H12922

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

DESCRIPTIVE REPORT

Type of Survey:	Basic Hydrographic Survey
Registry Number:	H12922

LOCALITY

State(s):	Mississippi
General Locality:	Southeastern Vicinity of the Chandeleur Islands
Sub-locality:	25 NM SW 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

H12922

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:	**25 NM SW of Chandeleur Islands**
Scale:	**40000**
Dates of Survey:	**08/02/2016 to 08/19/2016**
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 H12922

Project: OPR-J311-KR-16

Locality: Southeastern Vicinity of the Chandeleur Islands

Sublocality: 25 NM SW of Chandeleur Islands

Scale: 1:40000

August 2016 - August 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, south of the Chandeleur Islands. Survey H12922 was conducted in accordance with the Statement of Work (July 7, 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° 33' 11.22" N 88° 59' 11.06" W	29° 26' 3.97" N 88° 52' 13.56" W

Table 1: Survey Limits

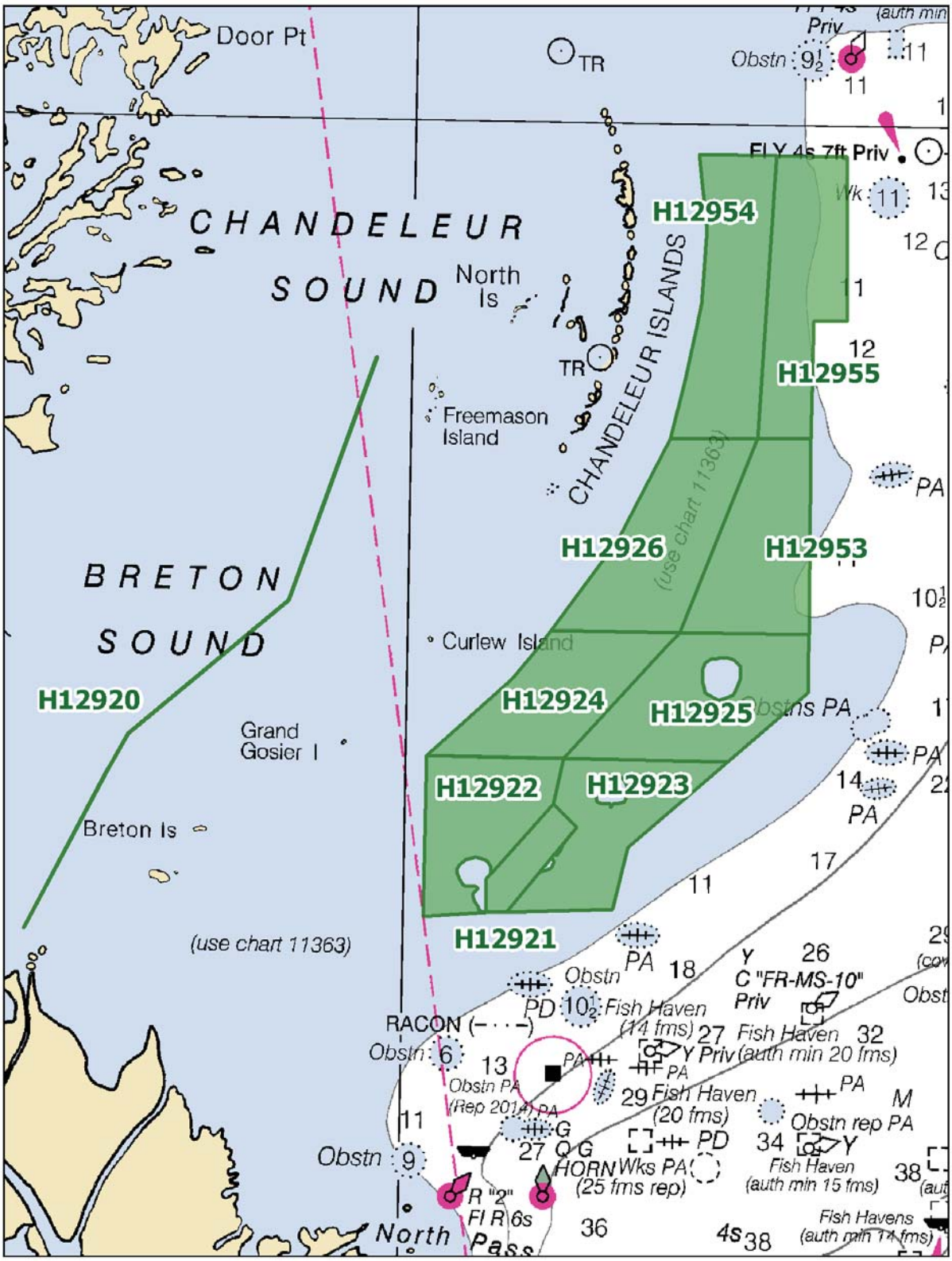


Figure 1: OPR-J311-KR-16 Assigned Survey Areas

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 125 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 percent 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 object detection resolution as required by the coverage classification. Survey coverage was obtained within the survey area depicted in the Project Reference File (PRF) OPR-J311-KR-16_PRF.000.

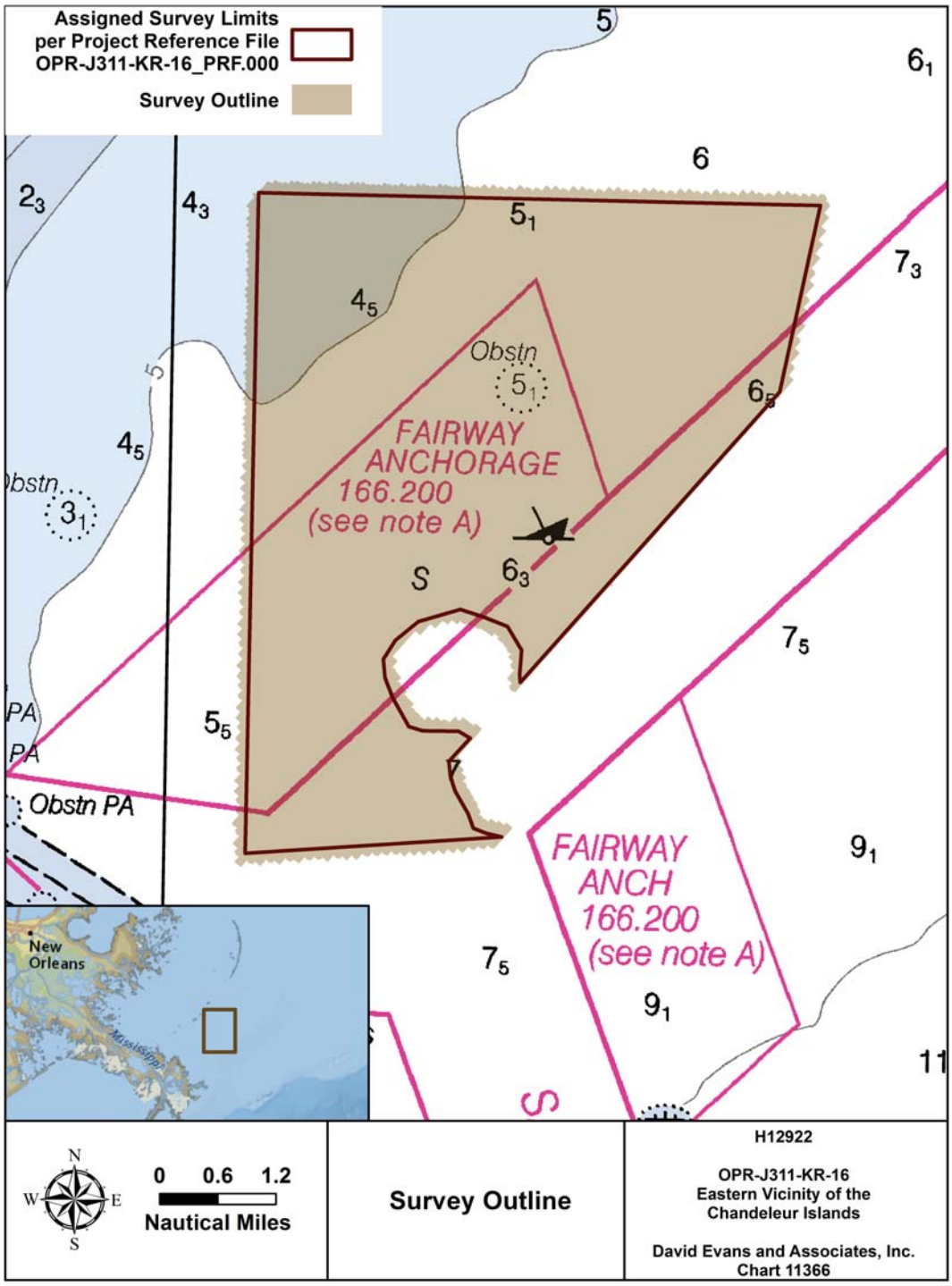


Figure 2: H12922 Survey Outline

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	10.6	10.6
	Lidar Mainscheme	0.0	0
	SSS Mainscheme	15.4	15.4
	SBES/SSS Mainscheme	0.0	0
	MBES/SSS Mainscheme	429.7	429.7
	SBES/MBES Crosslines	18.0	18
	Lidar Crosslines	0.0	0
Number of Bottom Samples			3
Number Maritime Boundary Points Investigated			0
Number of DPs			0
Number of Items Investigated by Dive Ops			0
Total SNM			28.52

Table 2: Hydrographic Survey Statistics

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

Survey Dates	Day of the Year
08/02/2016	215
08/03/2016	216
08/04/2016	217
08/05/2016	218
08/19/2016	232

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 Micro SV&P	Primary Sound Speed Profiler
AML	Micro SV Xchange	Surface Sound Speed
Sea-Bird Electronics	SEACAT SBE 19-03 CTD	Secondary Sound Speed Profiler

Table 5: Major Systems Used

B.2 Quality Control

B.2.1 Crosslines

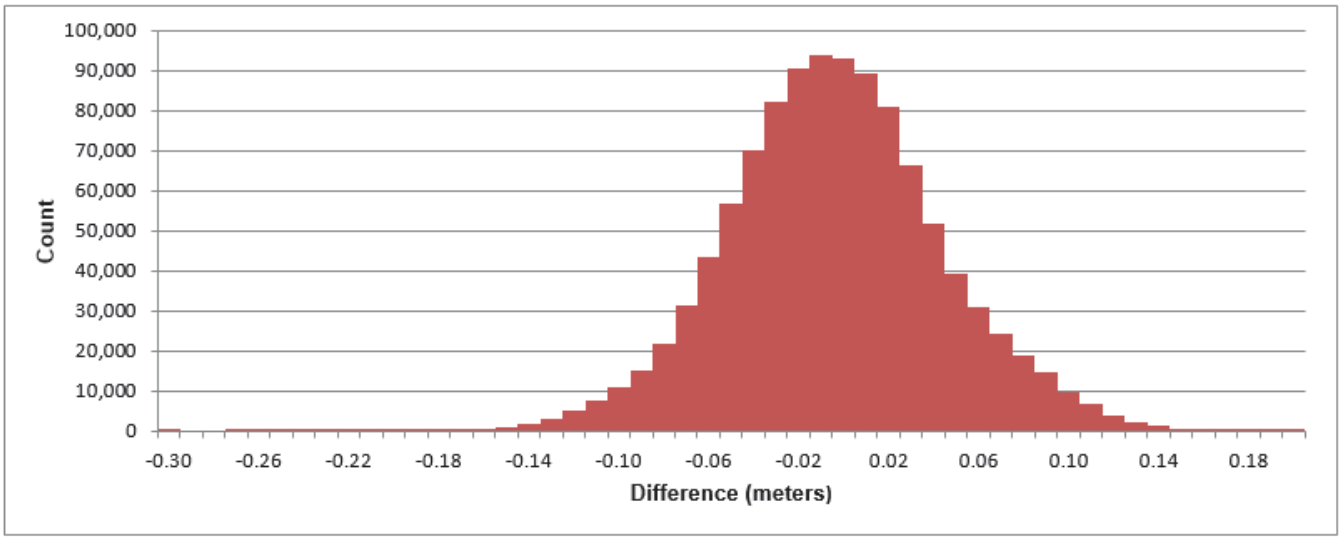
Crosslines acquired for this survey totaled 4.09% of mainscheme acquisition.

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 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. Outliers from the difference analysis were reviewed in HIPS subset editor and found to result from a combination of sound speed and tide artifacts.



Mean:	-0.001 m	Standard Deviation:	0.047 m
Minimum:	-0.302 m	Bin size:	0.01 m
Maximum:	0.207 m	Number of Nodes:	1,070,585

Figure 4: H12922 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	n/a 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 0.235 meters to 0.850 meters with a standard deviation of 0.008 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 44% to 162%. The mean allowable uncertainty for the surface is 47% with a standard deviation of 0.014.

B.2.3 Junctions

Survey H12922 junctions with surveys F00546, H12735, H12847, H12921, H12923 and H12924.

The Bathymetric Attributed Grid (BAG) for survey F00546 was downloaded from NOAA's National Centers for Environmental Information (NCEI) website for comparison with H12922. The junction analyses with surveys H12735 and H12847, which were not available on the NCEI website, used data from other sources. A preliminary BAG for survey H12735 was provided by the Hydrographic Surveys Division (HSD) for use during the junction analysis with this survey. For H12847, a copy of the CSAR surface that DEA submitted to the Atlantic Hydrographic Branch was used.

The finalized H12922 surface was compared to each junction survey by generating a difference surface with CARIS HIPS. At the time of writing, data from surveys H12923 and H12924 were still being processed. The Descriptive Reports for these respective surveys will include the junction analysis with H12922.

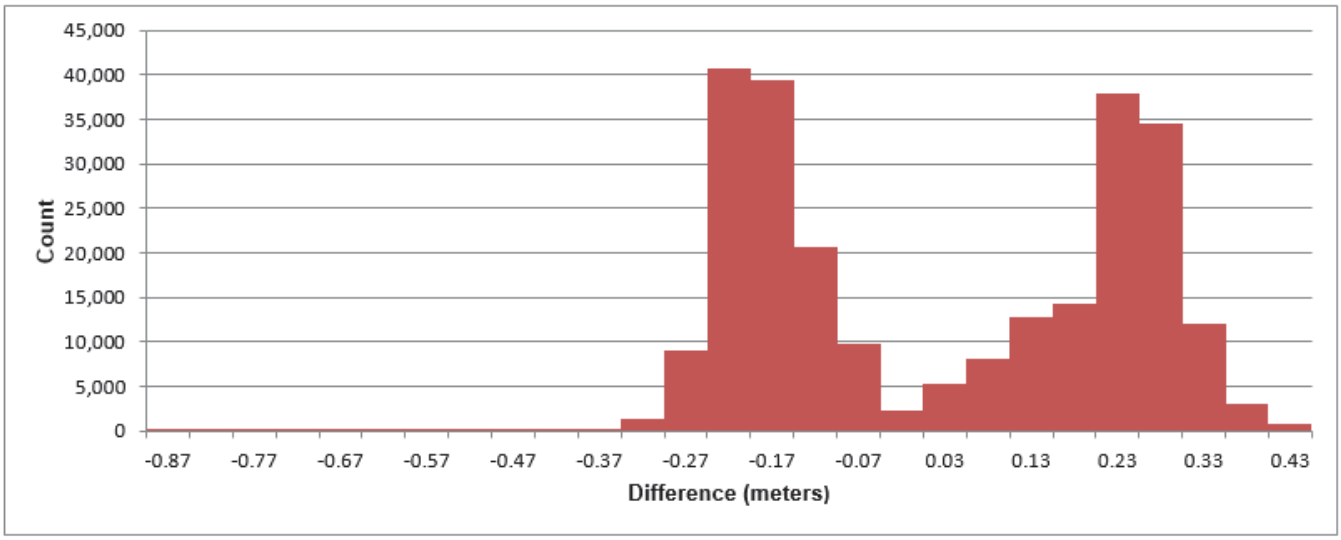
The following junctions were made with this survey:

Registry Number	Scale	Year	Field Unit	Relative Location
F00546	1:40000	2007	C & C Technologies, Inc.	E
H12735	1:20000	2015	Oceans Surveys, Inc.	S
H12847	1:20000	2015	David Evans and Associates, Inc	W
H12921	1:40000	2016	David Evans and Associates, Inc.	E
H12923	1:40000	2016	David Evans and Associates, Inc.	E
H12924	1:40000	2016	David Evans and Associates, Inc	N

Table 8: Junctioning Surveys

F00546

H12922 survey depths generally range from 24 centimeters deeper than F00546 to 24 centimeters shoaler than F00546. The bimodal distribution, observed in the histogram of differences appears to be caused by systematic errors in the F00546 survey where soundings from adjacent survey lines from the prior survey are alternately shoaler than and deeper than H12922 survey depths. The minimum (H12922 up to 88 centimeters shoaler than F00546) and maximum (H12922 up to 44 centimeters deeper than F00546) reported differences appear to result from a combination of natural seafloor change, which has occurred since the prior survey, and systematic artifacts observed in the prior survey. Without access to the prior survey's processed data the hydrographer is unable to determine the cause of the systematic offset.



Mean:	0.025 m	Standard Deviation:	0.213 m
Minimum:	-0.882 m	Bin size:	0.05 m
Maximum:	0.436 m	Number of Nodes:	252,475

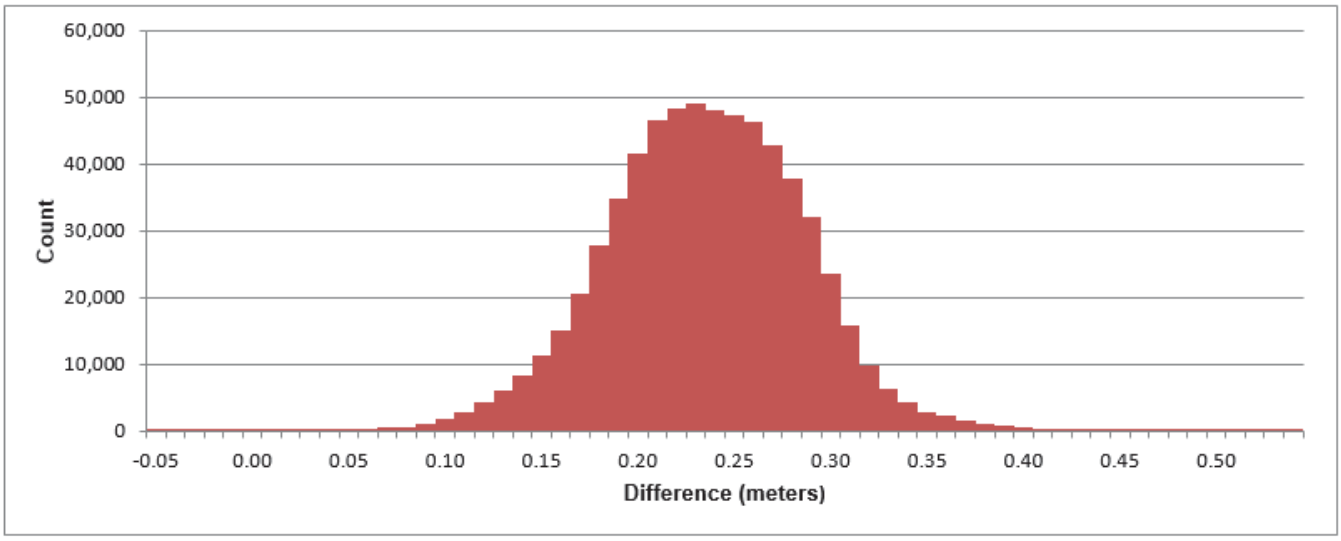
Figure 5: Junction results between H12922 1-meter and F00546 2-meter bathy grids

H12735

The mean difference between H12922 and H12735 survey depths is 24 centimeters (H12922 deeper than H12735). It appears that the bias between the two surveys results from the use of disparate tide zoning schemes. Prior survey H12735 used zoning correctors from the NWLON gauge Pilots Station East, SW Pass, LA (8760922) while survey H12922 was controlled from the NWLON gauge Dauphin Island (8735180).

DEA requested a copy of the H12735 tide zoning scheme from the HSD Operations Branch in order to investigate the bias observed between the two surveys. Zoned water levels were created for zone CGM125, which is the zone encompassing the survey junction, during the timeframe of the H12735 survey (June 2015

to July 2015). Water levels zoned from Pilots Station East to CGM125 are consistently higher than those zoned from Dauphin Island with an increasing trend in the differences over the time period of the analysis. A raw survey depth measured within zone CGM125 and corrected with data from Pilots Station East would be shoaler than the same depth corrected from Dauphin Island. A plot of the differences between the zoned water levels (with linear trend line) are presented in Figure 7.



Mean:	0.236 m	Standard Deviation:	0.051 m
Minimum:	-0.053 m	Bin size:	0.01 m
Maximum:	0.546 m	Number of Nodes:	646,237

Figure 6: Junction results between H12922 1-meter and H12735 4-meter bathy grids

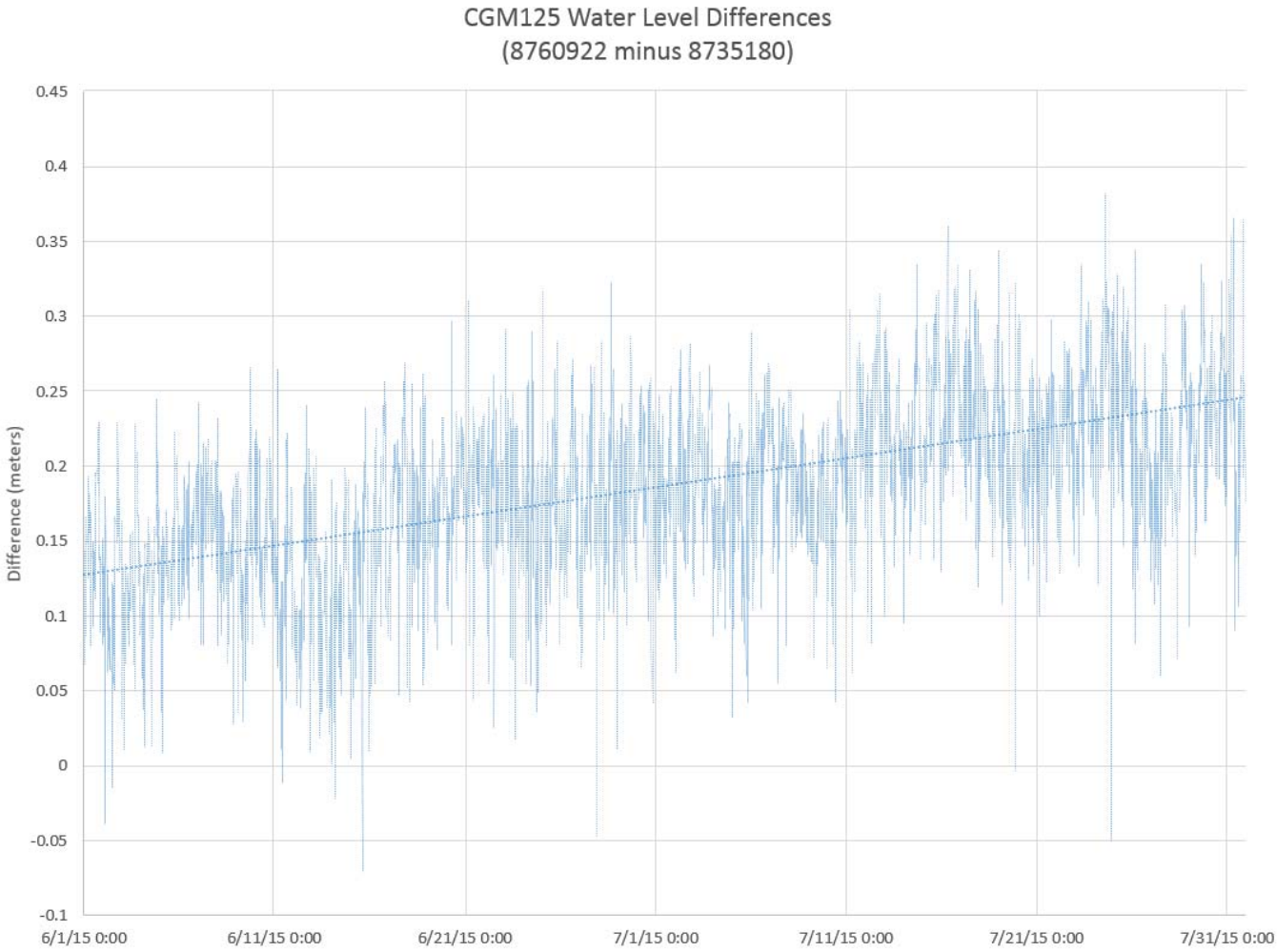
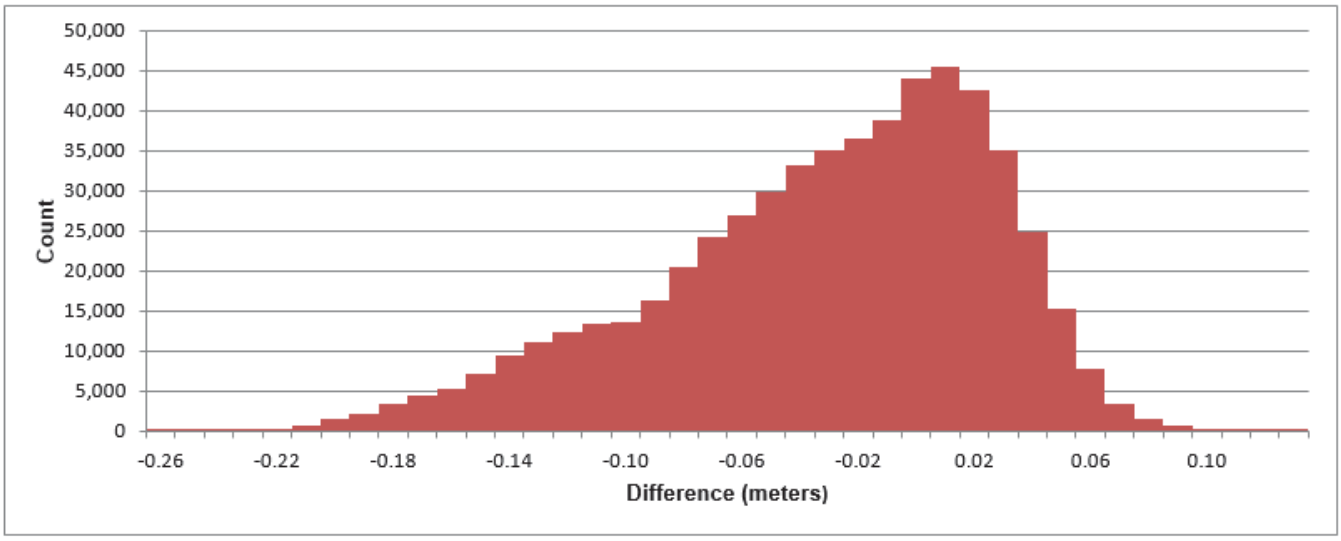


Figure 7: Zone CGM125 Water Level Differences

H12847

The mean difference between H12922 and H12847 survey depths is 3 centimeters (H12922 shoaler than H12847). The minimum and maximum differences are associated with sound speed and tide zoning artifacts.

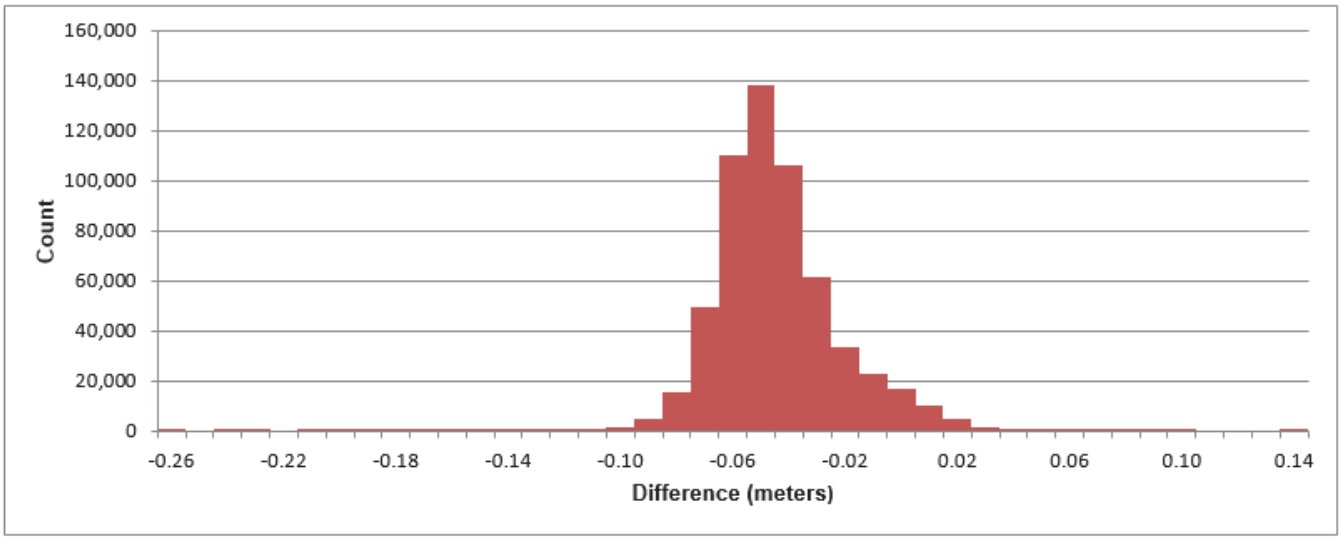


Mean:	-0.029 m	Standard Deviation:	0.057 m
Minimum:	-0.263 m	Bin size:	0.01 m
Maximum:	0.137 m	Number of Nodes:	567,421

Figure 8: Junction results between H12922 1-meter and H12847 1-meter bathy grids

H12921

The mean difference between H12922 and H12921 survey depths is 4 centimeters (H12922 shoaler than H12921). The minimum and maximum differences are associated with sound speed artifacts.



Mean:	-0.042 m	Standard Deviation:	0.021 m
Minimum:	-0.258 m	Bin size:	0.01 m
Maximum:	0.143 m	Number of Nodes:	580,764

Figure 9: Junction results between H12922 1-meter and H12921 50-centimeter bathy grids

H12923

The junction analysis between H12923 and H12922 will be included in the H12923 DR.

H12924

The junction analysis between H12924 and H12922 will be included in the H12924 DR.

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

There were no conditions or deficiencies that affected equipment operational effectiveness.

B.2.6 Factors Affecting Soundings

There were no factors that affected corrections to soundings.

B.2.7 Sound Speed Methods

Sound Speed Cast Frequency: Approximately 15-minute intervals.

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

Sound speed profiles acquired on 08/02/2016 (DN 215) were processed using the down cast portion of the profile instead of the upcast, which is the typical method reported in the DAPR. The downcast was used in order to provide a better representation of the water column sound speed.

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 Object Detection 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 99% 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 H12922 are detailed in the DAPR. A summary multibeam processing log is included in Separate I of this report.

B.3.2 Calibrations

No additional calibration tests were conducted beyond those discussed in the DAPR.

B.4 Backscatter

Multibeam backscatter was logged in Hypack 7K format and included with the H12922 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 9: 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 10: 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
H12922_MB_1m_MLLW	CUBE	1 meters	8.54 meters - 14.85 meters	NOAA_1m	Complete Coverage
H12922_MB_1m_MLLW_Final	CUBE	1 meters	8.54 meters - 14.85 meters	NOAA_1m	Finalized Complete Coverage
H12922_SSS_1m_100	Mosaic	1 meters	0 meters - 0 meters	N/A	100- percent coverage

Table 11: 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 H12922 can be found in the OPR-J311-KR-16 Horizontal and Vertical Control Report (HVCR), submitted under a separate cover. 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 12: NWLON Tide Stations

File Name	Status
8735180.tid	Verified Observed

Table 13: Water Level Files (.tid)

File Name	Status
J311KR2016RevCORP.zdf	Final

Table 14: 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 15: USCG DGPS Stations

D. Results and Recommendations

D.1 Chart Comparison

The majority of the chart comparison was performed by comparing H12922 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
11353	1:40000	8	07/2016	10/11/2016	10/22/2016
11363	1:80000	44	02/2013	10/11/2016	10/22/2016
11366	1:250000	16	06/2015	10/11/2016	10/22/2016

Table 16: Largest Scale Raster Charts

11353

Approach chart 11353 was compared to US5LA24M within the H12922 survey area. No differences were observed between the charts.

11363

Approach chart 11363 was compared to US4LA34M within the H12922 survey area. No differences were observed between the charts.

11366

General Chart was compared to US3GC04M within the H12922 survey area. No differences were observed between the charts.

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?
US5LA24M	1:40000	42	09/15/2016	09/15/2016	NO
US4LA34M	1:80000	29	01/06/2015	10/24/2016	NO
US3GC04M	1:250000	52	11/05/2014	11/03/2016	NO

Table 17: Largest Scale ENCs

US5LA24M

In general, surveyed depths range from two feet deeper to two feet shoaler than charted on ENC US5LA24M. A small area to the north is as much as six feet deeper than charted.

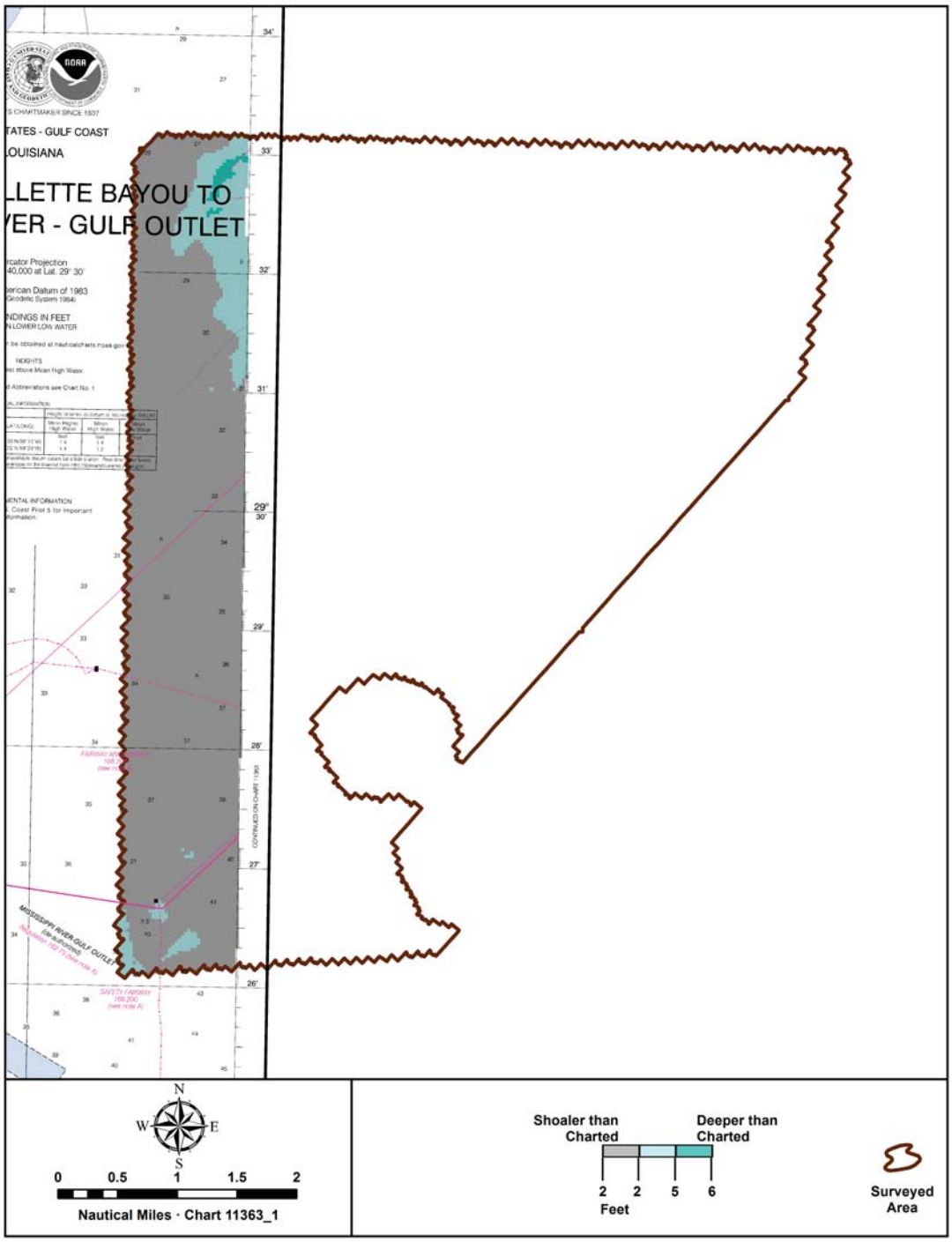


Figure 10: Depth Difference between H12922 and chart US5LA24M

US4LA34M

In general, surveyed depths range from two feet deeper to three feet shoaler than charted on ENC US4LA34M. Some areas are as much as seven feet deeper than charted.

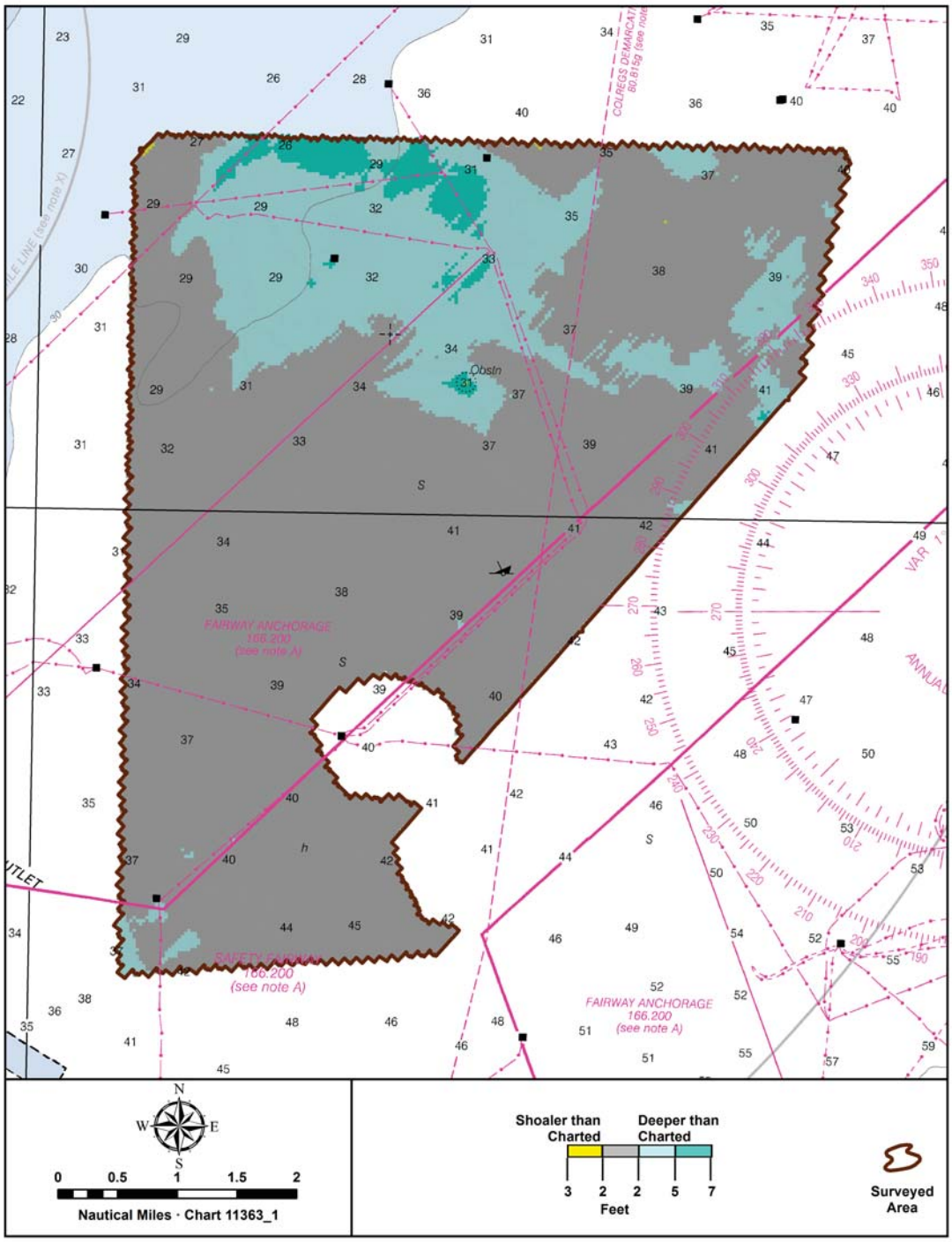


Figure 11: Depth Difference between H12922 and chart US4LA34M

US3GC04M

In general, surveyed depths range from 2 to 8 feet deeper than charted on ENC US3GC04M. The apparent shoaling in the southern end of the survey area appears to result from the inclusion of an incorrect sounding on charts US3GC04M and 11366 outside of the survey area. These charts portray a 12-fathom 5-foot sounding (equivalent to 77 feet) south of the survey area while larger scale charts 11535 and 11363 show a 41-foot sounding in this location.

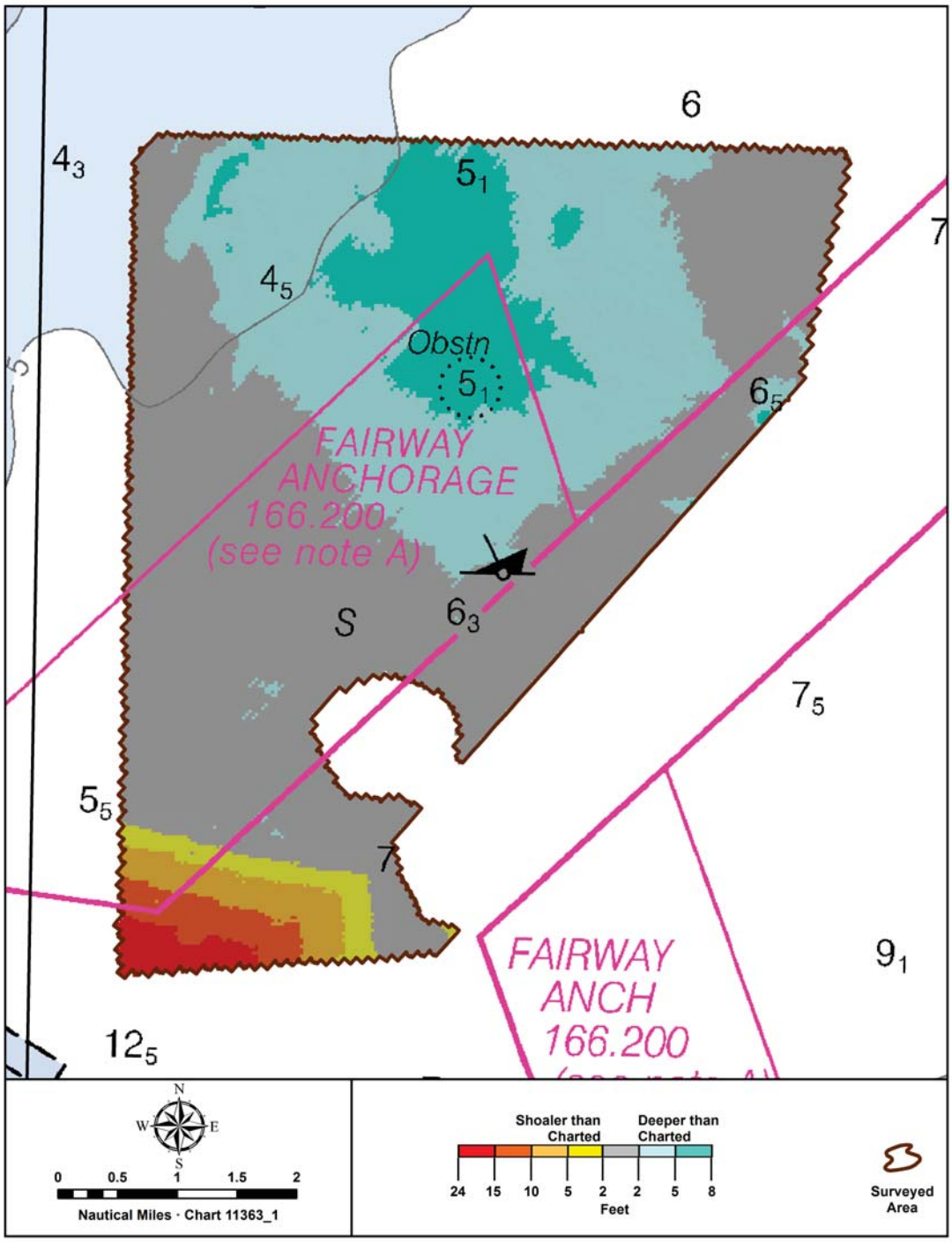


Figure 12: Depth Difference between H12922 and chart US3GC04M

D.1.3 Maritime Boundary Points

No Maritime Boundary Points were assigned for this survey.

D.1.4 Charted Features

The Wreck (showing any portion of hull or superstructure) has been disproved by the survey and is included in the FFF with a description of 'Delete'.

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

Three Dangers to Navigation (DtoNs) were submitted for this survey.

H12922 DtoN 01 reported an uncharted obstruction within the survey area. This feature has been added to the charts using preliminary survey information.

H12922 DtoN 02 and DtoN 03 reported sections of pipeline which are visibly exposed on the seabed in the multibeam 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 H12922 survey area.

D.1.8 Channels

The H12922 survey area encompasses portions of a charted safety fairway (33 CFR 166.200) and a charted fairway anchorage (33 CFR 166.200). There are no maintained navigation channels or channel lines within the survey area.

D.1.9 Bottom Samples

Three bottom samples were acquired on August 19, 2016 (DN232). 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 located within the H12922 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 H12922 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.

In some areas, there are exposed pipelines or evidence of buried pipelines in the survey data and bathymetric surfaces which are not charted. The hydrographer recommends that the charts be updated with contemporary pipeline source documentation.

No submarine cables or tunnels were charted or located within the H12922 survey area.

D.2.6 Ferry Routes and Terminals

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

D.2.7 Platforms

Three platforms are charted within the survey area. One of the three platforms was found within 80 meters (2 millimeters at survey scale) of its charted position and has been included in the FFF with a description of 'Retain'. Two 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

Approver Name	Approver Title	Approval Date	Signature
Jonathan L. Dasler, PE, PLS, CH	NSPS/THSOA Certified Hydrographer, Chief of Party	12/14/2016	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: 2016.12.14 11:28:06 -08'00'
Jason Creech, CH	NSPS/THSOA Certified Hydrographer, Charting Manager / Project Manager	12/14/2016	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: 2016.12.14 11:28:30 -08'00'
Kathleen Schacht	MBES Data Processing Manager	12/14/2016	Digitally signed by Kathleen Schacht DN: cn=Kathleen Schacht, o=David Evans and Associates, Inc., ou, email=kmsc@deainc.com, c=US Date: 2016.12.14 11:29:05 -08'00'
Dave Moehl, CH, LSIT	Lead Hydrographer	12/14/2016	Digitally signed by Dave Moehl DN: cn=Dave Moehl, o=David Evans and Associates, Inc., ou=Marine Services Division, email=dlm@deainc.com, c=US Date: 2016.12.14 11:47:52 -08'00'

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

H12922
TIMES OF HYDROGRAPHY

Project: OPR-J311-KR-16
Contractor Name: David Evans and Associates, Inc.
Date: August 13, 2016
Inclusive Dates: August 2, 2016 - August 13, 2016
Field work is complete
Time (UTC)

Day Number	Date	Start Time	End Time
215	08/02/2016	7:18:34	23:35:04
216	08/03/2016	0:43:47	23:55:12
217	08/04/2016	0:17:35	23:54:35
218	08/05/2016	0:18:20	22:10:29
226	08/13/2016	8:45:04	14:20:02

H12922
FINAL TIDE NOTE AND ZONING

DATE: August 13, 2016

HYDROGRAPHIC BRANCH: Atlantic Hydrographic Branch
HYDROGRAPHIC PROJECT: OPR-J311-KR-16
HYDROGRAPHIC SURVEY: H12922

LOCALITY: Southeastern Vicinity of the Chandeleur Islands
SUB-LOCALITY: 25 NM SW of Chandeleur Islands

TIME PERIOD [1] : August 2, 2016 - August 13, 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:

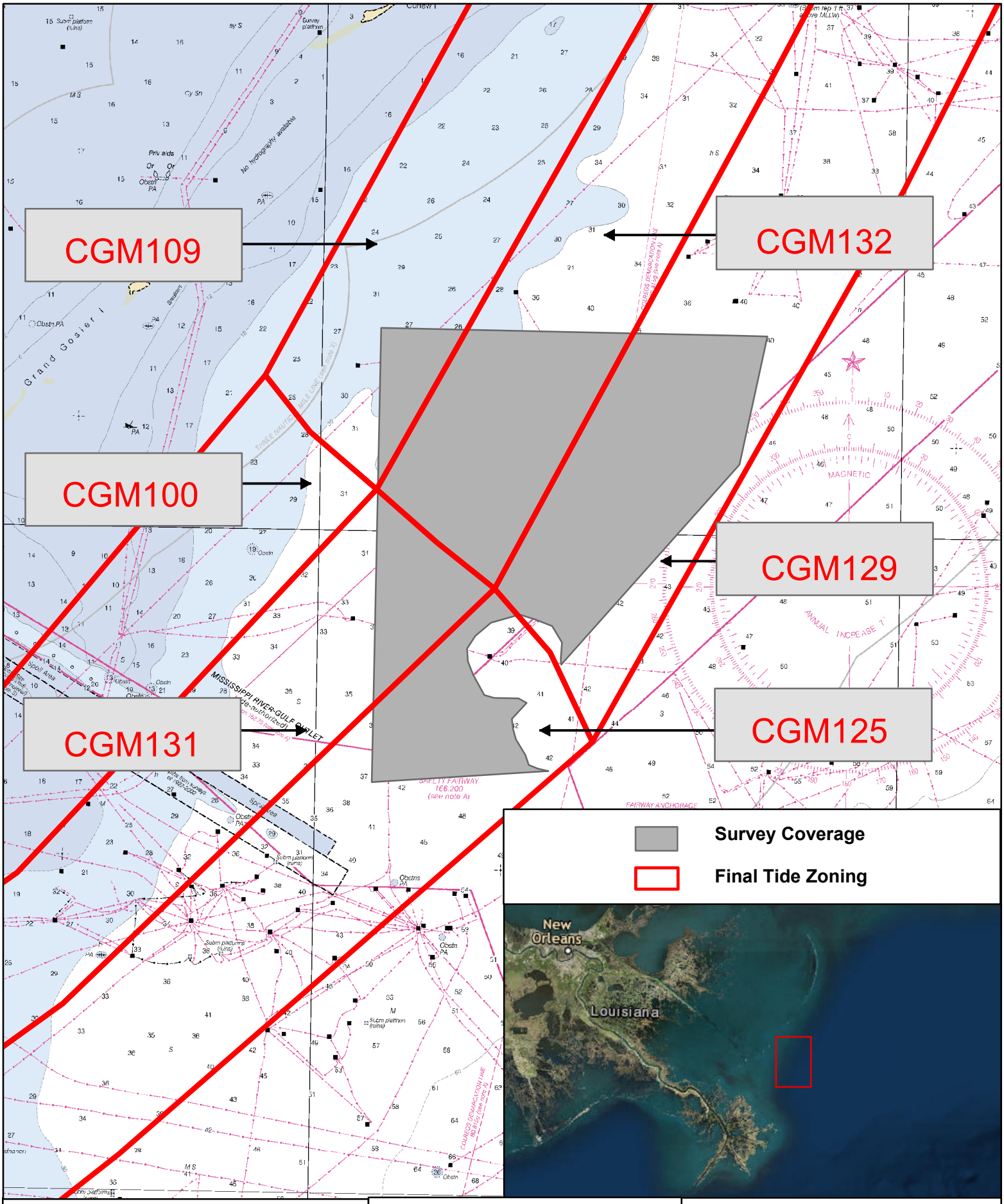
8735180	0.361m

FINAL ZONING AND TIDAL REDUCERS TO CHART DATUMN:

Zone	(Mins)	Range Ratio	Station
CGM100	-36	1.04	8735180
CGM109	-36	1.13	8735180
CGM125	-60	1.00	8735180
CGM129	-60	1.08	8735180
CGM131	-48	1.00	8735180
CGM132	-48	1.13	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 11363

H12922
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

PROJECT CORRESPONDENCE

From: Christina Fandel - NOAA Federal <christina.fandel@noaa.gov>
Sent: Wednesday, October 12, 2016 8:10 AM
To: Jason Creech
Subject: Re: Question on 2016 HSSD Holiday Spec

Hi Jason,

I apologize for my delay in response.

In regards to MBES holidays for the 100% SSS coverage with concurrent MBES requirement, gaps in MBES coverage are not considered holidays if underlying, HSSD-compliant side scan data exists. If however, underlying quality SSS data does not exist (*e.g.* within the SSS waterfall), the MBES holiday requirements does apply. In addition, all identified SSS contacts must be developed following HSSD 6.1.3.2.

Please let me know if this is unclear and feel free to provide an example if additional guidance is needed.

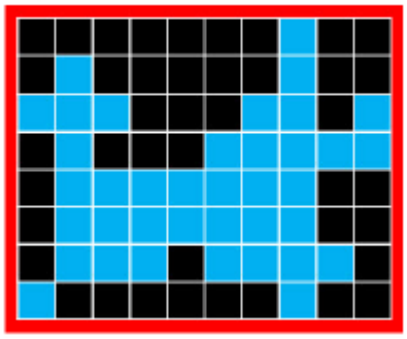
Thank you,

Christy

On Fri, Oct 7, 2016 at 8:36 AM, Jason Creech <Jasc@deainc.com> wrote:

> Good Morning Christy
>
> We have a question on the on the MBES holiday specification in the 2016 HSSD for surveys using side scan sonar coverage with concurrent multibeam.
>
> The HSSD says that the multibeam sonar data shall follow the multibeam coverage specifications excepting density requirements. This implies that holiday criteria apply which we are unsure about.
>
> It's always been our understanding that MBES holidays are allowed as long as they are not full swath along track breaks in MBES coverage.
>
> Would the example complete coverage holiday included in the 2016 HSSD require fill when there is underlying SSS coverage?

a



Thanks,

Jason

Jason Creech, CH | Senior Associate, Nautical Charting Program Manager

David Evans and Associates, Inc. | Marine Services Division | www.deamarine.com

t: 360.314.3200 | c: 804.516.7829 | jasc@deainc.com

DAVID EVANS AND ASSOCIATES INC. MARINE SERVICES

Follow us on LinkedIn | Twitter | Facebook | YouTube

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Physical Scientist
Hydrographic Surveys Division
Office of Coast Survey, NOAA
Christina.Fandel@noaa.gov

(301) 713 - 2702 x 133

From: Jon Dasler
Sent: Thursday, July 21, 2016 2:20 PM
To: Jason Creech
Subject: FW: Hydrographic Technical Directive 2016-3: Horizontal Datums for hydrographic surveys
Attachments: HTD2016-03_RevisionOfHorizontalDatum-signed.pdf

FYI

Jon L. Dasler, PE, PLS, CH | Senior Vice President, Director of Marine Services
David Evans and Associates, Inc. | Marine Services Division | www.deamarine.com
t: 360.314.3200 | c: 503.799.0168 | jld@deainc.com

From: Michael Gonsalves - NOAA Federal [mailto:michael.gonsalves@noaa.gov]
Sent: Thursday, July 21, 2016 2:10 PM
To: Michael Gonsalves - NOAA Federal
Cc: Eric Berkowitz - NOAA Federal; Richard Brennan - NOAA Federal; Lorraine Robidoux - NOAA Federal; John Nyberg - NOAA Federal; Mike Aslaksen - NOAA Federal; Samuel Greenaway; Russell Proctor - NOAA Federal; _OMAO MOP CO Rainier; _OMAO MOP CO Fairweather; CO.Thomas Jefferson - NOAA Service Account; CO.Ferdinand Hassler - NOAA Service Account; Evans, Rod E.; George Reynolds; Andrew Orthmann; Arthur Wright; David Neff; Millar, David FPI; Deam Moyles; Jon Dasler; Tara Levy; _NOS OCS HSD OPS; _NOS OCS HSD AHB; _NOS OCS HSD PHB
Subject: Hydrographic Technical Directive 2016-3: Horizontal Datums for hydrographic surveys

Greetings,

The attached Hydrographic Technical Directive (HTD) provides a revision to the horizontal datum requirement, as stated in the 2016 Hydrographic Surveys Specifications and Deliverables. This HTD changes the requirement from WGS84 to NAD83, which brings us into compliance with other civilian federal agencies (see the document for further details).

If there are any questions or concerns about meeting this specification, please consult with your HSD Project Manager or Contracting Officer's Representative.

Very respectfully,

~~ michael.gonsalves, LCDR/NOAA
HSD Operations Branch, Chief

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SERVICE
Office of Coast Survey
Silver Spring, Maryland 20910-3282

July 21, 2016 HTD 2016-03

MEMORANDUM FOR: Distribution

FROM: for Captain Eric W. Berkowitz, NOAA
Chief, Hydrographic Surveys Division

SUBJECT: Hydrographic Technical Directive 2016-03

TITLE: Revision of Horizontal Datum in 2016 HSSD

EFFECTIVE DATE: July 21, 2016

SECTION 1. PURPOSE

The 2016 HSSD horizontal datum requirement (Section 2.1) is stated as World Geodetic System of 1984 (WGS84 (G1674)). This Technical Directive changes the Horizontal datum requirement to North American Datum of 1983 (NAD 83). The purpose of this policy change is to comply with the Office of Management and Budget Circular A-16 (OMB A-16). Under OMB A-16, as a civilian federal agency responsible for a component of the National Spatial Data Infrastructure, NOAA Office of Coast Survey is required to use geodetic control, and the only geodetic control allowed under OMB A-16 is that found in the National Spatial Reference System, which includes NAD 83, but does not include WGS 84.

NAD 83 is the official civilian datum of the federal government. It is defined and accessed in a way that allows high accuracy geodetic surveying in the United States to centimeters of accuracy. WGS 84 is the official military datum of the federal government. Outside of the military, it is defined and accessed primarily through broadcast GPS orbits, providing a few meters of accuracy on the ground. The two systems differ in their geocenter by some 2.2 meters, meaning all coordinates in the two systems on the surface (latitude, longitude, height) will reflect differences in the +/- 2.2 meter level. In 2022 a new datum will replace NAD 83 built upon the international standard (the ITRF). This new datum will also align with WGS 84 at a few centimeters at that time, since WGS 84 aligns with ITRF already, making the two systems reasonably indistinguishable for many purposes. However, the replacement for NAD 83 will likely contain elements which provide stable coordinates within each tectonic plate, whereas WGS 84 does not have any plate-specific elements. While the two systems will be co-defined and aligned in 2022, they will drift apart at the rate of tectonic speeds (some few cm / year, depending on location). As such, with a defined tectonic velocity model tying the replacement for NAD 83 to the ITRF (and thus WGS 84), the National Geodetic Survey recommends users continue to use NAD 83 until its replacement is available.

SECTION 2. POLICY

This HTD modifies Section 2.1 of the 2016 HSSD. Under this revised policy, Section 2.1 now states:

"All positions will be referenced to the North American Datum of 1983 (NAD 83). This datum must be used throughout a survey project for everything that has a geographic position or for which a position is to be determined. Those documents used for comparisons, such as charts, junctional surveys, and prior surveys, must be referenced or adjusted to NAD 83. In addition, all software used on a survey must contain the correct datum parameters.

The only exception for the NAD83 datum requirement is that the S-57 feature file will be in the WGS84 datum."

SECTION 3. RESPONSIBILITIES

HSD Operations Branch to maintain HTD until change has been reviewed during the 2017 HSSD update cycle.

SECTION 4. GENERAL

(Not applicable)

SECTION 5. EFFECT ON OTHER ISSUANCES

This Directive revises Section 2.1 'Horizontal Datum' of the March 2016 NOS Hydrographic Surveys Specifications and Deliverables.

Please contact LCDR Michael Gonsalves (michael.gonsalves@noaa.gov), Chief HSD Operations Branch, with any questions or comments concerning this Directive.

Distribution:
(1) Hydrographic Surveys Division
(2) Chief, Marine Charting Division
(3) Chief, Remote Sensing Division
(4) Chief, CSDL's Hydrographic Systems and Technology Branch
(5) Chief, Navigation Services Division
(6) NOAA Ship *Rainier*
(7) NOAA Ship *Fairweather*
(8) NOAA Ship *Thomas Jefferson*
(9) NOAA Ship *Ferdinand Hassler*
(10) C&C Technologies
(11) David Evans and Associates
(12) eTrac
(13) Fugro
(14) Leidos
(15) Ocean Surveys
(16) TerraSond
(17) Williamson and Associates

From: Christina Fandel - NOAA Federal <christina.fandel@noaa.gov>
Sent: Friday, July 08, 2016 6:50 AM
To: Jason Creech; Jon Dasler
Cc: Michael Gonsalves - NOAA Federal; Corey Allen - NOAA Federal
Subject: Feature Development: Multibeam Water Column Deliverable Guidance

Jon, Jason,

In reference to feature developments via multibeam water column, please deliver raw water column data files in addition to an appropriately attributed final feature file and final grids.

If the least depth observed in the water column data is shoaler than the bathymetry, update the grid and final feature file accordingly using the water column least depth.

However, if the least depth observed in the water column data is not shoaler than the bathymetry, ensure the grid and final feature file reflect the bathymetry least depth and populate the remrks attribute of the feature with "Multibeam water column data acquired over feature did not indicate a least depth shoaler than observed in the bathymetry. Raw multibeam water column data have been included in the digital data files submission."

Thank you and please let me know if you have any questions,

Christy

--
Physical Scientist
Hydrographic Surveys Division
Office of Coast Survey, NOAA
Christina.Fandel@noaa.gov
(301) 713 - 2702 x 133

APPROVAL PAGE

H12922

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

- H12922_DR.pdf
- Collection of depth varied resolution BAGS
- Processed survey data and records
- H12922_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.

Digitally signed by HILLSTROM.BRIANA.WELTON.1267667531
Date: 2017.12.08 15:18:23 -05'00'

Approved:_____

Lieutenant Commander Briana Welton Hillstrom, NOAA
Chief, Atlantic Hydrographic Branch