H12335

NOAA FORM 76-35A
U.S. DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL OCEAN SERVICE

DESCRIPTIVE REPORT

Type of Survey: Hydrographic Multibeam & 200% Sidescan

Project No. : OPR-K354-KR-11

Registry No. : H12335

LOCALITY

State: Louisiana

General Locality: Gulf of Mexico

Sub-locality: 21 NM S of Pt Au Fer Island

2011

CHIEFS OF PARTY
John Baker

NOAA FORM 77-28 (11-72)

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

REGISTRY NUMBER: H12335

HYDROGRAPHIC TITLE SHEET

State: Louisiana

General Locality: Gulf of Mexico

Locality: 21 NM S of Pt Au Fer Island

Scale: 1:40,000 Date of Survey: July 2011 to August 2011

Instructions Dated: June 2011 Project Number: OPR-K354-KR-11

Vessels: M/V *Inez McCall*

Chiefs of Party: John Baker

Surveyed by: C&C Technologies Personnel

Soundings taken by echosounder: ***Simrad EM3002 Multibeam Echosounder****

Verification by: Atlantic Hydrographic Branch Personnel

Soundings in: Feet: X Fathoms: ____ Meters: ____ at MLW: ____ MLLW: X

Remarks: Multibeam Hydrographic Survey of H12335 (Sheet 6)
Data collection in meters, referenced to MLLW, later converted into feet
200% side scan sonar coverage, with concurrent multibeam coverage
UTC time was used exclusively
3 Grab samples were taken
Tidal Zones: CGM 761, WGM 266, 276, 265, 277, 264
Tidal Station: 8762075 (Port Fourchon, LA)

NOAA FORM 77-28 SUPERSEDES FORM C & GS - 537

red, bold, italic comments made during office processing

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/.

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DESCRIPTIVE REPORT TO ACCOMPANY HYDROGRAPHIC SURVEY H12335

INTRODUCTION

The purpose of this survey is to provide accurate hydrographic data to NOAA in order to update existing nautical charts in a high commercial traffic area in the Gulf of Mexico near the Louisiana coast.

A. AREA SURVEYED

The survey area is located approximately 21 nautical miles south of Pt. Au Fer Island, Louisiana, in the Gulf of Mexico. Illustrations No.1 and 2 show the layout of H12335 (Sheet 6) of Project OPR-K354-KR-11. Water depths in the survey area range from 5.7 to 12.2 m Mean Lower Low Water. Data were acquired between July 1 – 20, July 27 and 28, and August 3 and 31, 2011 (Calendar day numbers 182 – 201, 208, 209, 215 and 243). Survey statistics that includes the total survey line and crossline nautical miles, number of bottom samples and number of investigations are shown in Tables No. 1 and 2.

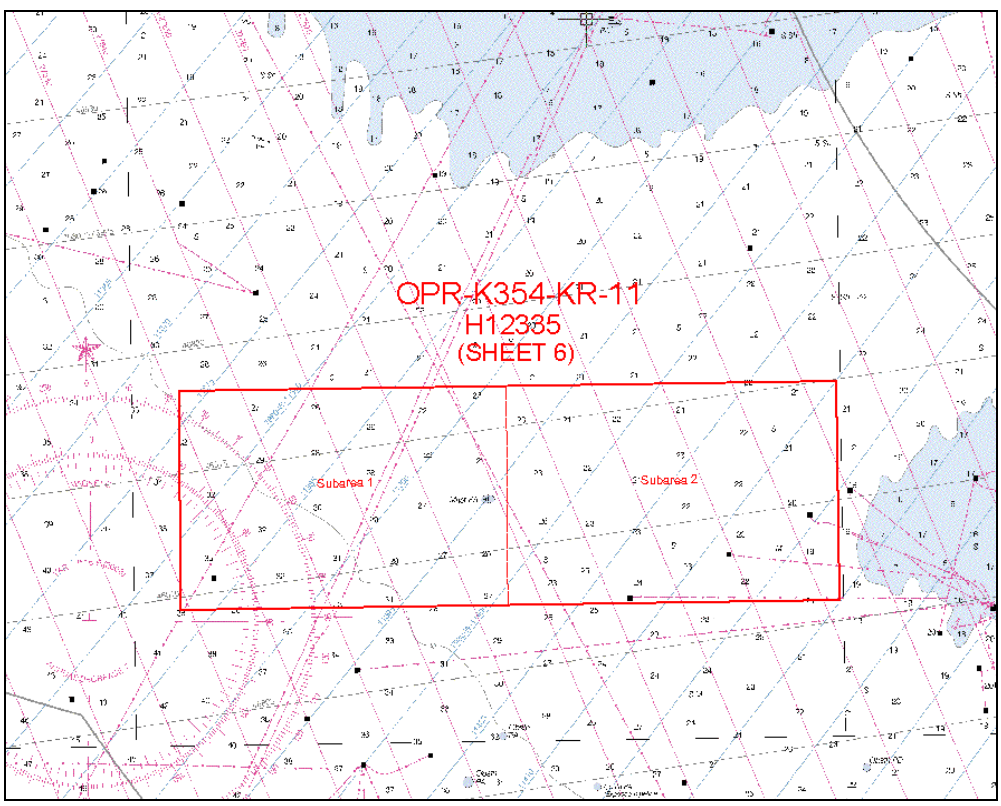


Illustration No. 1. Large scale survey coverage graphic of H12335.

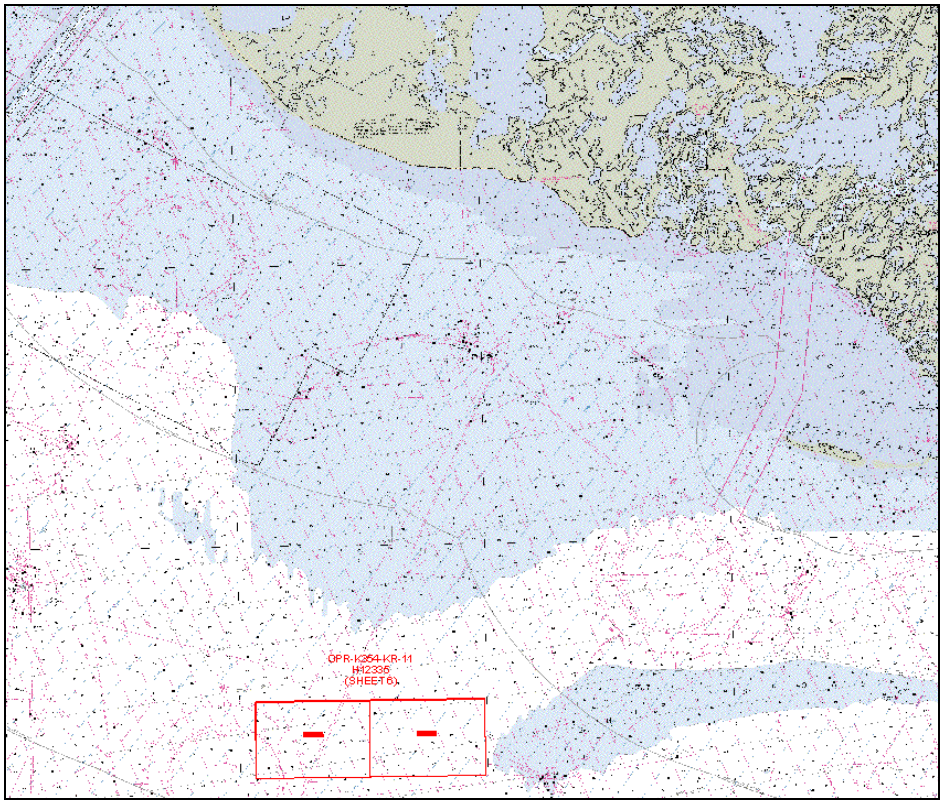


Illustration No. 2. Small scale survey coverage graphic of H12335.

Table No. 1. Survey Line Statistics

	Inez McCall	Total
LNM Side Scan + Multibeam	1034.49	1034.49
LNM Crosslines	91.12	91.12
LNM Investigations	3.77	3.77

Table No. 2. Additional Survey Statistics

Total square nautical miles of survey area	23.11
Number of bottom samples collected	3
Number of items investigated	3*

***Only three items were investigated, but 2 items were investigated twice.**

B. DATA ACQUISITION AND PROCESSING

Refer to the OPR-K354-KR-11 Data Acquisition and Processing Report (DAPR) for additional information regarding survey systems, operational, processing and quality control procedures. Additional and supplemental information is included in this descriptive report.

B.1 Equipment

Survey operations were conducted from the *M/V Inez McCall*. The vessel is 108 ft. (33 m) long and 24 ft. (7.3 m) wide with an approximate draft of 8 ft. (2.5 m). A central reference point was established prior to the survey from which all relevant offsets were measured. Primary systems and equipment utilized on the *M/V Inez McCall* are listed in Table 3.

Table No. 3. Survey Equipment List

System	Manufacturer	Model
Multibeam Echo Sounder	Simrad	EM3002
Side Scan Sonar	Klein	5000
Single Beam Echo Sounder	ODOM	Echotrac DF3200 MK II
Motion Sensor	Applanix	POS MV-320 V.3
Primary Positioning System	CNAV	2050
Secondary Positioning System	CNAV	2050
Tertiary Positioning System	Applanix	POS MV-320 V.3
Sound Speed at Transducer	YSI Electronics	600R
Sound Velocity Profiler	Seabird	SBE19
SSS acquisition	Chesapeake Technology Inc.	SonarWiz Map
Multibeam acquisition	C&C Technologies	Hydromap
SSS Cable Payout Indicator	Subsea Systems, Inc.	PI-5600

B.2 Quality Control

B.2.1 Survey Methods

For management purposes, the survey area was divided into two subareas (labeled 1 and 2) with separate line-plans in order to conduct survey operations. The main survey lines were oriented east to west throughout both subareas. Two hundred percent (200%) side scan sonar (SSS) coverage and concurrent set line spacing multibeam echosounder (MBES) data were acquired in accordance with the coverage required as stated in the Project Instructions for this survey. Additional high-resolution multibeam developments were conducted over significant features (see section B.4.2 for more details).

The shallowest charted soundings determined survey line spacing and the side scan sonar range scale. In subarea 1 the side scan sonar was operated with a range of 50 m per channel and a line spacing of 40 m in water depths less than 25 ft. and with a range of 75 m per channel and a line spacing of 60 m in water depths of 25 to 35 ft. In subarea 2 the side scan sonar was operated entirely with a range of 50 m per channel and a line spacing of 40 m;

charted water depths in subarea 2 do not exceed 27 ft. The criteria of acquiring 200% SSS coverage for object detection was accomplished using the aforementioned parameters and Technique 1 as set forth in Section 6.1 of the HSSD (2011), in which a single survey was conducted with the track lines separated by less than one-half the distance required for 100-percent coverage. The SSS track lines used to generate coverage mosaics were identified by an odd/even numbering system.

B.2.2 Crosslines

Crosslines were run prior to the collection of main line data and perpendicular to the main lines so that quality control statistics could be performed after each main line was completed. Based on pre-plot calculations, the total crossline miles were 91.12 nm, while the total main line miles were 1034.49 nm. The crosslines comprised 8.8 percent of the total data set as compared to the main scheme lines, compliant with set line spacing crossline requirements of Section 5.2.4.3 of the HSSD (2011), which states that lineal mileage of crosslines will be at least 8% of mainscheme mileage in areas surveyed with set line spacing coverage. Rerun line miles are not included in these totals.

As can be seen in the sample statistics found in Separates V, the main lines and cross lines depth values showed very good agreement. Each main line was compared to all cross lines for which there was overlapping data. The graphs show the mean difference, RMS difference, and confidence interval for each beam.

Crossline comparisons were also performed in CARIS HIPS/SIPS 7.1 using the surface difference tool. Separate 1-m BASE surfaces of the mainscheme lines and crosslines were created for each subarea and a difference BASE surface computed. The difference surface was examined with a user-defined color range map in 0.2 m increments from –0.6 m to 0.6 m. In subarea 1 the majority of the differences between the mainscheme lines and the crosslines are between –0.2 and 0.2 m (Illustration No. 3). The depth values of the mainlines and crosslines do not differ by more than the maximum allowable TVU (total vertical uncertainty) for IHO order 1 surveys the water depths of 6 to 13 m, which ranges from ±0.51 to ±0.53. In subarea 2 the majority of the differences between the mainscheme lines and crosslines are again between –0.2 and 0.2 m (Illustration No. 4). Although there are some regions where the differences are between –0.2 and –0.4 m and 0.2 and 0.4 m, there does not seem to be systematic differences across the survey area. The depth values of the mainlines and crosslines in this region do not differ by more than the maximum allowable TVU, which is ±0.51 in water depths of 5 to 9 m.

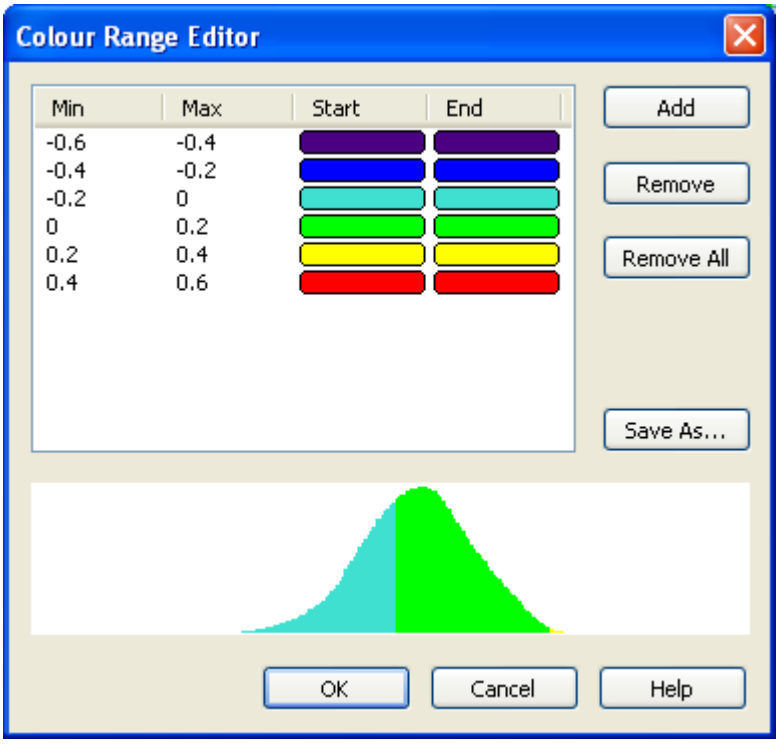


Illustration No. 3. Color range map and histogram used to evaluate the depth differences between mainline and crosslines for Subarea 1.

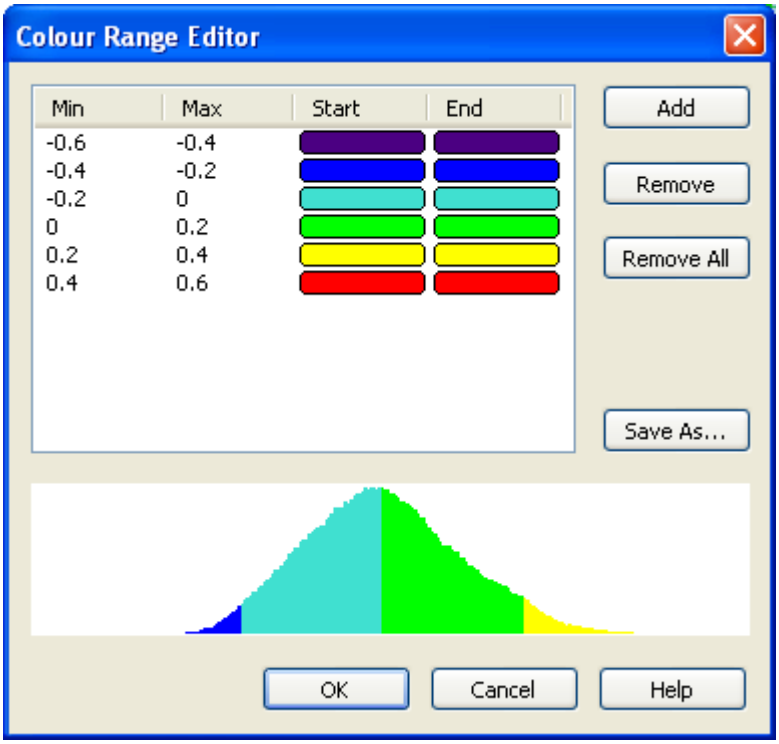


Illustration No. 4. Color range map and histogram used to evaluate the depth differences between mainline and crosslines for Subarea 2.

Statistical crossline information was also generated by comparing each of the crosslines to the depth layer of the 1-m BASE surface of the main survey lines. In general, crossline comparisons showed very good agreement with the mainscheme lines. In general, >99% of crossline soundings were considered to meet IHO Order 1a standards. Crossline comparisons generated with the CARIS QC report utility are shown in Separate IV.

B.2.3 Uncertainty

CARIS HIPS was used to compute the Total Propagated Uncertainty (TPU) for each sounding. The measured tide uncertainty parameter was set to 0.009 m and the zoning parameter set to 0.102 m. The measured sound speed parameter was set to 2 m/s and the surface sound speed parameter to 0.800 m/s. All BASE surfaces were created based upon the IHO Order 1a standards.

B.2.4 Survey Junctions

This survey has junctions with two surveys on its eastern margin. Details of these surveys are shown in Table No. 4 and outlined in Illustration No. 5

Table No. 4. H12335 Survey Junctions

Registry Number	Scale	Year	Platform	Relative Location
H12250	20000	2010	C&C Technologies, Inc.	E
H12253	20000	2010	C&C Technologies, Inc.	E
H12334	***40000***	***2010***	***C&C Technologies, Inc.***	***S***

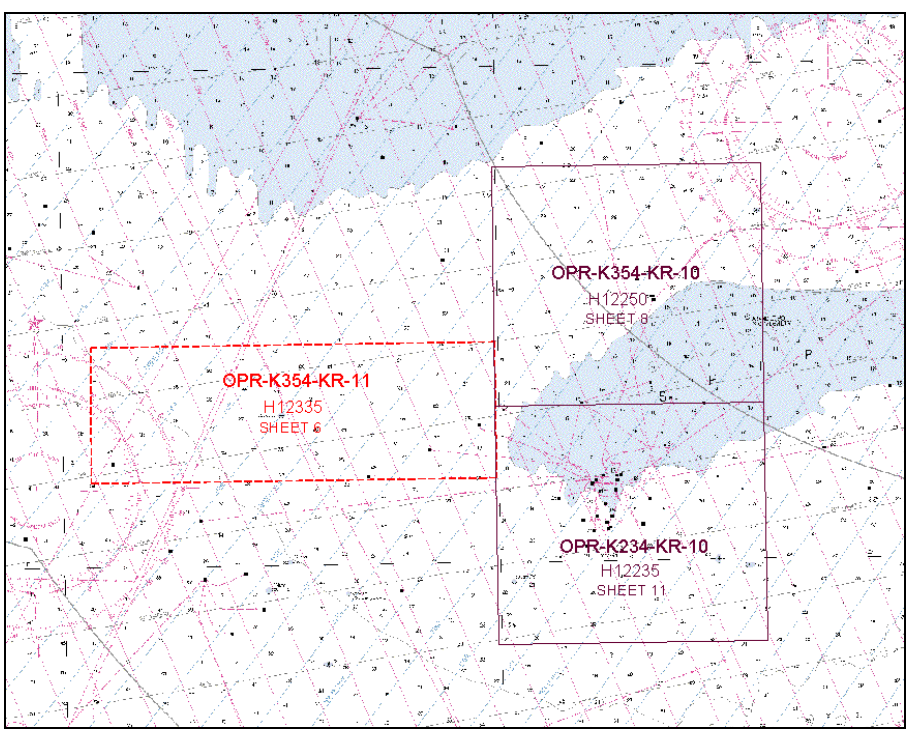


Illustration No. 5. H12335 Survey Junctions.

Although continuous multibeam coverage is not obtained within a survey or between surveys due to set-line spacing, a CARIS difference surface between each junction survey and survey H12335 was computed to ensure general agreement of depths where overlap of sounding data occurred. The difference surfaces were evaluated with a user-defined color range map in 0.2 m increments from –0.6 m to 0.6 m. Because more extreme difference values between 0.6 and 0.7 m as well as –0.6 to –0.7 m were observed, these 0.1 m increments were added to the color map. The depth difference values between H12335 and H12253 ranges between –0.31 and 0.67 m, however, the majority of the values are between –0.2 and 0.4 m (Illustration No. 6). The depth difference values between H12335 and H12550 ranges between –0.68 and 0.60 m, however, the majority of the values are between –0.2 and 0.4 m, with a smaller amount of difference values between –0.4 and –0.2 m (Illustration No. 7). The most extreme difference values that are greater than ±0.5 m appear to occur mainly on overlap of swath edges.

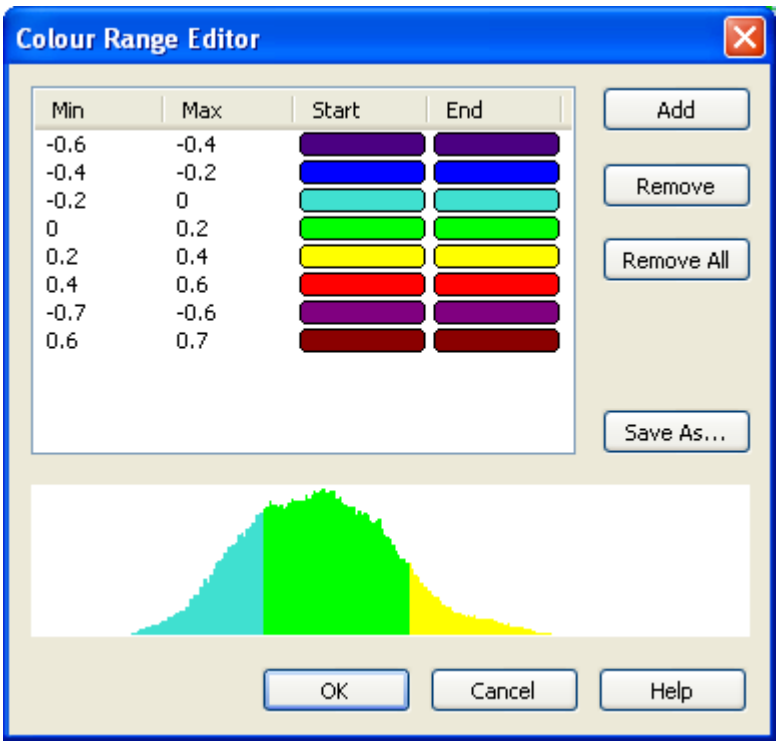


Illustration No. 6. Color range map and histogram used to evaluate the depth differences between H12235 and the junction with H12253.

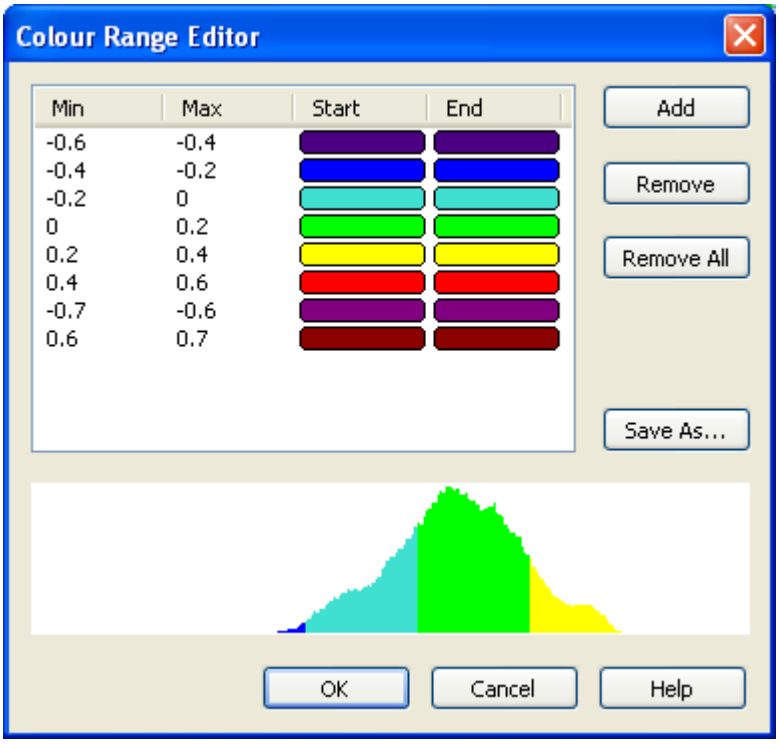


Illustration No. 7. Color range map and histogram used to evaluate the depth differences between H12235 and the junction with H12250.

B.2.5 Sonar System Quality Control

Prior to the survey, a standard patch test was performed to determine correctors for latency, pitch, roll, and heading. Two patch tests were conducted, the first outside of Port Fourchon, LA on the 14th of June 2011, and a second south of Cameron, LA on July 30th. The second test was done as a check on quality of the first calibration and results from the second patch test were used as the final offset values.

Draft corrections were verified generally on a daily basis, mainly in conjunction with the sound speed casts, and entered into the multibeam collection software to be applied in real-time.

An Odom Echotrac MKII single beam echosounder was continuously operated and monitored during the survey as an independent check on the multibeam bottom-detect. In addition, lead line comparisons were conducted periodically throughout the survey as an independent check on the multibeam bottom-detect. The lead line logs are included in Separate I – Data Acquisition and Processing Logs.

Sea Bird Electronics SBE19 CTDs were used for speed of sound measurements. Casts were performed at least once daily and more often as needed. The multibeam data was corrected for the water column sound speed in real-time. An Endeco YSI sound speed profiler was used to determine the sound speed at the transducer. Sound speed logs are included in Separates II – Sound Speed Data for additional information.

B.2.6 Unusual Conditions/Factors Affecting Soundings/Imagery

Large schools of fish were often noted in the acquisition logs, as well as the presence of seaweed. In addition, shallow water, thermoclines, warm water and the soft bottom of the region has the potential to impact the side scan sonar imagery. The quality of the side scan sonar was monitored closely and the height of the fish manually adjusted to obtain the best possible data.

The 100% and 200% side scan sonar imagery was evaluated in these circumstances to ensure that no contacts were obscured.

B.3 Corrections to Echo Soundings

No additional deviations from the Correction to Echo Soundings section in the Data Acquisition and Processing Report occurred.

B.4 Data Processing

B.4.1 Coverage BASE Surfaces and Mosaics

Multibeam data processing was conducted using CARIS HIPS/SIPS 7.0.2 SP2 on the vessel and CARIS HIPS/SIPS 7.1.0 with Hot Fixes 1 and 2 in the office. One BASE surface was created for each subarea at a scale of 1:40000 with a resolution of 1 meter, in accordance with Section 5.2.2.2 and 5.2.2.3 of the HSSD (2011), which states that a 1-m BASE surface will be created for 0-20 m water depths. One BASE surface was created for the all the investigations at a scale of 1:40000 and a resolution of 0.5 m.

Side scan sonar data was processed using Chesapeake Technologies SonarWiz5 V.5.01.0026 software in the field and SonarWiz5 V.5.03.0027 software in the office. All of the side-scan sonar data collected for this project has been layback corrected. 1-m resolution mosaics were created for each 100% SSS coverage mosaics.

B.4.2 SSS Imagery and Contacts

SSS data was evaluated twice and all contacts with a shadow identified on each 100% SSS coverage. These contacts were correlated and evaluated in either the CARIS HIPS/SIPS or CARIS Notebook map window with respect to BASE surfaces and charted information. In accordance with Section 6.3.2 of the HSSD (2011), in water depths of less than or equal to 20 m, contacts with heights computed from the shadow length of 1 m or more were considered significant. All significant contacts not fully developed with mainscheme MBES coverage were investigated with additional MBES coverage. A sounding that represented the least depth of each significant contact was designated using CARIS HIPS/SIPS. A list of all side scan sonar contacts is contained in Separate V and significant features are represented and attributed in the S-57 feature file. Refer to the Data Acquisition and Processing Report for details on the side scan sonar contact processing and correlation workflow.

C. VERTICAL AND HORIZONTAL CONTROL

The vertical datum for the soundings is Mean Lower Low Water (MLLW). Tide and water level corrections were determined and applied in accordance with the CO-OPS Statement of Work. Data from Port Fourchon, LA (8762075) was used as the source of tides. Verified tides with final tide zoning were applied to the data

The horizontal datum for the survey is the North American Datum of 1983 (NAD 83) and the projection is Universal Transverse Mercator (UTM) Zone 15 North.

D. RESULTS AND RECOMMENDATIONS

D.2.1 Charts and Notices to Mariners

Chart comparisons were performed in CARIS HIPS/SIPS 7.1 using the final BASE surfaces of mainscheme and investigation lines, colored depth ranges, and sounding layers. The data was compared to with the largest scale chart in this area, summarized in Tables No. 5 and 6.

Table No. 5. Nautical Charts used for Comparison

Chart Number	Scale	Edition	Edition Date
11356	1:80,000	38	Jun 08

Table No. 6. Nautical Chart Correction Dates

Chart Number	Corrected Through	
	NM	LNM
11356	Jun 14/08	Jun 03/08

The Local Notices to Mariners (LNM) were reviewed for the duration of the survey (July 1 to August 31, 2011). District 8 LNM 35/11 (September 6, 2011) was the last notice reviewed for this project. One notice to mariners (District 8 LNM 33/11 – August 15, 2011) was issued within the survey bounds during the duration of the survey. This notice corresponds with the feature that was submitted as a DTON for this survey.

D.2.2 Charted Soundings

Charted soundings were compared to a sounding layer as well as color range maps. The sounding layers were generated from a 5-m BASE surface with a 250-ft and 190-ft single-defined radius for Subareas 1 and 2, respectively, using a radius value of distance on the ground (in ft.). In the western half of the survey area (mainly Subarea 1) there is a general deepening from 24 ft. in the northeast corner to 39 ft. in the southwest corner (Illustration No. 8). The eastern half of the survey area (mainly subarea 2) is generally shoaler, with depths ranging between 19 and 28 ft. and displays more irregular bathymetry (Illustration No. 8). Although the CARIS color range maps are in meters (Illustration No. 9), the general trends remain unchanged.

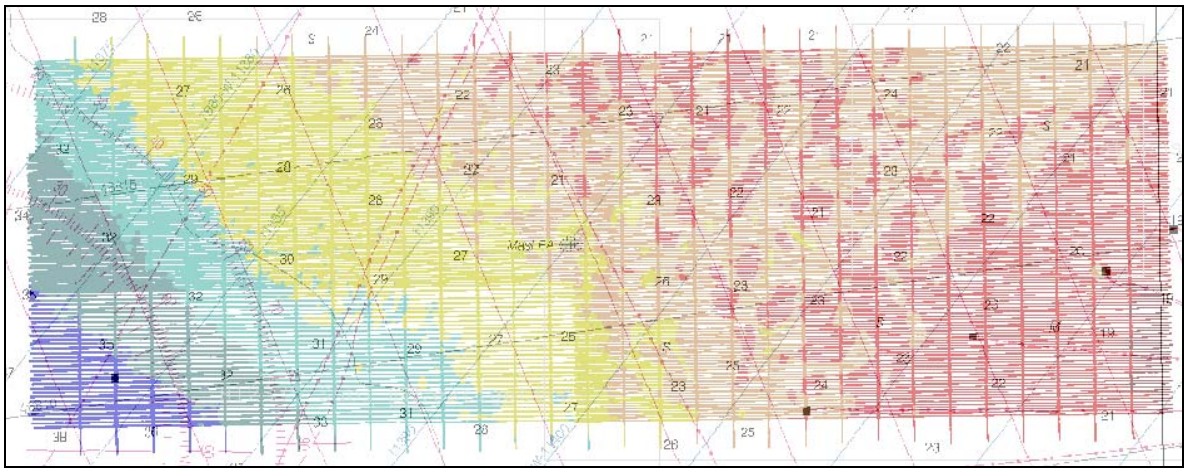
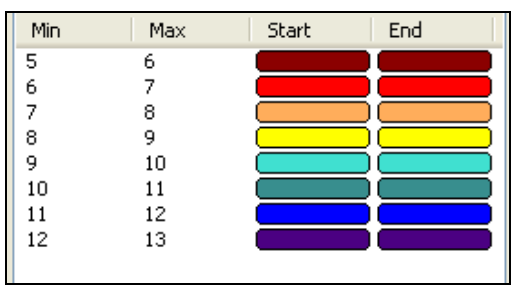


Illustration No. 8. H12335 Survey area with colored depth ranges shown in Illustration No. 4.



Min	Max	Start	End
5	6		
6	7		
7	8		
8	9		
9	10		
10	11		
11	12		
12	13		

Illustration No. 9. CARIS color range map (in meters) used in Illustration No. 3.

In the western half of the survey area (mainly Subarea 1), charted and surveyed soundings are generally within 1 to 2 ft. of each other, and charted soundings are mainly shoaler than surveyed soundings. The largest discrepancy between charted and surveyed soundings occurs in the northeastern portion of Subarea 1 where surveyed depths are up to 5 ft. deeper than charted soundings (Illustration No. 10). This is most evident near the 21-ft charted sounding (Illustration No. 10; red circle)

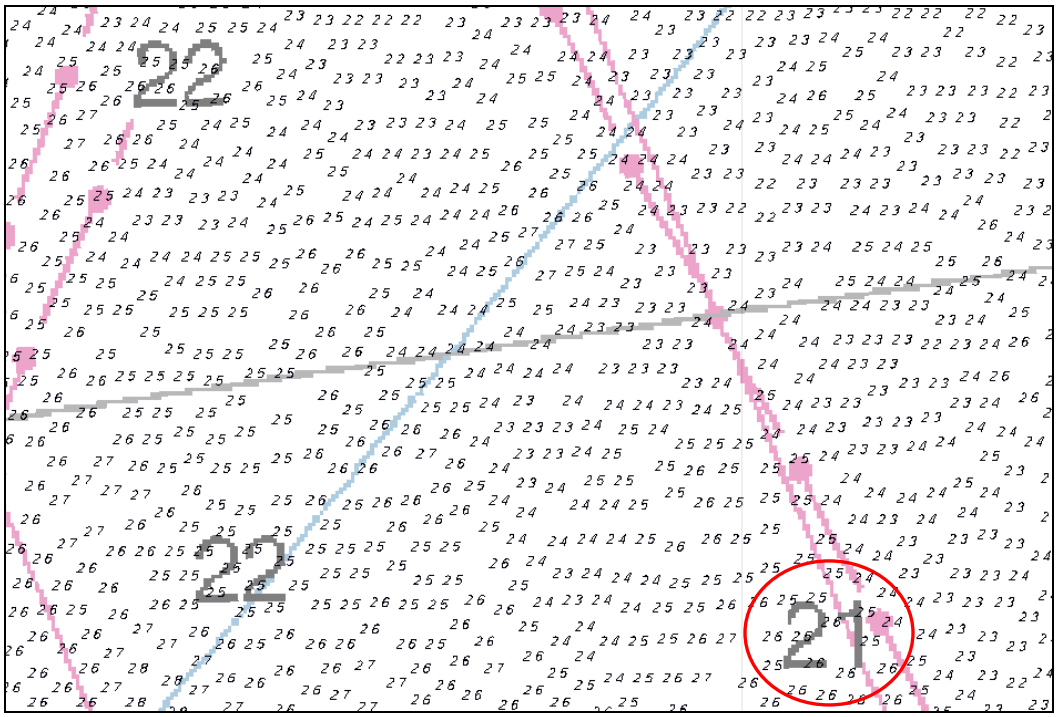


Illustration No. 10. Region in the central portion of the survey area where surveyed soundings around the 21-ft charted sounding (red circle) are up to 5 ft. deeper.

In the eastern half of the survey area (mainly subarea 2) the charted and surveyed soundings are generally within 1 to 3 ft. of each other and the charted soundings area shoaler than surveyed soundings. An exception to this occurs in the lower southeastern section of the subarea. Charted soundings of 23, 22 and 21 ft. in this area (circled in red in Illustration No. 11) and charted soundings of 23 and 24 ft. (circled in red in Illustration No. 12) are consistently 1 to 2 ft. deeper than surveyed soundings.

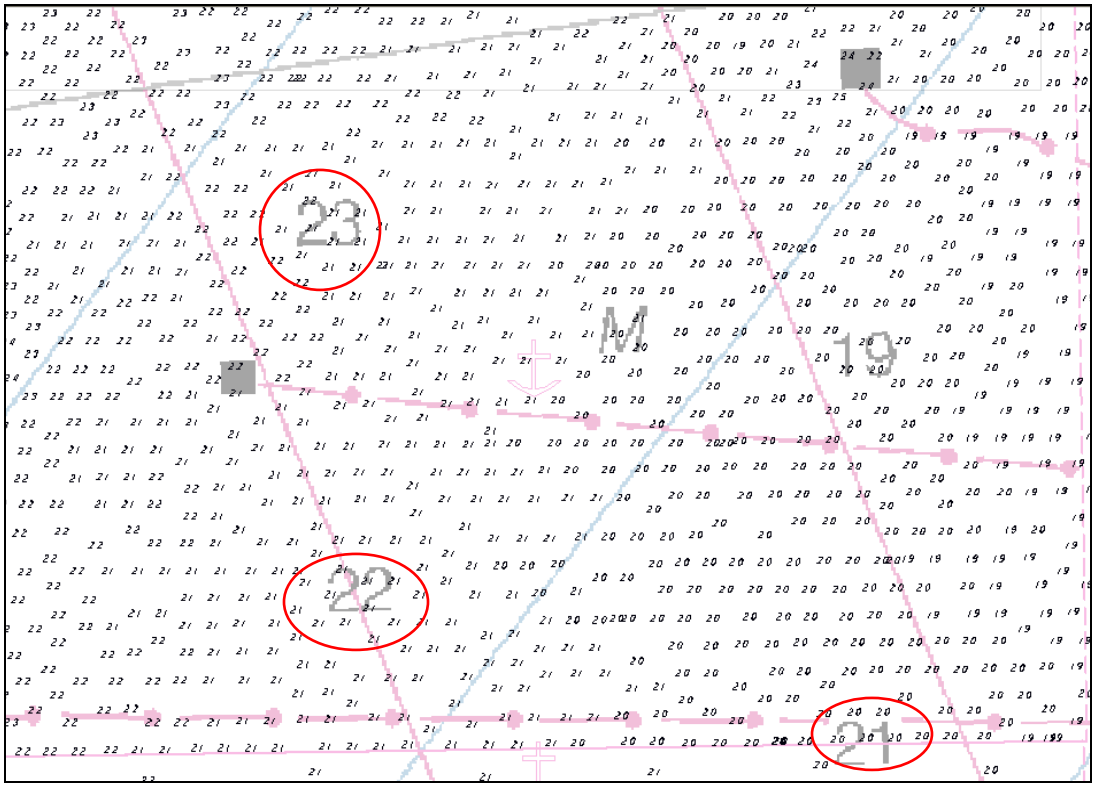


Illustration No. 11. Charted soundings of 23, 22 and 21 ft. in the southeastern section of the eastern half of the survey area (subarea 2) are consistently 1 to 2 ft. deeper than surveyed soundings.

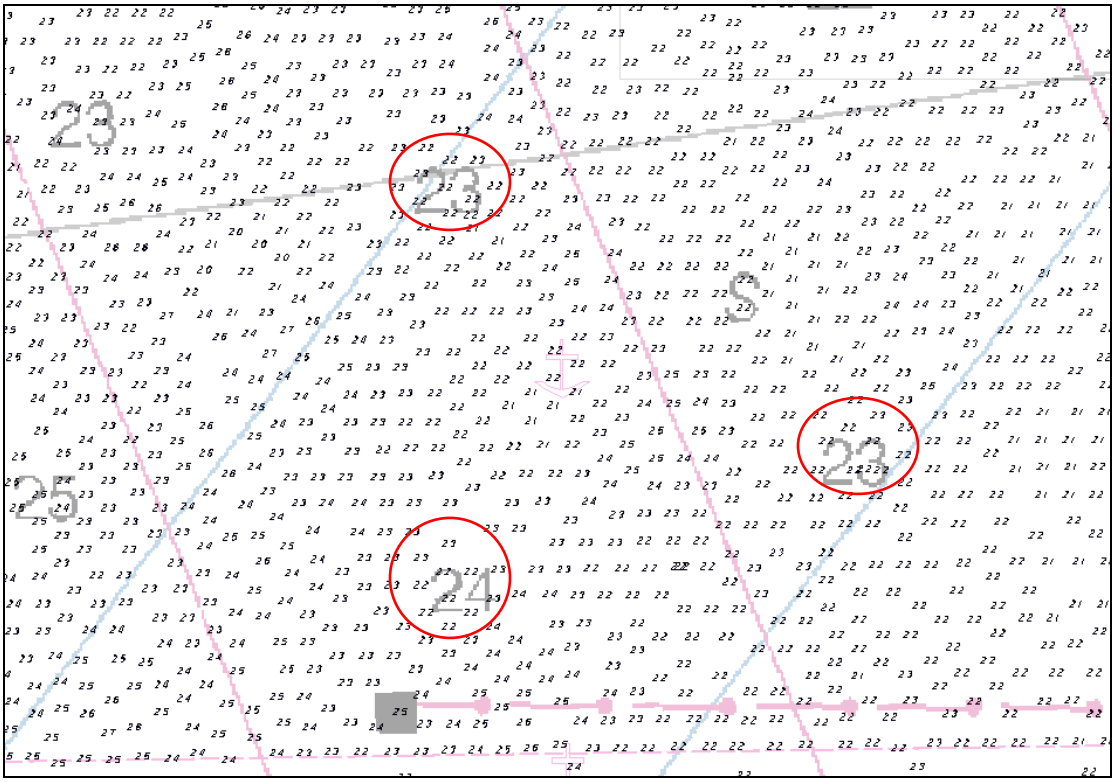


Illustration No. 12. Charted soundings of 23 and 24 ft. in the southern section of the eastern half of the survey area (subarea 2) are consistently 1 to 2 ft. deeper than surveyed soundings.

The 30-ft contour is charted in the western portion of subarea 1 and runs diagonally through the area from northwest to southeast. The surveyed 30-ft soundings are generally in good agreement with the charted 30-ft contour in the northern portion of the survey area. However, this trend is less prominent in the southern portion of the survey area. This is exemplified with a color range chart created in CARIS with soundings of 0 to 9.144 m in red and soundings greater than 9.144 m in blue; 9.144 m represents ~30 ft. (Illustration No. 13). In the region that encompasses the central portion of the charted contour the majority of the surveyed 30-ft depths are located southwest of the contour (Illustration No. 13; Box. 1). In the lower portion of the survey area that encompasses the 30-ft contour, there is more variation between the 29 and 30 ft. depths and there is no clear separation between them. However, the outer limit of the charted 30-ft contour appears to be located beyond the majority of the 29-ft surveyed soundings (Illustration No 13; Box 2). Examination of the sounding layer also confirms these trends (Illustrations No. 14 and 15).

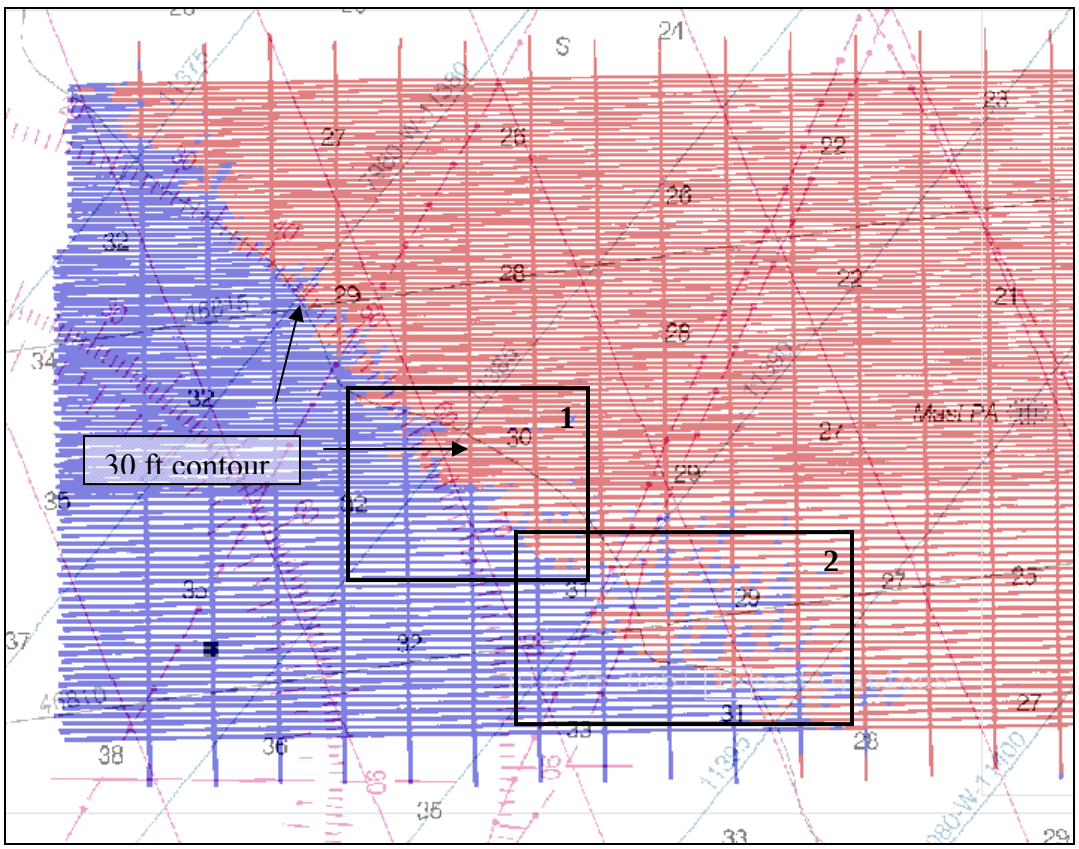


Illustration No. 13. Comparison between charted 30-ft contour and surveyed soundings. Soundings of 0 to 9.144 m are in red and soundings greater than 9.144 m in blue; 9.144 m represents ~30 ft.

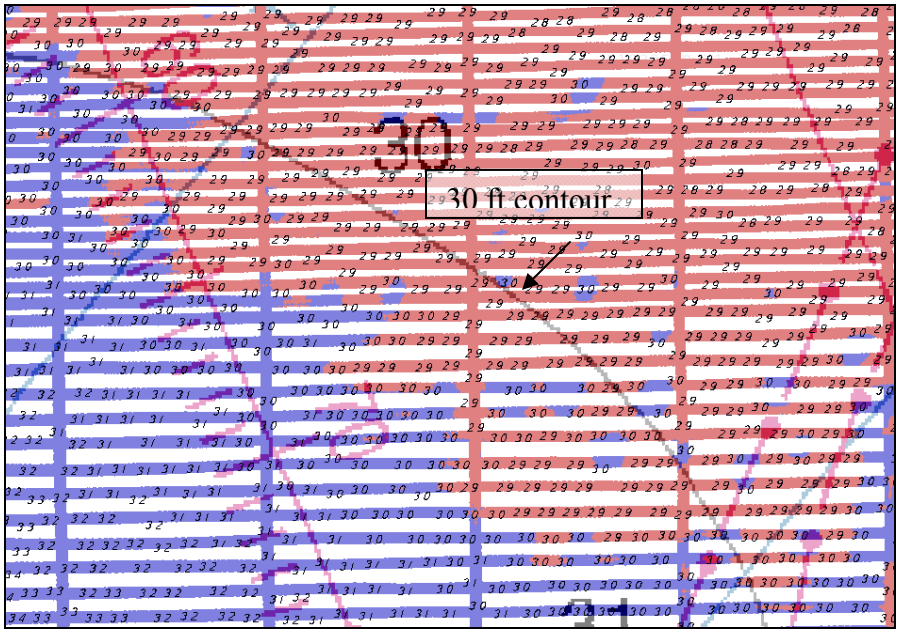


Illustration No. 14. Illustration showing region of Box 1 in Illustration No. 7 with sounding layer superimposed. Surveyed 30-ft depths are mainly found southwest of the charted 30-ft contour.

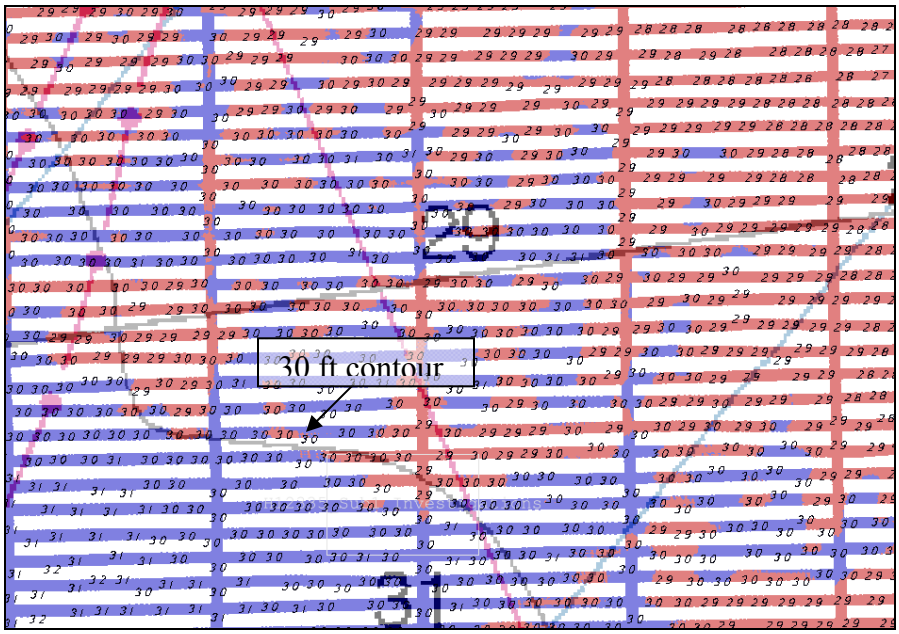


Illustration No. 15. Illustration showing region of Box 2 in Illustration No. 7 with sounding layer superimposed. There is no clear distinction between the 29 and 30 ft. surveyed depths. However, the outer limit of the charted 30 ft. contour appears to be located beyond the majority of the 29 ft. soundings.

D.2.3 Charted Features

D.2.3.1 AWOIS

One AWOIS item was assigned for full investigation within the survey area (Table No. 7). No contact was found within the AWOIS area and the hydrographer recommends removal from chart 11356.

Table No. 7. AWOIS item assigned for full investigation.

AWOIS Number	Chart Latitude	Chart Longitude	Comments
~~11236~~ ***12803***	28°53'00.802"N	91°15'00.299"W	Remove from Chart 11356

D.2.3.2 Investigation Items

A total of five investigations were conducted in the survey area (Table No. 8). Additional information regarding these contacts is logged in the Side Scan Sonar Contact list in Separate V.

Primary contact 198-04107S was first investigated on July 28, 2011 (JD 209) and additional coverage obtained on August 03, 2011 (JD215). These investigations confirmed the contact as significant with a least depth of 7.87 m in surrounding water depths of 9.0 m. This contact was submitted as a DTON (see following section D.1.3.3).

A potential target was located on line 6115-2 near shotpoint 56, 13.8 m from nadir. The target was not evident on the adjacent line (6114-1), however, a fish contact on the side scan was in the vicinity with the potential to have obscured the target. The object was not fully ensonified by the multibeam of line 6115-2, and further multibeam data was acquired on July 28, 2011 (JD 209). Two multibeam investigation lines picked up a potential target on the outer starboard beams (H12335-INV-1-4.0 and H12335-INV-1-6.0). However, the lines that went more directly over the target (H12335-INV-1-2.0, H12335-INV-1-3.0, H12335-INV-1-5.0) did not indicate evidence of a contact. In addition, the beams that indicated a potential target showed the target only 0.5 to 0.6 m in height, which would not be considered a significant contact. Side scan sonar data collected concurrently with this investigation did not indicate a contact. A second MBES investigation of this potential target took place on August 3, 2011 (JD 215) and although only one multibeam line (H35-INV-1-3.0) ensonified the location of the potential contact, no contact was evident. For these reasons, the data on the outer beams of H12335-INV-1-4.0 and H12335-INV-1-6.0 was cleaned and contact 182-160113P is not considered a real feature.

An investigation of Primary contact 186-110419P took place on August 31, 2011 (JD 243) The contact was located on line 6181-2 between shotpoints 38 and 39, 8.8 m from nadir. Side scan sonar data indicated that the target was 0.84 m in height and was also visible on adjacent survey line 6180-1 but not considered significant. The feature was also evident in the mainscheme multibeam line data of line 6181-2. In order to fully develop the contact, further MB data was collected. The multibeam investigation of this contact confirmed the existence

of the contact. Outer beams of one investigation line (H35-INV-A-4.0) indicated that the target was potentially significant, with a least depth of 6.87 m. However, the lines that more directly ensonified the target (H35-INV-A-2.0, H35-INV-A-3.0 and H35-INV-A-6.0) revealed least depths of 7.3 to 7.5 m in water depths of 7.5 to 7.7 m. For these reasons, Primary target 186-114019P is not considered a significant contact and the multibeam data of line H35-INV-A-4.0 was further cleaned. Although not considered a significant contact, a sounding was designated in CARIS to ensure that the least depth would carry through to the finalized BASE surface. The final designated sounding was selected in subset editor as 7.045 m. An additional, smaller contact (186-114025P) was also observed in this investigation area, however, the contact was not shoaler than 186-114019P and a sounding was not designated.

Table No. 8. Significant features that required further investigation.

Primary SSS Contact Number	Subarea	Least Depth (m)	Survey Latitude	Survey Longitude	Remarks
198-104107S	1	7.866	28°51'54.7"W	91°16'25.3"W	Submitted as a DTON
182-160113P	2	n/a	n/a	n/a	Existence disproved by MB investigation
186-114019P	2	7.045	28°52'56.97"W	91°11'58.01"W	Not considered a significant contact

D.2.3.3 Danger to Navigation Reports

One Danger to Navigation report was issued for the survey area resulting from the investigation of Primary contact 198-104107S. The H12335 Danger to Navigation is shown in Table No. 9 and a copy of the report is included in Appendix I. Note that the least depth of the feature, after verified tides were applied to the data, has changed from 8.06 m to 7.886 m (refer to Section D.1.3.2).

Table No. 9. Dangers to Navigation

Feature	Depth (ft.)	Depth (m)	Survey Latitude	Survey Longitude
Obstruction	26.43	8.06	28°51’54.7”N	091°16’24.5”W

D.2.3.4 Existing Infrastructure

The platforms in Table No. 10 were found as charted. Table No. 11 shows the name and position of an uncharted platform that was present during the survey. The position of each platform was calculated from the layback corrected primary side scan sonar file. See Data Acquisition and Processing Report for details on primary and secondary contacts. Table No 12 shows a list of structures that are currently charted, but were no longer present at the time of the survey. The positions of these platforms were obtained from Chart 11356.

Table No. 10. Platforms found as charted

Surveyed Position			
Latitude	Longitude	Platform Name	Chart Action
28°52'45.451"N	91°10'27.988"W	SS-100 DA OCSG7750	Remain as charted
28°51'46.537"N	91°13'01.628"W	SGY-SS-106 No. 1	Remain as charted

Table No. 11. Uncharted Platforms found at time of survey

Surveyed Position			
Latitude	Longitude	Platform Name	Chart Action
28°54'07.232"N	91°11'15.148"W	HGOM SS-101 No.1	Add to chart

Table No. 12. Charted Platforms not present at time of survey

Charted Position			
Latitude	Longitude	Location	Chart Action
28°52'05.458"N	91°18'52.207"W	Subarea 1 – SS103	Remove
28°52'17.421"N	91°11'36.521"W	Subarea 2 – SS101	Remove

D.2.3.5 Feature Report

A Final Feature File for obstructions, oil and gas infrastructure, and bottom samples has been submitted as a CARIS .hob file in a CARIS Notebook project.

D.3 Additional Results

D.3.1 Prior Surveys

Refer to Section B.2.4 for information on survey junctions and Section D.1 for comparison to nautical chart 11356. ***No prior survey comparisons were performed during this survey.***

D.3.2 Aids to Navigation

No aids to navigation are charted within the survey area, and none were found during survey operations.

D.3.3 Additional Infrastructure

Several submarine pipelines are charted within the survey area, but no evidence of these were found in the multibeam or side scan data. However, evidence of a possible uncharted pipeline was found on the side scan sonar data in the very western portion of the survey area. The contacts are shown in the Side Scan Sonar Contact list in Separate V.

E. APPROVAL SHEET

LETTER OF APPROVAL

REGISTRY NUMBER H12335

This report and the accompanying smooth sheet are respectfully submitted.

Field operations contributing to the accomplishment of the survey H12335 were conducted under my direct supervision with frequent personal checks of progress and adequacy. This report and CARIS project have been closely reviewed and are considered complete and adequate as per the Statement of Work.

This report is accompanied by the Data Acquisition and Processing Report for project OPR-K354-KR-11.

John Baker
Chief of Party
C&C Technologies
November 2011

APPENDIX I

TIDES AND WATER LEVELS

Castle Parker

From: Kathleen Jamison
Sent: Friday, April 20, 2012 12:29 PM
To: Tara Levy
Cc: Nicole Kuenzel; Carolyn Lindley; Castle Parker; Sarah Eggleston
Subject: Texas Gas Platform and zoning for OPR-K354-KR-11

Hi Tara,

I just spoke with Carolyn Lindley in co-ops to clarify what we are requesting with zoning for OPR-K354-KR-11. CO-OPS has not received a zoning package from JOA since they were not subcontracted to do zoning for Texas Gas Platform subordinate gauge. What they need from C&C is either 1) a new zoning package to include zoning that uses the Texas Gas Platform gauge and the Port Fourchon (8762075) NWLON station; or
2) a justification of why the addition of the Texas Gas Platform gauge was not needed to achieve vertical accuracy standards for the survey.
This justification should include your methods for determining the difference in vertical accuracy between the use of just the Port Fourchon gauge vs. the use of both gauges. An example of methods could be a difference surface of your data reduced with one gauge vs.
both.

If you have any questions regarding zoning or need more specifics you may contact Carolyn Lindley directly, but be sure to cc me on any emails sent back and forth between C&C and co-ops.

As for documentation, please include a copy of this email (and any subsequent emails that might provide further clarification) in Appendix V. of the DR for the remaining OPR-K354-KR-11 surveys that you have not yet submitted to AHB (H12330, H12331, H12332, and H12333). For the surveys you have already submitted to the branch (H12334 and H12335), AHB will include a copy of this email in Appendix V (so no need to resubmit any DRs or the DAPR if it is determined that the zoning difference is acceptable).

-Kathleen

--
Kathleen Jamison
Physical Scientist, Operations Branch
Hydrographic Surveys Division
Office of Coast Survey
NOAA National Ocean Service
Kathleen.Jamison@noaa.gov
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SURVEYING GPS TIDES HYDROGRAPHY

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Anchorage, AK 99507
(907) 561-0136 Phone
(907) 561-0143 Fax
www.joasurveys.com

Tidal Zoning Report for OPR-K354-KR2011

5/1/2012

JOA Surveys, LLC
Mike Zieserl
mike@joasurveys.com

C & C Technologies (C & C) requested that JOA Surveys, LLC (JOA) revise the preliminary tidal zoning provided by CO-OPS for hydrographic survey OPR-K354-KR2011. CO-OPS provided preliminary tidal zoning using MLLW water level data from NOAA NWLON 876-2075 Port Fourchon, LA. JOA revised the tidal zoning to use MLLW water level data from the tertiary station 876-3535 Texas Gas Platform, Caillou Bay, LA. The tidal zoning geometry was not edited.

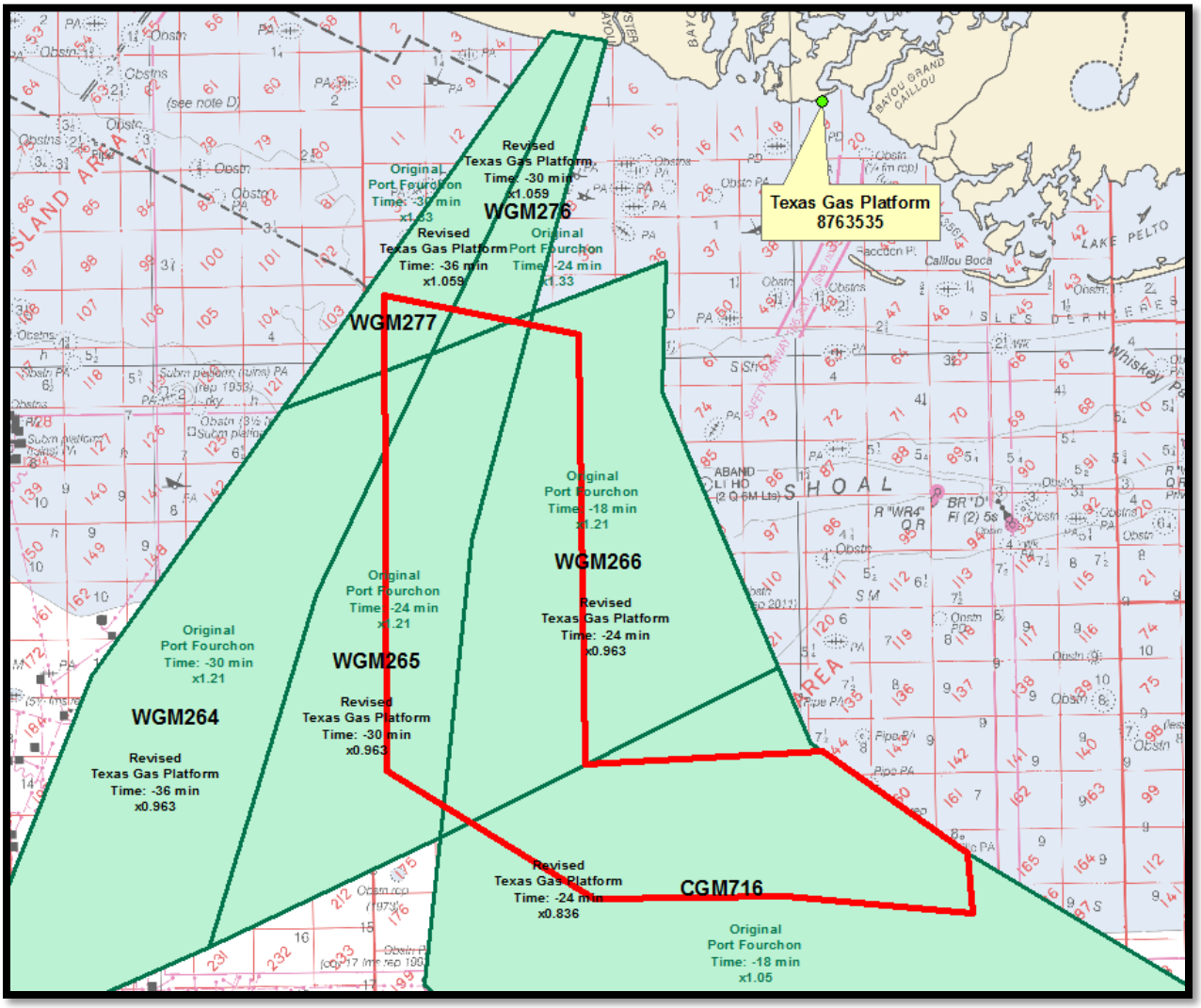
To create the revised zoning factors, one year of MLLW water level data from Texas Gas Platform and Port Fourchon were compared using a least squares best fit algorithm. The range ratio and time offset determined from this comparison were used to convert the preliminary CO-OPS tidal zoning from Port Fourchon to Texas Gas Platform. The results of the least squares comparison are listed below:

```
LSQ ZONING RESULTS
Best fit Texas Gas Platform data to Port Fourchon
Range Ratio:        0.796
Time Offset:        -6.0 minutes
Mean:               0.000 m
1 sigma:            0.067 m
2 sigma:            0.132 m
```

To convert the preliminary CO-OPS zoning from Port Fourchon to Texas Gas Platform, the preliminary tidal zoning range ratio was multiplied by 0.796 and 6 minutes was subtracted from the time offset. The original and revised zoning factors are listed in the table below. In addition, one year of original and revised zoned MLLW data were differenced to determine the 2 sigma of the difference.

	Port Fourchon		Texas Gas Platform		
Zone Name	**Original Range Ratio**	**Original Time Offset**	**Revised Range Ratio**	**Revised Time Offset**	**2 sigma of difference**
WGM265	1.21	-24 min	0.963	-30 min	0.159 m
WGM266	1.21	-18 min	0.963	-24 min	0.159 m
CGM716	1.05	-18 min	0.836	-24 min	0.138 m

A map of the preliminary (green font) and revised (black font) tidal zoning is shown below. The preliminary survey area is shown in red, this survey area is approximate.



APPENDIX II

SUPPLEMENTAL SURVEY RECORDS AND CORRESPONDENCE

-No correspondence

APPENDIX III

SURVEY

FEATURES REPORT

- No maritime boundaries
- No wrecks

H12335_DTON Report

Registry Number: H12335
State: Louisiana
Locality: Gulf of Mexico
Sub-locality: 21 NM S of Pt Au Fer Island
Project Number: OPR-K354-KR-11
Survey Date: 07/01/2011 - 08/31/2011

Charts Affected

Number	Edition	Date	Scale (RNC)	RNC Correction(s)*
11356	38th	06/01/2008	1:80,000 (11356_1)	[L]NTM: ?
11340	73rd	08/01/2008	1:458,596 (11340_1)	[L]NTM: ?
1116A	73rd	08/01/2008	1:458,596 (1116A_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	UNKNOWN	AWOIS	[no data]	[no data]	[no data]	---

1.1) AWOIS #12803 - UNKNOWN

No Primary Survey Feature for this AWOIS Item

Search Position: 28° 53' 00.8" N, 091° 15' 00.3" W

Historical Depth: [None]

Search Radius: 1000

Search Technique: S2, MB, SD

Technique Notes: [None]

History Notes:

CGD8, LNM 11/73; REPORTS AN UNIDENTIFIED FISHING VESSEL HAS BEEN REPORTED SUNK IN SHIP SHOAL BLOCK 102, AT APPROXIMATE LAT. 28/53/00 N., LON. 091/15/00 W. (NAD27) IN 21 FEET OF WATER WITH PART OF THE MAST VISIBLE ABOVE WATER.

Survey Summary

Charts Affected: 11356_1, 1116A_1, 11340_1, 411_1

Remarks:

$CSYMB/remrks: AWOIS Object ID: 12803; Area surveyed with 200% SSS and set line spacing SWMB. Not observed during survey, either visually or within the survey data.

Feature Correlation

Source	Feature	Range	Azimuth	Status
AWOIS_EXPORT	AWOIS # 12803	0.00	000.0	Primary

Hydrographer Recommendations

Remove from Chart

S-57 Data

[None]

Office Notes

SAR; AWOIS item not located with 200% SSS. Feature is considered disproved.

COMPILATION: Concur. No indication of wreck in SSS. Delete dangerous wreck, Mast PA, depth unknown.

H12335_DTON Report

Registry Number: H12335
State: Louisiana
Locality: Gulf of Mexico
Sub-locality: 21 NM S of Pt Au Fer Island
Project Number: OPR-K354-KR-11
Survey Date: 10/12/2011

Charts Affected

Number	Edition	Date	Scale (RNC)	RNC Correction(s)*
11356	38th	06/01/2008	1:80,000 (11356_1)	[L]NTM: ?
11340	73rd	08/01/2008	1:458,596 (11340_1)	[L]NTM: ?
1116A	73rd	08/01/2008	1:458,596 (1116A_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	DTON #1	Obstruction	7.87 m	28° 51' 54.8" N	091° 16' 25.3" W	---

1.1) DTON #1

DANGER TO NAVIGATION

Survey Summary

Survey Position: 28° 51' 54.8" N, 091° 16' 25.3" W

Least Depth: 7.87 m (= 25.81 ft = 4.301 fm = 4 fm 1.81 ft)

TPU (±1.96σ): **THU (TPEh)** [None] ; **TVU (TPEv)** [None]

Timestamp: 2011-285.14:54:42.000 (10/12/2011)

Dataset: H12335_DTONS_forPYDRO.000

FOID: US 0000061071 00001(02260000EE8F0001)

Charts Affected: 11356_1, 1116A_1, 11340_1, 411_1

Remarks:

OBSTRN/remrks: OBSTRN/remrks: Obstruction was located with side scan sonar and further developed using a multibeam echosounder. Feature submitted as a DTON using observed tides; the least depth was 8.06 m. After applying verified tides, the least depth is 7.866 m

Feature Correlation

Source	Feature	Range	Azimuth	Status
H12335_DTONS_forPYDRO.000	US 0000061071 00001	0.00	000.0	Primary

Hydrographer Recommendations

It is recommended that this item be charted as an obstruction

Cartographically-Rounded Depth (Affected Charts):

26ft (11356_1)

4 ¼fm (1116A_1, 11340_1, 411_1)

S-57 Data

Geo object 1: Obstruction (OBSTRN)

Attributes: EXPSOU - 2:shoaler than range of depth of the surrounding depth area

NINFOM - Add OBSTRUCTION

QUASOU - 6:least depth known

SORDAT - 20110831

SORIND - US,US,graph,H12335

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

VALSOU - 7.866 m

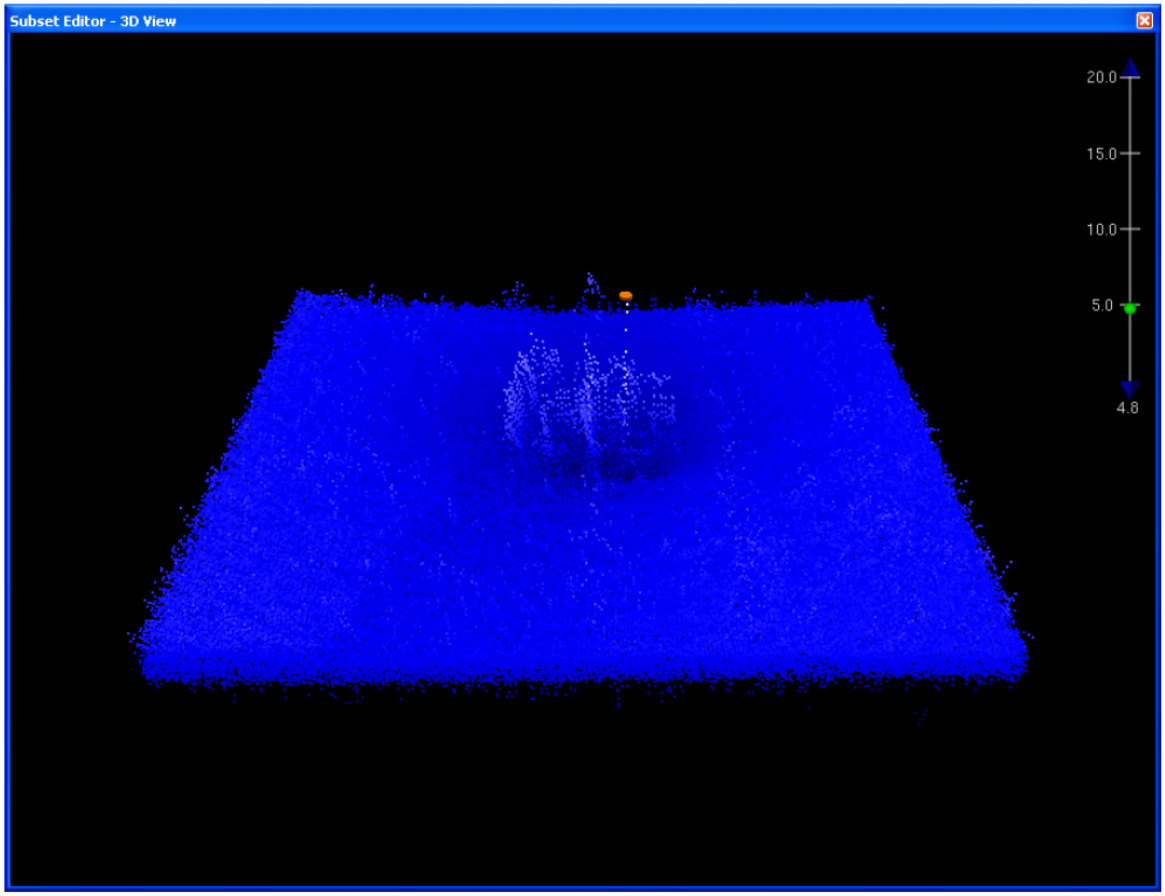
WATLEV - 3:always under water/submerged

Office Notes

SAR; 7.886 m obstruction located during survey with 200% SSS and developed with object detection multibeam.

COMPILATION: Concur. Delete charted dangerous 26 ft obstruction reported (2011), add dangerous 26 ft obstruction in present survey location.

Feature Images



Multibeam 3D view in CARIS HIPS and SIPS

Figure 1.1.1

APPROVAL PAGE

H12335

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

- H12335_DR.pdf
- Collection of depth varied resolution BAGS
- Processed survey data and records
- H12335_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: 2012.08.31 11:46:48 -04'00'

LT Abigail Higgins
Chief, Atlantic Hydrographic Branch