H13188

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

DESCRIPTIVE REPORT

Type of Survey:	Navigable Area
Registry Number:	H13188

LOCALITY

State(s):	Louisiana
General Locality:	Mississippi River
Sub-locality:	Mississippi River, Vicinity of Mile 232.5 to 205

2018

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

LIBRARY & ARCHIVES

Date:

U.S. DEPARTMENT OF COMMERCE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION	REGISTRY NUMBER:
HYDROGRAPHIC TITLE SHEET	**H13188**

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 232.5 to 205**
Scale:	**5000**
Dates of Survey:	**08/15/2018 to 09/09/2019**
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:	**Pacific 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 15N, LWRP. 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 H13188

Project: OPR-J347-KR-18

Locality: Mississippi River

Sublocality: Mississippi River, Vicinity of Mile 232.5 to 205

Scale: 1:5000

August 2018 - September 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 H13188 was conducted in accordance with the November 19, 2018 Statement of Work and Hydrographic 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
30° 29' 22.57" N 91° 14' 51.57" W	30° 16' 27.98" N 91° 8' 12.71" 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.

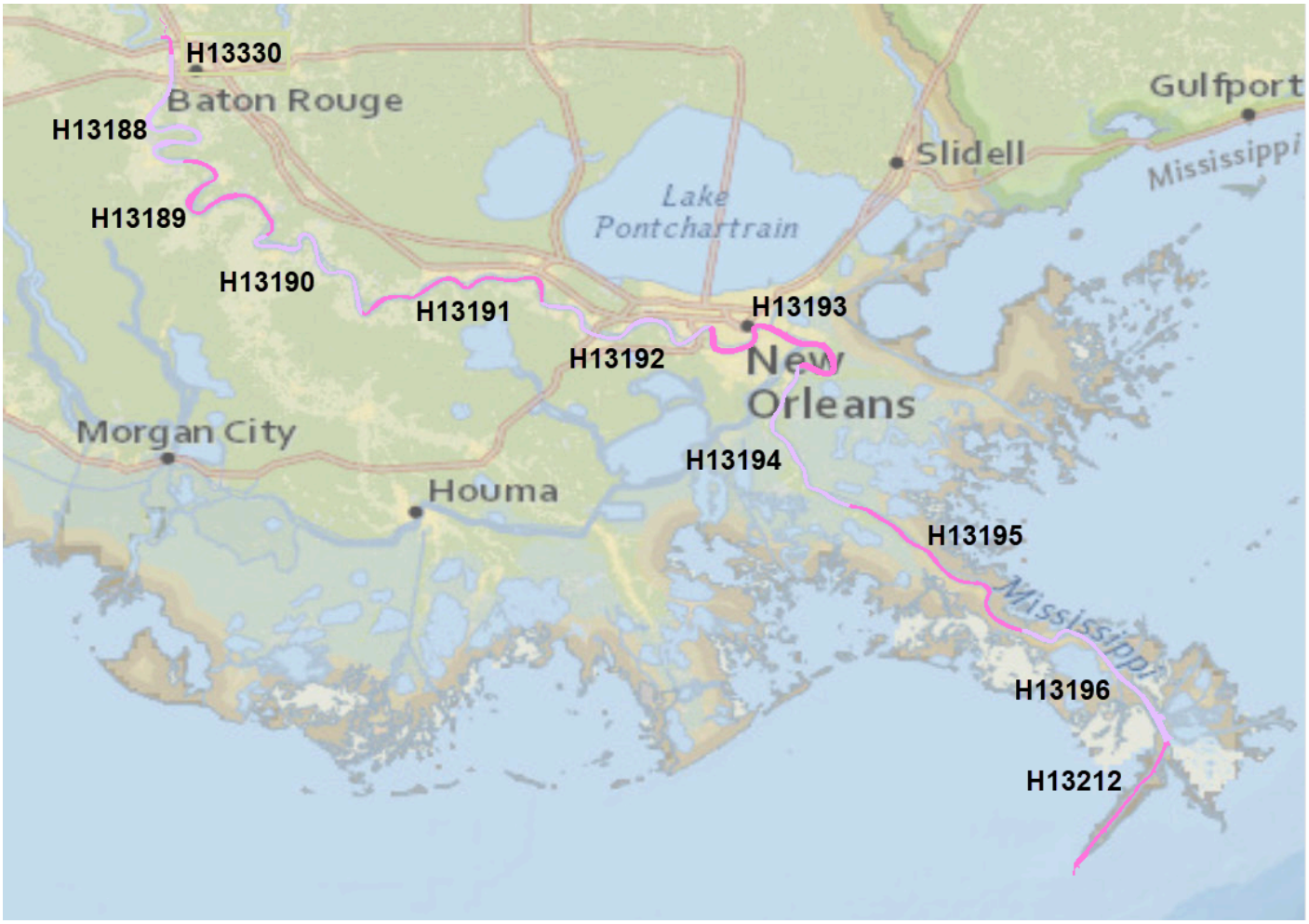


Figure 1: OPR-J347-KR-18 Survey Areas

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. 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, or Mobile Mapping System (MMS); 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 0.25 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 large barge fleeting areas. Other factors that blocked or impeded safe vessel operations resulting in data gaps included: berthed vessels that remained during survey operations; low wires behind structures; mooring lines; in-water facilities, ruins, and overgrown vegetation along shoreline. 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 H13188.

The Project Instructions required the use of the MMS for scanning of bridges, overhead cables, and terminal facilities located in the survey area. These areas, which are depicted in Figure 3, were identified in the Project Reference File (PRF) as Anchorage area feature types (ACHARE). Overhead clearances of the assigned bridges and cables, discussed in D.2.3 Overhead Features, were computed from LAS data. MMS acquisition was expanded outside of these assigned areas to encompass the entire survey area in order to facilitate the survey, management, and reporting of all shoreline and nearshore features located within the project area.

Figure 2: H13188 Survey Outline

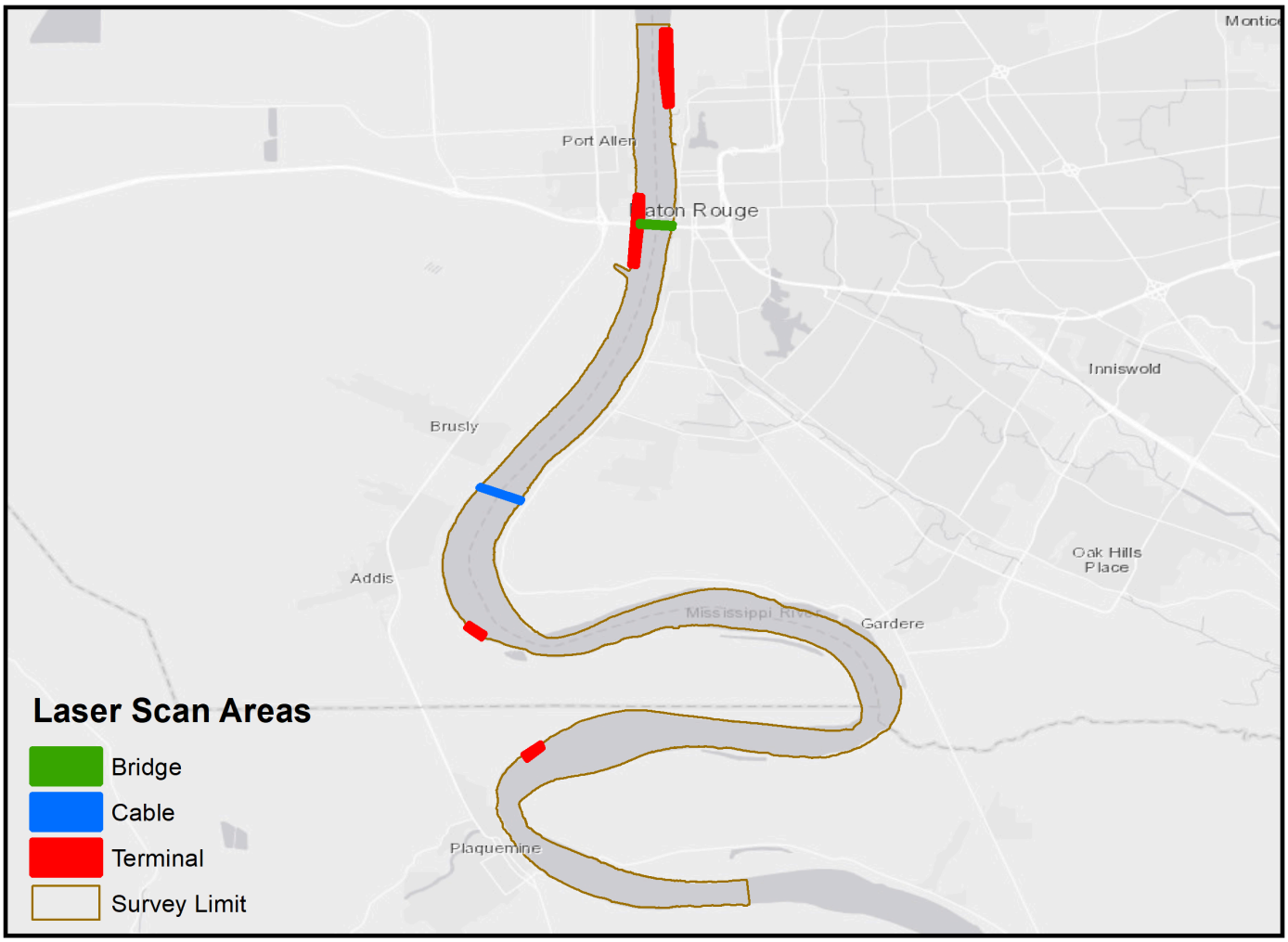


Figure 3: H13188 Assigned Mobile Mapping Areas

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	413.72	457.32	871.03
	Lidar Mainscheme	60.87	0.00	60.87
	SSS Mainscheme	0	0	0
	SBES/SSS Mainscheme	0	0	0
	MBES/SSS Mainscheme	0	0	0
	SBES/MBES Crosslines	19.07	15.57	34.64
	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				10.43

Table 3: Hydrographic Survey Statistics

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

Survey Dates	Day of the Year
08/15/2018	227

Survey Dates	Day of the Year
08/16/2018	228
09/02/2018	245
09/03/2018	246
09/04/2018	247
09/05/2018	248
09/06/2018	249
09/07/2018	250
09/08/2018	251
09/09/2018	252
09/10/2018	253
09/11/2018	254
09/12/2018	255
09/13/2018	256
09/14/2018	257
09/15/2018	258
09/16/2018	259
09/17/2018	260
09/19/2018	262
09/20/2018	263
09/23/2018	266
09/24/2018	267
10/06/2018	279
10/07/2018	280
09/09/2019	252

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 except for sonar settings used during acquisition of some fill and investigation data. For fill and investigation lines conducted on September 9, 2019 (DN252), the dual-head multibeam system was operated in equi-angular (EA) mode, rather than equi-distant (ED) mode as 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 4: S/V Blake

Figure 5: 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
RIEGL	LMS-Z390i	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	MVP30-350	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 3.98% 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.

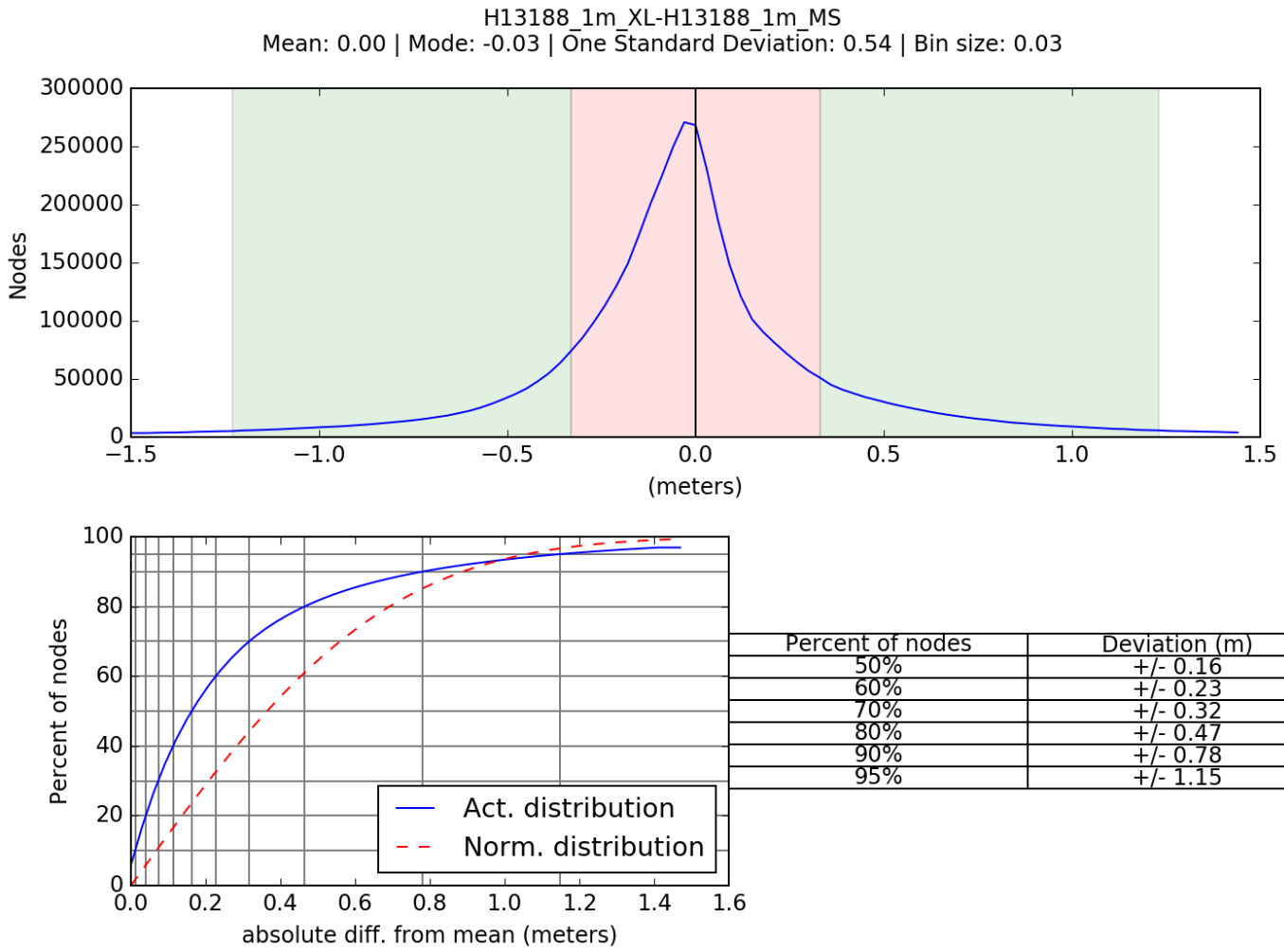
Crossline analysis was performed using the CARIS Hydrographic Information Processing System (HIPS) Quality Control (QC) Report tool, which compares crossline data to a gridded surface and reports results by beam number. Crosslines were compared to a 1-meter CUBE surface encompassing mainscheme, fill, 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.

For this survey, crosslines were generally conducted a number of days after mainscheme acquisition. This resulted in a time differential occasionally exceeding two weeks between mainscheme and crossline acquisition and significant change in the riverbed was apparent. Tests run prior to the 2019 flooding event showed sediment wave movement at a rate of 0.25 meters per hour with even higher rates observed during flooding. Due to these changes in the riverbed, crossline statistics exceed International Hydrographic Organization (IHO) Order 1 specification as reported by the CARIS HIPS QC Report tool. As survey operations progressed downstream crossline acquisition was generally conducted on the same day as mainscheme acquisition in order to reduce the impact of the changing riverbed on crossline agreement. Even with these operational adjustments, crossline statistics routinely exceed IHO Order 1 specifications.

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 Figures 6 and 7, units are represented in meters. Figure 7 depicts a difference surface portraying the sediment migration seen throughout the duration of survey. This figure details crosslines conducted up to 16 days after the mainscheme lines were acquired. Change is significant in the sediment wave field with horizontal migration of up to 20 meters occurring between mainscheme and crossline acquisition. The mean and mode in Figure 6 show good agreement and indicate a mass balance in sediment migration (equal shoaling and erosion) across the crossline swath. The shape of the waves is apparent in both the crossline/mainscheme difference image and multibeam hillshade. In the crossline difference image, overlaid 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 and Crossline Comparison.

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%	+/- 0.16
60%	+/- 0.23
70%	+/- 0.32
80%	+/- 0.47
90%	+/- 0.78
95%	+/- 1.15

Figure 6: H13188 Crossline Difference Distribution Summary Plot

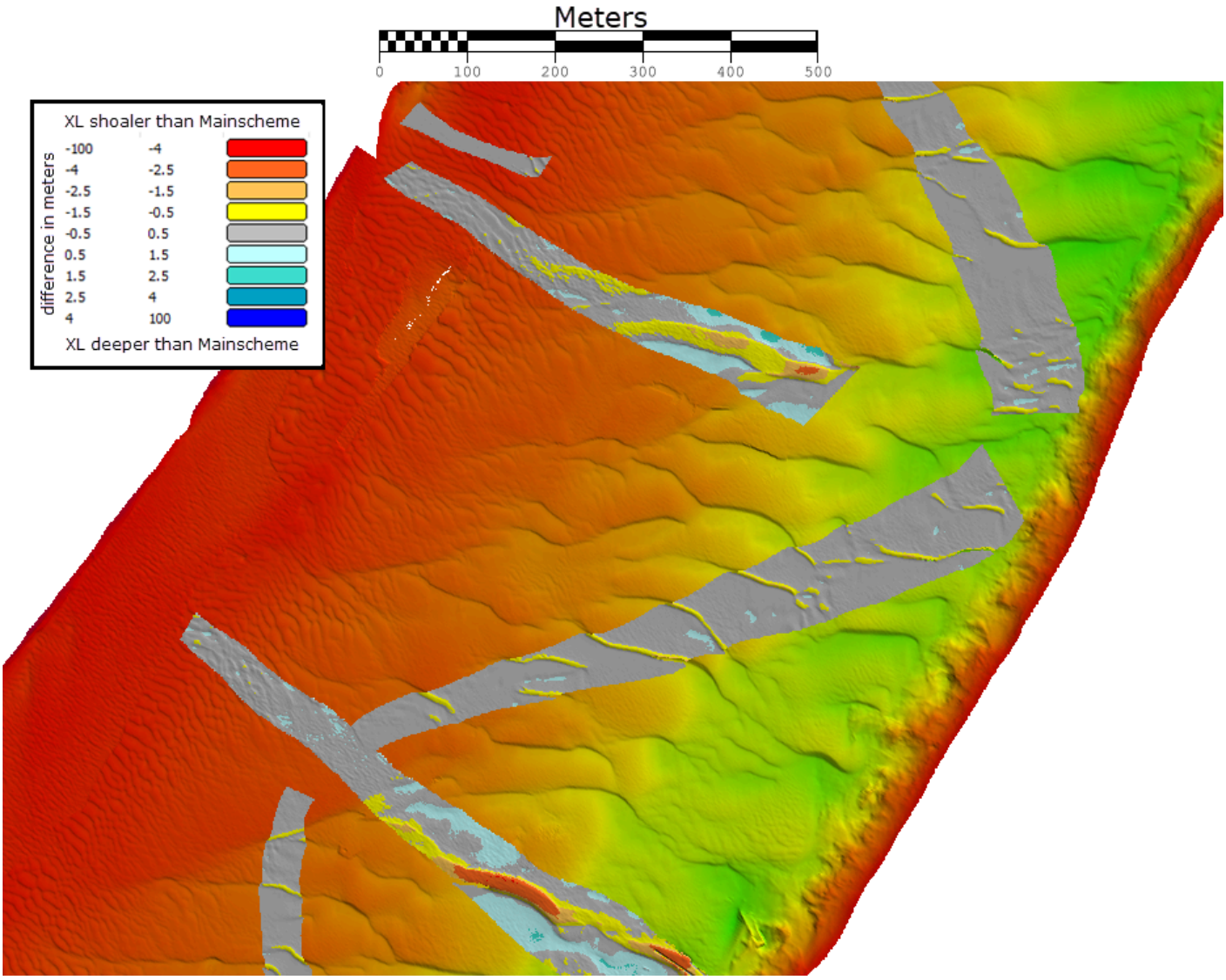


Figure 7: H13188 crossline difference surface overlayed on the multibeam hillshade highlighting sediment migration

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	1.0 meters/second	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 an SBE 19+ SeaCAT CTD, an AML BaseX or an AML SmartX sound speed sensors. The S/V Blake used an AML BaseX to acquire sound speed measurements on September 4, 2018 (DN246) and September 9, 2019 (DN252). 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 greater 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 8 through 10.

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.

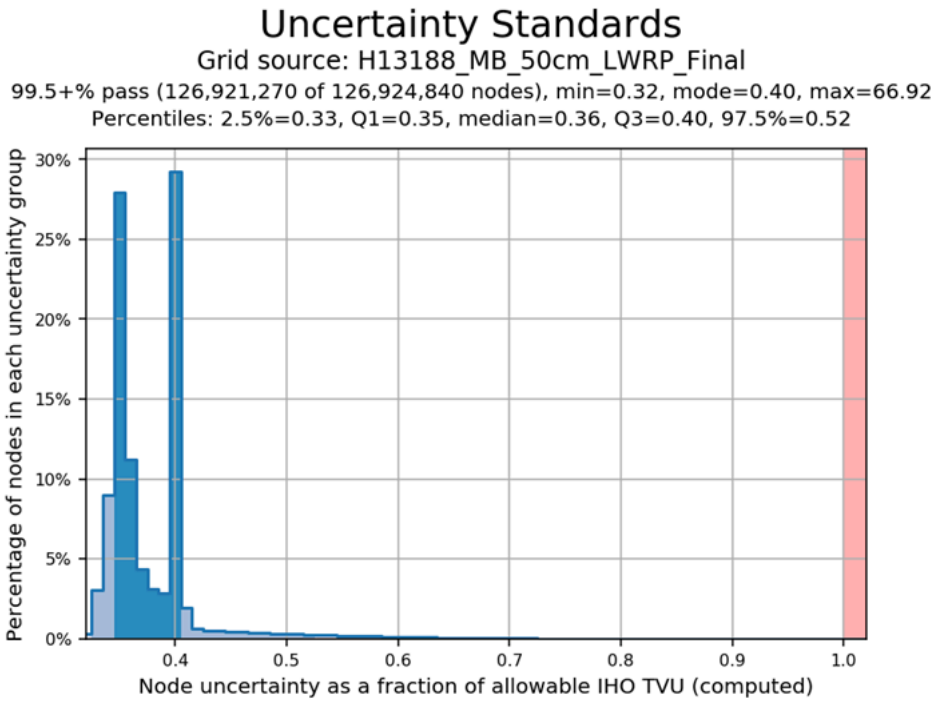


Figure 8: Node TVU statistics - 50cm finalized

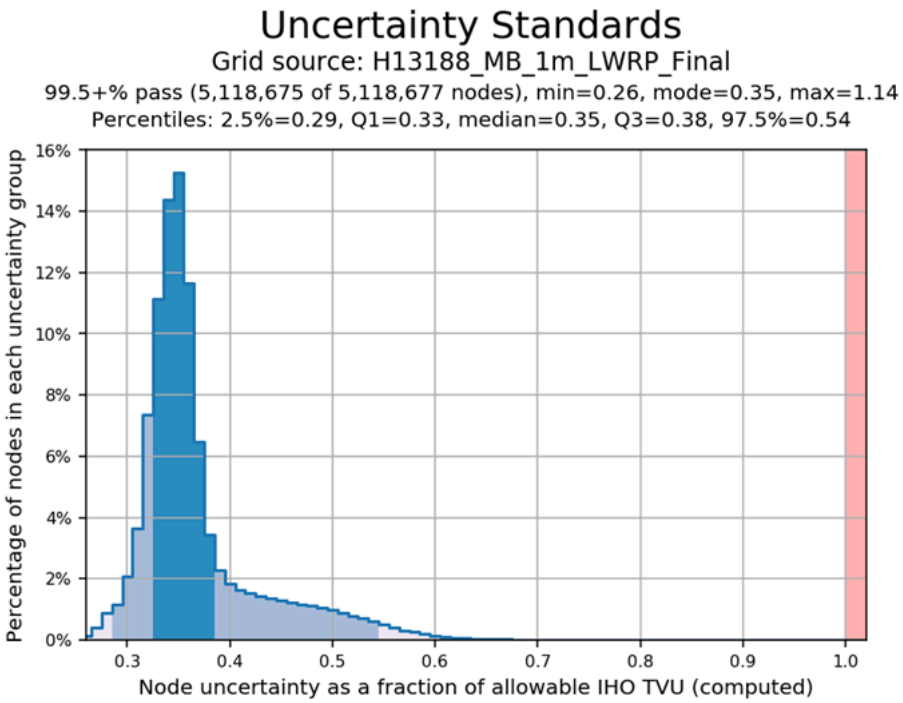


Figure 9: Node TVU statistics - 1m finalized

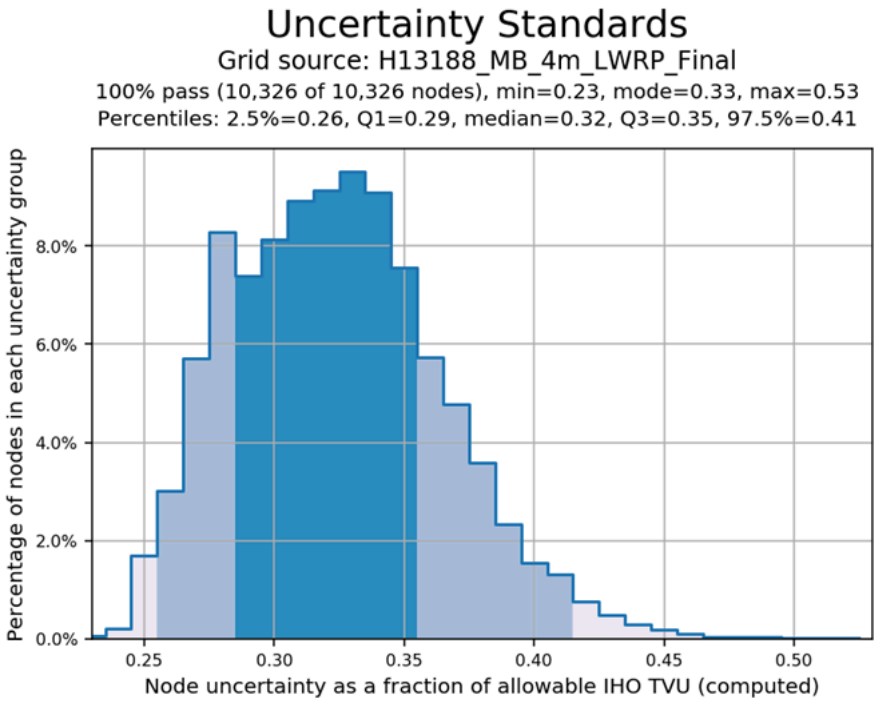


Figure 10: Node TVU statistics - 4m finalized

B.2.3 Junctions

Survey H13188 junctions with current surveys H13189 and H13330. No prior surveys were specified as junctions in the Project Instructions.

The following junctions were made with this survey:

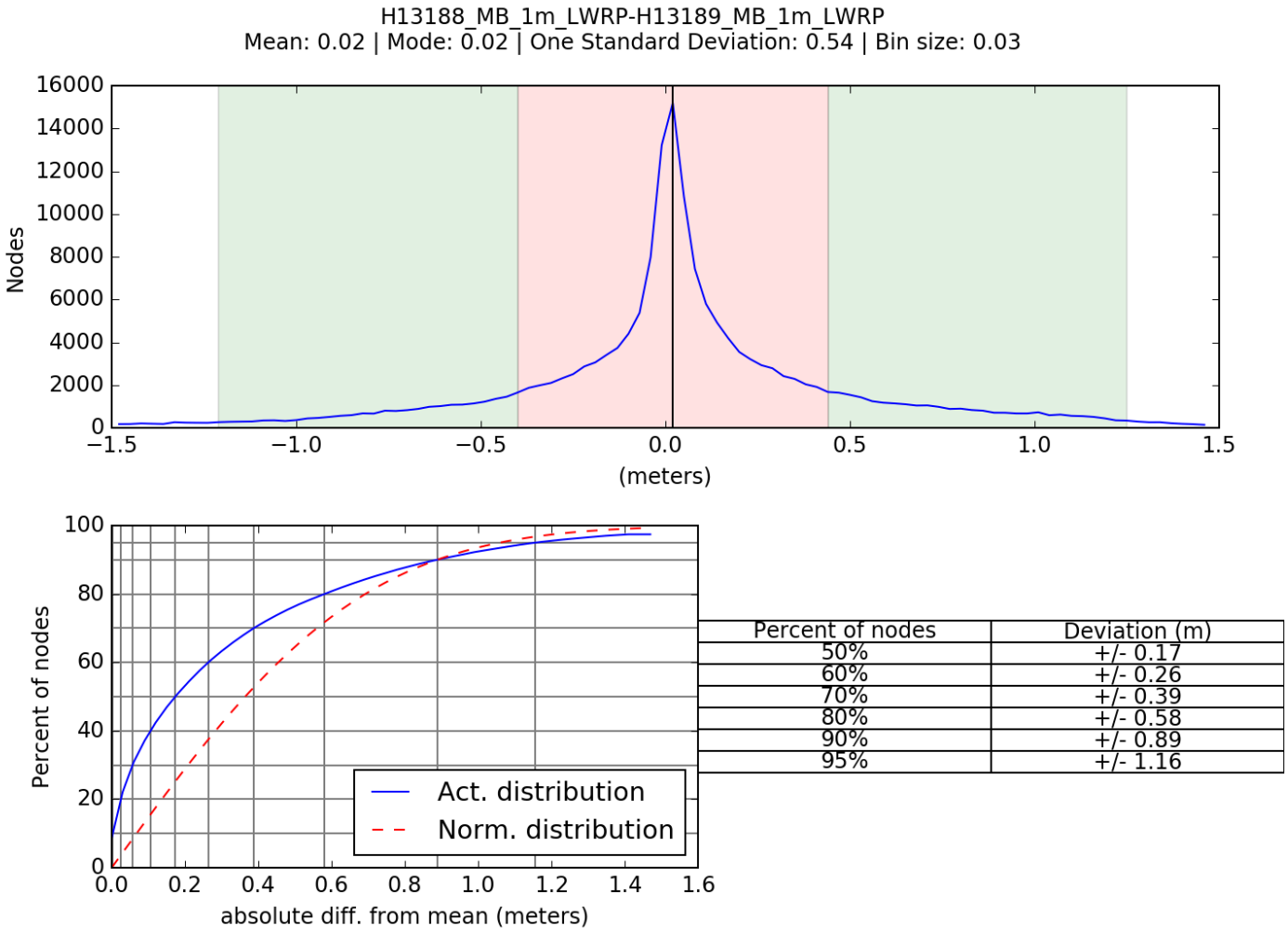
Registry Number	Scale	Year	Field Unit	Relative Location
H13189	1:5000	2018	David Evans & Associates, Inc.	S
H13330	1:5000	2018	David Evans & Associates, Inc.	N

Table 9: Junctioning Surveys

H13189

Survey H13189 is also part of the OPR-J347-KR-18 survey project. The mean difference between H13188 and H13189 survey depths is 2 centimeters (H13188 shoaler than H13189), shown in Figure 11. Major

differences are representative of surveys impacted by sediment migration over time. The majority of mainscheme acquisition for the two surveys was separated by 10 days. Figure 12, represented in meters, shows the area of overlap with grey shades showing general agreement. Warmer colors represent H13188 survey depths shoaler than H13189, while cooler colors indicate H13188 survey depths deeper than H13189.



Percent of nodes	Deviation (m)
50%	+/- 0.17
60%	+/- 0.26
70%	+/- 0.39
80%	+/- 0.58
90%	+/- 0.89
95%	+/- 1.16

Figure 11: Distribution summary plot of survey H13188 1-meter vs H13189 1-meter

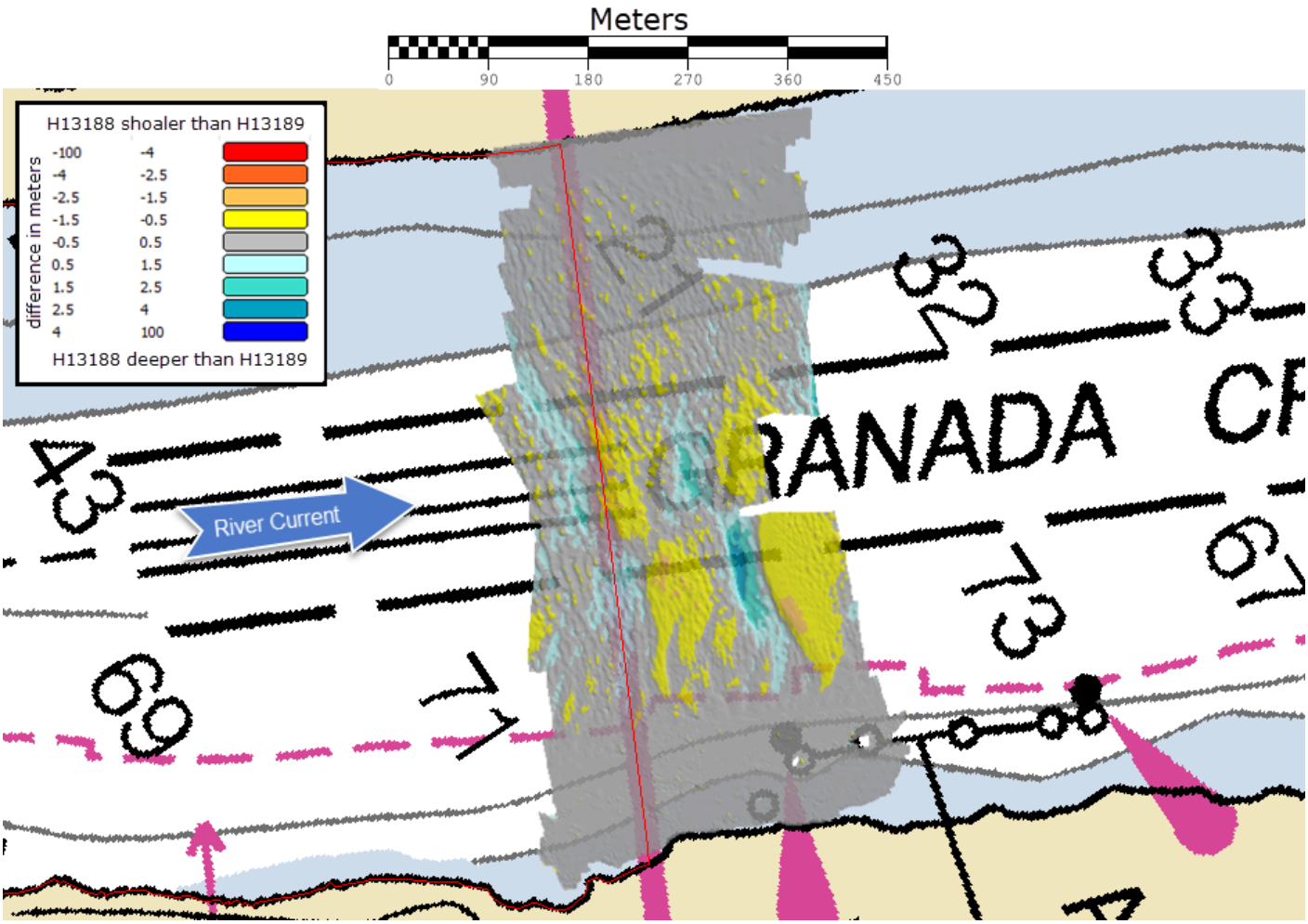


Figure 12: Junction difference surface between surveys H13188 1-meter and H13189 1-meter

H13330

At the time of writing, data from survey H13330 was still being processed. The Descriptive Report for H13330 will include the junction analysis with H13188.

The junction analysis from the DR for H13330 states: "Survey H13188 is also part of the OPR-J347-KR-18 survey project. The mean difference between H13330 and H13188 survey depths is 1.76 meters (H13330 deeper than H13188), shown in Figure 11. Major differences are representative of surveys impacted by sediment migration over time. Survey H13188 and H13330 mainscheme acquisition data were conducted over one year apart, where during this time major events included historic flooding on the Mississippi River. Figure 12, represented in meters, shows the area of overlap with Grey shades showing general agreement. Warmer colors represent H13330 survey depths shoaler than H13188, while cooler colors indicate H13330 survey depths deeper than H13188.

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

High Frequency artifact in dual-head MBES system

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 13 and 14 display the artifact for the dual-head operations.

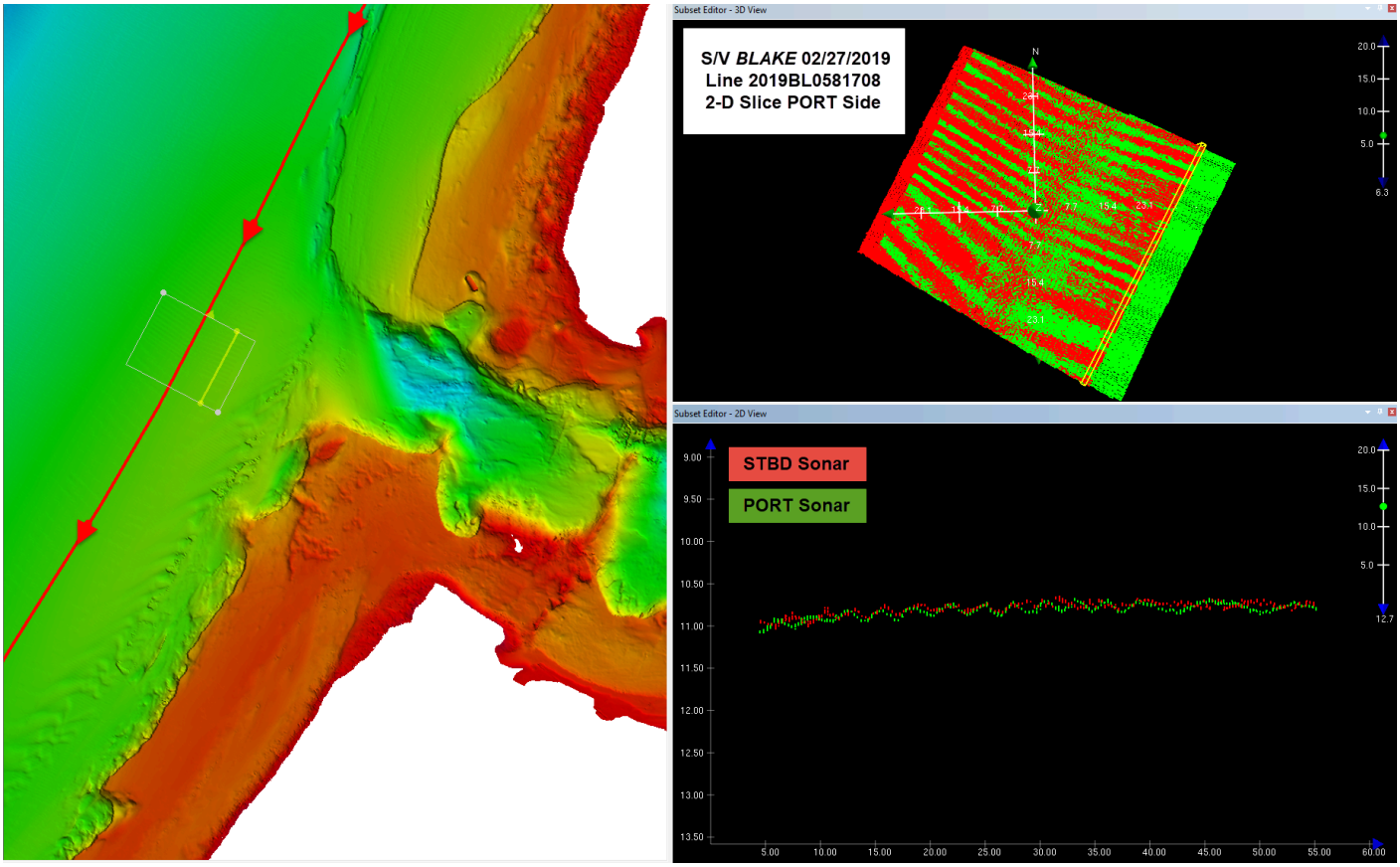


Figure 13: Example of high frequency artifact shown in surface and along track subset. Subsets of differing magnitudes between separate sonar heads of dual-head system shown on port side of swath (starboard beams shown in red, port beams in green)

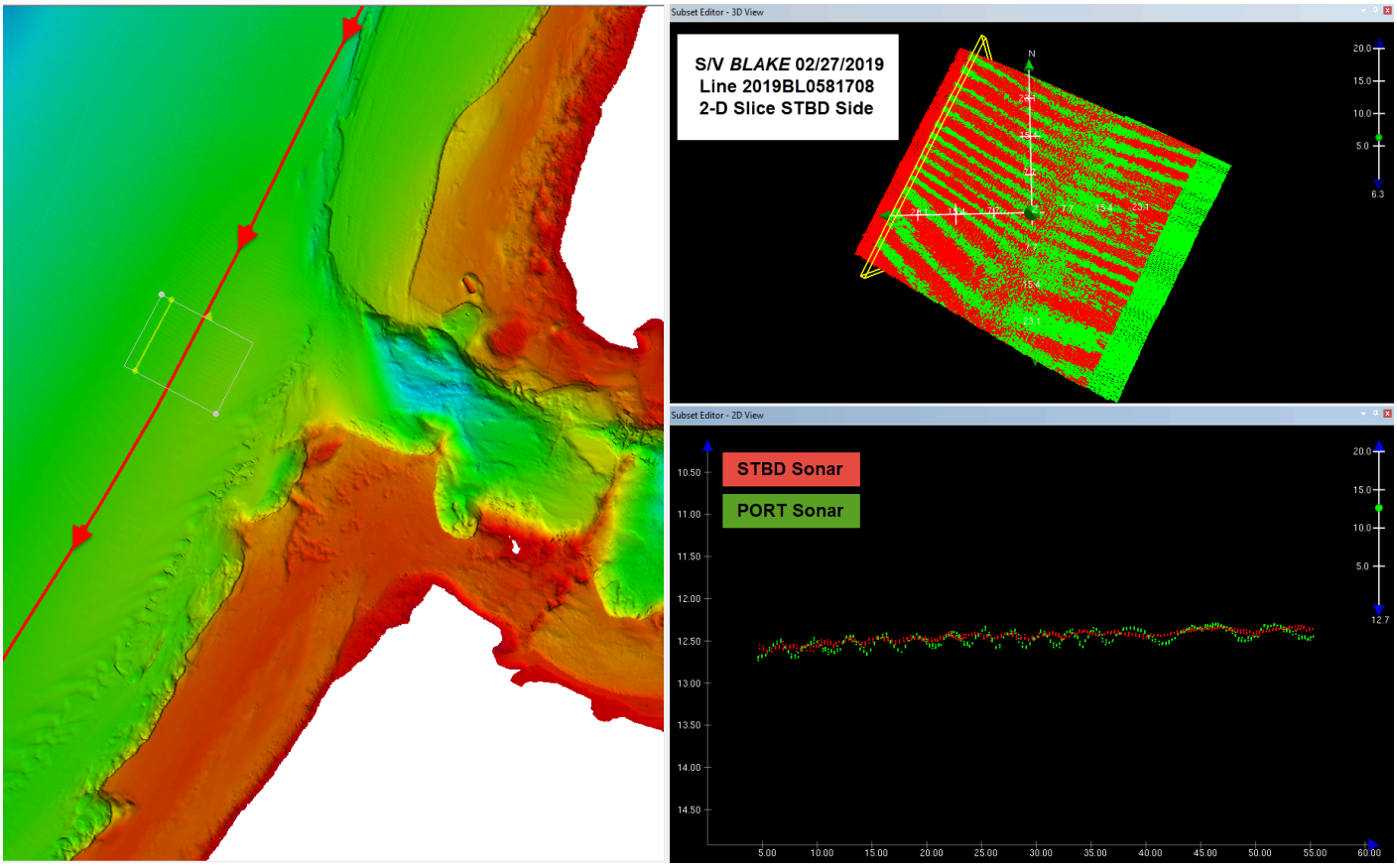


Figure 14: Example of high frequency artifact shown in surface and along track subset. Subsets of differing magnitudes between separate sonar heads of dual-head system shown on starboard side of swath (starboard beams shown in red, port beams in green)

Delayed Heave

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 Auxiliary Data tool. Delayed heave is chosen during the SVC and Merge processing steps.

For the RHIB Sigsbee, delayed heave was obtained by using the post-processed Hydrins 'smart heave' solution. The data was exported to a custom *.txt file, loaded to the delayed heave HDCS using CARIS Generic Data Parser (GDP) utility and applied during the SVC and Merge processing steps.

The following lines are submitted with real-time heave due to logging errors during acquisition that resulted in no file for which to derive the 'smart heave' solution being logged:
-All lines collected by RHIB Sigsbee on September 13, 2018 (DN256);
-Lines acquired by RHIB Sigsbee between 14:20 and 21:09 on September 17, 2018 (DN260);
-Lines acquired by RHIB Sigsbee between 17:51 and 17:53 on September 19, 2018 (DN262).

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. Figure 15 shows an example of horizontal movement (approximately 5 meters) in sediment waves that resulted in disagreement for H13188 submitted surfaces.

Some areas of the greatest disagreement have been noted in the H13188_Notes_for_Reviewer.hob file with the SNDWAV area feature class, submitted in Appendix II 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 16. A high vertical exaggeration is used in Figure 16 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.

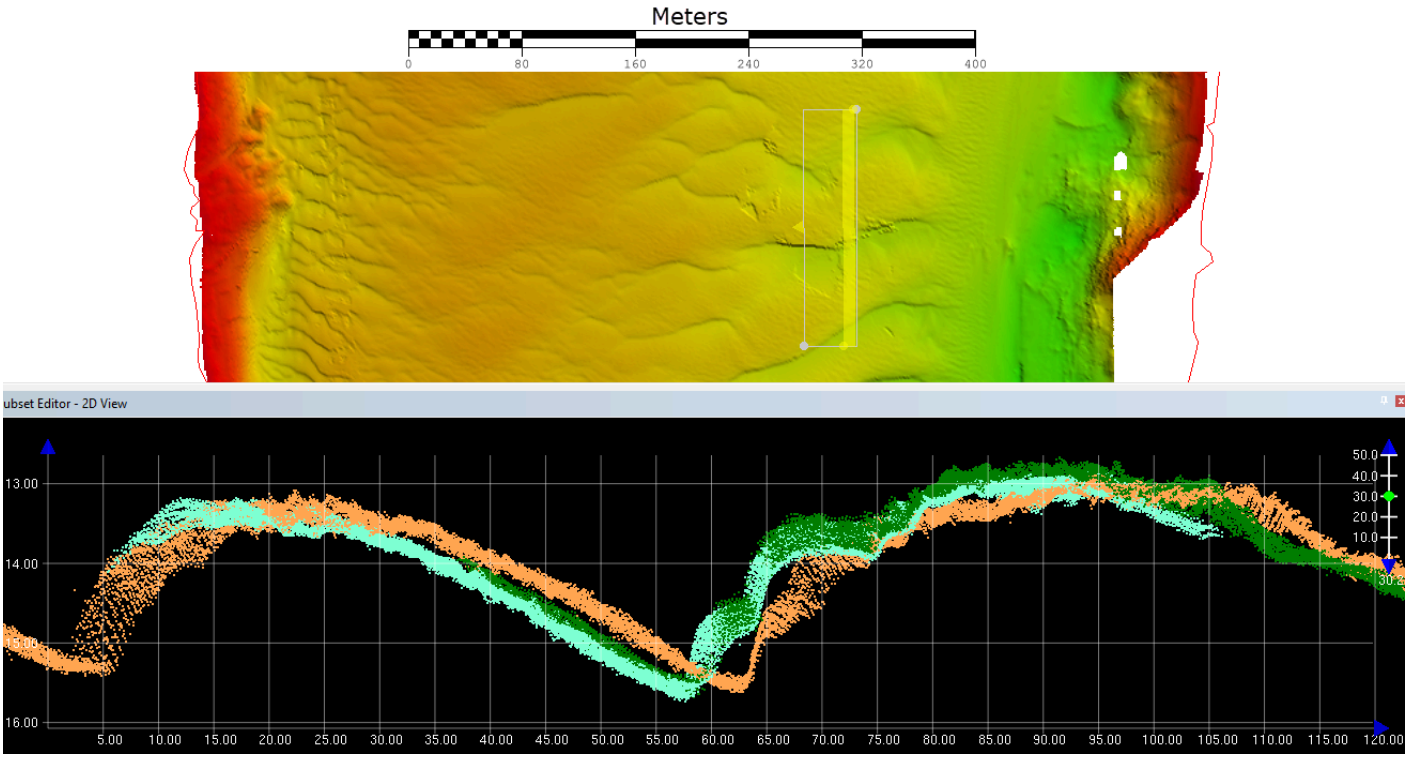


Figure 15: Example of artifacts caused by sediment migration during H13188 operations

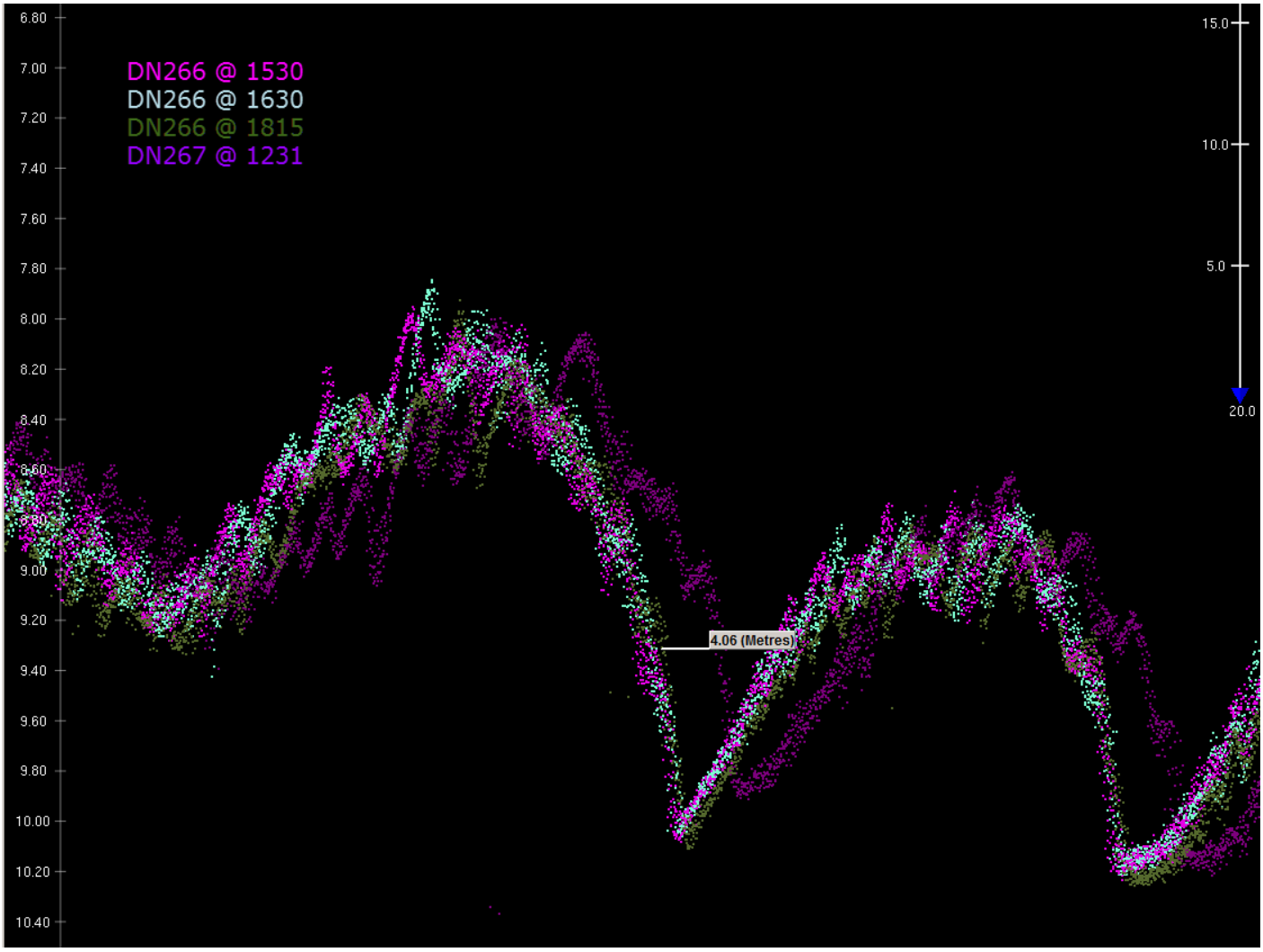


Figure 16: Along-track subset view of field test portraying river bottom changes due to sediment migration

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, AML BaseX, or SBE 19+ SeaCAT CTD 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 H13188 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 four-hour interval based on consistent profiles observed throughout the day of survey. The following days have sound speed measurement applications that differed from the four-hour interval specified in the DAPR:
- September 10, 2018 (DN253): RHIB Sigsbee line 2018SI2531236 applied with a five-hour interval.
- September 15, 2018 (DN258): two sound speed measurements were obtained by RHIB Sigsbee and were applied to all lines acquired this day with an eight-hour interval. RHIB Sigsbee worked in the same general vicinity all day and kept watch for any changes in surface sound speed that may indicate additional sound speed measurements.

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

During H13188 survey operations, the S/V Blake and RHIB Sigsbee did not consistently acquire a sound speed profile before starting acquisition each survey day. For most days, the time differential varied between start of acquisition and the first cast of the day. A sound speed profile was acquired prior to acquisition during RHIB Sigsbee operations on September 4 (DN247), September 6 (DN249), September 15 (DN258), 2018, and S/V Blake operations on September 9, 2019 (DN252). As the Mississippi River is well mixed in this reach, there was no temporal or spatial variation in sound speed during acquisition and sounding data were not impacted. Taking sound speed casts prior to and after acquisition was corrected as survey operations progressed downstream.

The following days had equipment failures that resulted in operations that deviated from the DAPR:
- September 4, 2018 (DN246): the MVP aboard the S/V Blake malfunctioned and required repair. RHIB Sigsbee transferred the BaseX to the S/V Blake after the malfunction and both vessels used the two casts for sound speed measurements acquired by S/V Blake.
- September 19, 2018 (DN262): the BaseX aboard the RHIB Sigsbee malfunctioned and would not log data. For this day, all data collected by the RHIB Sigsbee has been sound speed corrected using measurements obtained by the S/V Blake's MVP. Both vessels were working in the same general vicinity during this time period with no spatial or temporal variation observed within the profiles.

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.

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 17 through 19.

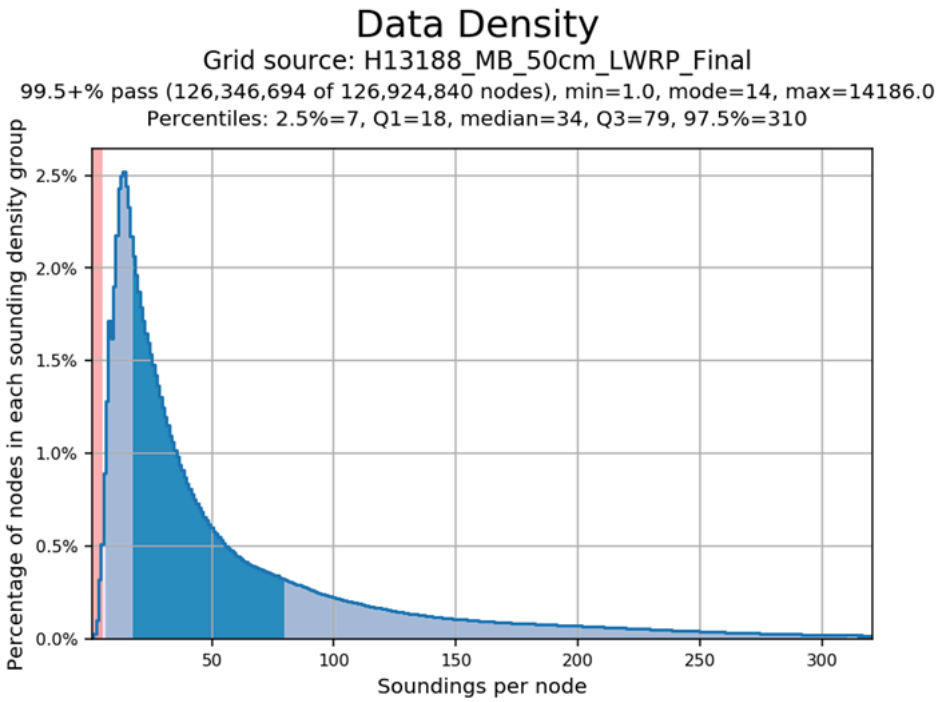


Figure 17: Node density statistics - 50cm finalized

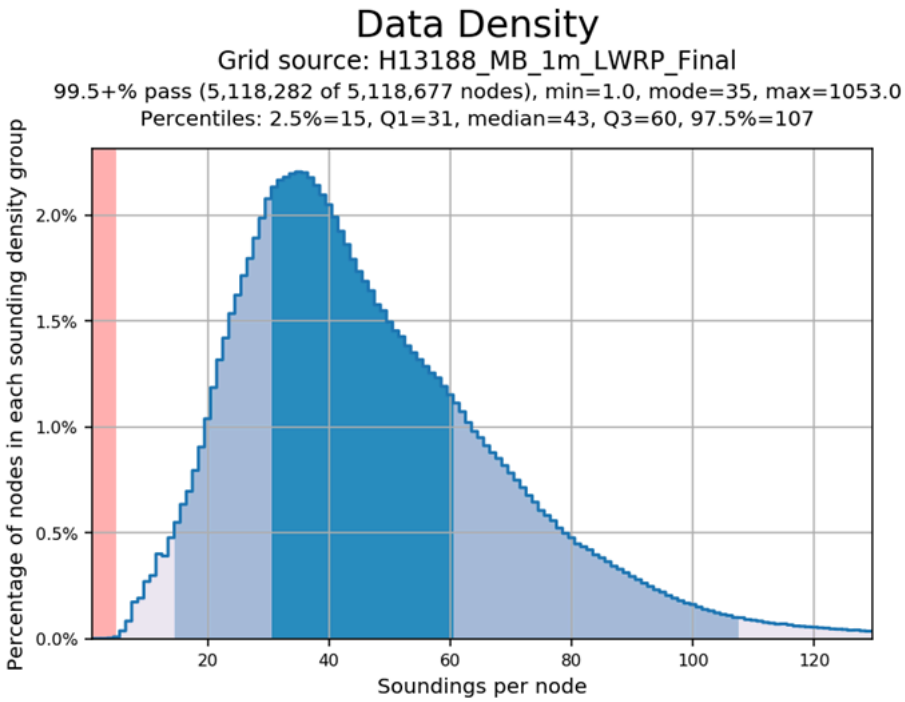


Figure 18: Node density statistics - 1m finalized

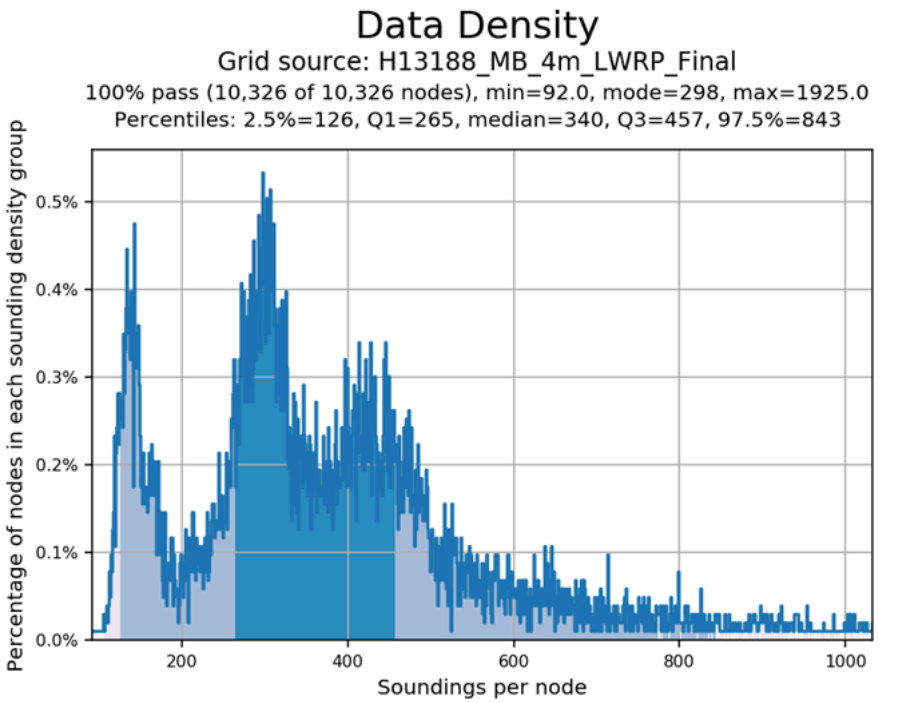


Figure 19: Node density statistics - 4m finalized

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 the field unit was physically unable to operate, or safety concerns limited access.
- 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 underneath barge fleets or 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 barge fleet or 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 that exist in the final surfaces have been noted in the H13188_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 H13188_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

The following calibrations were conducted after the initial system calibration discussed in the DAPR:

Calibration Type	Date	Reason
Patch Test	2019-09-05	Remobilization of OPR-J347-KR-18 fieldwork

Table 10: Calibrations not discussed in the DAPR.

A patch test was conducted for the S/V Blake on September 5, 2019 (DN248) before recommencing acquisition on OPR-J347-KR-18. This patch test was not finalized by the office before submittal of the DAPR on September 20, 2019 and is included in the HVF submitted with this survey.

B.4 Backscatter

Multibeam backscatter was logged in Hypack 7k format and included with the H13188 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.

For the dual-head sonar configuration used in this survey, the processed depth files in the HDCS survey lines contain combined bathymetric data from both sonar heads. However, due to software limitations, the resulting gsf and backscatter mosaic are based on time series data in .7k files (snippets data) from one individual sonar head, paired with the dual-head sounding data. This is represented in the backscatter mosaic with the vessel name BlakeDHS and BlackDHP, indicating one set of .7k files from the starboard or port head, respectively, of the dual-head system was paired with the combined-head HDCS.

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 11: 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
H13188_MB_50cm_LWRP	CARIS Raster Surface (CUBE)	0.5 meters	-4.424 meters - 50.029 meters	NOAA_0.5m	Object Detection
H13188_MB_1m_LWRP	CARIS Raster Surface (CUBE)	1 meters	-4.404 meters - 49.973 meters	NOAA_1m	Object Detection
H13188_MB_4m_LWRP	CARIS Raster Surface (CUBE)	4 meters	-4.285 meters - 49.875 meters	NOAA_4m	Object Detection
H13188_MB_50cm_LWRP_Final	CARIS Raster Surface (CUBE)	0.5 meters	-4.424 meters - 20.000 meters	NOAA_0.5m	Object Detection
H13188_MB_1m_LWRP_Final	CARIS Raster Surface (CUBE)	1 meters	18.000 meters - 40.000 meters	NOAA_1m	Object Detection
H13188_MB_4m_LWRP_Final	CARIS Raster Surface (CUBE)	4 meters	36.000 meters - 49.875 meters	NOAA_4m	Object Detection

Table 12: Submitted Surfaces

Bathymetric grids were created relative to LWRP in CUBE format using Object Detection resolution requirements as described in the HSSD.

B.5.3 Rejection of Fill and Investigation Data in Areas of Disagreement

Fill and investigation data were collected by the S/V Blake on September 9, 2019 (DN252). Due to historic flooding restricting access to these areas, there was approximately a one-year stand down on survey operations after mainscheme acquisition. Areas of large disagreement exist in these data where the river bottom has greatly changed since the prior mainscheme collection. HSD staff provided guidance on how to address data that impacted the surface deliverables negatively for data acquired on DN252. To limit the effect on the surface, soundings collected on this fill and investigation day of survey that were in disagreement with previous acquisition have been rejected in subset editor. Investigation lines with soundings on a feature that remained intact over time were generally accepted, and the surrounding soundings on the seafloor that caused disagreement were rejected. Figure 20 illustrates an example of large disagreement of 6 meters between mainscheme acquisition and a investigation line, 2019BL2522117. The following details how specific lines were processed.

Lines with all soundings completely rejected in subset editor:
2019BL2522215 (fill line, no feature present in holiday)
2019BL2522223 (fill line, no feature present in holiday)
2019BL2522228 (fill line, no feature present in holiday)

Line 2019BL2522117 has partially rejected soundings in areas of large disagreement.

Line 2019BL2522047 generally agrees with the prior survey lines and was processed as discussed in the DAPR.

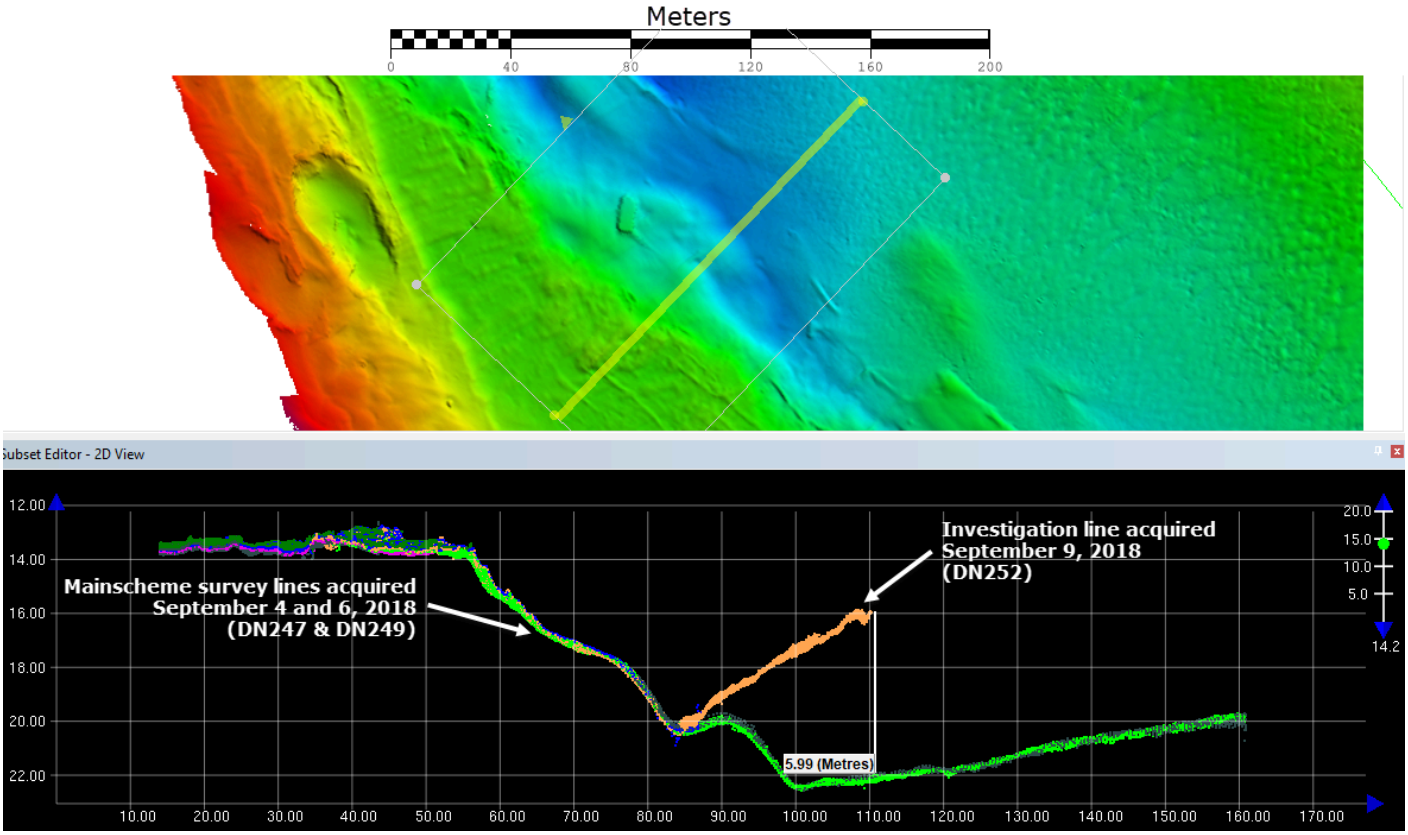


Figure 20: Example of large disagreement from rejected line 2019BL25221117

The "Investigation line acquired" date should be September 9, 2019 in Figure 20.

B.5.4 Designated Soundings

A total of 210 soundings in H13188 were designated in bathymetric data: 205 soundings to facilitate feature management for inclusion in the H13188 Final Feature File (FFF), and five soundings to override the gridded surface model.

B.5.5 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.5.6 Mobile Laser Scanner Data

A vessel-based 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. If vessels at berth limited lidar data collection during initial MMS acquisition in high priority areas assigned in the Project Instructions, data were attempted to be reacquired using the secondary laser scanner during MBES survey operations. Further, supplemental photographs were taken of some features where the MMS imagery was not sufficient to accurately depict the feature.

C. Vertical and Horizontal Control

A complete description of the horizontal and vertical control for survey H13188 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 13: ERS method and SEP file

While ERS via VDATUM is listed in Table 13, it was one of the limited options available in the XML DR schema's enumerated values. The separation model covering the H13188 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. 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 15.

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 H13188. 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 H13188 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?
US6LA54M	1:12000	10	04/04/2019	04/04/2019	NO

Table 14: Largest Scale ENCs

US6LA54M

ENC US6LA54M covered the entire extents of survey H13188. Figures 21 through 37 show the magnitude of differences along the comparison area.

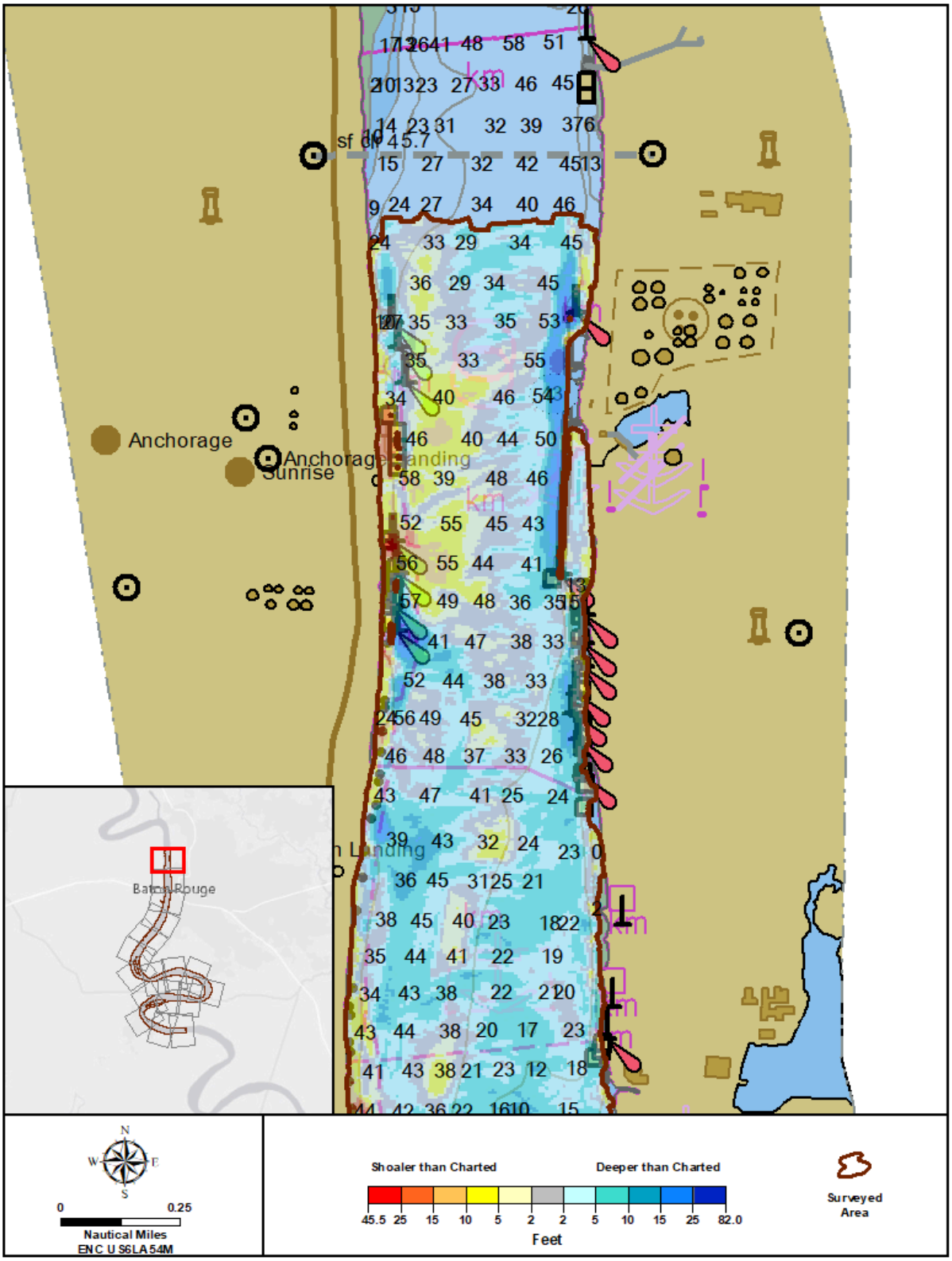


Figure 21: Depth difference between H13188 and chart US6LA54M, area 1 of 17

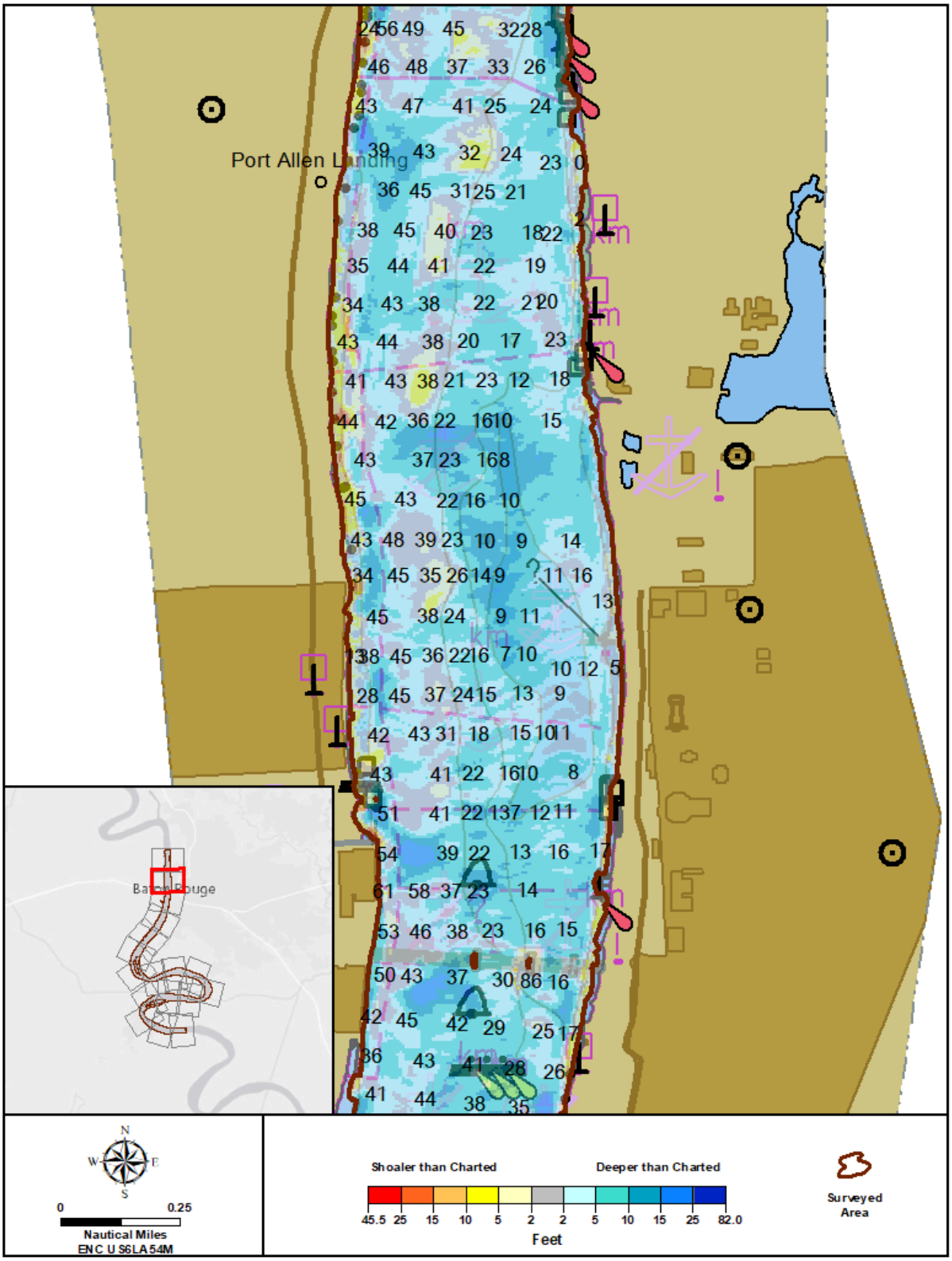


Figure 22: Depth difference between H13188 and chart US6LA54M, area 2 of 17

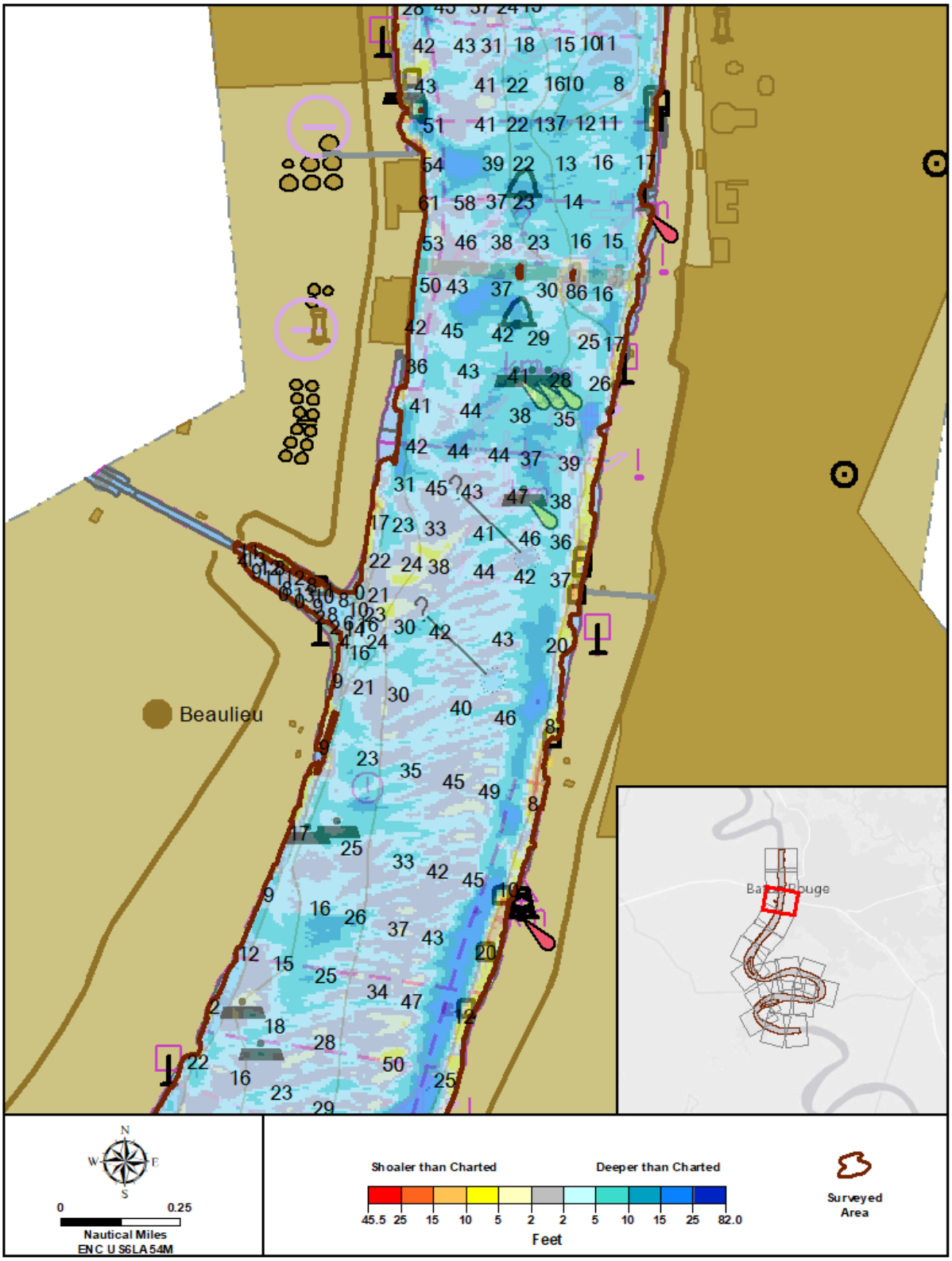


Figure 23: Depth difference between H13188 and chart US6LA54M, area 3 of 17

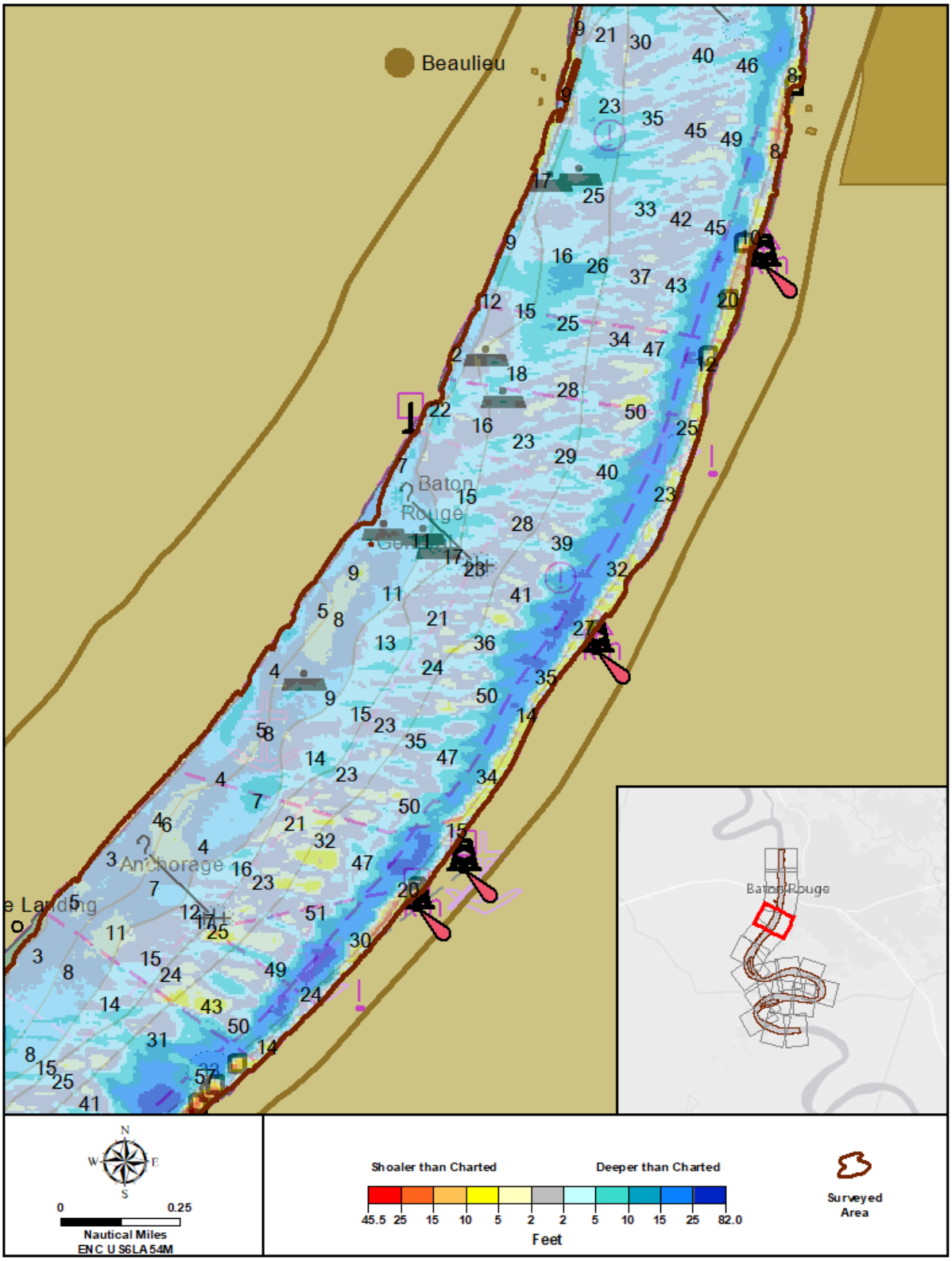


Figure 24: Depth difference between H13188 and chart US6LA54M, area 4 of 17

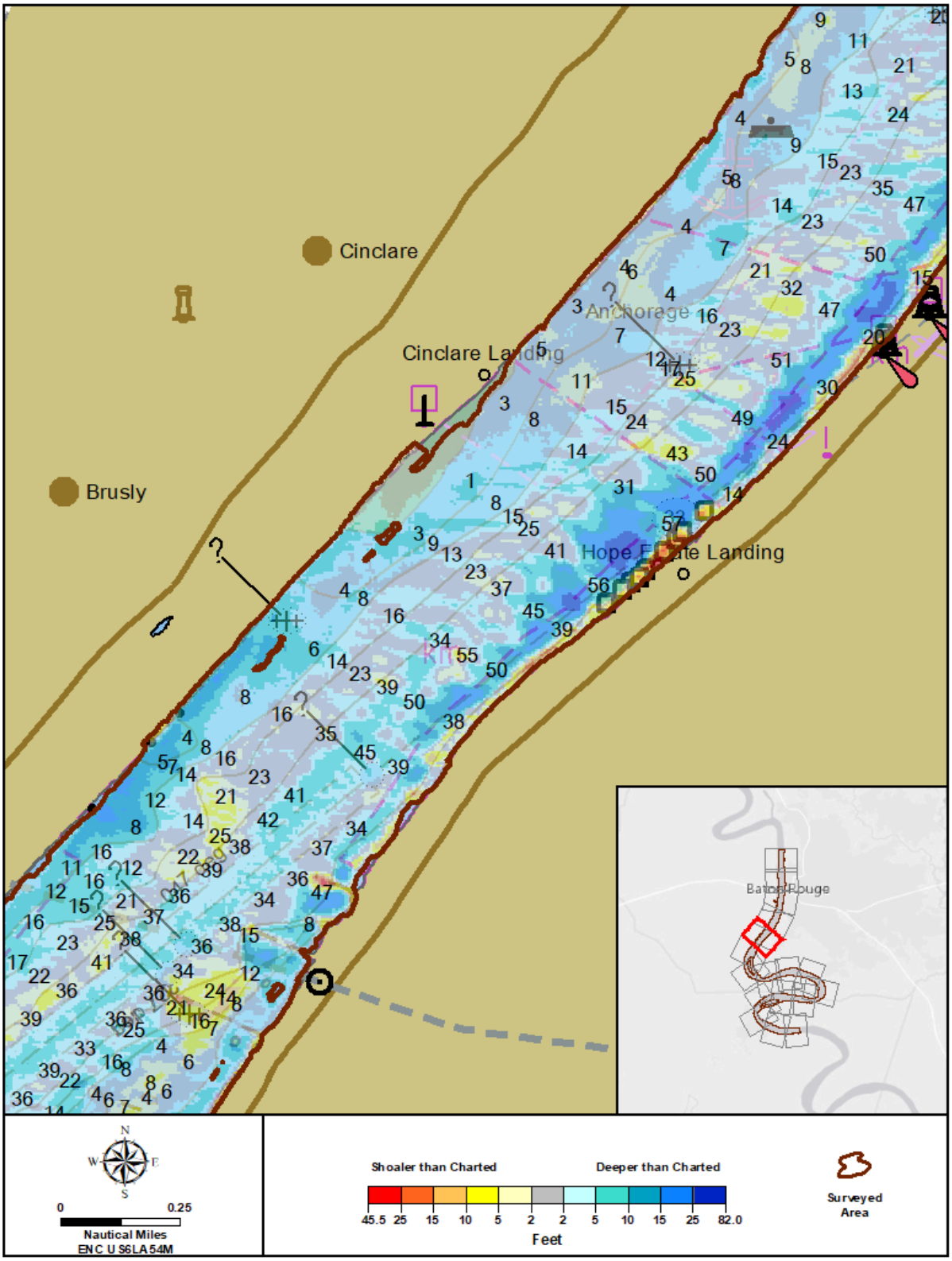


Figure 25: Depth difference between H13188 and chart US6LA54M, area 5 of 17

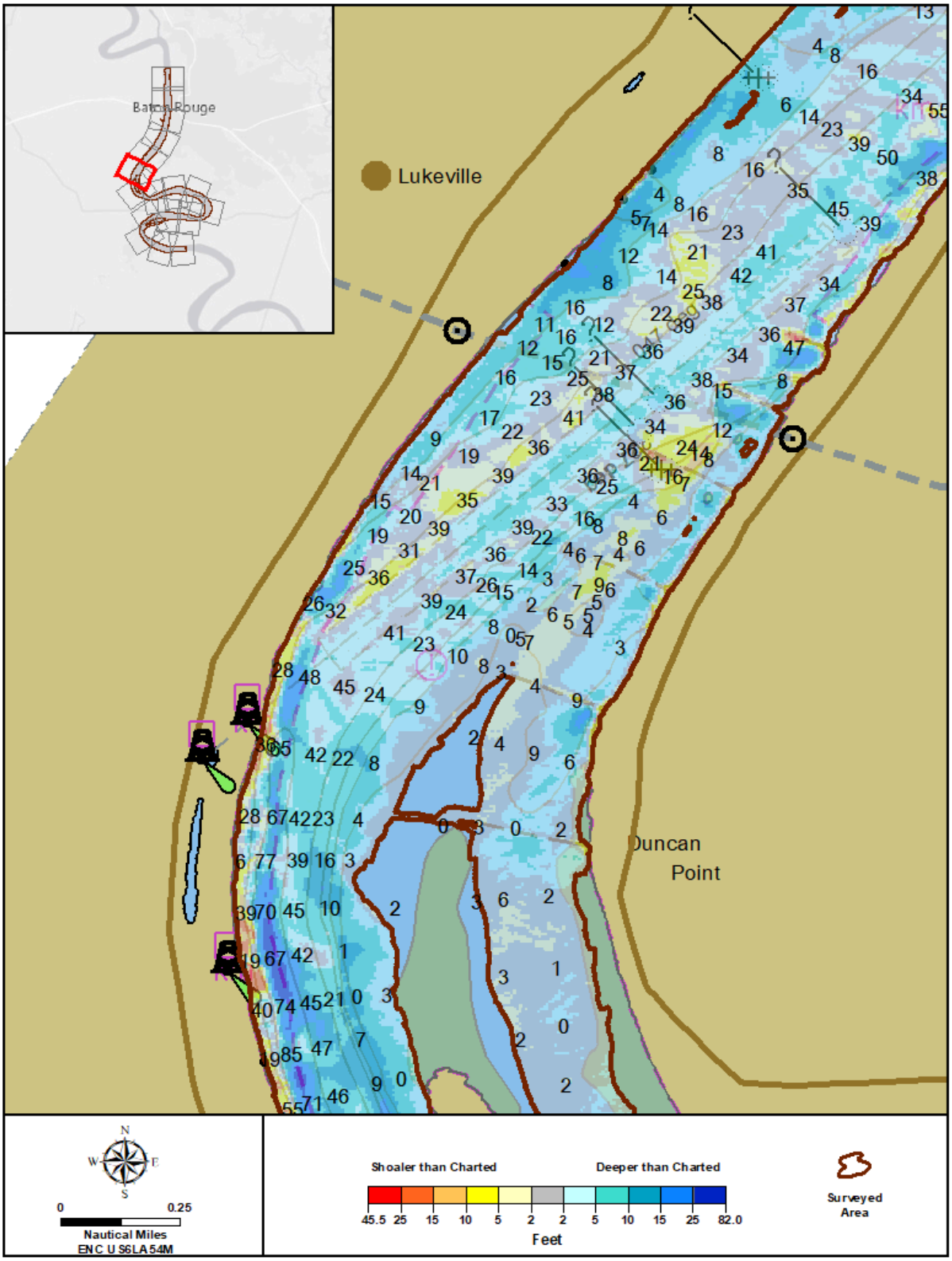


Figure 26: Depth difference between H13188 and chart US6LA54M, area 6 of 17

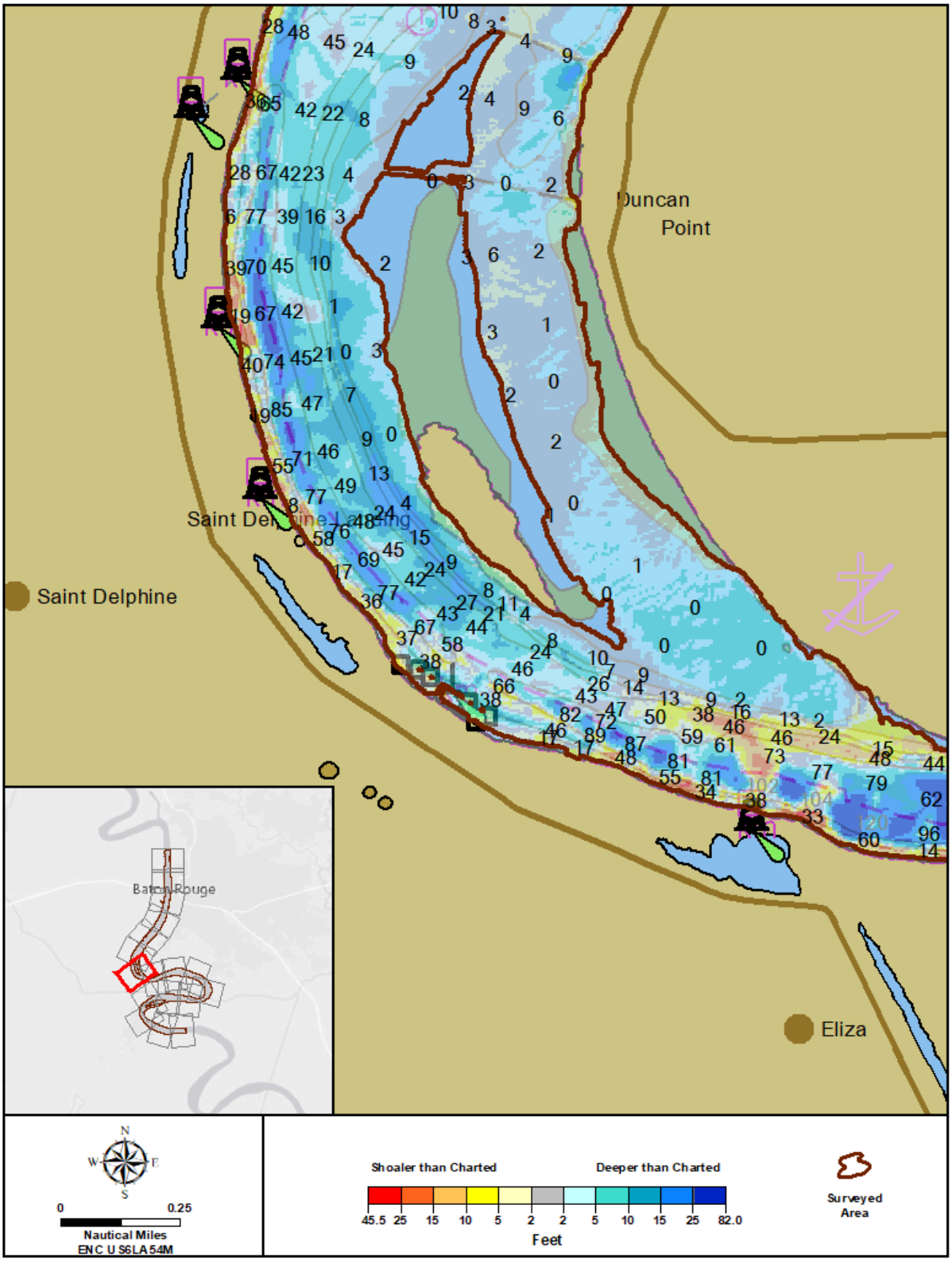


Figure 27: Depth difference between H13188 and chart US6LA54M, area 7 of 17

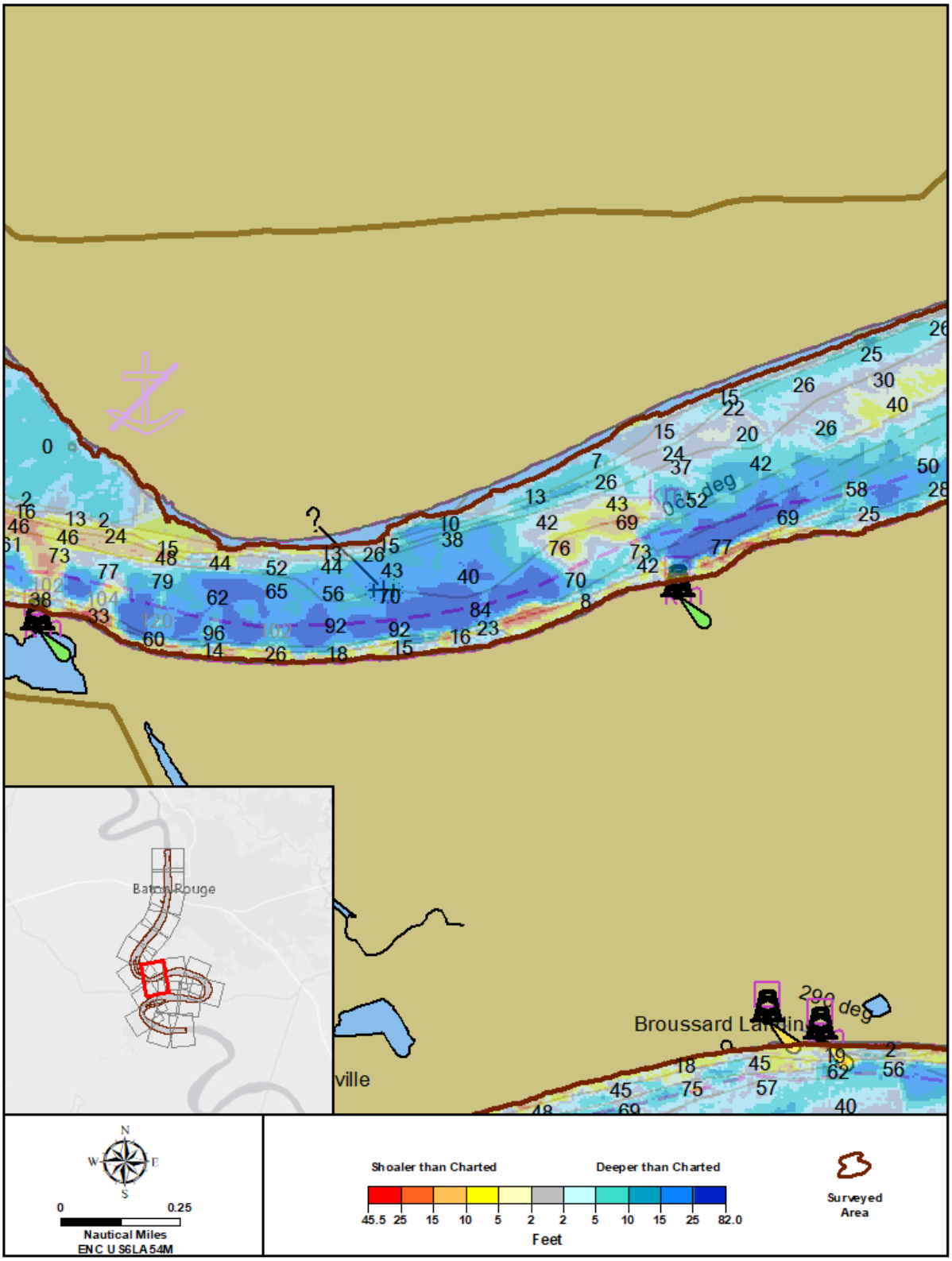


Figure 28: Depth difference between H13188 and chart US6LA54M, area 8 of 17

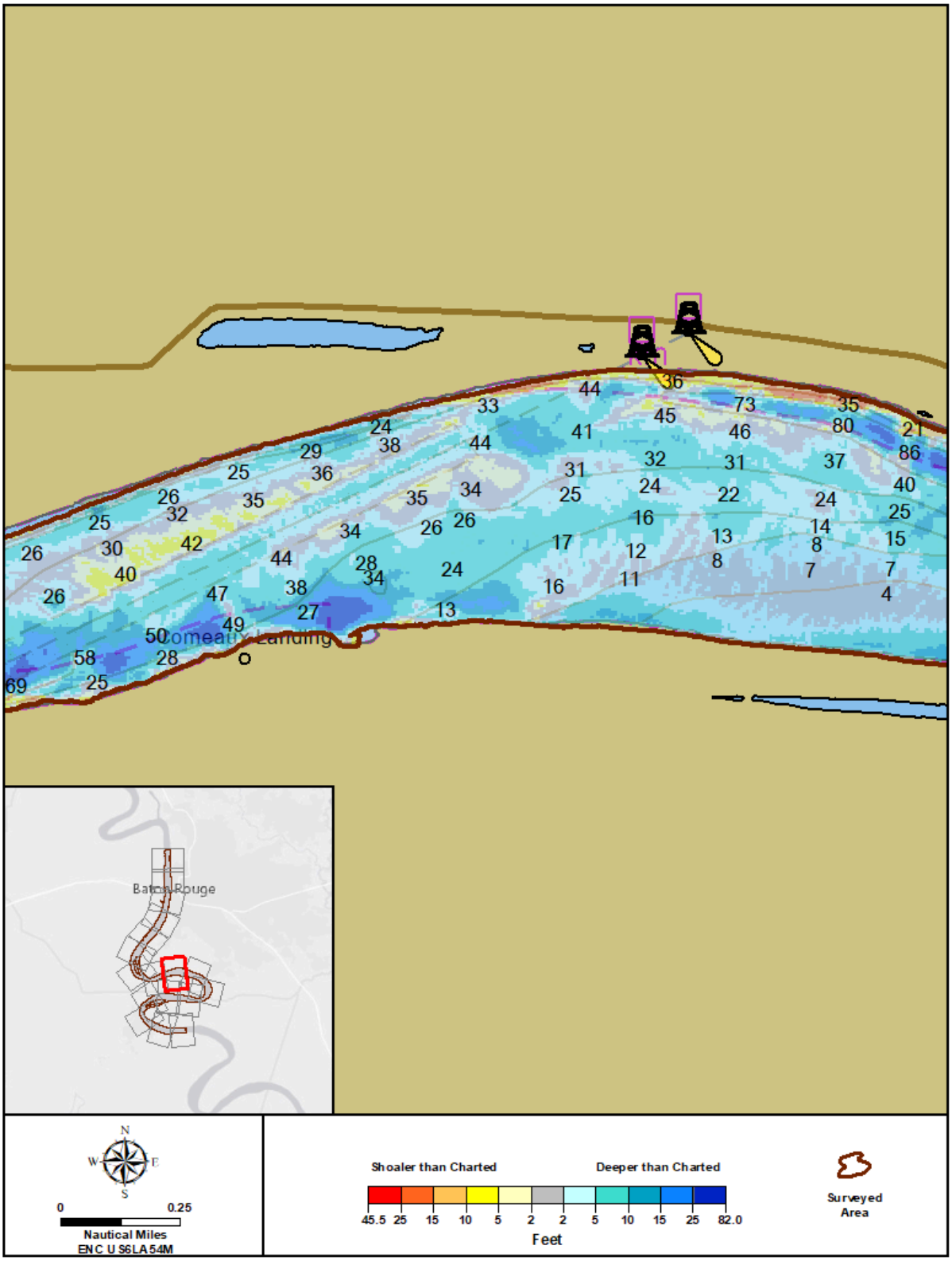


Figure 29: Depth difference between H13188 and chart US6LA54M, area 9 of 17

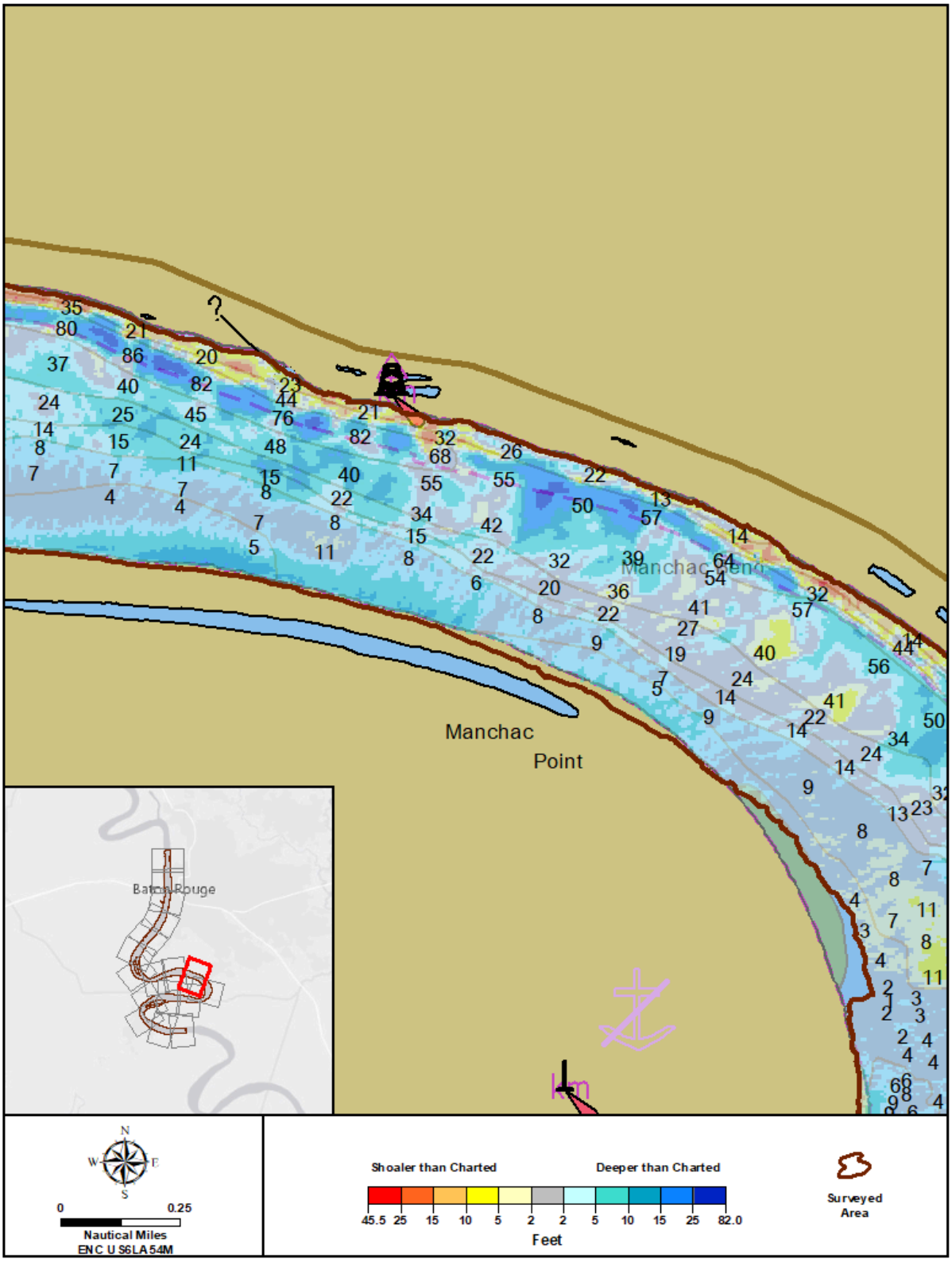


Figure 30: Depth difference between H13188 and chart US6LA54M, area 10 of 17

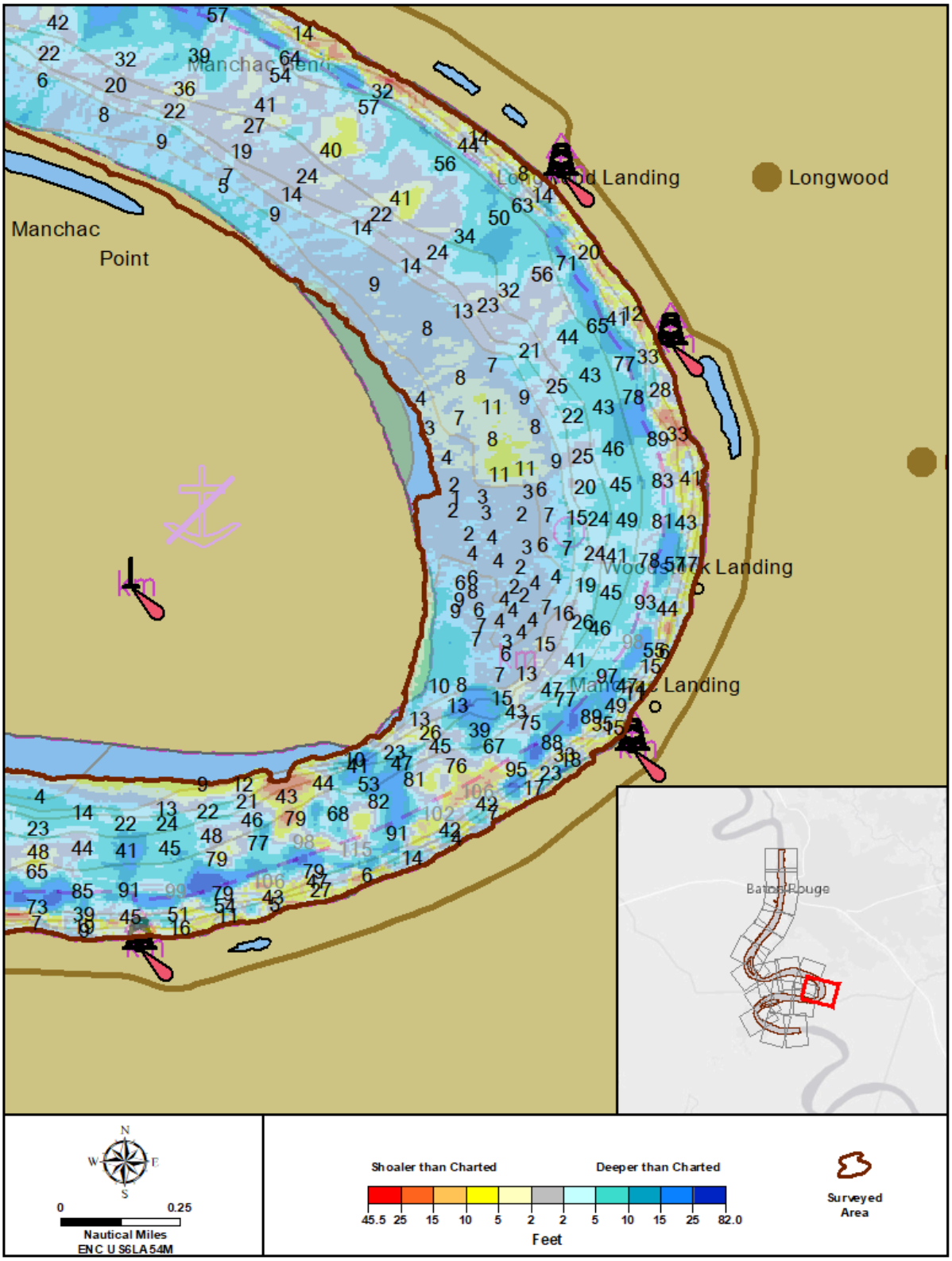


Figure 31: Depth difference between H13188 and chart US6LA54M, area 11 of 17

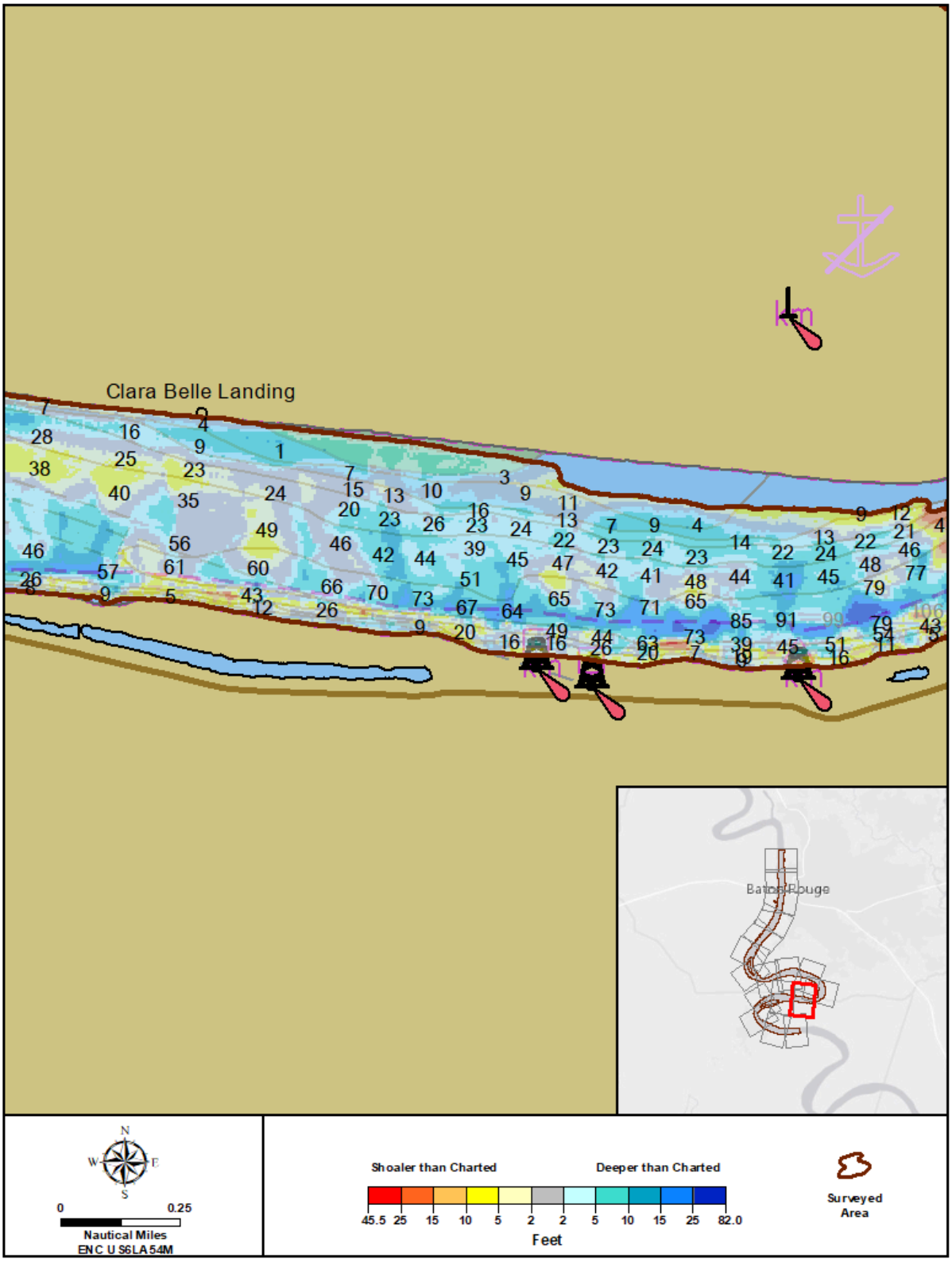


Figure 32: Depth difference between H13188 and chart US6LA54M, area 12 of 17

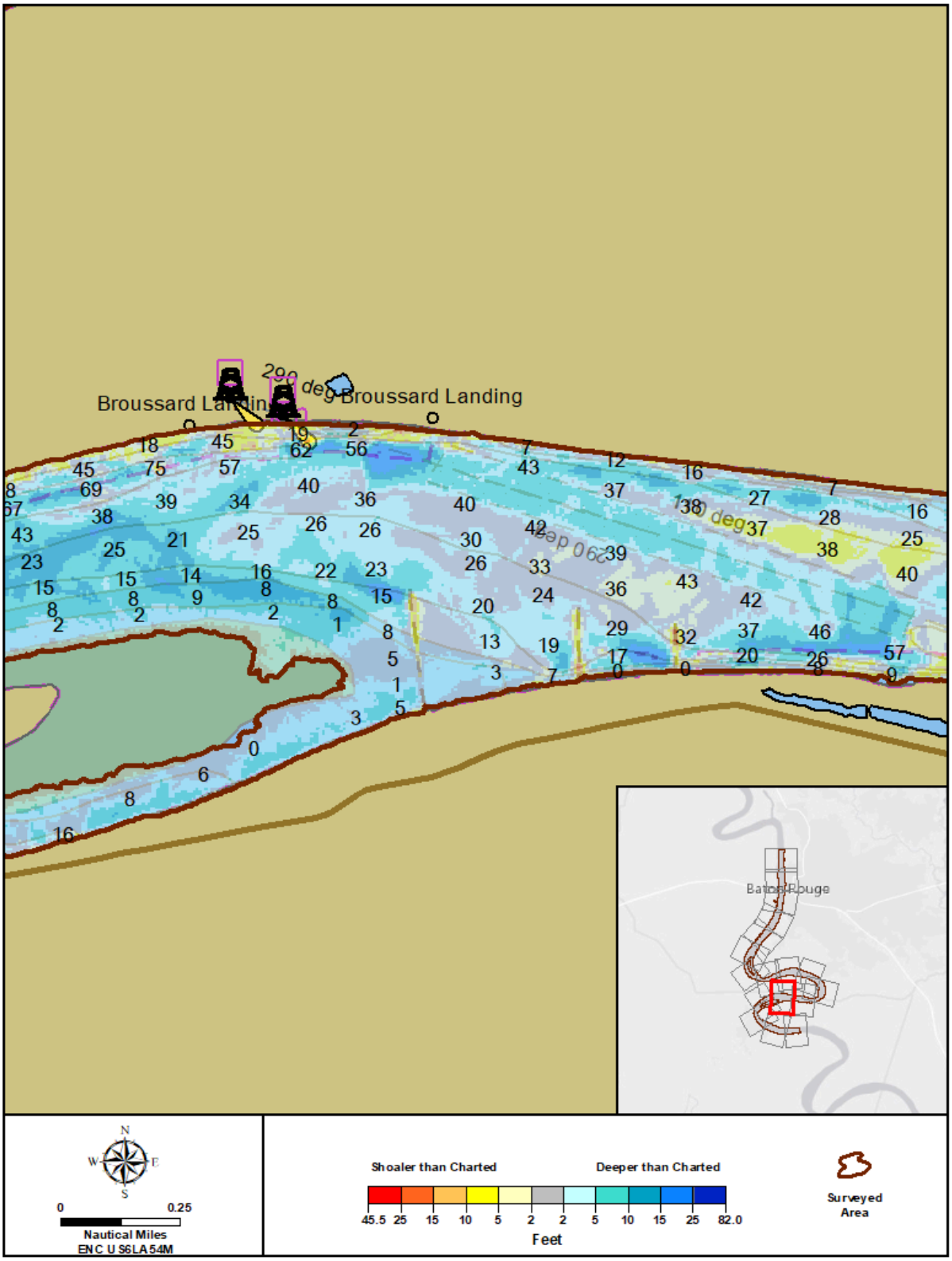


Figure 33: Depth difference between H13188 and chart US6LA54M, area 13 of 17

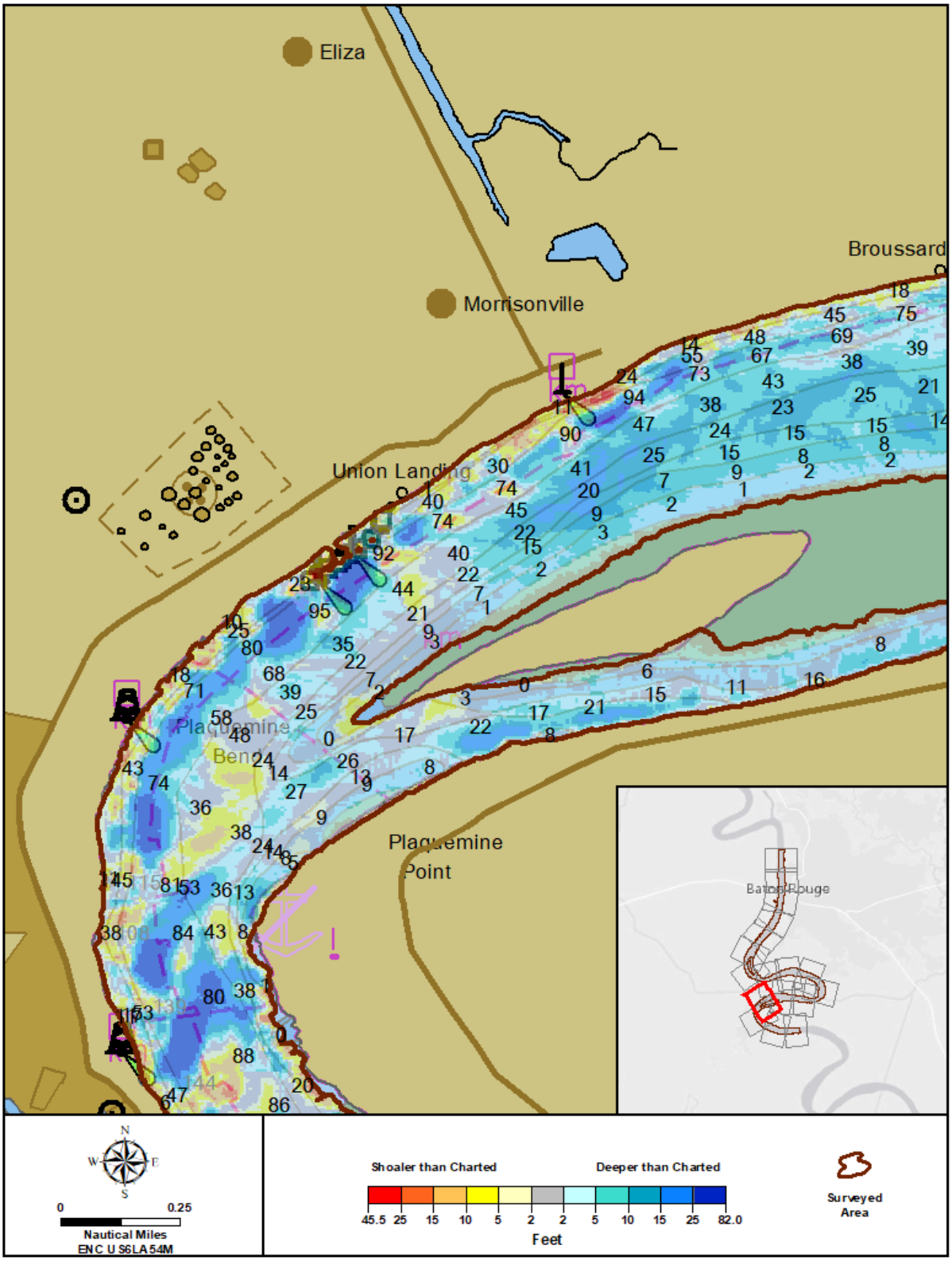


Figure 34: Depth difference between H13188 and chart US6LA54M, area 14 of 17

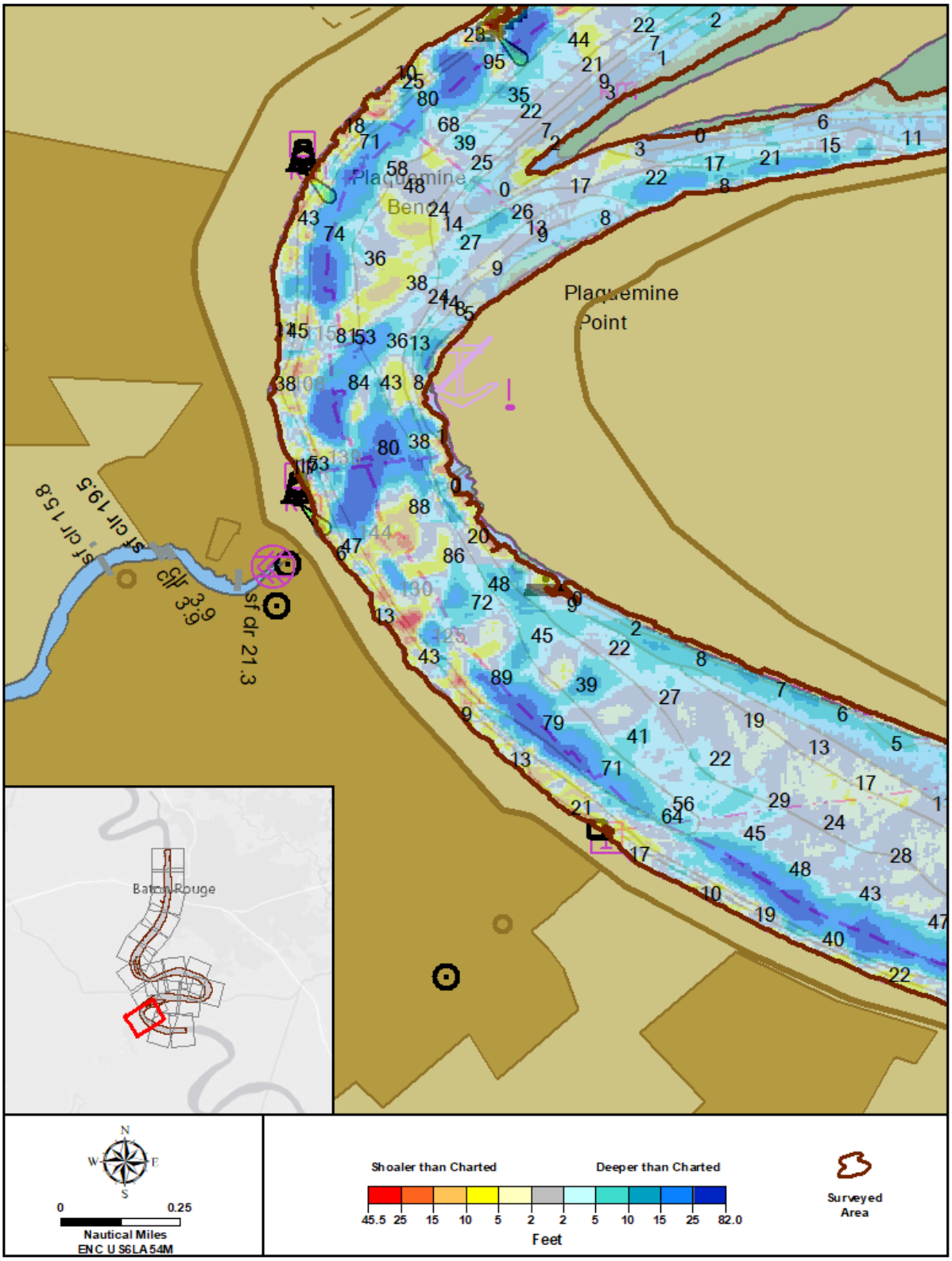


Figure 35: Depth difference between H13188 and chart US6LA54M, area 15 of 17

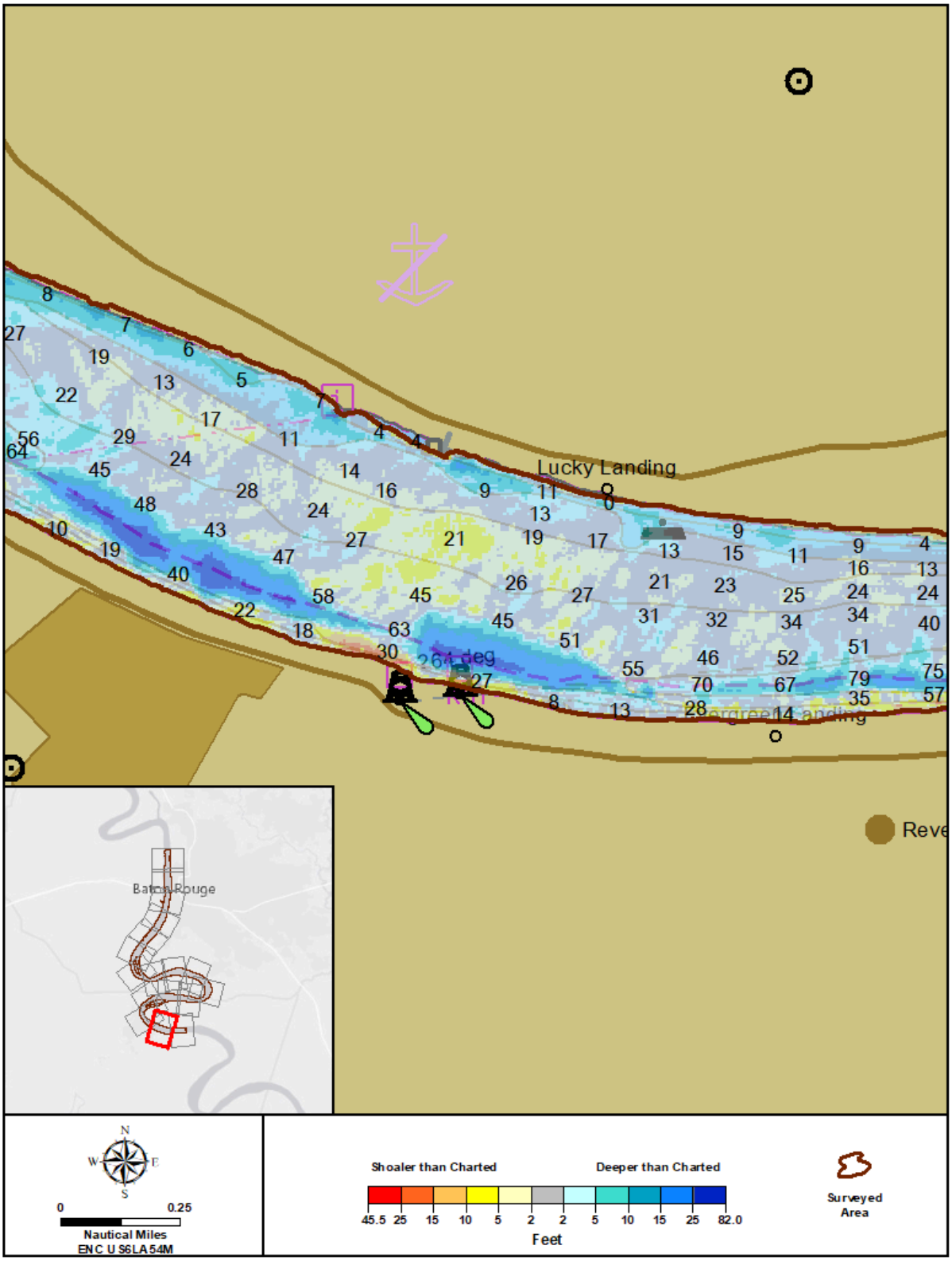


Figure 36: Depth difference between H13188 and chart US6LA54M, area 16 of 17

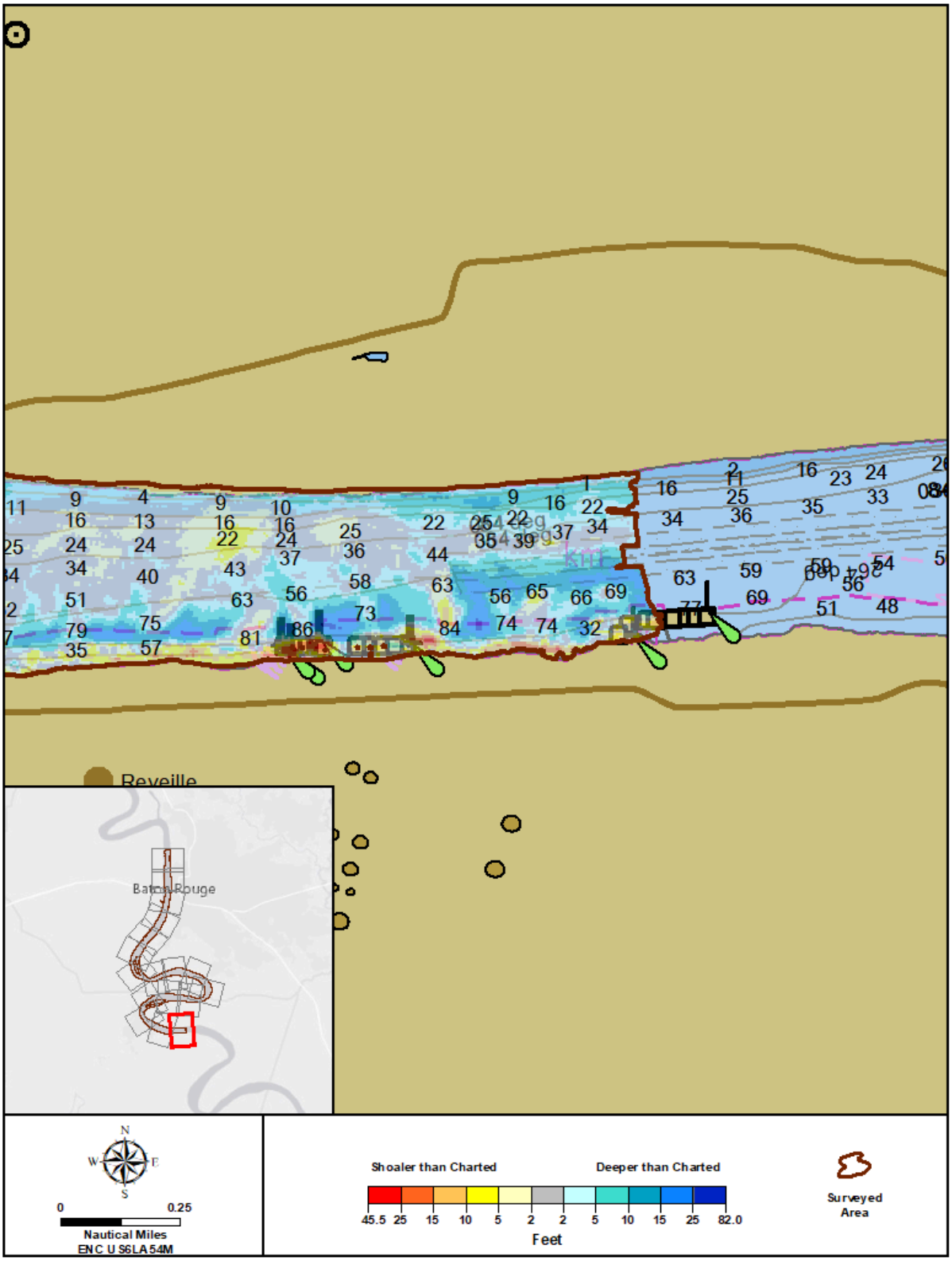


Figure 37: Depth difference between H13188 and chart US6LA54M, area 17 of 17

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 H13188. All assigned features included in the project Composite Source File (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 17 charted features labeled as Position Approximate (PA) and/or Reported (rep).

- The Wreck PA, always dry, charted along the east bank at mile 230.0 AHOP was disproved by the survey.
- The Obstruction PA with depth unknown charted mid river at mile 228.6 AHOP was disproved by the survey.
- The Obstruction PA with depth unknown charted mid river at mile 228.3 AHOP was disproved by the survey.
- The Shoal rep 1984 charted along the west bank at mile 228.0 AHOP can be updated with surveyed depths.
- The Shoaling rep 2017 PA charted along the east bank at mile 227.0 AHOP can be updated with surveyed depths.
- The Wreck PA with depth unknown charted mid river at mile 226.9 AHOP was disproved by the survey.
- The Wreck PA with depth unknown charted mid river at mile 225.9 AHOP was disproved by the survey.
- The Shoaling rep 2016 PA charted mid river at mile 225.8 AHOP can be updated with surveyed depths.
- The Wreck PA with depth unknown charted along the west bank at mile 225.0 AHOP was relocated 37m northwest of the charted location by the survey.
- The Obstruction PA with depth unknown charted mid river at mile 224.9 AHOP was disproved by the survey.
- The Obstruction PA with depth unknown charted mid river at mile 224.3 AHOP was disproved by the survey.
- The Obstruction PA with depth unknown charted mid river at mile 224.2 AHOP was disproved by the survey.
- The Wreck PA with depth unknown charted along the east bank at mile 224.1 AHOP was disproved by the survey.
- The Shoaling rep 2017 PA charted mid river at mile 223.4 AHOP can be updated with surveyed depths.
- The Wreck PA with depth unknown charted mid river at mile 220.6 AHOP was disproved by the survey.
- The Obstruction PA with depth unknown charted along the east bank at mile 217.4 AHOP was disproved by the survey.

- The Shoal PA charted mid river at mile 215.3 AHOP can be updated with surveyed depths. The Shoal PA is in the vicinity of submitted Danger to Navigation (DtoN) 2 further discussed in section D.1.5 of this report.

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 of ‘New’. The FFF includes assigned features, both baring and submerged, charted shoreward of the NALL that were too hazardous to survey. The baring features were either beyond the detection range of the MMS or obscured by river traffic, such as moored vessels or barge fleets. Multiple unsuccessful attempts were made to detect these outstanding obscured features. 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

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 Dangers to Navigation to immediate hazards that could cause loss of life or impact waterborne commerce.

Three DtoN reports were submitted for this survey; one on September 18, 2018 and two on October 9, 2018.
- Survey H13188 DtoN 1 reported an uncharted obstruction between miles 232 and 233 AHOP. The obstruction lies approximately 45 meters from the Exxon Oil dock on the river's east bank and was submitted with preliminary geometry and VALSOU attributes. This feature has been added to the relevant ENC and RNC charts using preliminary survey information. The FFF includes this DtoN submission as an area wreck with final VALSOU attributed.
- Survey H13188 DtoN 2 reported significant shoaling and the realignment of the channel in the vicinity of Manchac Point (mile 215 AHOP). The DtoN has been accurately portrayed on the relevant ENC with updated soundings and contours. The relevant RNC has added soundings to reflect the shoaling area but has retained the old contours which may result in confusion of the mariner. This nonstandard DtoN has not been included in the H13188 FFF as it is depicted in the bathymetric surface provided.
- Survey H13188 DtoN 3 reported an uncharted obstruction within a charted revetment area at mile 225 AHOP with preliminary geometry and VALSOU attributes. This feature has been added to the relevant ENC and RNC charts using preliminary survey information. The FFF includes this DtoN submission as an area obstruction with final VALSOU attributed.

D.1.6 Channels

There are no pilot boarding areas within the limits of survey H13188.

The Upper Baton Rouge Anchorage, Middle Baton Rouge Anchorage, Lower Baton Rouge Anchorage and Baton Rouge General Anchorage are charted within the H13188 survey limits. MBES data acquired within this anchorage was carefully reviewed for features that could pose a risk to anchoring or navigation. New features were discovered in the Baton Rouge General Anchorage and the Lower Baton Rouge Anchorage. All surveyed features within the designated anchorages are included in the FFF.

Survey area H13188 contains the Red Eye, Sardine Point, Medora, and Granada Crossing Channels. According to the chart, the project depth for crossing channels is 45 feet (13.7 meters) for a width of 500 feet (152.4 meters). The controlling depths are published in Navigation Bulletins issued periodically by the New Orleans District Corps of Engineers, New Orleans, Louisiana. Crossing channels may be marked by buoys during low water. The crossing channels, using the project depth of 45 feet, are included in the chart comparison graphics, Figures 24, 28, 29, 33 and 37, above. In general surveyed depths are deeper than the project depths of the crossing channels, but small areas of encroachment (portrayed by the yellow colors in the comparison graphics) can be seen in all of the aforementioned crossing channels.

There are 12 range lights associated with all crossing channels within the limits of survey H13188. The Arlington Range rear light, Red Eye Range front light, both Richard Powell Range front and rear lights, both Old Hermitage Range front and rear lights, Medora Range front light, and Saint Louis Plantation Range front light were surveyed at charted locations. The Arlington Range front light, Red Eye Range rear light, Medora Range rear light, and Saint Louis Plantation Range rear light were too far or blocked from the lidar sensor for accurate returns and not addressed with this survey.

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 mobile lidar and imagery 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

One overhead cable and one bridge exist in the H13188 survey area. The Project Instructions required that these features be scanned with a mobile lidar system during survey operations and that published clearance heights be compared to surveyed clearances.

Overhead clearances were determined using LAS data acquired with the Riegl VUX 1HA mobile mapping system using ERS methods and the NOAA provided custom separation model. All clearances were determined relative to the Mississippi River Low Water Reference Plane (2007).

The bridge clearance was computed using Orbit 3DM Feature Extraction Pro (version 19.7), which includes an automated bridge clearance module specifically designed to compute bridge clearance heights. This functionality is typically used in the roadway transportation industry, but with cooperation from DEA, Orbit GT enhanced the software to operate on bridges spanning waterways relative to chart datum. The automated bridge clearance module required a LAS dataset relative to chart datum and an input polygon defining the area of interest where a clearance should be determined. Using the LAS data as a horizontal reference for the bridge structure, DEA created the input polygons, limiting the bounds of the polygon to areas spanning water, excluding land, bridge piers, and bridge fenders.

The clearance on the overhead cable was determined by using CARIS Base Editor to identify the valid LAS point with the lowest elevation at each cable crossing. Because the LAS data extended on to shore, the search area was limited to the portion of the cable spanning the river.

Both the Raster Nautical Chart (RNC) and ENC for this area include charted clearance heights for bridges and cables. The charted heights for all overhead features are identical on the RNC and ENC, though the ENC does not note the vertical datum for the assigned overhead features. The vertical datum for overhead features listed on the RNC is the Mississippi River 1927 High Water Plane (HWP), which is over 44 feet above LWRP at Baton Rouge, LA. In order to make clearance heights more meaningful to chart users and ease the burden for the mariner to compute clearances from local water level gauge data, the hydrographer recommends charting all clearance heights relative to LWRP, not HWP. Water level data available for this stretch of the river are published by USACE relative to an approximation of LWRP. Other river systems, like the Columbia River in Oregon and Washington, use the low water gradient datum (chart datum) for charting of soundings and heights.

One overhead power cable is charted within the survey area in the vicinity of the Red Eye Crossing at mile 224.3 AHOP. Figure 38 includes a table comparing the surveyed clearance height relative to LWRP to the charted clearance height relative to HWP. Figure 39 depicts the result of the clearance analysis.

The Horace Wilkinson Bridge (also referred to as the Baton Rouge Highway Bridge) is charted at mile 229.3 AHOP. Figure 40 includes a comparison of the surveyed clearance height relative to LWRP to the

charted clearance height relative to HWP. Figure 41 shows a 3D view of surveyed clearance heights using the minimum value of the bridge relative to LWRP. The FFF includes BRIDGE area features that have been segmented based on the clearance analysis input polygons which include surveyed clearance heights relative to LWRP as depicted in Figure 40. Figure 42 illustrates clearance heights for the Baton Rouge Highway Bridge by the United States Coast Guard. These heights are referenced to the Port Allen gauge. The USACE operates the Baton Rouge (01160) gauge at Port Allen, which provides river levels 3.21 feet higher than LWRP.

The ENC does not include the name of the Horace Wilkinson Bridge in the feature's object name field. The hydrographer recommends adding the bridge name to the ENC.

As an alternate check to minimum clearance of the Baton Rouge Highway Bridge, DEA compared LAS data on the bridge height clearance board located on the bridge pier to the surveyed clearance (Figure 43). Adding the surveyed LAS elevation relative to LWRP to the 140-foot clearance mark resulted in a clearance of 160.3 feet above LWRP compared to the Orbit minimum clearance of 161.9 feet for the channel span.

There is one minor overhead cable in a navigationally insignificant area extending between dolphins and a pier. This overhead cable has been included in H13188 FFF with a description of 'New'. Though not specified in the Project Instructions, the clearance height of the feature was able to be determined with the MMS system and has been included in the vertical clearance attribute for the feature. The feature is included in the FFF to aid in the survey review and chart compilation process and attributed with a recommendation of 'For info only'.

	Published Height (HWP) (ft)	Surveyed Height (LWRP) (ft)
Overhead Cable (224.3 AHOP)	149.9	183.2

Figure 38: H13188 Overhead Cable Clearance

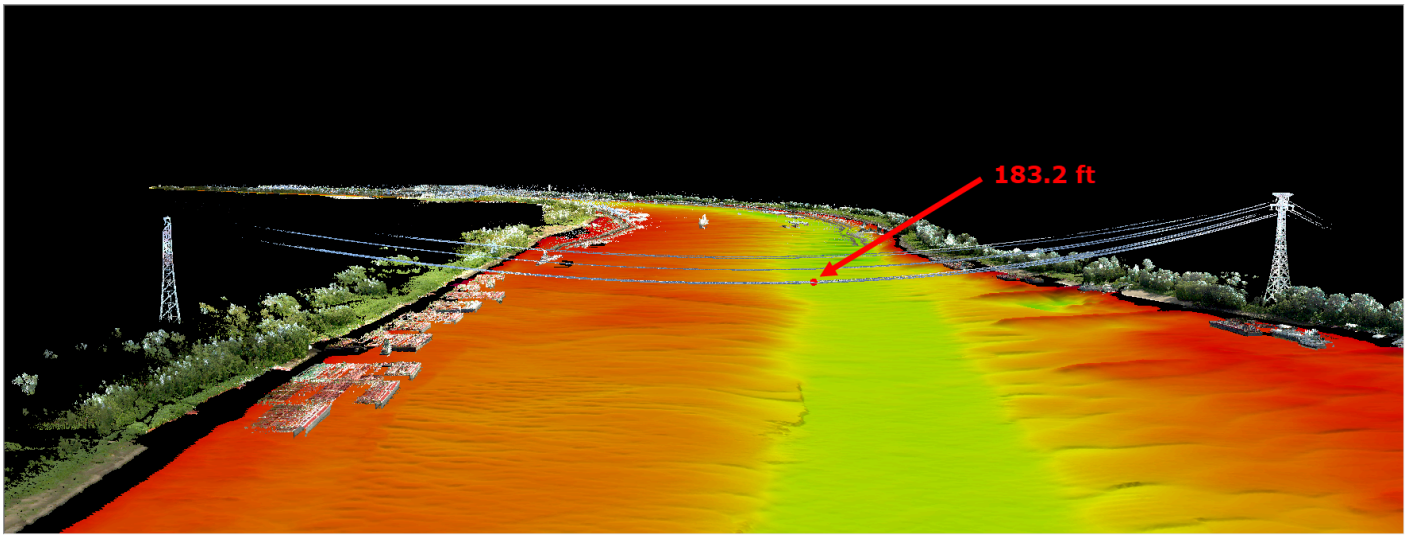


Figure 39: H13188 Overhead Cable Clearance (mile 224.3 AHOP, view looking upriver)

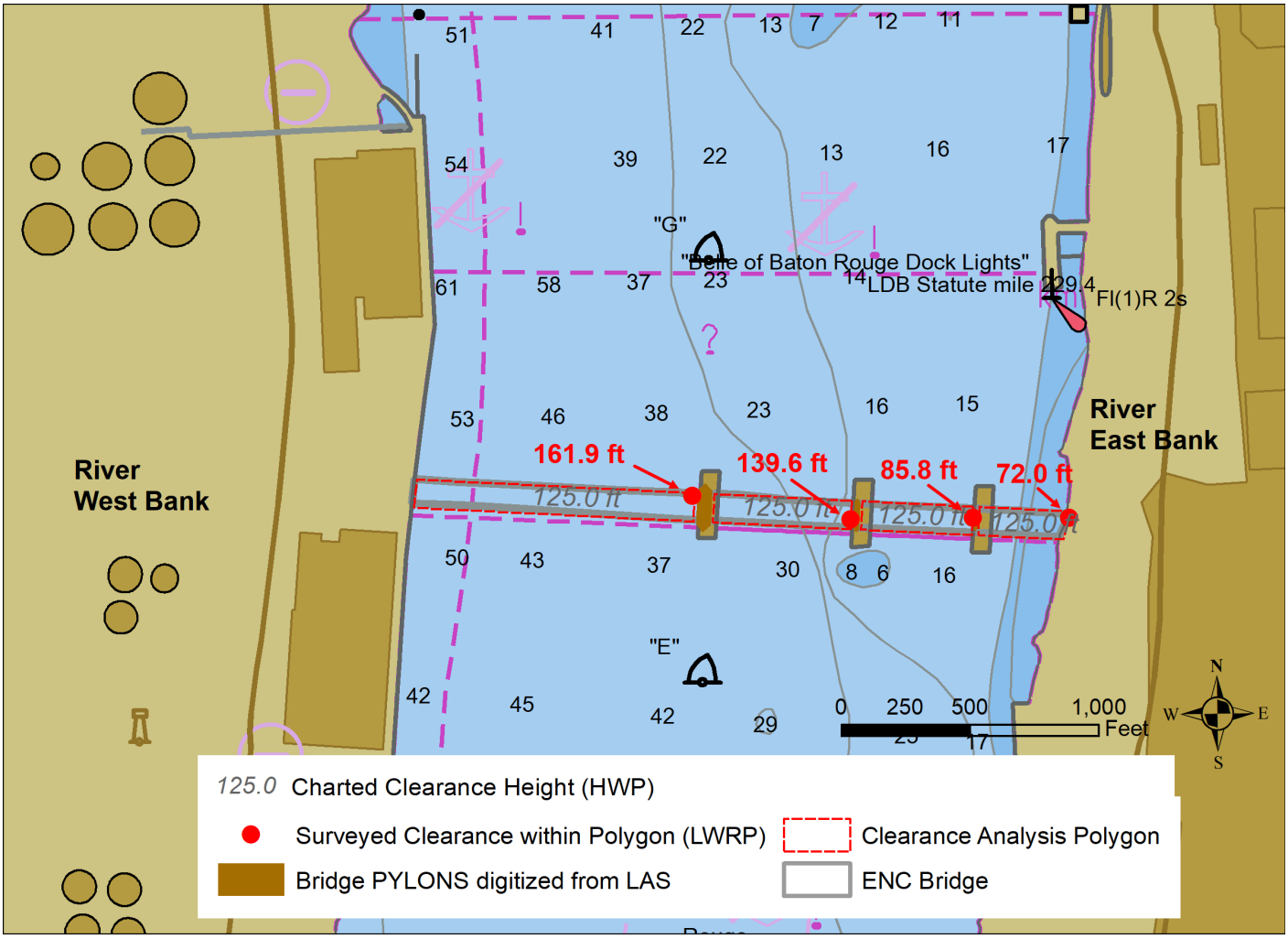


Figure 40: Horace Wilkinson Bridge Charted Clearance Comparison

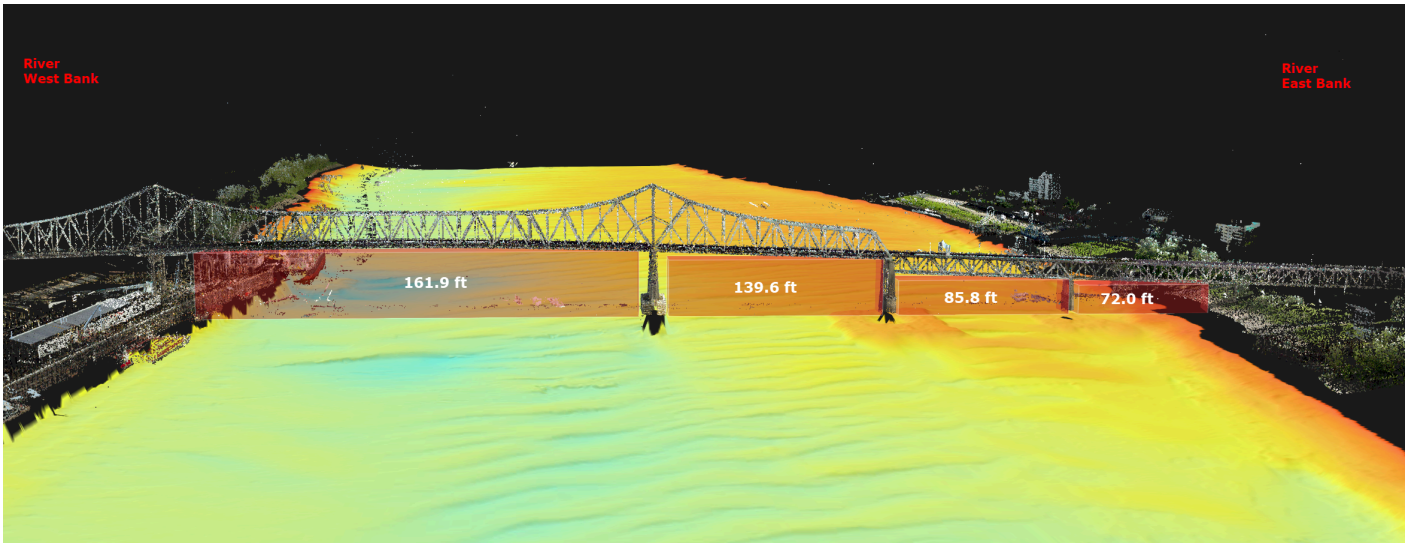
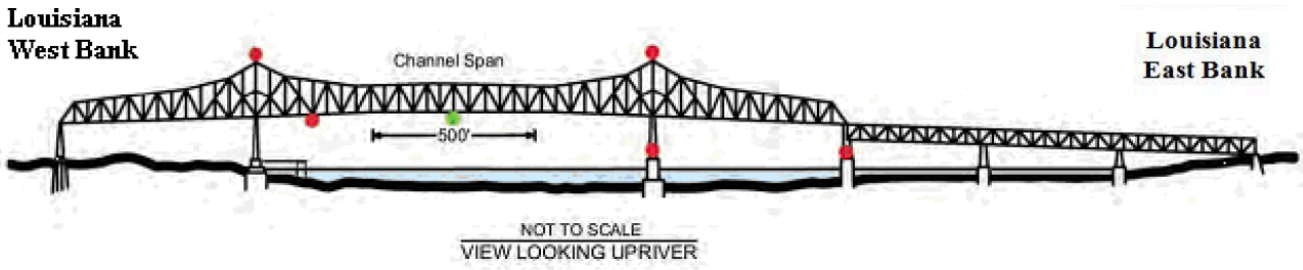


Figure 41: Horace Wilkinson Bridge Clearances (view looking upriver)

BATON ROUGE HWY BRIDGE (229.3)



Channel Span

- Center 500'
- Vertical Clearance = 174' minus Port Allen Gage
- Minimum Vertical Clearance = 127' at Port Allen Gage = 47'

Figure 42: Horace Wilkinson Bridge USCG Published Clearances

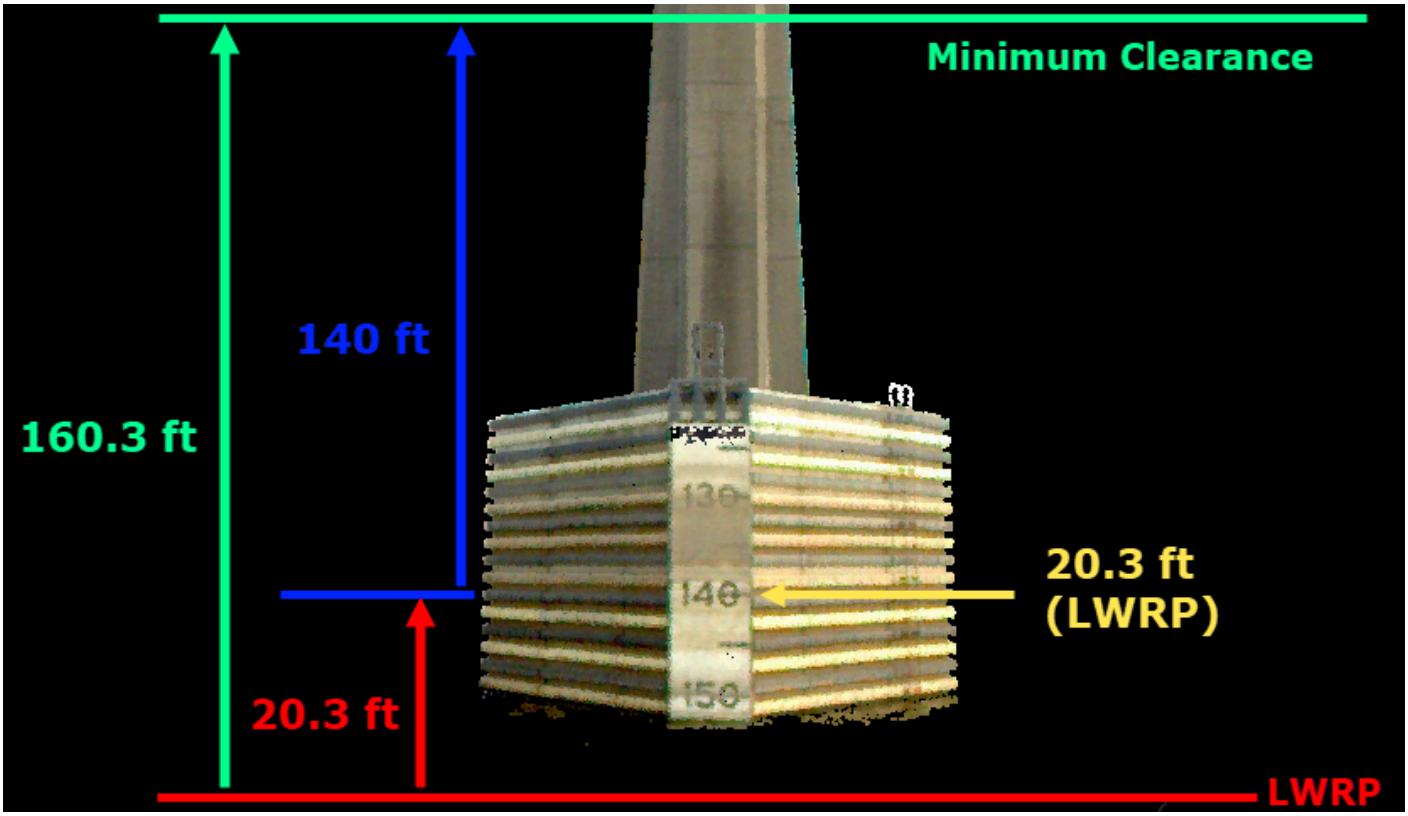


Figure 43: Horace Wilkinson Bridge Height Clearance Board

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 submerged cable areas, ten submerged pipeline areas, and one sewer pipeline charted in the survey extents of H13188, where anchoring, trawling, and dragging are restricted. When within the NALL, these precautionary areas and feature 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 H13188 has 12 new pipeline sections included in the FFF.

A pipeline report included in Appendix II, was submitted to the BSEE on August 19, 2019, reporting sections of exposed or unburied pipeline visible in the MBES data. The reports indicate 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

One ferry route exists within the limits of H13188. The Plaquemine to Sunshine Ferry (207.8 AHOP) was observed in operation during survey operations. The terminal on the east bank has surveyed geometry that matches the charted feature. The terminal on the west bank has updated geometry based on MMS data. The hydrographer recommends adding the route name to the ferry route's (FERYRT) object name on the ENC. The ferry route has not been included in the FFF as specified in the feature's CSF invesitgation requirements.

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.

Three dredging vessels were actively dredging during the time of survey operations in H13188. 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 were carefully reviewed. Dredging areas that created disagreement in the MBES surface were documented in the H13188_Notes_for_Reviewer.hob file with DRGARE area feature class, submitted in Appendix II of this report.

The following dredging activities were observed during survey operations on this sheet:
- The dredge, Wallace McGeorge, was observed actively dredging with dredging infrastructure and discharging downriver in the vicinity of Baton Rouge, approximately 231.5 AHOP on September 2, 2018.
- Dredging activity associated with maintaining the project depth for the Red Eye Crossing channel, approximately 223.7 AHOP, was observed discharging downriver on September 4, 5, and 7, 2018.
- Dredging activity associated with maintaining the project depth for the Sardine Point Crossing Channel, approximately 219.7 AHOP, was observed discharging downriver on October 7, 2018.

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 observed over the project timeline.

D.2.10 Barge Fleeting

Survey H13188 contained numerous areas where barge fleeting was present. This included both bank fleets and anchor fleets. These areas have been digitized from the MMS data and are included in the FFF with the MORFAC feature class with the recommendation of 'For info only'. Barge fleeting is continuously evolving and at any given time the barge fleet may be larger or smaller than the digitized areas submitted in the FFF. Barge fleets routinely limited the ability to reach the 2-meter survey coverage limits and resulted in unattainable holidays beneath the fleeting area. Figures 44 and 45 give project wide examples of the barge fleets experienced during survey operations.

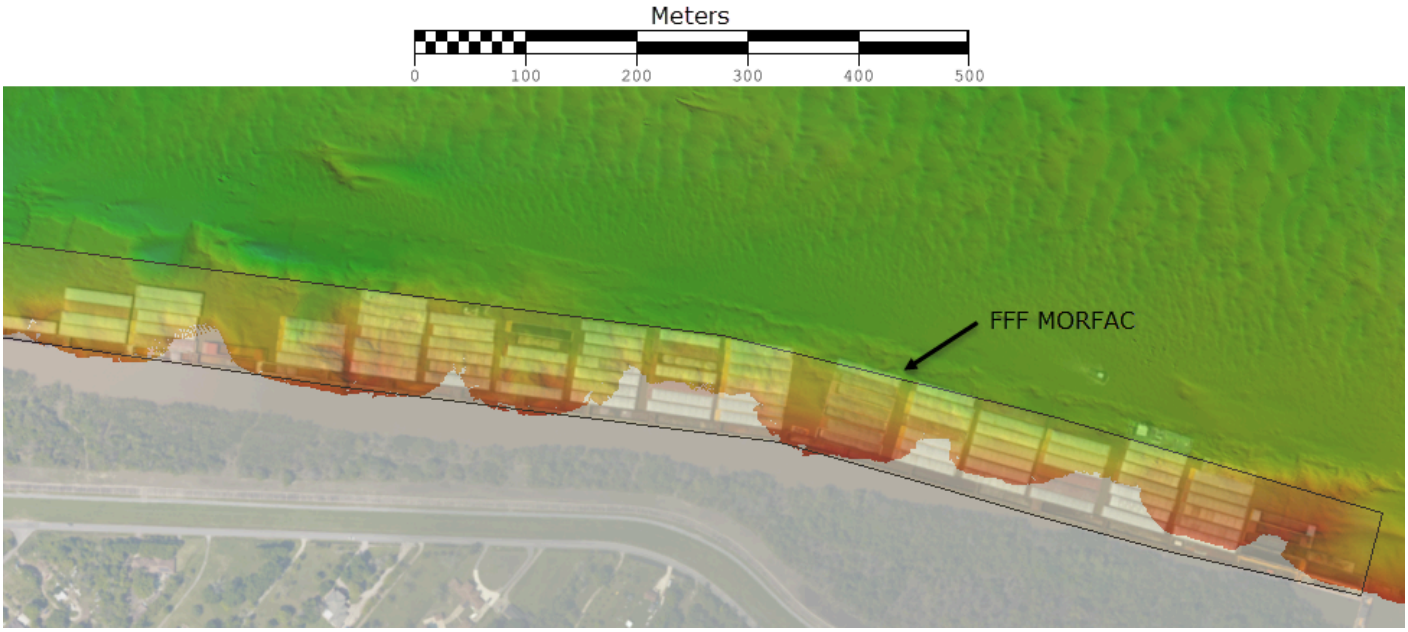


Figure 44: Survey data and barge fleet example found throughout the OPR-J347-KR-18 survey area

Figure 45: Photograph example of a barge fleet found throughout the OPR-J347-KR-18 survey area

D.2.11 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	12/13/2019	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: 2019.12.13 08:38:08 -08'00'
Jason Creech, CH	NSPS/THSOA Certified Hydrographer, Charting Manager / Project Manager	12/13/2019	Digitally signed by Jason Creech DN: cn=Jason Creech, o=David Evans and Associates, Inc., ou, email=jasc@deainc.com, c=US Date: 2019.12.13 08:38:33 -08'00'
Callan McGriff, EIT	IHO Cat-A Hydrographer, Lead Hydrographer	12/13/2019	Digitally signed by Callan McGriff DN: cn=Callan McGriff, o=David Evans and Associates, Inc., ou, email=cemc@deainc.com, c=US Date: 2019.12.13 08:39:21 -08'00'
David T. Moehl, PLS, CH	NSPS/THSOA Certified Hydrographer, Lead Hydrographer	12/13/2019	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: 2019.12.13 08:39:45 -08'00'

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

SURVEY CORRESPONDENCE

AID TO NAVIGATION REPORTS

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.
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804.516.7829 | jasc@deainc.com

H13188_USCG_AtoNs_RM_205_to_233

Remark1	Remark2	Object Name	Latitude	Longitude	Survey Date
LLNR 15165. New surveyed position using MMS data.	Beacon has been located approximately 9m southeast of charted location.	Georgia Pacific Wharf Light	30-16-31.301N	091-10-57.604W	9/24/2018
LLNR 15165. New surveyed position using MMS data.	Beacon has been located approximately 47m southeast of charted location.	Georgia Pacific Wharf Light	30-16-31.577N	091-11-02.945W	9/24/2018
LLNR 15165. New surveyed position using MMS data.	Beacon has been located approximately 99m northeast of charted location.	Georgia Pacific Wharf Light	30-16-31.724N	091-10-58.368W	9/24/2018
LLNR 15165. New surveyed position using MMS data.	Beacon has been located approximately 16m southwest of charted location.	Georgia Pacific Wharf Light	30-16-31.784N	091-10-47.562W	9/24/2018
Uncharted buoy surveyed using MMS data.			30-18-28.495N	091-13-30.308W	9/24/2018
LLNR 15190. New surveyed position using MMS data.	Beacon has been located approximately 26m west of charted location.	Plaquemine Wharf Light	30-18-40.252N	091-13-37.907W	9/24/2018
LLNR 15190. New surveyed position using MMS data.	Beacon has been located approximately 16m north of charted location.	Plaquemine Wharf Light	30-18-40.909N	091-13-36.952W	9/24/2018
LLNR 15190. New surveyed position using MMS data.	Beacon has been located approximately 15m northeast of charted location.	Plaquemine Wharf Light	30-18-44.272N	091-13-31.974W	9/24/2018
Uncharted buoy surveyed using MMS data.			30-18-45.521N	091-13-02.373W	9/24/2018
LLNR 15190. New surveyed position using MMS data.	Beacon has been located approximately 86m northeast of charted location.	Plaquemine Wharf Light	30-18-45.676N	091-13-29.925W	9/24/2018
Uncharted buoy surveyed using MMS data.			30-18-55.739N	091-09-33.623W	9/24/2018
Uncharted buoy surveyed using MMS data.			30-18-56.785N	091-12-29.386W	9/24/2018
Uncharted buoy surveyed using MMS data.			30-19-01.183N	091-11-54.478W	9/24/2018
Uncharted buoy surveyed using MMS data.			30-19-02.492N	091-10-08.165W	9/24/2018
Uncharted buoy surveyed using MMS data.			30-19-12.986N	091-08-39.135W	9/24/2018
Uncharted buoy surveyed using MMS data.			30-19-26.743N	091-08-31.264W	9/24/2018
Uncharted buoy surveyed using MMS data.			30-19-58.293N	091-08-45.175W	9/24/2018
Uncharted buoy surveyed using MMS data.			30-20-21.714N	091-13-13.367W	9/24/2018
Uncharted buoy surveyed using MMS data.			30-20-21.791N	091-13-33.061W	9/24/2018
LLNR 15265. New surveyed position using MMS data.	Beacon has been located approximately 158m southeast of charted location.	Dow Chemical Wharf Lights	30-20-26.060N	091-14-18.164W	9/24/2018
LLNR 15265. New surveyed position using MMS data.	Beacon has been located approximately 75m southeast of charted location.	Dow Chemical Wharf Lights	30-20-27.802N	091-14-20.543W	9/24/2018
LLNR 15265. New surveyed position using MMS data.	Beacon has been located approximately 91m northwest of charted location.	Dow Chemical Wharf Lights	30-20-30.903N	091-14-25.591W	9/24/2018
Uncharted buoy surveyed using MMS data.			30-20-29.685N	091-09-45.633W	9/24/2018
Uncharted buoy surveyed using MMS data.			30-20-30.548N	091-13-58.592W	9/24/2018
LLNR 15265. New surveyed position using MMS data.	Beacon has been located approximately 56m northwest of charted location.	Dow Chemical Wharf Lights	30-20-32.025N	091-14-27.305W	9/24/2018
Uncharted buoy surveyed using MMS data.			30-20-39.298N	091-10-54.165W	9/24/2018
Uncharted buoy surveyed using MMS data.			30-20-43.914N	091-14-20.056W	9/24/2018
Uncharted buoy surveyed using MMS data.			30-21-03.441N	091-14-30.530W	9/24/2018
Uncharted buoy surveyed using MMS data.			30-21-16.251N	091-14-35.082W	9/24/2018
Uncharted buoy surveyed using MMS data.			30-21-31.669N	091-14-36.958W	9/24/2018
LLNR 15335. New surveyed position using MMS data.	Beacon has been located approximately 95m northeast of charted location.	Greater Baton Rouge Port Commission Lighted Mooring Buoy D	30-25-56.706N	091-11-45.277W	9/24/2018
LLNR 15350. New surveyed position using MMS data.	Beacon has been located approximately 36m northeast of charted location.	Greater Baton Rouge Port Commission Lighted Mooring Buoy A	30-26-09.905N	091-11-47.132W	9/24/2018
LLNR 15345. New surveyed position using MMS data.	Beacon has been located approximately 45m northeast of charted location.	Greater Baton Rouge Port Commission Lighted Mooring Buoy B	30-26-10.271N	091-11-45.167W	9/24/2018
LLNR15355. New surveyed position using MMS data.	Buoy has been located approximately 45m south of charted location.	Interstate 10 Bridge Approach Buoy E	30-26-13.975N	091-11-47.771W	9/24/2018
LLNR 15360. Charted buoy not observed visually or in MMS data.		Interstate 10 Bridge Approach Buoy F	30-26-28.652N	091-11-47.223W	9/24/2018
LLNR 15370. New surveyed position using MMS data.	Beacon has been located approximately 10m north of charted location.	Belle of Baton Rouge Dock Lights	30-26-30.336N	091-11-32.015W	9/24/2018
LLNR 15365. Charted buoy not observed visually or in MMS data.		Interstate 10 Bridge Approach Buoy G	30-26-31.640N	091-11-47.187W	9/24/2018
LLNR 15405. New surveyed position using MMS data.	Beacon has been located approximately 9m northeast of charted location.	Exxon Refinery Dolphin and Dock Light	30-28-12.219N	091-11-35.957W	9/24/2018
LLNR 15405. New surveyed position using MMS data.	Beacon has been located approximately 35m south southeast of charted location.	Exxon Refinery Dolphin and Dock Light	30-28-15.384N	091-11-36.032W	9/24/2018
LLNR 15405. New surveyed position using MMS data.	Beacon has been located approximately 15m northeast of charted location.	Exxon Refinery Dolphin and Dock Light	30-28-16.696N	091-11-36.051W	9/24/2018
LLNR 15405. New surveyed position using MMS data.	Beacon has been located approximately 32m east of charted location.	Exxon Refinery Dolphin and Dock Light	30-28-19.647N	091-11-36.138W	9/24/2018
LLNR 15405. New surveyed position using MMS data.	Beacon has been located approximately 22m northeast of charted location.	Exxon Refinery Dolphin and Dock Light	30-28-22.607N	091-11-36.183W	9/24/2018
LLNR 15405. New surveyed position using MMS data.	Beacon has been located approximately 119m south of charted location.	Exxon Refinery Dolphin and Dock Light	30-28-25.553N	091-11-36.225W	9/24/2018
LLNR 15400. New surveyed position using MMS data.	Beacon has been located approximately 119m south of charted location.	Placid Mooring Facility Light	30-28-26.246N	091-12-00.156W	9/24/2018
LLNR 15405. New surveyed position using MMS data.	Beacon has been located approximately 13m north of charted location.	Exxon Refinery Dolphin and Dock Light	30-28-28.948N	091-11-36.230W	9/24/2018
LLNR 15405. Charted beacon not observed visually or in MMS data.		Exxon Refinery Dolphin and Dock Light	30-28-32.126N	091-11-35.925W	9/24/2018
LLNR 15400. New surveyed position using MMS data.	Beacon has been located approximately 19m north of charted location.	Placid Mooring Facility Light	30-28-33.816N	091-11-59.721W	9/24/2018
LLNR 15405. New surveyed position using MMS data.	Beacon has been located approximately 7m southeast of charted location.	Exxon Refinery Dolphin and Dock Light	30-28-37.046N	091-11-38.763W	9/24/2018
LLNR 15400. New surveyed position using MMS data.	Beacon has been located approximately 16m north of charted location.	Placid Mooring Facility Light	30-28-37.878N	091-11-59.338W	9/24/2018
LLNR 15400. New surveyed position using MMS data.	Beacon has been located approximately 9m northwest of charted location.	Placid Mooring Facility Light	30-28-41.470N	091-12-00.150W	9/24/2018
LLNR 15410. New surveyed position using MMS data.	Beacon has been located approximately 334m south of charted location.	Intercontinental Terminal Company Dolphin Light	30-28-50.374N	091-11-59.430W	9/24/2018
LLNR 15410. New surveyed position using MMS data.	Beacon has been located approximately 345m south of charted location.	Intercontinental Terminal Company Dolphin Light	30-28-54.416N	091-11-59.169W	9/24/2018
LLNR 15410. New surveyed position using MMS data.	Beacon has been located approximately 354m south of charted location.	Intercontinental Terminal Company Dolphin Light	30-28-57.260N	091-12-00.279W	9/24/2018
LLNR 15405. New surveyed position using MMS data.	Beacon has been located approximately 30m southwest of charted location.	Exxon Refinery Dolphin and Dock Light	30-29-09.308N	091-11-37.805W	9/24/2018

Jason Creech

From: Jason Creech
Sent: Monday, August 19, 2019 5:03 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 H13188 - Mile 233 AHOP to Mile 205 AHOP
Attachments: H13188_Exposed_Pipelines_for_BSEE.xlsx; H13188_Exposed_Pipelines.zip

Good Afternoon

While performing hydrographic surveys of the Mississippi River for NOAA Office of Coast Survey, David Evans and Associates, Inc. has discovered multiple segments of unburied pipelines within survey area H13188 which extends from Mile 233 AHOP to Mile 205 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. 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

H13188_Pipeline_01 is an area which encompasses many complex pipeline exposures that are difficult to depict with only a start and end point. The area is bounded by the following four coordinates. NW Corner: 30 29 12.641N, 91 12 02.291W NE Corner: 30 29 12.645, 91 11 59.691 SW Corner: 30 29 05.237, 91 12 02.273 SE Corner: 30 29 05.242, 91 11 59.673.

H13188_Pipeline_02 is a segment of exposed pipeline approximately 89 feet in length with starting coordinates 30 20 43.282N, 91 14 37.527W and ending at 30 20 43.747N, 91 14 36.666W. The exposed segment has a bearing of 57 degrees and was identified in multibeam echosounder data acquired on September 6, 2018 (DN 249). The pipeline is not located within a charted pipeline area and rises approximately 3 feet above the surrounding river bottom.

H13188_Pipeline_03 is a segment of exposed pipeline approximately 29 feet in length with starting coordinates 30 20 25.971N, 91 08 53.143W and ending at 30 20 25.743N, 91 08 53.350W. The exposed segment has a bearing of 217 degrees and was identified in multibeam echosounder data acquired on September 6, 2018 (DN 249). The pipeline is not located within a charted pipeline area and rises approximately 7 feet above the surrounding river bottom.

H13188_Pipeline_04 is a segment of exposed pipeline approximately 69 feet in length with starting coordinates 30 20 55.745N, 91 11 40.183W and ending at 30 20 55.228N, 91 11 39.674W. The exposed segment has a bearing of 139 degrees and was identified in multibeam echosounder data acquired on September 5, 2018 (DN 248). The pipeline is not located within a charted pipeline area and rises approximately 4 feet above the surrounding river bottom.

H13188_Pipelines_05_A is a segment of exposed pipeline approximately 29 feet in length with starting coordinates 30 29 14.496N, 91 11 36.945W and ending at 30 29 14.631N, 91 11 37.244W. The exposed segment has a bearing of 297

degrees and was identified in multibeam echosounder data acquired on September 2, 2018 (DN 245). The pipeline is located within a charted pipeline area and rises approximately 2 feet above the surrounding river bottom.

H13188_Pipelines_05_B is a segment of exposed pipeline approximately 45 feet in length with starting coordinates 30 29 13.887N, 91 11 36.941W and ending at 30 29 14.278N, 91 11 37.178W. The exposed segment has a bearing of 331 degrees and was identified in multibeam echosounder data acquired on September 2, 2018 (DN 245). The pipeline is located within a charted pipeline area and rises approximately 1 foot above the surrounding river bottom.

H13188_Pipelines_05_C is a segment of exposed pipeline approximately 32 feet in length with starting coordinates 30 29 13.039N, 91 11 37.529W and ending at 30 29 13.331N, 91 11 37.677W. The exposed segment has a bearing of 335 degrees and was identified in multibeam echosounder data acquired on September 2, 2018 (DN 245). The pipeline is located within a charted pipeline area and rises approximately 2 feet above the surrounding river bottom.

H13188_Pipelines_05_D is a segment of exposed pipeline approximately 80 feet in length with starting coordinates 30 29 12.402N, 91 11 36.972W and ending at 30 29 12.820N, 91 11 37.743W. The exposed segment has a bearing of 301 degrees and was identified in multibeam echosounder data acquired on September 2, 2018 (DN 245). The pipeline is located within a charted pipeline area and rises approximately 5 feet above the surrounding river bottom.

H13188_Pipelines_05_E is a segment of exposed pipeline approximately 70 feet in length with starting coordinates 30 29 12.812N, 91 11 35.773W and ending at 30 29 12.699N, 91 11 36.531W. The exposed segment has a bearing of 259 degrees and was identified in multibeam echosounder data acquired on September 2, 2018 (DN 245). The pipeline is located within a charted pipeline area and rises approximately 17 feet above the surrounding river bottom.

H13188_Pipelines_05_F is a segment of exposed pipeline approximately 49 feet in length with starting coordinates 30 29 11.832N, 91 11 37.438W and ending at 30 29 11.512N, 91 11 37.854W. The exposed segment has a bearing of 227 degrees and was identified in multibeam echosounder data acquired on September 2, 2018 (DN 245). The pipeline is located within a charted pipeline area and rises approximately 5 feet above the surrounding river bottom.

H13188_Pipelines_05_G is a segment of exposed pipeline approximately 56 feet in length with starting coordinates 30 29 10.469N, 91 11 36.796W and ending at 30 29 10.937N, 91 11 37.049W. The exposed segment has a bearing of 334 degrees and was identified in multibeam echosounder data acquired on September 2, 2018 (DN 245). The pipeline is located within a charted pipeline area and rises approximately 5 feet above the surrounding river bottom.

H13188_Pipelines_05_H is a segment of exposed pipeline approximately 65 feet in length with starting coordinates 30 29 10.983N, 91 11 36.696W and ending at 30 29 10.553N, 91 11 37.241W. The exposed segment has a bearing of 227 degrees and was identified in multibeam echosounder data acquired on September 2, 2018 (DN 245). The pipeline is located within a charted pipeline area and rises approximately 4 feet above the surrounding river bottom.

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

Jon Dasler

From: Martha Herzog - NOAA Federal <martha.herzog@noaa.gov>
Sent: Tuesday, August 21, 2018 3:14 PM
To: Jon Dasler
Cc: Jason Creech; Stacy Fullerton - NOAA Federal; Kathryn Pridgen - NOAA Federal; Corey Allen
Subject: Re: Mississippi River, call summary
Attachments: OPR-J347-KR-18_PRF_FINAL_Aug21_18.000; OPR-J347-KR-18_CSF_FINAL_Aug21_18.000

Jon,

I've attached a new CSF and PRF. The CSF should now better reflect the chart updates. I also found a few 'unassigned' and 'for info only' features that had not been added, which won't really impact you but gives you an improved product. The same goes with the PRF. I found a few very small blunders where the survey limits hadn't correctly snapped to the shoreline. This shouldn't impact anything either.

Just to let you know, a new 2018 xml schema will be released to the OCS website soon. There is no requirement to use it as the PI states the 2017 version or newer.

I'll be on leave Wednesday - Friday. If anything arises, please contact Corey or I should be available by cell (206-658-3649)

Thanks,
Martha

On Mon, Aug 20, 2018 at 5:52 PM, Jon Dasler <Jld@deainc.com> wrote:

> Martha,
>
> That would be great. Thank you.

Jon L. Dasler, PE, PLS, CH | Senior Vice President, Director of Marine Services

David Evans and Associates, Inc. | Marine Services Division | www.deamarine.com

t: 360.314.3200 | c: 503.799.0168 | jld@deainc.com

DAVID EVANS AND ASSOCIATES INC. MARINE SERVICES

From: Martha Herzog - NOAA Federal <martha.herzog@noaa.gov>
Sent: Monday, August 20, 2018 11:02 AM
To: Jon Dasler <Jld@deainc.com>
Cc: Jason Creech <Jasc@deainc.com>; Stacy Fullerton - NOAA Federal <stacy.fullerton@noaa.gov>; Kathryn Pridgen - NOAA Federal <kathryn.pridgen@noaa.gov>; Corey Allen <corey.allen@noaa.gov>

Subject: Re: Mississippi River, call summary

Jon,

I'll do a run-through of the CSF and check for other new updates to the ENC and provide you with an updated CSF soon.

Martha

On Fri, Aug 17, 2018 at 5:51 PM, Jon Dasler <Jld@deainc.com> wrote:

> Martha,
>
> Thank you for the update and clarification. As an FYI, the items we passed along were just an example after we did another review against the new ENC release on sheet 6. A full review of features on the new ENC release should be

done over the entire project (sheets 1-5 and 7-9) and a revised project wide CSF provided. Is that something you are working on?

Regards,

Jon

Jon L. Dasler, PE, PLS, CH | Senior Vice President, Director of Marine Services

David Evans and Associates, Inc. | Marine Services Division | www.deamarine.com

t: 360.314.3200 | c: 503.799.0168 | jld@deainc.com

From: Martha Herzog - NOAA Federal <martha.herzog@noaa.gov>
Sent: Friday, August 17, 2018 9:56 AM
To: Jason Creech <Jasc@deainc.com>
Cc: Jon Dasler <Jld@deainc.com>; Stacy Fullerton - NOAA Federal <stacy.fullerton@noaa.gov>; Kathryn Pridgen -

NOAA Federal <kathryn.pridgen@noaa.gov>; Corey Allen <corey.allen@noaa.gov>
Subject: Re: Mississippi River, call summary

Hi Jason,

Thanks for passing these along. It looks like a new ENC was released 2 weeks ago which added the obstruction and a few mooring buoys. I'm perplexed by the wreck as doesn't seem to be on either US5LA37M or US6LA35M (or a smaller scale ENC).

I'll update the CSF and pass along a new one this afternoon.

For clarification of the second graphic, the CSF is correct here, no areas of rip-rap were (or should be) assigned for investigation. Breakwaters were assigned if they protruded into the survey area and potentially navigable water.

As for the separation model, there has been an update. Jack may be able to create a new separation model which extends further onshore if you would like to use it. I'll keep you updated on the status of it. There is no requirement to use it or submit data beyond what is required in the PI.

Thanks,
Martha

On Fri, Aug 17, 2018 at 10:38 AM, Jason Creech <Jasc@deainc.com> wrote:

> Hey Martha
>
> Understood on #s 1 and 2.

3. I've attached a few hobs and screengrabs which depict some examples of charted features we've located that aren't in the CSF.

4. We can set up a multipage map series with data driven pages if you are ok with that. This will require many pages (possibly one per sheet?) to show coverage due to the size and shape of the survey area.

Let me know if you have any questions or input. By the way, I will be out of the office from 8/20 to 9/4. Jon Dasler will be the primary POC until my return. We're also looking for dates for a site visit and will follow up later today.

Thanks,

Jason.

From: Martha Herzog - NOAA Federal <martha.herzog@noaa.gov>
Sent: Tuesday, August 14, 2018 2:14 PM
To: Jason Creech <Jasc@deainc.com>; Jon Dasler <Jld@deainc.com>
Cc: Stacy Fullerton - NOAA Federal <stacy.fullerton@noaa.gov>; Kathryn Pridgen - NOAA Federal <kathryn.pridgen@noaa.gov>; Corey Allen <corey.allen@noaa.gov>
Subject: Mississippi River, call summary

Hi Jason,

Thanks for your call. I just wanted to recap a few things we talked about to ensure we are all the same page.

1. Even though the laser scanner data collection goes beyond the project limits and the separation model, there is not need to submit any data beyond the project area. It sounds like the laser scanning data is truncated at the separation model boundary creating automated editing of the limits of the point cloud. That works for us.

2. There is only need to reference the laser scanner data to the LWRP, no need to have the data on another datum.

3. A few unassigned submerged and potentially other mis-assigned items were found in the CSF. This is an oversight on my part. Thank you for catching that. I'll review the CSF and provide you with a new version. You stated that you may have some locations of these and could possibly provide them, which would be useful for me in quickly correcting the error.

4. As for representing the long survey area on a one page pdf, I got an idea from Meredith Payne (who puts together the weekly hydro ship report). If you are using ArcGIS, data driven pages or map series may be an easy way to do it. (There is no requirement to do it like this, and other methods would also work.)

Thanks,

Martha

Jason Creech

From: Martha Herzog - NOAA Federal <martha.herzog@noaa.gov>
Sent: Monday, August 27, 2018 7:58 AM
To: Jon Dasler; Jason Creech; Kathryn Pridgen - NOAA Federal
Subject: Additional LWRP Sep Model
Attachments: NAD83-LWRP2007_MLLW12B_Buffered.zip

Jon and Jason,

Jack was able to extend the separation model by approximately 1 km (attached). He says the standard deviation of differences between original version and this buffered one is less than 1 cm.

Martha

Jason Creech

From: Martha Herzog - NOAA Federal <martha.herzog@noaa.gov>
Sent: Monday, October 15, 2018 4:43 PM
To: Jason Creech; Jon Dasler
Cc: Kathryn Pridgen - NOAA Federal
Subject: temp nav aids

Hi Jason,

Thanks for your call and updates.

I just double checked and the advice I gave you stands: temporary navigation aids such as those you described to me should **not** be included FFF. Noting them in the DR with any supplemental correspondence you have will suffice. Have you noted anything in any LNMs about the temp lights? (I just checked the latest LNM and didn't see anything about new placement of temp nav aids but did see a note about the first DTON obstruction made it in there.)

As far as laser scanning data, LAS data format will easily work for us.

Martha

Jason Creech

From: Martha Herzog - NOAA Federal <martha.herzog@noaa.gov>
Sent: Friday, November 9, 2018 9:47 AM
To: Jason Creech
Cc: Jon Dasler
Subject: Re: MS River sediment migration examples

I spoke with Gene and our consensus was to let CUBE grid as it may and document the sediment migration in the DR. Of course you can always edit or remove soundings if you feel one line or another better represents the seafloor than the gridding algorithm does. For instance in the example of the sediment slump on Across_track_1, based on your observations and knowledge of the environmental conditions, if you feel the sediment fill in will remain, then you can edit the soundings for the grid to represent the shoal.

You can also denote the areas of major changes in the feature file with SNDWAV areas. This would give parity with changed areas in the grid and a heads up to the branch (and mariner) that the depth may be variable.

Martha

On Thu, Nov 8, 2018 at 8:58 AM, Jason Creech <Jasc@deainc.com> wrote:

> Hi Martha
>
> I've attached a few screengrabs from HIPS showing the sediment migration issues we discussed last week during your site visit.
>
> As you can expect this issue is impacting our deliverable surfaces and will show up when AHB runs flier finder or uses other methods to locate line to line disagreement in the survey data. We plan to discuss in the DRs and add some images to make this issue apparent to the reviewer. Let me know if you or Gene have any other suggestions.
>
> Thanks,
>
> Jason
>
> **Jason Creech, CH** | Vice President, Nautical Charting Program Manager
>
> **David Evans and Associates, Inc.**

Jason Creech

From: Martha Herzog - NOAA Federal <martha.herzog@noaa.gov>
Sent: Friday, November 16, 2018 12:55 PM
To: Jason Creech
Cc: Jon Dasler
Subject: Re: CSF/PRF
Attachments: GC_11369_for_info_only.000; OPR-J347-KR-18_PRF_MOD.000; OPR-J347-KR-18 _CSF_MOD.000

Hi Jason,

Thanks for the call and clearing up how you wanted the mod CSF/PRF delivered and the new GC for the original project area.

There is no need to add the GC features into the original 9 sheets. I attached it just for your information. The final CSF and PRF attached for the new modification areas (addition to sheet 1 and new sheet 10) contain the new GC features and will need to be verified.

Please let me know if you have any questions.

Martha

On Wed, Nov 14, 2018 at 2:20 PM Jason Creech <Jasc@deainc.com> wrote:

> Hi Martha
>
> If possible, we'd rather receive a CSF file with new features only. We've already extracted features from the original CSF for sheets 1-9, assigned some inhouse tracking codes, and starting attributing for delivery. Having to start from a new project wide CSF would get complicated. I just left a voicemail on this. Give me a call if you'd like to discuss.
>
> Thanks,
>
> Jason
>
> **From:** Martha Herzog - NOAA Federal <martha.herzog@noaa.gov>
> **Sent:** Wednesday, November 14, 2018 2:03 PM
> **To:** Jon Dasler <Jld@deainc.com>; Jason Creech <Jasc@deainc.com>
> **Subject:** CSF/PRF

Jon and Jason,

I have finished up a final version of CSF/PRF for the which includes the new GC. I just wanted to confirm that you would like the new GC features added to the original CSF for the sheets that have been already surveyed. This will add to the assigned feature count as I'm unable to remove the original features as there is no confirmation that they are no longer there, but it should reflect a number of piers a bit better.

If so, I'll go ahead and combine the files so there will be just one CSF and one PRF for Sheets 1-10.

I'm still waiting on Jack to finish the sep model for the added area but will get that to you when it is ready.

Thanks,

Martha

Jason Creech

From: Stacy Fullerton - NOAA Federal <stacy.fullerton@noaa.gov>
Sent: Monday, December 17, 2018 11:12 AM
To: Jon Dasler
Cc: Jason Creech; Kathryn Pridgen - NOAA Federal; Martha Herzog - NOAA Federal; Eastern Operations Eastern Operations - NOAA Service Account
Subject: Re: EA133C14CQ0037 1305M218FNCNJ0138 Modification P19001
Attachments: 18FNCNJ0138MODP19001- Executed.pdf

Hello,

Please find the attached fully executed modification for your records.

Thank you,

Stacy

On Thu, Dec 13, 2018 at 5:01 PM Jon Dasler <Jld@deainc.com> wrote:

> Stacy,
>
> Thank you for sending this. Attached is the signed modification P190001 to Contract EA133C-14-CQ-0037 Task Order 1305M218FNCNJ0138. Hope you have a great holiday season and are able to spend some quality time with family.
>
> Respectfully,
>
> Jon
>
> **Jon L. Dasler, PE, PLS, CH** | Senior Vice President, Director of Marine Services
>
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>
> t: 360.314.3200 | c: 503.799.0168 | jld@deainc.com

DAVID EVANS AND ASSOCIATES INC.
MARINE SERVICES

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From: Stacy Fullerton - NOAA Federal <stacy.fullerton@noaa.gov>
Sent: Thursday, December 13, 2018 4:12 AM
To: Jason Creech <Jasc@deainc.com>; Jon Dasler <Jld@deainc.com>
Cc: Kathryn Pridgen - NOAA Federal <kathryn.pridgen@noaa.gov>; Martha Herzog - NOAA Federal <martha.herzog@noaa.gov>
Subject: EA133C14CQ0037 1305M218FNCNJ0138 Modification P19001

Good Morning,

Please find the attached modification P19001 to Contract EA133C-14-CQ-0037 Task Order 1305M218FNCNJ0138. Please review, sign, and return a copy of the modification at your earliest convenience.

Respectfully,

Stacy

--

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Jason Creech

From: Martha Herzog - NOAA Federal <martha.herzog@noaa.gov>
Sent: Tuesday, December 18, 2018 5:48 PM
To: Jason Creech
Subject: Mississippi feature questions

Hi Jason,

Thanks for your calls and setting up the meeting. There were a lot of good questions. I just want to ensure I answered all of your questions (aside from bridges.). I've copied your original questions in gray with my answers below in black. Please let me know if I can provide any other clarification.

Happy Holidays,
Martha

1. For SLCONS terminating at the river bank, should we digitize large features (>5m width) as a line or area features? We are not sure where and how to close areas terminating at the shoreline.

For SLCONS > 5m, digitizing them as line or area features is fine as there is no specific distinction in the HSSD about this. Looking at the ENC and speaking with MCD, generally intact piers are digitized as lines. Ruined, submerged, or covers/uncovers are digitized as areas. It is up to your discretion if you follow this logic.

Closing the pier (line or area feature) anywhere inland of the shoreline or at the COALNE is fine. We aren't very picky about this as long there isn't a gap of water between the pier and the shoreline.

2. MORFAC point features exist in the CSF in front of the SLCONS. They are large enough (>5m width) to be created as MORFAC area features. Where a SLCONS (pier) also exists, should we digitize

- a separate, adjacent MORFAC area (that shares an edge with the SLCONS area)
- a single SLCONS area that encompasses the MORFAC area
- a SLCONS area that encompasses the MORFAC area and then also create a MORFAC area on top of the SLCONS area
- Other?

I've gotten a second opinion on what to do with the MORFACs abut piers. It is fine to have the larger pier area include abutting MORFAC into the pier area as in the example.

3. In cases like this, should the SLCONS line features be deleted and redrawn as new or modify? Should the SLCONS be redrawn as multiple segments that extend only between the MORFAC/SCLONS areas?

The original SLCONS feature should be flagged as "delete" with your surveyed SLCONS as "new."
For a single line SLCONS, it is fine to digitize it through the MORFAC area (especially if the catwalk like structure extends through it) or create separate lines extending through the MORFACs as we don't have a spec for this distinction.

4. Should this set of fenders be digitized split into several sections (A) based on the SLCONS or connected into a single straight line (B)?

For fenders that are co-located with the MORFAC, there is no need for the added fenders. If they differ, then there may be a need depending on the difference in distance.

5. How should we digitize and attribute terminals with conveyors and covered areas?

It is fine to digitize the boathouses and conveyors. I checked the IHO ENC product specification which helps to answer the boathouse question:
https://www.iho.int/iho_pubs/standard/S-57Ed3.1/S-57_AppB.1_AnnA_UOC_e4.0.0_Jun14_EN.pdf
"For covered boathouses, any associated objects should be encoded as they exist in the "real world"; e.g. jetties as SLCONS, pontoons as PONTON, mooring posts as MORFAC. The roofed area may be covered by a BUISGL object of type area, with attribute INFORM = Boathouse or Boatshed. If the service being provided by the structure is known, object classes SMCFAC (see clause 4.6.5) or HRBFAC (see clause 4.6.1) may also be encoded."

AtoNs out of position

6. How far out of position be before we reposition in the FFF?

For non fixed aids such as those on buoys, anything > 5m or greater if that is what the swing radius or how far it may get pushed by current. This can be modified to much less if the hydrographer thinks it is imperative to navigation.

Technically we should be submitting any aid that is incorrectly positioned but we agreed at the start of the project that it would not be necessary to report every that is off by a little and not causing any impact to navigation in order for you not to have to report 1000 lights for each survey. We didn't define a little at the time.

I would definitely report the example in the ppt to the USGC as it is nowhere near the charted or light list location.

7. Should repositioned AtoNs be modify or delete/new?

Delete/New.

8. Should secondary features (fog signals, lights etc.) also be repositioned? In some cases lights on piers appear to be associated with a charted beacons that do not exist. The secondary features are incorrectly charted and the primary features do not exist (*see image for example*).

If you find that it does not exist, flag it as "delete" with an explanation in the remarks.

Subsequent features (fog signal, beacon, etc.) associated with the ATON should follow the position of the ATON. If you can't confirm the secondary feature, the remarks can be something like, "new position of ATON, fog signal not audibly observed at time of survey.

9. Should all repositioned AtoNs be reported to the USCG via the USCG Navigation Center's Online ATON Discrepancy Report?

Yes, for fixed ATONs especially for federal aids or for ATONs positions differing >5m. I'm not sure anyone quite expected this level of mis-positioning. Jason mentioned he would reach out to the USCG to see if reporting can be done in group format instead of by individual ATON. I'll keep asking around here if something else can be done.

I learned a little about the accuracy of light positioning some of which you may already know. While lights should be positioned to 3 decimal places, they often aren't depending on the original source (a zero or two or even three may represent the final decimal positions). For private lights, USCG just take sthe position of what is on the permit which

could variable. If the private light position changes and the USCG isn't notified or the light isn't re-permitted, the old position remains in the light list. What is populated in the ENC inform field is often just the comments from the light list. Most USGC districts simply just don't have the funding to validate all of the lights. If you are finding that the federal nav aids are off, this is problematic as those should be verified more often.

Bridges

10. We are digitizing the footings as surveyed using SLCONS and assume we are required to digitize the bridges depicting the surveyed extents using BRIDGE areas. Bridges charted on the ENCs are broken into multiple segments, each attributed with a clearance height or a value of Unknown. How should the BRIDGE segments be broken up (one per span, smaller increments for finer resolution clearance identification, other?

11. We plan to report the lowest clearance per BRIDGE area. Typically, the lowest clearance height on a bridge is right at the junction with a bridge pier. Should we use this height for BRIDGE areas junctioning with a pier when it is the lowest clearance value or offset the clearance height search towards the navigable channel?

FYI - the footing areas should be encoded as PYLONS as they are on the chart.
TBD on more guidance on bridges. I've passed on your bridge ppt adding the differing clearance height graphic to Corey who discuss with Rick Brennan and others on how we should proceed on this.

Jason Creech

From: Martha Herzog - NOAA Federal <martha.herzog@noaa.gov>
Sent: Thursday, February 7, 2019 4:41 PM
To: Jason Creech
Subject: Re: OPR-J347-KR18 WEDKLP

Hi Jason,

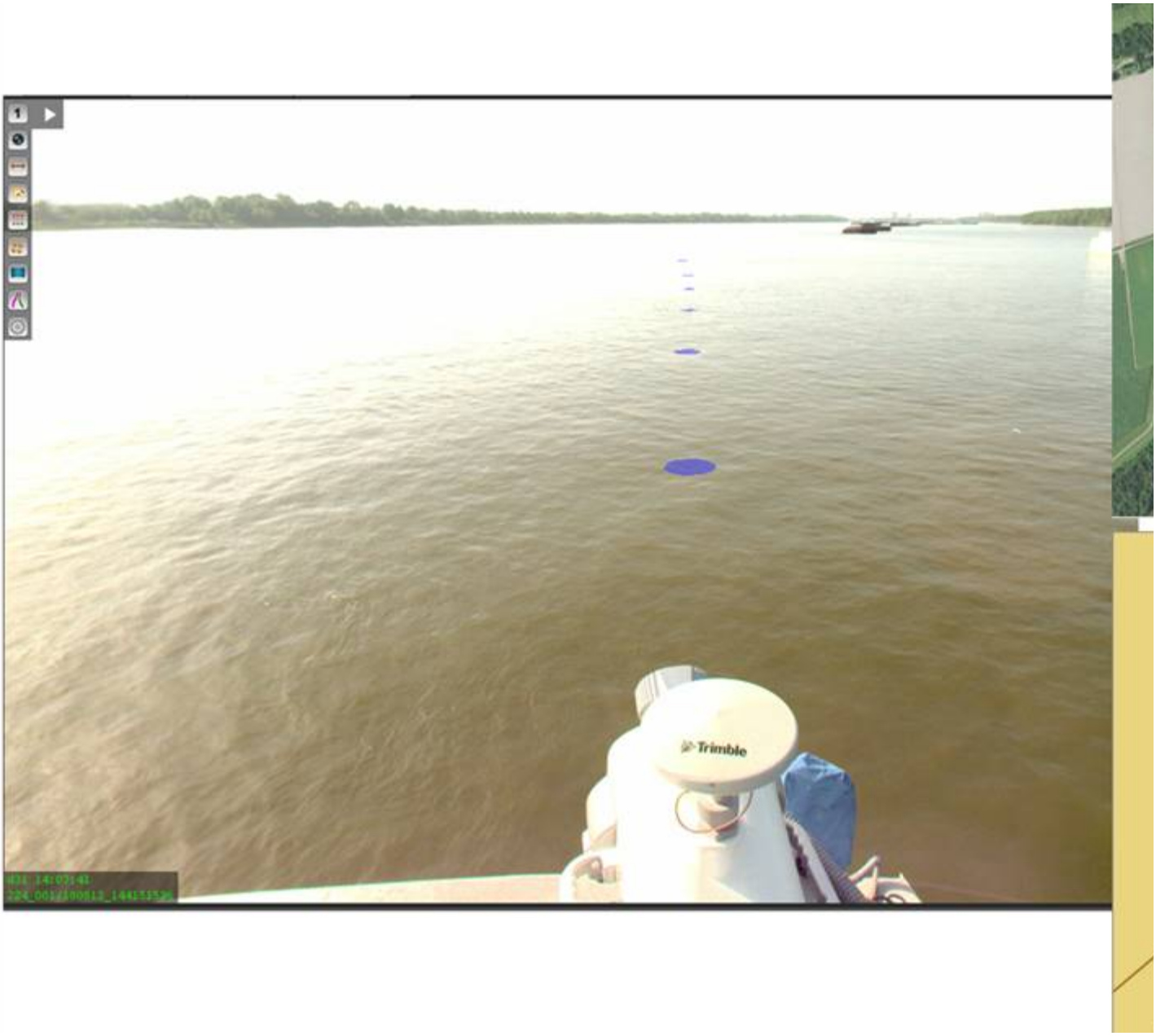
As for sea grass, if you see it, include it in the FFF. I'm assuming any sea grass may be a bit tricky to see. For the charted feature, if you can't truly delineate it, a retain should be fine for it. I wouldn't go to extraordinary lengths to hunt for it.

I'll be in the office until 5:30 and tomorrow will be working from home late morning - evening.

Martha

On Thu, Feb 7, 2019 at 4:23 PM Jason Creech <Jasc@deainc.com> wrote:

> Hi Martha
>
> I've got a quick question for you. What are the requirements for disproving or adding WEDKLP features for our Mississippi River survey? We have one WEDKLP (sea grass) feature assigned in our CSF and when reviewing the MMS imagery it looks like we are seeing some sort of submerged aquatic vegetation in the area (see example image below, the sea grass is hard to distinguish).
>
> Should seagrass of this nature be charted? If so do we need to attempt to delineate this patch in the FFF? Should we also be looking for other similar patches in the vicinity or project area. There is no is no seagrass impeding navigation or obscuring our ability to detect the bottom.
>
> So far we've been unable to pick this out of our MBES data but have not yet reviewed the backscatter.
>
> Thanks for any guidance you can offer.
>
> 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: Martha Herzog - NOAA Federal <martha.herzog@noaa.gov>
Sent: Wednesday, February 20, 2019 9:47 AM
To: Jon Dasler
Cc: Jason Creech
Subject: Re: New Orleans District Dredging Update

Jon,

Thanks for the update on the dredging schedule. I assume the dredges are working in the channel and dumping the spoils just outside of the channel. Right now, I agree, continue working and let me know if you see anomalies in the data from the dredging. I've let Corey and others know of the situation, and will let you know if their opinion differs.

Martha

On Tue, Feb 19, 2019 at 5:59 PM Jon Dasler <Jld@deainc.com> wrote:

> Martha,
>
> I was finally able to connect with Michelle Kornick, New Orleans District Chief of Navigation. She relayed that they have been working hard on dredging to keep the channel open since December, primarily from river mile 10.5 Above Head of Passes (AHP) out to the Gulf. Currently there are seven dredges working the area which I have listed below. For reference, Sheet 10 starts at Head of Passes running to the Gulf and river miles are designated as Below Head of Passes (BHP). We have already surveyed to mile 0 at Head of Passes and above.
>
> Hopper dredge river mile 10.0 AHP To 10.5 AHP
>
> Hopper dredge river mile 4.5 AHP To 3.5 AHP
>
> Hopper dredge river mile 3.5 AHP To 2.0 AHP
>
> Cutter dredge river mile 1.5 AHP To 2.0 BHP – any miles designated as BHP are in sheet 10
>
> Hopper dredge river mile 1.0 AHP To 1.5 BHP
>
> Cutter dredge river mile 13.5 BHP To 18.0 BHP – only working problem areas
>
> Hopper dredge alternating between the following areas: river mile 9.5 BHP To 10.5 BHP and 18.0 BHP to 19.5 BHP
>
> Michelle anticipates this are will be worked through the end of high water (end of April, May or June) and they publish these work areas on their website. I have listed her contact information below:
>
> Michelle.s.kornick@usace.army.mil
>
> 504-862-1842

We are inclined to just continue working and move in to Sheet 10 next week but open to discussion. Let us know if you want to discuss this in more detail.

Jon

Jon L. Dasler, PE, PLS, CH | Senior Vice President, Director of Marine Services

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t: 360.314.3200 | c: 503.799.0168 | jld@deainc.com

Jason Creech

From: Martha Herzog - NOAA Federal <martha.herzog@noaa.gov>
Sent: Monday, April 8, 2019 8:54 AM
To: Jason Creech
Subject: Re: Barges and ATONs

Hi Jason,

I have more info...

4 & 5. Just the master feature (BCNLAT, etc) will suffice as MCD has all the slave attribution. There is no need to include the previous position, but I some info in the remarks whether it is a newly positioned or a brand new ATON would be helpful.

I hope this helps and please let me know if you have any questions.

Martha

On Fri, Apr 5, 2019 at 3:57 PM Martha Herzog - NOAA Federal <martha.herzog@noaa.gov> wrote:

> Hi Jason,
>
> Sorry for the delay, I was trying to get all of the questions fully answered, but here is a start.
>
> 1. Yes, continue digitizing the permanent barges as PONTON areas.
>
> 2. I received further clarification from MCD that is inline with the ENC encoding guide. Categorized the fleeting area as a mooring facility (MORFAC, CATMOR of "tie up wall, WATLEV = floating). You can also use a CTNARE coincident with the MORFAC to highlight it to the mariner, if you choose.
>
> 3. Making the updates to the SLCONS to PONTON is up to your discretion. If you can tell that moves with water level, then PONTON will more accurately represent the feature.
>
> 4.&5 I'm still waiting to hear what would work best for MCD.
>
> 6.& 7. I talked to Jack yesterday and he said he is working on the SEP. Hopefully we'll get it soon.
>
> 8. I think when we talked about the training wall in the past, the question was what to do about the ruined sections and the guidance hasn't changed. They will still be the same SLCONS class but the condition will be ruined. SLCONS, CATSLC=training wall, CONDTN=ruined. Please let me know if this doesn't quite fit with what you are seeing. You can also use WATLEV (always dry, submerged, etc.)
>
> On Tue, Apr 2, 2019 at 3:48 PM Jason Creech <Jasc@deainc.com> wrote:
>
> > Good morning Martha

Thanks for the feedback on these items. We've reviewed and have a few question before we proceed.

1. We have been digitizing barges that are clearly fixed to the shoreline with either piles or with gangways (offices on barges, floating docks) as area features. I just wanted to confirm that both of these feature types should be depicted as PONTON. The project CSF includes some PONTON features from a GC depicting barges fixed to the shoreline with gangways. I have attached a PowerPoint file showing examples of these items which we believe to be permanent/ semi-permanent features.
2. Should we provide a general delineation of areas of barge fleets observed at time of survey? I briefly discussed that as an option when speaking to Captain Brennan at US Hydro. This would allow us to continue to work through the MMS data without delay and would give MCD an idea of where barge fleets were observed during survey operations as they work to determine how best to chart this information. We could include a description of this process in the DRs and attribute the features accordingly. If this is something you'd like us to do, what feature type would you recommend using? These areas would also define areas where barges were observed but we couldn't determine with certainty whether they were permanently fixed along the shoreline.
3. The charts / CSF currently depict some permanent barge piers as SLCONS. Should we update the feature type to PONTON?
4. For the AtoNs, should the .000 file also include the Deleted feature (incorrect position) or will the new (correct) position suffice?
5. Should the AtoNs .000 include the master object only (ex BNCLAT) or master and slave (LIGHTS, DAYMAR) objects?

I also have a few other questions related to the project.

6. Is there any update on a high water datum for the project area? We are currently using the LWRP for all feature heights up river of Head of Passes.
7. Can you provide an estimate for when the new SEP model will be available. We're holding off on scheduling the restart of survey operations until we know when we will have the new model.
8. Did MCD provide any guidance on depictions of the numerous pile dikes / training walls within the survey area. We want to make sure these are properly delineated in the FFF and that we designate these features correctly. We're currently working up some data examples for internal use which I can provide if you like.

That's it for now. Thanks so much for all of your help sorting this out. And let me know if you'd like me to clarify any of our questions.

Jason

From: Martha Herzog - NOAA Federal <martha.herzog@noaa.gov>
Sent: Friday, March 29, 2019 12:53 PM
To: Jason Creech <Jasc@deainc.com>
Subject: Barges and ATONs

Hi Jason,

I finally was about to get a little more information out of MCD for the barges. They are currently looking into a way of delineating the fleeting areas. For barges that are permanent and have piles driven through them, PONTON (floating pier) should work well. Potentially the fleeting areas may be categorized at caution areas, but stand by for the final decision which should happen by the end of next week.

I know it has been a little difficult submitting forms for each ATON that needs repositioning. Could you send me a .000 of the newly position lights per sheet with an indicator (maybe in the INFORM) field of whether they are federally maintained or private? I'll pass these onto MCD who will then poke the USCG about correcting them. Since the USCG is the source authority, MCD will ultimately only take their position.

Thanks,

Martha

Jason Creech

From: Jack Riley - NOAA Federal <jack.riley@noaa.gov>
Sent: Friday, April 5, 2019 7:31 PM
To: Martha Herzog - NOAA Federal; Jason Creech
Cc: Corey Allen
Subject: NAD83-LWRP2007_MLLW12B_Buffered_Ext CSAR SEP
Attachments: NAD83-LWRP2007_MLLW12B_Buffered_Ext.zip

Hello Martha and Jason,

See attached for the buffered-extended (Baton Rouge Harbor & a bit more seaward of Pilot Station East, SW Pass per latest HSD survey limits). Took a little longer than I thought to get everything spun up again on my new computer in HSTB -- during my first week back from CO-OPS. Again, sorry for the delay! Happy to discuss in any follow-up.

Thanks,
Jack
--

Jack L. Riley
Coast Survey Development Lab
240-847-8271

Jason Creech

From: Martha Herzog - NOAA Federal <martha.herzog@noaa.gov>
Sent: Tuesday, April 30, 2019 11:19 AM
To: Jason Creech; Jon Dasler
Subject: Follow up to discussion on 4/26

Jason,

Thanks for your call on Friday. I am just following up

WATLEV - I spoke with Stacy, and if you would like to use the 2019 Spec for WATLEV, NOAA would need to issue a modification to the contract. I'm happy to discuss that more and proceed to make a mod if that is convenient for you.

Data under piers - I forwarded the graphics of removing data under the pier to Gene at AHB, He concurs with your method.

For features upriver of Head of Passes, there cannot be any "always dry" features as there is no MHW for the Mississippi. Even baring features at LWRP will have the WATLEV of covers and uncovers.

Training walls - I'm still in the process of double checking the guidance I gave you about the ruined training walls. I'll send a followup email on this.

Martha

Jason Creech

From: Jack Riley - NOAA Federal <jack.riley@noaa.gov>
Sent: Friday, May 3, 2019 10:06 PM
To: Jon Dasler
Cc: Jason Creech; Rick Brennan; Martha Herzog - NOAA Federal; Corey Allen; Glen Rice
Subject: Re: FW: Mississippi LWRP Survey Findings PowerPoint
Attachments: NAD83-LWRP2007_MLLW_Geoid12B.zip

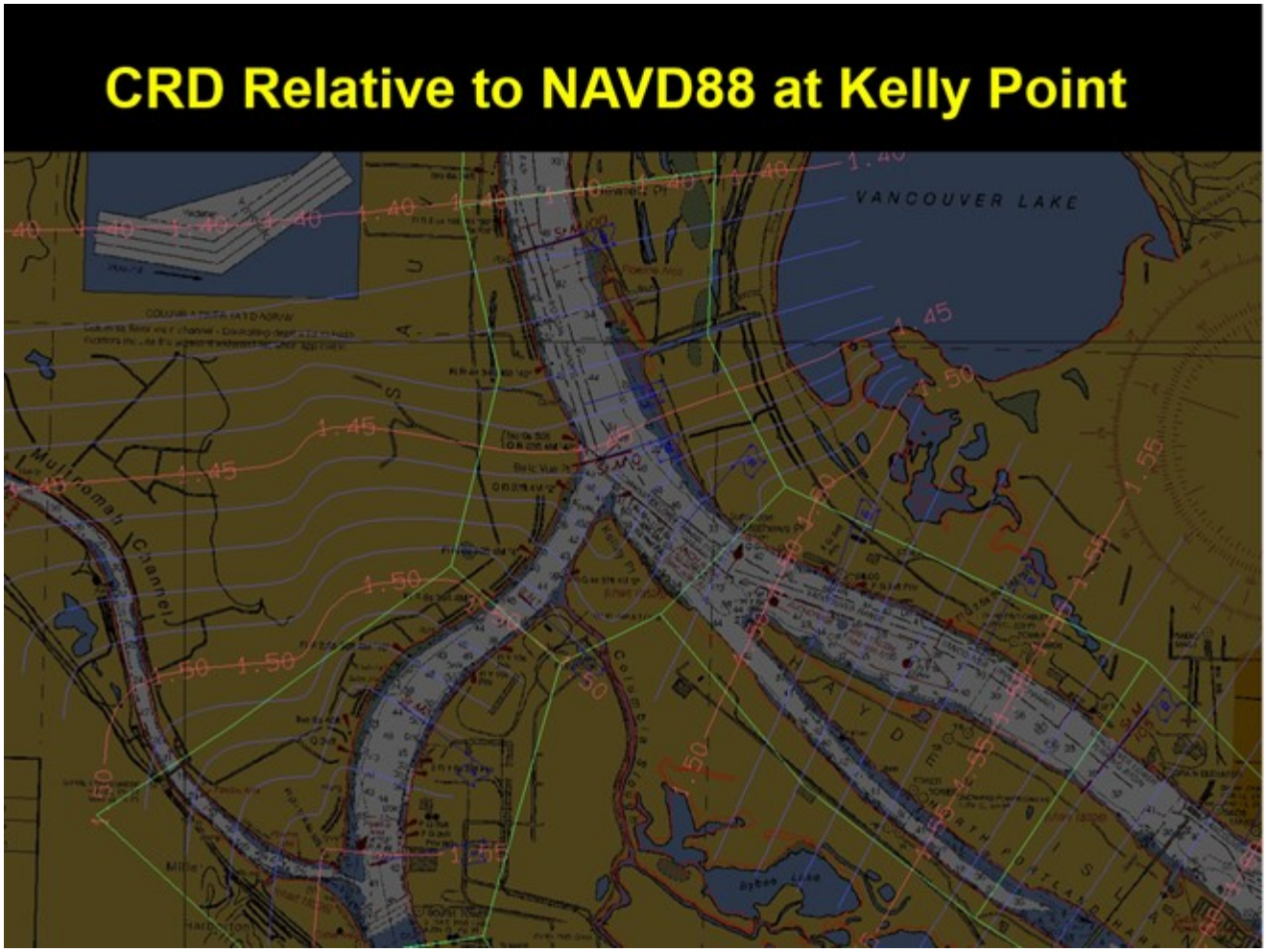
Jon,

See attached for the revised NAD83-LWRP2007/MLLW SEP [m] based upon/incorporating the unadulterated Geoid12B NAVD88, per our discussions through this evening.

Thanks,
Jack
--
Jack L. Riley
Coast Survey Development Lab
240-847-8271

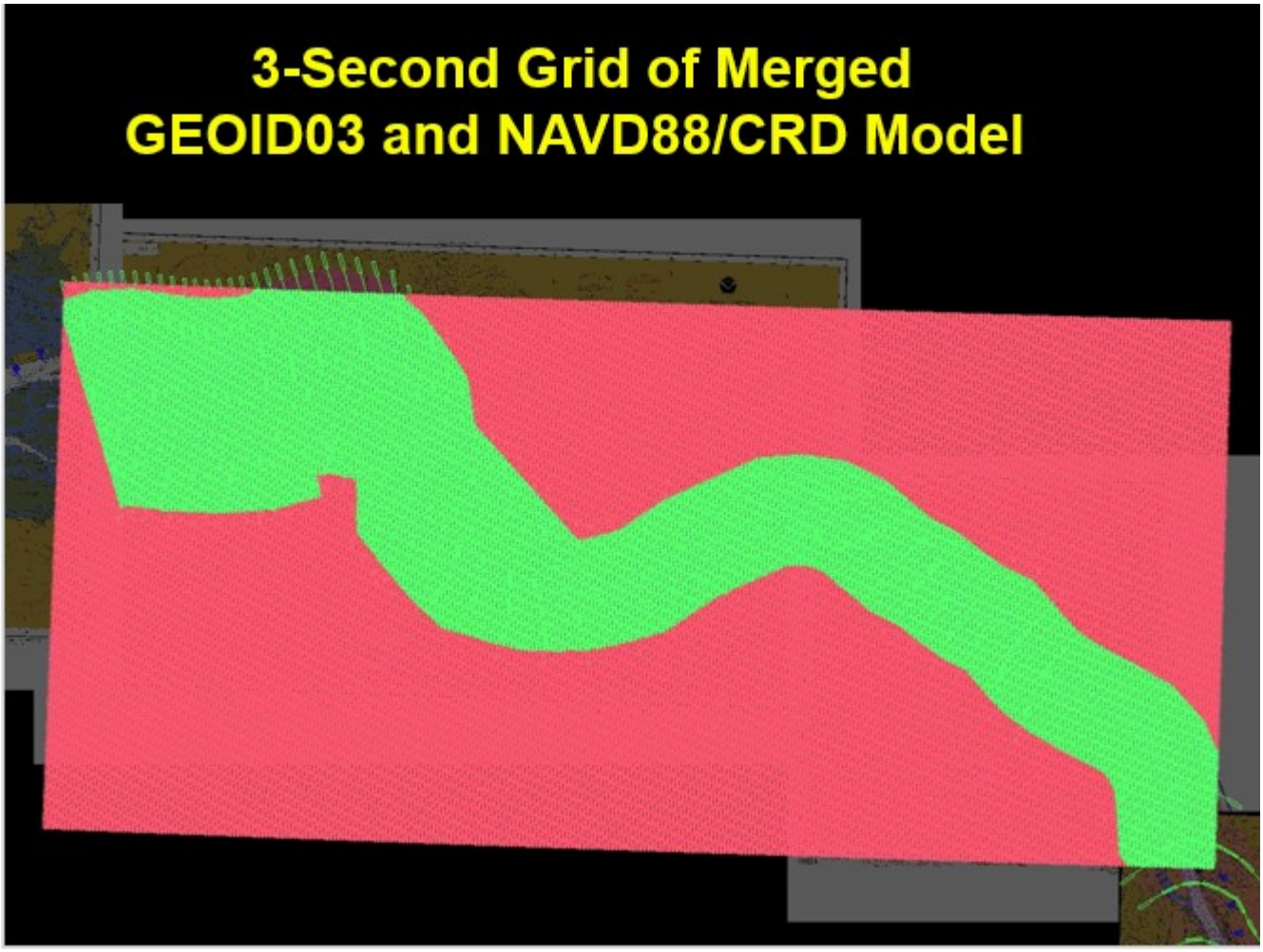
On Fri, May 3, 2019 at 7:48 PM Jon Dasler <Jld@deainc.com> wrote:

> Jack,
>
> I am still in the office if you want to call. I am not sure what you mean by “exclude the 2_D undulations perpendicular to the river”. The gradient model should be flat perpendicular to the river and include enough data points to capture geoid undulation when combining with the geoid model (100 meter of 3 arc second grid would be sufficient). Following is and example of the Triangular Irregular Network (TIN) model I generated for the Columbia River.



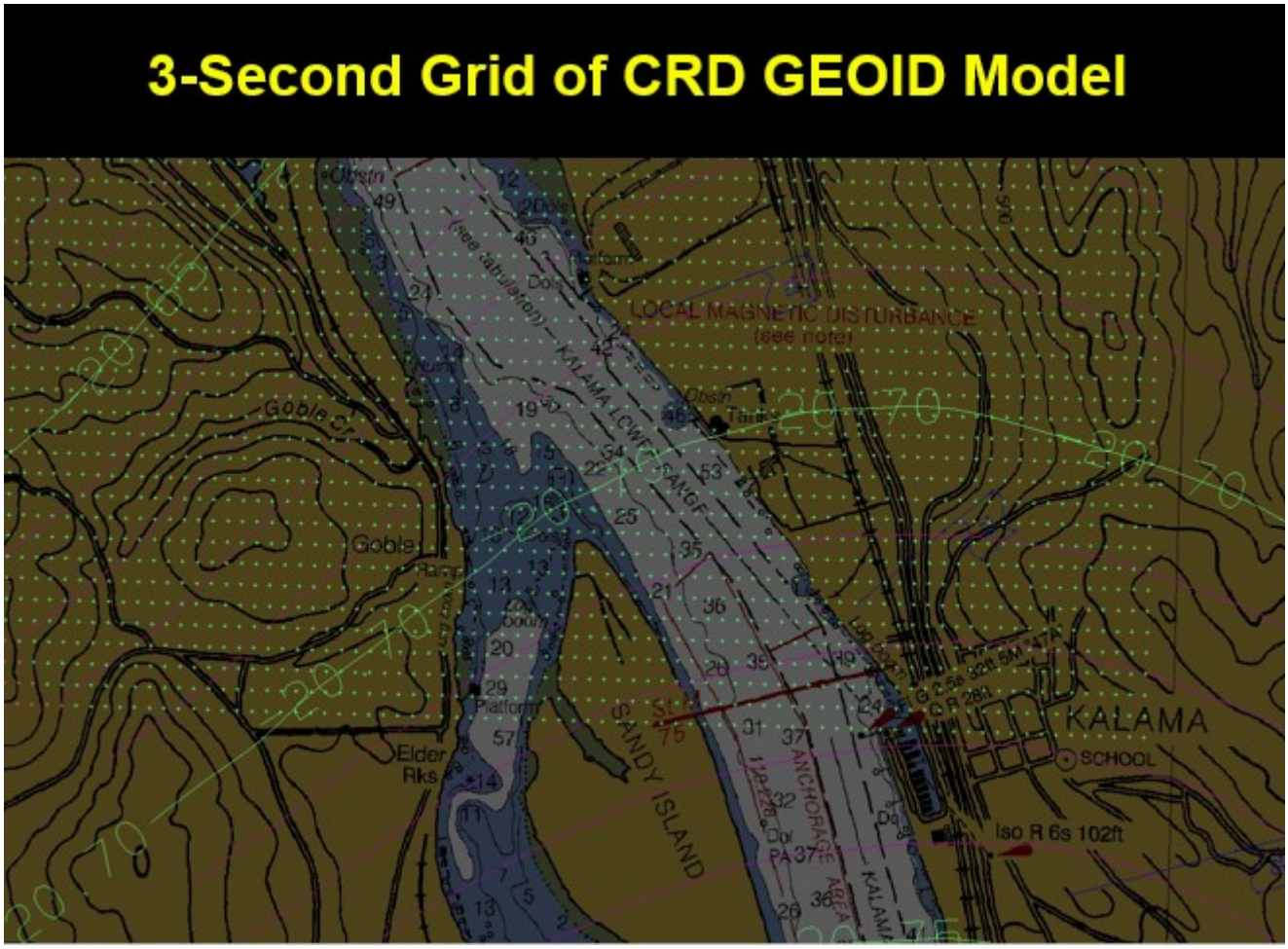
From that surface a 3 arc second grid was generated with values populated from the TIN and those grid values run through the Geoid model to develop

the separation model.



Resultant contours of separation model that incorporates the gradient datum on NAVD88 and the geoid model.

Resolution is sufficient to capture merging channel, river bends, and geoid undulations.



From: Jack Riley - NOAA Federal <jack.riley@noaa.gov>
Sent: Friday, May 03, 2019 4:31 PM
To: Jon Dasler <Jld@deainc.com>
Cc: Jason Creech <Jasc@deainc.com>; Rick Brennan <richard.t.brennan@noaa.gov>; Martha Herzog - NOAA Federal <martha.herzog@noaa.gov>; Corey Allen <corey.allen@noaa.gov>; Glen Rice <glen.rice@noaa.gov>
Subject: Re: FW: Mississippi LWRP Survey Findings PowerPoint

Okay -- the point I missed was the need to include the high-resolution gradient along the river, but [continuing to] exclude the 2-D geoidal undulations perpendicular to the river center line. So while my 2-D LWRP-NAVD88 component is accurate to the hydraulic model (2-D "road" version of the orange line on the plot with the USACE's blue stepped line and SEP -minus- geoid-09 and -12 plot), I need to include more samples to track that gradient path. I can revise and provide a Geoid12B version as well.

I discussed this with HSD today and said I would follow-up with you (per above) and phone call too, if you're available -- anytime is potentially good for me, including through the weekend. We all agreed that the presentation at the meeting next week needs to be simplified in terms of these model details. The slide showing contours on your version of the existing LWRP NOAA Model is inaccurate and comparing the Geoid09-realized LWRP2007 to 12B profiles should be limited to support the argument that's the correct way to go with ellipsoidally-referenced LWRP2007 realization.

Assuming the Geoid12B-version of the revised SEP I will send generates consistent results with the revised comparisons you've computed, we should update that on the slides. LWRP most likely continues to be nearly linear down river from Venice. CO-OPS says LWRP=NAVD88 at HOP (MM 0) and that MLLW=LWRP ~MM 1 on SW Pass & ~MM2 on Pass a Loutre. Our SEP includes the LWRP zero at HOP and continues seaward on MLLW, overriding VDatum by making use of CO-OPS NAVD88 on MLLW corrected values at Pilots Station East (8760922) = +34.8 cm, and Devon Energy Facility (8760417) of +21.7 cm.

Glen Rice (cc'd) will be able to attend the meeting on behalf of NOAA as well. Glen is keen on getting familiar with vertical datum decisions in his primary role with HSTB as Technical Lead on the NOAA National Bathymetric Source Project.

Jack L. Riley

Coast Survey Development Lab

240-847-8271

On Fri, May 3, 2019 at 6:23 PM Jon Dasler <Jld@deainc.com> wrote:

> We did one more exercise to see how we would compare to USACE gauge observations if we backed out the NOAA separation model to obtain the original ellipsoid height observation and applied Geoid12B or Geoid09 and subtracted USACE NAVD88 elevation of LWRP to get LWRP. In general, using Geoid12B reduces the difference from gauges with the exceptions being Baton Rouge, New Orleans (Carrolton), Algiers Locks, and Venice. These difference are likely due to USACE applying LWRP offset to old datums (NGVD29, etc.) Although Venice comparison gets worse, this puts the observation much closer at the CO-OPS gauge at Pilottown which we missed by 0.7 feet. Using Geoid12B should drive this down to 0.2 feet or less. We do not have NAVD88 elevations below RM 11 AHP (Venice) for LWRP or MLLW. It would be good to get the CO-OPS NAVD88 elevations from recent maintenance observations. Attached is the full spread sheet to see how these values were computed. The text G12b & USACE LWRP implies that we used GEOID12B to get to NAVD88 from original ellipsoid observations and then applied the appropriate USACE NAVD88 elevation of LWRP based on river mile of the gauge to obtain LWRP water surface elevations.

Gauge	Ship Float G12b & USACE LWRP ft	G12b Delta from Ship Float ft	G12b Delta from Gauge ft	Ship Float G09 & USACE LWRP ft	G09 Delta from Ship Float ft	G09 Delta from Gauge ft
Baton Rouge	21.23	0.19	1.17	21.44	-0.02	0.96

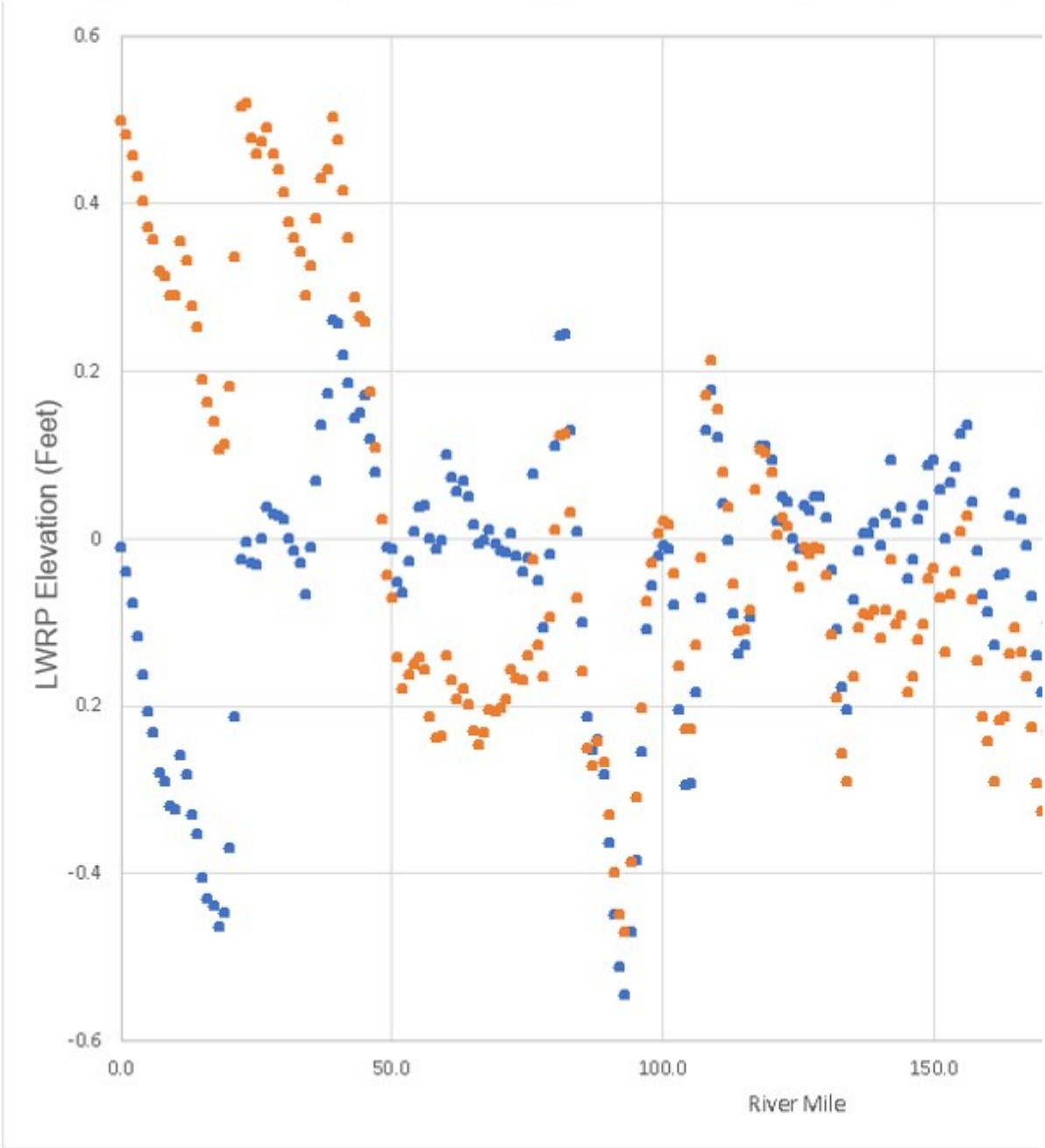
Donaldsonville	15.22	0.04	1.00	15.09	0.17	1.13
Reserve	11.27	-0.11	0.68	11.17	-0.01	0.78
BC NW	11.20	-0.04	0.85	11.13	0.03	0.92
Bonnet Carre	10.43	-0.06	0.65	10.38	-0.01	0.70
New Orleans	9.95	-0.11	0.97	10.00	-0.16	0.92
IHNC Lock	8.79	-0.56	0.39	8.88	-0.65	0.30
Algiers Lock	7.99	-0.21	0.72	7.99	-0.21	0.72
Alliance	4.94	-0.18	0.50	4.69	0.07	0.75
Pt a la Hache	6.36	0.00	0.42	6.33	0.03	0.45
Venice	2.16	0.50	0.40	2.77	-0.11	-0.21

From: Jon Dasler
Sent: Friday, May 03, 2019 1:24 PM
To: Jack Riley - NOAA Federal <jack.riley@noaa.gov>; Jason Creech <Jasc@deainc.com>
Cc: Rick Brennan <richard.t.brennan@noaa.gov>; Martha Herzog - NOAA Federal <martha.herzog@noaa.gov>; Corey Allen <corey.allen@noaa.gov>; Glen Rice <glen.rice@noaa.gov>
Subject: RE: FW: Mississippi LWRP Survey Findings PowerPoint

Below is another example. In this case we took the NAVD88 values at the river mile positions provided by USACE for the LWRP gradient. We computed ellipsoid heights for each point by applying GEOID09 in one test and GEOID12B in another test. We then applied your separation model to the ellipsoid heights (GEOID09 blue points, GEOID12B orange points), which should result in a zero elevation LWRP for at least one of the models. We believe the GEOID12B more accurately defines what we surveyed using NAD83 (2011).

USACE Mississippi LWRP vs N

NOAA Model test using USACE River Mile with NAVD88 elevation of LWRP con
GEOID12B then ellipsoid height converted to LWRP using NOAA Model. All poin
Ellipsoid heights derived using GEOID12B approximates survey using NAD83(20



From: Jon Dasler
Sent: Friday, May 03, 2019 1:11 PM
To: 'Jack Riley - NOAA Federal' <jack.riley@noaa.gov>; Jason Creech <Jasc@deainc.com>
Cc: 'Rick Brennan' <richard.t.brennan@noaa.gov>; 'Martha Herzog - NOAA Federal' <martha.herzog@noaa.gov>; 'Corey Allen' <corey.allen@noaa.gov>; 'Glen Rice' <glen.rice@noaa.gov>
Subject: RE: FW: Mississippi LWRP Survey Findings PowerPoint

To follow on this discussion and our observations, the data points you used to model LWRP are shown in pink on the attached image with associated NAVD88 height of LWRP and river mile. Note that your river miles are off by approximately 4 miles. Your model values match close to the contours (contours have inverse values labeled) of the model we generated by subtracting the geoid model from your separation values (as they should). The circled points are USACE river miles with the assigned NAVD88 value of LWRP with associated rive mile. My assessment of this difference is that you may have used a low resolution model of the NAVD88 elevations defining LWRP and we are seeing artifacts from the geoid or "hydraulic geoid" you applied. In short, if a survey used a geoid model to obtain an NAVD88 orthometric height (call it 6) and applied the NAVD88 elevation of LWRP (call it 1), when applied 6-1=5. If you have a hydraulic geoid model (call it 7) and apply your model of LWRP (call it 2), when applied you should get the same answer 7-2=5. This should hold true for any point in the model.

From: Jon Dasler
Sent: Friday, May 03, 2019 12:39 PM
To: Jack Riley - NOAA Federal <jack.riley@noaa.gov>; Jason Creech <Jasc@deainc.com>
Cc: Rick Brennan <richard.t.brennan@noaa.gov>; Martha Herzog - NOAA Federal <martha.herzog@noaa.gov>; Corey Allen <corey.allen@noaa.gov>; Glen Rice <glen.rice@noaa.gov>
Subject: RE: FW: Mississippi LWRP Survey Findings PowerPoint

Jack

I am not sure what you are using for a "hydraulic GEOID" or how you derived it but the NAVD88 elevations already define the hydraulic gradient. You just need to apply the geoid model to a high resolution model of the NAVD88 gradient to capture changes in the geoid. You should get the same separation at any point in the model when using an NAVD88 height of LWRP and using a GEOID model, generally how the gauge surveys were conducted. This is how the NAVD88 elevations of LWRP were originally defined, exactly the same as Columbia River Datum using a 3 second arc grid (roughly 100 meter grid) of CRD relative to NAVD88. The model of the river should be constructed first relative to the defining datum (NAVD88) using every point along the profile with equal elevations normal to the centerline profile (similar to a flat road surface). The result is the hydraulic gradient of the river relative to NAVD88. From there a high resolution grid is interpolated from the TIN model and the appropriate standard geoid model applied for a separation model from the appropriate datum, NAD83 (2011) in the case of the Mississippi River where the C4G network is being used for ellipsoid heights, to LWRP. At any point on the river the geoid model should be able to be subtracted to get the originally defined NAVD88 elevation of the LWRP gradient datum. This is exactly how the Columbia River model was generated with repeatable results at any gauge location or benchmark and allows for easy translation between NAVD88 and the gradient datum (CRD or NAVD88). To test this in your model, we took all the centerline data points with NAVD88 elevations of LWRP and added the GEOID09 and GEOID12B as two separate tests to obtain ellipsoid heights. We believe adding GEOID12B would more accurately represent ellipsoid heights relative to our survey

ellipsoid heights using NAD83(2011). From those ellipsoid heights (again how the gauges were surveyed) we subtract your separation model. The result is the undulation you see in the profile image attached.

We probably should have a conference call to discuss this in detail and I can pull up examples of Columbia River Datum modeling.

Jon

Jon L. Dasler, PE, PLS, CH | Senior Vice President, Director of Marine Services

David Evans and Associates, Inc. | Marine Services Division | www.deamarine.com

t: 360.314.3200 | c: 503.799.0168 | jld@deainc.com

DAVID EVANS AND ASSOCIATES INC. MARINE SERVICES

From: Jack Riley - NOAA Federal <jack.riley@noaa.gov>
Sent: Friday, May 03, 2019 12:03 PM
To: Jon Dasler <Jld@deainc.com>; Jason Creech <Jasc@deainc.com>

Cc: Rick Brennan <richard.t.brennan@noaa.gov>; Martha Herzog - NOAA Federal <martha.herzog@noaa.gov>; Corey Allen <corey.allen@noaa.gov>; Glen Rice <glen.rice@noaa.gov>
Subject: Re: FW: Mississippi LWRP Survey Findings PowerPoint

Jon and Jason,

I exported the LWRP2007-NAVD88 component from my TCARI solution and I am not seeing any oscillation in the LWRP profile. I see a monotonically-increasing function. There's also not much athwart variation (mm) in my LWRP -- consistent with a hydraulic datum. The NOAA NAD83-LWRP SEP is similarly hydraulic, where the USACE NAVD88-LWRP2007 values at the "risers" (staircase analogy; "treads" are the [constant] LWRP plateaus) are added to the local NAD83-NAVD88 to change the basis, and that is spatially interpolated (2-D Laplace). You are introducing all this tilt in your analysis when you un-apply the geoid to the *gridded* data. To recover the hydraulic LWRP you need to un-apply a linearly-interpolated "hydraulic geoid" differential surface.

Jack

--

Jack L. Riley

Coast Survey Development Lab

240-847-8271

On Fri, May 3, 2019 at 12:16 PM Jon Dasler <Jld@deainc.com> wrote:

> Jack
>
> Thank you for the response. I will be traveling to New Orleans on Monday at 3PM Pacific and will be at Stennis all day Tuesday. The meeting with New Orleans is at 10AM Central on Wednesday. Feel free to reach out to Jason and we can coordinate a conference call as needed.
>
> Jon

Jon L. Dasler, PE, PLS, CH | Senior Vice President, Director of Marine Services

David Evans and Associates, Inc. | Marine Services Division | www.deamarine.com

t: 360.314.3200 | c: 503.799.0168 | jld@deainc.com

From: Jack Riley - NOAA Federal <jack.riley@noaa.gov>
Sent: Friday, May 03, 2019 8:45 AM
To: Jon Dasler <Jld@deainc.com>
Cc: Rick Brennan <richard.t.brennan@noaa.gov>; Martha Herzog - NOAA Federal <martha.herzog@noaa.gov>
Subject: Re: FW: Mississippi LWRP Survey Findings PowerPoint

Hello Jon,

Yes, I have received the email and downloaded the presentation. I am working to follow-up on things this afternoon leading up to a check-in with the HSD at 1600. We will check-in back with you ASAP afterwards, in advance of the meeting next Wednesday; expect some info this PM with some follow up as needed early next week.

Thanks,

Jack

--

Jack L. Riley

Coast Survey Development Lab

240-847-8271

On Fri, May 3, 2019 at 11:33 AM Jon Dasler <Jld@deainc.com> wrote:

> All,
>
> Just checking in to make sure you received my email yesterday and you were able to download the PowerPoint. Following is an image that further illustrates what we are seeing. The dark circles are USACE mile point and black text is the associated NAVD88 elevation of LWRP color coded by difference from NOAA model. The pink dots are points used in the NOAA model with associated NAVD88 elevation of LWRP. The white haloed points are contour labels of NAVD88 inverse values of LWRP. These should match the core centerline mile values. Let us know when you are available for a meeting.
>
> Jon
>
> **Jon L. Dasler, PE, PLS, CH** | Senior Vice President, Director of Marine Services
>
> David Evans and Associates, Inc. | Marine Services Division | www.deamarine.com
>
> t: 360.314.3200 | c: 503.799.0168 | jld@deainc.com
>
>

Jason Creech

From: Martha Herzog - NOAA Federal <martha.herzog@noaa.gov>
Sent: Friday, May 3, 2019 12:58 PM
To: Jason Creech
Cc: Jon Dasler
Subject: Re: OPR-J347-KR-18 Training Walls Southwest Pass

Hi Jason,

I have better guidance for the training walls/pile dikes.

There is no need to mark small segments of the training wall (especially less than 10m) each as submerged, cov/uncov, and dry. For instance, if most of it is ruined with only small, intact sections, you can label the entire thing as ruined.

If a ruined segment has a pile or two seaward and appears to have once to be a part of the training wall extend the ruined segment to the pile. It doesn't make sense to have obstructions at the end of nearly every training wall.

For the ruined training walls that have jogs, continue to mark the training wall with the jog at the least depth of the ruins.

Please let me know if you have questions. I'd be happy to explain run through this with your PowerPoint.

On Fri, Apr 26, 2019 at 1:03 PM Jason Creech <Jasc@deainc.com> wrote:

> Hi Martha
>
> As we work to complete sheet 10 (Southwest Pass) we are looking to finalize our procedures for depicting training walls in our survey data, finalized grids, and final feature file. As expected, there is a lot going on with these structures and we want to make sure we have a firm understanding of requirements and expectations. I've created a PowerPoint deck with some example training walls with images and screengrabs from HIPS subset. I've also added some first cuts at general representation in the FFF.
>
> If possible we'd like to schedule some time to have a web meeting to review and discuss these items. I've added some comments and notes to help explain what we are showing, but think a review in real time would be most beneficial.
>
> Would you be available later this afternoon or first thing next week for a meeting? In the meantime, I'm happy to address any questions you may have about the slides.
>
> Thanks,

Jason

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

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804.516.7829 | jasc@deainc.com

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Jason Creech

From: Jack Riley - NOAA Federal <jack.riley@noaa.gov>
Sent: Friday, June 7, 2019 8:01 PM
To: Jon Dasler; Jason Creech
Subject: Re: MLLW on NAVD88 Pilottown - BHP
Attachments: Miss_River_Miles_LWRP2007-NAVD88_StationsInput.txt

Jack L. Riley
Coast Survey Development Lab
240-847-8271

On Fri, May 31, 2019 at 7:51 AM Jack Riley - NOAA Federal <jack.riley@noaa.gov> wrote:

Hello Jon & Jason,

Some info for the meeting this morning.

Jack

---------- Forwarded message ---------
From: **Jack Riley - NOAA Federal** <jack.riley@noaa.gov>
Date: Thu, May 30, 2019 at 6:15 PM
Subject: Fwd: Mississippi River Mapping Meeting
To: Corey Allen <corey.allen@noaa.gov>, Martha Herzog - NOAA Federal <martha.herzog@noaa.gov>

Datum values from CO-OPS; original (v1; see attachments for "NAVD88 on MLLW", so reversed sign below to show "MLLW on NAVD88" to align with plot convention) compared with recent values from CO-OPS to DEA (v2). Also, v3 for quick spot check by me.

MLLW on NAVD88 (Geoid12B)

Pilot Station East, SW Pass (8760922)
v1: -0.348 m = -1.14 ft = 13.7 in
v2: -0.222 m = -0.73 ft = 8.7 in
v3: BMs are not shown as published on the NWLON website, so used those available in WALI. I see v1 values using the two most recent BMs ('F' & 'G' set in 2010) and corresponding OPUS Shared Solutions (SS) ('F' @ 2018, 'G' 2015). I see values closer to v2 using older BMs ('C' & 'D' set in 2004) and corresponding OPUS SS ('C' 2012 @ , 'D' @ 2007)

Pilottown (8760721)
v1: +0.063 m = +0.21 ft = 2.5 in
v2: +0.162 m = +0.53 ft = 6.4 in
v3: I see values similar to v1 using BM 'D' (OPUS SS 2011) and v2 values using BM 'Pilot' (OPUS SS 2018).

Devon Energy, Pass a Loutre (8760417)
v1: -0.217 m = -0.71 ft = -8.5 in

v2: N/A
v3: I see values similar to v1 using one available BM ('A') having two OPUS SS.

---------- Forwarded message ---------
From: **Colleen Fanelli - NOAA Federal** <colleen.fanelli@noaa.gov>
Date: Wed, Oct 25, 2017 at 5:52 PM
Subject: Re: Mississippi River Mapping Meeting
To: Richard Brennan - NOAA Federal <richard.t.brennan@noaa.gov>
Cc: Corey Allen - NOAA Federal <corey.allen@noaa.gov>, Craig Winn - NOAA Federal <craig.winn@noaa.gov>, David Wolcott - NOAA Federal <david.wolcott@noaa.gov>, Edward Myers - NOAA Federal <edward.myers@noaa.gov>, Gerald Hovis - NOAA Federal <gerald.hovis@noaa.gov>, Jack Riley - NOAA Federal <jack.riley@noaa.gov>, Janice Eisenberg <janice.eisenberg@noaa.gov>, Laura Rear McLaughlin - NOAA Federal <laura.rear.mclaughlin@noaa.gov>, MeiLing Freeman - NOAA Federal <meiling.freeman@noaa.gov>, Michael Michalski - NOAA Federal <michael.michalski@noaa.gov>, Samuel Greenaway - NOAA Service Account <samuel.greenaway@noaa.gov>, Stephen A. White <stephen.a.white@noaa.gov>, Zizang Yang - NOAA Federal <zizang.yang@noaa.gov>, John Nyberg - NOAA Federal <john.nyberg@noaa.gov>, Mike Aslaksen - NOAA Federal <mike.aslaksen@noaa.gov>

Rick,

We can say for certain that the point in-which MLLW is equal to LWRP occurs south of the Head of Passes (MM 0). We can provide an approximate location within the southwestern pass and eastern pass but we cannot provide anything for the southern (central) pass due to a lack of observations and orthometric ties within the Bird's Foot. We cannot pinpoint an exact transition point, however, and the red line on the attached graphics is a mathematical interpolation between only 3 data points along the river. The interpolation method used was a spline fit between the active stations Pilots Station (SW Pass) and Pilottown, and the historical station Devon Energy.

At Head of Passes (MM 0), LWRP = NAVD88. Each Pass within the Bird's Foot has it's own mile markers (MM). It is assumed that this remains the same south of Head of Passes for our purpose here. This the intersection point is labelled as "NAVD88 = MLLW". For the Southwest Pass, MLLW is equal to LWRP at approximately MM 1. For the Eastern Pass, MLLW is equal to LWRP at approximately MM 2.

I hope this helps.

~Colleen

--
Colleen Fanelli
Oceanographer, Hydrographic Planning Team Lead
NOAA/National Ocean Service
Center for Operational Oceanographic Products and Services
Station 7127
1305 East-West Highway N/OPS3
Silver Spring, MD 20910
Colleen.Fanelli@noaa.gov
Phone (NEW): (240) 533 - 0615

Jason Creech

From: Jack Riley - NOAA Federal <jack.riley@noaa.gov>
Sent: Friday, June 21, 2019 3:56 PM
To: Jon Dasler; Jason Creech
Cc: Corey Allen; Martha Herzog - NOAA Federal; Richard Brennan
Subject: Updated MLLW-LWRP Model by NOAA/USACE
Attachments: NAD83-LWRP2007_RM13.4_MLLW2012-2016_Geoid12B.zip

Hello Jon and Jason,

See attached for the revised NAD83 - sounding datum separation model for the Mississippi River (zipped CSAR NAD83-LWRP2007_RM13.4_MLLW2012-2016_Geoid12B). The demarcation line separating the sounding datum definitions of LWRP and MLLW is at river mile (RM) 13.4 (near Duvic, Boothville-Venice, LA; MICHELLA Iso R 6s 7M "14" is at RM 13.5), per agreement between NOAA and USACE. Sounding datum is LWRP upriver (north) of RM 13.4, and is MLLW downriver (south) of RM 13.4. Given the current realizations of LWRP (2007) and MLLW (2012-2016), there exists a step change in the sounding datum model at RM 13.4 of approximately 13.5 cm (5.3 in = 0.44 ft).

I also increased the precision of the defined USACE LWRP profile relative to NAVD88 in the separation model to honor better that component at the 0.01-ft (3 mm) level perpendicular to the nominal river course. Above RM 13.4, the old model and new model are practically the same: Mean difference (old-new) = 8 mm, standard deviation = 4 mm. Min difference (old-new) = -5 mm, max difference = 21 mm (2.1 cm). 99% of the differences are less than 1.5 cm. Below RM 13.4, the change from MLLW 2007-2011 (old model) to MLLW 2012-2016 (new model) is significant: mean = 6.9 cm, standard deviation = 6.3 cm, min = -9.1 cm, max = 17.1 cm.

Jack
--

Jack L. Riley
Coast Survey Development Lab
240-847-8271

Jason Creech

From: Martha Herzog - NOAA Federal <martha.herzog@noaa.gov>
Sent: Monday, July 8, 2019 11:31 AM
To: Jason Creech
Cc: Corey Allen (Corey.Allen@noaa.gov); Jon Dasler; Christina Fandel - NOAA Federal
Subject: Re: OPR-J347-KR-18 Feature Developments

Jason,

At this time, HSD will not issue a waiver to preclude development of required submerged features per HSSD Section 7.3.3.

In the event that these features are unsafe to complete a feature development per HSSD Section 7.3.3, then, if safe to approach, develop the feature by acquiring an additional line of multibeam data at an orientation as close to 90 degrees as practicable ensuring the safety of the vessel and crew. If it is unsafe to approach the feature, then the field unit is not required to conduct a feature investigation per the safety statement annotated in the Project Instructions. Should a feature development not meet the requirements of HSSD Section 7.3.3 due to safety concerns, populate the feature's remarks attribute accordingly.

Please let me know if you have any questions,
Martha

On Fri, Jun 28, 2019 at 2:17 PM Jason Creech <Jasc@deainc.com> wrote:

> Hi Corey
>
> Thanks for taking my call yesterday. As I mentioned, we currently have six of our ten Mississippi River surveys open due to the need to run feature developments as required by the 2018 HSSD. These are Sheets 1-6 which are upriver between Baton Rouge and New Orleans. Given the impacts on survey productivity of the historic flooding within this stretch of river, we've been exploring options to wrap up these outstanding surveys. Data were initially collected in these areas between September and mid-November of 2018. Since then, these areas have been above flood stage with strong currents in excess of 7 knots and USCG restrictions on traffic which has prevented us from safely completing the open sheets. Currently, the long range forecast for the project area has river levels exceeding flood stage for the entirety of the 28 day forecast.
>
> There are over 390 features that require a feature development with an independent perpendicular pass within these six survey sheets, most are close to the shoreline and near features that impede running perpendicular lines. After some recent discussions with Martha, we have reviewed these features and found that over 80% of them have a valid least depth that has been confirmed by more than one survey line. The remaining features only have data from a single line and require new data confirming the least depth. That said, due to the proximity of these features to the shoreline and high river flows, we are unsure if we can safely obtain an independent pass run perpendicular to mainscheme survey lines as required by the Specs.

We'd like to request a waiver for the survey, removing the requirement to acquire the additional feature development line when a feature's least depth can be confirmed by another survey line. This waiver would allow us to focus our efforts on investigating 70 or so outstanding features with least depths from a single pass and allow investigation of these features running survey lines at an orientation that is safe to the vessel crew. We're exploring options outside of using the S/V Blake and her RHIB to complete these feature developments.

I've attached two zip files containing some example screenshots from HIPS. In most cases, these features fall along the shoreline which makes the acquisition of perpendicular survey lines difficult and hazardous. In these examples, multibeam soundings are colored by survey line.

The For_Waiver zip file includes examples of features with valid least depths confirmed by multiple passes, just not one perpendicular to mainscheme. A waiver of the perpendicular requirement would allow us to use these surveyed least depths and forgo additional development.

The For_Investigation zip includes examples of features with data from only a single survey line. These features may require additional data acquisition. A waiver of the perpendicular requirement would allow acquisition of new data at a safe orientation.

Please let me know if you have any questions. Our overall goal is to complete these surveys safely and deliver the data and products in a timely manner.

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

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--
Martha Herzog
NOAA Operations Team Lead | Operations Branch
Hydrographic Surveys Division | Office of Coast Survey
240-533-0028

Jason Creech

From: Kasey Whitfield - NOAA Affiliate <kasey.whitfield@noaa.gov>
Sent: Monday, July 29, 2019 12:33 PM
To: Eastern Operations Eastern Operations - NOAA Service Account; Jason Creech; Kathryn Pridgen - NOAA Federal; Christina Fandel - NOAA Federal
Subject: EA133C14CQ0037/1305M219FNCNJ0165 Mod P19001
Attachments: 4772_001.pdf

Good Afternoon,

Please find the attached fully executed no-cost administrative modification for the subject contract.

Respectfully,

Kasey

--
Kasey Whitfield
Contract Specialist, NOAA, AGO
Eastern Region Acquisition Division
Supporting the National Ocean Service
Contractor - I.M. Solutions, LLC
200 Granby Street, Room 800
Norfolk, VA 23510
Office: 757-605-7407

Jason Creech

From: Martha Herzog - NOAA Federal <martha.herzog@noaa.gov>
Sent: Tuesday, July 30, 2019 2:59 PM
To: Jason Creech
Subject: OPR-J347-KR-18

Jason,

Thanks for your call. To clarify the vertical control requirements in the project instructions - please reference all laser scanning data to the sounding datum using the provided LWRP-MLLW separation model.

Martha

--
Martha Herzog
NOAA Operations Team Lead | Operations Branch
Hydrographic Surveys Division | Office of Coast Survey
240-533-0028

Jason Creech

From: Martha Herzog - NOAA Federal <martha.herzog@noaa.gov>
Sent: Thursday, August 1, 2019 1:11 PM
To: Jason Creech
Cc: Jon Dasler
Subject: Re: OPR-J347-KR-18 Revetments

Follow Up Flag: Follow up
Flag Status: Flagged

Hi Jason,

I checked with Gene and he concurs with adding new revetment ares to the FFF as obstructions. For VALSOU, the least death of the MBES data in the area of the area obstruction should work. QUASOU would likely be 'least depth known' and TECSOU would likely be 'found with multibeam.'
The charted revetments can be noted with a retain.

Please let me know if you had additional questions,
Martha

On Tue, Jul 30, 2019 at 5:36 PM Jason Creech <Jasc@deainc.com> wrote:

> Hi Martha
>
> I'm following up on our phone conversation from this afternoon. We are working to finish the portrayal of the revetment areas for the Mississippi River project and want to make sure we are meeting your needs and following contract guidance.
>
> As I mentioned, we are not able to accurately depict the true limits of the revetments as portions of the mats are frequently buried. In these cases we feel it is safer to retain vs delete these sections. I've included a screengrab below showing an example of a charted revetment (included in PRF not CSF) vs revetment extents visible in the survey data and have a few questions.
>
> 1. Should revetments be included in the FFF or a separate file? These were not included in the project CSF.
> 2. Regarding portrayal, is it acceptable to retain all revetments and include new polygons where revetments are surveyed outside of the charted area (red polygons below)? This is what I mentioned when we spoke on the phone. The PRF revetment Investigation requirements are as follows… "Investigate revetment per HSSD section 7.3.1. Unchanged revetment shall be encoded as RESARE with descrp = retain. Inaccurately charted or missing revetment shall be noted with descrp = delete with the new or changed revetment encoded as OBSTRN with descrp = new." As I mentioned, we aren't able to disprove the revetments with MBES data only. It's my understanding that revetments located outside of the known/ charted areas are an issue because ships have been anchoring on top of and damaging the revetment mats.

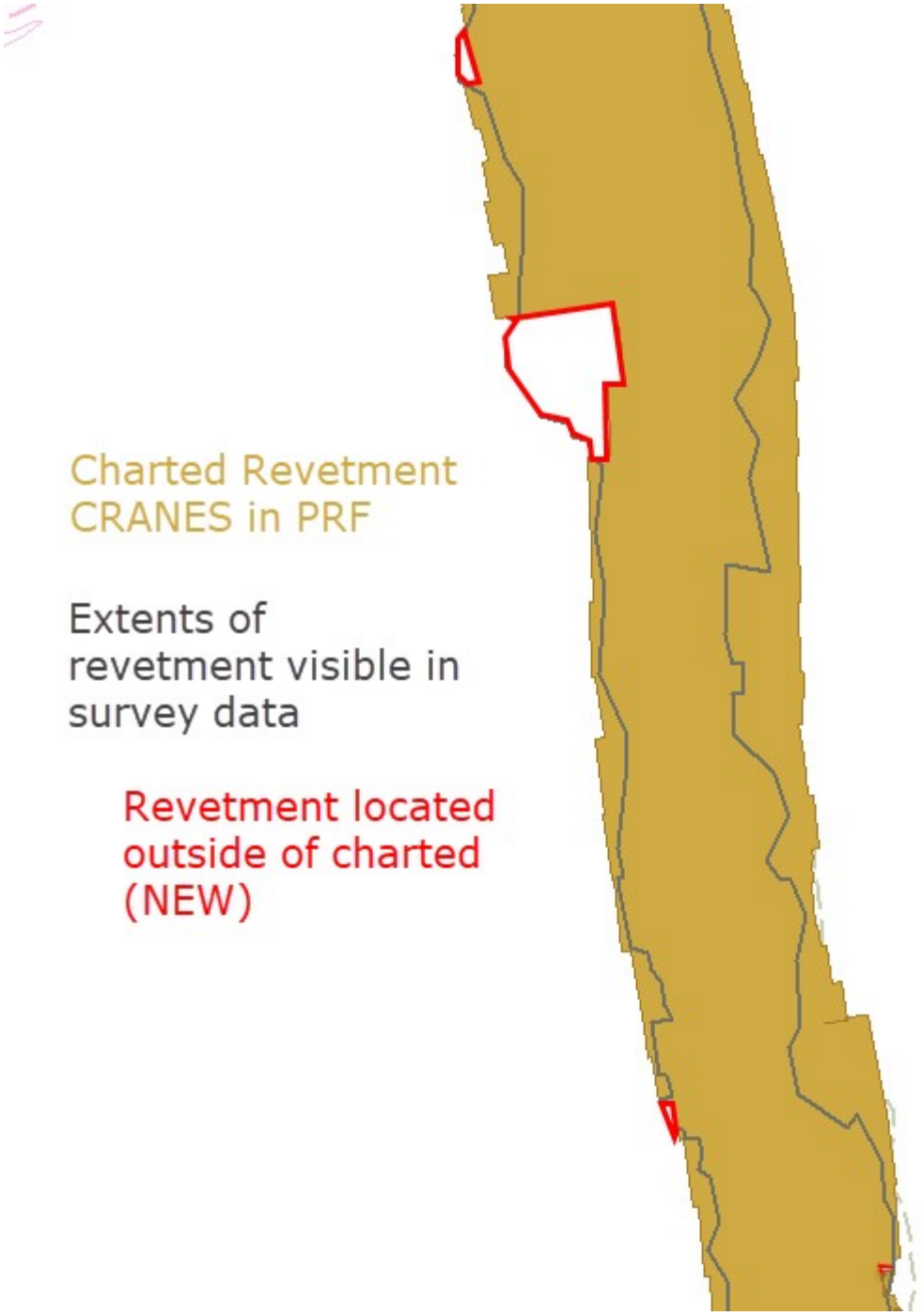
3. We wanted to verify that the feature encoding requirements are correct. Should new revetment areas be Obstruction areas? Obstructions have numerous mandatory attributes that we're unsure about populating when delineating revetments, including VALSOU.

I think that covers our questions.

Let me know if you'd like me to clarify anything.

Thanks,

Jason



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

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804.516.7829 | jasc@deainc.com

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--
Martha Herzog
NOAA Operations Team Lead | Operations Branch
Hydrographic Surveys Division | Office of Coast Survey
240-533-0028

Jason Creech

From: Martha Herzog - NOAA Federal <martha.herzog@noaa.gov>
Sent: Wednesday, August 7, 2019 4:33 PM
To: Jason Creech
Subject: Marine mammal/turtle logs

Jason,

I received an answer from our Environmental Compliance Coordinator to your question of whether anything needs to be stated if no marine mammals/turtles were seen - no action or statement is needed.

Martha

--
Martha Herzog
NOAA Operations Team Lead | Operations Branch
Hydrographic Surveys Division | Office of Coast Survey
240-533-0028

Jason Creech

From: Martha Herzog - NOAA Federal <martha.herzog@noaa.gov>
Sent: Wednesday, August 7, 2019 12:39 PM
To: Jason Creech
Subject: Re: OPR-J347-KR-18 Training Walls Southwest Pass

Hi Jason,

Yes that works as attributing the entire thing as ruined.

On Tue, Aug 6, 2019 at 4:28 PM Jason Creech <Jasc@deainc.com> wrote:

> Thanks Martha
>
> Most of these are ruined and composed of sections of baring and submerged piles. We will not designate the submerged sections and will avoid breaking these up so there is a single feature in the FFF for each training wall. See example below to be attributed as ruined.
>
> Jason

From: Martha Herzog - NOAA Federal <martha.herzog@noaa.gov>
Sent: Tuesday, August 6, 2019 4:17 PM
To: Jason Creech <Jasc@deainc.com>
Subject: Re: OPR-J347-KR-18 Training Walls Southwest Pass

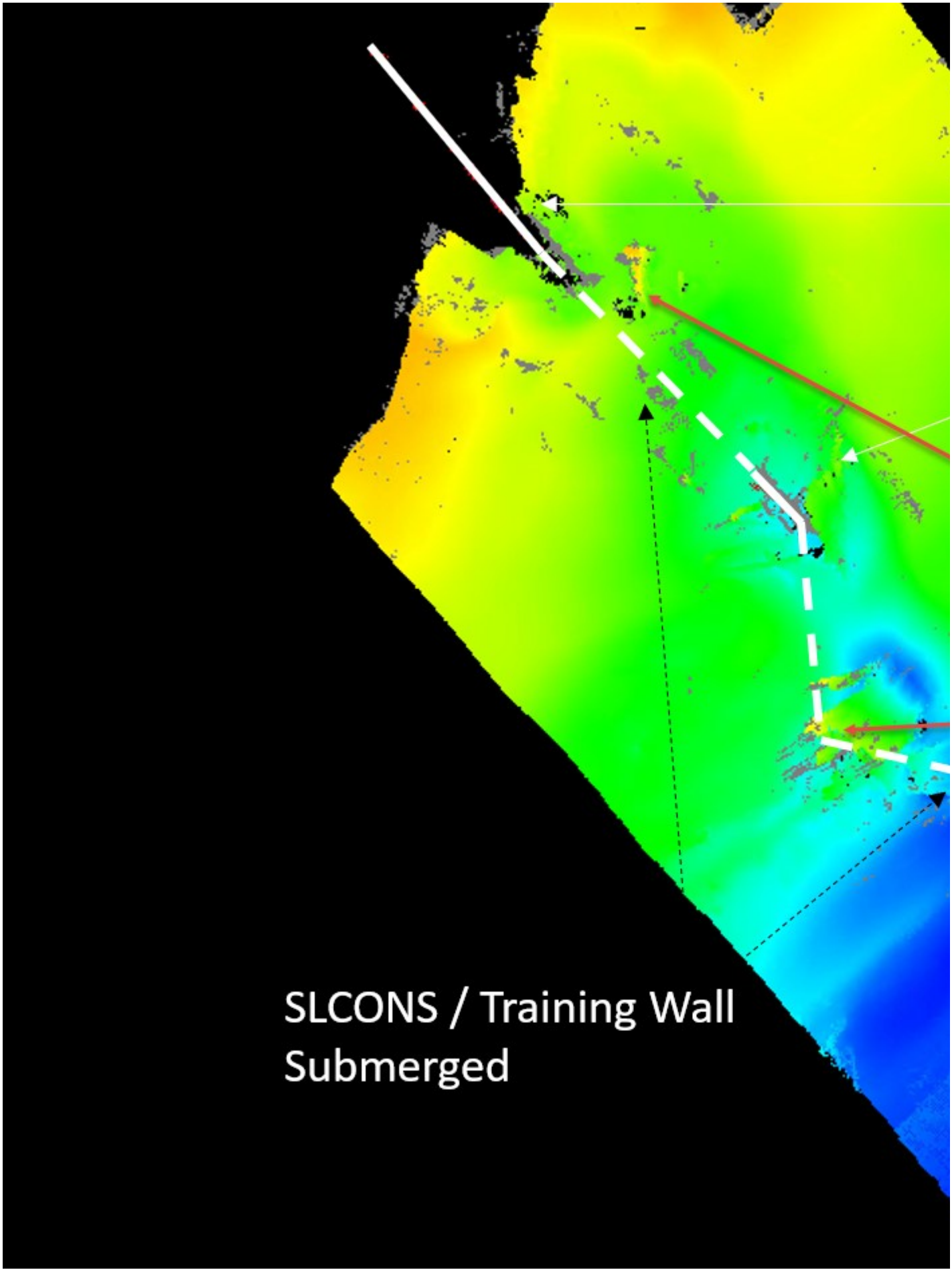
Hi Jason,

There is no need to designate every 2mm at survey scale (and please don't.) The ruined feature should take care of that as it is usually a baring feature.

As I stated in the earlier email above, there is no need to mark each small segment of the training wall as submerged, cov/uncov, and dry. For instance, if most of it is ruined with only small, intact sections, you can label the entire thing as ruined.

On Mon, Aug 5, 2019 at 4:07 PM Jason Creech <Jasc@deainc.com> wrote:

> Hi Martha
>
> We're working on our deliverables for Sheet 10 (SW Pass) and have a follow up question on the guidance you provided on training walls. Should the submerged sections of the training walls be designated so that the surface honors the least depths of the feature? Or does the fact that a ruined line feature is being digitized to depict the training wall put aside any designation requirement?
>
> I've included an example below (using a screengrab included in the slides I attached to this original email).
>
> Thanks for your guidance on this issue.
>
> Jason


SLCONS / Training Wall
Submerged

From: Martha Herzog - NOAA Federal <martha.herzog@noaa.gov>
Sent: Friday, May 3, 2019 12:58 PM
To: Jason Creech <Jasc@deainc.com>
Cc: Jon Dasler <Jld@deainc.com>
Subject: Re: OPR-J347-KR-18 Training Walls Southwest Pass

Hi Jason,

I have better guidance for the training walls/pile dikes.

There is no need to mark small segments of the training wall (especially less than 10m) each as submerged, cov/uncov, and dry. For instance, if most of it is ruined with only small, intact sections, you can label the entire thing as ruined.

If a ruined segment has a pile or two seaward and appears to have once to be a part of the training wall extend the ruined segment to the pile. It doesn't make sense to have obstructions at the end of nearly every training wall.

For the ruined training walls that have jogs, continue to mark the training wall with the jog at the least depth of the ruins.

Please let me know if you have questions. I'd be happy to explain run through this with your PowerPoint.

On Fri, Apr 26, 2019 at 1:03 PM Jason Creech <Jasc@deainc.com> wrote:

> Hi Martha
>
> As we work to complete sheet 10 (Southwest Pass) we are looking to finalize our procedures for depicting training walls in our survey data, finalized grids, and final feature file. As expected, there is a lot going on with these structures and we want to make sure we have a firm understanding of requirements and expectations. I've created a PowerPoint deck with some example training walls with images and screengrabs from HIPS subset. I've also added some first cuts at general representation in the FFF.

If possible we'd like to schedule some time to have a web meeting to review and discuss these items. I've added some comments and notes to help explain what we are showing, but think a review in real time would be most beneficial.

Would you be available later this afternoon or first thing next week for a meeting? In the meantime, I'm happy to address any questions you may have about the slides.

Thanks,

Jason

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

David Evans and Associates, Inc.

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804.516.7829 | jasc@deainc.com

ENERGY | LAND DEVELOPMENT | MARINE SERVICES | SURVEYING AND GEOMATICS | TRANSPORTATION | WATER AND ENVIRONMENT

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Martha Herzog

NOAA Operations Team Lead | Operations Branch

Hydrographic Surveys Division | Office of Coast Survey

240-533-0028

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Martha Herzog
NOAA Operations Team Lead | Operations Branch
Hydrographic Surveys Division | Office of Coast Survey
240-533-0028

Jason Creech

From: Martha Herzog - NOAA Federal <martha.herzog@noaa.gov>
Sent: Friday, August 9, 2019 4:04 PM
To: Jason Creech
Subject: Re: OPR-J347-KR-18 Training Walls Southwest Pass

Jason,

I'll add that if the ruined training wall has sections that are submerged, covers and uncovers, and dry, (or a combo of 2 of those), attribute the WATLEV with covers and uncovers.

Please let me know if you have any question,
Martha

On Wed, Aug 7, 2019 at 12:38 PM Martha Herzog - NOAA Federal <martha.herzog@noaa.gov> wrote:

> Hi Jason,
>
> Yes that works as attributing the entire thing as ruined.
>
> On Tue, Aug 6, 2019 at 4:28 PM Jason Creech <Jasc@deainc.com> wrote:
>
> > Thanks Martha
> >
> > Most of these are ruined and composed of sections of baring and submerged piles. We will not designate the submerged sections and will avoid breaking these up so there is a single feature in the FFF for each training wall. See example below to be attributed as ruined.
> >
> > Jason

From: Martha Herzog - NOAA Federal <martha.herzog@noaa.gov>
Sent: Tuesday, August 6, 2019 4:17 PM
To: Jason Creech <Jasc@deainc.com>
Subject: Re: OPR-J347-KR-18 Training Walls Southwest Pass

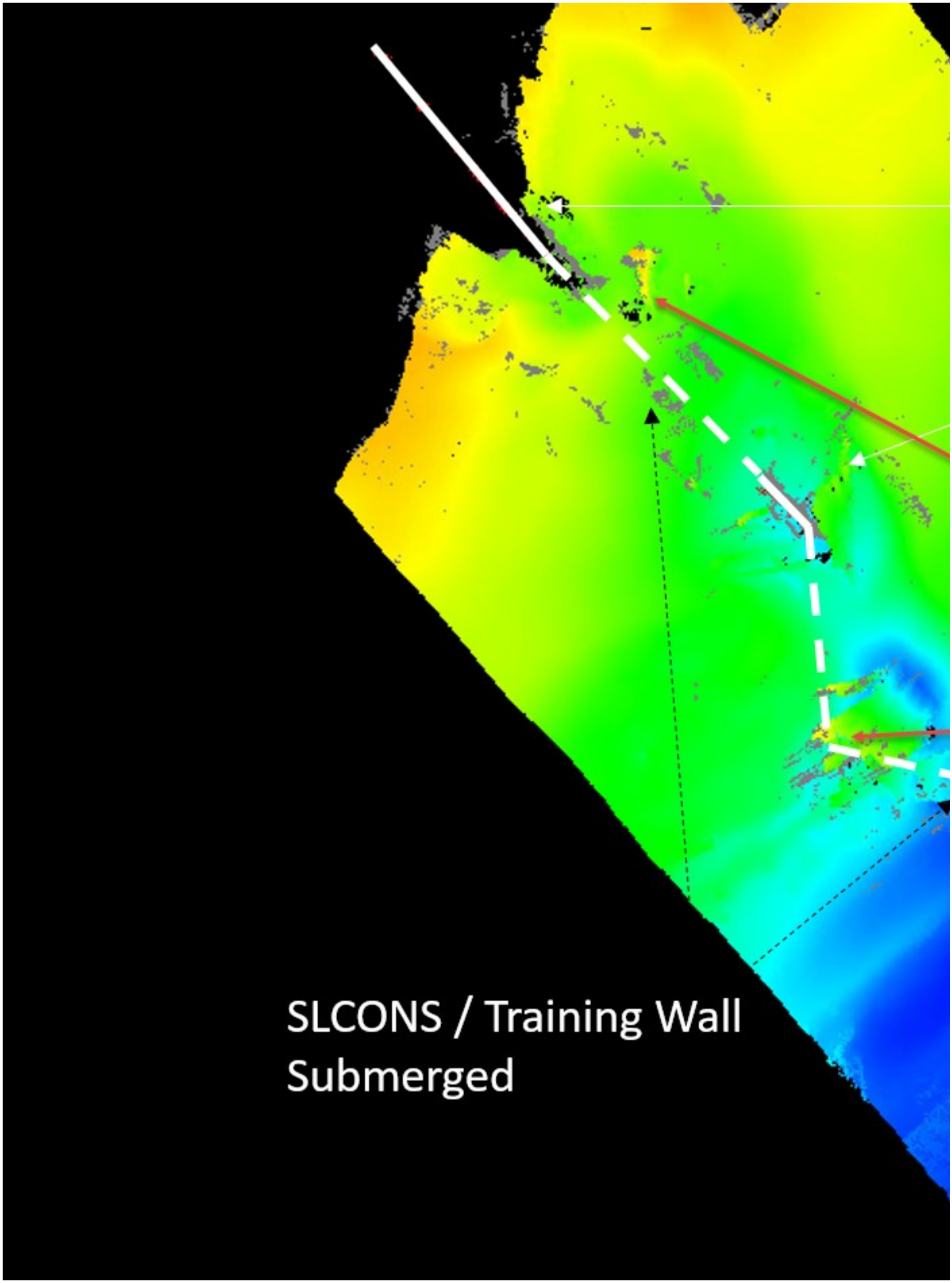
Hi Jason,

There is no need to designate every 2mm at survey scale (and please don't.) The ruined feature should take care of that as it is usually a baring feature.

As I stated in the earlier email above, there is no need to mark each small segment of the training wall as submerged, cov/uncov, and dry. For instance, if most of it is ruined with only small, intact sections, you can label the entire thing as ruined.

On Mon, Aug 5, 2019 at 4:07 PM Jason Creech <Jasc@deainc.com> wrote:

> Hi Martha
>
> We're working on our deliverables for Sheet 10 (SW Pass) and have a follow up question on the guidance you provided on training walls. Should the submerged sections of the training walls be designated so that the surface honors the least depths of the feature? Or does the fact that a ruined line feature is being digitized to depict the training wall put aside any designation requirement?
>
> I've included an example below (using a screengrab included in the slides I attached to this original email).
>
> Thanks for your guidance on this issue.
>
> Jason


SLCONS / Training Wall
Submerged

From: Martha Herzog - NOAA Federal <martha.herzog@noaa.gov>
Sent: Friday, May 3, 2019 12:58 PM
To: Jason Creech <Jasc@deainc.com>
Cc: Jon Dasler <Jld@deainc.com>
Subject: Re: OPR-J347-KR-18 Training Walls Southwest Pass

Hi Jason,

I have better guidance for the training walls/pile dikes.

There is no need to mark small segments of the training wall (especially less than 10m) each as submerged, cov/uncov, and dry. For instance, if most of it is ruined with only small, intact sections, you can label the entire thing as ruined.

If a ruined segment has a pile or two seaward and appears to have once to be a part of the training wall extend the ruined segment to the pile. It doesn't make sense to have obstructions at the end of nearly every training wall.

For the ruined training walls that have jogs, continue to mark the training wall with the jog at the least depth of the ruins.

Please let me know if you have questions. I'd be happy to explain run through this with your PowerPoint.

On Fri, Apr 26, 2019 at 1:03 PM Jason Creech <Jasc@deainc.com> wrote:

> Hi Martha
>
> As we work to complete sheet 10 (Southwest Pass) we are looking to finalize our procedures for depicting training walls in our survey data, finalized grids, and final feature file. As expected, there is a lot going on with these structures and we want to make sure we have a firm understanding of requirements and expectations. I've created a PowerPoint deck with some example training walls with images and screengrabs from HIPS subset. I've also added some first cuts at general representation in the FFF.

If possible we'd like to schedule some time to have a web meeting to review and discuss these items. I've added some comments and notes to help explain what we are showing, but think a review in real time would be most beneficial.

Would you be available later this afternoon or first thing next week for a meeting? In the meantime, I'm happy to address any questions you may have about the slides.

Thanks,

Jason

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

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Jason Creech

From: Martha Herzog - NOAA Federal <martha.herzog@noaa.gov>
Sent: Tuesday, August 13, 2019 9:31 AM
To: Jason Creech
Subject: Re: OPR-J347-KR-18 Submerged area features

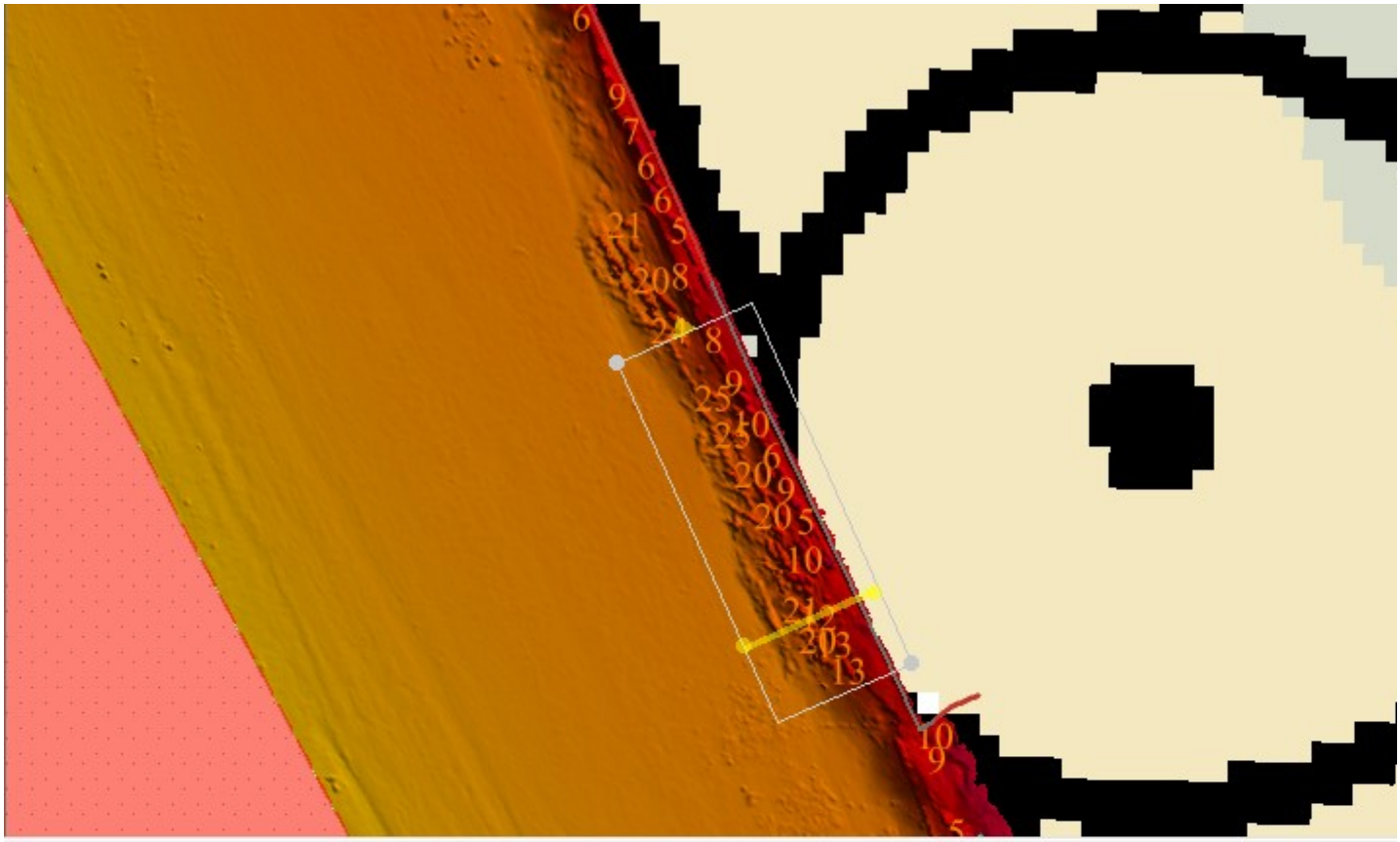
Hi Jason,

You can delineate an area of submerged piles as an area obstruction, and please only designate one sounding within the area. You can also depict a row of submerged piles with a line obstruction.

Please let me know if you have any other questions,
Martha

On Mon, Aug 12, 2019 at 5:10 PM Jason Creech <Jasc@deainc.com> wrote:

> Hi Martha
>
> We have a few questions regarding the use of submerged area features. We've been following the designated sounding distance specification of 2mm at survey scale (10 m) and minimum area requirement of 1mm (5 m).
>
> 1. When we use an area feature to depict items with horizontal dimensions greater than 5m, are we required to continue to follow the designated sounding rule (2mm at survey scale) or should only the shoalest depth within the area be designated? This impacts most if not all wrecks within our survey data and several potential obstruction areas (see image below).
> 2. We assume that it is acceptable to use obstruction area features to delineate large areas of submerged pilings. I've added some sample line work to depict the extents of a proposed obstruction area to the image below. Is this practice acceptable? This wouldn't be considered foul, as we have surveyed least depths on all of the submerged piles. Can we follow this same practice to depict a single row of submerged piles (not an area) with a line object?
>
> Thanks for the clarification on this.
>
> Jason



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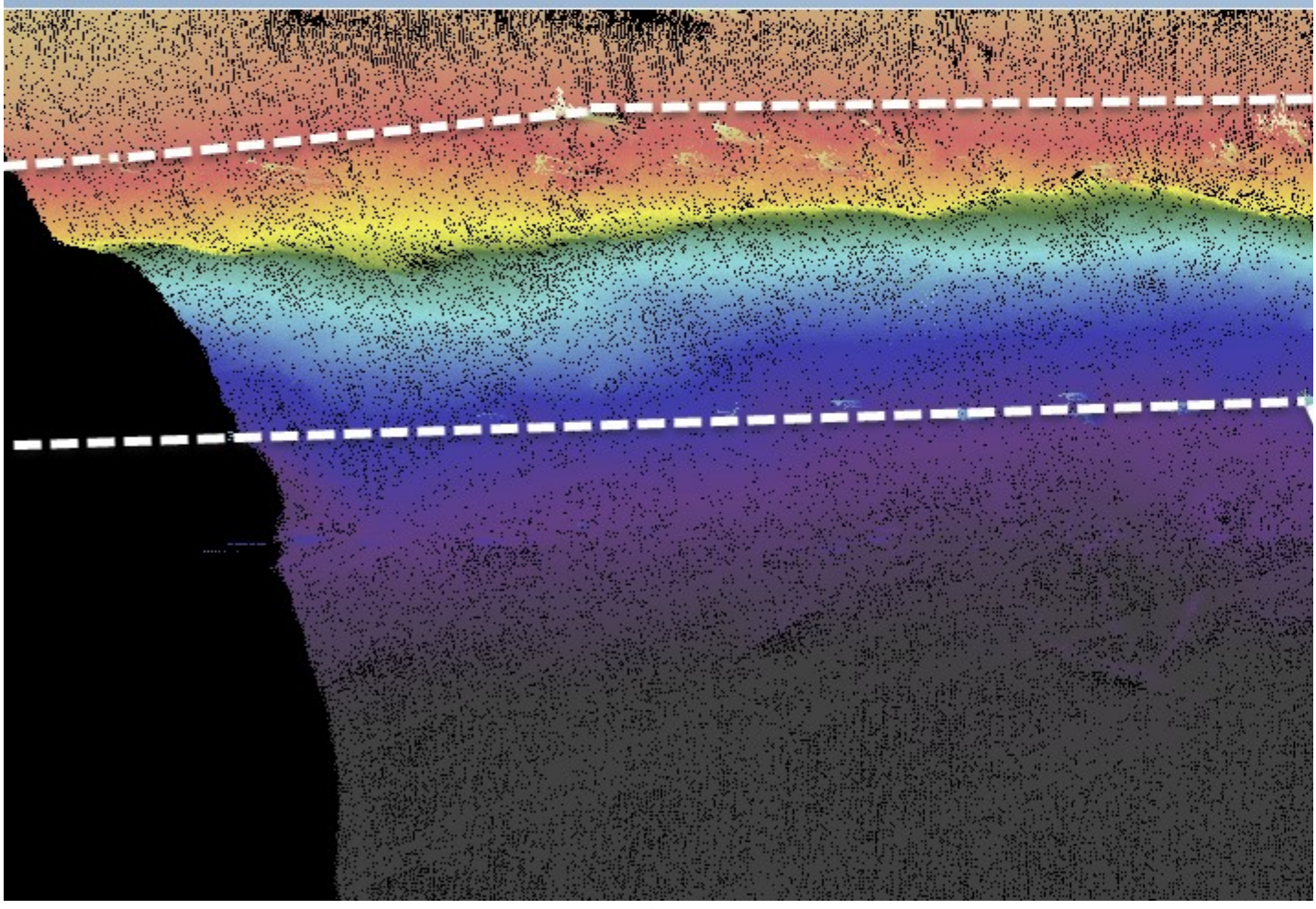

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240-533-0028

Jason Creech

From: Martha Herzog - NOAA Federal <martha.herzog@noaa.gov>
Sent: Tuesday, August 13, 2019 1:27 PM
To: Jason Creech
Subject: Re: Questions on DR Appendices and Separates

Jason,

Please concatenate the Appendices as one PDF file. There may be cases where only one of the examples is provided, per HSSD section 8.1.
There is no need to add a Water Level Appendices for ERS surveys.
Please concatenate the correspondence into a single PDF. If there is a next time, I'll set set up a spreadsheet that will grow for each of these sorts of questions to have it all in once place.

Martha

On Tue, Aug 13, 2019 at 12:11 PM Jason Creech <Jasc@deainc.com> wrote:

> Hi Martha
>
> We have a few questions on DR Appendices and Separates
>
> 1. The 2018 HSSD has some inconsistencies in the way we are to create our Appendices and Separates. Page 102 of the HSSD (2018) has the Appendices broken out in to multiple pdf files (H12345_Tide_Request.pdf, <Survey Registry Number>_DTON_Report_unique#.pdf, etc.). Page 113 of the HSSD (2018) says to submit a single concatenated PDF file. What should we do for these?
>
> 2. What are the current requirements for submitting a DR Appendix 1 for ERS surveys? Do ERS surveys require Appendix 1, if so what pages are required? For our Mississippi River surveys, we can produce Times of Hydrography but we don't have information to populate a Tide Note. Should we create a page for this document (and others?) and say "Not Applicable, ERS Survey"?
>
> 3. We have a lot of Project related correspondence to include with our surveys, including guidance on many of our questions. Should "Project Correspondence" be a single concatenated PDF file or multiple individual files?
>
> Thanks,

Jason

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

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Martha Herzog
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240-533-0028

Jason Creech

From: Jon Dasler
Sent: Thursday, August 15, 2019 6:10 PM
To: Jason Creech
Subject: Fwd: EA133C14CQ0037/1305M218FNCNJ0138 (T0005) Modification P19002
Attachments: image003.jpg; ATT00001.htm; Revised Final Project Instructions Aug. 2019.pdf; ATT00002.htm

Just got these.

Jon Dasler, PE, PLS
Director of Marine Services
David Evans and Associates, Inc.
360-314-3200
Mobile 503-799-0168
Email: jld@deainc.com
www.deamarine.com

Sent from my iPhone

Begin forwarded message:

> **From:** Nicole Lawson - NOAA Federal <nicole.lawson@noaa.gov>
> **Date:** August 15, 2019 at 2:41:06 PM MDT
> **To:** Jon Dasler <Jld@deainc.com>
> **Cc:** Kasey Whitfield - NOAA Affiliate <kasey.whitfield@noaa.gov>, Kathryn Pridgen - NOAA Federal <kathryn.pridgen@noaa.gov>, Christina Fandel - NOAA Federal <christina.fandel@noaa.gov>, Corey Allen - NOAA Federal <corey.allen@noaa.gov>, Martha Herzog <martha.herzog@noaa.gov>
> **Subject: Re: EA133C14CQ0037/1305M218FNCNJ0138 (T0005) Modification P19002**
>
> Good afternoon,
>
> All of the modified information was included in the modification Kasey sent out, but I have attached the revised Project Instructions for your information as well. Please let me know if you have any questions.
>
> Thanks,
> Nicole
>
> On Wed, Aug 14, 2019 at 10:19 AM Jon Dasler <Jld@deainc.com> wrote:
>
> > Thank you Kasey. We acknowledge receipt of the executed modification. Have a great day.
> >
> > Jon

Jon L. Dasler, PE, PLS, CH | Senior Vice President, Director of Marine Services

David Evans and Associates, Inc. | Marine Services Division | www.deamarine.com

t: 360.314.3200 | c: 503.799.0168 | jld@deainc.com

Jason Creech

From: Martha Herzog - NOAA Federal <martha.herzog@noaa.gov>
Sent: Wednesday, August 28, 2019 10:46 AM
To: Jason Creech
Subject: Re: Survey vs Project Correspondence

Hi Jason,

For all general project correspondence, you can simply add a "read me" file stating that all project correspondence was submitted with x survey. Correspondence specified such as Coast Pilot, and NCEI submissions need to be submitted with each survey as there are occasions where they can be for survey only instead of the entire project.

I hope this clarifies your questions.
Martha

On Wed, Aug 28, 2019 at 10:16 AM Jason Creech <Jasc@deainc.com> wrote:

> Hi Martha
>
> We are working on building our DR Appendices II and *Project Correspondence* documents for the Mississippi River surveys and have some questions about the current guidance on these reports. We've had quite a bit of communications during these surveys and we want to make sure that we deliver everything that is necessary and include in the proper report.
>
> I've looked through the Specs and see the following requirements for DR Appendix II. There is a mix of survey specific communications and project wide communications.
>
> DR Appendix II
>
> DtoNs
>
> Other
>
> Coast Pilot Review **(project)**
>
> Pipelines/ Seeps **(survey)**
>
> AtoNs **(survey)**

Channels **(survey)**

NCEI **(project)**

Progress Reports **(project)**

Survey Outlines **(survey/ project)**

Environmental Compliance **(project)**

Other Survey related communications **(survey / project)**

modified PIs, emails, phone calls)

Should project wide communications included in Separate II be duplicated in the *Project Correspondence* document?

Is the any *Project Correspondence* info that should not be included in Appendix II?

Should *Project Correspondence* be delivered with each survey or only once unless revised?

Thanks,

Jason

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Martha Herzog
NOAA Operations Team Lead | Operations Branch
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240-533-0028

Jason Creech

From: Castle Parker - NOAA Federal <castle.e.parker@noaa.gov>
Sent: Wednesday, October 16, 2019 11:00 AM
To: Jason Creech
Cc: Martha Herzog - NOAA Federal; AHB Chief - NOAA Service Account
Subject: FW: Mississippi River Footings

Hello Jason,
Just got off the phone with Martha Herzog and we both agree to keep the bridge support foundations in the grid as you provided in the examples. I'm still waiting on a response from Tim Osborn for the Pilot's perspective, but that should stop us from the decision to include. Bearing in mind the change or deviation from HSSD, we are waiting on HSD OPS response on how to handle this deviation.

Thanks for bringing up this situation and the opportunity to respond.
Regards,
Gene

Castle Eugene Parker
NOAA Office of Coast Survey
Atlantic Hydrographic Branch
Hydrographic Team Lead / Physical Scientist
castle.e.parker@noaa.gov
office (757) 364-7472

From: Castle Parker - NOAA Federal <castle.e.parker@noaa.gov>
Sent: Wednesday, October 16, 2019 10:25 AM
To: Martha Herzog - NOAA Federal <martha.herzog@noaa.gov>; Tim Osborn - NOAA Federal <tim.osborn@noaa.gov>
Cc: James Miller - NOAA Federal <james.j.miller@noaa.gov>; Clinton Marcus - NOAA Federal <clinton.r.marcus@noaa.gov>; Jeffery Marshall - NOAA Federal <jeffery.marshall@noaa.gov>; AHB Chief - NOAA Service Account <ahb.chief@noaa.gov>; Jason Creech <Jasc@deainc.com>
Subject: FW: Mississippi River Footings

Good day,
Yesterday Jason Creech (DEA) presented a situation with the Mississippi River bridge foundations that have concrete footers that rise above the river bed, some foundations with significant height above the river floor. Select AHB personnel discussed this situation and agree with DEA about leaving the foundations in the bathy grid if the rise is significant. All of the soundings from the vertical support structure are rejected per HSSD. Leaving the soundings associated with the bridge support foundation is not in alignment with HSSD documented in Chap. 7 that states '*Data under charted man made features (e.g., piers, anchor chains) will be rejected and not included in delivered products.'* And, *'MBES data on pilings supporting and abutting piers and superstructures shall be rejected. The piers or structures shall be surveyed as shoreline construction (SLCONS) features.'*

Martha, this is a deviation from HSSD in that the foundation is not skin of the earth and would normally be rejected, but based upon the rise above the river bed can make the foundation least depth significant. If we keep the soundings related to the foundations in the data set and grid, do we want or need a waiver? This is a one-off situation with HSSD.

Question: Is the MS River surveys going to be used and sourced for BIENC products and if so, would it benefit the product to keep the footers in the grid. The depth curves of the BIENC would be reflective of the bridge footer foundation with multiple concentric depth curves.

Tim, would the Pilots that transit the area object to the concentric depth curves associated with the bridge support foundation if and when the BIENC is created. From a Pilot's point of view, is it beneficial to keep the foundation reflective within the bathy grid?

The first example below is associated with the Huey P Long Bridge (new Orleans) ; the scale within the images are metric values. We have review Marine Traffic and note that some bulk carriers have drafts that are close the minimum depth of the first example of the foundation at 10m depth. The second example appears to be the bridge at Wallace, LA.

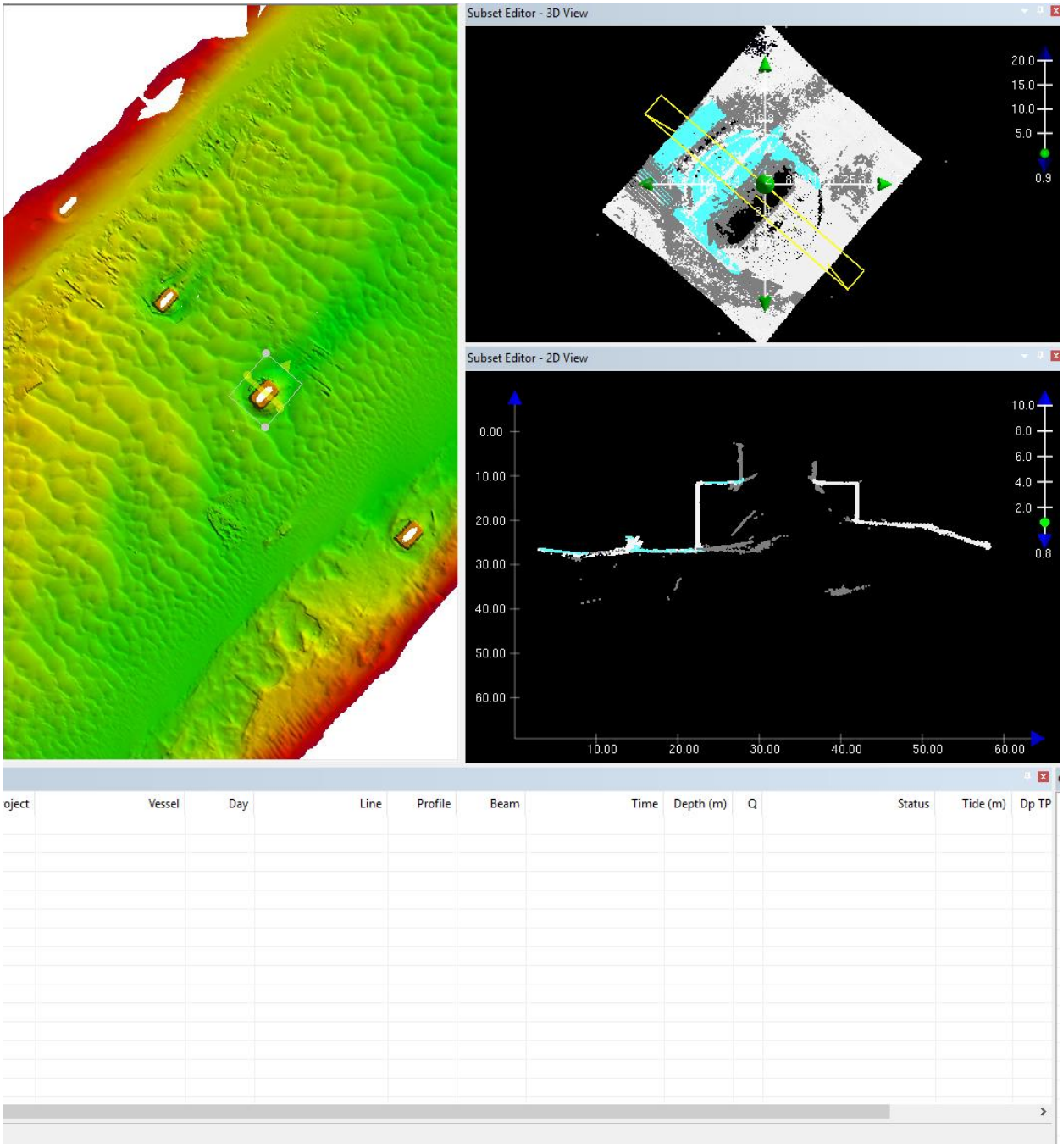
As it stands at the end of our conversation at AHB, we are inclined to leave the bridge support foundations included in the bathy grid. We would not create cartographic objects for the foundations and would not be included in the FFF as SLCONS shoreline construction.

Consideration and input is requested.
Thanks,
gp

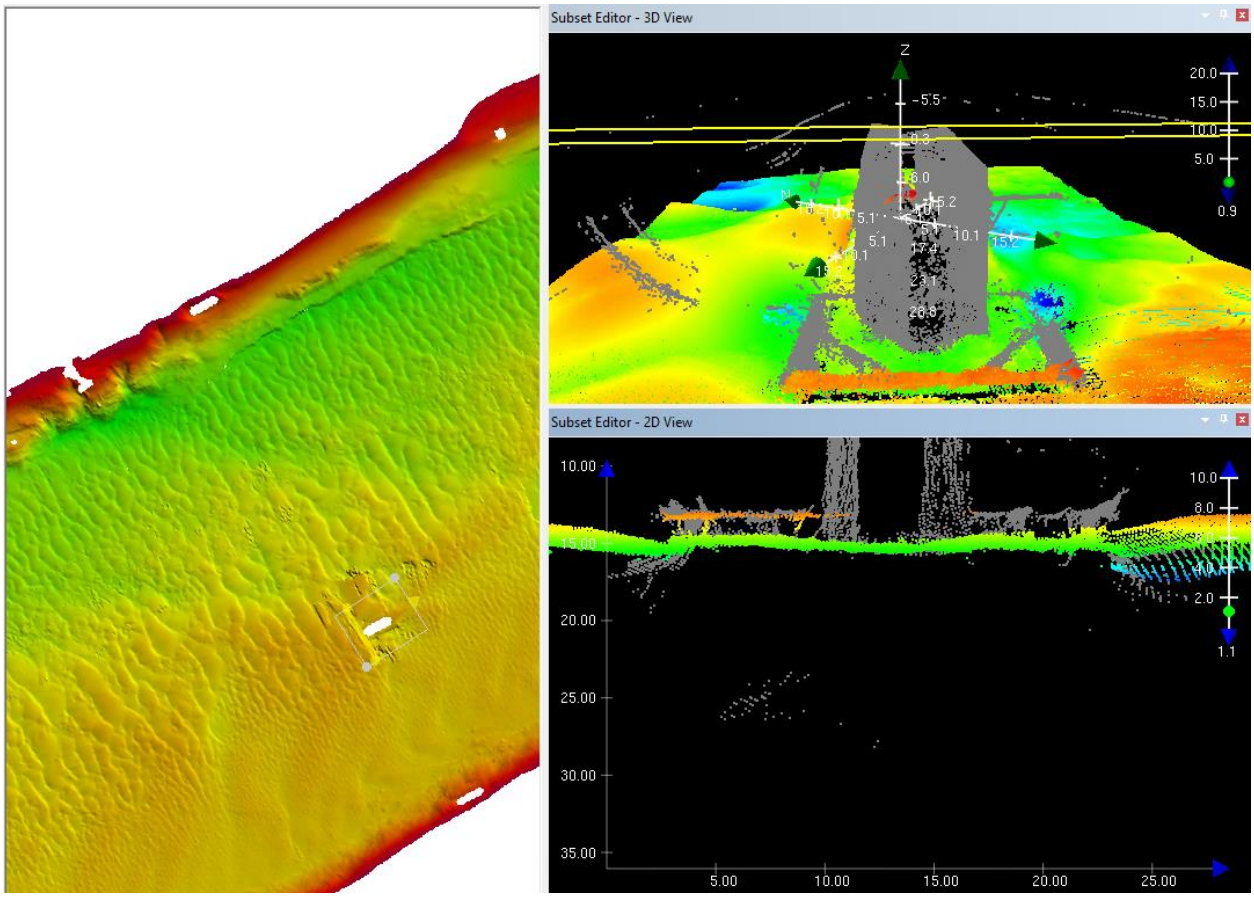
Castle Eugene Parker
NOAA Office of Coast Survey
Atlantic Hydrographic Branch
Hydrographic Team Lead / Physical Scientist
castle.e.parker@noaa.gov
office (757) 364-7472

From: Jason Creech <Jasc@deainc.com>
Sent: Tuesday, October 15, 2019 3:27 PM
To: castle.e.parker@noaa.gov
Subject: Mississippi River Footings

Examples included



oject	Vessel	Day	Line	Profile	Beam	Time	Depth (m)	Q	Status	Tide (m)	Dp TP



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APPROVAL PAGE

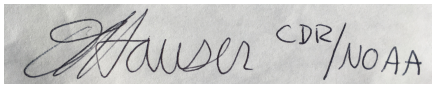
H13188

Data meet or exceed current specifications as certified by the OCS survey acceptance review process. Descriptive Report and survey data except where noted are adequate to supersede prior surveys and nautical charts in the common area.

The following products will be sent to NCEI for archive

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

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



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Approved:_____

Commander Olivia Hauser, NOAA
Chief, Pacific Hydrographic Branch