

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-10-2

Registry No. H12237

Locality

State Florida

General Locality Gulf of Mexico

Sub-locality 7 NM SE of Entrance to
Choctawhatchee Bay

2010

George G. Reynolds

CHIEF OF PARTY

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Date.....

HYDROGRAPHIC TITLE SHEET		REGISTRY NO. <u>H12237</u>
State	<i>Florida</i>	
General Locality	<i>Gulf of Mexico</i>	
Sub-Locality	<i>7 NM SE of Entrance to Choctawhatchee Bay</i>	
Scale	1:40,000	
Date of Survey	<i>April 5, 2010 – May 28, 2010</i>	
Instructions Dated	<i>Preliminary, March 8, 2010; Final, June 8, 2010</i>	
Project No.	<i>OPR-J364-KR-10-2</i>	
Vessel	<i>R/V Ferrel – USCG Official Number 1182802</i>	
Chief of Party	<i>George G. Reynolds</i>	
Surveyed By	<i>Robert M. Wallace, John R. Bean, Joseph V. Tyler, Alexander G. Unrein, John R. Ayer, Bonnie L. Johnston</i>	
Soundings by echo sounder	<i>Reson Seabat 7101</i>	
Verification by	<i>Michael J. Engels</i>	
Soundings in	<i>Meters (MLLW)</i>	
REMARKS: <i>All Times Recorded in UTC</i>		
<i>Data Recorded and Presented relative to UTM Zone 16 North</i>		
Contractor: <i>Ocean Surveys, Inc. 129 Mill Rock Rd. East Old Saybrook, CT 06475</i>		
<i>Office Processing notes in bold red italics</i>		

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 5 APRIL 2010 TO 28 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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DESCRIPTIVE REPORT TO ACCOMPANY HYDROGRAPHIC SURVEY H12237

Project Number OPR-J364-KR-10-2

May 28, 2010

Ocean Surveys, Inc. – *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 southeast of the entrance to Choctawhatchee Bay, Florida (Figure 1).

A. AREA SURVEYED

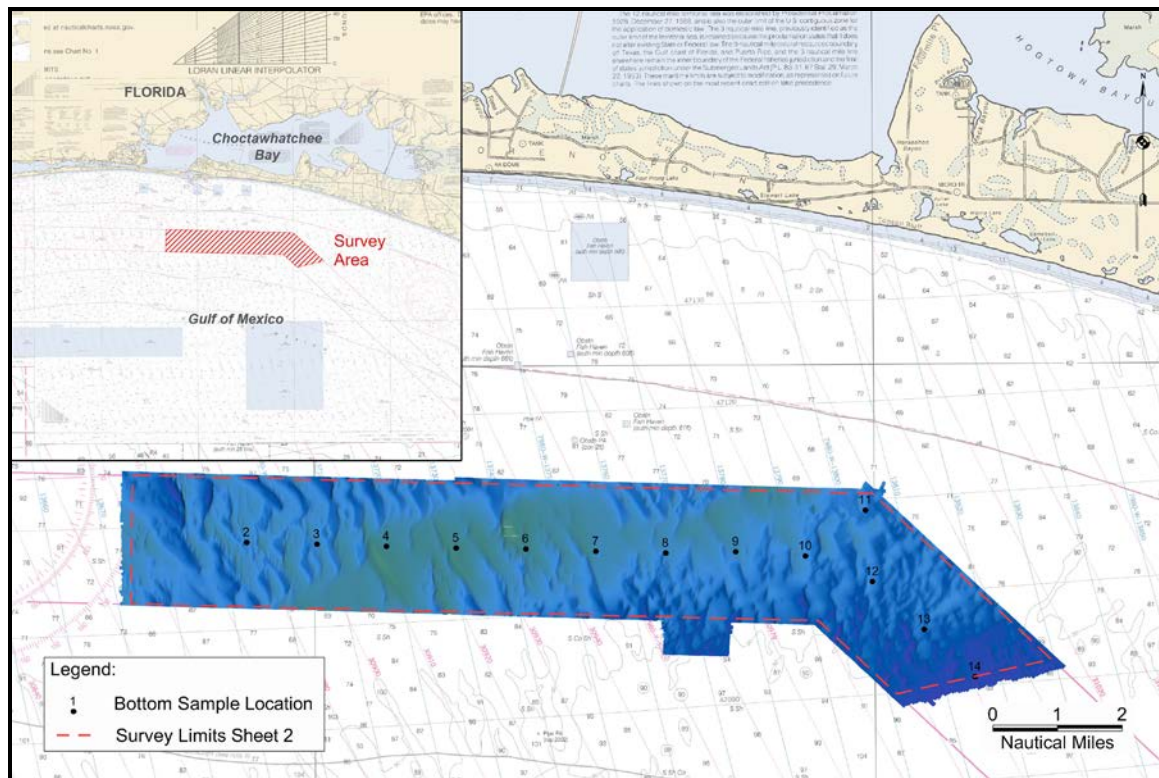


Figure 1. H12237 survey area overlain on RNC 11388. The multibeam coverage image was developed from a 5-meter grid surface and is colored by depth.

This survey provides hydrographic data for the Gulf of Mexico waters southeast of the entrance to Choctawhatchee Bay. This survey junctions with contemporary Survey H12236 to the west. Survey data were acquired to meet requirements specified in the contract Statement of Work (SOW, May 21, 2010)*, and NOS Hydrographic Surveys Specifications and Deliverables Manual, April 2010 (HSSD 2010). The survey limits are primarily defined by charted Safety Fairway boundaries as set forth in the Hydrographic Survey Project Instructions and Statement of Work*. Two hundred percent (200%) side scan sonar (SSS) coverage with concurrent shallow water multibeam echo sounder (SWMB) coverage were obtained per “set line spacing” specifications to water depths of approximately 105 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 30.2 square nautical miles (Figure 1).

Table 1
General Location of Survey H12237

Northern Limit Latitude (N)	Southern Limit Latitude (N)	Western Limit Longitude (W)	Eastern Limit Longitude (W)
30-18-40	30-14-30	86-33-34	86-16-27

The mainscheme SSS/SWMB tracklines were run parallel to the safety fairway boundary lines (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 are indicated in Table 3.

Initial onsite system calibration was performed on April 5, 2010 (DN 095) for the *R/V Ferrel*. Fourteen (14) bottom samples were acquired on May 27, 2010 (DN 147). Mainscheme data, cross line data, additional calibration data and significant target development were acquired on the following dates: April 5, May 11, 12, and 19-27 [Calendar Day Numbers (DN) 095, 131, 132, 139-147 (2010)].

****Data filed with original field records.***

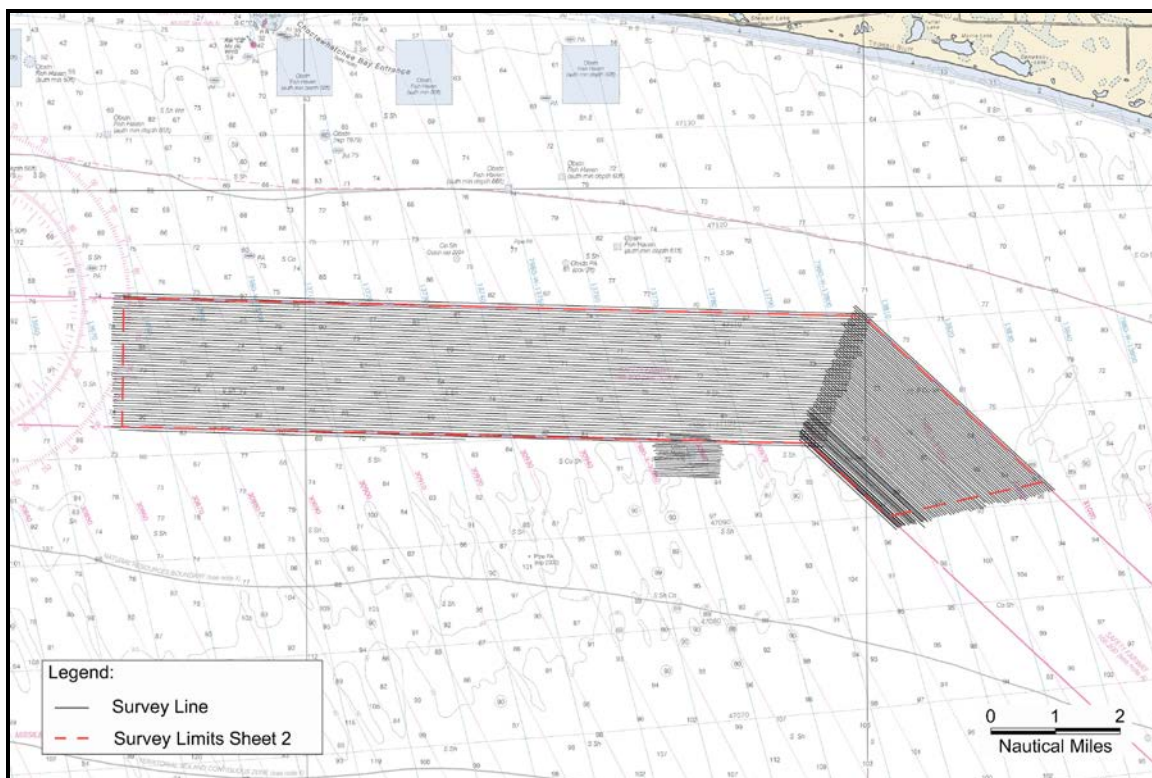


Figure 2. H12237 survey area with SSS/SWMB tracklines in black overlaid on RNC 11388.

Table 2
H12237 Survey Line Spacing

Water Depths (meters)	Trackline Offset (meters)	SSS Range Scale (meters)
22-31	65	75
17-31	85	100

Table 3
H12237 R/V Ferrel Survey Trackline Statistics

Concurrent MB/SSS Lineal NM	Multibeam Only Lineal NM	SSS Only Lineal NM	Cross Lines Lineal NM	Square Nautical Miles Covered	Bottom Samples Acquired
779.1	12.7	44.2	51.3	30.2	14

B. DATA ACQUISITION AND PROCESSING

Refer to OPR-J364-KR-10 Data Acquisition and Processing Report (DAPR)* for a complete description of data acquisition and processing systems, survey vessels, quality control procedures and data processing methods. Additional information to supplement sounding and survey data, and any deviations from the DAPR* are included in this descriptive report.

B.1 Equipment

Survey operations were conducted from Reservoir Geophysical's *R/V Ferrel*, a 44.5-meter steel vessel, with a 9.8-meter beam and 1.8-meter draft and powered by two 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
H12237 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 Sensor (Real-Time Surface Sound Speed)	Sea-Bird	MicroCAT SBE37
Primary Navigation DGPS	Applanix/Trimble	POS MV 320 V.4
Secondary Navigation DGPS	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

**Data filed with original field records.*

B.2 Quality Control (QC)

B.2.1 System Calibration

The initial SWMB system calibration for the *R/V Ferrel*, which included a patch test and performance surface evaluation, was performed on April 5, 2010 (DN 095) southeast of the entrance to Pensacola Bay. The latency and alignment values were updated in the CARIS vessel file, FERREL_7101_511_ED.hvf, prior to beginning acquisition for contemporary project OPR-J364-KR-09.

Data acquisition was begun on project OPR-J364-KR-10 immediately following completion of project OPR-J364-KR-09. No changes were made to the system configuration between projects. A patch test was performed on May 12 (DN 132) in the same location as the original test to verify the Reson 7101 alignment values before commencing survey operations for project OPR-J364-KR-10. It was found that the latency and attitude bias values calculated from the May 12 (DN 132) patch test were unchanged from the values calculated from the system calibration run on April 5 (DN 095). Two check lines acquired on May 12 (DN 132), processed with the verified bias values, were compared to a performance surface generated from SWMB data collected on April 5 (DN 095). The check lines showed excellent agreement with the performance surface. Therefore, the pitch, roll, and yaw values from April 5 (DN095) were deemed adequate and were not modified in the Reson 7101 HVFs. A final post-survey patch test was performed on May 27, 2010 (DN 147), which, once again, verified the system alignment.

Transducer draft and echo sounder function were 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 51.3 lineal nautical miles of cross line data were acquired by the *R/V Ferrel* on May 19-21, 2010 (DNs 139-141). The cross line mileage factor is 6.6% of the 779.1 nautical miles of mainscheme tracklines.

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.

****Data filed with original field records.***

B.2.3 Data Quality Review

B.2.3.1 CARIS BASE Surface Standard Deviation and Uncertainty

The standard deviation and uncertainty BASE surfaces were reviewed to direct sounding editing and evaluated to search for systematic errors, sporadic noise (fish, water column disturbances, etc.), and areas that warranted additional investigation (bathymetric features). In general, the final combined uncertainty BASE surfaces generated from the higher of the standard deviation or uncertainty values were appropriate for the bathymetric relief observed in the survey area. Highest standard deviation values were observed over rock, wreck and obstruction features and steep slopes. 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 indicate that 100.0% of the nodes from the final combined 2-meter surface meet IHO Order 1 uncertainty specifications. QC BASE surface reports for all final surfaces are included 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 2010, Section 6.3.2 (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 2010, Section 5.2.2.1. 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, UWTROC).

Table 5
Significant Contact Selection Criteria

Surrounding Depth or Area (meters)	Significant Contact Height (meters)
≤ 20	≥ 1.0
> 20	10% of surrounding depth

B.2.4 Survey Junctions

Survey H12237 junctions with contemporary Survey H12236 (1:40,000, 5/28/10) to the west.

**Data filed with original field records.*

B.2.4.1 H12237-H12236 Junction

There is an approximate overlap of 0.4 kilometers between bathymetric data from Surveys H12237 and H12236. Depths from the final combined 2-meter BASE surfaces from Surveys H12237 and H12236 were compared in CARIS HIPS. Further analyses consisting of a surface-to-surface comparison (Figure 3) and statistical analysis (Figure 4) were performed using 10-meter by 10-meter surfaces. Depths from H12237 showed excellent agreement with depths from H12236. Depth discrepancies equaled 20 centimeters or less and the mean difference between survey depths equaled 0.018 meters. *Concur with clarification. Office processing determined a depth difference of 20 to 50 centimeters between depths in surveys H12237 and H12236.*

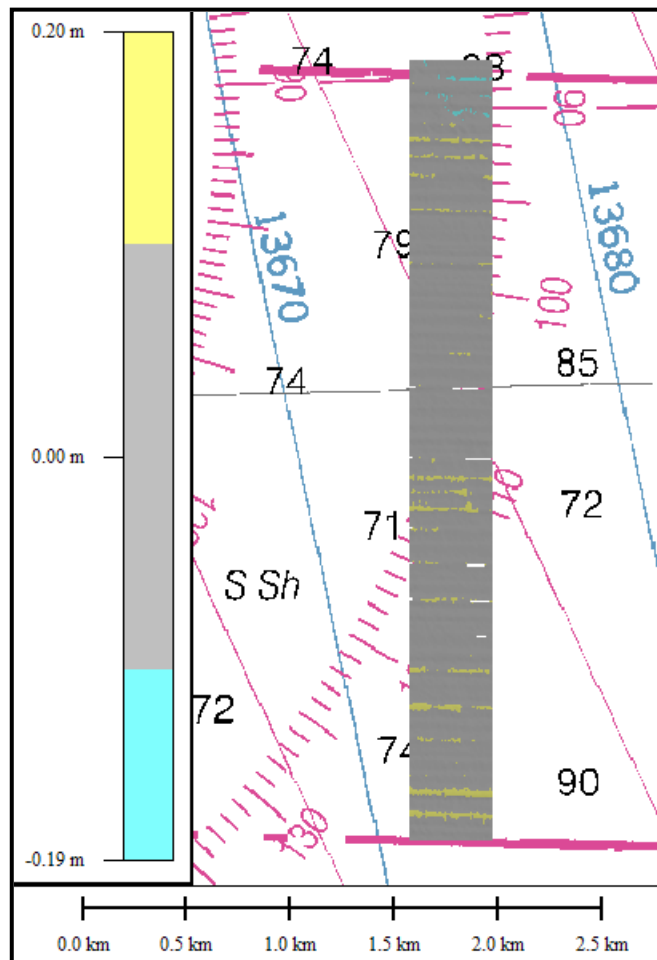


Figure 3. Surface-to-surface difference map comparing depths from Survey H12237 to depths from Survey H12236 overlaid on RNC 11388. Difference values are based on 10-meter by 10-meter data sampling. Grey areas represent depth differences of less than 0.10 meters. The maximum difference between surfaces is 0.20 meters.

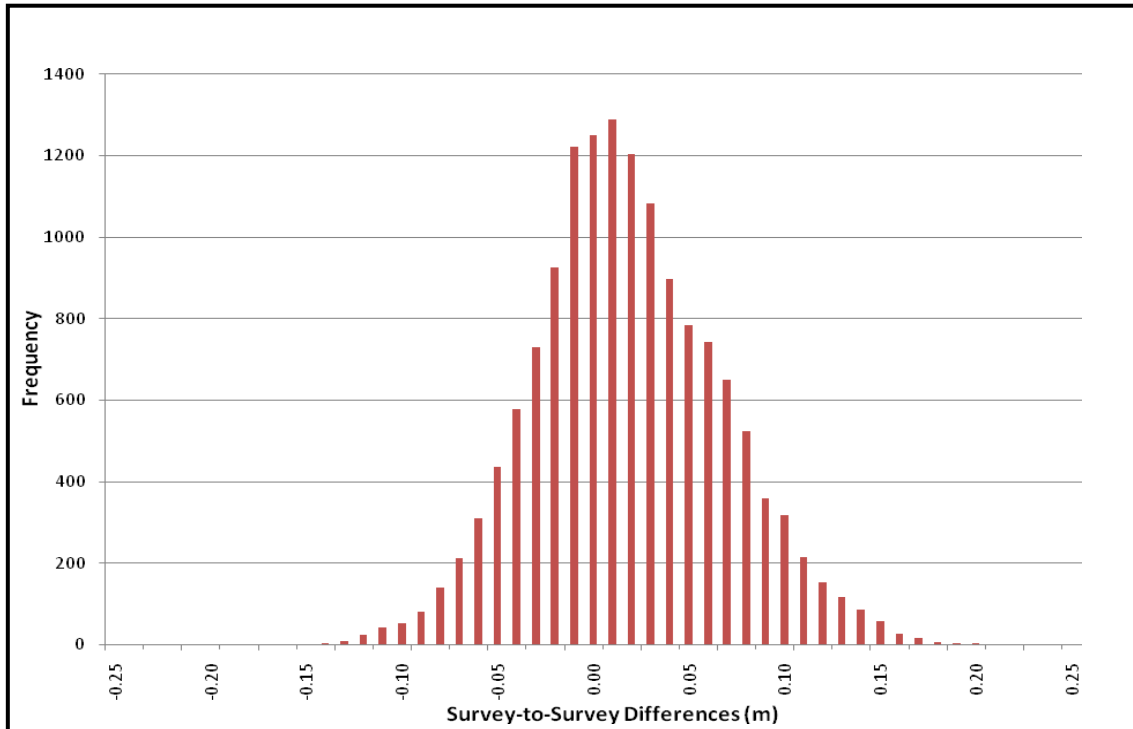


Figure 4. Surface-to-surface difference histogram comparing Survey H12237 to Survey H12236. Difference values are based on 10-meter by 10-meter data sampling. Average difference between surveys is 0.018 meters with a standard deviation of ± 0.05 meters. Ninety-four (94) percent of the difference values were within 2 sigma of the mean.

B.2.5 Unusual Conditions/Factors Affecting Soundings/Imagery

The sound speed profiles measured throughout the limits of Survey H12237 showed high variability. The predominant trend observed in the MVP profiles was a decrease in sound speed of approximately 8 to 15 m/s between depths of 5 and 25 meters. Sound speed profiles were viewed in real time during acquisition to assist in identifying the depths in the water column 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 and the SSS operator attempted to fly the towfish at depths below the refractive lens (Figure 5). In some areas, adjustments to towfish height did not help eliminate refraction in the side scan imagery. In these instances, the SSS data were rejected from the line record and rerun at a later time.

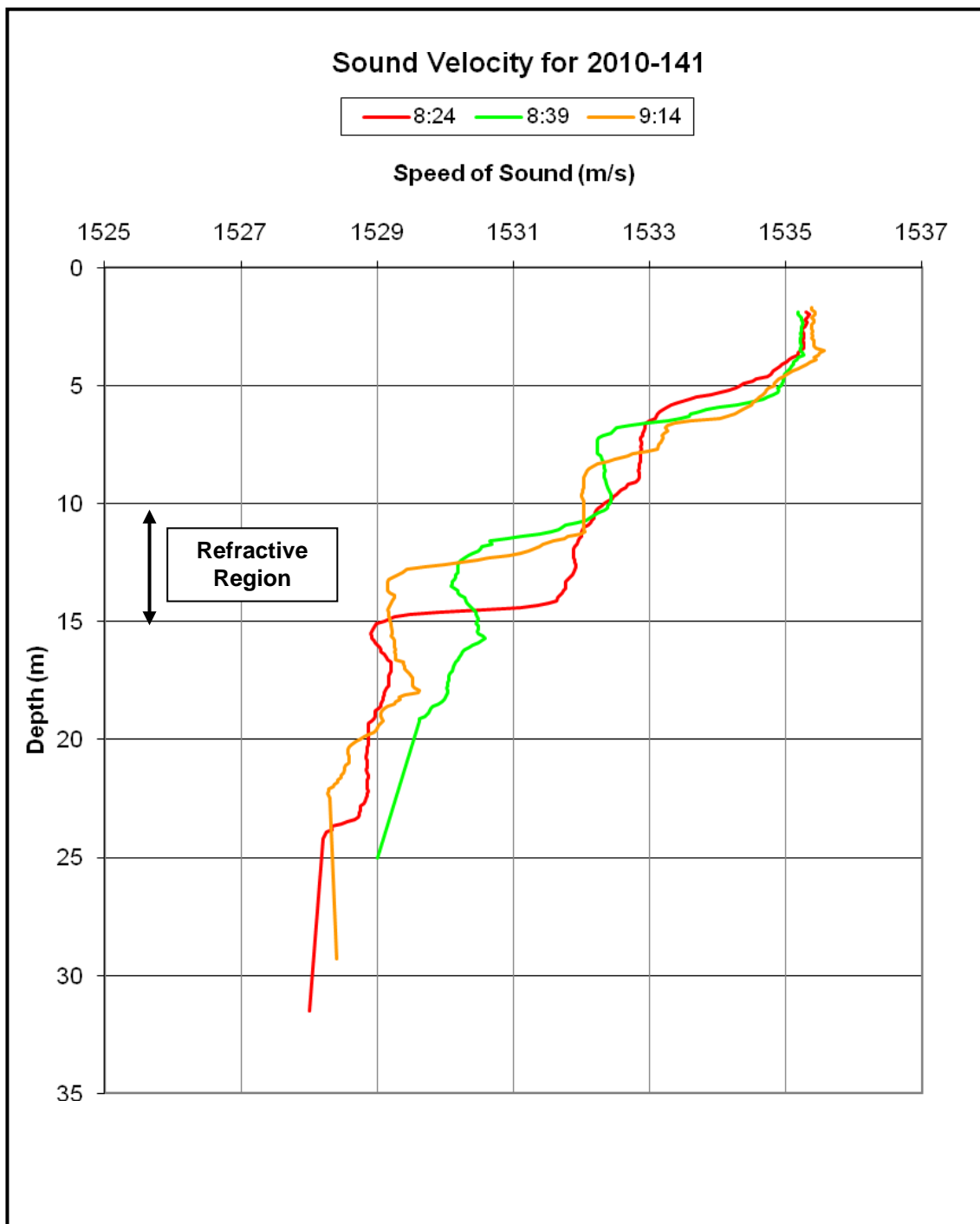


Figure 5. Sample sound speed profiles from May 21 (DN 141) demonstrate rapid decreases in sound speed, or “plateaus,” observed in the water column between approximate depths of 10-15 meters. Side scan operators reviewed profiles in real time to assist in determining an optimal height at which to fly the towfish to reduce refraction effects.

The SSS range scale was maintained at 100 meters except in the southeastern section of the survey area where the range scale was reduced to 75 meters to avoid refraction effects in the outer swath. The line plan was adjusted accordingly to ensure that full 200% coverage was obtained. All changes in SSS range settings were recorded in the Acquisition Log located in Separate I*.

Sound speed variability also affected the SWMB data. To ensure that this did not compromise the quality of the data, the field team took frequent sound speed casts to accurately portray the site conditions. The frequency of MVP casts typically ranged from 15 to 30 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.

Many of the MVP casts' extended Velocwin depth points did not appear to be projected correctly based on the trend of the sound speed profiles. The extended depth points were edited at the processor's discretion to better reflect the trend of the sound speed profile. All of the SWMB lines were sound speed corrected using CARIS HIPS' "Nearest in Distance within Time" method.

Despite the efforts taken to reduce sound speed artifacts in the SWMB data, refraction effects were evident in the outer beams. Multibeam swaths for mainscheme survey lines were angle filtered by 55 to 60 degrees on port and starboard sides to reduce sound speed related sounding uncertainty. Multibeam lines acquired for feature investigation were angle filtered to 45 degrees on port and starboard. The day-to-day or line-specific angle filter method is noted in the daily processing logs.

During SWMB acquisition, 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.

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 2010). If holidays were found that exceeded the tolerances, additional multibeam fill-in lines were collected.

**Data filed with original field records.*

Fish were frequently seen in both the multibeam and SSS data (Figure 6). Fish 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 the contact was visible in 200% side scan coverage and had a significant height, it was investigated with object detection multibeam coverage to verify or disprove the presence of a feature. In some instances, where the fish obscured a significant portion of the seafloor, SSS data were rejected and rerun at a later time.

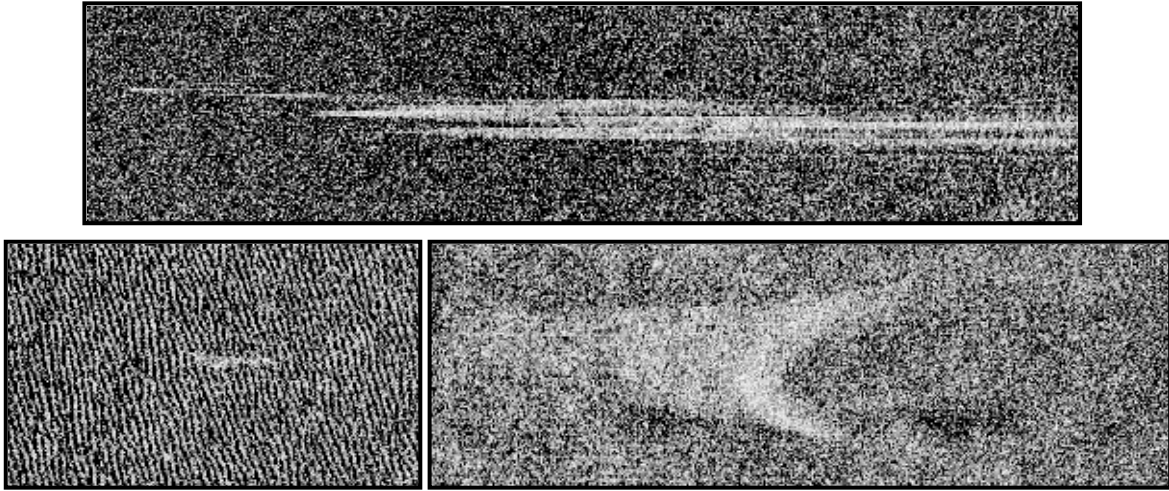


Figure 6. Examples of fish seen in the side scan imagery.

A vertical offset is apparent in the BASE surface standard deviation layers where mainscheme SWMB lines overlap fill-in and object investigation SWMB lines collected May 26th through 27th (DNs 146-147) (Figure 7). Multibeam data collected on these dates were approximately 0.10-0.15 meters deeper than the overlapping mainscheme survey lines (Figure 8). The offset appears to be tidal and it did not exceed the allowable IHO Order 1 error budget of 0.55 to 0.65 meters at the survey depths of 17-32 meters.

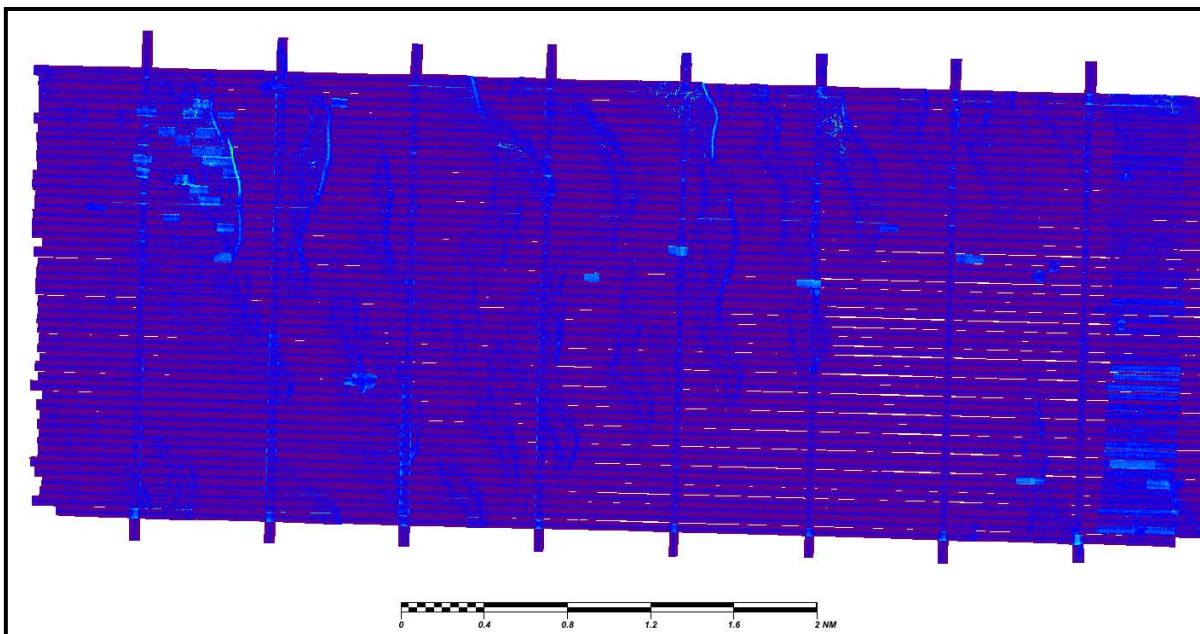


Figure 7. A subset of the standard deviation layer of the final combined BASE surface is displayed with the color range set between 0 and 0.3 meters to better isolate areas of higher standard deviation. Fill-in and contact investigation lines collected on May 26-27 (DNs 146-147) appear light blue among the mainscheme lines. Numerous seafloor ridges are also visible as bright areas in the standard deviation layer.

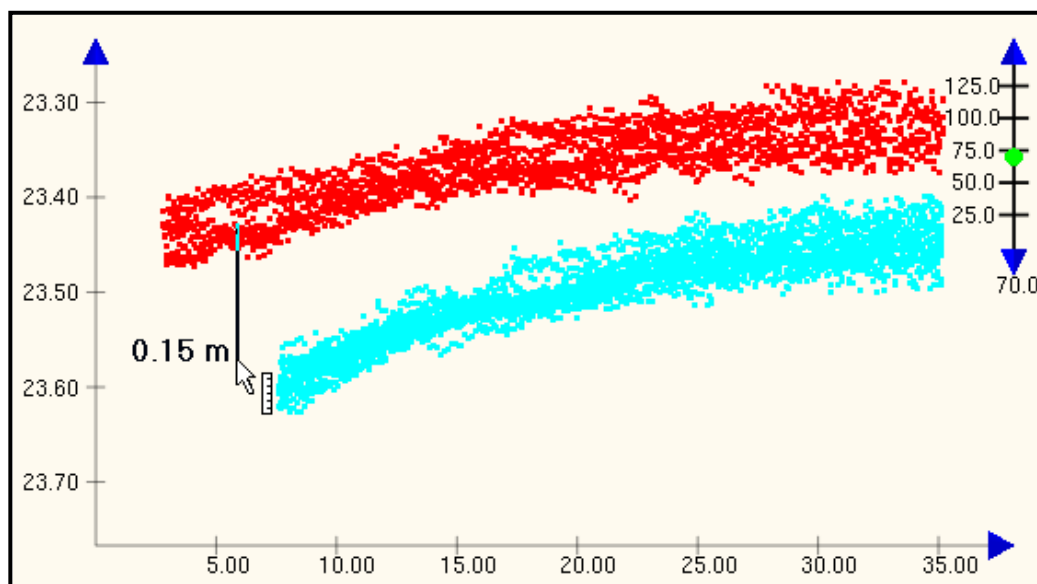


Figure 8. An example of the vertical offset between a mainscheme SWMB line collected on May 19 (DN 139) (red) and a fill-in SWMB line collected on May 26 (DN 146) (cyan) displayed in CARIS HIPS Subset Editor. Depths and distances are in meters.

OSI undertook a brief water level analysis in an attempt to understand and validate the vertical offset depicted in Figure 7. 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 Panama City tide gauge. The analysis demonstrated that the departure of the PPVRS-derived water level data from the zone-corrected, verified water levels is generally consistent in magnitude and direction with the offset displayed in Figure 8.

B.2.6 Sounding Coverage, Equipment and

As noted in Table 4, a Reson Model 7101 multibeam echo sounder was employed to acquire sounding data. The system was configured to operate using 511 equidistant beams. The range scale was closely monitored and adjusted for depth changes to optimize the swath coverage and system ping rate. A review of the raw data files of several MBES lines indicated that the ping rate oscillated around 8 pings per second. The combination of the high beam number and ping rate ensured the system had no trouble meeting mainscheme along track and grid node density requirements at typical survey speeds.

For contact developments requiring “Object Detection” coverage, the survey vessel was operated at a survey speed typically less than 6 knots. The Reson 7101 swath width was narrowed to 120 degrees while maintaining the 511 beam setting. Multiple near-nadir passes were run for each contact development to make certain that extremely dense, high quality soundings were available for least depth determination.

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*. Transducer 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.

Comparison casts taken with the CTD unit were not included with the SVP files used in sound speed correction of the multibeam data. Processing logs were updated indicating whether each MVP file was converted and appended to the current SVP file.

B.3.1 Static Draft Corrections

Static draft values were measured at the end of each survey day and recorded in the acquisition log. The static draft was also measured before and after each fueling.

*** Data filed with original field records**

The CARIS vessel configuration file was updated with daily time tags and static draft values.

Static draft values did not vary more than 0.05 meters between daily measurements, except for a larger difference in water level of 0.081 meters between measurements taken before and after fueling. Water level corrections were applied during the CARIS HIPS merge process.

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, aka “skunk stripe” bathymetry. Full multibeam coverage of the survey area was not required. All potentially significant features located with mainscheme SSS or SWMB were developed with high density, near nadir multibeam sonar data to meet the HSSD requirement of “Object Detection Coverage.”

B.4.2 Coverage BASE Surfaces and Mosaics

It is stated in the HSSD 2010, Section “5.2.2.2 Complete Multibeam Coverage,” that a grid resolution of 1 meter shall be used in survey depths less than 22 meters and a 2-meter grid resolution be used in survey depths of 20-44 meters. Survey depths for H12237 range from approximately 17-32 meters.

The survey area was divided into two field sheets, which were used to generate coverage BASE surfaces with 2-meter grid resolutions. Four field sheets were created for areas of the survey where depths were less than 22 meters, and one field sheet was created over AWOIS Item 14789. The extents of these five field sheets were used to generate BASE surfaces with a 1-meter grid resolution. Field sheet size was chosen to ensure the number of nodes per grid was less than 25 million, based on guidance from the Office of Coast Survey Field Procedures Manual (FPM, April 2009), “Section 4.2.3.8.1 Field Sheet and Grid Size Guidance.” The layout for Survey H12237 field sheet deliverables is displayed in Figure 9 and the field sheet names with their BASE surface resolutions are provided in Table 6.

A field sheet titled “H12237_Full_Combined” is also included with the deliverables. This field sheet encompasses the entire survey area and includes a 2-meter x 2-meter Final Combined Surface that was generated from the seven finalized, sub-area BASE surfaces shown in Figure 9. All surfaces were generated in CARIS HIPS using the “Shallow Configuration” under the CUBE Parameters’ Advanced settings menu. None of the multibeam coverage surfaces contained along-track holidays spanning over 3 nodes. A sounding layer was generated from the Final Combined Surface and was exported to a CARIS Notebook HOB file and used during chart comparison.

The 200% SSS coverage was attained using vessel track lines separated by one-half the distance required for 100-percent SSS coverage. Side scan mosaics with 1-meter resolution were created for each 100% SSS coverage. Each coverage mosaic was generated under its own field sheet, which encompassed the entire survey area.

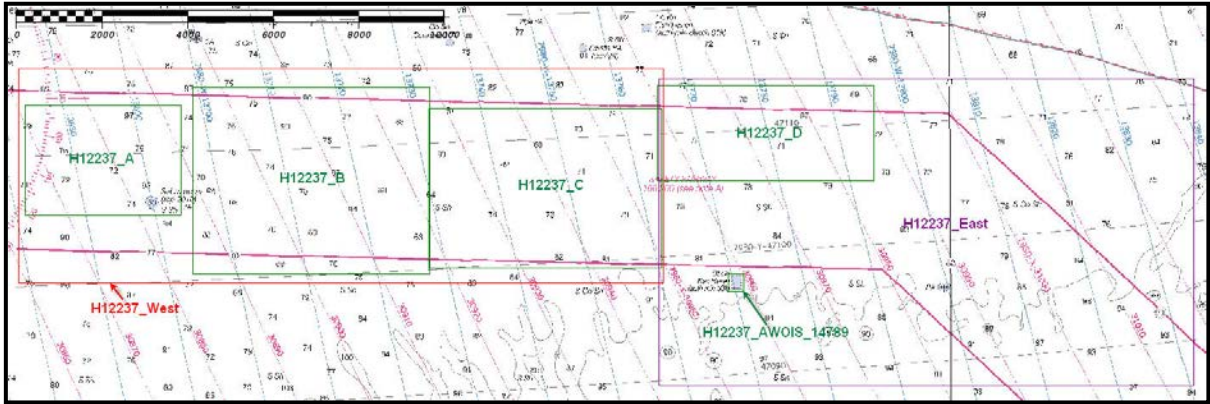


Figure 9. Layout of H12237 field sheet deliverables.

Table 6
H12237 Field Sheets

Field Sheet Name	Surface Resolution (meters)	Depth Range (meters)	Coverage Type
H12237_East	2	20-32	SWMB
H12237_West	2	17-31	SWMB
H12237_A	1	17-31	SWMB
H12237_B	1	19-30	SWMB
H12237_C	1	18-31	SWMB
H12237_D	1	20-27	SWMB
H12237_AWOIS_14789	1	23-31	SWMB
H12237_Full_Combined	2	all	SWMB
H12237_SSS_100	1	all	SSS
H12237_SSS_200	1	all	SSS

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 Panama City, FL (872-9108) serves as datum control for Survey H12237.

The survey area is located within Zones CGM1 and CGM8 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.

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 mainscheme line and item investigation 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 the Eglin Air Force Base, FL station. 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. Due to degradation in the USCG Eglin AFB signal on May 19 (DN 139), the primary navigation system was temporarily supplied with correctors from the Mobile Point station. Initial dynamic draft and patch calibration data 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 the vessel's berth. Position confidence checks were accomplished during fuel or weather stops 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**

** Data filed with original field records.*

***Also see Appendix II of this report*

Chart comparisons were performed in CARIS HIPS/SIPS, Notebook and Easy View using surface models, contours and soundings that were 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 August 31, 2010 and are submitted with the survey data.

The Local Notice to Mariners (LNM) and Notice to Mariners (NM) issued during the survey period (May 19, 2010 to May 28, 2010) were reviewed for significant updates. Coast Guard District 8 LNM 19/2010 (May 26, 2010) was the final notice reviewed for this project.

Table 7
H12237 Affected Chart

Chart Number	Scale	Edition	ENC
11388	1:80,000	17th, Feb/04	US4FL74M

D.1.1 General Chart Comparison

Surveyed depths agreed over most charted soundings within three feet (1 meter). Bathymetry of the H12237 survey area revealed a dynamic seafloor, featuring large sandy shoals interspersed with deep channels. High-resolution data from this survey provide more detailed delineation of sea bed topography and individual features. Specific differences between charted and surveyed soundings are discussed in the detailed chart comparisons below.

- A pair of submerged, floating obstructions, potentially buoys, were submitted as Dangers to Navigation (DTON) on May 28, 2010 and have been added to the chart as an obstruction feature. The DTON report is available in Appendix I*.
- The charted PA Wreck and Obstrn Fish Haven located within the survey area were included as AWOIS investigation items, which are discussed in detail under Appendix II*, Survey Feature Report.
- All obstructions, wrecks, and rocks with significant heights relative to the surrounding depths are included in the S-57 feature file (H12237_S57_Feature.000)**.
- Survey depths were frequently much deeper than surrounding charted depths in the area between charted sounding positions (Figures 10 and 11).

**Data appended to this Report*

***Data filed with original field records*

- Depths surveyed in these basins were up to 19 feet (5.8 meters) deeper than surrounding charted depths. The deepening trend was generally more widespread throughout the eastern limits of the survey area. *Concur.*

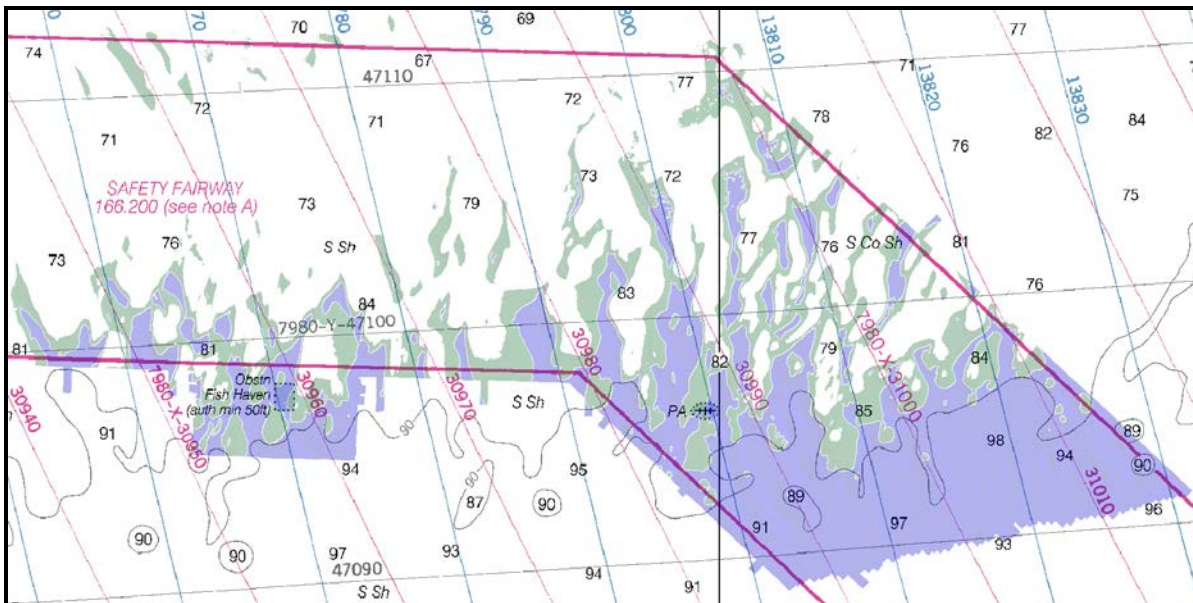


Figure 10. In the eastern reaches of the survey, deep areas surveyed between charted soundings on RNC 11388 are highlighted using CARIS BASE surfaces finalized by depth. Surveyed depths between 85 and 90 feet are colored in green and surveyed depths greater than 90 feet are colored in blue. Charte soundings are in feet.

Concur.

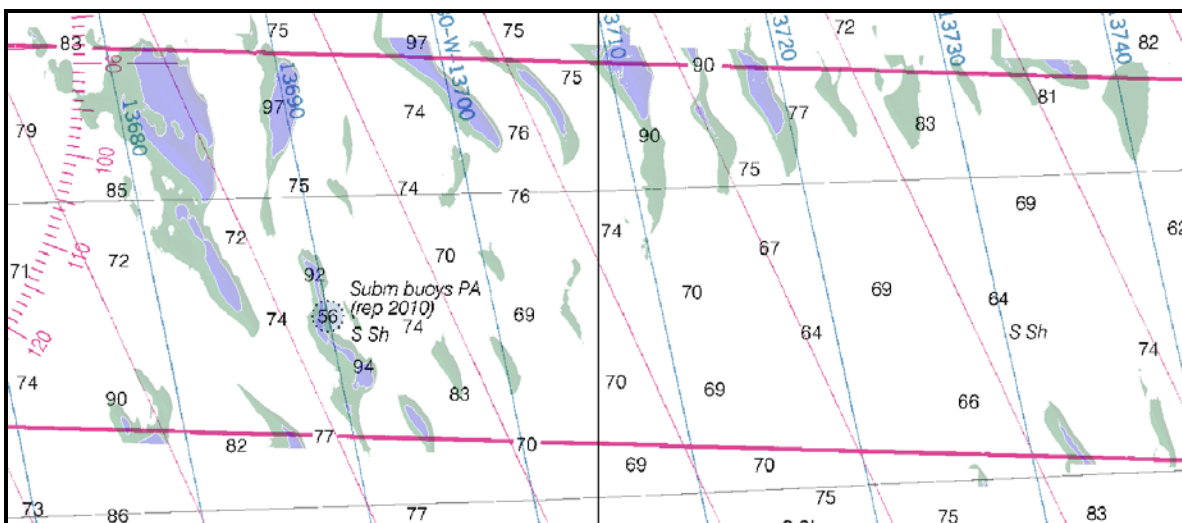


Figure 11. In the western reaches of the survey, deep areas surveyed between charted soundings on RNC 11388 are highlighted using CARIS BASE surfaces finalized by depth. Surveyed depths between 85 and 90 feet are colored in green and surveyed depths greater than 90 feet are colored in blue. Charte soundings are in feet.

Concur.

- The 90-foot contour in the southeast corner of the survey area is encroaching toward shore (Figure 12). Survey depths are typically three to ten (3-10) feet deeper than the charted 90-foot contour. It is recommended that the contour be updated with recent survey depths. **Concur.**

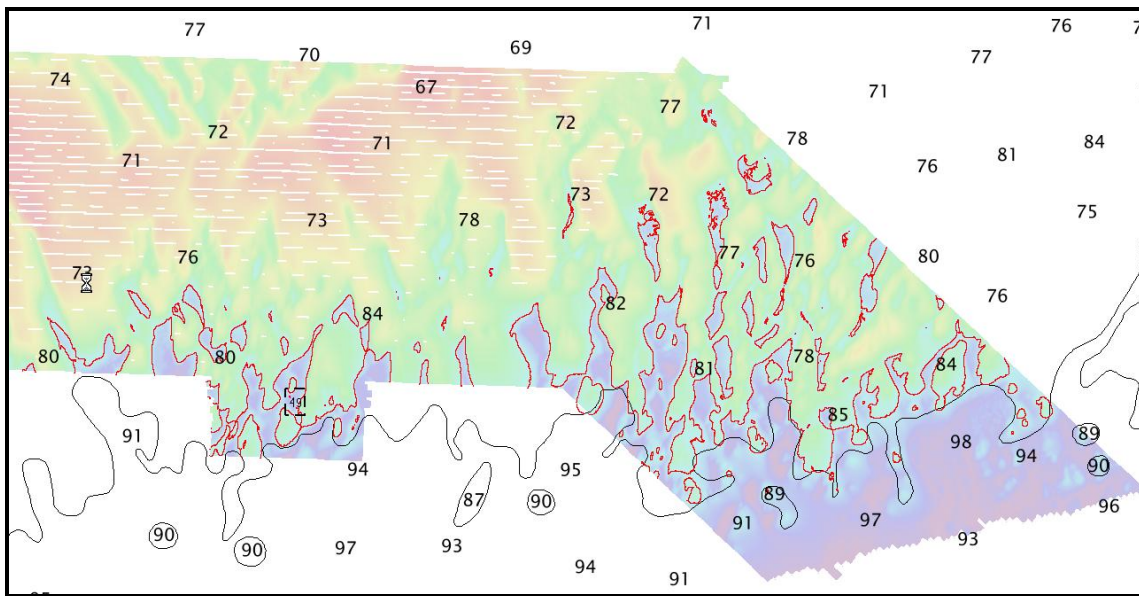


Figure 12. The surveyed 90-foot contour, colored in red, is shown in reference to the charted 90-foot contour from ENC US4FL74M, in black. A 2-meter coverage surface colored by depth is shown in the background. Chart soundings are in feet. **Concur.**

D.1.2 Detailed Chart Comparison and Charted Features*

Chart 11388/ENC US4FL74M (Soundings in feet)

- H12237-1: A 56-foot obstruction was added to the chart following submission of the H12237 DTON Report (See Appendix I**). The obstruction is believed to be a pair of submerged, floating obstructions, potentially buoys, approximately 26.2 feet (8.0 meters) high off the seafloor. A least depth of 56.4 feet (17.2 meters) was surveyed at 30-16-55.03W, 86-31-38.12W (Figure 13). An OBSTRN object is included in the S-57 feature file (H12237_S57_Features.000).

***See also Appendices I & II**

****Data appended to this Report**

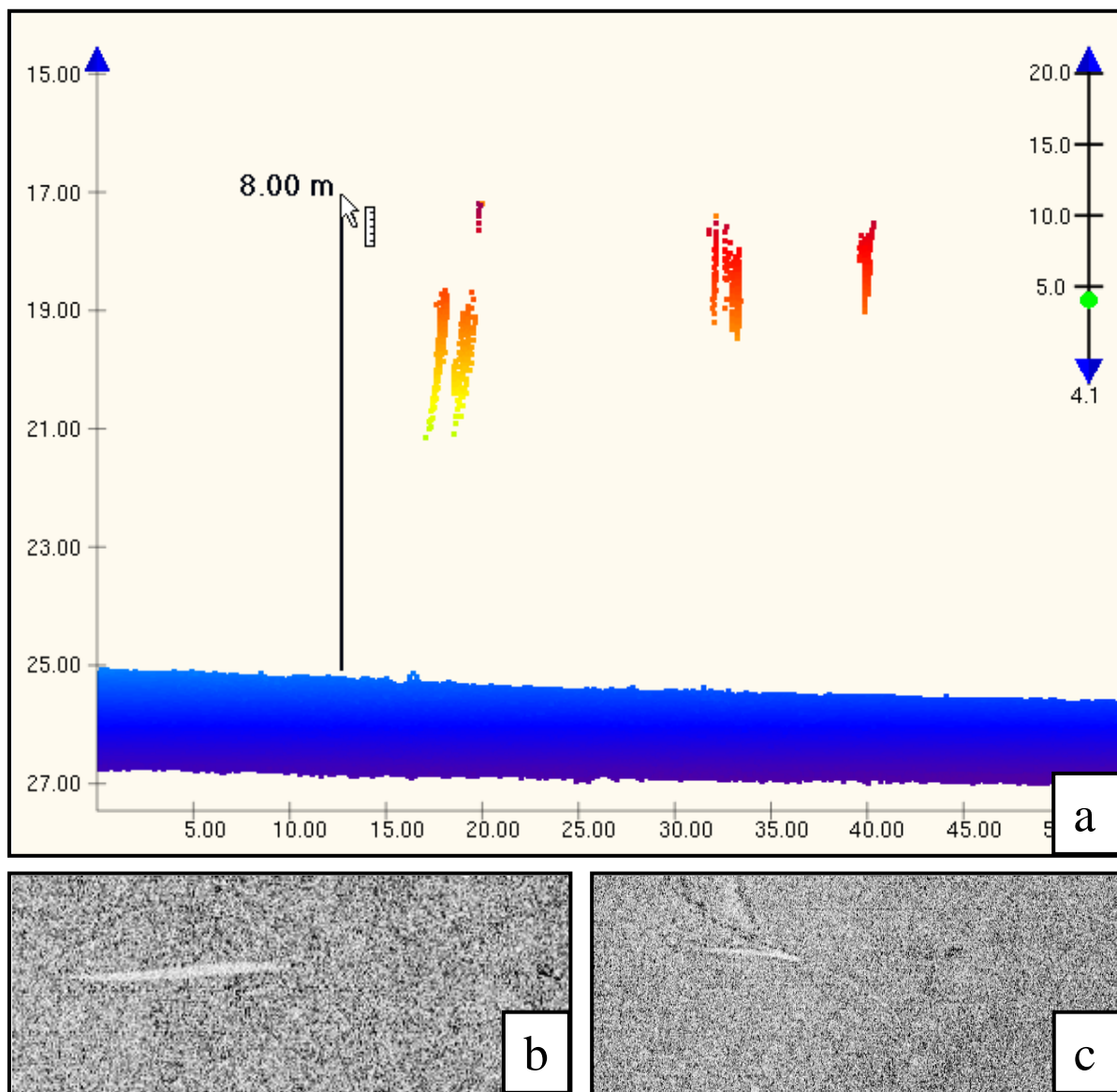


Figure 13. (a) View of the floating obstruction in CARIS Subset Editor with soundings colored by line. Depth and distance are in meters. (b, c) Side scan sonar imagery of the obstruction, Contacts 140-09260001 and 140-10120001, respectively.

- H12237-2: A Wreck PA charted at 30-15-48.00N, 86-20-06.00W was disproved with 200% SSS and complete SWMB. No wrecks were located within the area defined by the 400-meter AWOIS search radius. It is recommended the Wreck PA be removed from Chart 11388. See AWOIS Item 14790 under Appendix II* – Survey Feature Report for additional information. **Data appended to this Report*

- H12237-3: Two wrecks were verified within a charted Obstr Fish Haven (auth min 50ft) with 200% SSS and object detection coverage SWMB (Figure 14). A least depth of 83.4 feet (25.4 meters) was developed on the “northern” wreck at 30-15-55.26N, 86-23-09.83W. The wreck measures approximately 77 feet (23.5 meters) long by 26 feet (7.9 meters) wide and 12.5 feet (3.8 meters) high. A piece of debris is evident approximately 40 feet (12.2 meters) southwest of the northern wreck. The debris does not have significant height. The “southern” wreck is positioned at 30-15-50.86N, 86-23-06.97W with a least depth of 76.7 feet (23.4 meters). The wreck measures approximately 88 feet (26.8 meters) long by 25 feet (7.6 meters) wide and 21 feet (6.4 meters) high. The wrecks are included in the S-57 feature file (H12237_S57_Feature.000) and described in Appendix II* as AWOIS Item 14789. No other obstructions were identified in the Fish Haven. It is recommended that the Obstr Fish Haven remain as charted.

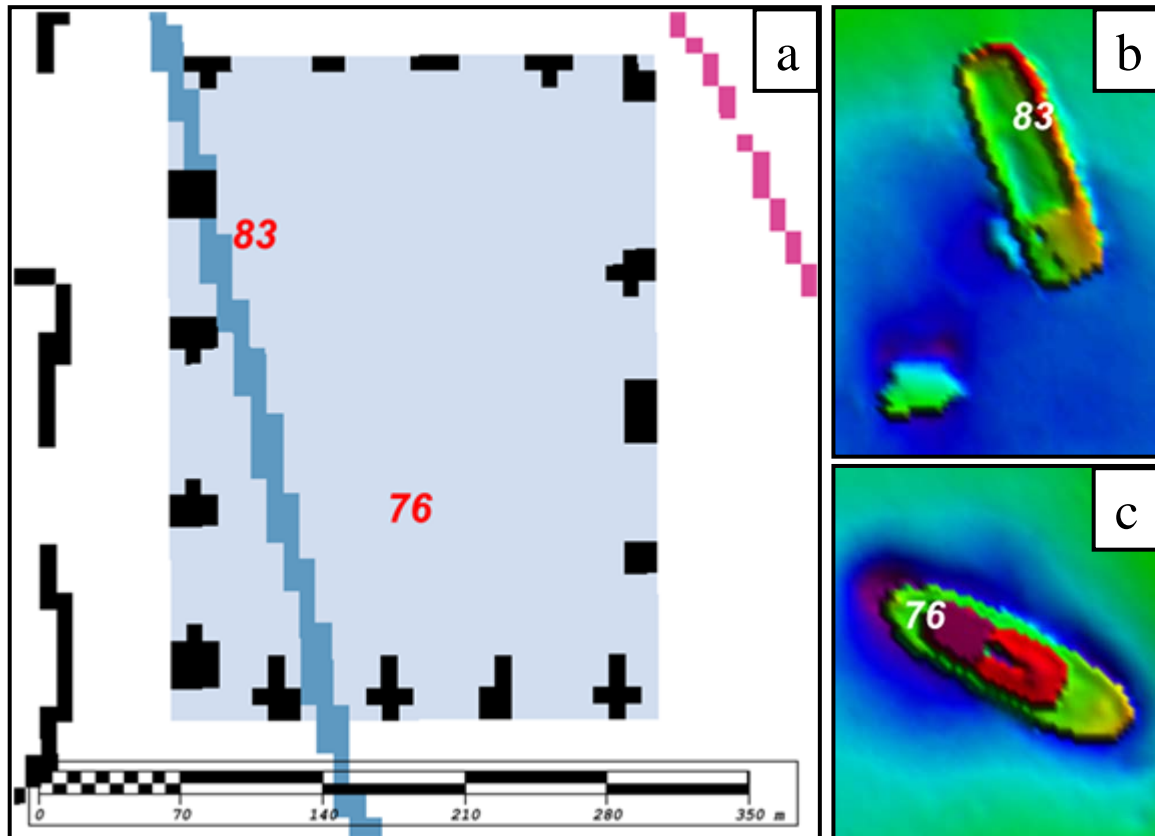


Figure 14. (a) Wreck least depth positions are shown in red in reference to the Obstr Fish Haven as charted on RNC 11388. Depths are in feet. (b) The northern wreck has a least depth of 83 feet. (c) The southern wreck has a least depth of 76 feet.

**Data appended to this Report*

H12237-4: The charted 90-foot contour has shifted significantly inshore in the vicinity of 30-15-49.82N, 86-19-28.59W (Figure 15). Survey depths are up to 9 feet (2.7 meters) deeper than the charted 90-foot contour in this area. It is recommended that the charted contour be updated with survey depths.

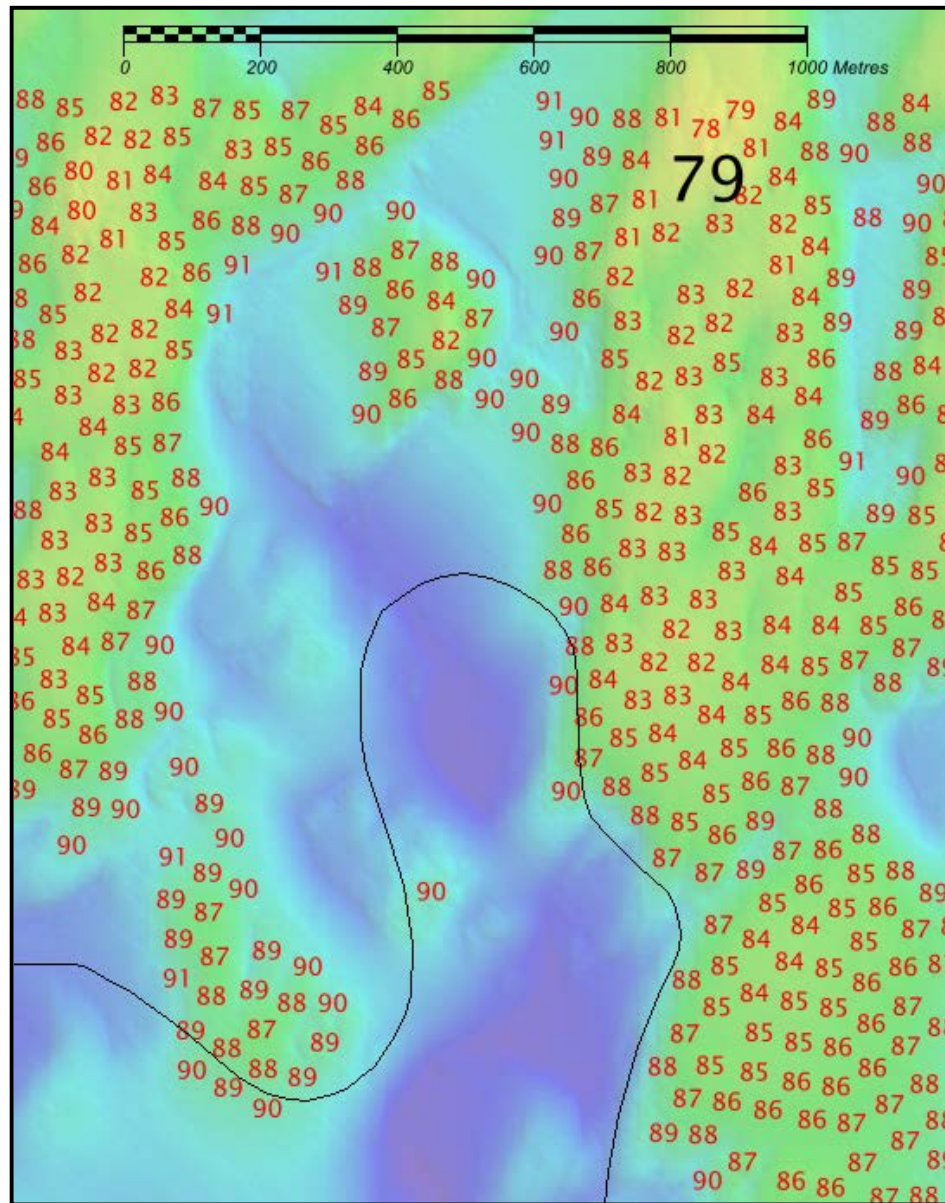


Figure 15: Survey soundings ≤ 90 feet are shown in red in reference to the charted 90-foot contour on ENC US4FL74M, in black. The surveyed 90-foot contour has shifted inshore of its charted position. A 2-meter resolution BASE surface colored by depth is shown in the background.

- H12237-5: There were two instances where significant shoaling was observed over charted soundings. These discrepancies are listed below.
 - Depths between 79 and 85 feet (24.1 and 25.9 meters) were developed over a charted 90-foot sounding located at 30-16-29.10N, 86-32-54.55W.
 - Depths between 78 and 84 feet (23.8 and 25.6 meters) were developed over a charted 90-foot sounding located at 30-18-14.19N, 86-29-21.54W. *Concur.*
- H12237-6: Survey depths between 85 and 93 feet (25.9 and 28.3 meters) were surveyed over a charted 81-foot sounding located at 30-16-11.38N, 86-23-40.08W. *Concur.*
- H12237-7: Shoaling was surveyed between charted soundings of 75 and 92 feet (Figure 16). A least depth of 70.6 feet (21.5 meters) was developed over the shoal at 30-17-24.31N, 86-31-41.04W. *Concur.*

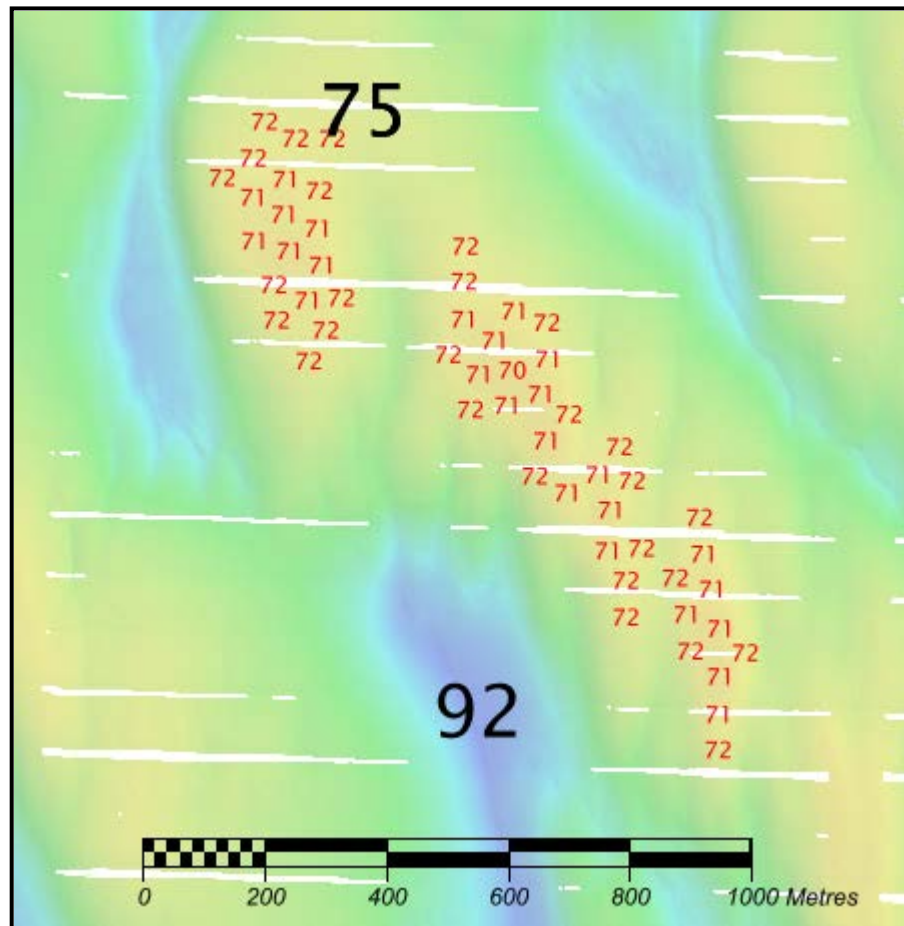


Figure 16. Survey depths ≤ 72 feet developed over the shoal are highlighted in red and overlain on a 2-meter resolution BASE surface colored by depth. Charted soundings from ENC US4FL74M are shown in black. All depths are in feet. *Concur.*

- H12237-8: Two shoals were surveyed between charted soundings of 71, 72, and 73 feet (Figure 17). Least depths of 67.6 feet (20.6 meters) and 69.4 feet (21.2 meters) were developed at positions 30-17-39.98N, 86-22-53.42W and 30-17-26.53N, 86-23-20.60W over the east and west shoals respectively. A rock with a least depth of 69.3 feet (21.1 meters) was located in the vicinity of the charted 73-foot depth, positioned at 30-17-08.77N, 86-23-10.12W. *Concur.*

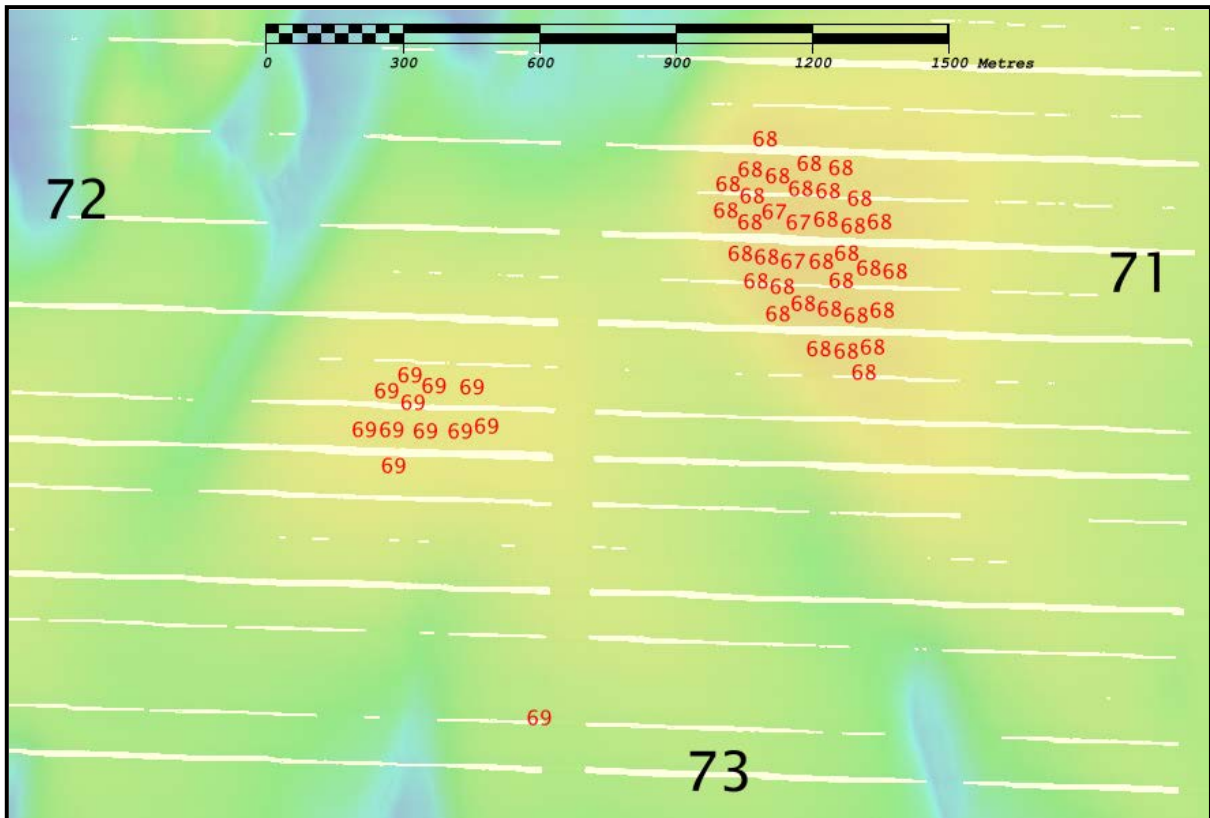


Figure 17. Survey depths developed over the shoals are highlighted in red and overlain on a 2-meter resolution BASE surface colored by depth. Charted soundings from ENC US4FL74M are shown in black. All depths are in feet. *Concur.*

- H12237-9: An obstruction with an approximate height of 6.2 feet (1.9 meters) was developed at 30-17-33.25N, 86-23-51.77W in the vicinity of a charted 72-foot sounding (Figure 18). It is included as an OBSTRN object in the S-57 feature file (H12237_S57_Features.000).

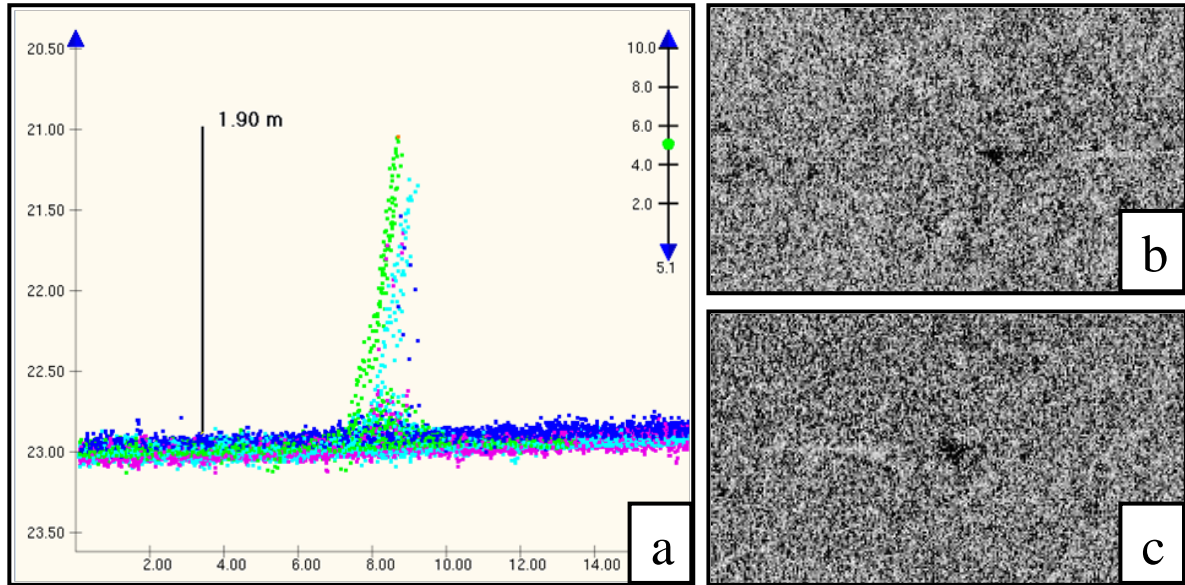


Figure 18. (a) The 69-foot obstruction displayed in CARIS HIPS Subset Editor with soundings colored by survey line; depth and distance units are in meters. (b, c) Side scan sonar imagery of the obstruction from two overlapping survey lines, Contacts 141-22360001 and 141-15520002, respectively. *Concur with clarification; the 69ft obstruction is deeper than 66 ft. More shoal soundings exist in the vicinity. No charting recommendation.*

- H12237-10: Several shoals were surveyed between charted soundings of 94, 96, and 98 feet (Figure 19). A depth of 91.2 feet (27.8 meters) was developed at 30-15-33.45N, 86-17-50.19W over a shoal located between charted soundings of 94 and 98 feet. A least depth of 90.1 feet (27.5 meters) was developed at 30-15-30.96N, 86-17-34.19W in the vicinity of a charted 94-foot sounding. A least depth of 91.1 feet (27.8 meters) was developed at 30-15-21.41N, 86-17-11.66W over a shoal located between charted soundings of 94 and 96 feet. *Concur.*

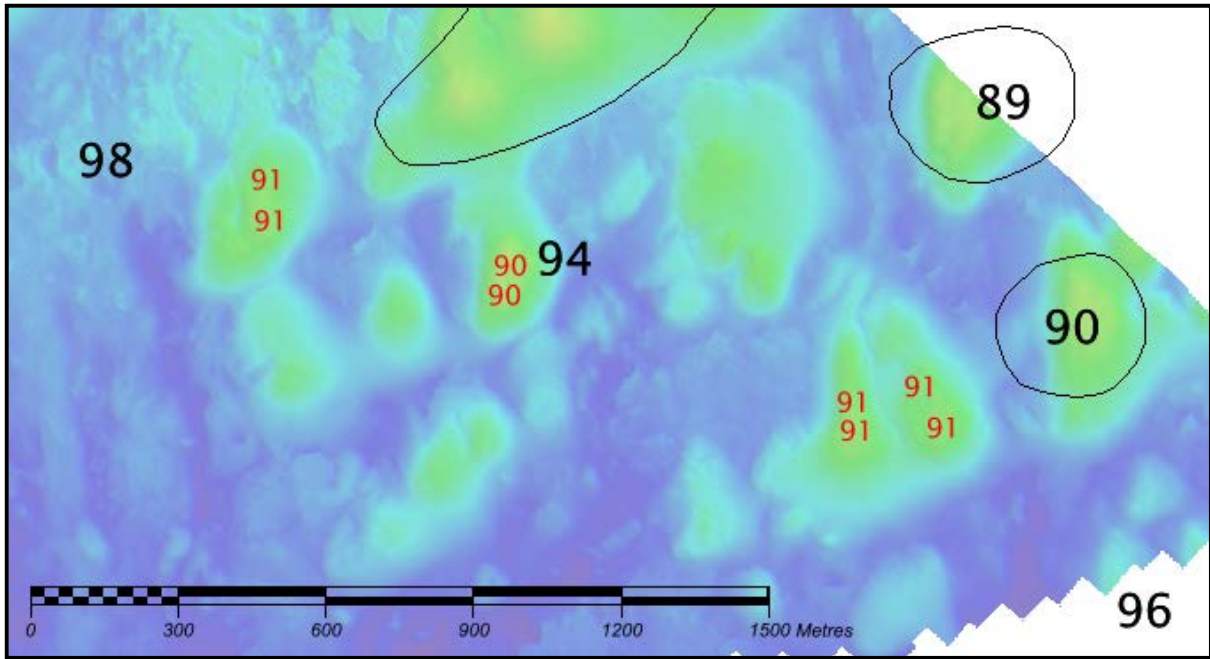


Figure 19. Several shoals were developed between charted soundings of 94, 96, and 98 feet. Surveyed least depths over the shoals are displayed in red over a 2-meter resolution BASE surface colored by depth. Soundings and contours from ENC US4FL74M are shown in black. All depths are in feet. *Concur.*

- H12237-12: Two new obstructions were developed in the vicinity of a charted 73-foot sounding located at 30-16-45.00N, 86-25-49.85W. The first, triangular-shaped obstruction, has a least depth of 67.2 feet (20.5 meters) developed at 30-16-34.58N, 86-25-44.07W (Figure 21). The second item is composed of two, 10-foot (3-meter) tall features with a least depth of 61.6 feet (18.8 meters) developed at 30-16-47.94N, 86-26-01.69W (Figure 22).^{*} These obstructions are included as OBSTRN objects in the S-57 feature file (H12237_S57_Features.000).

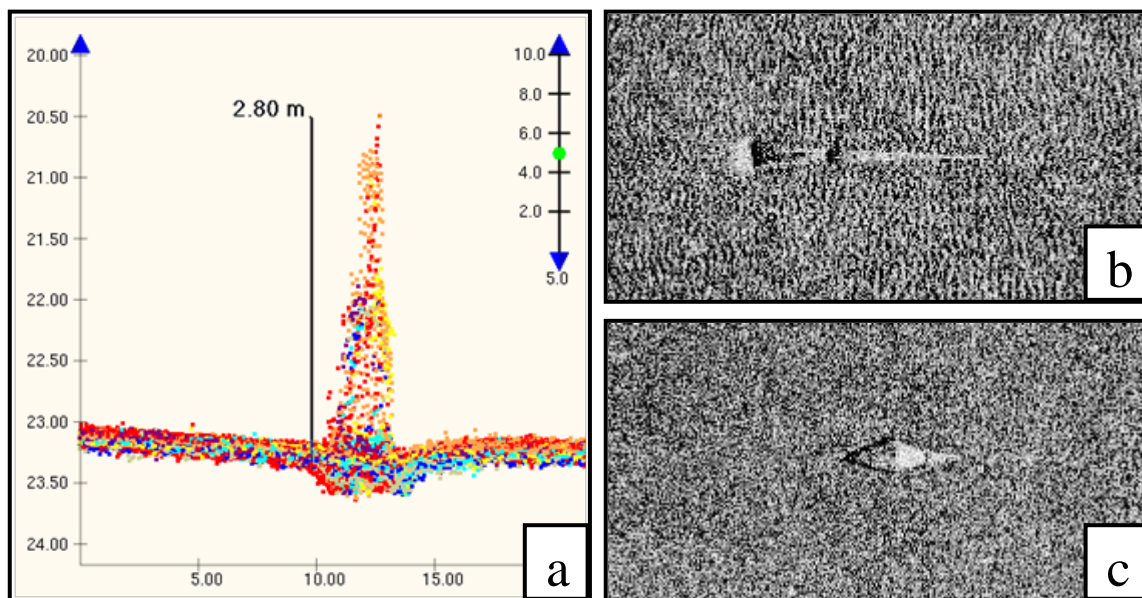


Figure 21. (a) The 67-foot obstruction displayed in CARIS HIPS Subset Editor with soundings colored by survey line; depth and distance units are in feet. (b, c) Side scan sonar imagery of the obstruction from two overlapping survey lines, Contacts 142-16080003 and 142-15210002, respectively. *Concur with clarification; the 67ft obstruction is deeper than 66 ft. More shoal soundings exist in the vicinity. No charting recommendation.*

^{}See also Appendix II*

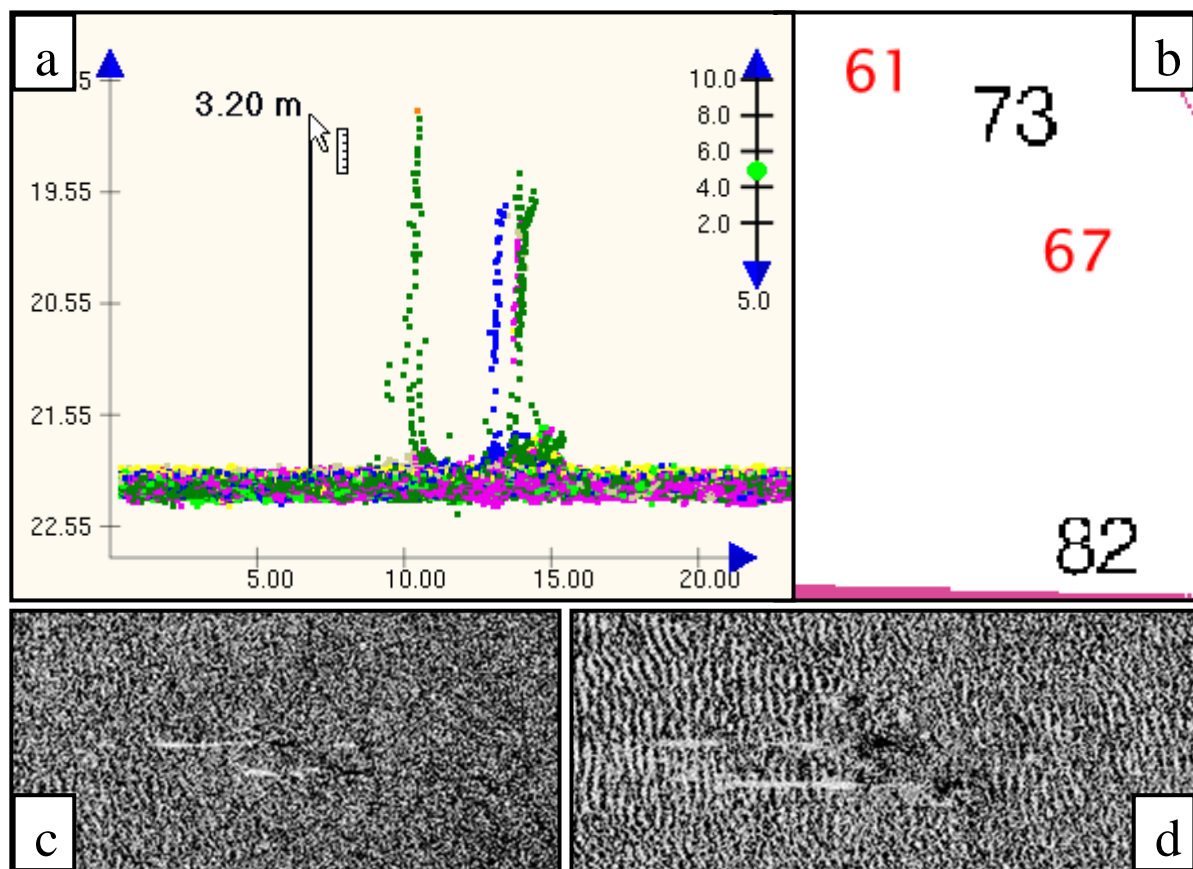


Figure 22. (a) The 61-foot obstruction* displayed in CARIS HIPS Subset Editor with soundings colored by survey line; depth and distance units are in meters. (b) H12237-12 obstructions (least depths) are displayed in red in reference to RNC 11388. Depths are in feet. (c, d) Side scan sonar imagery of the two 10-foot tall features from overlapping survey lines, Contacts 142-12080004 and 142-11190007, respectively. **See also Appendix II*

- H12237-13: A low, flat wreck was surveyed at position 30-17-53.05N, 86-27-22.90W. The wreck has a least depth of 68.4 feet (20.8 meters) and is located approximately 400 meters south of a charted 81-foot sounding. The wreck measures approximately 74 feet (22.6 meters) long by 38 feet (11.6 meters) wide and 7.5 feet (2.3 meter) high. The wreck is illustrated in Figure 23 and included as a WRECKS object in the S-57 feature file (H12237_S57_Feature.000). *

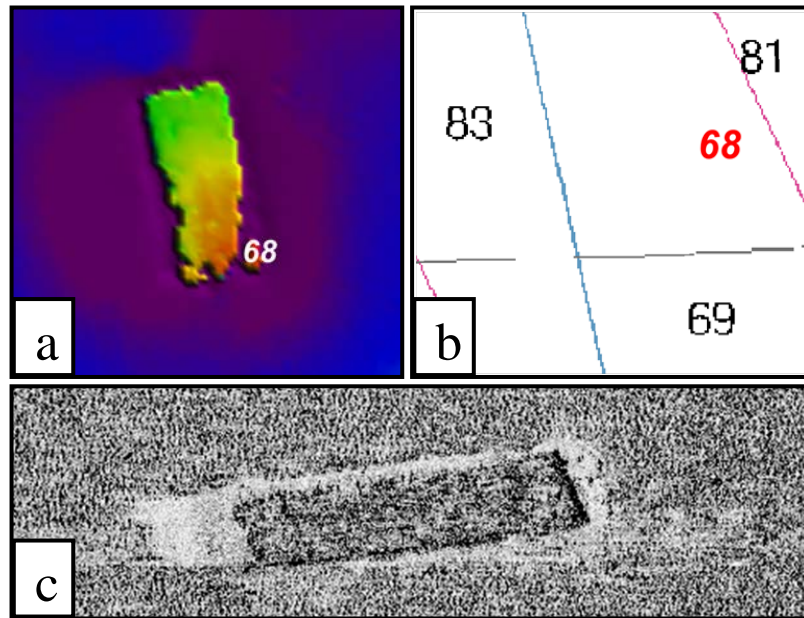


Figure 23. (a) The wreck displayed in a 50-centimeter resolution BASE surface colored by depth. The location of the wreck least depth is shown in white. (b) The obstruction least depth is displayed in red in reference to RNC 11388. All depths are in feet. (c) Side scan sonar imagery of the wreck, Contact 139-14010004. *

**See also Appendix II*

H12237-14: A spire-like obstruction (Figure 24) with a least depth of 66.1 feet (20.1 meters) was observed at position 30-16-48.56N, 86-24-43.13W, 150 meters north of a charted 73-foot sounding on RNC 11388. It is included as an OBSTRN object in the S-57 feature file (H12237_S57_Features.000).

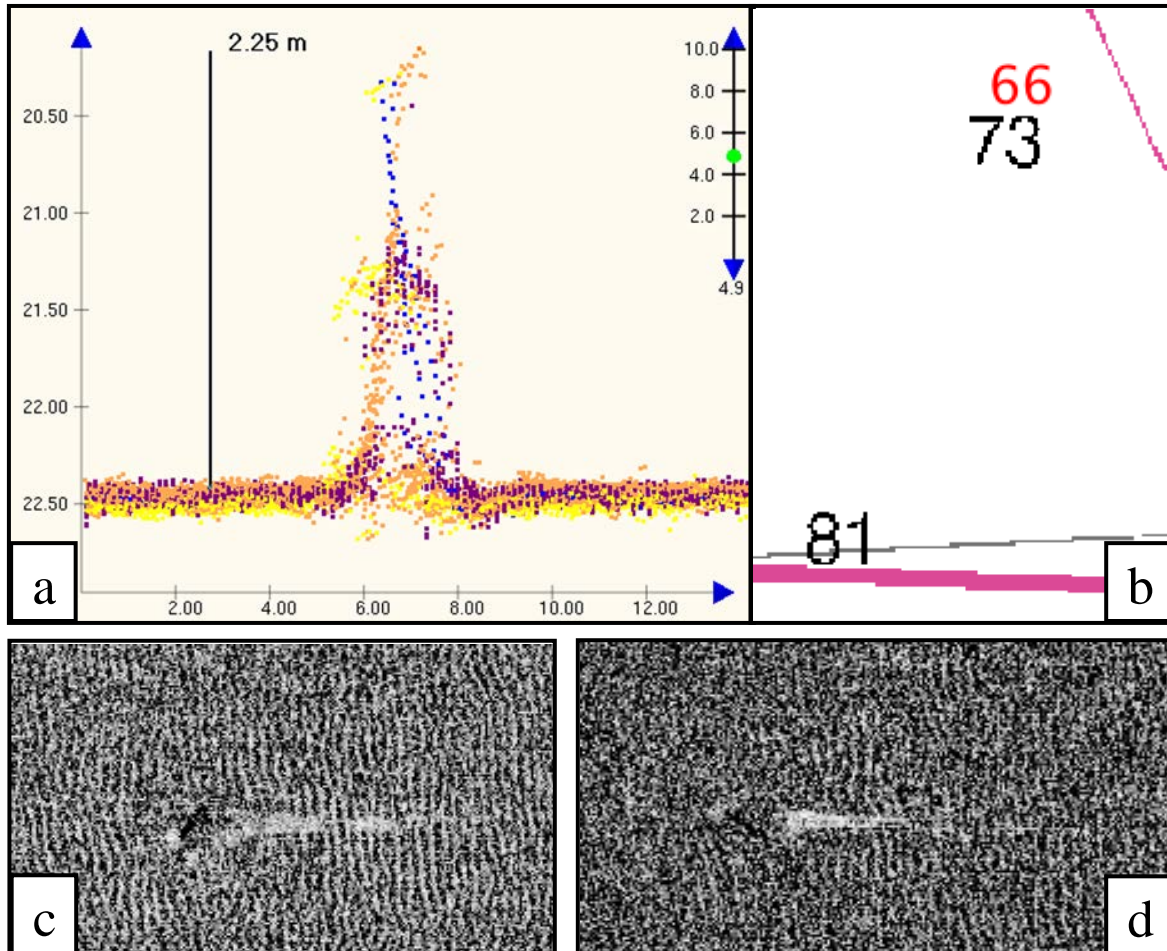


Figure 24. (a) The 66-foot obstruction displayed in CARIS HIPS Subset Editor with soundings colored by survey line; depth and distance units are in meters. (b) The obstruction least depth is displayed in red in reference to RNC 11388. Depths are in feet. (c, d) Side scan sonar imagery of the obstruction from two overlapping survey lines, Contacts 142-10320001 and 142-11190005, respectively. *Concur with clarification; this features was found to be navigationally insignificant and was generalized as a sounding during office processing.*

D.1.3 Controlling and Tabulated Depths
Not applicable for this survey.

D.1.4 AWOIS Items*

There were four (4) AWOIS* item investigations assigned within the survey area (Table 8). All AWOIS items were investigated employing either 200% SSS along with 100% multibeam coverage.

Table 8
H12237 AWOIS Investigations

AWOIS Record	Latitude (N)	Longitude (W)	Description	Status
14787	30-18-00	86-28-18	Pipeline Adrift	Disproved
14788	30-17-30	86-26-06	Anchored White Cylinder	Disproved
14789	30-15-53.4	86-23-07.2	Charted Obstn Fish Haven	Verified
14790	30-15-48	86-20-06	Charted Dangerous Wreck (PA)	Disproved

See Appendix II** – Survey Feature Report, for complete reporting on AWOIS Item investigation.

D.1.5 Dangers to Navigation (DTON)

A DTON report was generated for one (1) feature. A summary is presented in Table 9 and a copy of the report is included in Appendix I**.

Table 9
Dangers to Navigation

Item #	Feature	Depth Feet	Depth Meters	Latitude (N)	Longitude (W)	Description
1	Obstruction	56.35	17.18	30-16-55.03	86-31-38.12	Two Submerged Buoys

D.2 Additional Results

D.2.1 Shoreline Verification

Shoreline verification was not required for this survey.

D.2.2 Comparison with Prior Surveys

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

**See Appendix II of this Report*

***Data appended to this Report.*

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 this survey.

D.2.5 Other Data

D.2.5.1 Bottom Characteristics

Fourteen (14) bottom samples were acquired to determine bottom characteristics. Bottom samples were spaced at approximately 2000-meter intervals. 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**

Several uncharted obstructions were identified and delineated in the SSS data, SWMB data, and BASE surfaces. An S-57 feature file (H12237_S-57_Features.000/.hob) was created to emphasize navigationally significant objects discovered during the survey, update charted objects and to 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 2010. Table 10 describes the attribute mapping for the S-57 feature file.

Table 10
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.

****Data appended to this Report.***

*****See Appendix II of this Report.***

D.2.6.2 S-57 Contact File*

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

Table 11
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 12 describes the attribute mapping for the S-57 critical soundings file.

Table 12
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.

****Data filed with original field records***

E. APPROVAL SHEET**LETTER OF APPROVAL
REGISTRY NO. H12237**

This report and the accompanying data are respectfully submitted.

Field operations contributing to the accomplishment of Survey H12237 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 – H12237
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 H12236 on December 23, 2010. They are named as follows:

<u>Report Name</u>	<u>Date of Report</u>
OPR-J364-KR-10_DAPR.pdf	December 23, 2010
OPR-J364-KR-10_HVCR.pdf	December 23, 2010

Appendix I

Danger to Navigation Reports

H12237_DR_DTON

Registry Number: H12237
State: Florida
Locality: Gulf of Mexico
Sub-locality: Pensacola
Project Number: OPR-J364-KR-10
Survey Dates: May 20, 2010 - May 27, 2010

Charts Affected

Number	Edition	Date	Scale (RNC)	RNC Correction(s)*
11388	17th	02/01/2004	1:80,000 (11388_1)	USCG LNM: 06/09/2009 (05/04/2010) NGA NTM: 11/18/2006 (05/15/2010)
1115A	43rd	11/01/2008	1:456,394 (1115A_1)	[L]NTM: ?
11360	43rd	11/01/2008	1:456,394 (11360_1)	[L]NTM: ?
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	56ft Obstruction	Obstruction	17.18 m	30° 16' 55.0" N	086° 31' 38.1" W	---

1 - Default

1.1) GP No. 1 / H12237_DtoN_1.xls

DANGER TO NAVIGATION

Survey Summary

Survey Position: 30° 16' 55.0" N, 086° 31' 38.1" W
Least Depth: 17.18 m (= 56.35 ft = 9.391 fm = 9 fm 2.35 ft)
TPU ($\pm 1.96\sigma$): THU (TPEh) [None] ; TVU (TPEv) [None]
Timestamp: 2010-147.10:14:42.751 (05/27/2010)
GP Dataset: H12237_DtoN_1.xls
GP No.: 1
Charts Affected: 11388_1, 1115A_1, 11360_1, 11006_1, 411_1

Remarks:

Feature depths are corrected to Mean Lower Low Water datum using preliminary, zoned, tides from NWLON Station 8729108, Panama City. Horizontal positions are referenced to the North American Datum of 1983 (NAD83).

Two floating obstructions, potentially submerged buoys, were developed approximately 30 to 50 meters apart with a multibeam echosounder (MBES) to meet object detection coverage specifications. The obstructions had approximate heights of 9 meters (31 feet) above the surrounding sea floor.

Initial investigation of the obstructions indicated only one buoy; however, on repeated passes with MBES, two distinct obstructions were visible on the same survey line.

Verified tides were not available as of May 27, 2010, the generation date of the DtoN Report.

Feature Correlation

Source	Feature	Range	Azimuth	Status
H12237_DtoN_1.xls	1	0.00	000.0	Primary

Hydrographer Recommendations

Recommend charting 56ft Obstruction at the Latitude 30-16-55.03N and Longitude 86-31-38.12W.

Cartographically-Rounded Depth (Affected Charts):

56ft (11388_1)

9 ¼fm (1115A_1, 11360_1, 11006_1, 411_1)

S-57 Data

Geo object 1: Obstruction (OBSTRN)
Attributes: OBJNAM - 56ft Obstruction
QUASOU - 6:least depth known
SORDAT - 20100527
SORIND - US,US,graph,H12237
TECSOU - 3:found by multi-beam
VALSOU - 17.175 m
WATLEV - 3:always under water/submerged

Office Notes

SAR: This feature is real. Ensonified with OD MBES and 200% SSS. Refer to compilation for cartographic recommendation.

Compile: Concur with clarification. Shown on chart 11388; 17th Ed., 020/1/2004 and smaller scale charts as a dangerous obstruction "submerged buoys", least depth 56 feet. Office processing determined that the position is slightly different from charted position. Delete charted dangerous obstruction "submerged buoys rep 2010", least depth 56 feet. Chart a dangerous obstruction "submerged buoys", least depth 56 feet at the present survey position.

Feature Images

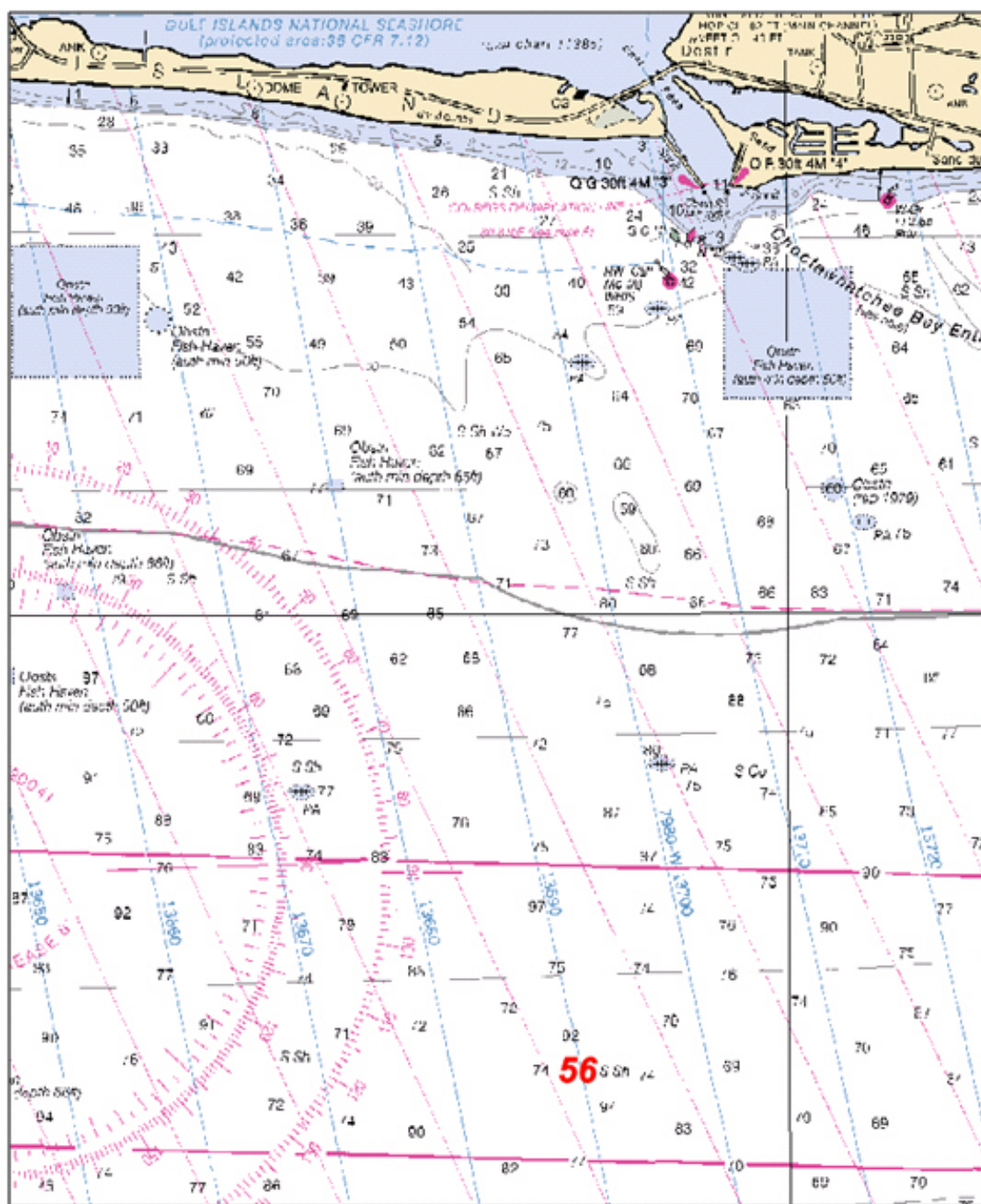


Figure 1. The position of the DtoN reflects the shoaler of the two obstructions, in reference to NOS RNC 11388. The surveyed sounding is in red and all depths are in feet.

Figure 1.1.1

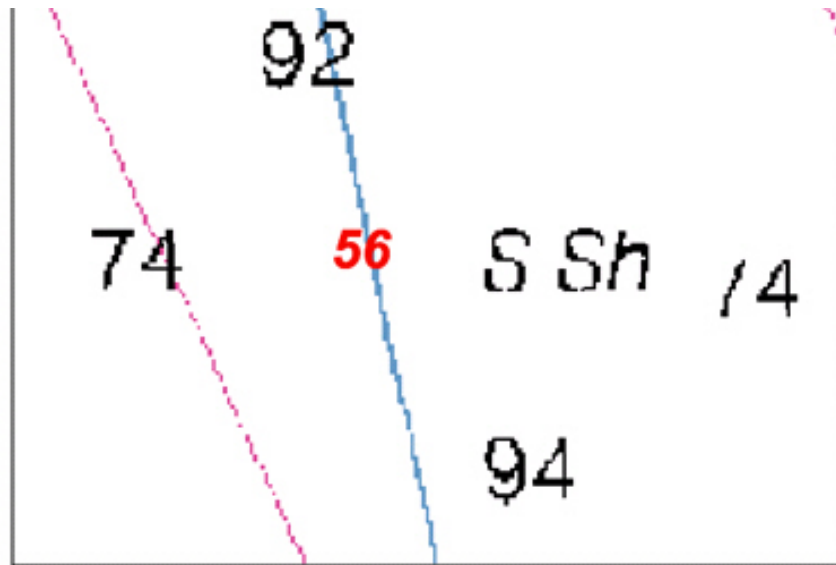


Figure 2. The least depth of the DtoN (red) is shown in relation to the surrounding charted depths from RNC 11388. All depths are in feet.

Figure 1.1.2

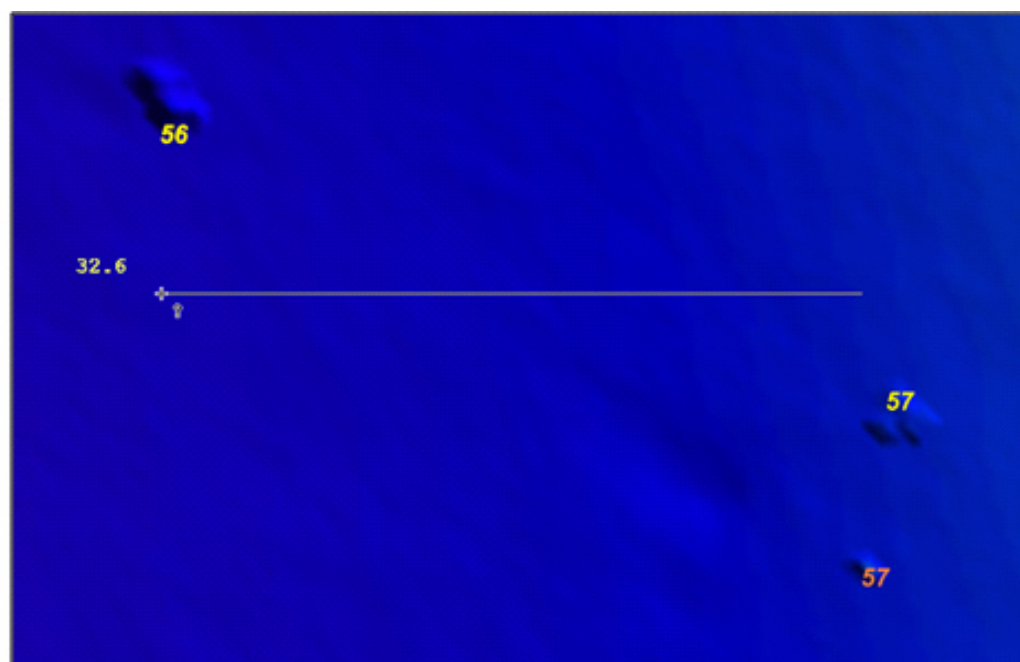


Figure 3. The two suspected buoys were positioned approximately 30 meters apart, from east to west, as displayed in the CARIS Map view with a 0.5-meter gridded surface in the background. The yellow soundings are the least depths surveyed on the buoys on May 27, 2010. The orange sounding is the least depth on the southeast buoy surveyed on May 26, 2010. The position of the southeast buoy varied by approximately 8 meters between May 26 and 27.

Figure 1.1.3

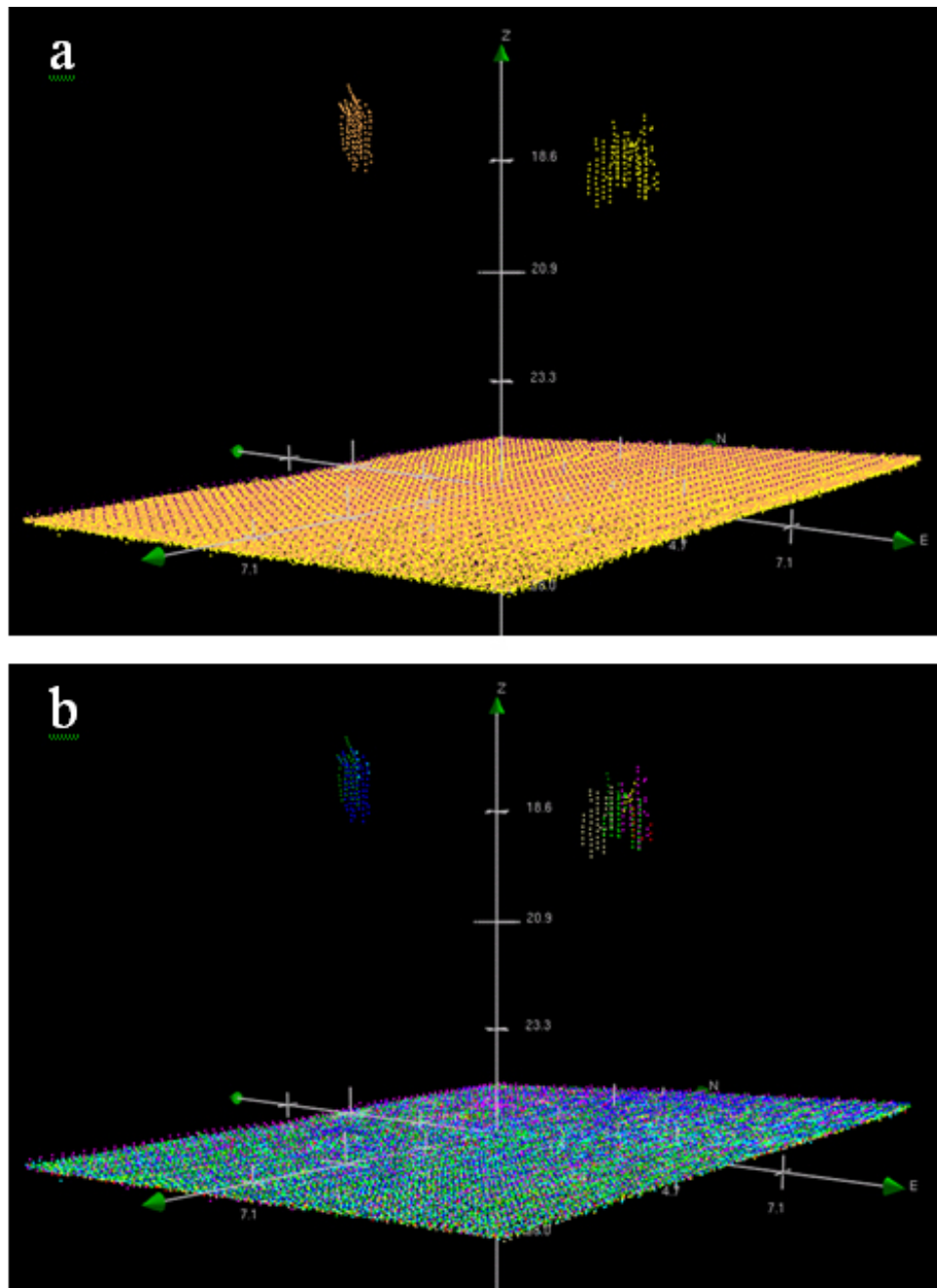


Figure 4. Southeast buoy displayed in CARIS Subset Editor 3D View. Soundings are colored by survey day in the top image, May 26th in orange and May 27th in yellow (a). Soundings are colored by survey line in the bottom image (b). Compass distance units are in meters.

Figure 1.1.4

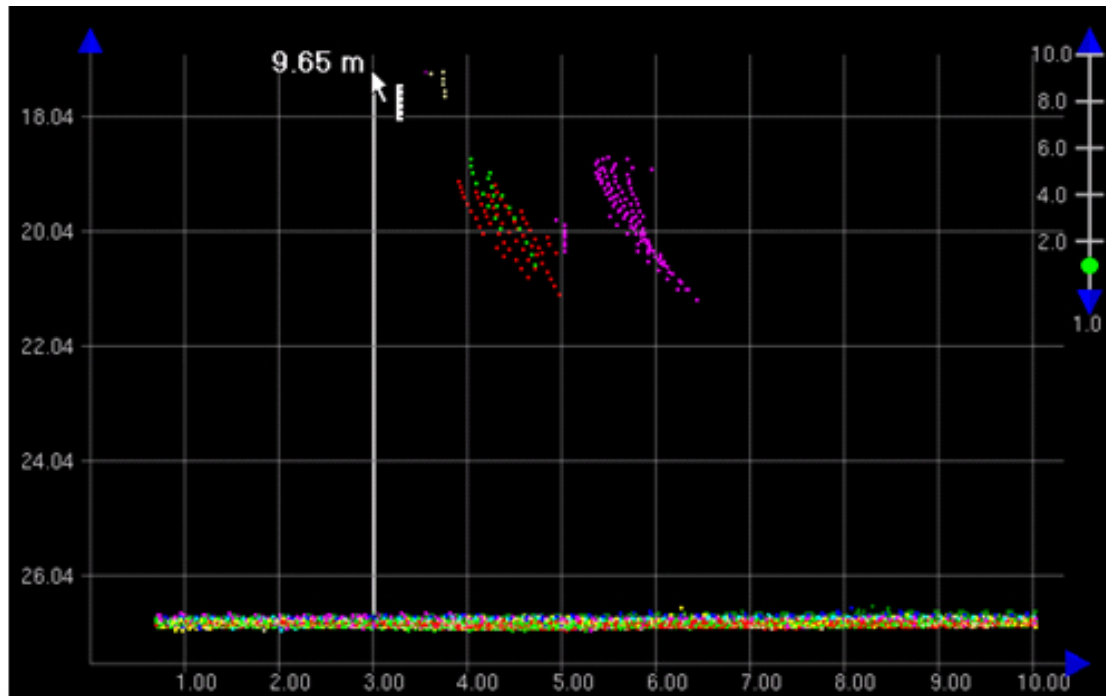


Figure 5. Northwest buoy displayed in CARIS Subset Editor 3D View. Soundings are colored by survey line and all units are in meters.

Figure 1.1.5

Appendix II

Survey Feature Report

H12237_DR_AWOIS

Registry Number: H12237
State: Florida
Locality: Gulf of Mexico
Sub-locality: 7 NM SE of Entrance to Choctawhatchee Bay
Project Number: OPR-J364-KR-10
Survey Dates: April 05, 2010 - May 28, 2010

Charts Affected

Number	Edition	Date	Scale (RNC)	RNC Correction(s)*
11388	17th	02/01/2004	1:80,000 (11388_1)	[L]NTM: ?
1115A	43rd	11/01/2008	1:456,394 (1115A_1)	[L]NTM: ?
11360	43rd	11/01/2008	1:456,394 (11360_1)	[L]NTM: ?
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	AWOIS14789_83ftWk	Wreck	25.41 m	30° 15' 55.3" N	086° 23' 09.8" W	14789
1.2	AWOIS14789_76ftWk	Wreck	23.37 m	30° 15' 50.9" N	086° 23' 07.0" W	---
1.3	Assigned_Uncharted	AWOIS	[no data]	[no data]	[no data]	---
1.4	Assigned_Uncharted	AWOIS	[no data]	[no data]	[no data]	---
1.5	Disproved_Wk	AWOIS	[no data]	[no data]	[no data]	---

1 - DR_AWOIS

1.1) AWOIS14789_83ftWk

Primary Feature for AWOIS Item #14789

Search Position: 30° 15' 53.4" N, 086° 23' 07.2" W
Historical Depth: 15.24 m
Search Radius: 600
Search Technique: S2, MB
Technique Notes: [None]

History Notes:

CL 1125/05, 8/2/2005; USACE -- Dept of Army received application from Okaloosa County for artificial reef nourishment by placement of vessel at 30 15 53.4 N / 86 23 07.2 W. Charted as Obstr Fish Haven (auth min depth 50'). (KSJ 5/3/2010)

Survey Summary

Survey Position: 30° 15' 55.3" N, 086° 23' 09.8" W
Least Depth: 25.41 m (= 83.36 ft = 13.893 fm = 13 fm 5.36 ft)
TPU ($\pm 1.96\sigma$): THU (TPEh) [None] ; TVU (TPEv) [None]
Timestamp: 2010-148.00:00:00.000 (05/28/2010)
Dataset: H12237_Features.000
FOID: US 0000005531 00001(02260000159B0001)
Charts Affected: 11388_1, 1115A_1, 11360_1, 11006_1, 411_1

Remarks:

WRECKS/remrks: AWOIS Item 14789: Two wrecks were verified with 200% SSS and Obj Det Cov SWMB within Chd (11388) Obstr Fish Haven. Desig Sndg is L.D. on northern wreck.

Feature Correlation

Source	Feature	Range	Azimuth	Status
H12237_Features.000	US 0000005531 00001	0.00	000.0	Primary
AWOIS_EXPORT	AWOIS # 14789	-1.00	000.0	Secondary (grouped)

Hydrographer Recommendations

Wreck least depth is deeper than Obstn Fish Haven auth min depth of 50ft. It is recommended that the fish haven remains as charted.

Cartographically-Rounded Depth (Affected Charts):

83ft (11388_1)

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

S-57 Data

Geo object 1: Wreck (WRECKS)
Attributes: CATWRK - 1:non-dangerous wreck
INFORM - 2010FE1462028_702- 336- 411
QUASOU - 6:least depth known
SORDAT - 20100528
SORIND - US,US,Survy,H12237
TECSOU - 3,2:found by multi-beam,found by side scan sonar
VALSOU - 25.408 m
WATLEV - 3:always under water/submerged

Office Notes

SAR: This feature is real and hydrographically significant. Ensonified with 200% SSS and OD MBES.

Compile: 83 ft wreck is located in a charted fish haven with a least depth that is deeper than Obstn Fish Haven auth min depth of 50ft. It is recommended that the the Wk is not charted and the fish haven remains as charted.

Feature Images

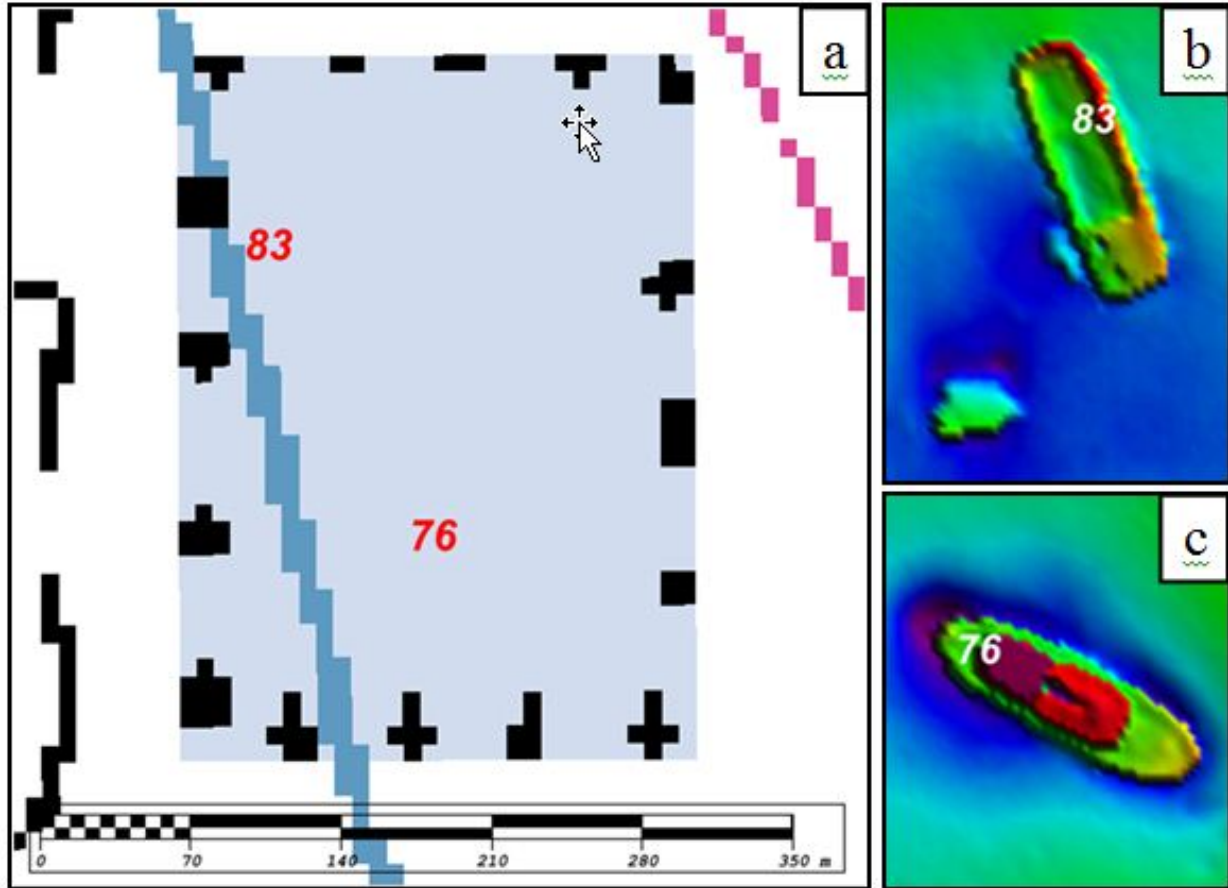
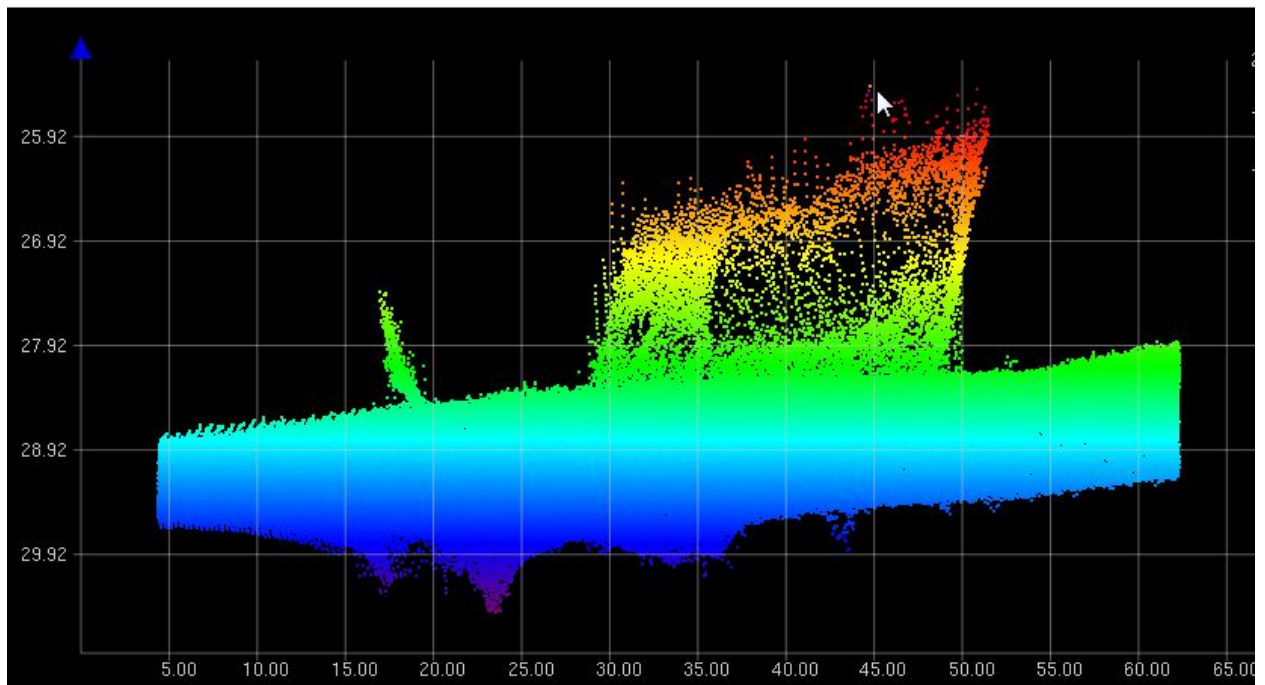


Figure 14. (a) Wreck least depth positions are shown in red in reference to the Obstin Fish Haven as charted on RNC 11388. Depths are in feet. (b) The northern wreck has a least depth of 83 feet. (c) The southern wreck has a least depth of 76 feet.

Figure 1.1.1

*Figure 1.1.2**Figure 1.1.3*

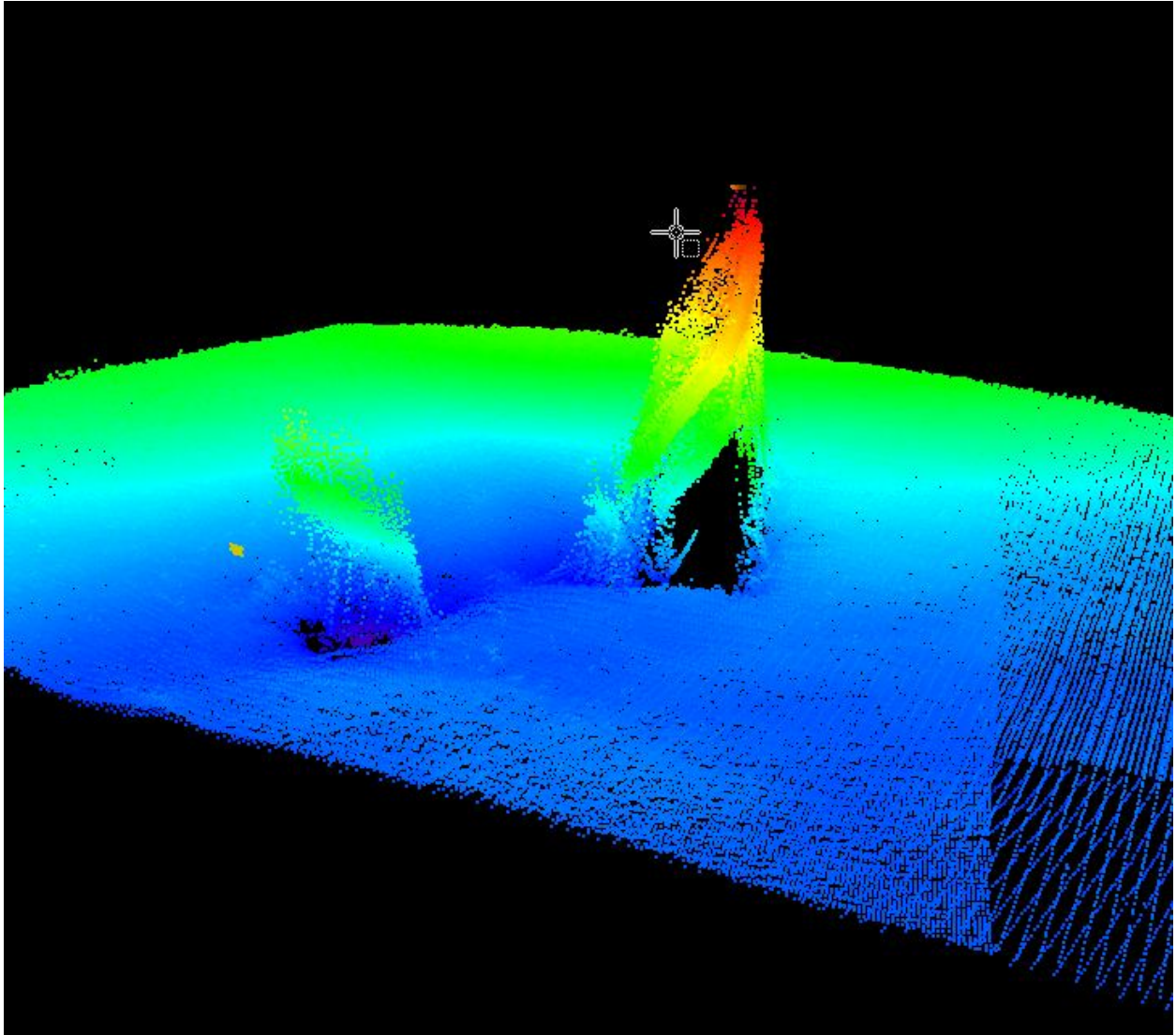


Figure 1.1.4

1.2) AWOIS14789_76ftWk

Survey Summary

Survey Position: 30° 15' 50.9" N, 086° 23' 07.0" W
Least Depth: 23.37 m (= 76.68 ft = 12.781 fm = 12 fm 4.68 ft)
TPU ($\pm 1.96\sigma$): THU (TPEh) [None] ; TVU (TPEv) [None]
Timestamp: 2010-148.00:00:00.000 (05/28/2010)
Dataset: H12237_Features.000
FOID: US 0000005532 00001(02260000159C0001)
Charts Affected: 11388_1, 1115A_1, 11360_1, 11006_1, 411_1

Remarks:

WRECKS/remrks: AWOIS Item 14789: Two wrecks were verified with 200% SSS and Obj Det Cov SWMB within Chd (11388) Obstn Fish Haven. Desig Sndg is L.D. on southern wreck.

Feature Correlation

Source	Feature	Range	Azimuth	Status
H12237_Features.000	US 0000005532 00001	0.00	000.0	Primary

Hydrographer Recommendations

Wreck least depth is deeper than Obstn Fish Haven auth min depth of 50ft. It is recommended that the fish haven remains as charted.

Cartographically-Rounded Depth (Affected Charts):

76ft (11388_1)

13fm (1115A_1, 11360_1, 11006_1, 411_1)

S-57 Data

Geo object 1: Wreck (WRECKS)
Attributes: CATWRK - 1:non-dangerous wreck
 INFORM - 2010FE1462022_708- 353- 385
 QUASOU - 6:least depth known
 SORDAT - 20100528
 SORIND - US,US,Survy,H12237
 TECSOU - 3,2:found by multi-beam,found by side scan sonar

VALSOU - 23.373 m

WATLEV - 3:always under water/submerged

Office Notes

SAR: This feature is real and hydrographically significant. Ensonified with 200% SSS and OD MBES.

Compile: 76 ft wreck is located in a charted fish haven with a least depth that is deeper than Obstr Fish Haven auth min depth of 50ft. It is recommended that the the Wk is not charted and the fish haven remains as charted.

Feature Images

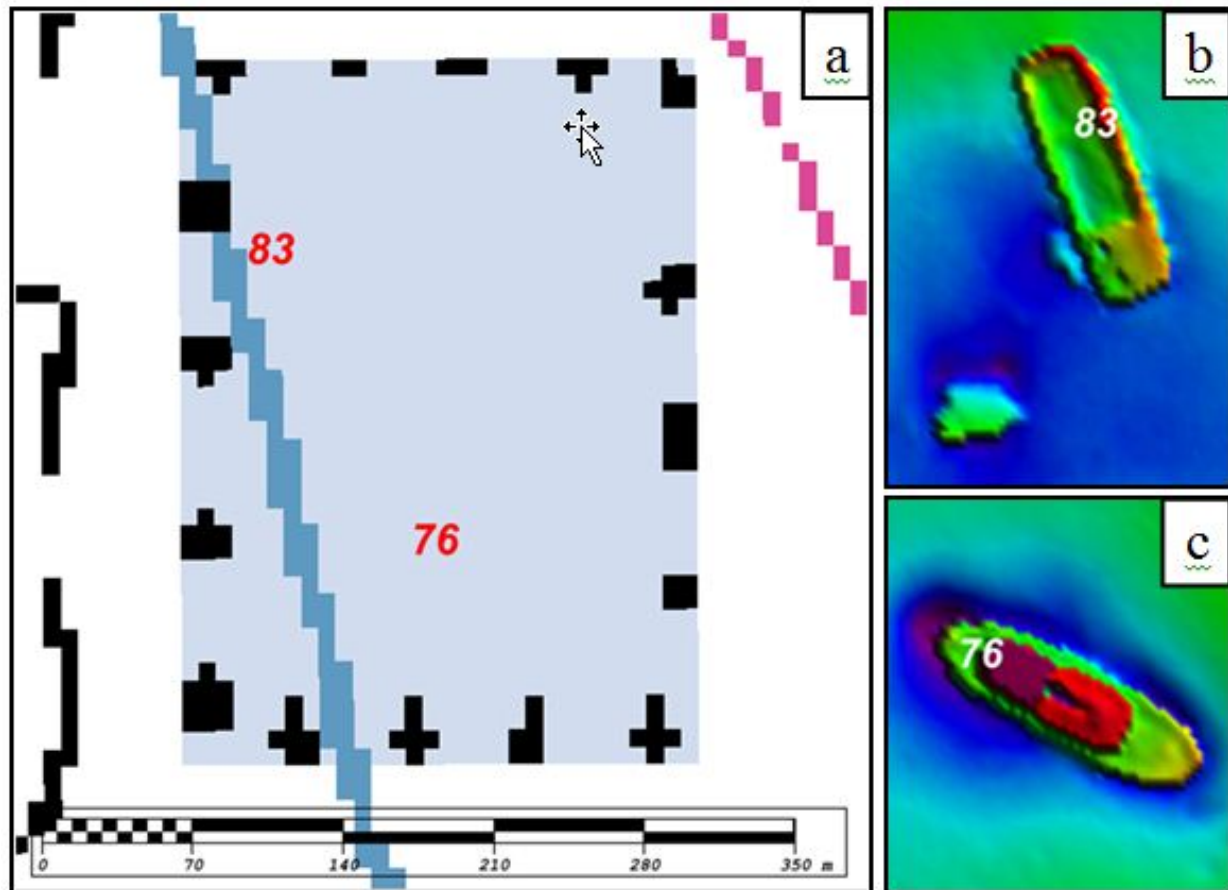
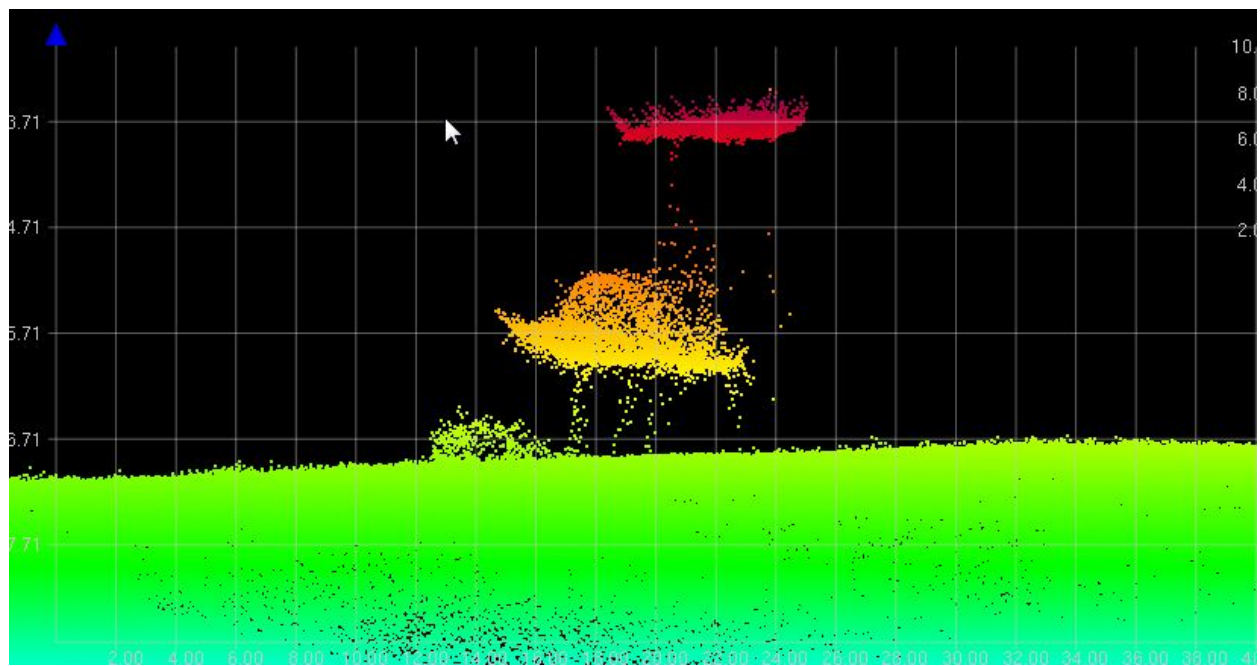


Figure 14. (a) Wreck least depth positions are shown in red in reference to the Obstr Fish Haven as charted on RNC 11388. Depths are in feet. (b) The northern wreck has a least depth of 83 feet. (c) The southern wreck has a least depth of 76 feet.

Figure 1.2.1

*Figure 1.2.2**Figure 1.2.3*

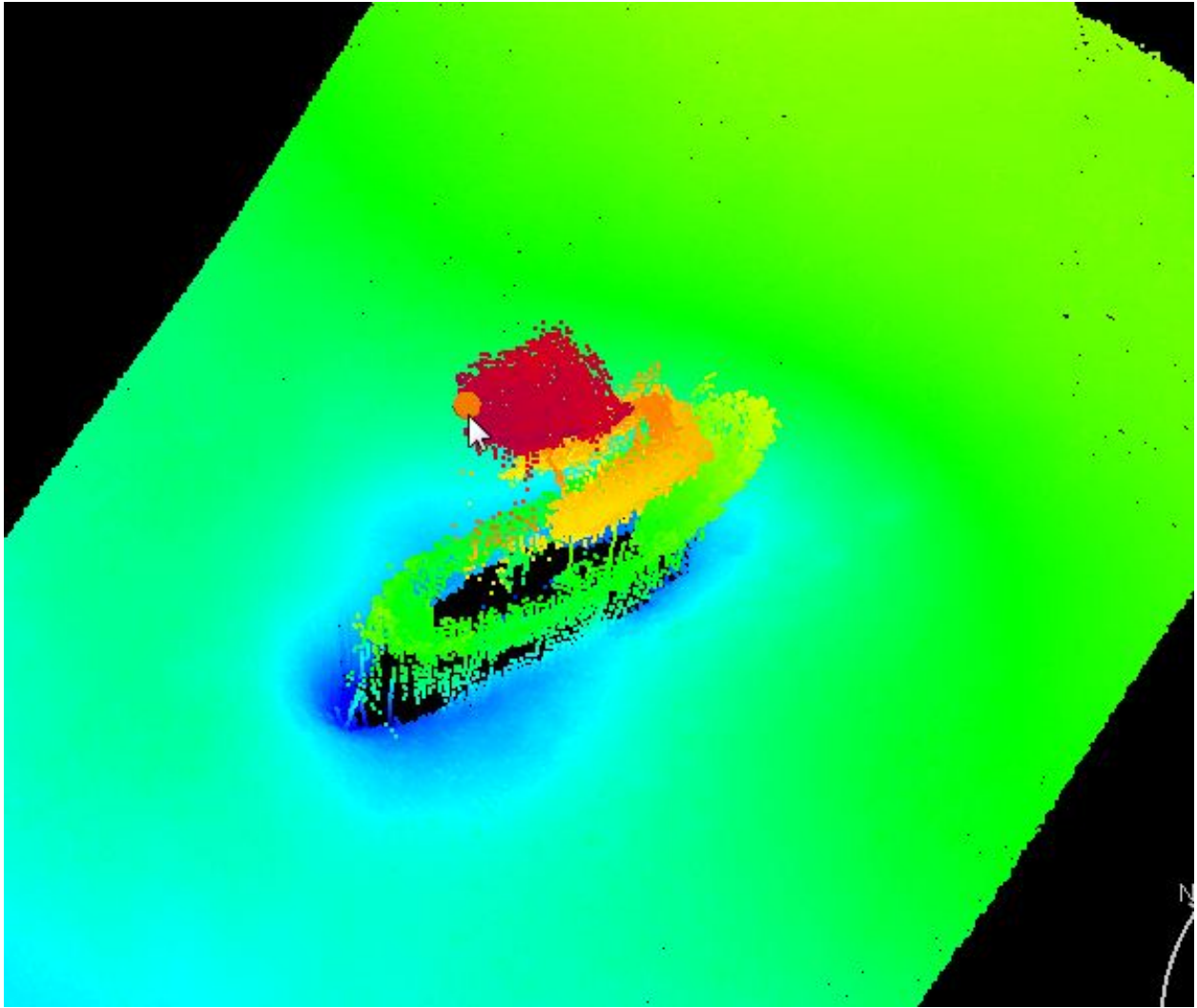


Figure 1.2.4

1.3) AWOIS #14787 - Assigned_Uncharted

No Primary Survey Feature for this AWOIS Item

Search Position: 30° 18' 00.0" N, 086° 28' 18.0" W
Historical Depth: [None]
Search Radius: 0
Search Technique: [None]
Technique Notes: [None]

History Notes:

LNM33/02--8th CGD, 08/12/02; 1000 ft pipeline adrift, no identifying marks noted. (KSJ 5/3/2010)

Survey Summary

Charts Affected: 11388_1, 1115A_1, 11360_1, 11006_1, 411_1

Remarks:

[None]

Feature Correlation

Source	Feature	Range	Azimuth	Status
AWOIS_EXPORT	AWOIS # 14787	0.00	000.0	Primary

Hydrographer Recommendations

[None]

S-57 Data

[None]

Office Notes

AWOIS# 14787 feature is uncharted on largest scale chart. Feature was not found within the survey area of H12237. The survey area to the North of AWOIS# 14787 stops ~500 meters from the AWOIS position. Feature is considered disproved within the survey area of H12237. No change in charting recommended.

1.4) AWOIS #14788 - Assigned_Uncharted

No Primary Survey Feature for this AWOIS Item

Search Position: 30° 17' 30.0" N, 086° 26' 06.0" W
Historical Depth: [None]
Search Radius: 0
Search Technique: [None]
Technique Notes: [None]

History Notes:

LNM49/85--8th CGD, 08/12/02; Anchored White Cylinder sunk at 30 17 30 / 86 26 06. Reported by STA Destin. (KSJ 5/3/2010)

Survey Summary

Charts Affected: 11388_1, 1115A_1, 11360_1, 11006_1, 411_1

Remarks:

[None]

Feature Correlation

Source	Feature	Range	Azimuth	Status
AWOIS_EXPORT	AWOIS # 14788	0.00	000.0	Primary

Hydrographer Recommendations

[None]

S-57 Data

[None]

Office Notes

AWOIS# 14787 feature is uncharted on largest scale chart. Feature was not found within the survey area of H12237. The survey area to the North of AWOIS# 14787 stops ~1400 meters from the AWOIS position. Feature is considered disproved within the survey area of H12237. No change in charting recommended.

1.5) AWOIS #14790 - Disproved_Wk

No Primary Survey Feature for this AWOIS Item

Search Position: 30° 15' 48.0" N, 086° 20' 06.0" W
Historical Depth: [None]
Search Radius: 400
Search Technique: S2,MB
Technique Notes: [None]

History Notes:

LNM32/07--8th CGD, 8/7/2007; 23' F/V reportedly sunk in Gulf of Mexico in approximate position 30 15 48 / 86 20 06 on August 5, 2007. Wreck is reportedly not marked. Charted as dangerous wreck PA. (KSJ 5/3/10)

Survey Summary

Charts Affected: 11388_1, 1115A_1, 11360_1, 11006_1, 411_1

Remarks:

Ensonified with OD MBES and 200% SSS. No evidence of the charted Wk was found. This feature is considered disprove.

Feature Correlation

Source	Feature	Range	Azimuth	Status
AWOIS_EXPORT	AWOIS # 14790	0.00	000.0	Primary
Disproval.000	US 0000016833 00001	-1.00	-999.0	Secondary (grouped)

Hydrographer Recommendations

[None]

S-57 Data

[None]

Office Notes

SAR: Ensonified with OD MBES and 200% SSS. No evidence of the charted Wk was found. This feature is considered disprove.

Compile: Delete Wreck PA.

Appendix III

Final Progress Spreadsheet

And

Survey Outline

*Ocean Surveys, Inc.***May Survey Progress Estimate****FY 2010 Task Order Number 5**

OPS			FIELD		
Project Number and Name	Sheet Identifier	Registry Number	Date Field Work Began	Date Field Work Completed	May Cumulative % Complete
<i>OPR-J364-KR-10 Florida Safety Fairways, Florida</i>	1	H12236	5/12/10	5/28/10	100%
	2	H12237	5/19/09	5/28/10	100%

Figure 1. Final Progress Spreadsheet, Table 1.

*Ocean Surveys, Inc.***May Project Statistics****FY 2010 Task Order Number 5**

Project	Location	Month/ Year	LNM MB		LNM SSS		LNM Combo		Combo Type	
			Ship	Launch	Ship	Launch	Ship	Launch	Ship	Launch
OPR-J364-KR-10	Florida Safety Fairways, Florida	May-10	1915		1776		1776			MB/SSS
		TOTAL	1915	0	1776	0	1776	0	n/a	n/a

Project	Location	Month/ Year	Items Investigated	Tide Gauges Installed / Removed	Bottom Samples	Days at Sea (Operating Days)	Days Lost Due to Weather	Days Lost Due to Equipment or Other
OPR-J364-KR-10	Florida Safety Fairways, Florida	May-10	7	0	28	17	0	0
		TOTAL	7	0	28	17	0	0

Figure 1. Final Progress Spreadsheet, Table 2.

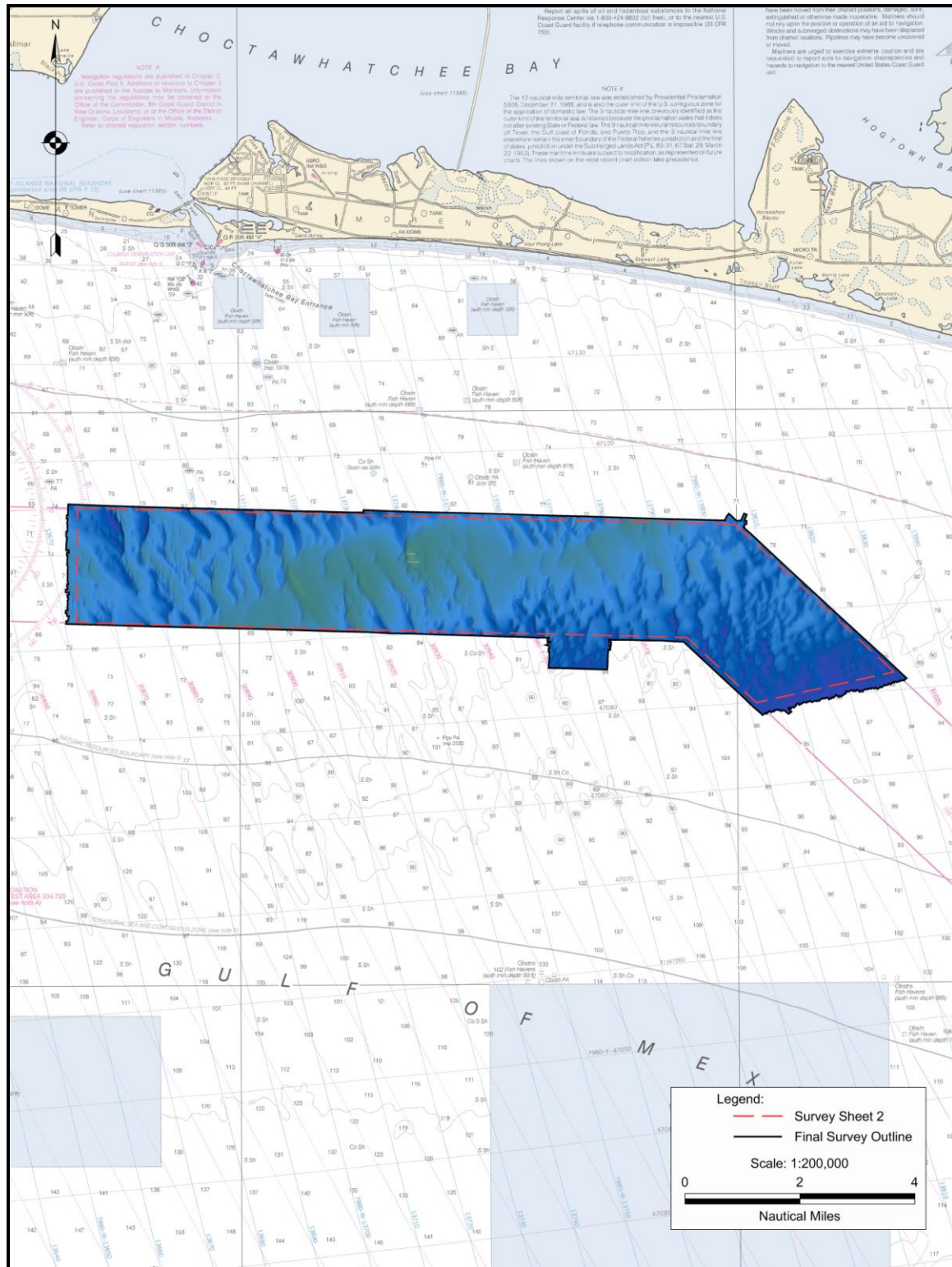


Figure 2. Final Survey Outline.

Appendix IV

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
5/19/2010	139	05:12:57	23:32:22
5/20/2010	140	00:37:37	23:13:59
5/21/2010	141	00:32:21	23:53:34
5/22/2010	142	00:35:54	23:49:48
5/23/2010	143	00:23:32	23:38:09
5/24/2010	144	00:57:58	19:02:53
5/25/2010	145	02:52:49	04:27:56
5/26/2010	146	08:01:20	20:34:26
5/27/2010	147	07:06:43	10:22:25

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 [mailto:ggr@oceansurveys.com]
Sent: Friday, May 14, 2010 10:24 AM
To: 'OET OET'; 'Thomas.Landon'
Cc: 'kathleen.jamison'
Subject: OPR-J364-KR-10 - Add Panama City Station to Hydro Hot List

Hi Tom:

OSI has moved operations to OPR-J364-KR-10 (see attached sketch). To support this survey we request that the National Water Level Observation Network station at Panama City, FL (872-9108) be placed on the hydro hot list. Survey operations started in this area on May 11, 2010.

Please let me know if you need any additional information.

Thanks for your help

Regards

George

George Reynolds

Ocean Surveys, Inc.

91 Sheffield St

Old Saybrook, CT

06475

860-388-4631 Ext 112

<http://www.oceansurveys.com>

From: George Reynolds [mailto:ggr@oceansurveys.com]
Sent: Tuesday, June 08, 2010 5:14 PM
To: 'OET OET'; 'Thomas.Landon'
Cc: 'kathleen.jamison'
Subject: RE: OPR-J364-KR-10 - Add Panama City Station to Hydro Hot List

Hi Tom,

We have completed OPR-J364-KR-10 survey operations and no longer need data from the Panama City, FL (872-9108) gauge. The Panama City gauge can be removed from the Hydro Hot List.

Thanks for your help.

Regards

George

Appendix V

Supplemental Survey Records and Correspondence

Bottom Samples

Bottom samples were obtained at approximate 2000-meter intervals across the site. Sediment grab locations are included in the S-57 feature file (H12237_S57_Features.hob).

OSI Bottom Sample Designation	Latitude, N (NAD83)	Longitude, W (NAD83)	Depth (meters)	Description
2-1	30-17-18.88	86-32-27.08	26.2	Medium, Light Gray, Sand
2-2	30-17-17.26	86-31-12.31	24.2	Medium, Light Gray, Sand
2-3	30-17-15.37	86-29-57.02	22.7	Medium, Brown and Gray, Sand
2-4	30-17-13.18	86-28-42.56	20.8	Medium, Gray, Sand
2-5	30-17-11.21	86-27-27.89	20.1	Medium/Coarse, Gray, Sand
2-6	30-17-10.08	86-26-13.16	20.5	Medium/Coarse, Gray, Sand
2-7	30-17-07.56	86-24-58.11	22.5	Medium, Gray, Sand
2-8	30-17-05.64	86-23-43.30	22.7	Medium, Gray, Sand
2-9*	30-17-06.45	86-22-28.16	22.4	Medium/Coarse, Light Gray, Sand
2-10	30-17-02.14	86-21-13.53	23.5	Medium/Coarse, Light Gray, Sand
2-11	30-17-44.47	86-20-08.99	25.0	Coarse, Gray, Sand
2-12	30-16-38.10	86-20-01.97	24.7	Medium, Gray, Sand
2-13	30-15-53.35	86-19-06.71	25.8	Medium, Gray, Sand
2-14	30-15-08.97	86-18-12.51	30.9	Coarse, Gray, Sand with Shell hash

*Moved target location north due to possible contact near original intended location.















Correspondence

E-mail correspondence between OSI and the COTR follows.

From: kathleen.jamison
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

From: kathleen.jamison [mailto:Kathleen.Jamison@noaa.gov]
Sent: Friday, May 14, 2010 3:19 PM
To: George Reynolds
Subject: VelociWin

George,

As per our conversation, you may continue to use VelociWin and the Wilson equation until the new VelociWin software is ready, as long as you continue to meet the standard of a sound speed profile with an error less than 2 meters per second, as explained in 5.2.3.3 of the Specs & Deliverables.

--

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

From: Catherine Perren <Catherine.A.Perren@noaa.gov>
Date: Tue, 01 Jun 2010 11:57:24
To: 'George Reynolds' <ggr@oceansurveys.com>;
'kathleen.jamison' <Kathleen.Jamison@noaa.gov>
Cc: 'Ben Evans' <Benjamin.K.Evans@noaa.gov>
Subject: OSI, DG133C08CQ0007T005, Re: NCNJ3000-10-10497

Attached is a copy of the above referenced task order. If you have any questions, feel free to contact me.

Catherine Perren
Contract Specialist
National Capital Acquisition Division
1305 East-West Hwy.
SSMC4, Rm. 7608
Silver Spring, MD 20910
301-713-0820 x126
fax (301) 713-0808

From: kathleen.jamison
Sent: Tuesday, June 08, 2010 5:13 PM
To: George Reynolds
Subject: Project Instructions for OPR-J364-KR-10

Hi George,

Here are the official and final project instructions for OPR-J364-KR-10. I know that you have all the information contained in the document, but this way you've got the official PI for your records.

--

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

From: George Reynolds [mailto:ggr@oceansurveys.com]
Sent: Friday, June 11, 2010 10:34 AM
To: LCDR Richard Brennan
Cc: kathleen Jamison
Subject: OPR-J364-KR-10 Raw MBES and SSS directory size info

LCDR Brennan,

The following are the raw data directory sizes for OPR-J364-KR-10, Florida and Alabama Safety Fairways, Sheets 1 & 2.

H12236 (Sheet 1)

R/V Ferrel

MBES Raw directory raw/hsx - 51 GB

SSS Raw directory xtf - 78 GB

H12237 (Sheet 2)

R/V Ferrel

MBES Raw directory raw/hsx - 42 GB

SSS Raw directory xtf - 80 GB

Please let me know if you have any questions or need additional information.

Regards
George

George Reynolds
Ocean Surveys, Inc.
91 Sheffield St
Old Saybrook, CT
06475
860-388-4631 Ext 112
<http://www.oceansurveys.com>

AHB COMPILATION LOG

General Survey Information	
REGISTRY No.	H12237
PROJECT No.	OPR-J364-KR-10-2
FIELD UNIT	OCEAN SURVEYS, INC.
DATE OF SURVEY	20100405 - 20100528
LARGEST SCALE CHART	<i>11388_1, edition 17, 20040201, 1:80,000</i>
ADDITIONAL CHARTS	N/A
SOUNDING UNITS	FEET
COMPILER	SELF-MILLER

Source Grids	File Name
	H:\Compilation\H12237_XXXX_XX\AHB_H12237\SAR Final Products\GRIDS
H12237_AWOIS_14789_CUBE_1m_Final	T:\Surveys\H12237_J364_OSI\AHB_H12237\SAR Final Products\GRIDS
H12237_DT_0to22_AHB_1m_Final	T:\Surveys\H12237_J364_OSI\AHB_H12237\SAR Final Products\GRIDS
H12237_DT_20to44_AHB_2m_Final	T:\Surveys\H12237_J364_OSI\AHB_H12237\SAR Final Products\GRIDS
Surfaces	File Name
	H:\Compilation\H12237_XXXX_XX\AHB_H12237\COMPILE\Working
<i>Combined</i>	H12237_2m_Combined.csar
<i>Interpolated TIN</i>	\Interpolated TIN\H12237_12m_InterpTIN.csar
<i>Shifted Interpolated TIN</i>	\Shifted Surface\H12237_12m_InterpTIN_Shifted.csar
Final HOBs	File Name
	H:\Compilation\H12237_XXXX_XX\AHB_H12237\COMPILE\Final_Hobs
<i>Survey Scale Soundings</i>	H12237_SS_Soundings.hob
<i>Chart Scale Soundings</i>	H12237_CS_Soundings.hob
<i>Contour Layer</i>	H12237_Contours.hob
<i>Feature Layer</i>	H12237_Features.hob
<i>Meta-Objects Layer</i>	H12237_MetaObjects.hob
<i>Blue Notes</i>	H12237_BlueNotes.hob
<i>ENC Retain Soundings</i>	H12237_ENC_Retain_Soundings.hob

Meta-Objects Attribution	
Acronym	Value
M_COVR	
CATCOV	1 – coverage available
SORDAT	20100528
SORIND	US,US,graph,H12237
M_QUAL	
CATZOC	1 – zone of confidence A1
INFORM	R/V Ferrel
POSACC	05.0 m
SORDAT	20100528
SORIND	US,US,graph,H12237
SUREND	20100528
SURSTA	20100405

DEPARE	
DRVALV 1	55.000 ft
DRVALV2	104.000 ft
SORDAT	20100828
SORIND	US,US,graph,H12237
M_CSCL	
CSCALE	N/A
SORDAT	N/A
SORIND	N/A

SPECIFICATIONS:

- I. COMBINED SURFACE:
 - a. Number of SAR Final Grids: 03
 - b. Resolution of Combined (m): 2 m

- II. SURVEY SCALE SOUNDINGS (SS):
 - a. Attribute Name: Depth
 - b. Selection criteria: Radius, Shoal bias
 - c. Radius value is: mm at map scale
 - i. Use single-defined radius: X.XX
 - ii. And/Or use radius table file: H12237_SS_SSR.txt

	A	B	C
1	18.2881	27.432	1.1
2	27.4321	36.8046	1.2
 - d. Queried Depth of All Soundings
 - i. Minimum: 17.069 m
 - ii. Maximum: 31.699 m

- III. INTERPOLATED TIN SURFACE:
 - a. Resolution (m): 12 m
 - b. Interpolation method: Natural Neighbor
 - c. Shift value: -0.75 ft [only include applicable shift values]
[-0.75 feet (And/Or) -0.75 fathoms]

- IV. CONTOURS:
 - a. Attribute Name: Depth
 - b. Use a Depth List: H12237_depth_contours.txt
 - c. Output Options: Create contour lines
 - i. Line Object: DEPCNT
 - ii. Value Attribute: VALDCO

- V. FEATURES:
 - a. Number of Chart Features: 12 [all features included in H-Cell including seabed areas]
 - b. Number of Non-Chart Features: 14 [includes seabed areas]

- VI. CHART SURVEY SOUNDINGS (CS):
 - a. Number of ENC CS Soundings: 094
 - b. Attribute Name: Depth
 - c. Selection criteria: Radius, Shoal bias
 - d. Radius value is: Distance on the ground (m)
 - i. Use single-defined radius: X.XX m
 - ii. And/Or use radius table file: H12237_CS_SSR_.txt

[80k = chart scale]

Version Updated 07/28/11

This Document is for Office Process use only and is intended to supplement, not supersede or replace, information/recommendations in the Descriptive or H-Cell Reports.

	A	B	C
1	18.2881	27.432	925
2	27.4321	36.8046	975

e. Number Survey CS Soundings: 98

VII. NOTES:
[Type text]