H12657

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

DESCRIPTIVE REPORT

Type of Survey:	Basic Hydrographic Survey
Registry Number:	H12657

LOCALITY

State(s):	Alabama
General Locality:	Approaches to Mobile Bay
Sub-locality:	16NM South of Mobile Point

2014

CHIEF OF PARTY
Alex T. Bernier

LIBRARY & ARCHIVES

Date:

U.S. DEPARTMENT OF COMMERCE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION	REGISTRY NUMBER:
HYDROGRAPHIC TITLE SHEET	**H12657**

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):	**Alabama**
General Locality:	**Approaches to Mobile Bay**
Sub-Locality:	**16NM South of Mobile Point**
Scale:	**40000**
Dates of Survey:	**07/27/2014 to 09/13/2014**
Instructions Dated:	**04/15/2014**
Project Number:	**OPR-J312-KR-14**
Field Unit:	**Leidos (formerly SAIC)**
Chief of Party:	**Alex T. Bernier**
Soundings by:	**Multibeam Echo Sounder**
Imagery by:	**Side Scan Sonar Multibeam Echo Sounder Backscatter**
Verification by:	**Atlantic Hydrographic Branch**
Soundings Acquired in:	**meters at Mean Lower Low Water**

Remarks:

Contract: DG133C-08-CQ-0003.

Contractor: Leidos, 221 Third Street, Newport, RI 02840 USA

Subcontractor: Divemasters, Inc., 15 Pumpshire Road, Toms River, NJ 08753

Leidos Doc 15-TR-007

All times were recorded in UTC.

Data were collected in UTM Zone 16

Table of Contents

List of Tables

List of Figures

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/.

Descriptive Report to Accompany Survey H12657

Project: OPR-J312-KR-14

Locality: Approaches to Mobile Bay

Sublocality: 16NM South of Mobile Point

Scale: 1:40000

July 2014 - September 2014

Leidos (formerly SAIC)

Chief of Party: Alex T. Bernier

A. Area Surveyed

The area surveyed was a section of Mobile Bay Approaches off Alabama (Figure 1).

A.1 Survey Limits

Data were acquired within the following survey limits:

Northwest Limit	Southeast Limit
30° 04’ 31.50” N 088° 00’ 06.72” W	29° 54’ 10.60” N 087° 49’ 15.71” W

Table 1: Survey Limits

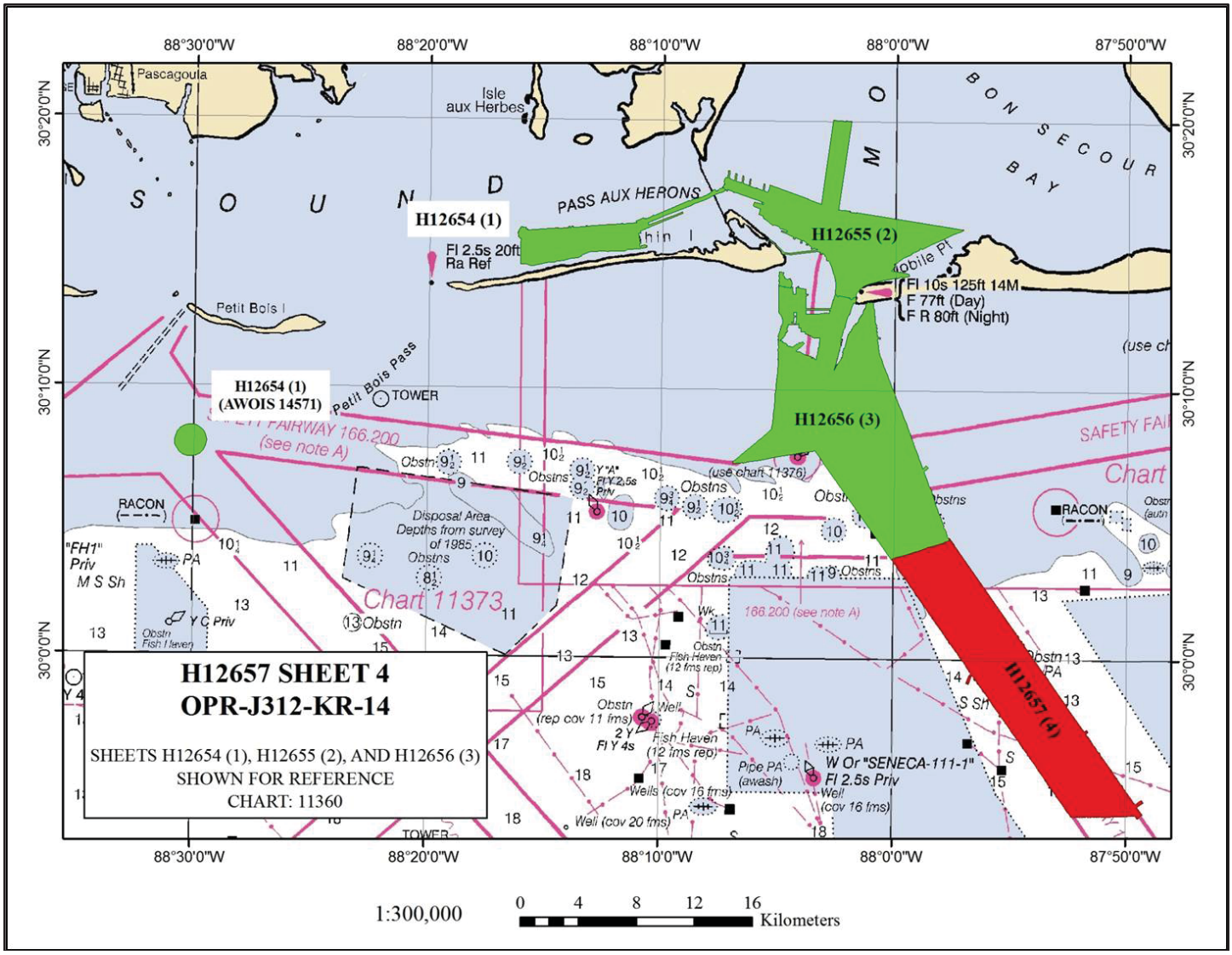


Figure 1: H12657 Survey Bounds

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

A.2 Survey Purpose

The purpose of this survey is to update existing NOS nautical charts. This project will cover approximately 100 square nautical miles in the Approaches to Mobile Bay as designated in NOAA Hydrographic Survey Priorities, 2013 edition.

A.3 Survey Quality

The entire survey is adequate to supersede previous data.

Leidos, formerly Science Applications International Corporation (SAIC), warrants only that the survey data acquired by Leidos and delivered to NOAA under Contract DG133C-08-CQ-0003 reflects the state of the sea floor in existence on the day and at the time the survey was conducted.

H12657 was surveyed in accordance with the following documents:
1. Project Instructions, OPR-J312-KR-14, dated 15 April 2014
2. NOS Hydrographic Survey Specifications and Deliverables, April 2014
3. OPR-J312-KR-14 Statement of Work, dated 10 March 2014

A.4 Survey Coverage

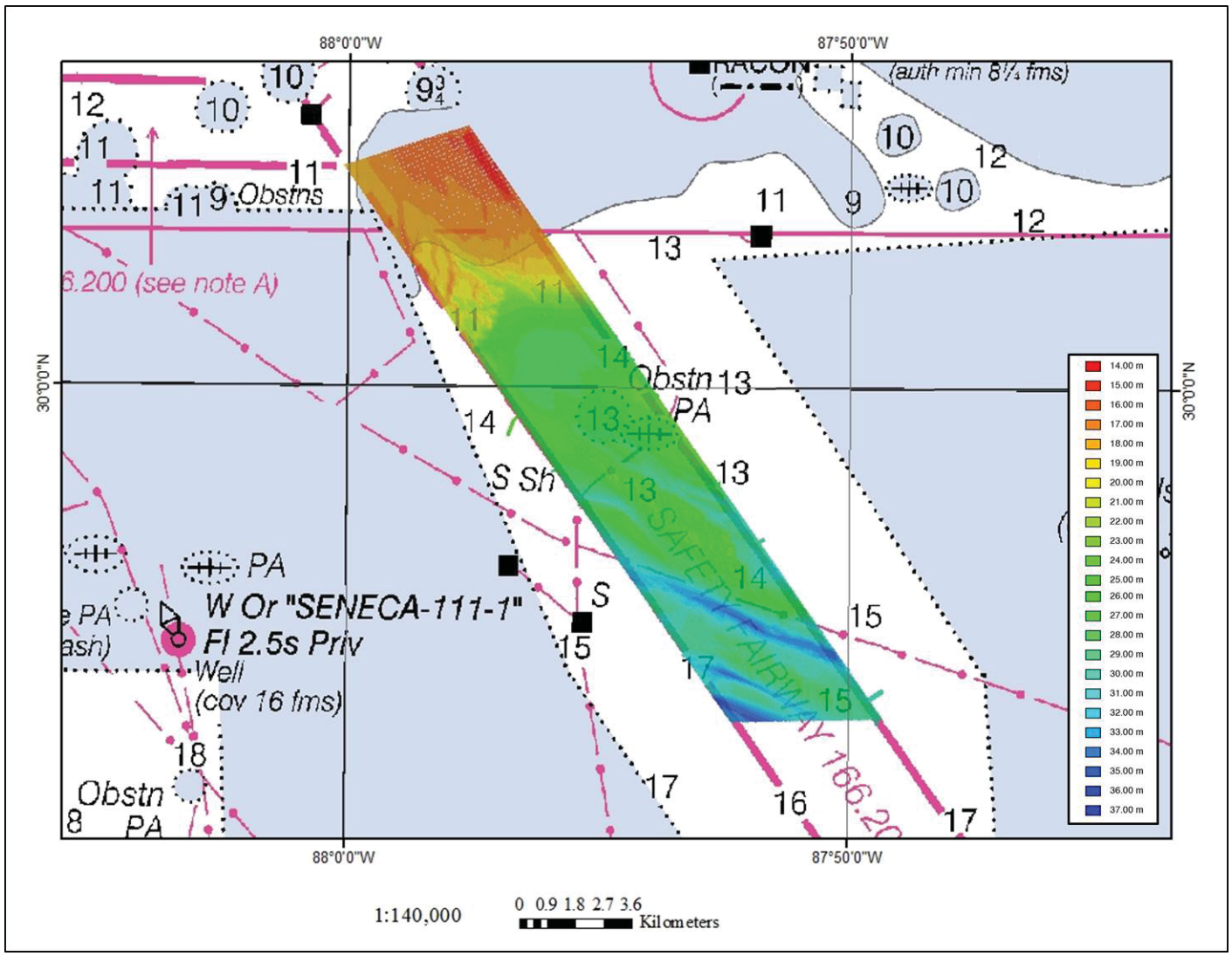


Figure 2: Final Bathymetry Coverage for H12657

Survey Coverage was in accordance with the requirements in the Project Instructions and the HSSD.

A.5 Survey Statistics

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

	HULL ID	*M/V Atlantic Surveyor*	*Total*
LNM	**SBES Mainscheme**	0	0
	MBES Mainscheme	0	0
	Lidar Mainscheme	0	0
	SSS Mainscheme	0	0
	SBES/MBES Combo Mainscheme	0	0
	SBES/SSS Combo Mainscheme	0	0
	MBES/SSS Combo Mainscheme	938.01	938.01
	SBES/MBES Combo Crosslines	78.73	78.73
	Lidar Crosslines	0	0
Number of Bottom Samples			7
Number AWOIS Items Investigated			0
Number Maritime Boundary Points Investigated			0
Number of DPs			0
Number of Items Items Investigated by Dive Ops			0
Total Number of SNM			27.3

Table 2: Hydrographic Survey Statistics

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

Survey Dates	Julian Day Number
07/27/2014	208
07/28/2014	209
07/29/2014	210
07/30/2014	211
07/31/2014	212
08/01/2014	213
08/02/2014	214
08/03/2014	215
08/04/2014	216
08/05/2014	217
08/06/2014	218
09/10/2014	253
09/11/2014	254
09/12/2014	255
09/13/2014	256

Table 3: Dates of Hydrography

B. Data Acquisition and Processing

B.1 Equipment and Vessels

Leidos used their ISS-2000 software on a Windows 7 platform to acquire these survey data. Survey planning and data analysis were conducted using the Leidos SABER software on Red Hat Enterprise 6 Linux platforms. L-3 Klein 3000 side scan data were collected on a Windows 7 platform using L-3 Klein's SonarPro software. Subsequent processing and review of the side scan data, including the generation of coverage mosaics, were accomplished using SABER.

A detailed description of the systems and vessel used to acquire and process these data is included in the Data Acquisition and Processing Report (DAPR) for OPR-J312-KR-14, delivered on 16 January 2015. There were no variations from the equipment configuration described in the DAPR.

B.1.1 Vessels

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

Hull ID	*M/V Atlantic Surveyor*
LOA	110 feet
Draft	9 feet

Table 4: Vessels Used

The M/V Atlantic Surveyor was used to collect multibeam sonar (RESON 7125 SV), side scan sonar (L-3 Klein 3000), and sound speed data during twenty-four hours per day survey operations.

A detailed description of the vessel used is included in Section A of the Data Acquisition and Processing Report (DAPR).

B.1.2 Equipment

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

Manufacturer	Model	Type
RESON	SeaBat 7125 SV	MBES
L-3 Klein	3000	SSS
Applanix	POS/MV 320	Positioning and Attitude System
Trimble	Probeacon	Positioning System
Brooke Ocean Technology	MVP-30	Sound Speed System

Table 5: Major Systems Used

A detailed description of the equipment installed is included in Section A of the Data Acquisition and Processing Report (DAPR).

B.2 Quality Control

B.2.1 Crosslines

Crosslines, acquired for this survey, totalled 8.39% of mainscheme acquisition.

There were 78.73 linear nautical miles of crosslines and 938.01 linear nautical miles of mainscheme lines surveyed on H12657. This resulted in crossline mileage approximately 8.39% of the mainscheme mileage which meets the requirement (Section 5.2.4.3 of the HSSD) to achieve at least eight percent for a multibeam survey using set line spacing. H12657 requirements were for set line spacing in water depths 4 meters to 20 meters and complete multibeam coverage in depths greater than 20 meters. The greater of the two requirements for crossline comparisons defined in Section 5.2.4.3 of the HSSD was therefore used. The mainscheme lines were orientated 145°/325° and spaced 55 meters apart. Crosslines were oriented 55°/235° and spaced 675 meters apart. Refer to the "Multibeam Processing Log" section within Separates I for information on the delineation of mainscheme and crossline data files.

In the field, hydrographers conducted daily comparisons of mainscheme to near nadir crossline data to ensure that no systematic errors were introduced and to identify potential problems with the survey systems. After the application of all correctors and completion of final processing in the office, separate two-meter CUBE PFM grids were built. One grid contained the full valid swath (±60° from nadir) of mainscheme multibeam and the other included only the near nadir swath (±5° from nadir) crossline data. Difference grids were then generated by subtracting one grid from the other.

The SABER Frequency Distribution Tool was used to analyze the difference grids. All comparisons fell within the requirement defined in Section 5.2.4.3 of the HSSD which states that at least 95% of the depth difference values are to be within the maximum allowable total vertical uncertainty. Figure 3 summarizes the comparison results. See Separates II for a complete discussion of the analysis and tabular results.

DIFFERENCE GRID	IHO 1A Maximum Allowable Uncertainty (Meters) for the Range of Depths	Percent of Depth Differences Less than IHO Order 1A Maximum
M/V Atlantic Surveyor RESON 7125 SV Multibeam Crossline (Class 1) to Mainscheme	0.537 – 0.687	100

Figure 3: Summary of Crossing Analysis

B.2.2 Uncertainty

The Total Propagated Uncertainty (TPU) model that Leidos has adopted had its genesis at the Naval Oceanographic Office (NAVOCEANO), and is based on the work by Rob Hare and others ("Error Budget Analysis for NAVOCEANO Hydrographic Survey Systems, Task 2 FY 01", 2001, HSRC FY01 Task 2 Final Report). Once the TPU model is applied to the GSF bathymetry data, each beam is attributed with the horizontal uncertainty and the vertical uncertainty at the 95% confidence level. For specific details on the use and application of the SABER Total Propagated Uncertainty model, see Section B.1 in the DAPR.

The vertical and horizontal uncertainty values that were estimated by the TPU model for individual multibeam soundings varied little across the dataset, tending to be most affected by beam angle. During application of horizontal and vertical uncertainties to the GSF files, individual beams where either the horizontal or vertical uncertainty exceeded the maximum allowable IHO S-44 5th Edition Order 1a specifications were flagged as invalid. As a result, all individual soundings used in development of the final CUBE depth surface had modeled vertical and horizontal uncertainty values at or below the allowable IHO S-44 5th Edition, Order 1a uncertainty.

During the creation of the CUBE surface, two separate vertical uncertainty surfaces are calculated by the SABER software. One surface contains the standard deviation of all soundings that are contributing to the CUBE hypothesis (Hyp. StdDev) and the other contains the average of the vertical uncertainty of all soundings contributing to the CUBE hypothesis (Hyp. AvgTPE). A third vertical uncertainty surface is generated from the larger value of these two uncertainties at each node and is referred to as the Hypothesis Final Uncertainty. For specific details on this process see Section B.2 of the DAPR.

The final two-meter PFM CUBE surface contained final vertical uncertainties that ranged from 0.470 to 0.987 meters. The IHO Order 1a maximum allowable vertical uncertainty was calculated to range between 0.535 to 0.693 meters, based on the minimum CUBE depth (14.536 meters) and maximum CUBE depth (36.937 meters). The SABER Check PFM Uncertainty function was used to highlight all instances in the Hypothesis Final Uncertainty surface where a given node exceeded the IHO Order 1a allowable vertical uncertainty for the CUBE depth at that node. The final two-meter PFM CUBE surface contained 77 individual CUBE nodes with final vertical uncertainties that exceeded IHO Order 1a allowable vertical uncertainty. The nodes that exceed the IHO Order 1a allowable vertical uncertainty for the CUBE depth are located on steep slopes and around features where there is a high variability in the depth soundings.

The SABER Check PFM Uncertainty function was also run on each of the 27 half-meter feature PFM Hypothesis Final Uncertainty surfaces. The results are listed in Figure 4. As expected, there are higher numbers of nodes that exceed uncertainty limits due to the smaller node resolution and the high variability of sounding depths around features.

The SABER Frequency Distribution Tool was used to review the Hypothesis Final Uncertainty surface within the final two-meter PFM grid and the 27 half-meter resolution PFM grids. The results show that in the final two-meter PFM grid, 99.93% of all nodes had final uncertainties less than or equal to 0.500 meters. In the 27 individual feature PFM grids, at least 99.41% of all grid nodes contained total vertical uncertainties of 0.500 meters or less.

Feature Area	Feature Number(s)	Number of CUBE Nodes Exceeding IHO Order 1a	Percent of Nodes with TVU <= 0.500 (Meters)
1	92, 93	51	99.82
2	4, 66	113	99.45
3	6, 89, 91	42	99.89
4	8, 52, 67	32	99.91
5	9, 42	48	99.81
6	10	7	99.95
7	12, 16, 96	44	99.89
8	14	25	99.73
9	19, 59, 64	33	99.89
10	21	15	99.88
11	22	28	99.81
12	25, 45	46	99.75
13	27, 28	79	99.71
14	29, 30, 31, 34	138	99.73
15	32, 33	71	99.75
16	35, 36, 37	67	99.83
17	38, 39	25	99.91
18	47, 48	38	99.83
19	53	6	99.95
20	54, 55, 56	43	99.87
21	74, 75	29	99.87
22	77	10	99.81
23	80	13	99.90
24	82	49	99.41
25	84	24	99.80
26	85, 86, 87	80	99.77
27	98, 100, 101, 103	39	99.91

Figure 4: Number of Nodes Exceeding the Allowable IHO Order 1a Uncertainty in the Feature BAG Files 1 of 27 through 27 of 27

B.2.3 Junctions

An analysis of H12657 junctions with contemporary survey H12656 was performed. Figure 5 shows the general locality of H12657 as it relates to the sheet for which junction was performed. Details for H12656 are listed in Table 6. See Separates II for a complete discussion of the junction results and tabular listings.

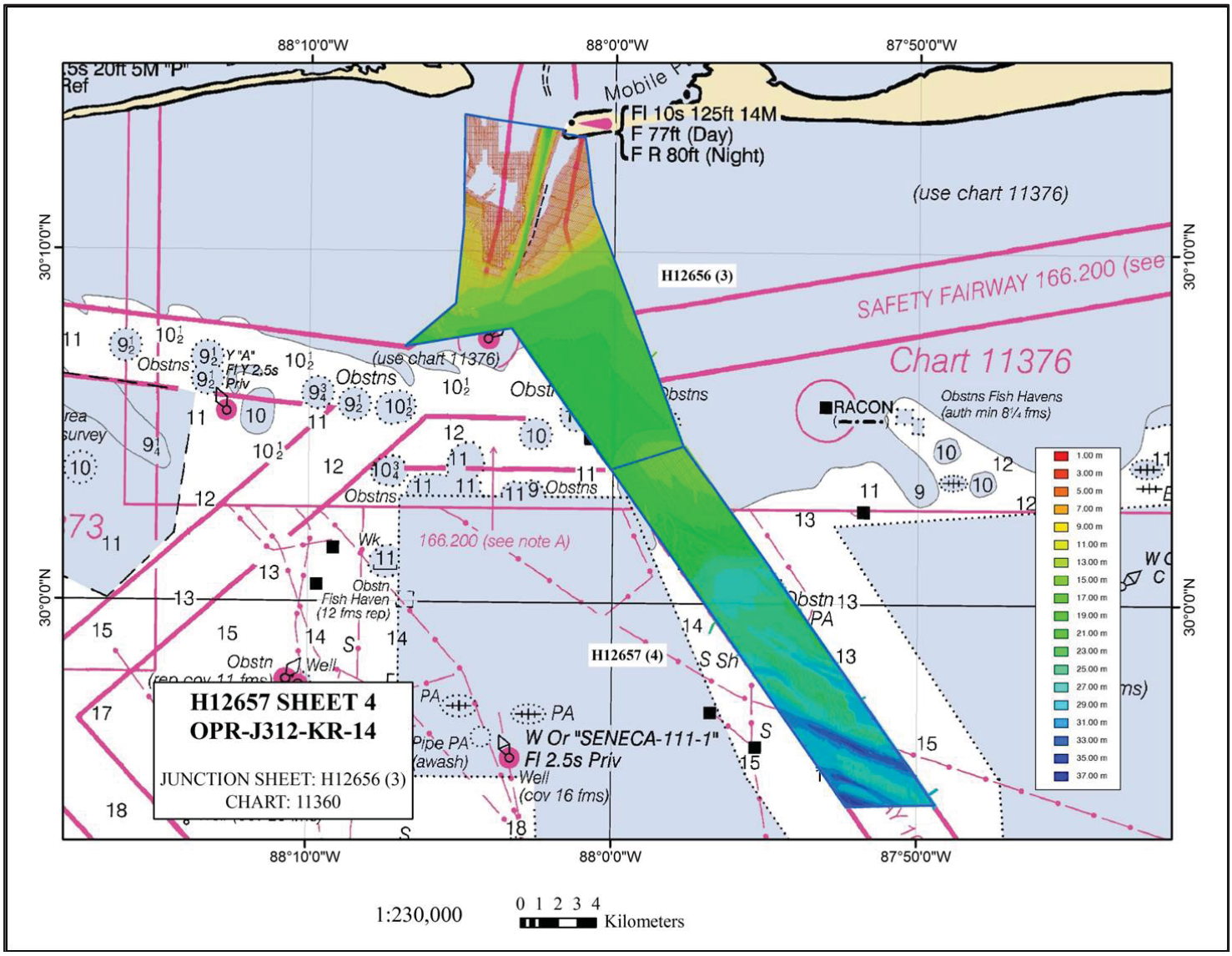


Figure 5: General Locality of H12657 with Contemporary Survey H12656

The following junctions were made with this survey:

Registry Number	Scale	Year	Field Unit	Relative Location
H12656	1:20000	2014	Leidos	N

Table 6: Junctioning Surveys

H12656

H12657 junctions with H12656 to the north; 95.21% of the comparisons agreed within ±0.12 meters.

B.2.4 Sonar QC Checks

Sonar system quality control checks were conducted as detailed in the quality control section of the DAPR.

B.2.5 Equipment Effectiveness

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

B.2.6 Factors Affecting Soundings

There were no other factors that affected corrections to soundings.

B.2.7 Sound Speed Methods

Sound Speed Cast Frequency: On the M/V Atlantic Surveyor, the MVP-30 was used to collect sound speed profile (SSP) data. SSP data were obtained at intervals frequent enough to meet depth accuracy requirements. Section 5.2.3.3 of the HSSD requires that if the sound speed measured at the sonar head differs by more than two meters/second from the commensurate profile data, then another cast shall be acquired. There were times when the sound speed values exceeded the two meters/second threshold due to the local temporal and tidal variability. During these times, several profiles were acquired and reapplied in an effort to reduce these effects. The product of this effort resulted in the final data bearing no significant artifacts due to sound speed differences.

Additional information can be found in Section A.7 of the DAPR.

A total of 233 sound speed profiles were applied to online data for H12657. All profiles that were applied for online bathymetry data collection were acquired within one kilometer of the bounds of the survey area. Please refer to the DAPR for specific details regarding acquisition (Section A.7) and application (Section C.1.3) of sound speed profiles.

Confidence checks of the sound speed profile casts were conducted by comparing at least two consecutive casts taken with different SV&P Smart Sensors. Five sound speed confidence checks were conducted during H12657 and the results can be found in Separates II within the “Comparison Cast Log” section.

Sound speed profiles were obtained for four different survey purposes. The “Sound Speed Profile Log” section of Separates II is a cumulative report detailing each cast associated with H12657. The log is separated by the purpose of the applied cast, with individual tables for; “Used for Bathymetry” (online bathymetry), “Used for Comparison”, “Used for Lead Line”, and “Used for Closing”. Additionally, in a

separate folder on the delivery drive (H12657/Data/Processed/SVP/CARIS_SSP), there are four files (.svp) for the MVP sound speed data. These files contain concatenated SSP data that have been formatted for use in CARIS. The CARIS SSP files are designated based on the purpose of the cast and their filenames match the tables within the "Sound Speed Profile Log". All sound speed profile files are delivered with the H12657 data and are broken out into sub-folders, which correspond to the purpose of each cast.

B.2.8 Coverage Equipment and Methods

All equipment and survey methods were used as detailed in the DAPR.

B.2.9 Coverage Analysis

The Project Instructions specified coverage in depths between 4 meters and 20 meters as "200% SSS with concurrent Set Line Spacing SBES or MBES, or Object Detection MBES" and in depths greater than 20 meters as "Complete MBES with Backscatter". To achieve this coverage, the M/V Atlantic Surveyor used a towed L-3 Klein 3000 side scan sonar set to a 75-meter range scale. Mainscheme line spacing was 55-meters which ensured complete multibeam coverage in waters greater than 20 meters. While side scan data were not required in water depths greater than 20 meters, for efficiency, side scan data were collected throughout the entire survey area.

This combination of line spacing and range settings resulted in 10 to 35 meters of overlap between adjacent lines to ensure at least 200% side scan coverage was achieved and that in depths greater than 20 meters complete MBES coverage was achieved. Multibeam backscatter data were acquired for all water depths.

The SABER Gapchecker routine was used to flag multibeam data gaps exceeding the allowable limit of three contiguous nodes. Additionally, the entire surface was visually scanned for holidays at various points during the data processing effort. Additional survey lines were run to fill any holidays that were detected. A final review of the CUBE Depth surface in the two-meter PFM grid containing all multibeam showed that there were no areas where three or more nodes sharing adjacent sides lacked data.

A final review of the CUBE Depth surface in the 27 half-meter PFM grids showed that there were no areas where three or more nodes sharing adjacent sides lacked data over significant features.

All PFM grids were examined for the number of soundings contributing to the chosen CUBE hypotheses for each node by running SABER's Frequency Distribution Tool on the Hypothesis Number of Soundings (Hyp # Soundings) surface of each PFM grid. The Hyp # Soundings surface reports the number of soundings that were used to compute the chosen hypothesis. Analysis of the H12657 final two-meter PFM grid in water depths less than 20 meters revealed that 99.84% of all nodes contained three or more soundings; satisfying the requirements for set line spacing surveys, as specified in Section 5.2.2.3 of the HSSD. In addition analysis of the final two-meter PFM grid in water depths greater than 20 meters revealed that 99.97% of all nodes contained five or more soundings; satisfying the requirements for complete coverage, as specified in Section 5.2.2.2 of the HSSD.

Analysis of the 27 half-meter PFM grids showed that at least 96.36% of all populated nodes contained five or more soundings; satisfying the requirements for object detection coverage (HSSD Section 5.2.2.1).

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

In accordance with the April 2014 NOS HSSD and Project Instructions, Leidos collected multibeam backscatter with all GSF data acquired by the RESON 7125 SV. The multibeam settings used were checked to ensure acceptable quality standards were met and to avoid any acoustic saturation of the backscatter data. The multibeam backscatter data acquired were written to the GSF in real-time by ISS-2000 and are delivered in the final GSF files for this sheet.

B.5 Data Processing

B.5.1 Software Updates

There were no software configuration changes after the DAPR was submitted.

The following Feature Object Catalog was used: NOAA Extended Attribute File V5-2.

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
H12657_MB_2m_MLLW	BAG	2 meters	14.536 meters - 36.937 meters	N/A	MBES TracklineSBES Set Line Spacing

Surface Name	Surface Type	Resolution	Depth Range	Surface Parameter	Purpose
H12657_MB_50cm_MLLW_1of27	BAG	50 centimeters	23.484 meters - 25.956 meters	N/A	Object Detection
H12657_MB_50cm_MLLW_2of27	BAG	50 centimeters	26.748 meters - 30.871 meters	N/A	Object Detection
H12657_MB_50cm_MLLW_3of27	BAG	50 centimeters	23.754 meters - 28.127 meters	N/A	Object Detection
H12657_MB_50cm_MLLW_4of27	BAG	50 centimeters	26.298 meters - 30.721 meters	N/A	Object Detection
H12657_MB_50cm_MLLW_5of27	BAG	50 centimeters	22.550 meters - 27.069 meters	N/A	Object Detection
H12657_MB_50cm_MLLW_6of27	BAG	50 centimeters	25.548 meters - 27.139 meters	N/A	Object Detection
H12657_MB_50cm_MLLW_7of27	BAG	50 centimeters	24.508 meters - 27.651 meters	N/A	Object Detection
H12657_MB_50cm_MLLW_8of27	BAG	50 centimeters	15.382 meters - 16.946 meters	N/A	Object Detection
H12657_MB_50cm_MLLW_9of27	BAG	50 centimeters	25.860 meters - 30.492 meters	N/A	Object Detection
H12657_MB_50cm_MLLW_10of27	BAG	50 centimeters	26.790 meters - 29.603 meters	N/A	Object Detection
H12657_MB_50cm_MLLW_11of27	BAG	50 centimeters	23.838 meters - 27.384 meters	N/A	Object Detection
H12657_MB_50cm_MLLW_12of27	BAG	50 centimeters	22.950 meters - 26.887 meters	N/A	Object Detection
H12657_MB_50cm_MLLW_13of27	BAG	50 centimeters	15.849 meters - 18.959 meters	N/A	Object Detection

Surface Name	Surface Type	Resolution	Depth Range	Surface Parameter	Purpose
H12657_MB_50cm_MLLW_14of27	BAG	50 centimeters	14.536 meters - 18.794 meters	N/A	Object Detection
H12657_MB_50cm_MLLW_15of27	BAG	50 centimeters	14.767 meters - 17.691 meters	N/A	Object Detection
H12657_MB_50cm_MLLW_16of27	BAG	50 centimeters	16.920 meters - 20.628 meters	N/A	Object Detection
H12657_MB_50cm_MLLW_17of27	BAG	50 centimeters	16.457 meters - 19.892 meters	N/A	Object Detection
H12657_MB_50cm_MLLW_18of27	BAG	50 centimeters	25.740 meters - 28.198 meters	N/A	Object Detection
H12657_MB_50cm_MLLW_19of27	BAG	50 centimeters	32.402 meters - 33.853 meters	N/A	Object Detection
H12657_MB_50cm_MLLW_20of27	BAG	50 centimeters	27.088 meters - 30.395 meters	N/A	Object Detection
H12657_MB_50cm_MLLW_21of27	BAG	50 centimeters	27.168 meters - 30.886 meters	N/A	Object Detection
H12657_MB_50cm_MLLW_22of27	BAG	50 centimeters	25.266 meters - 28.028 meters	N/A	Object Detection
H12657_MB_50cm_MLLW_23of27	BAG	50 centimeters	25.012 meters - 27.433 meters	N/A	Object Detection
H12657_MB_50cm_MLLW_24of27	BAG	50 centimeters	26.522 meters - 28.922 meters	N/A	Object Detection
H12657_MB_50cm_MLLW_25of27	BAG	50 centimeters	24.508 meters - 26.754 meters	N/A	Object Detection
H12657_MB_50cm_MLLW_26of27	BAG	50 centimeters	24.292 meters - 27.189 meters	N/A	Object Detection

Surface Name	Surface Type	Resolution	Depth Range	Surface Parameter	Purpose
H12657_MB_50cm_MLLW_27of27	BAG	50 centimeters	22.390 meters - 26.503 meters	N/A	Object Detection
H12657_ss_1_100_mosaic	SSS Mosaic	1 meters	-	N/A	100% SSS
H12657_ss_2_100_mosaic	SSS Mosaic	1 meters	-	N/A	200% SSS

Table 7: Submitted Surfaces

A PFM CUBE Depth surface was used to assess and document multibeam survey coverage. The CUBE depth is populated with either the node's chosen hypothesis or the depth of a feature or designated sounding set by the hydrographer, which overrides the chosen hypothesis. The range of CUBE depths in H12657 was from 14.536 meters (47.690 feet, 0.470 meter uncertainty) to 36.937 meters (121.184 feet, 0.579 meter uncertainty). Section 5.2.2 of the HSSD requires a four-meter grid resolution for depths ranging from zero meters to 40 meters for set line spacing and two-meter resolution for complete coverage in depths ranging from 18 meters to 40 meters. Due to the duel coverage requirements of the survey, Leidos requested and was granted permission to deliver the final grid at the higher two-meter node resolution. Therefore, the final CUBE surface for H12657 was generated at two-meter grid node resolution. Over significant features, CUBE surfaces were generated at half-meter grid node resolution to meet the object detection specifications defined in Section 5.2.2.1 of the HSSD. Fifty-six significant features were identified in H12657 and 27 half-meter resolution PFM grids were generated to cover these 56 features. Data within the half-meter resolution CUBE PFM grids also remain in the two-meter CUBE PFM grid.

The final gridded bathymetry data are delivered as Bathymetric Attributed Grids (BAG). The BAG files were exported from CUBE PFM grids as detailed in Section B.2.5 of the DAPR. The two-meter BAG file was compressed, while the 27 half-meter BAG files were uncompressed.

B.5.3 Side Scan Coverage Analysis

For all details regarding side scan data processing, see Section B.3 of the DAPR. The Project Instructions required 200% side scan coverage with concurrent set line spacing multibeam or singlebeam data for 4 meters to 20 meters water depth, and complete multibeam coverage with backscatter data in water depths greater than 20 meters. 200% side scan coverage was collected and verified for the entire survey area by generating two separate 100% coverage mosaics at one-meter cell size resolution as specified in Section 8.3.1 of the HSSD. The first and second 100% coverage mosaics were independently reviewed using tools in SABER to verify data quality and swath coverage. Both coverage mosaics are determined to be complete and sufficient to meet the requirements contained within the Project Instructions. The mosaics are delivered as TIFF (.tif) images with accompanying world files (.tfw).

· H12657_ss_1_100_mosaic

· H12657_ss_2_100_mosaic

Side scan sonar contacts were investigated and confirmed using SABER Contact Review. All side scan sonar contacts and accompanying images are delivered in the Side Scan Sonar Contacts S-57 file; for specifics refer to Section D.2.12.

C. Vertical and Horizontal Control

No vertical or horizontal controls were established, recovered, or occupied during data acquisition for OPR-J312-KR-14, which includes H12657. Therefore, a Horizontal and Vertical Control Report was not required.

C.1 Vertical Control

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

Standard Vertical Control Methods Used:

Discrete Zoning

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

Station Name	Station ID
Pascagoula NOAA Lab, MS	8741533

Table 8: NWLON Tide Stations

File Name	Status
8741533_verified_072014_to_102014.tid	Verified Observed

Table 9: Water Level Files (.tid)

File Name	Status
J312KR2014CORP.zdf	Final

Table 10: Tide Correctors (.zdf or .tc)

No final tide note was provided by the NOAA Center for Operational Oceanographic Products and Services (CO-OPS). Leidos is not required to have a final tide note from CO-OPS for H12657 however, a final tide note has been provided by Leidos in Appendix I.

The Tides Statement of Work specified NOAA tide stations 8735180 Dauphin Island, AL and 8741533 Pascagoula NOAA Lab, MS as the sources for water level correctors for OPR-J312-KR-14. A full explanation of the tide zone assessment is detailed in Section C.4 of the DAPR. For H12657, 8741533 Pascagoula NOAA Lab, MS was the source of all final verified water level heights for determining correctors to soundings. All data for H12657 were contained within three tide zones (CGM29, CGM37A, and CGM37) which were provided from NOAA.

Leidos did not revise the delivered tide zones for tide station 8741533 Pascagoula NOAA Lab, MS as the water level zoning parameters in the file J312KR2014CORP.zdf, provided by National Ocean Service (NOS) were deemed adequate for the application of observed verified water levels. As a result, they were accepted as final and applied to all H12657 bathymetry data.

C.2 Horizontal Control

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

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

Please refer to the DAPR for details regarding all antenna and transducer offsets.

During survey data acquisition, the ISS-2000 real-time system provided a continuous view of the positioning comparison between the POS/MV and the Trimble DGPS. An alarm was triggered within ISS-2000 if the comparisons were not within an acceptable range. Any soundings with total horizontal uncertainties exceeding the maximum allowable IHO S-44 5th Edition Order 1a specifications were flagged as invalid and therefore were not used in the CUBE Depth calculations.

The following DGPS Stations were used for horizontal control:

DGPS Stations
English Turn, LA (293 kHz)
Eglin (AFB), FL (295 kHz)
Millers Ferry, AL (320 kHz)

Table 11: USCG DGPS Stations

D. Results and Recommendations

D.1 Chart Comparison

The chart comparisons were conducted using the Leidos SABER software to view the BSB raster charts with overlain data for H12657 such as the CUBE gridded surface, selected soundings, contacts, and features. Charting recommendations for depths follow Section 5.1.2 of the HSSD where depths and uncertainties are to be rounded by standard arithmetic rounding (round half up) and accompanying chart depth units are rounded using NOAA cartographic rounding (0.75 round up). All CUBE depths and uncertainty values are provided to millimeter precision.

For ENC comparisons, a combination of Jeppesen's dKart Inspector, SevenCs' SeeMyDENC, and CARIS' EasyView were used in conjunction with SABER.

United States Coast Guard (USCG) District 8 Local Notice to Mariners publications were reviewed for changes subsequent to the date of the Hydrographic Survey Project Instructions and before the end of survey (as specified in Section 8.1.4 of the HSSD). The Notice to Mariners reviewed were from week 26/14 (02 July 2014) until week 07/15 (18 February 2015).

H12657 data meet data accuracy standards and bottom coverage requirements. Recommend updating the common areas of all charts using data from this survey. Charting recommendations for all features are provided in the S-57 Final Feature File.

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
11376	1:80000	57	01/2014	02/03/2015	02/14/2015
11360	1:456394	44	10/2010	02/03/2015	02/14/2015

Table 12: Largest Scale Raster Charts

11376

Chart 11376 covers the H12657 survey area, north of 30° 02' 41.00"N.

CUBE depths within sheet H12657 agreed with the charted depths and were generally within ±1 foot of the charted depths, except for the charted 43-foot sounding in approximately 30° 04' 19.76"N 087° 57' 41.74"W which was in CUBE depths of 51 to 53 feet.

The two charted 60-foot depth curves, which coincide with H12657, were generally found to be in agreement with the survey data, and both were found to be located within 500 meters of their charted locations.

The charted 54-foot dangerous obstruction labeled Obstns in approximately 30° 03’ 45.83”N 087° 59’ 46.49”W was not found.

The charted 51-foot dangerous obstruction labeled Obstns in approximately 30° 03’ 45.77”N 087° 59’ 05.30”W was not found.

The charted 51-foot dangerous obstruction labeled Obstn in approximately 30° 03’ 08.21”N 087° 59’ 25.31”W was not found. An obstruction with a least depth of 54 feet (16.398 meters, 0.470 meter uncertainty) in 30° 03’ 11.96”N 087° 59’ 30.55”W (Feature 27) was found approximately 180 meters to the NW. An obstruction, with a least depth of 52 feet (15.849 meters, 0.470 meter uncertainty) in 30° 02’ 59.73”N 087° 59’ 23.01”W (Feature 28) was found approximately 270 meters to the SSW.

All submarine features on this chart that fell within the survey data are discussed in Section D.2.5.

All new uncharted features found, assigned AWOIS items, and charted feature updates are documented in the Final Feature File (S-57).

11360

Chart 11360 covers the entire H12657 survey area.

CUBE depths within sheet H12657 agreed with the charted depths and were generally within ±1 fathom of the charted depths.

The charted 10-fathom depth curve, which coincides with H12657, was generally found to be in agreement with the survey data. A small area with CUBE depths less than 10 fathoms was found centered in approximately 30° 01’ 46.41”N 087° 58’ 15.10"W, approximately 1500 meters southeast of the charted 10-fathom curve.

The charted dangerous wreck labeled PA in approximately 29° 59’ 11.73”N 087° 53’ 58.70”W was found with a least depth of 14 fathoms (25.198 meters 0.470 meter uncertainty) in 29° 59’ 13.60”N 087° 54’ 01.32”W (Feature 86).

All submarine features on this chart that fell within the survey data are discussed in Section D.2.5.

All new uncharted features found, assigned AWOIS items, and charted feature updates are documented in the Final Feature File (S-57).

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?
US4AL11M	1:80000	34	10/21/2014	02/11/2015	NO
US3GC05M	1:456394	35	08/19/2014	02/03/2015	NO

Table 13: Largest Scale ENCs

US4AL11M

ENC US4AL11M covers the H12657 survey area, north of 30° 02’ 41.00”N.

CUBE depths within sheet H12657 agreed with the charted depths and were generally within ±0.5 meters of the charted depths, except for the charted 13.1-meter sounding in 30° 04’ 19.72”N 087° 57’ 42.41”W which was in CUBE depths of 15.6 to 16.2 meters.

The two charted 18.2-meter depth curves, which coincide with H12657, were generally found to be in agreement with the survey data, and both were found to be located within 500 meters of their charted locations.

The charted 16.4-meter dangerous obstruction labeled OBSTRN located in 30° 03’ 45.83”N 087° 59’ 46.49”W was not found.

The charted 15.5-meter dangerous obstruction labeled OBSTRN located in 30° 03’ 45.77”N 087° 59’ 05.30”W was not found.

The charted 15.5-meter dangerous obstruction labeled OBSTRN located in 30° 03’ 08.21”N 087° 59’ 25.31”W was not found. An obstruction with a least depth of 16.398 meters (0.470 meter uncertainty) in 30° 03’ 11.96”N 087° 59’ 30.55”W (Feature 27) was found approximately 180 meters to the NW. An obstruction, with a least depth of 15.849 meters (0.470 meter uncertainty) in 30° 02’ 59.73”N 087° 59’ 23.01”W (Feature 28) was found approximately 270 meters to the SSW.

All submarine features on this chart that fell within the survey data are discussed in Section D.2.5.

All new uncharted features found, assigned AWOIS items, and charted feature updates are documented in the Final Feature File (S-57).

US3GC05M

ENC US3GC05M covers the entire H12657 survey area.

CUBE depths within sheet H12657 agreed with the charted depths and were generally within ±1 meter of the charted depths, except for the following charted soundings.

The charted 20.1-meter sounding in 30° 01’ 35.50”N 087° 55’ 50.19”W was in CUBE depths of 22 to 23 meters.

The charted 25.6-meter sounding in 29° 56’ 42.65”N 087° 51’ 43.43”W was in CUBE depths of 29 to 30 meters.

The charted 18.2-meter depth curve, which coincides with H12657, was generally found to be in agreement with the survey data. A small area with CUBE depths less than 18.2 meters was found centered in approximately 30° 01’ 46.41”N 087° 58’ 15.10"W, approximately 1500 meters southeast of the charted 18.2-meter curve

The charted dangerous wreck located in 29° 59’ 11.77”N 087° 53’ 57.78”W was found with a least depth of 25.198 meters (0.470 meter uncertainty) in 29° 59’ 13.60”N 087° 54’ 01.32”W (Feature 86).

All submarine features on this chart that fell within the survey data are discussed in Section D.2.5.

All new uncharted features found, assigned AWOIS items, and charted feature updates are documented in the Final Feature File (S-57).

D.1.3 AWOIS Items

No AWOIS items were assigned for this survey.

D.1.4 Maritime Boundary Points

No Maritime Boundary Points were assigned for this survey.

D.1.5 Charted Features

All charted features labeled PA, ED, PD, or Rep not assigned as an AWOIS item and investigated were discussed in Section D.1 for each chart.

D.1.6 Uncharted Features

See the S-57 Final Feature File for all the details and recommendations regarding new uncharted features investigated.

D.1.7 Dangers to Navigation

No Danger to Navigation Reports were submitted for this survey.

D.1.8 Shoal and Hazardous Features

No shoals or potentially hazardous features exist for this survey.

D.1.9 Channels

H12657 covered a section of safety fairway approaching Mobile Bay from approximately 29° 54’ 10.97”N to approximately 30° 04’ 31.45”N. The soundings and charted features within the designated safety fairway were compared to the survey depths and features of H12657 for each chart as discussed in Section D.1.1 and Section D.1.2.

D.1.10 Bottom Samples

In accordance with both the Project Instructions and Section 7.1 of the HSSD, bottom characteristics were obtained for H12657. Bottom characteristics were acquired at the seven locations proposed in the Project Reference File (PRF) by NOAA. Leidos did not modify any bottom sample locations from the locations provided by NOAA. Bottom characteristics collected during H12657 are included in the H12657 S-57 Final Feature File, H12657_FFF.000, within the Seabed Area (SBDARE) object and are classified according to the requirements set forth in Appendix H of the HSSD.

D.2 Additional Results

D.2.1 Shoreline

Shoreline was not assigned in the Hydrographic Survey Project Instructions or Statement of Work.

D.2.2 Prior Surveys

The junction analysis with the contemporary 2014 survey, H12656, was conducted and the results are presented in Section B.2.3 of this Report.

D.2.3 Aids to Navigation

No Aids to navigation (ATONs) exist for this survey.

D.2.4 Overhead Features

No overhead features exist for this survey.

D.2.5 Submarine Features

Charted pipelines fell within the survey coverage of H12657, however; no evidence of exposed pipelines were visible in the multibeam or side scan data.

D.2.6 Ferry Routes and Terminals

No ferry routes or terminals exist for this survey.

D.2.7 Platforms

No platforms exist for this survey.

D.2.8 Significant Features

No significant features exist for this survey.

D.2.9 Construction and Dredging

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

D.2.10 Designated Soundings

Designated soundings were used to help better preserve the shallowest sounding relative to the computed depth surface. Separate flags exist in the Generic Sensor Format (version 3.06) for designated soundings and features. All depths flagged as features and designated soundings override the CUBE best estimate of the depth in the final BAG files. Both the designated soundings and features flags as defined within GSF are mapped to the same HDCS flag when ingested into CARIS (PD_DEPTH_DESIGNATED_MASK).

Fourteen designated soundings were set for H12657 to preserve the least depth on non-significant objects. The difference between the least depth of these objects and the CUBE depth was more than one-half the maximum allowable total vertical uncertainty at that depth.

D.2.11 Final Feature S-57 File

Included with H12657 delivery is the S-57 Final Feature File, H12657_FFF.000. Details on how this file was generated and quality controlled can be found in Section B.2.6 of the DAPR. The S-57 feature file delivered for H12657 contains millimeter precision for the value of sounding (VALSOU) attribute. As specified in Section 8.2 of the HSSD, the S-57 feature file is in the WGS84 datum and is unprojected with all depth units in meters. All of the features found in H12657 are retained within the S-57 Final Feature File.

For each feature contained in the Final Feature File (S-57), the Feature Correlator Sheet was exported as an image file (.jpg) and is included in the S-57 Final Feature File under the NOAA Extended Attribute field “images”.

D.2.12 Side Scan Sonar Contacts S-57 File

Included with H12657 delivery is the Side Scan Sonar Contact S-57 File, H12657_SSCon.000. Details on how this file was generated and quality controlled can be found in Section B.3.5 of the DAPR. As specified in Section 8.2 of the HSSD, the S-57 feature file is in the WGS84 datum and is unprojected with all depth units in meters.

All side scan contacts are retained within the Side Scan Sonar Contact S-57 File. For each contact included in this S-57 file, a JPEG image of the side scan contact is included under the NOAA Extended Attribute field “images”.

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 BAG files, 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, Project Instructions, and the OPR-J312-KR-14 Statement of Work. 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.

Report Name	Report Date Sent
OPR-J312-KR-14_DAPR.pdf	2015-01-16
H12654_DR.pdf	2015-01-16
H12656_DR.pdf	2015-02-02
H12655_DR.pdf	2015-02-12

Approver Name	Approver Title	Approval Date	Signature
Alex T. Bernier	Lead Hydrographer	02/27/2015	Alex T. Bernier Digitally signed by Alex T. Bernier DN: cn=Alex T. Bernier, o=Marine Survey and Engineering Solutions, ou=Leidos, email=alex.t.bernier@leidos.com, c=US Date: 2015.02.26 11:26:51 -05'00'

F. Table of Acronyms

Acronym	Definition
AHB	Atlantic Hydrographic Branch
ATON	Aid to Navigation
AWOIS	Automated Wreck and Obstruction Information System
BAG	Bathymetric Attributed Grid
CO-OPS	Center for Operational Products and Services
CORS	Continually Operating Reference Station
CTD	Conductivity Temperature Depth
CSF	Composite Source File
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
FFF	Final Feature File
GAMS	GPS Azimuth Measurement Subsystem
GPS	Global Positioning System
HSD	Hydrographic Surveys Division
HSSD	Hydrographic Survey Specifications and Deliverables
HVCR	Horizontal and Vertical Control Report
IHO	International Hydrographic Organization
IMU	Inertial Motion Unit
LNM	Local Notice to Mariners
LNM	Linear Nautical Miles
MCD	Marine Chart Division
MHW	Mean High Water
MLLW	Mean Lower Low Water
NAD 83	North American Datum of 1983
NM	Notice to Mariners
NOAA	National Oceanic and Atmospheric Administration

Acronym	Definition
NOS	National Ocean Service
OCS	Office of Coast Survey
MBES	Multibeam Echosounder
POS/MV	Position and Orientation System for Marine Vessels
PRF	Project Reference File
SBES	Singlebeam Echosounder
SNM	Square Nautical Miles
SSS	Side Scan Sonar
SSP	Sound Speed Profiler
TPU	Total Propagated Uncertainty
USCG	United Stated Coast Guard
UTM	Universal Transverse Mercator
ZDF	Zone Definition File

APPENDIX I

TIDES AND WATER LEVELS

APPENDIX I. TIDES AND WATER LEVELS

Field Tide Note

A field tide note was not required for H12657.

Final Tide Note

Observed verified water levels for the station in Pascagoula, MS (8741533) were downloaded from the NOAA Tides and Currents web site. Water Level correctors were prepared for each zone using the **SABER Create Water Level Files** software. The **SABER Apply Correctors** software applied the water level data to the multibeam data according to the zone containing the nadir beam of each ping.

Please refer to the H12657 Descriptive Report Section C.1 for details regarding final tides for H12657. The water level zoning correctors applied to all multibeam data for H12657 were based entirely on Pascagoula, MS (8741533).

No final tide note was provided by NOAA Center for Operational Oceanographic Products and Services (CO-OPS), Leidos is not required to have a final tide note from CO-OPS.

The on-line times for acquisition of valid hydrographic data are presented in the Abstract Times of Hydrography, H12657 (Table A-1).

Abstract Times of Hydrography

Project: OPR-J312-KR-14
Registry No.: H12657
Contractor Name: Leidos
Date: 27 February 2015
Sheet Designation: 4
Inclusive Dates: 27 July 2014 –13 September 2014
Field work is complete.

Begin Date	Begin Julian Day	Begin Time	End Date	End Julian Day	End Time
7/27/2014	208	08:42:49	7/28/2014	209	05:08:54
7/29/2014	210	17:52:37	8/06/2014	218	03:42:24
9/10/2014	253	23:37:07	9/11/2014	254	10:57:38
9/12/2014	255	01:15:47	9/12/2014	255	15:53:13
9/13/2014	256	02:11:53	9/13/2014	256	08:53:14

Table A-1: Abstract Times of Hydrography, H12657

Transmittal Letter to CO-OPS

A transmittal letter to CO-OPS was not required for H12657.

Other Correspondence Relating to Tides

There is no other correspondence relating to tides and/or water levels.

APPENDIX II

SUPPLEMENTAL SURVEY RECORDS AND CORRESPONDENCE

APPENDIX II. SUPPLEMENTAL SURVEY RECORDS AND CORRESPONDENCE

This appendix contains copies of email exchanges between Leidos and NOAA concerning various aspects of the survey, data processing, and submittal topics.

Also, in accordance to HSSD Section 7.4 (Coast Pilot Data), the Coast Pilot products are included in Appendix II as stand-alone PDF files. These files are also provided in a Coast_Pilot_Review folder under Project_Reports in accordance with HSSD Appendix J.

Note that there were no DTONs submitted for this sheet.

CORRESPONDENCE

From: Lori Powdrell - NOAA Federal <lori.powdrell@noaa.gov>
Sent: Thursday, May 29, 2014 2:05 PM
To: Quintal, Rebecca T.
Cc: Michael.Gonsalves@noaa.gov; Evans, Rod E.; Davis, Gary R.; Donaldson, Paul L.; Bernier, Bridget W.
Subject: Re: Summary of OPR-J312-KR-14 telecom yesterday
Attachments: OPR-J312-KR-14_CSF.000; OPR-J312-KR-14_PRF.000

Rebecca,

Please see the updated CSF and PRF files, I added the AWOIS information for 2 items (on the far west side of Sheet 1), I am not sure why this information wasn't included in the first place. The other 3 AWOIS items that were mentioned should not have been included, they are going to be in very shallow water so you don't need to worry about them (they are located in Dauphin Island Bay, Sheet 1).

Please let me know if you have another other quesitons or if anything else is missing.

Thanks,
Lori

On Tue, May 20, 2014 at 3:36 PM, Quintal, Rebecca T. <REBECCA.T.QUINTAL@leidos.com> wrote:

Lori,

Great. Thanks for getting us feedback so quickly.

-Rebecca

From: Lori Powdrell - NOAA Federal [mailto:lori.powdrell@noaa.gov]
Sent: Tuesday, May 20, 2014 2:46 PM
To: Quintal, Rebecca T.
Cc: Michael.Gonsalves@noaa.gov; Evans, Rod E.; Davis, Gary R.; Donaldson, Paul L.; Bernier, Bridget W.
Subject: Re: Summary of OPR-J312-KR-14 telecom yesterday

Rebecca,

Please see my comments below on your questions:

5. Three bottom samples are in the same location.

- Please delete the 2 extra bottom samples in your files. I will delete them on my end as well. That way the processing branch will not receive a copy of data at any point with these extra bottom samples.

8. Page 134 of the 2014 HSSD states that AWOIS History in a .txt file will be provided with the PRF.

- These text files are attached (PDF)

9. Page 114 of the 2014 HSSD states: "The AWOIS point (CRANE) shall not be included in the FFF. The exception to this rule is if the hydrographer cannot verify an AWOIS item because of safety or if the AWOIS item is inshore of the NALL ("Completed" items only). In this case the CRANE feature shall be included in the FFF attributed with Description(descrp) = "Not Addressed" and Remarks = "reason not addressed".

- Yes, you should put the CRANE feature into the FFF if the AWOIS item was not verified due to safety or if the feature is inshore of the NALL. The CRANE feature is just a place holder which carries all of the attribution. There are times when an area is cluttered with features and it is not clear which feature the AWOIS item is referring to. Therefore, the hydrographer should put the CRANE feature into the FFF with a "not addressed" comment.

10. Section 7.4 (Coast Pilot Data) in the 2014 HSSD does not indicate the preferred format of the report.

- The preferred format is PDF

11. Page 115 of the 2014 HSSD it states "A copy of the Coast Pilot products shall be included in Appendix II of the Descriptive Report." But on Page 181 (Contractor Data Directory Structure) it shows a new folder called Coast_Pilot_Review under Project_Reports.

- We will fix the requirement for next year's Specs but we will ask that you follow this year's requirements and include them twice. The 2015 Specs will only require that you include them in the folder, Coast_Pilot_Review

12. The example naming convention for Other Correspondence provided on page 117 of the 2014 HSSD "H12345_Bomb_Ordinance_Area.pdf" seems to suggest that each correspondence should be provided as a separate PDF file. Leidos has been submitting a single PDF of all of the correspondence (see attached example).

- all of the Other Correspondence can be submitted as one PDF. In the 2015 HSSD text will change to:

  Other Correspondence (if applicable)

(Note: All Other Correspondence should be combined into one PDF):

Format: <Survey Registry Number>_Other_Correspondence.pdf

Example: "H12345_Other_Correspondence.pdf "

15. Page 150 of the 2014 HSSD states that "The following reports shall be included on the submitted data drive in a clearly labeled directory"… "The latest Project Instructions, including any changes and the original Project Reference Files/Composite Source Files as submitted by HSD Operations Branch."

- I still need a definite answer here, this was a request to add to this year's Specs but we need to discuss if it is necessary to include this at all since the processing branches have access to the original files already.

I will also look into the AWOIS items that are incorrect in the shorline files and get you the updated information.

Let me know if you have any other questions.

Thanks,
Lori

On Fri, May 16, 2014 at 10:05 AM, Quintal, Rebecca T. <REBECCA.T.QUINTAL@leidos.com> wrote:

Hello Lori and Mike,

Thank you for the productive meeting yesterday to discuss OPR-J312-KR-14 (Contract: DG133C-08-CQ-0003; TO-10). This email is an attempt to capture the questions and answers that were discussed during our telecom. Please let me know if I left anything out or if I didn't quite get it right. I put the answers to the questions in green font.

1. Lori shared the Survey Requests covering OPR-J312-KR-14 via Live Meeting the and offered to email them to Leidos.

    a. Email received Thu 5/15/2014 1:25 PM. Thank you!

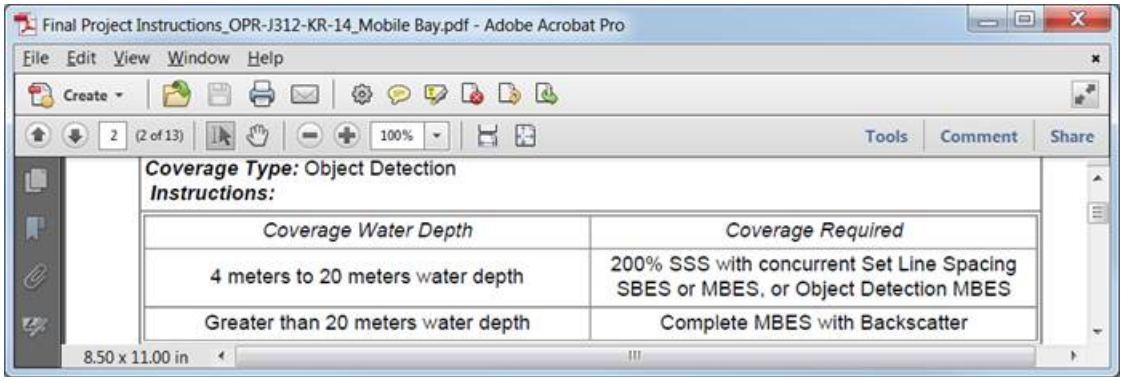
2. The SOW references the 2013 edition of the HSSD.

    a. Question: May Leidos perform the survey and deliver to the 2014 edition?

    b. Answer: Yes

3. NOAA confirmed that while the Project Instructions state "Object Detection" under the Coverage Type, the actual Coverage Requirements outlines below for the two water Depth regimes are what is actually required. I.E. 200% SSS with concurrent Set Line Spacing SBES or

MBES, or Object Detection MBES for 4-20 meters water depth; and Complete MBES with Backscatter for >20 meters water depth.



4. Approximately 11 bottom samples are inshore of the NALL (4 meter depth) line.

    a. Question: Can we move the locations to depths that we can get to?

    b. Answer: Yes

5. Three bottom samples are in the same location.

    a. Question: Should we just perform one bottom sample at that location?

    b. Answer: only one bottom sample at that location is necessary.

6. On assigned AWOIS items in the Investigation Requirements attribute (invreq) there are multiple search techniques; such as S2, ES, MBES, SD, VS.

    a. Question: Are all techniques required or will any one of the techniques satisfy coverage?

    b. Answer: only one technique is required.

7. Many of the assigned features in the CSF are well inshore of the NALL (4 meter depth) line.

    a. Question: What are the expectations for the assigned features in the CSF file in shore of the NALL(4 meter depth) line?

    b. Answer: Assigned features in shore of NALL line are not required to be collected.

    c. Question: Are photographs sufficient for exposed features inshore of the NALL line and therefore only observed at a distance? This would include approximate positioning.

    d. Answer: Yes

8. Page 134 of the 2014 HSSD states that AWOIS History in a .txt file will be provided with the PRF.

a. Question: Ledios did not receive the text files. Please send.

b. Answer: NOAA will email.

9. Page 114 of the 2014 HSSD states: "The AWOIS point (CRANE) shall not be included in the FFF. The exception to this rule is if the hydrographer cannot verify an AWOIS item because of safety or if the AWOIS item is inshore of the NALL ("Completed" items only). In this case the CRANE feature shall be included in the FFF attributed with Description(descrp) = "Not Addressed" and Remarks = "reason not addressed".

a. Question: Should we actually be delivering CRANE objects (from the PRF) in the FFF, or should it actually be the object (WRECKS, OBSTRN, etc.) from the ENC?

b. Answer: NOAA will look into and get back to us.

10. Section 7.4 (Coast Pilot Data) in the 2014 HSSD does not indicate the preferred format of the report.

a. Should the report be in PDF or Word format etc?

b. Answer: NOAA will look into and get back to us.

11. Page 115 of the 2014 HSSD it states "A copy of the Coast Pilot products shall be included in Appendix II of the Descriptive Report." But on Page 181 (Contractor Data Directory Structure) it shows a new folder called Coast_Pilot_Review under Project_Reports.

a. Question: From reading what is being asked for it seemed like the Coast Pilot Report is a project wide report (i.e. not a separate report for each sheet) and therefore it does make sense for it to be delivered only once and to be delivered under Project Reports instead of under the appendices of a specific sheet. Is this correct?

b. Answer: NOAA will look into and get back to us.

12. The example naming convention for Other Correspondence provided on page 117 of the 2014 HSSD "H12345_Bomb_Ordinance_Area.pdf" seems to suggest that each correspondence should be provided as a separate PDF file. Leidos has been submitting a single PDF of all of the correspondence (see attached example).

a. Question: Should supplemental Correspondence be submitted as individual PDF files for each correspondence?

b. Answer: NOAA will look into and get back to us.

13. Lori confirmed that progress sketches only need to be delivered via TOMIS and not emailed as well.

a. Question: Were there any changes to the Excel file format?

b. Answer: Yes there were additions made for processing once the data acquisition phase is over. NOAA sent the latest version of the Excel file via email on Fri 5/16/2014 8:11 AM. There may be further revisions, and the COR will send if there are.

c. Question: Ledios has been sending in a ESRI map of the progress (similar to what was required years ago) as a previous COR found it helpful. Is this still beneficial for Ledios to submit?

d. Answer: Yes, if Leidos doesn't mind generating the graphic it would still be beneficial.

14. Page 122 of the 2014 HSSD states that: "All images and other linked files shall be included in a folder named "SupportFiles" and shall be reference in the XML file using relative path names. Both the XML file and the SupportFiles folder shall be submitted as a single zip file, named according to the Registry Number of the Survey (ex: H12345.zip).

a. Question: So on the delivery drive, under the Directory Example: OPR-D302-KR-13_Coastal_Virginia\H12559\Data\Descriptive_Report\Report there will be 2 files: 1) a PDF file of the report and 2) a zip file that contains the XML and a folder called SupportFiles that contains the images and files referenced in the XML?

b. Answer: Yes.

15. Page 150 of the 2014 HSSD states that "The following reports shall be included on the submitted data drive in a clearly labeled directory"… "The latest Project Instructions, including any changes and the original Project Reference Files/Composite Source Files as submitted by HSD Operations Branch."

a. Question: Page 181 (Contractor Data Directory Structure) does not list a folder to put the SOW, PI, PRF, and CSF into. It seems that these files should be delivered under Project_Reports for this. Is there a preferred naming convention for this folder?

b. Answer: NOAA will look into and get back to us.

16. Leidos mentioned that we will need the Pascagoula (8741533) and Dauphin Island (8735180) tide gauges added to the Hydro Hot List. Leidos will send a spate email request for this once we get closer to starting the survey acquisition.

I think that about covers it. Please let me know if there are any clarifications needed to what I have listed above.

Thanks again for the meeting!
-Rebecca

Rebecca T. Quintal | Leidos
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From: Lori Powdrell - NOAA Federal <lori.powdrell@noaa.gov>
Sent: Wednesday, September 10, 2014 11:49 AM
To: Quintal, Rebecca T.
Cc: Evans, Rod E.
Subject: Re: Question about node resolution for OPR-J312-KR-14

Rebecca,

I spoke to Gene, at AHB, and he agreed to accept the 2m resolutions for the set line spacing coverage.

Thank you,
Lori

On Wed, Sep 10, 2014 at 9:31 AM, Quintal, Rebecca T. <REBECCA.T.QUINTAL@leidos.com> wrote:
Hi Lori,

Since the PI calls for Complete MBES Coverage for water depths greater than 20 meters water and HSSD calls for 2-meter node resolution for the 18-40 meters it just made sense to deliver the shallower data to 2-meters node resolution too. It seems strange to deliver the shallow water to a larger node resolution than the deeper depths. So that was our thinking for delivering the whole sheet(s) at 2-meter node resolution.

Thanks for following up with AHB on this!
-Rebecca

From: Lori Powdrell - NOAA Federal [mailto:lori.powdrell@noaa.gov]
Sent: Wednesday, September 10, 2014 7:23 AM
To: Quintal, Rebecca T.
Cc: Evans, Rod E.
Subject: Re: Question about node resolution for OPR-J312-KR-14

Rebecca,

I apologize for the delay in my response. I spoke to a few people about this request and my initial response is that there is no problem delivering the grids at a 2 meter node resolution but I would like to know why you chose to create the 2 meter node resolution instead of the 4 meter. I also would like to talk to AHB before giving you the go-ahead just in case they have a different thought.

Thanks,
Lori

On Fri, Sep 5, 2014 at 10:28 AM, Quintal, Rebecca T. <REBECCA.T.QUINTAL@leidos.com> wrote:
Lori,

The OPR-J312-KR-14 project instructions require the following:

Coverage Water Depth	*Coverage Required*
4 meters to 20 meters water depth	200% SSS with concurrent Set Line Spacing SBES or MBES, or Object Detection MBES
Greater than 20 meters water depth	Complete MBES with Backscatter

Leidos has collected 200% SSS with concurrent Set Line Spacing and MBES in water depths from 4 meters to 20 meters; and deeper since the majority of the survey area fell in the 4-20 meter water depth range. We have complete MBES coverage from approximately 16 meters or deeper.

The HSSD Set Line spacing node resolution (Section 5.2.2.3 Set Line Spacing) is 4 meters for 0-40 meters water depth. Then the Complete Multibeam coverage requirement (Section 5.2.2.2 Complete Multibeam Coverage) is 1-meter node resolution for 0-20 meters water depth, 2- meter node resolution for 18-40 meters water depth, and 4-meter node resolution for 36-40 meters water depth.

The combination of the HSSD specs and the PI requirements seems to indicate that we should create 4-meter resolution grids for 0-20 meters water depth (set lines spacing) and 2-meter node resolution grids for 18-40 meters water depth (complete MBES). Is it acceptable to deliver grids at 2-meter node resolution for all water depths?

Thanks,
-Rebecca

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From: Lori Powdrell - NOAA Federal [mailto:lori.powdrell@noaa.gov]
Sent: Tuesday, September 30, 2014 2:48 PM
To: Quintal, Rebecca T.
Subject: Re: Summary of OPR-J312-KR-14 telecom yesterday

Rebecca,

I am sorry I haven't gotten back to you on this yet. A lot of people are out of the office this time of year and I wanted to run it by them before giving you an answer. You do not have to worry about added these files to the submitted data drive, the latest files are already provided by the COR.

We will look into updating the 2015 Specs to clear that up.

Thanks,
Lori

On Thu, Sep 25, 2014 at 4:14 PM, Quintal, Rebecca T. <REBECCA.T.QUINTAL@leidos.com> wrote:

Lori,

Hello. I'm just checking in on the one remaining item from our exchange this spring.

15. Page 150 of the 2014 HSSD states that "The following reports shall be included on the submitted data drive in a clearly labeled directory"… "The latest Project Instructions, including any changes and the original Project Reference Files/Composite Source Files as submitted by HSD Operations Branch."

- I still need a definite answer here, this was a request to add to this year's Specs but we need to discuss if it is necessary to include this at all since the processing branches have access to the original files already.

Do you know if we should create a new folder under the Project_Reports directory for the PI, SOW, PRF and CSF files?

Thanks!
-Rebecca

From: Castle Parker - NOAA Federal [mailto:castle.e.parker@noaa.gov]
Sent: Monday, January 12, 2015 7:39 AM
To: Bernier, Bridget W.

Cc: Quintal, Rebecca T.; Matthew Jaskoski - NOAA Federal
Subject: RE: BAG files

Hello and good morning Bridget,
Regarding 2gb BAG, I don't think will be a problem. We encountered CSAR grid with file size over 7.4gb and encounter a bit slower read time and that's the only negative experience. So I don't think the 2gb BAG will cause problems. When AHB generates the final BAG from the CSAR grid, compression is on. If nothing changes within the bathy data and thus grid update is not required, the submitted BAGs are considered as the source and I think the BAG are re-exported to contain the revised metadata. Currently we cannot revise the metadata and thus the re-export. So far I have not viewed any negative aspects from a compressed BAG.

If you want to post (ftp) a text BAG, let me know where to download and we'll check it out.
Thanks and have a GREAT day!
Gene

From: Bernier, Bridget W. [mailto:BRIDGET.W.BERNIER@leidos.com]
Sent: Friday, January 09, 2015 11:52 AM
To: Gene Parker
Cc: Quintal, Rebecca T.
Subject: RE: BAG files

Hi Gene,

How is everything going? I hope well.

I wanted to touch base with you regarding BAGs prior to our first delivery for the Task Order 10 work, which will be next week. CARIS made the release for Hips&Sips (version 8.1.11) which includes the update for the BAG display.

From our largest sheet the BAG file, version 1.5.1 with optional surfaces, when not compressed is 2.0GB. Is this size allowable for the delivery?

If that is too large, we can continue to split the BAGs as we have done in the past. What is the allowable file size, so that we can ensure that the total number of BAGs is manageable?

Also, would you like BAGs to be compressed or not compressed?

Sample BAG files can be provided if that would be helpful.

Thanks!
-Bridget

APPENDIX III

SURVEY FEATURES REPORT

AWOIS - none
Dangers to Navigation - none
Maritime Boundary - none
Wrecks - one

H12657 Feature Report

Registry Number: H12657
State: Alabama
Locality: Approaches to Mobile Bay
Sub-locality: 16 NM South of Mobile Point
Project Number: OPR-J312-KR-14
Survey Dates: 07/24/2014 - 09/13/2014

Charts Affected

Number	Edition	Date	Scale (RNC)	RNC Correction(s)*
1115A	43rd	11/01/2008	1:456,394 (1115A_1)	[L]NTM: ?
11360	44th	10/01/2010	1:456,394 (11360_1)	USCG LNM: 4/19/2016 (6/14/2016) NGA NTM: 4/6/2013 (7/2/2016)
11006	32nd	08/01/2005	1:875,000 (11006_1)	[L]NTM: ?
411	52nd	09/01/2007	1:2,160,000 (411_1)	[L]NTM: ?

* Correction(s) - *source: last correction applied (last correction reviewed--"cleared date")*

Features

No.	Name	Feature Type	Survey Depth	Survey Latitude	Survey Longitude	AWOIS Item
1.1	add 14 fathom Wreck	Wreck	25.20 m	29° 59' 13.6" N	087° 54' 01.3" W	---
1.2	0_ 0003000332 00001	Wreck	[None]	29° 59' 11.8" N	087° 53' 57.8" W	---

1.1) add 14 fathom Wreck

Survey Summary

Survey Position:	29° 59' 13.6" N, 087° 54' 01.3" W
Least Depth:	25.20 m (= 82.67 ft = 13.778 fm = 13 fm 4.67 ft)
TPU (±1.96σ):	**THU (TPEh)** [None] ; **TVU (TPEv)** [None]
Timestamp:	1981-001.01:01:01.001 (01/01/1981)
Dataset:	H12657_Wreck.000
FOID:	0_ 0003000331 00001(FFFE002DC80B0001)
Charts Affected:	1115A_1, 11360_1, 11006_1, 411_1

Remarks:

WRECKS/remrks: Approximately 14 x 6.0m in an SE by NW orientation. Approximately 1.3m high in 25.5m of water.

Feature Correlation

Source	Feature	Range	Azimuth	Status
H12657_Wreck.000	0_ 0003000331 00001	0.00	000.0	Primary
H12657_Wreck.000	0_ 0003000332 00001	110.57	300.9	Secondary (grouped)

Hydrographer Recommendations

The charted dangerous wreck located in 29° 59’ 11.77”N 087° 53’ 57.78”W was found with a least depth of 25.198 meters (0.470 meter uncertainty) in 29° 59’ 13.60”N 087° 54’ 01.32”W (Feature 86), update wreck.

Arithmetically-Rounded Depth (Unit-wise Affected Charts):

14ft (1115A_1, 11360_1, 11006_1, 411_1)

S-57 Data

Geo object 1:	Wreck (WRECKS)
Attributes:	CATWRK - 2:dangerous wreck
	INFORM - Feature 086 - MB File: asmba14256.d03; Ping: 6324; Beam: 280; Depth: 25.198m; Time: 02:34:34.07; H. Uncert.: 1.500m; V. Uncert.: 0.470m.
	QUASOU - 6:least depth known
	SORDAT - 20140913

SORIND - US,US,graph,H12657

TECSOU - 3,2:found by multi-beam,found by side scan sonar

VALSOU - 25.198 m

WATLEV - 3:always under water/submerged

Office Notes

SAR: Verified via 200% SSS.

Compile: add 14 fathom Wreck.

Feature Images

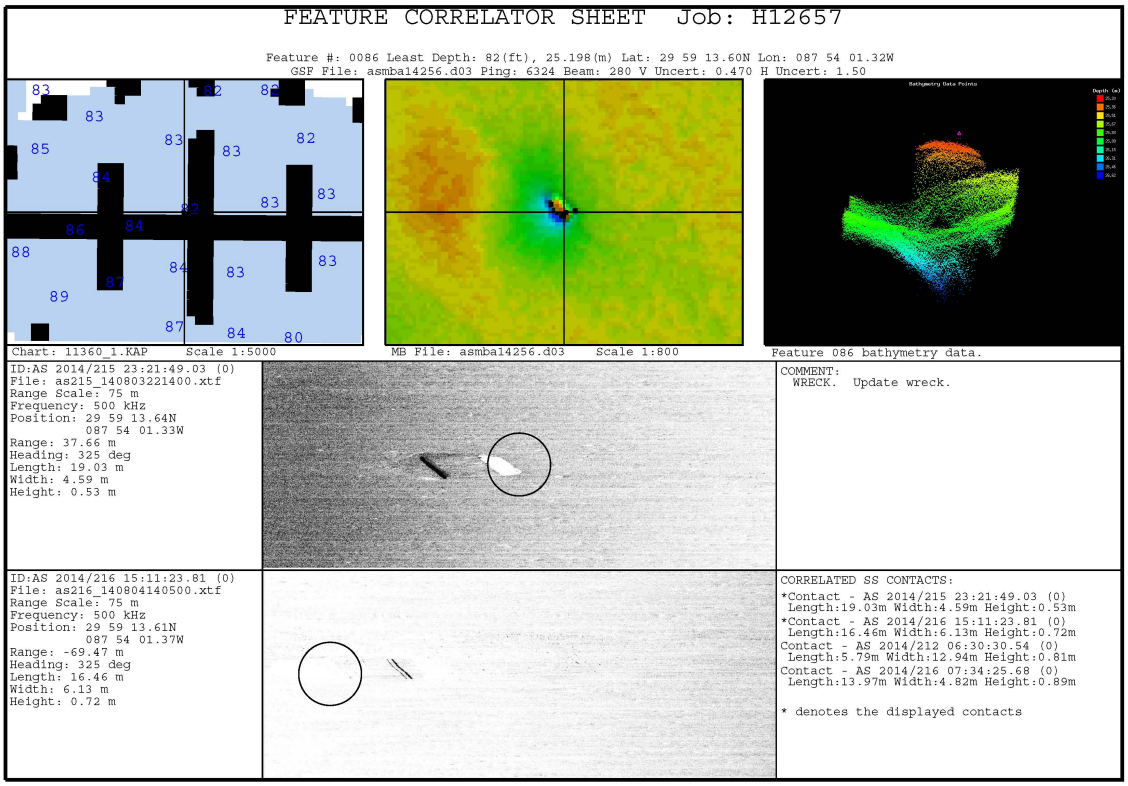

Figure 1.1.1

APPROVAL PAGE

H12657

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

- H12657_DR.pdf
- Collection of depth varied resolution BAGS
- Processed survey data and records
- H12655_H12656_H12657_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 Jasmine Cousins
DN: cn=Jasmine Cousins, o=NOAA, ou=Atlantic Hydrographic Branch, email=jasmine.cousins@noaa.gov, c=US
Date: 2016.09.26 11:52:15 -04'00'

Approved:_____

Lieutenant Commander Briana Welton, NOAA
Chief, Atlantic Hydrographic Branch