H13795

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

DESCRIPTIVE REPORT

Type of Survey:	Navigable Area
Registry Number:	H13795

LOCALITY

State(s):	Alabama
General Locality:	Mobile Alabama
Sub-locality:	Mobile River

2023

CHIEF OF PARTY
Dan Jacobs

LIBRARY & ARCHIVES

Date:

U.S. DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

REGISTRY NUMBER:

HYDROGRAPHIC TITLE SHEET

H13795

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):	**Alabama**
General Locality:	**Mobile Alabama**
Sub-Locality:	**Mobile River**
Scale:	**10000**
Dates of Survey:	**05/09/2023 to 05/15/2023**
Instructions Dated:	**05/04/2023**
Project Number:	**S-J906-NRTST-23**
Field Unit:	**NOAA Navigation Response Team - Galveston**
Chief of Party:	**Dan Jacobs**
Soundings by:	**Multibeam Echo Sounder**
Imagery by:	**Side Scan Sonar**
Verification by:	**Pacific Hydrographic Branch**
Soundings Acquired in:	**meters at Mean Lower Low Water**

Remarks:

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

Table of Contents

List of Tables

List of Figures

Descriptive Report to Accompany Survey H13795

Project: S-J906-NRTST-23

Locality: Mobile Alabama

Sublocality: Mobile River

Scale: 1:10000

May 2023 - May 2023

NOAA Navigation Response Team - Galveston

Chief of Party: Dan Jacobs

A. Area Surveyed

Mobile River commencing at the Chickasaw Bridge and North, terminating at the Interstate 65 Bridge (General WK Wilson Jr. Bridge).

A.1 Survey Limits

Data were acquired within the following survey limits:

Northwest Limit	Southeast Limit
30° 54' 51.87" N 88° 3' 47.56" W	30° 44' 14.72" N 87° 56' 34.37" W

Table 1: Survey Limits

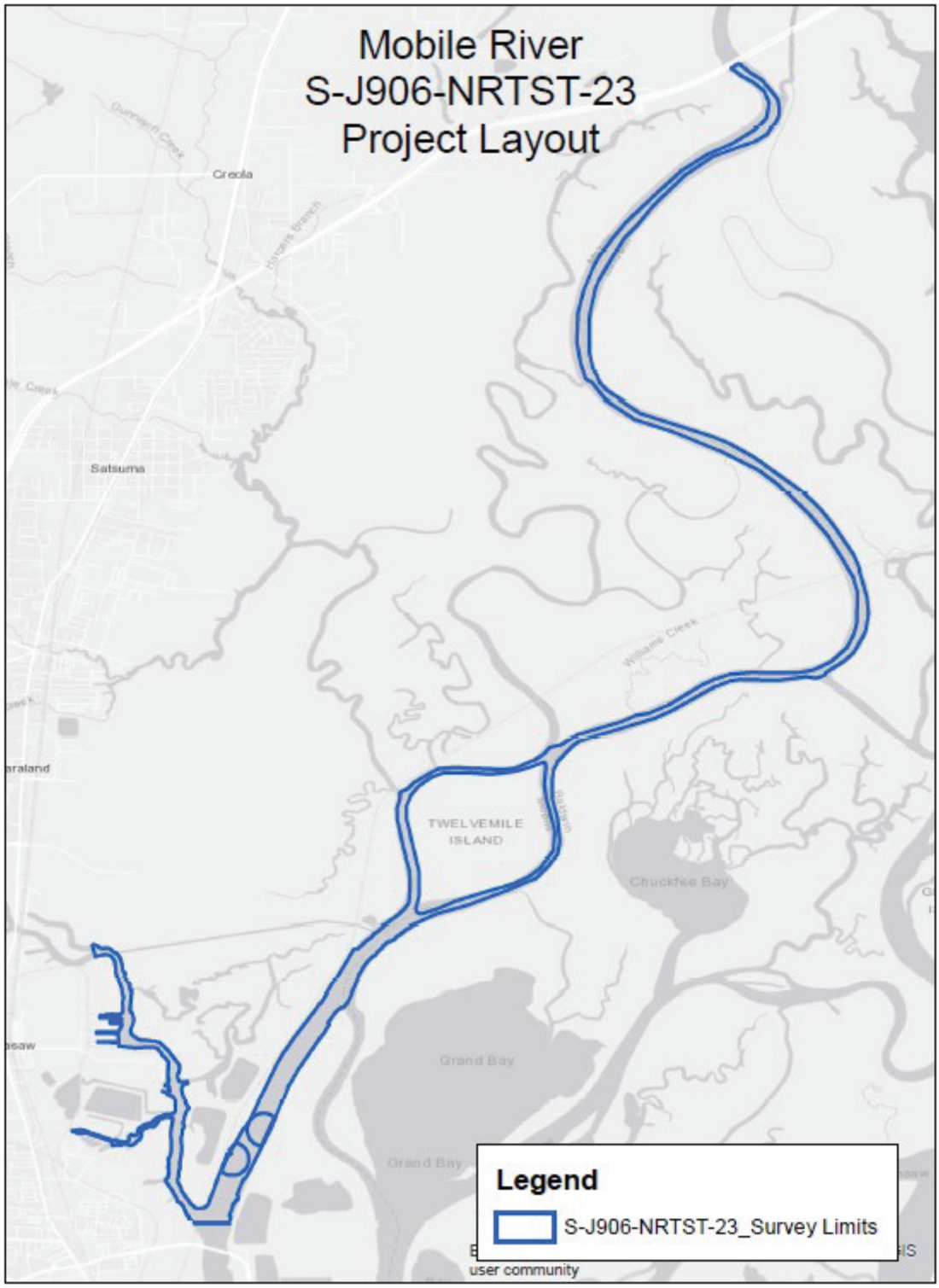


Figure 1: S-J906-NRTST-23 Mobile River Project Boundary

Acquisition to the assigned survey sheet limits were not attained where floating logs, overhanging branches, shoaling, vessel traffic and vessels tied up alongside precluded the teams' safe approach to the edge of the river bank/sheet limits. This leg of the river is a busy barge hub with frequent traffic at the Chickasaw Swing Bridge. Not all assigned features were addressed for these reasons.

A.2 Survey Purpose

This project will provide modern bathymetric data for Mobile Bay. The project area was identified as a high priority area for NOAA's National Water Center, and is a statistically significant hot spot within the 2018 hydrographic health model, a risk model that Coast Survey uses for evaluating priorities based upon navigational risks and the necessary quality of data to support modern traffic. Conducting a modern bathymetric survey in this area will identify hazards and changes to the seafloor, update NOAA National Ocean Survey (NOS) charts and products, and provide forecasters at NOAA's National Water Center with bathymetric data for critical hydrodynamic modeling necessary to understand the timing and impact of rapid river stage increases and decreases, the duration of high water, inundation, or drought. Survey data from this project is intended to supersede all prior survey data in the common area.

A.3 Survey Quality

The entire survey is adequate to supersede previous data.

A.4 Survey Coverage

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

Water Depth	Coverage Required
0-20 meters	Complete coverage, MBES concurrent with SSS.

Table 2: Survey Coverage

Survey Coverage was specified as Complete Coverage per the project instructions. Complete Coverage was attained employing MBES bathymetry concurrent with 100 percent side scan imagery per HSSD 5.2.2. Additionally, two UCF areas were assigned requiring object detection coverage (200 percent side scan imagery concurrent with 50cm, MBES bathymetry).
Acquisition to the assigned survey sheet limits were not attained where floating logs, overhanging branches, shoaling, vessel traffic and vessels tied up alongside precluded the teams' safe approach to the edge of the river bank/sheet limits. This leg of the river is a busy barge hub with frequent traffic at the Chickasaw Swing Bridge. Not all assigned features were addressed for these reasons.

Likewise, the two assigned, unverified charted feature (UCF) radii were not fully examined. However, the field believes neither of the two UCF features exist in the middle of the channel where 200 percent side scan data and nearly 100 percent object detection multibeam data was attained.

Figure 2: Barges rafted up along the banks of Mobile River near Chickasaw Creek.[Courtesy of Cooper Barge Co]

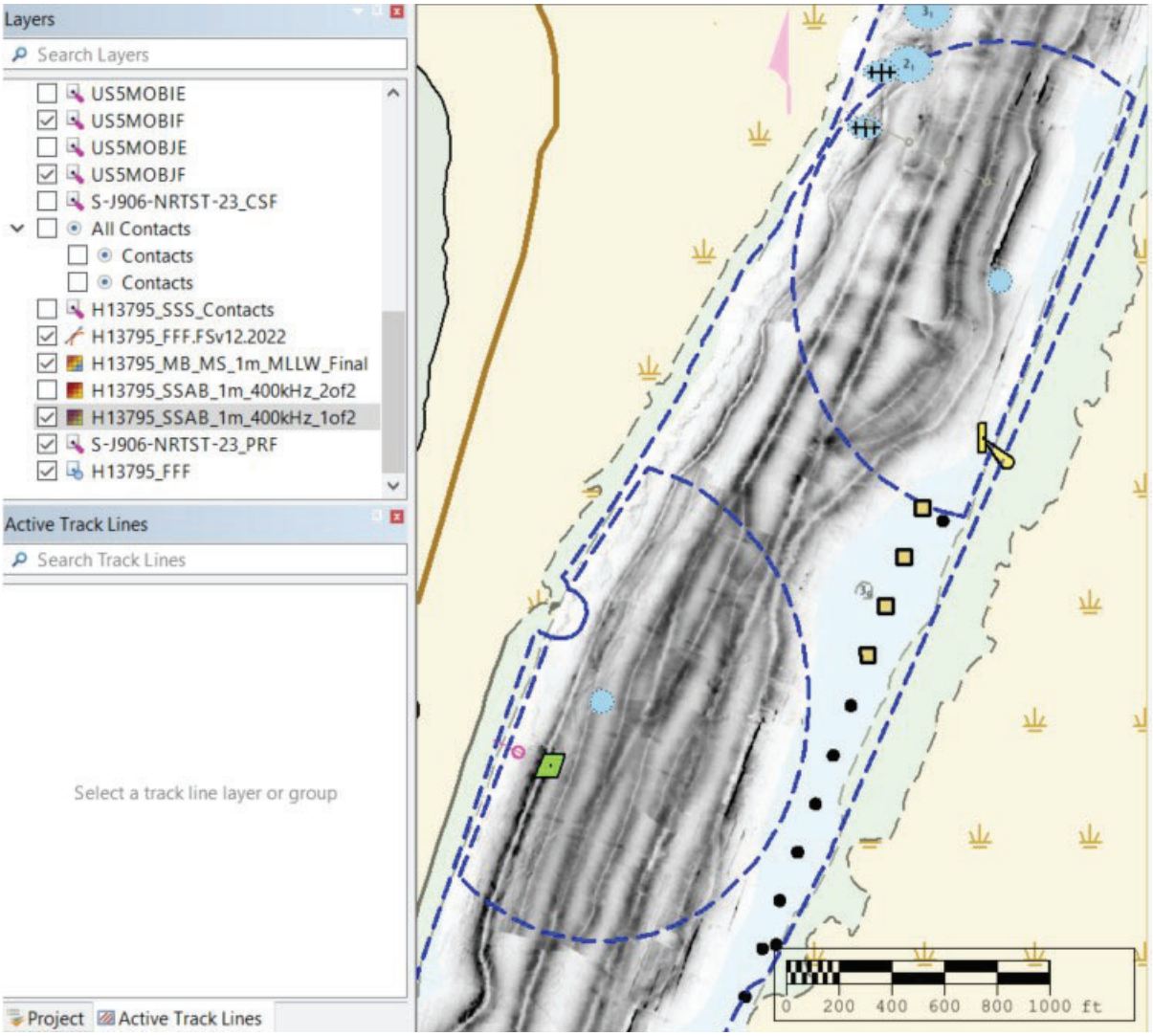


Figure 3: Missed 100% SSS coverage (white space) inside UCF Radii (blue circle).

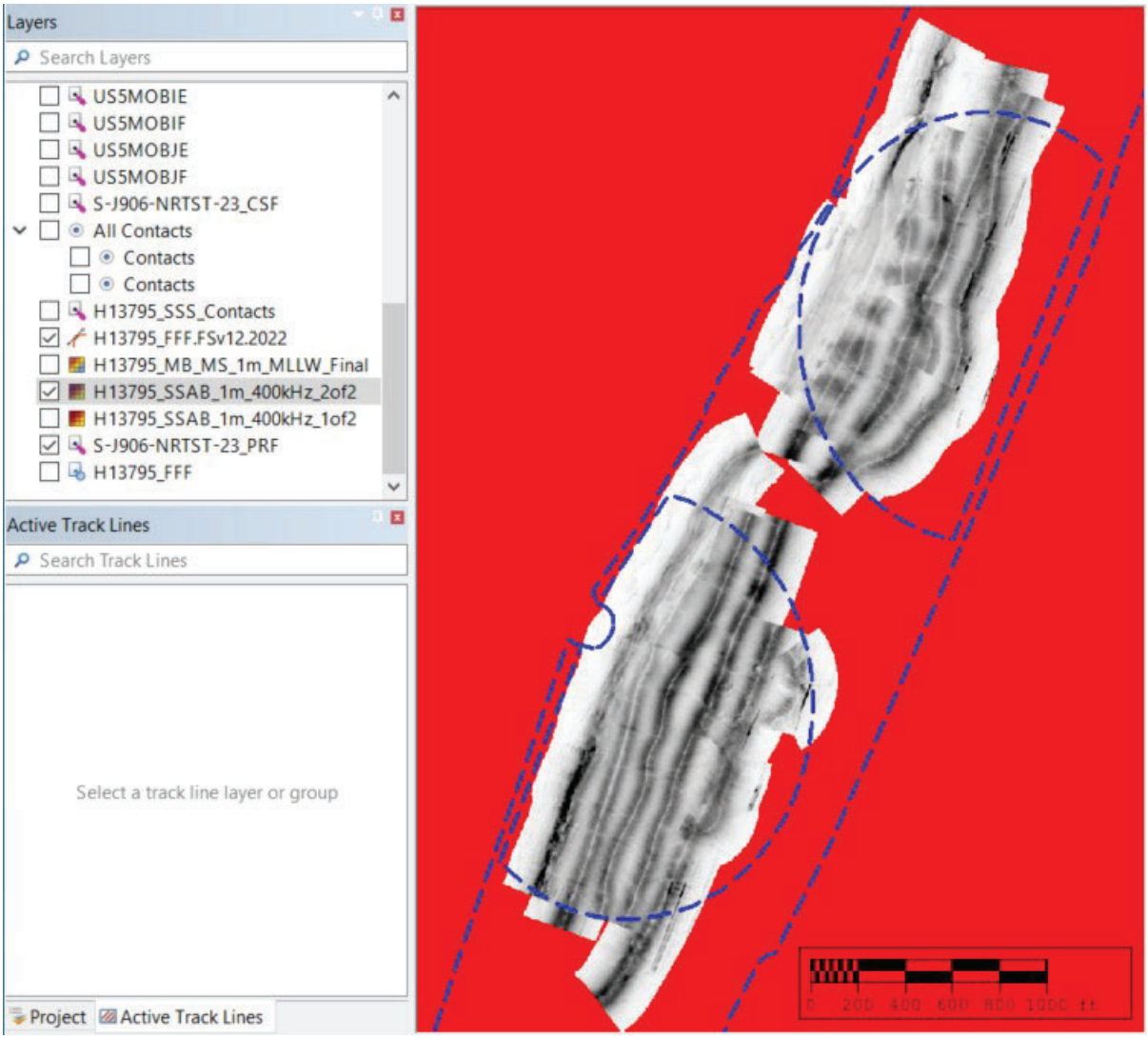


Figure 4: Missed 200% SSS coverage (red space) inside UCF Radii (blue circle).

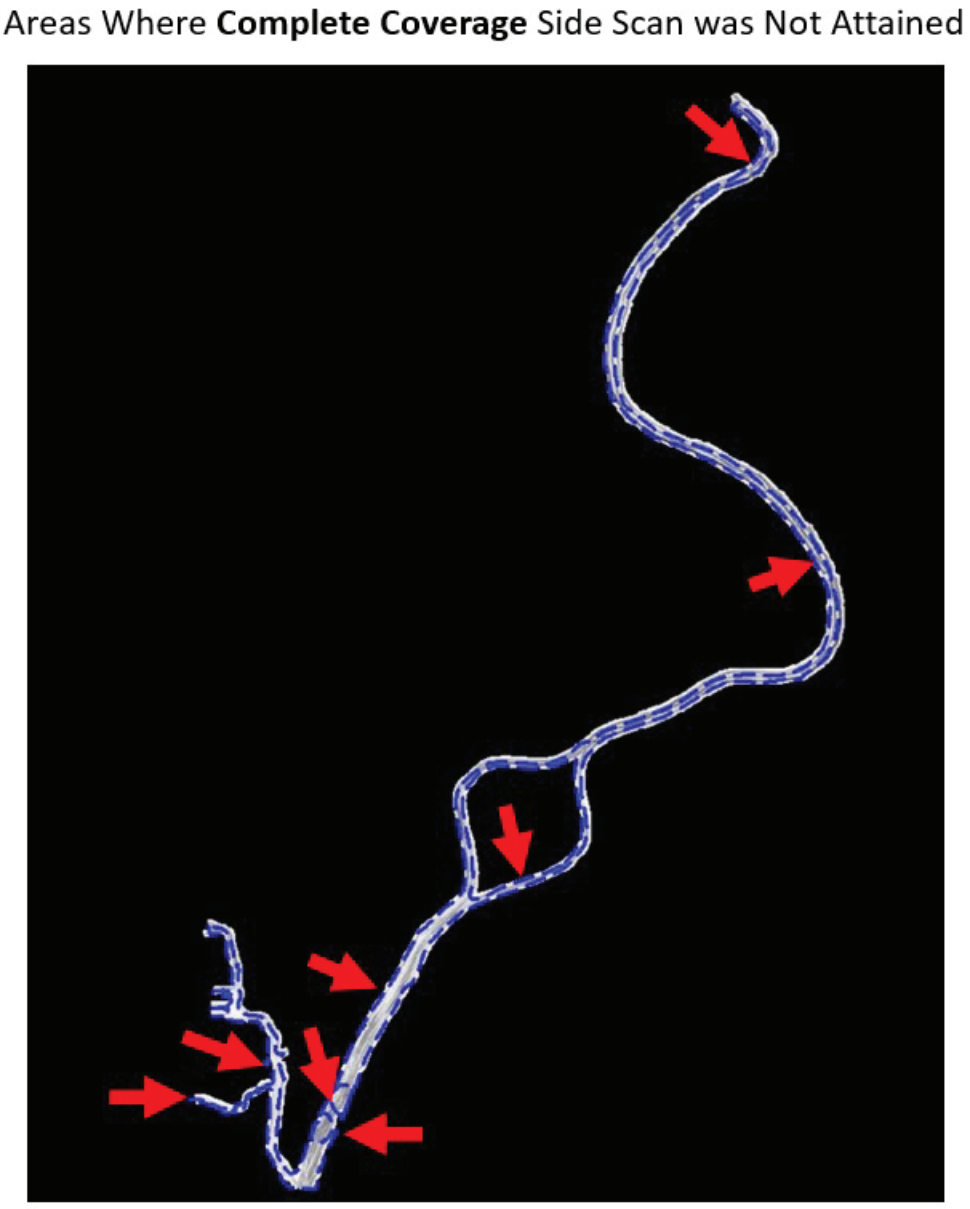


Figure 5: Areas were Complete Coverage Side Scan was not attained (red arrows).

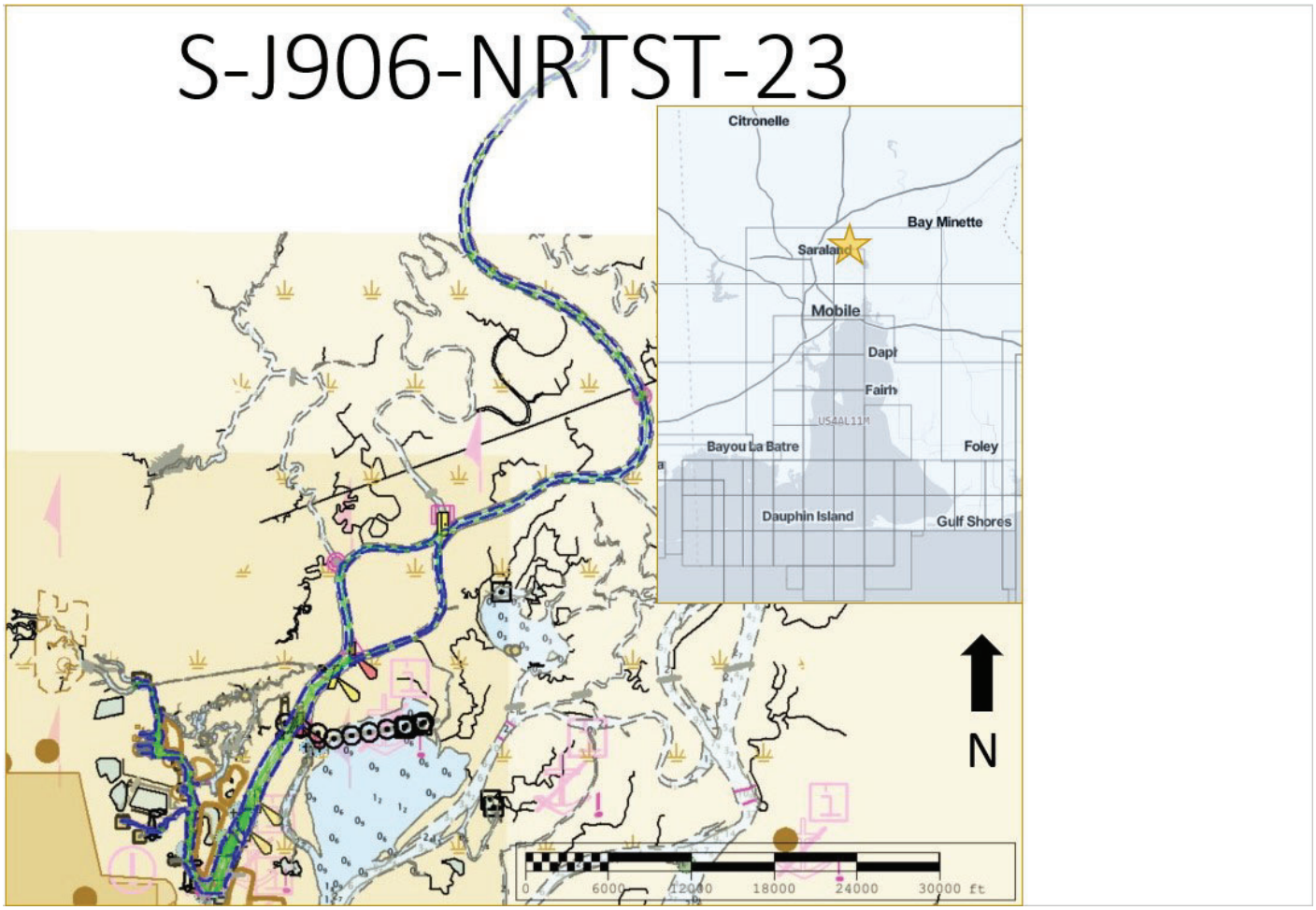


Figure 6: S-J906-NRTST-23 Coverage Graphic, Mobile River, vicinity of Mobile AL

A.6 Survey Statistics

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

	HULL ID	*S3005*	*S3008*	*Total*
LNM	**SBES Mainscheme**	0.0	0.0	0.0
	MBES Mainscheme	0.0	0.0	0.0
	Lidar Mainscheme	0.0	0.0	0.0
	SSS Mainscheme	0.0	0.0	0.0
	SBES/SSS Mainscheme	0.0	0.0	0.0
	MBES/SSS Mainscheme	57.37	44.03	101.4
	SBES/MBES Crosslines	6.99	3.44	10.43
	Lidar Crosslines	0.0	0.0	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				5.58

Table 3: Hydrographic Survey Statistics

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

Survey Dates	Day of the Year
05/09/2023	129
05/10/2023	130

Survey Dates	Day of the Year
05/11/2023	131
05/12/2023	132
05/15/2023	135

Table 4: Dates of Hydrography

Survey dates began on 9MAY2023 and concluded on 15MAY2023.

B. Data Acquisition and Processing

B.1 Equipment and Vessels

Refer to the Data Acquisition and Processing Report (DAPR) for a complete description of data acquisition and processing systems, survey vessels, quality control procedures and data processing methods. Additional information to supplement sounding and survey data, and any deviations from the DAPR are discussed in the following sections. Note that S3005 had not yet completed its 2023 HSRR when this project was conducted. Using S3005's DAPR and HVFs from 2022.

B.1.1 Vessels

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

Hull ID	*3008*	*3005*
LOA	10.0 meters	10.0 meters
Draft	0.5 meters	0.5 meters

Table 5: Vessels Used

Figure 7: NRT Vessel

NRT Vessels are 30 foot, aluminum hulled fire boats modified for NOAA hydrographic survey operations. S3005 and S3008 are powered by dual 225 horsepower Honda outboard engines. A Kohler 7.5 EKD generator supplies AC power for two workstations, 5 monitors, one POS system, one multibeam echosounder system, and one side scan sonar system.

B.1.2 Equipment

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

Manufacturer	Model	Type
Kongsberg Maritime	EM 2040C	MBES
EdgeTech	4125	SSS

Table 6: Major Systems Used

Figure 8: MBES used aboard S3008 and S3005

Figure 9: SSS used aboard S3008 and S3005

Figure 10: Castaway Sound Speed Sensor used aboard S3008 and S3005

Please reference NRT-Stennis (S3005) and (S3008) DAPRs, accompanying this project for a complete listing of equipment and specifications. Note that S3005 had not received its annual HSRR during the time of this survey and its DAPR and HVFs from 2022 were used.

B.2 Quality Control

B.2.1 Crosslines

A crossline percentage of 10.43 LNM met the minimum percentage requirements as specified in the HSSD, Section 5.2.4.2. Uncertainty standards between a 1m Mainscheme grid versus a 1m Crossline grid passed NOAA IHO TVU requirements. See graphic below.

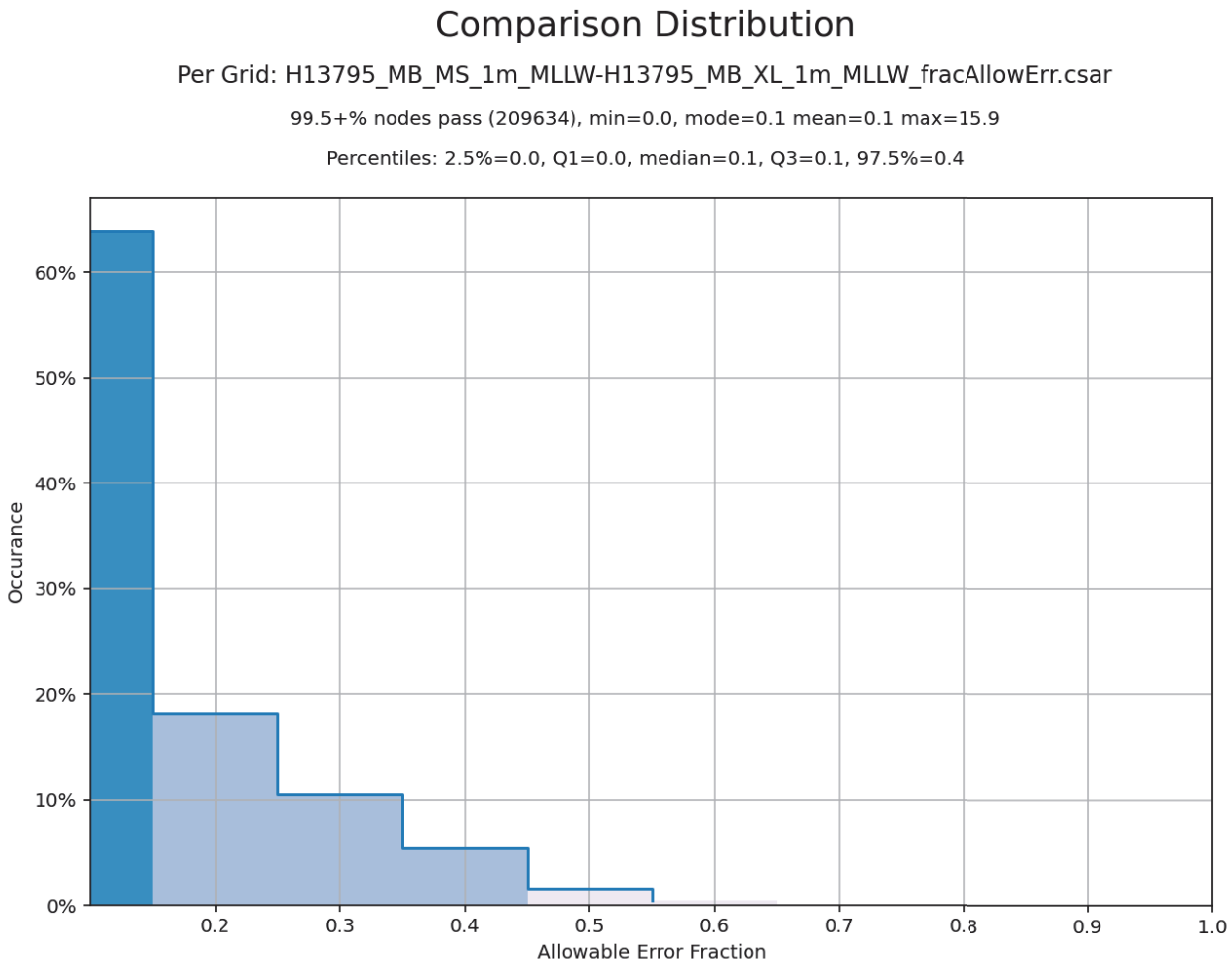


Figure 11: Crosslines versus Mainscheme Lines, 99 percent pass

B.2.2 Uncertainty

The following survey specific parameters were used for this survey:

Method	Measured	Zoning
ERS via VDATUM	0.1 meters	0.1 meters

Table 7: Survey Specific Tide TPU Values.

Method	Measured	Zoning
ERS via VDATUM	0.07 meters	0.07 meters

Table 8: Survey Specific Tide TPU Values.

Hull ID	Measured - CTD	Measured - MVP	Measured - XBT	Surface
S3008	4 meters/second	0 meters/second	0 meters/second	0.2 meters/second
S3005	4 meters/second	0 meters/second	0 meters/second	0.2 meters/second

Table 9: Survey Specific Sound Speed TPU Values.

Per HSSD, Section 5.2.3.3 the above sound speed uncertainty values were implemented and lie within conservative range estimates. Per project instructions, an additional Vdatum model with uncertainty of 0.07m was used in the creation of the 1 meter surface referenced to NAVD88. This non-standard surface will facilitate flood inundation modeling for the river systems north of Mobile Bay. However, the project is being submitted with a MLLW Vdatum model with an uncertainty of 0.10m. All submitted grids passed NOAA's Uncertainty and Density Standards by over 95 percent. Please reference the SupportFiles folder for all histogram outputs.

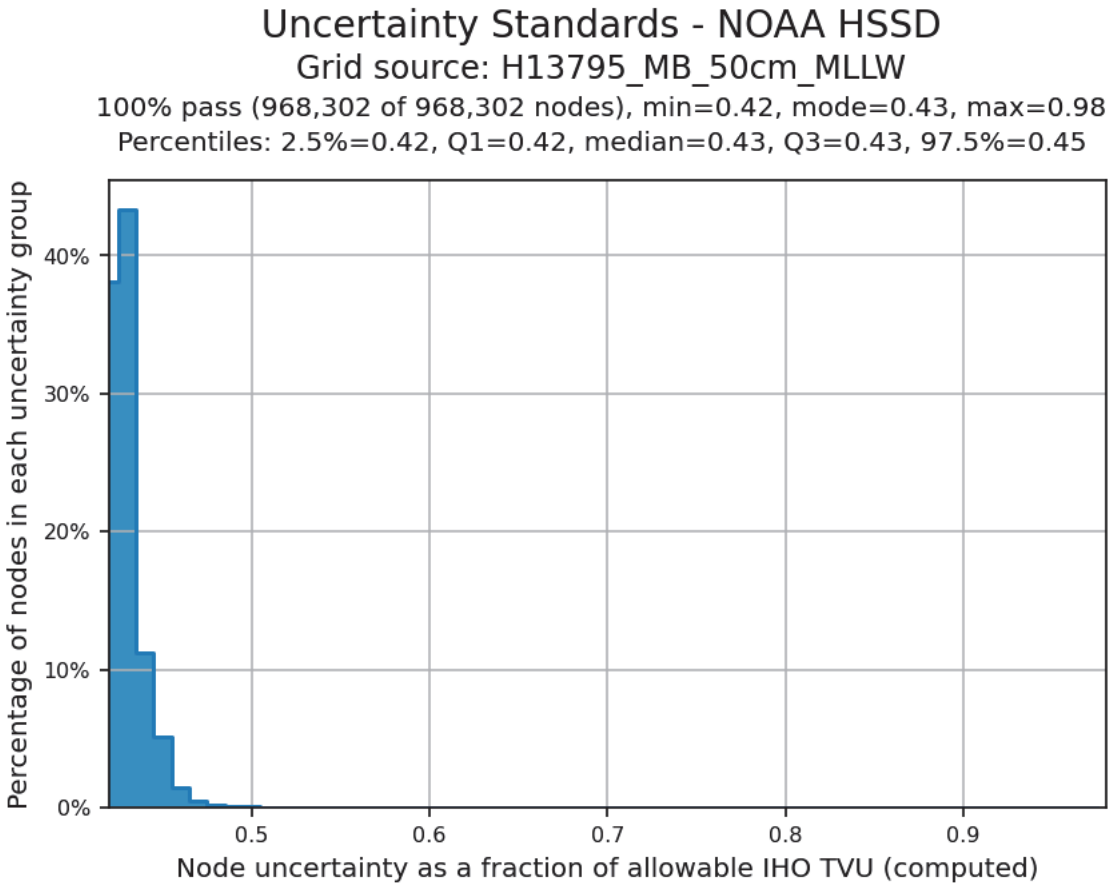


Figure 12: NOAA 1meter Grid Uncertainty 99.5 plus percent pass

B.2.3 Junctions

No Junctions were prescribed per Project Instructions.

There are no contemporary surveys that junction with this survey.

B.2.4 Sonar QC Checks

Sonar system quality control checks were conducted as detailed in the quality control section of the DAPR.

B.2.5 Equipment Effectiveness

Vessel Hull Design is Noisy the Hull Mounted MBES

Bubble sweep artifacts did contribute to noisy MBES data on the outer beams of S3008 and S3005. Hull design modifications are being investigated by NRB/HSTB to mitigate the issue.

Over 25 thousand fliers were rejected in the 1cm grid. Despite performing nine rounds of Flier Finder cleaning, 1600 fliers still remain. The Noisy Edges (6) fliers occur at abrupt depth changes such as on the edges of sand waves and cannot be eliminated without creating additional fliers. A memo to PHB Chief regarding the issue can be found in the Project Correspondence folder.

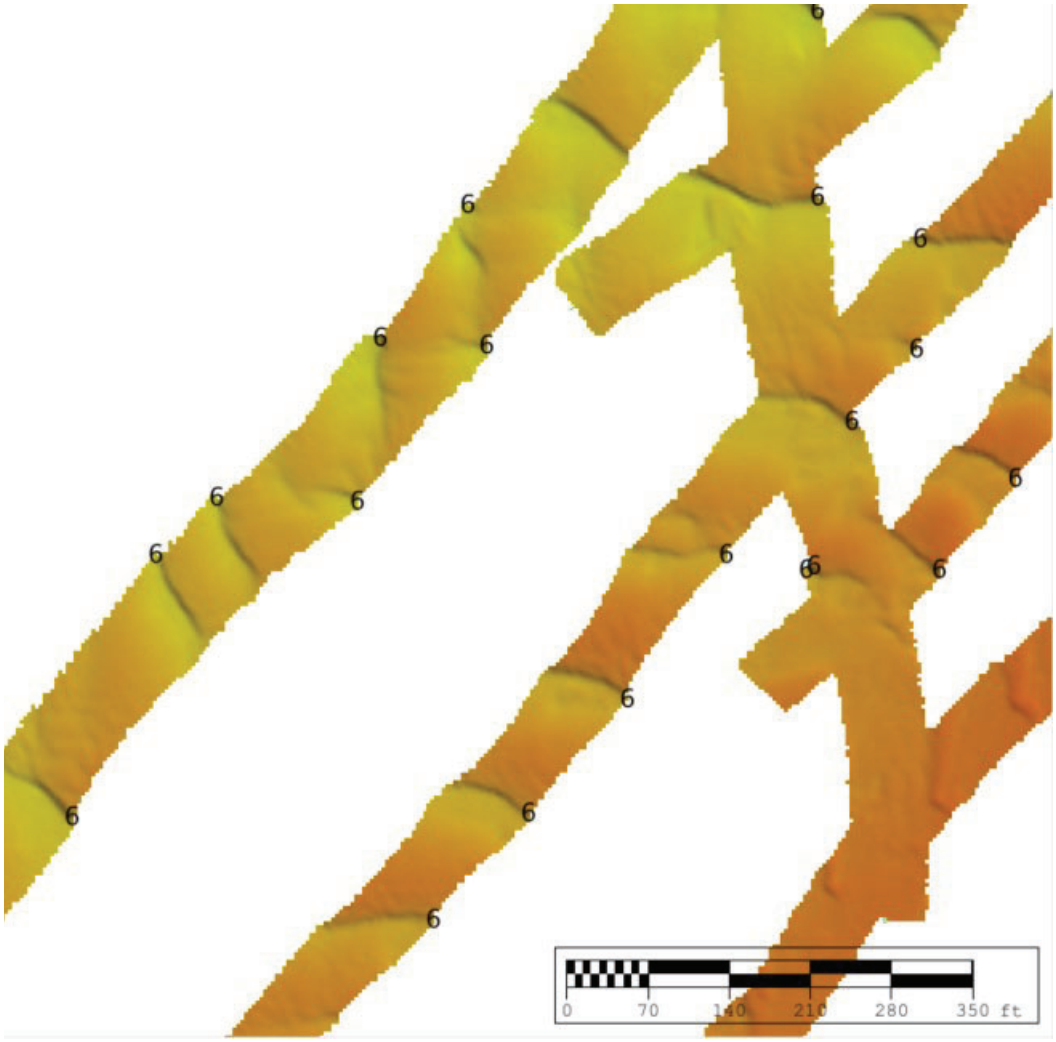


Figure 13: Noisy Edges (6) continue to regenerate after careful editing edges of sand waves

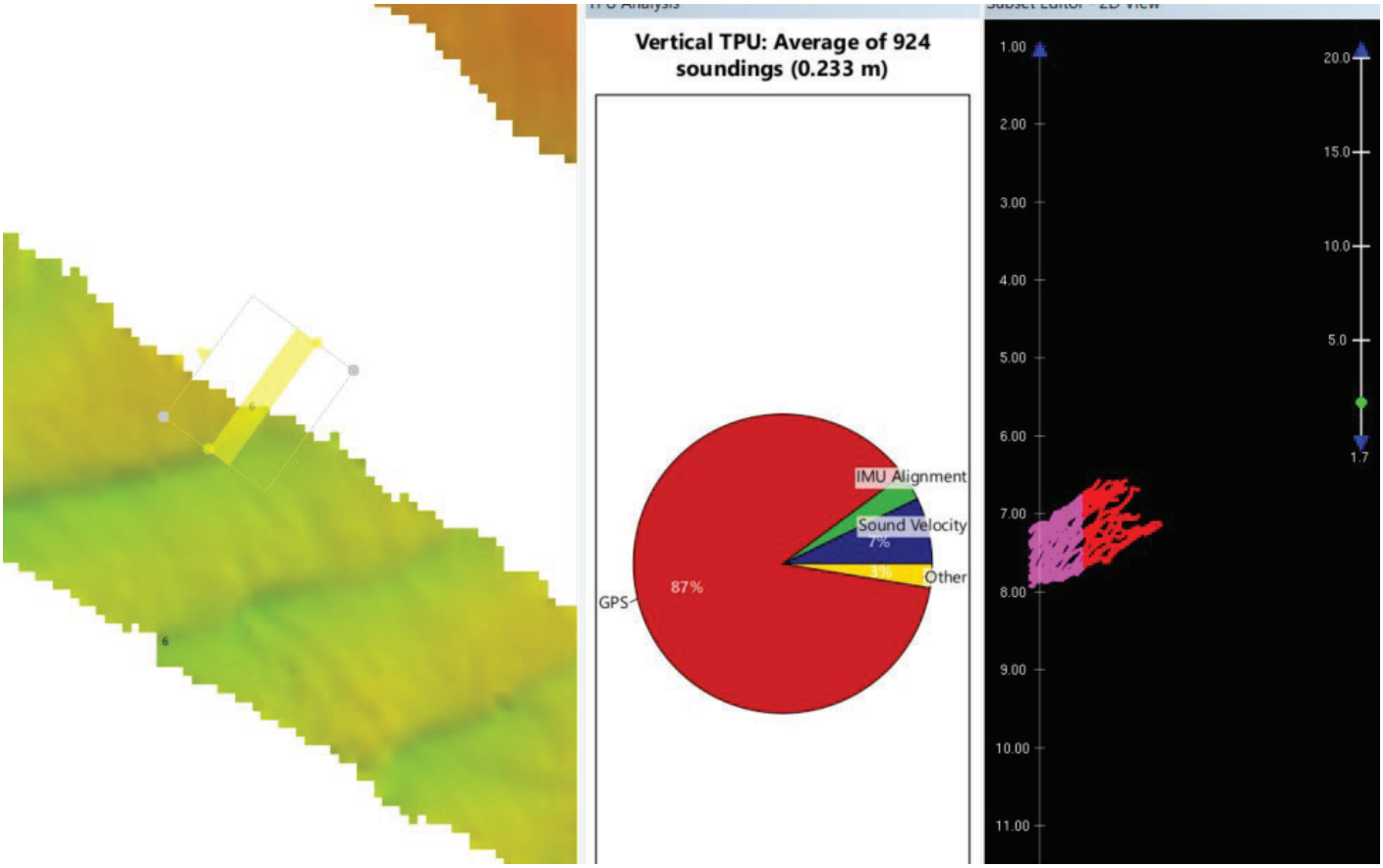
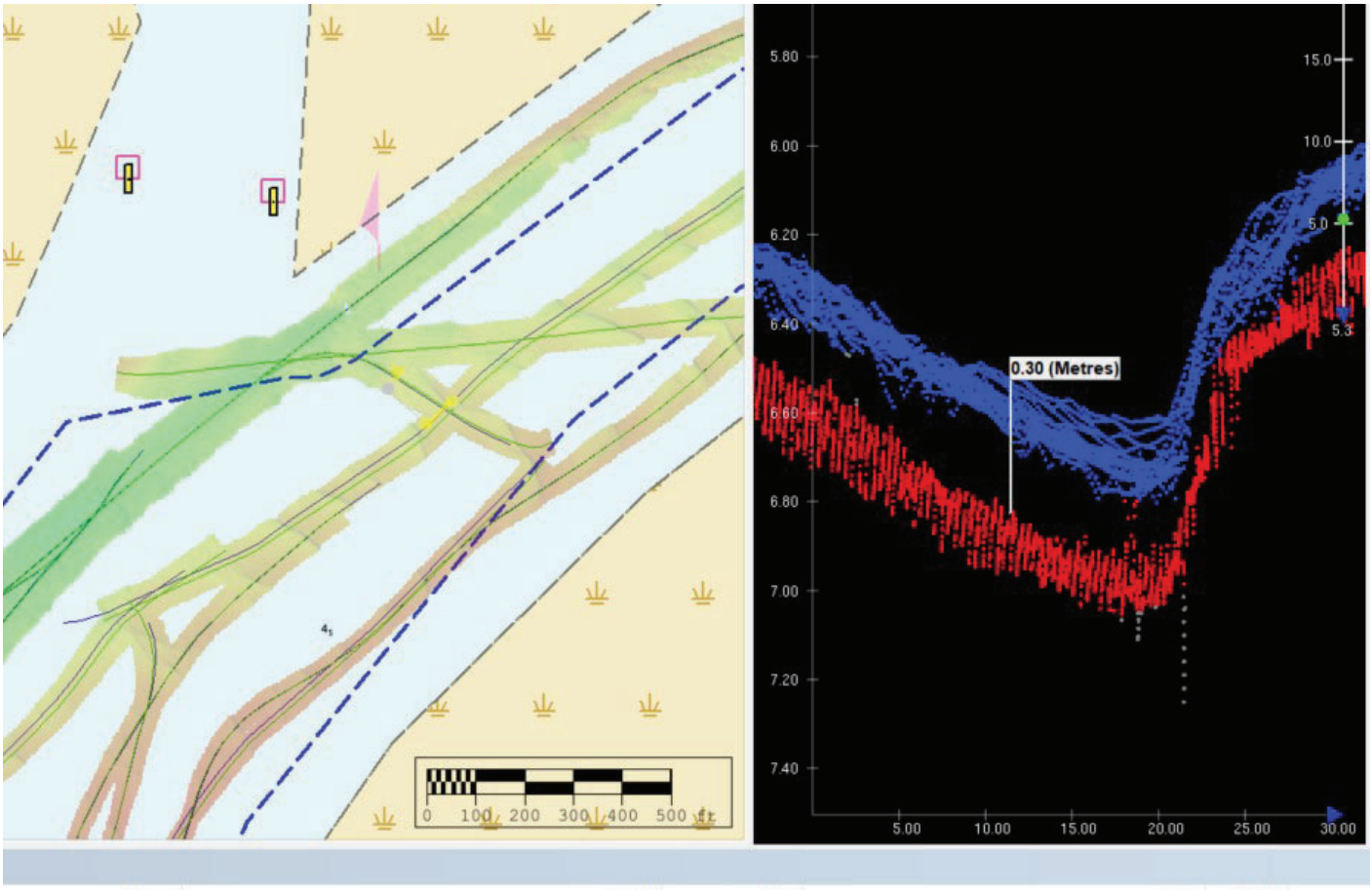


Figure 14: Typical TPU breakdown, Noisy Edge Fliers (6) adjacent to Sand Waves

B.2.6 Factors Affecting Soundings

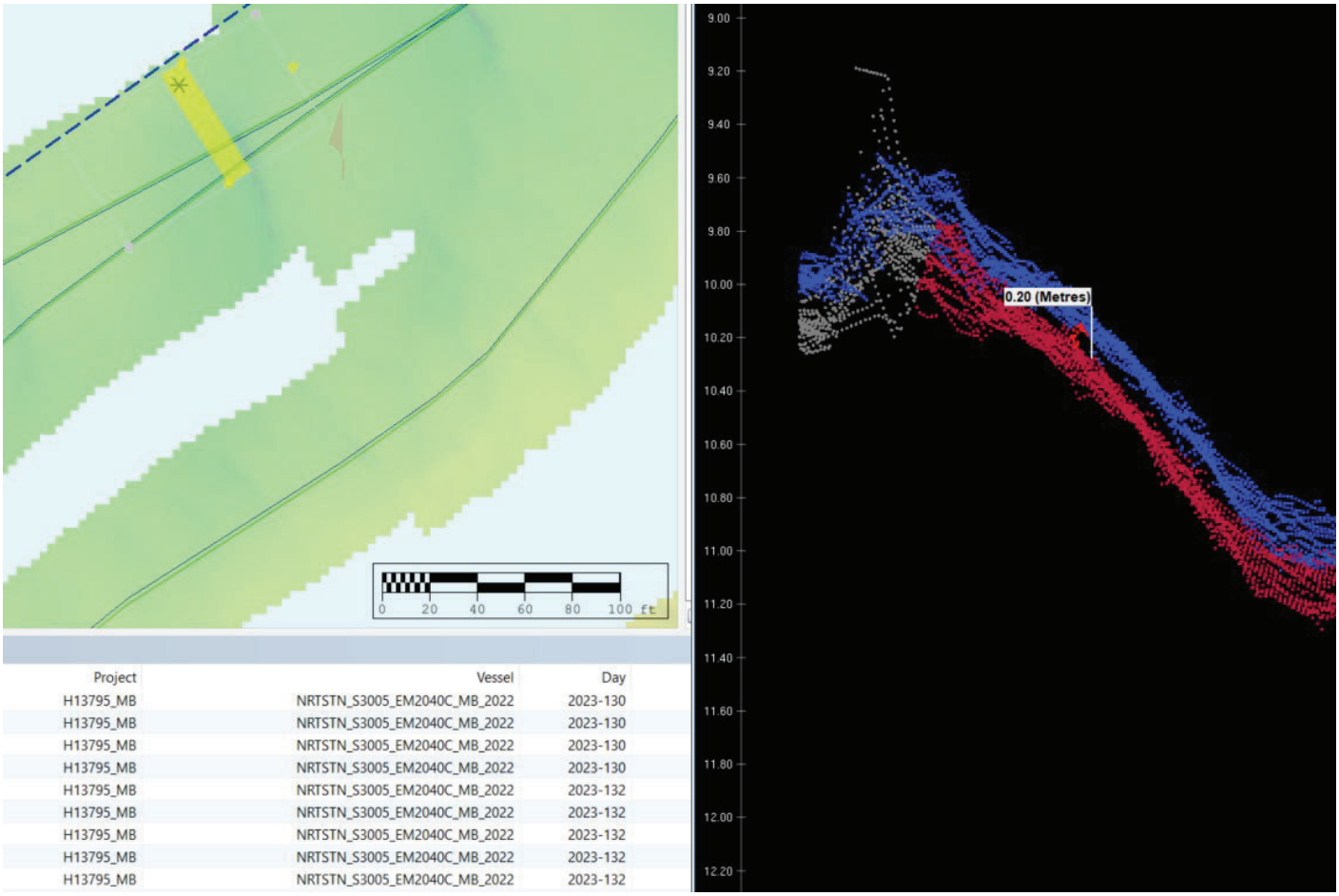
River Tubidity and Current

Owing to heavy suspended sediment loads and fast moving water (>4 kts) bathymetry suffered near running tug boats and river bends. Migrating sand waves were noted near 12 Mile Island and fliers abounded in that area as well as the Chickasaw Creek region.



Project	Vessel	Day	Line	Profile
H13795_MB	NRTSTN_S3005_EM2040C_MB_2022	2023-130	0055_20230510_163452_S3005	2,164
H13795_MB	NRTSTN_S3005_EM2040C_MB_2022	2023-130	0055_20230510_163452_S3005	2,165
H13795_MB	NRTSTN_S3005_EM2040C_MB_2022	2023-130	0055_20230510_163452_S3005	2,165
H13795_MB	NRTSTN_S3005_EM2040C_MB_2022	2023-132	0173_20230512_170219_S3005	567
H13795_MB	NRTSTN_S3005_EM2040C_MB_2022	2023-132	0173_20230512_170219_S3005	567
H13795_MB	NRTSTN_S3005_EM2040C_MB_2022	2023-132	0173_20230512_170219_S3005	567
H13795_MB	NRTSTN_S3005_EM2040C_MB_2022	2023-132	0173_20230512_170219_S3005	567
H13795_MB	NRTSTN_S3005_EM2040C_MB_2022	2023-132	0173_20230512_170219_S3005	571
H13795_MB	NRTSTN_S3005_EM2040C_MB_2022	2023-132	0173_20230512_170219_S3005	572

Figure 15: Migrating sand waves example 1



Project	Vessel	Day
H13795_MB	NRTSTN_S3005_EM2040C_MB_2022	2023-130
H13795_MB	NRTSTN_S3005_EM2040C_MB_2022	2023-130
H13795_MB	NRTSTN_S3005_EM2040C_MB_2022	2023-130
H13795_MB	NRTSTN_S3005_EM2040C_MB_2022	2023-130
H13795_MB	NRTSTN_S3005_EM2040C_MB_2022	2023-132
H13795_MB	NRTSTN_S3005_EM2040C_MB_2022	2023-132
H13795_MB	NRTSTN_S3005_EM2040C_MB_2022	2023-132
H13795_MB	NRTSTN_S3005_EM2040C_MB_2022	2023-132
H13795_MB	NRTSTN_S3005_EM2040C_MB_2022	2023-132

Figure 16: Migrating sand waves example 2

B.2.7 Sound Speed Methods

Sound Speed Cast Frequency: Sound Speed Cast Frequency: Sound speed cast frequency for F00869 was not less than one cast per every four hours of survey.

Cast frequency met or exceeded 1 cast per every 4 hours of survey.

B.2.8 Coverage Equipment and Methods

All equipment and survey methods were used as detailed in the vessel DAPRs.

B.3 Echo Sounding Corrections

B.3.1 Corrections to Echo Soundings

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

B.3.2 Calibrations

All sounding systems were calibrated as detailed in the DAPR.

B.4 Backscatter

Backscatter data was processed using FMGT and Caris softwares - a departure from standard backscatter processing using only CARIS. The new SOP is included in the supplemental folder of the Descriptive Report.

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 and SIPS	11.4.25
Applanix	POSPac	8.9

Table 10: Primary bathymetric data processing software

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

Manufacturer	Name	Version
CARIS	HIPS and SIPS	11.4.25

Table 11: Primary imagery data processing software

The following Feature Object Catalog was used: NOAA Profile Version 2023..

NOAA Profile Version 2023 was utilized by the Caris Object Catalogue, Caris HIPS and SIPS, version 11.4.25

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
H13795_MB_1m_MLLW	CARIS Raster Surface (CUBE)	1 meters	0.49 meters - 20.3 meters	NOAA_1m	Complete MBES
H13795_MB_1m_MLLW_Final	CARIS Raster Surface (CUBE)	1 meters	0.49 meters - 20.3 meters	NOAA_1m	Complete MBES
H13795_MB_1m_NAVD88	CARIS Raster Surface (CUBE)	1 meters	0.49 meters - 20.3 meters	NOAA_1m	Complete MBES
H13795_SSAB_1m_400kHz_1of2	SSS Mosaic	1 meters	0.0 meters - 20.0 meters	NOAA_1m	100% SSS
H13795_SSAB_1m_400kHz_2of2	SSS Mosaic	1 meters	0.0 meters - 20.0 meters	NOAA_1m	200% SSS
H13795_MB_50cm_MLLW	CARIS Raster Surface (CUBE)	0.5 meters	0.49 meters - 20.3 meters	NOAA_0.5m	Object Detection
H13795_MB_50cm_MLLW_Final	CARIS Raster Surface (CUBE)	0.5 meters	0.49 meters - 20.3 meters	NOAA_0.5m	Object Detection
H13795_MB_1m_NADV88_Final	CARIS Raster Surface (CUBE)	1 meters	0.49 meters - 20.3 meters	NOAA_1m	Complete MBES

Table 12: Submitted Surfaces

The project is a Complete Coverage survey consisting of 100 percent side coverage accompanied with skunk-stripped, 1m multibeam. However, a 200 percent side scan layer and a half-meter, object detection, multibeam surface is also being submitted for the south end of the sheet to address two UCF radii. Although the radii were not completely esonified due to vessels moored alongside, the field believes neither UCF exist in the main channel where half-meter MBES object detection MBES also occurred.

Per project instructions, an additional Vdatum model with uncertainty of 0.07m was used in the creation of the 1 meter surface referenced to NAVD88. This non-standard surface will facilitate flood inundation modeling for the river systems north of Mobile Bay. However, the project is being submitted in the MLLW Vdatum with an uncertainty of 0.10m.

C. Vertical and Horizontal Control

Additional information discussing the vertical or horizontal control for this survey can be found in the accompanying HVCR.

C.1 Vertical Control

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

ERS Datum Transformation

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

Method	Ellipsoid to Chart Datum Separation File
ERS via VDATUM	S-J906-NRTST-23_NAD83(2011)-NAVD88(GEOID18)_1sigma7cm S-J906-NRTST-23-TensawRiver_2023-06-26_NAD83-MLLW_PtCloud_1sigma10cm

Table 13: ERS method and SEP file

Per project instructions, an additional Vdatum model with uncertainty of 0.07m was used in the creation of the 1 meter surface referenced to NAVD88. This non-standard surface will facilitate flood inundation modeling for the river systems north of Mobile Bay. However, the project is being submitted with a MLLW Vdatum model with an uncertainty of 0.10m. Please reference the memo "Vdatum_Instructions_Jack_Riley" in the Project Correspondence folder of this project for ERTDM modeling discussions.

C.2 Horizontal Control

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

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

The following PPK methods were used for horizontal control:

- RTX

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 16N. Horizontal and vertical positioning were achieved in accordance with practices outlined in the DAPR. Processing and products for Survey H13795 were conducted and completed in NAD 83 per HSSD specification. Refer to the DAPR for a complete description of horizontal control procedures. RTX Precise Positioning-Real Time Extended (PP-RTX) processing methods were used in Applanix POSPac MMS software to produce Smoothed Best Estimate of Trajectory (SBET) files and their associated uncertainty for post-processing horizontal correction.

PPP

Trimble CenterPoint RTX is the preferred method for the positioning for then Gulf of Mexico where horizontal accuracies of 2cm or less may be achieved without the use of reference stations. CenterPoint RTX service was accessed via an internet connection within one hour after field operations had concluded. Applanix POSPac MMS 8.8 software was used to access Trimble RTX servers to produce a Smoothed Best Estimate of Trajectory (SBET) file implementing the Applanix proprietary "SmartBase" algorithm. The SBET file consisted of GPS position and attitude data corrected and integrated with inertial measurements and correctors which were then exported to the reference ellipsoid. These SBET navigation and attitude files were applied to all lines in CARIS and supersede initial positioning and attitude data.

WAAS

The Wide Area Augmentation System (WAAS) was used for real-time horizontal control during data acquisition.

D. Results and Recommendations

D.1 Chart Comparison

A chart comparison was performed for all 5 ENCs spatially coinciding to the survey area. Note that the northern third of the survey area has no associated ENCs. Six (6) soundings were flagged as DTON candidates using the "CA Tools" utility in Pydro 22. The Hydrographers did not deem any of the deeper chart soundings to be actual DTONs based on their close proximity to the river's edge and/or vessel draft maximums of 9 feet. The field recommends updating, repositioning, or deleting those ENC soundings. A comprehensive soundings analysis can be found in the appendices folder. See images, below. Not all designated soundings are associated to features in the final feature file, as some were chosen to capture the shoalest point on the river bottom where migrating sand waves confounded the CUBE algorithm.

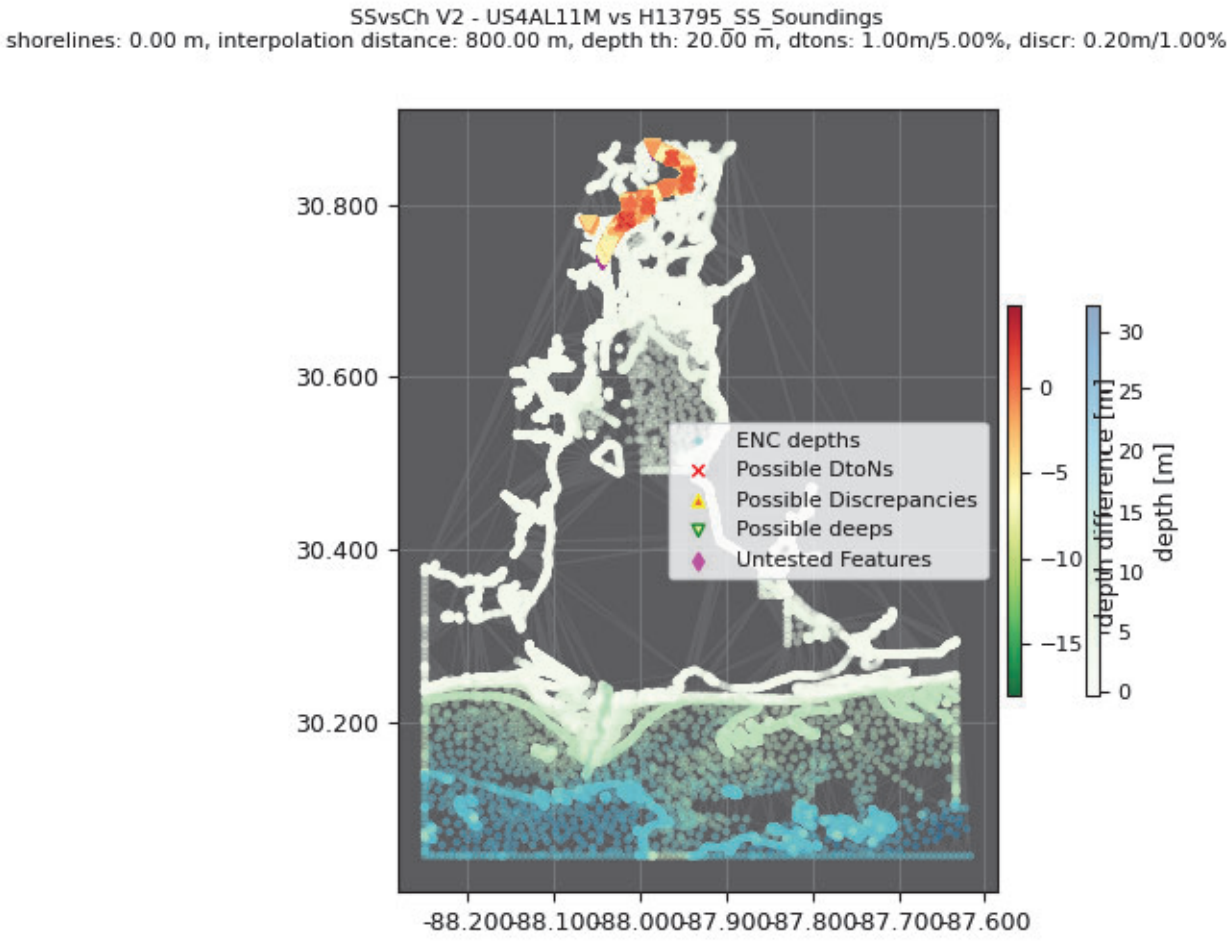


Figure 17: US4AL11M Chart Comparison to H13795 Soundings

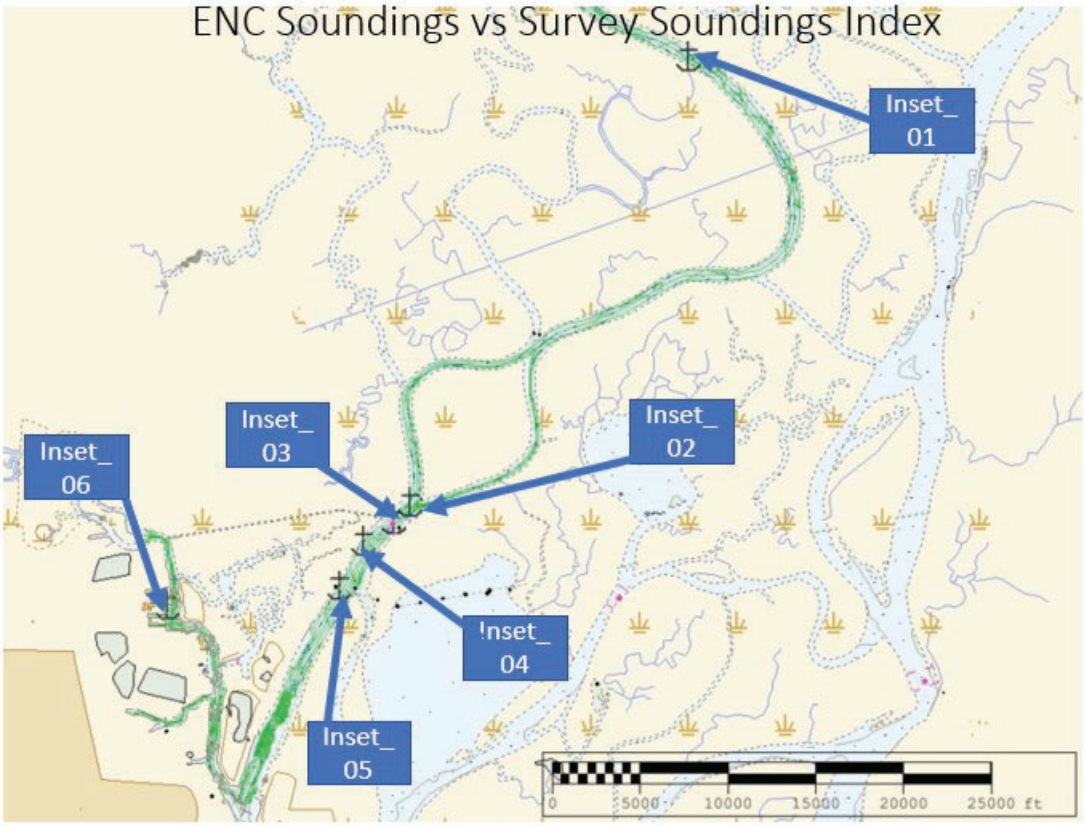


Figure 18: Sounding Comparison Index, All Soundings in Meters

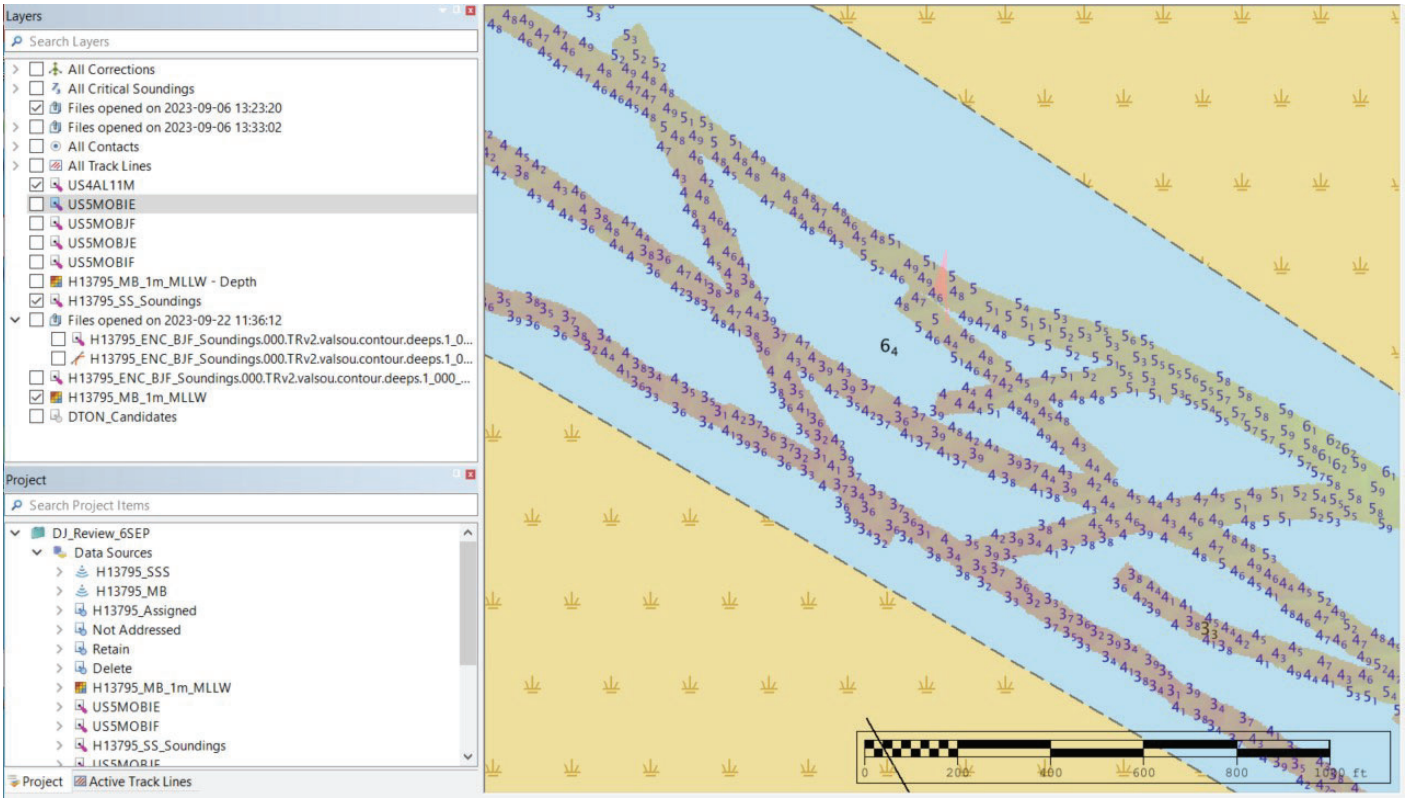


Figure 19: Inset 1, US4AL11M sounding (Black) vs H13795 soundings (Blue)

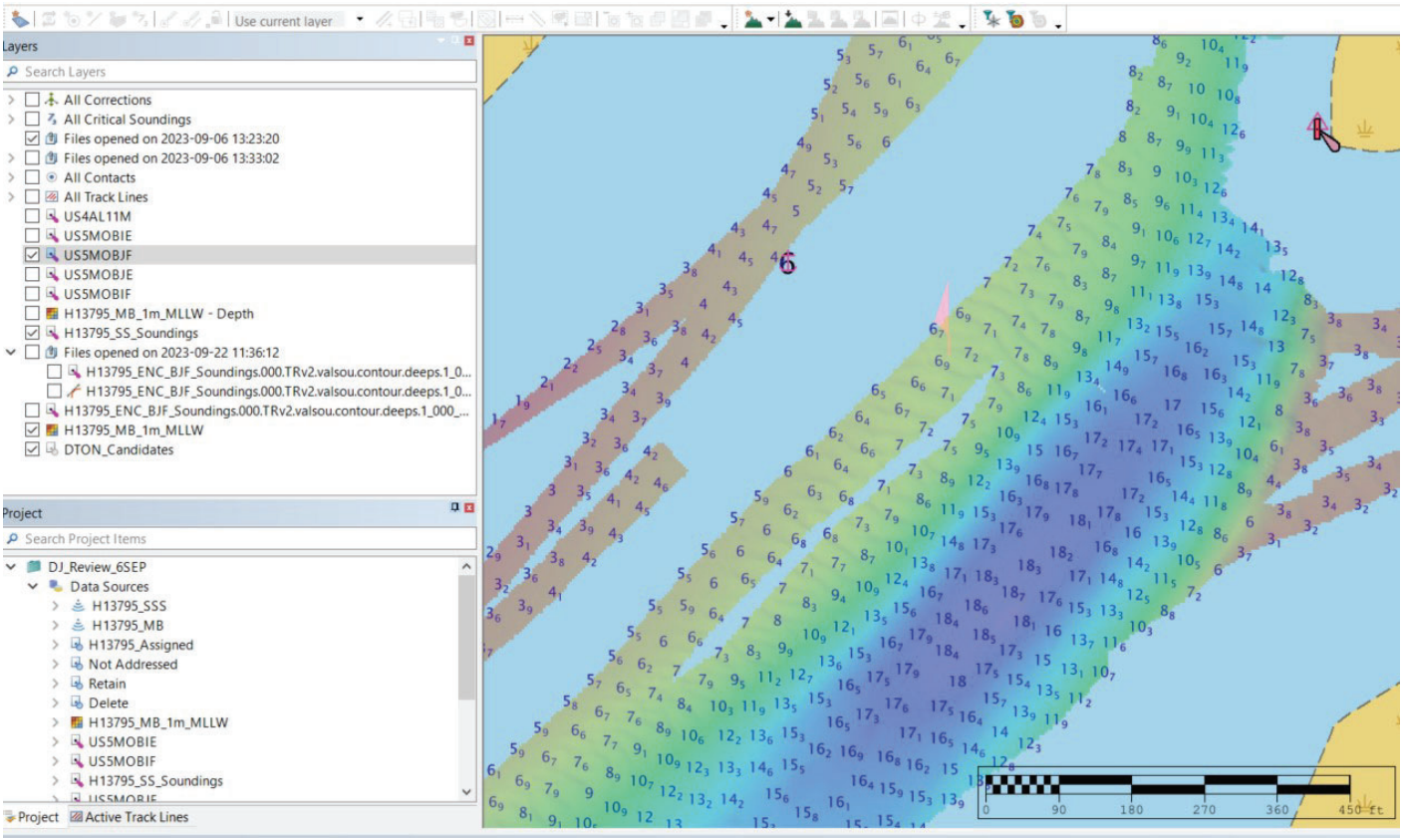


Figure 20: Inset 2, US5MOBJF sounding (Black) vs H13795 soundings (Blue)

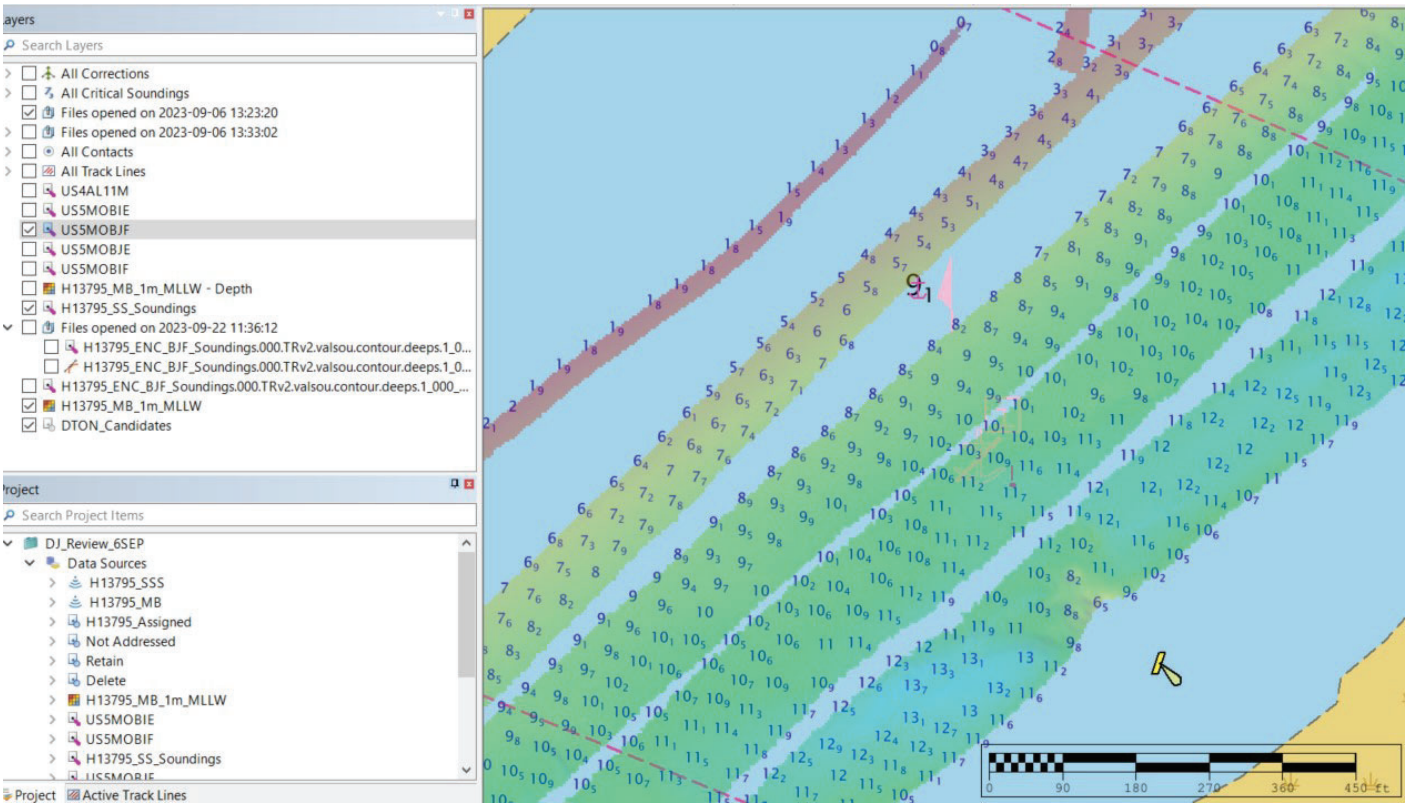


Figure 21: Inset 3, US5MOBJF sounding (Black) vs H13795 soundings (Blue)

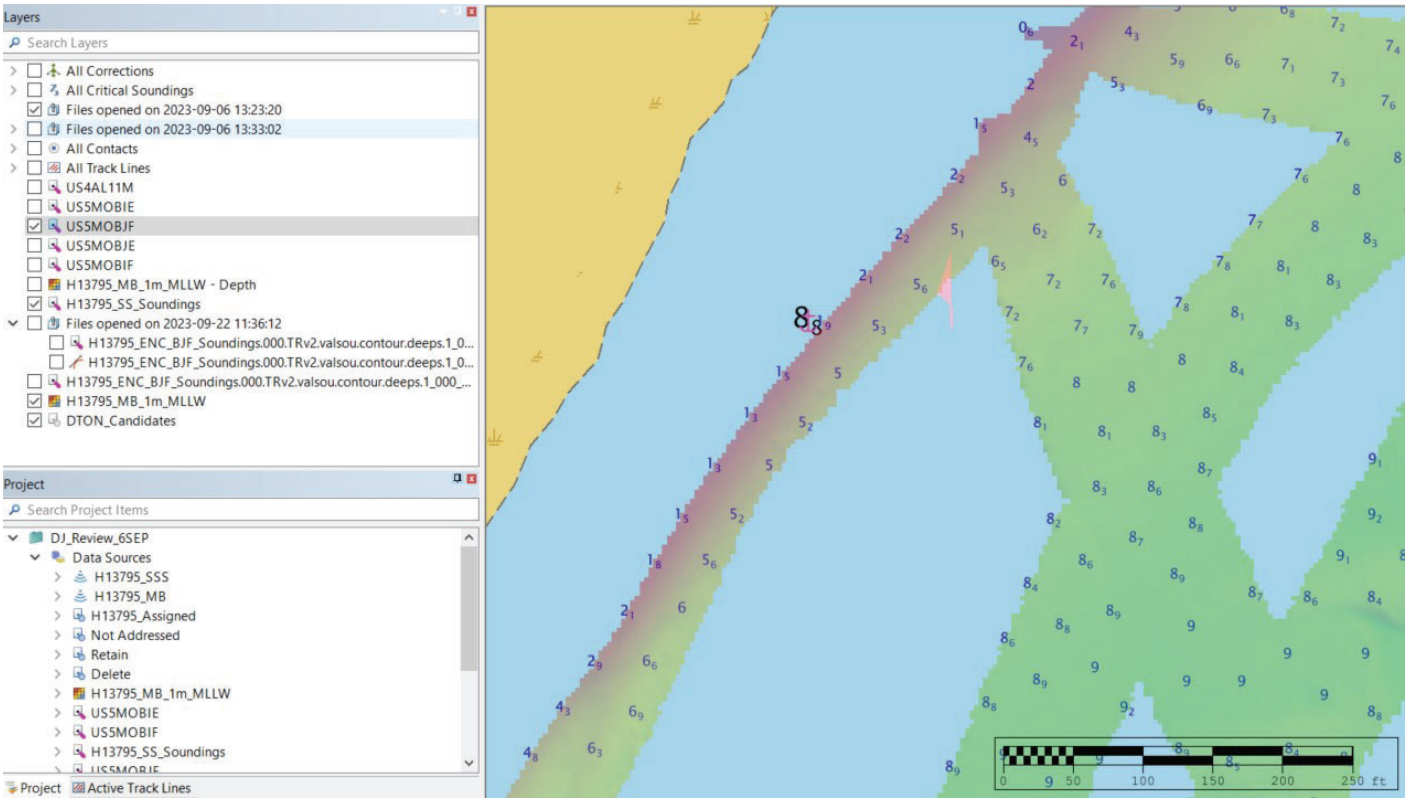


Figure 22: Inset 4, US5MOBJF sounding (Black) vs H13795 soundings (Blue)

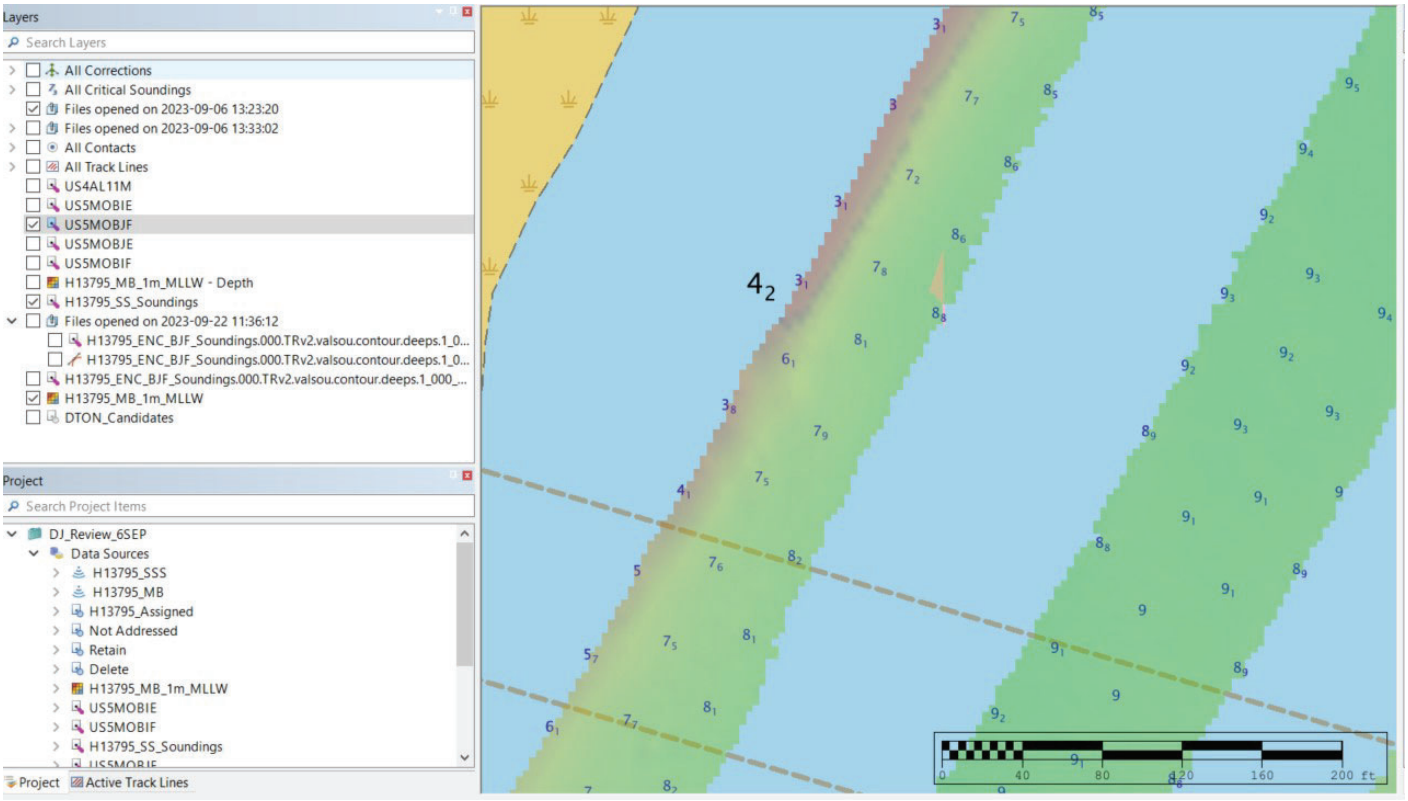


Figure 23: Inset 5, US5MOBJF sounding (Black) vs H13795 soundings (Blue)

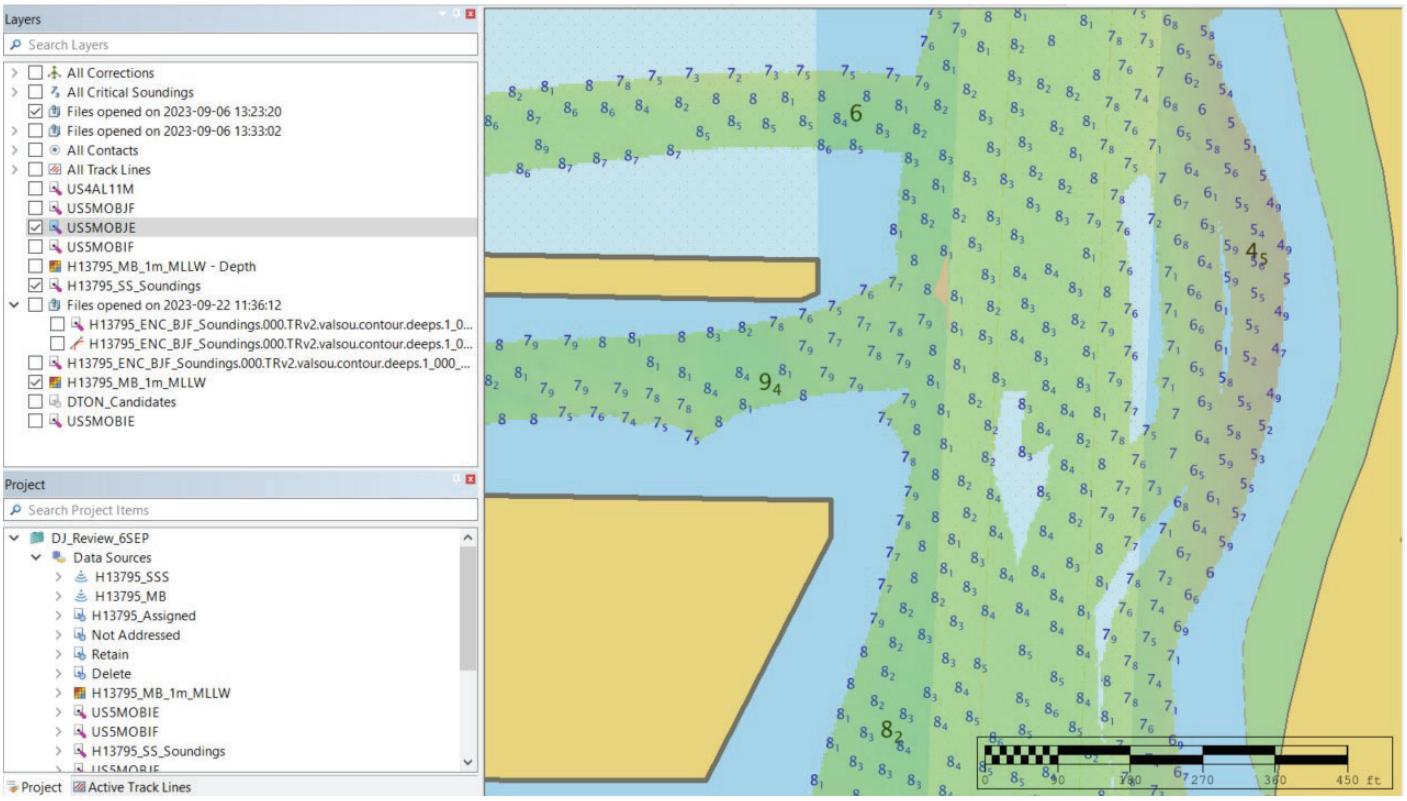


Figure 24: Inset 6, US5MOBJE sounding (Black) vs H13795 soundings (Blue)

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
US5MOBIE	1:10000	1	09/28/2023	05/31/2023
US5MOBJF	1:10000	1	09/28/2023	05/31/2023
US5MOBJE	1:10000	1	09/28/2023	05/31/2023
US5MOBIF	1:10000	1	09/28/2023	05/31/2023
US4AL11M	1:80000	70	09/28/2023	09/27/2023

Table 14: Largest Scale ENCs

D.1.2 Shoal and Hazardous Features

Six (6) soundings were flagged as DTON candidates using the "CA Tools" utility in Pydro 22. The Hydrographers did not deem any of the deeper chart soundings to be actual DTONs based on their close proximity to the river's edge and/or vessel draft maximums of 9 feet. The field recommends updating, repositioning, or deleting those deeper ENC soundings. A comprehensive soundings analysis can be found in the appendices folder. Not all designated soundings are associated to features in the final feature file, as some were chosen to capture the shoalest point on the river bottom where sand waves confounded the CUBE algorithm.

D.1.3 Charted Features

Please reference the final feature file.

D.1.4 Uncharted Features

Please reference the final feature file.

D.1.5 Channels

No Channel survey depths were shallower than tabulated in the ENC. The Chickasaw Creek region of this survey is regularly dredged. Per the investigation requirements, these dredged areas are not included in the final feature file.

D.2 Additional Results

D.2.1 Aids to Navigation

Navigation aids exist and were assigned to H133795. All navigation aids were present, charted in the correct position and serving their intended purpose. Please reference the Final Feature File.

D.2.2 Maritime Boundary Points

No Maritime Boundary Points were assigned for this survey.

D.2.3 Bottom Samples

No bottom samples were required for this survey.

D.2.4 Overhead Features

All charted/assigned overhead cables were visually confirmed by the field and no discrepancies existed. Per the investigation requirements, they are not included in the final feature file.

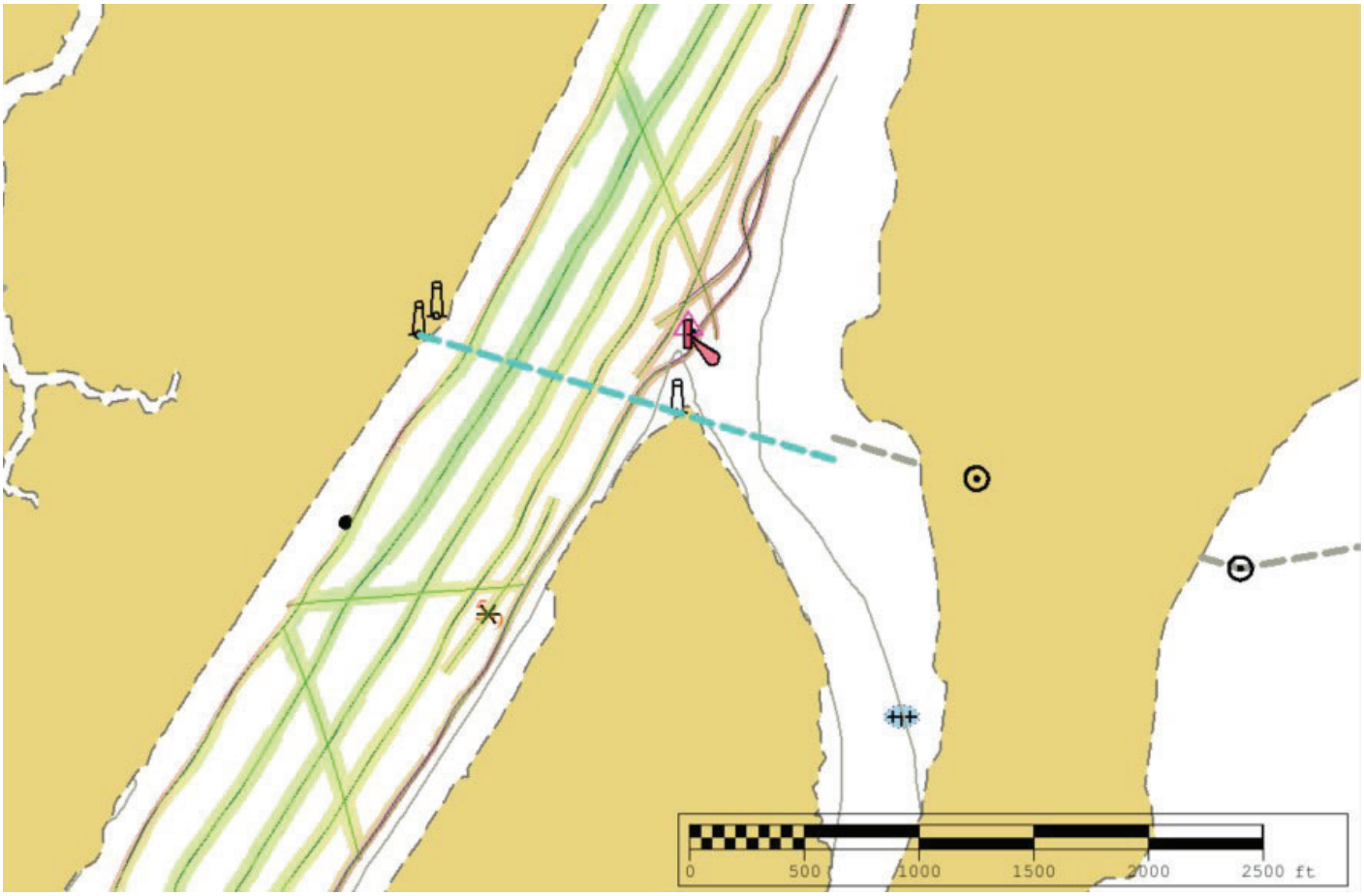


Figure 25: Overhead Cables

D.2.5 Submarine Features

A charted (US5MOBIF)/assigned submarine pipe was investigated. Its scour appears to be within 17m of the charted position. The feature appears to be covered in the riverbed.

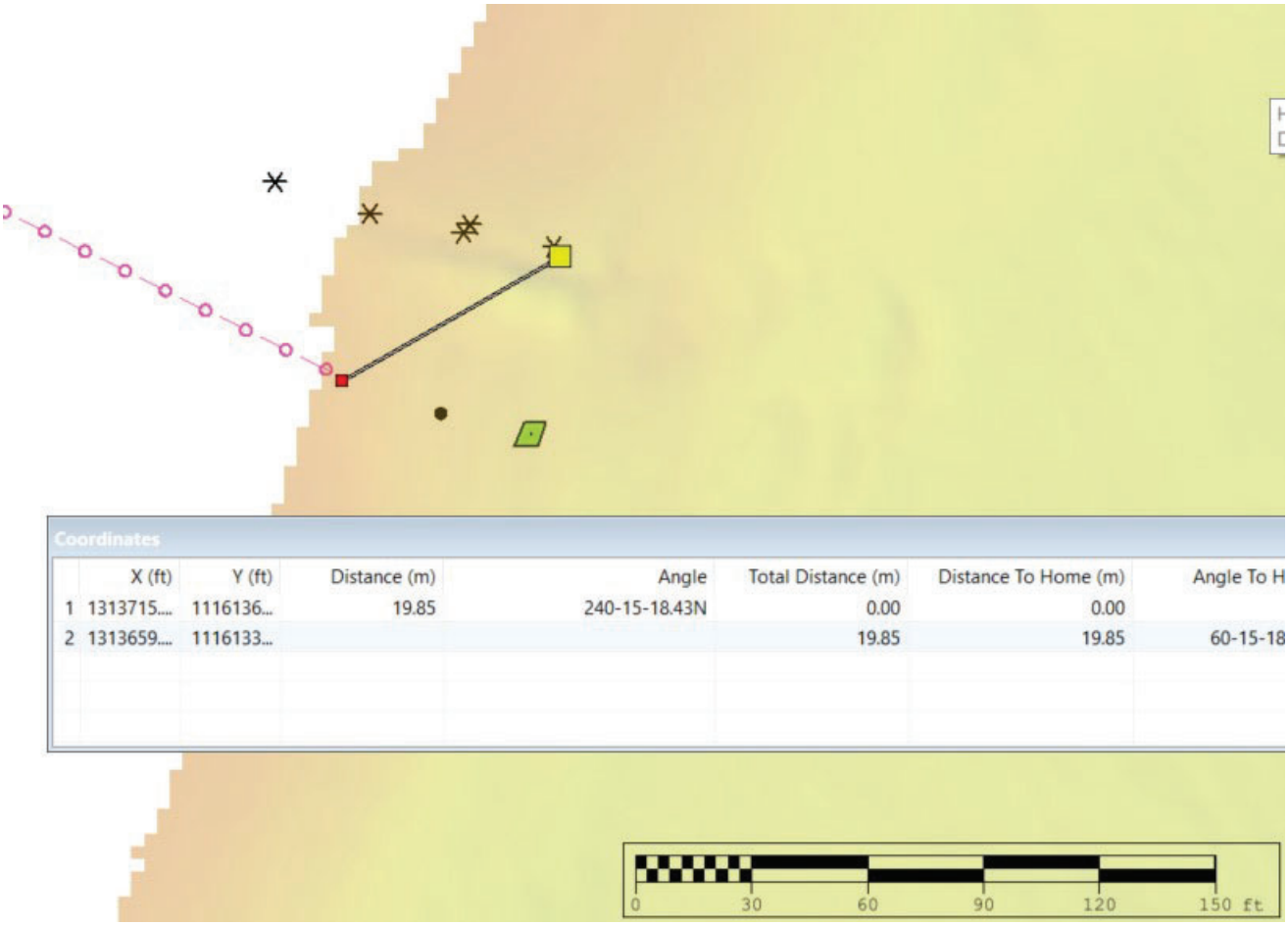


Figure 26: Submarine feature located within 20m of Charted (US5MOBIF) position

D.2.6 Platforms

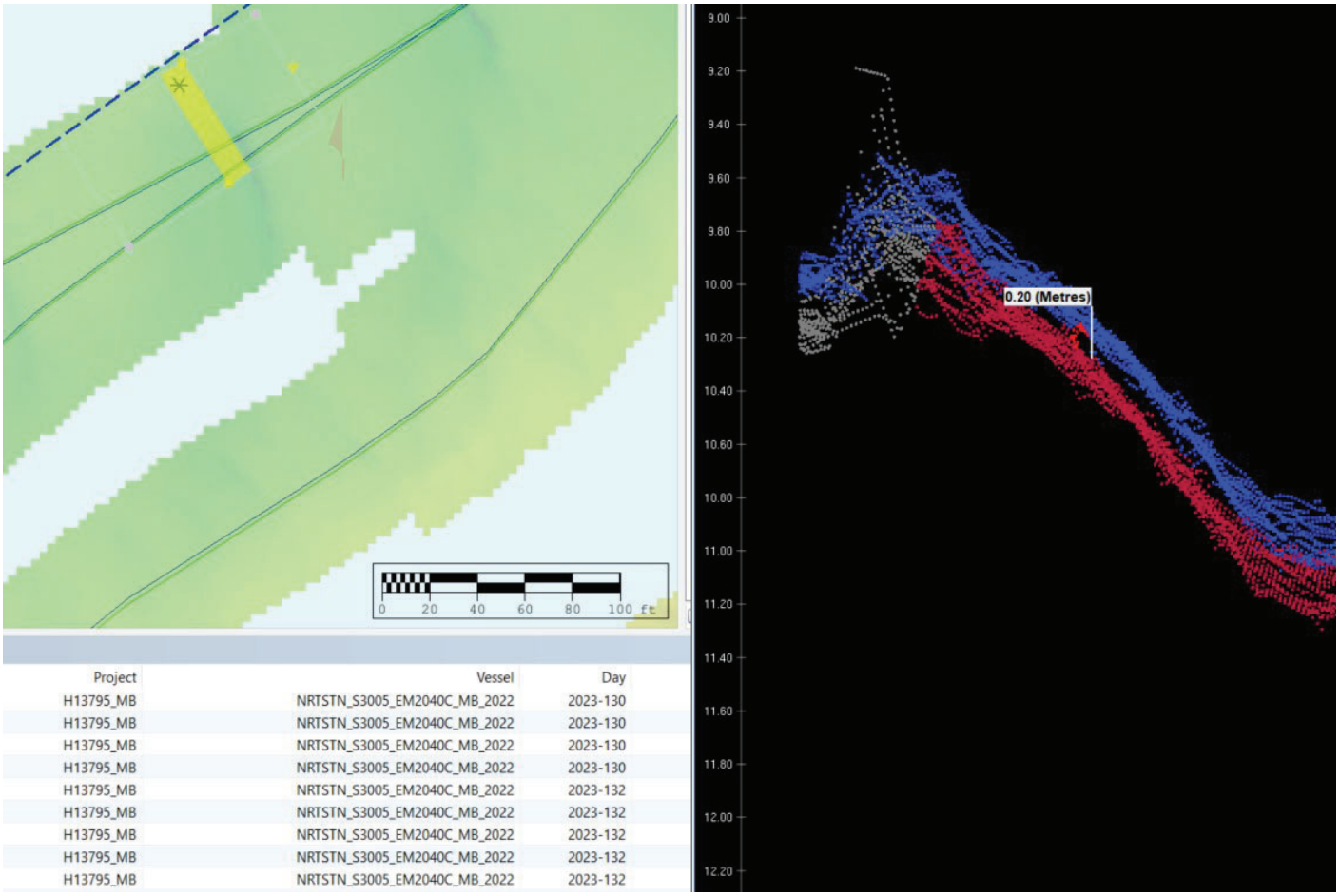
No platforms exist for this survey.

D.2.7 Ferry Routes and Terminals

No ferry routes or terminals exist for this survey.

D.2.8 Abnormal Seafloor or Environmental Conditions

Owing to heavy suspended sediment loads and fast moving water (>4 kts) bathymetry suffered near running tug boats and river bends. Migrating sand waves were noted north of 12 Mile Island and fliers abounded in that area as well as the Chickasaw Creek region.



Project	Vessel	Day
H13795_MB	NRTSTN_S3005_EM2040C_MB_2022	2023-130
H13795_MB	NRTSTN_S3005_EM2040C_MB_2022	2023-130
H13795_MB	NRTSTN_S3005_EM2040C_MB_2022	2023-130
H13795_MB	NRTSTN_S3005_EM2040C_MB_2022	2023-130
H13795_MB	NRTSTN_S3005_EM2040C_MB_2022	2023-132
H13795_MB	NRTSTN_S3005_EM2040C_MB_2022	2023-132
H13795_MB	NRTSTN_S3005_EM2040C_MB_2022	2023-132
H13795_MB	NRTSTN_S3005_EM2040C_MB_2022	2023-132
H13795_MB	NRTSTN_S3005_EM2040C_MB_2022	2023-132

Figure 27: Migrating Sand Waves

D.2.9 Construction and Dredging

No present or planned construction or dredging exist within the survey limits.

D.2.10 New Survey Recommendations

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

D.2.11 ENC Scale Recommendations

No new ENC scales are recommended for this area.

E. Approval Sheet

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

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

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

Please note that this survey has 1611 fliers occurring at sand wave edges. A memo explaining the issue to PHB Chief can be found in the project correspondence folder. The DR also calls out these edge fliers, which continue to re-generate inward after careful deletion.

Approver Name	Approver Title	Approval Date	Signature
Dan Jacobs	Chief of Party	10/18/2023	JACOBS.DAN.L.1151633478 Digitally signed by JACOBS.DAN.L.1151633478 Date: 2023.10.20 10:14:28 -05'00'

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