

H13040

U.S. Department of Commerce  
National Oceanic and Atmospheric Administration  
National Ocean Service

**DESCRIPTIVE REPORT**

Type of Survey: Navigable Area

Registry Number: H13040

**LOCALITY**

State(s): Louisiana

General Locality: Gulf of Mexico

Sub-locality: Tiger Shoal

**2017**

CHIEF OF PARTY  
George G. Reynolds

LIBRARY & ARCHIVES

Date:

**HYDROGRAPHIC TITLE SHEET**

**H13040**

**INSTRUCTIONS:** The Hydrographic Sheet should be accompanied by this form, filled in as completely as possible, when the sheet is forwarded to the Office.

State(s): **Louisiana**

General Locality: **Gulf of Mexico**

Sub-Locality: **Tiger Shoal**

Scale: **40000**

Dates of Survey: **08/03/2017 to 10/12/2017**

Instructions Dated: **06/21/2017**

Project Number: **OPR-K354-KR-17**

Field Unit: **Ocean Surveys, Inc.**

Chief of Party: **George G. Reynolds**

Soundings by: **Multibeam Echo Sounder**

Imagery by: **Side Scan Sonar Multibeam Echo Sounder Backscatter**

Verification by: **Atlantic Hydrographic Branch**

Soundings Acquired in: **meters at Mean Lower Low Water**

**Remarks:**

The purpose of this project is to provide contemporary surveys to update National Ocean Service (NOS) nautical charting products. All times are recorded in UTC. Data recorded and presented relative to UTM Zone 15 North. THE INFORMATION PRESENTED IN THIS REPORT AND THE ACCOMPANYING BASE SURFACES REPRESENTS THE RESULTS OF SURVEYS PERFORMED BY OCEAN SURVEYS, INC. DURING THE PERIOD OF 3 AUGUST 2017 TO 12 OCTOBER 2017 AND CAN ONLY BE CONSIDERED AS INDICATING THE CONDITIONS EXISTING AT THAT TIME. REUSE OF THIS INFORMATION BY CLIENT OR OTHERS BEYOND THE SPECIFIC SCOPE OF WORK FOR WHICH IT WAS ACQUIRED SHALL BE AT THE SOLE RISK OF THE USER AND WITHOUT LIABILITY TO OSI.

*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 Centers for Environmental Information (NCEI) and can be retrieved via <https://www.ncei.noaa.gov/>.*

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## Descriptive Report to Accompany Survey H13040

Project: OPR-K354-KR-17

Locality: Gulf of Mexico

Sublocality: Tiger Shoal

Scale: 1:40000

August 2017 - October 2017

**Ocean Surveys, Inc.**

Chief of Party: George G. Reynolds

### A. Area Surveyed

This survey provides hydrographic data for the Gulf of Mexico waters approaching the Louisiana Coast south of Marsh Island. The general locations of the survey limits are presented in Table 1.

#### A.1 Survey Limits

Data were acquired within the following survey limits:

Northwest Limit	Southeast Limit
29° 23' 48.86" N 92° 14' 20.99" W	29° 18' 22.28" N 92° 0' 26.57" W

*Table 1: Survey Limits*

Survey limits were acquired in accordance with the requirements in the Project Instructions and the HSSD.

#### A.2 Survey Purpose

Per the Hydrographic Survey Project Instructions: The Louisiana Coast project will provide contemporary surveys to update National Ocean Service (NOS) nautical charting products. It is in the vicinity of the Atchafalaya River Delta and Port of Morgan City, LA. The survey will address concerns of migrating shoals and exposed hazards by updating bathymetry and positions of hazards, reducing the risk to navigation.

The Port of Morgan City is growing significantly and is working on programs to deepen and maintain the ship channel through the Gulf, bay, and up the Atchafalaya River to the Port of Morgan City where it will intersect with the Gulf of Mexico Intracoastal Waterway. The Port serves the offshore oil, shrimping, seafood, chemicals, and machinery industries. In addition to the port commerce, the Atchafalaya River Delta

has a rich ecosystem that supports both commercial fishing and recreational fishing communities. Updated charts from this project will support commerce and protect the environment by improving the safety of navigation for area traffic.

The project will cover approximately 185 square nautical miles of high priority survey area identified in the 2017 Hydrographic Health model. Adjacent modern surveys show shoaling, with contours that have migrated up to 9 miles since the 1935 vintage source surveys. The adjacent 2016 Atchafalaya survey uncovered numerous exposed pipelines and hazards. This project will significantly update the chart. Data from this project will supersede all prior survey data in the common area.

### A.3 Survey Quality

The entire survey is adequate to supersede previous data.

### A.4 Survey Coverage

The following table lists the coverage requirements for this survey as assigned in the project instructions:

Water Depth	Coverage Required
All waters in survey area	LNM not to exceed 6300 LNM. Acquire backscatter data during all multibeam data acquisition (HSSD Section 6.2). Report significant shoaling via weekly progress report. COR may adjust survey prioritization based on observed shoaling.
Inshore limit to 4 meters water depth for H13041 - H13043	200 meter set line spacing HSSD Section 5.2.2.4 Option A.
Greater than 4 meters water depth for H13041 - H13043	Complete Coverage (refer to HSSD Section 5.2.2.3)
All waters in survey area of H13040	Complete Coverage (refer to HSSD Section 5.2.2.3)
Disproval radius of features in all waters	Complete Coverage (refer to HSSD Section 5.2.2.3)

Survey Coverage is in accordance with the requirements in the Hydrographic Survey Project Instructions (June 21, 2017), the Statement of Work, [May 18, 2017 (SOW)], and the Hydrographic Surveys Specifications and Deliverables, [April 2017 (HSSD)]. Where required, Complete Coverage was accomplished by acquiring one hundred percent (100%) side scan sonar (SSS) coverage with concurrent multibeam echosounder (MBES) with backscatter or Complete Coverage MBES with backscatter.

Additional SSS and MBES coverage was obtained as necessary to fill gaps in coverage, to provide a least depth for all significant SSS contacts and for charted feature disprovals. Gaps in the 100% SSS coverage were addressed with SSS fill-in lines or covered with complete MBES data. Bathymetric splits were also

acquired to verify or disprove charted depths that fell between two MBES survey lines when the charted depth was shallower than the adjacent survey soundings. The final survey area covers 56.48 square nautical miles (Figure 1).

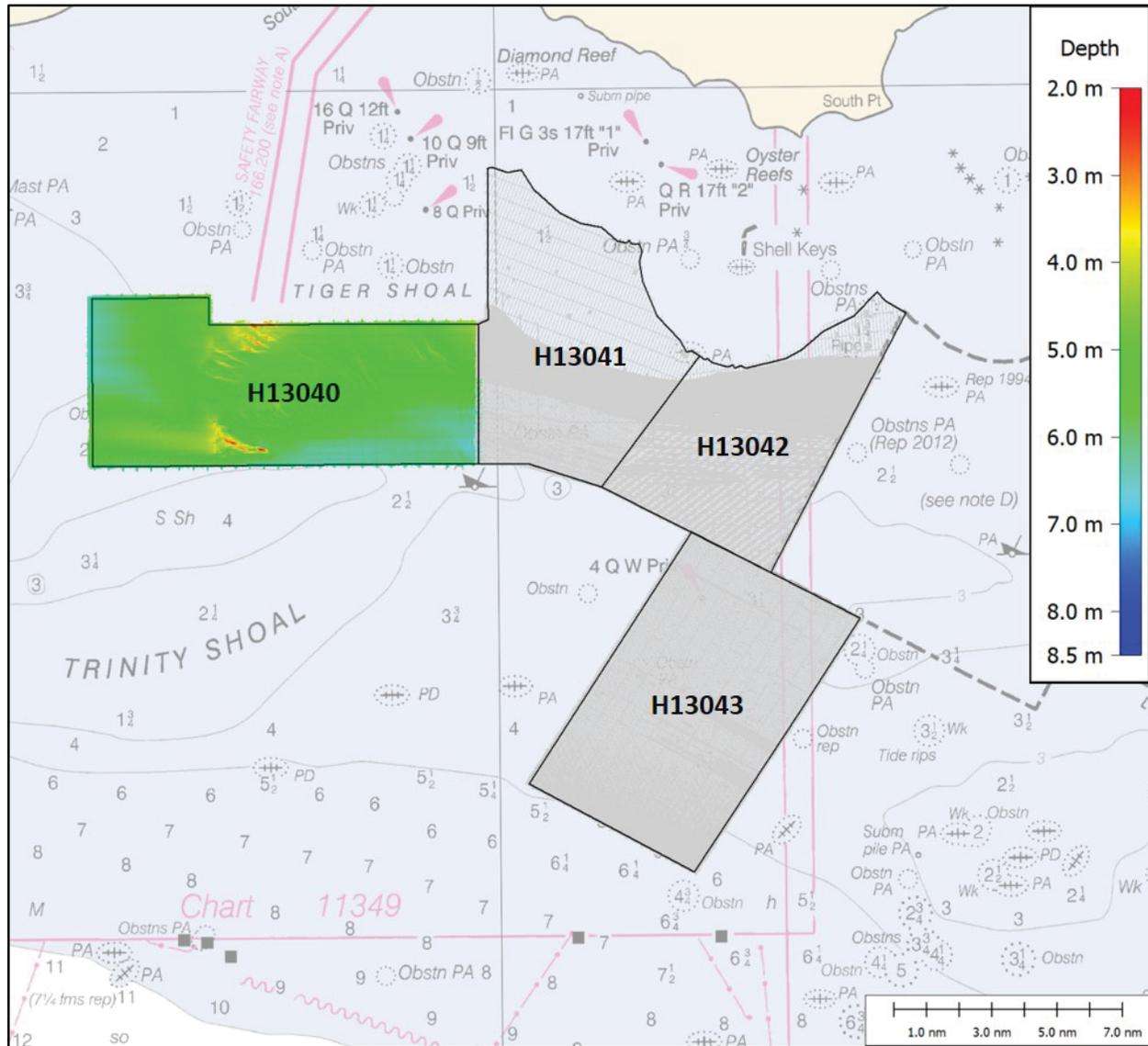


Figure 1: Survey H13040 MBES coverage overlaid on RNC 11340.

### A.5 Survey Statistics

The following table lists the mainscheme and crossline acquisition mileage for this survey:

	<b>HULL ID</b>	<i>R/V Ocean Explorer "OE"</i>	<i>R/V Osprey "SB"</i>	<b>Total</b>
<b>LNM</b>	<b>SBES Mainscheme</b>	0	0	0
	<b>MBES Mainscheme</b>	0	36.54	36.54
	<b>Lidar Mainscheme</b>	0	0	0
	<b>SSS Mainscheme</b>	0	0	0
	<b>SBES/SSS Mainscheme</b>	0	0	0
	<b>MBES/SSS Mainscheme</b>	1893.07	172.12	2065.19
	<b>SBES/MBES Crosslines</b>	135.15	0	135.15
	<b>Lidar Crosslines</b>	0	0	0
<b>Number of Bottom Samples</b>				10
<b>Number Maritime Boundary Points Investigated</b>				0
<b>Number of DPs</b>				0
<b>Number of Items Investigated by Dive Ops</b>				0
<b>Total SNM</b>				56.48

*Table 2: Hydrographic Survey Statistics*

The following table lists the specific dates of data acquisition for this survey:

<b>Survey Dates</b>	<b>Day of the Year</b>
08/04/2017	216
08/05/2017	217
08/06/2017	218
08/07/2017	219
08/08/2017	220
08/09/2017	221
08/10/2017	222
08/11/2017	223
08/12/2017	224
08/13/2017	225
08/14/2017	226
08/15/2017	227
08/17/2017	229
08/18/2017	230
08/19/2017	231
08/20/2017	232
09/01/2017	244
09/02/2017	245
09/03/2017	246
09/18/2017	261
09/19/2017	262
09/20/2017	263
09/21/2017	264
10/11/2017	284
10/12/2017	285

*Table 3: Dates of Hydrography*

The lineal nautical miles (LNM) for MBES only development and fill in lines were included under the heading "Mainscheme MBES" in Table 2, Hydrographic Survey Statistics. There was no SSS-only mileage for this survey.

## B. Data Acquisition and Processing

### B.1 Equipment and Vessels

Refer to the OPR-K354-KR-17 Data Acquisition and Processing Report (DAPR) for a complete description of data acquisition and processing systems, survey vessels, quality control procedures and data processing methods. Additional information to supplement sounding and survey data, and any deviations from the DAPR are discussed in the following sections.

#### B.1.1 Vessels

The following vessels were used for data acquisition during this survey:

<b>Hull ID</b>	<i>R/V Ocean Explorer "OE"</i>	<i>R/V Osprey "SB"</i>
<b>LOA</b>	18 meters	7.9 meters
<b>Draft</b>	2 meters	0.6 meters

*Table 4: Vessels Used*

The survey was conducted employing two vessels. Much of the relatively deep reaches of the study area were surveyed using the R/V Ocean Explorer. A smaller vessel, the R/V Osprey, surveyed relatively shallow reaches of the study area as well as certain “deep” water areas. For the sake of clarity, especially as concerns the field data file naming convention, two distinct abbreviations are employed. Specifically, files generated on the R/V Ocean Explorer include “OE” in the name and files generated on the R/V Osprey include “SB” which is meant to indicate “small boat” files.

## B.1.2 Equipment

The following major systems were used for data acquisition during this survey:

<b>Manufacturer</b>	<b>Model</b>	<b>Type</b>
Onboard the R/V Ocean Explorer	-	-
EdgeTech	4125	SSS
Teledyne RESON	SeaBat 7125 SV2	MBES
ODIM Brooke Ocean	MVP30	Sound Speed System
AML Oceanographic	Micro X	Sound Speed System
AML Oceanographic	Base X	Sound Speed System
Applanix	POS MV 320 v4	Positioning and Attitude System
Trimble	ProBeacon	Positioning System
Trimble	MS750	Positioning System
Onboard the R/V Osprey	-	-
EdgeTech	4125	SSS
Teledyne RESON	SeaBat 8125	MBES
Sea-Bird Scientific	SBE-37	Sound Speed System
AML Oceanographic	Base X	Sound Speed System
Applanix	POS MV 320 v5	Positioning and Attitude System
Leica	MX52R	Positioning System
Trimble	DSM232	Positioning System

*Table 5: Major Systems Used*

Table 5 summarizes the primary equipment used on the respective vessels to acquire MBES and SSS data. All equipment was installed, calibrated and operated in accordance with the DAPR.

## B.2 Quality Control

### B.2.1 Crosslines

Multibeam/single beam echo sounder/side scan sonar crosslines acquired for this survey totaled 6.43% of mainscheme acquisition.

A total of 135.15 nm of crossline data were acquired August 4-5, 2017 (DN 216-217). Crosslines were run nominally perpendicular to mainscheme lines (Figure 2). Crosslines were acquired exclusively by the R/V Ocean Explorer. The majority of mainscheme line miles were also surveyed by the R/V Ocean Explorer. However, the R/V Osprey acquired approximately 130 nm of shallow water mainscheme sounding data through which a number of crosslines pass.

Soundings from mainscheme lines and crosslines were compared periodically throughout survey operations reviewing preliminary MBES surfaces and using CARIS HIPS Subset Editor. Crossline comparisons provided confirmation that the system offsets and biases were entered correctly and verified the accuracy of sounding correctors (i.e. tide, sound speed, TrueHeave).

Statistical quality control information was compiled from a difference surface, generated in CARIS HIPS, between the depth layer of a 1-meter CUBE surface composed only of crossline data and the depth layer of a 1-meter CUBE surface composed only of mainscheme data. The crossline analysis results demonstrate good agreement between crossline soundings and mainscheme soundings, with the depth differences less than or equal to 0.54 meters with an average difference of 0.08 meters. The allowable TVU for the range of water depths within Survey H13040 is 0.50 to 0.51 meters.

Figure 3 is a histogram showing the distribution of depth differences for all comparison grid cells considered. The total number of 1-meter comparison cells equaled 1,433,913. Of 1,433,913 possible comparison cells, 1,395,602 or 97.32% of the cells include crossline and mainscheme soundings that match within +/- 25 centimeters and 99.99% that match within 50 centimeters.

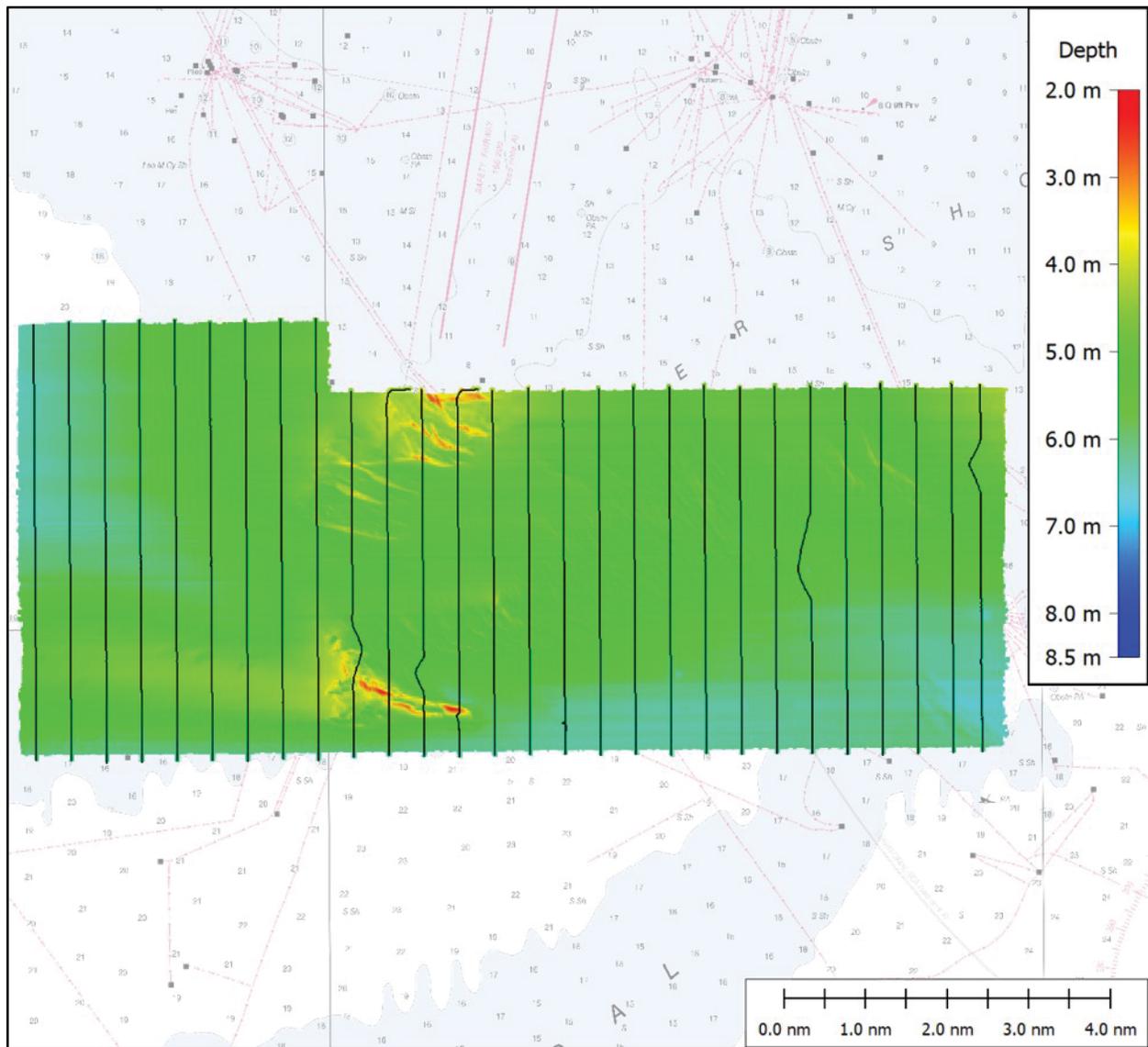
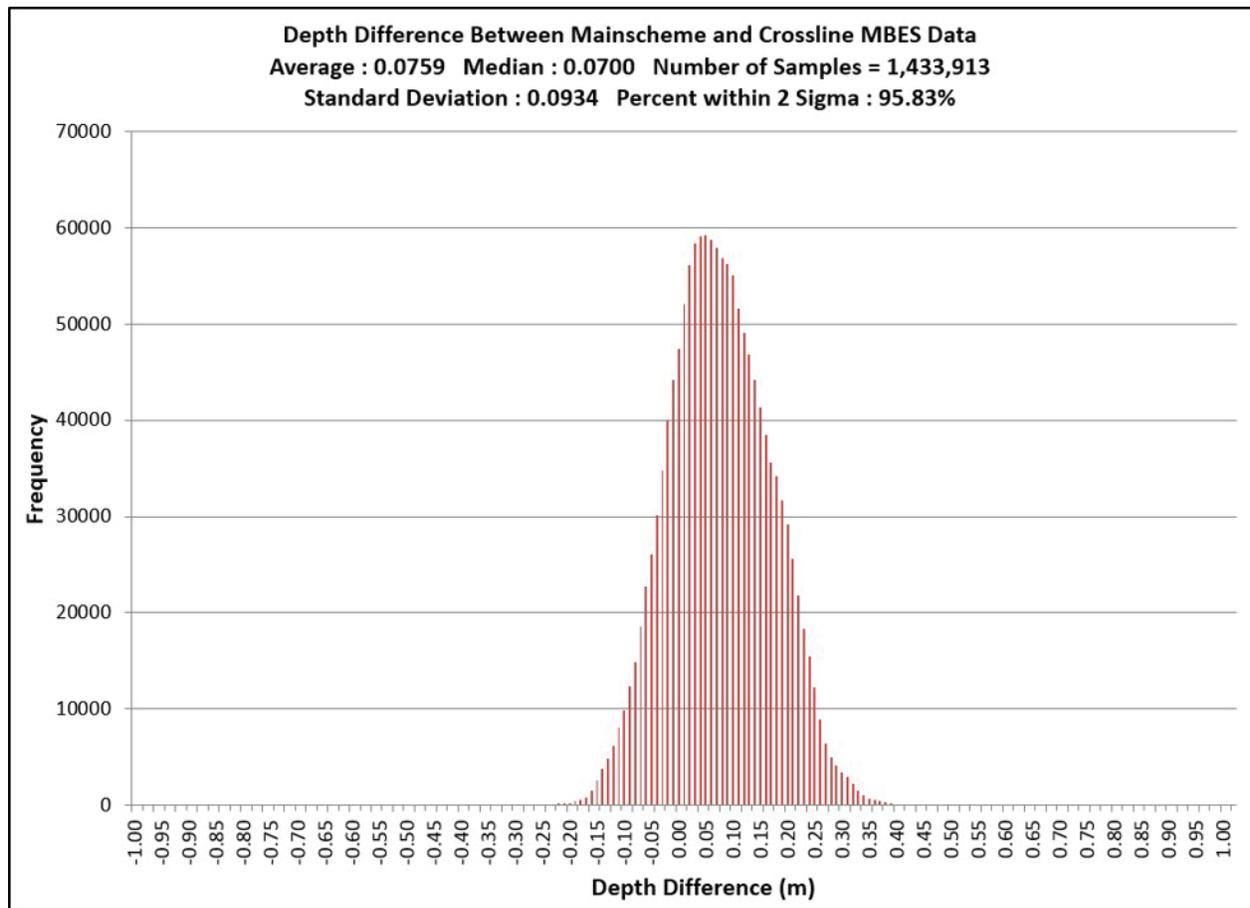


Figure 2: An overview of the crossline layout on a 1-meter surface created from mainscheme MBES data and colored by depth. RNC 11349 is visible in the background.



*Figure 3: The graph shows a frequency distribution of the depth differences between the H13040 crossline data and the H13040 mainscheme MBES data. Statistics from the depth difference sample set are displayed above the graph.*

### B.2.2 Uncertainty

The following survey specific parameters were used for this survey:

Method	Measured	Zoning
Discrete Zoning	0.01 meters	0.19 meters

*Table 6: Survey Specific Tide TPU Values.*

Hull ID	Measured - CTD	Measured - MVP	Surface
R/V Ocean Explorer		1 meters/second	2 meters/second
R/V Osprey	4 meters/second		2 meters/second

*Table 7: Survey Specific Sound Speed TPU Values.*

The methods used to minimize the uncertainty in the corrections to echo soundings are described in detail in Section B. Processing and Quality Control of the project DAPR. Survey H13040 did not deviate from the methods documented in the DAPR.

The Total Vertical Uncertainty Quality Check (TVU QC) "Ratio Method" was used to evaluate IHO uncertainty for the finalized surface. The TVU QC "Ratio Method" is described in the Chapter 4 Appendices of the NOAA OCS Field Procedures Manual (FPM) dated April 2014. Per the FPM TVU QC section, "The hydrographer should use the finalized surface because this surface will identify areas where either the uncertainty or the standard deviation exceeded the maximum allowable error and the greater of these two values is used in addition to having the uncertainty scaled to a 95% CI, whereas unfinalized surface uncertainties are reported at the 68% CI." The FPM TVU QC section also states that, "[ratio] values which do not require further examination are from -1 to 0 and the values which do require further examination are from -100 to -1".

A finalized surface was used in this analysis. The surface was finalized using the "greater of the two" option as the basis for calculating "Final Uncertainty" in the CARIS "Finalize Base Surface" utility.

One (1) MBES CUBE (Combined Uncertainty and Bathymetric Estimator) surface was delivered along with Survey H13040; "H13040\_MB\_1m\_MLLW\_Final."

Results from the TVU QC indicate that 99.99% of the nodes in this surface meet IHO Order 1 uncertainty specifications, i.e. the ratio values of nearly all the nodes are less than -1. Of the 67,717,316 nodes considered, 92 had a ratio value below -1. Upon examination it was found that the nodes with ratio values below -1 were located over known seafloor disturbances and/or known discrete features resulting in higher standard deviation values and finalized uncertainty values, which is to be expected.

### **B.2.3 Junctions**

Two (2) prior surveys and one (1) contemporary survey junction with Survey H13040. Figure 4 displays the location of the prior and contemporary junction surveys for Project OPR-K354-KR-17. The allowable TVU for the range of water depths within Survey H13040 is 0.50 to 0.51 meters. Therefore, according to the XMLDR Junction Area "maximum difference" threshold guidance equation ( $\text{SQRT2} * \text{TVU}$ ) the junction discrepancy action threshold = 0.71 meters.

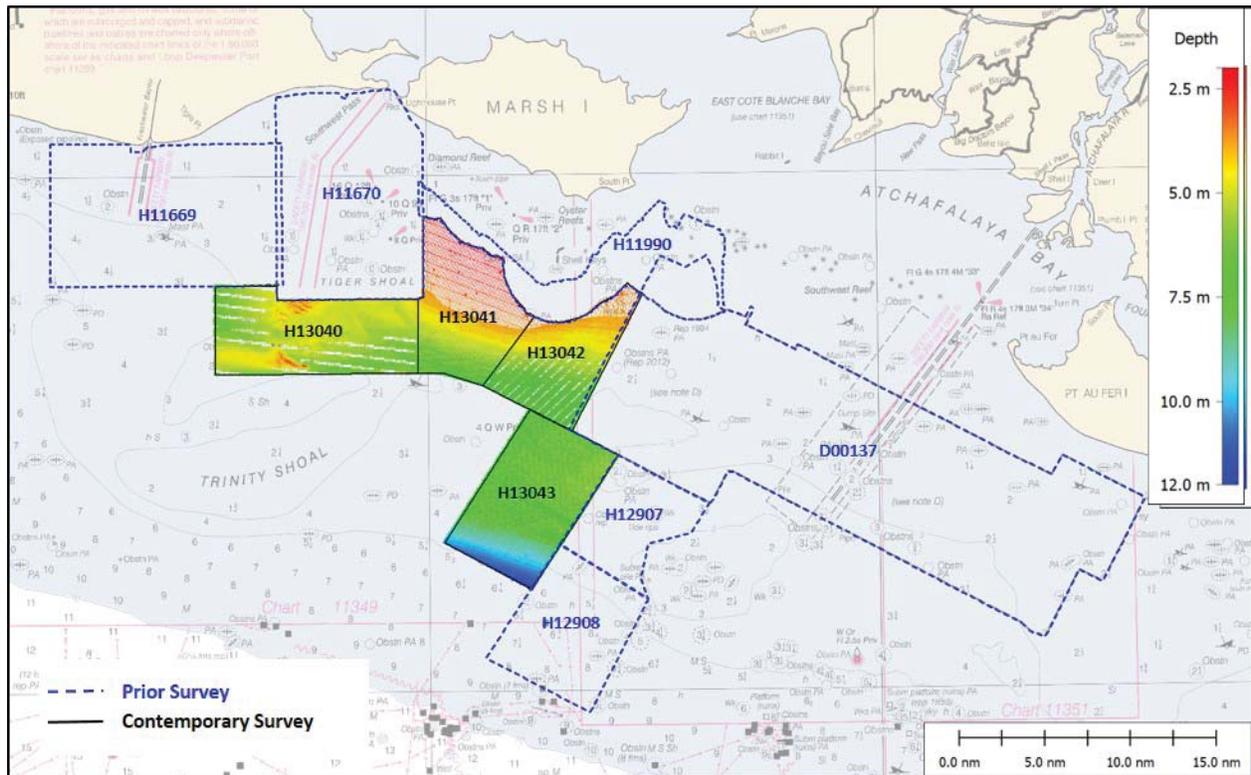


Figure 4: Survey junctions for Project OPR-K354-KR-17. RNC 11340 is displayed in the background.

The following junctions were made with this survey:

Registry Number	Scale	Year	Field Unit	Relative Location
H11669	1:20000	2007	C&C	N
H11670	1:20000	2007	C&C	N
H13041	1:40000	2017	Oceans Surveys, Inc.	E

Table 8: Junctioning Surveys

H11669

Survey H11669, a MBES/SSS survey conducted by C&C in 2007-2009, overlaps the northern border of H13040. Survey H11669 and Survey H13040 were run with the intention of achieving either 200% or 100% SSS coverage respectively. As such, each survey's MBES coverage is essentially "skunk stripe coverage." The mainscheme line plan for each survey was oriented nominally east-west with crosslines oriented nominally north-south. The common border length is approximately 6,900 meters. The junction area between the surveys is relatively sparse. Parallel skunk stripe mainscheme lines have an overlap of

approximately 70 meters and the combined crossline overlap into the adjacent survey areas is as much as 500 meters.

Depth data for Survey H11669 were downloaded from the National Geophysical Data Center (NGDC) website (<http://www.ngdc.noaa.gov>) in the form of a 2-meter resolution Bathymetric Attributed Grid (BAG), "H11669\_2m\_MLLW\_6of6.bag."

To conduct the junction comparison a 2-meter CUBE surface was generated from the entire MBES data set for Survey H13040, "H13040\_MB\_2m\_MLLW." In CARIS HIPS, depths from the "H11669\_2m\_MLLW\_6of6" BAG were subtracted from the depths in the "H13040\_MB\_2m\_MLLW" CUBE surface using the CARIS HIPS Difference Surface function. A histogram of the differences is shown in Figure 5.

Depths from the H13040 survey show decent agreement with depths from the H11669 survey. Depth discrepancies equaled 51 centimeters or less with a mean difference of 11 centimeters. On average, Survey H11669 depths were deeper than H13040 depths which, overall, is likely due to sediment transport in the H13040 survey area since the 2007-2009 survey was conducted. The magnitude of differences is spatially random but like-magnitude differences are regionally concentrated, i.e. differences are not line-by-line which might suggest a tide or systematic deficiency in one of the surveys. In fact, depth changes throughout Survey H13040, as compared to the remaining junction surveys and the presently charted depths, suggest that the entire survey area is prone to depth changes due to sediment transport.

All (100%) junction comparison cells have a difference < 0.71 meters.

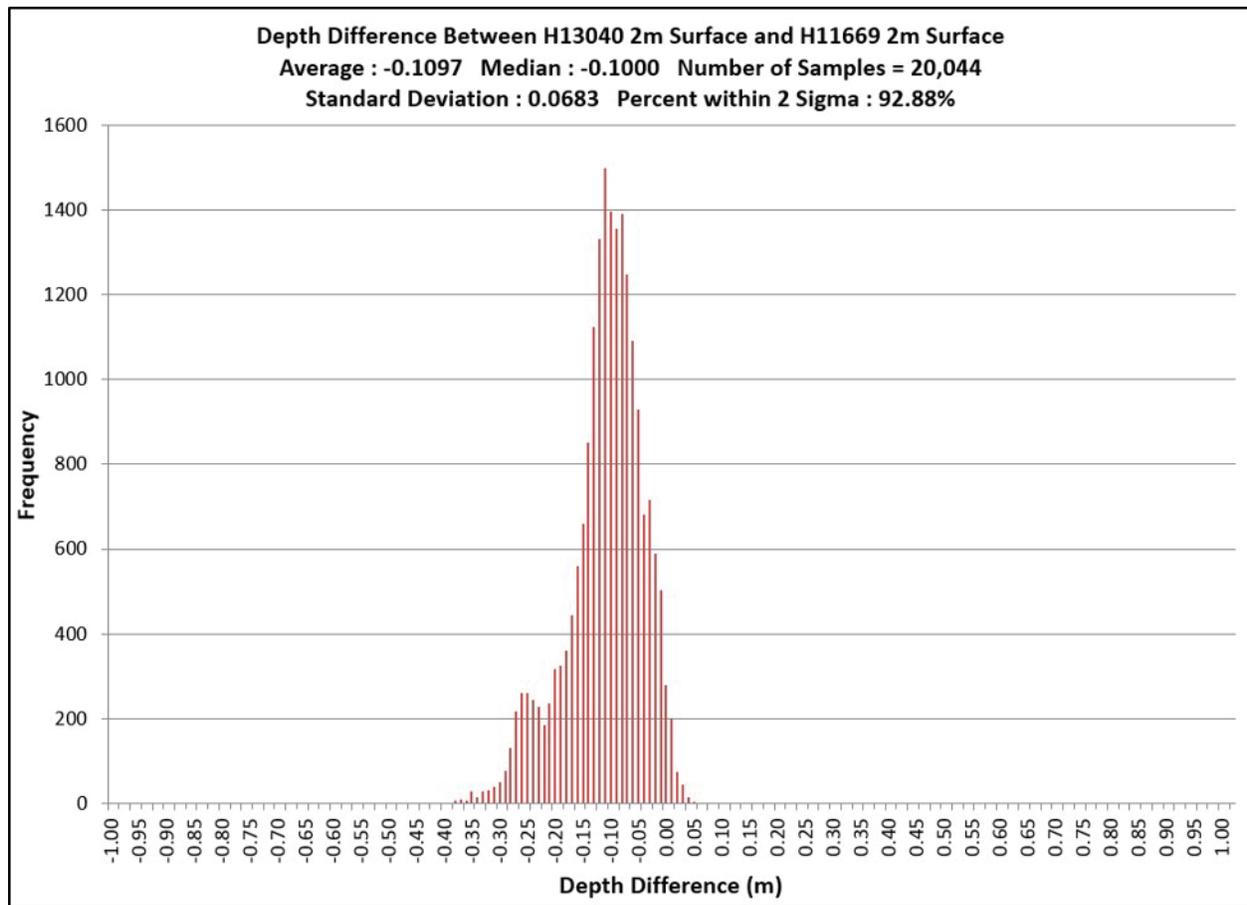


Figure 5: Surface-to-surface difference histogram comparing Survey H13040 to H11669.

## H11670

Survey H11670, a MBES/SSS survey conducted by C&C in 2007-2008, overlaps the northern border of H13040. Survey H11670 and Survey H13040 were run with the intention of achieving either 200% or 100% SSS coverage respectively. As such, each survey's MBES coverage is essentially "skunk stripe coverage." The mainscheme line plan for each survey was oriented nominally east-west with crosslines oriented nominally north-south. The common border length is approximately 15,400 meters. The junction area between the surveys is relatively sparse. Parallel skunk stripe mainscheme lines have an overlap of approximately 30 meters and the combined crossline overlap into the adjacent survey areas is as much as 475 meters.

Depth data for Survey H11670 were downloaded from the National Geophysical Data Center (NGDC) website (<http://www.ngdc.noaa.gov>) in the form of 2-meter resolution Bathymetric Attributed Grids (BAG), "H11670\_2m\_MLLW\_1of6.bag" and "H11670\_2m\_MLLW\_6of6.bag"

To conduct the junction comparison a 2-meter CUBE surface was generated from the entire MBES data set for Survey H13040, "H13040\_MB\_2m\_MLLW". In CARIS HIPS, depths from the "H11670\_2m\_MLLW\_1of6" and "H11670\_2m\_MLLW\_6of6" BAGs were subtracted from the depths

in the "H13040\_MB\_2m\_MLLW" CUBE surface using the CARIS HIPS Difference Surface function. A histogram of the differences is shown in Figure 6.

Overall, depths from the H13040 survey show decent agreement with depths from the H11670 survey. In the extreme, depth discrepancies range from -1.39 meters to +1.29 meters. However the mean difference between surveys is only 8 centimeters. On average, Survey H11670 depths were deeper than H13040 depths. Area specific shoaling and deepening trends are observed in the overlapping datasets. As mentioned in the H11669 Junction discussion above, it is surmised that sediment transport has occurred since the 2007-2008 survey. The largest discrepancy between survey depths (in the area of maximum difference range described above) occurs on Tiger Shoal where the peaks of what is interpreted to be a mobile bedform appear to have moved west since the 2007-2008 survey.

Most (99.02%) junction comparison cells have a difference < 0.71 meters.

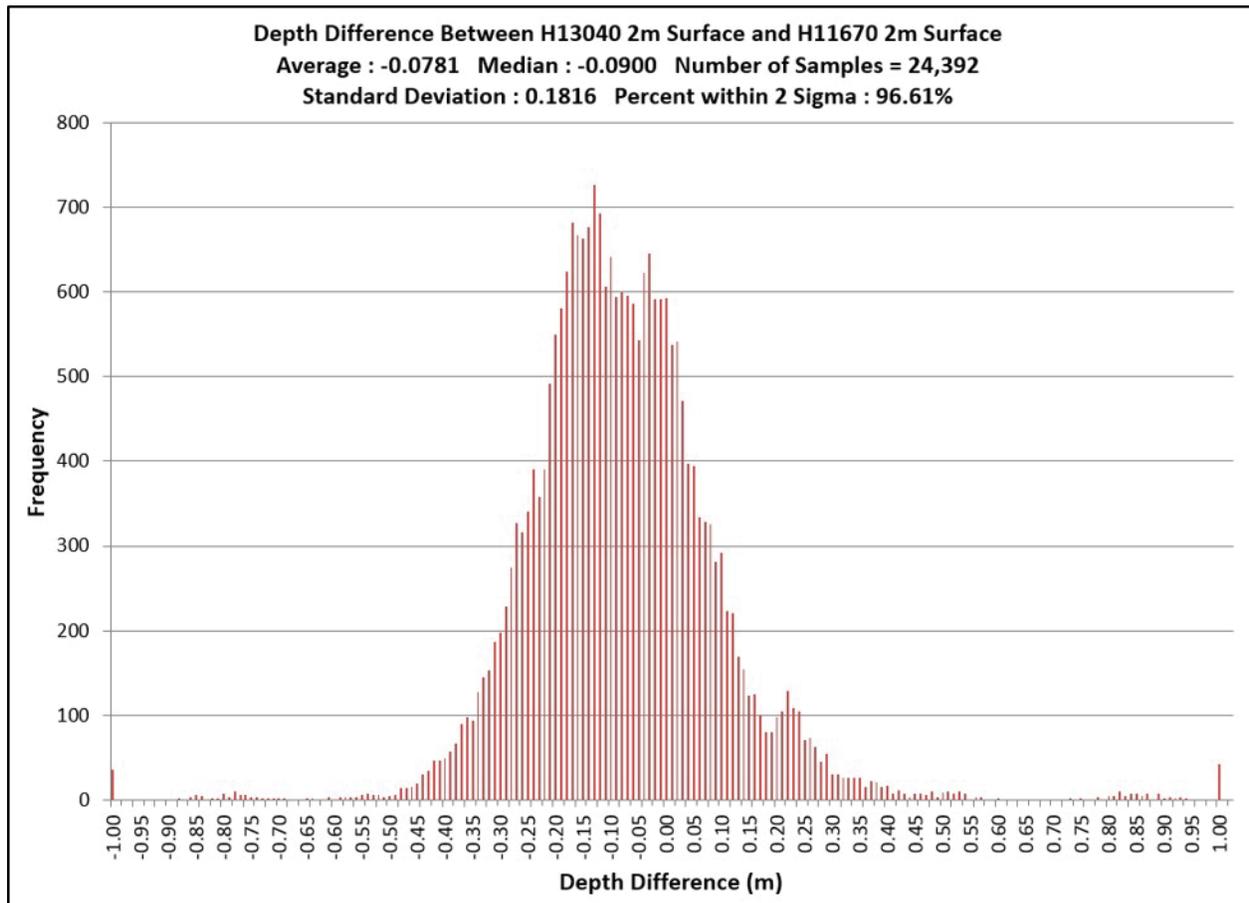


Figure 6: Surface-to-surface difference histogram comparing Survey H13040 to H11670.

H13041

The approximate overlap between the bathymetric data from contemporary Surveys H13040 and H13041 was approximately 300 meters along a common border of approximately 8,000 meters. Both surveys were acquired to meet 100% SSS Coverage, not complete MBES coverage. Given the fact that the respective line plans meet at an obtuse angle there is a fair amount of overlapping data despite the skunk stripe nature of MBES coverage.

Depths from 1-meter BASE surfaces compiled from the MBES data from each survey, "H13040\_MB\_1m\_MLLW" and "H13041\_MB\_1m\_MLLW," were compared using the CARIS HIPS Difference Surface function. A histogram of the differences is shown in Figure 7. Depths from the H13040 survey show good agreement with the depths from the H13041 survey. Depth discrepancies generally equaled 25 centimeters or less with a mean difference of 2 centimeters. Differences appear to be tide related.

All (100%) junction comparison cells have a difference < 0.71 meters.

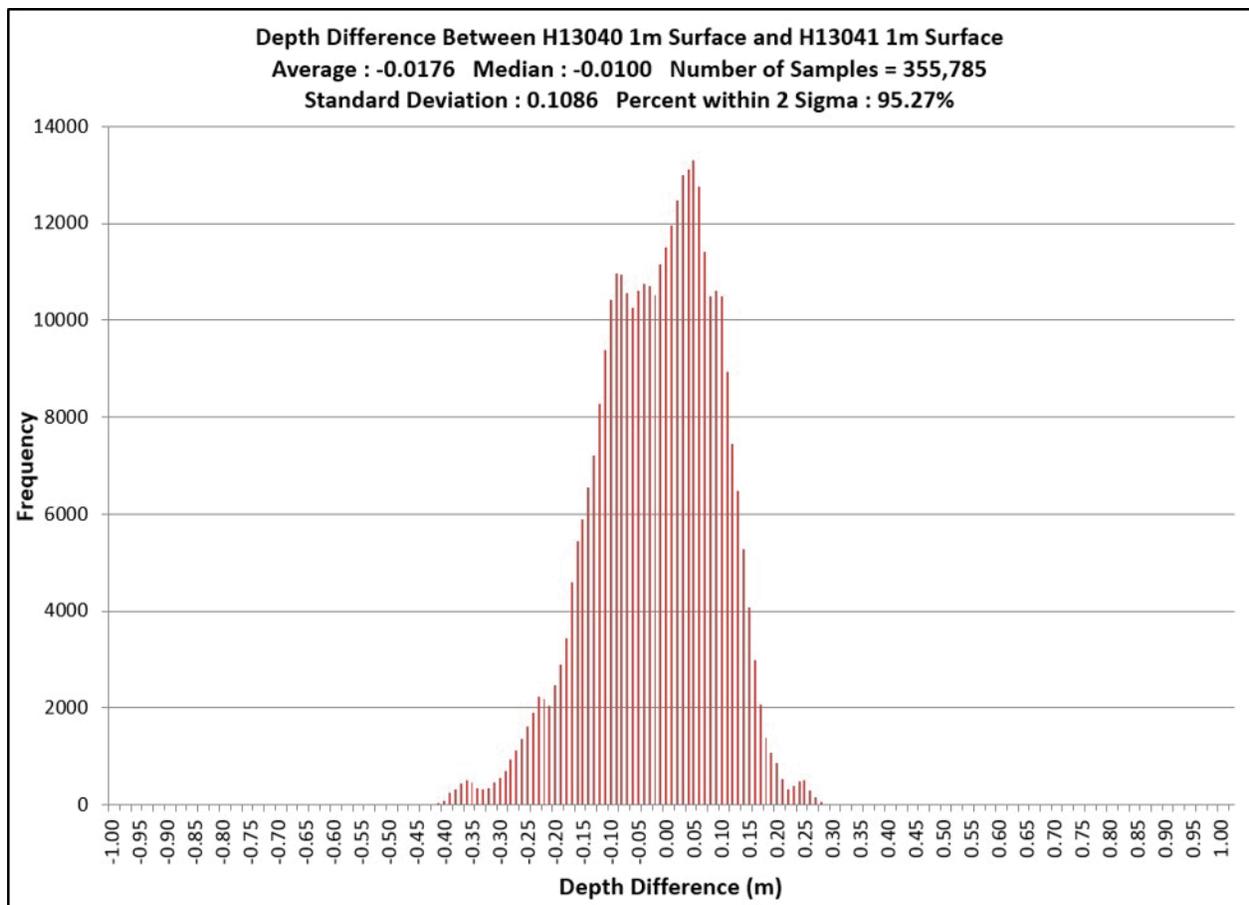


Figure 7: Surface-to-surface difference histogram comparing Survey H13040 to H13041.

## **B.2.4 Sonar QC Checks**

Sonar system quality control checks were conducted as detailed in the Quality Control section of the DAPR. Results from the MBES bar checks are included in Appendix II of the DAPR.

## **B.2.5 Equipment Effectiveness**

### R/V Ocean Explorer MBES Time Sync Errors

Onboard the R/V Ocean Explorer occasional time sync alarms were observed on the Reson 7125 Seabat display during data acquisition. This phenomenon did not occur on the R/V Osprey (using a Reson 8125). The field personnel noted that along with the time sync alarm a brief gap may be observed in the real time display of the Seabat waterfall window. In some cases these events resulted in what appeared to be a gap in the recorded HYPACK .HSX file. Using an EXCEL utility developed by OSI, each and every HYPACK .HSX file was analyzed for these types of gaps upon check-in to the data processing flow. Upon review of the HYPACK .HSX files affected by the time sync gaps, it was noted that the sounding pings were in fact present but, a number of sounding pings would be time tagged with identical times. It is surmised that the gaps are not due to the Reson multibeam hardware, rather that the gaps are associated with acquisition computer buffering. The majority of gaps were less than 1 second. Throughout the entire project, 69 time sync gaps were detected.

When possible (and practical) the HYPACK .HSX time-stacked sounding pings were manually edited and the time stamps rewritten (interpolated/advanced at a 1/15 second interval until proper timing was reacquired). The 1/15 second interval was chosen because the sonar ping rate was limited, via user control, to a rate of 15 pings/second and the sonar range was maintained at a setting that did not limit the pings below 15/second. The affected lines were not converted to CARIS HDCS data until the time stacking editing had been completed. There were certain cases when a given gap was deemed unrepairable based on its duration or its relative location within a file.

By manually editing certain HYPACK .HSX files many lines were "saved." In some cases a gap occurred outside the bounds of the survey area or in an area with adjacent line overlap. In these cases the affected data were rejected. Between "saving" lines and rejecting certain affected data none of the delivered data contain gaps that exceeded 3x3 surface nodes in the 1-meter Complete Coverage surface.

### POSPac TrueHeave gaps

Especially during the first few days of data acquisition (DN 218, DN 219, DN 220) and periodically thereafter the recorded, stand-alone Applanix POSPac files were affected by occasional brief network interruptions with durations on the order of around 5 to 22 seconds. It was believed initially that the cause of the outages was a faulty network cable on the R/V Ocean Explorer (which was replaced on DN 221). However, additional outages on the R/V Ocean Explorer after DN 221 and the fact that both vessels ultimately experienced outages suggest that network collisions may have been the culprit. The result of the network interruptions is an associated gap in the TrueHeave or delayed heave record for each file

affected. It turns out that a number of the gaps described herein occur between times of data acquisition, e.g. before the start of acquisition for the day or between lines. For those files affected a custom "repair" was undertaken.

CARIS HIPS does not allow for application of TrueHeave files with data gaps. Rather than forgo using the discontinuous TrueHeave files, OSI developed a utility to "fill" TrueHeave gaps with the real-time heave data recorded by HYPACK. In practice the utility loops through a given POSpac file and searches for gaps in the TrueHeave record of > 0.1 second. If a gap is detected the utility then polls the appropriate HYPACK .HSX file and extracts the non-delayed, real-time heave values for the period of the data gap. Finally, a TrueHeave file (supplemented with real-time heave as appropriate) is written as a TrueHeave group 111-only file (.000 format). During data check-in each and every POSpac file was analyzed for TrueHeave gaps. For the few days affected by the network interruptions, the OSI utility-generated .000 files were used in lieu of the POSpac .000 file for application of TrueHeave. The analysis and generation of "repaired" files described above were undertaken prior to ingestion into the CARIS HIPS data processing work flow. The "repaired" files include a "TH" for TrueHeave in the file name instead of the OSI default notation of "POS." For example, a file named "17ES024\_OE\_2017\_TH\_219\_0807.000" was generated after repairing the POSpac file named "17ES024\_OE\_2017\_POS\_219\_0807.000."

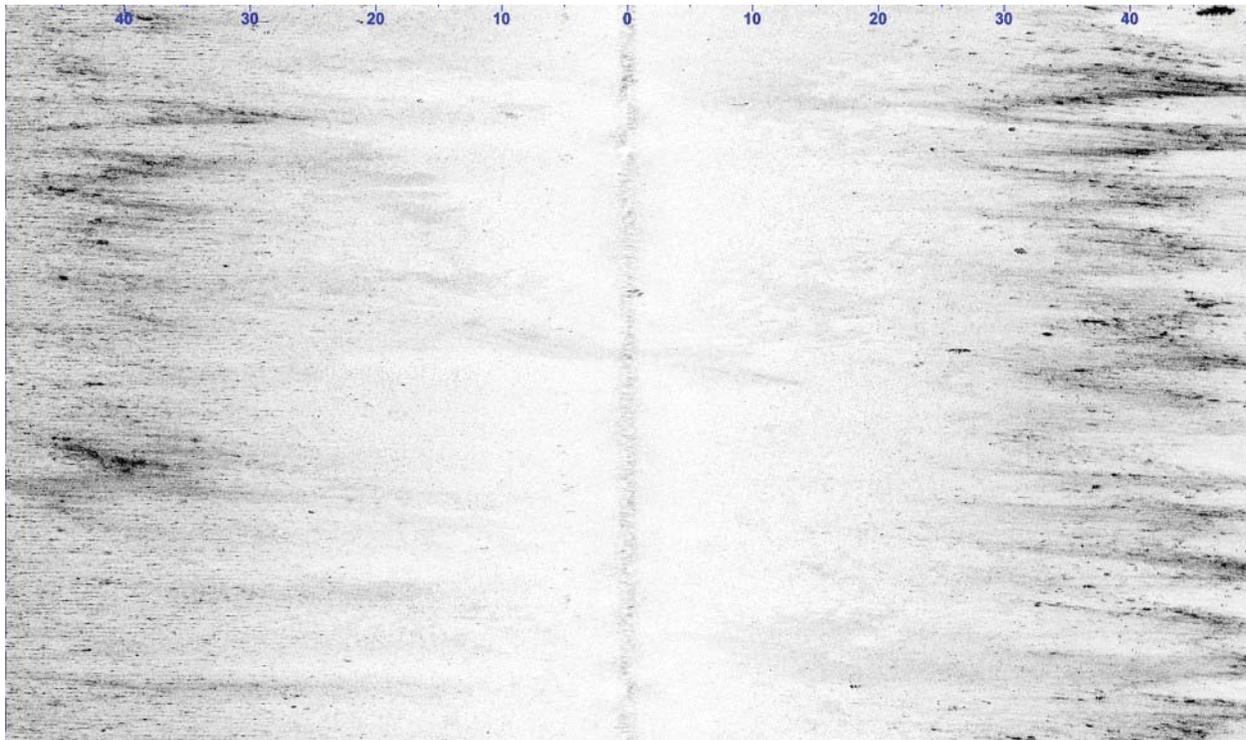
It is important to note that at no time did the network outages described above result in an interruption to the real time network stream as recorded by HYPACK.

On August 7, 2017 (DN219) one POSpac TrueHeave file was not recoverable from the data disk due to a computer crash. These MBES data affected by this lost file, 17ES024\_OE\_2017\_POS\_219\_0807\_2.017, were processed using the real time heave. The non-recoverable file affected only one MBES file, 2017OE2191401\_5004.HSX.

## **B.2.6 Factors Affecting Soundings**

### SSS Refraction

Dynamic sound speed changes affected the SSS imagery at times, causing refraction in the outer ranges of the SSS swath (Figure 8). To ensure that 100% coverage of high quality SSS data was acquired, when necessary, SSS lines with excessive refraction were rejected or the portion of the line with severe refraction was re-run. Due to the relatively shallow water depths and the relatively close line spacing employed in some locations, there were many instances of outer range refraction that did not trigger a re-run or rejection. In these cases high quality, 100% SSS coverage was achieved using only a portion of the imagery from a given line. For example, if refraction affected only the outer 20 meters of the 50 meter image range but the vessel was running on a 40 meter offset line plan, ample overlap was still achieved between adjacent tracklines resulting in greater than 100% SSS coverage of the area. In this scenario SSS imagery was not rejected.

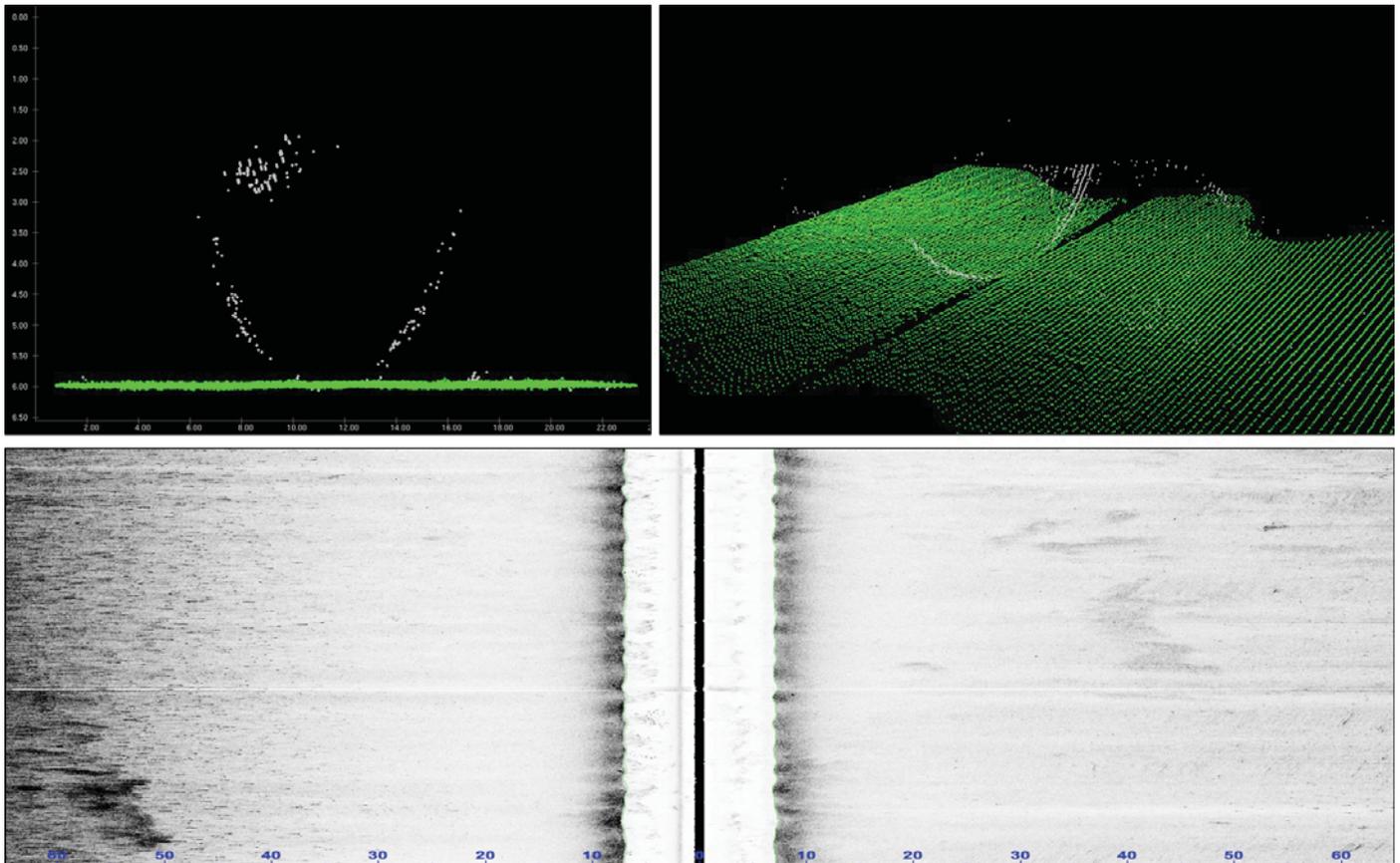


*Figure 8: Refraction in the SSS imagery is visible in both channels of a survey line acquired with the fixed-mount 4125 SSS.*

#### Sea State Induced White Streaks in SSS Imagery and MBES "Blowouts"

Both the Reson 7125 and Reson 8125 systems experienced periodic bursts of motion-induced noise or "blowouts," typically affecting between 1 and 4 sequential profiles. Efforts were made to reduce this noise during acquisition, including adjustments to system gain and power, in addition to the multibeam pole fairing that was installed (on the R/V Ocean Explorer only) to reduce cavitation effects. The noise bursts were infrequent and were encountered when sea state worsened. Accepted data affected by blowouts did not show any coverage gaps in excess of 3 x 3 nodes in the 1-meter MBES coverage surface.

The fixed mount SSS data were also impacted by sea state conditions, such that when the wave frequency and height increased more cavitation effects were observed near the transducer head with a dark return noted at the top of the water column in the raw SSS record. The cavitation noise at the transducer head resulted in intermittent black lines across the SSS record, which occasionally coincided with blowouts in the MBES data (Figure 9). The term "black line" is seen in the acquisition log to denote these types of events. The acquisition SSS waterfall was the opposite palette as the CARIS SSS palate. Therefore, a "black line" noted in the log coincides with a white line in CARIS. To ensure that 100% coverage was attained where the white streaks occurred, holiday fill-in lines were acquired over the location of the streaks with either MBES or SSS coverage as necessary.



*Figure 9: This figure shows how cavitation noise at the SSS and MBES transducer heads presented in the converted data. Noise at the 4125 TX head is visible as a dark return at the top of the water column with white streaking across the raw SSS imagery (bottom). In this instance, the SSS white streak coincided with an MBES blowout (top right and top left images).*

### Tide Offset

Review of surface data indicated that there were a number of minor tide-related offsets between MBES data collected on different days scattered throughout Survey H13040. There were no noteworthy tide events that affected this survey. However, there was a consistent offset on the scale of 10 to 30 centimeters between the predicted and verified tides at the LAWMA, Amerada Pass LA tide station during the period of the survey. Overall, the tide correctors were modeled well for Survey H13040, showing good agreement between survey days. Tide offsets generally equaled 20 cm or less and are likely associated with local environmental effects, i.e. wind setup. Figure 10 highlights a portion of the survey area where a tide offset was noted between a crossline from DN 217 and mainscheme data from DN 220 and DN 223 .

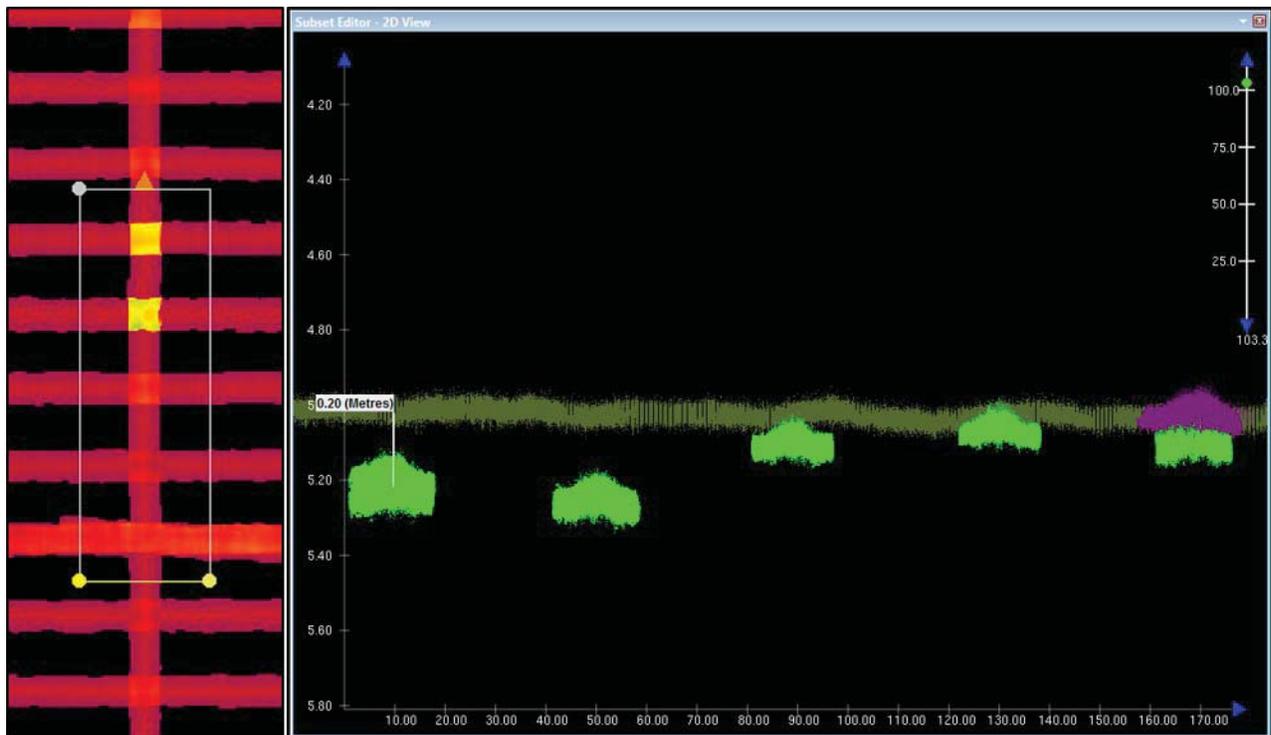


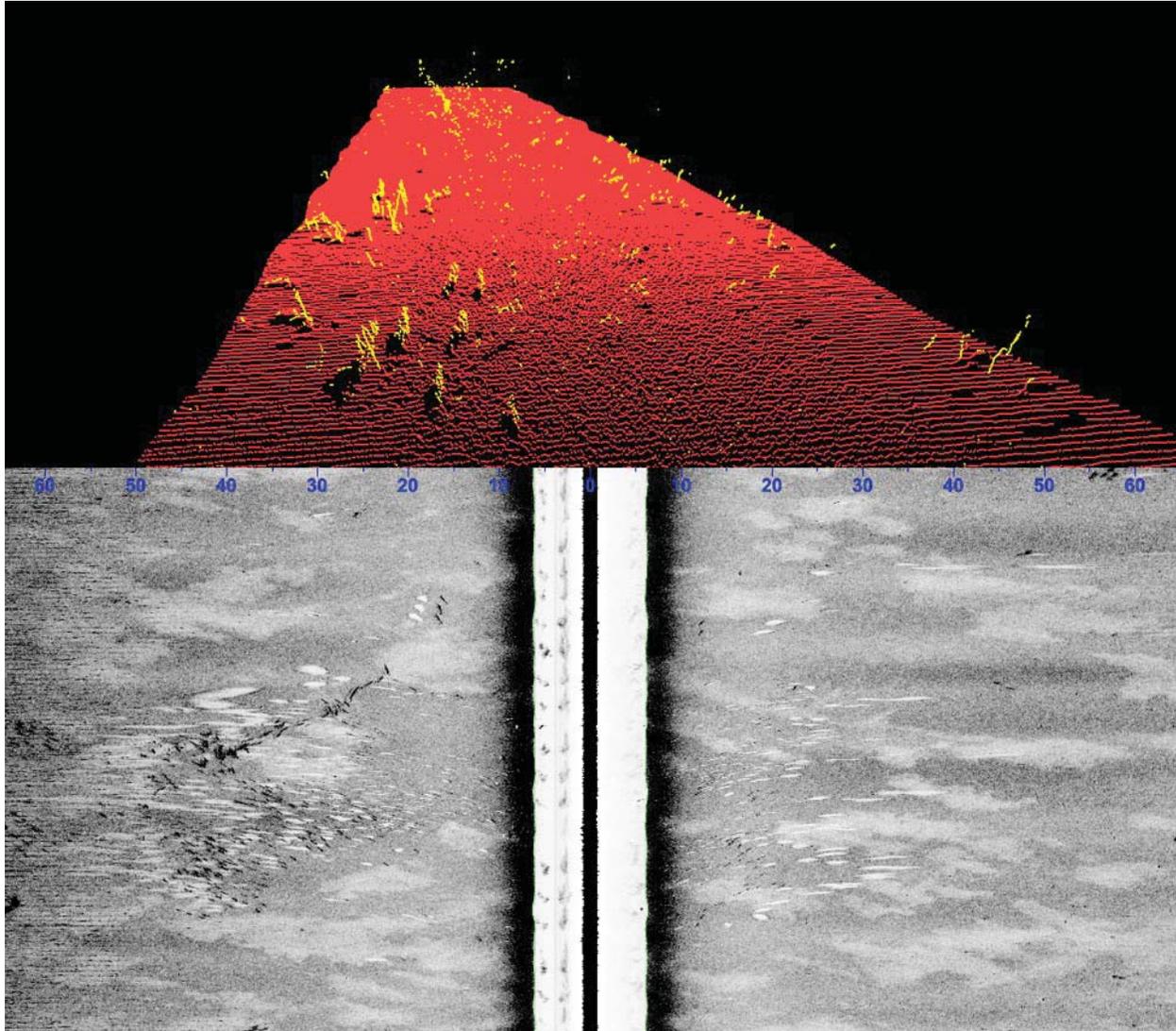
Figure 10: The left image shows a subset window displayed over the Standard Deviation layer from the H13040 1-meter CUBE surface. The yellow/green colors indicate areas of higher standard deviation in the surface due to a tide offset. The right image displays MBES data loaded into CARIS Subset Editor with a tide offset noted between DN 217 (dark green) and some of the survey lines from DN 220 (light green). Other lines from DN 220 (light green) and DN 223 (purple) agree with the crossline depth. Depths and distances are in meters.

### Fish in SSS Imagery and MBES Data

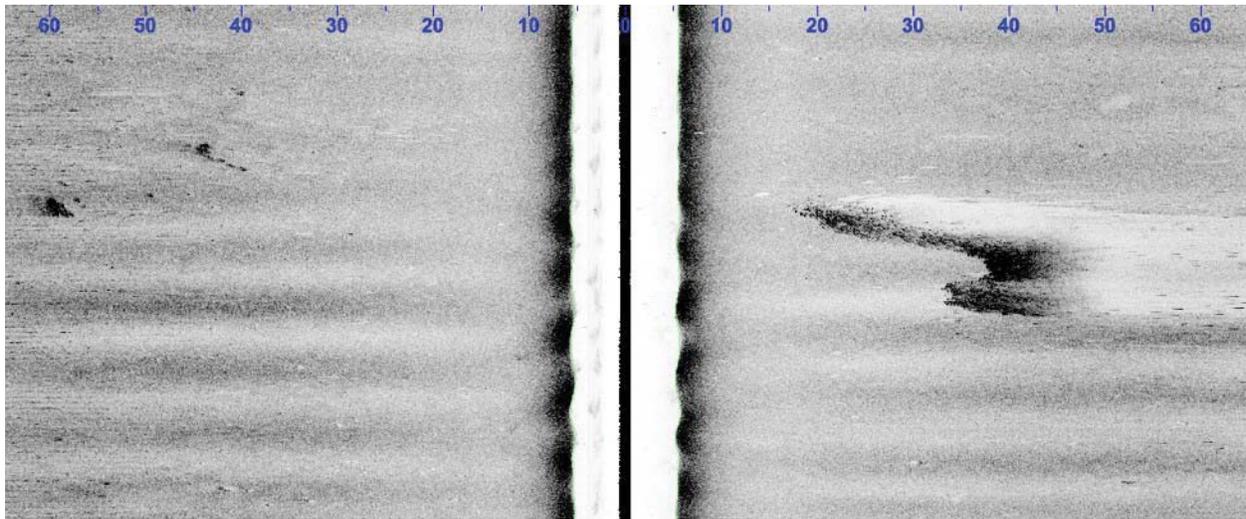
An abundance of fish and marine sea life were seen in the SSS and MBES data, either as lone swimmers or in schools (Figures 11-13). Fish and dolphins were noted in the acquisition log by the field team, and these areas were carefully reviewed during data processing. Shadows in the SSS, usually detached from a dark return, were typically associated with fish either in the water column or at a position closer to nadir. In the cases where a visible shadow was recorded in the SSS, the contact was designated as a fish, for two reasons: 1) the possibility that the assumed fish was actually a feature and 2) to assist processors in rejecting fish-related noise from the MBES data.

Dolphin pods were present within the survey area, as well as large schools of fish, which at times created large shadows in the SSS imagery and gaps in the MBES data where soundings on fish and dolphins were rejected. To ensure that possible significant features were not located in these fish and dolphin shadows, these fish/dolphin related coverage gaps were developed with 200% SSS coverage or complete MBES coverage.

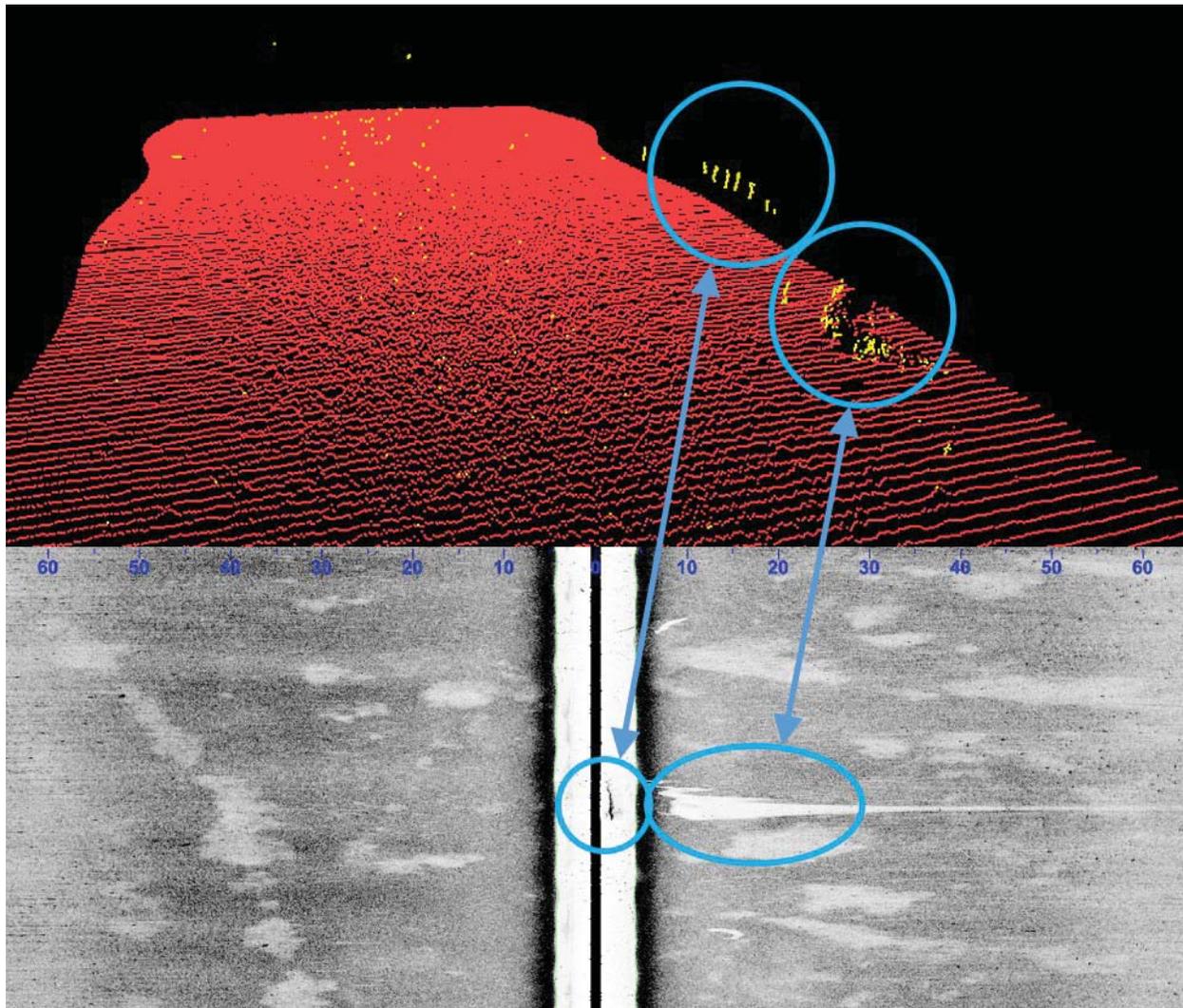
As compared to the other three survey sheets in this project, Survey H13040 had the least amount of fish and dolphin interference. Over 14,000 fish contacts were identified in Survey H13040.



*Figure 11: A school of individual large fish as it appears in the MBES data and in the water column of the raw, un-slant range corrected SSS imagery. The image on the top was taken from the CARIS Subset Editor 3D window with rejected soundings, in this case returns off of the individual fish, colored yellow.*



*Figure 12: SSS image showing a large "fish ball" on the starboard channel.*



*Figure 13: An example of a dolphin as it appears in the water column of the MBES and un-slant range corrected SSS and the acoustic shadow cast in each dataset. In the top panel the rejected MBES soundings are colored yellow.*

### **B.2.7 Sound Speed Methods**

Sound Speed Cast Frequency: Onboard the R/V Ocean Explorer sound speed profile data were acquired with the ODIM MVP30 approximately every 15 minutes as documented in the DAPR. On the R/V Osprey sound speed profiles were acquired at an interval of approximately 1-2 hours or better.

All MBES lines were sound speed corrected using CARIS HIPS' "Nearest in Distance Within Time" method. For MBES data acquired by the R/V Ocean Explorer the interval used was one (1) hour. For MBES data acquired by the R/V Osprey the interval used was two (2) hours. For the duration of data acquisition for Project OPR-K354-KR-17, the water column was relatively well-mixed.

OSI submitted H13040 sound speed data in NetCDF format to the National Centers for Environmental Information (NCEI) on December 7, 2017 via the S2N tool. NCEI assigned the sound speed submission Accession Numbers 0169266 and 0169267. Correspondence regarding the NCEI data submission is included in Appendix II.

### **B.2.8 Coverage Equipment and Methods**

This survey was conducted to develop 100% SSS coverage along with concurrent MBES with backscatter for all survey depths, i.e. Complete Coverage, Option B as defined in Section 5.2.2.3 of the HSSD 2017. For all disprovals either 200% SSS or Complete Coverage MBES was achieved. All depths within Survey H13040 were shallower than 20 meters. Per the HSSD which states "Gaps in SSS coverage should be treated as gaps in MBES coverage and addressed accordingly," gaps in SSS coverage and holidays caused by fish, dolphins, or white line noise were developed with Complete Multibeam or a second side scan coverage. All potentially significant features located with mainscheme SSS or MBES were developed with high density multibeam sonar data to meet the Project Instructions/HSSD requirement of Complete Coverage Multibeam.

The survey methods used to meet coverage requirements did not deviate from those described in the DAPR.

### **B.2.9 Density**

To confirm the HSSD Density coverage requirements, the Compute Statistics tool was utilized within CARIS HIPS and SIPS to generate statistics for the Density layer of the CUBE surface. The HSSD states that at least 95% of the surface nodes shall be populated with at least 5 soundings for the Complete Coverage (Option B) 1-meter surface.

The Compute Statistics tool generates an ASCII export containing two columns: 1) sounding density value and 2) the number of nodes that returned that value. This export was used to determine the percentage of nodes with a sounding density greater than or equal to 5 for the submitted CUBE surface.

The percentage of nodes with density greater than or equal to 5 soundings for the 1-meter Complete Coverage surface is as follows: H13040\_MB\_1m\_MLLW\_Final = 99.14%.

## **B.3 Echo Sounding Corrections**

### **B.3.1 Corrections to Echo Soundings**

All data reduction procedures conform to those detailed in the DAPR.

### B.3.2 Calibrations

All sounding systems were calibrated as detailed in the DAPR.

## B.4 Backscatter

Backscatter data were acquired concurrent with bathymetry data for Survey H13040. Backscatter data were recorded with HYSWEEP SURVEY in .7K format or .81X format by the R/V Ocean Explorer and R/V Osprey respectively. These data were periodically reviewed to ensure function of the backscatter acquisition process. No specific instructions were made in the Project Instructions regarding coverage, ground truthing or processing for the Backscatter data, as such, these data are delivered in raw format in the "Preprocess \MBES" directory per the HSSD, Section 8.3.4 Backscatter Deliverables.

## B.5 Data Processing

### B.5.1 Primary Data Processing Software

The following software program was the primary program used for bathymetric data processing:

Manufacturer	Name	Version
CARIS	HIPS	10.4

*Table 9: Primary bathymetric data processing software*

The following software program was the primary program used for imagery data processing:

Manufacturer	Name	Version
CARIS	SIPS	10.4

*Table 10: Primary imagery data processing software*

The following Feature Object Catalog was used: NOAA Profile V\_5\_5.

Software versions described in Section A of the DAPR were used throughout acquisition and processing of data for Project OPR-K354-KR-17.

## B.5.2 Surfaces

The following surfaces and/or BAGs were submitted to the Processing Branch:

Surface Name	Surface Type	Resolution	Depth Range	Surface Parameter	Purpose
H13040_MB_1m_MLLW_Final	CARIS Raster Surface (CUBE)	1 meters	2.22 meters - 7.69 meters	NOAA_1m	Complete Coverage (Option B)
H13040_SSS_1m_100	SSS Mosaic	1 meters	-	N/A	100% SSS
H13040_SSS_1m_200	SSS Mosaic	1 meters	-	N/A	200% SSS

*Table 11: Submitted Surfaces*

One (1) MBES CUBE surface and two (2) SSS mosaics comprise the total surfaces delivered with Survey H13040. To demonstrate MBES coverage requirements were met for Complete Coverage (Option B) a 1-meter CUBE surface was generated for the entire survey area.

Two 1-meter SSS mosaics were submitted as GeoTIFFs to satisfy the SSS coverage requirements of 100% coverage and 200% coverage over charted feature disprovals and SSS fill-ins. In addition, a higher resolution, 25-centimeter SSS mosaic image composed of all SSS lines was submitted in the ECW (Enhanced Compressed Wavelet) format to assist with the survey review.

A holiday exists in the 100% SSS coverage mosaic at the centroid of the large, three-segmented platform mentioned in H13040 DTON #2. In this case as much coverage was achieved as safe navigation practice allowed.

## C. Vertical and Horizontal Control

Additional information regarding the vertical or horizontal control for this survey can be found in the accompanying Horizontal and Vertical Control Report (HVCR) for Project OPR-K354-KR-17.

### C.1 Vertical Control

The vertical datum for this project is Mean Lower Low Water.

Traditional Methods Used:

## Discrete Zoning

The following National Water Level Observation Network (NWLON) stations served as datum control for this survey:

Station Name	Station ID
LAWMA, Amerada Pass, LA	876-4227

Table 12: NWLON Tide Stations

File Name	Status
8764227.tid	Verified Observed

Table 13: Water Level Files (.tid)

File Name	Status
K354KR2017rev.zdf	Final

Table 14: Tide Correctors (.zdf or .tc)

A final verified tide file was created from verified water level data from the primary tide station LAWMA, Amerada Pass, LA (876-4227) obtained from the CO-OPS website upon completion of survey operations. Discrete zoning methods were utilized to apply tide correctors in CARIS HIPS. The survey area is located within Zones 82, 115, and 154 as provided in the preliminary tidal zoning scheme included with the project SOW.

Final project data are delivered with verified tides applied using a slightly altered version of the preliminary zoning file provided by CO-OPS, "K354KR2017rev.zdf." Neither time nor magnitude multiplier changes were made to the preliminary zoning file provided by CO-OPS. However, the CO-OPS provided zoning file was found to have a minor flaw in the 6th vertex of Zone #82. It was discovered during data processing that this vertex did not fall exactly on a nearby vertex of the adjacent zone (the presumed intention of CO-OPS). The result was a long, narrow, triangular area with no zoning coverage. The non-coverage triangle had two legs roughly 11.6 kilometers long with the third leg being only about 4 meters long. OSI adjusted the Zone #82 vertex which resulted in elimination of the non-coverage area. The OSI-edited zoning file included with the project deliverables uses the same name as noted above, i.e. the file name, as delivered by CO-OPS, was retained.

## C.2 Horizontal Control

The horizontal datum for this project is North American Datum of 1983 (NAD83).

The projection used for this project is UTM Zone 15 North.

All data products, except the S-57 Final Feature File (FFF) are referenced to Latitude/Longitude, UTM Zone 15 North. The S-57 Final Feature File, H13040\_FFF.000, is referenced to the World Geodetic System Datum of 1984 (WGS 84).

All MBES and SSS line and item investigation position data were acquired using an Applanix POS-MV operating in Differential GPS (DGPS) mode. The POS MV on both vessels was configured to receive USCG Differential beacon correctors from the English Turn, LA station. On one occasion during Survey H13040 USCG Differential beacon correctors from the Angleton, TX station were input to the POS MV on the R/V Ocean Explorer due to a relatively prolonged outage of the English Turn, LA beacon. In this case the poor reception is believed to be attributable to foul weather between the English Turn, LA station and the survey area. The English Turn, LA outage affected only one line (2017OE2240859\_5234.HSX) and lasted from approximately 08:52 to 09:18 on 8-12-2017 (DN224). Other English Turn, LA outages did occur. However, none of the outages were of a duration long enough to trigger a change in beacon source. Rather, affected lines were either aborted or ended early when a short outage was detected.

Onboard the R/V Osprey the English Turn beacon was used exclusively. Like the R/V Ocean Explorer, a few short English Turn, LA beacon outages were experienced but none of a duration sufficient to trigger a beacon change.

On both vessels a secondary GPS, used to facilitate real-time horizontal control confidence checks, was supplied with correctors from the Angleton, TX beacon.

Prior to and during the course of the survey the accuracy of the primary positioning system on each vessel was verified by means of a physical measurement to a horizontal control point established at the respective vessel's base of operation. In the case of the R/V Ocean Explorer the checkpoint was established at Shell Morgan Landing in the Intracoastal Waterway. Position confidence checks for this vessel were accomplished, when practical, during fuel or weather stops. In the case of the R/V Osprey the checkpoint was established at a dock in the Quintana Canal at Cypremort Point, LA. Position confidence checks for this vessel were accomplished daily. Refer to the DAPR and HVCR for additional details. For the R/V Ocean Explorer, positioning system confidence checks were performed utilizing both DGPS signal sources mentioned above whereas the R/V Osprey utilized only the English Turn, LA beacon for positioning confidence checks.

The following DGPS Stations were used for horizontal control:

DGPS Stations
English Turn, LA (primary), 293 kHz
Angleton, TX (secondary), 301 kHz

*Table 15: USCG DGPS Stations*

## D. Results and Recommendations

### D.1 Chart Comparison

Chart comparisons were performed in CARIS HIPS/SIPS using finalized BASE surfaces, contours and selected soundings. The latest editions of the NOAA NOS Electronic Nautical Charts (ENC) were downloaded from the NOAA Office of Coast Survey website (<http://www.nauticalcharts.noaa.gov/>) regularly during survey operations, and after the survey was completed for final comparisons. The ENCs used for final comparisons were downloaded on November 15, 2017 and are submitted with the survey deliverables.

Local Notice to Mariners (LNM) and Notice to Mariners (NM) spanning the period beginning subsequent to the date of issuance of the final Hydrographic Project Instructions (June 21, 2017) and ending on November 15, 2017 were consulted in conjunction with the chart comparison.

The following sections adhere to the Descriptive Report sounding rounding system as described in Section 5.1.2 of the HSSD. Specifically, features described below having “precision” depths are presented along with the sounding's TPU. Depth and TPU are rounded to the nearest centimeter by standard arithmetic rounding ("round half up").

During the chart comparison it was found that the shoalest soundings for charted regions were on shoal (seafloor) features. The chart comparisons documented below will discuss general seafloor changes, shoaling and deepening trends. All new or charted features identified, updated or disproved within Survey H13040 were addressed and attributed in the S-57 Final Feature File. For more information on the methodology that was used to build the FFF see Section B.2.5 Feature Verification in the DAPR.

An overview of the areas of change between charted depths and H13040 surveyed soundings is shown in Figure 14. The figure displays a difference surface made by subtracting a 10-meter resolution depth surface generated from the H13040 MBES data from a 250-meter resolution depth surface interpolated from the charted ENC soundings within the project area (ENC source date noted below). Regions of shoaling are represented by positive depth differences (hot colors) and regions of deepening are represented by negative depth differences (cool colors). As evidenced by the coloring in Figure 14 a large portion of the survey area has become deeper since the last survey. The greatest areas of change (blue shading) are immediately east of two discrete migrating shoals (roughly middle-north and middle-south in Figure 14). The shoals appears to be migrating westward and a deepening trend is observed in their wake.

One may expect to see a "hot spot" or a region of shoaling at the location of the migrating shoal located immediately west of the deepening spot (blue/purple) on the south side of in Figure 14. However, the ENC used in preparing this depth change analysis was downloaded on November 15, 2017. As such the shoaling trend discussed in H13040 DTON #1 has already been applied to the ENC. Accordingly, for this comparison, the newly positioned shoal does not show as a red/yellow "hot spot" in Figure 14 since, in the immediate area of the shoal, the surface-to-surface subtraction is essentially using the same data and the net change is zero. For reference, the newly surveyed shoal is immediately west of the blue-shaded area of deepening in the southern 1/3rd of Figure 14.

A detailed description of each chart comparison follows.

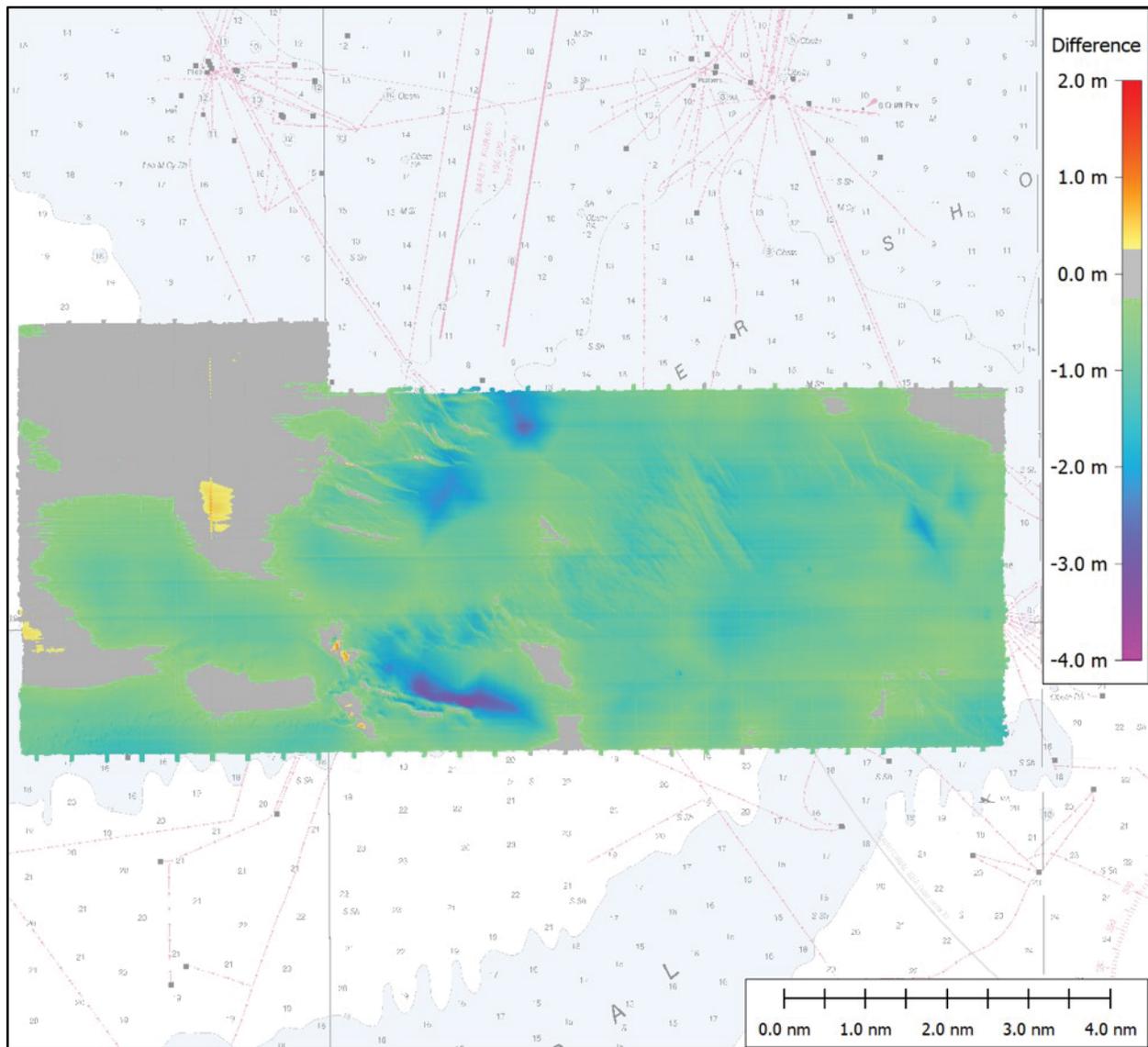


Figure 14: A depth difference surface overlaid on RNC 11349 provides an overview of the areas of change between charted depths and H13040 surveyed soundings.

### D.1.1 Electronic Navigational Charts

The following are the largest scale ENC's, which cover the survey area:

ENC	Scale	Edition	Update Application Date	Issue Date	Preliminary?
US4LA15M	1:80000	27	09/29/2017	10/27/2017	NO
US3GC03M	1:458596	54	07/27/2017	10/13/2017	NO
US4LA21M	1:80000	30	08/25/2017	10/18/2017	NO

*Table 16: Largest Scale ENC's*

#### US4LA15M

ENC US4LA15M is analogous to RNC 11349. In fact, these two chart products essentially share the same geographic footprint. Therefore, chart comparison notes entered under ENC US4LA15M apply to RNC 11349. Within the survey area ENC US4LA15M overlaps ENC US3GC03M (discussed below).

As mentioned above a large portion of the survey area has shoaled. The shoaling trend is on the order of 1-meter for much of the affected area. In the northwest corner of the survey there has been little to no change. Other smaller regions of little to no change are also evident throughout the survey. The greatest magnitude of deepening, about 3.5 meters since the last survey, is east of the migrating shoals in the southern region of the survey.

A 12-foot contour depth area located at approximate position 29-21-31.0N, 92-01-07.8W was disproved. The depths in this area are now greater than 16 feet.

A 12-foot contour depth area located at approximate position 29-19-53.2N, 92-09-07.1W was disproved. The depths in this area are now greater than 16 feet.

A 12-foot contour depth area located at approximate position 29-19-57.2N, 92-07-58.2W was disproved. The depths in this area are now greater than 15 feet.

A 12-foot contour depth area located at approximate position 29-19-53.4N, 92-08-35.8W was disproved. The depths in this area are now greater than 16 feet.

A 12-foot contour depth area located at approximate position 29-21-20.7N, 92-01-47.8W was disproved. The depths in this area are now greater than 15 feet.

A 12-foot contour depth area located at approximate position 29-19-01.2N, 92-07-37.9W was disproved. The depths in this area are now greater than 18 feet.

An 18-foot contour depth area located at approximate position 29-18-43.0N, 92-04-29.9W was disproved. The depths in this area are now greater than 20 feet.

A recently altered 12-foot contour depth area at approximate position 29-19-15.2N, 92-08-53.4W does not accurately portray the full, recently sounded dataset. The southwest side of this 12-foot contour was altered (extended southwestward) to account for the shoal data included in H13040 DTON #1. However, the northeastern side of the contour was not moved southwestward to account for the deepening trend in the area (NOS/NOAA was not in possession of the full sounding set at this time). It is anticipated that this 12-foot contour will be redrawn once the data accompanying this report is incorporated to the chart update process.

A 12-foot contour centered at the following general location: 29-22-22.6N, 92-08-26.3W should be redrawn based on recently surveyed soundings.

The long, continuous 18-foot contour which enters the survey area in the northwest corner and ultimately exits the survey area on the southeast corner will be largely redrawn based on the recently surveyed soundings.

### US3GC03M

ENC US3GC03M falls entirely within the bounds of RNC 11340. However, as seen in the figure below, despite the fact that the ENC and RNC charts are published at the same scale they do not share the same geographic boundary. Chart comparison notes entered under ENC US3GC03M apply to RNC 11340 where the two charts have overlapping coverage.

The long, continuous 18-foot (3-fathom) contour which enters the survey area in the northwest corner and ultimately exits the survey area on the southeast corner will be largely redrawn based on the recently surveyed soundings. It is presumed that this contour is meant to mimic the 18-foot contour shown on ENC US4LA15M as they are closely aligned. However, as presently charted, the respective 18-foot contours are offset by as much as 1,700 meters within the survey area.

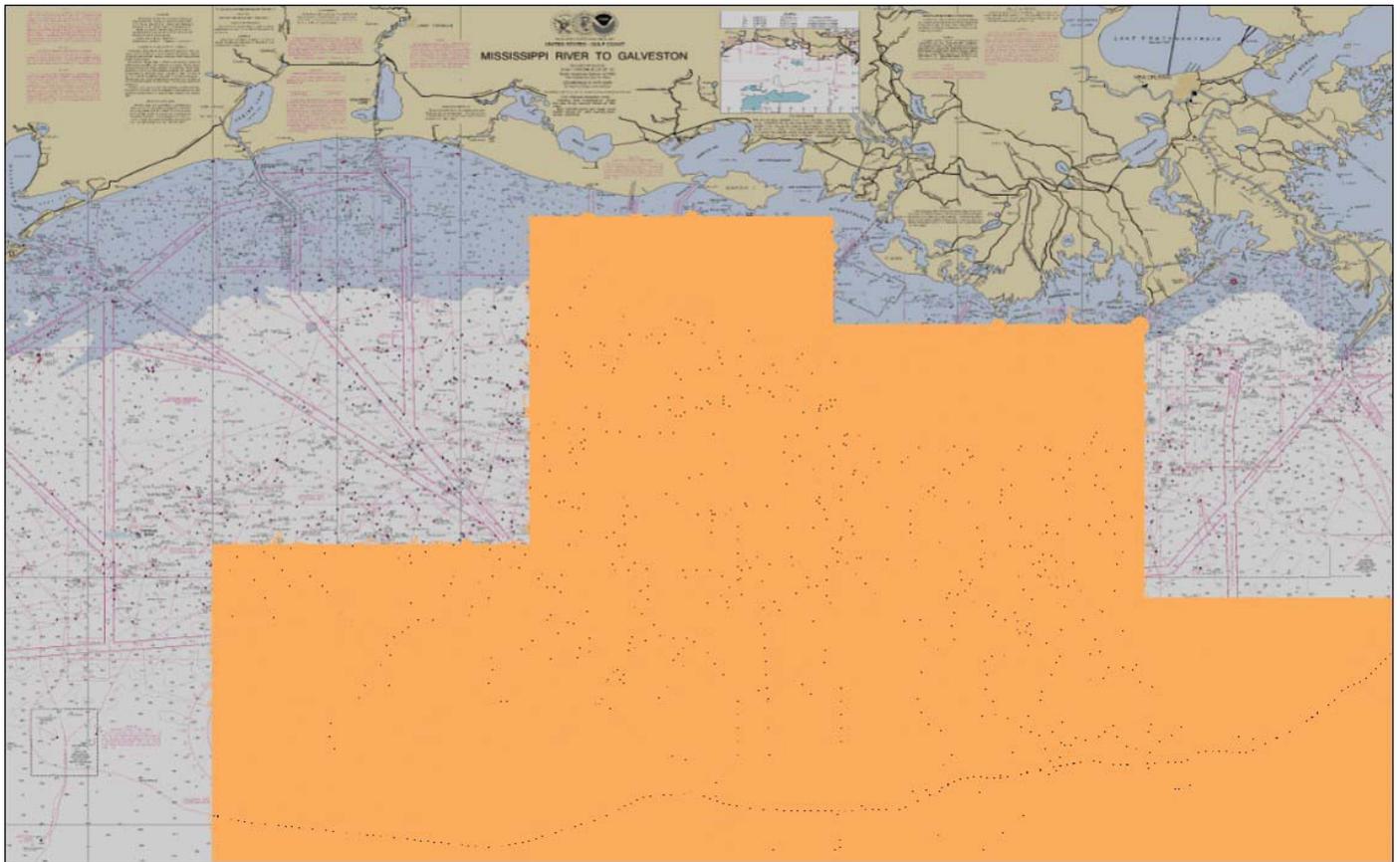


Figure 15: An overview of ENC US3GC03M (shaded orange) superimposed on RNC 11340.

#### US4LA21M

Data from Survey H13040 do not intersect ENC US4LA21M.

#### **D.1.2 Maritime Boundary Points**

No Maritime Boundary Points were assigned for this survey.

#### **D.1.3 Charted Features**

The Project Instructions' guidance on Shoreline and Nearshore Features states, "Submit a Final Feature File in accordance with HSSD Section 7. Contact the COR if there are any questions regarding feature assignments and feature management. All features with attribute 'asgnmnt' populated with 'Assigned' shall be addressed in accordance with Chapter 7 of the HSSD. Investigation requirements for all assigned features will be provided in the investigation requirement attribute 'invreq.' For the purposes of disproval, charted features labeled with a "PA" will have a search radius of 160 meters, charted features labeled with a "PD"

will have a search radius of 240 meters, and other features without a position qualifier will have a search radius of 80 meters. With respect to wellheads, reference HSSD Chapter 7.5.1. If a wellhead is not found, for the purposes of disproval, a 50 m search radius shall be used following the feature disproval techniques for a complete coverage survey outlined in HSSD Section 7.3.4. Include feature in the FFF with descrp = delete."

Guidance on attribution of charted and CSF-assigned features varies between NOS-NOAA documents pertaining to this survey. For example, guidance on New/Delete vs. Update attribution is quite detailed in the HSSD Section 7.5.2 which lists numerous attribution change thresholds. In contrast, the CSF investigation requirements for platforms states, "If visually confirmed, include in FFF with descrp=retain. If not visible, conduct a feature disproval (Section 7.3.4) and if disproved, include in FFF with descrp = delete." The addition of uncharted BSSE Wellheads in the CSF (which were, as assigned, often closer to a surveyed platform than the CSF-defined position of the platform) creates further uncertainty on how to attribute certain features. Given the ambiguity in directives, OSI consulted with the COR for clarification via e-mail on December 6, 2017. The COR's December 11, 2017 response follows: "Include both the significant wellheads and platform features in the FFF, and reposition any platform that deviates greater than 10 meters from the center point of the corresponding charted feature, based on the Page 97 of the HSSD. These are all delete/add for the charted platforms." A record of this correspondence is included in DR Appendix II.

Within the bounds of Survey H13040, 120 features were assigned for investigation within the Composite Source File (CSF): one (1) buoy (BOYLAT), one (1) mooring facility (MORFAC), four (4) wrecks (WRECKS), twenty five (25) platforms (OSFPLF), thirty five (35) pipeline sections (PIPSOL), and fifty five (55) obstructions (OBSTRN). Of the assigned obstructions, fifty three (53) were "BSSE wellhead" obstructions. The buoy is discussed in the ATON section of this report.

A mooring facility (MORFAC) charted at ENC US4LA15M position 29-20-08.01N, 92-10-05.86W (ENC US3GC03M position 29-20-08.23N, 92-10-05.93W) was disproved with 200% SSS and partial MBES coverage within a search area defined by an 80-meter radius. The ENC US4LA15M chart symbol for the MORFAC correlates well with its ENC US3GC03M and RNC counterpart.

Of the four (4) assigned wrecks, all were disproved with 200% SSS and partial MBES coverage within the feature-specific search radii, i.e. 160 meters for the three (3) "PA" wrecks and 240 meters for the single (1) "PD" wreck. What appears to be a non-dangerous wreck (in relation to presently charted soundings) was detected at position 29-19-47.54N, 92-04-21.35W. This wreck-like feature is located approximately 1,734 meters northwest of the ENC-charted wreck located at 29-18-59.52N, 92-03-47.94W. The new wreck is discussed further in the Uncharted Features section of this report. For the disproved wrecks discussed herein the ENC US4LA15M wreck symbols correlate well with their RNC counterparts. However, the ENC US3GC03M wreck symbols are 100 to 400 meters distant from their ENC US4LA15M counterparts at various azimuths.

See DR Section D.2.6 Platforms for information regarding the verification or disproval of the charted platforms.

Of the fifty five (55) obstructions assigned for investigation all but two (2) are BSSE Wellheads. The two (2) non-BSSE Wellhead assigned obstructions include a charted SNAG and a non-specific OBSTN PA.

Neither of these assigned obstructions was attributed with a known depth. Both the SNAG and the OBSTN PA were disproved with 200% SSS and partial MBES coverage within the feature-specific search radii. For the disproved non-BSSE Wellhead obstructions discussed herein the ENC US4LA15M obstruction symbols correlate well with their RNC counterparts. However, the ENC US3GC03M obstruction symbols are nearly 200 meters distant from their ENC US4LA15M counterparts at various azimuths.

All BSSE Wellhead obstructions are recommended for deletion. Of the fifty three (53) BSSE Wellhead obstructions, seven (7) were coincident with verified charted platforms; however, in each case, no evidence of a wellhead aside from the verified platform was found within the disproof area centered on the CSF provided positions defined by a 50-meter search radius. All other BSSE Wellhead obstructions were either stand-alone features or were coincident with CSF-assigned platforms. Each of these remaining forty six (46) BSSE Wellhead obstructions was disproved with 200% SSS and partial MBES in a 50-meter search radius (unless a larger radius was compulsory due to the missing platform). In one case a BSSE Wellhead obstruction symbol falls at the terminus of a charted pipeline and on (near) a disproved, CSF-assigned platform that does not have a corresponding ENC/RNC platform symbol. This CSF-assigned platform is located at position 29-22-23.27N, 92-03-23.25W. For a more complete description of the well head investigations, refer to the H13040 FFF. The source indication (SORIND) attribute field was blank for the BSSE well head features submitted in the CSF; therefore, the SORIND fields are blank for the disproved well heads attributed with a description (descrp) of "Delete" in the FFF.

Thirty five (35) pipeline features were assigned for investigation in the CSF. Many of the pipelines, as packaged and assigned in the CSF, extend outside the bounds of the H13040 survey area. As such, a number of the assigned pipelines are coincident with pipelines in adjacent sheets. During preliminary data processing there were thirty six (36) pipeline or potential pipeline detections identified in Survey H13040. The majority of these detections are duplicate detections, i.e. a single feature imaged on one or more adjacent tracklines. Discounting the duplicated detections, the total number of pipeline or potential pipeline detections is twenty (20). A number of these potential detections were later deemed to be something other than an exposed pipeline, e.g. a water column dolphin or a low relief escarpment. Two (2) of the twenty (20) detections, occurring in the vicinity of position 29-19-27.00N, 92-00-34.00W, are outside the boundary of H13040 and thus are "investigated" in Survey H13041.

All but two pipeline detections are less than or equal to about 1-meter above the seafloor. Both pipeline detections that are about 1.0 meter above the seafloor fall within the footprint of an appropriately placed RNC chart symbol (only 32 and 45 meters from the surveyed position of the respective platforms). Therefore, none of the detections are deemed Dangers to Navigation (DTON) and all valid pipeline detections, as interpreted during late stage processing, were forwarded to the COR via e-mail on December 21, 2017 according to guidance in Section 1.7 of the HSSD regarding Non-DTON Seeps and Pipelines. A "seep" is included in the aforementioned Non-DTON pipeline notification. What is presumed to be one or more gas leaks (adjacent to a platform and at the confluence of three charted pipelines in H13040) was detected in multiple passes of MBES data. The main seep is located at approximate position 29-22-05.1N, 92-00-42.6W. The secondary seep, if it is in fact a seep, is located approximately 17 meters distant from the primary seep.

Regarding the OCS-provided CSF, it should be noted that not all "assigned" features included in the CSF were addressed during the survey. This note is made in light of the Project Instructions' directive that, "all features with attribute 'asgnmnt' populated with 'Assigned' shall be addressed in accordance with

Chapter 7 of the HSSD.” The following time line and narrative are offered as an explanation thereof. The Draft Project Instructions are dated May 2, 2017 and the Draft Composite Source File (CSF) and Project Reference File (PRF) were issued on May 19, 2017. The Final Project Instructions are dated June 21, 2017, and the Final Data Package (including "final" CSF and PRF) was issued to OSI on July 5, 2017. The draft Project Instructions included seven (7) potential sheets, i.e. HXXXXXX Registry Numbers. The negotiated survey effort, reflected in the Final Project Instructions and PRF include four (4) of the seven (7) original sheets. The remaining three (3) sheets are depicted as “unassigned” in the figure included with the Final Project Instructions. However, the Final CSF (file date 5-19-2017) does not reflect the reduction in sheets mentioned above. As such, there are a number of Final CSF “assigned” features that fall well outside of the four surveyed sheets. OSI’s assumption that the CSF “assigned” features falling within the three “unassigned” sheets need not be addressed was confirmed in correspondence with the COR (see Descriptive Reports Appendix II, Correspondence). For clarity the CSF “assigned” features that fall within the three “unassigned” sheets mentioned above are not included in the FFFs.

Prior to this year, exposed pipes and seeps were handled as DTONs and therefore were appended to the FFF. The 2017 HSSD includes a new category of feature, "non-DTON seeps and pipes." However, the 2017 HSSD does not mention whether or not to include these non-DTON features in the FFF. The HSSD only addresses undetected charted pipelines and recommends that a non-detected pipeline should be attributed "Retain." In a December 11, 2017 e-mail to the COR, OSI inquired about how to treat exposed, non-DTON pipes and seeps in the FFF. The COR's December 12, 2017 response follows, "The current requirement of the "Non-DTON Seep and Pipeline Report" is a separate deliverable from the FFF. Your historic method of including the pipeline segments in the FFF is good. How you manage the other features is up to your discretion. The features that are not cartographically significant they will be ignored in the FFF." Given this latitude in how to treat the non-DTON seeps and pipes, OSI chose to include them in the FFF as discrete features.

#### **D.1.4 Uncharted Features**

In general there were very few new features surveyed in H13040. Of the relatively few SSS contacts chosen most were either fish (chosen independent of the mass fish targeting scheme described in the DAPR) or features of insignificant height. All noteworthy new obstructions were surveyed with Complete Coverage MBES. In consideration of each obstruction's nearby soundings or proximity to existing platforms, none of the new obstructions warrant DTON notification.

A feature located at position 29-21-15.53N, 92-09-34.66W with a least depth of 14 feet (4.20 m,  $\pm 0.40$  TPU) is a nondescript mound located over 500 meters from the nearest charted feature. The 14-foot "nondescript mound" feature is presently surrounded by 14-foot and 15-foot charted soundings (Figure 16)

Another feature appears to be a non-dangerous wreck-like item detected at position 29-19-47.54N, 92-04-21.35W with a least depth of 16 feet (5.01 m,  $\pm 0.40$  TPU). As mentioned above this wreck was deemed "non-dangerous" in light of the nearby, presently charted soundings. This wreck-like feature is located approximately 1,734 meters northwest of the ENC-charted "Wreck PD" located at 29-18-59.521N, 92-03-47.941W. The 16-foot wreck-like feature is presently surrounded by 14-foot, 15-foot, and 17-foot charted soundings (Figure 17). This wreck-like feature does not meet the criteria for sounding designation given that it is less than 1.0 meter proud of the seafloor. However, in this case, hydrographer's discretion

drove the decision to designate the shoal sounding on the feature. This feature is attributed as a "dangerous" wreck in the FFF due to its relative depth as compared to the recently surveyed soundings.

A feature located at position 29-19-35.25N, 92-05-25.49W with a least depth of 15 feet (4.69 m,  $\pm 0.40$  TPU) has the shape of a large Danforth-type anchor (this is not to suggest that the feature is an anchor). The 15-foot feature is presently surrounded by 15-foot, 16-foot, and 17-foot charted soundings (Figure 18).

Within Survey H13040 there are at least two noteworthy exposed pipeline features, both having a nominal height of 1.0 meter proud of the seafloor. In both cases these "pipe arch" obstructions are within the footprint of a nearby RNC-charted platform. In neither case is the pipe arch cause for undue concern in light of the nearby, presently charted soundings. The two pipe arches are also discussed in the Non-DTON Seep and Pipeline Report. This report was forwarded to the COR on December 21, 2017 and is included in H13040 DR Appendix II. The position and depths of the two noteworthy pipe arches follows:

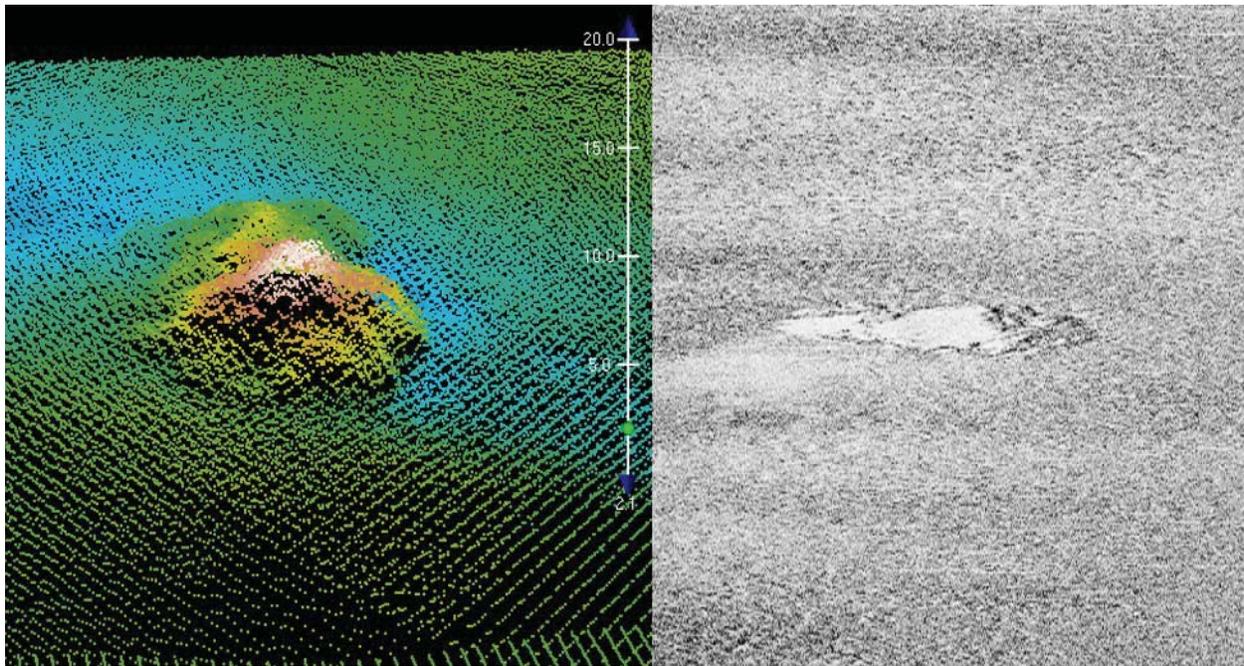
Pipe Arch #1 (Non-DTON Seep and Pipeline Report Image Key #3) 29-22-03.18N, 92-01-28.18W, 14 feet (4.34 m,  $\pm 0.40$  TPU).

Pipe Arch #2 (Non-DTON Seep and Pipeline Report Image Key # 12) 29-22-05.35N, 92-00-41.92W, 12 feet (3.74 m,  $\pm 0.40$  TPU).

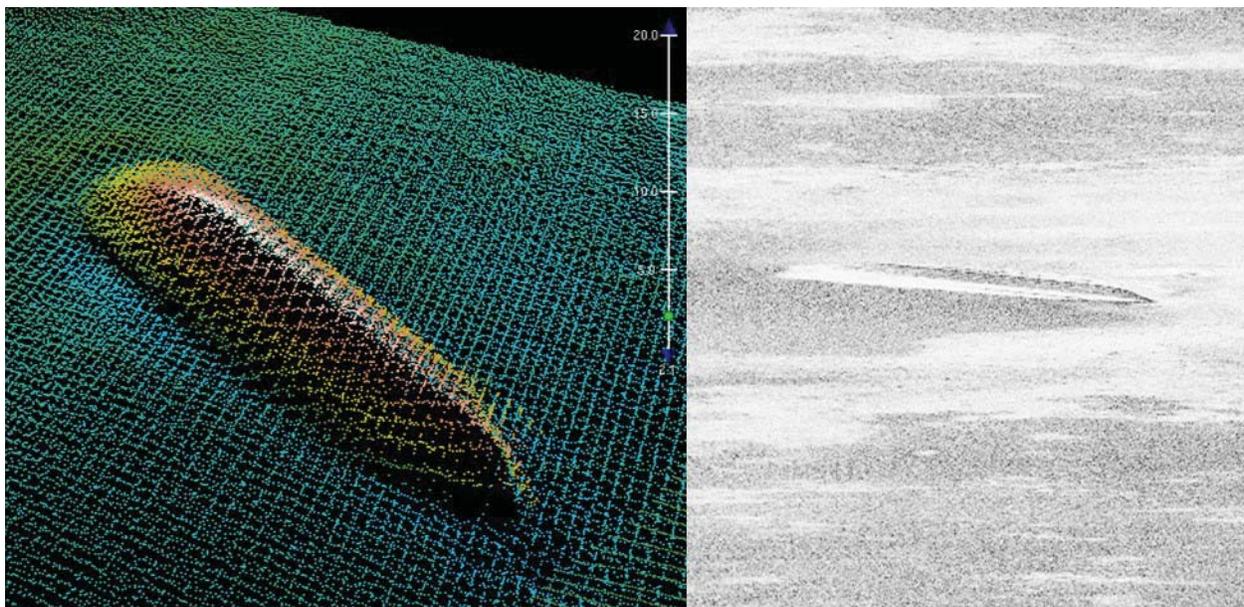
In close proximity to the second listed pipe arch (and charted platform discussed above) there exists a region of disturbed seafloor surrounding the platform. The disturbance is likely associated with construction and/or sediment movement associated with the Non-DTON seeps included in the Non-DTON Seep and Pipeline Report. The shoalest mound in the disturbed area is located at position 29-22-04.96N, 92-00-42.12W and has a least depth of 10 feet (3.10 m,  $\pm 0.40$  TPU). Like the pipe arch, the disturbed seafloor is entirely within the footprint of the RNC-charted platform. Figure 19 shows the spatial relationship between the two seeps, H13040 pipe arch #2, the surveyed platform, and the shoalest disturbed bottom mound.

There exists a pipeline arch at position 29-22-03.18N, 92-01-28.18W that, for a number of reasons, does not meet the criteria for DTON notification. Nor does this pipeline arch meet the criteria for sounding designation given that it is just less than 1.0 meter proud of the seafloor. In this case hydrographer's discretion drove the decision to designate the shoal sounding on the pipe arch.

See H13040\_FFF.000 for additional information.



*Figure 16: A 14-foot "nondescript mound" feature is represented in CARIS HIPS Subset Editor 3D with the soundings colored by depth (left) and in the SIPS waterfall SSS imagery (right).*



*Figure 17: A 16-foot wreck-like feature is represented in CARIS HIPS Subset Editor 3D with the soundings colored by depth (left) and in the SIPS waterfall SSS imagery (right).*

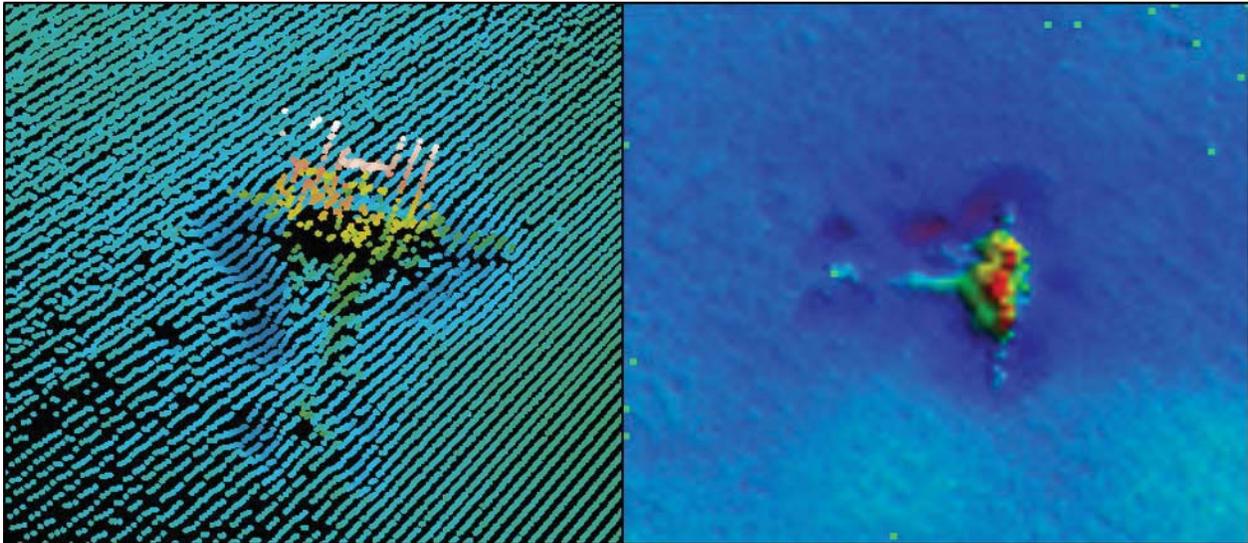


Figure 18: A 15-foot anchor-like feature is represented in CARIS HIPS Subset Editor 3D with the soundings colored by depth (left) and shown as a CARIS depth surface (right).

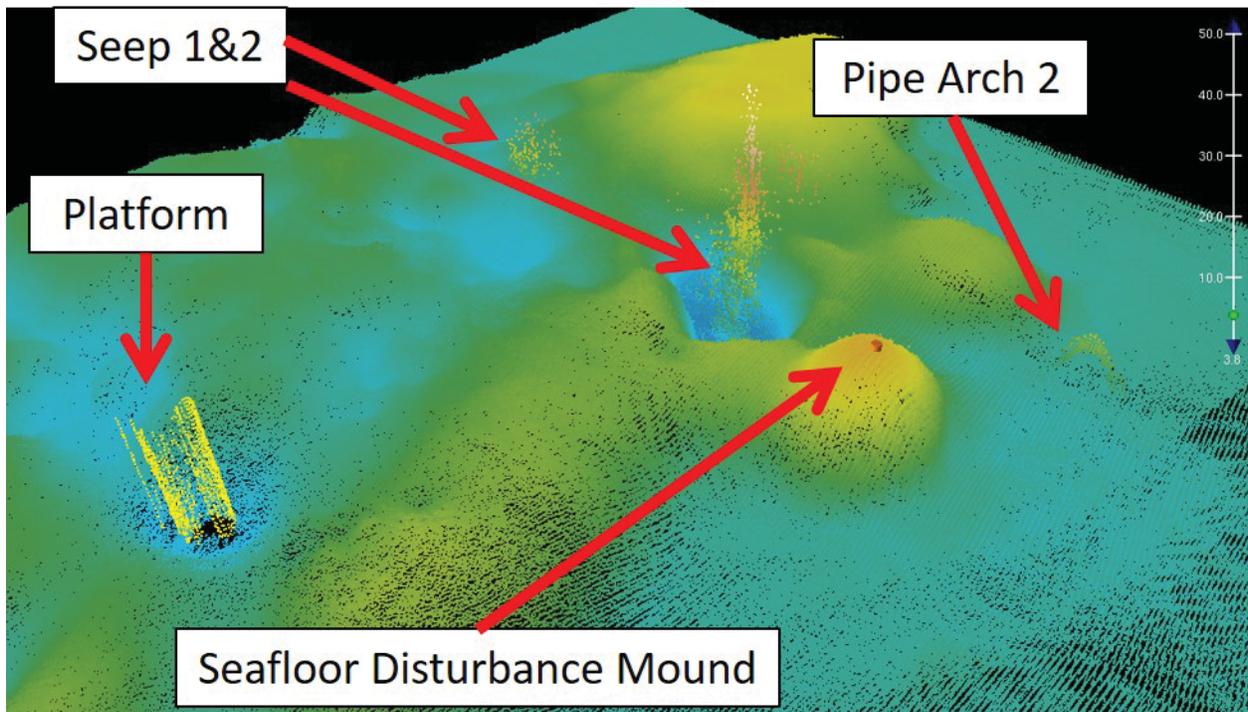


Figure 19: A disturbed seafloor area mound is represented in relation to other H13040 features of interest in CARIS HIPS Subset Editor 3D with the soundings colored by depth.

### D.1.5 Shoal and Hazardous Features

The methods employed in conducting the Shoal and Hazard Features analysis are the same as described above for the Chart Comparison discussion.

In Survey H13040 the only hazardous features surveyed are shoal features associated with what appears to be two large scale mobile bedforms. This is not surprising given that a large portion of the survey falls within the sea area/named water area known as "Tiger Shoal." In fact, the two shoal areas of note can said to be part of Tiger Shoal.

The first shoal area of note was the subject of "H13040\_DtoN\_1\_Shoal.000" submitted to AHB on September 21, 2017. The general location of this shoal is 29-19-11.2N, 92-09-09.0W. This shoal appears to have migrated around one half mile to the west from its previously charted position. Information included in H13040 DTON #1 has since been used to update contours and soundings on ENC US4LA15M and RNC 11349. The change/public notification was first made via LNM 41/17 (October 11, 2017). LNM 41/17 called for deletion one (1) sounding and addition of seven (7) new soundings in the area. The deletion/addition of soundings was in reference to the 46th Edition of RNC 11349. The 47th Edition of RNC 11349 was published on October 1, 2017 and includes the changes referenced herein as well as alteration of one charted contour and the addition of one charted contour in the vicinity of the DTON soundings. LNM 45/17 (November 8, 2017) provides notification of the 47th Edition of RNC 11349. The updated ENC US4LA15M was issued on October 27, 2017. This shoal is included in the ENC US4LA15M discussion (above) in reference to a "recently altered 12-foot contour depth area."

The second shoal area of note is on the northern border of H13040 at the following general location: 29-22-22.6N, 92-08-26.3W. This shoal did not warrant a DTON submittal as the shoal depths are generally in keeping with the charted soundings of the area and the shoal is generally bound by the existing 12-foot contour. It is anticipated however that the 12-foot contour will be redrawn as there is a deepening trend in this area (as well as across the entire sheet).

Two DTONs were generated as a result of this survey.

#### **D.1.6 Channels**

No channels exist for this survey. There are no designated anchorages, precautionary areas, safety fairways, traffic separation schemes, pilot boarding areas, or channel and range lines within the survey limits.

#### **D.1.7 Bottom Samples**

Ten (10) bottom samples were acquired in close proximity to the recommended positions included in the PRF provided with the OPR-K354-KR-17 Project Instructions. Both vessels shared responsibility for sediment sample acquisition. On each vessel a sediment sampler was deployed from a davit to acquire the requisite sample. Bottom sample locations were logged in a target file in HYPACK SURVEY. Once the sample was on deck it was photographed and classified based on the criteria outlined in Appendix H, Bottom Classification, in the HSSD. In general, sediment was found to be in keeping with anticipated nearshore, coastal Louisiana sediments and as-charted conditions. Specifically, sediment within Survey H13040 ranges in consistency from soft mud to stiff sand with some samples containing shell hash.

## **D.2 Additional Results**

### **D.2.1 Shoreline**

Shoreline was not assigned in the Hydrographic Survey Project Instructions or Statement of Work.

### **D.2.2 Prior Surveys**

Prior survey data exist for this survey area. However, with the exception of the assigned junction surveys, prior data were not investigated.

### **D.2.3 Aids to Navigation**

One ATON exists within Survey H13040. The CSF-"assigned" buoy, red nun #2, is located near the southwest end of Tiger Shoal. The buoy was visually observed at its approximate charted position. The ENC-charted and CSF-defined position of the buoy is 29-19-24.570N, 92-09-29.346W. However, the Light List, corrected to Week 45/17 (November 8, 2017) suggests the buoy position is 29-19-24.72N, 92-09-29.82W. The MBES as-surveyed position of the buoy block is 29-19-24.40N, 92-09-28.15W. The buoy block's as-surveyed position is approximately 33 meters ESE of the ENC-charted position.

It is assumed that the "intended purpose" of this buoy, as placed and charted, is to mark the western edge of the shoal feature previously charted at approximate position 29-19-19.5N, 92-08-51.7W. As discussed below, the shoal has migrated west approximately one half of a nautical mile. Assuming that the nun's intended purpose is to mark the western edge of the shoal this indicates that the buoy should be moved west to account for the shifting shoal. However, a Wreck PA symbol is presently charted about 800 meters (0.4 nautical miles) to the northwest of the red nun. A vessel returning from sea may use this buoy as a waypoint for entering the Southwest Pass safety fairway. Given this scenario, shifting the buoy west to accommodate the shoal migration would serve to put the Wreck PA symbol in the natural approach to the safety fairway which, to a mariner, may be a confusing scenario. As noted in the Charted Features section above, all of the charted wrecks in Survey H13040 were disproved. Therefore, it is recommended that the red nun is moved west to accommodate the shifting shoal once the Wreck PA symbol located at position 29-19-42.28N, 92-09-51.35W is removed from the chart products.

### **D.2.4 Overhead Features**

No overhead features exist for this survey.

### **D.2.5 Submarine Features**

As discussed above, thirty five (35) charted pipelines (PIPSOL) are located within Survey H13040. On RNC 11349, only magenta pipeline symbols are shown. This symbol represents supply pipelines for oil, gas, chemicals, or water, according to U.S. Chart No. 1: Symbols, Abbreviations and Terms used on Paper and

Electronic Navigational Charts. None of the Information contained within ENC US4LA15M or the CSF refute the RNC symbolism. None of the charted pipelines have a buried depth value (BURDEP). Six (6) of the ENC charted pipelines have a status of "disused." The majority of the charted pipelines were not visible in the SSS or MBES data.

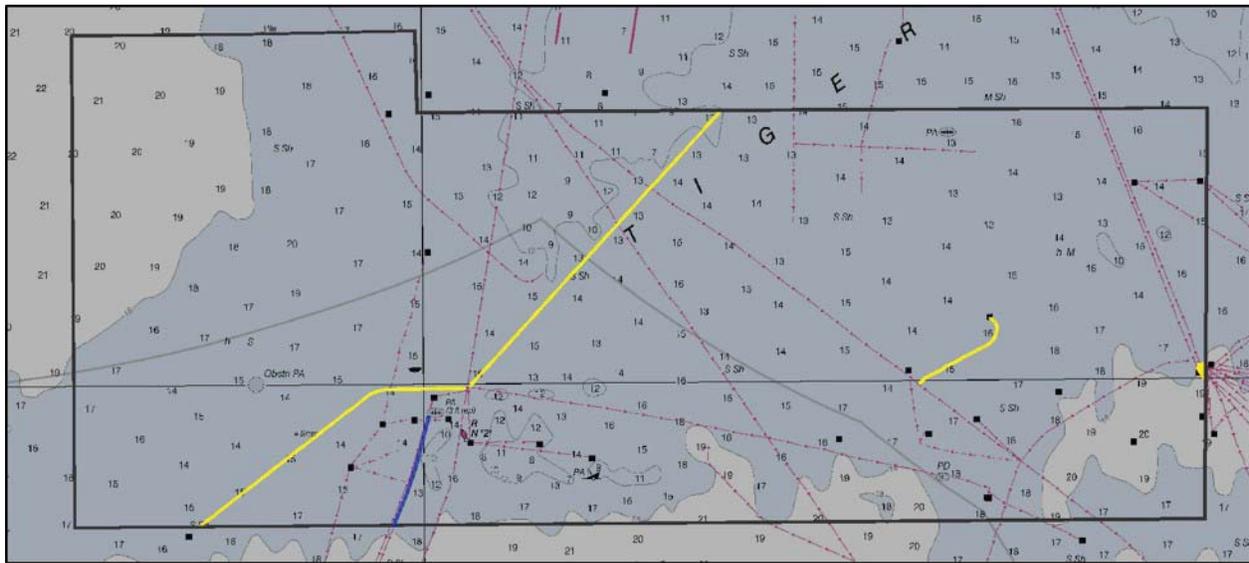
All ENC pipelines within the survey area have a RNC counterpart. All CSF assigned pipelines are represented (within the survey area) in ENC US4LA15M as well as the the large scale RNC of the area, RNC 11349. The pipelines are not represented on ENC US3GC03M.

To further the submarine features discussion an alternate pipeline information source was consulted. The consult includes review of information contained in a pipeline shape file (.SHP) downloaded from the Bureau of Ocean Energy Management (BOEM) on November 30, 2017. Prior to including the BOEM shape file in this analysis, the portion of the shape file that intersects with the OPR-K354-KR-17 project area was reprojected to UTM, Zone 15N, NAD83 and saved as a .DXF file. In CARIS HIPS/SIPS the BOEM pipeline .DXF file was then visually compared to the charted pipelines within the project area to identify any potentially uncharted BOEM pipelines. All but one charted pipeline has a BOEM pipeline counterpart. However, the results of the analysis suggest that there may be over a dozen uncharted BOEM-listed pipe segments within Survey H13040.

The majority of potentially uncharted BOEM pipe segments mentioned above fall within a pipeline confluence area at approximate position 29-20-06.8N, 92-00-42.6W. At this location there already exists a tangle of charted pipelines and a large, sprawling platform. Therefore, the addition of uncharted BOEM pipelines in this area would not practically serve the mariner/chart user.

There are three instances of more distinct, stand-alone BOEM pipelines, not being represented on the ENC/RNC chart products. The general position of these uncharted BOEM pipe segments is as follows: 29-19-23.9N, 92-11-22.9W, 29-21-27.6N, 92-07-52.4W, and 29-20-16.6N, 92-03-27.1W. With two exceptions, no evidence of the uncharted pipelines was detected in the MBES or SSS data. However, all of the three uncharted BOEM pipelines discussed herein intersect either a charted pipeline or platform. In two cases there is evidence of the existence of an uncharted BOEM pipeline intersecting a charted pipeline. In these cases a linear feature, proud of the seafloor, is observed to cross a charted pipeline. In both cases the linear feature falls on, and is oriented identically to the BOEM-defined pipeline. These instances are believed to be pipe crossings where the BOEM-defined pipeline is laid over the existing charted pipeline. These interpreted pipe crossings occur at the following positions: 29-22-01.9N, 92-07-16.3W and 29-19-57.8N, 92-09-27.4W. In one case an ENC/RNC charted pipeline, located in the vicinity of position 29-18-52.2N, 92-10-11.9W, does not have a BOEM pipeline counterpart. Uncharted BOEM pipelines as well as the charted pipeline without a BOEM pipeline counterpart are displayed in Figure 20.

The shape file, "ppl\_arcs.shp" (contained within ppl\_arcs.zip) and re-projected .DXF file, "BOEM\_Pipelines\_UTM\_15N\_NAD83\_Meters.dxf" are included with the digital deliverables along with the RNC/ENC charts considered in the chart comparison. BOEM pipeline data were obtained at the following web address: <https://www.data.boem.gov/Main/Mapping.aspx>



*Figure 20: BOEM-defined pipelines that are not charted are highlighted in yellow in reference to RNC 11349. The charted pipeline without a BOEM counterpart is highlighted in blue. Survey H13040 sheet limits are shown in black.*

## D.2.6 Platforms

Twenty five (25) platforms (OSFPLF) were assigned for investigation in the CSF for Survey H13040. Of these, only 24 platforms exist on ENC US4LA15M and only 23 (or 24, see discussion below) platforms exist on RNC11349. There are no platforms depicted on ENC US3GC03M. The instance of the "missing" ENC platform occurs at the CSF platform positioned at 29-22-23.27N, 92-03-23.20W. Of the two instances where RNC 11349 appears to have missing platforms, one instance occurs at the aforementioned location. The second possible instance of a "missing" RNC platform is at approximate position 29-19-23.4N, 92-09-26.7W where what looks like only one RNC platform is charted but two ENC/CSF platforms exist in close proximity to one another. In this case the intention may have been to depict two RNC platforms but the separation between platform symbols is so small as to be practically indistinguishable as two distinct symbols.

Of the twenty five (25) assigned platforms, seven (7) platforms were found to exist. All existing platforms were surveyed in close proximity to the CSF/ENC defined locations, i.e. a distance of less than 80 meters from the CSF/ENC defined position (80 m is equivalent to 2 mm at a scale of 1:40,000). However, all but one (1) of the surveyed platforms are greater than or equal to 10 meters from the CSF listed position. Therefore, all but one (1) of the CSF platforms that were confirmed via the survey were "deleted" in the FFF and "new" platforms were established at the surveyed locations. One (1) surveyed platform is attributed with "retain." All other CSF-assigned platforms are recommended for deletion as they were disproved visually at the surface and with 200% SSS coverage and partial MBES coverage within the disproval area defined by an 80-meter radius (or larger) centered on the CSF provided platform position.

Images are included in the FFF for all verified platforms. The existing platforms are as follows (positions per CSF):

29-19-51.499920N, 92-09-52.692120W  
29-19-23.534040N, 92-05-02.399280W  
29-20-39.530040N, 92-03-13.686120W  
29-22-03.143640N, 92-01-29.196120W  
29-22-03.949680N, 92-00-42.231960W  
29-20-03.544800N, 92-00-44.354520W  
29-19-35.814360N, 92-00-41.994720W

One of the platforms with coordinates listed above is a large, three-segmented, sprawling platform with the main structures connected by catwalks (See Figure 21). The two major structures, oriented nominally south-north, when measured center-to-center, are separated by nearly 100 meters. As such, it is recommended in H13040 DTON #2 that, at a minimum, an additional platform symbol be added to both ENC US4LA15M and RNC 11349. The existing, appropriately placed, ENC/CSF platform symbol is located at position 29-20-03.54N, 92-00-44.35W (recommended "new" at 29-20-04.75N, 92-00-44.31W). This position describes the southern structure. The new platform symbol could be added at the nominal center of the northern structure at position 29-20-07.79N, 92-00-44.57W. It is noted that BOEM-listed platform positions fall on both the charted platform position and the recommend platform symbol addition discussed in this paragraph. BOEM platforms are described below.

To further the offshore platform discussion an alternate platform information source was consulted. The consult includes review of information contained in a platform shape file (.SHP) downloaded from the Bureau of Ocean Energy Management (BOEM) on November 30, 2017. Prior to including the BOEM shape file in this analysis, the portion of the shape file that intersects with the OPR-K354-KR-17 project area was reprojected to UTM, Zone 15N, NAD83 and saved as a .DXF file. In CARIS HIPS/SIPS the BOEM platform .DXF file was then visually compared to the charted platforms within the project area to identify any potentially uncharted BOEM platforms. Given that only seven (7) CSF-assigned platforms were found during the survey, it follows that there were no uncharted platforms within the bounds of the survey limits (except the "new" platform section recommended for charting above). The majority of BOEM-listed platforms coincide with ENC/CSF-charted platforms. However, there are thirteen (13) BOEM-listed platforms that do not have an ENC/CSF counterpart. Of these BOEM platforms, nine (9) are positioned at the end of, or over charted pipelines. One of the BOEM platforms is located at the position of the "missing" ENC/RNC platform mentioned above at CSF-platform position 29-22-23.27N, 92-03-23.20W.

Notice to Mariners 41/17 (October 14, 2017) calls for deletion of a platform from RNC 11349. RNC 11349 coincides with ENC US4LA15M. The position of the recommended deletion is as follows: 29-22-23N 92-03-23W. Neither the ENC nor the RNC have a platform symbol at (or near) this position. See the FFF for additional information regarding the disproved and verified charted platforms.

The shape file, "platforms.shp" (contained within platforms.zip) and re-projected .DXF file, "BOEM\_Platforms\_UTM\_15N\_NAD83\_Meters.dxf" are included with the digital deliverables along with the RNC/ENC charts considered in the chart comparison. BOEM platform data were obtained at the following web address: <https://www.data.boem.gov/Main/Mapping.aspx>



*Figure 21: Large, three-segmented platform discussed in Section D.2.6. above. In this photo the smallest of the main structures is not visible as it is masked by one of the foreground structures.*

### **D.2.7 Ferry Routes and Terminals**

No ferry routes or terminals exist for this survey.

### **D.2.8 Abnormal Seafloor and/or Environmental Conditions**

As noted above there is evidence of long term sediment transport within the survey area, i.e. the shoal soundings of Tiger Shoal appear to be migrating westward. During the period of the survey, evidence of short term sediment movement was observed. Figure 22 depicts a portion of the depth surface from the western side of Survey H13040. Water depth in this area is around 6.2 meters. Featured in the image are MBES data acquired on 80-meter mainscheme lines from DN 222 and 40-meter split lines from DN 264. Even at 5x vertical exaggeration the mainscheme lines on the surface appears smooth while the split lines show "sediment wave" relief on the order of 15 centimeters. Sediment grabs acquired in the vicinity of this example were described as "stiff sandy mud." It is assumed that the change in bottom character between

DN 222 and DN 264 is largely attributable to the relatively close passage of Hurricane Harvey (around DN 237-242).

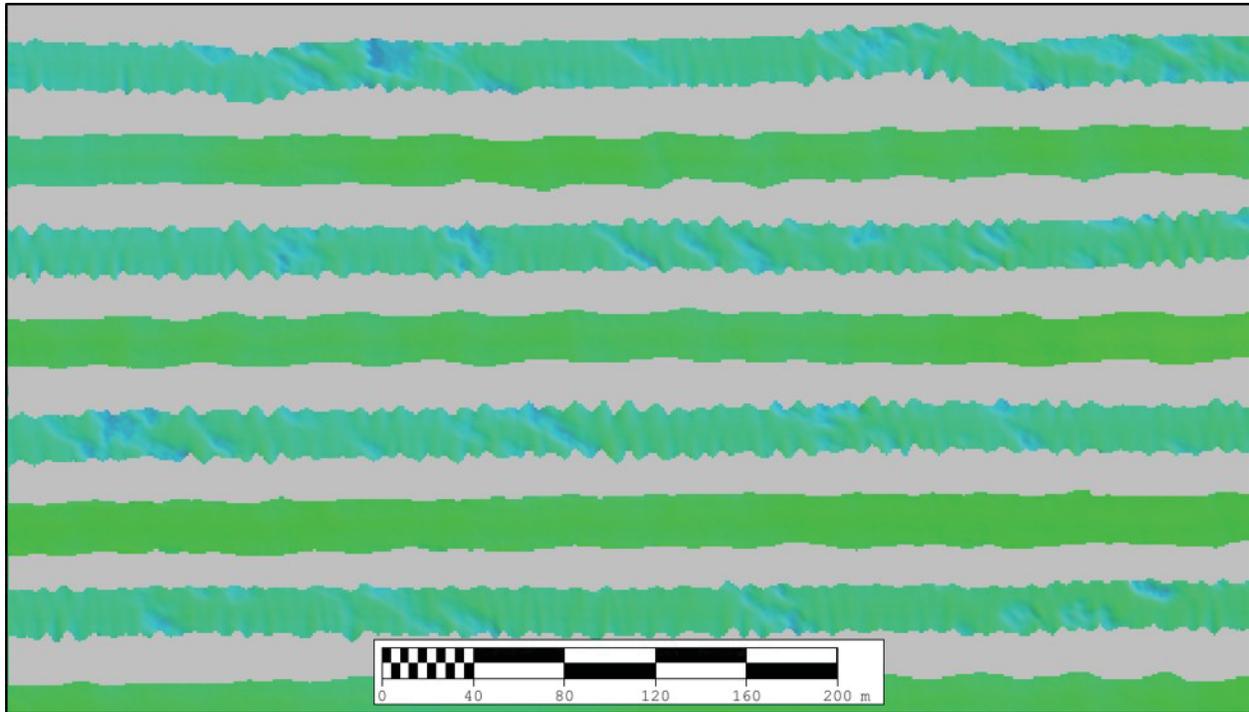


Figure 22: Example of sediment transport in H13040 which occurred over a relatively short period of time.

### D.2.9 Construction and Dredging

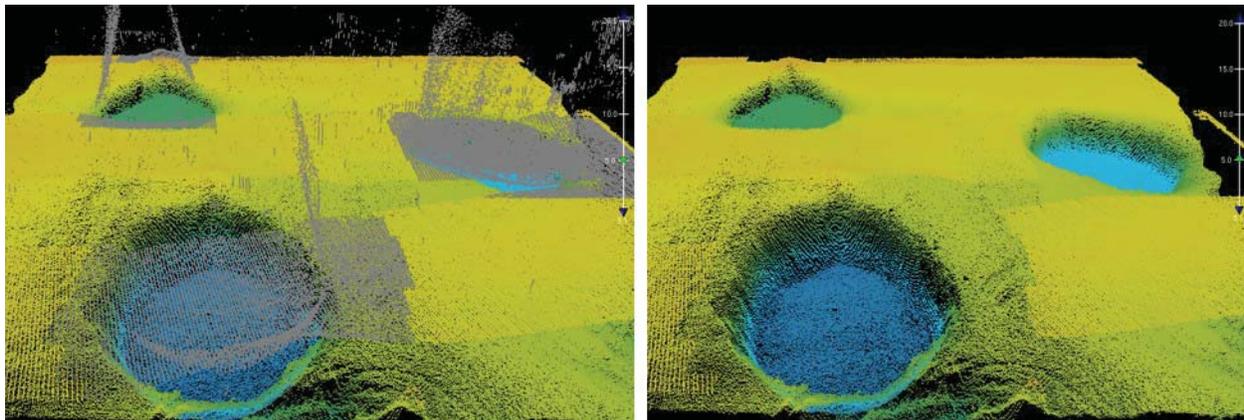
Except for the presence of temporary jackup barges attending to platform maintenance, no other construction or dredging was observed within the survey limits at the time of data acquisition.

### D.2.10 New Survey Recommendation

No new surveys or further investigations are recommended for this area.

### D.2.11 Editing of Jackup Barge Footprints

In one instance a jackup barge visited an area within H13040 at a time between the acquisition of mainscheme MBES lines and investigation MBES lines. Therefore, what was first surveyed as a relatively flat seafloor was later found to have three large depressions. In the case of overlapping data in the area of the jackup barge footprints the older data (DN223) was rejected and the newer data (DN 261) was retained (Figure 23). The jackup barge footprints are found at approximate position 29-20-41.5N, 92-03-15.1W.



*Figure 23: Jackup barge footprints shown with rejected soundings displayed (colored grey left panel) and with rejected soundings removed (right panel).*

### **D.2.12 Marine Mammal Observations**

Per direction in Section 1.5 of the HSSD all personnel aboard the survey vessel used during Project OPR-K354-KR-17 were "trained" as Marine Mammal Observers prior to commencement of the survey. Training consisted of each surveyor and vessel crew member watching the US Navy video referenced in the HSSD.

As noted multiple times in the survey acquisition log, large, mobile water column sonar targets (assumed to be dolphins) were ensonified by either the MBES or the SSS. The dolphin-assumption is based on both the size and behavior of the sonar targets. Often times these observations did not coincide with a visual (above water) sighting. Visual observations, when noted, were recorded on NOAA/NMFS, AFSC/NMML Form 11US (POP) which is included as Appendix L of the HSSD.

Completed digital 11US (POP) forms were compiled and transmitted along with the Project's digital marine mammal training record to [pop.information@noaa.gov](mailto:pop.information@noaa.gov) and [ocs.ecc@noaa.gov](mailto:ocs.ecc@noaa.gov) with a CC to the Project's COR, Starla Robinson. These records are also included in Descriptive Report Appendix II.

### **D.2.13 Coast Pilot Review**

In reference to the OPR-K354-KR-17 survey area the Coast Pilot Report, included with the July 6, 2017 Final Data Package, states that, "there are no paragraphs included in the U.S. Coast Pilot 5 that describe this area and thus, there are no investigation items to be listed." The survey area considered in the Coast Pilot Report does not exactly match the area ultimately surveyed. However, the Report's "no-investigations" statement still applies to the area actually surveyed. Furthermore, the Hydrographic Survey Project Instructions contained only general guidance regarding the Coast Pilot. As such OSI was not able to "respond to each question posed in the Coast Pilot Field Report" as mentioned in Section 8.1.3 of the HSSD. In lieu of targeted responses to an assigned Coast Pilot Field Report, OSI conducted a general review of relevant Coast Pilot excerpts. Specifically, pertinent paragraphs from the following Coast Pilot section were considered: Coast Pilot 5 - 45th Edition, 2017 updated through 12-October-2017, Mississippi River to Sabine Pass.

Within the Coast Pilot Edition mentioned above there are no specific, detailed, relevant entries concerning the assigned H13040 survey area. Rather, only entries of a general nature are mentioned and are not refutable based on the observations of the OSI field team. Regarding “areas frequently transited and facilities utilized during in-ports” (as mentioned in the HSSD Section 8.1.3), Coast Pilot entries are somewhat more relevant. However, there are only a few Coast Pilot entries that OSI's general review attempts to address as most entries were not relevant to the "areas frequently transited by the survey vessel and facilities utilized during in-ports."

OSI's Coast Pilot Review Report and the original Coast Pilot Report, mentioned above, were transmitted to [ocs.nbd@noaa.gov](mailto:ocs.nbd@noaa.gov) and [coast.pilot@noaa.gov](mailto:coast.pilot@noaa.gov) with a CC to the Project's COR, Starla Robinson. These records are also included in Descriptive Report Appendix II.

#### **D.2.14 Inset Recommendation**

No new insets are recommended for this area.

## E. Approval Sheet

As Chief of Party, field operations for this hydrographic survey were conducted under my direct supervision, with frequent personal checks of progress and adequacy. I have reviewed the attached survey data and reports.

All field sheets, this Descriptive Report, and all accompanying records and data are approved. All records are forwarded for final review and processing to the Processing Branch.

The survey data meet or exceed requirements as set forth in the NOS Hydrographic Surveys and Specifications Deliverables, Field Procedures Manual, Letter Instructions, and all HSD Technical Directives. These data are adequate to supersede charted data in their common areas. This survey is complete and no additional work is required with the exception of deficiencies noted in the Descriptive Report.

Report Name	Report Date Sent
Data Acquisition and Processing Report	2018-01-19
Horizontal and Vertical Control Report	2018-01-19

Approver Name	Approver Title	Approval Date	Signature
George G. Reynolds	Chief of Party	01/31/2018	



Digitally signed by  
George G. Reynolds  
Date: 2018.01.31  
16:52:01 -05'00'

## F. Table of Acronyms

<b>Acronym</b>	<b>Definition</b>
<b>AHB</b>	Atlantic Hydrographic Branch
<b>AST</b>	Assistant Survey Technician
<b>ATON</b>	Aid to Navigation
<b>AWOIS</b>	Automated Wreck and Obstruction Information System
<b>BAG</b>	Bathymetric Attributed Grid
<b>BASE</b>	Bathymetry Associated with Statistical Error
<b>CO</b>	Commanding Officer
<b>CO-OPS</b>	Center for Operational Products and Services
<b>CORS</b>	Continually Operating Reference Station
<b>CTD</b>	Conductivity Temperature Depth
<b>CEF</b>	Chart Evaluation File
<b>CSF</b>	Composite Source File
<b>CST</b>	Chief Survey Technician
<b>CUBE</b>	Combined Uncertainty and Bathymetry Estimator
<b>DAPR</b>	Data Acquisition and Processing Report
<b>DGPS</b>	Differential Global Positioning System
<b>DP</b>	Detached Position
<b>DR</b>	Descriptive Report
<b>DTON</b>	Danger to Navigation
<b>ENC</b>	Electronic Navigational Chart
<b>ERS</b>	Ellipsoidal Referenced Survey
<b>ERZT</b>	Ellipsoidally Referenced Zoned Tides
<b>FFF</b>	Final Feature File
<b>FOO</b>	Field Operations Officer
<b>FPM</b>	Field Procedures Manual
<b>GAMS</b>	GPS Azimuth Measurement Subsystem
<b>GC</b>	Geographic Cell
<b>GPS</b>	Global Positioning System
<b>HIPS</b>	Hydrographic Information Processing System
<b>HSD</b>	Hydrographic Surveys Division
<b>HSSD</b>	Hydrographic Survey Specifications and Deliverables

<b>Acronym</b>	<b>Definition</b>
<b>HSTP</b>	Hydrographic Systems Technology Programs
<b>HSX</b>	Hypack Hysweep File Format
<b>HTD</b>	Hydrographic Surveys Technical Directive
<b>HVCR</b>	Horizontal and Vertical Control Report
<b>HVF</b>	HIPS Vessel File
<b>IHO</b>	International Hydrographic Organization
<b>IMU</b>	Inertial Motion Unit
<b>ITRF</b>	International Terrestrial Reference Frame
<b>LNM</b>	Linear Nautical Miles
<b>MCD</b>	Marine Chart Division
<b>MHW</b>	Mean High Water
<b>MLLW</b>	Mean Lower Low Water
<b>NAD 83</b>	North American Datum of 1983
<b>NAIP</b>	National Agriculture and Imagery Program
<b>NALL</b>	Navigable Area Limit Line
<b>NM</b>	Notice to Mariners
<b>NMEA</b>	National Marine Electronics Association
<b>NOAA</b>	National Oceanic and Atmospheric Administration
<b>NOS</b>	National Ocean Service
<b>NRT</b>	Navigation Response Team
<b>NSD</b>	Navigation Services Division
<b>OCS</b>	Office of Coast Survey
<b>OMAO</b>	Office of Marine and Aviation Operations (NOAA)
<b>OPS</b>	Operations Branch
<b>MBES</b>	Multibeam Echosounder
<b>NWLON</b>	National Water Level Observation Network
<b>PDBS</b>	Phase Differencing Bathymetric Sonar
<b>PHB</b>	Pacific Hydrographic Branch
<b>POS/MV</b>	Position and Orientation System for Marine Vessels
<b>PPK</b>	Post Processed Kinematic
<b>PPP</b>	Precise Point Positioning
<b>PPS</b>	Pulse per second
<b>PRF</b>	Project Reference File

<b>Acronym</b>	<b>Definition</b>
<b>PS</b>	Physical Scientist
<b>PST</b>	Physical Science Technician
<b>RNC</b>	Raster Navigational Chart
<b>RTK</b>	Real Time Kinematic
<b>SBES</b>	Singlebeam Echosounder
<b>SBET</b>	Smooth Best Estimate and Trajectory
<b>SNM</b>	Square Nautical Miles
<b>SSS</b>	Side Scan Sonar
<b>ST</b>	Survey Technician
<b>SVP</b>	Sound Velocity Profiler
<b>TCARI</b>	Tidal Constituent And Residual Interpolation
<b>TPE</b>	Total Propagated Error
<b>TPU</b>	Topside Processing Unit
<b>USACE</b>	United States Army Corps of Engineers
<b>USCG</b>	United Stated Coast Guard
<b>UTM</b>	Universal Transverse Mercator
<b>XO</b>	Executive Officer
<b>ZDA</b>	Global Positioning System timing message
<b>ZDF</b>	Zone Definition File

APPENDIX I  
TIDES AND WATER LEVELS

# **Appendix I**

## **Tides and Water Levels**

The following table summarizes the days in which data were collected that contribute to the final accepted data set.

**Table 1**  
**Abstract of Times of Hydrography**

<b>Date</b>	<b>Day Number</b>	<b>Min. Time UTC</b>	<b>Max. Time UTC</b>
8/4/2017	216	16:46:32	23:34:18
8/5/2017	217	00:16:36	16:35:40
8/6/2017	218	14:01:01	23:41:36
8/7/2017	219	00:35:02	23:33:48
8/8/2017	220	00:22:07	23:28:32
8/9/2017	221	01:06:46	14:43:41
8/10/2017	222	16:29:52	23:46:28
8/11/2017	223	00:32:23	23:44:55
8/12/2017	224	00:26:28	23:51:36
8/13/2017	225	00:51:14	23:48:43
8/14/2017	226	00:26:15	23:44:30
8/15/2017	227	00:27:10	15:30:22
8/17/2017	229	00:12:41	23:35:06
8/18/2017	230	00:28:32	23:49:03
8/19/2017	231	00:22:14	23:03:20
8/20/2017	232	00:27:27	23:41:36
9/1/2017	244	14:51:32	22:20:41
9/2/2017	245	14:12:01	22:18:36
9/3/2017	246	14:10:33	23:34:53
9/18/2017	261	17:48:45	22:20:29
9/19/2017	262	14:16:26	22:16:18
9/20/2017	263	14:53:17	22:35:53
9/21/2017	264	14:11:19	23:14:38
10/11/2017	284	18:50:02	22:39:28
10/12/2017	285	15:06:16	15:17:48

Tide/water levels for this project were provided exclusively by NOAA as verified data from NOAA Tide Station 876-4227, LAWMA, LA. The project is located within zones indicated by preliminary tidal zoning included in the project Statement of Work. Time and range corrections were applied to LAWMA, LA (876-4227) verified tide data according to Table 2.

Based on the results of crossline analysis, it appears that the time and range factors as provided in the preliminary zoning scheme are adequate.

Coordinated Universal Time (UTC) was used to annotate the tide records and all other data obtained for this project.

Preliminary tide correctors were retrieved daily from the CO-OPS website. Verified tides were retrieved as they were made available by CO-OPS. Tide data were applied to processed soundings employing the CARIS “Import Tide to HIPS” function.

A slightly altered version of the CARIS-format zoning file, “K354KR2017rev.zdf” (provided by CO-OPS), was employed to facilitate the application of final tide zoning scheme factors. During data processing OSI discovered a minor flaw in the 6<sup>th</sup> vertex of CO-OPS-provided Zone #82; the vertex did not fall exactly on a nearby vertex of the adjacent zone which is the presumed intention of CO-OPS. The result was a long, narrow, triangular area with no zoning coverage. The non-coverage triangle had two legs roughly 11.6 kilometers long with the third leg being only about 4 meters long. OSI adjusted the Zone #82 vertex which resulted in elimination of the non-coverage area. The 6<sup>th</sup> vertex as delivered by CO-OPS was 29.448176, -92.096407. OSI changed this vertex to 29.448128, -92.096409. In making the edit neither time nor magnitude multiplier changes were made to the preliminary zoning file. The OSI-edited zoning file, included with the project deliverables, uses the same name as noted above, i.e. the file name, as delivered by CO-OPS, was retained.

**Table 2**  
**Tide Zones Associated with Project OPR-K354-KR-17**

<b>Zone</b>	<b>Time Correction</b>	<b>Range Correction</b>
65	-60	0.94
66	-60	1.03
82	-72	1.31
115	-78	1.28
154	-72	1.22
182	-60	1.12
189	-84	1.31
191	-66	1.12
193	-72	1.25
263	-66	1.03

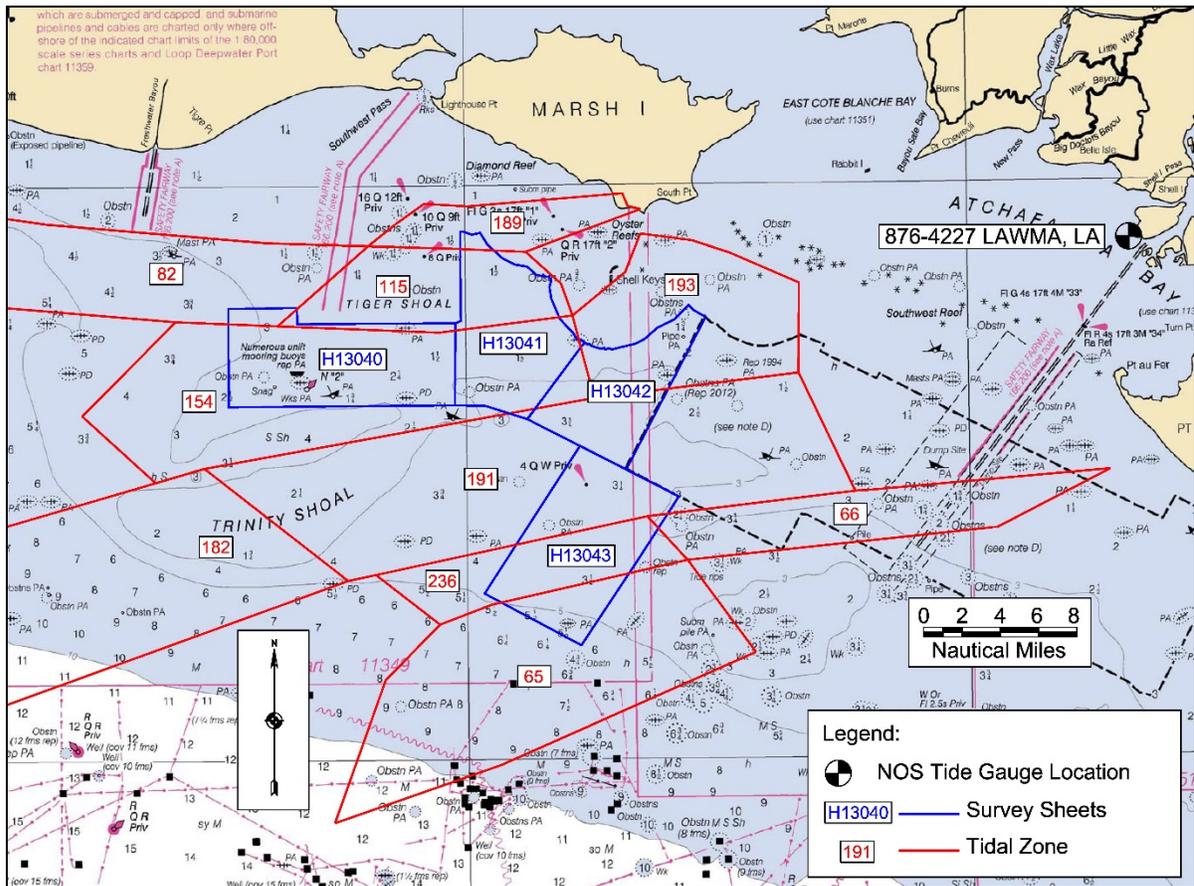


Figure 1. Project survey boundaries (blue lines), tidal zone boundaries (red lines), and the LAWMA, LA tide station location. In this figure the western end of Tide Zones 182 and 82 have been cropped for the sake of clarity of the 2017 project area.

## APPENDIX II

# SUPPLEMENTAL SURVEY RECORDS AND CORRESPONDENCE

**From:** OCS NDB - NOAA Service Account [mailto:[ocs.ndb@noaa.gov](mailto:ocs.ndb@noaa.gov)]  
**Sent:** Friday, December 15, 2017 9:38 AM  
**To:** Bob Wallace <[rmw@oceansurveys.com](mailto:rmw@oceansurveys.com)>  
**Cc:** NSD Coast Pilot <[coast.pilot@noaa.gov](mailto:coast.pilot@noaa.gov)>; Starla Robinson - NOAA Federal <[starla.robinson@noaa.gov](mailto:starla.robinson@noaa.gov)>; George G Reynolds <[ggr@oceansurveys.com](mailto:ggr@oceansurveys.com)>  
**Subject:** Re: NOAA Contract Hydrographic Survey Coast Pilot Review Report (Project OPR-K354-KR-17)

Good morning, Mr. Wallace,

Thanks for submitting this report. We here at NOAA's National Ocean Service, Marine Chart Division did indeed receive this info and it's been entered in the system for application to the Coast Pilot. Sorry for not responding, that was my oversight. I certainly appreciate you checking back.

Thanks again,

John Whiddon, Cartographer  
Nautical Data Branch/Marine Chart Division/  
Office of Coast Survey/National Ocean Service/  
Contact: [ocs.ndb@noaa.gov](mailto:ocs.ndb@noaa.gov)



On Fri, Dec 15, 2017 at 9:31 AM, Bob Wallace <[rmw@oceansurveys.com](mailto:rmw@oceansurveys.com)> wrote:

All,

I sent this e-mail back on November 29, 2017. I never received a response from any of the NOAA addressees so I am sending again to be sure that it was received.

Would one of the NOAA folks please let me know if you received this e-mail and two attached .PDF documents.

Thanks, Bob Wallace

**From:** Bob Wallace [mailto:[rmw@oceansurveys.com](mailto:rmw@oceansurveys.com)]

**Sent:** Wednesday, November 29, 2017 3:59 PM

**To:** 'ocs.ndb@noaa.gov' <[ocs.ndb@noaa.gov](mailto:ocs.ndb@noaa.gov)>; 'coast.pilot@noaa.gov' <[coast.pilot@noaa.gov](mailto:coast.pilot@noaa.gov)>

**Cc:** 'starla.robinson@noaa.gov' <[starla.robinson@noaa.gov](mailto:starla.robinson@noaa.gov)>; 'George G Reynolds' <[ggr@oceansurveys.com](mailto:ggr@oceansurveys.com)>; 'Bob Wallace' <[rmw@oceansurveys.com](mailto:rmw@oceansurveys.com)>; 'David Somers' <[dts@oceansurveys.com](mailto:dts@oceansurveys.com)>

**Subject:** NOAA Contract Hydrographic Survey Coast Pilot Review Report (Project OPR-K354-KR-17)

All,

Attached are two Coast Pilot-related .PDFs. The first document is the original Coast Pilot Report furnished with the July 6, 2017 "Final Data Package" for NOS-NOAA contract survey OPR-K354-KR-17. The second document is OSI's Coast Pilot Review Report. Given that there were no specific Coast Pilot Report investigations assigned, OSI conducted a general review of pertinent Coast Pilot sections as applies to the general locality of the survey area and the areas frequently transited and facilities utilized during in-ports.

Please don't hesitate to contact me if you have any questions or concerns.

Regards, Bob Wallace

**Robert M. Wallace Jr.**

Project Manager

**OCEAN SURVEYS, INC.**

129 Mill Rock Road East, Old Saybrook, CT 06475

**T** [860-388-4631](tel:860-388-4631) x129 **M** [860-227-3099](tel:860-227-3099) **F** [860-388-5879](tel:860-388-5879)

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**From:** Starla Robinson - NOAA Federal [<mailto:starla.robinson@noaa.gov>]  
**Sent:** Friday, November 17, 2017 5:56 PM  
**To:** George Reynolds <[ggr@oceansurveys.com](mailto:ggr@oceansurveys.com)>  
**Cc:** Douglas Wood - NOAA Federal <[douglas.wood@noaa.gov](mailto:douglas.wood@noaa.gov)>; Corey Allen - NOAA Federal <[corey.allen@noaa.gov](mailto:corey.allen@noaa.gov)>  
**Subject:** Re: CSF "assigned" features in "unassigned" sheets

Hello George,

To confirm, OSI is not responsible for the CSF assigned features that are outside the surveyed area beyond the surveyed extent defined by what OSI was able to complete of the main scheme before squaring off (H13040 through H13043).

I absolutely agree with the assumption and thanks for asking.

Happy Holidays,  
Starla

H13043	4	17 Miles South of South Point	Louisiana	40000	53	Additional sheet not yet assigned. As the LNM are completed, the KR will square off the acquired area and ensure the full investigation of any features within the surveyed extent.
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*Starla D. Robinson, Physical Scientist*  
*NOS - OCS - Hydrographic Survey Division - Operations Branch*  
*National Oceanic Atmospheric Administration*  
*Office: 240-533-0034 (Updated 6/13/17)*  
*Cell: 360-689-1431*  
*Website: [HSD Planned Hydrographic Surveys](#)*

On Fri, Nov 17, 2017 at 4:41 PM, George Reynolds <[ggr@oceansurveys.com](mailto:ggr@oceansurveys.com)> wrote:

Hi Starla,

We have begun writing the project reports and, in re-reading the various project documentation and reviewing files, we noticed the following potential bookkeeping/reporting issue. You may recall that the Draft Project Instructions, Composite Source File (CSF) and Project Reference File (PRF) considered a seven-sheet survey program. The Final Project Instructions and PRF consider the survey that was ultimately conducted, a four-sheet survey. However, the Final CSF does not reflect the change from seven sheets to four sheets. As such the Final CSF includes many "assigned" features that fall well outside of the four-sheet survey. We don't believe that NOAA intended for us to cover the 100+ CSF "assigned" features that fall outside of the assigned survey area, i.e. within the three sheets that were dropped from the original "draft" survey program. However, we have no documentation attesting to such. Assuming you agree with this assumption, would you please document that OSI is not responsible for investigating any features beyond those located within the four (4) assigned sheets. We will include your correspondence in with the Project Deliverables, i.e. a page in DR Appendix II, Correspondence.

Thanks, George

From: Starla Robinson - NOAA Federal <[starla.robinson@noaa.gov](mailto:starla.robinson@noaa.gov)>  
Date: 12/11/17 5:46 PM (GMT-05:00)  
To: GGR Backup <[ggr@oceansurveys.com](mailto:ggr@oceansurveys.com)>  
Cc: Douglas Wood - NOAA Affiliate <[douglas.wood@noaa.gov](mailto:douglas.wood@noaa.gov)>, Corey Allen - NOAA Federal <[corey.allen@noaa.gov](mailto:corey.allen@noaa.gov)>, Briana Welton - NOAA Federal <[Briana.Hillstrom@noaa.gov](mailto:Briana.Hillstrom@noaa.gov)>, Castle Parker - NOAA Federal <[castle.e.parker@noaa.gov](mailto:castle.e.parker@noaa.gov)>, Martha Herzog - NOAA Federal <[martha.herzog@noaa.gov](mailto:martha.herzog@noaa.gov)>  
Subject: Re: Platform vs. Update Clarification

Hello George,

Include both the significant wellheads and platform features in the FFF, and reposition any platform that deviates greater than 10 meter from the center point of the corresponding charted feature, based on the page 97 of the HSSD. These are all delete/add for the charted platforms.

Thank you,  
Starla

--

*Starla D. Robinson, Physical Scientist  
NOS - OCS - Hydrographic Survey Division - Operations Branch  
National Oceanic Atmospheric Administration  
Office: 240-533-0034 (Updated 6/13/17)  
Cell: 360-689-1431  
Website: [HSD Planned Hydrographic Surveys](#)*

On Wed, Dec 6, 2017 at 10:19 AM, GGR Backup <[ggr@oceansurveys.com](mailto:ggr@oceansurveys.com)> wrote:

Good morning Starla,

We would like some S-57 clarification/guidance regarding offshore platforms and BSSE wellheads in close proximity to each other. Please see the attached PDF.

In the 2 examples provided and many other cases the wellhead position is much closer to the surveyed positioned of the platform and the surveyed platform position is greater than 20 meters from the CSF platform position. Given our survey scale of 1:40,000, what are the distance thresholds for updating vs new/delete for a feature position?

Should we mark both the CSF wellhead and CSF platform as "delete" and create a new platform feature at the surveyed position? Or, mark the wellhead as "delete" and the platform as "retain" at the CSF position?

Thanks,

George

## Reference HSSD 7.5.2

New/Delete vs. Update:

1. Charted feature is found in new position via multibeam, lidar, vessel-mounted laser scanning, or any remote sensing system capable of generating a georeferenced point cloud sufficient to differentiate features at survey scale, regardless of proximity to charted feature:

- descrp = Delete for charted feature (delivered from CSF)
- descrp = New for surveyed feature (derived from grid sounding for multibeam and lidar, derived from point cloud for laser scanning)

2. Charted feature is found via visual observation or handheld laser range finder, within 10 m of the charted feature:

- descrp = Update (populate surveyed height/depth of feature, not position)

3. Charted feature is found via visual observation or handheld laser range finder, greater than 10 m from the charted feature:

- descrp = Delete for charted feature (delivered from CSF)
- descrp = New for surveyed feature (derived from visual observation or handheld laser range finder)

4. Charted line or area feature geometry has changed.

- descrp = Update; then manually edit the geometry

Note: if the new area extents border the edge of bathymetry, instead of manually editing the geometry, the hydrographer may use 'recomd' = edit the geometry to extents of bathymetry

OR when extensive geometry changes are needed:

- descrp = Delete for incorrectly charted feature

**CSF Investigation Requirements:**

Platform. If visually confirmed, include in FFF with descrp=retain. If not visible, conduct a feature disproof (Section 7.3.4) and if disproved, include in FFF with descrp = delete.

BSSE wellhead. See Project Instructions for further information. Contact HSD Project Manager/COR for clarification, if needed.

**Project Instructions:**

With respect to wellheads, reference HSSD Chapter 7.5.1. If a wellhead is not found, for the purposes of disproof, a 50 m search radius shall be used following the feature disproof techniques for a complete coverage survey outlined in HSSD Section 7.3.4. Include feature in the FFF with descrp = delete.

**From:** Starla Robinson - NOAA Federal [mailto:starla.robinson@noaa.gov]

**Sent:** Tuesday, December 12, 2017 5:19 PM

**To:** George Reynolds <ggr@oceansurveys.com>

**Cc:** David T. Somers <dts@oceansurveys.com>; Bob Wallace <rmw@oceansurveys.com>; Douglas Wood - NOAA Affiliate <douglas.wood@noaa.gov>; Corey Allen - NOAA Federal <corey.allen@noaa.gov>; Martha Herzog - NOAA Federal <martha.herzog@noaa.gov>

**Subject:** Re: non-DTON pipelines and seeps in the FFF

Hello George,

Excellent question.

The current requirement of the "Non-DTON Seep and Pipeline Report" is a separate deliverable from the FFF. Your historic method of including the pipeline segments in the FFF is good. How you manage the other features is up to your discretion. The features that are not cartographically significant they will be ignored in the FFF.

Thank you,

Starla

--

*Starla D. Robinson, Physical Scientist  
NOS - OCS - Hydrographic Survey Division - Operations Branch  
National Oceanic Atmospheric Administration*

*Office: 240-533-0034 (Updated 6/13/17)*

*Cell: 360-689-1431*

*Website: [HSD Planned Hydrographic Surveys](#)*

On Mon, Dec 11, 2017 at 2:06 PM, George Reynolds <[ggr@oceansurveys.com](mailto:ggr@oceansurveys.com)> wrote:

Hi Starla,

We are compiling the "Non-DTON Seep and Pipeline Report" and FFF files for our sheets and have a question about pipeline FFF attribution.

The pipeline investigation requirements are "See HSSD Section 1.6.2 for Elevated Pipeline guidance or Section 1.7 for Non-DTON Exposed Pipeline guidance. If pipeline is not elevated or exposed, include in FFF with descrp = retain."

HSSD Sections 1.7 and 1.6.2 are straight forward but we are not as clear on the FFF requirements.

How should pipelines that have exposed sections or seeps be attributed in the FFF? Also, should the exposed pipelines and seeps be included in the FFF separately from the full-length pipeline object?

In prior years we have included exposed pipelines in the FFF because they were full DtoNs per the older HSSDs, but have not included the seeps as they were not physical features.

Thanks, George

**From:** Starla Robinson - NOAA Federal [mailto:starla.robinson@noaa.gov]  
**Sent:** Monday, September 18, 2017 1:56 PM  
**To:** George Reynolds <ggr@oceansurveys.com>  
**Cc:** Corey Allen - NOAA Federal <corey.allen@noaa.gov>; Douglas Wood - NOAA Affiliate <douglas.wood@noaa.gov>  
**Subject:** Fwd: H13040 Southern Shoal area

Hello George,

This looks good for the shoals! A mile west is a significant change for the chart!

Just as a reminder, the PA disproval per Section 7.3.4 and the disproval radius listed in the PI.

Thanks,  
Starla

### **Section 7.3.4 Feature Disprovals**

*"Feature disproval techniques for a complete coverage survey:*

- *Complete coverage multibeam (Section 5.2.2.3) or*
- *200% side scan sonar coverage that conforms to Section 6.1.1*

*Note: 100% side scan sonar coverage is not sufficient to disprove a feature."*

--

*Starla D. Robinson, Physical Scientist  
NOS - OCS - Hydrographic Survey Division - Operations Branch  
National Oceanic Atmospheric Administration  
Office: 240-533-0034 (Updated 6/13/17)  
Cell: 360-689-1431  
Website: [HSD Planned Hydrographic Surveys](#)*

----- Forwarded message -----

**From:** George Reynolds <ggr@oceansurveys.com>  
**Date:** Sat, Sep 16, 2017 at 10:32 AM  
**Subject:** H13040 Southern Shoal area  
**To:** Starla Robinson - NOAA Federal <starla.robinson@noaa.gov>  
Hi Starla,

OSI has completed our first pass over the southern shoal located in H13040 at 40m line spacing, please see the attached figures.

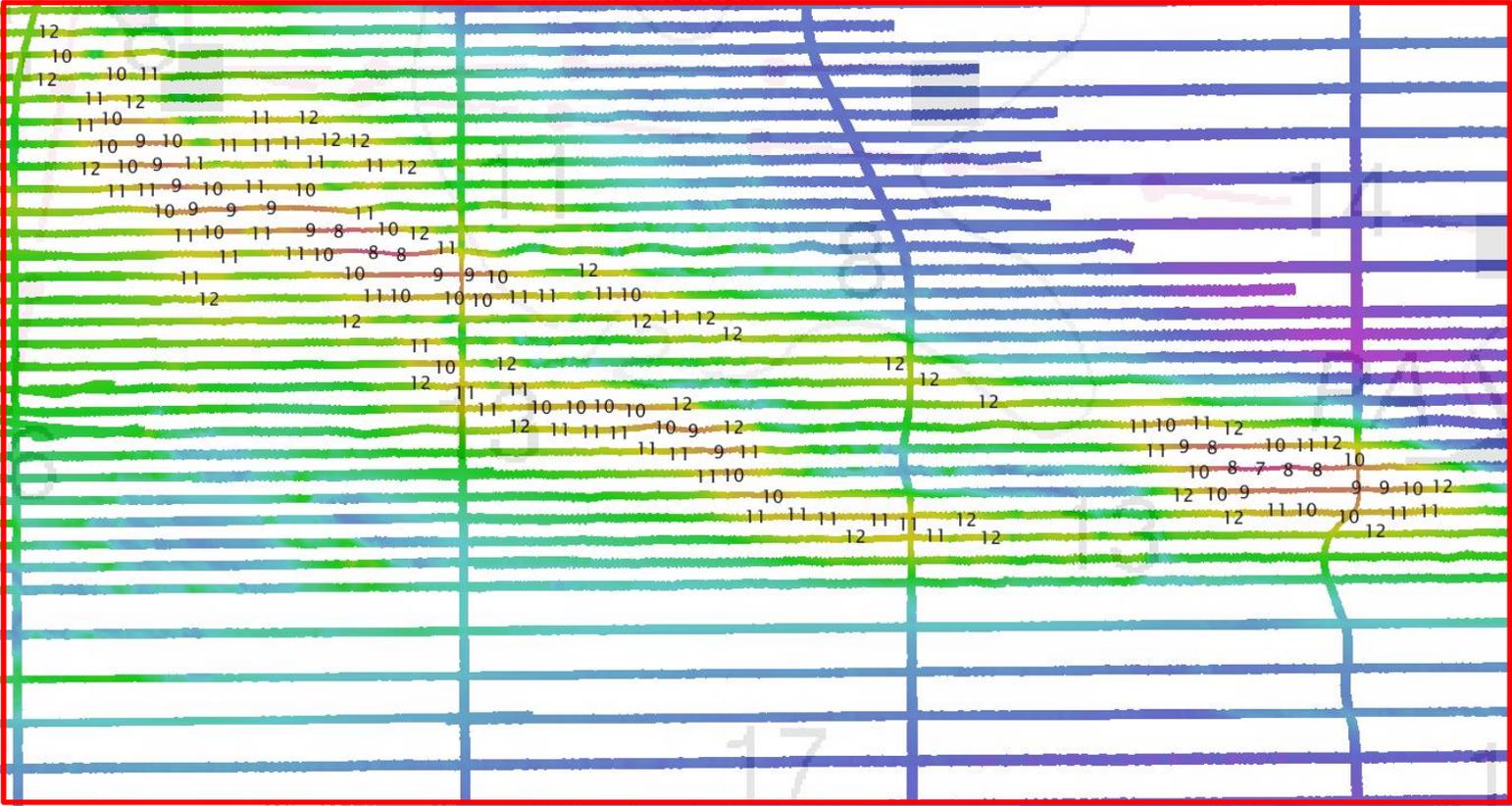
Given that these shoal areas have moved about a mile west of charted and here are no indications of any features on the side scan between multibeam swaths, is our existing coverage sufficient for charting?

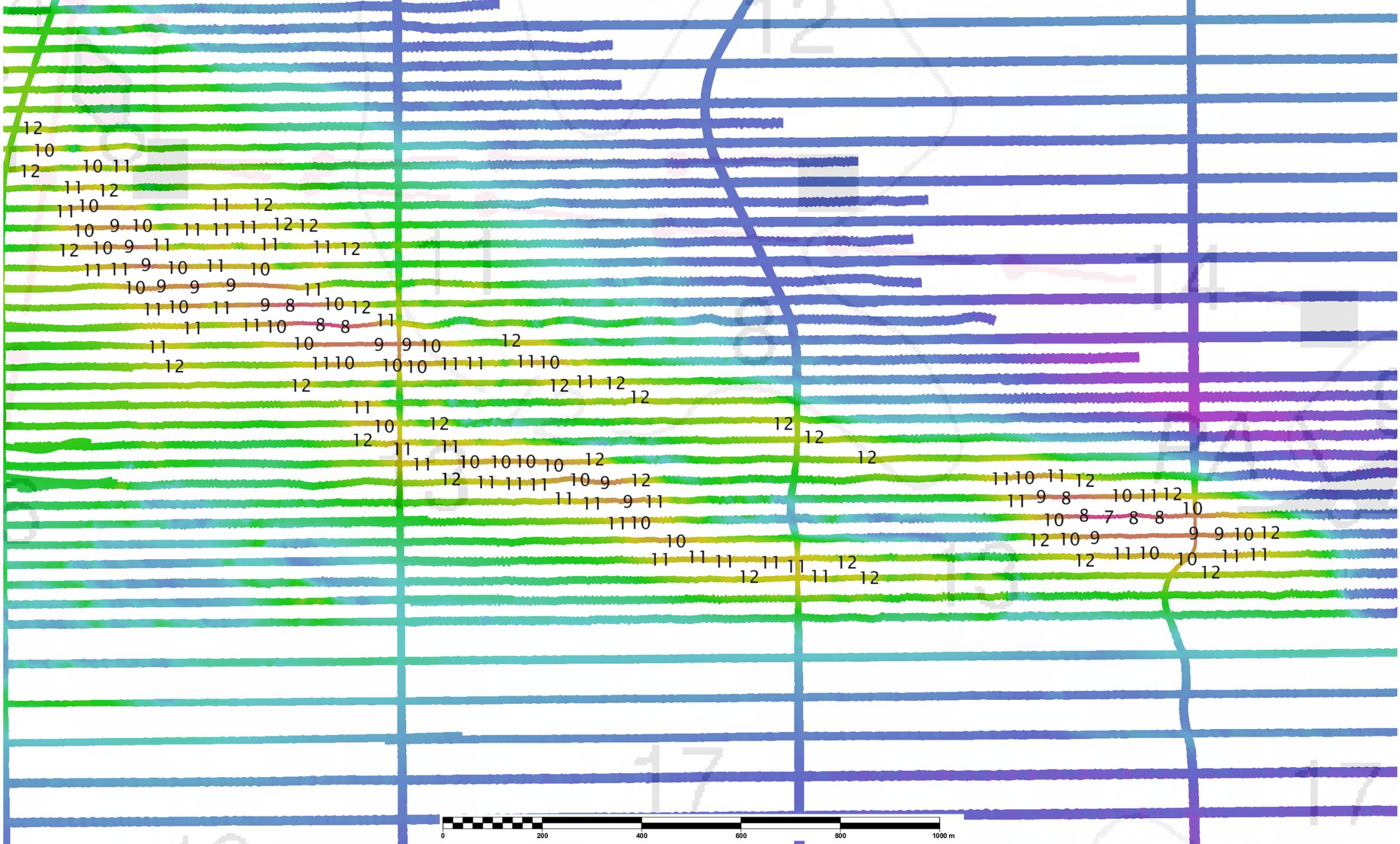
Only one platform located on the north end of the shoal and R N "2" were found, there was no sign of either wreck PA. And lastly, we will, of course, submit these shoals as DtoNs.

Thanks, George



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From: [Alexandra.Grotsky@noaa.gov](mailto:Alexandra.Grotsky@noaa.gov) [mailto:[Alexandra.Grotsky@noaa.gov](mailto:Alexandra.Grotsky@noaa.gov)]

Sent: Thursday, December 14, 2017 11:30 AM

To: [jjd@oceansurveys.com](mailto:jjd@oceansurveys.com)

Subject: NCEI acceptance confirmation for Reference ID: GUTAE6

Dear Joseph DiPalma:

Thank you for sending your data and metadata files to the NOAA National Centers for Environmental Information (NCEI). NCEI received these data, SOUND VELOCITY collected from R/V Ocean Explorer in Gulf of Mexico from 2017-08-04 to 2017-10-12, on 2017-12-07 21:47:46 via S2N.

After reviewing your submission package (metadata and data), I assigned your submission an NCEI Accession Number 0169266. This number is a tracking identifier for the NCEI Ocean Archive. Please reference this number when corresponding with NCEI about these data.

You can find information about these archived data at <http://accession.nodc.noaa.gov/0169266>.

After further reviewing your data, creating any additional representations of these data in a format that is more preservable in the NCEI Ocean Archive, and developing necessary tracking metadata, NCEI will publish these archived data online. You may access the archival copy of your original data via the link listed above.

In addition to creating an archival copy of these data, NCEI may include all or part of your data into one or more product databases, such as the World Ocean Database.

Please let me know if you have any questions or if you have additional data and documentation that you would like to archive with these data.

Thank you again for choosing to archive your data with the National Centers for Environmental Information (NCEI).

Regards,

Alexandra Grotsky

[Alexandra.Grotsky@noaa.gov](mailto:Alexandra.Grotsky@noaa.gov)

-----

Subject: [Send2NCEI] data submission confirmation for Reference ID: GUTAE6  
To: [jjd@oceansurveys.com](mailto:jjd@oceansurveys.com)  
From: [NODC.DataOfficer@noaa.gov](mailto:NODC.DataOfficer@noaa.gov)

Dear Joseph DiPalma,

Thank you for submitting your data collection, titled "SOUND VELOCITY collected from R/V Ocean Explorer in Gulf of Mexico from 2017-08-04 to 2017-10-12", to the NOAA National Centers for Environmental Information (NCEI). Your submission package has been assigned Reference ID: GUTAE6. After reviewing your data and metadata, NCEI will update you about the archival status of your submission package.

You will be notified if NCEI creates an archival information package (accession) of your data, including the unique identifier for that archival information package (the NCEI Accession number). When your data are archived, NCEI keeps an exact copy of the data and metadata you sent and will develop necessary tracking and discovery metadata. In addition, NCEI may create additional versions to ensure your data are preserved for long-term access.

Upon completion of these archival ingest actions, NCEI will publish your data online (including a copy of your original files). You will receive another email once your submission package (Reference ID: GUTAE6) is published for global access. In addition, NCEI may include all or part of your data into one or more product databases, such as the World Ocean Database.

If you have any questions about NCEI archival processes, please contact [NODC.DataOfficer@noaa.gov](mailto:NODC.DataOfficer@noaa.gov). Also, if at any time you wish to update your submission package, please send an e-mail to [NODC.DataOfficer@noaa.gov](mailto:NODC.DataOfficer@noaa.gov) with your request. Please remember to include your submission package Reference ID.

Thank you again for choosing to archive your data with the National Centers for Environmental Information (NCEI).

NCEI Data Officer Team  
NOAA National Centers for Environmental Information NOAA/NESDIS  
1315 East-West Highway  
Silver Spring, MD 20910  
USA

From: [Alexandra.Grodsky@noaa.gov](mailto:Alexandra.Grodsky@noaa.gov) [mailto:[Alexandra.Grodsky@noaa.gov](mailto:Alexandra.Grodsky@noaa.gov)]

Sent: Thursday, December 14, 2017 11:30 AM

To: [jjd@oceansurveys.com](mailto:jjd@oceansurveys.com)

Subject: NCEI acceptance confirmation for Reference ID: JG5TKB

Dear Joseph DiPalma:

Thank you for sending your data and metadata files to the NOAA National Centers for Environmental Information (NCEI). NCEI received these data, SOUND VELOCITY collected from R/V Osprey in Gulf of Mexico from 2017-09-01 to 2017-10-12, on 2017-12-07 21:55:48 via S2N.

After reviewing your submission package (metadata and data), I assigned your submission an NCEI Accession Number 0169267. This number is a tracking identifier for the NCEI Ocean Archive. Please reference this number when corresponding with NCEI about these data.

You can find information about these archived data at <http://accession.nodc.noaa.gov/0169267>.

After further reviewing your data, creating any additional representations of these data in a format that is more preservable in the NCEI Ocean Archive, and developing necessary tracking metadata, NCEI will publish these archived data online. You may access the archival copy of your original data via the link listed above.

In addition to creating an archival copy of these data, NCEI may include all or part of your data into one or more product databases, such as the World Ocean Database.

Please let me know if you have any questions or if you have additional data and documentation that you would like to archive with these data.

Thank you again for choosing to archive your data with the National Centers for Environmental Information (NCEI).

Regards,

Alexandra Grodsky

[Alexandra.Grodsky@noaa.gov](mailto:Alexandra.Grodsky@noaa.gov)

---

Subject: [Send2NCEI] data submission confirmation for Reference ID: JG5TKB  
To: [jjd@oceansurveys.com](mailto:jjd@oceansurveys.com)  
From: [NODC.DataOfficer@noaa.gov](mailto:NODC.DataOfficer@noaa.gov)

Dear Joseph DiPalma,

Thank you for submitting your data collection, titled "SOUND VELOCITY collected from R/V Osprey in Gulf of Mexico from 2017-09-01 to 2017-10-12", to the NOAA National Centers for Environmental Information (NCEI). Your submission package has been assigned Reference ID: JG5TKB. After reviewing your data and metadata, NCEI will update you about the archival status of your submission package.

You will be notified if NCEI creates an archival information package (accession) of your data, including the unique identifier for that archival information package (the NCEI Accession number). When your data are archived, NCEI keeps an exact copy of the data and metadata you sent and will develop necessary tracking and discovery metadata. In addition, NCEI may create additional versions to ensure your data are preserved for long-term access.

Upon completion of these archival ingest actions, NCEI will publish your data online (including a copy of your original files). You will receive another email once your submission package (Reference ID: JG5TKB) is published for global access. In addition, NCEI may include all or part of your data into one or more product databases, such as the World Ocean Database.

If you have any questions about NCEI archival processes, please contact [NODC.DataOfficer@noaa.gov](mailto:NODC.DataOfficer@noaa.gov). Also, if at any time you wish to update your submission package, please send an e-mail to [NODC.DataOfficer@noaa.gov](mailto:NODC.DataOfficer@noaa.gov) with your request. Please remember to include your submission package Reference ID.

Thank you again for choosing to archive your data with the National Centers for Environmental Information (NCEI).

NCEI Data Officer Team  
NOAA National Centers for Environmental Information NOAA/NESDIS  
1315 East-West Highway  
Silver Spring, MD 20910  
USA

**From:** Starla Robinson - NOAA Federal [<mailto:starla.robinson@noaa.gov>]  
**Sent:** Monday, June 26, 2017 1:47 PM  
**To:** George Reynolds <[ggr@oceansurveys.com](mailto:ggr@oceansurveys.com)>; Emily Clark - NOAA Federal <[emily.clark@noaa.gov](mailto:emily.clark@noaa.gov)>  
**Cc:** Douglas Wood - NOAA Affiliate <[douglas.wood@noaa.gov](mailto:douglas.wood@noaa.gov)>; russell.quintero <[russell.quintero@noaa.gov](mailto:russell.quintero@noaa.gov)>; Corey Allen - NOAA Federal <[corey.allen@noaa.gov](mailto:corey.allen@noaa.gov)>  
**Subject:** Re: Final Project Instructions OPR-K354-KR-17, Louisiana Coast, LA

Hello Emily and George,

I want to follow up on a conversation George and I had this morning.

- 1) CO-OPS will have new tide zones for the area in August. We would like to supersede the existing tide zones via a change memo when they become available.
- 2) I stated that there is no expectation that OSI collects sidescan on the crosslines.
- 3) George would like to be CCed on any emails going to OSI.

Thank you,  
Starla

--

*Starla D. Robinson, Physical Scientist  
NOS - OCS - Hydrographic Survey Division - Operations Branch  
National Oceanic Atmospheric Administration  
Office: 240-533-0034 (Updated 6/13/17)  
Cell: 360-689-1431  
Website: [HSD Planned Hydrographic Surveys](#)*

On Mon, Jun 26, 2017 at 11:34 AM, Starla Robinson - NOAA Federal <[starla.robinson@noaa.gov](mailto:starla.robinson@noaa.gov)> wrote:  
Hello George,

Would OSI be willing to use a modified version of the existing zoning for now, and we will issue a memo with updated zoning in August?

Thanks,  
Starla

On Fri, Jun 23, 2017 at 10:06 PM, George Reynolds <[ggr@oceansurveys.com](mailto:ggr@oceansurveys.com)> wrote:

Hi Starla.

In reviewing the project instructions, it appears that the preliminary tide zoning does not cover H13040 (survey priority 1).

Thanks, George

**From:** Starla Robinson - NOAA Federal [<mailto:starla.robinson@noaa.gov>]  
**Sent:** Friday, September 15, 2017 11:08 AM  
**To:** George Reynolds <[ggr@oceansurveys.com](mailto:ggr@oceansurveys.com)>  
**Cc:** Corey Allen - NOAA Federal <[corey.allen@noaa.gov](mailto:corey.allen@noaa.gov)>; Douglas Wood - NOAA Affiliate <[douglas.wood@noaa.gov](mailto:douglas.wood@noaa.gov)>  
**Subject:** Re: Louisiana Coast Sounding Verification

Good morning George,

Thank you for asking for clarification. The official guidance is:

All charted depths falling between sounding lines and shallower by two feet or greater than adjacent water-level corrected surveyed soundings shall be verified or disproved. Verification and disproval of shoal charted depths that fall between set line spacing shall be accomplished by acquiring a star-like pattern using three lines centered on the charted depth and each extending 1 mm at chart scale. All significant shoals or features found in waters less than 20 m deep shall be developed to complete coverage standards.

A 40-meter will radius star-like pattern at the centroid of the sounding will cover a 1mm footprint at chart scale. This will be sufficient to disprove the sounding.

Please copy this guidance to your consults folder.

Thank you,  
Starla

--

*Starla D. Robinson, Physical Scientist*  
*NOS - OCS - Hydrographic Survey Division - Operations Branch*  
*National Oceanic Atmospheric Administration*  
*Office: 240-533-0034 (Updated 6/13/17)*  
*Cell: 360-689-1431*  
*Website: [HSD Planned Hydrographic Surveys](#)*

**From:** Starla Robinson - NOAA Federal [mailto:starla.robinson@noaa.gov]  
**Sent:** Monday, September 11, 2017 3:33 PM  
**To:** George Reynolds <ggr@oceansurveys.com>  
**Cc:** Corey Allen - NOAA Federal <corey.allen@noaa.gov>; Martha Herzog - NOAA Federal <martha.herzog@noaa.gov>; Douglas Wood - NOAA Affiliate <douglas.wood@noaa.gov>  
**Subject:** Re: FW: H13040 sounding verification

Hello George,

Following up on our conversation regarding sounding disapprovals:

- If the multibeam lines, on either side of a sounding are shoaler than the sounding, the data will be superseded. No additional disapproval of a *deep sounding* is required.
- If the multibeam lines are deeper then the sounding, the *shoal sounding* must be disproved using the star-like pattern discussed. This follows HSSD section 5.2.2.1 Bathymetric Splits.

Thanks,  
Starla

--

*Starla D. Robinson, Physical Scientist*  
*NOS - OCS - Hydrographic Survey Division - Operations Branch*  
*National Oceanic Atmospheric Administration*  
*Office: 240-533-0034 (Updated 6/13/17)*  
*Cell: 360-689-1431*  
*Website: [HSD Planned Hydrographic Surveys](#)*

Hello George,

Attached are the updated tide zones for OPR-K354-KR-17, Louisiana Coast. These tide zones completely cover the project area.

Please copy this email into your correspondence folder.

Thank you,  
Starla Robinson

PS: A change memo is pending. I wanted to make sure we sent the data to you sooner than waiting to finalize that process.

--

*Starla D. Robinson, Physical Scientist*  
*NOS - OCS - Hydrographic Survey Division - Operations Branch*  
*National Oceanic Atmospheric Administration*  
*Office: 240-533-0034 (Updated 6/13/17)*  
*Cell: 360-689-1431*  
*Website: [HSD Planned Hydrographic Surveys](#)*

----- Forwarded message -----

From: **David Wolcott - NOAA Federal** <[david.wolcott@noaa.gov](mailto:david.wolcott@noaa.gov)>

Date: Fri, Jul 28, 2017 at 6:11 PM

Subject: Project Instructions for OPR-K354-KR-2017 Louisiana Coast (Revised)

To: Russell Quintero - NOAA Federal <[russell.quintero@noaa.gov](mailto:russell.quintero@noaa.gov)>, Gerald Hovis <[gerald.hovis@noaa.gov](mailto:gerald.hovis@noaa.gov)>, "\_NOS.CO-OPS.HTP" <[nos.coops.hpt@noaa.gov](mailto:nos.coops.hpt@noaa.gov)>, "J. Corey Allen" <[corey.allen@noaa.gov](mailto:corey.allen@noaa.gov)>, Starla Robinson - NOAA Federal <[Starla.Robinson@noaa.gov](mailto:Starla.Robinson@noaa.gov)>



**UNITED STATES DEPARTMENT OF COMMERCE**  
**National Oceanic and Atmospheric Administration**  
National Ocean Service  
Silver Spring, Maryland 20910

DATE: 07/28/2017

MEMORANDUM FOR: LT Russell Quintero  
Chief, Operations Branch N/CS31

FROM: Gerald Hovis  
Chief, Products and Services Branch, N/OPS3

SUBJECT: Delivery of Tide Requirements for Hydrographic Surveys

Tide requirements for hydrographic survey project OPR-K354-KR-2017 (Revised) Louisiana Coast are being provided in Microsoft Word format. A .ZIP file containing all pertinent ESRI ArcGIS files, as well as a tidal zoning graphic in PDF, is attached to this email and posted to the Sharepoint website under the project name "OPR-K354-KR-17". Six minute preliminary data for LAWMA, LA (8764227) may be retrieved in one month increments over the internet from the CO-OPS SOAP web services at <http://opendap.co-ops.nos.noaa.gov/axis/text.html> by clicking on "Six Minute Data".

--

David Wolcott  
Oceanographic Division  
Center for Operational Oceanographic Products and Services  
National Ocean Service  
National Oceanic and Atmospheric Administration

1305 East-West Highway, 7133  
Silver Spring, MD 20910  
Office: 240-533-0614  
Fax: 301-713-4437

**From:** George Reynolds [mailto:ggr@oceansurveys.com]  
**Sent:** Friday, June 23, 2017 10:06 PM  
**To:** 'Starla Robinson - NOAA Federal' <starla.robinson@noaa.gov>  
**Cc:** 'Douglas Wood - NOAA Affiliate' <douglas.wood@noaa.gov>; 'Emily Clark - NOAA Federal' <emily.clark@noaa.gov>; 'russell.quintero' <russell.quintero@noaa.gov>; 'Corey Allen - NOAA Federal' <corey.allen@noaa.gov>  
**Subject:** RE: Final Project Instructions OPR-K354-KR-17, Louisiana Coast, LA

Hi Starla.

In reviewing the project instructions, it appears that the preliminary tide zoning does not cover H13040 (survey priority 1).

Thanks,  
George

**From:** OCS NDB - NOAA Service Account [mailto:[ocs.ndb@noaa.gov](mailto:ocs.ndb@noaa.gov)]

**Sent:** Friday, September 22, 2017 5:59 PM

**To:** Castle E Parker <[Castle.E.Parker@noaa.gov](mailto:Castle.E.Parker@noaa.gov)>

**Cc:** Briana Welton <[Briana.Hillstrom@noaa.gov](mailto:Briana.Hillstrom@noaa.gov)>; Tim Osborn <[Tim.Osborn@noaa.gov](mailto:Tim.Osborn@noaa.gov)>; Emily Clark - NOAA Federal <[EmilyClark@noaa.gov](mailto:EmilyClark@noaa.gov)>; Corey Allen <[Corey.Allen@noaa.gov](mailto:Corey.Allen@noaa.gov)>; Station Inspections - NOAA Service Account <[station.inspections@noaa.gov](mailto:station.inspections@noaa.gov)>; Douglas Wood - NOAA Federal <[douglas.wood@noaa.gov](mailto:douglas.wood@noaa.gov)>; \_NOS OCS PBA Branch <[ocs.pba@noaa.gov](mailto:ocs.pba@noaa.gov)>; \_NOS OCS PBB Branch <[ocs.pbb@noaa.gov](mailto:ocs.pbb@noaa.gov)>; \_NOS OCS PBC Branch <[ocs.pbc@noaa.gov](mailto:ocs.pbc@noaa.gov)>; \_NOS OCS PBD Branch <[ocs.pbd@noaa.gov](mailto:ocs.pbd@noaa.gov)>; \_NOS OCS PBE Branch <[ocs.pbe@noaa.gov](mailto:ocs.pbe@noaa.gov)>; \_NOS OCS PBG Branch <[ocs.pbg@noaa.gov](mailto:ocs.pbg@noaa.gov)>; James M Crocker <[James.M.Crocker@noaa.gov](mailto:James.M.Crocker@noaa.gov)>; Matt Kroll <[Matt.Kroll@noaa.gov](mailto:Matt.Kroll@noaa.gov)>; NSD Coast Pilot <[coast.pilot@noaa.gov](mailto:coast.pilot@noaa.gov)>; Pearce Hunt <[Pearce.Hunt@noaa.gov](mailto:Pearce.Hunt@noaa.gov)>; PHB Chief <[PHB.Chief@noaa.gov](mailto:PHB.Chief@noaa.gov)>; Tara Wallace <[Tara.Wallace@noaa.gov](mailto:Tara.Wallace@noaa.gov)>

**Subject:** Fwd: H13040 DtoN #1 Submission to NDB

DD-28818 has been registered by the Nautical Data Branch and directed to Products Branch G for processing.

The DtoNs reported are several shoals in Tiger Shoal, LA.

The following charts are affected:

11349 kapp 64

11340 kapp 49

The following ENC's are affected:

US4LA15M

US3GC03M

References:

H13040

OPR-K354-KR-17

This information was discovered by a NOAA contractor and was submitted by AHB.

Nautical Data Branch/Marine Chart Division/

Office of Coast Survey/National Ocean Service/

Contact: [ocs.ndb@noaa.gov](mailto:ocs.ndb@noaa.gov)

From: **Castle Parker - NOAA Federal** <[castle.e.parker@noaa.gov](mailto:castle.e.parker@noaa.gov)>  
Date: Fri, Sep 22, 2017 at 10:31 AM  
Subject: H13040 DtoN #1 Submission to NDB  
To: OCS NDB - NOAA Service Account <[ocs.ndb@noaa.gov](mailto:ocs.ndb@noaa.gov)>  
Cc: Briana Hillstrom - NOAA Federal <[Briana.Hillstrom@noaa.gov](mailto:Briana.Hillstrom@noaa.gov)>, Tim Osborn - NOAA Federal <[tim.osborn@noaa.gov](mailto:tim.osborn@noaa.gov)>, Emily Clark - NOAA Federal <[emily.clark@noaa.gov](mailto:emily.clark@noaa.gov)>, Corey Allen - NOAA Federal <[corey.allen@noaa.gov](mailto:corey.allen@noaa.gov)>, Station Inspections - NOAA Service Account <[station.inspections@noaa.gov](mailto:station.inspections@noaa.gov)>, Douglas Wood - NOAA Federal <[douglas.wood@noaa.gov](mailto:douglas.wood@noaa.gov)>

Good day,

Please find attached compressed file associated with H13040 DtoN #1 for submission to Nautical Data Branch (NDB) and Marine Chart Division (MCD). This danger submission contains seven shoal soundings on Tiger Shoal.

The information originates from NOAA contract field unit and was submitted to the Atlantic Hydrographic Branch (AHB) for review, processing, and submission. The contents of the attached compressed file were generated at AHB. The attached zip file contains a DtoN Letter (PDF), associated image files, and a Pydro XML file.

If you have any questions, please direct them back to me through email or phone [757-364-7472](tel:757-364-7472).

Thank you for your assistance with this matter.

Regards,

Gene Parker

*Castle Eugene Parker*

*NOAA Office of Coast Survey*

*Atlantic Hydrographic Branch*

*Hydrographic Team Lead / Physical Scientist*

*[castle.e.parker@noaa.gov](mailto:castle.e.parker@noaa.gov)*

*office [\(757\) 364-7472](tel:757-364-7472)*

**From:** David Somers [<mailto:dts@oceansurveys.com>]  
**Sent:** Thursday, September 21, 2017 11:30 AM  
**To:** [ahb.dton@noaa.gov](mailto:ahb.dton@noaa.gov); [starla.robinson@noaa.gov](mailto:starla.robinson@noaa.gov)  
**Cc:** George Reynolds <[ggr@oceansurveys.com](mailto:ggr@oceansurveys.com)>  
**Subject:** H13040\_DtoN\_1\_Shoal, OPR-K354-KR-17

Good Morning,

OSI has compiled and attached a DtoN feature file (H13040\_DtoN\_1\_Shoal.000) along with a chartlet image for survey H13040. The DtoN is a new shoal represented by soundings 12 feet and shallower per the NOAA sounding rounding rule (i.e. 12.75' and shallower).

Please let me know if OSI can provide any additional information regarding the shoal.

Regards,

**David Somers**

Data Processing Manager

**OCEAN SURVEYS, INC.**

129 Mill Rock Road East, Old Saybrook, CT 06475

**T** 860-388-4631 x135 **M** 860-575-3361 **F** 860-388-5879

[dts@oceansurveys.com](mailto:dts@oceansurveys.com) | [www.oceansurveys.com](http://www.oceansurveys.com)

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**From:** Starla Robinson - NOAA Federal [mailto:starla.robinson@noaa.gov]  
**Sent:** Friday, January 26, 2018 9:55 AM  
**To:** Bob Wallace <rmw@oceansurveys.com>; George Reynolds <ggr@oceansurveys.com>; David T. Somers <dts@oceansurveys.com>  
**Cc:** Corey Allen - NOAA Federal <corey.allen@noaa.gov>; Castle Parker - NOAA Federal <castle.e.parker@noaa.gov>; Martha Herzog - NOAA Federal <martha.hertzog@noaa.gov>  
**Subject:** Fwd: FW: DTON correspondence record request

Hello George,

Attached is Genes response and updated spreadsheet.

Thank you,  
Starla

----- Forwarded message -----

**From:** **Castle Parker - NOAA Federal** <[castle.e.parker@noaa.gov](mailto:castle.e.parker@noaa.gov)>  
**Date:** Fri, Jan 26, 2018 at 9:28 AM  
**Subject:** RE: FW: DTON correspondence record request  
**To:** Starla Robinson - NOAA Federal <[Starla.Robinson@noaa.gov](mailto:Starla.Robinson@noaa.gov)>  
**Cc:** Corey Allen - NOAA Federal <[corey.allen@noaa.gov](mailto:corey.allen@noaa.gov)>, Christina Fandel - NOAA Federal <[christina.fandel@noaa.gov](mailto:christina.fandel@noaa.gov)>, AHB Chief - NOAA Service Account <[ahb.chief@noaa.gov](mailto:ahb.chief@noaa.gov)>, James Miller - NOAA Federal <[james.j.miller@noaa.gov](mailto:james.j.miller@noaa.gov)>, Martha Herzog - NOAA Federal <[martha.hertzog@noaa.gov](mailto:martha.hertzog@noaa.gov)>

Good day Starla,

I have annotated the OSI spreadsheet with AHB actions as of today. I should mention that NDB and MCD have been really confusing with HSD and MCD (NDB) policy with these submissions. AHB has re-addressed the DtoN submission that occurred within 2017 in order to comply with the HSSD 1.6.2. NDB sent a response email indicating they were not going to apply and registered as "History Letter" (1/24/18); the following day on 1/25/18 NDB registered the DtoN submission. In order to comply with HSSD 1.6.2 we can modify the submitted feature's object class if significant, so that the submission will not be a linear obstruction (PIPSOL), rather submitted as OBSTRN or SOUNDG. There are several emails regarding this subject matter between HSD and MCD concerning the submission, NDB registration, and application of the DtoNs.

By way of a comment embedded in the EXCEL spreadsheet used by OSI and AHB to track Project DtoN status, AHB informed OSI that, “Feature was not submitted [to NDB] based upon the current disposition of charted platforms. The submitted features will be updated in the survey's Hcell, but was determined not to warrant DtoN submission as the currently charted platforms indicate baring features within the near common area.”

Survey	OSIDTON #	General Description	OSI to AHB e-mail	AHB to NDB e-mail	NDB Verification e-mail	AHB Forwards NDB Reistration email	OSI Comments	AHB Comments
H13040	2	three segmented grey platform	12/14/2017	Not Submitted	N/A	N/A	Not yet charted as of 1-10-2018.	Feature was not submitted based upon the current disposition of charted platforms. The submitted features will be updated in the survey's Hcell, but was determined not to warrant DtoN submission as the currently charted platforms indicate baring features within the near common area.

**From:** David Somers [mailto:dts@oceansurveys.com]  
**Sent:** Thursday, December 14, 2017 5:22 PM  
**To:** ahb.dton@noaa.gov; Starla Robinson - NOAA Federal <starla.robinson@noaa.gov>  
**Cc:** George Reynolds <ggr@oceansurveys.com>; Bob Wallace <rmw@oceansurveys.com>  
**Subject:** H13040, H13041, H13042, and H13043 DtoNs

Good Afternoon,

OSI has compiled and attached 7 DtoN feature files along with supporting imagery for surveys H13040, H13041, H13042, and H13043.

**H13040 DtoN 2 - Large platform**

H13041 DtoN 1 - AtoN not present

H13042 DtoN 5 - Large platform, recently uncharted platform

H13042 DtoN 6 - Obstructions near platform

H13042 DtoN 7 - Obstruction near pipe arch

H13043 DtoN 1 - AtoN not present

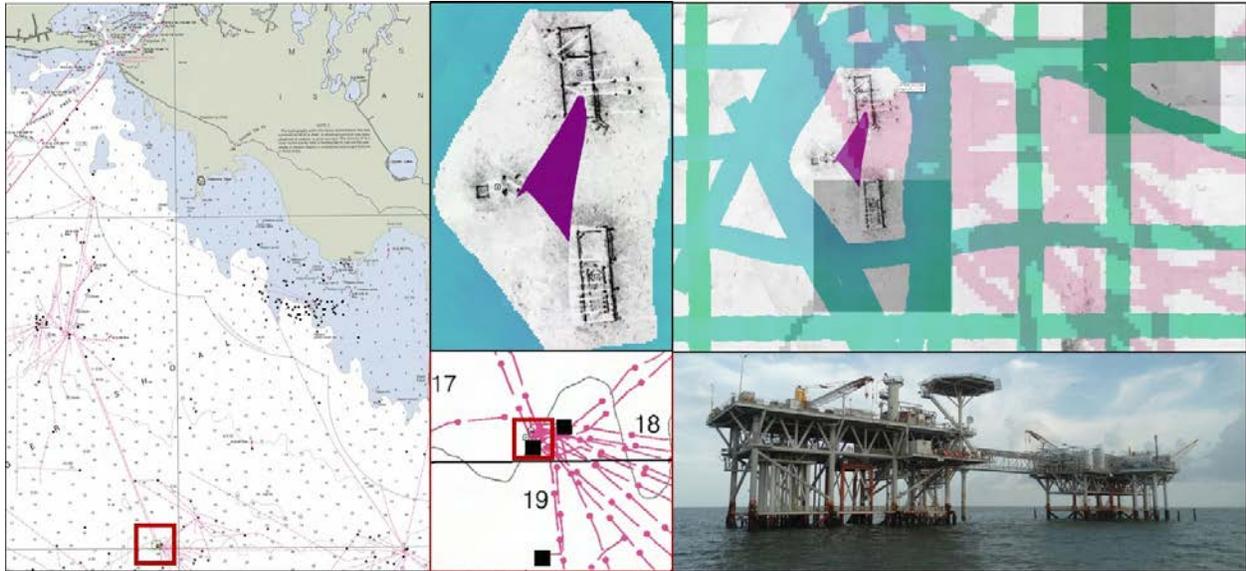
H13043 DtoN 2 - Obstruction

Please let me know if OSI can provide any additional information regarding these DtoNs.

Regards,  
Dave

**David Somers**  
Data Processing Manager

**OCEAN SURVEYS, INC.**  
129 Mill Rock Road East, Old Saybrook, CT 06475  
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[dts@oceansurveys.com](mailto:dts@oceansurveys.com) | [Ocean Surveys Incorporated](http://Ocean Surveys Incorporated)



A charted platform extends beyond the chart symbol and has three distinct sections.  
 Section locations: 29-20-07.79N, 92-00-44.57W; 29-20-06.10N, 92-00-46.00W; 29-20-04.75N, 92-00-44.31W.

Chartlet 1 of 1

Project: OPR-K354-KR-17 Survey: H13040 State: Louisiana Locality: Louisiana Coast Sub-Locality: Tiger Shoal Survey Scale: 1:40000	Sounding Units: Feet Sounding Datum: MLLW Horizontal Datum: NAD 83 Projection: UTM 15 Tide: Verified	 <p>R/V OCEAN EXPLORER &amp; R/V OSPREY August 8, 2017</p>
--	--	---

**From:** Jay Nunenkamp - NOAA Federal [mailto:jay.nunenkamp@noaa.gov]  
**Sent:** Wednesday, November 29, 2017 2:03 PM  
**To:** Bob Wallace <rmw@oceansurveys.com>  
**Subject:** Re: NOAA Contract Hydrographic Survey MMO Records (Project OPR-K354-KR-17)

Bob:

Received, thank you.

Sincerely,

Jay Nunenkamp  
Environmental Compliance Coordinator  
Office of Coast Survey  
National Oceanic and Atmospheric Administration (NOAA)  
240-533-0118  
SSMC3 Room 6513

On Wed, Nov 29, 2017 at 1:59 PM, Bob Wallace <[rmw@oceansurveys.com](mailto:rmw@oceansurveys.com)> wrote:

All,

Attached is a .7z format zip file containing a tabulation of OSI's "trained observers" as well as 32 individual Marine Mammal Observation Logs. Observations were made during OSI's contract hydrographic survey entitled "Louisiana Coast", NOAA Project Number OPR-K354-KR-17. The period of the survey was August 3, 2017 through October 12, 2017.

Please don't hesitate to contact me if you have any questions or concerns.

Regards, Bob Wallace

**Robert M. Wallace Jr.**

Project Manager

**OCEAN SURVEYS, INC.**

[129 Mill Rock Road East, Old Saybrook, CT 06475](#)

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The following table summarizes Ocean Surveys, Inc. staff who were onboard the *R/V Ocean Explorer* “OE” or the *R/V Osprey* “SB” during NOAA Contract Survey entitled “Louisiana Coast” (Project OPR-K354-KR-17). The period of the survey was August 3, 2017 to October 12, 2017.

<b>Personnel</b>	<b>Position</b>	<b>Marine Species Awareness Video View Date</b>
Robert Wallace	Lead Hydrographer	May 2, 2016
John Bean	Senior Hydrographer	May 2, 2016
Curt Ramsey	Hydrographic Survey Technician	July 22, 2016
George Main Sr.	Captain	July 22, 2016
Logan Crouse	Hydrographic Survey Technician	July 21, 2017
Rick Waters	Captain	July 21, 2017
Dalton Leonhardt	Hydrographic Survey Technician	August 18, 2017

**From:** Starla Robinson - NOAA Federal [mailto:starla.robinson@noaa.gov]  
**Sent:** Friday, December 22, 2017 12:09 PM  
**To:** Bob Wallace <rmw@oceansurveys.com>  
**Subject:** Re: Non-DTON Seep and Pipeline Reports for H13042 and H13043

Thank you Bob. Reports received. Happy Holidays! – Starla

--

*Starla D. Robinson, Physical Scientist*  
*NOS - OCS - Hydrographic Survey Division - Operations Branch*  
*National Oceanic Atmospheric Administration*  
*Office: 240-533-0034 (Updated 6/13/17)*  
*Cell: 360-689-1431*  
*Website: [HSD Planned Hydrographic Surveys](#)*

On Thu, Dec 21, 2017 at 4:03 PM, Bob Wallace <[rmw@oceansurveys.com](mailto:rmw@oceansurveys.com)> wrote:

Starla,

Attached are Non-DTON Seep and Pipeline reports for OPR-K354-KR-17, Surveys H13042 and H13043. We are presenting the information as stand-alone compilation reports (rather than in the body of an e-mail) since there are multiple reportable items per sheet.

The Non-DTON reports for Surveys H13040 and H13041 preceded this e-mail.

Please let me know that you received both e-mails once you have.

Thanks, Bob Wallace

**Robert M. Wallace Jr.**

Project Manager

**OCEAN SURVEYS, INC.**

129 Mill Rock Road East, Old Saybrook, CT 06475

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Starla Robinson - NOAA Federal &lt;starla.robinson@noaa.gov&gt;

---

## Non-DTON Seep and Pipeline Reports for H13040 and H13041

3 messages

**Bob Wallace** <rmw@oceansurveys.com>

Thu, Dec 21, 2017 at 3:59 PM

To: starla.robinson@noaa.gov

Cc: George G Reynolds &lt;ggr@oceansurveys.com&gt;, David Somers &lt;dts@oceansurveys.com&gt;, Bob Wallace &lt;rmw@oceansurveys.com&gt;

Starla,

Attached are Non-DTON Seep and Pipeline reports for OPR-K354-KR-17, Surveys H13040 and H13041. We are presenting the information as stand-alone compilation reports (rather than in the body of an e-mail) since there are multiple reportable items per sheet.

The Non-DTON reports for Surveys H13042 and H13043 will follow in a separate e-mail.

Please let me know that you received both e-mails once you have.

Thanks, Bob Wallace

**Robert M. Wallace Jr.**

Project Manager

**OCEAN SURVEYS, INC.**

129 Mill Rock Road East, Old Saybrook, CT 06475

**T** 860-388-4631 x129 **M** 860-227-3099 **F** 860-388-5879[rmw@oceansurveys.com](mailto:rmw@oceansurveys.com) | [www.oceansurveys.com](http://www.oceansurveys.com)Follow us: [LinkedIn](#) | [Twitter](#) | [Facebook](#)

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**2 attachments****OPR-K354-KR-17\_H13040\_Non-DTON Seep and Pipeline Report.pdf**

5528K

 **OPR-K354-KR-17\_H13041\_Non-DTON Seep and Pipeline Report.pdf**  
5280K

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**Starla Robinson - NOAA Federal** <starla.robinson@noaa.gov>  
To: Bob Wallace <rmw@oceansurveys.com>

Fri, Dec 22, 2017 at 12:08 PM

Thank you Bob. Reports received. Happy Holidays! - Starla

[Quoted text hidden]

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*Starla D. Robinson, Physical Scientist*  
*NOS - OCS - Hydrographic Survey Division - Operations Branch*  
*National Oceanic Atmospheric Administration*  
*Office: 240-533-0034 (Updated 6/13/17)*  
*Cell: 360-689-1431*  
*Website: [HSD Planned Hydrographic Surveys](#)*

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**Starla Robinson - NOAA Federal** <starla.robinson@noaa.gov>  
To: Tim Osborn - NOAA Federal <tim.osborn@noaa.gov>  
Cc: Corey Allen - NOAA Federal <corey.allen@noaa.gov>

Fri, Dec 22, 2017 at 12:14 PM

Hello Tim,

Attached is the *Non-DTON Seep and Pipeline* reports for OPR-K354-KR-17, Surveys H13040 and H13041. These were compiled for submittal to Bureau of Ocean Energy Management (BOEM)/Bureau of Safety and Environmental Enforcement (BSEE)/US Coast Guard (USCG) as appropriate.

Happy Holidays!  
Starla

[Quoted text hidden]

[Quoted text hidden]

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## 2 attachments

 **OPR-K354-KR-17\_H13040\_Non-DTON Seep and Pipeline Report.pdf**  
5528K

 **OPR-K354-KR-17\_H13041\_Non-DTON Seep and Pipeline Report.pdf**  
5280K

APPROVAL PAGE

H13040

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 NCEI for archive

- Descriptive Report
- Collection of Bathymetric Attributed Grids (BAGs)
- Collection of backscatter mosaics
- Processed survey data and records
- Bottom samples
- GeoPDF of survey products

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: \_\_\_\_\_

**Lieutenant Commander Ryan Wartick NOAA**  
Chief, Atlantic Hydrographic Branch