

H12246

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-KR10

Registry No. : H12246

LOCALITY

State: Louisiana

General Locality: Gulf of Mexico

Sublocality: 6 NM N of West Ship Shoal

2011

CHIEFS OF PARTY
Scott Croft, John Baker

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NOAA FORM 77-28 (11-72)		U.S. DEPARTMENT OF COMMERCE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION		REGISTRY No: H12246	
HYDROGRAPHIC TITLE SHEET					
				FIELD NUMBER: Sheet 4	
State: <u>Louisiana</u>					
General Locality: <u>Gulf of Mexico</u>					
Locality: <u>6 NM N of West Ship Shoal</u>					
Scale: <u>1:40,000</u> Date of Survey: June 2010 July 2010 to October 2011					
Instructions Dated: <u>May 2010</u> Project Number: <u>OPR-K354-KR-10</u>					
Vessels: <u>M/V Inez McCall</u>					
Chiefs of Party: <u>Scott Croft, John Baker</u>					
Surveyed by: <u>C&C Technologies Personnel</u>					
Soundings taken by echosounder, hand lead line, or pole: <u>Simrad EM3002 Multibeam Echo sounder</u>					
Verification by: C&C Technologies Personnel Atlantic Hydrographic Branch					
Soundings in: Feet: <u> X </u> Fathoms: <u> </u> Meters: <u> </u> at MLW: <u> </u> MLLW: <u> X </u>					
Remarks: Hydrographic Survey of Sheet 4 (H12246)					
<u>Data collection in meters, referenced to MLLW, later converted into feet</u>					
<u>200% side scan sonar, with concurrent multibeam coverage</u>					
<u>UTC time was used exclusively</u>					
<u>Grab samples were not taken</u>					
<u>Tidal Zones: CGM 716, 717, 718, 732, 733, WGM 266, 414, 415, 416</u>					
<u>Tidal Station: 8762075 (Port Fourchon, LA) UTM Zone 15N</u>					

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

Bold, italic, red notes in the Descriptive Report were made during office processing.

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*SEPARATES

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Separates II	Sound Speed Data
Separates III	Hydrographic Survey Project Instructions and Statement of Work
Separates IV	Crossline Comparisons
Separates V	Side Scan Contact Listing and Images of Significant Contacts

**Data filed with original field records.*

DESCRIPTIVE REPORT TO ACCOMPANY HYDROGRAPHIC SURVEY H12246

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 6 NM N of West Ship Shoal in the Gulf of Mexico. Illustrations No. 1 and 2 show the layout of Sheet 4 (H12246) of Project (OPR-K354-KR-10). Water depths in the survey area range from 13 feet to 29 feet Mean Lower Low Water. Survey statistics that includes the total survey line and crossline nautical miles and number of investigations are shown in Tables No. 1.

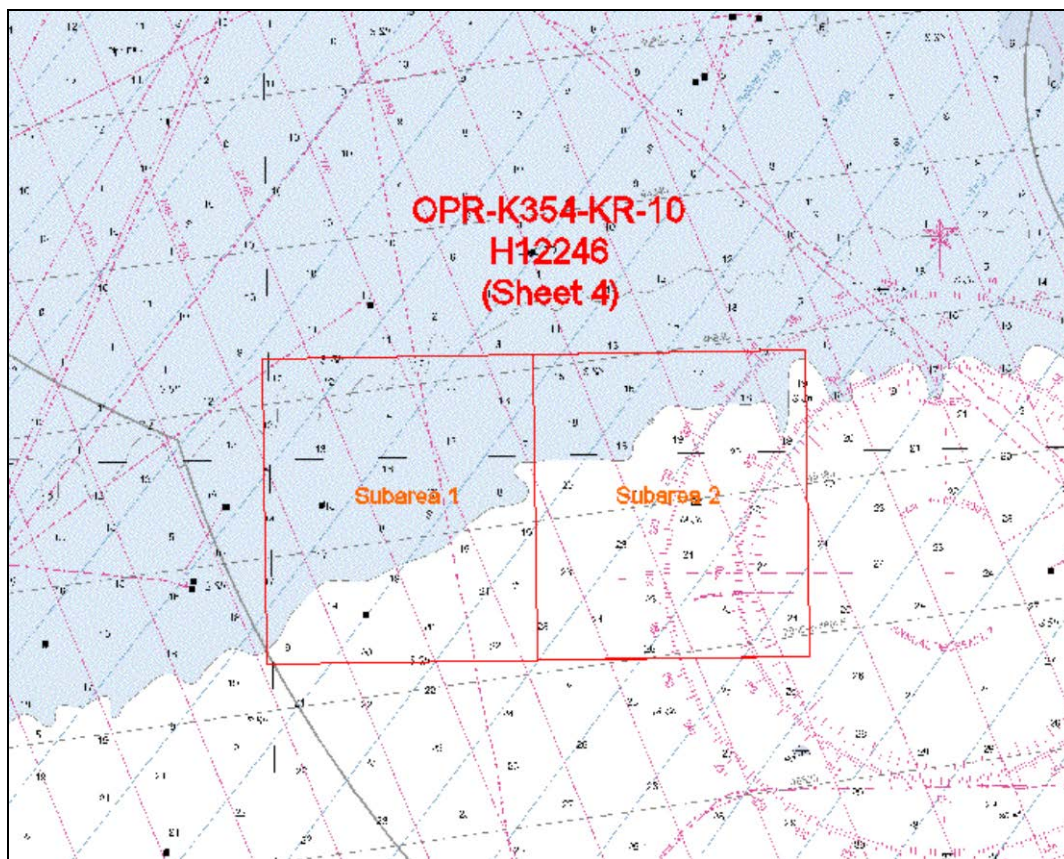


Illustration No. 1: Large Scale Survey Coverage Graphic

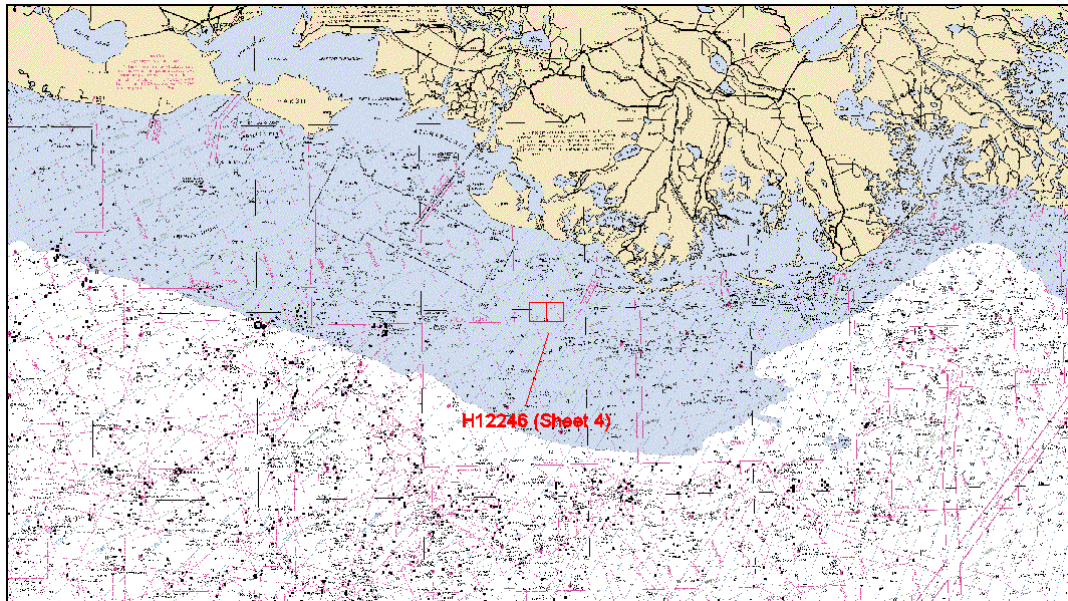


Illustration No. 2: Small Scale Survey Coverage Graphic

Table No. 1: Survey Statistics

	<i>Inez McCall</i>	Total
LNM Side Scan + Multibeam	512.37	512.37
LNM Crosslines	27.21	27.21
LNM Investigations	3.75	3.75

Number of items investigated	5
Total square nautical miles	17.33

ACQUISITION DATES*July 16-18, 20, 21 2010**August 4-8 2010**September 12-15 2010**October 16 2010**August 21 2011**October 3 2011***B. DATA ACQUISITION AND PROCESSING**

Refer to the OPR-K354-KR-10 *Data Acquisition and Processing Report (DAPR) for additional information regarding survey systems, vessel diagrams, operational, processing and quality control procedures. Additional and supplemental information is included in this descriptive report. * *Data included with survey deliverables.*



B.1 EQUIPMENT

The *M/V Inez McCall* conducted survey operations for this project. The vessel is 33.5 meters long and 7.5 meters wide with an approximate draft of 2.75 meters. 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 2.

Table No. 2: 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
Primary Positioning System	CNAV	2050
Secondary Positioning System	CNAV	2050
Tertiary Positioning System	Applanix	POS MV
Sound Speed at Transducer	YSI Electronics	600R
Primary CTD	Seabird	SBE19 Plus
Secondary CTD	Seabird	SBE19
SSS Collection	Sonarwiz	Version 4
Multibeam Collection	C&C Technologies	Hydromap

B.2 QUALITY CONTROL

Side scan sonar and multibeam data were acquired in accordance with the coverage required for this survey. To ensure quality control specific field procedures were conducted as well as a variety of data analyzing tools to validate the data. These methods are briefly outlined below. Refer to the *DAPR for additional data acquisition, processing and quality control procedures. *** Data included with survey deliverables.**

B.2.1 SURVEY METHODS

In order to efficiently carry out this survey, the survey lines were oriented roughly east west throughout the survey area. The side scan was operated with ranges of 100, 75 and 50 meters per channel. This was dependant on line spacing, which was set to 90, 60, and 40 meters respectively. These parameters allowed us to effectively meet the criteria of 200 percent side scan coverage, using Technique 2, as set forth in Section 6.1 of the ** “Specifications and Deliverables” document. Coverage mosaics were developed using an odd/even numbering system to check that sufficient coverage was obtained. ****Data filed with original field records.**

B.2.2 CROSSLINES

Crosslines were run prior to the collection of main line data so that quality control statistics could be performed on the data after each line. Based on pre-plot calculations, the total crossline miles were 27 nm, while the total main line miles were 512 nm. The crosslines comprised about five percent of the total data set as compared to the main scheme lines. Rerun line miles are not included in these totals.

During data acquisition, each main line was also compared to all cross lines for which there was overlapping data. These graphs show the mean difference, RMS difference, and confidence interval for each beam. There is a section of data run over top of ship shoal that was very noisy, making crossline comparisons difficult for the statistical processing software used on the vessel. The lines affected are 4001 to 4007 in subarea 1. The graphs for these seven lines have not been included in *Separates IV. **Data filed with original field records.*

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 frequency distribution of the differences between the mainscheme lines and the crosslines shows that the majority of the deviation is between 0 and -0.4m (Illustration No. 3). This is within specifications for the maximum allowable TVU (total vertical uncertainty) for IHO order 1a surveys in water depths 4 to 9 m. Some of the depth values in upper half of Subarea 1 do lie in the -0.4 to -0.6 range as seen in Illustration No.3. This portion of the survey area was very shallow (4-5m) and the multibeam data collected was very noisy. The same deviation trend is in subarea 2; however, there is a region where the differences are between 0m and 0.2m (Illustration No. 4). Overall, the majority of the depth values of the mainlines and crosslines in this survey do not differ by more than the maximum allowable TVU, which is ± 0.51 in water depths of 4 to 9 m.

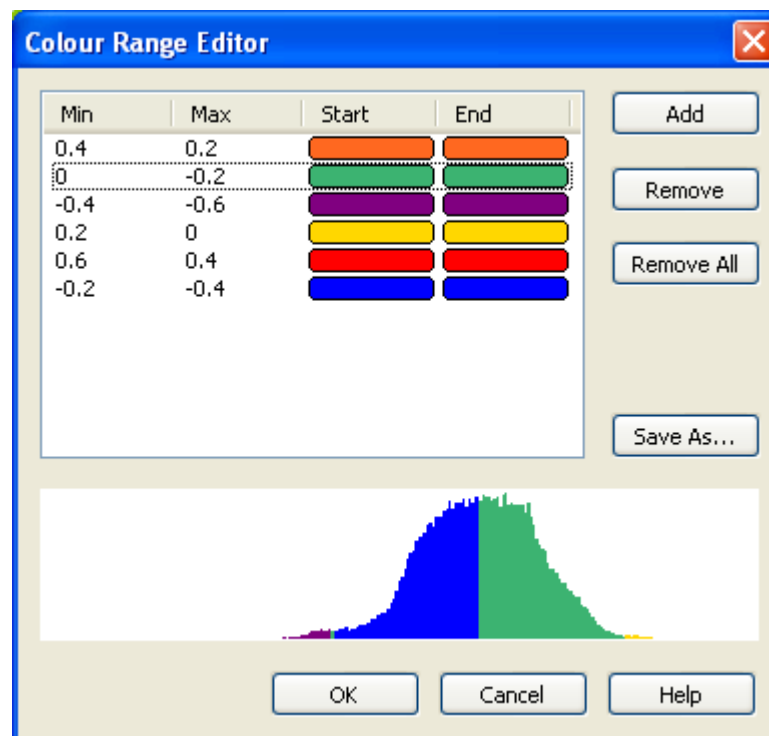


Illustration No. 3. Color range map and histogram used to evaluate the depth differences between mainline and crosslines for Subarea 1.

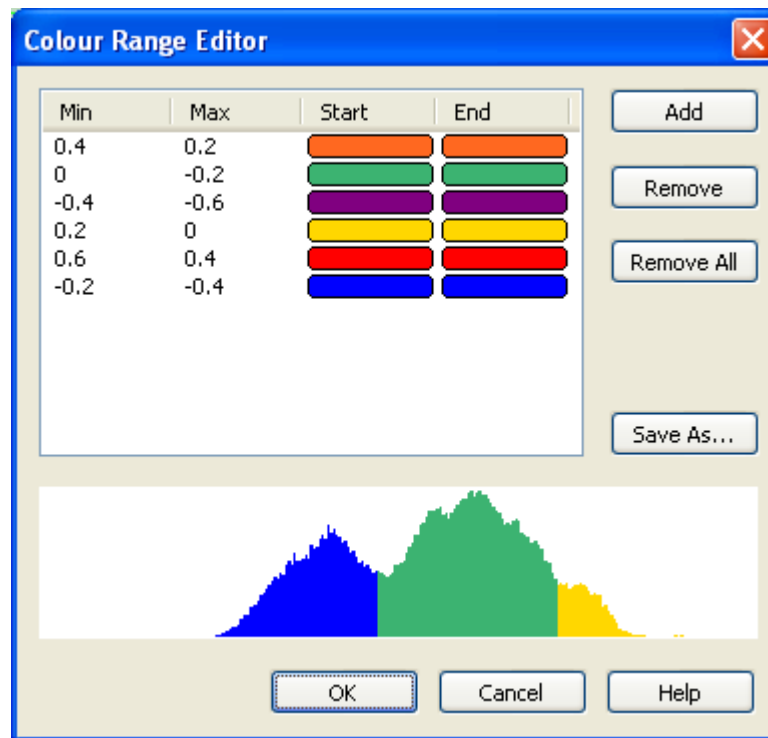


Illustration No. 4. Color range map and histogram used to evaluate the depth differences between mainline and crosslines for Subarea 2.

Additional, crossline information was generated by comparing each of the crosslines to the depth layer of a 1-m BASE surface of the main survey lines. The mainlines and crosslines depth values showed very good agreement. 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. **Data filed with original field records.*

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 no junctions with previous surveys.

B.2.5 SONAR SYSTEM QUALITY CONTROL

Four patch tests were performed to calibrate the multibeam system. An initial patch test, took place south of Cameron, LA on July 6, 2010. Another three patch tests were performed; the first outside of Port Fourchon, LA on the 14th of June 2011, the second was south of



Cameron, LA on July 30th, 2011 and a third on September 20th, 2011 outside Port of Fourchon, LA.

On June 14th, 2011 a patch test was performed for the commencement of the 2011 NOAA project OPR-K354-KR-11. A second test was done as a check on the quality of the first calibration. The results from the July 30th patch tests were used as the final angular offsets. This was done because of concerns with the accuracy of the heading results.

On September 20th, 2011 another patch test was performed due to equipment failure. The EM3002 stopped working; after troubleshooting the topside and connections, it was determined that the problem was below the waterline, either with the cable or with the transducer. The boat was put into dry dock; the transducer and cable were replaced and a new patch test was performed.

All Results of these tests were entered into the SIS software, and are shown in the tables below.

Table No. 3: Patch Test Results (July 6, 2010-South of Cameron, LA)

Roll	Pitch	Heading
-0.236°	2.440°	358.430°

Table No. 4: Patch Test Results (June 30, 2011 – South of Cameron, LA)

Roll	Pitch	Heading
-0.125°	4.463°	-1.665°

Table No. 5: Patch Test Results (September 22, 2011 –South of Port Fourchon , LA)

Roll	Pitch	Heading
-0.117°	4.755°	-1.569°

As well, the angular sector on the multibeam was set so that the criterion of two times water depth, as well as all accuracy, resolution, and detection criteria as set forth in Sections 5.2 and 5.3 of the * “Specifications and Deliverables” document, were met. ** Data filed with original field records*

Leadlines were conducted daily, when possible, to assess whether draft corrections needed to be applied to the multibeam collection software. The lead line logs are included in *Separate I – Data Acquisition and Processing Logs.

An Odom Echotrac MKII single beam echosounder was used as an independent check on the multibeam system. Sound velocity was imputed daily into the echo sounder.

Sound velocity casts were performed daily to measure the sound speed in the water column. Often casts were performed more than once to ensure accurate multibeam bottom detection. The water column sound speed was compared to the sound speed at the transducer. 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.



B.2.6 UNUSUAL CONDITIONS/FACTORS AFFECTING SOUNDINGS

Shallow water was a factor that affected sonar imagery in this survey area. The quality of the side scan sonar was monitored closely and the height of the tow fish adjusted to keep it flying as high as possible in the water column. Another factor concerns a geological feature (Ship Shoal). The shallow depths of the shoal affected the multibeam data acquired in the first seven lines of sub one. The data collected over this feature was very noisy making crossline comparisons difficult.

B.3 CORRECTIONS TO ECHO SOUNDINGS

Prior to data collection on October 7th 2010, the computer for the EM3002 control software was swapped out due to a hardware failure. At this time, the positional and angular EM3002 mounting offsets in the control software (SIS) were also changed. No change should have been made to the offsets, and all future data was collected using these incorrect values.

To correct this error, the HIPS vessel file was updated with a second entry under Swath 1. This entry, beginning on October 7th (2010-280), uses the HVF correction values found in table No. 6 and No. 7 below to adjust the data.

Due to the shallow water in the area, the angular, along track, and across track values went unnoticed. The vertical offset of nearly 0.4 meters was noticed right away when the lead line performed prior to data collection on 2010-280 was off by 0.4 meters. This error was corrected for in the multibeam control software as a subtraction to the waterline to CRP (draft) value. Because of this real-time correction, the 0.398-meter vertical offset is not entered in the HIPS vessel file.

To correct the angular offsets, the patch test results from June 30th, 2011 were used. This was done because after testing, the roll value from this patch test better corrected the data.

Table No. 6: Multibeam positional offsets (from CRP)

	Y (Forward)	X (Starboard)	Z (Vertical)
Correct value (in SIS)	14.518 m	0.170 m	3.048 m
Incorrect value (in SIS)	14.80 m	0.00 m	2.65 m
HVF correction	-0.282	0.170	0.398

Table No. 7: Multibeam angular offsets

	Roll (Positive starboard down)	Pitch (Positive bow up)	Heading (Positive clockwise)
Correct value (in SIS)	-0.125	4.463	358.335 (-1.665)
Incorrect value (in SIS)	0.10	9.3	3.28
HVF correction	-0.225	-4.837	-4.945



B.4 DATA PROCESSING

Refer to the **Data Acquisition and Processing Report* for further details on the side scan sonar and multibeam processing. **Data included with survey deliverables.*

B.4.1 COVERAGE BASE SURFACE AND MOSAICS

Multibeam data processing was conducted using CARIS HIPS/SIPS 6.1 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 the project instructions for this survey, which states that a 1-m BASE surface will be created for 0-20 m water depths. One BASE surface was created for investigations at a scale of 1:40000 and a resolution of 0.5 m.

Side scan sonar data was processed using Chesapeake Technologies SonarWiz4 V.4.04.0118 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. Mosaics at 1m resolutions were created for even and odd lines in each subarea to check for 100% SSS coverage.

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 (2010), 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 investigated 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. *** Data filed with original records*

C. VERTICAL AND HORIZONTAL CONTROL

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. 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. *Concur.*

D. RESULTS AND RECOMMENDATIONS

See Appendix I and II of this Report for final charting recommendations.

D.1 CHART COMPARISON AND NOTICES TO MARINERS

The following chart was used for comparison purposes.

Table No. 8: Nautical Charts used for Comparison

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

The following table shows the last corrected NM and LNM for the chart.

Table No. 9: Nautical Chart Correction Dates

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

The Notices to Mariners were reviewed from the last updated notice for each digital chart, to September 2010. During that time, there were no notices to mariners issued for the charted area within the survey bounds.

D.1.2 CHARTED SOUNDINGS

The sounding layers were generated from a 1-m BASE surface with a 5-ft single-defined radius for Subareas 1 and 2, respectively, using a radius value of distance on the ground (in ft.). In Subarea 1 there is a general deepening from 13 ft in the northeast corner to 27ft in the southwest corner. In Subarea 2 there is a general deepening from 17 ft in the northeast corner to 29 ft in the southwest corner. Overall, surveyed depths are two to three feet deeper than ~~surveyed~~ **charted** depths. There are some areas where the difference is as large as five feet (see Illustration No. 5), and as little as one foot (see Illustration No. 6). But there is no pattern to this distribution.

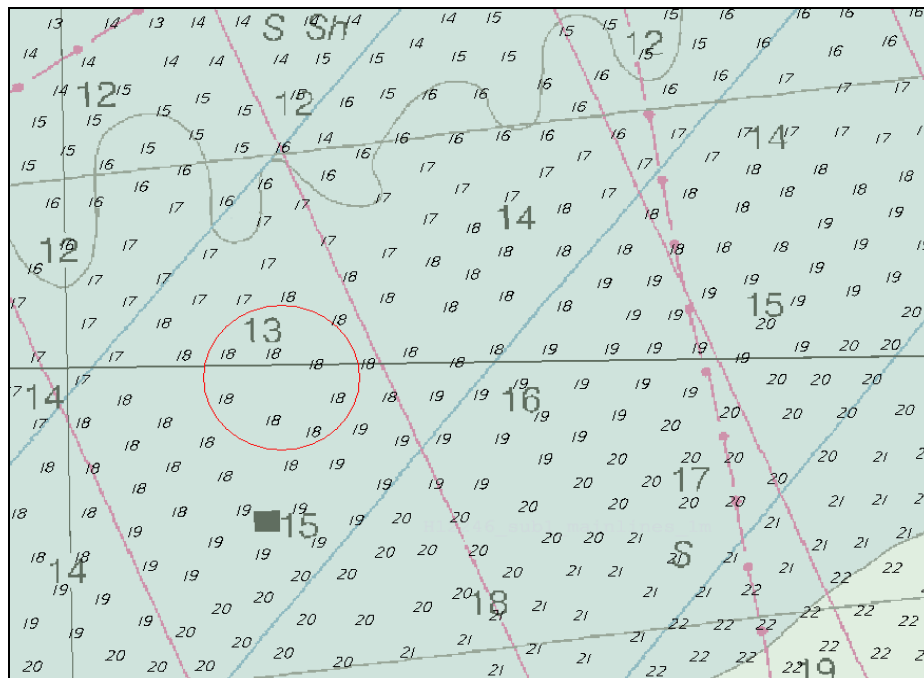


Illustration No. 5. Region on the eastern side of the survey area where surveyed soundings around the 13ft charted sounding (red circle) are up to 5 ft deeper.

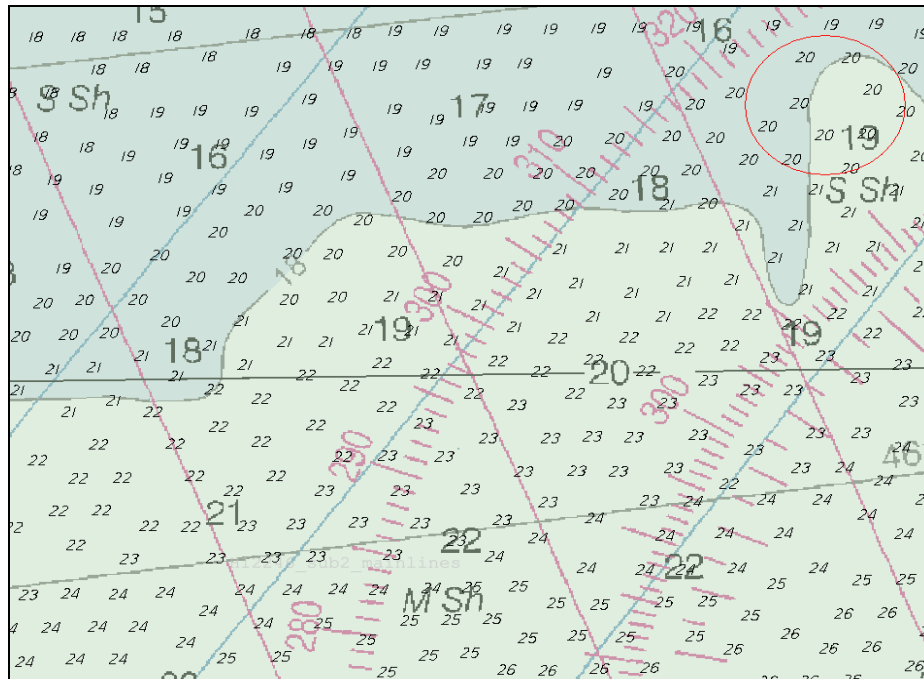


Illustration No. 6. Region on the top western side of the survey area where surveyed soundings around the 19-ft charted sounding (red circle) are only 1 ft deeper.

D.1.3 CHARTED FEATURES

D.1.3.1 AWOIS ITEMS

There are no AWOIS items assigned for full investigation within the H12246 survey area.
Concur.

D.1.3.2 INVESTIGATION ITEMS

A total of five investigations were conducted in the survey area (Table No. 10). Additional information regarding these contacts is logged in the Side Scan Sonar Contact list in *Separate V. Three of the five investigated items have soundings designated in CARIS to ensure that a least depth would carry through to the final BASE surface. ***Data filed with original field records.**

Significant contact 256-031047P was first investigated on August 21, 2011 (JD 233) and additional coverage obtained on October 3, 2011 (JD 276). These investigations confirmed the contact as significant with a least depth of 4.148 m in surrounding charted water depths of 4 m. This contact was submitted as a DTON (see following section D.1.3.3).

A significant contact 289-135406P was detected on lines 4005-1 and 4006-1 and it was further investigated August 21, 2011 (JD 233). The multibeam investigation lines proved that it was significant. Its' least depth was 4.659m in approximately 5.5m surveyed depths in the surrounding area, meaning this feature protrudes close to a meter above the sea floor. This



contact was submitted to AHB but it was rejected as a danger to navigation based on the current charted depths for the area. The current charted depths are shoaler than the submitted feature's least depth. The feature is in line with the current charted depths.

Another significant contact was located on line 4034-1 and it was evident on an adjacent line (4035-1) as an insignificant contact. As well the object was not fully ensonified by multibeam therefore it was further investigated on August 21, 2011 (JD 233). This target was found to be insignificant. The multibeam investigation lines fully ensonified the target; however its least depth was found to be 5.241m in surroundings waters 6m deep.

A potential target was located on line 4085-1, approximately 33m from nadir. The target was not evident on the adjacent line 4086-1. The object was not ensonified by the multibeam of line 4085-1, and further multibeam data was acquired on August 21, 2011 (JD 233). No SSS or multibeam investigation lines picked up any target on primary contact 198-080426S coordinates so it is not considered a real feature.

Another potential danger to navigation was located on line 4152-1, approximately 50m from nadir. Once this target was investigated on August 21st, 2011 its existence was disproved by multibeam.

Table No. 10: Significant features that required further investigation.

Primary SSS Contact Number	Subarea	Least Depth (m)	Survey Latitude	Survey Longitude	Remarks
256-031047P	1	4.148	029°00'393"N	091°09'12.1"W	Submitted as a DTON
289-135406P	1	4.659	029°00'54.9"N	091°07'31.0"W	Submitted as a DTON but rejected by AHB
217-080035S	1	5.241	029°00'13.7"N	091°08'41.5"W	Not a significant contact
198-080426S	1	N/A	N/A	N/A	Existence disproved by MB investigation
218-140906P	2	N/A	N/A	N/A	Existence disproved by MB investigation

D.1.3.3 DANGER TO NAVIGATION REPORTS

One Danger to Navigation report was issued for the survey area resulting from the investigation of Primary contact 256-031047P. The H12246 Danger to Navigation is shown in Table No. 10 and a copy of the report is included in **Appendix I. *Data appended to this Report.*

Table No. 11: DTON

Feature	Depth (ft)	Depth (m)	Survey Latitude	Survey Longitude
Obstruction	13.609	4.148	029°00'39"N	091°09'12"W

D.1.3.4 EXISTING INFRASTRUCTURE

The following platforms in Table No. 12 were found as charted. These are the only two platforms charted in the survey area, and no uncharted platforms were found. The position of



these platforms was calculated from the layback corrected primary side scan sonar file. See *Data Acquisition and Processing Report for details on primary and secondary contacts.

* *Data included with survey deliverables.*

Table No. 12: Charted Platforms – Found as Charted

Surveyed Position			
Latitude	Longitude	Platform Name	Chart Action
28°58'27.182"N	91°08'56.001"W	SS 76#3	Remain as charted
28°59'33.458"N	91°09'25.856"W	No visible name	Remain as charted

D.1.3.5 FEATURE REPORT

S57 feature file for oil and gas infrastructure has been submitted in a Caris Notebook project.

D.2 ADDITIONAL RESULTS

D.2.1 PRIOR SURVEYS

Comparison with prior surveys was not required for this survey area. See 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. *Concur.*

D.2.3 OTHER PERTINENT INFORMATION

The following is a list of acronyms that may be found in the DR, DAPR, project logs, sidescan sonar logs and sonar contact listing.

HM	Harmonic mean
WD	Water depth
LL	Lead line
MB	Multibeam
SB	Singlebeam
WOW	Wait on weather
EOL	End of line
SOL	Start of line
SSS	Side scan sonar
RR	Re-run
SS	Ship Shoal (block name)
ST	South Timbalier (block name)
PL	South Pelto (block name)
SSP	Sound Speed Profile
C/I	Cable in



C/O	Cable out
Wpt	Waypoint
P/L	Pipeline
P/F	Platform

LETTER OF APPROVAL

REGISTRY NUMBER H12246

This report and the accompanying smooth sheet are respectfully submitted.

Field operations contributing to the accomplishment of the survey H12246 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-10.

A handwritten signature in black ink, appearing to read 'JB' or 'John Baker'.

John Baker
Chief of Party
C&C Technologies
November 2011

APPENDIX I

DANGERS TO NAVIGATION

H12446_Danger To Navigation

Registry Number:

State:

Locality:

Sub-locality:

Project Number:

Survey Date: [None]

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 #2: Add dangerous 13 ft obstructions. Delete charted 13 foot obstructions Rep (2011)	Obstruction	4.15 m	29° 00' 39.5" N	091° 09' 12.3" W	---

1.1) DTON #2: Add dangerous 13 ft obstructions. Delete charted 13 foot obstructions Rep (2011)

DANGER TO NAVIGATION

Survey Summary

Survey Position: 29° 00' 39.5" N, 091° 09' 12.3" W
Least Depth: 4.15 m (= 13.61 ft = 2.268 fm = 2 fm 1.61 ft)
TPU ($\pm 1.96\sigma$): THU (TPEh) [None] ; TVU (TPEv) [None]
Timestamp: 2011-306.12:54:17.000 (11/02/2011)
Dataset: H12246_DTON.000
FOID: US 0000090696 00001(0226000162480001)
Charts Affected: 11356_1, 1116A_1, 11340_1, 411_1

Remarks:

OBSTRN/remrks: This feature consists of a shoal area adjacent to several vertical pillar-like objects protruding from the seafloor. Including the shoal and adjacent targets, the area measures 48837ft². Taken from the top of one of the pillar formations, a least depth measurement of 13.609ft was determined. After verified tide corrections, the surveyed depths in this area are 17.5ft. With this calculated depth, the obstruction protrudes approximately 4 ft above the sea floor. The features were located using sidescan sonar and further developed using a multibeam echo sounder.

Feature Correlation

Source	Feature	Range	Azimuth	Status
H12246_DTON.000	US 0000090696 00001	0.00	000.0	Primary

Hydrographer Recommendations

It is recommended that this item be charted as a 13 ft obstruction at 29/00/39N, 91/09/12W.

Cartographically-Rounded Depth (Affected Charts):

13ft (11356_1)

2 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
OBJNAM - 256-031047P

QUASOU - 6:least depth known

SORDAT - 20111003

SORIND - US,US,graph,H12246

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

VALSOU - 4.148 m

WATLEV - 3:always under water/submerged

Office Notes

Compilation: Concur. Delete charted dangerous obstructions Rep (2011). Add dangerous 13 ft obstructions in the present survey location.

Feature Images

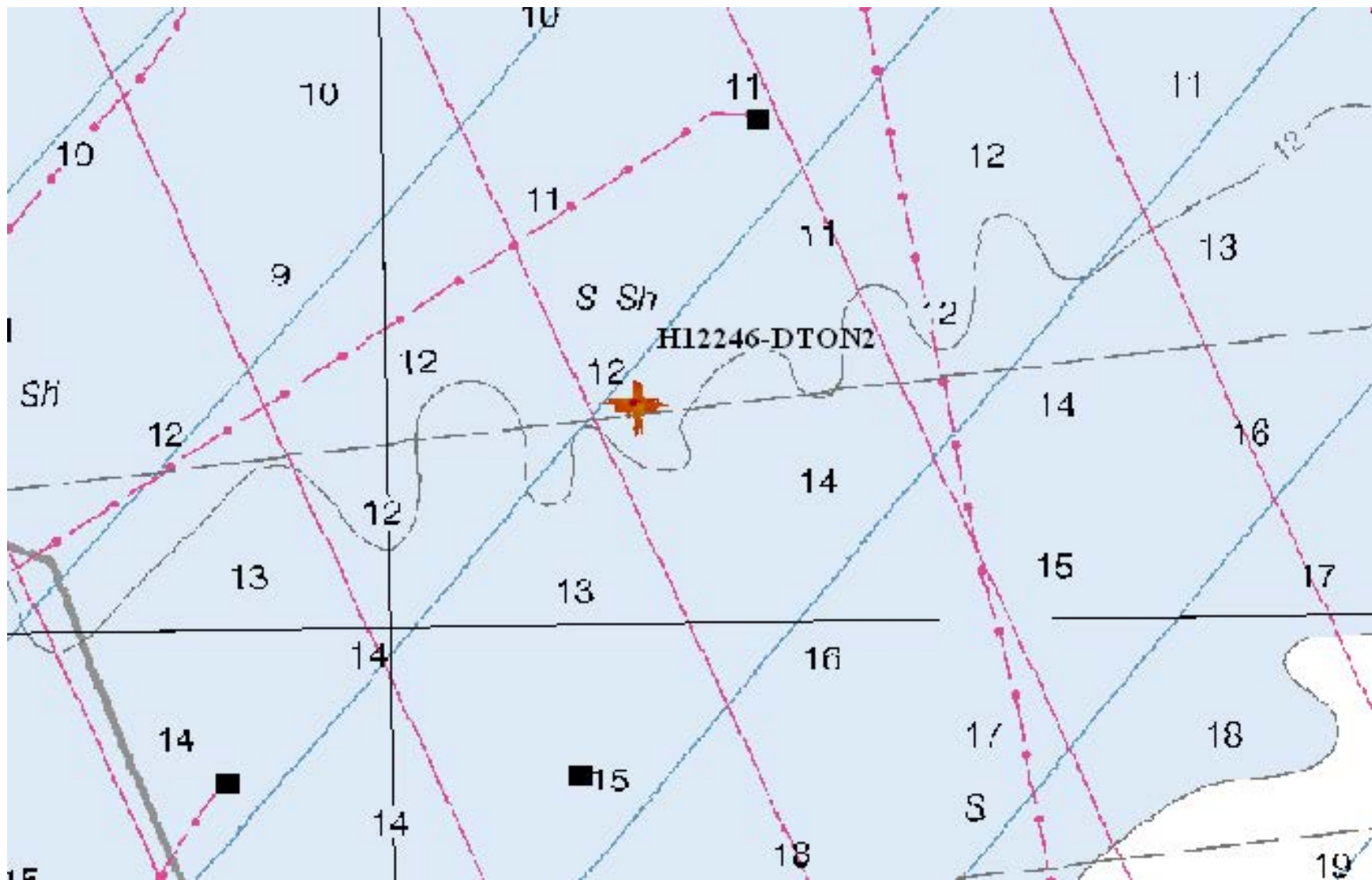


Figure 1.1.1

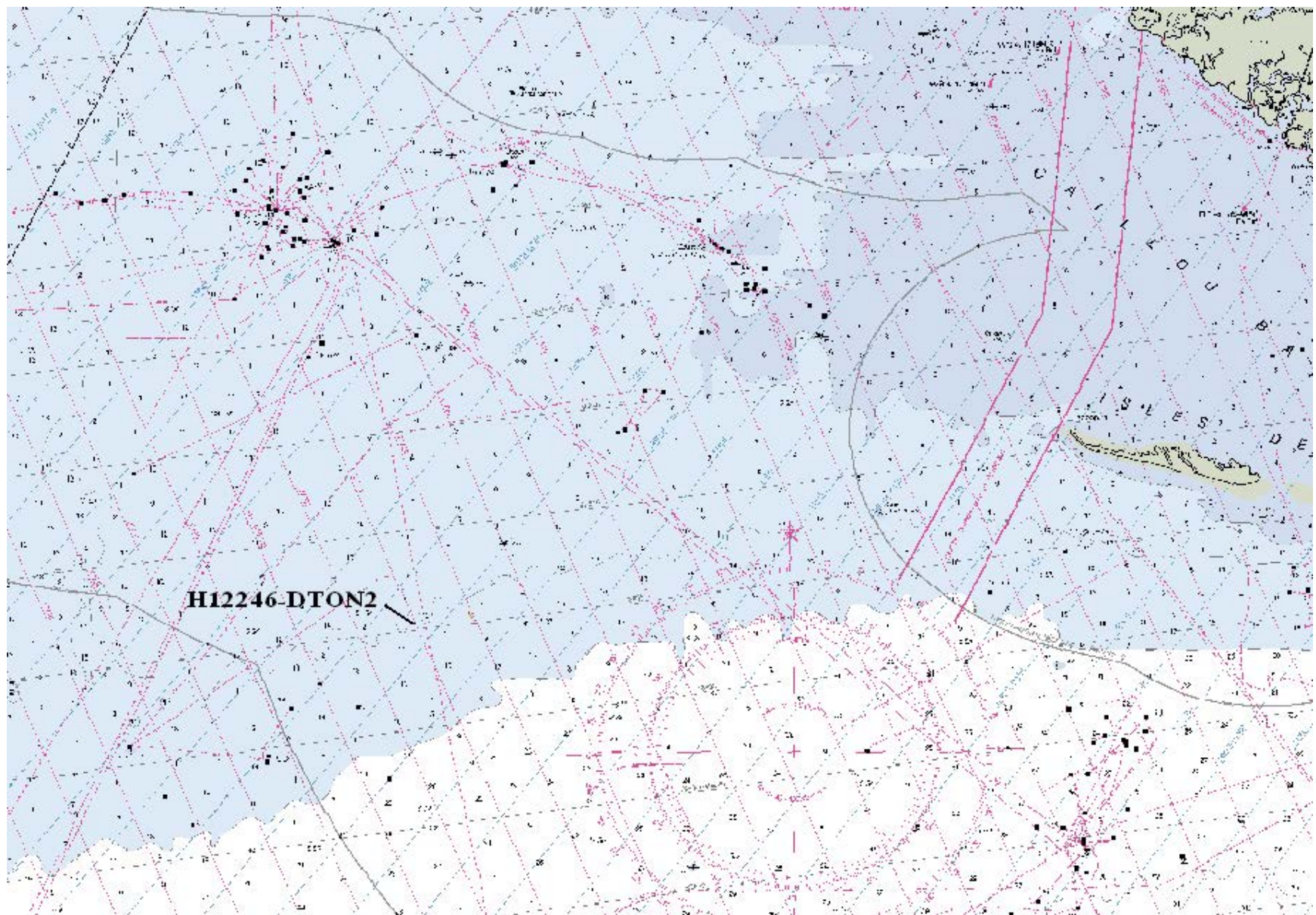


Figure 1.1.2

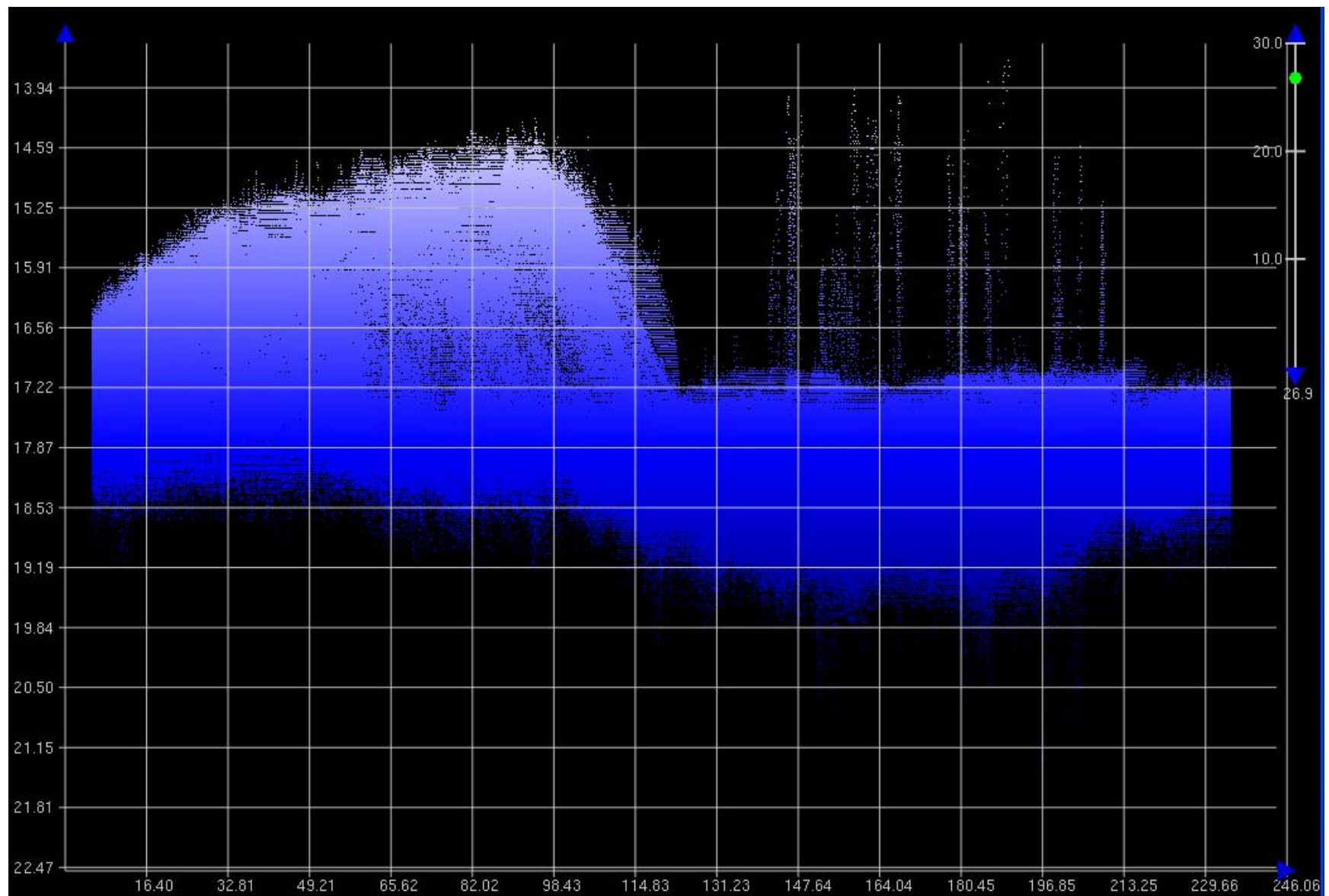


Figure 1.1.3

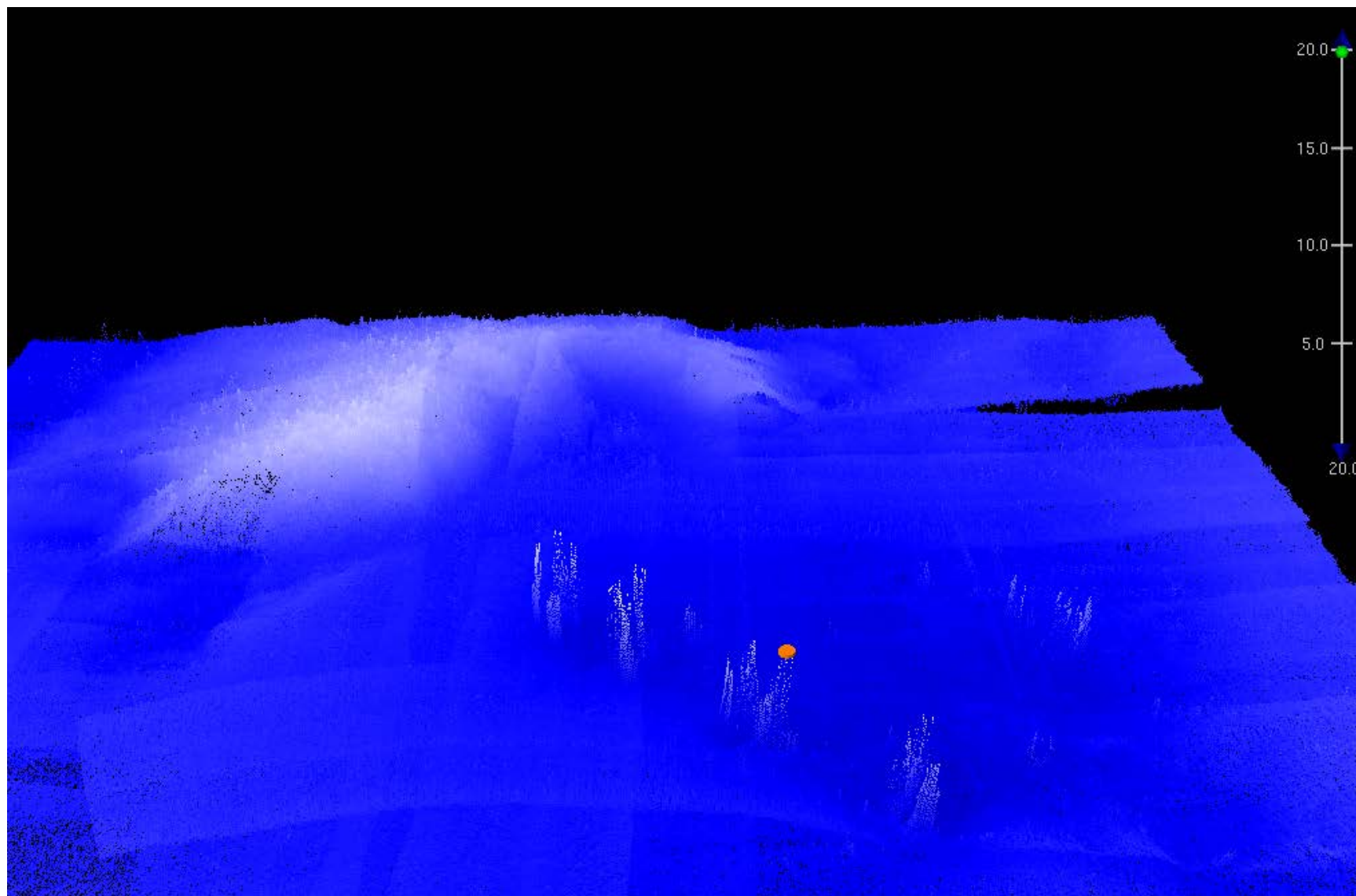
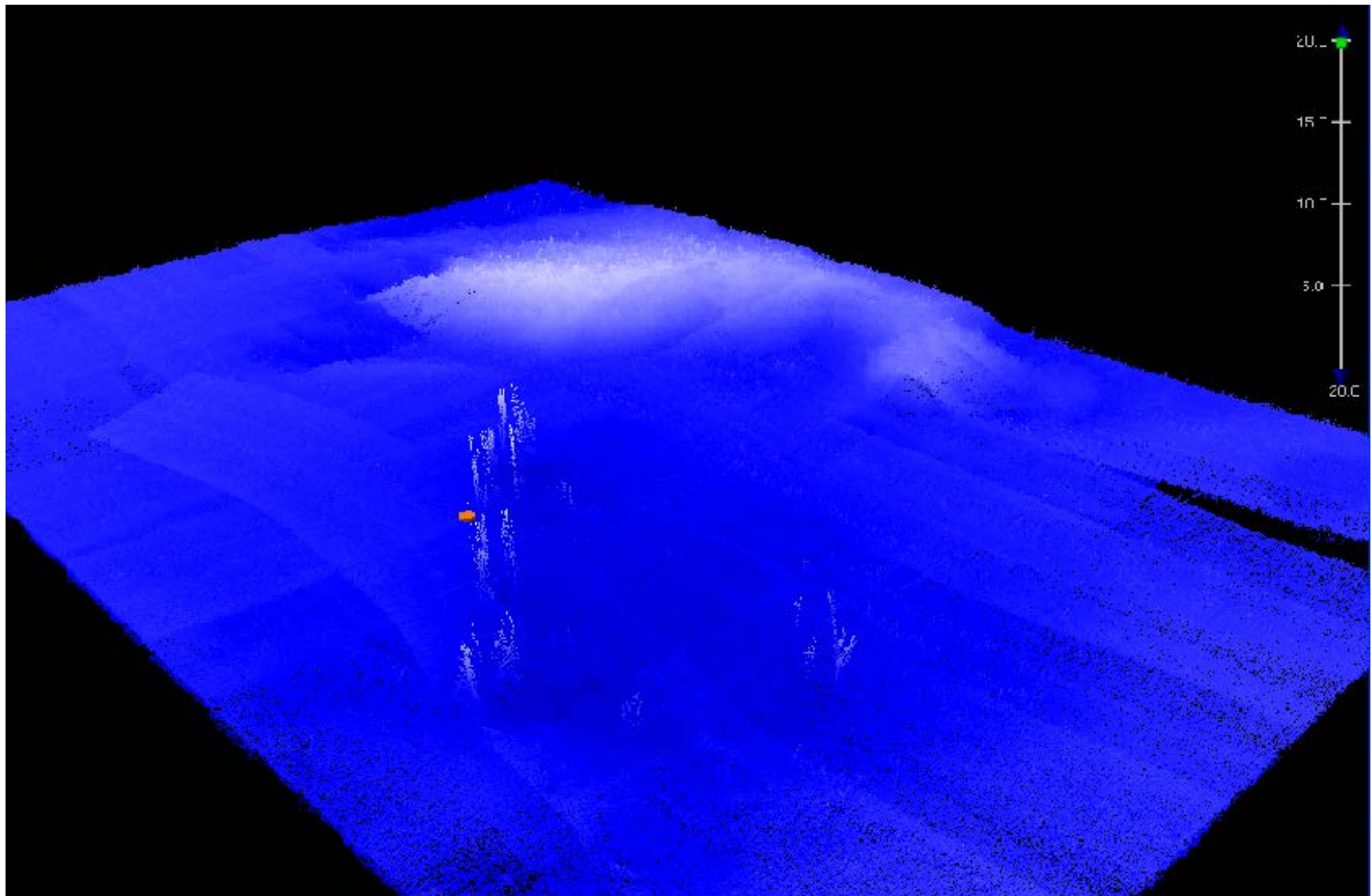


Figure 1.1.4

*Figure 1.1.5*

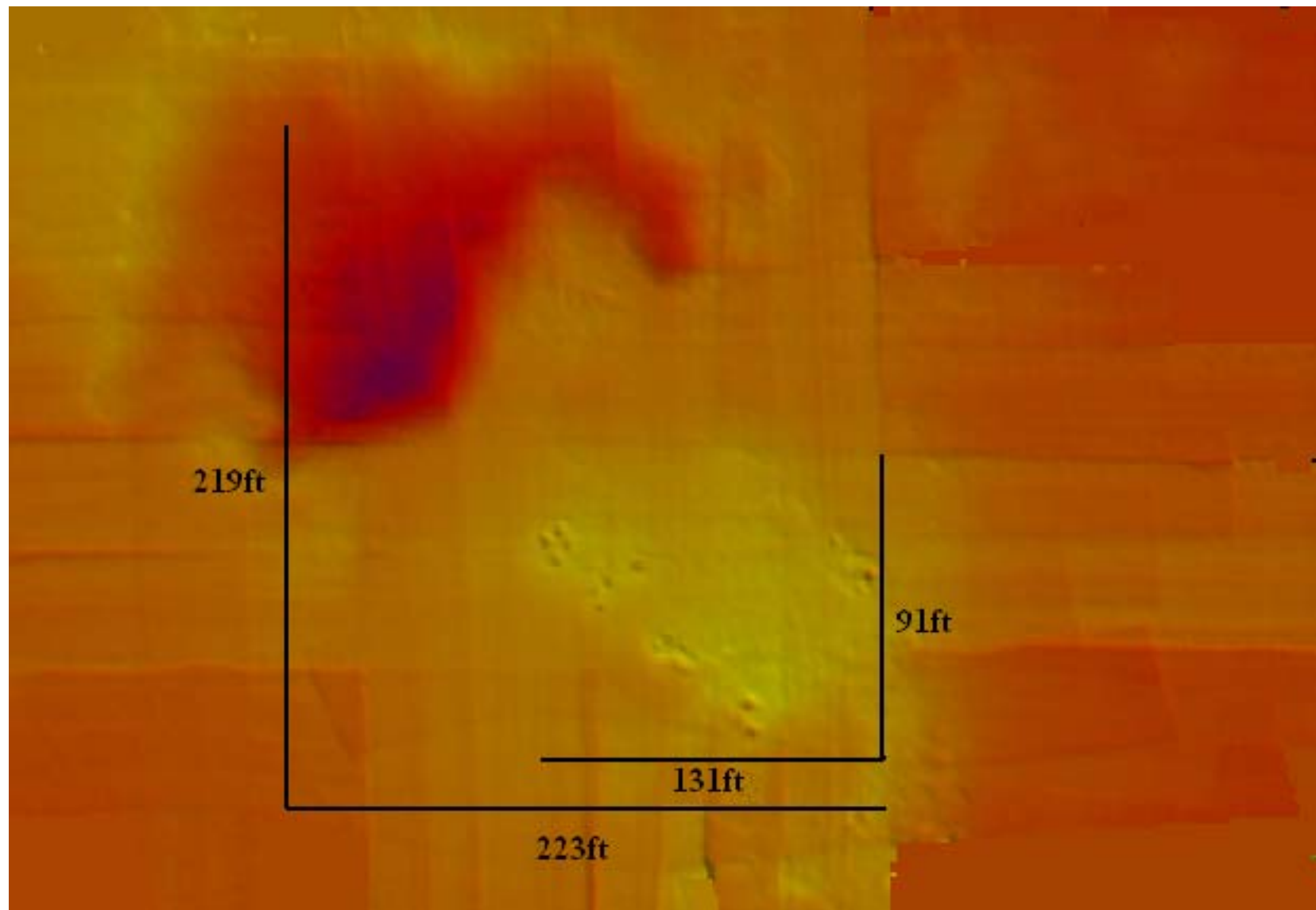


Figure 1.1.6



Figure 1.1.7

APPENDIX II

SURVEY FEATURES REPORT

H12246_Charted Features

Registry Number:

State:

Locality:

Sub-locality:

Project Number:

Survey Date: 10/03/2011

Charts Affected

Number	Edition	Date	Scale (RNC)	RNC Correction(s)*
11356	38th	06/01/2008	1:80,000 (11356_1)	USCG LNM: 9/27/2011 (9/27/2011) NGA NTM: 10/16/2010 (10/8/2011)
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	Delete charted platform, add present survey platform.	GP	[None]	28° 59' 33.4" N	091° 09' 25.4" W	---
1.2	Delete charted platform, add present survey platform.	GP	[None]	28° 58' 27.2" N	091° 08' 56.0" W	---

1.1) Delete charted platform, add present survey platform.

Survey Summary

Survey Position: 28° 59' 33.4" N, 091° 09' 25.4" W
Least Depth: [None]
TPU ($\pm 1.96\sigma$): THU (TPEh) [None] ; TVU (TPEv) [None]
Timestamp: 2011-276.00:00:00.000 (10/03/2011)
Dataset: H12246_Features.000
FOID: US 0000090686 00001(02260001623E0001)
Charts Affected: 11356_1, 1116A_1, 11340_1, 411_1

Remarks:

OFSPFL/remrks: Platforms were found as charted

Feature Correlation

Source	Feature	Range	Azimuth	Status
H12246_Features.000	US 0000090686 00001	0.00	000.0	Primary

Hydrographer Recommendations

Remain as charted

S-57 Data

Geo object 1: Offshore platform (OFSPFL)
Attributes: NINFOM - Add offshore platform
OBJNAM - No visible name
SORDAT - 20111003
SORIND - US,US,graph,H12246

Office Notes

COMPILATION: Concur. Delete charted platform, add present survey platform.

1.2) Delete charted platform, add present survey platform.

Survey Summary

Survey Position: 28° 58' 27.2" N, 091° 08' 56.0" W
Least Depth: [None]
TPU ($\pm 1.96\sigma$): THU (TPEh) [None] ; TVU (TPEv) [None]
Timestamp: 2011-276.00:00:00.000 (10/03/2011)
Dataset: H12246_Features.000
FOID: US 0000090685 00001(02260001623D0001)
Charts Affected: 11356_1, 1116A_1, 11340_1, 411_1

Remarks:

OFSPFL/remrks: Platforms were found as charted

Feature Correlation

Source	Feature	Range	Azimuth	Status
H12246_Features.000	US 0000090685 00001	0.00	000.0	Primary

Hydrographer Recommendations

Remain as charted

S-57 Data

Geo object 1: Offshore platform (OFSPFL)
Attributes: NINFOM - Add offshore platform
OBJNAM - SS 76#3
SORDAT - 20111003
SORIND - US,US,graph,H12246

Office Notes

COMPILATION: Concur. Delete charted platform, add present survey platform.

H12246_Bottom Samples

Registry Number:

State:

Locality:

Sub-locality:

Project Number:

Survey Date: 01/01/2006

Charts Affected

Number	Edition	Date	Scale (RNC)	RNC Correction(s)*
11356	38th	06/01/2008	1:80,000 (11356_1)	USCG LNM: 9/27/2011 (9/27/2011) NGA NTM: 10/16/2010 (10/8/2011)
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	Retain Seabed Characteristic - sand,shells	GP	[None]	29° 00' 58.9" N	091° 09' 17.2" W	---
1.2	Retain Seabed Characteristic - sand	GP	[None]	28° 59' 25.5" N	091° 08' 12.2" W	---
1.3	Retain Seabed Characteristic - sand,shells	GP	[None]	28° 57' 57.4" N	091° 08' 08.0" W	---
1.4	Retain Seabed Characteristic - sticky	GP	[None]	28° 58' 43.1" N	091° 07' 14.3" W	---
1.5	Retain Seabed Characteristic - sand,shells	GP	[None]	29° 00' 48.8" N	091° 06' 22.7" W	---
1.6	Retain Seabed Characteristic - mud,shells	GP	[None]	28° 59' 23.3" N	091° 05' 35.9" W	---

1.1) Retain Seabed Characteristic - sand,shells

Survey Summary

Survey Position: 29° 00' 58.9" N, 091° 09' 17.2" W
Least Depth: [None]
TPU ($\pm 1.96\sigma$): THU (TPEh) [None] ; TVU (TPEv) [None]
Timestamp: 2006-001.00:00:00.000 (01/01/2006)
Dataset: H12246_BottomSamples.000
FOID: US 0000090716 00001(02260001625C0001)
Charts Affected: 11356_1, 1116A_1, 11340_1, 411_1

Remarks:

[None]

Feature Correlation

Source	Feature	Range	Azimuth	Status
H12246_BottomSamples.000	US 0000090716 00001	0.00	000.0	Primary

Hydrographer Recommendations

[None]

S-57 Data

Geo object 1: Seabed area (SBDARE)
Attributes: NATSUR - 4,17:sand,shells
 NINFOM - Retain Seabed Characteristic
 SORDAT - 20060100
 SORIND - US,US,graph,chart 11356

Office Notes

COMPILATION; Retain Seabed Characteristic

1.2) Retain Seabed Characteristic - sand

Survey Summary

Survey Position: 28° 59' 25.5" N, 091° 08' 12.2" W
Least Depth: [None]
TPU ($\pm 1.96\sigma$): THU (TPEh) [None] ; TVU (TPEv) [None]
Timestamp: 2006-001.00:00:00.000 (01/01/2006)
Dataset: H12246_BottomSamples.000
FOID: US 0000090718 00001(02260001625E0001)
Charts Affected: 11356_1, 1116A_1, 11340_1, 411_1

Remarks:

[None]

Feature Correlation

Source	Feature	Range	Azimuth	Status
H12246_BottomSamples.000	US 0000090718 00001	0.00	000.0	Primary

Hydrographer Recommendations

[None]

S-57 Data

Geo object 1: Seabed area (SBDARE)
Attributes: NATSUR - 4:sand
NINFOM - Retain Seabed Characteristic
SORDAT - 20060100
SORIND - US,US,graph,chart 11356

Office Notes

COMPILATION; Retain Seabed Characteristic

1.3) Retain Seabed Characteristic - sand,shells

Survey Summary

Survey Position: 28° 57' 57.4" N, 091° 08' 08.0" W
Least Depth: [None]
TPU ($\pm 1.96\sigma$): THU (TPEh) [None] ; TVU (TPEv) [None]
Timestamp: 2006-001.00:00:00.000 (01/01/2006)
Dataset: H12246_BottomSamples.000
FOID: US 0000090714 00001(02260001625A0001)
Charts Affected: 11356_1, 1116A_1, 11340_1, 411_1

Remarks:

[None]

Feature Correlation

Source	Feature	Range	Azimuth	Status
H12246_BottomSamples.000	US 0000090714 00001	0.00	000.0	Primary

Hydrographer Recommendations

[None]

S-57 Data

Geo object 1: Seabed area (SBDARE)
Attributes: NATSUR - 4,17:sand,shells
 NINFOM - Retain Seabed Characteristic
 SORDAT - 20060100
 SORIND - US,US,graph,chart 11356

Office Notes

COMPILATION; Retain Seabed Characteristic

1.4) Retain Seabed Characteristic - sticky

Survey Summary

Survey Position: 28° 58' 43.1" N, 091° 07' 14.3" W
Least Depth: [None]
TPU ($\pm 1.96\sigma$): THU (TPEh) [None] ; TVU (TPEv) [None]
Timestamp: 2006-001.00:00:00.000 (01/01/2006)
Dataset: H12246_BottomSamples.000
FOID: US 0000090715 00001(02260001625B0001)
Charts Affected: 11356_1, 1116A_1, 11340_1, 411_1

Remarks:

[None]

Feature Correlation

Source	Feature	Range	Azimuth	Status
H12246_BottomSamples.000	US 0000090715 00001	0.00	000.0	Primary

Hydrographer Recommendations

[None]

S-57 Data

Geo object 1: Seabed area (SBDARE)
Attributes: NATQUA - 5:sticky
 NINFOM - Retain Seabed Characteristic
 SORDAT - 20060100
 SORIND - US,US,graph,chart 11356

Office Notes

COMPILATION; Retain Seabed Characteristic

1.5) Retain Seabed Characteristic - sand,shells

Survey Summary

Survey Position: 29° 00' 48.8" N, 091° 06' 22.7" W
Least Depth: [None]
TPU ($\pm 1.96\sigma$): THU (TPEh) [None] ; TVU (TPEv) [None]
Timestamp: 2006-001.00:00:00.000 (01/01/2006)
Dataset: H12246_BottomSamples.000
FOID: US 0000090719 00001(02260001625F0001)
Charts Affected: 11356_1, 1116A_1, 11340_1, 411_1

Remarks:

[None]

Feature Correlation

Source	Feature	Range	Azimuth	Status
H12246_BottomSamples.000	US 0000090719 00001	0.00	000.0	Primary

Hydrographer Recommendations

[None]

S-57 Data

Geo object 1: Seabed area (SBDARE)
Attributes: NATSUR - 4,17:sand,shells
 NINFOM - Retain Seabed Characteristic
 SORDAT - 20060100
 SORIND - US,US,graph,chart 11356

Office Notes

COMPILATION; Retain Seabed Characteristic

1.6) Retain Seabed Characteristic - mud,shells

Survey Summary

Survey Position: 28° 59' 23.3" N, 091° 05' 35.9" W
Least Depth: [None]
TPU ($\pm 1.96\sigma$): THU (TPEh) [None] ; TVU (TPEv) [None]
Timestamp: 2006-001.00:00:00.000 (01/01/2006)
Dataset: H12246_BottomSamples.000
FOID: US 0000090713 00001(0226000162590001)
Charts Affected: 11356_1, 1116A_1, 11340_1, 411_1

Remarks:

[None]

Feature Correlation

Source	Feature	Range	Azimuth	Status
H12246_BottomSamples.000	US 0000090713 00001	0.00	000.0	Primary

Hydrographer Recommendations

[None]

S-57 Data

Geo object 1: Seabed area (SBDARE)
Attributes: NATSUR - 1,17:mud,shells
 NINFOM - Retain Seabed Characteristic
 SORDAT - 20060100
 SORIND - US,US,graph,chart 11356

Office Notes

COMPILATION; Retain Seabed Characteristic

APPENDIX III

RESERVED

APPENDIX IV

TIDES AND WATER LEVELS

The tidal data applied to all multibeam echo sounder data was downloaded from the following website:

http://tidesandcurrents.noaa.gov/station_retrieve.shtml?type=Historic%20Tide%20Data&state=Louisiana&id1=876

ABSTRACT OF TIMES OF HYDROGRAPHY

Project: OPR-K354-KR-10

Contractor Name: C & C Technologies, Inc.

Inclusive Dates: July 16, 2010 - October 16th, 2010

Registry No.: H12246 (Sheet 4)

Date: January 2011

Sheet Number: 4

Field Work is Complete

Time (UTC)

Date	Julian Day	Start	End	Year
7/16/2010	197	1328	2400	2010
7/17/2010	198	0000	1849	2010
7/18/2010	199	0323	0513	2010
7/20/2010	201	1359	2400	2010
7/21/2010	202	0000	0139	2010
8/4/2010	216	0518	2400	2010
8/5/2010	217	0000	2400	2010
8/6/2010	218	0000	2400	2010
8/7/2010	219	0000	2400	2010
8/8/2010	220	0000	0835	2010
9/12/2010	255	1918	2400	2010
9/13/2010	256	0000	1104	2010
9/13/2010	256	1545	2400	2010
9/14/2010	257	0000	2400	2010
9/15/2010	258	0000	0645	2010
10/16/2010	283	0411	1307	2011

APPENDIX V

SUPPLEMENTAL SURVEY RECORDS
AND CORRESPONDENCE

REPORT OF DANGER TO NAVIGATION

Hydrographic Survey Registry Number: H12246

Survey Title: State: Louisiana
Locality: Gulf of Mexico
Sub Locality: 6 NM N of West Ship Shoal

Project Number: OPR-K354-KR-10
Survey Dates: July 16th, 2010 – August 21st, 2011
Survey Danger Acquisition Date and Time: August 21st, 2011, 17:19:59UTC

Feature is reduced to Mean Lower Low Water using verified tides and is positioned on NAD83.

Charts affected: 11356 38th Edition/June, 2008, scale 1:80,000, NAD 83
11340 75th Edition/May, 2011, scale 1:458,596, NAD 83

DANGER TO NAVIGATION

FEATURE	DEPTH(FT)	LATITUDE(N)	LONGITUDE(W)
Obstruction	15.033	29/00/55	91/07/31

Remarks:

Least depth measurement of this item is 15.033 feet in charted 13foot depths. After observed tide corrections, the surveyed depths in this area are 18 feet, meaning this feature protrudes approximately 3 feet above the sea floor. This 16 x 17 foot feature was located with sidescan sonar and further developed using a multibeam echo sounder.

Hydrographers Recommendations:

It is recommended that this item be charted as a 15 ft obstruction at 29/00/55N, 91/07/31W.

Feature Correlation

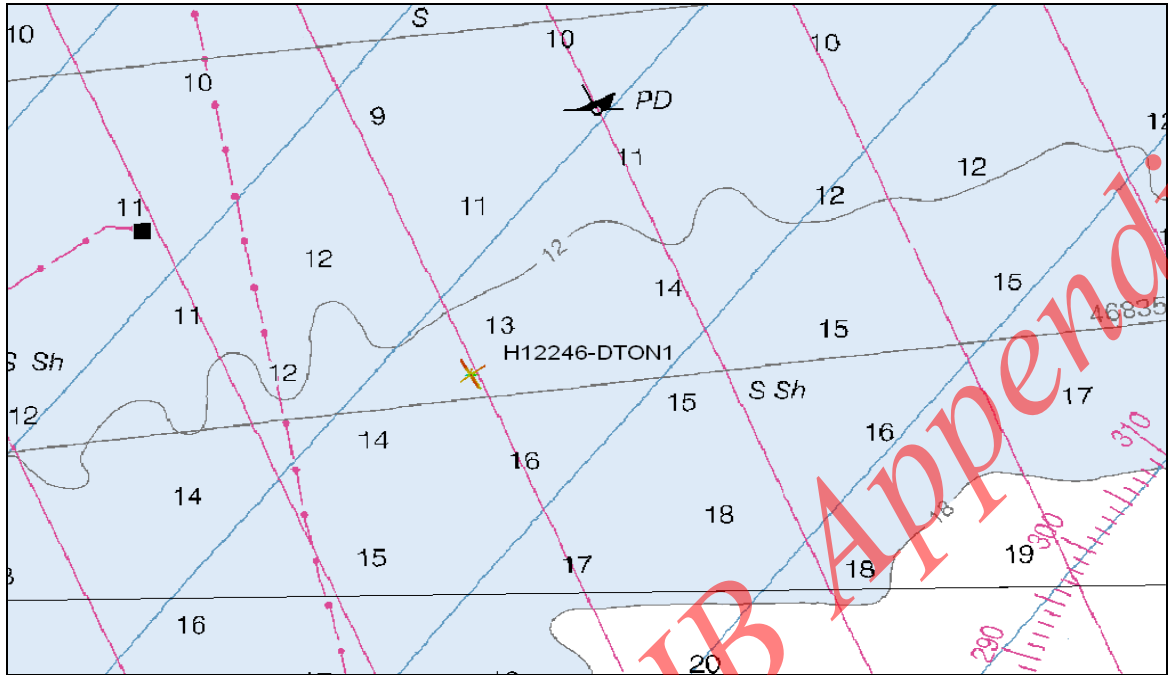


Chart No.11356 feature correlation

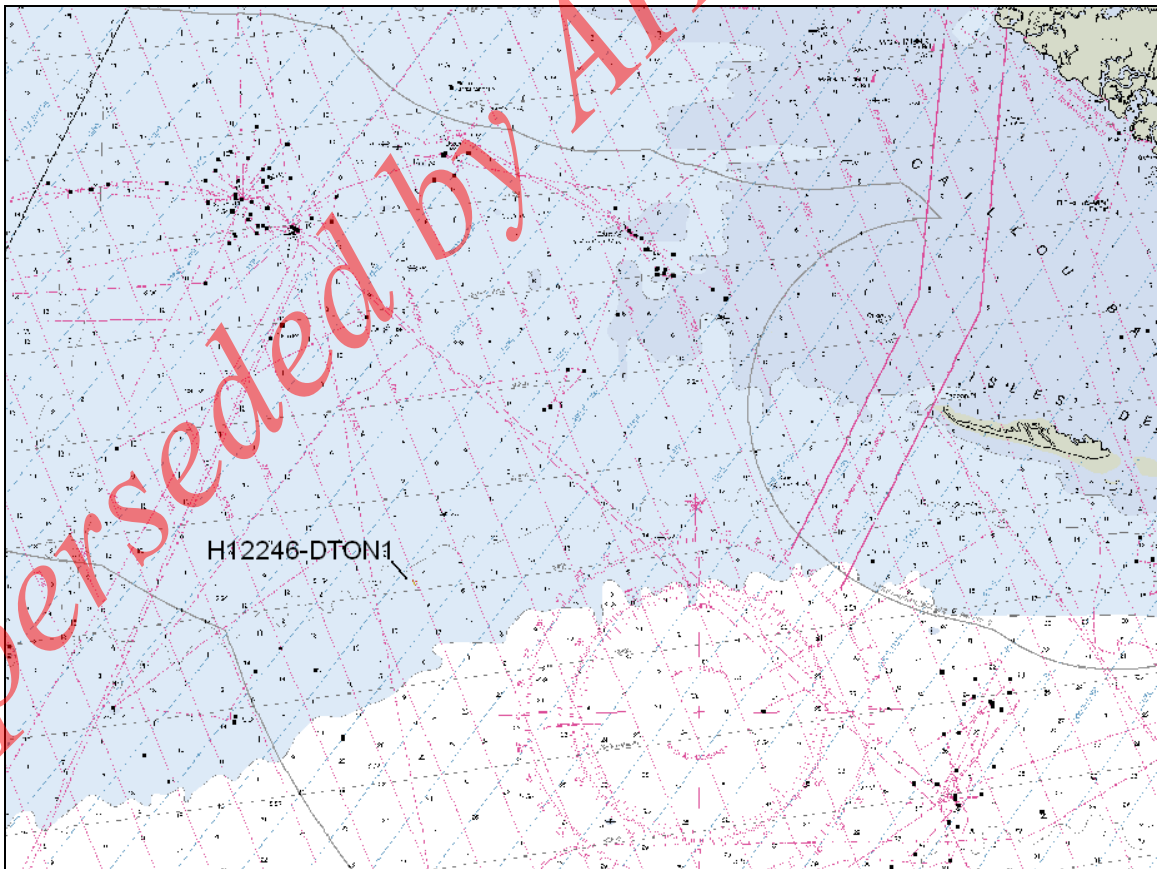
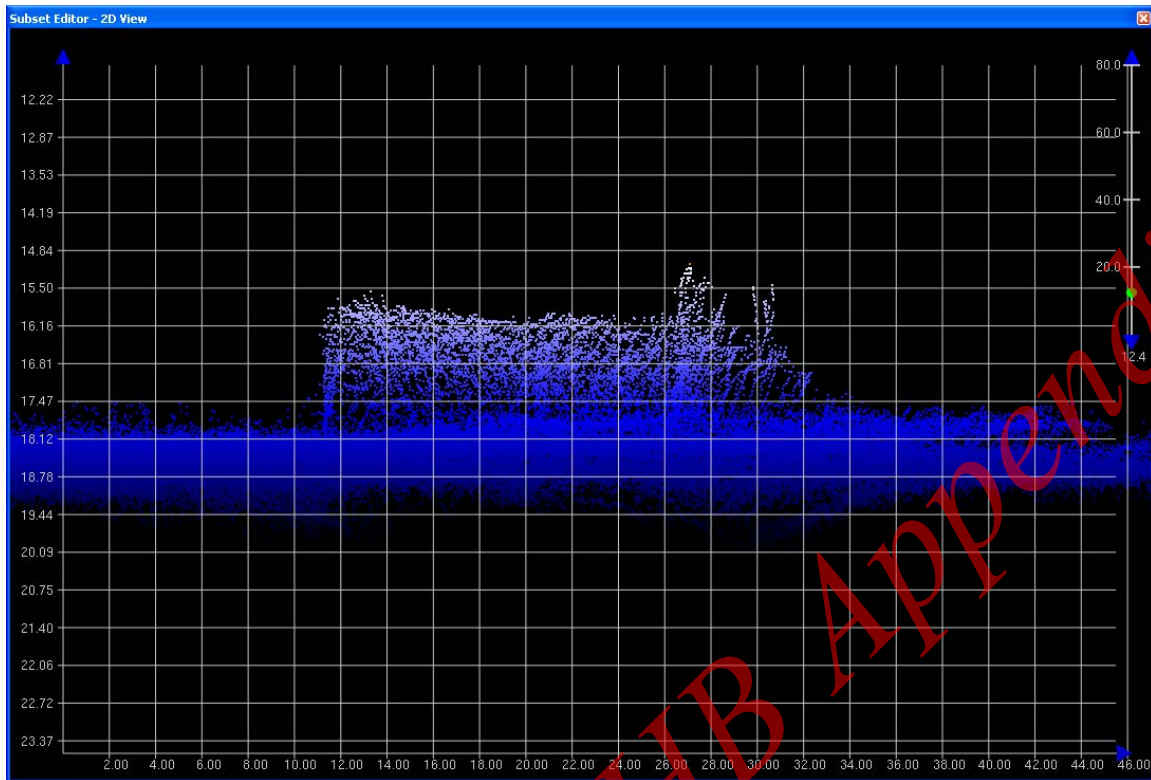
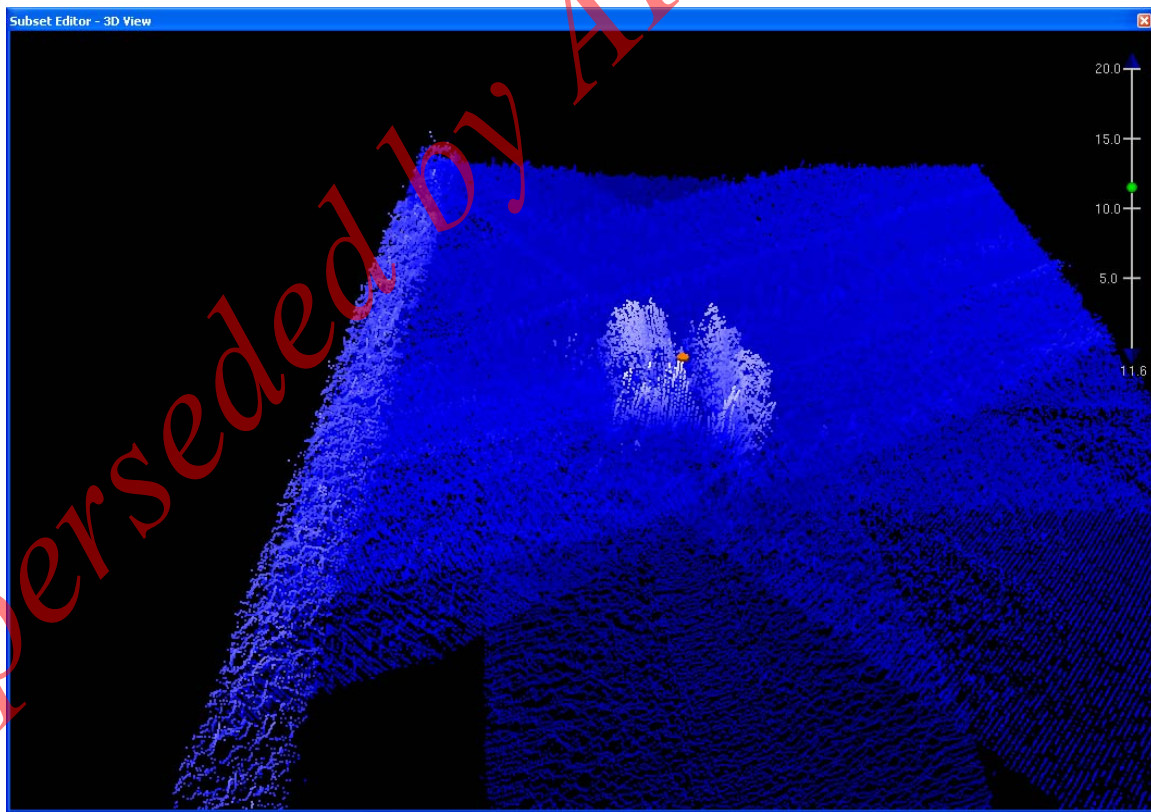


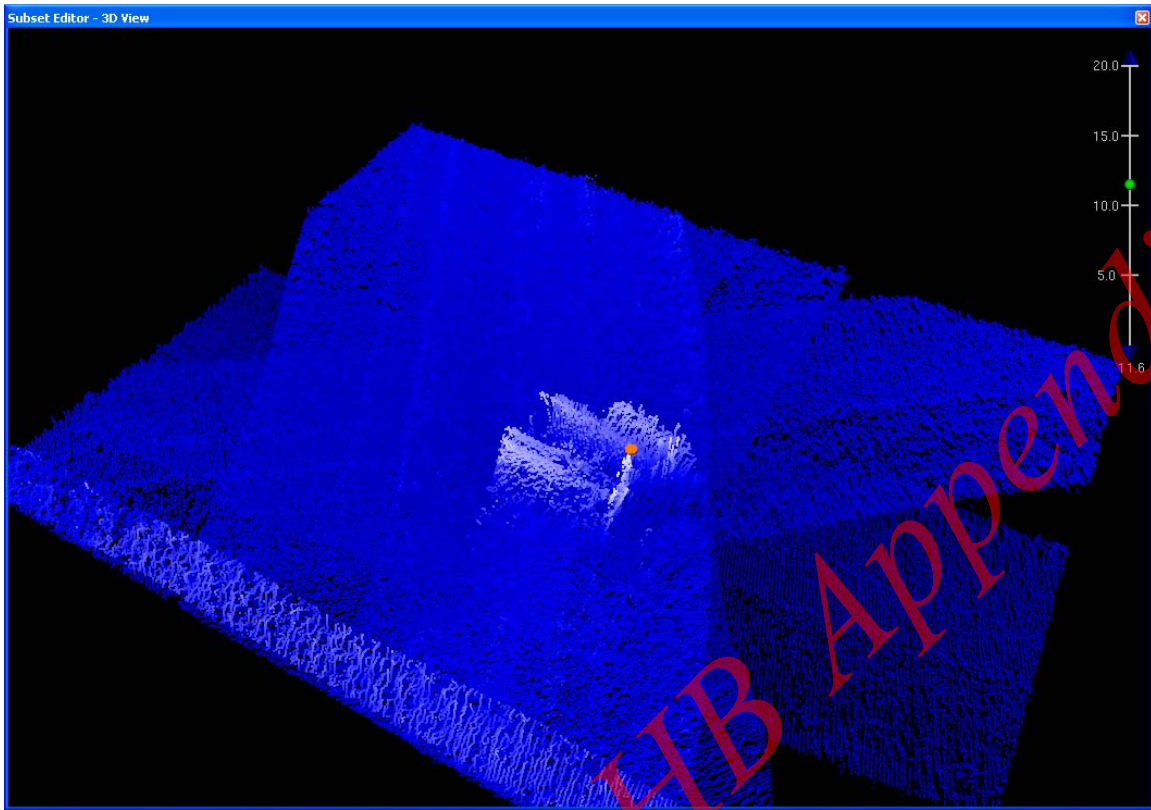
Chart No.11356 feature correlation



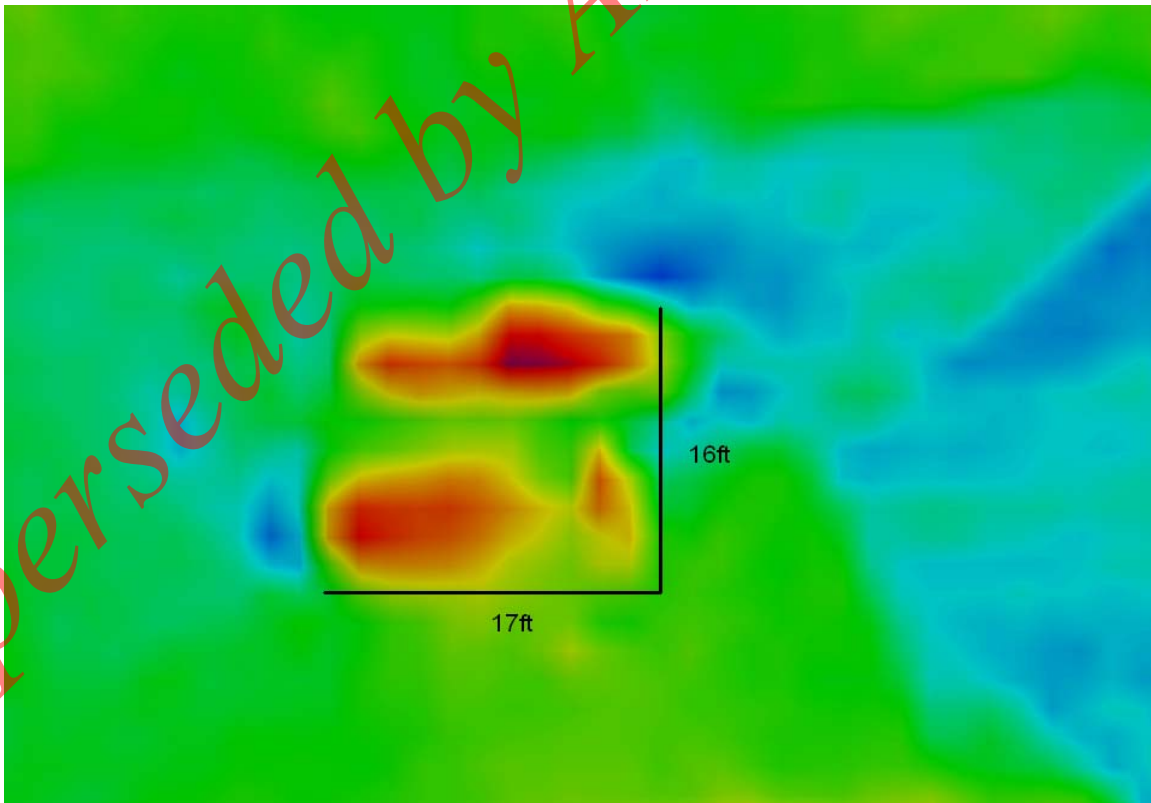
Multibeam profile view in CARIS HIPS and SIPS



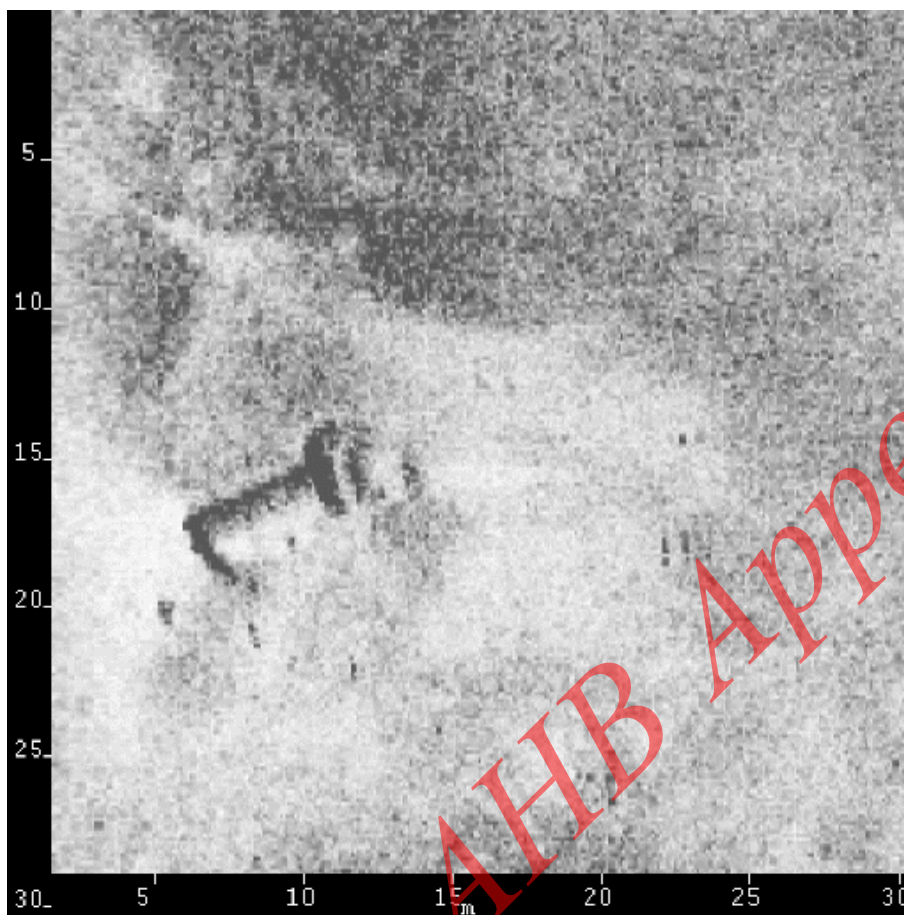
Multibeam 3D view in CARIS HIPS and SIPS



Multibeam 3D view in CARIS HIPS and SIPS



Measurements taken from HIPS base surface



Sidescan Sonar image in Sonarwiz MAP

REPORT OF DANGER TO NAVIGATION

Hydrographic Survey Registry Number: H12246

Survey Title: State: Louisiana
Locality: Gulf of Mexico
Sub Locality: 6 NM N of West Ship Shoal

Project Number: OPR-K354-KR-10
Survey Dates: July 16th, 2010 – October 3rd, 2011
Survey Danger Acquisition Date and Time: October 3rd, 2011, 23:58:45 UTC

Feature is reduced to Mean Lower Low Water using verified tides and is positioned on NAD83.

Charts affected: 11356 38th Edition/June, 2008, scale 1:80,000, NAD 83
11340 75th Edition/May, 2011, scale 1:458,596, NAD 83

DANGER TO NAVIGATION

FEATURE	DEPTH(FT)	LATITUDE(N)	LONGITUDE(W)
Obstruction	13.609	29/00/39	91/09/12

Remarks:

This feature consists of a shoal area adjacent to several vertical pillar-like objects protruding from the seafloor. Including the shoal and adjacent targets, the area measures 48837ft². Taken from the top of one of the pillar formations, a least depth measurement of 13.609ft was determined. After verified tide corrections, the surveyed depths in this area are 17.5ft. With this calculated depth, the obstruction protrudes approximately 4 ft above the sea floor. The features were located using sidescan sonar and further developed using a multibeam echo sounder.

Hydrographers Recommendations:

It is recommended that this item be charted as a 13 ft obstruction at 29/00/39N, 91/09/12W.

Feature Correlation

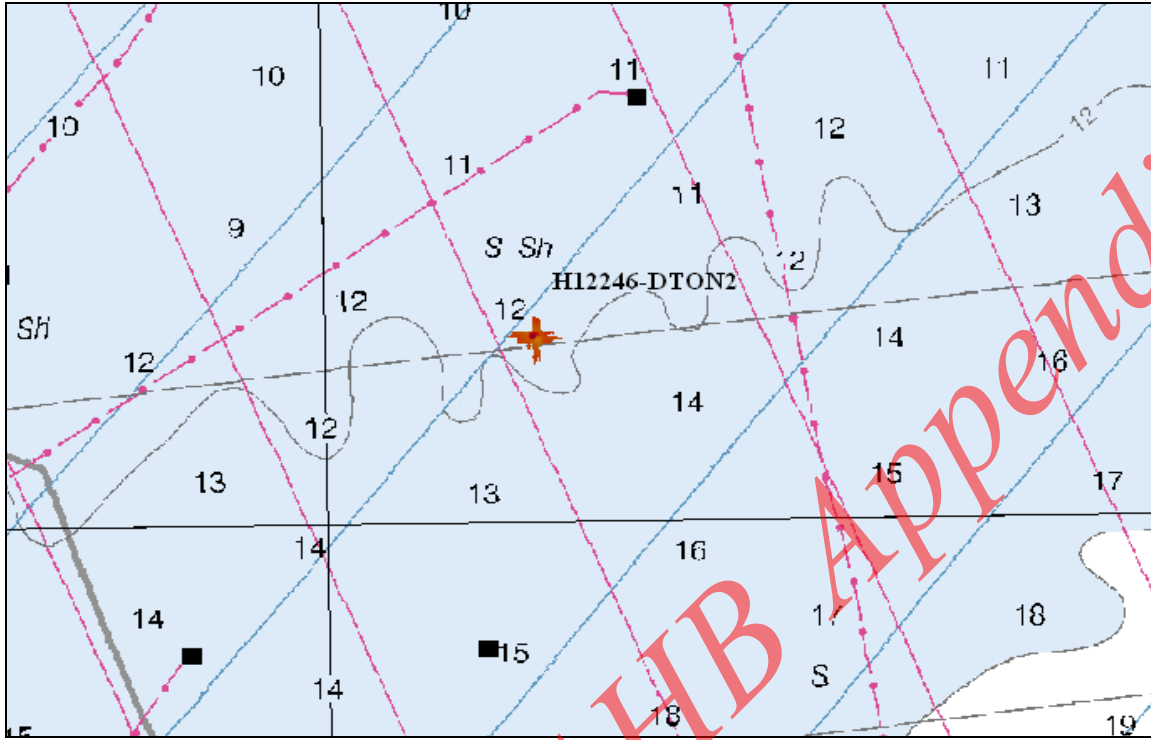


Chart No.11356 feature correlation

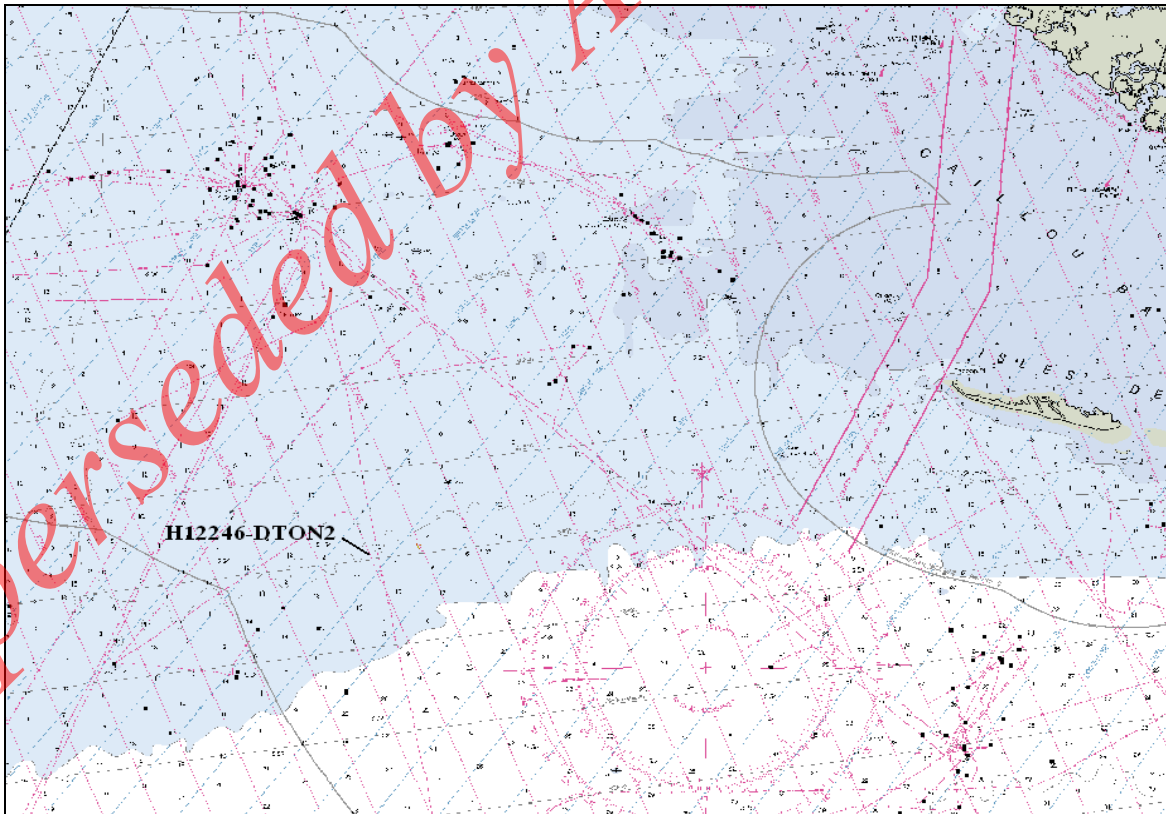
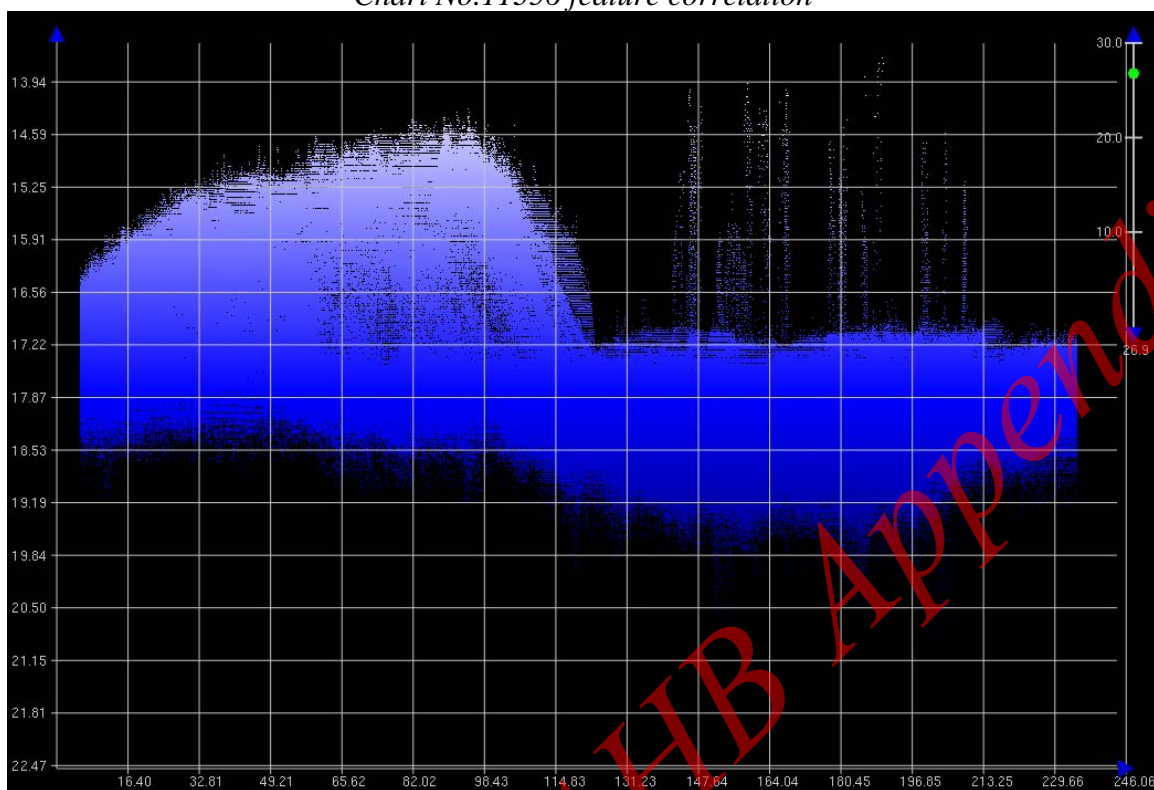
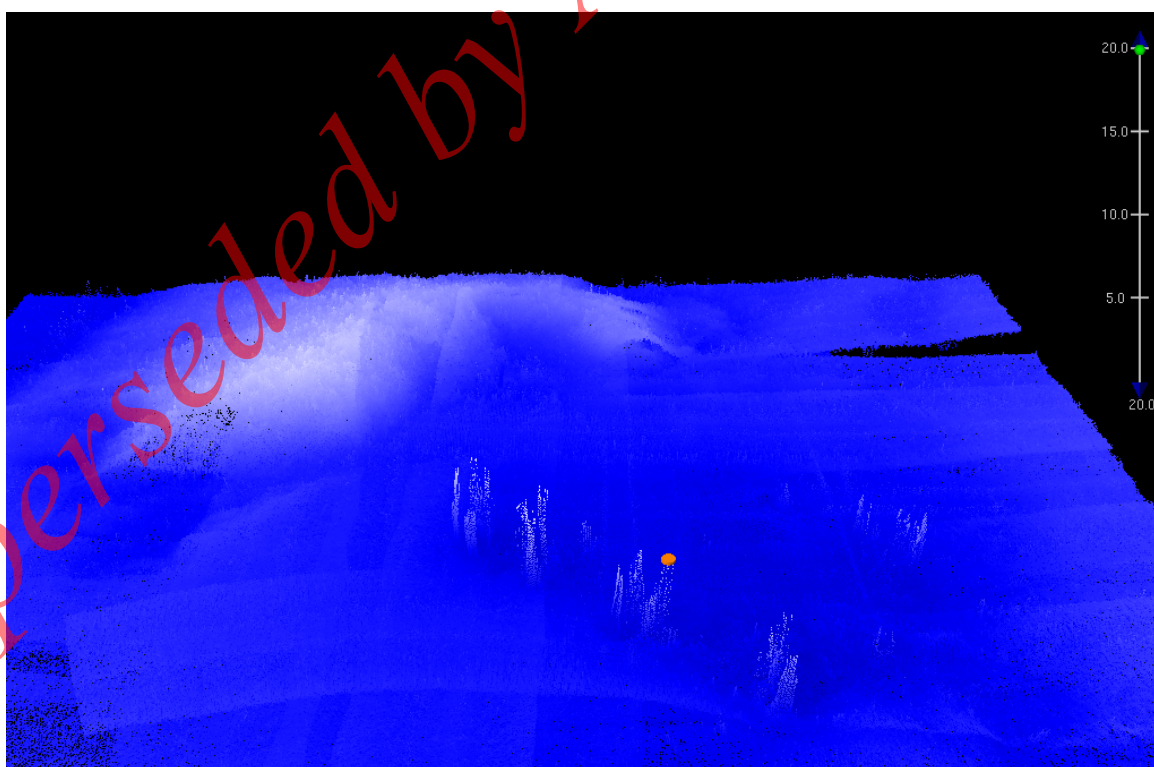


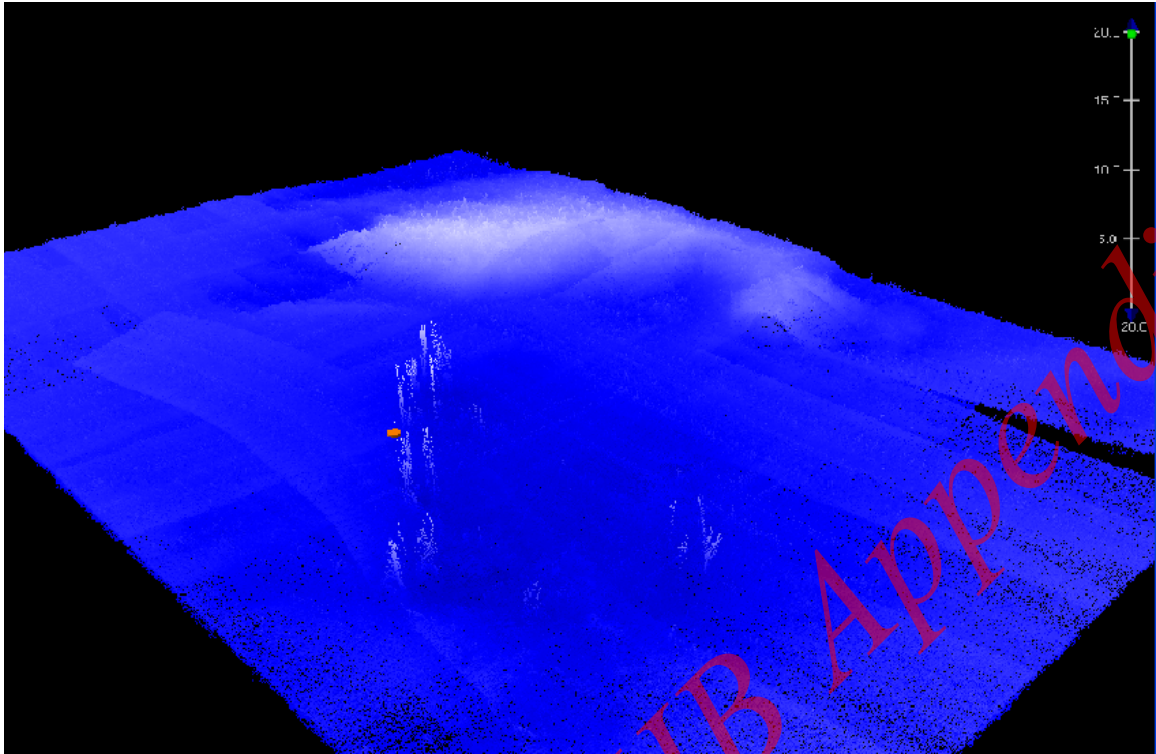
Chart No.11356 feature correlation



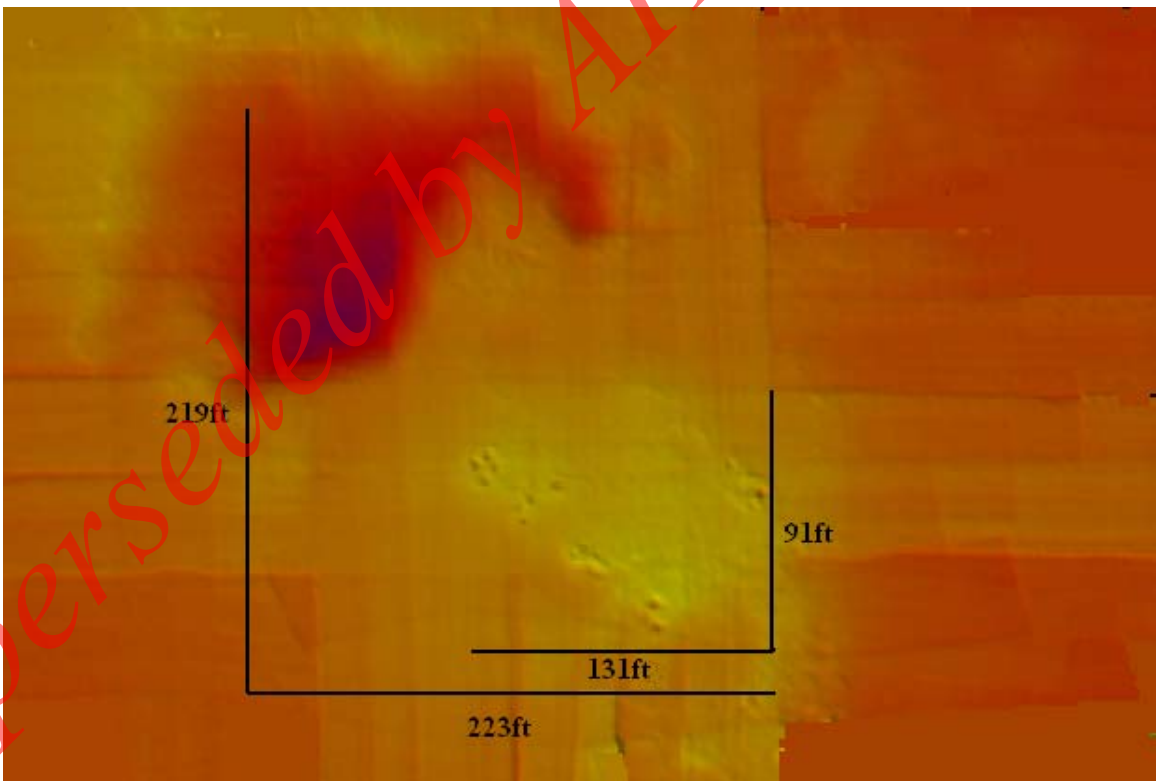
Multibeam profile view in CARIS HIPS and SIPS



Multibeam 3D view in CARIS HIPS and SIPS



Multibeam 3D view in CARIS HIPS and SIPS



Measurements taken from HIPS base surface



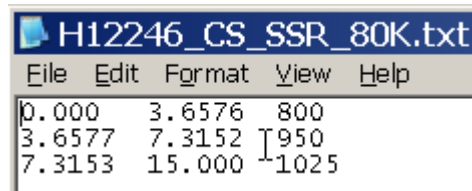
Sidescan Sonar image in Sonarviz MAP

AHB COMPILATION LOG

General Survey Information	
REGISTRY No.	H12246
PROJECT No.	OPR-K354-KR-10
FIELD UNIT	C&C Technologies
DATE OF SURVEY	20100716 - 20111003
LARGEST SCALE CHART	11356, edition 38, 20080601, 1:80,000
ADDITIONAL CHARTS	N/A
SOUNDING UNITS	FEET
COMPILER	Deborah A. Bland
Source Grids	File Name T:\ H12246_K354_CC\AHB_H12246\SAR Final Products\GRIDS
	H12246_Sub1_1m_Final.csar H12246_sub1_Investigations_Final.csar H12246_sub2_Final.csar H12246_sub2_investigations_Final.csar
Surfaces	File Name T:\ H12246_K354_CC\AHB_H12246\COMPILE\Working
<i>Combined</i>	H12246_4m_Combined.csar
<i>Interpolated TIN</i>	\Interpolated TIN\ H12246_12m_InterpTIN.csar
<i>Shifted Interpolated TIN</i>	\Shifted Surface\ H12246_12m_InterpTIN_Shifted.csar
Final HOBs	File Name T:\ H12246_K354_CC\AHB_H12246\COMPILE\Final_Hobs
<i>Survey Scale Soundings</i>	H12246_SS_Soundings.hob
<i>Chart Scale Soundings</i>	H12246_CS_Soundings.hob
<i>Contour Layer</i>	H12246_Contours.hob
<i>Feature Layer</i>	H12246_Features.hob
<i>Meta-Objects Layer</i>	H12246_MetaObjects.hob
<i>Blue Notes</i>	H12246_BlueNotes.hob
Meta-Objects Attribution	
Acronym	Value
M_COVR	
CATCOV	1 – coverage available
SORDAT	20111003
SORIND	US,US,graph,H12246
M_QUAL	
CATZOC	1 – zone of confidence A1
INFORM	M/V Inez McCall
TECSOU	3 - Found by multi-beam
POSACC	5.0 m
SORDAT	20111003
SORIND	US,US,graph,H12246
SUREND	20111003
SURSTA	20100716
DEPARE	
DRVALV 1	12.0 ft
DRVALV2	30.0 ft
SORDAT	20111003
SORIND	US,US,graph,H12246

SPECIFICATIONS:

- I. COMBINED SURFACE:
 - a. Number of SAR Final Grids: 4
 - b. Resolution of Combined (m): 4 m
- II. SURVEY SCALE SOUNDINGS (SS):
 - a. Attribute Name: Depth
 - b. Selection criteria: Radius, Shoal bias
 - c. Radius value is: 1 mm at map scale 80K
 - i. Use single-defined radius: 1.0
 - ii. And/Or use radius table file: HXXXXXX_SS_SSR_XXk.txt [XXk = chart scale]
 - d. Queried Depth of All Soundings
 - i. Minimum: 4.009 m
 - ii. Maximum: 8.895 m
- III. INTERPOLATED TIN SURFACE:
 - a. Resolution (m): 12 m
 - b. Interpolation method: Natural Neighbor
 - c. Shift value: -0.75 ft [only include applicable shift values]
[-0.75 feet (And/Or) -0.75 fathoms]
- IV. CONTOURS:
 - a. Attribute Name: Depth
 - b. Use a Depth List: H12246_depth_contours.txt
 - c. Output Options: Create contour lines
 - i. Line Object: DEPCNT
 - ii. Value Attribute: VALDCO
- V. FEATURES:
 - a. Number of Chart Features: 4 [all features included in H-Cell]
 - b. Number of Non-Chart Features: 1 [all features submitted by field & not included in H-Cell]
- VI. CHART SURVEY SOUNDINGS (CS):
 - a. Number of ENC CS Soundings: 52
 - b. Attribute Name: Depth
 - c. Selection criteria: Radius, Shoal bias
 - d. Radius value is: Distance on the ground (m)
 - i. Use single-defined radius: N/A
 - ii. And/Or use radius table file: H12246_CS_SSR_80K.txt [XXk = chart scale]



- e. Number Survey CS Soundings: 47

- VII. NOTES:
[Type text]