H13196

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

DESCRIPTIVE REPORT

Type of Survey:	Navigable Area
Registry Number:	H13196

LOCALITY

State(s):	Louisiana
General Locality:	Mississippi River
Sub-locality:	Mississippi River, Vicinity of Mile 26 to 0

2018

CHIEF OF PARTY
Jonathan L. Dasler, PE, PLS, CH

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Date:

U.S. DEPARTMENT OF COMMERCE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION	REGISTRY NUMBER:
HYDROGRAPHIC TITLE SHEET	**H13196**

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:	**Mississippi River**
Sub-Locality:	**Mississippi River, Vicinity of Mile 26 to 0**
Scale:	**5000**
Dates of Survey:	**08/10/2018 to 04/22/2019**
Instructions Dated:	**08/08/2019**
Project Number:	**OPR-J347-KR-18**
Field Unit:	**David Evans and Associates**
Chief of Party:	**Jonathan L. Dasler, PE, PLS, CH**
Soundings by:	**Multibeam Echo Sounder**
Imagery by:	**Multibeam Echo Sounder Backscatter**
Verification by:	**Atlantic Hydrographic Branch**
Soundings Acquired in:	**meters at LW Reference Plane 2007**

Remarks:

Any revisions to the Descriptive Report (DR) applied during office processing are shown in red italic text. The DR is maintained as a field unit product, therefore all information and recommendations within this report are considered preliminary unless otherwise noted. The final disposition of survey data is represented in the NOAA nautical chart products. All pertinent records for this survey are archived at the National Centers for Environmental Information (NCEI) and can be retrieved via https://www.ncei.noaa.gov/. Products created during office processing were generated in NAD83 UTM 16N, LWRP and MLLW. All references to other horizontal or vertical datums in this report are applicable to the processed hydrographic data provided by the field unit.

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Descriptive Report to Accompany Survey H13196

Project: OPR-J347-KR-18

Locality: Mississippi River

Sublocality: Mississippi River, Vicinity of Mile 26 to 0

Scale: 1:5000

August 2018 - April 2019

David Evans and Associates

Chief of Party: Jonathan L. Dasler, PE, PLS, CH

A. Area Surveyed

David Evans and Associates, Inc. (DEA) conducted a hydrographic survey of the assigned area in the Mississippi River. Survey H13196 was conducted in accordance with the November 19, 2018 Statement of Work and Hydographic Survey Project Instructions dated August 8, 2019.

The Hydrographic Survey Project Instructions reference the National Ocean Service (NOS) Hydrographic Surveys Specifications and Deliverables Manual (HSSD) (March, 2018) as the technical requirements for this project.

A.1 Survey Limits

Data were acquired within the following survey limits:

Northwest Limit	Southeast Limit
29° 22' 1.87" N 89° 32' 19.14" W	29° 8' 44.74" N 89° 14' 33.14" W

Table 1: Survey Limits

Survey Limits were surveyed in accordance with the requirements in the Project Instructions and the HSSD.

For this document, cardinal directions are generalized to river flow due to the winding nature of the Mississippi River. North is used for upriver and south is used for downriver. When facing downriver, the left bank is referenced as east, and the right bank is referenced as west.

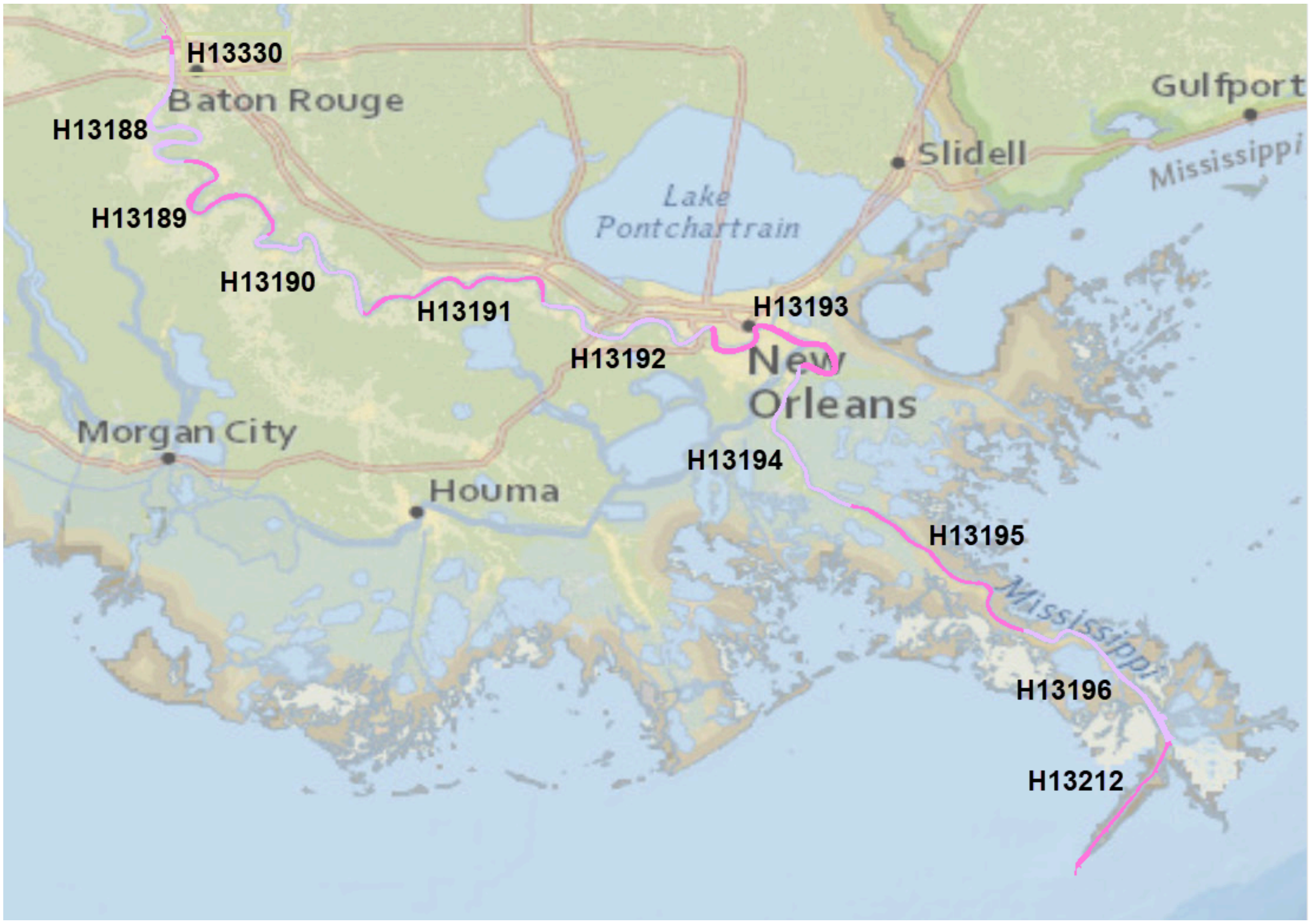


Figure 1: OPR-J347-KR-18 Survey Areas

A.2 Survey Purpose

The Ports of Southern Mississippi River represent the largest port complex in the world and one of the most heavily trafficked waterways in the United States. Annually, over 500 million tons of cargo is moved on the Lower Mississippi. This project area includes the Port of South Louisiana, the Port of New Orleans, the Port of Greater Baton Rouge, and Plaquemines Port, all ranking in the top 12 ports for annual tonnage in the United States. The Port of South Louisiana, river mile 114.9 to 168.5, is the largest tonnage port in the western hemisphere, handling approximately 262 million tons. The Port of New Orleans, river mile 81.2 to 114.9, handles approximately 90 million tons annually. The Port of Greater Baton Rouge, river mile 168.5 to 253, and Plaquemines Port, river mile 0 to 81.2, handle approximately 73 and 57 million tons annually, respectively.*

Critical Charting updates are needed for the Mississippi River, especially for areas outside of the U.S. Army Corps of Engineers (USACE) federally maintained channel areas. These areas outside of the federally maintained channel account for the majority of the navigable river and include ports and terminals essential for commerce and trade. The new bathymetric data in this project area, encompassing 89 SNM, will support high resolution charting products for maritime commerce and update National Ocean Service (NOS) nautical charting products.

* U.S. Army Corps of Engineers, Navigation Data Center, Waterborne Commerce Statistics Center, Principal Ports of the United States, www.navigationdatacenter.us/data/datappor.htm

A.3 Survey Quality

The entire survey is adequate to supersede previous data.

The river bottom is continuously changing due to currents, vessel propeller wash, dredging activity, construction and/or other factors present in the river environment. Changes in the river bed were observed during acquisition, primarily due to sediment migration and dredging activity. Section B.2.6 of this report further discusses these issues and impacts to the final deliverable data. In all cases the hydrographer has verified that soundings accurately depicted the river bed at the time of acquisition.

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	Object Detection Coverage (HSSD Section 5.2.2.2)

Table 2: Survey Coverage

Project Instructions called for high resolution charting at 1:5,000 survey scale to support NOAA's Precision Navigation initiative for the Mississippi River including: Object Detection Coverage for all waters in the survey area to the 2-meter depth contour; Ellipsoid Reference Survey (ERS) using a custom separation model for the Mississippi River; verification of ATONs; assignment of shoreline and nearshore features (including bridges, overhead wires, revetments, assigned existing terminals, and all uncharted features) to be obtained by a vessel based mobile laser scanning technology and imaging system; and delivery of LAS data referenced using ERS methods. Operational challenges included, but were not limited to: conducting surveys in a heavily congested industrial waterway; high river current velocities and transiting debris from high water levels; over 465 miles of shoreline surveys in restricted waters with small launch operations in close proximity to terminals, large barge fleets, wrecks, ruins, submerged piling, and numerous snags; minimal river access for provisioning and refueling; dynamic sediment migration exceeding 0.5 meters per hour in some areas; resolution of chart datum and revisions to the separation model; coordinating mapping efforts with ships at berth; dense fog; on-going dredging operations; and various navigational trials associated with a heavily trafficked industrial waterway. To mitigate these challenges and with the volume of shoreline operations required, survey operations were conducted during daylight hours only, AIS and internet vessel tracking systems were utilized, and continuous communications were made to terminal operators and vessel captains by radio and phone.

Object detection coverage was obtained over the survey area in depths greater than 2 meters relative to chart datum using 100% multibeam echosounder (MBES) and backscatter unless otherwise discussed in individual sections of this report. This coverage type follows Option A of the Object Detection Coverage requirement specified in Section 5.2.2 of the 2018 HSSD. Historic flooding of the Mississippi River during OPR-J347-KR-18 survey impacted safe operations in high currents and restricted operations. Many features were in locations that restricted a 90-degree pass due to strong currents and proximity to shoreline, fixed structures or barge fleeting. Further, flooding and strong river currents resulted in significant sediment migration during and between survey operations, evident on this survey sheet.

Unavoidable coverage gaps are evident in some areas and are primarily due to safety concerns. Factors that blocked or impeded safe vessel operations resulting in data gaps included: high river currents, berthed vessels that remained during survey operations, submerged piles and other features, high water topping shoreline construction features resulting in rapids and turbidity, debris fields behind structures, dredging infrastructure, in-water facilities, training walls, and ruins. Significant efforts were expended to maximize coverage to the extent possible in these areas. Section B.2.10 of this report discusses issues restricting this survey coverage in greater detail. Figure 2 depicts the survey outline that was obtained for H13196.

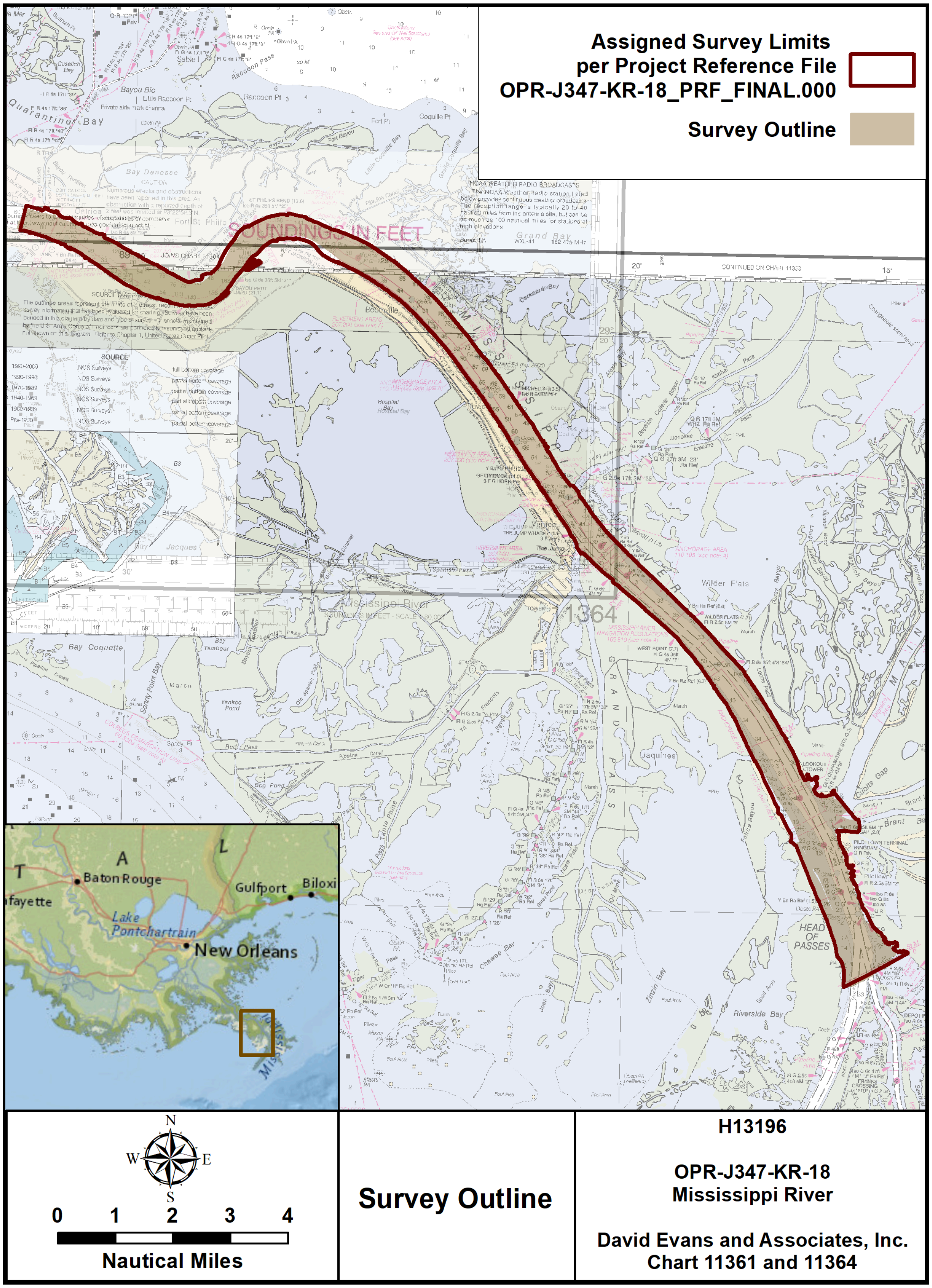


Figure 2: H13196 Survey Outline

A.6 Survey Statistics

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

	HULL ID	*S/V Blake*	*RHIB Sigsbee*	*Total*
LNM	**SBES Mainscheme**	0	0	0
	MBES Mainscheme	473.02	475.58	948.60
	Lidar Mainscheme	52.00	0	52.00
	SSS Mainscheme	0	0	0
	SBES/SSS Mainscheme	0	0	0
	MBES/SSS Mainscheme	0	0	0
	SBES/MBES Crosslines	24.04	15.20	39.24
	Lidar Crosslines	0	0	0
Number of Bottom Samples				0
Number Maritime Boundary Points Investigated				0
Number of DPs				0
Number of Items Investigated by Dive Ops				0
Total SNM				11.31

Table 3: Hydrographic Survey Statistics

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

Survey Dates	Day of the Year
08/10/2018	222
01/27/2019	27
01/28/2019	28
01/29/2019	29
01/30/2019	30
01/31/2019	31
02/01/2019	32
02/02/2019	33
02/03/2019	34
02/06/2019	37
02/07/2019	38
02/08/2019	39
02/09/2019	40
02/10/2019	41
02/11/2019	42
02/12/2019	43
02/13/2019	44
02/15/2019	46
02/16/2019	47
02/17/2019	48
02/25/2019	56
02/26/2019	57
03/13/2019	72
04/22/2019	112

Table 4: Dates of Hydrography

B. Data Acquisition and Processing

B.1 Equipment and Vessels

The OPR-J347-KR-18 Data Acquisition and Processing Report (DAPR), previously submitted with survey H13195, details equipment and vessel information as well as data acquisition and processing procedures.

There were no vessel or equipment configurations used during data acquisition that deviated from those described in the DAPR.

B.1.1 Vessels

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

Hull ID	*S/V Blake*	*RHIB Sigsbee*
LOA	83 feet	18 feet
Draft	4.5 feet	1.0 feet

Table 5: Vessels Used

Figure 3: S/V Blake

Figure 4: RHIB Sigsbee

B.1.2 Equipment

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

Manufacturer	Model	Type
Teledyne RESON	SeaBat T50-R	MBES
Teledyne RESON	SeaBat T50-P	MBES
RIEGL	VUX-1HA	Lidar System
Applanix	POS MV 320 v5	Positioning and Attitude System
Applanix	POS LV 620	Positioning and Attitude System
iXblue	Hydrins	Positioning and Attitude System
Trimble	SPS851	Positioning System
Trimble	SPS855	Positioning System
Intuicom	RTK Bridge-X	Positioning System
AML Oceanographic	Micro SVP&T	Sound Speed System
AML Oceanographic	SmartX	Sound Speed System
AML Oceanographic	BaseX	Sound Speed System
AML Oceanographic	MicroX SV	Sound Speed System
Sea-Bird Scientific	SBE 19plus	Conductivity, Temperature, and Depth Sensor

Table 6: Major Systems Used

B.2 Quality Control

B.2.1 Crosslines

Multibeam/single beam echo sounder/side scan sonar crosslines acquired for this survey totaled 4.14% of mainscheme acquisition.

Lidar crosslines acquired for this survey totaled 0.00% of mainscheme acquisition.

Multibeam crosslines were run across the entire survey area to provide a varied spatial and temporal distribution for analysis of internal consistency within the survey data.

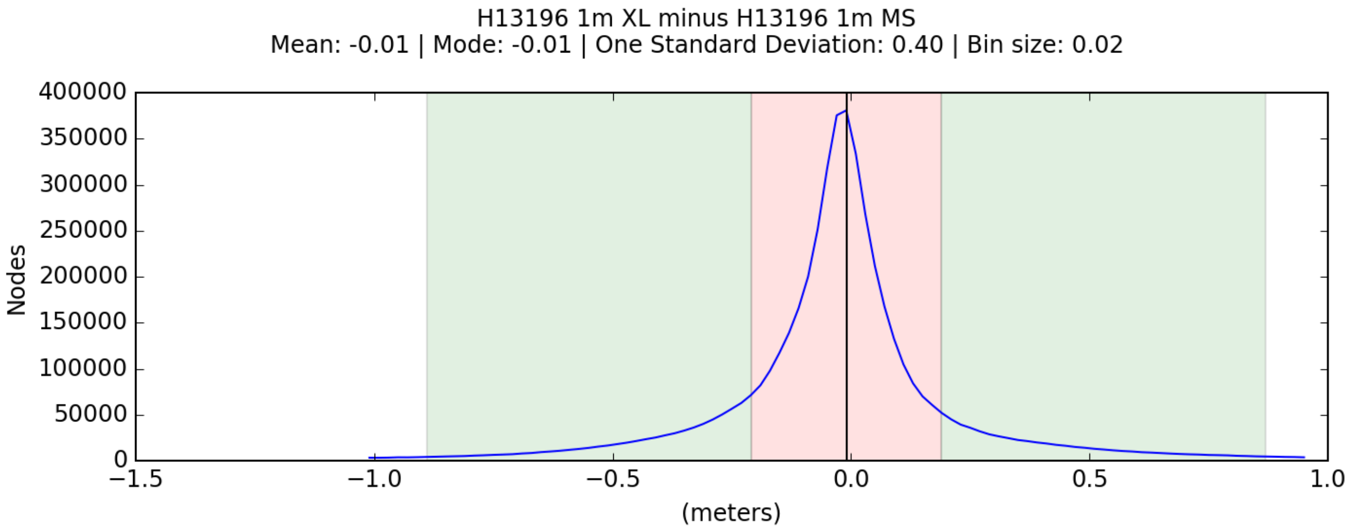
Crossline analysis was performed using the CARIS Hydrographic Information Processing System (HIPS) Quality Control (QC) Report tool, which compares crossline data to a gridded surface and reports results by beam number. Crosslines were compared to a 1-meter CUBE surface encompassing mainscheme, fill, and investigation data for the entire survey area. The QC Report tabular output and plots for both survey vessels are included in Separate II Checkpoint Summary and Crossline Comparison. For the S/V Blake the output and plot contain data from a dual-head system, beams 1 to 256 are from the starboard head while 257 to 512 are from the port head.

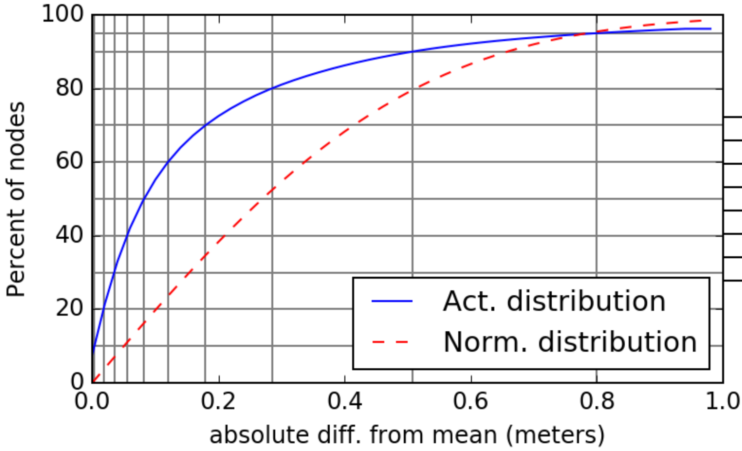
Due to significant sediment migration occurring within the survey, crosslines were generally conducted on the same day (occasionally next day) as mainscheme acquisition in order to reduce the impact of the changing riverbed on crossline agreement. This resulted in a typical time differential of less than ten hours between mainscheme and crossline acquisition and significant change in the riverbed was still apparent. Tests run prior to the 2019 flooding event, which was in full swing during this survey, showed sediment wave movement at a rate of 0.25 meters per hour with even higher rates observed during flooding. Even with these operational adjustments, crossline statistics from the S/V Blake, which operated in deeper water over the main channel, exceed International Hydrographic Organization (IHO) Order 1 specification as reported by the CARIS HIPS QC Report tool.

DEA performed an additional crossline analysis using the NOAA Pydro Compare Grids tool to analyze the differences between gridded mainscheme depths and gridded crossline depths. Input grids were 1-meter resolution CUBE surfaces of mainscheme and crossline depths. Results from the crossline to mainscheme difference analysis are depicted in Figure 5. Figure 6 depicts a difference surface portraying the sediment migration seen throughout the duration of survey. This figure details crosslines conducted at the end of the survey day, approximately eight hours after the first mainscheme line was acquired. Change is significant in the sediment wave field with horizontal migration of up to 6 meters occurring between mainscheme and crossline acquisition. The shape of the waves is apparent in both the crossline/mainscheme difference image and the final multibeam hillshade. In the crossline difference image, overlayed on the final multibeam hillshade, shades of yellow and red indicate shoaling in meters and shades of blue indicate deepening in meters with both following the form of the wave field as sediment waves migrate. Shades of grey indicate areas that meet requirements and are generally outside the sediment wave field where there has been less change.

DEA remains confident that data consistency was maintained during acquisition based on swath to swath comparison of two vessel platforms and three sonars operating simultaneously in the same survey area. DEA confirmed that a systematic error, such as positioning or sound speed measurements, was not a factor leading to these large differences based on weekly system comparisons detailed in Separate I Acquisition and Processing Logs of this report. To further document the system performance, an additional crossline report was run on data acquired in the vicinity of Gulfport Channel, near the project's mobilization grounds and outside of the influence of sediment migration. The output of this report confirms the S/V Blake's sonar and acquisition and processing procedures are capable of acquiring data that exceeds IHO specification for Order 1 and Special Order as reported by the HIPS QC Report tool. Output from the report is included in Separate II Checkpoint Summary & Crossline Comparisons.

This issue was not limited to this survey area; sediment migration affected the entire OPR-J347-KR-18 project area. Impacts of sediment migration are further discussed in section B.2.6 of this report.





Percent of nodes	Deviation (m)
50%	+/- 0.08
60%	+/- 0.12
70%	+/- 0.18
80%	+/- 0.28
90%	+/- 0.51
95%	+/- 0.80

Figure 5: H13196 Crossline Difference Distribution Summary Plot

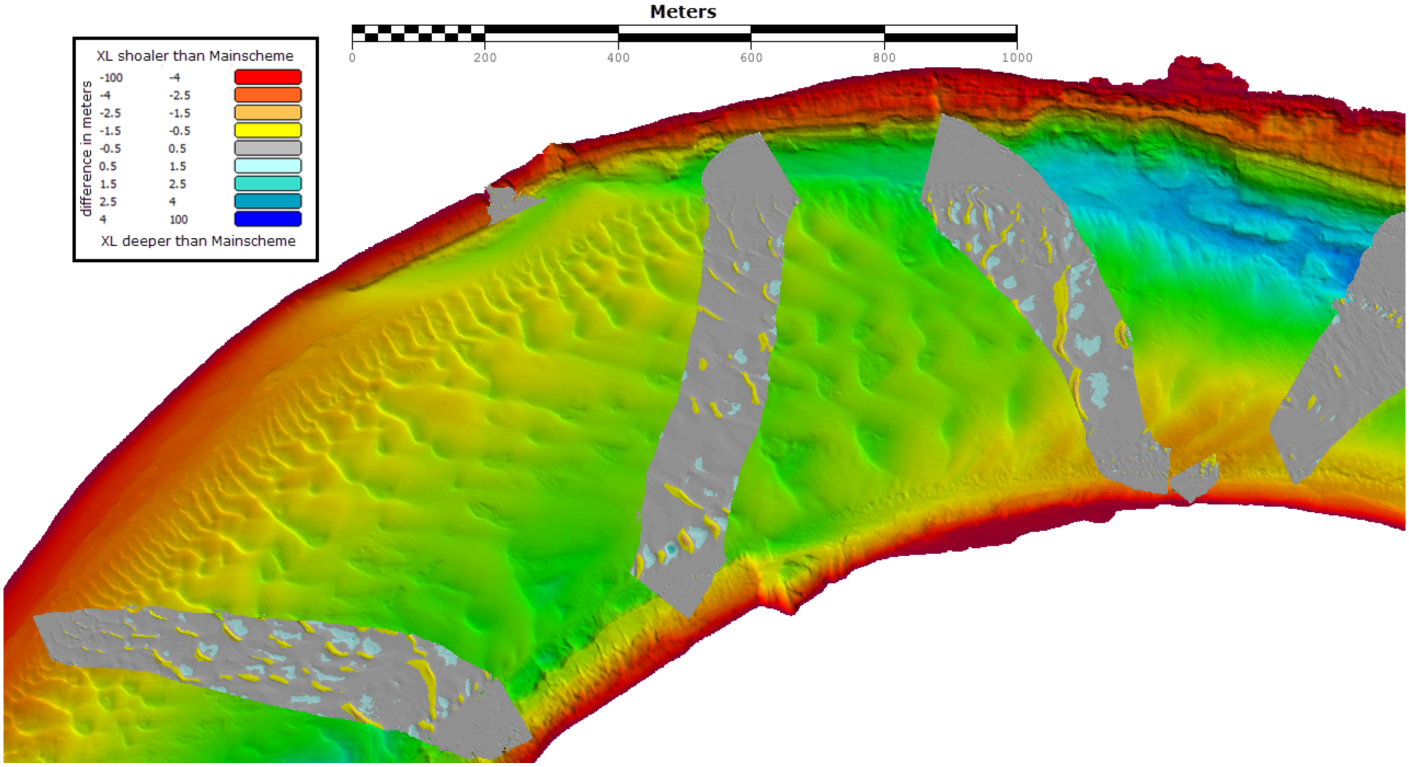


Figure 6: H13196 crossline difference surface overlayed on the multibeam hillshade highlighting sediment migration

B.2.2 Uncertainty

The following survey specific parameters were used for this survey:

Method	Measured	Zoning
ERS via VDATUM	0.030 meters	0.084 meters

Table 7: Survey Specific Tide TPU Values.

Hull ID	Measured - CTD	Measured - MVP	Surface
S/V Blake	N/A	1.0 meters/second	0.5 meters/second
RHIB Sigsbee	1.0 meters/second	N/A	0.5 meters/second

Table 8: Survey Specific Sound Speed TPU Values.

Additional discussion of these parameters is included in the DAPR. Sound speed profiles collected from the RHIB Sigsbee were acquired with AML BaseX or AML SmartX sound speed sensors. The measurement uncertainty for these sensors is listed in the CTD column in Table 8.

During surface finalization in HIPS, the "Greater of the two values" option was selected, where the calculated uncertainty from Total Propagated Uncertainty (TPU) is compared to the standard deviation of the soundings influencing the node, and where the greater value is assigned as the final uncertainty of the node. The uncertainty of the finalized surfaces increased for nodes where the standard deviation of the node was great than the TPU.

To determine if the surface grid nodes met IHO Order 1 specification, a ratio of the final node uncertainty to the allowable uncertainty at that depth was determined. As a percentage, this value represents the amount of error budget utilized by the total vertical uncertainty (TVU) at each node. Values greater than 100% indicate nodes exceeding the allowable IHO uncertainty. The resulting calculated TVU values of all nodes in the submitted finalized surfaces are shown in Figures 7 through 9.

The finalized surfaces include occasional large vertical uncertainties which exceed IHO Order 1 allowances. These high uncertainties were caused by introducing areas of high depth standard deviation associated with steep slopes when finalizing surfaces with the greater of the two option; and incorporating erroneous real-time sonar uncertainty values during TPU computation. On occasion, the real-time uncertainty logged during acquisition included a sounding with an extremely high depth uncertainty which was well outside of realistic values. During processing, an IHO filter was applied to all sounding data, with rejecting soundings exceeding IHO Order 1 thresholds for TVU. These rejected soundings have at times been reaccepted after thorough review by the hydrographer. This issue appears to have been caused by an unresolved software bug in either the sonar top side unit or acquisition system impacting the reported uncertainty, but not the actual depth.

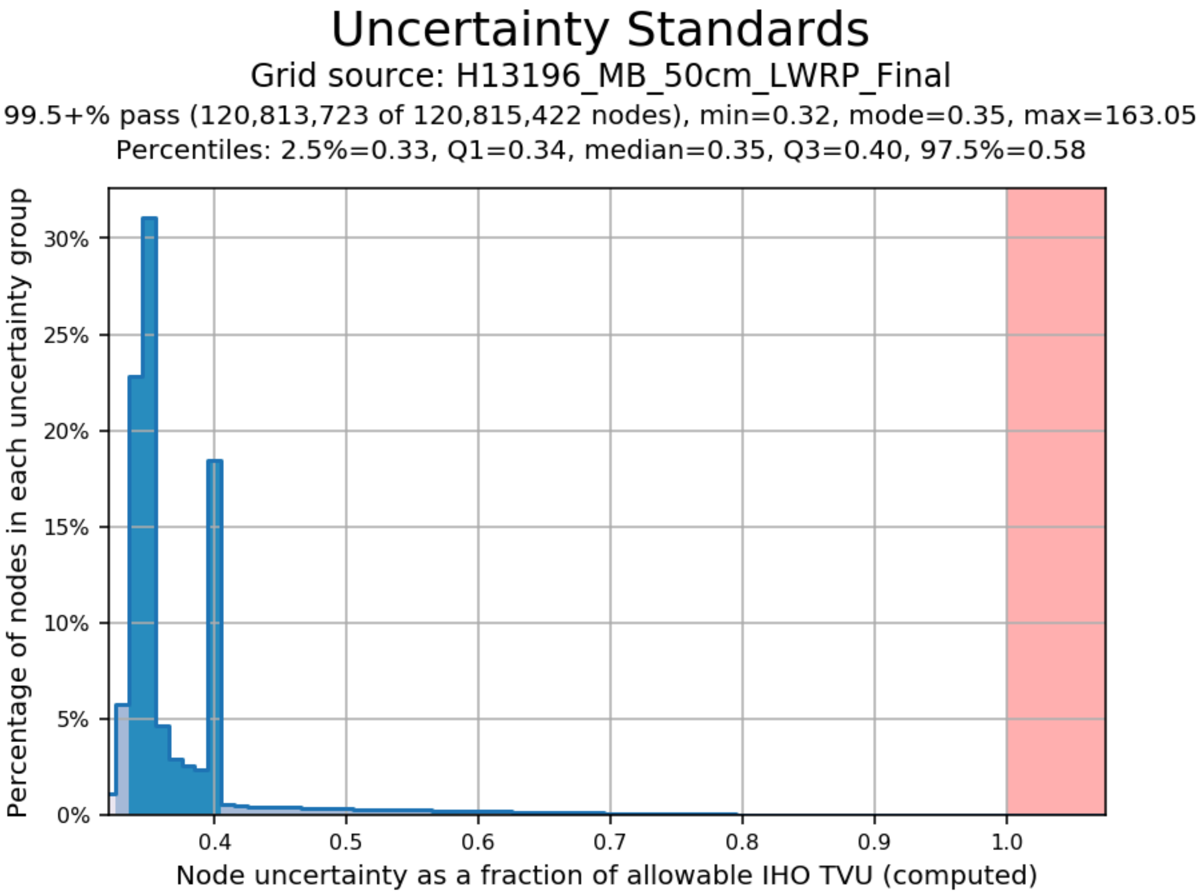


Figure 7: Node TVU statistics - 50cm finalized

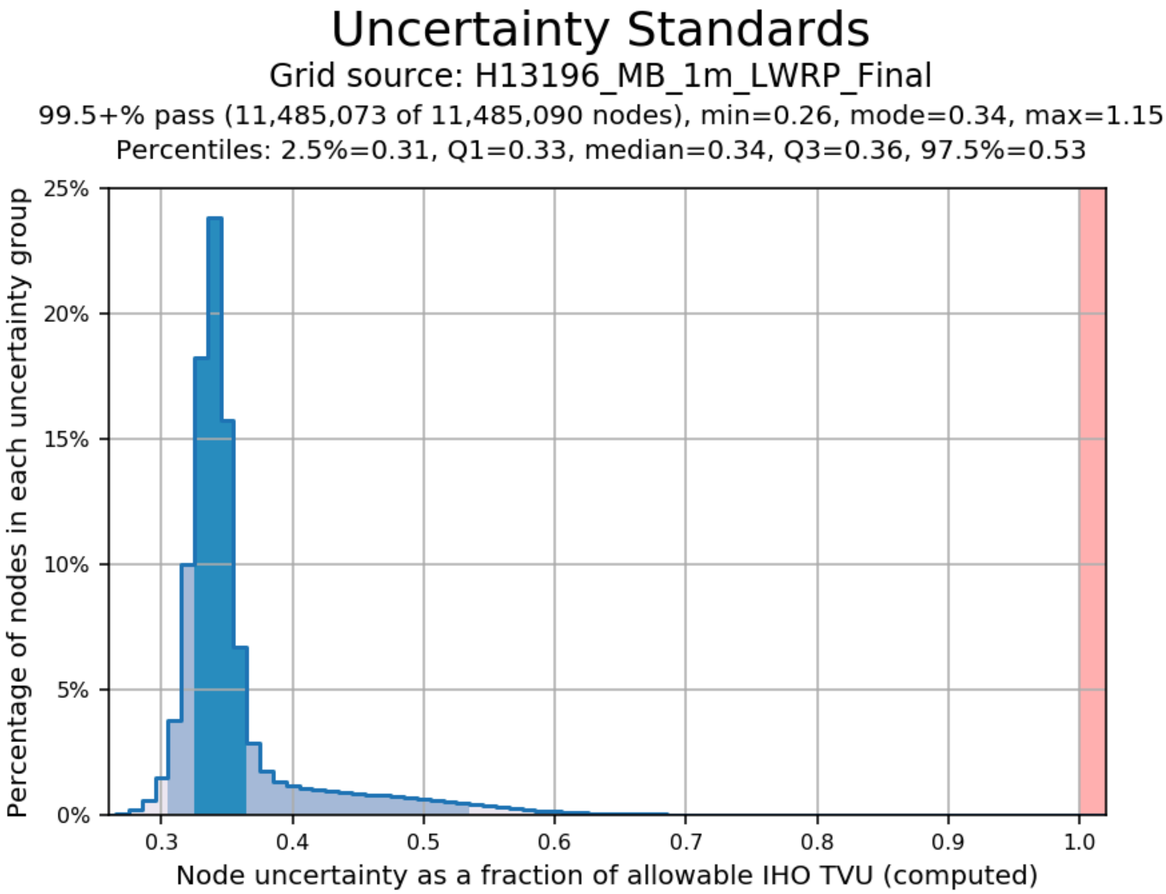


Figure 8: Node TVU statistics - 1m finalized

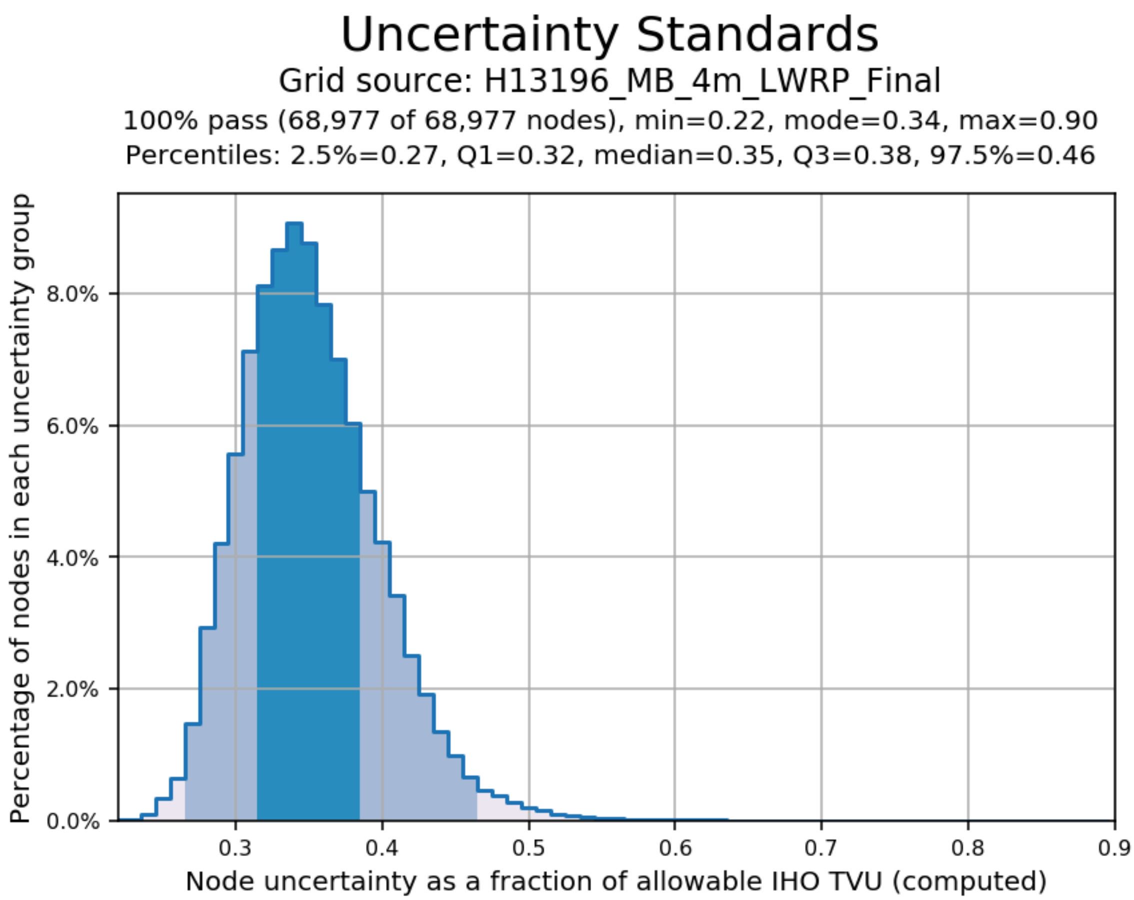


Figure 9: Node TVU statistics - 4m finalized

B.2.3 Junctions

Survey H13196 junctions with current surveys H13195 and H13212. No prior surveys were specified as junctions in the Project Instructions.

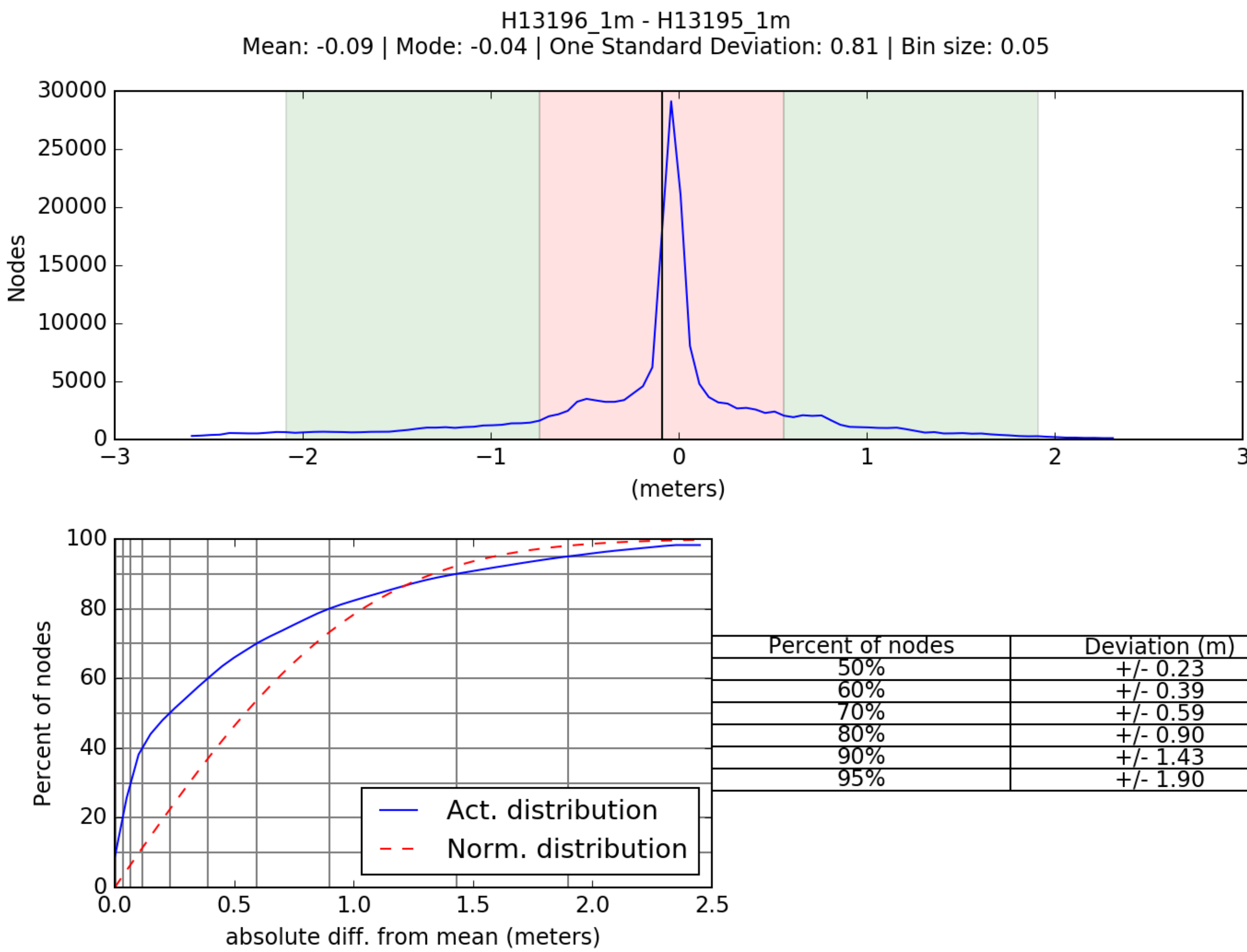
The following junctions were made with this survey:

Registry Number	Scale	Year	Field Unit	Relative Location
H13195	1:5000	2018	David Evans & Associates, Inc.	N
H13212	1:5000	2018	David Evans & Associates, Inc.	S

Table 9: Junctioning Surveys

<u>H13195</u>

Survey H13195 is also part of the OPR-J347-KR-18 survey project. The mean difference between H13196 and H13195 survey depths is 9 centimeters (H13196 shoaler than H13195), shown in Figure 10. The surveys agree well, with major differences representative of surveys impacted by sediment migration over the duration of the two surveys. The majority of mainscheme survey operations in the junctioning area were acquired for survey H13195 on January 23, 2019 (DN023) and January 27, 2019 (DN027) for survey H13196. The time gap of four days resulted in significant sediment migration before starting operations on H13196. Figure 11, represented in meters, shows the area of overlap with grey shades showing generalized agreement. Warmer colors represent H13196 survey depths shoaler than H13195, while cooler colors indicate H13196 survey depths deeper than H13195.



Percent of nodes	Deviation (m)
50%	+/- 0.23
60%	+/- 0.39
70%	+/- 0.59
80%	+/- 0.90
90%	+/- 1.43
95%	+/- 1.90

Figure 10: Distribution summary plot of survey H13196 1-meter vs H13195 1-meter

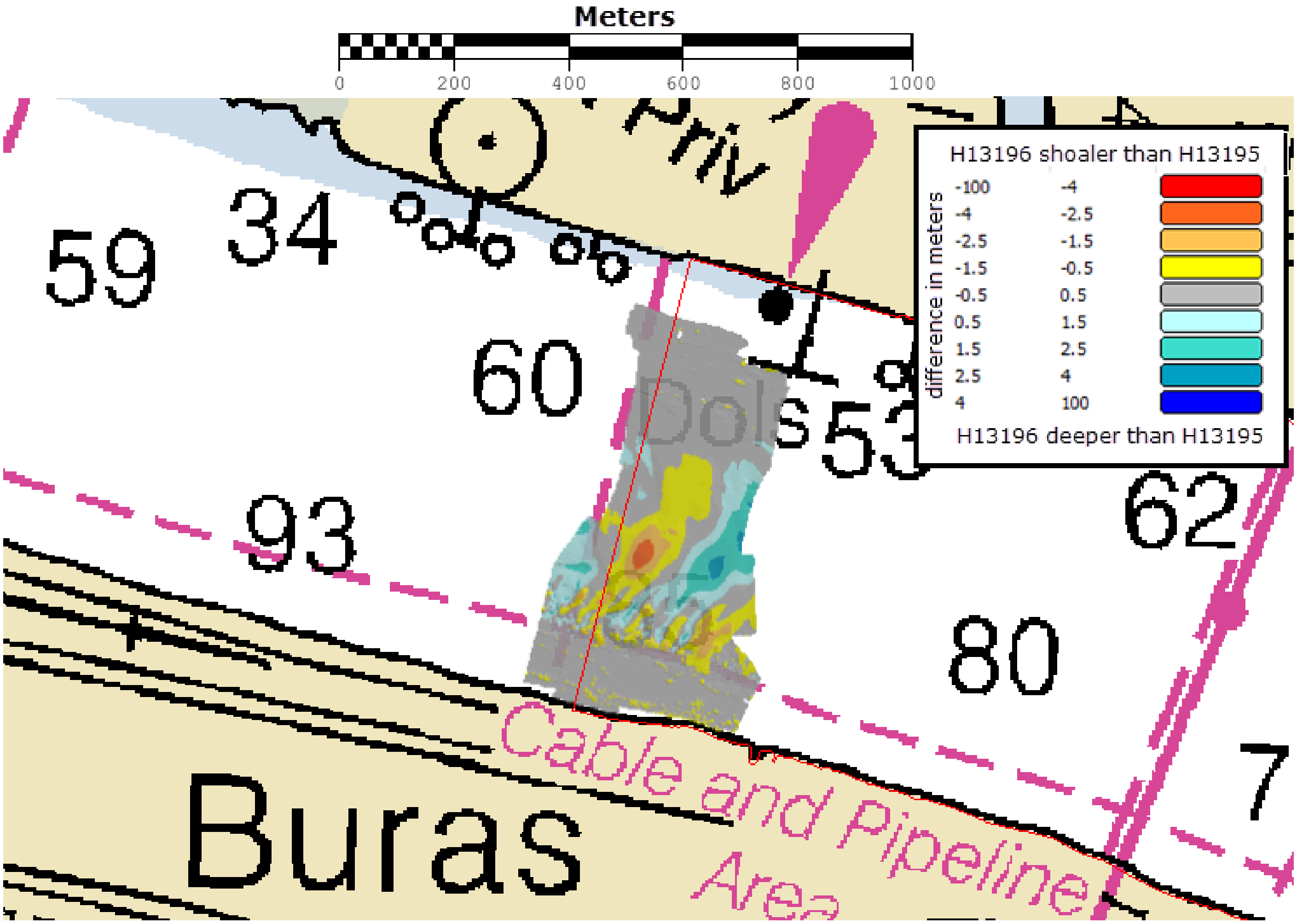
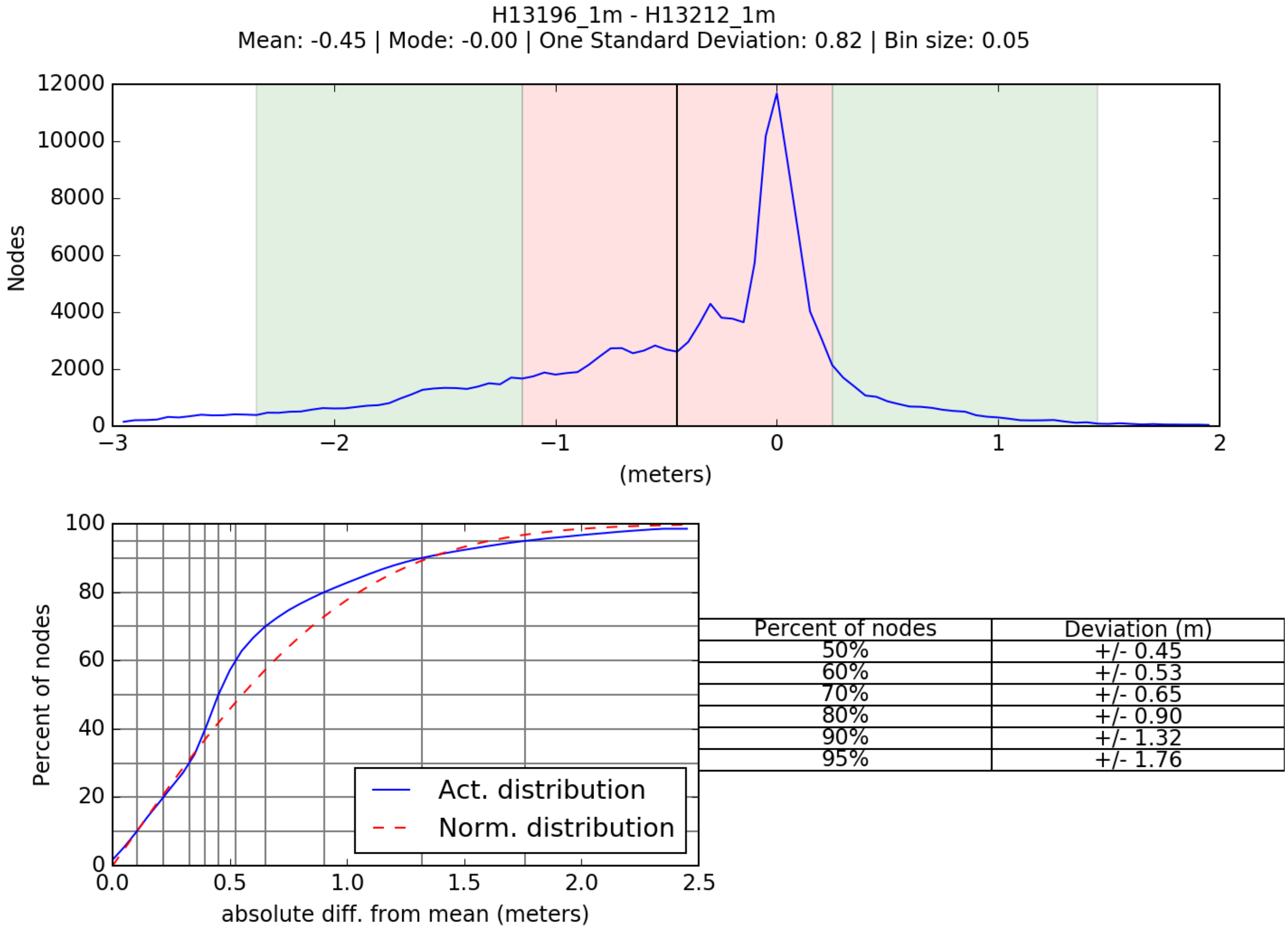


Figure 11: Junction difference surface between surveys H13196 1-meter and H13195 1-meter

<u>H13212</u>

Survey H13212 is also part of the OPR-J347-KR-18 survey project. The mean difference between H13196 and H13212 survey depths is 45 centimeters (H13196 shoaler than H13212), shown in Figure 12. The surveys show major differences representative of surveys impacted by sediment migration over the duration of the two surveys. The majority of mainscheme survey operations in the junctioning area were acquired for survey H13196 on February 10, 2019 (DN041) and February 26-27, 2019 (DN057-058) for survey H13212. The time gap of 16 days resulted in significant sediment migration before starting operations on H13212. Figure 13, represented in meters, shows the area of overlap with grey shades showing generalized agreement. Warmer colors represent H13196 survey depths shoaler than H13212, while cooler colors indicate H13196 survey depths deeper than H13212.



Percent of nodes	Deviation (m)
50%	+/- 0.45
60%	+/- 0.53
70%	+/- 0.65
80%	+/- 0.90
90%	+/- 1.32
95%	+/- 1.76

Figure 12: Distribution summary plot of survey H13196 1-meter vs H13212 1-meter

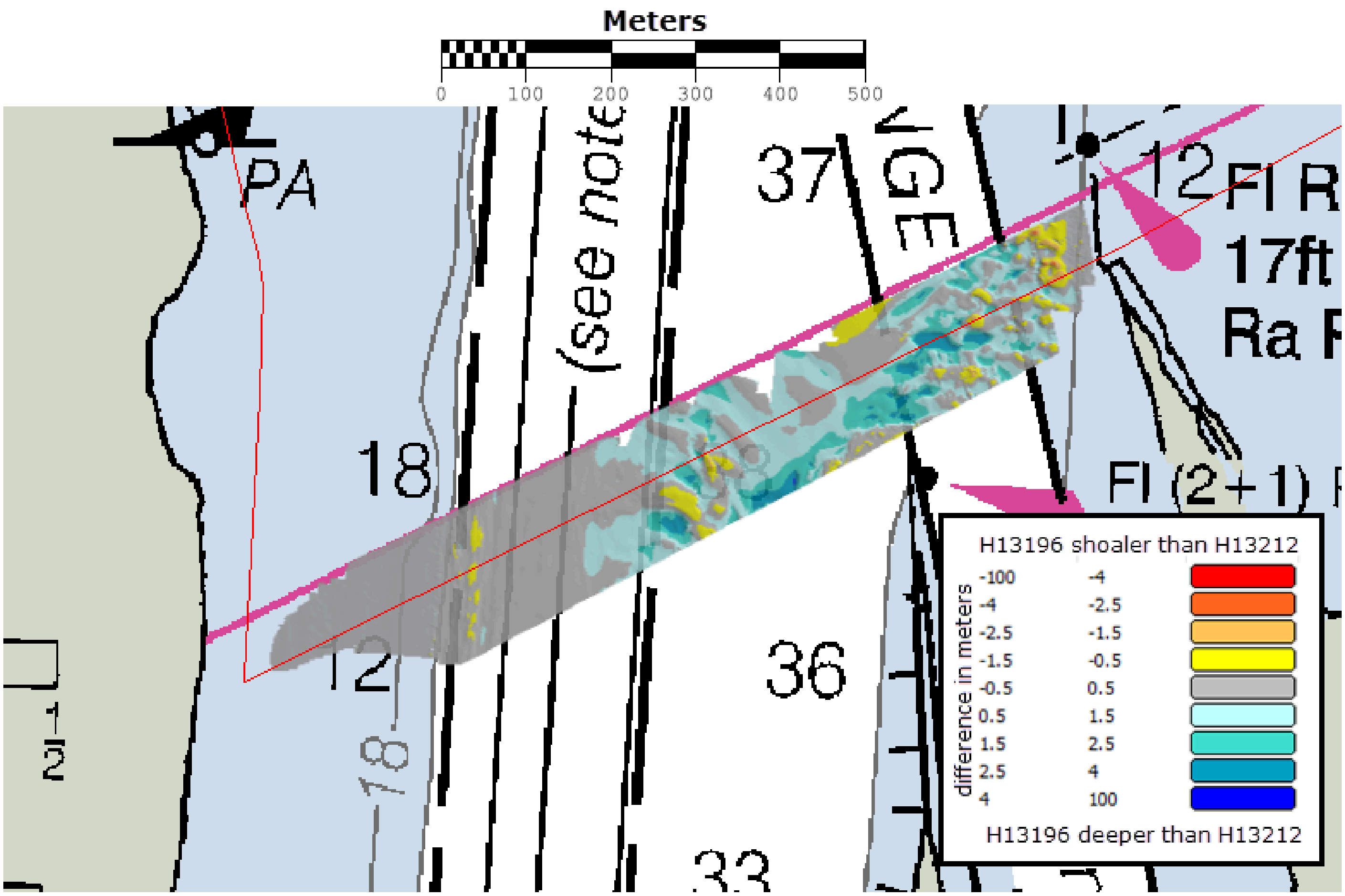


Figure 13: Junction difference surface between surveys H13196 1-meter and H13212 1-meter

B.2.4 Sonar QC Checks

Quality control is discussed in detail in Section B of the DAPR. Results from weekly position checks and weekly multibeam bar checks are included in Separate I Acquisition and Processing Logs of this report. Sound speed checks can be found in Separate II Sound Speed Data Summary of this report.

Multibeam data were reviewed at multiple levels of data processing including: CARIS HIPS conversion, subset editing, and analysis of anomalies revealed in CUBE surfaces.

B.2.5 Equipment Effectiveness

<u>High Frequency artifact in dual-head MBES system</u>

High frequency artifacts are visible periodically in the data collected with the dual-head system on the S/V Blake. Despite extensive testing and troubleshooting of mount stability under a range of vessel motion dynamics and speed, applied offsets, and application of patch tests bias, no single source of the artifact could be identified. The high frequency artifact was transient and unrelated to vessel dynamics and loading on sonar mounts at different speeds and induced rolling during testing and is periodically present in both sonars, with a higher magnitude observed on the port sonar. From the findings of the troubleshooting, it is the hydrographer's belief that this is not related to mount instability relative to the IMU of patch test bias values applied and may be related to minor transient timing issues in the dual head system relative to the application of motion data (primarily role). Under this assumption, the further away the sensor is from the ship reference point, the great the magnitude of the error. In this case, while the artifact negatively affects the aesthetic of the final surface deliverable, it is well within IHO specifications for this survey. Figures 14 and 15, display the transient artifact for the dual-head operations.

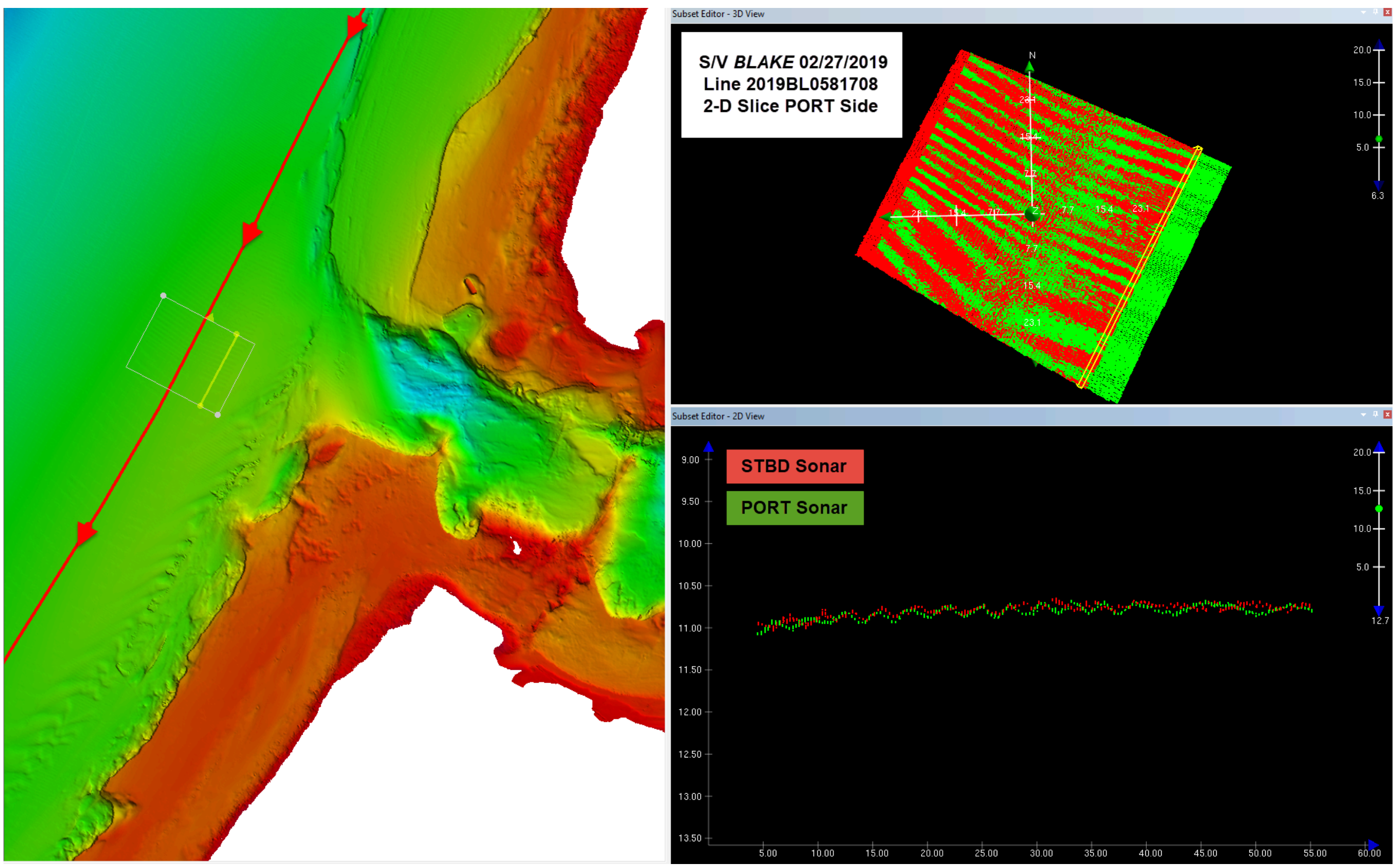


Figure 14: Example of high frequency artifact shown in surface and along track subset. Subsets of differing magnitudes between separate sonar heads of dual-head system shown on port side of swath (starboard beams shown in red, port beams in green)

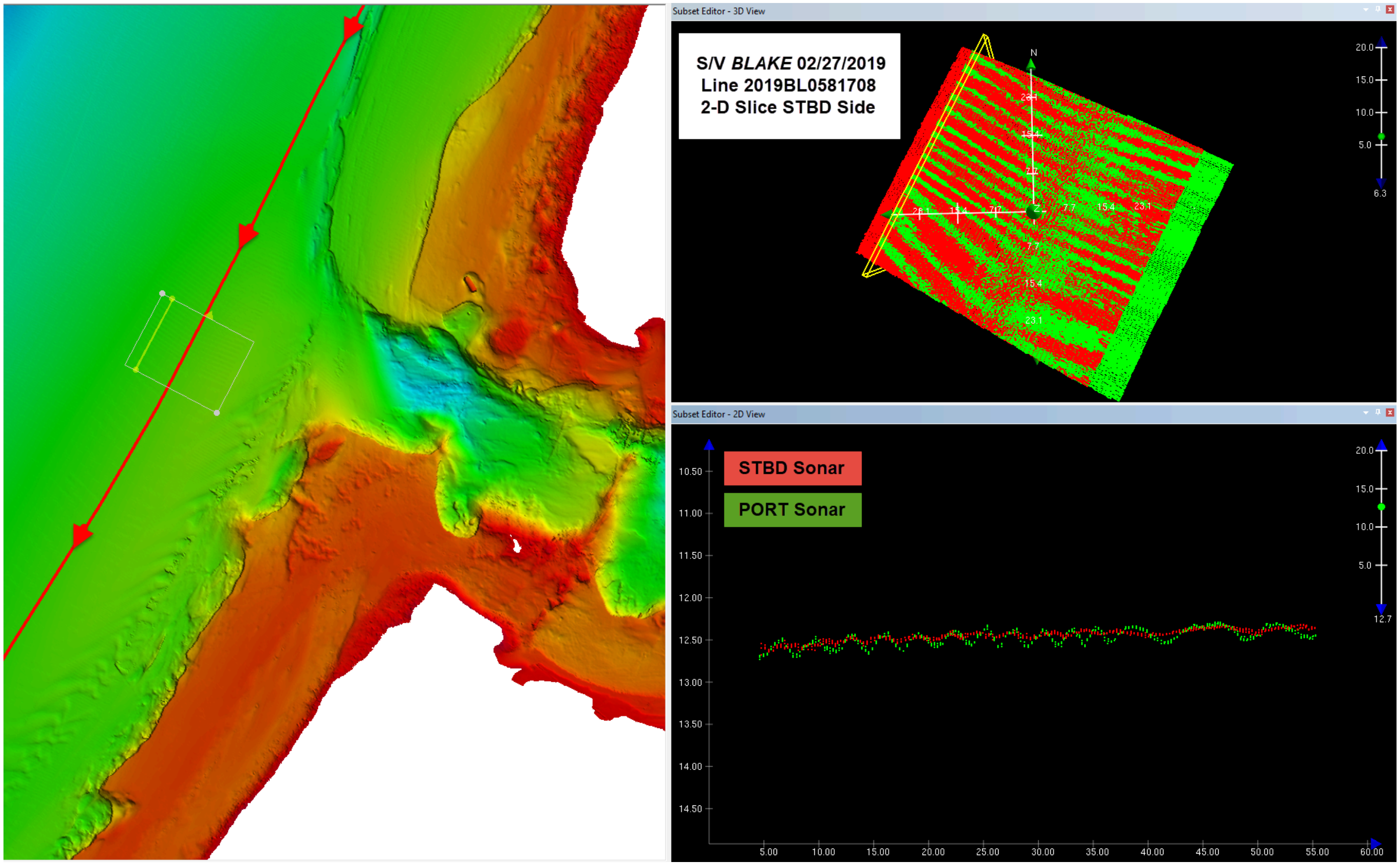


Figure 15: Example of high frequency artifact shown in surface and along track subset. Subsets of differing magnitudes between separate sonar heads of dual-head system shown on starboard side of swath (starboard beams shown in red, port beams in green)

Bottom tracking in shallow water

During survey acquisition, it was apparent that the combination of shallow water and the river bottom type (an assumption of soft silty mud) made it difficult to get a clean bottom track return from the MBES system. This most frequently was displayed in shallow, flat areas out of the main channel current. To try to mitigate the effect, sonar settings were changed by the hydrographer during acquisition, including changing power, gain, time variable gain (TVG) settings, and pulse length. In the end no clear solution fixed the issue and the hydrographer continuously tuned the sonar for the best return at the time. This is likely a limitation of the instrument and the acoustic properties of the sediments in the depths being surveyed. The HDCS dataset was well cleaned to mitigate the effects to the final surfaces. However, artifacts within IHO specifications, will be apparent in the final delivered surface as shown in Figure 16, with units represented in meters.

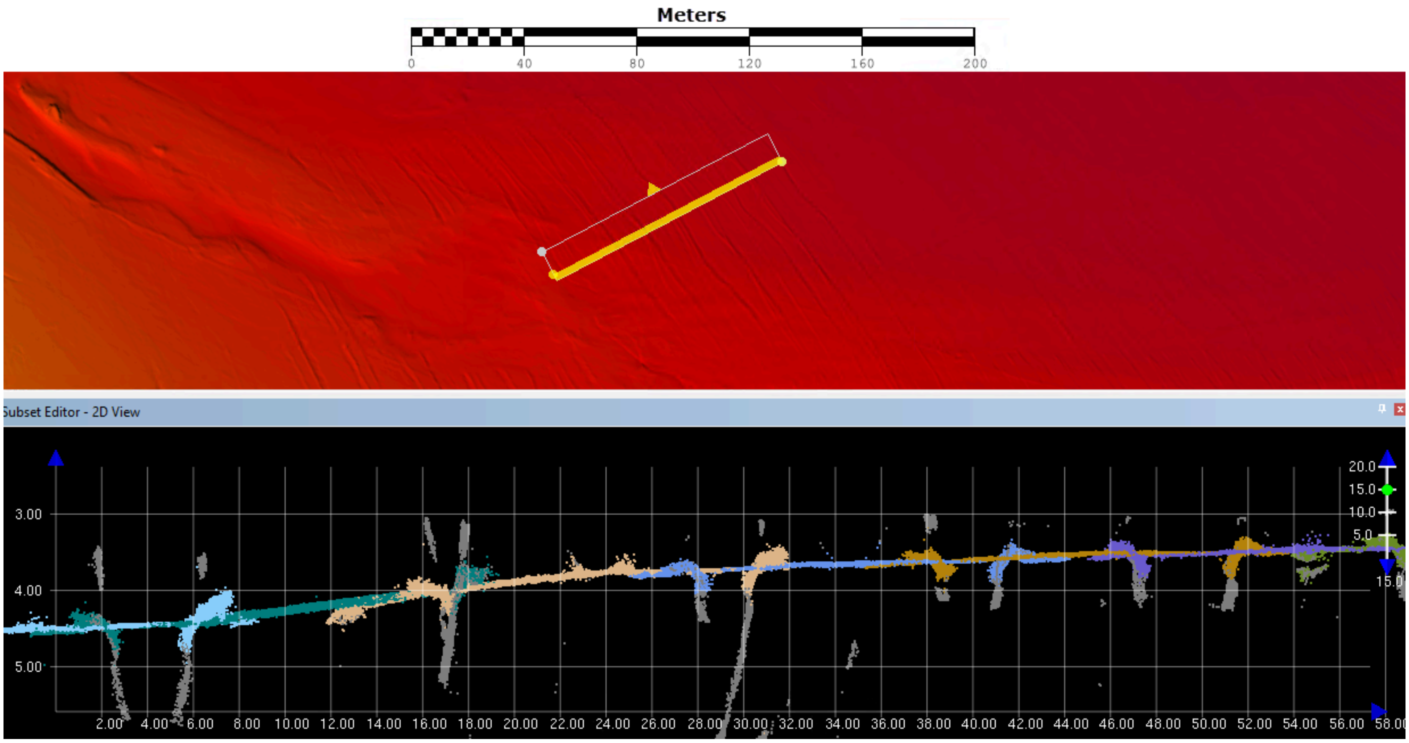


Figure 16: Example of erroneous bottom tracking of flat shoal areas in HDCS data and resultant surface artifact (gray soundings rejected manually by hydrographer to limit effects to the surface)

<u>Delayed Heave</u>

Delayed heave was applied to data collected by the S/V Blake using the POS M/V .000 file logged during acquisition. This file is loaded using the CARIS Import Auxillary Data tool. Delayed heave is chosen during the SVC and Merge processing steps.

Delayed heave was applied to data collected by the RHIB Sigsbee using the IXSEA Output_E.log file logged during acquisition. This file is formatted similarly to the POS M/V .000 file for delayed heave, but does not contain any position, motion, or associated RMS values. The Output_E.log file was loaded using the CARIS Import Auxillary Data tool and applied during the SVC and Merge processing steps.

Lines acquired by RHIB Sigsbee, between the times 16:59 and 18:50 on February 11, 2019 (DN042), are submitted with real-time heave due to logging errors during acquisition that resulted in no delayed heave file being logged.

B.2.6 Factors Affecting Soundings

Sediment Migration

Sediment migration on the river bottom was evident throughout the course of this survey. Crosslines and fill lines that were run hours after mainscheme acquisition still exceeded the allowable vertical uncertainty in some areas. Following guidance from HSD OPS and the Atlantic Hydrographic Branch, the hydrographer allowed the CUBE algorithm to estimate a gridded depth in these areas without manual cleaning of the sounding data. The submitted surface has numerous artifacts resulting from these areas of disagreement. When reviewed, soundings deemed as fliers were still rejected. It is the hydrographer's belief that the submitted depths were accurate at the time of the survey. An example of horizontal and vertical movement in sediment waves that resulted in disagreement for H13196 submitted surfaces is shown in Figure 17.

Some areas of the greatest disagreement have been noted in the H13196_Notes_for_Reviewer.hob file with the SNDWAV area feature class, submitted in Appendix II Supplemental Survey Records of this report. This is not an exhaustive list of areas but should detail those that show the major surface artifacts resulting from sediment migration.

In the vicinity of Baton Rouge, while in an area of significant sediment migration but prior to flood levels, a field test was conducted to attempt to quantify the amount of change the river bottom experienced at that time of survey. The same line was run upstream at similar speeds with time elapsing between subsequent passes. A subset of the results is shown in Figure 18. A high vertical exaggeration is used in Figure 18 to highlight the magnitude of the sediment migration. The hydrographer's best estimate is that the smaller waves on top are migrating at nearly 1 meter per hour while the larger waves, nearly 2 meters high, are migrating at 5 meters per day.

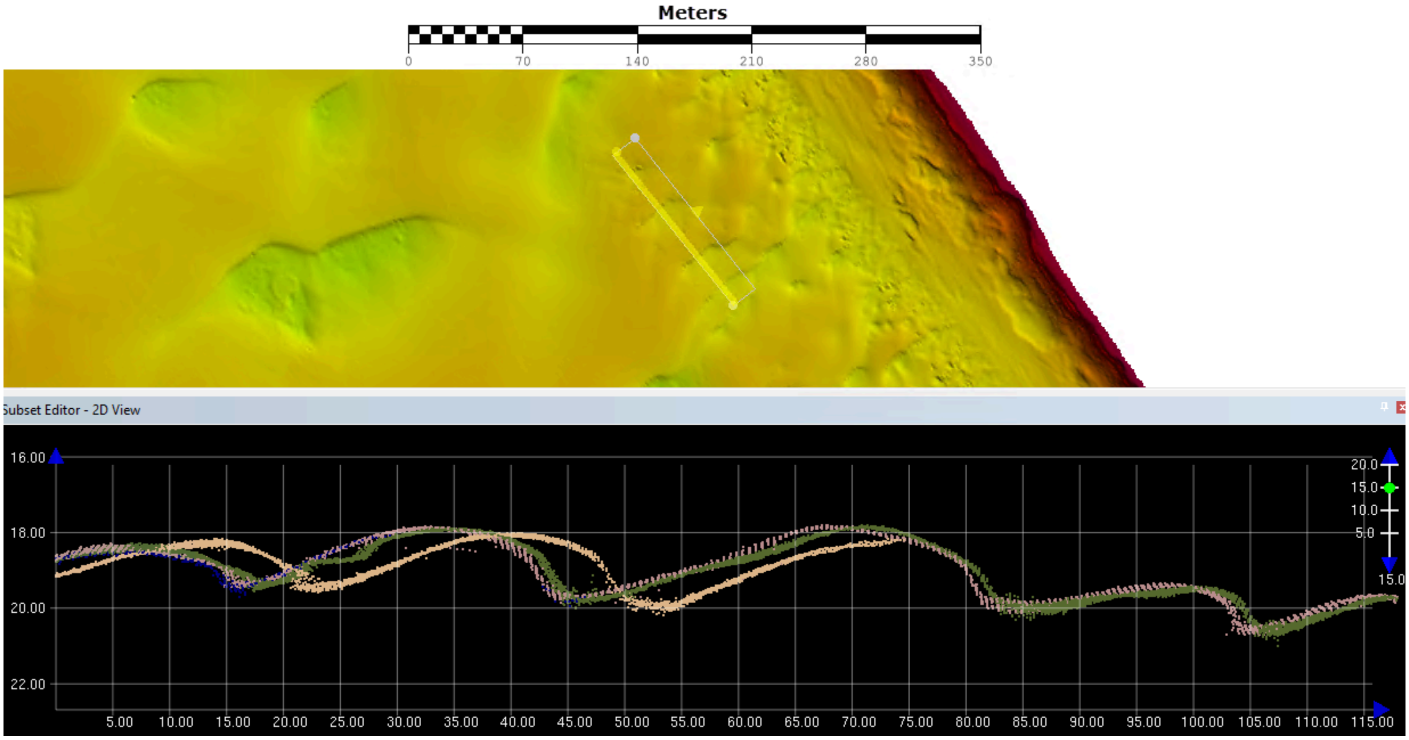


Figure 17: Example of artifacts caused by sediment migration during H13196 operations

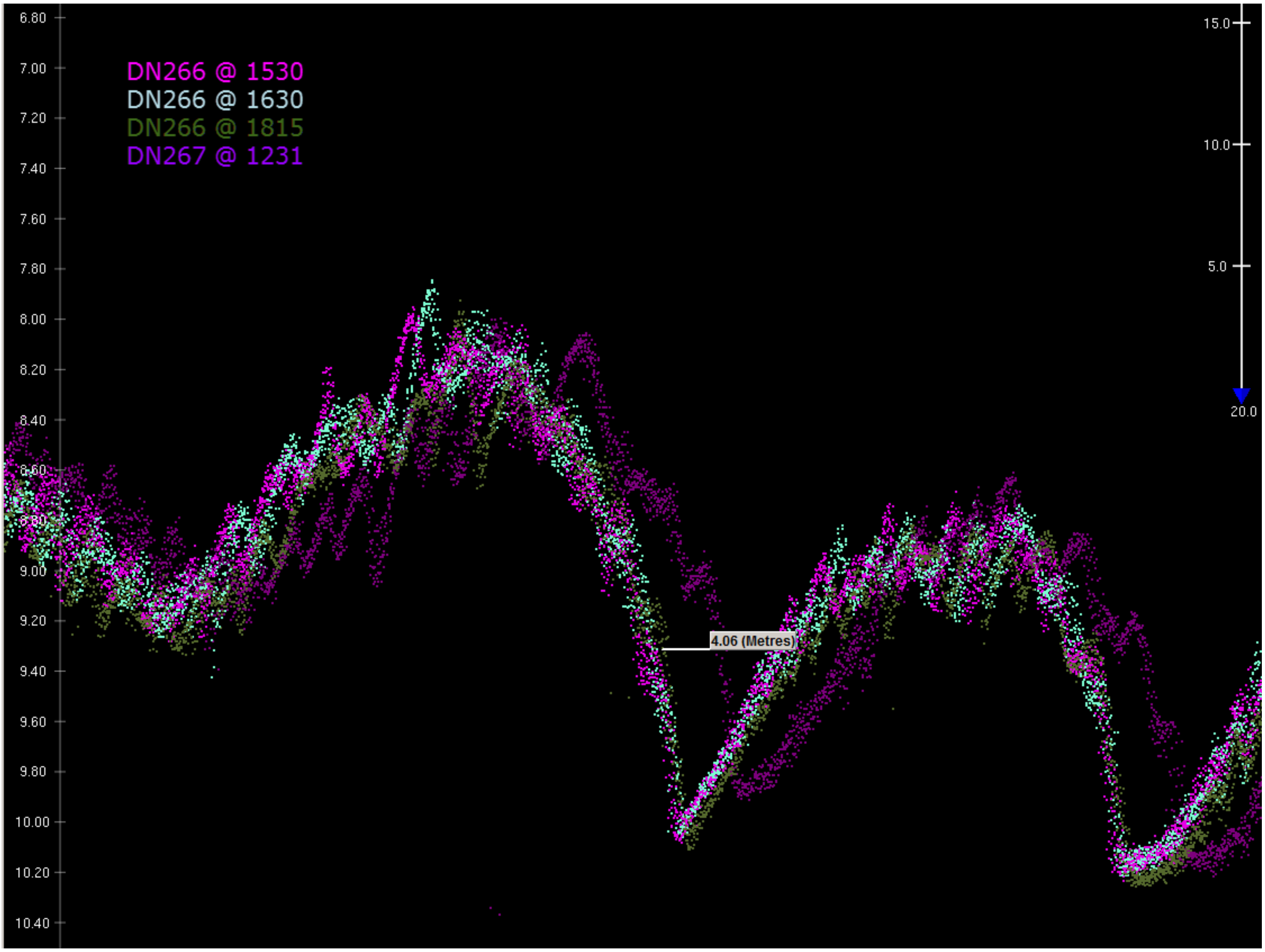


Figure 18: Along-track subset view of field test portraying river bottom changes due to sediment migration

B.2.7 Sound Speed Methods

Sound Speed Cast Frequency: Approximately four-hour intervals

An AML Oceanographic Moving Vessel Profiler (MVP) and an AML SmartX or BaseX were the primary instruments used to acquire sound speed readings during multibeam operations for the S/V Blake and the RHIB Sigsbee, respectively. Additional discussion of sound speed methods can be found in the DAPR.

For H13196 survey operations, sound speed was well mixed and varied negligibly, both temporally and spatially. Due to the consistent sound speed profile encountered in this reach of the river, sound speed profiles were measured at approximately one to two-hour intervals during survey operations. Sound speed readings were applied in CARIS at a of four-hour interval based on consistent profiles observed throughout the day of survey.

All sound speed measurements were made within 250 meters of the planned survey boundary.

In general, a sound speed measurement was made immediately preceding bathymetric operations, per HSSD. Occasionally a sound velocity profile was taken before survey operations and then rejected during data QC or taken shortly after the start of acquisition. Figure 19 details all instances when there was a deviation from the HSSD for H13196.

Day Number	Vessel	Time of first SSP (UTC)	Time of first ping (UTC)	Comments
2019-027	RHIB Sigsbee	17:09	16:58	SV taken 9 minutes after starting acquistion. Data analyzed, SV changes minimal.
2019-029	RHIB Sigsbee	16:44	15:44	SV taken 1 hour after starting acquistion. Data analyzed, SV changes minimal.
2019-032	RHIB Sigsbee	14:01	13:40	SV taken 21 minutes after starting acquistion. Data analyzed, SV changes minimal.
2019-056	S/V Blake	14:02	14:00	SV taken proceeding short fill line, 2 minutes after starting acquistion. Data analyzed, SV changes minimal.

Figure 19: Sound speed measurement exceeding start of operations specification

B.2.8 Coverage Equipment and Methods

Survey speeds were typically maintained to meet or exceed along-track density requirements. However, due to swift current pushing the vessel downriver and the need to maintain maneuverability, combined with deep areas requiring expansion of the sonar range and thereby slowing the sonar ping rate, along-track low-density areas are occasionally present in the final data. These typically are narrow swaths centered along nadir and do not impact meeting density requirements for 95% of all nodes.

Mobile lidar coverage was obtained on the full extents of both river banks spanning the survey area with the following exception. From mile 0 to 4 Above Head of Passes (AHOP) there is sparse to no lidar coverage on the west bank and several sections with no coverage on the east bank. Lidar coverage was not obtained in this area due to shallow waters restricting the S/V Blake's ability to transit in range of the shoreline for reliable lidar returns. These areas all fall shoreward of the NALL as determined by MBES coverage obtained by RHIB Sigsbee.

B.2.9 Density

The sounding density requirement of 95% of all nodes, populated with at least five soundings per node, was verified by analyzing the density layer of each finalized surface. Individual surface results are stated in Figures 20 through 22.

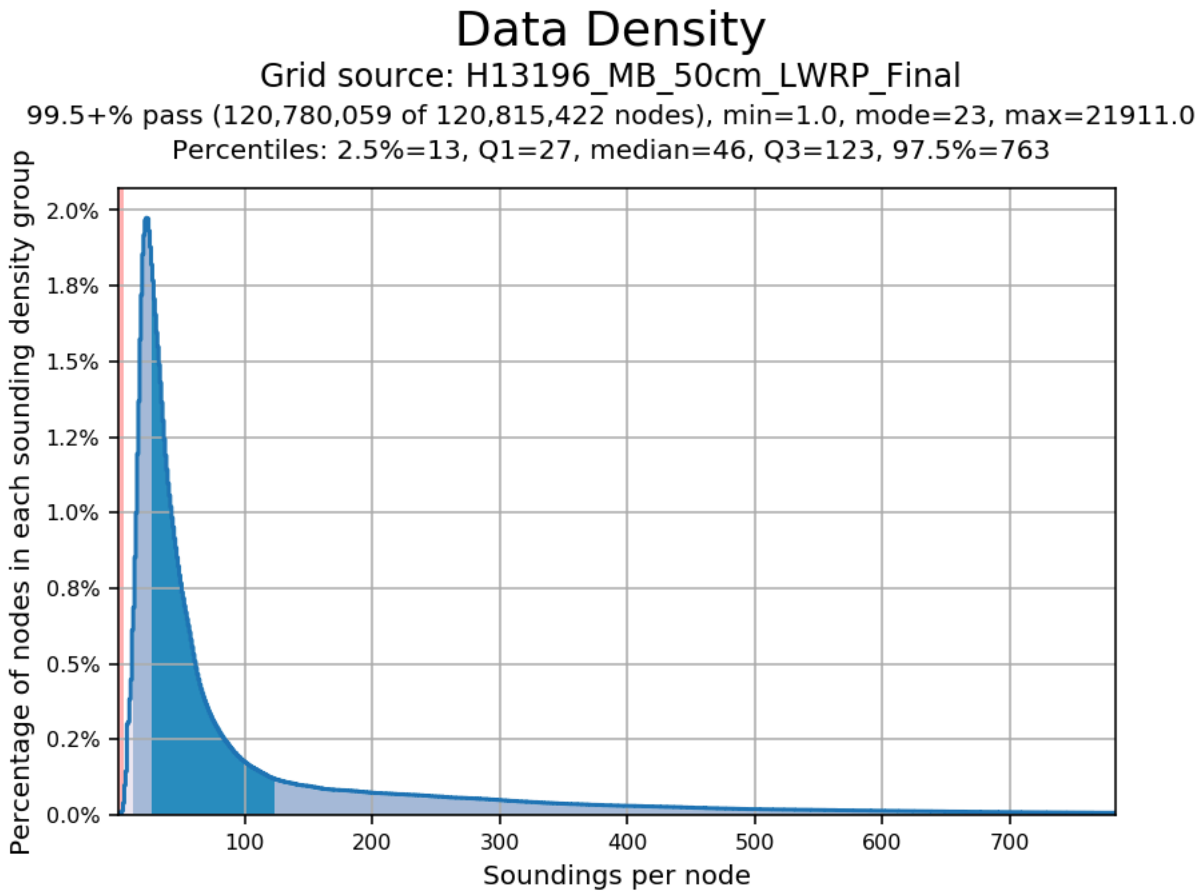


Figure 20: Node density statistics - 50cm finalized

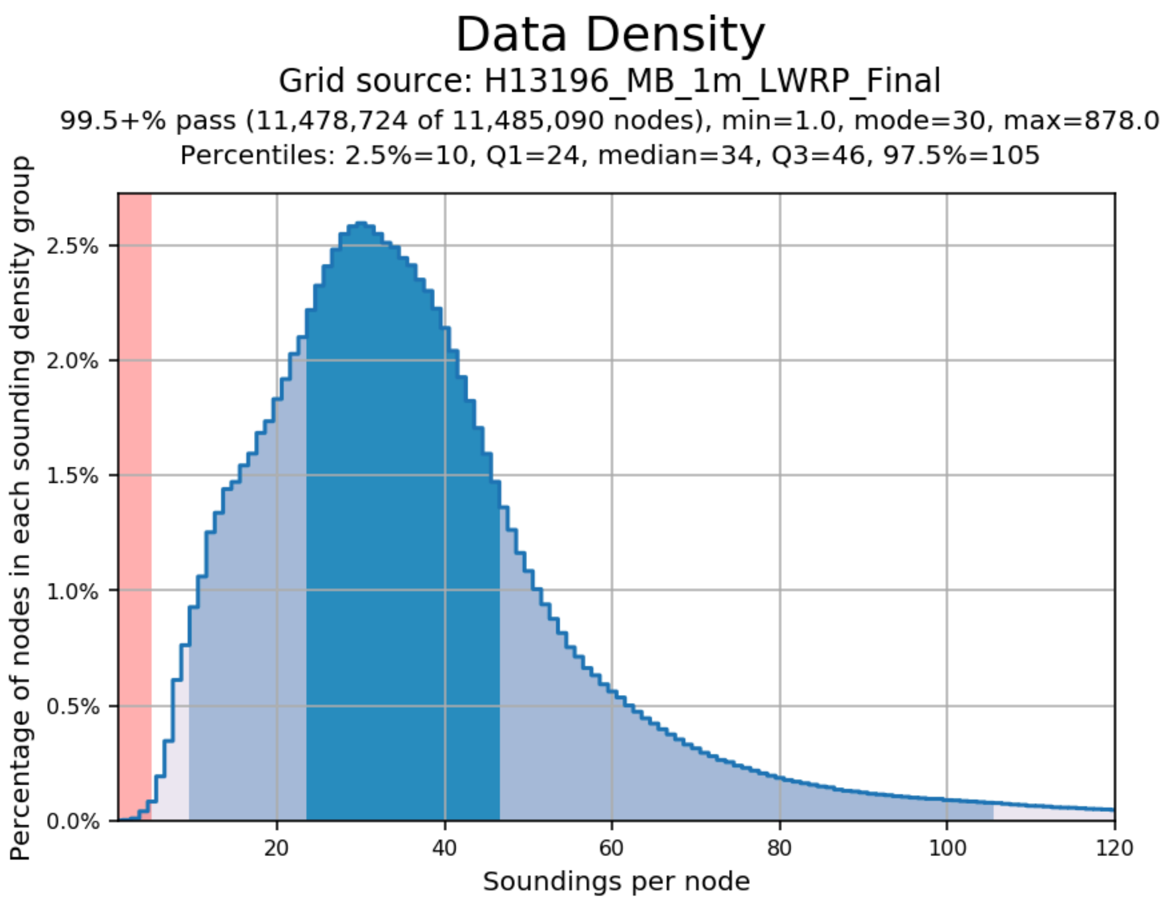


Figure 21: Node density statistics - 1m finalized

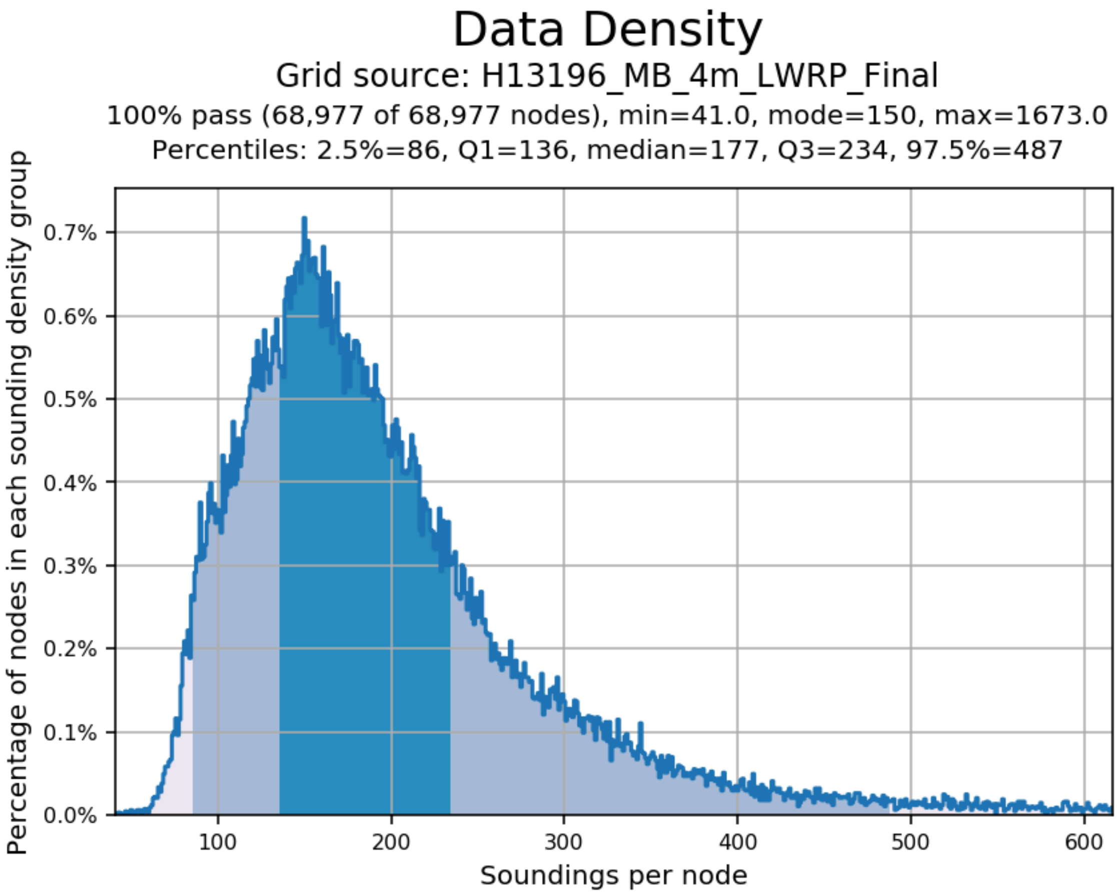


Figure 22: Node density statistics - 4m finalized

B.2.10 Data gaps in bathymetric coverage

Occasional data gaps in the final Object Detection surfaces exist due to operational restrictions at time of survey. These data gaps were further analyzed after acquisition and determined to be unattainable due to safety or other factors impacting vessel operations. Significant effort was expended during survey operations to maximize object detection coverage in these areas.

Some of the sources for these data gaps include:
- Holidays or 2-meter coverage gaps behind pier structures where field unit was physically unable to operate, or safety concerns limited their ability.
- Holidays beyond the 2-meter curve (NALL) which were not further investigated due to safety concerns in shallow water.
- Holidays or 2-meter coverage gaps in the vicinity of shoreline construction features being inundated by high water levels creating rapids and turbidity.
- Holidays or 2-meter coverage gaps underneath anchored/moored vessels. These were revisited at least one other time in subsequent days. Typically, the field hydrographer would acquire data along the achievable

extents of the gap, and document the existence of the vessel with targets and/or photos. AIS or internet-based vessel tracking tools were used to alert the field unit when vessels were underway.
- Holidays created beneath baring structures that met the area requirements were rejected in the survey data for final delivery.
- Holidays created by rejecting a temporary dredge pipeline from the final deliverables.
- Any 2-meter coverage gaps that were previously met prior to final separation model adjustment further discussed in section C.3.2 of this report.

Holidays that exist in the final surfaces have been noted in the H13196_Notes_for_Reviewer.hob with the cvrage area feature class, submitted in Appendix II, and attributed with remarks stating the contributing factor leading to the data gap. Areas were the 2-meter curve was not met are included in the H13196_Notes_for_Reviewer.hob with SLCONS feature class and attributed with remarks stating the contributing factor for this deficiency.

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

Multibeam backscatter was logged in Hypack 7k format and included with the H13196 digital deliverables. Data were processed periodically in CARIS HIPS to evaluate backscatter quality, but the processed data is not included with the deliverables. For dual-head MBES data on S/V Blake, individual 7k files were logged for each sonar head in order to better facilitate additional changes required between systems.

For data management purposes, the names of multibeam crosslines have been appended with the suffix _XL. This change was made to HIPS files only. The original file names of raw data files (Hypack HSX and 7k) have been retained.

Backscatter processing to be performed at the Branch deviates from the current OCS Backscatter Processing SOP dated 02/13/2020. Specifically, for the dual-head sonar configuration used with this survey; the processed depth files in the HDCS survey lines contain combined bathymetric data from

both sonar heads. However, due to software limitation the resulting GSF and backscatter mosaic are based on time series data in .7k files from one individual sonar head, paired with the dual-head sounding data. This is represented in the backscatter mosaic with the vessel name BlakeDHS or BlakeDHP, indicating one set of .7k files from the starboard or port head, respective of the dual-head system which was paired with the combined-head HDCS. The naming convention for the MBAB mosaic is H13196_MBAB_BlakeDHS_2m_350kHz_1of2.tif (DHS for the starboard head of a dual head configuration). This product is the best available from the files associated with this particular dual-head sonar configuration and combined-head acquisition process.

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/SIPS	10.4.5

Table 10: Primary bathymetric data processing software

The following Feature Object Catalog was used: NOAA Profile Version 5.7.

A detailed listing of all data processing software, including software used to process the mobile lidar data, is included in the DAPR.

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
H13196_MB_50cm_LWRP	CARIS Raster Surface (CUBE)	0.5 meters	-0.003 meters - 61.720 meters	NOAA_0.5m	Object Detection
H13196_MB_1m_LWRP	CARIS Raster Surface (CUBE)	1 meters	0.033 meters - 61.433 meters	NOAA_1m	Object Detection
H13196_MB_4m_LWRP	CARIS Raster Surface (CUBE)	4 meters	0.126 meters - 61.448 meters	NOAA_4m	Object Detection

Surface Name	Surface Type	Resolution	Depth Range	Surface Parameter	Purpose
H13196_MB_50cm_LWRP_Final	CARIS Raster Surface (CUBE)	0.5 meters	-0.096 meters - 20.000 meters	NOAA_0.5m	Object Detection
H13196_MB_1m_LWRP_Final	CARIS Raster Surface (CUBE)	1 meters	18.000 meters - 40.000 meters	NOAA_1m	Object Detection
H13196_MB_4m_LWRP_Final	CARIS Raster Surface (CUBE)	4 meters	36.000 meters - 61.448 meters	NOAA_4m	Object Detection

Table 11: Submitted Surfaces

Bathymetric grids were created relative to LWRP or MLLW in CUBE format using Object Detection resolution requirements as described in the HSSD. Survey H13196 contains a 13-centimeter discontinuity in the model at the transition of chart datum from MLLW to LWRP. Figure 23 shows the location of the change in chart datum at river mile 13.4 AHOP as agreed upon by the USACE and NOAA Center for Operational Oceanographic Products and Services, and reflected in the model.

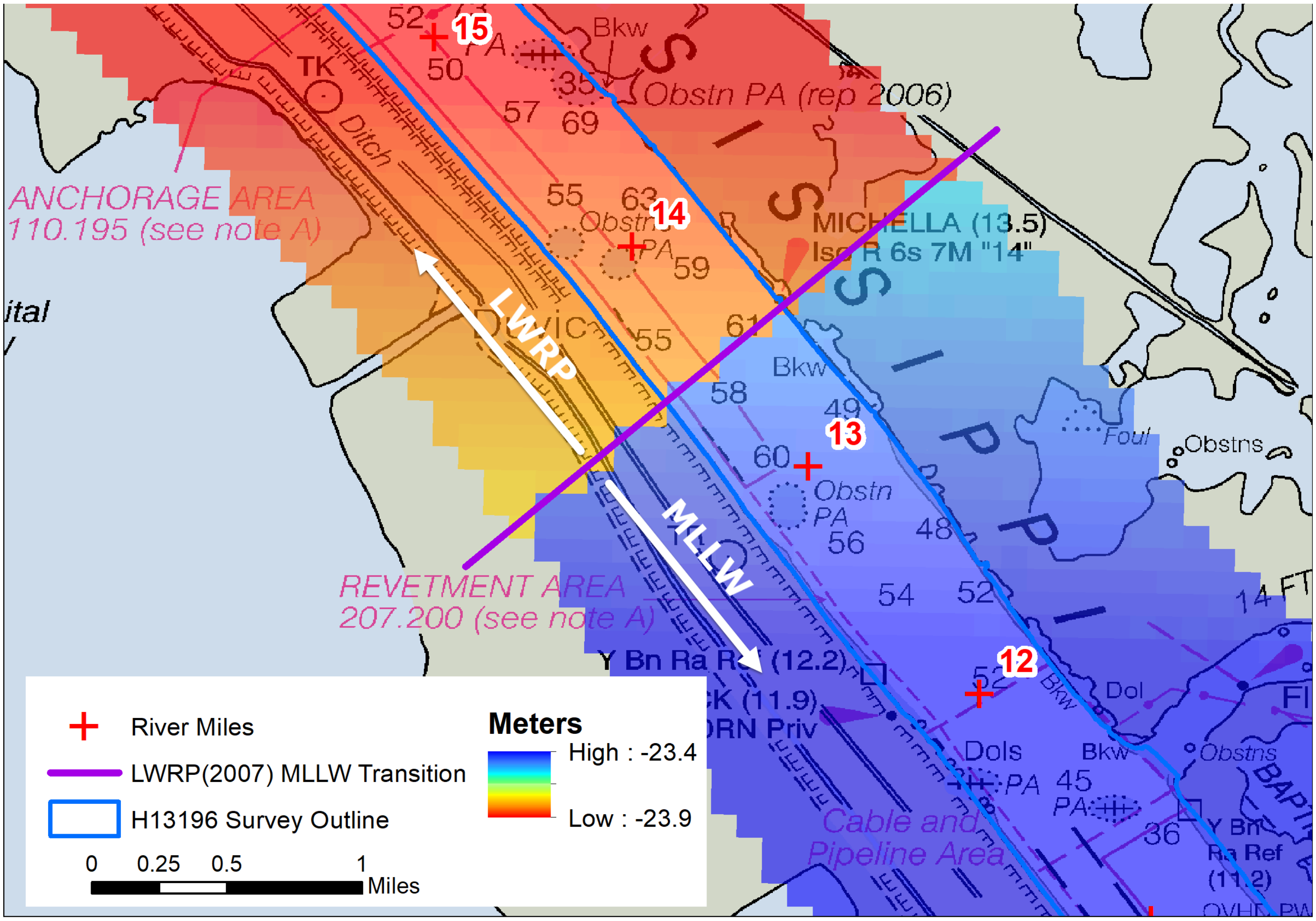


Figure 23: Overview showing the location of the chart datum change

During survey review, it was decided to create a single Variable Resolution grid to reduce the number of deliverables and to reduce potential fliers and grid tearing due to sediment transport and survey data collected at different time periods. This grid was created using NOAA VR CUBE specifications for Object Detection Ranges.

B.5.3 Designated Soundings

A total of 92 soundings in H13196 were designated in bathymetric data: 91 soundings to facilitate feature management for inclusion in the H13196 Final Feature File (FFF), and one to override the gridded surface model.

B.5.4 CARIS HDCS Navigation Sources

During processing of S/V Blake HDCS lines, navigation information was imported from POS M/V .000 files while importing delayed heave, motion and associated RMS values. This navigation source, Applanix.ApplanixGroup1, is automatically applied at merge when it exists. However, when a CARIS project file is rebuilt, CARIS will report that the navigation source is the HDCSNav. This is a display issue only and does not change the navigation source.

This is not an issue for data collected by the RHIB Sigsbee, which relies on HDCS navigation, and does not apply logged navigation, motion and RMS.

Additionally, when a line is renamed, such as with the suffix _XL, the HDCSNav source disappears from the metadata display. Again, this appears to be a display issue only and does not change any navigation sources.

B.5.5 Mobile Laser Scanner Data

A vessel based Mobile Mapping System (MMS) was used to acquire lidar and imagery data along the survey area's shoreline in order to facilitate the survey, management, and reporting of shoreline and nearshore features. Processed LAS data from the laser scanner are included with the survey deliverables in the Processed directory. Imagery data collected by the MMS were used for feature interpretation during processing. Photos of individual features were extracted from the imagery data or taken during hydrographic survey operations and included with the images attribute in the FFF.

C. Vertical and Horizontal Control

A complete description of the horizontal and vertical control for survey H13196 can be found in the OPR-J347-KR-18 Horizontal and Vertical Control Report (HVCR), to be submitted with the final survey for this project. A summary of horizontal and vertical control for this survey follows.

C.1 Vertical Control

The vertical datum for this project is LW Reference Plane 2007.

ERS Datum Transformation

The following ellipsoid-to-chart vertical datum transformation was used:

Method	Ellipsoid to Chart Datum Separation File
ERS via VDATUM	NAD83-LWRP2007_RM13.4_MLLW2012-2016_Geoid12B.csar

Table 12: ERS method and SEP file

While ERS via VDATUM is listed in Table 12, it was one of the limited options available in the XML DR schema's enumerated values. The separation model covering the H13196 survey area was constructed by the

HSD Operations Branch specifically for this survey project using NAVD88 (GEOID 2012B) to Mississippi River Low Water Reference Plane of 2007 (LWRP 2007) values published by USACE and Mean Lower Low Water (MLLW 2012-2016) at the agreed upon location for chart datum change between the USACE and NOAA. Refer to the HVCR submitted under separate cover for additional information.

C.2 Horizontal Control

The horizontal datum for this project is North American Datum of 1983 (NAD 83).

The projection used for this project is Universal Transverse Mercator (UTM) Zone 16.

RTK

During acquisition, RTK correctors were obtained from Louisiana State University's (LSU) Center for Geoinformatics (C4G) service via a dedicated cellular modem. These correctors provided RTK level of accuracy for horizontal and vertical positions for all survey data. If a loss of service was experienced during acquisition it was noted by the field watch stander, and those data were further analyzed to be resurveyed. No prolonged outages were experienced during survey acquisition of H13196. Verification of the C4G Network correctors were conducted by the field unit at various monuments established by USACE along the shoreline of the OPR-J347-KR-18 project area. Methods, analysis and results of these monument check-ins are further documented in the project wide HVCR.

C.3 Additional Horizontal or Vertical Control Issues

C.3.1 Water Level Floats

Water level floats were conducted by the field unit at the location of each USACE or NOAA gauge within the OPR-J347-KR-18 project area. Methods, analysis and results of these floats are further documented in the project wide HVCR. In general, these floats helped identify issues between the USACE and NOAA datums and that of the LWRP 2007 separation model utilized during acquisition. These tests resulted in iterations to the model by NOAA, discussed in detail in the HVCR.

C.3.2 Separation model change and re-processing

As discussed in section C4 of the DAPR and the project wide HVCR, due to a revision of the separation model used during acquisition, all ERS water levels were reprocessed after the revised model was issued. Refer to section B4.c of the DAPR for an outline of the processing steps.

D. Results and Recommendations

D.1 Chart Comparison

The chart comparison was performed by comparing H13196 survey depths to a digital surface generated from electronic navigational charts (ENCs) covering the survey area. A 10-meter product surface was generated from a triangular irregular network (TIN) created from the ENC's soundings, depth contours, and depth features. An additional 10-meter HIPS product surface of the entire survey area was generated from the 4-meter CUBE surface. The chart comparison was conducted by creating and reviewing a difference surface using the ENC surface and survey surface as inputs. The chart comparison also included a review of all assigned charted features within the survey area. The results of the comparison are detailed below. Sediment migration and other river environmental conditions contribute to a continually changing river bottom resulting in large differences observed by the field unit daily.

The relevant charts used during the comparison were reviewed to check that all US Coast Guard (USCG) Local Notice to Mariners (LNMs) issued during survey acquisition, and impacting the survey area, were applied and addressed by this survey.

D.1.1 Electronic Navigational Charts

The following are the largest scale ENCs, which cover the survey area:

ENC	Scale	Edition	Update Application Date	Issue Date	Preliminary?
US6LA53M	1:12000	8	10/23/2018	04/04/2019	NO
US6LA5AM	1:12000	6	07/17/2018	07/23/2019	NO

Table 13: Largest Scale ENCs

<u>US6LA53M</u>

ENC US6LA53M covered the extents of survey H13196 from miles 26 AHOP to 19.7 AHOP. Figures 24 through 26 show the magnitude of differences along the comparison area.

<u>US6LA5AM</u>

ENC US6LA5AM covered the extents of survey H13196 from miles 19.7 AHOP to 0.0, Head of Passes. Figures 26 through 35 show the magnitude of differences along the comparison area.

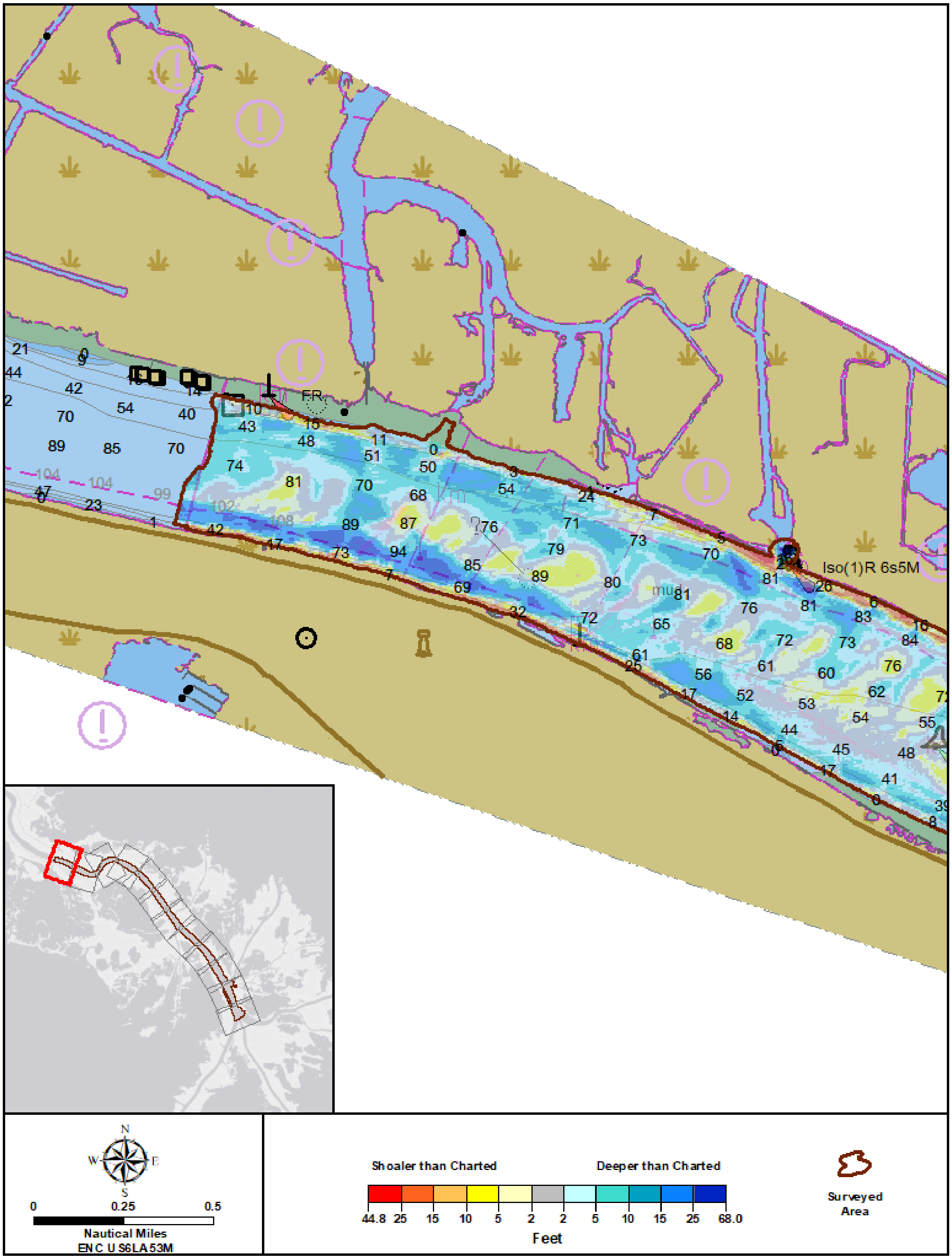


Figure 24: Depth difference between H13196 and chart US6LA53M, area 1 of 12

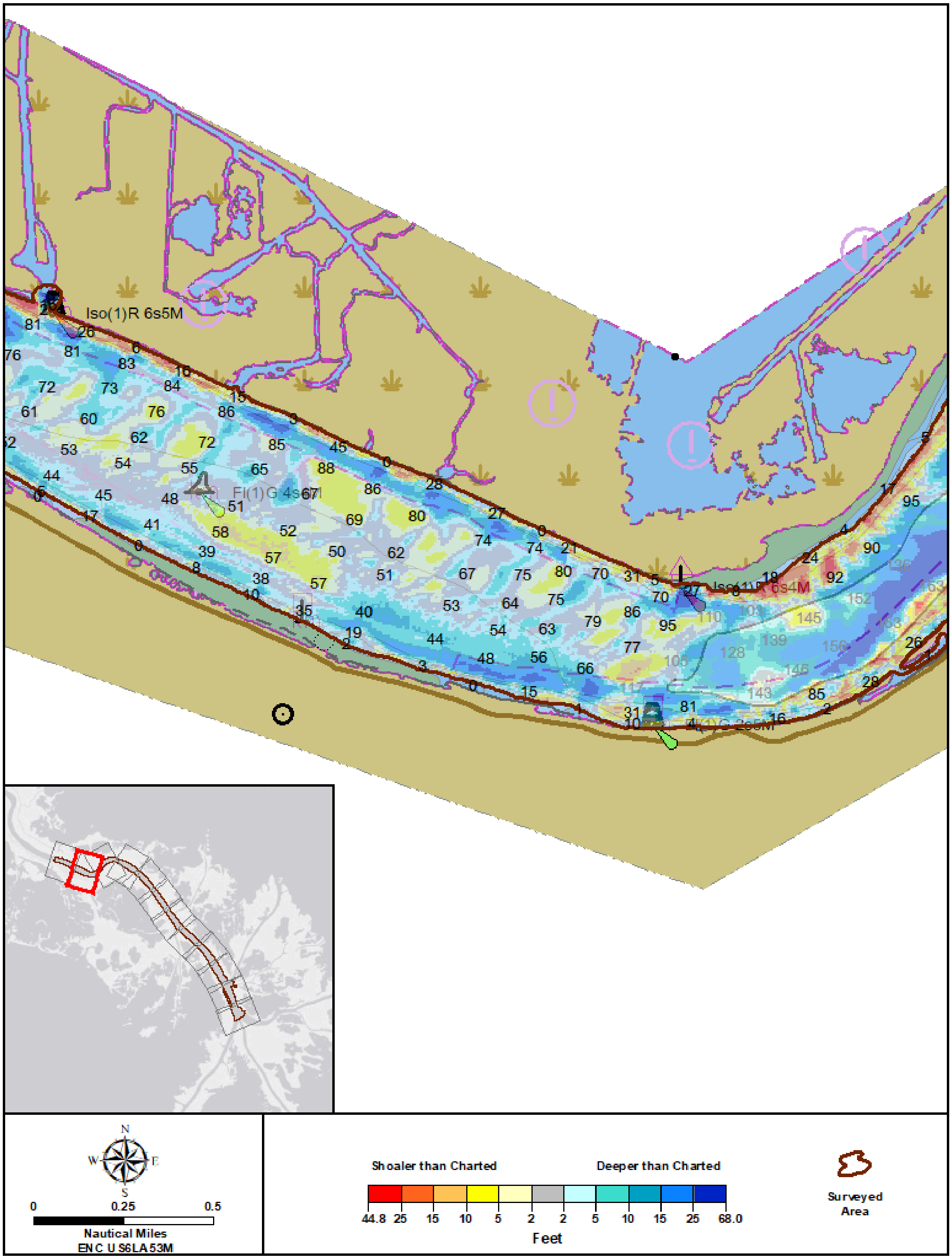


Figure 25: Depth difference between H13196 and chart US6LA53M, area 2 of 12

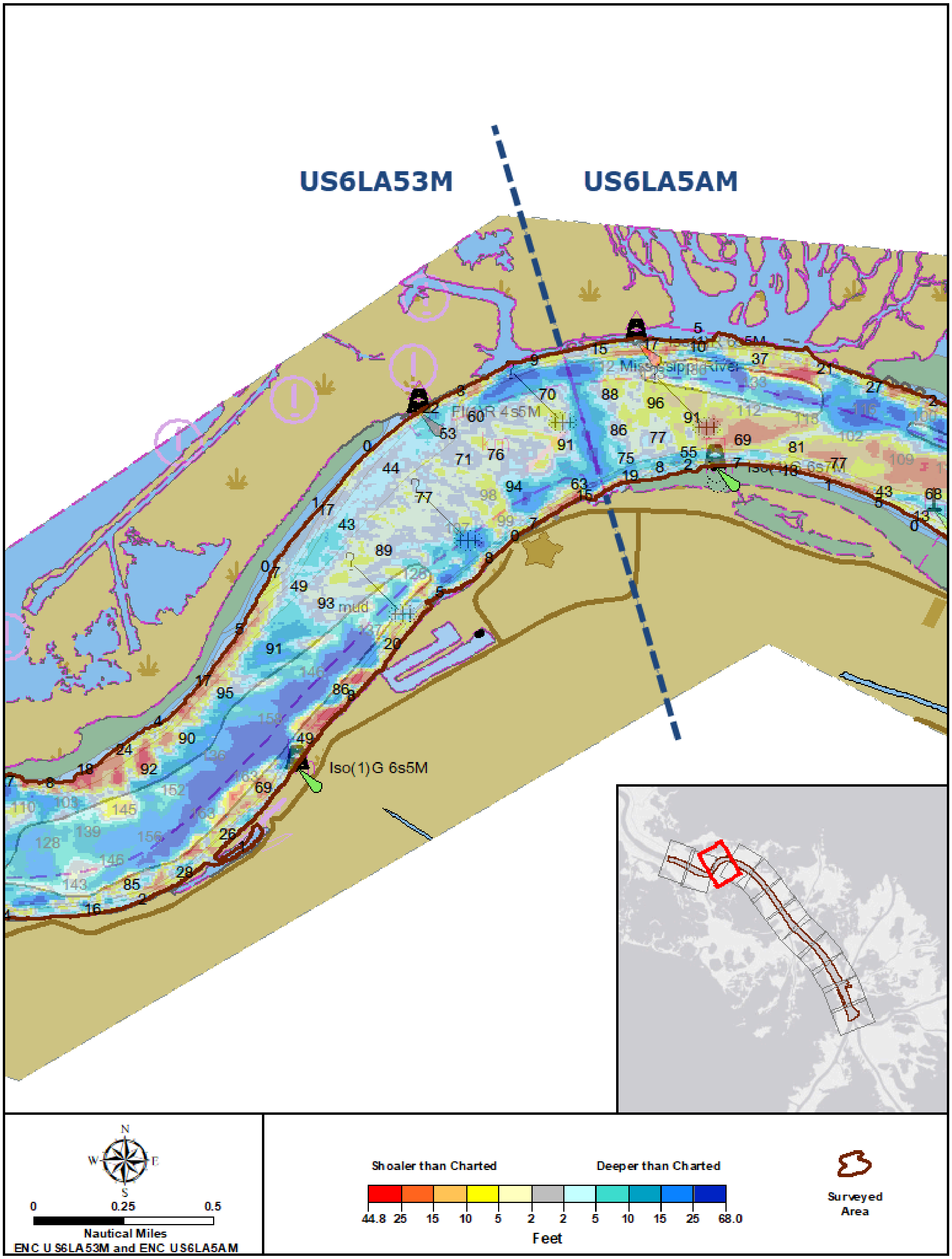


Figure 26: Depth difference between H13196 and charts US6LA53M and US6LA5AM, area 3 of 12

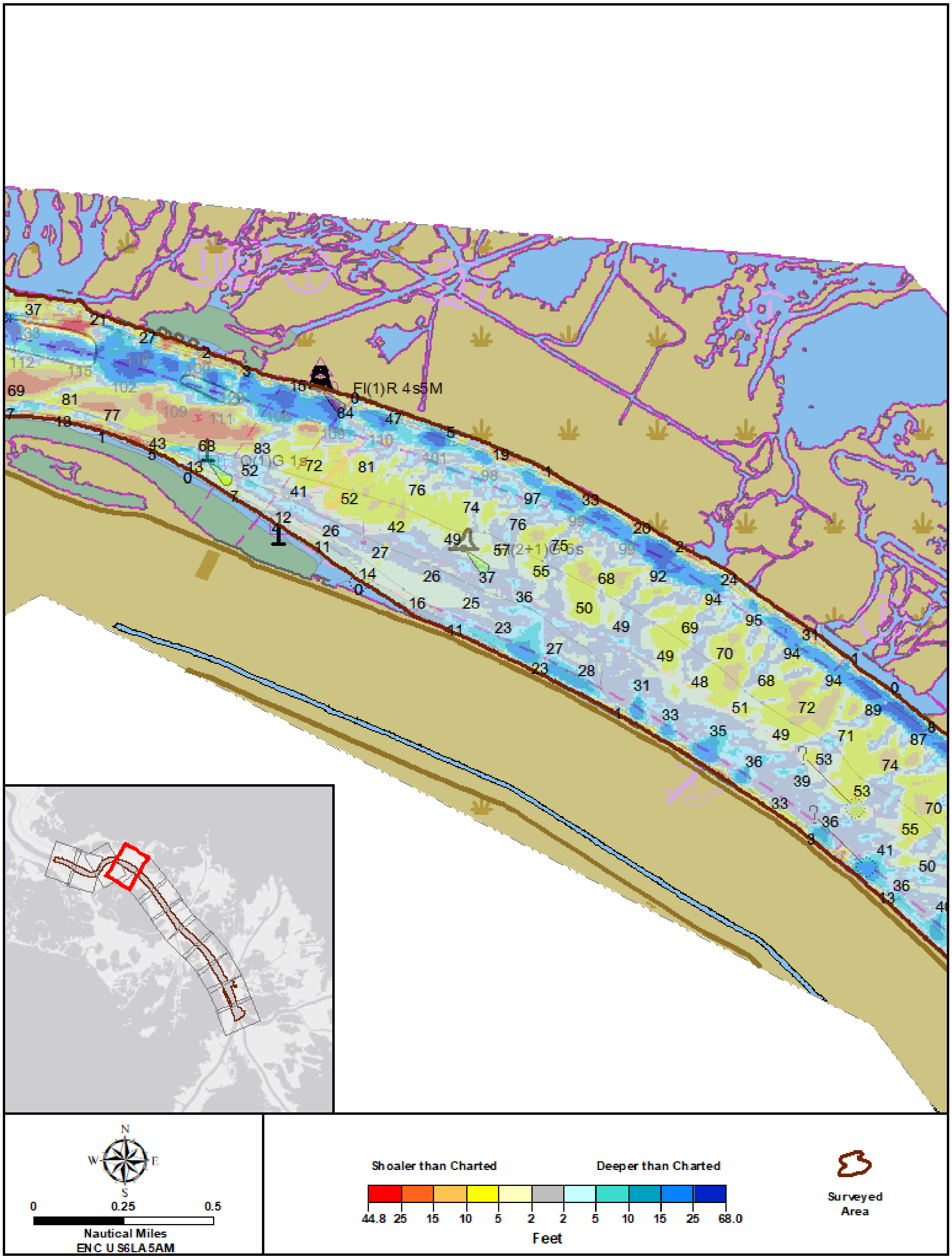


Figure 27: Depth difference between H13196 and chart US6LA5AM, area 4 of 12

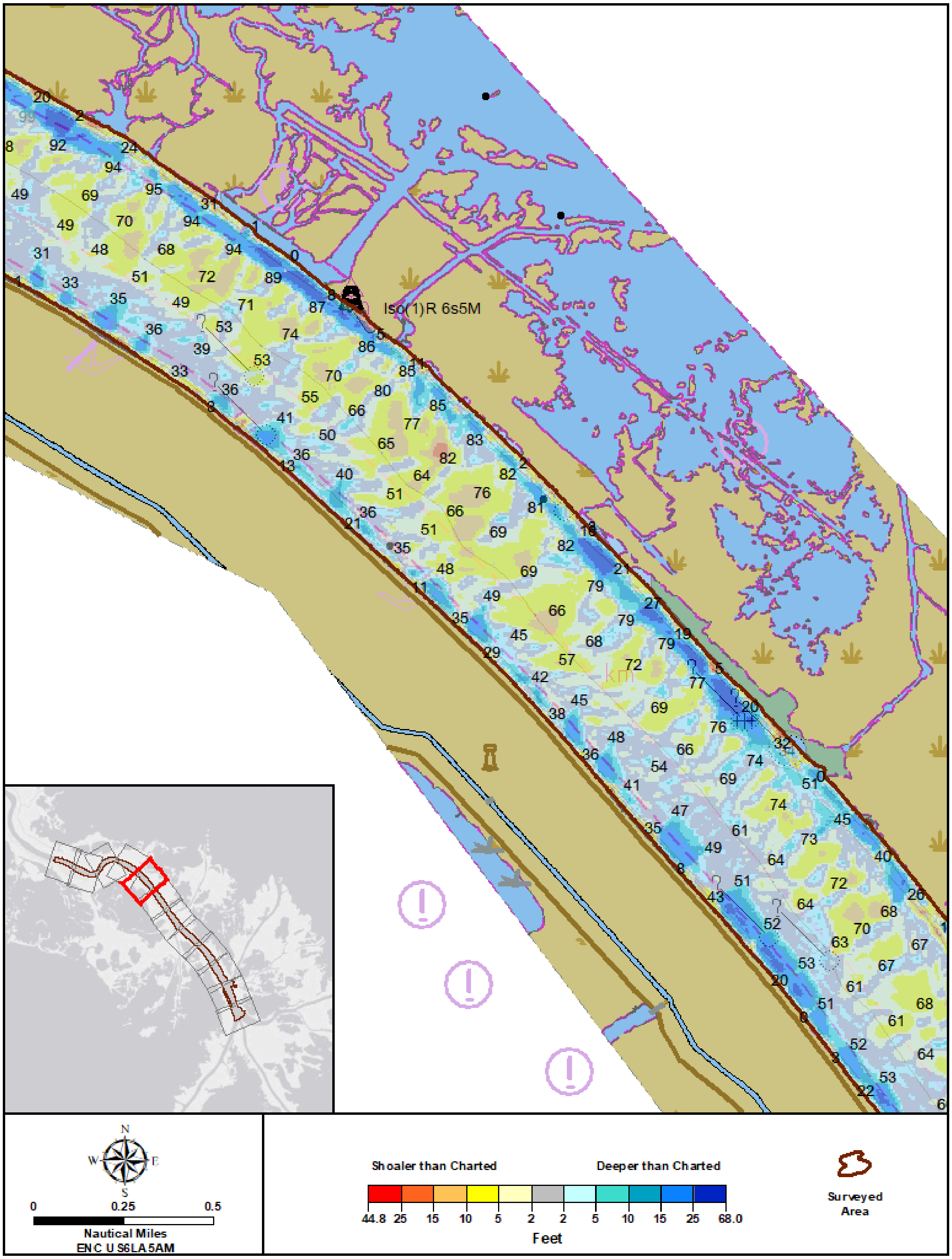


Figure 28: Depth difference between H13196 and chart US6LA5AM, area 5 of 12

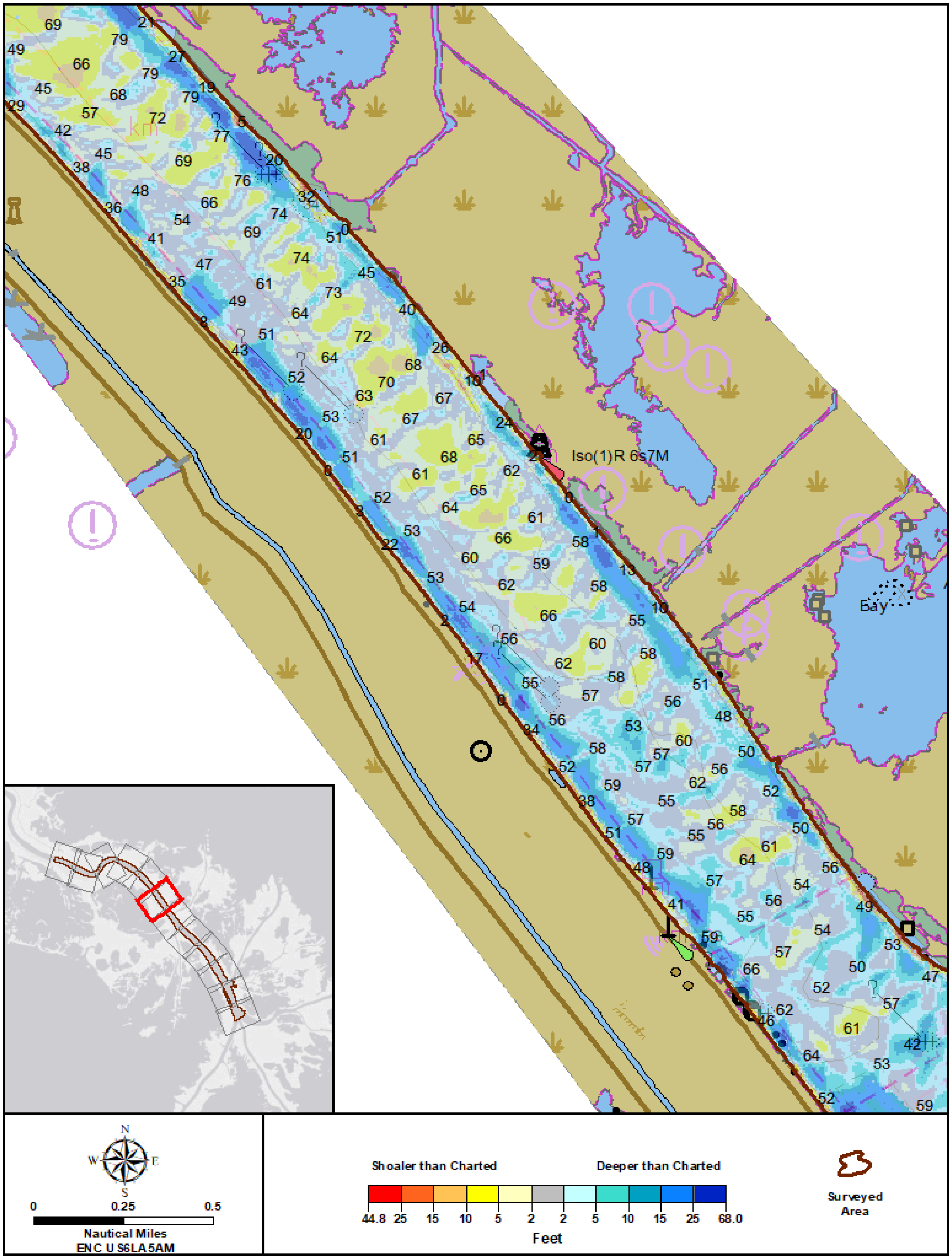


Figure 29: Depth difference between H13196 and chart US6LA5AM, area 6 of 12

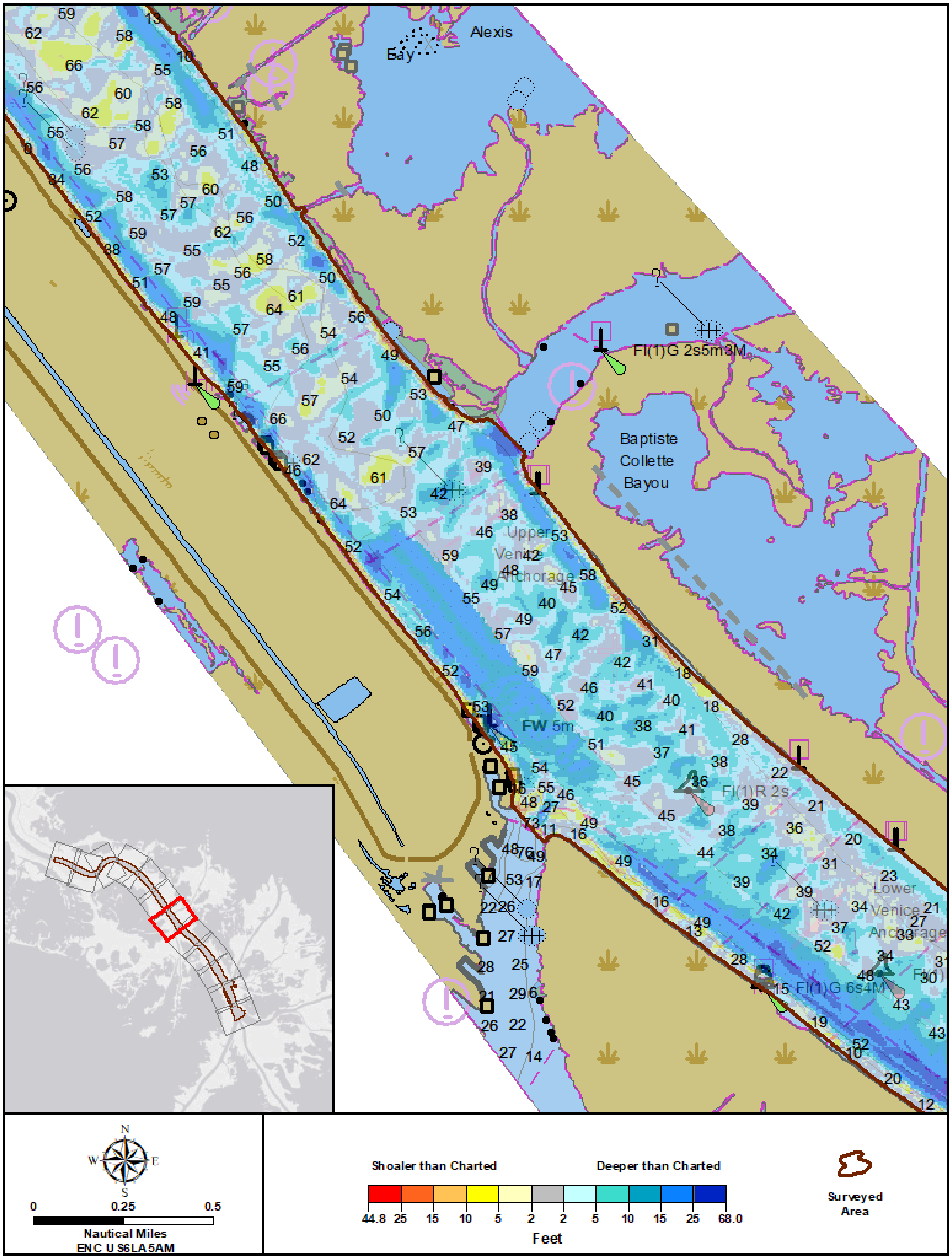


Figure 30: Depth difference between H13196 and chart US6LA5AM, area 7 of 12

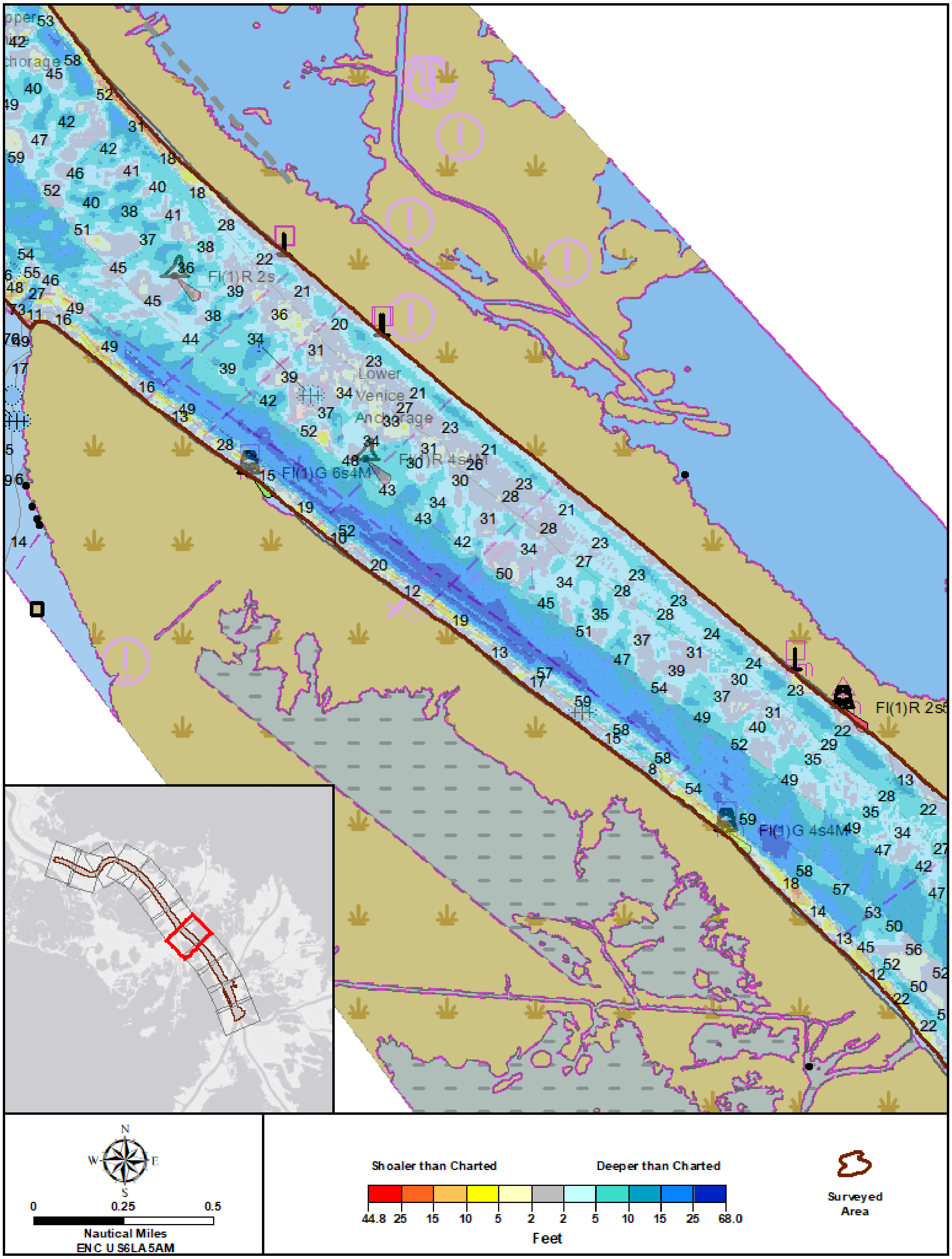


Figure 31: Depth difference between H13196 and chart US6LA5AM, area 8 of 12

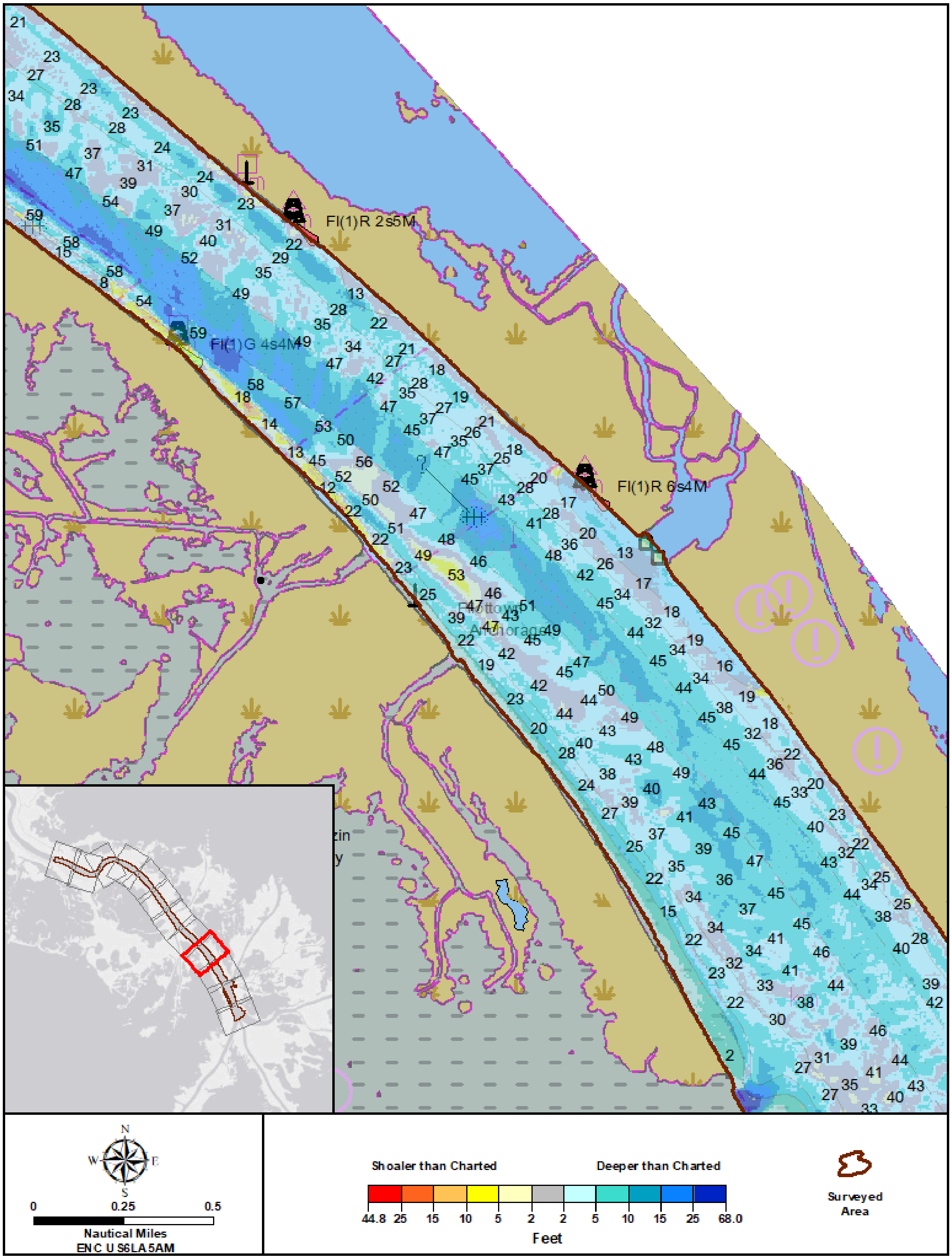


Figure 32: Depth difference between H13196 and chart US6LA5AM, area 9 of 12

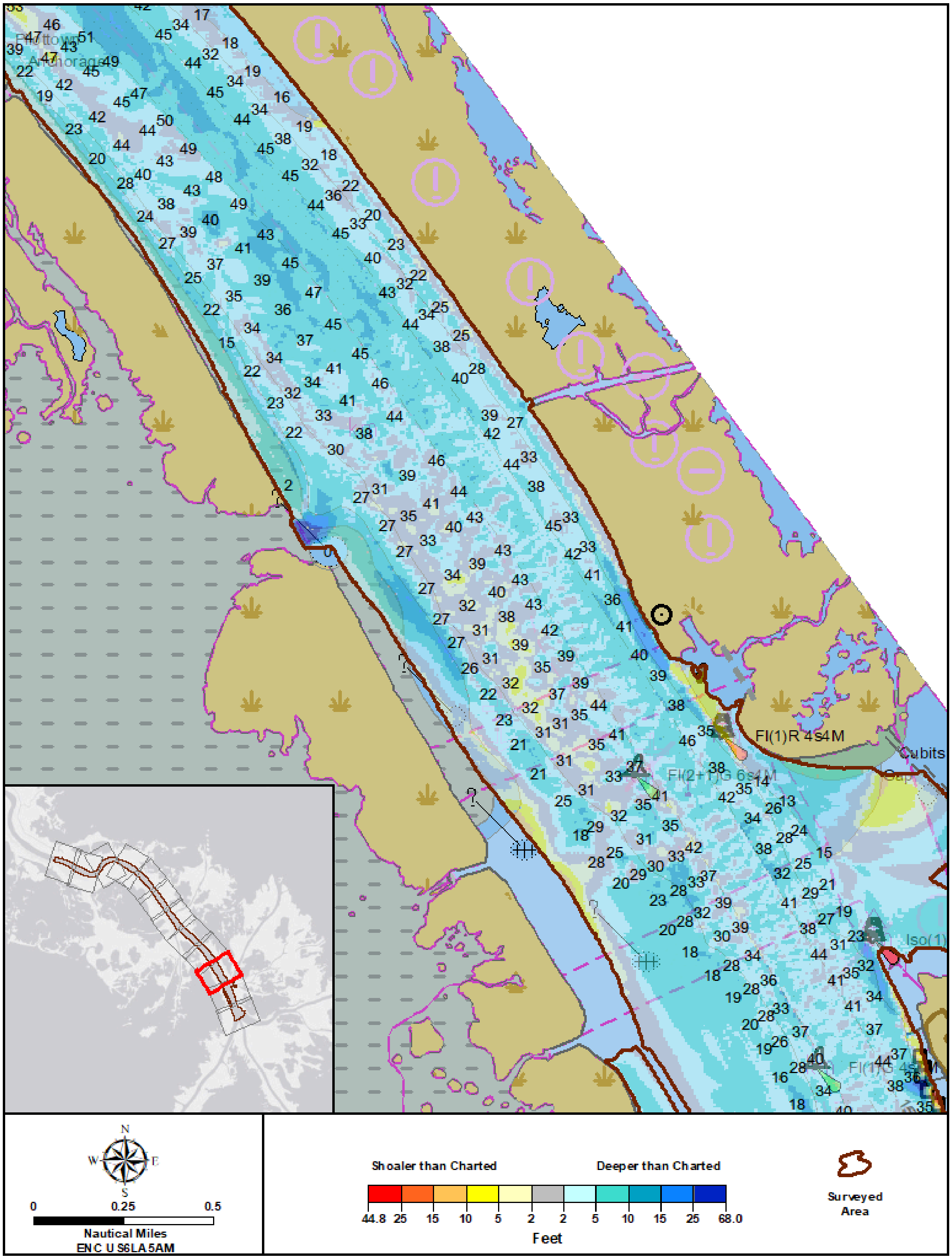


Figure 33: Depth difference between H13196 and chart US6LA5AM, area 10 of 12

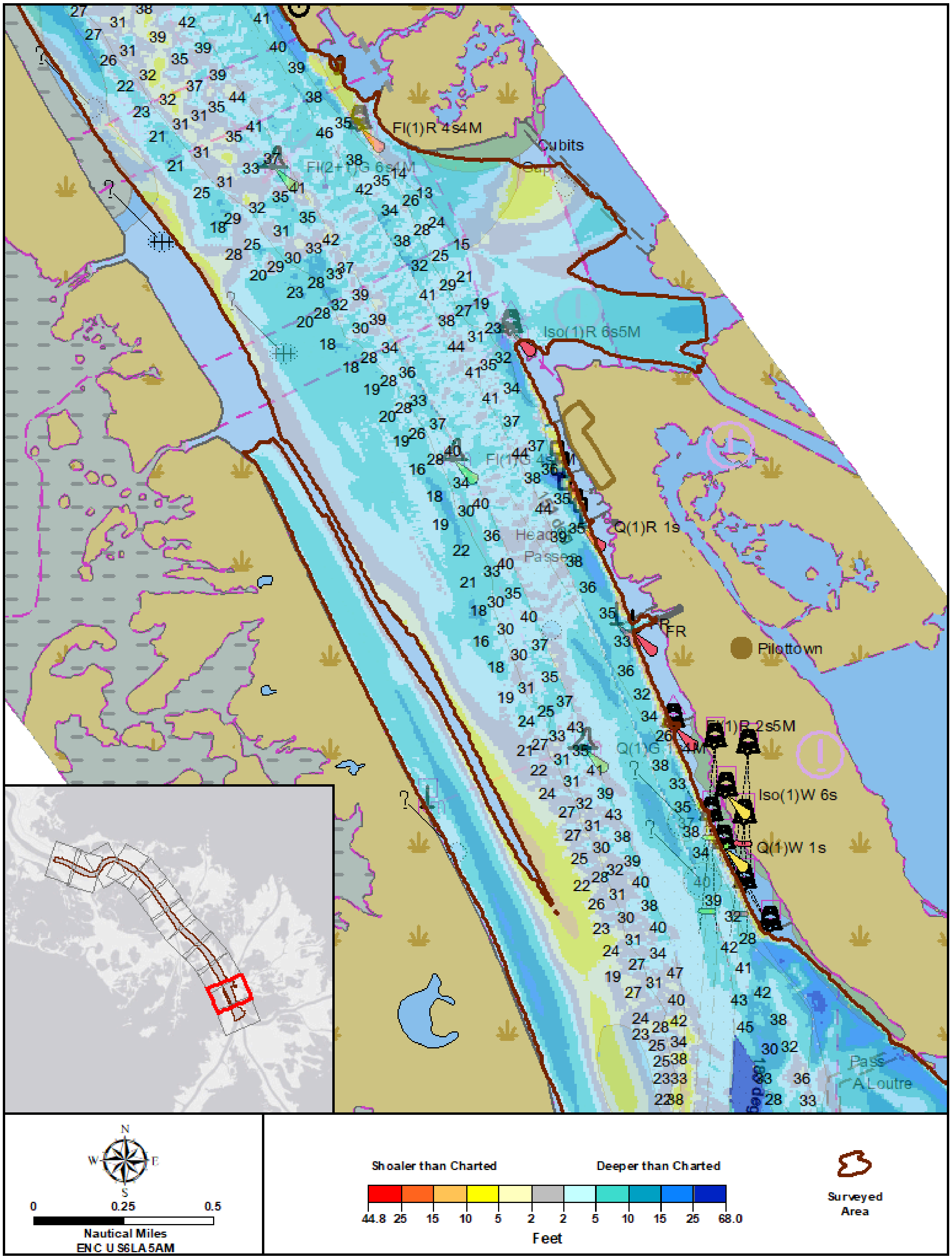


Figure 34: Depth difference between H13196 and chart US6LA5AM, area 11 of 12

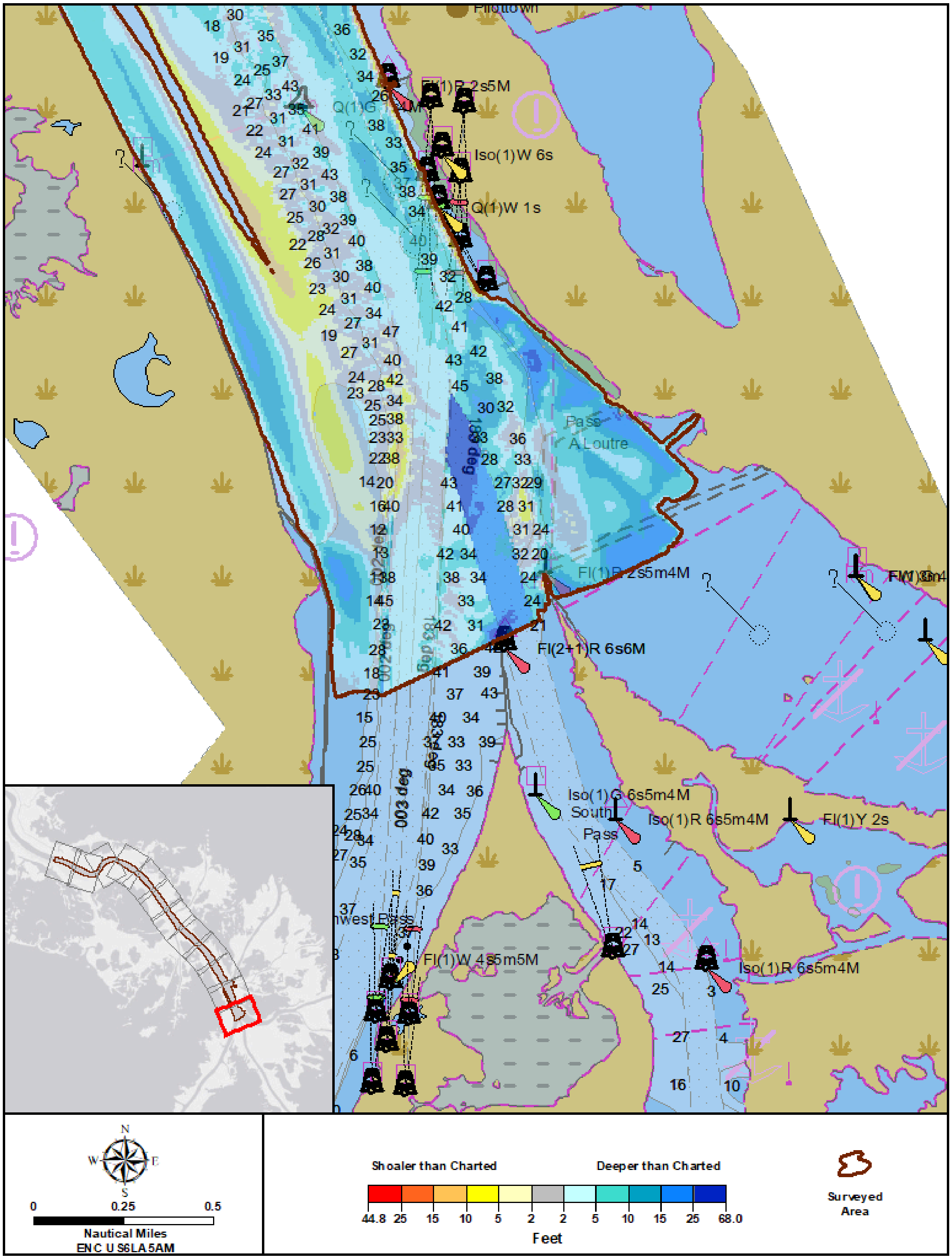


Figure 35: Depth difference between H13196 and chart US6LA5AM, area 12 of 12

D.1.2 Maritime Boundary Points

No Maritime Boundary Points were assigned for this survey.

D.1.3 Charted Features

Numerous charted features exist within the limits of sheet H13196. All assigned features included in the project CSF have been addressed by the survey and are included in the FFF. Due to the large scale of the survey (1:5,000), many charted features have been recommended for deletion to be replaced by new higher resolution features digitized from the survey data. The hydrographer frequently requested guidance from HSD staff on appropriate depiction and attribution of features when the procedures set in the HSSD were insufficient to support the requirements of this precision navigation survey. Copies of this correspondence are included in Appendix II.

The survey area includes 23 charted features labeled as Position Approximate (PA) and one labeled as Position Doubtful (PD).

- The Obstruction PA with depth unknown charted mid river at mile 24.7 AHOP was disproved by the survey.
- The Wreck PA with depth unknown charted along the west bank at mile 20.4 AHOP was disproved by the survey.
- The Wreck PA with depth unknown charted along the west bank at mile 20.1 AHOP was disproved by the survey.
- The Wreck PA with depth unknown charted mid river at mile 19.7 AHOP was disproved by the survey.
- The Wreck PA with depth unknown charted mid river at mile 19.4 AHOP was disproved by the survey.
- The Obstruction PA with depth unknown charted mid river at mile 16.4 AHOP was disproved by the survey.
- The Obstruction PA with depth unknown charted along the west bank at mile 16.2 was disproved by the survey.
- The Wreck PA with depth unknown charted along the east bank at mile 14.8 AHOP was disproved by the survey. A new wreck depicted by an area feature was surveyed approximately 15 meters northwest of this location.
- The Obstruction PA (35 ft rep 2006) with least depth reported (not confirmed) charted along the east bank at mile 14.6 AHOP was disproved by the survey. A new obstruction depicted by an area feature was surveyed approximately 10 meters south of this location.
- The Obstruction PA with depth unknown charted along the west bank at mile 14.1 AHOP was disproved by the survey.
- The Obstruction PA with depth unknown charted mid river at mile 13.9 AHOP was disproved by the survey.
- The Wreck PA with depth unknown charted along the west bank at mile 11.8 AHOP was disproved by the survey.
- The Wreck PA with depth unknown charted mid river at mile 11.5 AHOP was disproved by the survey.

- The Obstruction PA with depth unknown charted along the west bank at mile 10.5 AHOP was disproved by the survey.
- The Wreck PA with depth unknown charted mid river at mile 9.7 AHOP was disproved by the survey.
- The Wreck PA with depth unknown charted mid river at mile 6.9 AHOP was disproved by the survey.
- The Obstruction PA (cov 1 ft) with least depth known charted along the west bank at mile 4.7 AHOP was verified by the survey.
- The Obstruction PA with depth unknown charted along the west bank at mile 4.0 AHOP was disproved by the survey.
- The Wreck PA with depth unknown charted along the west bank at mile 3.5 AHOP was not addressed by the survey. This feature falls outside the NALL.
- The Wreck PD with depth unknown charted along the west bank at mile 3.1 AHOP was disproved by the survey.
- The Obstruction PA with depth unknown charted along the west bank at mile 1.4 AHOP was disproved by the survey.
- The Obstruction PA (38 ft rep 2006) with least depth reported (not confirmed) charted along the east bank at mile 1.3 AHOP was disproved by the survey.
- The Obstruction PA (41 ft rep 2005) with least depth reported (not confirmed) charted mid river at mile 1.1 AHOP was disproved by the survey.
- The Wreck PA with depth unknown charted along the west bank at mile 0.1 AHOP was not addressed by the survey. This feature was not included as an assigned feature in the CSF or present on the ENC, and may likely need to be removed from the RNC.

All disproved features have been included in the FFF with a description of 'Delete'. All new features have been included in the FFF depicting the feature as surveyed and with a description 'New'. The FFF includes assigned features, both baring and submerged, charted shoreward of the NALL that were too hazardous to survey. These features are included in the FFF with a description of ‘Not Addressed’.

D.1.4 Uncharted Features

All uncharted features discovered during survey acquisition are addressed in the FFF. Refer to the FFF for additional information.

D.1.5 Shoal and Hazardous Features

No Dangers to Navigation (DtoNs) were submitted for this survey. Potential DtoNs are included as new features in the FFF. Because of the significant change that occurred within the project area since the last survey of the Mississippi River, HSD staff advised DEA to limit reporting of DtoNs to immediate hazards that could cause loss of life or impact waterborne commerce.

D.1.6 Channels

There are no safety fairways or traffic separation schemes within the limits of H13196.

The southernmost 11 miles of H13196 includes the northern extents of Southwest Pass, which provides safe transit into the Mississippi River. According to the chart, the controlling depth for this section of the channel is 45 feet. H13196 also includes the north section of Cypress Range, which is the start of South Pass, in the vicinity of Head of Passes that has a controlling depth of 17 feet. Survey H13196 has small areas of encroachment of the shoulders on the cut bank, that are shoaler than the controlling depth. The controlling depths for both channels were included in the chart comparison images contained in section D.1.1 of this report. Warm colors in the channels, representing H13196 surveyed soundings shoaler than controlling depths, can be seen encroaching into the channel on Figures 34 and 35.

The following anchorages are charted within the H13196 survey limits: Pilottown Anchorage, Lower Venice Anchorage, Upper Venice Anchorage, Boothville Anchorage, and Ostrica Anchorage. MBES data acquired within these anchorages were carefully reviewed for features that could pose a risk to anchoring or navigation. New uncharted features were discovered in the Pilottown, Upper Venice, Boothville, and Ostrica anchorages. All surveyed features within designated anchorages are included in the FFF.

There are four range lines within the survey limits. Pilottown A west range front light, Pilottown A range front light, and both Cubits Gap range front and rear lights were positioned using MMS lidar surveying techniques and are included in the FFF. The remaining range lights were too far from the lidar sensor for accurate returns and are not addressed with this survey.

The charted Restricted Area, Mississippi River Regulated Navigation Area, was verified during survey operations. While not shown on the chart, in the vicinity of Venice to Pilottown, there is the pilot boarding and deboarding area for pilots switching between the Crescent River Port Pilots and the Associated Branch Pilots.

D.1.7 Bottom Samples

No bottom samples were required for this survey.

D.2 Additional Results

D.2.1 Shoreline

Shoreline investigations were completed using lidar survey techniques. Refer to the DAPR for additional information regarding the acquisition and processing of these data. All new and assigned features have been included in the sheet’s FFF with appropriate comments and recommendations.

D.2.2 Aids to Navigation

Aids to Navigation (AtoNs) were investigated using mobile lidar and visual observations. AtoNs that were missing, damaged, or not serving their intended purpose were reported to the USCG via email on August 23, 2019. Due to the large number of AtoNs requiring reporting, email was used for reporting instead of using the USCG Navigation Center’s Online ATON Discrepancy Report as specified in the HSSD. This method was approved by the HSD Project Manager for this hydrographic survey. A copy of the email submittal is included in Appendix II. AtoNs have been included in the sheet’s FFF with appropriate comments and recommendations.

D.2.3 Overhead Features

There is one assigned charted overhead power line located within the H13196 survey area. This feature, which crosses a small unnamed embayment along the east bank of the river at mile 3.7 (AHOP), was confirmed visually during survey operations and has been included in the H13196 FFF with a description of 'Retain'. The cable was located shoreward of the 2-meter inshore limit and was too small and far away to be resolved by the MMS. However, three uncharted poles supporting the overhead cable were detected by the MMS and have been included in the FFF with description ‘New’.

There are two minor overhead cables, in navigationally insignificant areas extending behind structures to shore, that were identified from the MMS. These overhead cables have been included in the H13196 FFF with a description of 'New'. Though not required by the Project Instructions, the clearance height of one of these features was able to be determined with the MMS system and has been included in the vertical clearance attribute for the feature. The clearance height for the second minor overhead cable could not be determined. These features were included in the FFF to aid in the survey review and chart compilation process and are included in the FFF with a recommendations attribute of ‘For info only'.

D.2.4 Submarine Features

All submarine features were investigated entirely using object detection MBES coverage.

The OPR-J347-HR-18 Project Instructions required that all revetments within the survey area be investigated and delineated in the FFF if detected in the MBES data. In most areas, revetments or sections of revetments are visible in the MBES data and surfaces. In areas where the charted revetments are not visible, the hydrographer is unable to determine if the revetment mats are not visible because they are no longer present, or if they have been buried by sediment. Revetment mats visible in the MBES data and extending beyond the limits of the PRF revetment polygons have been included in the FFF as obstruction area features. The VALSOU of each area obstruction has been populated with the minimum gridded depth within the obstruction area polygon. The HSD Project Manager and AHB personnel provided input on portrayal of revetments in the FFF. Correspondence related to this guidance is included in Appendix II.

There are nine cable and pipeline areas charted in the survey extents of H13196, where anchoring, trawling, and dragging are restricted. These precautionary areas were surveyed using object detection MBES coverage techniques and carefully reviewed for any pipelines or cables that were exposed and pose a risk to navigation. Survey H13196 has three new submerged pipeline sections included in the FFF. These pipelines were submitted to the Bureau of Safety and Environmental Enforcement (BSEE).

A pipeline report included in Appendix II, was submitted to the BSEE on August 21, 2019, reporting sections of exposed or unburied pipeline visible in the MBES data. The report indicates the positions of the start and end points of sections of what appear to be exposed pipelines based on interpretation of multibeam data. It is possible that some of the reported items include submerged outfalls and other linear features with a signature of a pipeline that are not associated with oil and gas infrastructure. Due to the inability to accurately depict the location and orientation of all exposed pipelines with a single line segment, these features have been included in the FFF should further action be required after survey submittal. It is not the hydrographer’s intention that these pipeline features be used as source information for charting without further validation of origin.

D.2.5 Platforms

No platforms exist for this survey.

D.2.6 Ferry Routes and Terminals

No ferry routes or terminals exist for this survey.

D.2.7 Abnormal Seafloor and/or Environmental Conditions

Evidence of large and quickly moving sediment waves were visible in the MBES data during acquisition. Refer to section B.2.6 of this report for additional information.

D.2.8 Construction and Dredging

No construction was observed within the survey limits during survey operations.

The USACE Mississippi Valley Division, New Orleans District (MVN) had numerous dredging projects during the time of survey operations in H13196 to address the active shoaling in Southwest Pass deposited by long-term high river stages during historic flooding. Bathymetric data was collected before, during, and after dredging activities; resulting in large disagreements of river bottom locations and artifacts in the surface. In addition, dredging operations typically created an extremely turbid water column with suspended sediment that lowered the efficiency of the MBES returns.

The areas of active dredging were surveyed using object detection MBES coverage techniques and carefully reviewed. Dredging areas that created disagreement in the MBES surface were documented in the H13196_Notes_for_Reviewer.hob file with the DRGARE area feature class, submitted in Appendix II of this report.

The hopper dredges, Glenn Edwards and USACE Wheeler, were observed actively dredging in the vicinity of Head of Passes on February 9, 2019. Additional dredging infrastructure, such as floating and submerged pipes were noted during acquisition. One submerged pipe, at approximate mile 2 AHOP, was manually removed from the submitted bathymetry resulting in data gaps. The pipe and resulting data gaps are included in the H13196_Notes_for_Reviewer.hob, submitted in Appendix II of this report, and shown in Figure 36 below. In the figure, the hillshade is depicted with red being less than 2 meters in depth and gray representing all depths greater than 2 meters.

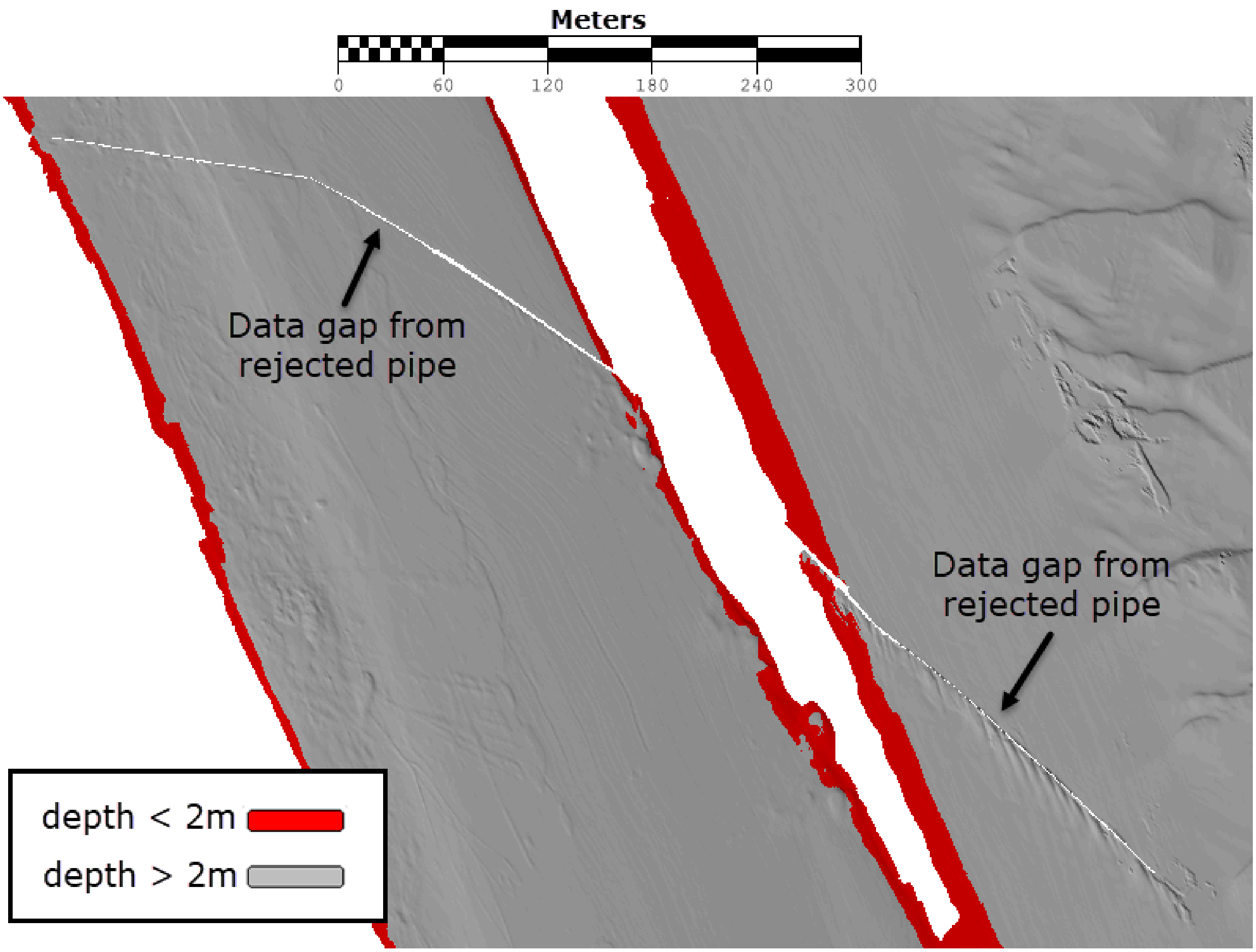


Figure 36: Submerged dredge pipe rejected from bathymetry resulting in data gaps

D.2.9 New Survey Recommendation

The hydrographer recommends that this area be resurveyed regularly due to the significant change in depths from sediment migration and dredging observed over the project timeline.

D.2.10 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, with the exception of the deficiencies outlined in this report. All records are forwarded for final review and processing to the Processing Branch.

The survey data meets or exceeds requirements as set forth in the NOS Hydrographic Surveys Specifications and Deliverables, Field Procedures Manual, and Letter Instructions. These data are adequate to supersede charted data in their common areas. This survey is complete and no additional work is required.

Report Name	Report Date Sent
Data Acquisition and Processing Report	2019-09-20
Coast Pilot Report	2019-07-11

Approver Name	Approver Title	Approval Date	Signature
Jonathan L. Dasler, PE, PLS, CH	NSPS/THSOA Certified Hydrographer, Chief of Party	10/10/2019	Digitally signed by Jon L. Dasler DN: cn=Jon L. Dasler, o=David Evans and Associates, Inc., ou, email=jld@deainc.com, c=US Date: 2019.10.10 13:48:11 -07'00'
Jason Creech, CH	NSPS/THSOA Certified Hydrographer, Charting Manager / Project Manager	10/10/2019	Digitally signed by Jason Creech DN: cn=Jason Creech, o=David Evans and Associates, Inc., ou, email=jasc@deainc.com, c=US Date: 2019.10.10 13:49:12 -07'00'
Callan McGriff, EIT	IHO Cat-A Hydrographer, Lead Hydrographer	10/10/2019	Digitally signed by Callan McGriff DN: cn=Callan McGriff, o=David Evans and Associates, Inc., ou, email=cemc@deainc.com, c=US Date: 2019.10.10 13:50:12 -07'00'
David T. Moehl, PLS, CH	NSPS/THSOA Certified Hydrographer, Lead Hydrographer	10/10/2019	Digitally signed by Dave Moehl DN: cn=Dave Moehl, o=David Evans and Associates, Inc., ou=Marine Services Division, email=dtm@deainc.com, c=US Date: 2019.10.10 13:51:35 -07'00'

F. Table of Acronyms

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

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

Acronym	Definition
PRF	Project Reference File
PS	Physical Scientist
RNC	Raster Navigational Chart
RTK	Real Time Kinematic
RTX	Real Time Extended
SBES	Singlebeam Echosounder
SBET	Smooth Best Estimate and Trajectory
SNM	Square Nautical Miles
SSS	Side Scan Sonar
SSSAB	Side Scan Sonar Acoustic Backscatter
ST	Survey Technician
SVP	Sound Velocity Profiler
TCARI	Tidal Constituent And Residual Interpolation
TPU	Total Propagated Uncertainty
USACE	United States Army Corps of Engineers
USCG	United States Coast Guard
UTM	Universal Transverse Mercator
XO	Executive Officer
ZDF	Zone Definition File

Jason Creech

From:	Jason Creech
Sent:	Friday, August 23, 2019 4:02 PM
To:	Ussery, James C CIV; Boriskie, Timothy B CIV; Duane, Jesse L BMCS; Shaffer, Jeremy BMC; D08-DG-District-MarineInfo
Cc:	Authement, Adam F BOSN3; Martha Herzog (martha.herzog@noaa.gov); Tim Osborn (Tim.Osborn@noaa.gov); Jon Dasler (Jld@deainc.com)
Subject:	Mississippi River Aton Discrepancies - Mile 233 AHOP to Mile 22 BHOP
Attachments:	H13188_USCG_AtoNs_RM_205_to_233.xlsx; H13189_USCG_AtoNs_RM_180_to_205.xlsx; H13190_USCG_AtoNs_RM_157_to_180.xlsx; H13191_USCG_AtoNs_RM_130_to_157.xlsx; H13192_USCG_AtoNs_RM_104_to_130.xlsx; H13193_USCG_AtoNs_RM_78_to_104.xlsx; H13194_USCG_AtoNs_RM_54_to_78.xlsx; H13196_USCG_AtoNs_RM_26_to_0.xlsx; H13212_USCG_AtoNs_RM_0_to_-22.xlsx

Hi Jim

We've completed our review of charted AtoNs located within our Mississippi River hydrographic project area and have generated AtoN Discrepancies reports for USCG. Similar to the report for Mile 54 AHOP to Mile 26 AHOP submitted on June 26, 2019, each attached spreadsheet includes new and missing ATONs as well any ATON found to be more than 2 meters out of position. All positions (Lat/Long in the spreadsheet) are referenced to NAD83(2011) and were extracted from our vessel mounted mobile mapping system (MMS) which relied on real-time kinematic GPS during acquisition. These surveys are part of NOAA's Precision Navigation initiative for the Mississippi River and will be used to generate new high resolution charts of the river.

I have attached excel spreadsheets listing the ATON discrepancies for each of the NOAA defined survey areas. Mile 54 AHOP to Mile 26 AHOP, which was previously submitted, has not been included.

H13188 - Mile 233 AHOP to Mile 205 AHOP
H13189 - Mile 205 AHOP to Mile 180 AHOP
H13190 - Mile 180 AHOP to Mile 157 AHOP
H13191 - Mile 157 AHOP to Mile 130 AHOP
H13192 - Mile 130 AHOP to Mile 104 AHOP
H13193 - Mile 104 AHOP to Mile 78 AHOP
H13194 - Mile 78 AHOP to Mile 54 AHOP
H13196 - Mile 26 AHOP to Mile 0 AHOP
H13212 - Mile 0 AHOP to Mile 22 BHOP

I've copied Martha Herzog, the NOAA Office of Coast Survey Project Manager for these surveys and Tim Osborn, the NOAA Central Gulf Coast Regional Navigation Manager on this email.

Please let me know if you have any questions.

Thanks,
Jason

Jason Creech, CH | Vice President, Nautical Charting Program Manager
David Evans and Associates, Inc.
2801 SE Columbia Way, Suite 130 | Vancouver, WA, 98661 | www.deainc.com

H13196_USCG_AtoNs_RM_26_to_0.xlsx

Remarks1	Remarks2	Object name	Latitude	Longitude	Survey Date
LLNR 13160. New surveyed position using Blake laser data.	Beacon has been located approximately 12m southwest of charted location.	Bayou Grand Liard Light 21A	29-20-23.766N	089-28-56.378W	8/10/2018
LLNR 13110. New surveyed position using Blake laser data. Beacon post is not upright although daymarker is still visible.	Beacon has been located approximately 3m northwest of charted location.	Boothville Anchorage Lower Daybeacon 12.2	29-17-36.878N	089-22-00.198W	8/10/2018
LLNR 13130. New surveyed position using Blake laser data.	Beacon has been located approximately 3m northwest of charted location.	Boothville Anchorage Upper Daybeacon 18.5	29-21-18.167N	089-26-02.325W	8/10/2018
LLNR 13135. New surveyed position using Blake laser data.	Beacon has been located approximately 172m south southwest of charted location.	Boothville Water Intake Light	29-21-26.609N	089-26-15.845W	8/10/2018
LLNR 13025. New surveyed position using Blake laser data.	Beacon has been located approximately 21m south southeast of charted location.	Cubits Gap Light 4	29-11-32.628N	089-15-51.666W	8/10/2018
LLNR 13020. New surveyed position using Blake laser data.	Buoy has been located approximately 39m south southeast of charted location.	Cubits Gap Lighted Buoy 3	29-11-10.688N	089-16-01.028W	8/10/2018
LLNR 13140. New surveyed position using Blake laser data.	Beacon has been located approximately 5m south of charted location.	Fort Jackson Light 19	29-21-39.086N	089-26-50.878W	8/10/2018
LLNR 13125. New surveyed position using Blake laser data.	Buoy has been located approximately 37m east southeast of charted location.	Fort Jackson Lighted Buoy A	29-21-16.672N	089-25-30.170W	8/10/2018
LLNR 7150. Charted beacon not observed visually or in MMS data.	Beacon light list location is in Alabama.	Lower Hall Landing Dock Light	29-16-31.724N	089-21-07.842W	8/10/2018
LLNR 13150. New surveyed position using Blake laser data.	Beacon has been located approximately 5m southwest of charted location.	Harvey Light 20A	29-21-48.266N	089-27-40.408W	8/10/2018
LLNR 13085. New surveyed position using Blake laser data.	Buoy has been located approximately 9m southeast of charted location.	Jump Shoal Lighted Buoy 10A	29-16-20.588N	089-20-34.241W	8/10/2018
LLNR 13065. New surveyed position using Blake laser data. Diamond-shaped yellow dayboard (DAYMAR) with yellow reflective border missing.	Beacon has been located approximately 6m west of charted location.	Lower Venice Anchorage Upper Daybeacon 9.6	29-16-11.017N	089-20-00.257W	8/10/2018
LLNR 13180. New surveyed position using Blake laser data.	Buoy has been located approximately 69m east southeast of charted location.	Neptune Light 24	29-21-31.767N	089-30-33.931W	8/10/2018
LLNR 13035. New surveyed position using Blake laser data.	Beacon has been located approximately 4m northeast of charted location.	Old Quarantine Station Light 6	29-12-07.350N	089-16-17.167W	8/10/2018
LLNR 13030. New surveyed position using Blake laser data.	Buoy has been located approximately 38m south southeast of charted location.	Old Quarantine Station Lighted Buoy A	29-11-59.457N	089-16-31.461W	8/10/2018
LLNR 13115. New surveyed position using Blake laser data.	Beacon has been located approximately 6m west northwest of charted location.	Olga Light 16	29-20-45.456N	089-24-10.000W	8/10/2018
LLNR 13175. Charted beacon not observed visually or in MMS data.		Ostrica Anchorage Lower Daybeacon 23.0	29-20-41.327N	089-29-54.654W	8/10/2018
LLNR 12990. Charted beacon not observed visually or in MMS data.		Pilottown Anchorage Lower Daybeacon 1.5	29-10-13.619N	089-16-06.123W	8/10/2018
LLNR 13045. New surveyed position using Blake laser data.	Beacon has been located approximately 4m south southwest of charted location.	Pilottown Anchorage Upper Daybeacon 6.7	29-14-04.277N	089-18-22.641W	8/10/2018
LLNR 13015. Charted beacon not observed visually or in MMS data.		Pilottown Terminal Wing Dam Light	29-11-00.410N	089-15-40.244W	8/10/2018
LLNR 13000. New surveyed position using Blake laser data.	Beacon has been located approximately 3m northwest of charted location.	Pilottown Wingdam Light 2	29-10-27.161N	089-15-25.060W	8/10/2018
LLNR 13010. Charted beacon not observed visually or in MMS data.		River Pilots Wharf Light	29-10-44.219N	089-15-34.434W	8/10/2018
LLNR 13120. New surveyed position using Blake laser data.	Beacon has been located approximately 3m east of charted location.	Saint Anne Light 18	29-21-44.189N	089-25-55.438W	8/10/2018
LLNR 13145. New surveyed position using Blake laser data.	Beacon has been located approximately 3m north northwest of charted location.	Saint Philips Bend Light 20	29-22-00.318N	089-27-04.145W	8/10/2018
LLNR 12670. New surveyed position using Blake laser data. Beacon damaged and buoy now marks the shoal.	Buoy has been located approximately 7m southeast of charted location.	South Pass Light 16	29-09-05.468N	089-14-58.804W	8/10/2018
LLNR 13190. New surveyed position using Blake laser data.	Beacon has been located approximately 102m south southwest of charted location.	Tanker Loading Dock Light	29-21-58.658N	089-32-05.047W	8/10/2018
LLNR 13190. New surveyed position using Blake laser data.	Beacon has been located approximately 120m south southeast of charted location.	Tanker Loading Dock Light	29-21-58.004N	089-32-01.963W	8/10/2018
LLNR 13190. New surveyed position using Blake laser data.	Beacon has been located approximately 169m southeast of charted location.	Tanker Loading Dock Light	29-21-57.411N	089-31-59.566W	8/10/2018
LLNR 13090. Charted beacon not observed visually or in MMS data.		The Jump Wharf Lights	29-16-31.616N	089-21-08.068W	8/10/2018
LLNR 13080. Charted beacon not observed visually or in MMS data.		Upper Venice Anchorage Lower Daybeacon 10.0	29-16-24.450N	089-20-16.194W	8/10/2018
LLNR 13095. Charted beacon not observed visually or in MMS data.		Upper Venice Anchorage Upper Daybeacon 11.2	29-17-10.435N	089-20-59.881W	8/10/2018
LLNR 13095. Charted beacon not observed visually or in MMS data.	Location from LNM report: LNM 23/00	Upper Venice Anchorage Upper Daybeacon 11.2	29-17-10.499N	089-20-59.575W	8/10/2018
LLNR 13050. New surveyed position using Blake laser data.	Beacon has been located approximately 5m southwest of charted location.	West Point Light 7	29-14-48.040N	089-19-02.394W	8/10/2018
LLNR 13065. Charted beacon not observed visually or in MMS data.		Lower Venice Anchorage Upper Daybeacon 9.6	29-16-10.982N	089-19-59.751W	8/10/2018
LLNR 13155. New surveyed position using Blake laser data.	Beacon has been located approximately 22m northwest of charted location.	Bayou Petit Liard Light 21	29-20-49.134N	089-28-01.433W	8/10/2018
Uncharted, lighted beacon surveyed using MMS data. Unable to determined light attribution during day ops.			29-22-00.090N	089-32-09.425W	8/10/2018
Uncharted, lighted beacon surveyed using MMS data. Unable to determined light attribution during day ops.			29-21-15.727N	089-27-39.534W	8/10/2018
Uncharted, lighted beacon surveyed using MMS data. Unable to determined light attribution during day ops.			29-21-17.739N	089-27-37.088W	8/10/2018
Uncharted, lighted beacon surveyed using MMS data. Unable to determined light attribution during day ops.			29-17-27.694N	089-21-51.819W	8/10/2018
Uncharted, lighted beacon surveyed using MMS data. Unable to determined light attribution during day ops.			29-17-22.237N	089-21-47.200W	8/10/2018

Jason Creech

From: Jason Creech
Sent: Wednesday, August 21, 2019 1:25 PM
To: pipelines@bsee.gov
Cc: Martha Herzog (martha.herzog@noaa.gov); Tim Osborn (Tim.Osborn@noaa.gov); Jon Dasler (Jld@deainc.com); Angie Gobert (angie.gobert@bsee.gov)
Subject: Mississippi River Unburied Pipelines H13196 - Mile 26 AHOP to Mile 0 AHOP
Attachments: H13196_Exposed_Pipelines.zip; H13196_Exposed_Pipelines_for_BSEE.xlsx

Good Afternoon

While performing hydrographic surveys of the Mississippi River for NOAA Office of Coast Survey, David Evans and Associates, Inc. has discovered what appear to be multiple segments of unburied pipelines within survey area H13196 which extends from Mile 26 AHOP to Mile 0 AHOP. I have included a text description if each exposure below and attached two files supporting this report. Attached is a spreadsheet containing the locations of the start and end points of the segments and a zip file containing screen shots from our multibeam sonar data and overview maps of each exposure. This report is based on interpretation of multibeam sonar data. All reported exposures have the signature of a pipeline. All coordinates are relative to NAD83(2011) and listed in degrees minutes seconds (DMS). Angie Gobert, BSEE Chief, Supervisory Petroleum Engineer, Pipeline Section has provided input on the format of the spreadsheet and report.

Please let me know if you have any questions or require additional information. Martha Herzog, the NOAA Project Manager for these surveys, and Tim Osborn, the NOAA Central Gulf Coast Regional Navigation Manager have been copied on this email. Additional reports for other portions of the Mississippi River to follow.

Thank you,
Jason Creech

H13196_Pipeline_01 is a segment of exposed pipeline approximately 107 feet in length with starting coordinates 29 21 47.045N, 89 26 07.172W and ending at 29 21 46.771N, 89 26 08.343W. The exposed segment has a bearing of 256 degrees and was identified in multibeam echosounder data acquired on January 28, 2019 (DN 028). The pipeline is not located within a charted pipeline area and rises approximately 11 feet above the surrounding river bottom.

H13196_Pipeline_02 is a segment of exposed pipeline approximately 196 feet in length with starting coordinates 29 12 00.790N, 89 16 53.309W and ending at 29 11 59.170N, 89 16 52.092W. The exposed segment has a bearing of 148 degrees and was identified in multibeam echosounder data acquired on February 8, 2019 (DN 039). The pipeline is partly located within a charted pipeline area and rises approximately 3 feet above the surrounding river bottom.

Jason Creech, CH | Vice President, Nautical Charting Program Manager
David Evans and Associates, Inc.
2801 SE Columbia Way, Suite 130 | Vancouver, WA, 98661 | www.deainc.com
804.516.7829 | jasc@deainc.com

Jason Creech

From: Jason Creech
Sent: Tuesday, June 11, 2019 10:47 AM
To: 'survey.outlines@noaa.gov'
Cc: Martha Herzog (martha.herzog@noaa.gov)
Subject: OPR-J347-KR-18 Survey Outlines
Attachments: H13194_survey_outline.000; H13195_survey_outline.000; H13196_survey_outline.000; H13212_survey_outline.000

Good Morning

I have attached some outlines for completed OPR-J347-KR-18 surveys. Outlines are included for the following surveys:

H13194
H13195
H13196
H13212

Please let me know if you have any questions or feedback on these products.

Thanks,
Jason

Jason Creech, CH | Vice President, Nautical Charting Program Manager
David Evans and Associates, Inc.
2801 SE Columbia Way, Suite 130 | Vancouver, WA, 98661 | www.deainc.com
804.516.7829 | jasc@deainc.com

Jason Creech

From: Jason Creech
Sent: Thursday, September 26, 2019 8:48 AM
To: Christopher Paver - NOAA Federal
Cc: NODC.submissions@noaa.gov; Martha Herzog (martha.herzog@noaa.gov)
Subject: RE: OPR-J347-KR-18 NCEI Sound Speed Data
Attachments: OPR-J347-KR-18_20190926.zip

Hi Chris

I am resubmitting the OPR-J347-KR-18 sound speed data acquired in support of the Mississippi River hydrographic project. We have adjusted the instrument information based on your comments. Let me know if you need anything else.

Thanks,

Jason

Jason Creech, CH | Vice President, Nautical Charting Program Manager
David Evans and Associates, Inc.
2801 SE Columbia Way, Suite 130 | Vancouver, WA, 98661 | www.deainc.com
t: 804.806.4440 | c: 804.516.7829 | jasc@deainc.com

From: Christopher Paver - NOAA Federal <christopher.paver@noaa.gov>
Sent: Thursday, September 19, 2019 3:00 PM
To: Jason Creech <Jasc@deainc.com>
Cc: NODC.submissions@noaa.gov; Martha Herzog (martha.herzog@noaa.gov) <martha.herzog@noaa.gov>
Subject: Re: OPR-J347-KR-18 NCEI Sound Speed Data

The information provided looks good. Thanks for being amicable.

Chris

On Thu, Sep 19, 2019 at 6:57 PM Jason Creech <Jasc@deainc.com> wrote:

> Hi Chris
>
> We can resubmit, no problem.
>
> Are the make and models that I provided acceptable? Should we include and serial number information?

Thanks
Jason

Jason Creech

From: Christopher Paver - NOAA Federal <christopher.paver@noaa.gov>
Sent: Thursday, September 19, 2019 2:45:28 PM
To: Jason Creech <Jasc@deainc.com>
Cc: NODC.submissions@noaa.gov <NODC.submissions@noaa.gov>; Martha Herzog (martha.herzog@noaa.gov) <martha.herzog@noaa.gov>
Subject: Re: OPR-J347-KR-18 NCEI Sound Speed Data

Hey Jason,
Thanks for the boat info.

The instrument controlled vocab mappings are basic on our end, e.g. XBT, SVP, etc... The important item is to ensure the submitted files have instrument make and model information so that we can make the mappings to controlled vocab. Adding this information will also enable future users to better understand the data. In some cases we find out that certain instruments weren't properly calibrated or otherwise, which can affect data quality.

Will you be able to add the instrument information to the files and resubmit?

Thanks,
Chris

On Thu, Sep 19, 2019 at 2:33 PM Jason Creech <Jasc@deainc.com> wrote:

> Hi Chris
>
> Thanks for the response. The Sigsbee is an 18-foot rigid hulled inflatable boat (RHIB) with a draft of 1 foot used during the hydrographic survey of the Mississippi River. It's MMSI number is 368061220.
>
> What are the available instruments in your mappings?
>
> We used the following instrumentation.
>
> AML Oceanographic MVP30-350 with Micro SVP&T
>
> AML Oceanographic Base X2
>
> AML Oceanographic SBE 19+ SeaCAT
>
> AML Oceanographic Smart X

Will replacing the instrument fields with this manufacture and model information suffice? Should we exclude the serial numbers?

Thanks,

Jason

From: Christopher Paver - NOAA Federal <christopher.paver@noaa.gov>
Sent: Thursday, September 19, 2019 9:38 AM
To: Jason Creech <Jasc@deainc.com>
Cc: NODC.submissions@noaa.gov; Martha Herzog (martha.herzog@noaa.gov) <martha.herzog@noaa.gov>
Subject: Re: OPR-J347-KR-18 NCEI Sound Speed Data

Hey Jason,

The OCS Survey Profile OPR-J347-KR-18 submission cannot be processed at this time as it contains instrument and platform information that has not been previously mapped to controlled vocabulary.

Instruments
25653
4962
5588
8704

Platform

SI SIGSBEE

With regards to the instruments, we would strongly recommend the instrument global attribute field contain at the very least a make/model. If possible, please update the applicable files and resubmit.

For the platform, please provide an email with unique identifying information, e.g. a combination of IMO, MMSI, Call Sign, Flag, dimensions, year built, etc.

Regards,

Chris

On Wed, Sep 18, 2019 at 4:05 PM Jason Creech <Jasc@deainc.com> wrote:

Hello

I have attached all sound speed data acquired in support of hydrographic project OPR-J347-KR-18. Data were acquired by David Evans and Associates, Inc. under contract to NOAA Office of Coast Survey.

Please let me know if you have any questions on this submittal.

Thanks,

Jason

Jason Creech, CH | Vice President, Nautical Charting Program Manager

David Evans and Associates, Inc.

2801 SE Columbia Way, Suite 130 | Vancouver, WA, 98661 | www.deainc.com

804.516.7829 | jasc@deainc.com

David Evans and Associates, Inc.
2801 SE Columbia Way, Suite 130
Vancouver, WA 98661
Phone: 360-314-3200
Fax: 360-314-3250

OPR-J347-KR-18
Marine Mammal Trained Observers

Inclusive Dates: 8/9/2018 - 4/30/2019
General Locality: Mississippi River

H Number	Sub Locality	Priority
H13188	Mississippi River, Vicinity of Mile 232.5 to 205	1
H13189	Mississippi River, Vicinity of Mile 205 to 180	2
H13190	Mississippi River, Vicinity of Mile 180 to 156.5	3
H13191	Mississippi River, Vicinity of Mile 156.5 to 130	4
H13192	Mississippi River, Vicinity of Mile 130 to 104.3	5
H13193	Mississippi River, Vicinity of Mile 104.3 to 78	6
H13194	Mississippi River, Vicinity of Mile 78 to 54	7
H13195	Mississippi River, Vicinity of Mile 54 to 26	8
H13196	Mississippi River, Vicinity of Mile 26 to 0	9
H13212	Mississippi River, Southwest Pass	10

Observer	Position	Training Video[1] Date
Brandon Harr	Survey Crew	8/3/2018
Callan McGriff	Survey Crew	7/31/2018
Daniel Prince	Survey Crew	8/20/2018
David Moehl	Survey Crew	8/7/2018
James Guilford	Survey Crew	10/25/2018
Jason Creech	Survey Crew	8/8/2018
Jason Dorfman	Survey Crew	8/22/2018
John Staly	Survey Crew	8/28/2018
Kathleen Slacht	Survey Crew	8/1/2018
Kori Ktona	Survey Crew	8/6/2018
Laura Rajnak	Survey Crew	7/31/2018
Sam Werner	Survey Crew	7/31/2018
Steven Loy	Survey Crew	3/13/2019
Tim McClinton	Survey Crew	8/6/2018
Chris Aaron	Vessel Crew	8/7/2018
George Hopkins	Vessel Crew	8/3/2018
Harry Stutzke	Vessel Crew	8/29/2018
Jarrod Leckich	Vessel Crew	8/3/2018
Jerry David Keith	Vessel Crew	8/3/2018
Ryan Willis	Vessel Crew	8/7/2018
Timothy Kennedy	Vessel Crew	8/3/2018

[1] Marine Species Awareness Training Video: https://www.youtube.com/watch?v=KKo3r1yVBBA

Jason Creech

From: OCS NDB - NOAA Service Account <ocs.ndb@noaa.gov>
Sent: Friday, July 12, 2019 11:30 AM
To: Laura Jeffery - NOAA Federal
Cc: Jason Creech; coast.pilot@noaa.gov; Martha Herzog (martha.herzog@noaa.gov); Richard.Powell@noaa.gov
Subject: Re: OPR-J347-KR-18 Coast Pilot Review Report

The report has been registered by NDB as L-331-2019.

Thanks,
Diane

Nautical Data Branch/Marine Chart Division/
Office of Coast Survey/National Ocean Service/
National Oceanic and Atmospheric Administration
United States Department of Commerce
Contact: ocs.ndb@noaa.gov

On Fri, Jul 12, 2019 at 10:21 AM Laura Jeffery - NOAA Federal <laura.jeffery@noaa.gov> wrote:

> Good morning Jason,
>
> Thank you for your updates - Coast Pilot 5 - Mississippi report. It will be registered and processed soon.
>
> Much appreciated! Have a great day.
>
> On Thu, Jul 11, 2019 at 1:26 PM Jason Creech <Jasc@deainc.com> wrote:
>
>> Good afternoon
>>
>> I have attached the Coast Pilot Review Report for hydrographic survey project OPR-J347-KR-18.
>>
>> Please let me know if you have any questions.
>>
>> Thanks,
>>
>> Jason

APPROVAL PAGE

H13196

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
- Data Acquisition and Processing Report
- Collection of Bathymetric Attributed Grids (BAGs)
- Processed survey data and records
- Geospatial PDF of survey products
- Collection of backscatter mosaics

The survey evaluation and verification have been conducted according to current OCS specifications, and the survey has been approved for dissemination and usage of updating NOAA's suite of nautical charts.

Approved: MCGOVERN.MEGHAN.ELIZABETH.1284020495 Digitally signed by MCGOVERN.MEGHAN.ELIZABETH.1284020495 Date: 2020.06.10 11:04:02 -04'00'

Commander Meghan McGovern, NOAA
Chief, Atlantic Hydrographic Branch