NOAA FORM 76-35A

U.S. DEPARTMENT OF COMMERCE

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL OCEAN SERVICE

Descriptive Report

Type of Survey *Shallow Water Multibeam Hydrographic and Side Scan Sonar Survey*
Project No. *OPR-J364-KR-09-C*
Registry No. *H12062*

Locality

State *Florida*
General Locality *Gulf of Mexico*
Sub-locality *15 NM S of Pensacola Bay Entrance*

2010

George G. Reynolds

CHIEF OF PARTY

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HYDROGRAPHIC TITLE SHEET

REGISTRY NO.

H12062

State	*Florida*
General Locality	*Gulf of Mexico*
Sub-Locality	*15 NM S of Pensacola Bay Entrance*
Scale	*1:10,000*
Date of Survey	*October 23, 2009 to May 11, 2010*
Instructions Dated	*September 21, 2009*
Project No.	*OPR-J364-KR-09-C*
Vessel	*R/V Able II - Registration Number CT4788BB* *R/V Ferrel - Official Number 1182802*
Chief of Party	*George G. Reynolds*
Surveyed By	*John G. Wetmur, Robert M. Wallace, Matthew T. Grennan, Bonnie L. Johnston, Michael D. Lincoln, John R. Bean, Kerry H. Cutler, Alexander G. Unrein, Joseph V. Tyler, John R. Ayer*
Soundings by echo sounder	*Reson Seabat 7101*
Verification by	*Michael J. Engels*
Soundings in	*Meters (MLLW)*

REMARKS: *All Times Recorded in UTC*

Data Recorded and Presented relative to UTM Zone 16 North

Original SOW modified by January 21, 2010 Amendment of Solicitation (Refer to Separate III of the Descriptive Report.)

Contractor: *Ocean Surveys, Inc.*
91 Sheffield St.
Old Saybrook, CT 06475

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. Revisions and Rednotes were generated during office processing. The processing branch concurs with all information and recommendations in the DR unless otherwise noted. Page numbering may be interrupted or non-sequential. All pertinent records for this survey, including the Descriptive Report, are archived at the National Geophysical Data Center (NGDC) and can be retrieved via http://www.ngdc.noaa.gov/.

THE INFORMATION PRESENTED IN THIS REPORT AND THE ACCOMPANYING BASE SURFACE REPRESENTS THE RESULTS OF A SURVEY PERFORMED BY OCEAN SURVEYS, INC. DURING THE PERIOD OF 23 OCTOBER 2009 TO 11 MAY 2010 AND CAN ONLY BE CONSIDERED AS INDICATING THE CONDITIONS EXISTING AT THAT TIME. REUSE OF THIS INFORMATION BY CLIENT OR OTHERS BEYOND THE SPECIFIC SCOPE OF WORK FOR WHICH IT WAS ACQUIRED SHALL BE AT THE SOLE RISK OF THE USER AND WITHOUT LIABILITY TO OSI.

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SEPARATES*

DESCRIPTIVE REPORT
TO ACCOMPANY
HYDROGRAPHIC SURVEY H12062

Project Number OPR-J364-KR-09-C
May 11, 2010
Ocean Surveys, Inc. – *R/V Able II*, *R/V Ferrel*
Chief of Party: George G. Reynolds

INTRODUCTION

The purpose of this survey is to provide NOAA with modern, accurate hydrographic survey data to update the nautical charts of the Gulf of Mexico, in the Safety Fairway south of Pensacola Bay, Florida.

A. AREA SURVEYED

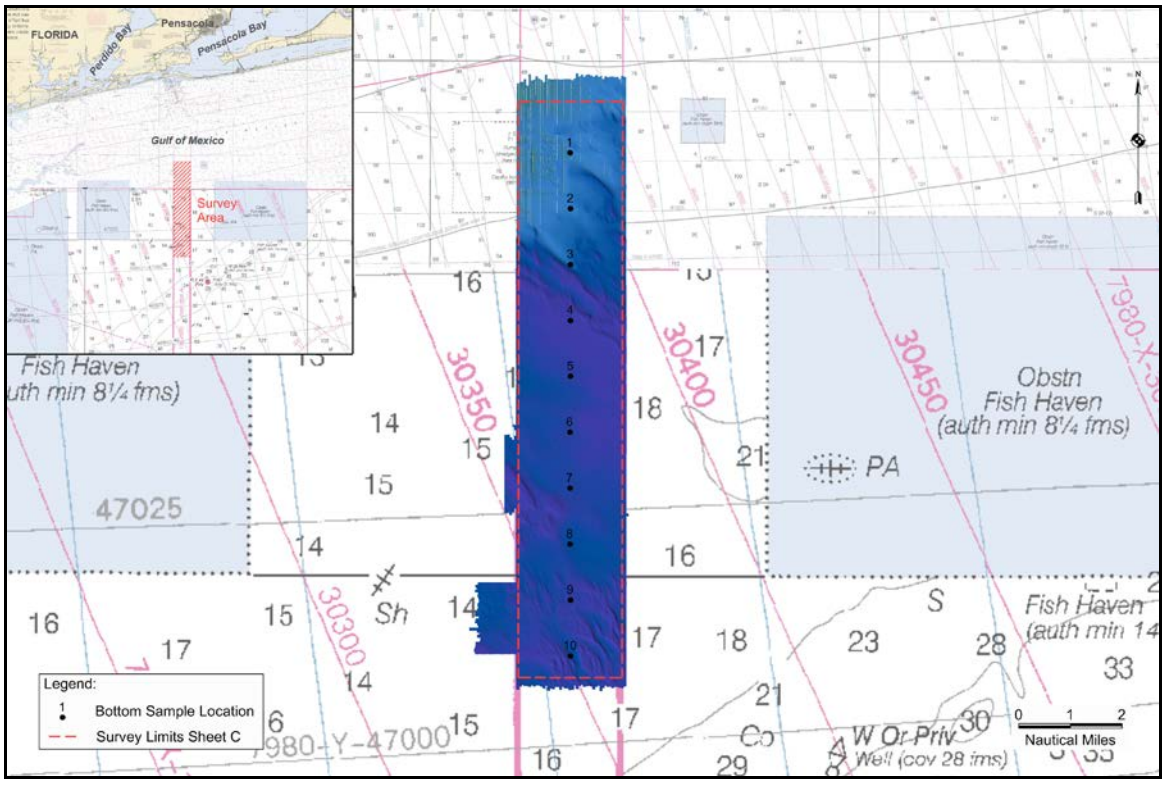


Figure 1. H12062 survey area overlain on RNCs 11360 and 11382. Multibeam colored by depth coverage image was developed from a 4-meter surface.

This survey provides hydrographic data for the Gulf of Mexico waters south of the Pensacola Bay Entrance. The survey junctions with contemporary Survey H12061 to the north. The general locations of the survey limits are presented in Table 1. The survey area includes the Safety Fairway and a portion of a dumping ground south of Pensacola Bay. Survey data were acquired to meet requirements specified in the contract Statement of Work (SOW, September 21, 2009; amended January 21, 2010) and NOS Hydrographic Surveys Specifications and Deliverables, April 2009 (HSSD 2009). Two hundred percent (200%) side scan sonar (SSS) coverage with concurrent shallow water multibeam (SWMB) echo sounder coverage were collected at set line spacing to water depths of approximately 120 feet. Additional SWMB coverage was obtained as necessary to provide a least depth for all significant SSS contacts and assigned AWOIS investigation items. The final survey area covers 25.34 square nautical miles (Figure 1).

Table 1
General Location of Survey H12062

Northern Limit Latitude (N)	Southern Limit Latitude (N)	Western Limit Longitude (W)	Eastern Limit Longitude (W)
30-09-32	29-57-55	87-18-03	87-15-39

Mainscheme SSS/SWMB tracklines were run parallel to the long axis of the Safety Fairway boundary (Figure 2). SSS tracklines were separated by one-half the distance required for 100% coverage plus an allowance for overlap and trackline maintenance. Trackline offset and accompanying SSS range scale settings are presented in Table 2. Survey trackline statistics for each vessel are listed in Table 3A and 3B.

Initial onsite system calibration was performed on October 23, 2009 for the *R/V Able II* and April 5, 2010 for the *R/V Ferrel* [Calendar Day Numbers (DN) 296 (2009), and 095 (2010)]. Cross line data were acquired from the *R/V Able II* on February 17-18 (DN 048-049). Ten (10) bottom samples were acquired from the *R/V Able II* on February 20, 2010 (DN 051). Mainscheme data, cross line data, and significant target development were acquired from the *R/V Ferrel* on the following dates: April 22-23, 26-27, and May 4-8, 10-11, 2010 (DNs 048-049, 112-113, 116-117, 124-128 and 130-131, 2010).

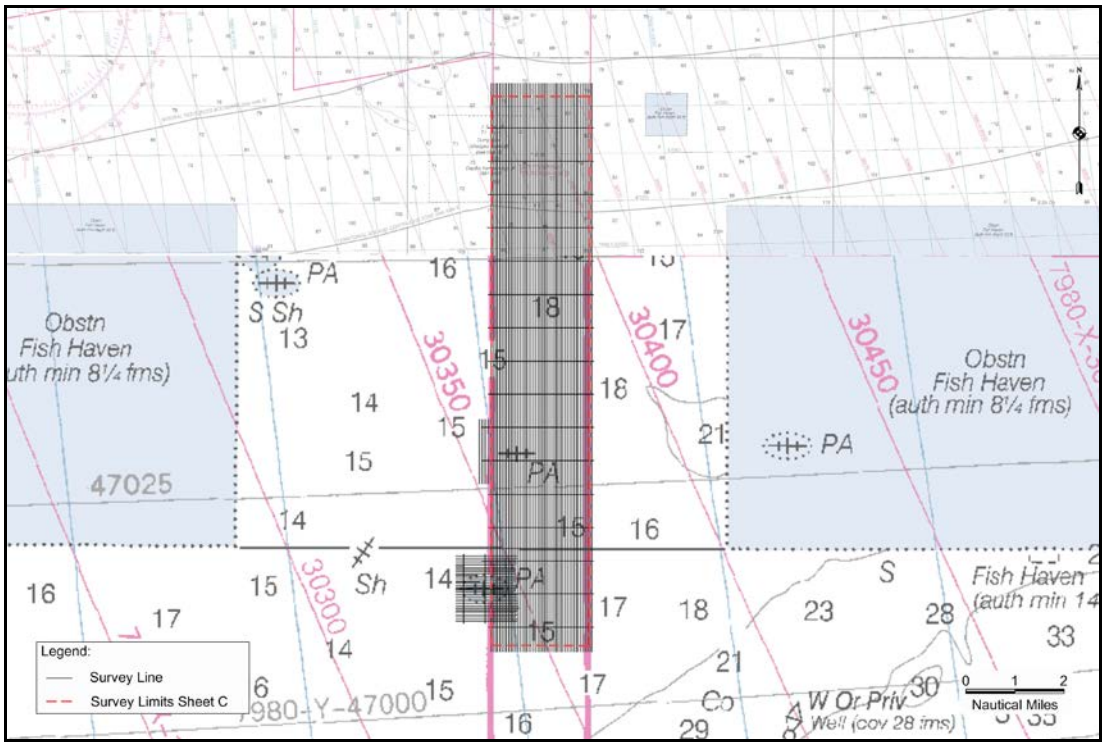


Figure 2. H12062 survey area with SSS/SWMB tracklines in black overlaid on RNCs 11360 and 11382.

Table 2
H12062 Survey Line Spacing

Water Depths (meters)	Trackline Offset (meters)	SSS Range Scale (meters)
> 20	85	100

Table 3A
H12062 *R/V Able II* Survey Trackline Statistics

Concurrent MB/SSS Lineal NM	Multibeam Only Lineal NM	Additional Developments Lineal NM	Cross Lines Lineal NM	Square Nautical Miles Covered	Bottom Samples Acquired
0	0	0	15.64	0	10

Table 3B
H12062 *R/V Ferrel* Survey Trackline Statistics

Concurrent MB/SSS Lineal NM	Multibeam Only Lineal NM	Additional Developments Lineal NM	Cross Lines Lineal NM	Square Nautical Miles Covered	Bottom Samples Acquired
585.31	3.52	69.32	38.24	25.34	0

B. DATA ACQUISITION AND PROCESSING

Refer to OPR-J364-KR-09 Data Acquisition and Processing Report (DAPR) for a complete description of data acquisition and processing systems, survey vessels, quality control procedures and data processing methods. Additional information to supplement sounding and survey data, including deviations from the DAPR, is documented in this descriptive report.

B.1 Equipment

Survey operations were conducted from two platforms: OSI's *R/V Able II* and Reservoir Geophysical's *R/V Ferrel*. The *R/V Able II* is a 7.6-meter fiberglass vessel, with a 3-meter beam and 0.8-meter draft. The vessel is powered by twin 150 HP outboard engines. The *R/V Ferrel* R-492 is a 44.5-meter steel vessel, with a 9.8-meter beam and 1.8-meter draft and powered by two 375 HP CAT D 353 diesel engines. Table 4 summarizes the primary equipment used to acquire SWMB and SSS data. All equipment was installed, calibrated and operated in accordance with the DAPR.

Table 4
H12062 Primary Survey Equipment

System	Manufacturer	Model/Version No.
Multibeam Echo Sounder	Reson	7101
Side Scan Sonar	Klein	5000
Moving Vessel Profiler	ODIM	MVP30
Sound Speed Profiler	Sea-Bird	SeaCAT SBE 19
Sound Speed Profiler	Sea-Bird	SeaCAT SBE 19+
Sound Speed Sensor (Real-Time Surface Sound Speed)	Sea-Bird	MicroCAT SBE37
Primary Navigation DGPS	Applanix/Trimble	POS MV 320 V.4
Secondary Navigation DGPS (Position Integrity Alarm)	Trimble	MS750
Vessel Attitude and Heading	Applanix/Trimble	POS MV 320 V.4
Multibeam acquisition, trackline control, position fixing	HYPACK, Inc.	Survey (V 9.0- 9.1.0.0) and Hysweep (V 9.0.26.0) 2009
SSS acquisition	Chesapeake Technology, Inc.	SonarWiz V4.04.0061
U.S.C.G. Differential Beacon Receivers (2)	Trimble	Probeacon
Survey GPS	Trimble	5700
Bar Check	OSI	Lead Disk
SSS Cable Payout Indicator	Hydrographic Consultants	SCC16"
Tide Gauge	Hazen	HTG5000

The *R/V Able II* collected SWMB cross line data on February 17-18 (DNs 048-049) and bottom samples on February 20, 2010 (DN 051). The remainder of the survey was completed from the *R/V Ferrel*. The Reson 7101 echo sounder was used to acquire SWMB on both platforms. No SSS data were acquired with the *R/V Able II*.

The primary difference in survey methods between platforms was the incorporation of the ODIM Moving Vessel Profiler on the *R/V Ferrel* to collect sound speed profiles of the water column while underway. Sea-Bird SeaCAT SBE 19/19+ Profiler CTD units were used to acquire sound speed profiles on the *R/V Able II* and comparison casts on the *R/V Ferrel*.

B.2 Quality Control

B.2.1 System Calibration

SWMB system calibration surveys (patch tests) were performed on each platform prior to the start of data acquisition. The initial patch test for the *R/V Able II* was performed on October 23, 2009 (DN 296) in Pensacola Bay, north of the survey area. Multiple interim patch tests were performed throughout the period of the "small boat" survey. A post-survey patch test was performed on February 23, 2010 (DN 054) to verify the original alignment values.

The initial patch test for the *R/V Ferrel* was performed on April 5, 2010 (DN 095) southeast of the entrance to Pensacola Bay. A post-survey patch test was performed on May 12 (DN 132) to verify the original alignment values.

For both platforms transducer draft and echo sounder function was confirmed by means of bar checks and "spot checks" with a calibrated lead line performed prior to the start of survey operations and at weekly intervals during the course of the survey.

B.2.2 SWMB Cross Lines

A total of 53.9 lineal nautical miles of cross line data were acquired. The *R/V Able II* logged 15.64 nautical miles of cross line information on February 17-18 (DNs 048-049). On April 26 (DN 116) the *R/V Ferrel* acquired 38.24 nautical miles of cross line data. Cross line mileage equaled 9.2% of the 585 nautical miles of mainscheme SWMB lines.

Statistical quality control information was generated by comparing each of the cross lines to the final combined 2-meter x 2-meter CARIS BASE (Bathymetry Associated with Statistical Error) surface. Cross line comparisons generated with the CARIS QC Report utility are presented in Separate IV.

Cross line comparisons showed excellent agreement with the finalized BASE surface generated from the mainscheme survey lines. All cross line soundings considered in the analyses met IHO Order 1 uncertainty standards. Overall, there was good agreement between overlapping line and day-to-day sounding coverage as observed in the BASE surface depth and standard deviation layers.

B.2.3 Data Quality Review

B.2.3.1 CARIS BASE Surface Standard Deviation and Uncertainty

The standard deviation and uncertainty BASE surface layers were reviewed to direct sounding editing and to search for systematic errors, sporadic noise (fish, water column disturbances, etc.) and bathymetric features that warranted additional investigation. In general, the final combined uncertainty BASE surfaces generated from the higher of either the standard deviation or uncertainty values were appropriate for the bathymetric relief observed in the survey area. Highest standard deviation values were observed over bathymetric features and obstruction features in addition to steep-sloped deep-water ridges. The CARIS QC BASE surface report utility was used to evaluate IHO uncertainty for the final combined 2-meter BASE surface. Results from the QC BASE surface report indicated that 100% of the nodes from the final combined 2-meter surface met IHO Order I uncertainty specifications. QC BASE surface reports are included for all final surfaces in Separate IV. *

B.2.3.2 SSS Imagery and Contacts

Contacts with approximately 1-meter heights and greater were identified in 2 x 100% coverage SSS imagery and attributed with feature classifications and descriptive remarks if applicable. A custom CARIS "ContactFeatures.hcf" was created for feature classification when positioning contacts and is submitted with the session data. Contacts were classified according to SSS shadow height and surrounding depths as specified in the SOW and HSSD 2009 (Table 5). All contacts were correlated and evaluated in the CARIS HIPS/SIPS map window with respect to BASE surfaces, contours and charted information. Each significant contact was examined in the CARIS subset editor and a sounding was designated for the representative least depth of each contact (or Primary/Secondary contact pair). All significant contacts were developed with additional SWMB coverage to meet the object detection sounding density as specified in the HSSD 2009. A tabulation of all side scan contacts, individual contact images, and supporting correlation tools (spreadsheet and database format) are presented in Separate V. Isolated shoal features that were outstanding or navigationally significant with respect to the surrounding depths are represented and attributed in the S-57 feature file (i.e. OBSTRN, WRECKS).

Table 5
Significant Contact Selection Criteria

Surrounding Depth or Area (meters)	Significant Contact Height (meters)
>20	10% of surrounding depth

B.2.4 Survey Junctions

Survey H12062 junctions with contemporary Survey H12061 (2/23/2010, 1:10,000) to the north. There is an approximate overlap of 1 kilometer between bathymetric data from Survey H12062, acquired with the *R/V Ferrel,* and H12061, acquired with the *R/V Able II*. Depths from the combined final 2-meter BASE surfaces from Surveys H12061 and H12062 were compared in CARIS HIPS. Further analysis consisting of a surface-to-surface comparison (Figure 3) and statistical analysis (Figure 4) was performed using 10-meter by 10-meter surfaces. Depths from H12062 showed excellent agreement with depths from H12061. Depth discrepancies generally equaled 20 centimeters or less and the average difference between survey depths equaled -0.01 meters.

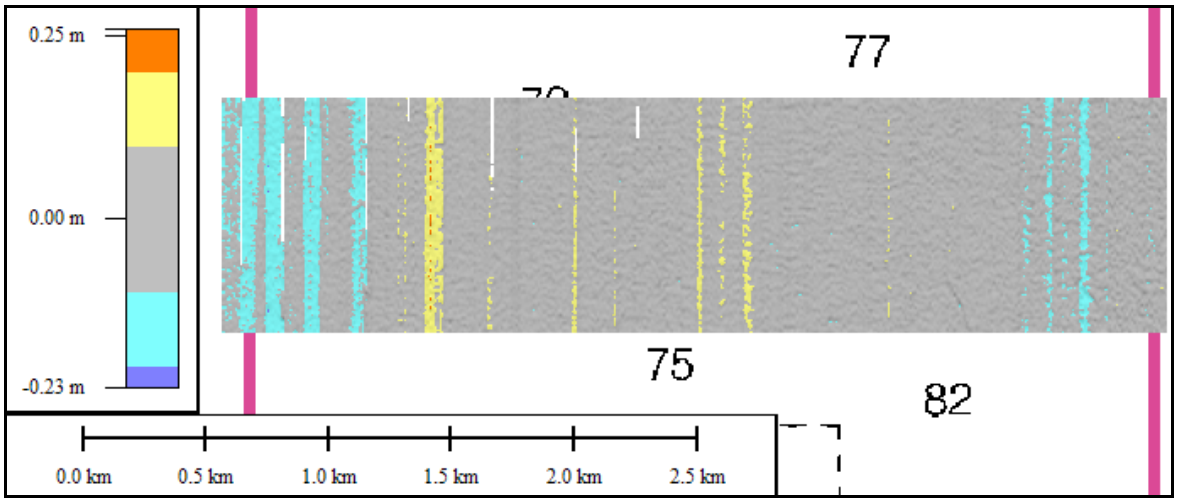


Figure 3. Surface-to-surface difference map comparing sounding depths from Survey H12062 to survey depths from H12061 overlaid on RNC 11382. Difference values are based on 10-meter by 10-meter data sampling. Grey areas represent depth differences of less than 0.10 meters. Maximum difference is 0.26 meters.

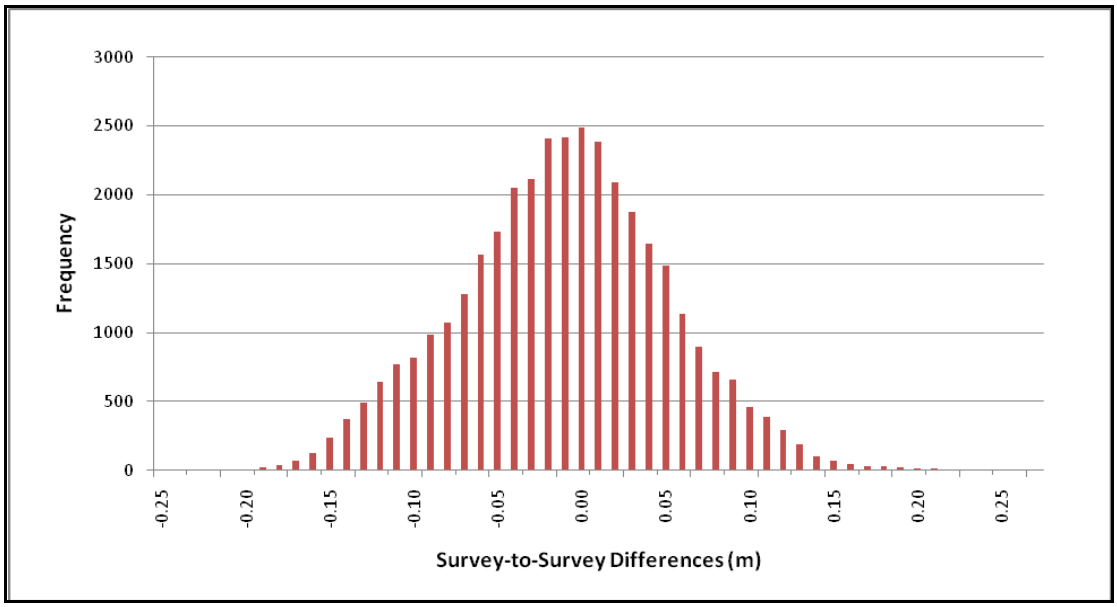


Figure 4. Surface-to-surface difference histogram comparing depths from Survey H12062 to Survey H12061. Difference values are based on 10-meter by 10-meter data sampling. Average difference between surveys is -0.01 meters with a standard deviation of ± 0.06 meters. Ninety-five (95) percent of the difference values were within 2 sigma of the mean.

B.2.5 Unusual Conditions/Factors Affecting Soundings/Imagery

Sound speed profiles measured throughout the limits of Survey H12062 were variable, with changes up to 10 m/s in the water column. The variability in profiles was time and space dependent, possibly attributed to the influx of fresh water from Pensacola Bay. This variability caused refraction in the side scan imagery and periodically influenced the outer beams of the multibeam swath. To ensure this did not compromise the quality of the final dataset, various steps were taken by both the collection team and the processing team.

Sound speed profiles were viewed real-time during acquisition to assist in identifying the depths where refraction may be more severe due to rapid changes in sound speed. "Plateaus" and "bulges" in the profile served as indicators of depths prone to higher refraction (Figure 5). These indicators allowed the SSS operator to fly the towfish at depths above or below the refractive lens while keeping it within the altitude threshold specified in the HSSD 2009 (8-20% of the SSS range).

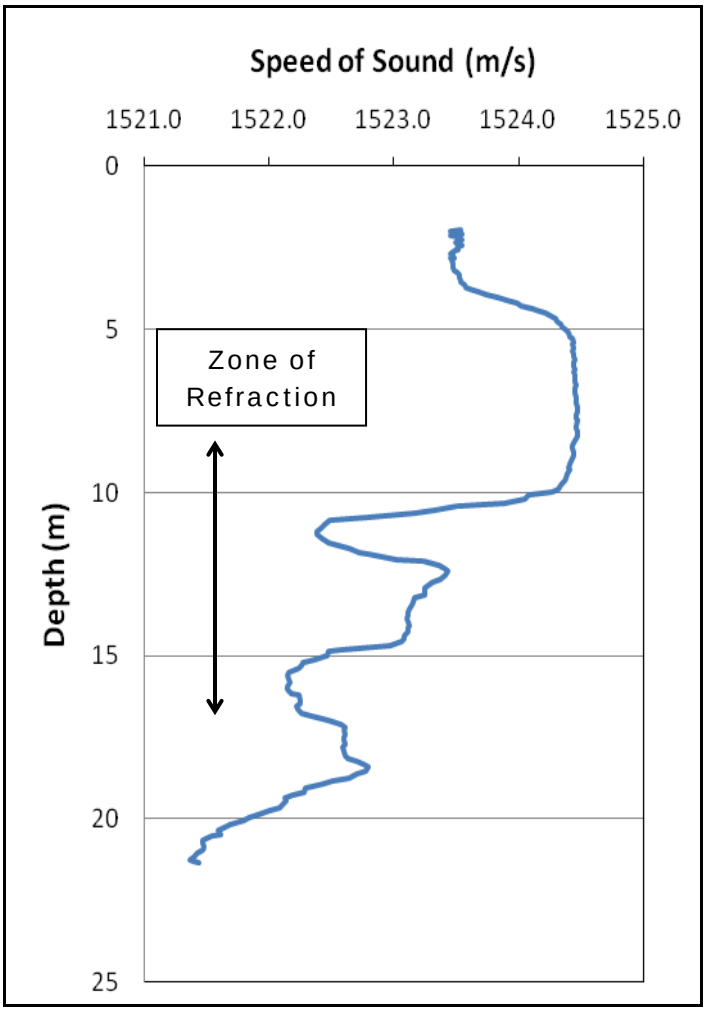


Figure 5. Sample sound speed profile from day 124-2010 in an area where significant refraction was observed.

When the towfish could not be flown at an altitude where refraction effects were unavoidable, the vessel would relocate to an adjacent area where refraction effects were less prounounced. If refraction effects in the SSS imagery were minor or in small isolated areas, data collection would continue. These isolated refraction areas in the data were reviewed by the processor and removed if neccesary, to be recollected at a later time. Before leaving the site, a final review of the data was conducted to ensure all areas had proper coverage and all significant areas of refraction had been resolved.

The variability in the sound speed profiles also had an effect on the multibeam data. To overcome this issue, the field team took frequent sound speed casts to accurately map the dynamic sound speed conditions. Casts were taken at both ends of a given survey area and interspersed in the middle as appropriate. The frequency of MVP casts typically ranged from 20 to 60 minutes. Surface sound speed values were displayed in the HYSWEEP survey

window and recorded in the data file. The surface values were monitored throughout the survey for variations that indicated a new sound speed profile was needed.

The method selected in CARIS HIPS to sound speed correct the multibeam lines was determined based on the spatial and temporal changes observed in sound speed profiles over the course of the day. Some lines were corrected using individual casts as recommended by the field team. The majority of the lines were sound speed corrected using CARIS HIPS' "Nearest in Distance Within Time" method. The day-to-day sound speed correction method is noted in the daily processing logs. Despite the efforts taken to reduce sound speed artifacts, refraction was evident in some of the outer beams of the multibeam data. Multibeam swaths for mainscheme survey lines were filtered to 60 degrees from nadir in order to reduce sound speed related uncertainty.

During SWMB acquisition with the *R/V Ferrel*, the Reson 7101 would experience periodic bursts of motion-induced noise or "blowouts" that typically affected between 2 to 4 sequential profiles, and in most cases required the entire swath to be rejected in processing. Efforts were made to reduce this noise, including adjustments to system gain and power, in addition to the multibeam pole fairing that was installed to reduce cavitation effects. The frequency of the noise bursts would typically increase as sea-state worsened. Therefore, operations were suspended when the frequency or length of blowouts became too high.

All multibeam data were closely reviewed by the processor in CARIS HIPS using both the Swath Editor and Subset Editor to identify and remove the noisy data. The coverage surfaces were then reviewed for any holidays that exceeded the coverage requirement that no gaps in surfaces be greater than 3 nodes (HSSD 2009). Per e-mail correspondence with the COTR on September 16, 2009 (see Appendix V) OSI was instructed that grid resolutions of 2m for depths less than 20 meters and 4m for depths 20 - 40 meters are acceptable. If holidays were found that exceeded the tolerances, additional multibeam fill-in lines were collected. A final holiday check was performed using CARIS' BASE Surface QC Report, and those results can be found in Separate IV.

Large schools of fish and numerous pods of dolphins were frequently seen in both the multibeam and SSS data (Figure 6). Fish and dolphins were noted in the acquisition log by the field team, and these areas were carefully reviewed during data processing. If seen on only one side scan line, the contact was designated as fish. If seen in 200% side scan coverage and a significant height was measured, the contact was investigated with object detection multibeam coverage to verify or disprove the presence of a feature. If the imagery was obstructed to the point it was unusable, the SSS data were rejected and re-collected at a later time.

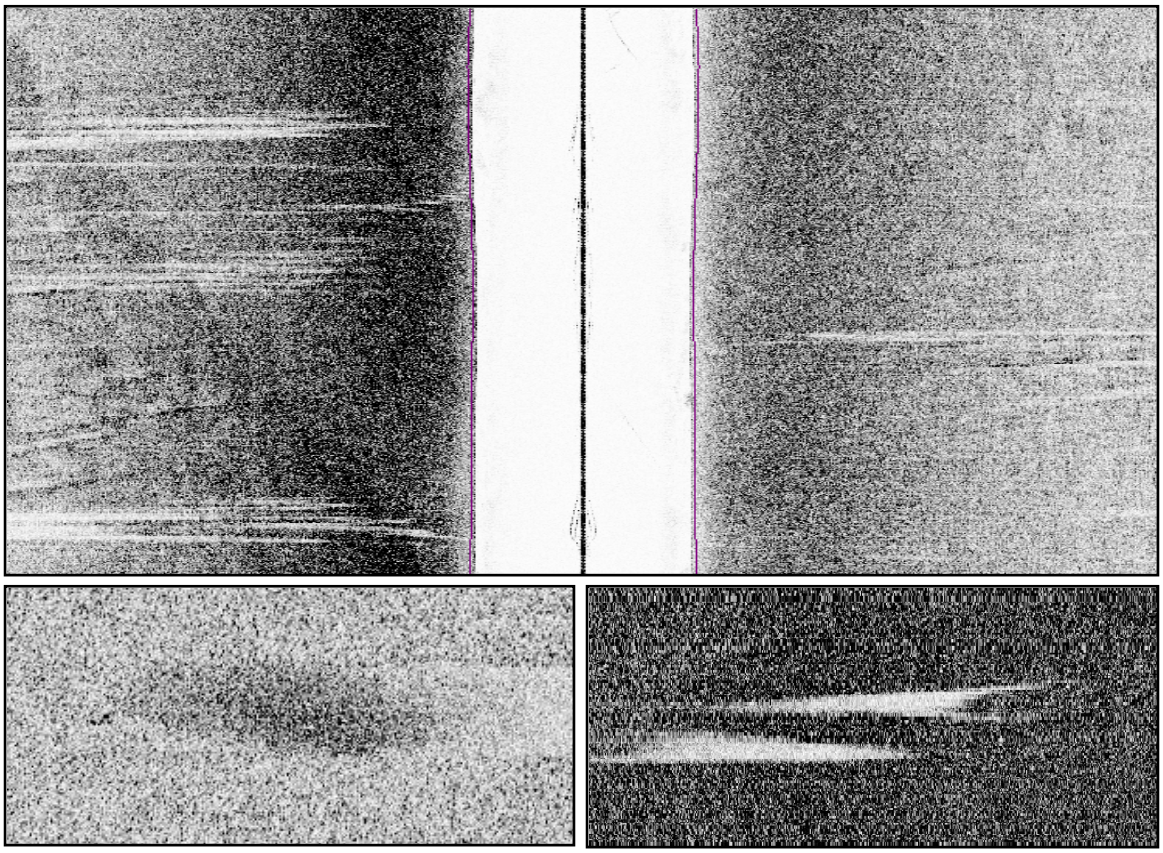


Figure 6. Examples of fish/dolphin noise seen in the side scan imagery.

Several gaps were present in the preliminary tide data recorded by the Pensacola tide station (872-9840), the primary tide gauge for Survey H12062 (Figure 7). These gaps occurred between February 17 and 18, 2010 (DNs 048 and 049) while the *R/V Able II* collected cross line data. The gaps were filled in the verified tide data provided by CO-OPS via NOAA's Tides and Currents website. The gaps in preliminary tide data, once filled by CO-OPS in the verified tide data, did not appear to have a significant impact on the tide-corrected multibeam data based on the comparison of these cross lines to the mainscheme data.

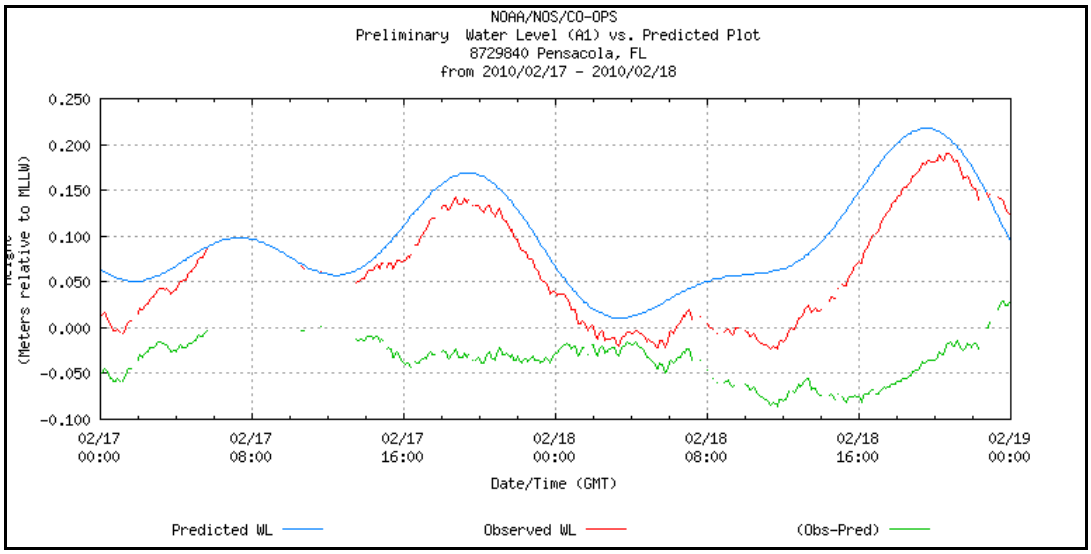


Figure 7. A graph downloaded from the NOAA Tides and Currents website shows the observed tide data gaps at Pensacola gauge.

Based on cross line and standard deviation surface analysis results, verified tides appear to model the tides correctly for the majority of the survey period. However, there are several areas in the combined final BASE surface that have above average standard deviation values where overlapping data were collected on different days (Figure 8). The vertical offset between survey lines appears to be tide-induced, and the magnitude of the offset does not exceed 0.2 meters, well below the allowable IHO Order 1 error budget for 20-meter depths (±0.56 meters).

OSI undertook a brief water level analysis in an attempt to understand and validate the vertical offset depicted in Figure 8. Utilizing the Applanix POSPac MMS software, water level data, at the location of the survey vessel, were derived employing the Post-Processed Virtual Reference Station (PPVRS) technique. These water level data were compared to coincidental zone-corrected, verified water level data from the Pensacola tide gauge. The analysis in fact demonstrated that the departure of the PPVRS-derived water level data from the zone-corrected, verified water levels are generally consistent in magnitude and direction with the offset observed between survey lines.

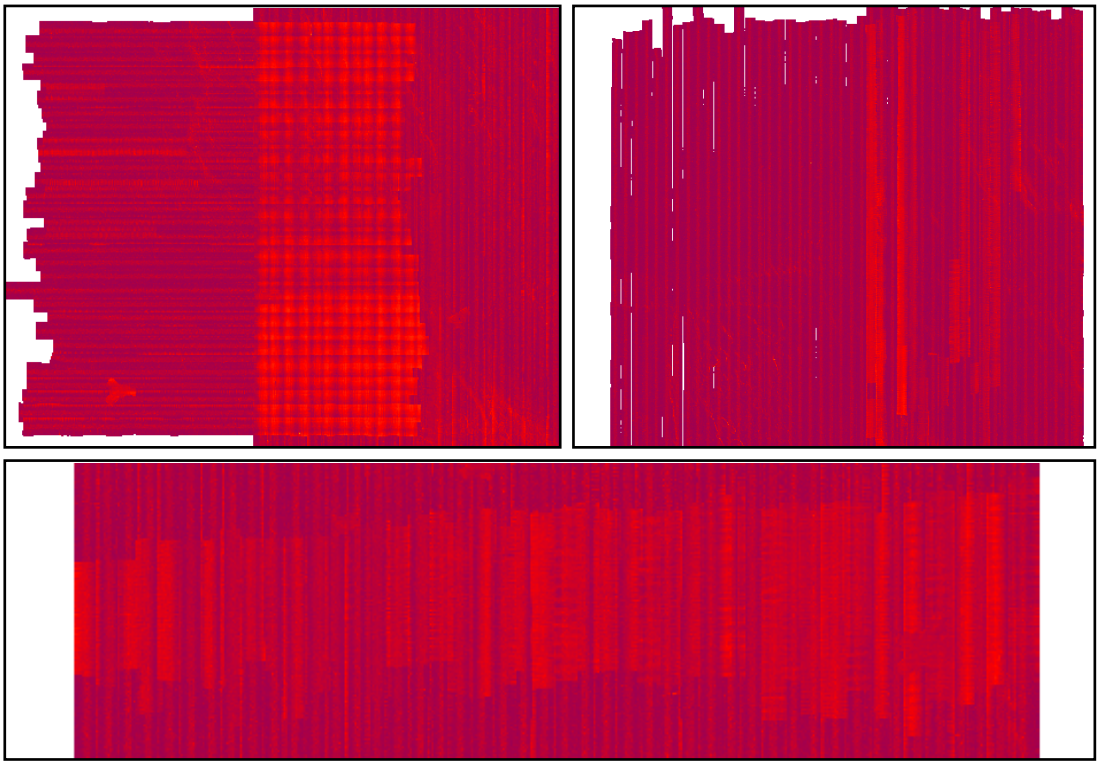


Figure 8. Evidence of tidal offsets as shown in the standard deviation layer of the final combined 2-meter BASE surface.

B.2.6 Sounding Coverage, Equipment and Methods

As noted in Table 4, a Reson Model 7101 multibeam echo sounder was employed to acquire sounding data. The sytem was configured to operate using 511 beams. Due to the shallow conditions throughout the site, the multibeam system ping rate was maintained at a relatively high rate. The combination of the high beam number and ping rate ensured the system met the mainscheme along-track and grid/node density requirements at typical survey speeds.

During mainscheme multibeam data collection, the Reson 7101 was configured to operate using 511 equidistant beams within a 140 degree swath. During contact investigations the swath width was narrowed to 120 degrees, while maintaining the same number of beams, therby increasing sounding density. In addition to narrowing the swath, the survey vessel was operated at a survey speed typically less than 6 knots. These modifications along with the collection of multiple near-nadir passes for each contact development, ensured that extremely dense, high-quality soundings were available for least depth determination of contact developments.

B.3 Corrections to Echo Soundings

Preliminary patch test values were calculated in the field and final values were verified in CARIS HIPS.

Corrections to echo soundings were performed in accordance with the DAPR. However, on the *R/V Able II* additional multibeam echo sounder calibrations were completed due to variability in roll alignment noted during preliminary processing. The minute roll offset variation is attributed to the act of deploying and recovering the transducer pole each day. A routine roll calibration was performed each day prior to data acquisition. The roll offset in the CARIS Vessel Configuration File, ABLEII_7101_511_Cross_Lines.hvf, was updated on February 17 and 18 (DNs 048 and 049).

Alignment correctors for the *R/V Ferrel* remained unchanged for the duration of survey operations. Latency and attitude bias values calculated from the initial patch test were confirmed by a final patch test conducted after data acquisition was complete.

For the *R/V Able II,* all comparison casts taken with the secondary CTD units were removed from the concatenated SVP files prior to sound speed correcting the multibeam data. The office processors' initials were appended to the end of the file name to indicate the raw concatenated SVP file had been updated.

B.3.1 Static Draft Corrections

Static draft values were measured prior to survey operations each day and recorded in the acquisition log. The static draft was also measured before and after each fueling. The CARIS vessel file was updated with daily time tags and static draft values. Static draft corrections were applied during the merge process. The water level values did not vary more than approximately 0.02 meters for the *R/V Able II* and 0.05 meters for the *R/V Ferrel*.

B.4 Data Processing

B 4.1 Survey Coverage

This survey was conducted to develop 200% SSS coverage within the survey limits along with concurrent SWMB, also known as "skunk stripe" bathymetry. Full multibeam coverage of the survey area was not required. All potentially significant features located with mainscheme SSS were developed with high density, near nadir multibeam sonar data to meet the HSSD 2009 requirement for "Object Detection Coverage."

B 4.2 Coverage BASE Surfaces and Mosaics

Survey H12062 was divided into two field sheets (Figure 9 and Table 6) based upon the number of nodes (limited by CARIS HIPS) per field sheet (less than 25 million nodes). The required grid resolution for Survey H12062 was 2 meters for depths less than 20 meters and 4 meters for depths of 20-40 meters, per email correspondence from NOAA dated September 16, 2009 (see Appendix V). The 2-meter surfaces were generated in CARIS HIPS using the "Shallow Configuration" under the CUBE Parameters' Advanced Settings menu.

In addition to the two mainscheme multibeam surfaces, 21 (twenty one) small field sheets were created over features located during multibeam developments of side scan targets. The investigation item field sheets had approximate dimensions of 50 meters x 50 meters. BASE surfaces were generated using the CUBE algorithm and finalized within each field sheet at a grid resolution of 1-meter, which was the required grid size at depths less than 23 meters to demonstrate "Complete Multibeam Coverage" over side scan sonar target investigations, per the same email correspondence referenced in the above paragraph (see Appendix V). The 1-meter BASE surfaces were generated with the CUBE algorithm, IHO Order 1, and with CUBE parameter settings configured such that only soundings that fell within a fixed radial distance of 0.71 meters of a node were used to calculate sounding density. In the event that no feature was located following item investigation with multibeam development lines or the feature height was navigationally insignificant at the survey depth, a field sheet was not generated over that investigation area.

A 2-meter combined sounding field sheet is also included in the deliverables. This sheet, "H12062_ Full_Combined_2m," includes the gridded soundings from field sheets H12062_North, H12062_South and the 21 item investigation field sheets listed in Table 6.

Employing the choice SSS imagery as discussed in Section B.2.5., a 1-meter resolution coverage mosaic field sheet was created for each 100% SSS coverage.

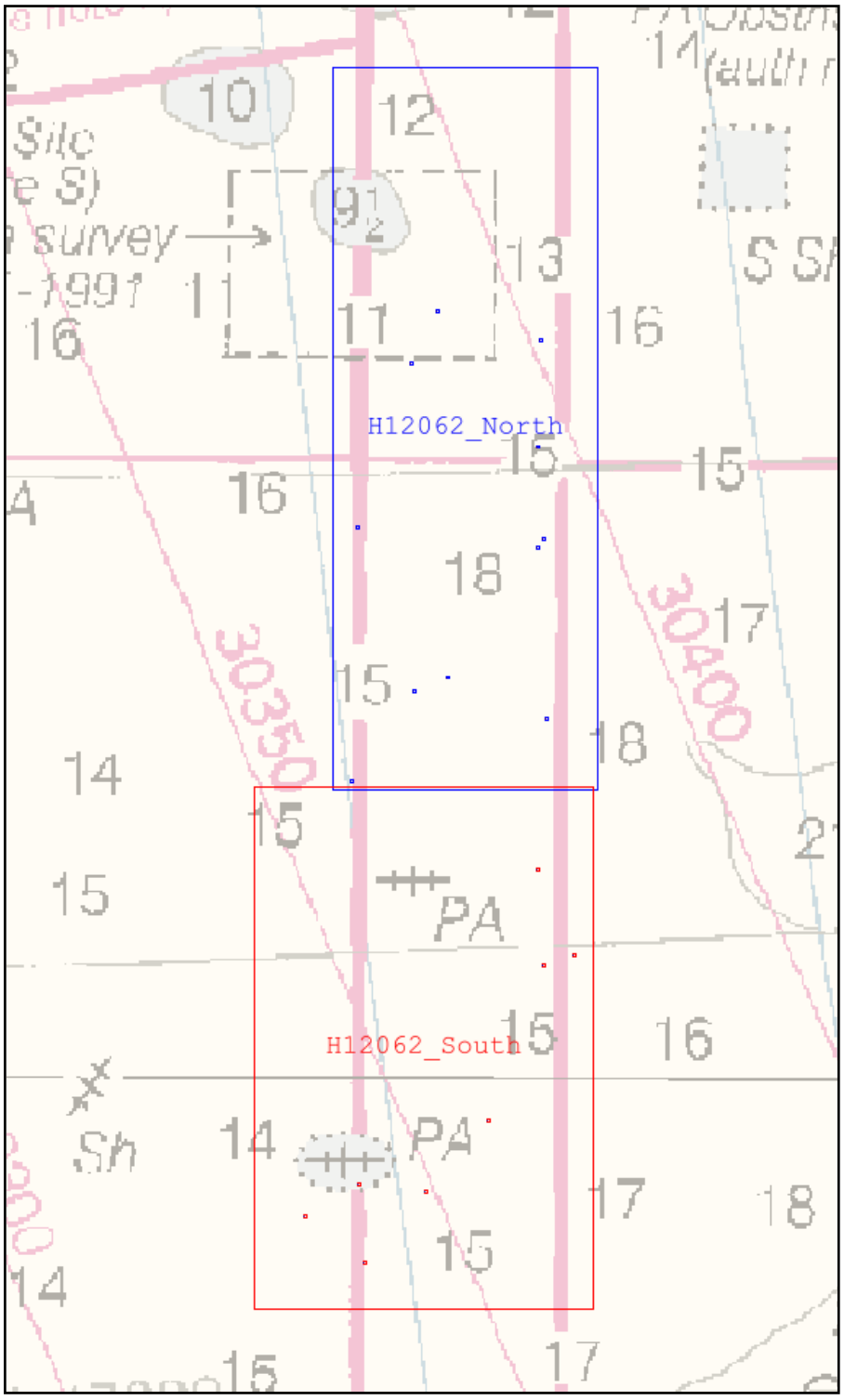


Figure 9. H12062 final sub-area sounding field sheet layout.

Table 6
H12062 Field Sheets

Field Sheet Name	Resolution (meters)	Depth Range (meters)	Type
H12062_North	2	20-37	SWMB coverage
H12062_South	2	27-37	SWMB coverage
Item_1_FS_North	1	21-23	SWMB coverage
Item_2_FS_North	1	22-24	SWMB coverage
Item_3_FS_North	1	24-28	SWMB coverage
Item_4_FS_North	1	27-30	SWMB coverage
Item_5_FS_North	1	28-32	SWMB coverage
Item_6_FS_North	1	28-31	SWMB coverage
Item_7_FS_North	1	28-31	SWMB coverage
Item_8_FS_North	1	28-31	SWMB coverage
Item_9_FS_North	1	26-29	SWMB coverage
Item_10_FS_North	1	29-33	SWMB coverage
Item_11_FS_North	1	27-30	SWMB coverage
Item_12_FS_South	1	28-31	SWMB coverage
Item_13_FS_South	1	27-30	SWMB coverage
Item_14_FS_South	1	27-30	SWMB coverage
Item_15_FS_South	1	29-32	SWMB coverage
Item_16_FS_South	1	27-30	SWMB coverage
Item_17_FS_South	1	27-30	SWMB coverage
Item_18_FS_South	1	27-30	SWMB coverage
Item_19_FS_South	1	27-30	SWMB coverage
Item_20_FS_North	1	32-34	SWMB coverage
Item_21_FS_South	1	30-33	SWMB coverage
H12062_Full_Combined	2	all	SWMB coverage
H12062_SSS_100	1	all	SSS coverage
H12062_SSS_200	1	all	SSS coverage

C. VERTICAL AND HORIZONTAL CONTROL

C.1 Vertical Control

The vertical datum for this project is Mean Lower Low Water (MLLW). The operating National Water Level Observation Network (NWLON) station at Pensacola, FL (872-9840) serves as datum control for Survey H12062.

The survey area is located within Zones CGM8 and CGM29 as provided in the preliminary tidal zoning scheme included with the project SOW CD. Based on the results of cross line analysis, it appears that the time and range factors as provided in the preliminary zoning scheme are adequate.

OSI home office and field personnel monitored preliminary tide data available on the NOAA CO-OPS website. The NOAA Pensacola (872-9840) gauge experienced a series of preliminary tide gaps between February 17 and 18 (DNs 048 and 049). The largest gap was 5 hours in length; however, it did not coincide with data acquisition. All gaps were filled by CO-OPS prior to issuance of verified tide data.

C.2 Horizontal Control

The horizontal datum for this project is the North American Datum of 1983 (NAD83). All data products are referenced to Latitude/Longitude or Universal Transverse Mercator (UTM) Zone 16, meters.

All primary position data were acquired using an Applanix POS MV operating in Differential GPS (DGPS) mode. The unit was configured to receive USCG Differential beacon correctors from Eglin Air Force Base, FL. Differential beacon correctors from the U.S. Coast Guard station in Mobile Point, AL, were used by the secondary navigation system to facilitate real-time horizontal control confidence checks. On May 4, 2010 (DN 124), there was a period of approximately six hours when correctors from Eglin Air Force Base could not be received. During this time, the differential correctors from Mobile Point were used for the primary system. Initial dynamic draft and patch calibration data (for each vessel) were acquired with the POS-MV operating in RTK GPS mode.

Prior to and during the course of the survey the accuracy of the primary positioning system was verified by means of a physical measurement to a project horizontal control point established at each vessel's berth. The horizontal control points were established using the National Geodetic Survey's Online Positioning Users Service (OPUS) technology. Position confidence checks were accomplished daily on *R/V Able II* and at least bi-weekly, for the *R/V Ferrel*. Refer to the DAPR and Horizontal and Vertical Control Report (HVCR) for additional details.

D. RESULTS AND RECOMMENDATIONS

D.1 Chart Comparison

Chart comparisons were performed in CARIS HIPS/SIPS, Notebook and Easy View using surface models, contours and soundings generated from the combined final BASE surface. The latest editions of the NOAA NOS Raster Nautical Charts (RNC) and Electronic Nautical Charts (ENC) were downloaded from the NOAA Coast Survey WWW site (http://www.nauticalcharts.noaa.gov/) weekly during survey operations, and when the survey was completed for final comparisons. The RNCs and ENCs used for final comparisons, summarized in Table 7, were downloaded on June 15, 2010 and are submitted with the survey data.

The Local Notice to Mariners (LNM) and Notice to Mariners (NM) issued during the survey period (October 23, 2009 to May 11, 2010) were reviewed for significant updates. Coast Guard District 8 LNM 19/2010 (May 12, 2010) was the final notice reviewed for this project.

Table 7
H12062 Affected Charts

Chart Number	Scale	Edition	ENC
1115A (11360)	1: 456,394	43rd, Nov./08	US3GC05
11382	1:80,000	41st, May/10	US4FL71

D.1.1 General Chart Comparison

In general, charted and surveyed depths agreed within 3 feet (1 meter) to Chart 11382 and 1 fathom (2 meters) for small scale Chart 1115A. Specific differences are discussed in the detailed chart comparisons below.

- Two (2) uncharted obstructions were surveyed in the Safety Fairway. Positions and least depths were developed and are submitted with the S-57 feature file, H12062_S57_Features.000.
- A number of obstructions with insignificant heights (<10% water depth HSSD 2009) were surveyed in the Safety Fairway. Least depths were designated on the contacts and generally they were not significantly shoaler than charted depths.
- The survey partially covered a charted dump site located in the northwest corner of the survey area. The survey data confirms the location of this site. It is primarily within the charted extents of this dump site that the charted soundings differ significantly from the surveyed depths.
- High-resolution data from this survey provided more detailed delineations of depth areas and individual features.

D.1.2 Detailed Chart Comparison and Charted Features

The chart features listed below were common to Charts 11382 and 1115A. (Soundings in Feet and Fathoms)

- H12062-1: The eastern half of a charted Dump Site (dredged material) approximately centered at 30-07-57N, 87-18-00W coincided with H12062 survey limits. Dredge spoils appear to have been dumped in a pattern that reflects the square shape of the charted dump site extents (Figure 10). The dump site's charted least depth of 57 feet/9 ½ fathoms (17.4 meters) was disproved with 100% SWMB. There are no surveyed depths to support the 60-foot/10-fathom contour surrounding the charted 57-foot sounding. An average depth of 70 feet/11.7 fathoms (21.3 meters) was developed over the charted 57-foot depth and the shallowest depth surveyed in the vicinity was 68.3 feet/11.4 fathoms (20.8 meters) at 30-08-28.79N, 87-18-02.40W (Figure 11). The least depth developed within the dump site was 65.8 feet/11.0 fathoms (20.0 meters) at 30-08-08.89N, 87-17-41.88W over a new shoal located approximately 650 meters (8 mm at chart scale) southeast of the charted 57-foot/9 ½ fathom shoal.

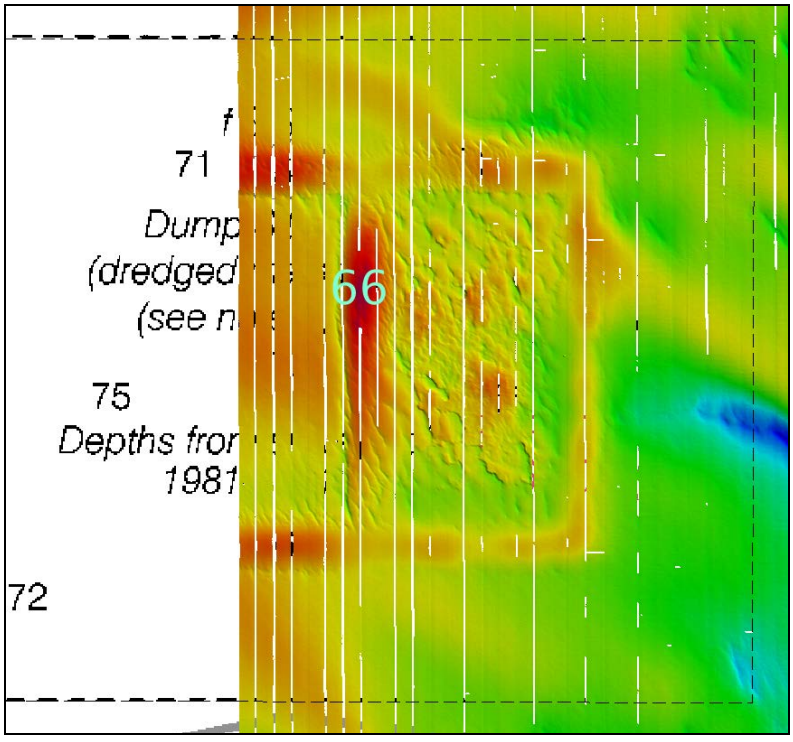


Figure 10. Survey H12062 covered the eastern half of a charted Dump Site. A 2-meter BASE surface colored by depth is overlain on RNC 11382 with the Dump Site limits represented by the dashed black line. The location of the least depth of 66 feet surveyed within the dump site is shown in cyan.

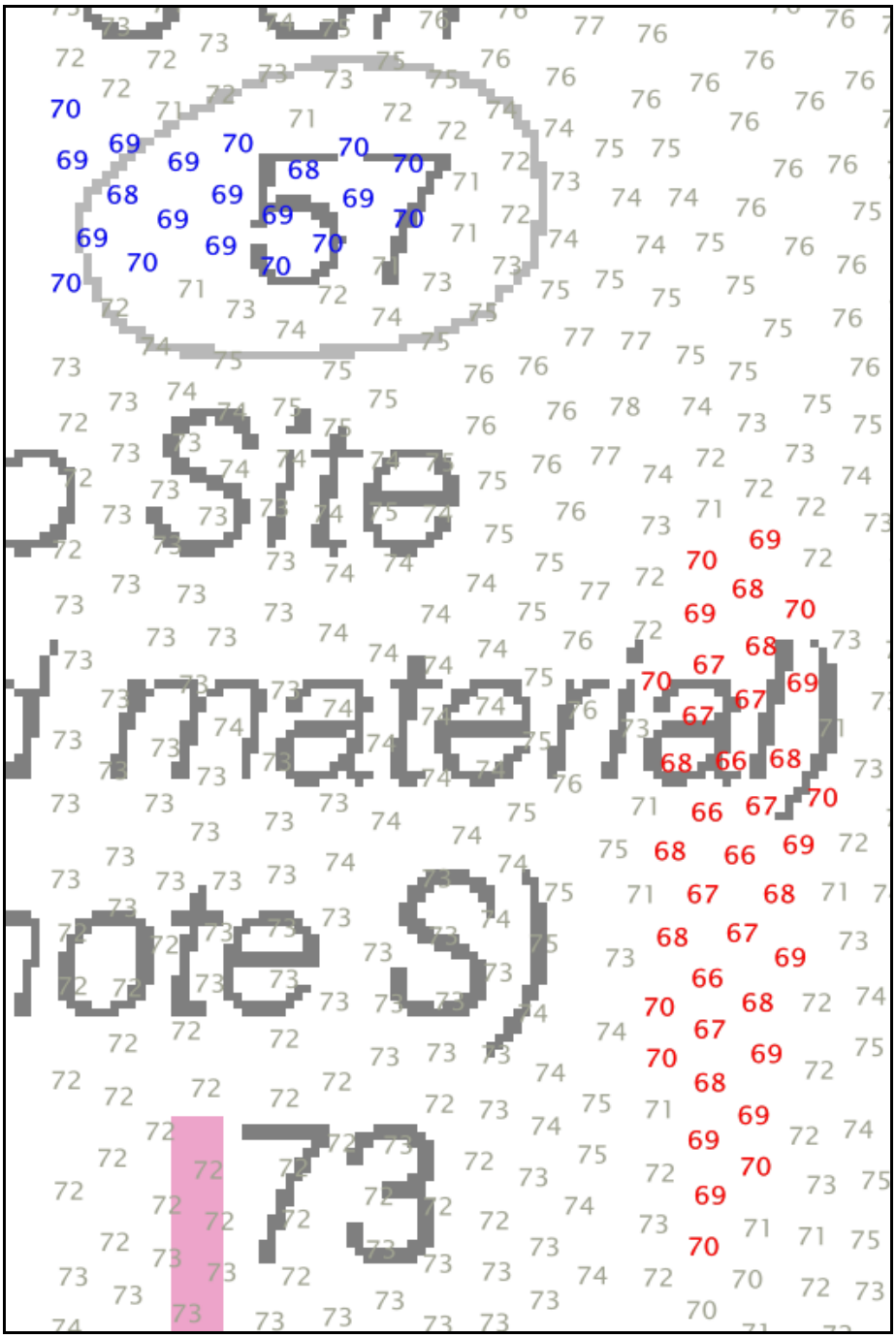


Figure 11. Soundings surveyed over the 57-foot shoal were deeper than charted (blue). A new shoal with a least depth of 66 feet (11 fathoms) was developed southeast of the charted shoal (red). All depths are in feet with RNC 11382 displayed in the background.

- H12062-2: An obstruction with a least depth of 81.1 feet/13.5 fathoms (24.7 meters) developed at 30-06-09.95N, 87-16-00.20W was found in the vicinity of a charted 93-

foot/15-fathom sounding (Figures 12 and 13). The obstruction is included as an OBSTRN object in the S-57 Feature File (H12062_S57_Features.000).

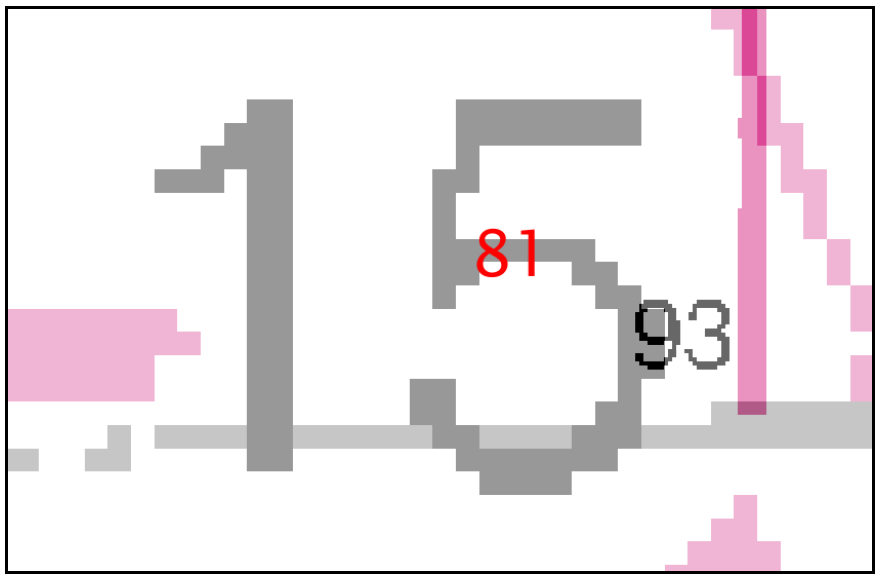


Figure 12. The location of the 81-foot obstruction, in red, shown in relation to the 15-fathom sounding of RNC 1115A and the 93-foot sounding of RNC 11382.

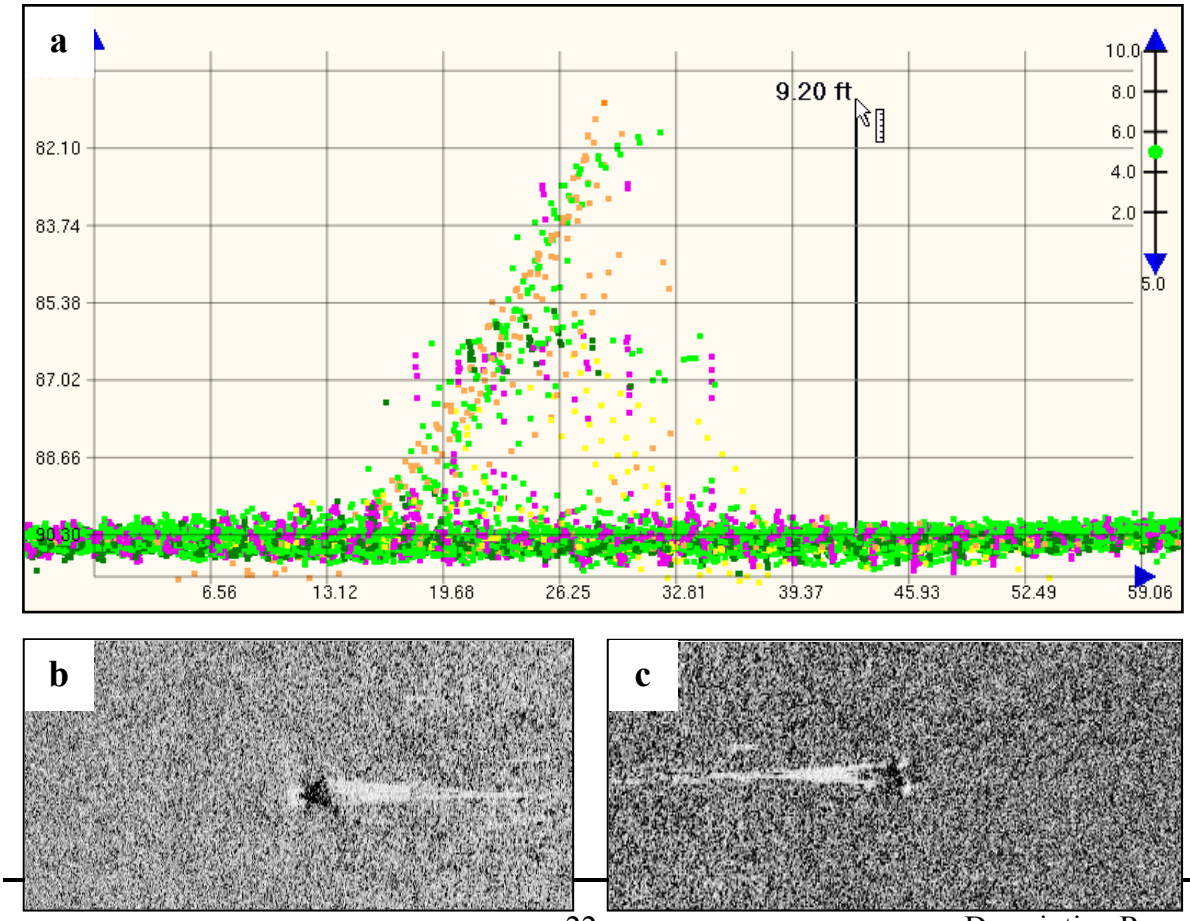


Figure 13. (a) The new 81-foot obstruction displayed in CARIS HIPS Subset Editor with soundings colored by survey line; depth and distance units are in feet. (b, c) Side scan sonar imagery of the obstruction from two overlapping survey lines, Contacts 124-21120003 and 124-23000003, respectively.

Chart 11382 (Soundings in Feet)

- H12062-3: A least depth sounding of 71.2 feet (21.7 meters) was developed on a 3-foot tall contact at 30-09-02.08N 087-17-02.20W, a position approximately 130 meters (1.6 mm at chart scale) northwest of a charted depth of 75 feet.
- H12062-4: A least depth sounding of 72.8 feet (22.2 meters) was found on a 3-foot tall contact at 30-09-38.65N 087-16-17.73W, a position approximately 160 meters (2 mm at chart scale) east of a charted depth of 77 feet.
- H12062-5: Surveyed depths were 4 to 10 feet (1.2 to 3.0 meters) deeper over charted soundings of 66 and 77 feet located approximately at 30-07-43N, 87-16-57W in the southeast corner of the Dump Site (Figure 14). A 6-foot (1.8 meter) tall obstruction with a least depth of 69.6 feet (21.2 meters) was developed at 30-07-29.48N, 87-17-07.66W between the charted 69- and 77-foot soundings. The obstruction height is "insignificant" for the surrounding depth, but it is a shallow point within the Dump Site. The least depth was flagged as a Designated Sounding in CARIS HIPS.

Figure 14. Survey depths (blue) in feet are shown where significant depth changes were noted relative to charted depths in RNC 11382.

- H12062-6: A new shoal was surveyed south of the charted Dump Site extending between charted soundings of 85 and 87 feet in the vicinity of 30-06-22N, 87-17-14W (Figure 15). In general depths surveyed over the shoal differed with charted depths by less than 6 feet (1.8 meters). However, two 5-foot (1.5-meter) tall obstructions with least depths of 75.5 and 78.6 feet (23.0 and 24.0 meters) were developed over the shoal at 30-06-34.41N, 87-17-21.54W and 30-06-17.02N, 87-16-58.07W, respectively. The 75-foot obstruction was located approximately 300 meters (3.75 mm at chart scale) east of the charted 85-foot sounding. It is recommended that the shoal soundings supersede charted depths.

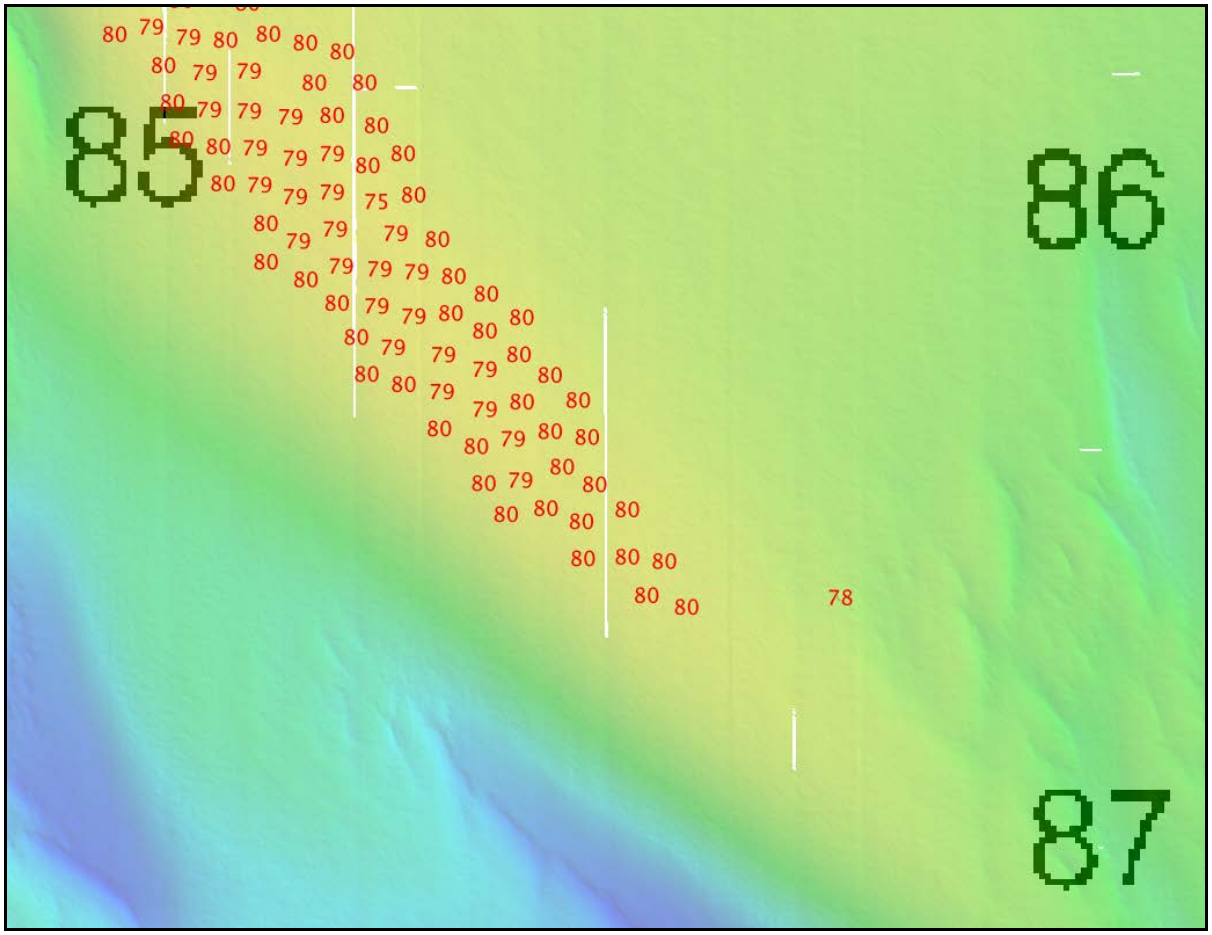


Figure 15. Survey depths (red) in feet are shown in an area south of the Dump Site where significant depth changes were noted relative to charted depths in RNC 11382.

Chart 1115A (Soundings in Fathoms)

- H12062-7: A"Non-Dangerous Wreck PA" of unknown depth charted at 30-02-00.74N, 87-17-29.89W was disproved with 200% SSS and 100% SWMB. The least depth surveyed within the vicinity of the wreck area was 15.6 fathoms (28.5 meters) at 30-01-54.24N, 87-17-33.18W. See AWOIS Item #6958 under Appendix II – Survey Feature Report for additional information.
- H12062-8: An unknown dangerous wreck charted at 29-59-12.87N, 87-18-10.36W was disproved with 200% SSS and 100% SWMB. The least depth surveyed within the vicinity of the wreck area was 14.9 fathoms (27.2 meters) at 29-59-27.15N, 87-18-25.37W. See AWOIS Item #14311 under Appendix II – Survey Feature Report for additional information.

D.1.3 Controlling and Tabulated Depths

There were no charted channels located within the survey area.

D.1.4 AWOIS Items

There were two (2) AWOIS item investigations assigned within the survey area (Table 8). Both AWOIS items were investigated to the full extent possible using the recommended search techniques (e.g. S2, MB). See Appendix II – Survey Feature Report, for complete reporting on AWOIS Item investigation.

Table 8
H12062 AWOIS Investigations

AWOIS Record	Latitude (N)	Longitude (W)	Description	Status
6958	30-02-00.74	87-17-29.89	Wreck – *Spanish Fly*	Disproved
14311	29-59-12.87	87-18-10.36	Wreck – *Unknown Vessel*	Disproved

D.1.5 Danger to Navigation (DTON)

There were no Danger to Navigation Reports generated for the survey.

D.2 Additional Results

D.2.1 Shoreline Verification

Shoreline verification was not required for the survey.

D.2.2 Comparison with Prior Surveys

A comparison with prior surveys was not required for the survey.

D.2.3 Aids to Navigation (ATON)

There were no Aids to Navigation within the survey area.

D.2.4 Restricted Data

Not applicable for the survey.

D.2.5 Other Data

D.2.5.1 Bottom Characteristics

Ten (10) bottom samples were acquired to determine bottom characteristics. Bottom samples were spaced at approximately 2000-meter intervals in accordance with the SOW. A table listing the positions and descriptions of the bottom samples is included in Appendix V. A position and description of each sample are provided as attributed SBDARE objects in the S-57 feature file. Digital images with identification reference numbers are submitted with the survey data and referenced in the S-57 PICREP attribute.

D.2.6 S-57 Feature File

D.2.6.1 S-57 Chart Features File

Two (2) uncharted obstructions were identified and delineated in the SSS data, SWMB data and BASE surfaces. An S-57 feature file (H12062_S-57_Features.000/.hob) was created to emphasize navigationally significant objects discovered during the survey, update charted objects and provide information for these objects that could not be portrayed in the BASE surfaces. All S-57 features were attributed in accordance with guidance provided in the SOW and HSSD 2009. Table 9 describes the attribute mapping for the S-57 feature file.

Table 9
S-57 Chart Features Attribute Mapping

S-57 Attribute	Value
VALSOU	Corrected least depth
TECSOU	Technique used to develop VALSOU
INFORM	Unique Critical Sounding ID
SORDAT	Survey Date
SORIND	Survey reference – registry ID
PICREP	Contact image file name
userid*	Unique Contact ID
remrks*	Acquisition or processing remarks
recomd*	Charting recommendations

*These attributes are available in the CARIS Notebook HOB file format.

D.2.6.2 S-57 Contact File

All contacts are submitted in an S-57 attributed Notebook HOB file of $CSYMB objects. Table 10 describes the attribute mapping for the S-57 contact file.

Table 10
S-57 Contact Attribute Mapping

S-57 Attribute	Value
INFORM	Corrected least depth (m)
SORDAT	Survey Date
SORIND	Survey reference – registry ID
PICREP	Contact image file name
TXTDSC	Unique Critical Sounding ID (Line-beam-ping)
userid*	Unique Contact ID (Line-ping-offset)
remrks*	Acquisition or processing remarks
recomd*	Charting recommendations

*These attributes are available in the CARIS Notebook HOB file format.

D.2.6.3 S-57 Critical Sounding File

All critical soundings are submitted in an S-57 attributed Notebook HOB file of $CSYMB objects. Table 11 describes the attribute mapping for the S-57 critical soundings file.

Table 11
S-57 Critical Soundings Attribute Mapping

S-57 Attribute	Value
INFORM	Corrected least depth (m)
SORDAT	Survey Date
SORIND	Survey reference – registry ID
PICREP	Contact or feature image file name
TXTDSC	Unique Contact ID (Line-ping-offset)
userid*	Unique Critical Sounding ID (Line-beam-ping)
remrks*	Acquisition or processing remarks
recomd*	Charting recommendations

*These attributes are available in the CARIS Notebook HOB file format.

E. APPROVAL SHEET

LETTER OF APPROVAL

REGISTRY NO. H12062

This report and the accompanying data are respectfully submitted.

Field operations contributing to the accomplishment of Survey H12062 were conducted under my direct supervision with frequent personal checks of progress and adequacy. This report and associated data have been closely reviewed and are considered complete and adequate as per the Statement of Work.

George G. Reynolds
Ocean Surveys, Inc.
Chief of Party – H12062
September 8, 2011

Project-wide reports, the Data Acquisition and Processing Report (DAPR) and the Horizontal and Vertical Control Report (HVCR), were submitted with contemporary survey H12061 on August 24, 2010. They are named as follows:

Report Name	Date of Report
OPR-J364-KR-09_DAPR.pdf	August 18, 2010
OPR-J364-KR-09_HVCR.pdf	August 18, 2010

APPENDIX I

TIDES AND WATER LEVELS

Abstract of Times of Hydrography

The following table, "Abstract of Times of Hydrography," summarizes the days in which data were collected that contribute to the final accepted data set.

Date	Day Number	Min. Time UTC	Max. Time UTC
02/17/10	48	17:33:28	20:13:30
02/18/10	49	13:36:29	13:57:13
04/22/10	112	00:39:38	12:19:10
04/23/10	113	11:05:47	21:43:58
04/26/10	116	14:25:59	21:24:37
04/27/10	117	01:15:57	11:56:03
05/04/10	124	08:08:46	23:48:19
05/05/10	125	00:38:26	05:29:52
05/06/10	126	02:10:46	23:45:10
05/07/10	127	01:03:57	22:56:59
05/08/10	128	00:59:47	12:01:53
05/10/10	130	11:43:39	23:33:36
05/11/10	131	00:29:50	04:41:15

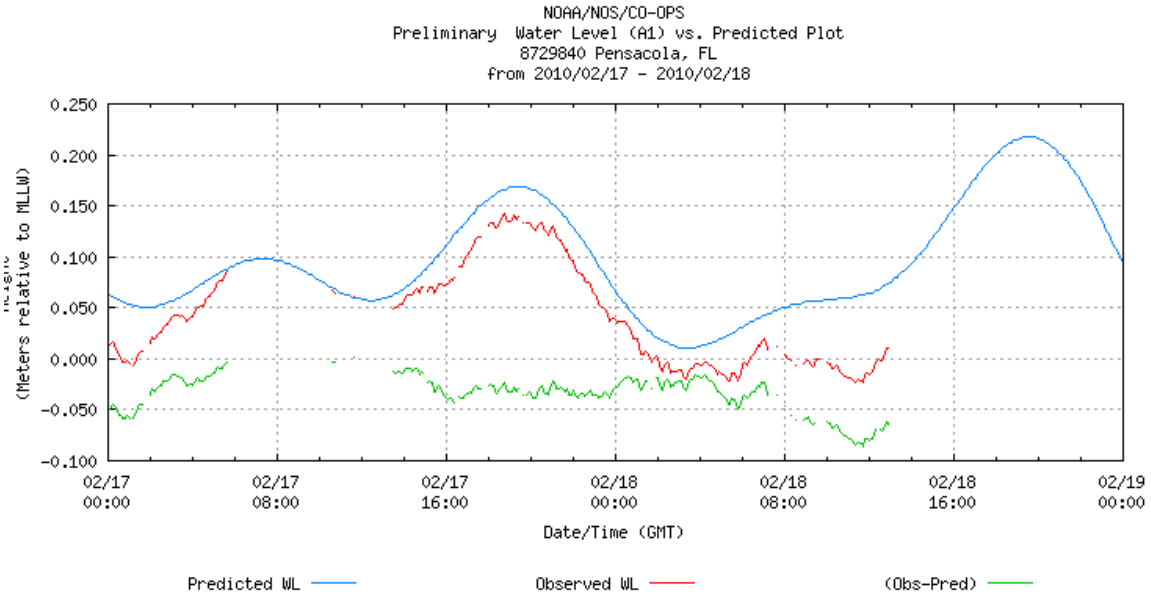
The COTR was notified via e-mail and telephone communications that the OSI field team was ready to commence survey operations. The COTR subsequently instructed CO-OPS to begin providing OSI with verified tides. Email correspondence concerning the tide gauge follows.

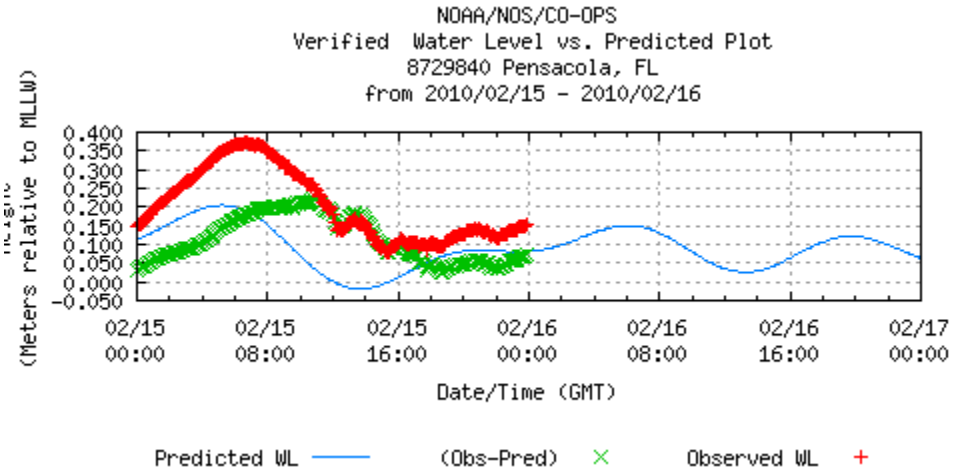
From: George Reynolds [ggr@oceansurveys.com]
Sent: Thursday, February 18, 2010 12:09 PM
To: kathleen Jamison
Subject: FW: Pensacola and Dauphin Island Tide Gauge Status and Forecast 2/18/10

Hi Kathleen,

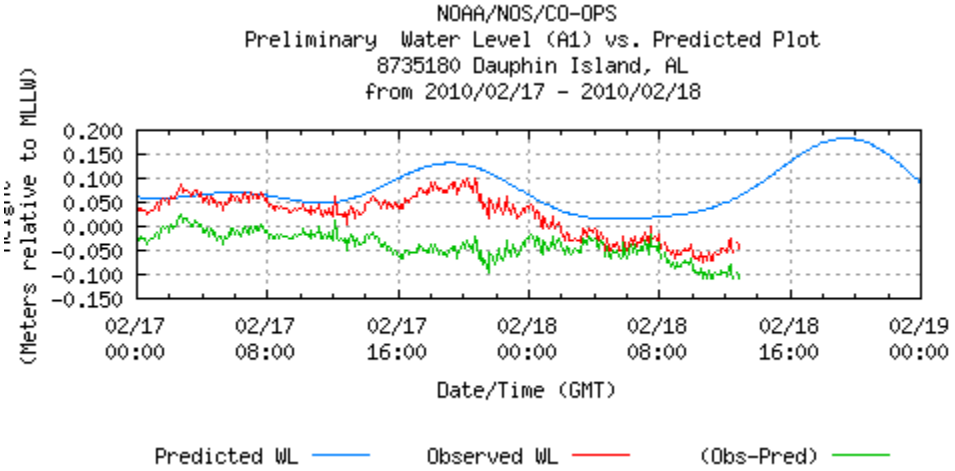
The Pensacola gauge is reporting intermittent data gaps. A large gap occurs between 0542 GMT on 2/17/10 and 1324 GMT on 2/17/10.

Regards
George

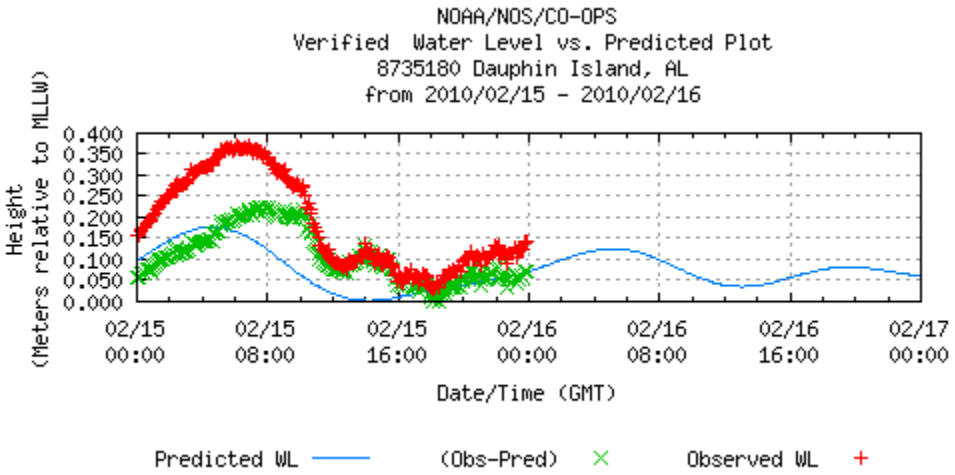




Verified tides are available through 2/15/10 (DN 046).
DAUPHIN ISLAND



Preliminary tides are available through today (DN049).



Verified tides are available through 2/15/10 (DN 046).

APPENDIX II

SUPPLEMENTAL SURVEY RECORDS AND CORRESPONDENCE

Bottom Samples

Bottom samples were obtained at required grid node locations (i.e. 2000 meters across site in water depths less than 100 feet per the HSSD 2009). Sediment grab locations are included as a separate S-57 feature file (H12062_Bottom_Samples.hob).

OSI Bottom Sample Designation	Latitude, N (NAD83)	Longitude, W (NAD83)	Depth (meters)	Description
C-01	30-08-13.75	87-16-52.64	23.2	Fine, Orange/Yellow, Sand and Shell
C-02	30-07-08.71	87-16-52.01	24.2	Fine, Orange/Yellow, Sand and Shell
C-03	30-06-03.88	87-16-51.71	25.9	Fine, Orange/Yellow, Sand
C-04	30-04-58.91	87-16-51.43	33.4	Fine, Orange/Yellow, Sand
C-05	30-03-53.89	87-16-51.22	31.1	Fine, Orange/Yellow, Sand
C-06	30-02-48.95	87-16-51.75	30.7	Fine, Orange/Yellow, Sand and Shell
C-07	30-01-43.84	87-16-51.51	30.1	Fine, Orange/Yellow, Sand
C-08	30-00-38.96	87-16-51.45	28.3	Fine, Orange/Yellow, Sand and Silt
C-09	29-59-34.02	87-16-51.12	31.1	Fine, Orange/Yellow, Sand with Silt and Shell
C-10	29-58-28.46	87-16-50.55	29.6	Fine, Orange/Yellow, Sand and Shell


C
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C 0 3
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C 0 4
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C 0 5
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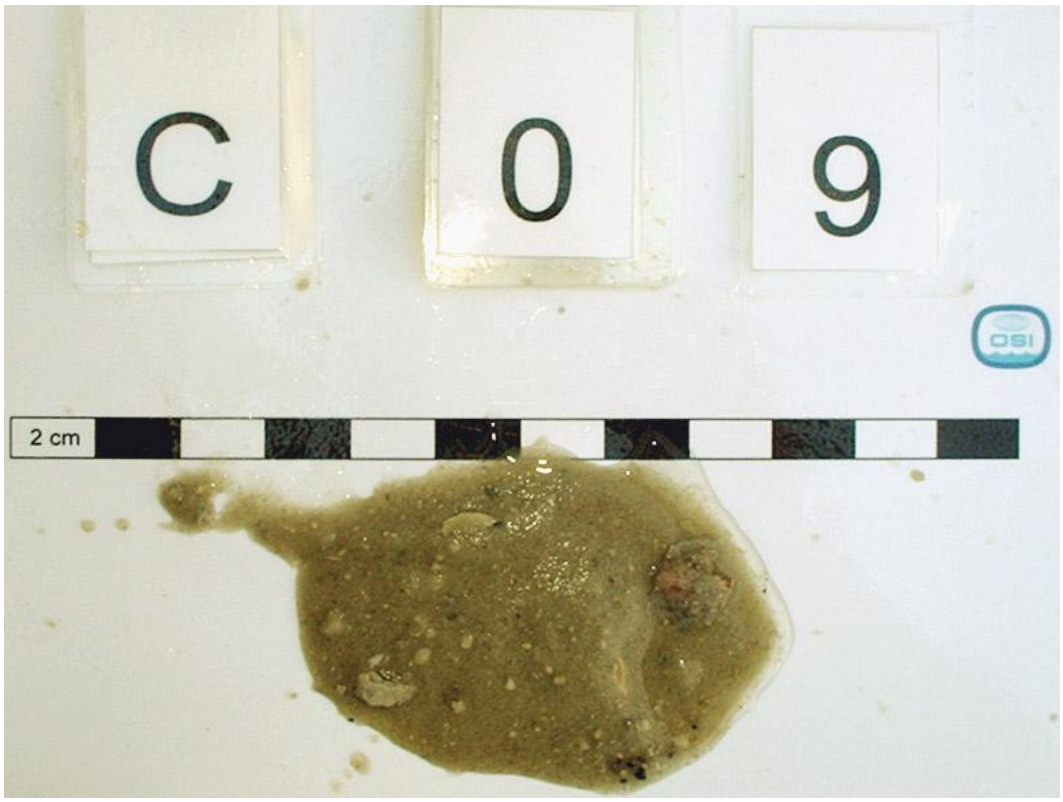
C 0 6
2 cm


C 0 7
2 cm


C 0 8
2 cm


C 0 9
2 cm


C 1 0
2 cm

Correspondence

E-mail correspondence between OSI and the COTR follows.

From: kathleen.jamison [mailto:Kathleen.Jamison@noaa.gov]
Sent: Wednesday, September 16, 2009 3:59 PM
To: George Reynolds
Subject: Specs & Deliverables requirements

Hi George,

After discussing the multibeam resolution requirements detailed in the 2009 Specs & Deliverables, 5.1.2, and taking into consideration your concerns about meeting some of the coverage specifications, we have decided on the following minimum requirements for your current project in the Gulf of Mexico:

For main scheme multibeam bathymetry acquired concurrently with 200% side scan coverage ("skunk stripe"):

* Grid resolutions of 2m for depths less than 20 meters and 4m for depths 20 - 40 meters are acceptable.
* Minimum sounding density shall be 3 soundings per node.
* Small holidays in the multibeam coverage due to mid-water targets or attitude dynamics are acceptable where adjacent soundings show no evidence of significant shoaling, and the 200% side scan coverage does not indicate the presence of a feature.

For multibeam developments of targets identified in side scan sonar:

* Coverage as per the "Complete Multibeam Coverage" specification (Section 5.1.2.2) over the feature and the immediate surrounding seabed.

Regarding tools for demonstrating sounding density:

* You may use any method to evaluate the density and resolution requirements you would like, provided that you can demonstrate these results to NOAA.
* For the purposes of this requirement, NOAA will not differentiate between the soundings actually falling within the square grid cell, and the soundings within the circular capture radius (provided the maximum sounding propagation distance is set to no greater than the grid resolution divided by sqrt(2), as required by the Specs and Deliverables)
* We note that the density layer feature in CARIS may be helpful.

Also very important:

1) The exemptions to the Specs & Deliverables listed above apply only to survey OPR-J364-KR-09. Any future projects must adhere to requirements detailed in the latest version of the Specs & Deliverables. Exemptions are granted only on a case-by-case basis.
2) All deviations from the Specs & Deliverables must be detailed in the Descriptive Report and DAPR as appropriate.

Please let me know if you have any further questions.

--
Kathleen Jamison
Physical Scientist, Data Acquisition Control Branch Hydrographic Surveys
Division NOAA Kathleen.Jamison@noaa.gov 301.713.2700 x109

AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT

1. Contract ID Code	Page	of Pages
	1	2

2. Amendment/Modification No	3. Effective Date	4. Requisition/Purchase Req. No.	5. Project No. (if applicable)
001	Jan 21, 2010	NCNJ3000-10-05092	

6. Issued By — Code AJF00012
ACQUISITION & GRANTS OFFICE OFA6
1335 EAST-WEST HWY., SSMC-1 RM 6300

SILVER SPRING, MD 20910
CATHERINE A. PERREN 301-713-0820 164

7. Administered By (If other than Item 6) — Code AJF50012
NOS/NMFS/OAR ACQUISITION DIVISION /OFA65
1305 EAST-WEST HWY., SSMC-4 RM 7141

SILVER SPRING, MD 20910

8. Name and Address of Contractor (No. Street, County, and Zip Code)

OCEAN SURVEYS, INC.
[illegible] SHEFFIELD STREET
OLD SAYBROOK CT 064752306

Vendor ID: 00012711
DUNS: 084798149

CAGE: 3Y156

(X) 9A. Amendment of Solicitation No.

9B. Date (See Item 11)

10A. Modification of Contract/Order No.
X DG133C-08-CQ-0007 T002

10B. Date (See Item 13)
Jul 28, 2009

Code | Facility Code

11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS

__ The above numbered solicitation is amended as set forth in item 14. The hour and date specified for receipt of Offers __ is extended __ is not extended. Offers must acknowledge receipt of this amendment prior to the hour and date specified in the solicitation or as amended, by one of the following methods: (a) By completing items 8 and 15, and returning ____ copies of the amendment; (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter, provided each telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.

12. Accounting and Appropriation Data (If required)
See Schedule $ 0.00

13. THIS ITEM APPLIES ONLY TO MODIFICATIONS OF CONTRACT/ORDERS. IT MODIFIES THE CONTRACT/ORDER NO. AS DESCRIBED IN ITEM 14.

__ A. This change order is issued pursuant to: (Specify authority) The changes set forth in item 14 are made in the Contract Order No. in item 10A.

X B. The above numbered Contract/Order is modified to reflect the administrative changes (such as changes in paying office, appropriation date, etc.) Set forth in item 14, pursuant to the authority of FAR 43.103 (b)

__ C. This supplemental agreement is entered into pursuant to authority of:

__ D. Other (Specify type of modification and authority)

E. IMPORTANT: Contractor | X | is not, | | is required to sign this document and return ____ copies to the issuing office.

14. Description of Amendment/Modification (Organized by UCF section headings, including solicitation/contract subject matter where feasible.)

The above referenced task order is hereby modified as follows:

Add 14 square nautical miles to the east side of the survey area and remove 14 square nautical miles from the west side of the survey area.

Except as provided herein, all terms and conditions of the document referenced in item 9A or 10A, as heretofore changed, remains unchanged and in full force and effect.

15A. Name and Title of Signer (Type or Print)		16A. Name and title of Contracting Officer (Type or Print)	
		JOHN WHITFIELD CONTRACT SPECIALIST john.whitfield@noaa.gov	301-713-0820 X135
15B. Contractor/Offeror (Signature of person authorized to sign)	15C. Date Signed	16B. United States of America John Whitfield (Signature of Contracting Officer)	16C. Date Signed 1/28/10

NSN 7540-01-152-8070 — 30-105 — STANDARD FORM 30 (REV. 10-83)
PREVIOUS EDITIONS UNUSABLE — Prescribed by GSA FAR (48 CFR) 53.243

SCHEDULE

Item No	Supplies/Services	Quantity	Unit	Unit Price	Amount
0001	An an independent contractor and not as an agent of the Government, provide hydrographic survey of the Florida and Alabama Safety Fairways in the Gulf of Mexico using Side Scan Sonar and Multibeam Sonar. The following ecquipment is being added to this task order: Klein 5000 V1 Side Scan Sonar _____ Contractor Signature Date _____ Contractor Date Accounting and Appropriation Data: 14.09.Z8K6BHS.P00.0013.010301031.100900030 0000000.25130000.000000 US$ 3,013,668.43	1	EA	3,013,668.43	3,013,668.43

-----Original Message-----
From: kathleen.jamison [mailto:Kathleen.Jamison@noaa.gov]
Sent: Wednesday, March 17, 2010 12:10 PM
To: George Reynolds; Castle.E.Parker; Benjamin K Evans
Subject: Re: Pensacola Topics

George,

See embedded remarks below.

-Kathleen

George Reynolds wrote:

Hi Kathleen,

Just a couple of discussion topics that we would like your input on.

Data collection for Pensacola Sheet B is complete and we are compiling the final deliverables. We have also completed the DAPR for Sheet B data which were obtained from a small boat, thus the Sheet B DAPR covers only small boat operations. The remaining Sheets (A, C and D) will be completed using both small and large vessels. We are planning to write a separate DAPR that will cover large vessel operations. This approach will allow us to complete and deliver Sheet B products independently of Sheets A, C and D. Is this approach acceptable?

I spoke with Gene Parker about this one. He suggested that, along with the DR for Sheet B, you should submit a DAPR now, since it is really only Section A - equipment and vessels specs, offsets, system bias calibrations, etc - that will change. Then, you would submit an appended DAPR along with Sheets A, C and D. The appended DAPR would stand on record as the "final" DAPR with the small AND large boat information. That way there would be just one DAPR on the project, not two, which would cause less confusion down the line. AHB would prefer this option, since a staggered sheet submission is generally better anyway, as it allows the branch to review the initial sheet and report submission and reply with feedback.

As you know the specs and deliverables requires that sound speed profilers "must be recalibrated when the survey is complete if the completion date is later than six months from the date of last re-calibration." The sound speed instruments we employed during Sheet B operations are just outside the six-month window for re-calibration; one unit was 4 days and the 2^nd unit was 12 days beyond the re-calibration due date on the last day of Sheet B data collection operations. (We are replacing both units with newly calibrated instruments for Sheets A, C and D). The Sheet B instruments passed the VelociWin comparison cast criteria throughout the survey including the last day of data collection operations. Given this

information we request that NOAA extend the six-month re-calibration criteria by 12 days for Sheet B. This extension will allow us to move forward with the Sheet B DR without having to wait 4 to 6 weeks for Sea-Bird to issue re-calibration reports.

Along the same lines, it would be better to submit Sheet B and the DR as soon as possible to AHB rather than wait out the 4-6 weeks to get the calibration reports back for the small boat instruments. So, for this time only, you may forgo the re-calibration of the small boat CTDs, since they are only 4 and 12 days over the 6-month window and you are not planning to use them during the large boat operations. Instead, if you already have the newly calibrated instruments for Sheets A, C, and D, you could do a single comparison of the Sheet B instruments to the newly calibrated instruments to see that they provide the same results.

The Pensacola tide gage is reporting inconsistent data. No survey data are currently being impacted; however, now may be a good time to service the gage if CO-OPS thinks it is appropriate.

Co-ops said thanks for letting them know and they will keep an eye on it. If the issue doesn't resolve itself, HPT will determine whether the gaps are fillable or if they need to do any gauge repairs.

Regards,

George

--
Kathleen Jamison
Physical Scientist, Data Acquisition Control Branch Hydrographic Surveys Division NOAA
Kathleen.Jamison@noaa.gov 301.713.2700 x109

-----Original Message-----
From: kathleen.jamison [mailto:Kathleen.Jamison@noaa.gov]
Sent: Friday, April 30, 2010 5:31 PM
To: George Reynolds
Subject: Re: Answers

As per our phone discussion:

1) The "exceptions" we have given for the FY09 work does not apply to the FY10 survey work. If adjustments need to be made to the FY10 project requirements that conflict with the 2010 Specs & Deliverables, that will be done on a case-by-case basis.

2) We concur with each of your statements below (#1-4).

3) #4 is the only topic that also applies to the 2010 survey sheets - you do not need to add cross lines just to reach the 4% if you are doing re-runs or fill-ins to the original line spacing. If your cross lines do not meet the 4% requirement, please explain this in the DR briefly - you can cite this email as documented permission from your COTR (that goes for any variation from the specs that is discussed and approved by your COTR - just document it!).

Have a great weekend - tell your crew to stay safe and listen to the Coast Guard - I'll be keeping my eye on what's happening to Pensacola regarding the spill, but please let me know if you hear of any useful information from the scene.

Regards,
Kathleen

George Reynolds wrote:
> Hi Kathleen,
>
> Thanks for following up on our discussion topics.
>
> For your reference, the following is a copy of our notes from the meeting
> aboard the Ferrel.
>
> 1. In water depths of greater than 20 meters, occasional SSS refraction
> is not a concern assuming that line spacing results in "Complete multibeam
> coverage".
>
> 2. In water depths of ?20m, refraction is acceptable only if, by means

> of confidence checks along the line, we are able to determine that we can
> see features across the entire record. This will not apply in the event
> that the refraction is sporadic as we will not have a "standard" by which
to
> judge the effects of refraction. "Complete multibeam coverage" will not
> suffice to replace the object detection capabilities of the SSS in ?20m.
> Only "object detection multibeam coverage" would serve in place of SSS.
>
> 3. During skunk stripe SSS/MB surveying the multibeam density
> requirement in water depths 20M and less is 5 soundings/1m cell with cell
> size increasing to 5% of water depth after 20m per "complete multibeam
> coverage" standards. Due to our "exception", we are required to populate
> cells with three soundings (<20m water = 2m cell, >20m water =4m cell).
Per
> "complete multibeam coverage" standards, holidays may span no more than 3
> nodes (cells). Therefore, with the exception of the cases presented
below,
> we are allowed 6m of along track holiday in <20m and 12m of along track
> holiday in >20m before we have to go back and fill-in the holiday. NOAA
> suggested that "common sense" should also be one of the tools that we use
> when making decisions on this subject.
>
> Larger holidays than described above may be acceptable if:
> Exception 1: We have overlapping coverage from adjacent swaths that
> populate some of the cells that would have been populated by the swath
that
> experienced the blowout.
> Exception 2: We have partial coverage within the blowout area and
are
> able to confidently retain some of the soundings within the blowout.
>
> Again, common sense should prevail.
>
> 4. Tie line percentage requirement applies to the planned or proposed
> line plan, not the actual line plan implemented. In other words, if we
plan
> on line spacing for 100M SSS and end up having to do in-fills to meet
> coverage requirements due to site conditions (i.e refraction), no
> additional tie lines are required to reach the 4% lineal nautical miles
run
> for the additional trackline miles.
>
> If you have any questions on the above please let me know.
>
> Looking forward to talking with you later today.

>
> Regards
> George
>
>
> -----Original Message-----
> From: kathleen.jamison [mailto:Kathleen.Jamison@noaa.gov]
> Sent: Friday, April 30, 2010 9:15 AM
> To: George Reynolds
> Subject: Answers
>
> Hi George,
>
> I will give you a call shortly to follow up on this email. Now that you
> have worked out the degraded imagery issues in Sheet A (to where
> contacts can be reliably observed in the imagery), I'd like to clarify
> which questions you still would like official answers on.
>
> For now, I can confirm two issues that we discussed last week and/or on
> our site visit:
>
> 1) Modification to Project Instructions permitting substitution of
> "Complete" multibeam echosounder coverage for 200% side scan sonar with
> concurrent "Set Line Spacing" multibeam in depths greater than 20 m.
>
> 2) Task award for OPR-J364-KR-10. The official word from the
> contracting office is "on or before May 22," although I have emphasized
> to them that this area is a priority, and to award the task order as
> soon as possible, so I'm hoping for something closer to May 15, although
> of course I cannot say for sure.
>
> Will you be suspending operations or making modifications in the spill
> aftermath? I had thought there wouldn't be much worry in Pensacola, at
> least in the near term while the oil will hit land in Louisiana and
> doesn't seem to be moving north east, but then I read that Pensacola is
> constructing a boom for the bay. Needless to say, the spill is causing
> quite the stir around here as we scramble to make our resources
> available to the Coast Guard!
--
Kathleen Jamison
Physical Scientist, Data Acquisition Control Branch
Hydrographic Surveys Division
NOAA
Kathleen.Jamison@noaa.gov
301.713.2700 x109

-----Original Message-----
From: "kathleen.jamison" <Kathleen.Jamison@noaa.gov>
Date: Thu, 15 Jul 2010 11:42:22
To: George Reynolds<ggr@oceansurveys.com>
Cc: Lori Knell<Lori.Knell@noaa.gov>
Subject: Visit on Tuesday

Hi George,

Thanks so much for providing such a great office visit experience earlier this week. I believe we were able to accomplish quite a bit, and I appreciate your gathering Bob and Bonnie to help out with everything.

Here are a few answers to the DR Questions (with input from Gene Parker at AHB):

Q. Should OSI include charting recommendations for item investigations other than AWOIS items?
A. Yes, the hydrographer (OSI) should make charting recommendations whenever it would be helpful.

Q. Should the title sheet state "feet" or "meters" at the bottom of the page?
A. It should be listed as "meters" – all processing is done in metric, and should only be converted to feet or fathoms following H-Cell compilation at the production branch.

Q. Is there any reason to continue putting the bold blue registry number on the cover page? It is not required in the Specs & Deliverables or the Statement of Work.
A. No, it is not mandatory – this is a relic from the hard copy days when the DR was placed in a folder horizontally for reference.

Q. Should OSI submit difference surfaces (images, graphics and explanations) in the DR for survey junctions?
A. Yes – the images and graphics often say more than the text.

Q. Is there any requirement for OSI to make Coast Pilot or ATON Report (for MCD) submissions?
A. No, there is no requirement for contractors to make submit separate Coast Pilot or ATON Reports. A SAR question flagged as a yellow "Not Applicable" does not affect the SAR score.

Q. How much should the "correspondence" section in Appendix 5 contain?
A. Only pertinent and relative information, e.g., where the production branch or the COTR provides guidance regarding "exceptions" or changes in

deliverables as required by the Statement of Work or Specs & Deliverables. Do not include information regarding DTONs in Appendix 5 – Appendix 1 DTON Report is sufficient.

Let me know if there's a question I missed, or if you have any further questions. I'm also going to start cc'ing Lori Knell on these emails, since she will be taking over my COTR duties while I am on my detail.

--
Kathleen Jamison
Physical Scientist, Data Acquisition Control Branch Hydrographic Surveys Division NOAA Kathleen.Jamison@noaa.gov 301.713.2700 x109

APPENDIX III

SURVEY FEATURES REPORT

H12062 AWOIS FEATURE REPORT

Registry Number: H12062
State: Florida
Locality: Gulf of Mexico
Sub-locality: 15 NM S of Pensacola
Project Number: OPR-J364-KR-09-C
Survey Date:

Charts Affected

Number	Edition	Date	Scale (RNC)	RNC Correction(s)*
1115A	44th	10/01/2010	1:456,394 (1115A_1)	USCG LNM: 8/16/2011 (9/20/2011) NGA NTM: 6/5/2010 (10/1/2011)
11360	44th	10/01/2010	1:456,394 (11360_1)	USCG LNM: 8/16/2011 (9/20/2011) NGA NTM: 6/5/2010 (10/1/2011)
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	AWOIS #14311 - Disproved	AWOIS	[no data]	[no data]	[no data]	---
1.2	AWOIS #6958 - Disproved	AWOIS	[no data]	[no data]	[no data]	---

1 - AWOIS

1.1) AWOIS #14311 - AWOIS #14311 - Disproved

No Primary Survey Feature for this AWOIS Item

Search Position: 29° 59' 12.9" N, 087° 18' 10.4" W
Historical Depth: [None]
Search Radius: 1000
Search Technique: S2, MB
Technique Notes: [None]

History Notes:

[None]

Survey Summary

Charts Affected: 1115A_1, 11360_1, 11006_1, 411_1

Remarks:

Status: AWOIS Item #14311, charted as “Dangerous Wreck PA” (RNC 1115A), was disproved. The area defined by the 1000-meter radius was covered with 200% SSS and complete SWMB. No obstruction resembling a dangerous wreck was found by the side scan or multibeam systems. A triangular obstruction with insignificant height, with respect to the surrounding depth, was developed at 28-58-58.37N 087-17-59.29W, approximately 530 meters south-east of the indicated AWOIS position (Figure 4). The obstruction’s least depth of 27.3 meters (89.5 feet; 14.9 fathoms) is also the least depth within the 1000 meter search radius. Side scan imagery and multibeam data for the contact can be found in Figures 5 and 6, respectively.

Feature Correlation

Source	Feature	Range	Azimuth	Status
AWOIS_EXPORT	AWOIS # 14311	0.00	000.0	Primary

Hydrographer Recommendations

It is recommended the wreck symbol be removed from the chart.

S-57 Data

Geo object 1: Cartographic symbol ($CSYMB)

Office Notes

SAR NOTE: No evidence of AWOIS 14311 within AWOIS radius centered at 29°59'12.124" , -087°18'12.157".

COMPILATION NOTES: Delete dangerous wreck, PA.

Feature Images

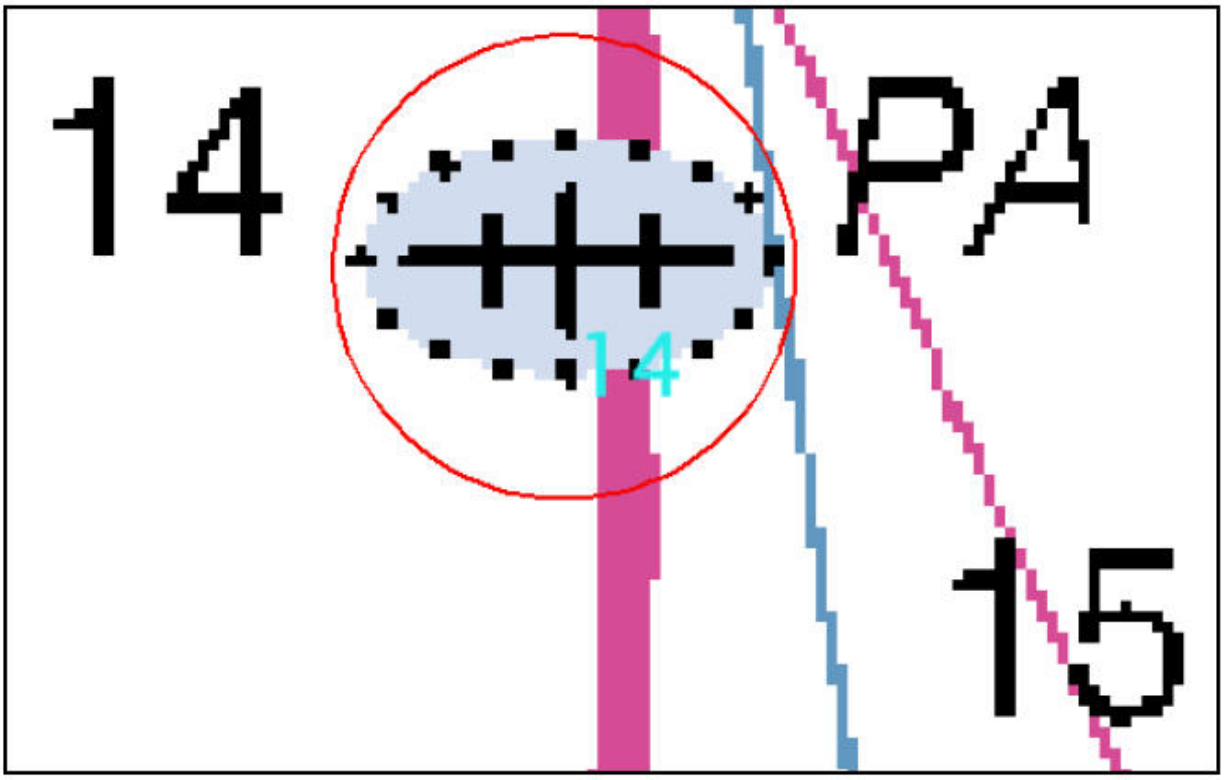


Figure 4. The least depth position of a triangular obstruction, highlighted in cyan, is shown in reference to the search area of AWOIS Item #14311, which is represented by the red circle and overlain on RNC 11360. All depths are in fathoms.

Figure 1.1.1

1.2) AWOIS #6958 - AWOIS #6958 - Disproved

No Primary Survey Feature for this AWOIS Item

Search Position:	30° 02' 00.7" N, 087° 17' 29.9" W
Historical Depth:	[None]
Search Radius:	1000
Search Technique:	S2, MB
Technique Notes:	[None]

History Notes:

HISTORY

BNM3534/84--THE P/C "SPANISH FLY" AFIRE ON 8/19/84. VESSEL ì

BURNING DOWN TO WATERLINE AND SLOWLY SINKING 14NM SOUTH OF ì

PENSACOLA SEA BOUY. NO CONFIRMATION, UNIT DIVERTED TO A HIGHER ì

PRIORITY.

LNM36/84--THE 27FT P/C "SPANISH FLY" HAS BEEN REPORTED BURNED ì

AND MAY HAVE SUNK APPROX. 14MILES SOUTH OF PENSACOLA SEA BOUY IN ì

VICINITY OF LAT. 30-02-00N, LONG. 87-17-30W IN 90FT OF WATER.

LNM17/85--NO PLANS TO SALVAGE VESSEL. (ENTERED, 3/24/88, MCR)

Survey Summary

Charts Affected: 1115A_1, 11360_1, 11006_1, 411_1

Remarks:

Status: AWOIS Item #6958, charted as “Non-Dangerous Wreck PA” (RNC 1115A), was disproved. The area defined by the 1000-meter radius was covered with 200% SSS and complete SWMB. No obstruction resembling a wreck of any kind was found by the side scan or multibeam systems. Two obstructions approximately 60 meters apart, both with insignificant heights, with respect to their surrounding depths, were developed near 30-02-20.86N 087-17-42.84W (Figure 1). This position is approximately 700 meters north-west of the reported AWOIS item. The least depth of these contacts is 15.8 fathoms (94.8 feet/28.9 meters). The least depth within the AWOIS search radius is 15.6 fathoms (93.6 feet/28.5 meters). Side scan images and multibeam data for these contacts can be found in Figures 2 and 3, respectively.

Feature Correlation

Source	Feature	Range	Azimuth	Status
AWOIS_EXPORT	AWOIS # 6958	0.00	000.0	Primary

Hydrographer Recommendations

It is recommended the wreck symbol be removed from the chart

S-57 Data

Geo object 1: Cartographic symbol ($CSYMB)

Office Notes

SAR NOTE: No evidence of AWOIS 6958 within AWOIS radius centered at 30°01'56.755" , -087°17'27.298".

COMPILATION NOTES: Delete non-dangerous wreck, PA.

Feature Images

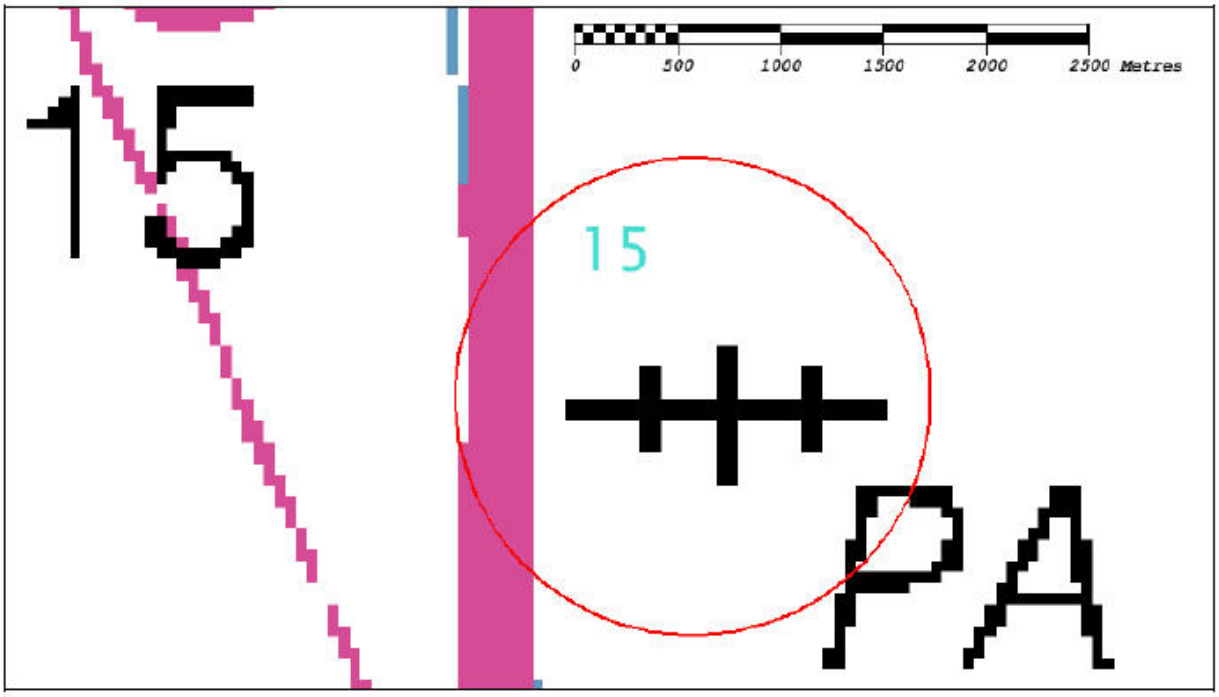


Figure 1. The least depth position on the two small obstructions, highlighted in cyan, is shown in reference to the search area for AWOIS Item #6958, which is represented by the red circle and overlain on RNC 11360. All depths are in fathoms.

Figure 1.2.1

1. DtoNs

-none

2. Maritime Boundary

-none

3. Wrecks

-none

APPROVAL PAGE

H12062

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 NGDC for archive

- H12062_DR.pdf
- Collection of depth varied resolution BAGS
- Processed survey data and records
- H12062_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.

Approved: 

Digitally signed by Abigail Higgins
DN: cn=Abigail Higgins, o=NOAA, ou=Office of Coast Survey, email=abigail.higgins@noaa.gov, c=US
Date: 2012.06.28 17:07:49 -04'00'

Lieutenant Abigail Higgins
Chief, Atlantic Hydrographic Branch