H12333

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. : H12333

LOCALITY

State: Louisiana

General Locality: Gulf of Mexico

Sub-locality: 27 NM S of Pt Au Fer Island

2012

CHIEF OF PARTY
Scott Croft, Tara Levy

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DATE:

NOAA FORM 77-28 (11-72)	U.S. DEPARTMENT OF COMMERCE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION	REGISTRY No: H12333

HYDROGRAPHIC TITLE SHEET

State:	Louisiana
General Locality:	Gulf of Mexico
Locality:	27 NM S of Pt Au Fer Island
Scale:	1:40,000
Date of Survey:	August 11, 2011 to November 5, 2011
Instructions Dated:	June, 2011
Project Number:	OPR-K354-KR-11
Vessels:	M/V Inez McCall
Chief of Party:	Scott Croft, Tara Levy
Surveyed by:	C&C Technologies Personnel
Soundings by echosounder:	Simrad EM3002 Multibeam Echo sounder
Verification by:	Atlantic Hydrographic Branch
Soundings in:	Feet: X Fathoms: _____ Meters: _____ at MLW: _____ MLLW: X

Remarks:

Hydrographic Survey of H12333 (Sheet 4)
Data collected in meters, referenced to MLLW, later converted into feet
200% side scan sonar, with concurrent multibeam coverage
UTC time was used exclusively
6 Grab samples were taken
Tidal Zones: CGM 716, WGM 266, 276, 265, 277, 264
Tidal Station: 8762075 (Port Fourchon, LA)

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The purpose of this survey is to provide contemporary surveys to update National Ocean Service (NOS) nautical charts. All separates are filed with the hydrographic data. Any revisions to the Descriptive Report (DR) generated during office processing are shown in bold red italic text. The processing branch maintains the DR as a field unit product, therefore, all information and recommendations within the body of the DR are considered preliminary unless otherwise noted. The final disposition of surveyed features is represented in the OCS nautical chart update products. All pertinent records for this survey, including the DR, are archived at the National Geophysical Data Center (NGDC) and can be retrieved via http://www.ngdc.noaa.gov/.

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DESCRIPTIVE REPORT TO ACCOMPANY HYDROGRAPHIC SURVEY H12333

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 27 nautical miles south of Pt. Au Fer Island, Louisiana, in the Gulf of Mexico. Illustrations No. 1 and 2 show the layout of H12333 (Sheet 4) of Project OPR-K354-KR-11. Water depths in the survey area range from 6.5 m to 19.1 m Mean Lower Low Water. Survey statistics including acquisition dates, the total survey line and crossline nautical miles, number of bottom samples and number of investigations are shown in Tables No. 1 – 3.

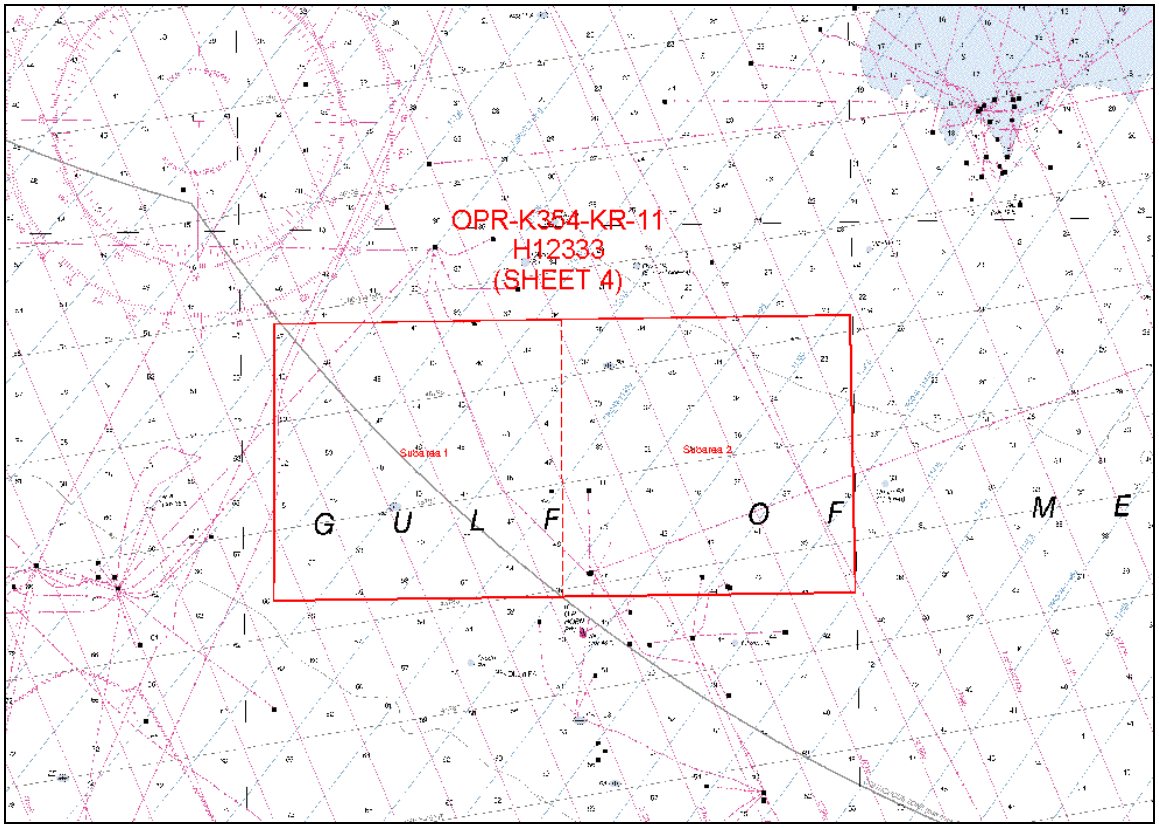


Illustration No. 1. Large Scale Survey Coverage Graphic

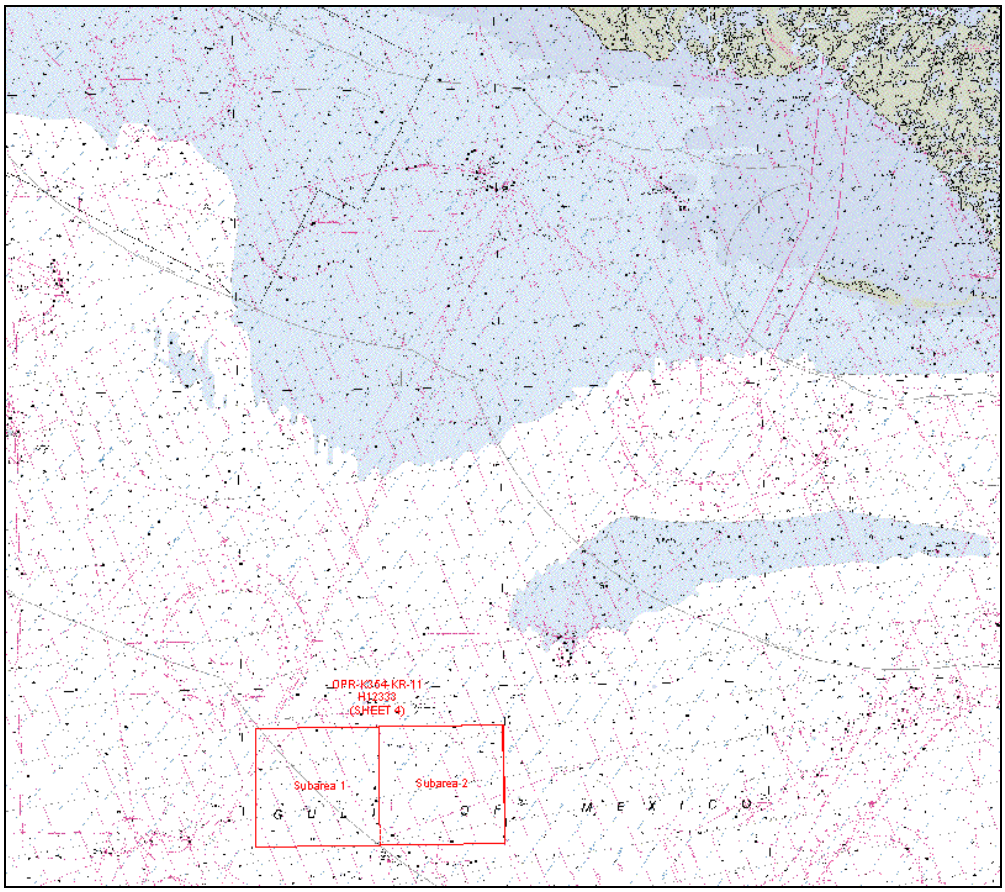


Illustration No. 2. Small Scale Survey Coverage Graphic

Table No. 1. Survey Line Statistics

	Inez McCall	Total
LNM Side Scan + Multibeam	772.77	772.77
LNM Crosslines	63.78	63.78
LNM Investigations	5.4	5.4

Table No. 2. Additional Survey Statistics

Total square nautical miles of survey area	34.47
Number of bottom samples collected	6
Number of items investigated	8

Table No. 3. Acquisition Dates

Month	Day	Year
August	11 – 22, 25, 31	2011
September	27	2011
November	5	2011

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 No 4.

Table No. 4. 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 requirements 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 charted water depths range from 39 to 55 feet. The side scan sonar was operated entirely with a range of 100 m per channel and a line spacing of 90 m. The majority of data within Subarea 2 was also collected with a range of 100 m per channel and a line spacing of 90 m; charted water depths do not exceed 46 feet. However, charted water depths in the upper northern portion of Subarea 2 range from 23 to 38 feet and the side scan sonar was operated with a range of 75 m per channel and a line spacing of 60 m. 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 tracklines separated by less than one-half the distance required for 100-percent coverage. The SSS tracklines used to generate coverage mosaics were identified by an odd/even numbering system.

B.2.2. Crosslines

Crosslines were run perpendicular to the mainscheme 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 63.78 nm, while the total main line miles were 772.77 nm. The cross lines comprised 8.3 percent of the total data set as compared to the mainscheme 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 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 surfaces were initially examined with a color range map in 0.2 m increments from -0.6 to 0.6 m. The difference values between the mainlines and crosslines of Subarea 1 range from -0.57 and 0.42 m and the majority of the difference values area within – 0.4 and 0.2 m (Illustration No. 3). The difference values between mainlines and crosslines of Subarea 2 range from -0.32 to 0.59 and the majority of difference values are within -0.2 and 0.4 m (Illustration No. 4). This shows that the majority of the mainline and crossline depth values do not differ by more than the maximum allowable TVU (total vertical uncertainty) for water depths of 6.5 to 19.1 m, which ranges from ±0.51 to ±0.56 m.

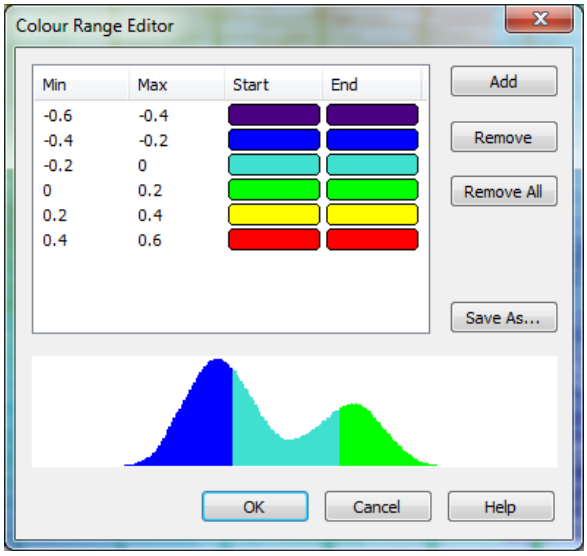


Illustration No. 3. Color range chart and histogram used to evaluate the differences between mainlines and crosslines of Subarea 1.

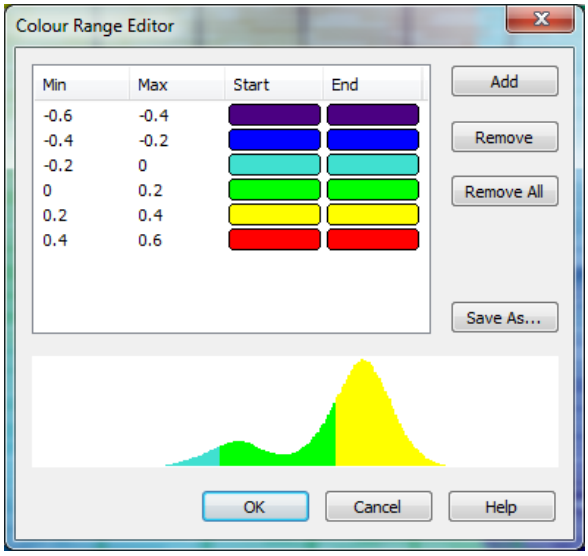


Illustration No. 4. Color range chart and histogram used to evaluate the differences between mainlines and crosslines of Subarea 2.

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 prior surveys on the eastern margin and two contemporary surveys to the north and south. Details of these surveys are shown in Table No. 5 and outlined in Illustration No. 5. Although continuous multibeam coverage is not obtained within a survey or between surveys due to the set-line spacing criteria, a CARIS difference surface between each junction survey and survey H12333 was computed to ensure general agreement of depths where overlap of sounding data occurred. Difference surfaces were created with the CARIS Difference Surface toll with H12333 as Surface 1 and the adjoining

survey as Surface 2. The difference surfaces were initially evaluated with a user-defined color range map in 0.2 m increments from –0.6 to 0.6 m. A summary of each junction follows.

Table No. 5. H12333 Survey Junctions

Registry Number	Scale	Year	Platform	Sublocality
H12253	20000	2010	C&C Technologies, Inc.	Southwest Ship Shoal
H12255	20000	2010	C&C Technologies, Inc.	7 NM S of West Ship Shoal
H12334	40000	2011	C&C Technologies, Inc.	24 NM S of Pt Au Fer Island
H12332	40000	2011	C&C Technologies, Inc.	31 NM S of Pt Au Fer Island

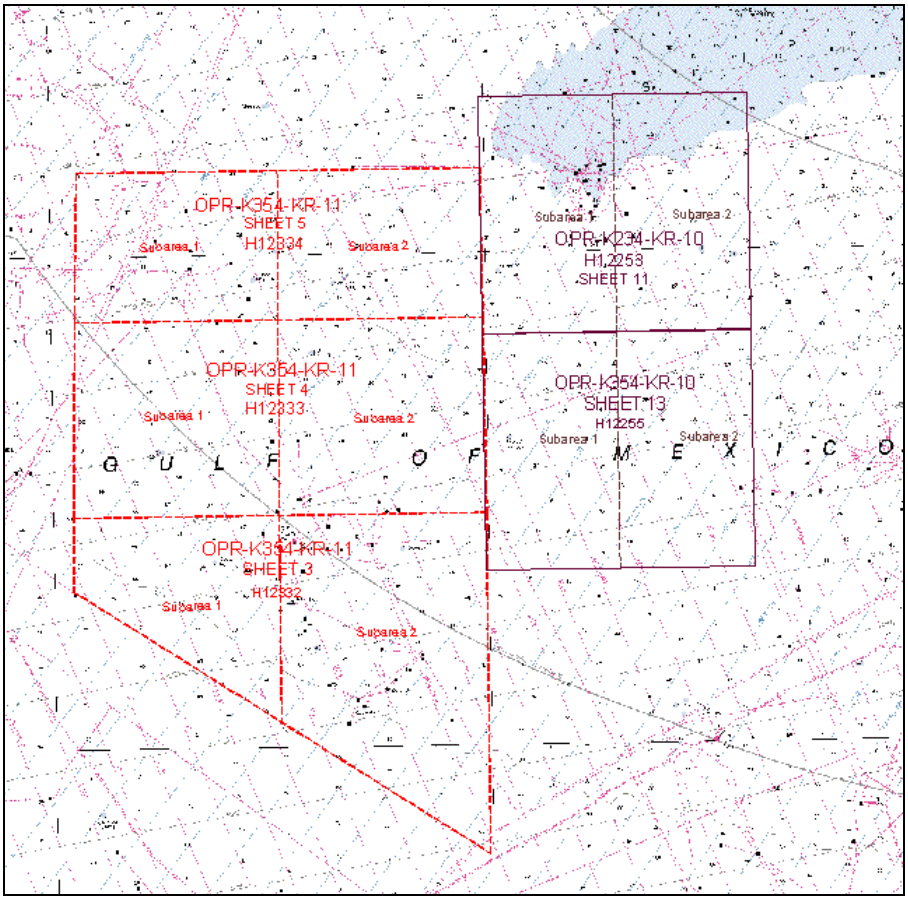


Illustration No. 5. H12333 Survey Junctions.

Junction with H12253

Survey H12333 has a small junction H12253 along the upper northeast corner; there is mainline to mainline data overlap. The finalized 1-m BASE surface of Subarea 1 of H12253 was compared to the 1-m BASE surface of Subarea 2 of H12333. The depth difference values range from -0.32 to 0.32 m and the majority of the difference values are within -0.2 to 0.2 m (Illustration No. 6).

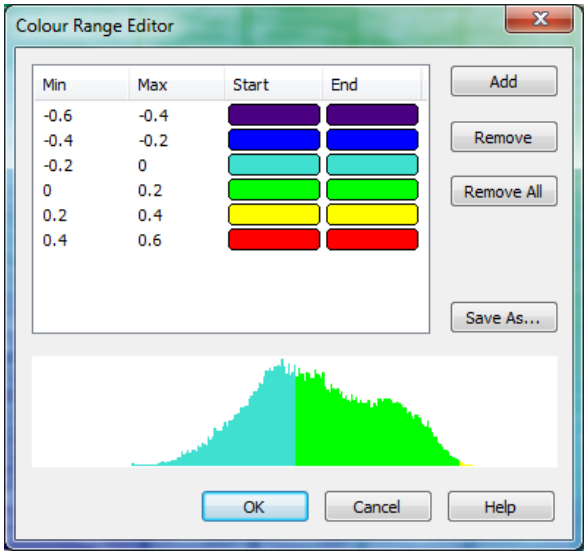


Illustration No. 6. Color range map and histogram used to evaluate the junction between Subarea 2 of H12333 and Subarea 1 of H12253.

Junction with H12255

Survey H12333 has a junction with survey H12255 along the eastern margin. The finalized 1-m BASE surface of Subarea 1 of H12255 was compared to the 1-m BASE surface of Subarea 2 of H12333. The depth difference values range from -0.43 to 0.68 m and the majority of the difference values are within 0.0 to 0.4 m (Illustration No. 7). A separate colormap was used to evaluate the more extreme difference values (Illustration No. 8). Mainline to mainline data overlap was generally minimal between these surveys, and the more extreme difference values are generally located where there is overlap of outer swath data.

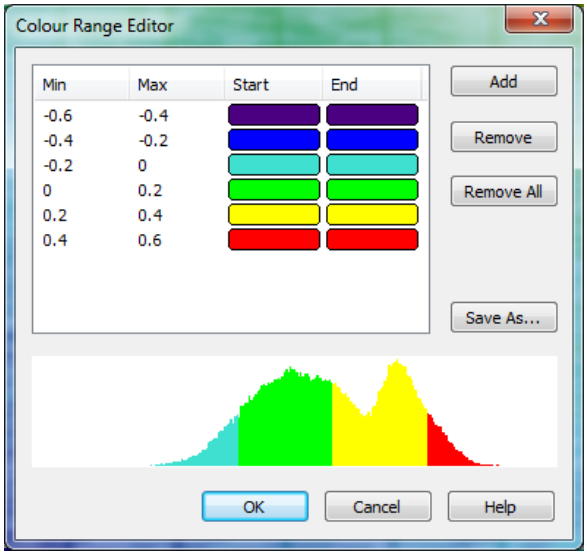


Illustration No. 7. Color range map and histogram used to evaluate the junction between Subarea 2 of H12333 and Subarea 1 of H12255.

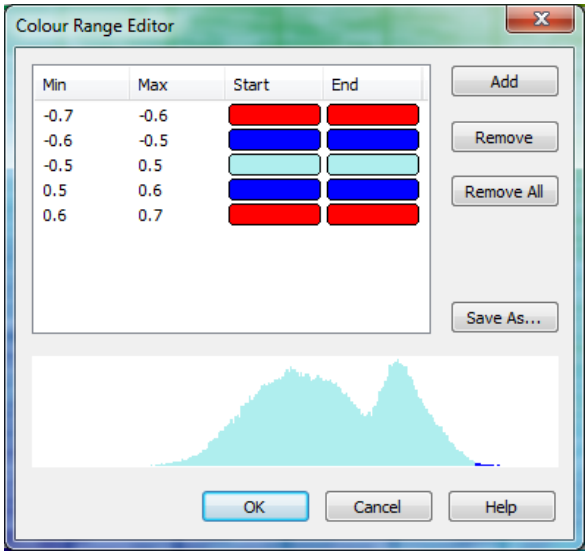


Illustration No. 8. Color range map and histogram used to evaluate the more extreme depth difference values between Subarea 1 of H12333 and Subarea 1 of H12255.

Junction with H12334

Survey H12333 has a junction with survey H12334 along the northern margin; crossline data from each survey overlaps mainline data of the adjacent survey. The finalized 1-m BASE surfaces of H12334 were compared to the 1-m BASE surfaces of H12333. The differences between Subarea 1 of H12333 and Subarea 1 of H12334 range from -0.53 to 0.29 m and the majority of the difference values are within -0.4 to 0.2 m (Illustration No. 9). The differences between Subarea 2 of H12333 and Subarea 2 of H12334 range from -0.71 to 0.38 m and the majority of the difference values are within -0.4 to 0.0 m (Illustration No. 10). A separate colormap was used to evaluate the more extreme difference values (Illustration No. 11); more extreme difference values were found where outer swath data of mainlines from H12334 overlap H12333-TIE-110-1 and H1233-TIE-112-1.

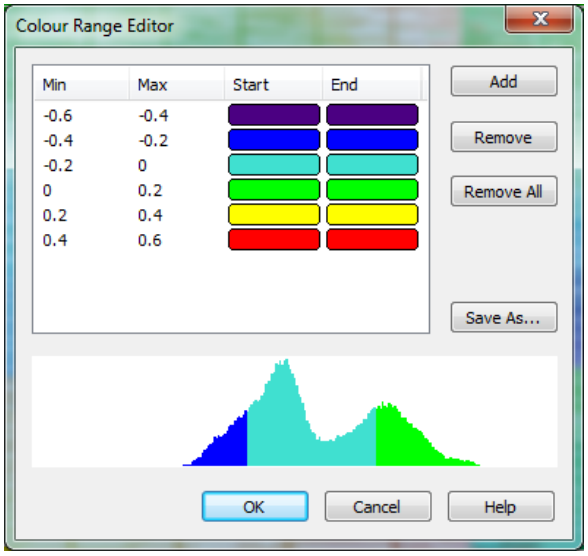


Illustration No. 9. Color range map and histogram used to evaluate the junction between Subarea 1 of H12333 and Subarea 1 of H12334.

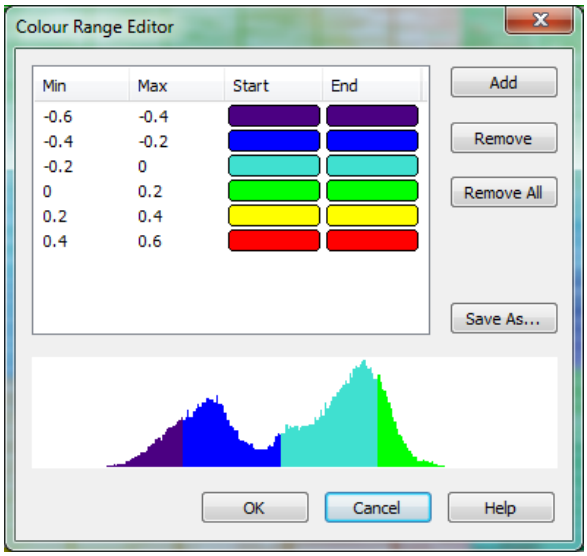


Illustration No. 10. Color range map and histogram used to evaluate the junction between Subarea 2 of H12333 and Subarea 2 of H12334.

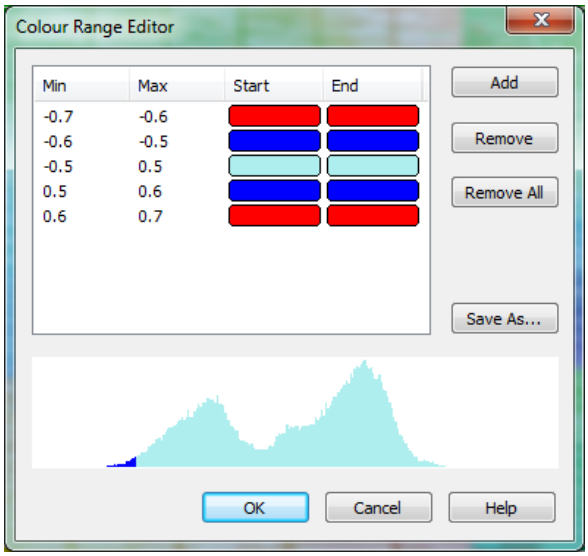


Illustration No. 11. Color range map and histogram used to evaluate the more extreme depth difference values between Subarea 2 of H12333 and Subarea 2 of H12334.

Junction with H12332

Survey H12333 has a junction with survey H12332 along the southern margin; crossline data of each survey overlaps mainline data of the adjacent survey. The depth difference values between Subarea 1 of H12333 and H12332 range from -0.19 to 0.57 m and the majority of the difference values are within 0.0 to 0.4 m (Illustration No. 12). The depth difference values between Subarea 2 of H12333 and H12332 range from -0.54 to 0.44 m and the majority of the difference values are within -0.2 and 0.2 m (Illustration No. 13).

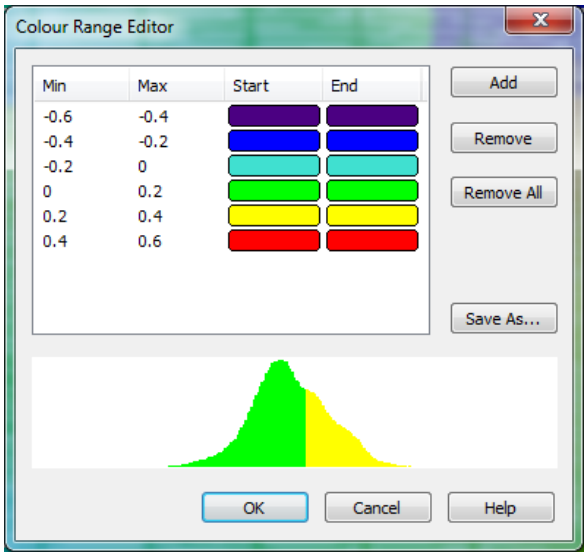


Illustration No. 12. Color range map and histogram used to evaluate the depth differences between Subarea 1 of H12333 and H12332.

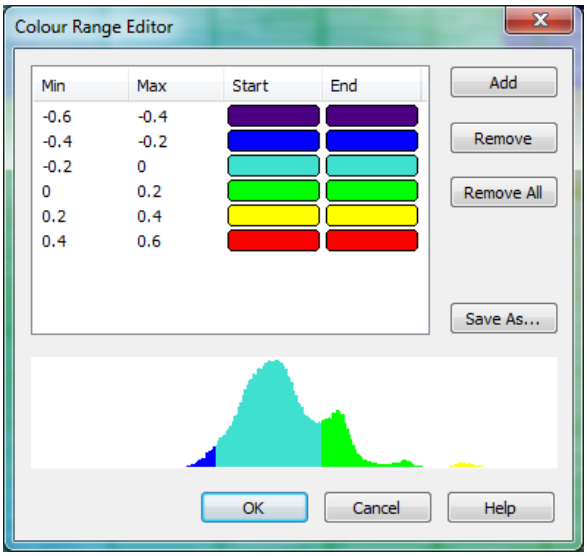


Illustration No. 13. Color range map and histogram used to evaluate the depth differences between Subarea 2 of H12333 and H12332.

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. Initially, a patch test was conducted outside of Port Fourchon, LA on the 14th of June, 2011. A second patch test was performed south of Cameron, LA on July 30th as a check on the quality of the first calibration; these results were used as the final angular offsets. The multibeam transducer and cable were replaced on September 21, 2011 due to equipment failure and a new patch test was performed on September 22th, 2011. Refer to the Data Acquisition and Processing Report for detailed patch test results.

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. Refer to the Data Acquisition and Processing Report for a description of sound speed corrections and to Separates II – Sound Speed Data for additional information.

There are several multibeam lines with brief data gaps that are associated with minor dropouts in navigation and attitude data. These are lines, 4111-1, 4125-1, 4152-1 and 4164-1. Fill-in lines were conducted later in the survey and are included in the final BASE surface. In addition, two lines H1233-TIE-107-1 and 4166-1 have no navigation or attitude data at the very beginning of lines; these areas are generally outside the specific survey bounds and were not re-run. Data from the beginning of 4166-1 where there is an issue was deleted in the CARIS project.

B.2.6. Unusual Conditions/Factors Affecting Soundings/Imagery

Several factors in the area had the potential to impact the side scan imagery. These include fish interference that was noted in the side scan sonar during review, as well as shallow and warm water, the presence of thermoclines, and a soft bottom. The quality of the side scan sonar was monitored closely and the height of the fish manually adjusted to obtain the best possible data.

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 7.1.1 with SP1 and SPHotFix 1 in the office. One BASE surface was created for each subarea at a scale of 1:40000 with a resolution of 1 m, 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 for each Subarea was also created for 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 and SonarWiz5 V5.04.0031 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

Side scan sonar 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). 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.

The NWLON water level station at Port Fourchon, LA (8762075) is the reference station for preliminary data for hydrography for project OPR-K354-KR-11. Final zoning was provided by CO-OPS (Refer to section C.5 of the DAPR). In addition, the water level station Texas Gas Platform (8763535) in Caillou Bay was maintained by C&C Technologies for the duration of survey operations. The NWLON station at Grand Isle, LA (8761724) serves as the datum control for the 8763535 station. Final zoning for the Texas Gas Platform gauge was provided by JOA (Refer to Appendix V). Illustration No. 14 shows the survey area, location of tide zones, tide stations 8762075 and 8763535 and the time/range correctors for those tide stations.

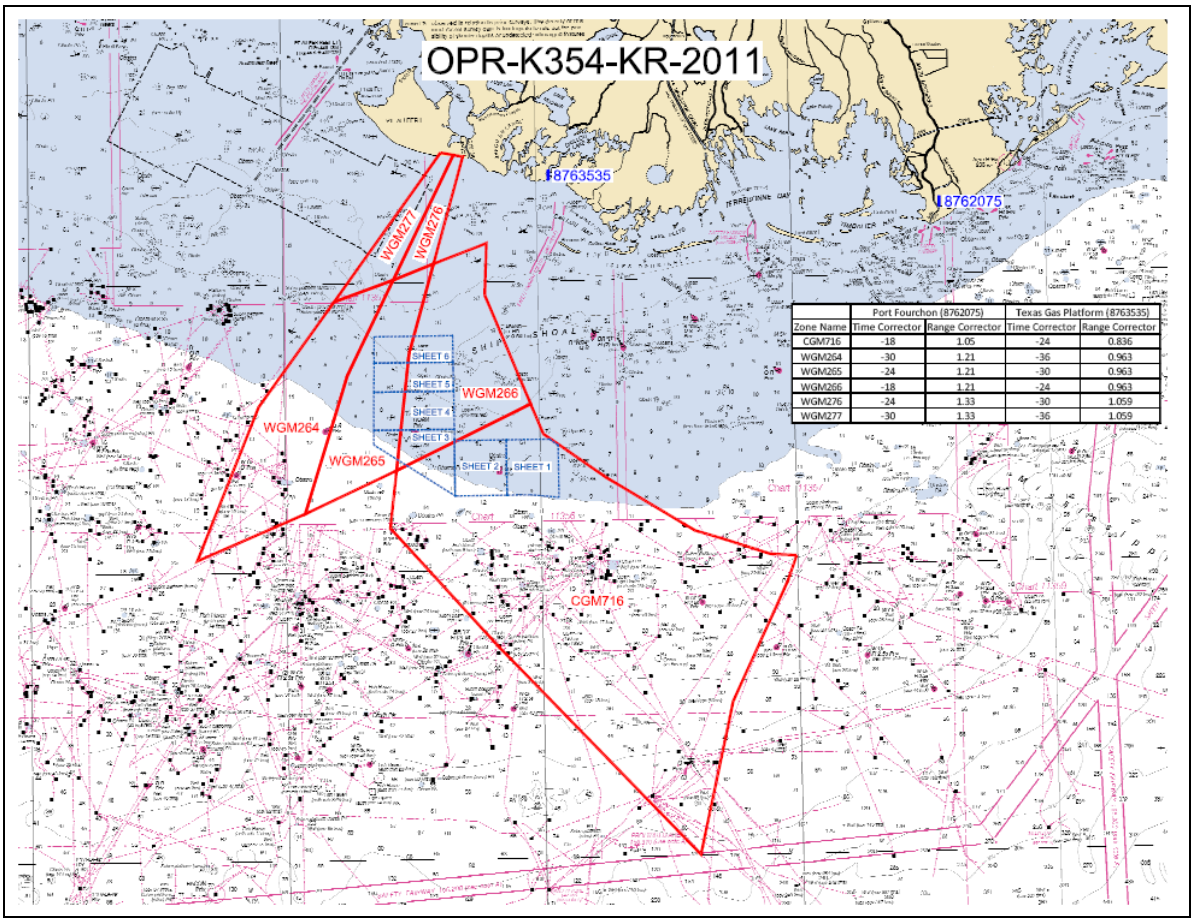


Illustration No. 14. Location of survey area, tide zones, tide stations 8762075 and 8763535 and the time/range correctors for those tide stations.

The majority of data for survey H12333 was collected between August 11 and August 25, 2011; additional investigations and fill-ins were conducted in September and November of 2011. Both the Port Fourchon tide gauge (8762075) and the Texas Gas Platform gauge (8763535) were operational during this time. The data from both tide stations shows general agreement (Illustration No. 15)

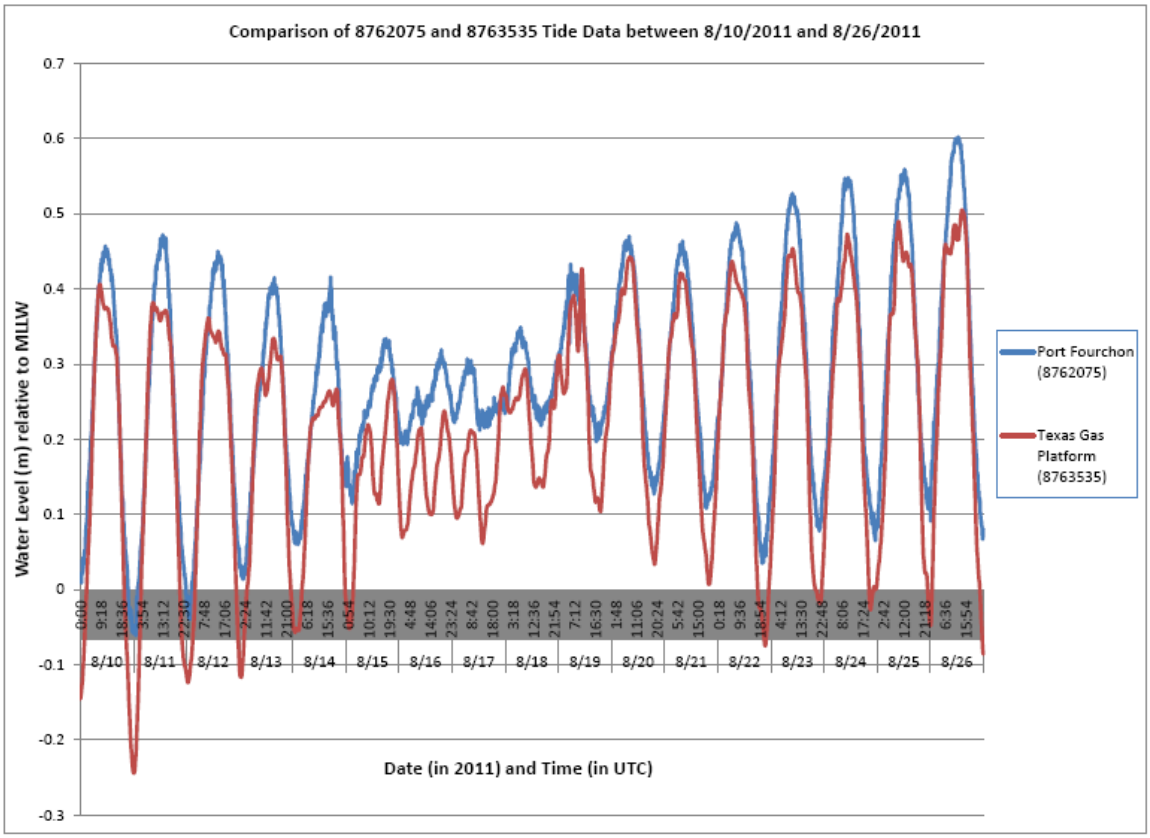


Illustration No. 15. Comparison of tidal data from 8762075 and 8763535 for the time during most data (mainlines and crosslines) were collected for survey H12333.

H12333 data was processed with both the Port Fourchon (8762075) tide data and the Texas Gas Platform (8763535) tide data. Separate 1-m BASE surfaces of the mainscheme and crosslines were created for each data set. A difference surface between the mainline data processed with the two sets of tide data was performed in CARIS HIPS/SIPS 7.1 using the surface difference tool. The mainline surface processed with 8762075 tide data was Surface 1 and the mainline surface processed with 8763535 tide data was Surface 2. The differences between the mainline data of Subarea 1 that were processed with the two sets of tides range from -0.25 to 0.02 m; Illustration No. 16 shows the distribution of values. The differences between the mainline data of Subarea 2 that were processed with the two sets of tides range from -0.23 to -0.03 m; Illustration No 17 shows the distribution of values. The data processed with the Port Fourchon tide data were consistently slightly shallower than the data processed with the Texas Gas Platform tide data.

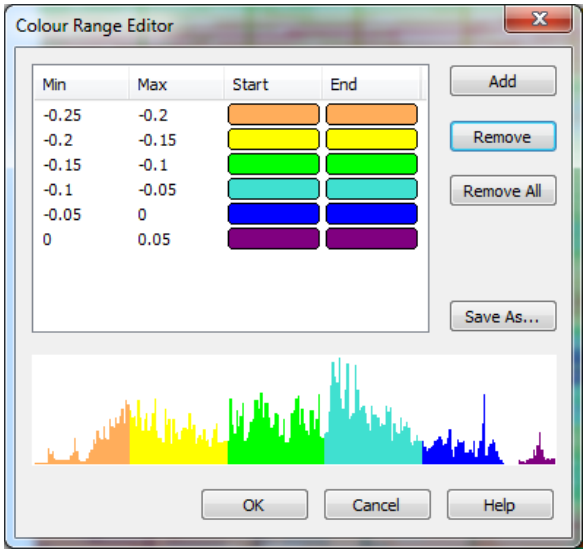


Illustration No. 16. Color range chart and histogram used to evaluate the differences between Subarea 1 mainlines processed with Port Fourchon tide data and Subarea 1 mainlines processed with Texas Gas Platform tide data.

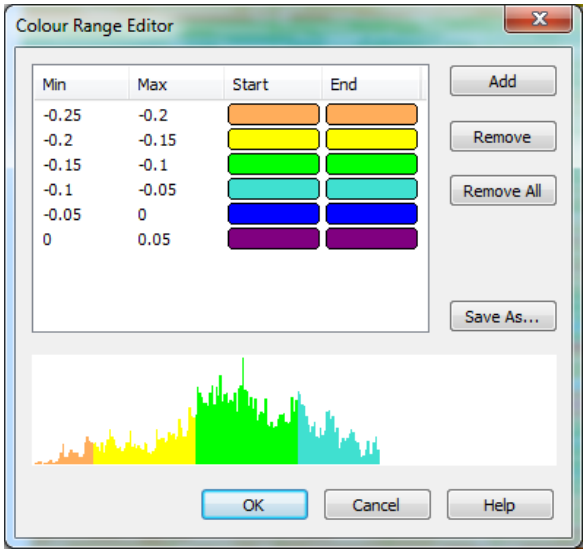


Illustration No. 17. Color range chart and histogram used to evaluate the differences between Subarea 2 mainlines processed with Port Fourchon tide data and Subarea 2 mainlines processed with Texas Gas Platform tide data.

In addition, separate crossline comparisons were generated for the data processed with the Port Fourchon tide data and the data processed with the Texas Gas Platform tide data. Difference surfaces between the mainline and crossline BASE surfaces of each data set were generated with the CARIS surface difference tool. The difference surfaces were inititally examined using a color range map in 0.2 m increments from -0.6 to 0.6 m.

The difference values for Subarea 1 processed with Port Fourchon (8762075) tide data ranges from -0.57 to 0.42 m and the majority are within -0.4 to 0.2 m (Illustration No. 18). The difference values for Subarea 1 processed with Texas Gas Platform (8763535) tide data ranges from -0.68 to 0.37 m and the majority are within -0.4 to 0.2 m (Illustration No. 19).

The difference values for Subarea 2 processed with Port Fourchon (8762075) tide data range from -0.32 to 0.59 m and the majority are within -0.0 and 0.4 m (Illustration No. 20). The difference values for Subarea 2 processed with Texas Gas Platform (8763535) range from -0.27 to 0.60 m and the majority are within -0.0 to 0.4 m (Illustration No 21).

This comparison analysis shows that the majority of the mainline and crossline depth values processed with either tide data do not differ by more than the maximum allowable TVU for water depths of 6 – 19 m, which ranges from ±0.51 to ±0.56 m.

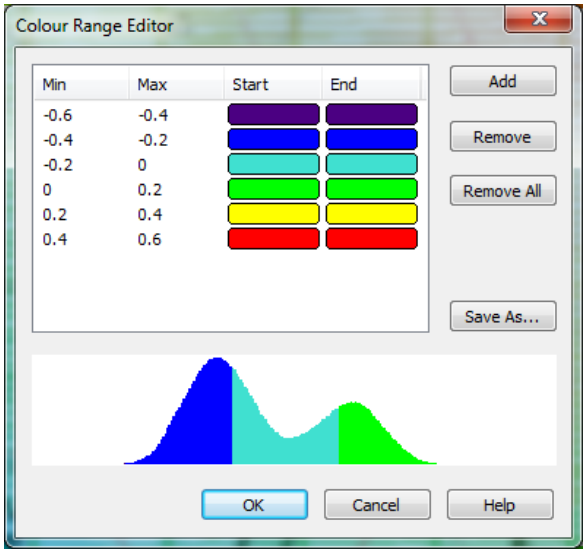


Illustration No. 18. Color range chart and histogram used to evaluate the differences between the mainlines and crosslines of Subarea 1 processed with Port Fourchon (8762075) tide data.

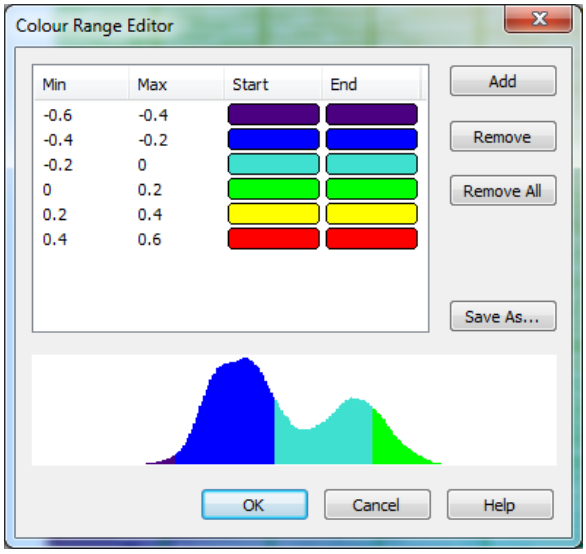


Illustration No. 19. Color range chart and histogram used to evaluate the differences between the mainlines and crosslines of Subarea 1 processed with Texas Gas Platform (8763535) tide data.

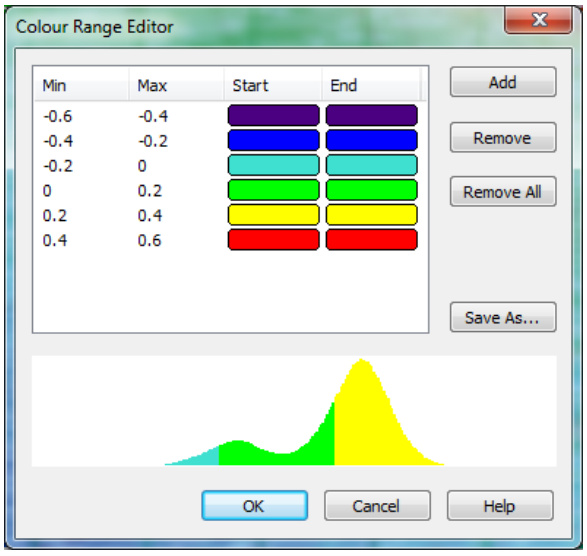


Illustration No. 20. Color range chart and histogram used to evaluate the differences between the mainlines and crosslines of Subarea 2 processed with Port Fourchon (8762075) tide data.

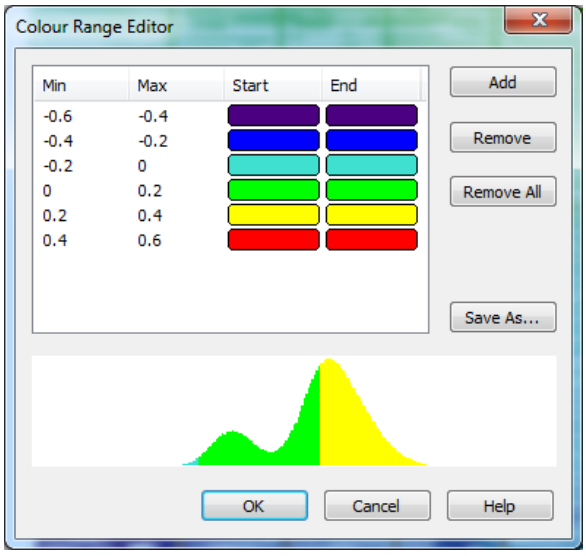


Illustration No. 21. Color range chart and histogram used to evaluate the differences between the mainlines and crosslines of Subarea 2 processed with Texas Gas Platform (8763535) tide data.

Preliminary junction analysis using the CARIS difference tool was also conducted in order to determine the variance between datasets processed with different tidal data. Survey H12333 has junctions with two OPR-K354-KR-11 surveys, H12332 and H12334 as well as two OPR-K354-KR-10 surveys; H12253 and H12255 (Refer to Illustration No. 7 in Section B.2.4). The junction analyses are described below.

Surveys H12253 and H12555 were processed with Port Fourchon tidal data. The finalized 1-m BASE surfaces of these surveys were compared to the 1-m BASE surfaces of H12333 that were processed separately with Port Fourchon and Texas Gas Platform tide data.

The differences between Subarea 2 of H12333 and Subarea 1 of H12253 that were processed with Port Fourchon tide data range from -0.32 to 0.32 m and the majority of the difference values are within -0.2 to 0.2 m (Illustration No. 22). The differences between Subarea 2 of H12333 processed with Texas Gas Platform tide data and Subarea 1 of H12253 processed with Port Fourchon tide data range from -0.16 to 0.52 m and the majority of the difference values are within 0.0 to 0.4 m (Illustration No. 23).

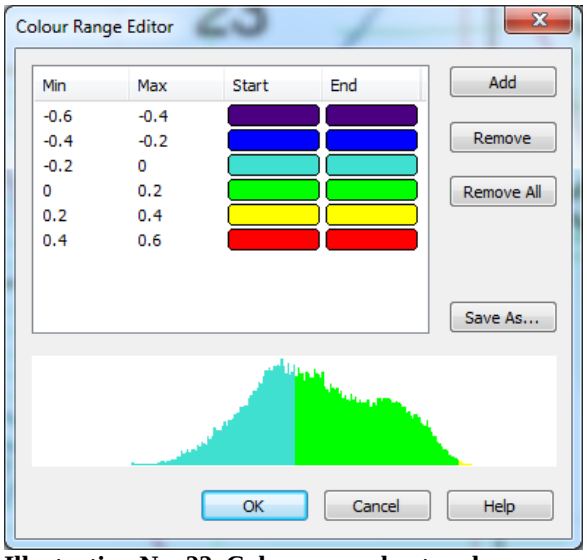


Illustration No. 22. Color range chart and histogram used to evaluate the differences between the junction of Subarea 2 of H12333 and Subarea 1 of H12253 processed with Port Fourchon tide data.

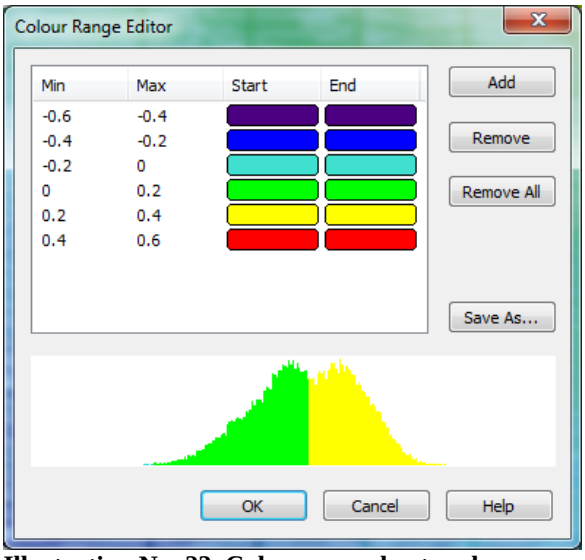


Illustration No. 23. Color range chart and histogram used to evaluate the differences between the junction of Subarea 2 of H12333 processed with Texas Gas Platform tide data and Subarea 1 of H12253 processed with Port Fourchon tide data.

The differences between Subarea 2 of H12333 and Subarea 1 of H12255 that were processed with Port Fourchon tide data range from -0.43 to 0.68 m and the majority of the difference values are within 0.0 to 0.4 m (Illustration No. 24). The differences between Subarea 2 of H12333 processed with Texas Gas Platform tide data and Subarea 1 of H12255 processed with Port Fourchon tide data range from -0.29 to 0.81 m and the majority of the difference values are within 0.0 to 0.5 m (Illustration No. 25).

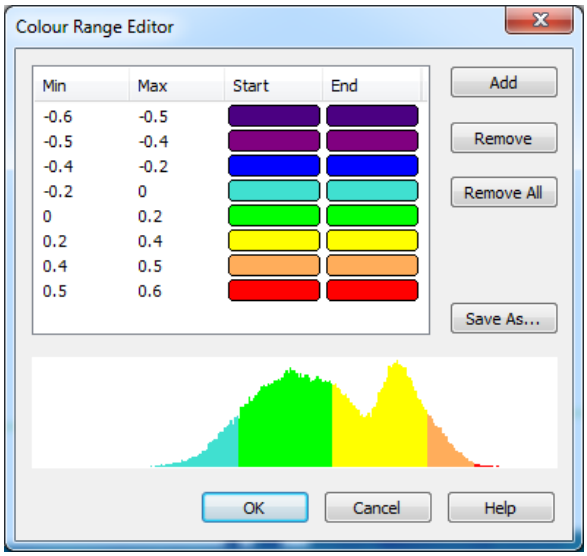


Illustration No. 24. Color range chart and histogram used to evaluate the difference between the junction of Subarea 2 of H12333 and Subarea 1 of H12255 processed with Port Fourchon tide data

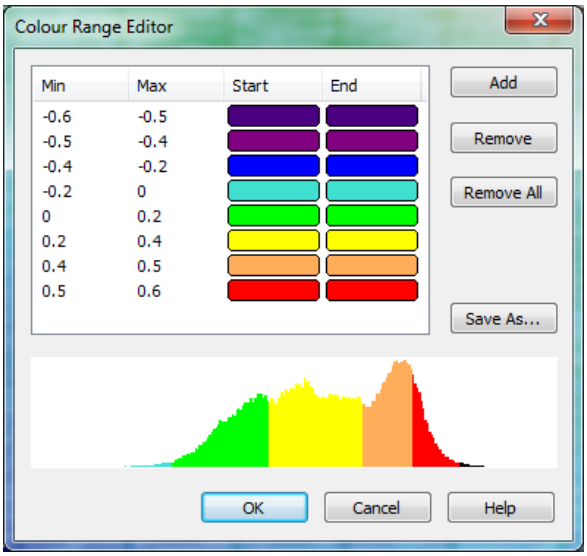


Illustration No. 25. Color range chart and histogram used to evaluate the difference between the junction of Subarea 2 of H12333 processed with Texas Gas Platform tide data and Subarea 1 of H12255 processed with Port Fourchon tide data.

H12333 has a junction with H12334 to the north. Due to lack of tide data from the Texas Gas Platform gauge during survey operations of H12334, this survey was processed with tide data from Port Fourchon. The finalized 1-m BASE surfaces of H12334 were compared to the 1-m BASE surfaces of H12333 that were separately processed with Port Fourchon and Texas Gas Platform tide data.

The differences between Subarea 1 of H12333 and Subarea 1 of H12334 that were processed with Port Fourchon tide data range from -0.53 to 0.29 m and the majority of the difference values are within -0.4 to 0.2 m (Illustration No. 26). The differences between Subarea 1 of H12333 processed with Texas Gas Platform tide data and Subarea 1 of H12334 processed with Port Fourchon tide data range from -0.45 to 0.50 m and the majority of the differences are within -0.2 to 0.4 m (Illustration No. 27).

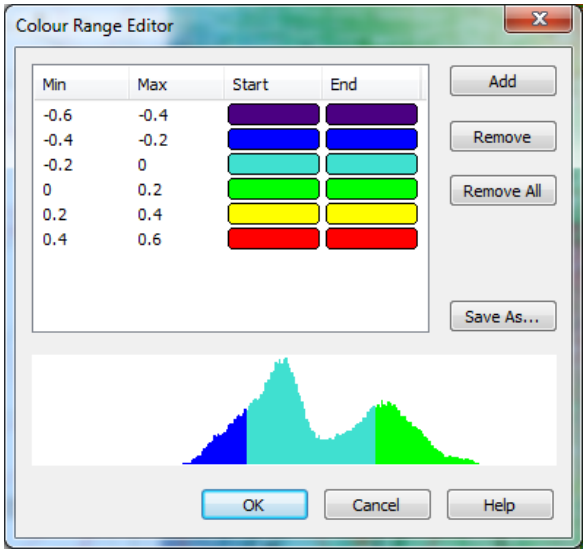


Illustration No. 26. Color range chart and histogram used to evaluate the differences between the junction of Subarea 1 of H12333 and Subarea 1 of H12334 processed with Port Fourchon tide data.

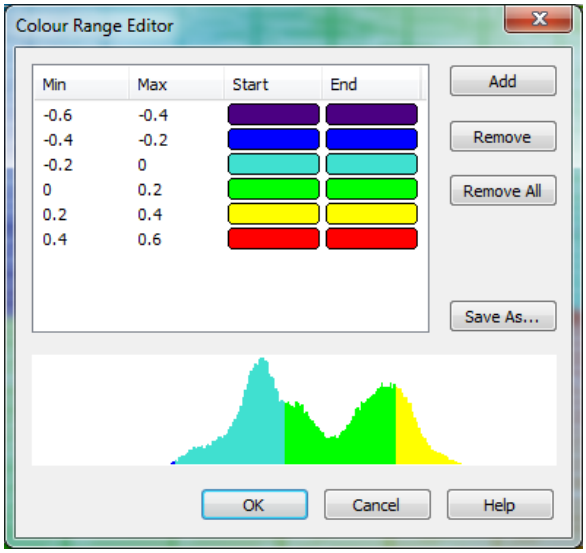


Illustration No. 27. Color range chart and histogram used to evaluate the differences between the junction of H12333 Subarea 1 processed with Texas Gas Platform tide data and Subarea 1 of H12334 processed with Port Fourchon tide data.

The differences between Subarea 2 of H12333 and Subarea 2 of H12334 that were processed with Port Fourchon tide data range from -0.71 to 0.38 m and the majority of the difference values are within -0.4 to 0.0 m (Illustration No. 28). The differences between Subarea 2 for H12333 processed with Texas Gas Platform tide data and Subarea 2 of H12334 processed with Port Fourchon tide data range from -0.58 to 0.46 m and the majority of the difference values are within -0.4 to 0.2 m (Illustration No. 29).

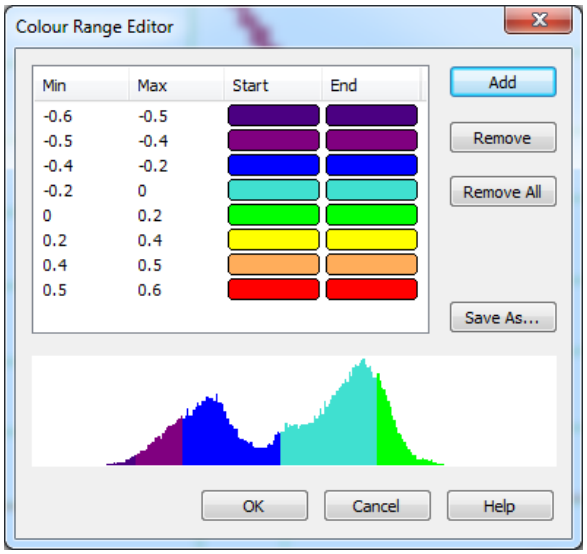


Illustration No. 28. Color range chart and histogram used to evaluate the differences between the junction of Subarea 2 of H12333 and Subarea 2 of H12334 processed with Port Fourchon tide data.

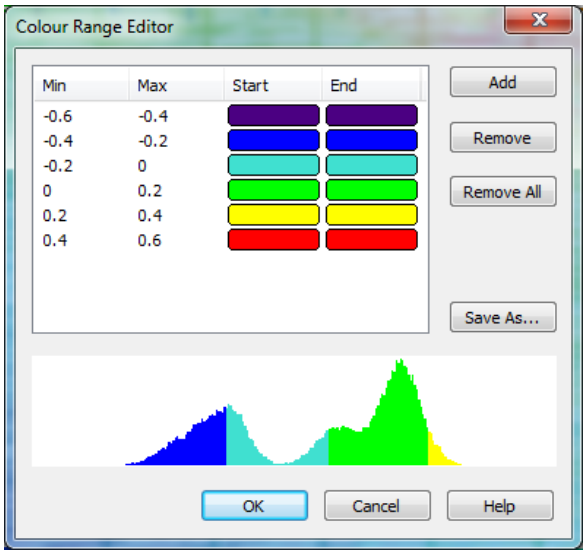


Illustration No. 29. Color range chart and histogram used to evaluate the differences between the junction of Subarea 2 of H12333 processed with Texas Gas Platform tide data and Subarea 2 of H12334 processed with Port Fourchon tide data.

Survey H12333 has a junction with H12332 to the south. Port Fourchon tide data was used for final data processing of survey H12332 based on the crossline comparisons and junction analysis, which did not indicate significant improvement in relative quality of the data using either tide gauge; in addition, there were significant data gaps in the Texas Gas Platform tide data due to Tropical Storm Lee. The 1-m BASE surface of H12332 was compared to the 1-m BASE surfaces of H12333 that were processed separately with Port Fourchon and Texas Gas Platform tide data.

The differences between Subarea 1 of H12333 and H12332 that were processed with Port Fourchon tide data range from -0.19 to 0.57 m and the majority of the difference values are within 0.0 to 0.4 m (Illustration No. 30). The differences between Subarea 1 of H12333 processed with Texas Gas Platform tide data and H12332 processed with Port Fourchon tide data range from -0.4 to 0.65 m and the majority are between 0.2 and 0.4 m (Illustration No. 31).

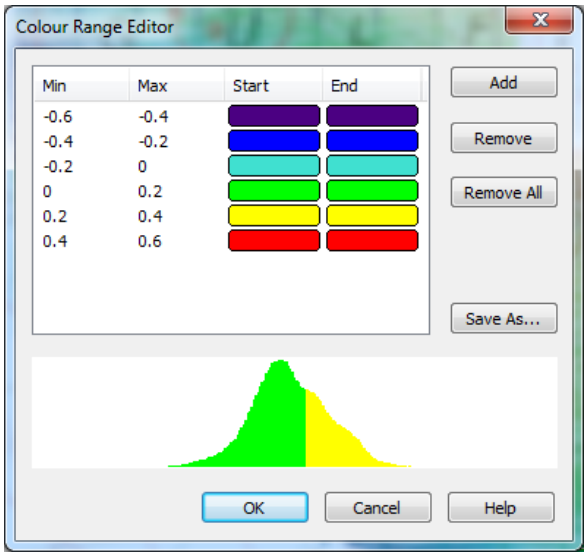


Illustration No. 30. Color range chart and histogram used to evaluate the differences between the junction of Subarea 1 of H12333 and H12332 processed with Port Fourchon tide data.

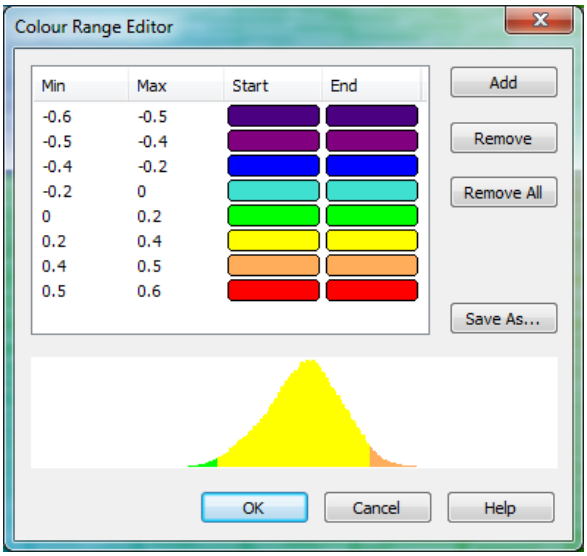


Illustration No. 31. Color range chart and histogram used to evaluate the differences between the junction of Subarea 1 of H12333 processed with Texas Gas Platform tide data and H12332 processed with Port Fourchon tide data.

The differences between Subarea 2 of H12333 and H12332 that were processed with Port Fourchon tide data range from -0.54 to 0.44 m and the majority of the difference values are within -0.2 and 0.2 m (Illustration No. 32). The differences between Subarea 2 of H12333 processed with Texas Gas Platform tide data and H12332 processed with Port Fourchon tide data range from -0.40 to 0.57 m and the majority of differences are within -0.2 and 0.2 m (Illustration No. 33).

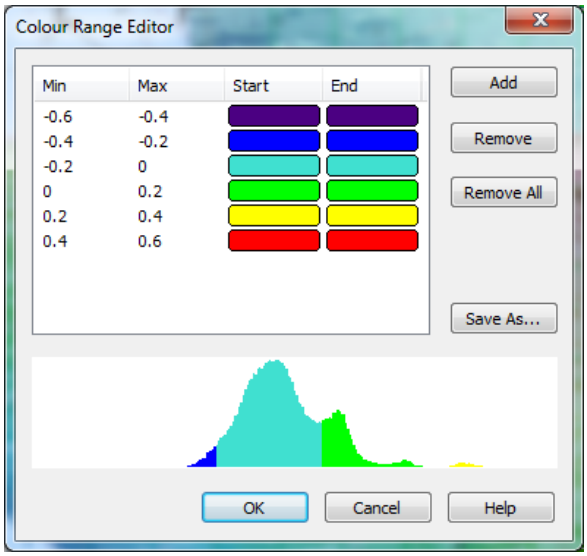


Illustration No. 32. Color range chart and histogram used to evaluate the differences between the junction of Subarea 2 of H12333 and H12332 processed with Port Fourchon tide data.

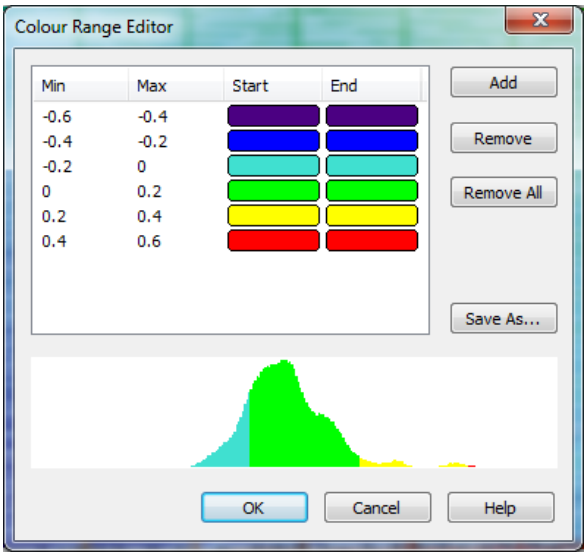


Illustration No. 33. Color range chart and histogram used to evaluate the differences between the junction of Subarea 2 of H12333 processed with Texas Gas Platform tide data and H12332 processed with Port Fourchon tide data.

Based on the crossline comparisons, there is no significant improvement in relative quality of the data using either tide gauge; for Subarea 1, the crossline and mainline data processed with Fourchon tide data shows slightly better agreement than the data processed with Texas tide data. In addition, the junction analysis shows that, in general, the H12333 data processed with Port Fourchon tide data shows improved agreement with adjacent survey junctions than those with H12333 data processed with Texas Gas Platform tide data. This is particularly the case with the junction of Subarea 2 of H12333 with Subarea 1 of H12255. An exception to this is the junction between Subarea 2 of H12333 and H123334; the H12333-Texas to H12334-Fourchon junction shows closer agreement. Because the majority of the crossline comparison and junction analysis shows slightly closer agreement of the data when using the Port Fourchon tide data, and to remain consistent within the OPR-K354-KR-11 survey area, Port Fourchon tides were used for the final processing of H12333 data.

D. RESULTS AND RECOMMENDATIONS

D.1. Chart Comparison

D.1.1. 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 the largest scale chart in this area, summarized in Tables No. 6 and 7.

Table No. 6. Nautical Charts used for Comparison

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

Table No. 7. 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. LNM 44/11 (November 09, 2011) was the last notice reviewed for this project. Three notices to mariners (District 8 LNM 36/08 – October 2, 2008) were issued within the survey bounds prior to survey operations. These LNM's were to add Submarine Pipelines PT 1 of 3 at 28-46-13.420 N, 91-14-21.450 W, Submarine Pipeline PT 2 of 3 ay 28-45-04.180 N, 91-14-20.880 W and Submarine Pipeline PT 3 of 3 at 28-45-03.180 N, 91-14-22.150 W. There are charted pipelines and platforms in the vicinity of these LNM, but no evidence of pipeline exposures in either the multibeam data or side scan sonar data from this survey.

D.1.2. Charted Soundings

Charted soundings were compared to a sounding layer as well as color range maps. The sounding layers were generated from a 1-m BASE surface with a 550-ft single-defined radius for both subareas. (Refer to the Data Acquisition and Processing Report for sounding selection criteria). Surveyed water depths range from 21.5 to 62.6 feet and there is a general deepening from northeast to southwest throughout the survey area. In the eastern portion of the survey area the depth transitions are more irregular than in the western portion of the survey area; the most irregular bathymetry is located in the shoalest, northeastern corner of the survey area (Illustration No. 34 and 35).

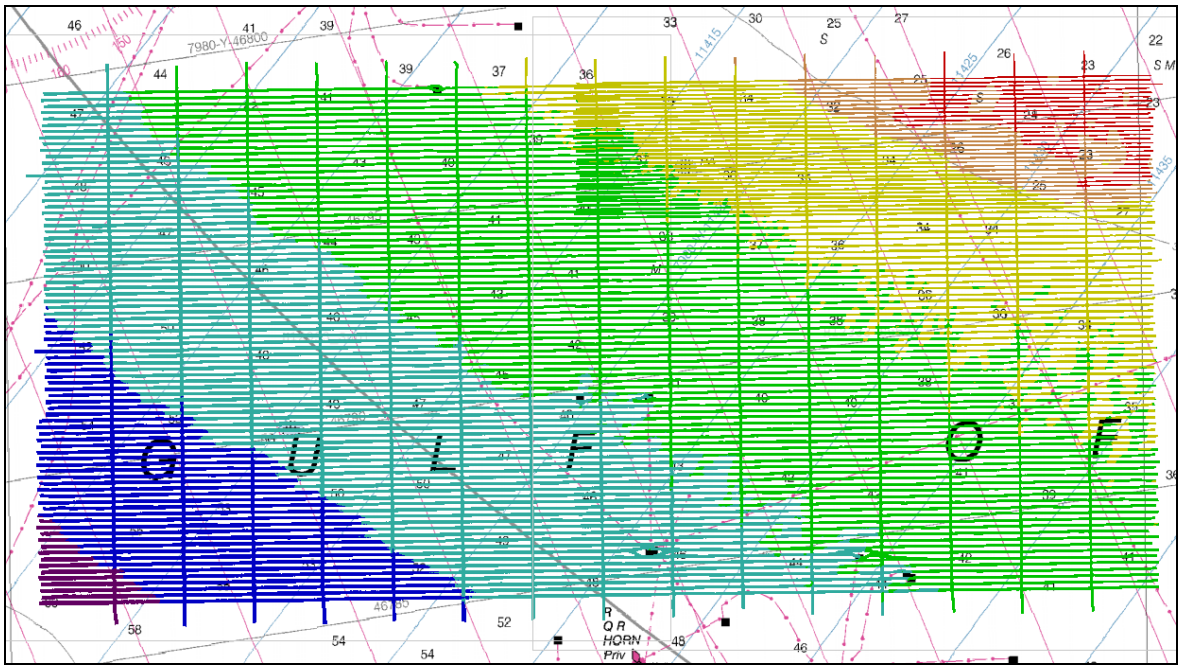


Illustration No. 34. H12333 Survey area with colored depth ranges Shown in Illustration No. 35.

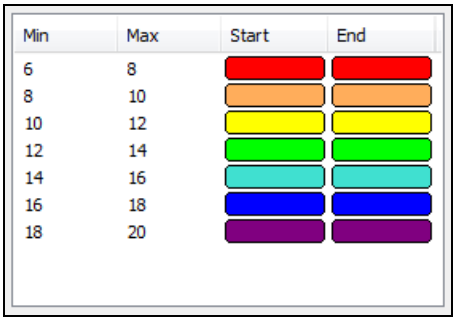


Illustration No. 35. CARIS color range map (in meters) used for Illustration No. 34

Surveyed depths generally agree with charted depths within 1 – 2 feet throughout the survey area. In cases where the depths are different by 1 – 2 feet, surveyed depths are generally deeper than charted depths. The most extreme differences between surveyed and charted depths occur in the northeast corner and in an isolated area on the eastern margin of the survey area. In the northeast corner of the survey area, just inside the charted 30-ft contour, the surrounding surveyed depths are up to 8 feet deeper than charted depths (Illustration No. 36). At the isolated location along the eastern margin of the survey area the surrounding surveyed depths are up to 6 feet deeper than the charted depth (Illustrations No. 37).

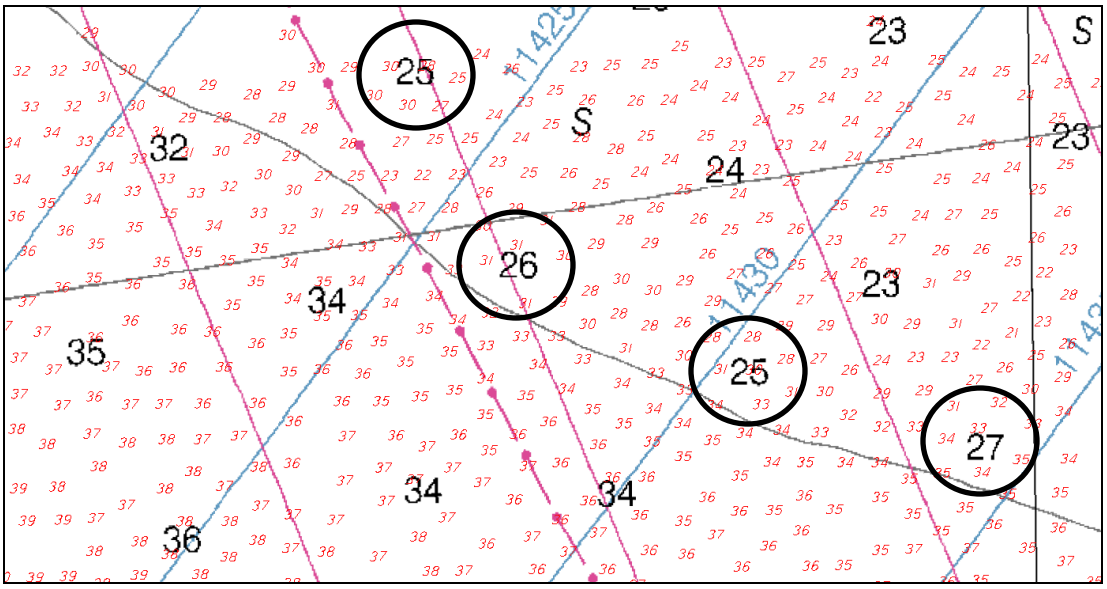


Illustration No. 36. Northeast corner of the survey area where surveyed depths are up to 8 feet deeper than charted depths (shown in black circles).

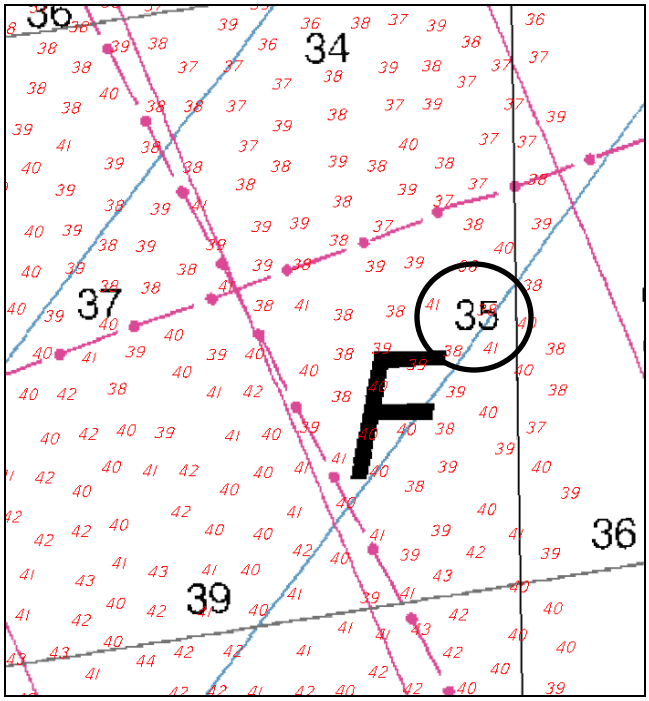


Illustration No. 37. Isolated region along the eastern margin of the survey area where surveyed depths are up 6 feet deeper than the charted 35-ft depth (shown in black circle).

The 30-ft contour is charted from northwest to southeast across the northeast corner of the survey area. In order to evaluate variance between the contour and surveyeddepths, a color range chart was created in CARIS with depths of 0 to 9.144 m in red and surveyed depths greater than 9.144 m in blue; 9.144 m represents ~ 30 ft. Although some surveyed depths greater than 30 feet extend beyond the charted contour in the northwest, the charted contour is generally located southwest of the 30-ft and shoaler surveyed depths. In addition, there are several isolated areas within the northeast corner that are 30 to 31 feet in depth (Illustration No. 38.). Examination of the sounding layer confirms these trends.

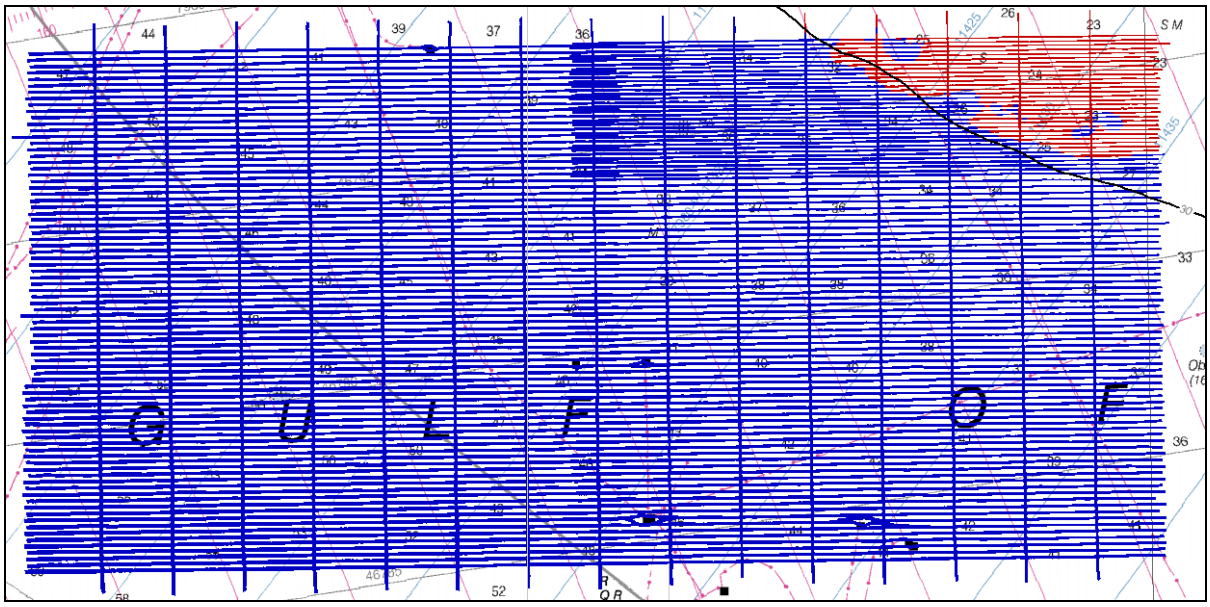


Illustration No. 38. Comparison of the charted 30-ft contour and surveyed depths; the 30-ft contour has been highlighted black. Surveyed depths within 0 to 9.144 m are shown in red and surveyed depths greater than 9.144 m are shown in blue; 9.144 m represents ~ 30 ft.

D.1.3. Charted Features

D.1.3.1. AWOIS

Two AWOIS items were assigned for investigation within the survey area (Table No. 8). A brief description of each AWOIS item is provided here and are further discussed in Appendix II: Survey Feature Report: AWOIS Report.

The radius of AWOIS item 12793 was surveyed with 200% SSS and set line spacing SWMB. Although all the contacts within the AWOIS radius were considered insignificant, 2 investigations were performed, H33-I-C and H33-I-E. H33-I-C did not show any evidence of a contact. H33-I-E confirmed the existence of a contact, but was insignificant (Refer to Section D.1.3.2 for more information). In addition, the unknown contact is ensonified on

mainline 4055-1 and appears to be 40 cm in height. Because there is no significant contact within the AWOIS radius, the hydrographer recommends removal from the chart.

The radius of AWOIS item 12791 was surveyed with 200% SSS and set line spacing SWMB. No significant contact was found within the AWOIS radius and the hydrographer recommends removal from the chart.

Table No. 8. AWOIS items assigned for full investigation.

AWOIS Record	Chart Latitude	Chart Longitude	Chart Action/Comments
12791	28-48-00.000 N	91-13-59.999 W	Remove from Chart 11356
12793	28-46-00.837 N	91-17-30.361 W	Remove from Chart 11356

D.1.3.2. Investigation Items

A total of eight investigations were conducted in the survey area (Table No. 9).

Table No. 9. H12333 investigation items.

SSS Contact Number	Investigation Name	Least Depth (m)	Survey Latitude	Survey Longitude	Remarks
227-010243S	H33-I-A	n/a	n/a	n/a	Depression
226-174911S	H33-I-B	n/a	n/a	n/a	Disproved
225-105617P	H33-I-C	n/a	n/a	n/a	Disproved
225-033037P	H33-I-D	n/a	n/a	n/a	Evident in SSS; no height off bottom in MB
227-034244S	H33-I-E	12.133	28-48-19.481	91-16-40.857	Confirmed as insignificant
227-085156S	H33-I-F	11.516	28-48-32.895	91-15-23.075	Confirmed as insignificant
231-184726S	H-33-II-A	10.070	28-48-20.021	91-12-41.676	Confirmed as insignificant
224-150725P	H33-I-Inv	14.925	28-45-11.382	91-16-55.111	DTON1

Primary contact 227 H33-I-A was further developed with multibeam and SSS investigation H33-I-A on August 15, 2011 (JD 227). The SSS investigation lines shows evidence of a contact, and several MB investigation lines directly ensonify the position of the contact; these show a depression. Only one investigation line (H33-I-A7) shows evidence that the contact may have height off the seafloor on the outer starboard beams. However, because the lines that directly ensonify the target do not show evidence of height off the bottom; the outer beams of line H33-I-A7 were cleaned to better represent the contact.

Primary contact 226-174911S was further developed with multibeam and SSS investigation H33-I-B on August 15, 2011 (JD 227). After further evaluation, the original SSS contact was deemed insignificant and the investigation disproved the existence of the contact.

Primary contact 225-105617P was further developed with multibeam and SSS investigation H33-I-C on August 15, 2011 (JD 227). After further evaluation, the original SSS contact was deemed insignificant and the investigation disproved the existence of the contact.

Primary contact 225-033037P was further developed with multibeam and SSS investigation H33-I-D on August 15, 2011 (JD 227). The investigation confirms the existence of a contact in the SSS, but there is no evidence of any height above the seafloor from the multibeam data.

Primary contact 227-034244S was further developed with multibeam and SSS investigation H33-I-E on August 15, 2011 (JD 227). The investigation confirms the existence of a contact, but is insignificant with a least depth of 12.133 m in 12.9 m of water for a height of 0.767 m above the seafloor.

Primary contact 227-085156S was further developed with multibeam and SSS investigation H33-I-F on August 15 and 16, 2011 (JD 227 and 228). The investigation data confirm the existence of a feature, but it is insignificant with a least depth of 11.516 m in 12 m of water for a height of 0.484 m off the bottom

Primary contact 231-184726S was further developed with multibeam and SSS investigation H33-II-A on August 21, 2011 (JD 233). The investigation confirmed the existence of the contact, but is insignificant with a least depth of 10.070 m in 10.6 m of water for a height of 0.53 m off the bottom.

Primary contact 224-150725P was further developed with multibeam and SSS investigation H33-I-Inv on September 27, 2011 (JD 270). This investigation confirmed the significance of the contact with a least depth of 14.925 m in 16 m of water for a height of 1.075 m off the bottom. The contact was submitted as DTON 1 (Refer to section D.1.3.3 for more information).

D.1.3.3. Danger to Navigation Reports

One Danger to Navigation Report was submitted for this survey. A summary is presented in Table No. 10 and a copy of the report is included in Appendix I.

Table No. 10. Danger to Navigation summary.

Feature	Depth (ft)	Depth (m)	Survey Latitude (N)	Survey Longitude (W)
Obstruction	48.966	14.925	28-45-11.382	91-16-55.111

D.1.3.4. Existing Infrastructure

The platforms in Table No. 11 were found as charted. The position of each platform was calculated from the layback corrected primary sidescan sonar contact. Refer to the Data Acquisition and Processing Report for details on primary and secondary contacts. Table No. 12 shows a platform that is currently uncharted. Although this platform is close to a charted platform, the contacts are 40 m from the edge of the platform (Illustration No. 39). It is recommended to remove the currently charted platform and add one in the location of the observed platform. Table No. 13 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. 11. Platforms found as charted

Surveyed Position			
Latitude	Longitude	Platform Name	Chart Action/Comments
28-48-39.369 N	91-16-11.214 W	SS126C	Remain as charted
28-46-13.349 N	91-14-58.367 W	SS129B	Remain as charted
28-46-13.707 N	91-14-21.837 W	SS129L	Remain as charted
28-45-02.488 N	91-14-21.310 W	SS129-AUX-A	Remain as charted
28-44-50.110 N	91-12-05.424 W	SS149C	Remain as charted

Table No. 12. Uncharted platform found during survey operations.

Surveyed Position			
Latitude	Longitude	Platform Name	Chart Action/Comments
28-45-00.146 N	91-12-31.463 W	SS130E	Add to Chart

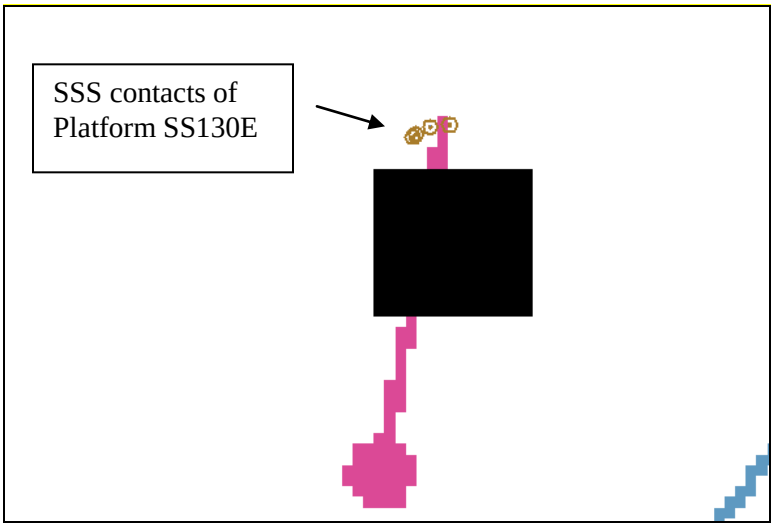


Illustration No. 39. Location of SS130E, slightly north of charted platform.

Table No. 13. Charted platforms not present at time of survey

Charted Position		
Latitude	Longitude	Chart Action
28-45-02.735 N	91-14-19.037 W	Remove from chart
28-44-57.527 N	91-12-30.834 W	Remove from chart
28-44-47.874 N	91-12-03.613 W	Remove from chart

There are several notable bottom features in the vicinity of charted platform SS129-AUX-A including 3 canholes (in red box of Illustration No. 40) and evidence of a submerged portion of the platform ensonified by multibeam line 4168Fillin-1-1 (Purple box of Illustration No. 40); this was retained in the data. A description of the item in the black box in Illustration No. 40 follows.

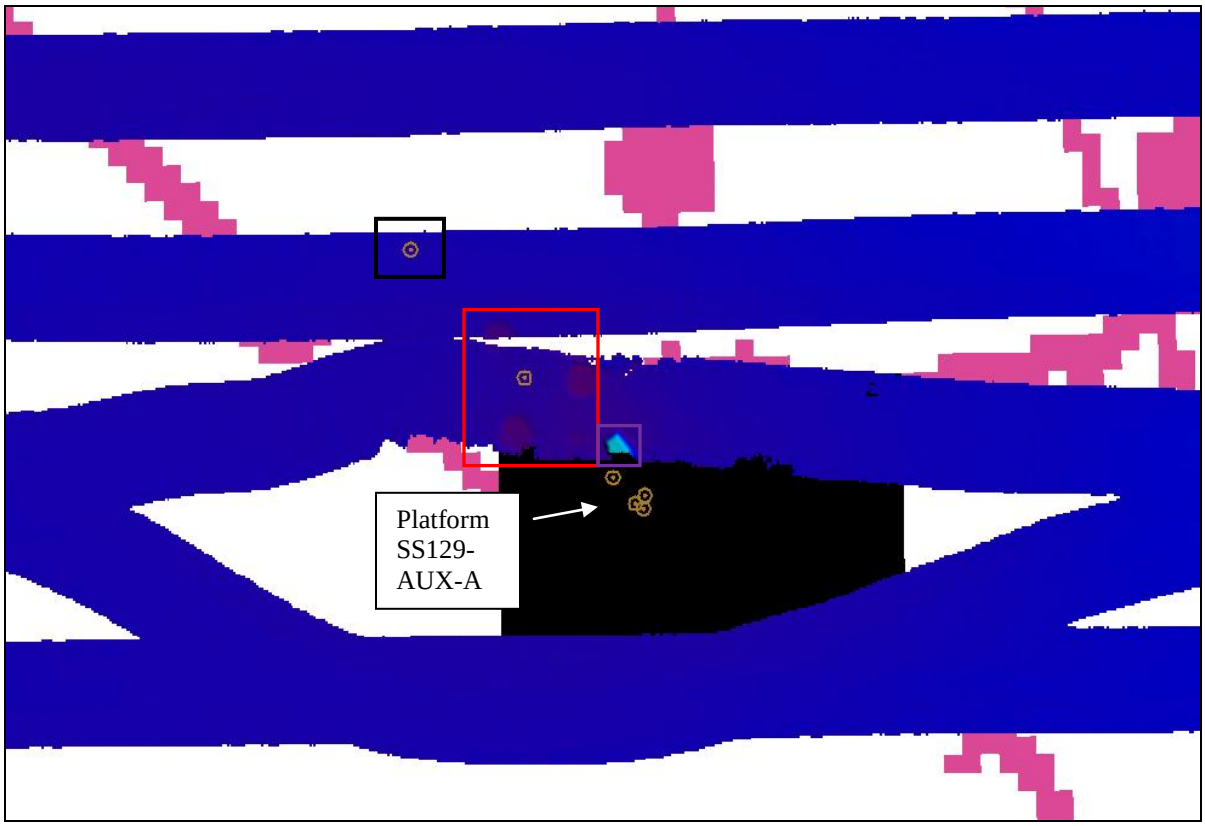


Illustration No. 40. Notable bottom features near platform SS129-AUX-A.

There appears to be a feature on mainline 4167-1 on the portside (Illustration No. 41), associated with contact 229-043001P, which has a measured height of 0.58 m. However, there is no evidence of a contact on the adjacent mainline 4166-1. In addition, a CARIS subset view of the potential contact shows extension both above and below the seafloor (Illustration No. 42); because this does not appear to be an accurate representation of the contact, the multibeam data was further cleaned.

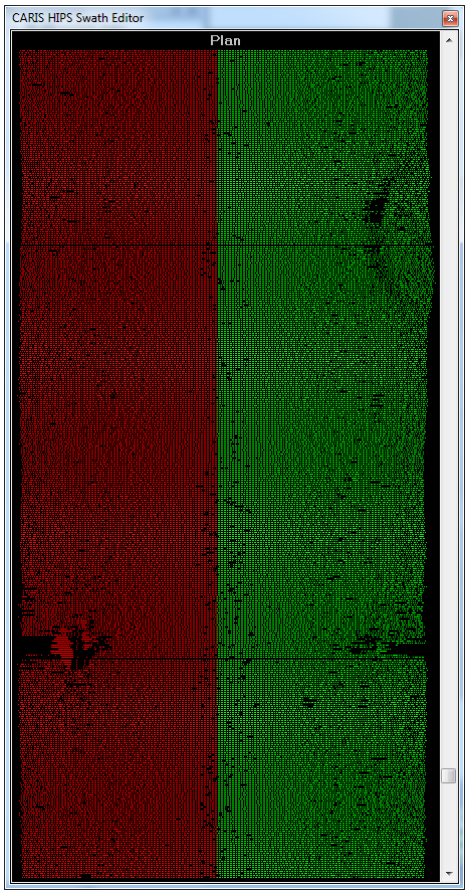


Illustration No. 41. Potential contact on the lower portside; also shown is a portion of a canhole on the upper starboard side.

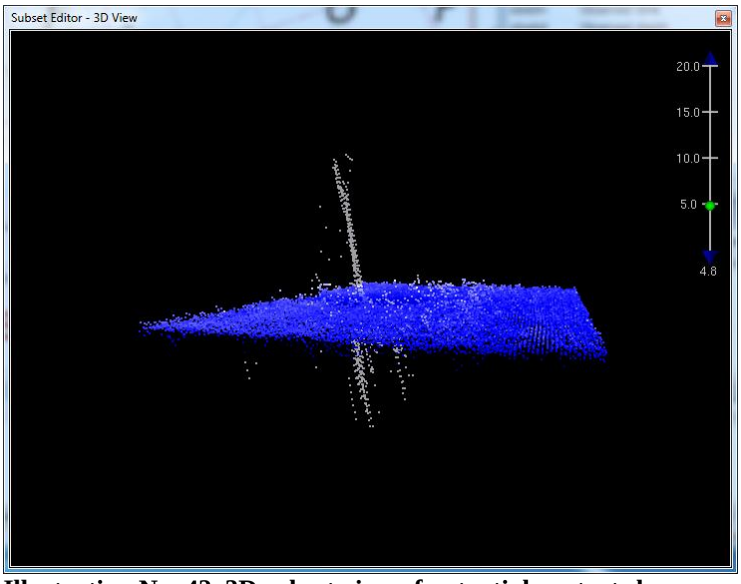


Illustration No. 42. 3D subset view of potential contact shown in Illustration No. 40; does not appear to be an accurate representation of the SSS contact and was further cleaned (points shown in gray).

D.1.3.5. 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.

Full multibeam coverage of Primary contact 228-233126P was acquired on line 4172-1. The feature is significant with a least depth of 12.743 m (Table No. 14) in 14.4 m of water for a height of 1.657 m off the bottom. However, the feature is located on a charted pipeline near platform SS149C and was therefore not submitted as a DTON. The least depth of the feature has been designated in the CARIS project and retained in the Final Feature File.

Table No. 14. Obstruction currently located on a charted pipeline.

SSS Contact Number	Least Depth (m)	Survey Latitude	Survey Longitude
228-233126P	12.743	28-44-51.261 N	91-12-08.347 W

In addition, there is a contact that was located once in H12333 and once in H12332, which is located at the southern extent of Subarea 1 of H12332, just inside the northern boundary of H12332. This contact was ensonified with H12333-TIE-103-1 from H12333 and H12332-TIE-103-1. Multibeam data from each line support evidence of a contact; however, the shallowest least depth is from data of H12333 and is therefore addressed in deliverables for this Sheet. According to H12333 survey data, the least depth of the feature is 15.880 m (52.100 ft) in surveyed water depths of 17.4 m (~57 ft), for a height of 1.52 m (~4.9 ft) off the bottom. However, the closest charted water depth is 55 feet and the feature would only be 2.9 feet off the bottom according to the current chart. The feature was not submitted as a DTON, but is included as an obstruction in the final feature file for H12333; a summary is shown in Table No 15.

Table No. 15. Obstruction currently uncharted.

SSS Contact Number	Least Depth (m)	Survey Latitude	Survey Longitude
224-043515P	15.880 m	28-44-40.508 N	91-17-15.586 W

D.2. Additional Results

D.2.1. Prior Surveys

Refer to Section B.2.4 for information on survey junctions and Section D.1 for comparison to nautical chart 11356.

D.2.2. Aids to Navigation

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

D.2.3. Additional Infrastructure

Investigation H33-I-E further developed an exposed pipeline contact (Table No. 16). The multibeam and SSS data confirm the existence of the contact with a least depth of 11.869 in 12.8 m of water for a height of 0.931 m off the bottom. Although close to 1 m off the bottom, the pipeline is currently charted and was not submitted as a DTON.

Table No. 16. Exposed pipeline contact.

SSS Contact Number	Investigation Name	Least Depth (m)	Survey Latitude (N)	Survey Longitude (W)	Remarks
227-034233S	H33-I-E	11.869	28-48-19.511	91-16-39.898	Exposed Pipeline - charted

E. APPROVAL SHEET

LETTER OF APPROVAL

REGISTRY NUMBER H12333

This report and the accompanying smooth sheet are respectfully submitted.

Field operations contributing to the accomplishment of the survey H12333 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.

Tara Levy
Chief of Party
C&C Technologies
May 2012

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
301.713.2700 x126

JOA Surveys, LLC
SURVEYING GPS TIDES HYDROGRAPHY

2000 E. Dowling Road, Suite 10
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.

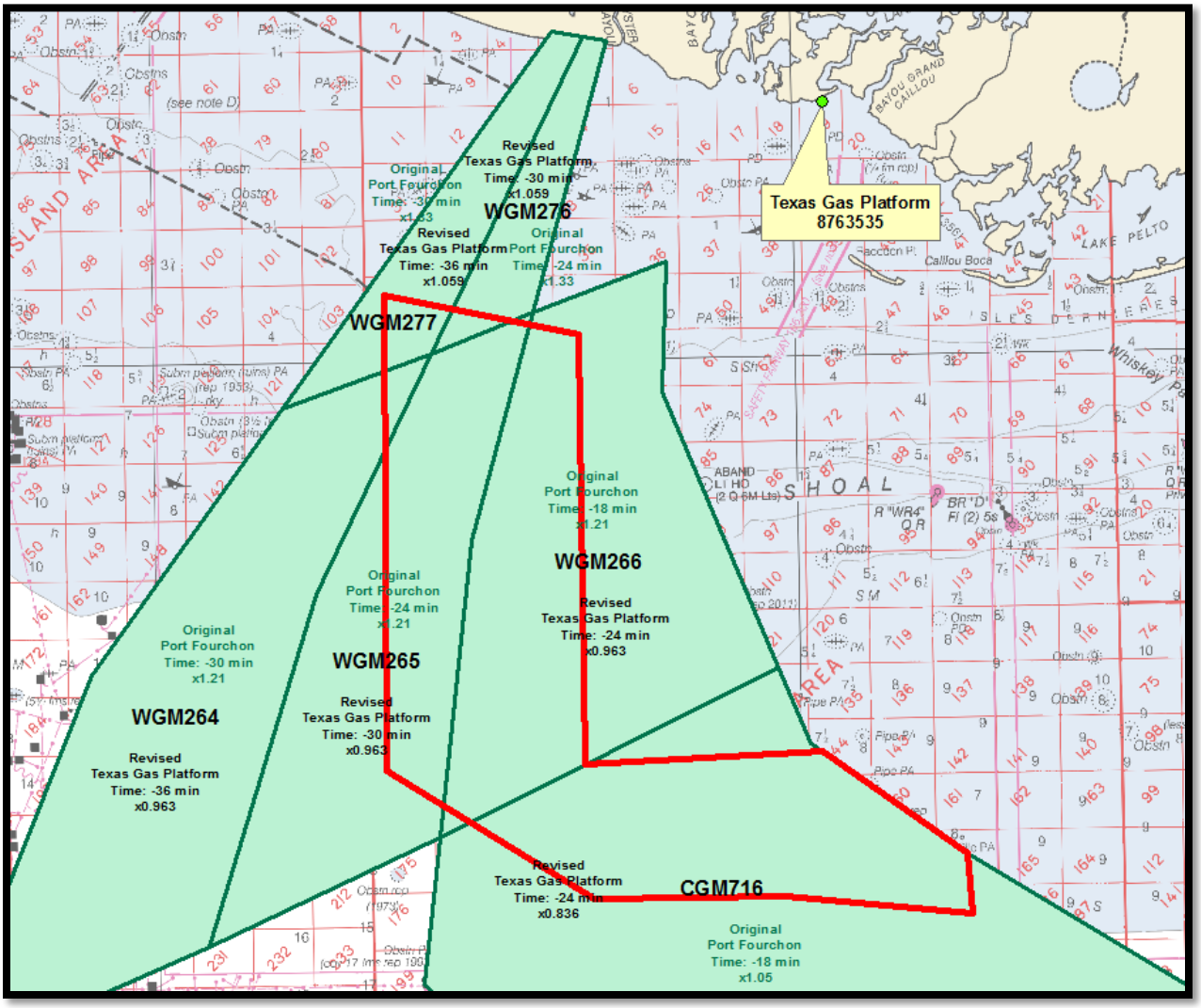
To create the revised zoning factors, one year of MLLW water level data from Texas Gas Platform and Port Fourchon were compared using a least squares best fit algorithm. The range ratio and time offset determined from this comparison were used to convert the preliminary CO-OPS tidal zoning from Port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

APPENDIX III
FEATURE REPORT
DtoN – one
AWOIS – two
Wrecks – none
Maritime Boundary - none

H12333 Danger to Navigation

Registry Number: H12333
State: Louisiana
Locality: Gulf of Mexico
Sub-locality: 27 NM South of Point Au Fer Island
Project Number: OPR-K354-KR-11
Survey Date: 11/05/2011

Charts Affected

Number	Edition	Date	Scale (RNC)	RNC Correction(s)*
11356	39th	06/01/2012	1:80,000 (11356_1)	USCG LNM: 5/14/2013 (5/21/2013) NGA NTM: 1/14/2012 (6/1/2013)
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 - 49ft Obstruction	Obstruction	14.93 m	28° 45' 11.4" N	091° 16' 55.1" W	---

1 - DtoN

1.1) DTON #1 - 49ft Obstruction

DANGER TO NAVIGATION

Survey Summary

Survey Position:	28° 45' 11.4" N, 091° 16' 55.1" W
Least Depth:	14.93 m (= 48.97 ft = 8.161 fm = 8 fm 0.97 ft)
TPU (±1.96σ):	**THU (TPEh)** [None] ; **TVU (TPEv)** [None]
Timestamp:	2011-309.00:00:00.000 (11/05/2011)
Dataset:	H12333_Features_Compile.000
FOID:	US 0000563215 00001(02260008980F0001)
Charts Affected:	11356_1, 1116A_1, 11340_1, 411_1

Remarks:

OBSTRN/remrks: Obstruction was located with side scan sonar and further developed using a multibeam echosounder. Feature submitted as DTON1; corresponds to Primary SSS contact 224-150725P

Feature Correlation

Source	Feature	Range	Azimuth	Status
H12333_Features_Compile.000	US 0000563215 00001	0.00	000.0	Primary

Hydrographer Recommendations

Add to chart

Cartographically-Rounded Depth (Affected Charts):

49ft (11356_1)

8fm (1116A_1, 11340_1, 411_1)

S-57 Data

Geo object 1:	Obstruction (OBSTRN)
Attributes:	NINFOM - Chart obstruction
	QUASOU - 6:least depth known
	SORDAT - 20111105
	SORIND - US,US,graph,H12333

TECSOU - 3:found by multi-beam

VALSOU - 14.925 m

WATLEV - 3:always under water/submerged

Office Notes

SAR: Feature located at survey position by 200% sidescan sonar and object detection multibeam. Feature was reported as a danger to navigation and has been applied to current charts.

COMPILE: Revise 49 ft obstruction to 49 ft shoal sounding at the survey position.

Feature Images

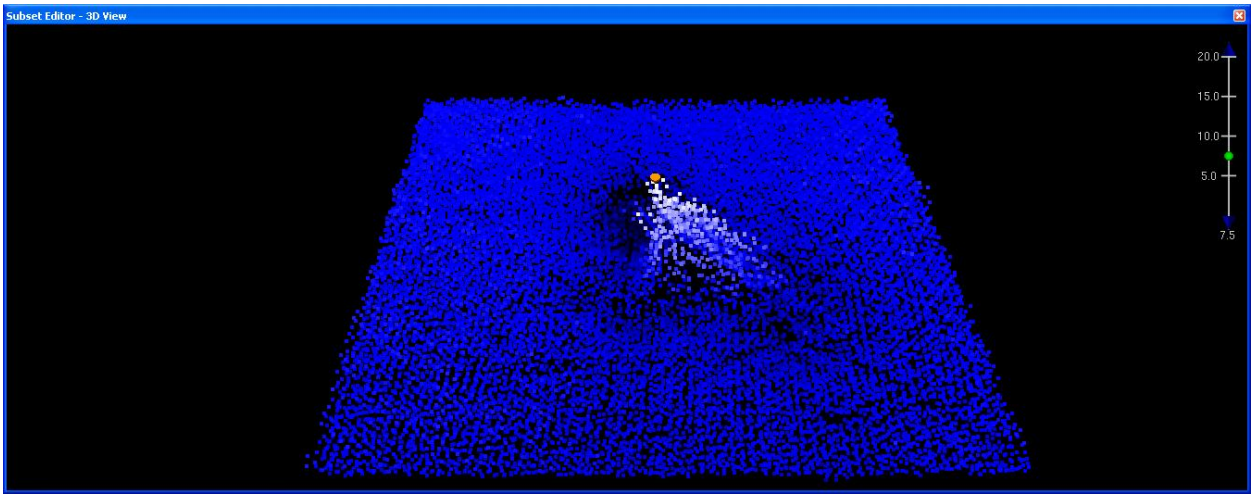


Figure 1.1.1

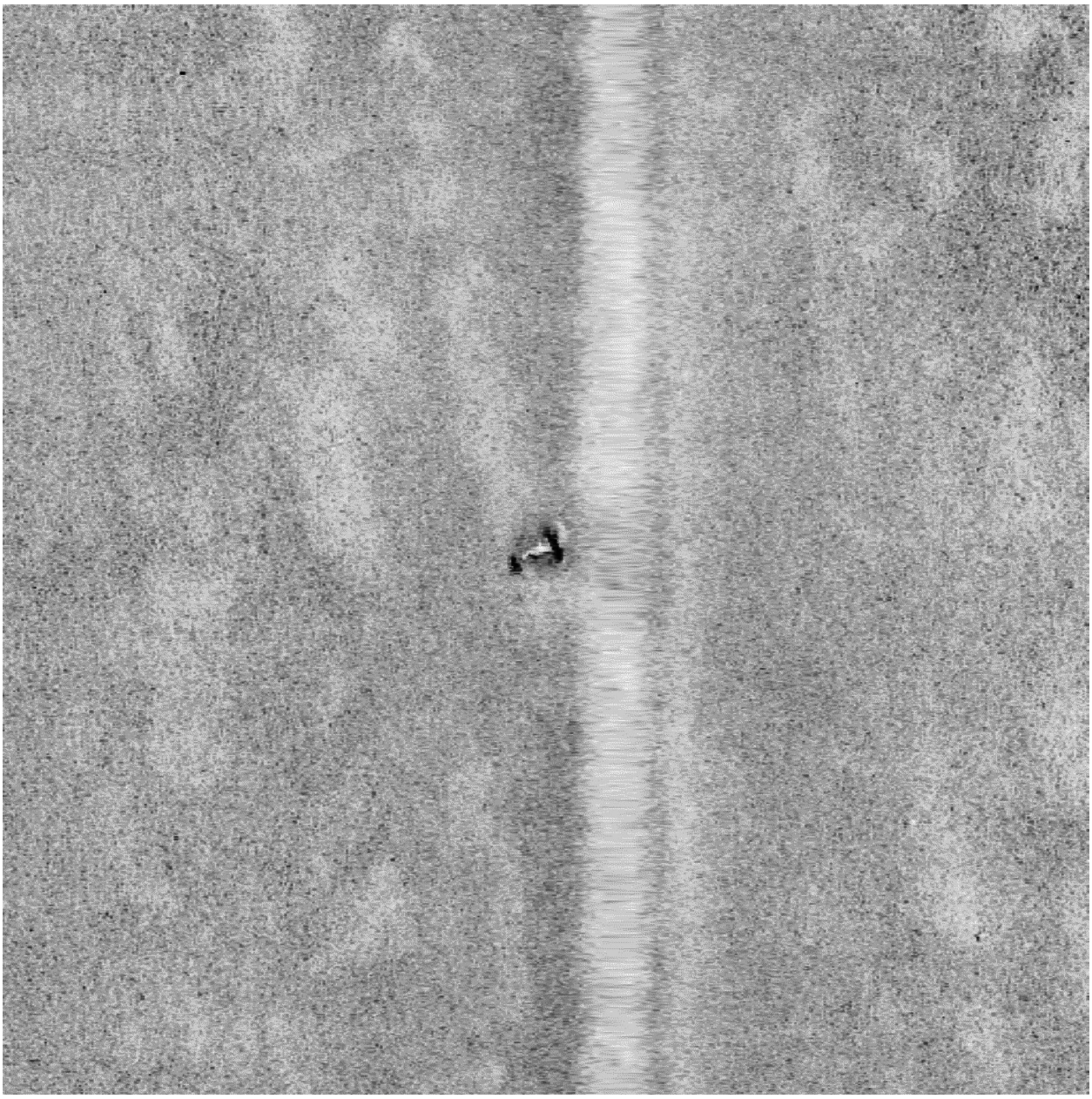


Figure 1.1.2

H12333 AWOIS

Registry Number: H12333
State: Louisiana
Locality: Gulf of Mexico
Sub-locality: 27 NM South of Point Au Fer Island
Project Number: OPR-K354-KR-11
Survey Date: 11/05/2011

Charts Affected

Number	Edition	Date	Scale (RNC)	RNC Correction(s)*
11356	39th	06/01/2012	1:80,000 (11356_1)	USCG LNM: 5/14/2013 (5/21/2013) NGA NTM: 1/14/2012 (6/1/2013)
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	AWOIS #12793 - Delete	GP	[None]	28° 46' 01.2" N	091° 17' 30.7" W	---
1.2	AWOIS #12791 - Delete	GP	[None]	28° 47' 59.9" N	091° 14' 00.6" W	---

1 - AWOIS

1.1) AWOIS #12793 - Delete

Survey Summary

Survey Position:	28° 46' 01.2" N, 091° 17' 30.7" W
Least Depth:	[None]
TPU (±1.96σ):	**THU (TPEh)** [None] ; **TVU (TPEv)** [None]
Timestamp:	2011-309.00:00:00.000 (11/05/2011)
Dataset:	awois.000
FOID:	US 0000000001 02387(0226000000010953)
Charts Affected:	11356_1, 1116A_1, 11340_1, 411_1

Remarks:

$CSYMB/remrks: $CSYMB/remrks: not observed during survey, either visually or within survey data; AWOIS 12793

Feature Correlation

Source	Feature	Range	Azimuth	Status
awois.000	US 0000000001 02387	0.00	000.0	Primary

Hydrographer Recommendations

Remove from chart

S-57 Data

Geo object 1:	Cartographic symbol ($CSYMB)
Attributes:	NINFOM - Delete wreck PA
	NTXTDS - ENC US4LA25M,ED16,Update 10
	SORDAT - 20111105
	SORIND - US,US,graph,H12333

Office Notes

SAR: Charted wreck PA (AWOIS #12793) disproved by 200% sidescan sonar.

COMPILE: Delete charted wreck PA.

1.2) AWOIS #12791 - Delete

Survey Summary

Survey Position:	28° 47' 59.9" N, 091° 14' 00.6" W
Least Depth:	[None]
TPU (±1.96σ):	**THU (TPEh)** [None] ; **TVU (TPEv)** [None]
Timestamp:	2011-309.00:00:00.000 (11/05/2011)
Dataset:	awois.000
FOID:	US 0000000002 02387(0226000000020953)
Charts Affected:	11356_1, 1116A_1, 11340_1, 411_1

Remarks:

$CSYMB/remrks: $CSYMB/remrks: Not observed during the survey, either visually or within survey data; AWOIS 12791

Feature Correlation

Source	Feature	Range	Azimuth	Status
awois.000	US 0000000002 02387	0.00	000.0	Primary

Hydrographer Recommendations

Remove from chart

S-57 Data

Geo object 1:	Cartographic symbol ($CSYMB)
Attributes:	NINFOM - Delete wreck PA
	NTXTDS - ENC US4LA25M,ED16,Update 10
	SORDAT - 20111105
	SORIND - US,US,graph,H12333

Office Notes

SAR: Charted wreck PA (AWOIS #12791) disproved by 200% sidescan sonar.

COMPILE: Delete charted wreck PA.

APPROVAL PAGE

H12333

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

- H12333_DR.pdf
- Collection of depth varied resolution BAGS
- Processed survey data and records
- H12333_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:  For: _____

LT Abigail Higgins, NOAA
Chief, Atlantic Hydrographic Branch