire side scan data where holidays and significant poor quality coverage existed. Side scan sonar contacts were developed with multibeam sonar to obtain a least depth of the contact using Complete Coverage requirements.

B.2.9 Density

The sounding density requirement of 80% of all nodes, populated with at least five soundings per node, was verified by exporting the density child layer of the finalized CUBE surface to an ASCII text file and compiling statistics on the density values. More than 95% of all final CUBE surface nodes contained five or more soundings.

B.3 Echo Sounding Corrections

B.3.1 Corrections to Echo Soundings

Data reduction procedures for survey H12955 are detailed in the DAPR. A summary multibeam processing log is included in Separate I of this report.

B.3.2 Calibrations

The following calibrations were conducted after the initial system calibration discussed in the DAPR:

Calibration Type	Date	Reason
MBES (400kHz)	2016-11-18	End of project calibration test.

Table 9: Calibrations not discussed in the DAPR.

The H12955 survey was still active at time of DAPR submission. An additional calibration test which was not reported in the DAPR is included in Table 9. A revision to DAPR Appendix II, which includes this calibration test and results from a new weekly bar check, has been included with the H12955 deliverables.

B.4 Backscatter

Multibeam backscatter was logged in Hypack 7K format and included with the H12955 digital deliverables. Data were processed periodically in CARIS HIPS to evaluate backscatter quality but the processed data is not included with the deliverables.

For data management purposes, the names of multibeam crosslines have been appended with the suffix _XL. This change was made to HIPS files only. The original file names of raw data files (Hypack HSX and 7k) have been retained.

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	9.1.6

Table 10: Primary bathymetric data processing software

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

Manufacturer	Name	Version
Chesapeake Technology, Inc.	SonarWiz	6.004.0006 and 6.004.0009

Table 11: Primary imagery data processing software

The following Feature Object Catalog was used: 5.3.4. A detailed listing of all data processing software is included in the OPR-J311-KR-16 DAPR.

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
H12955_MB_1m_MLLW	CUBE	1 meters	15.23 meters -	NOAA_1m	Complete Coverage

Surface Name	Surface Type	Resolution	Depth Range	Surface Parameter	Purpose
			21.54 meters		
H12955_MB_1m_MLLW_Final	CUBE	1 meters	15.23 meters - 21.54 meters	NOAA_1m	Finalized Complete Coverage
H12955_SSS_1m_100	Mosaic	1 meters	0 meters - 0 meters	N/A	100- percent coverage

Table 12: Submitted Surfaces

Bathymetric grids were created relative to Mean Lower Low Water (MLLW) in CUBE format using Complete Coverage resolution requirements as described in the HSSD.

C. Vertical and Horizontal Control

A complete description of the horizontal and vertical control for survey H12955 can be found in the OPR-J311-KR-16 Horizontal and Vertical Control Report (HVCR) which was submitted with the H12955 DR. A summary of horizontal and vertical control for this survey follows.

The horizontal datum for the project was the North American Datum of 1983 (NAD 83) as specified by Hydrographic Technical Directive (HTD) 2016-3: Revision of Horizontal Datum in 2016 HSSD. A copy of this HTD is included in the OPR-J311-KR-16 Project Correspondence.

C.1 Vertical Control

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

Standard Vertical Control Methods Used:

The following National Water Level Observation Network (NWLON) stations served as datum control for this survey:

Station Name	Station ID
Dauphin Island	8735180

Table 13: NWLON Tide Stations

File Name	Status
8735180.tid	Verified Observed

Table 14: Water Level Files (.tid)

File Name	Status
J311KR2016RevCORP.zdf	Final

Table 15: Tide Correctors (.zdf or .tc)

Tide zoning file J311KR2016RevCORP.zdf was provided with the project instructions and used for sounding correction within the assigned survey area.

C.2 Horizontal Control

The horizontal datum for this project is North American Datum of 1983 (NAD83).

The projection used for this project is NAD83 UTM Zone 16 North.

The following DGPS Stations were used for horizontal control:

DGPS Stations
English Turn, LA (293 kHz)

Table 16: USCG DGPS Stations

D. Results and Recommendations

D.1 Chart Comparison

The majority of the chart comparison was performed by comparing H12955 depths to a digital surface generated from electronic navigational charts (ENCs) covering the survey area. A 50-meter product surface

was generated from a triangular irregular network (TIN) created from the soundings, depth contours, and depth features for each ENC scale. An additional 50-meter HIPS product surface of the entire survey area was generated from the finalized MBES CUBE surfaces. The chart comparison was conducted by creating and reviewing the resultant difference surface. The chart comparison also included a review of all assigned charted features within the survey area.

The raster navigational chart (RNC) comparison was performed by manually comparing the RNC covering the survey area to the corresponding ENC and identifying discrepancies between the two chart formats.

The electronic and raster versions of the relevant charts used during the comparison were reviewed to check that all US Coast Guard (USCG) Local Notice to Mariners (LNMs) issued during survey acquisition and impacting the survey area were applied and addressed by this survey.

D.1.1 Raster Charts

The following are the largest scale raster charts, which cover the survey area:

Chart	Scale	Edition	Edition Date	LNM Date	NM Date
11373	1:80000	52	05/2015	02/21/2017	02/25/2017
11363	1:80000	45	01/2017	02/21/2017	02/25/2017
11366	1:250000	16	06/2015	02/07/2017	01/14/2017

Table 17: Largest Scale Raster Charts

11373

Coastal chart 11373 was compared to US4LA34M and US4MS12M within the H12955 survey area. No differences were observed between the charts.

11363

Coastal chart 11363 was compared to US4LA34M within the H12955 survey area. No differences were observed between the charts.

11366

General Chart 11366 was compared to US3GC04M within the H12955 survey area. The 10-fathom contour charted at northern extent of the survey area on the RNC does not match the depiction of the contour on the ENC. The deviation, which begins at the junction with larger scale chart 11373, continues to the north beyond the limit of the H12955 survey area. It appears that the results from hydrographic project OPR-J348-

KR-13, which were added to RNC 11366 as part of the release of Edition 16 (5/21/2016), were never applied to ENC US3GC04M. The hydrographer recommends updating US3GC04M with the findings from the most recent contemporary surveys.

In addition, charts 11366 and US3GC04 do not portray pipelines which are charted within the survey area on large scale charts 11363 and US4LA34M. As seen in Figure 12, numerous pipelines, both inside and outside of the H12955 survey area, are not accurately depicted on the smaller scale charts. The hydrographer recommends a review of this discrepancy by the Marine Chart Division (MCD).

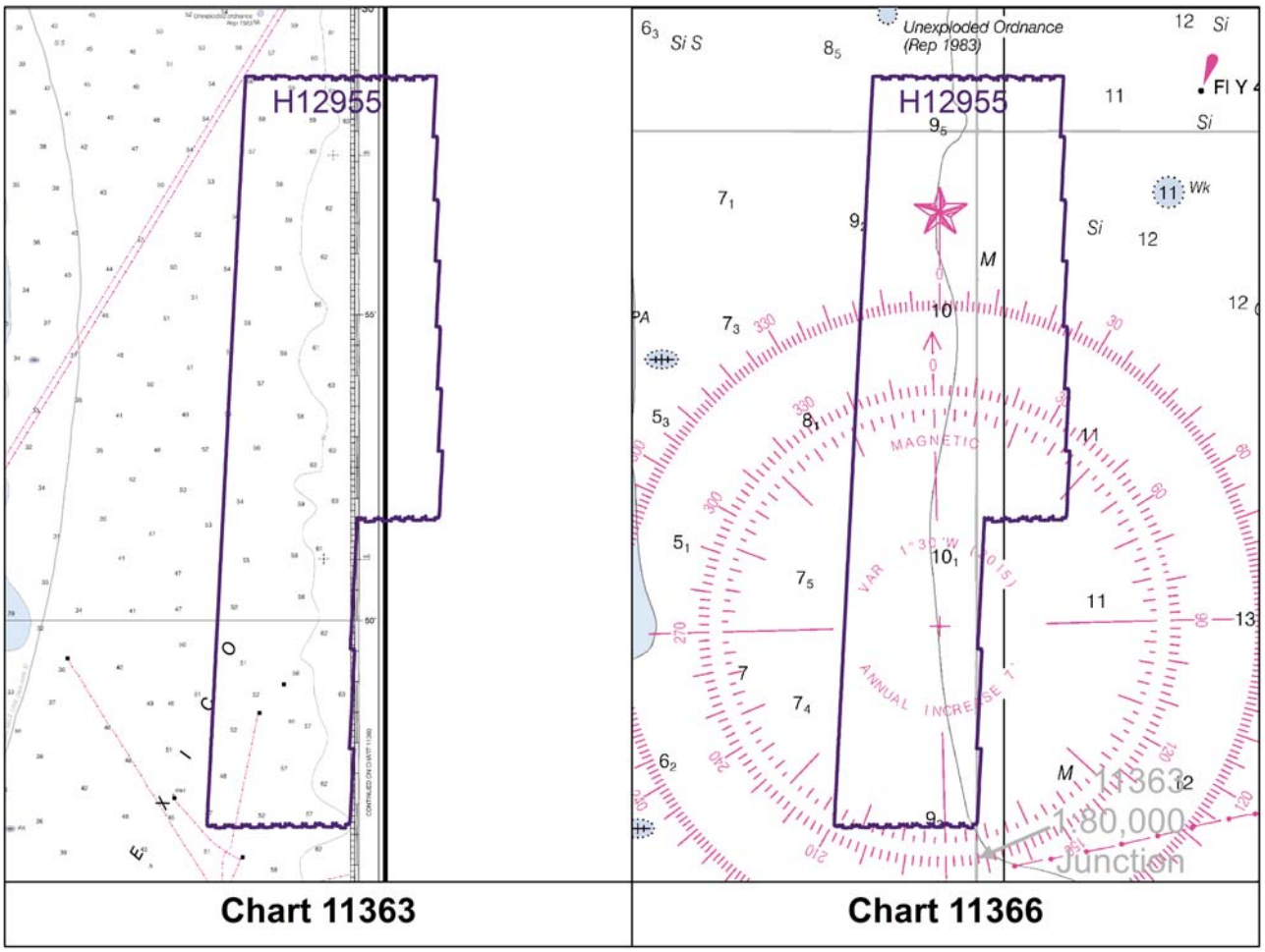


Figure 12: Inadequate depiction of pipelines on Chart 11366

D.1.2 Electronic Navigational Charts

The following are the largest scale ENCs, which cover the survey area:

ENC	Scale	Edition	Update Application Date	Issue Date	Preliminary?
US4LA34M	1:80000	30	02/09/2017	02/09/2017	NO
US4MS12M	1:80000	24	02/08/2017	02/08/2017	NO
US3GC04M	1:250000	53	02/14/2017	02/14/2017	NO

Table 18: Largest Scale ENCs

US4LA34M

In general, surveyed depths range from two feet shoaler to five feet deeper than charted on ENC US4LA34M. Soundings along the southern edge of the survey area are as much as six feet deeper than charted, while those along the northern edge are up to four feet shoaler than charted.

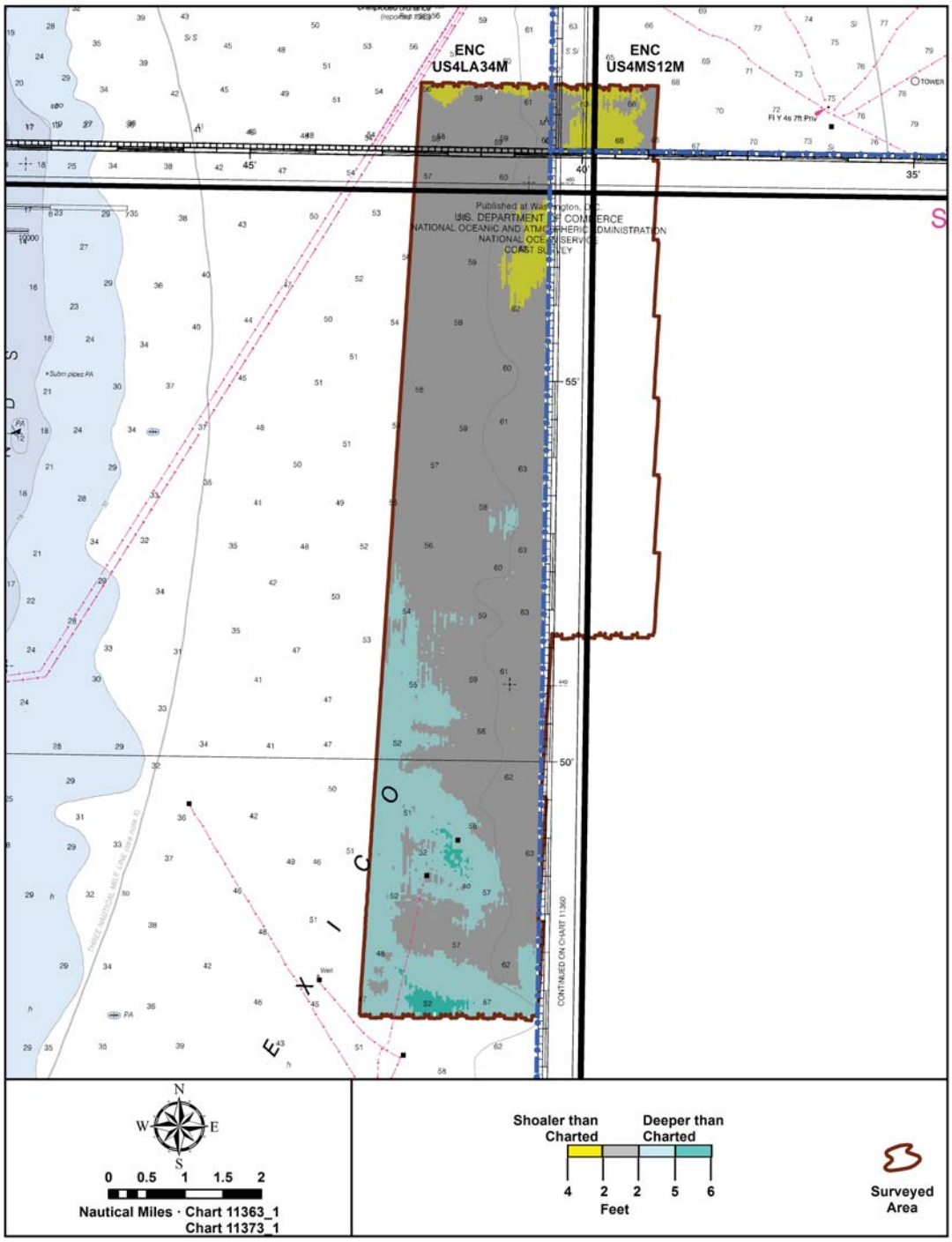


Figure 13: Depth Difference between H12955 and charts US4LA34M and US4MS12M

US4MS12M

In general, surveyed depths range from four feet shoaler to two feet deeper than charted on ENC US4MS12M.

US3GC04M

In general, surveyed depths range from two feet shoaler to five feet deeper than charted on ENC US3GC04M.

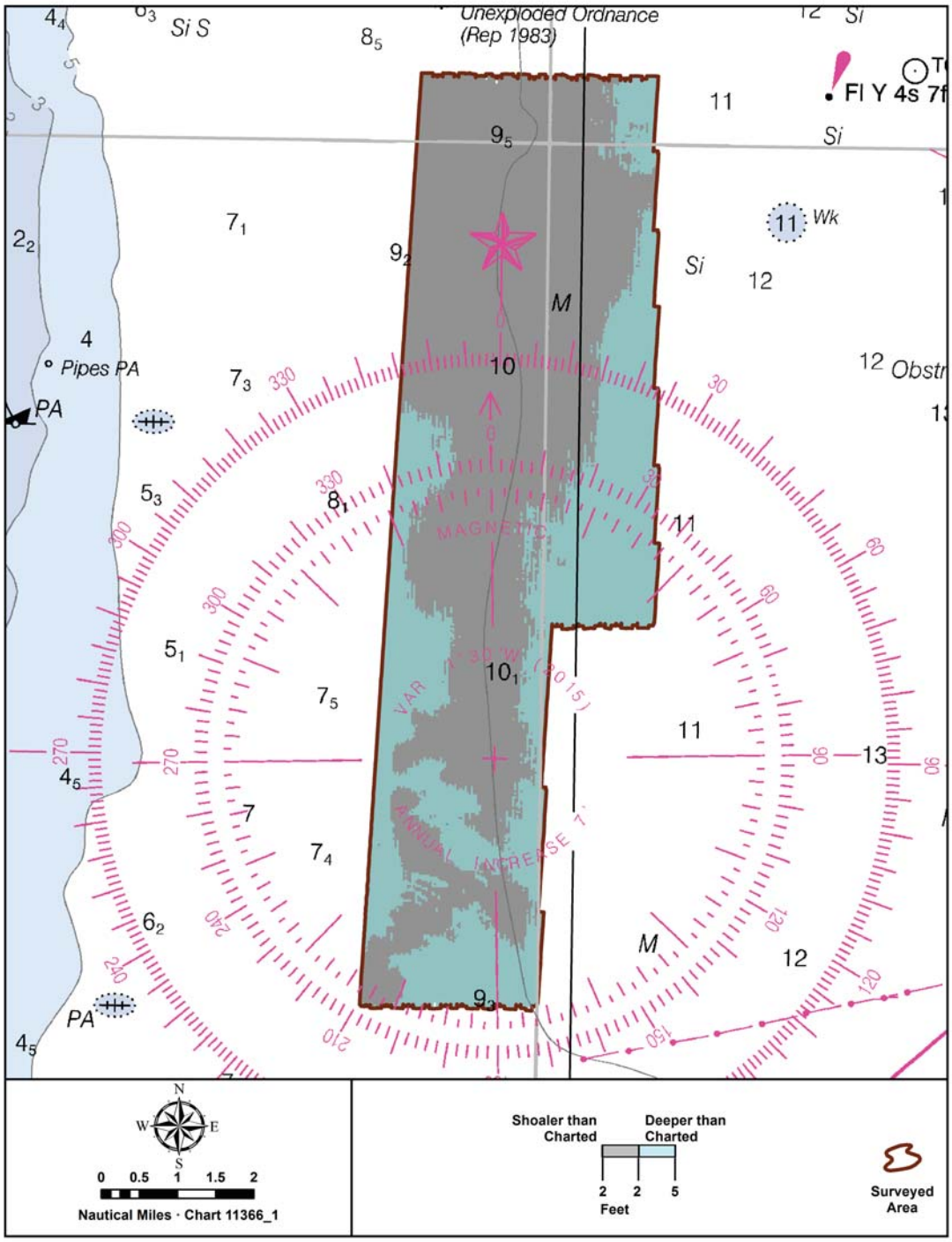


Figure 14: Depth Difference between H12955 and chart US3GC04M

D.1.3 Maritime Boundary Points

No Maritime Boundary Points were assigned for this survey.

D.1.4 Charted Features

The survey area does not contain any charted features labeled as Position Approximate (PA), Reported, Position Doubtful (PD), or Existence Doubtful (ED).

D.1.5 Uncharted Features

All uncharted features are portrayed in the FFF as surveyed and attributed with the description of 'New'.

D.1.6 Dangers to Navigation

The following DTON reports were submitted:

DTON Report Name	Date Submitted
H12955 Danger to Navigation 01 - Exposed Pipelines	2016-11-14

Table 19: DTON Reports

One Danger to Navigation (DtoN) was submitted for this survey.

H12955 DtoN 01 reported sections of pipeline which are visibly exposed on the seabed in the multibeam and side scan data. While not a direct hazard to surface navigation, these exposed pipelines were submitted using the DtoN process in order to facilitate the review and reporting of the exposed pipelines.

D.1.7 Shoal and Hazardous Features

No shoal or hazardous features were charted or located within the H12955 survey area.

D.1.8 Channels

The H12955 survey area does not contain any anchorage areas, maintained navigation channels, or channel lines.

D.1.9 Bottom Samples

Five bottom samples were acquired on September 18, 2016 (DN262). The sampling plan followed suggested sample locations included in the PRF provided by the Hydrographic Surveys Division.

D.2 Additional Results

D.2.1 Shoreline

Shoreline investigation was not assigned for this survey.

D.2.2 Prior Surveys

Other than the previously mentioned junction analyses, no other comparisons with prior surveys were conducted.

D.2.3 Aids to Navigation

No Aids to Navigation (AtoNs) were charted or observed within the H12955 survey area.

D.2.4 Overhead Features

There were no overhead bridges, cables, or other structures which would impact overhead clearance in the survey area.

D.2.5 Submarine Features

Multiple pipelines are charted within the survey area and are visible in the survey data and bathymetric surfaces. In some areas, pipelines are exposed on the seabed or there is evidence of buried pipelines beneath the seabed. Sections of pipeline which are visibly exposed on the seabed were reported as a DtoN and are included in the H12955 FFF as pipeline features. These features were submitted to the processing branch using the DtoN process so that the proper authorities could be notified about the condition of the pipelines.

No submarine cables or tunnels were charted or located within the H12955 survey area.

D.2.6 Ferry Routes and Terminals

There were no ferry routes or terminals within the survey area.

D.2.7 Platforms

Two platforms are charted within the survey area. Both of the charted platforms were disproved by the survey and are included in the FFF with description of ‘Delete’

D.2.8 Significant Features

There was no other information of scientific or practical value observed during the survey.

D.2.9 Construction and Dredging

No construction or dredging activities were observed during survey operations.

D.2.10 New Survey Recommendation

No new surveys or further investigations are recommended for this area.

D.2.11 Inset Recommendation

No new insets are recommended for this area.

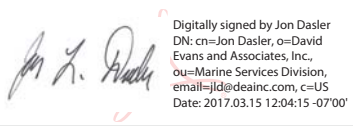
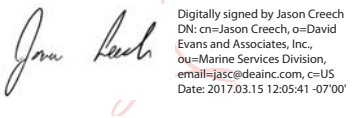
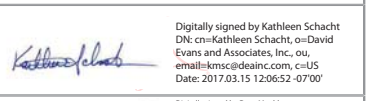
E. Approval Sheet

As Chief of Party, field operations for this hydrographic survey were conducted under my direct supervision, with frequent personal checks of progress and adequacy. 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 and Specifications Deliverables Manual, Statement of Work, and Hydrographic Survey Project Instructions. These data are adequate to supersede charted data in their common areas. This survey is complete and no additional work is required.

Report Name	Report Date Sent
OPR-J311-KR-16 Data Acquisition and Processing Report	2016-11-03
OPR-J311-KR-16 Horizontal and Vertical Control Report	2017-03-15

Approver Name	Approver Title	Approval Date	Signature
Jonathan L. Dasler, PE, PLS, CH	NSPS/THSOA Certified Hydrographer, Chief of Party	03/15/2017	 Digitally signed by Jon Dasler DN: cn=Jon Dasler, o=David Evans and Associates, Inc., ou=Marine Services Division, email=jld@deainc.com, c=US Date: 2017.03.15 12:04:15 -07'00'
Jason Creech, CH	NSPS/THSOA Certified Hydrographer, Charting Manager / Project Manager	03/15/2017	 Digitally signed by Jason Creech DN: cn=Jason Creech, o=David Evans and Associates, Inc., ou=Marine Services Division, email=jasc@deainc.com, c=US Date: 2017.03.15 12:05:41 -07'00'
Kathleen Schacht	MBES Data Processing Manager	03/15/2017	 Digitally signed by Kathleen Schacht DN: cn=Kathleen Schacht, o=David Evans and Associates, Inc., ou, email=kmsc@deainc.com, c=US Date: 2017.03.15 12:06:52 -07'00'
David T. Moehl, CH, LSIT	Lead Hydrographer	03/15/2017	 Digitally signed by Dave Moehl DN: cn=Dave Moehl, o=David Evans and Associates, Inc., ou=Marine Services Division, email=dtm@deainc.com, c=US Date: 2017.03.15 12:07:44 -07'00'

F. Table of Acronyms

Acronym	Definition
AHB	Atlantic Hydrographic Branch
ASCII	American Standard Code for Information Interchange
AWOIS	Automated Wreck and Obstruction Information System
BAG	Bathymetric Attributed Grid
CH	Certified Hydrographer
CSF	Composite Source File
CTD	Conductivity Temperature Depth
DAPR	Data Acquisition and Processing Report
DEA	David Evans and Associates, Inc
DGPS	Differential Global Positioning System
DN	Day Number
DtoN	Danger to Navigation
ED	Existence Doubtful
ENC	Electronic Navigational Chart
GPS	Global Positioning System
HIPS	Hydrographic Information Processing System
HSD	Hydrographic Surveys Division
HSSD	Hydrographic Surveys Specifications and Deliverables
HVCR	Horizontal and Vertical Control Report
IHO	International Hydrographic Organization
LNM	Local Notice to Mariners
MBES	Multibeam Echo Sounder
MLLW	Mean Lower Low Water
MVP	Moving Vessel Profiler
NOAA	National Oceanic and Atmospheric Administration
NSPS	National Society of Professional Surveyors
NWLON	National Water Level Observation Network
PA	Position Approximate
PD	Position Doubtful
PE	Professional Engineer
PLS	Professional Land Surveyor

Acronym	Definition
PRF	Project Reference File
QC	Quality Control
RNC	Raster Navigational Chart
SBES	Single Beam Echo Sounder
SSS	Side Scan Sonar
TIN	Triangular Irregular Network
TPU	Total Propagated Uncertainty
USCG	United Stated Coast Guard

APPENDIX I

TIDES AND WATER LEVELS

APPENDIX I
TIDES AND WATER LEVELS

H12955
TIMES OF HYDROGRAPHY

Project: OPR-J311-KR-16
Contractor Name: David Evans and Associates, Inc.
Date: November 18, 2016
Inclusive Dates: September 11, 2016 - November 18, 2016
Field work is complete
Time (UTC)

Day Number	Date	Start Time	End Time
255	09/11/2016	21:47:10	23:40:14
256	09/12/2016	0:12:38	23:56:45
257	09/13/2016	0:30:02	1:19:45
258	09/14/2016	0:42:06	23:59:19
259	09/15/2016	0:25:54	23:59:49
260	09/16/2016	0:24:22	18:31:37
263	09/19/2016	2:40:24	12:45:37
323	11/18/2016	10:25:54	10:37:28

H12955
FINAL TIDE NOTE AND ZONING

DATE: November 18, 2016

HYDROGRAPHIC BRANCH: Atlantic Hydrographic Branch
HYDROGRAPHIC PROJECT: OPR-J311-KR-16
HYDROGRAPHIC SURVEY: H12955

LOCALITY: Southeastern Vicinity of the Chandeleur Islands
SUB-LOCALITY: 8 NM E of Chandeleur Islands

TIME PERIOD [1] : September 11, 2016 - November 18, 2016

TIDE STATIONS USED:

Station Name	Station ID	Type	Latitude	Longitude
Dauphin Island, AL	8735180	Control	30° 15.0' N	88° 4.5' W

PLANE OF REFERENCE (MEAN LOWER LOW WATER) :

8735180	0.000m

HEIGHT OF MEAN HIGH WATER ABOVE PLANE OF REFERENCE:

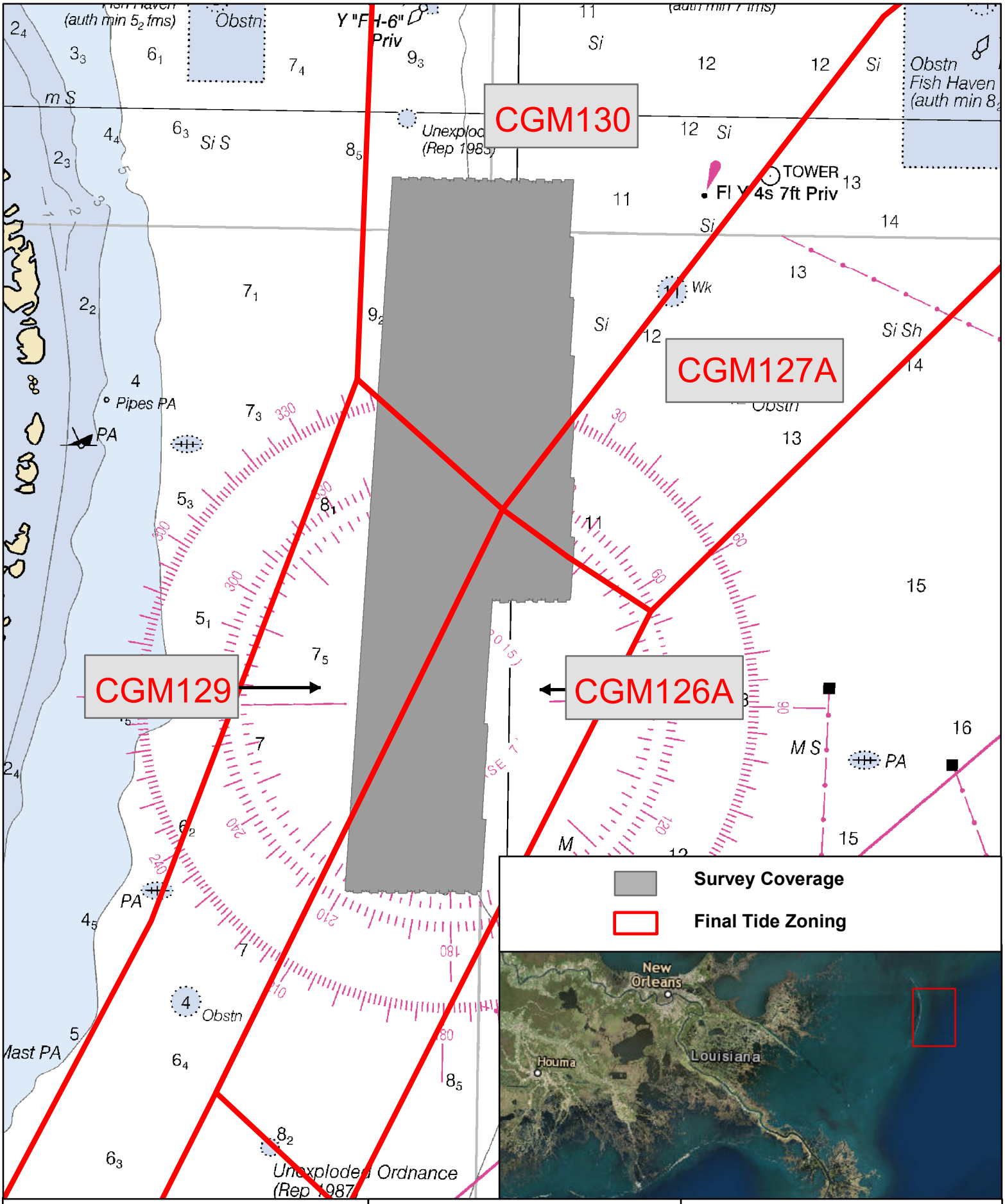
8735180	0.361m

FINAL ZONING AND TIDAL REDUCERS TO CHART DATUMN:

Zone	(Mins)	Range Ratio	Station
CGM126A	-66	1.13	8735180
CGM127A	-72	1.13	8735180
CGM129	-60	1.08	8735180
CGM130	-60	1.25	8735180

[1] Please refer to the comprehensive list in attached Times of Hydrography.

http://tidesandcurrents.noaa.gov/benchmarks.html?id=8735180



OPR-J311-KR-16
Eastern Vicinity of the Chandeleur Islands
David Evans and Associates, Inc.
Chart 11366

H12955
Final Tide Zoning

N W E S

0 0.75 1.5
Nautical Miles

APPENDIX II

SUPPLEMENTAL SURVEY RECORDS AND CORRESPONDENCE

OPR-J311-KR-16
Marine Mammal Trained Observers

David Evans and Associates, Inc.
2801 SE Columbia Way, Suite 130
Vancouver, WA 98661
Phone: 360-314-3200
Fax: 360-314-3250

Inclusive Dates: July 28, 2016 - November 18, 2016
General Locality: Southeastern Vicinity of the Chandeleur Islands

H Number	Sub Locality	Priority
H12920	Breton Sound Alternative Route 2016	1
H12921	25 NM S of Chandeleur Islands	2
H12922	25 NM SW of Chandeleur Islands	3
H12923	25 NM SE of Chandeleur Islands	4
H12924	20 NM SW of Chandeleur Islands	5
H12925	20 NM SE of Chandeleur Islands	6
H12926	10 NM SE of Chandeleur Islands	7
H12953	12 NM SE of Chandeleur Islands	8
H12954	5 NM E of Chandeleur Islands	9
H12955	8 NM E of Chandeleur Islands	10

Observer	Position	Training Video[1] Date
Alan Baker	Survey Crew	11/8/2016
Callan McGriff	Survey Crew	7/26/2016
Christine Smith	Survey Crew	8/15/2016
David Moehl	Survey Crew	7/20/2016
Jason Creech	Survey Crew	7/25/2016
Jason Seitz	Survey Crew	8/16/2016
Tim McClinton	Survey Crew	7/25/2016
Jason Dorfman	Survey Crew	7/20/2016
John Staly	Survey Crew	8/1/2016
Kathleen Schacht	Survey Crew	7/20/2016
Laura Rajnak	Survey Crew	7/28/2016
Mike Nichols	Survey Crew	7/21/2016
Pat Heidingsfelder	Survey Crew	7/26/2016
Joseph Fanslau	Survey Crew	8/12/2016
Jacob Miller	Survey Crew	9/2/2016
Rosanne Weglinski	Vessel Crew	7/25/2016
Sonja Bridges	Vessel Crew	7/25/2016
Brad Nowell	Vessel Crew	7/25/2016
JB McLendon	Vessel Crew	7/25/2016
Amber Abercrombie	Vessel Crew	9/10/2016
Harry Stutzke	Vessel Crew	8/8/2016

[1]Marine Species Awareness Training Video: https://www.youtube.com/watch?v=KKo3r1yVBBA

APPROVAL PAGE

H12955

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

The following products will be sent to NCEI for archive

- H12955_DR.pdf
- Collection of depth varied resolution BAGS
- Processed survey data and records
- H12955_GeoImage.pdf

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

Briana Welton Hillstrom

Digitally signed by HILLSTROM.BRIANA.WELTON.1267667531
Date: 2018.07.13 10:39:50 -04'00'

Approved:_____

Commander Briana W. Hillstrom, NOAA
Chief, Atlantic Hydrographic Branch