H13533

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

DESCRIPTIVE REPORT

Type of Survey:	Navigable Area
Registry Number:	H13533

LOCALITY

State(s):	Georgia
General Locality:	St. Andrews Sound
Sub-locality:	Jekyll Sound

2023

CHIEF OF PARTY
James Kirkpatrick

LIBRARY & ARCHIVES

Date:

U.S. DEPARTMENT OF COMMERCE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION	REGISTRY NUMBER:
HYDROGRAPHIC TITLE SHEET	**H13533**

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):	**Georgia**
General Locality:	**St. Andrews Sound**
Sub-Locality:	**Jekyll Sound**
Scale:	**10000**
Dates of Survey:	**05/24/2023 to 01/17/2024**
Instructions Dated:	**05/23/2023**
Project Number:	**S-G911-NRTFB-23**
Field Unit:	**NOAA Navigation Response Team - Fernandina**
Chief of Party:	**James Kirkpatrick**
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 17N, MLLW. All references to other horizontal or vertical datums in this report are applicable to the processed hydrographic data provided by the field unit.

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Descriptive Report to Accompany Survey H13533

Project: S-G911-NRTFB-23

Locality: St. Andrews Sound

Sublocality: Jekyll Sound

Scale: 1:10000

May 2023 - January 2024

NOAA Navigation Response Team - Fernandina

Chief of Party: James Kirkpatrick

A. Area Surveyed

Survey H13533, located in Jekyll Sound, GA.

A.1 Survey Limits

Data were acquired within the following survey limits:

Northwest Limit	Southeast Limit
31° 5' 33.94" N 81° 31' 3.46" W	30° 59' 48.87" N 81° 25' 24.36" W

Table 1: Survey Limits

Figure 1: H13533 Survey Area Overview

Areas that were not surveyed within the sheet limits due to time constraints will be completed in sheet number 1 for this survey area. Sheet number 1 with the registry number H13532 is expected to be completed in 2024 and is portrayed as the gray area in the image below.

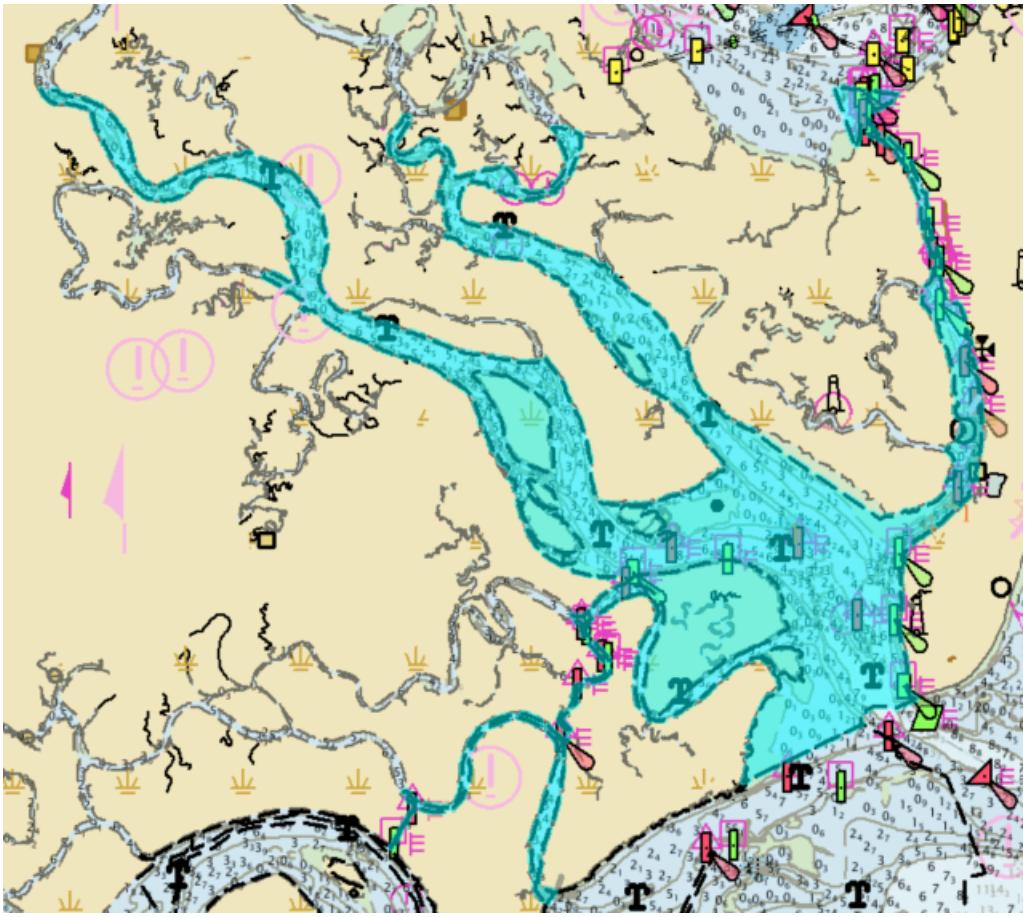

Figure 2: H13533 Sheet limits Project Instructions

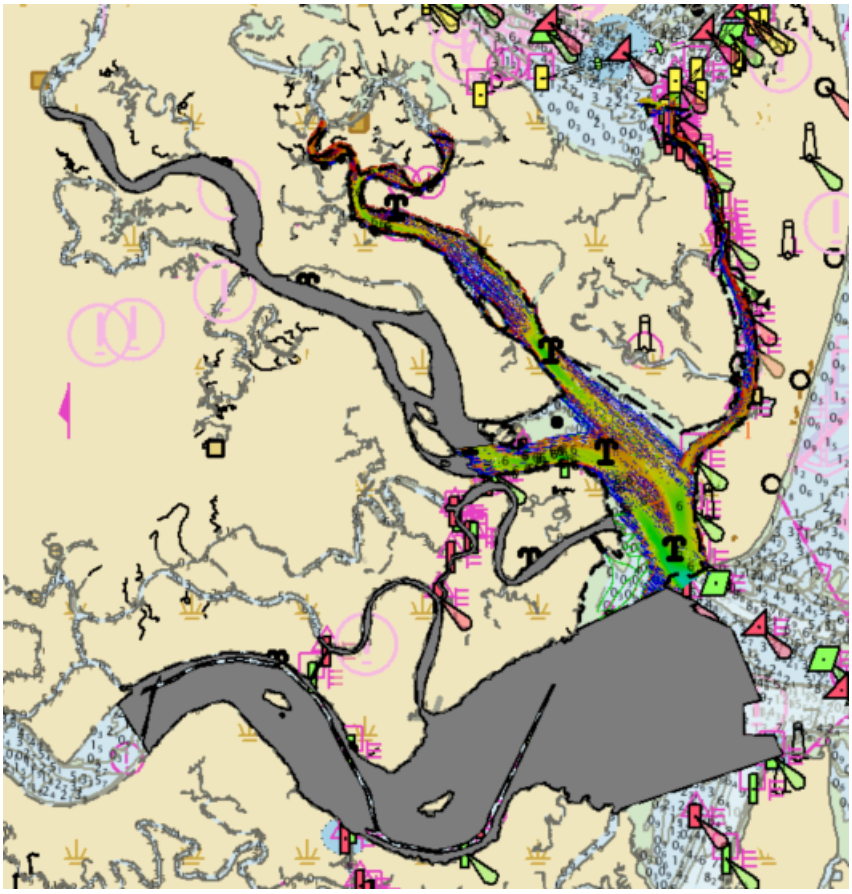

Figure 3: Multibeam data showing area covered and gray area expected to be completed during survey H13532

A.2 Survey Purpose

The Southeast Navigation Manager has received several requests for hydrographic survey in St. Andrew Sound and vicinity. The area has significant traffic from small boats, tugs and barges. It's been reported that there have been many small boat groundings. A contemporary survey is needed to update the nautical charts. 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
All waters in survey area	Object Detection Coverage (refer to HSSD Section 5.2.2.2)

Table 2: Survey Coverage

Object detection requirements were achieved with the exception of a few areas. One area did not recieve object detection coverage due to shallow water depth. The second area was unable to be surveyed due to shoal. There were also a couple holidays near the survey edges that were too shoal for surveying.

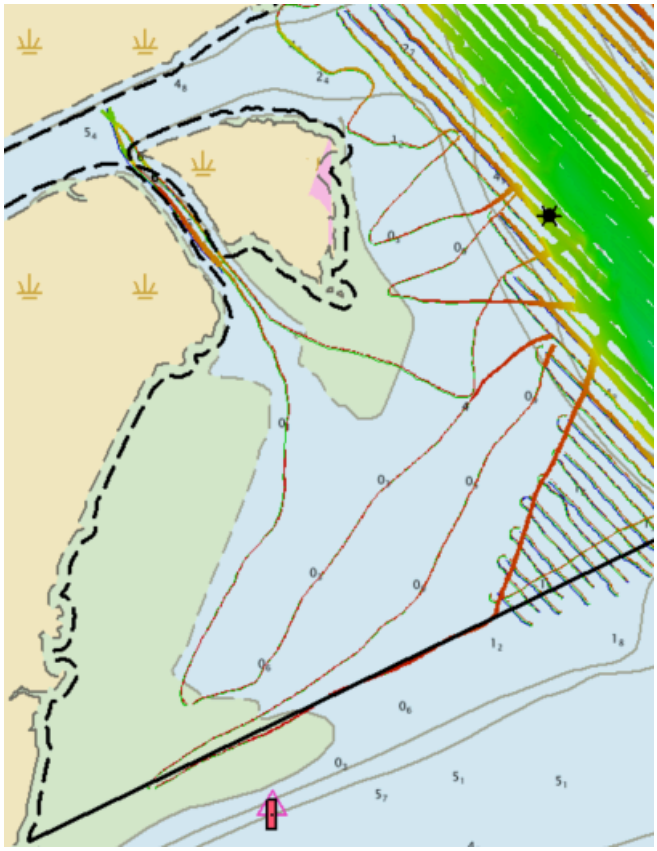

Figure 4: Shoal area unable to achieve object detection

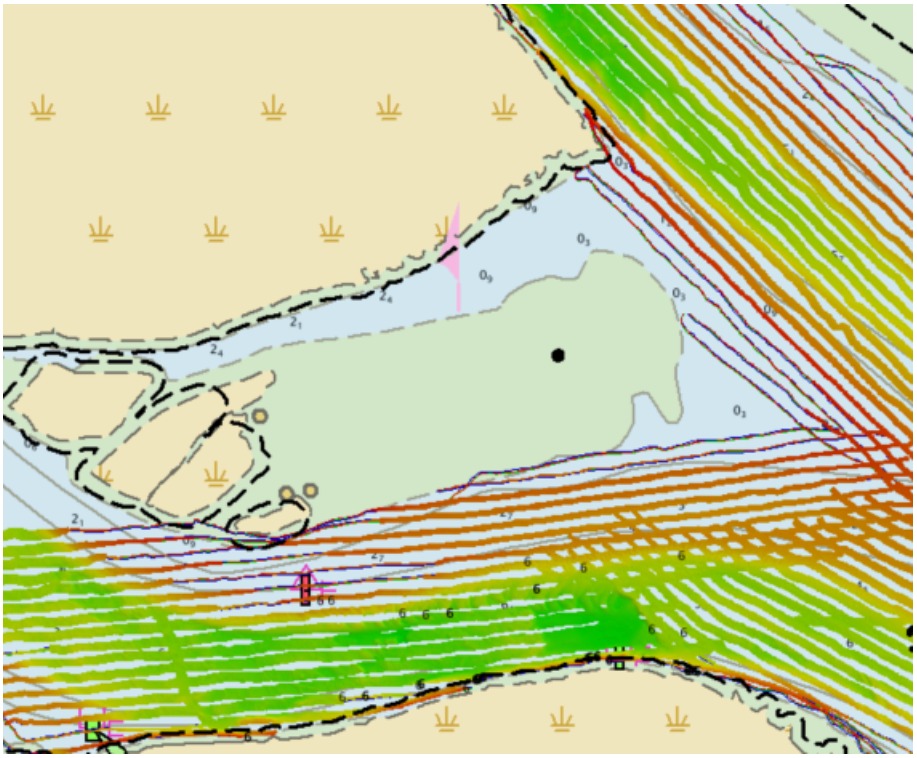

Figure 5: Shoal area unable to survey

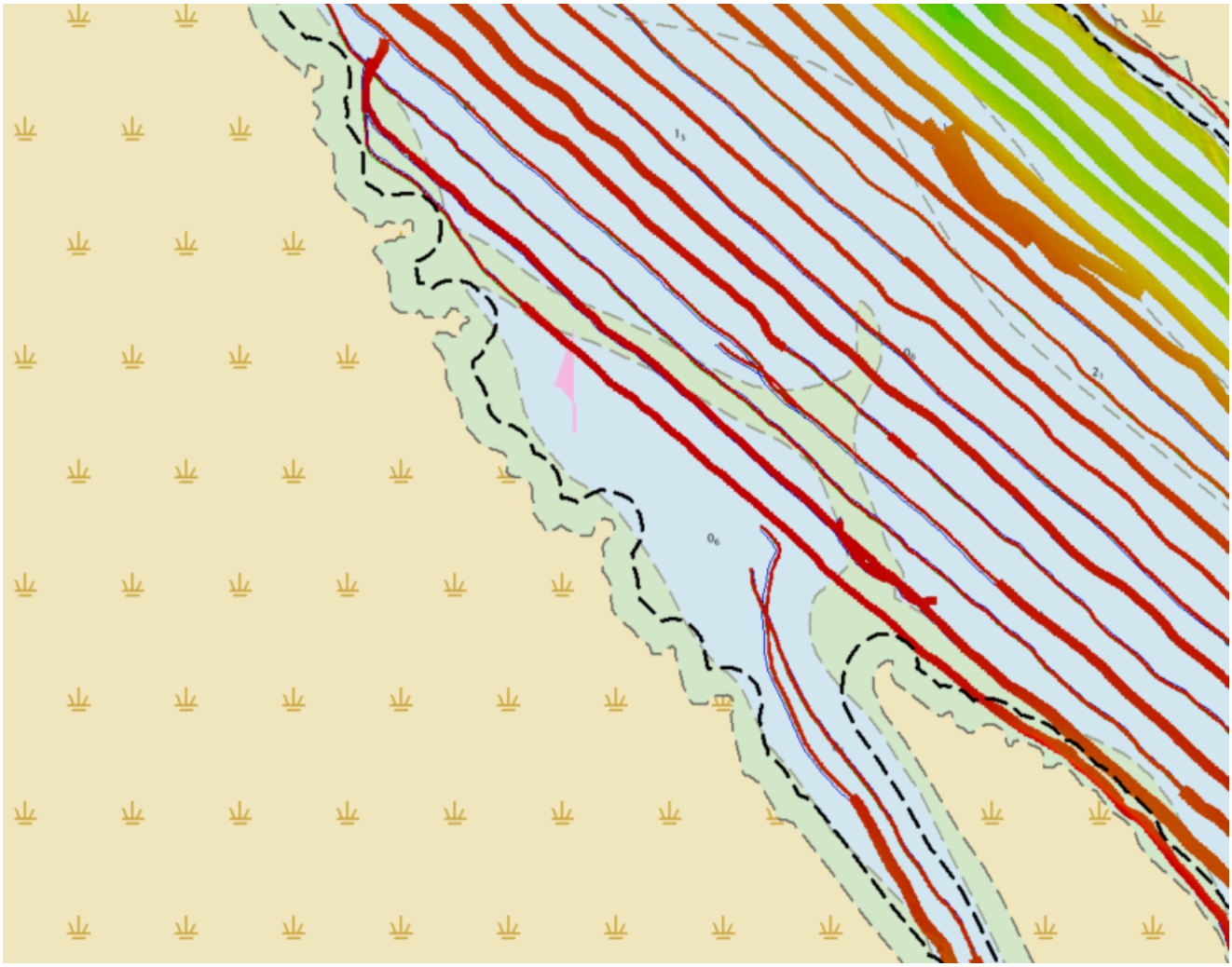

Figure 6: Holiday in shoal area

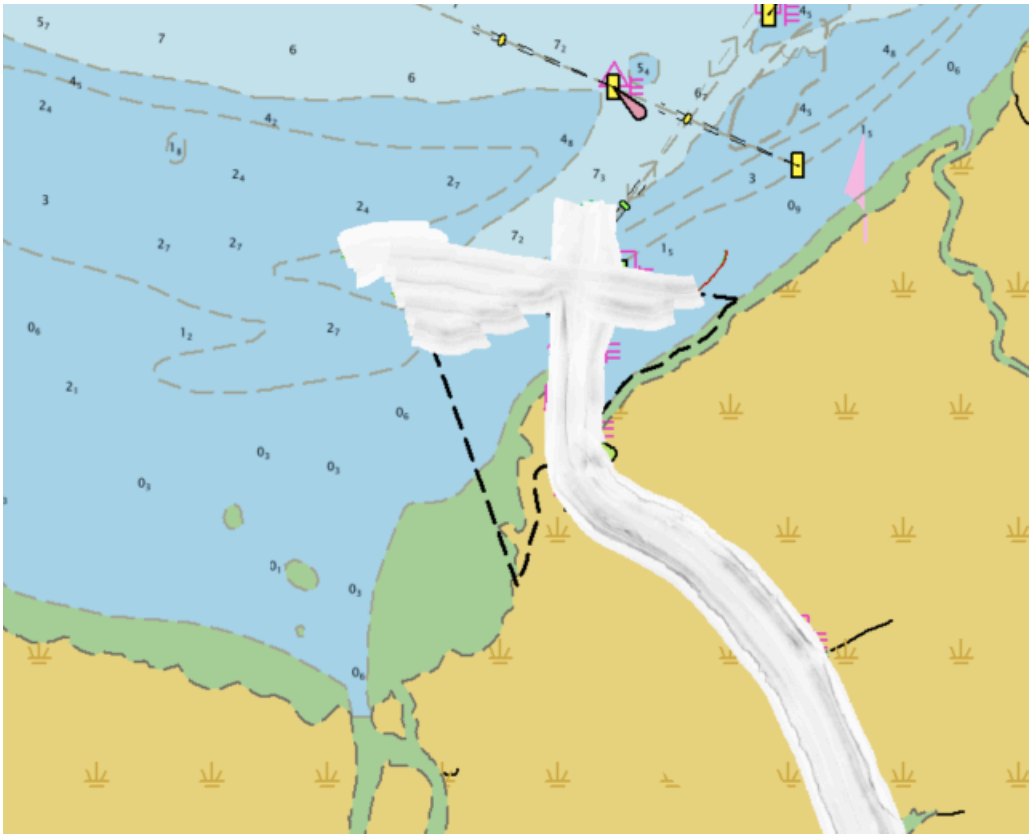

Figure 7: Shoal area holiday at entrance to Brunswick River

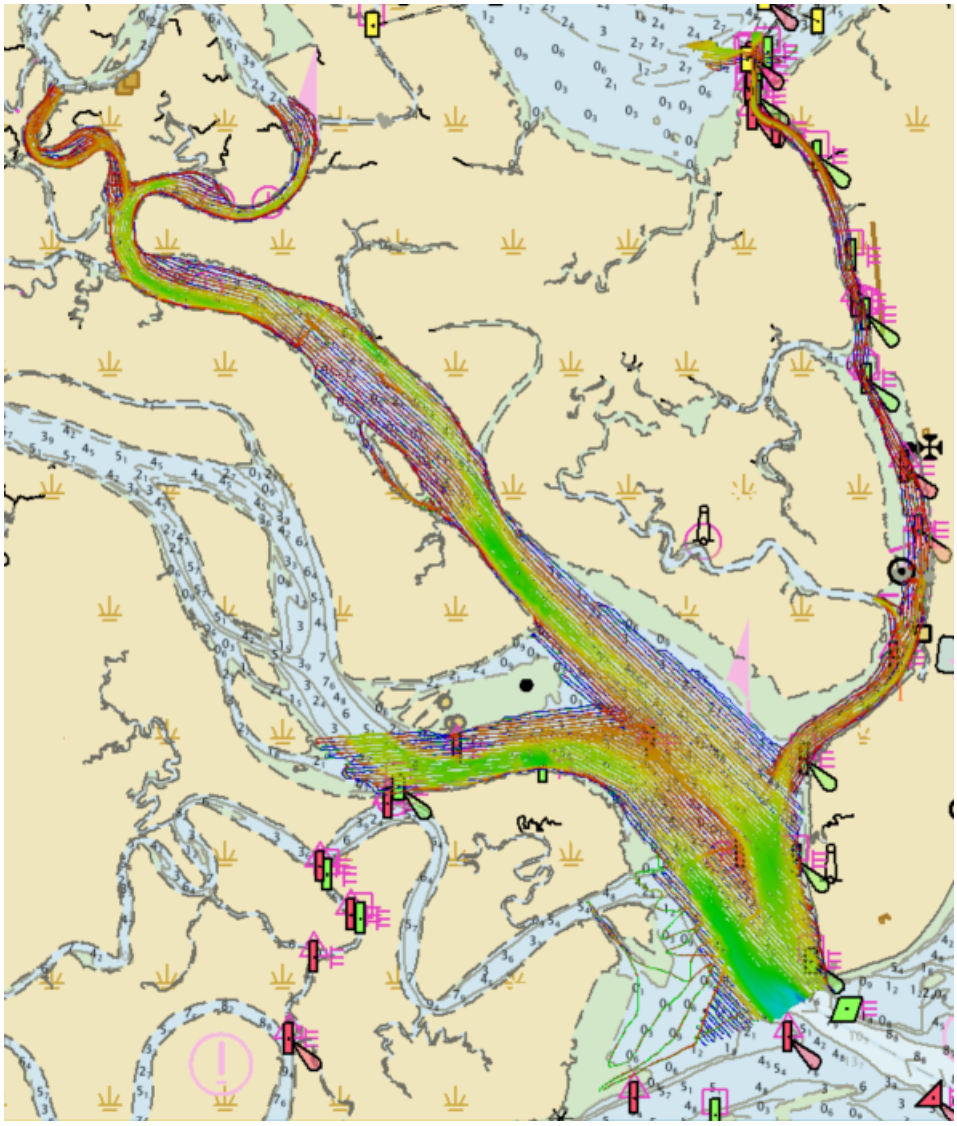

Figure 8: H13533 Multibeam Coverage

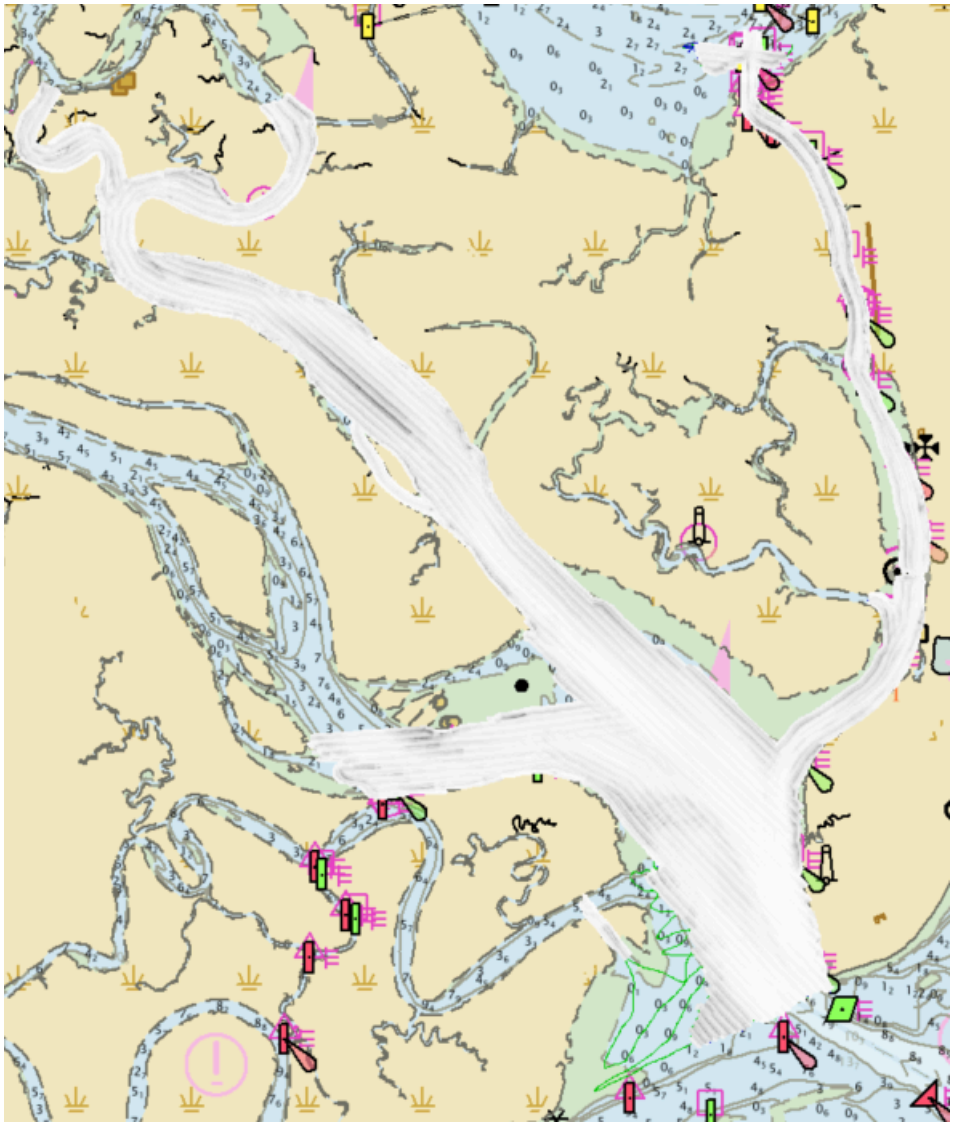

Figure 9: H13533 SSS Coverage

A.6 Survey Statistics

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

	HULL ID	*S3009*	*Total*
LNM	**SBES Mainscheme**	0.0	0.0
	MBES Mainscheme	234.84	234.84
	Lidar Mainscheme	0.0	0.0
	SSS Mainscheme	226.4	226.4
	SBES/SSS Mainscheme	0.0	0.0
	MBES/SSS Mainscheme	0.0	0.0
	SBES/MBES Crosslines	2.88	2.88
	Lidar Crosslines	0.0	0.0
Number of Bottom Samples			5
Number Maritime Boundary Points Investigated			0
Number of DPs			0
Number of Items Investigated by Dive Ops			0
Total SNM			4.37

Table 3: Hydrographic Survey Statistics

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

Survey Dates	Day of the Year
05/24/2023	144
05/25/2023	145

Survey Dates	Day of the Year
11/16/2023	320
11/20/2023	324
11/28/2023	332
12/12/2023	346
12/13/2023	347
01/17/2023	17

Table 4: Dates of Hydrography

Acquisition spanned a total of 8 non consecutive survey days.

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.

B.1.1 Vessels

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

Hull ID	***S3009***
LOA	10.5 meters
Draft	1.2 meters

Table 5: Vessels Used

Figure 10: S3009

All data for H13533 was collected by Navigation Response Team 2 and S3009.

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
Applanix	POS MV 320 v5	Positioning and Attitude System
AML Oceanographic	MicroX SV	Sound Speed System
YSI	CastAway-CTD	Conductivity, Temperature, and Depth Sensor

Table 6: Major Systems Used

B.2 Quality Control

B.2.1 Crosslines

Crosslines covered 1.2% of the mainscheme surface and were in good agreement with a mean difference of 0.69 m and a standard deviation of .07 m comparing 280,524 data points. A final day for crosslines was planned to meet the required 4% but were unable to complete due to a POS antenna failing and time constraints.

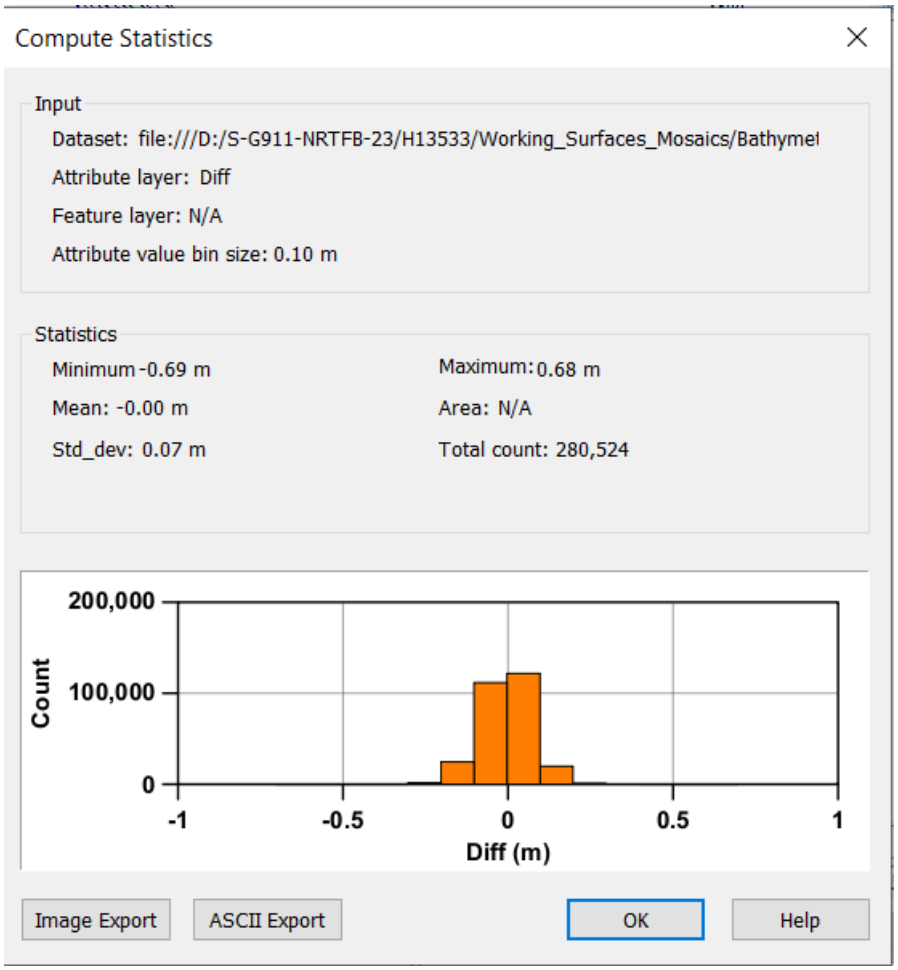

Figure 11: H13533 Crossline Analysis

B.2.2 Uncertainty

The following survey specific parameters were used for this survey:

Method	Measured	Zoning
ERS via VDATUM	N/A	10.9 centimeters

Table 7: Survey Specific Tide TPU Values.

Hull ID	Measured - CTD	Measured - MVP	Measured - XBT	Surface
S3009	2 meters/second	N/A	N/A	0.5 meters/second

Table 8: Survey Specific Sound Speed TPU Values.

The vertical uncertainty for the Jekyll sound survey is 10.9 cm. Sound speed uncertainty values were derived from manufacturer specifications.

B.2.3 Junctions

Survey H13533 overlaps with F00769 which was surveyed in 2020. Soundings taken from H13533 were in good agreement with F00769. After analyzing surfaces, there was a mean difference of .11 m and a standard deviation of .16 m comparing 154,730 soundings.

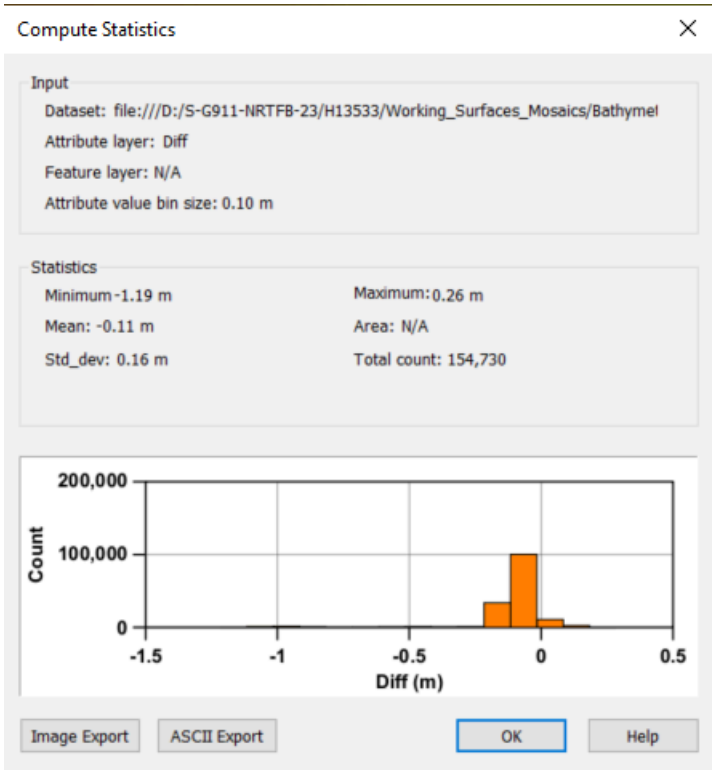

Figure 12: H13533 and F00769 analysis

The following junctions were made with this survey:

Registry Number	Scale	Year	Field Unit	Relative Location
H13532	1:10000	2024	NRT2	SW

Table 9: Junctioning Surveys

H13532

H13532 is a contemporary survey that junctions with this survey and is expected to be surveyed in 2024.

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

MBES data quality

There were areas of very shallow water where the multibeam system experienced blowouts. This is typical of the system used in shallow water and data quality was improved as best as possible during data processing. There were also areas with steep slopes where the multibeam had issues getting coverage. This also caused many edge fliers in this survey. Sandwaves were also present, contributing to edge fliers in the survey area. Data was improved to best possible quality during processing.

Figure 13: Multibeam blowouts in shallow area

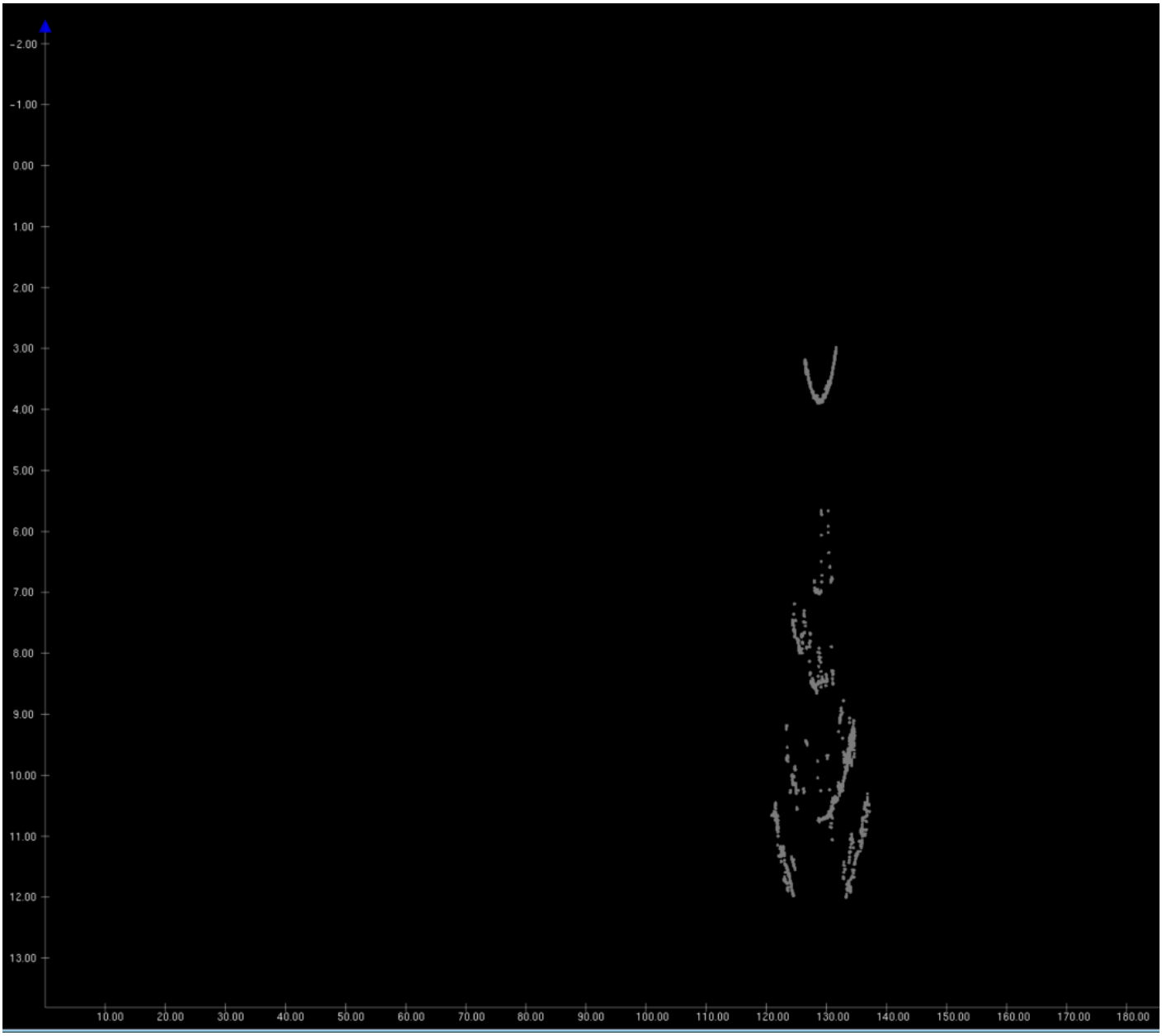

Figure 14: Multibeam blowout in subset editor showing rejected soundings

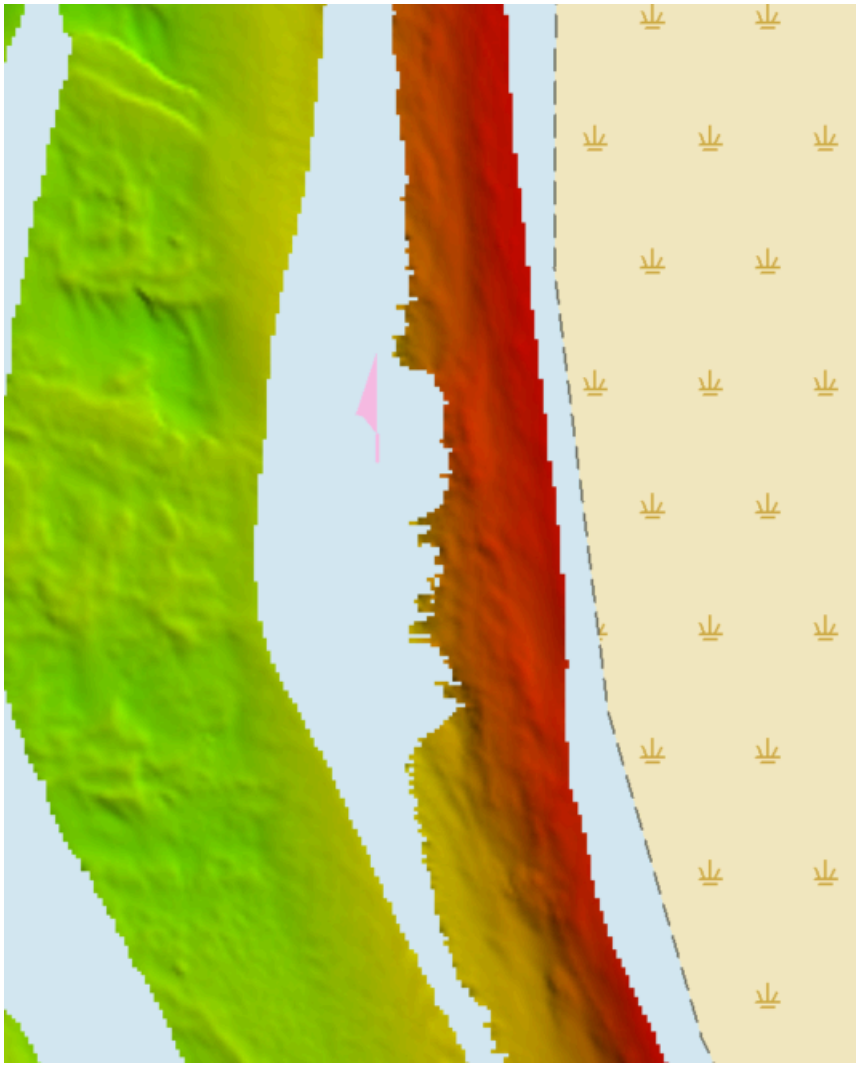

Figure 15: Steep slope

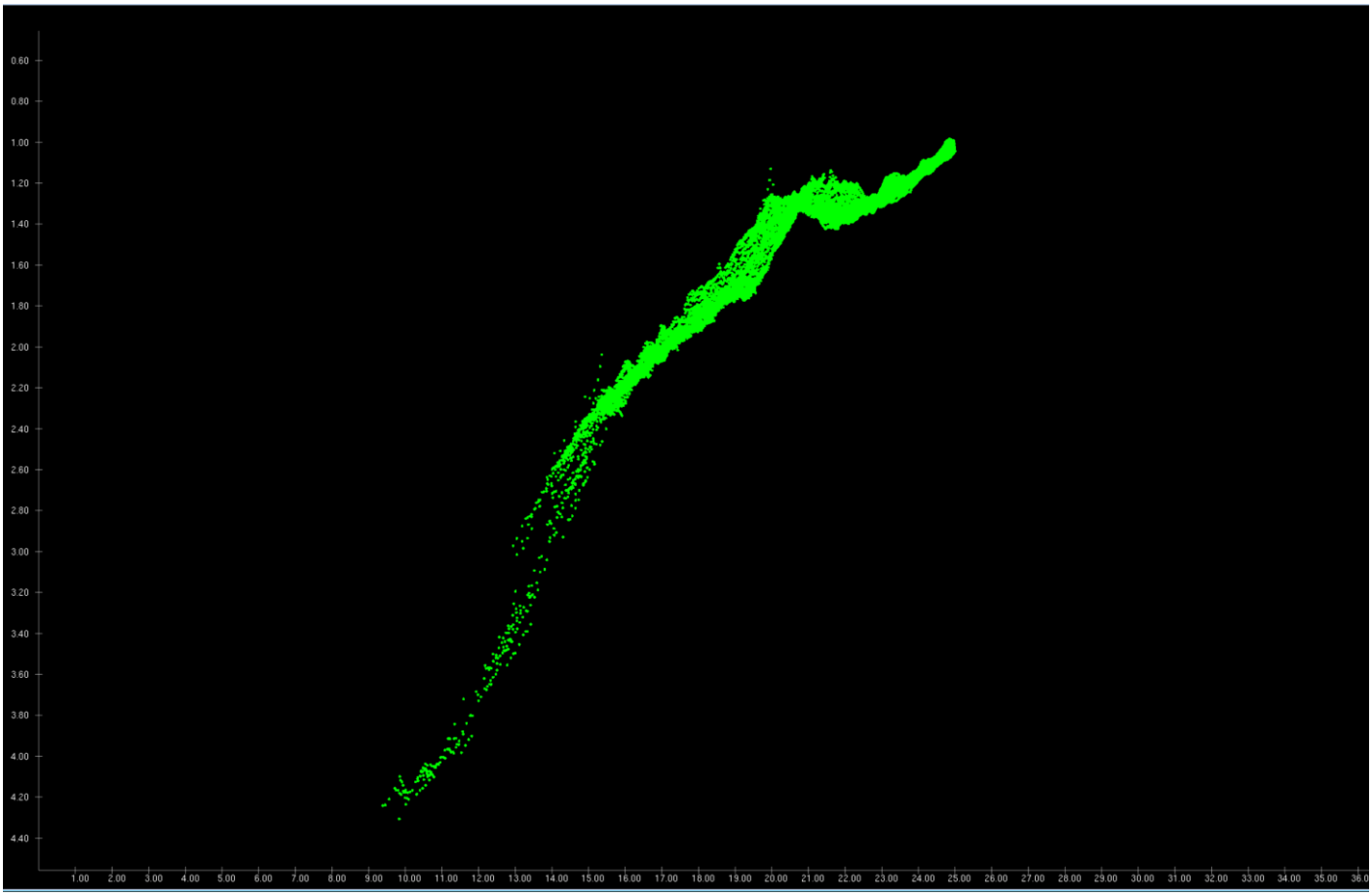

Figure 16: Steep slope in subset editor

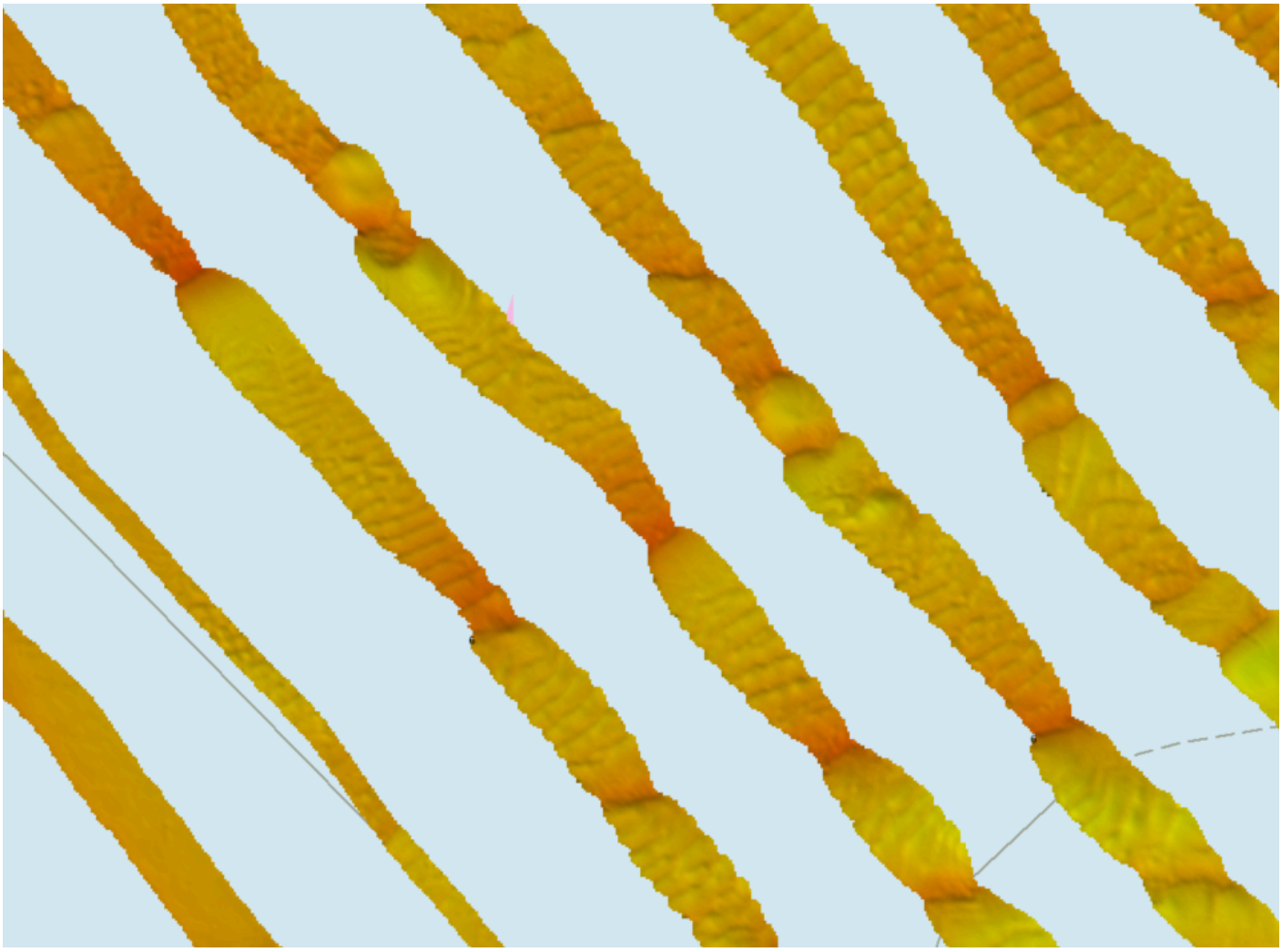

Figure 17: Sand waves resulting in edge fliers

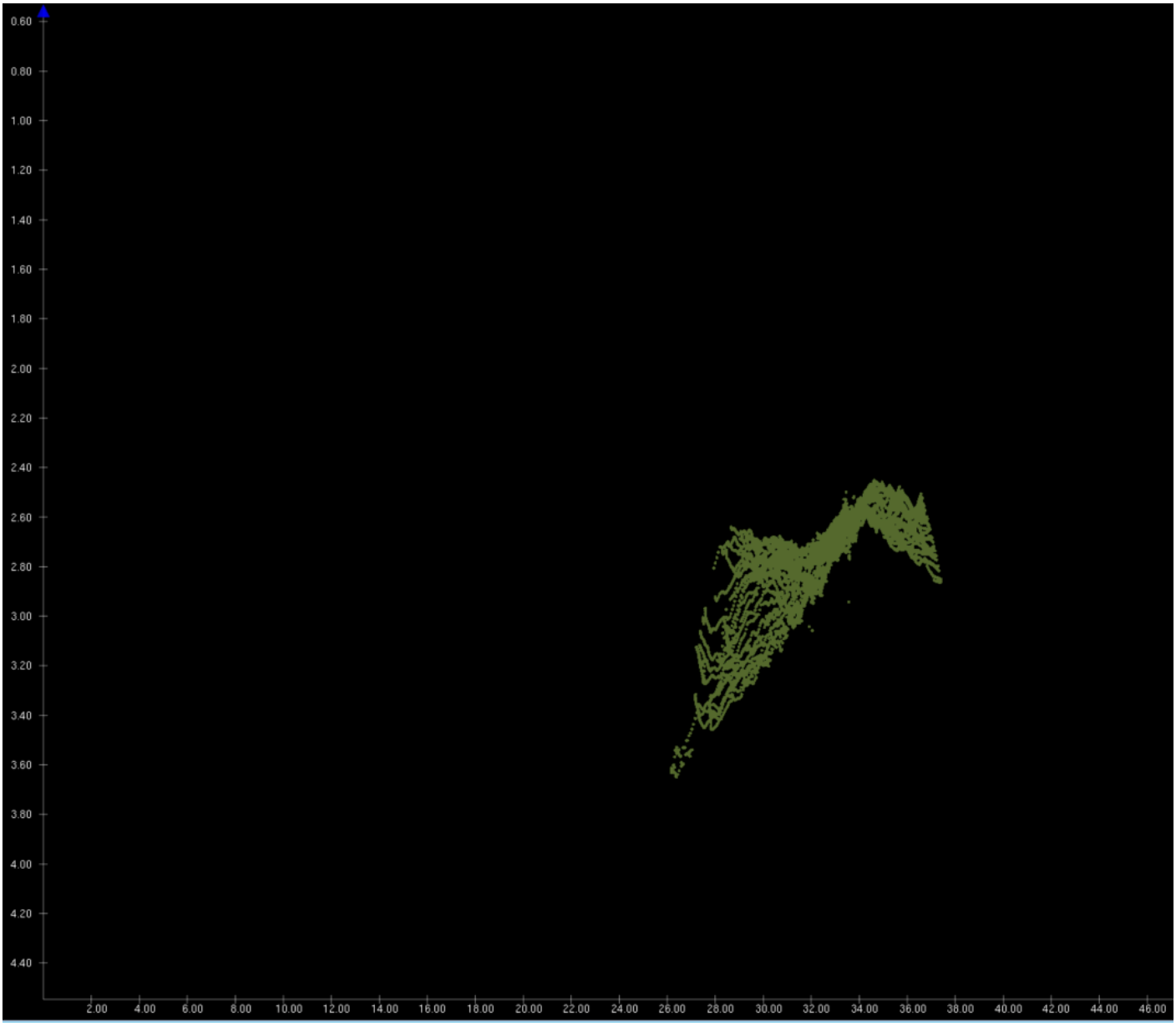

Figure 18: Sandwave flier in subset editor

B.2.6 Factors Affecting Soundings

Soft Mud Bottom and Multibeam data

During survey acquisition, in soft bottom the multibeam powered through the soft mud creating a noticable pattern in the surface throughout the data. Data was improved to best possible quality during processing.

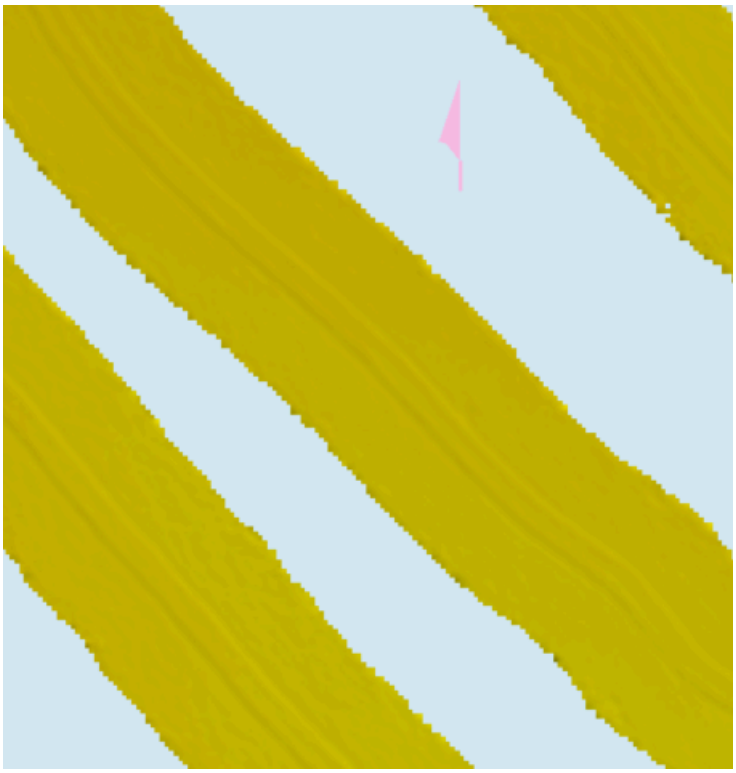

Figure 19: Soft bottom multibeam data

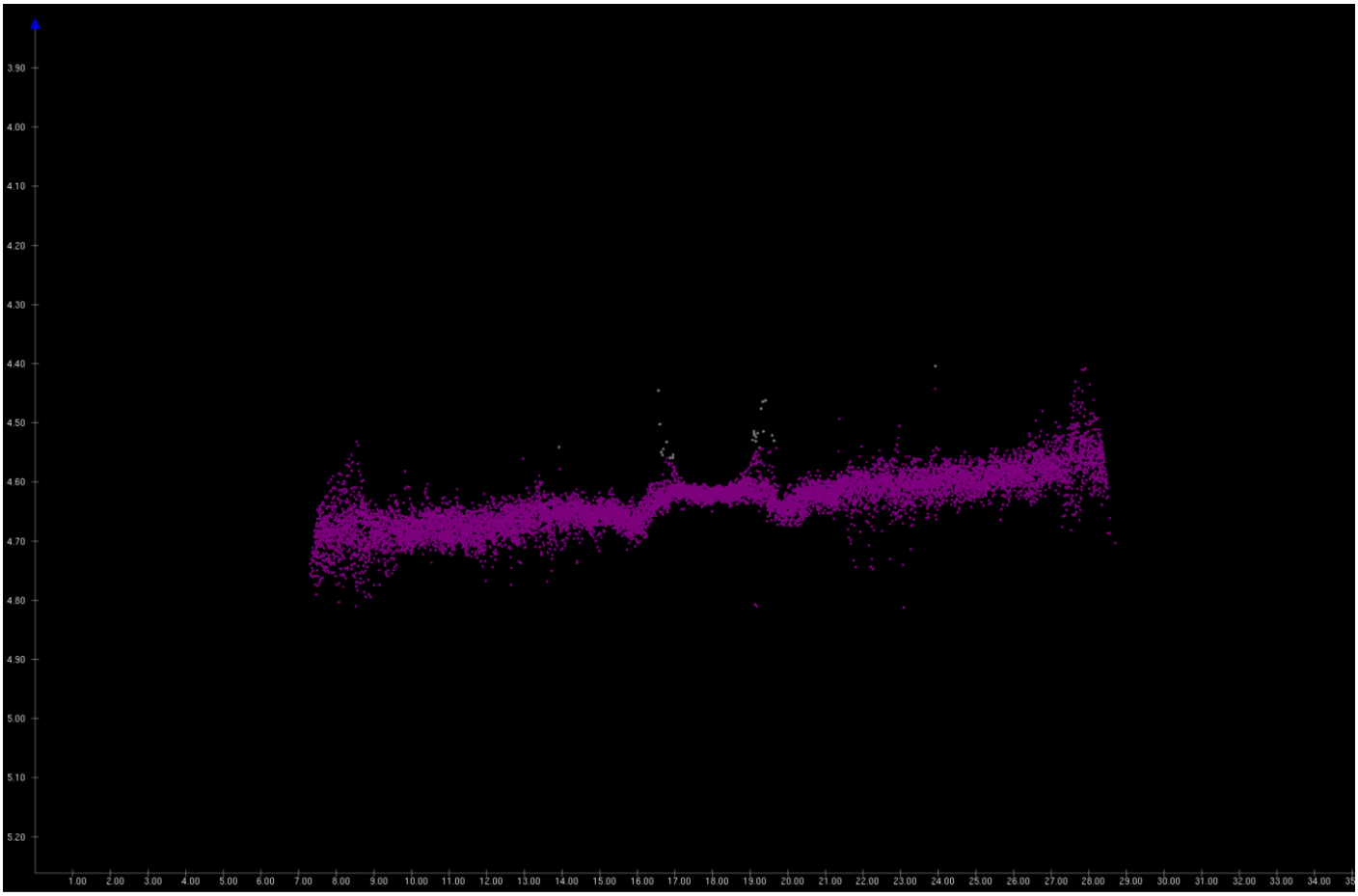

Figure 20: Soft bottom multibeam data in subset editor

Crab Pots

Acquisition of H13533 took place in a popular crabbing area and crab pots are evident in both sidescan and multibeam data. On occasion, these pots created spurious soundings that affected the multibeam data and were rejected.

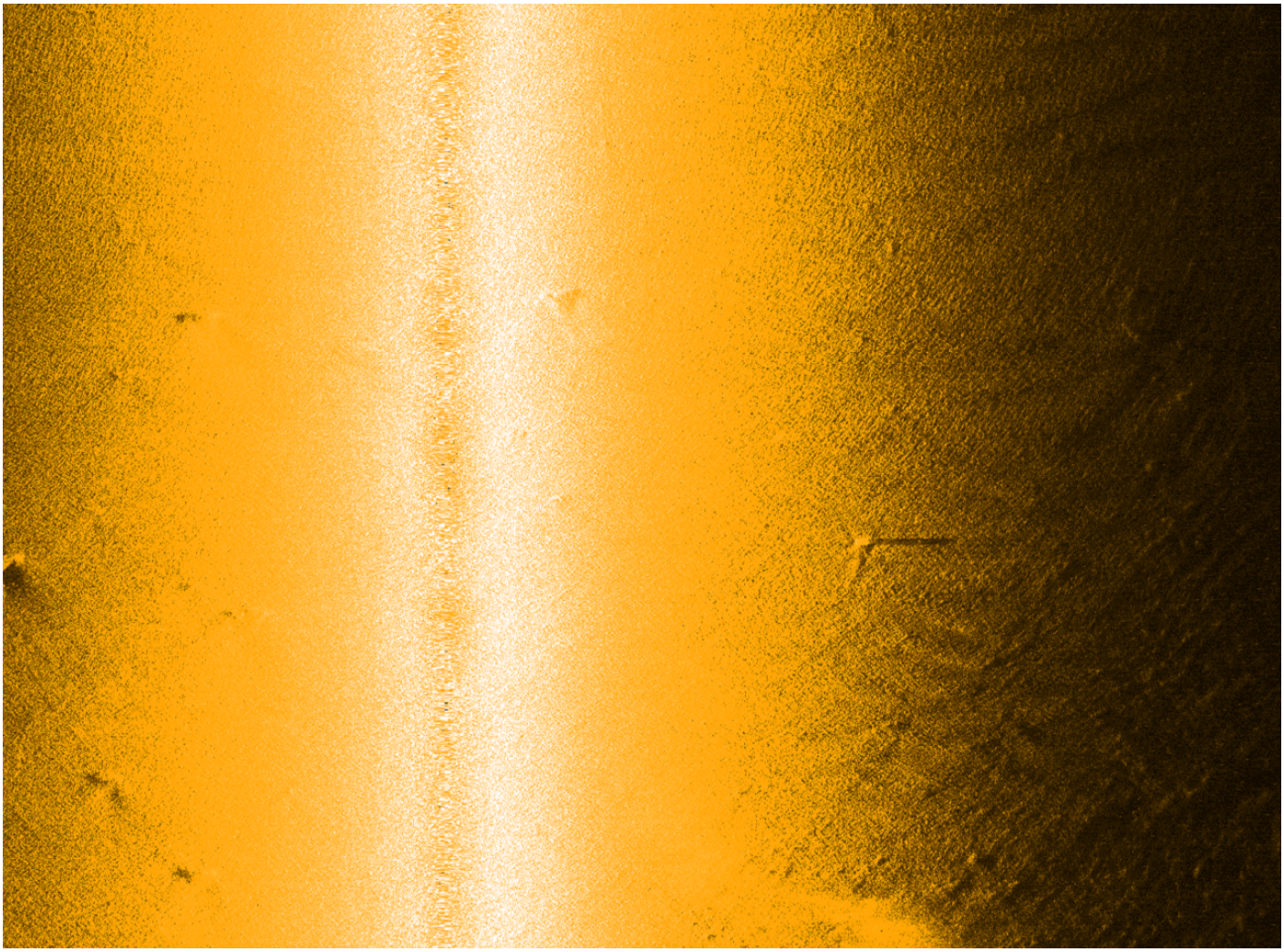

Figure 21: Crab pot in SSS

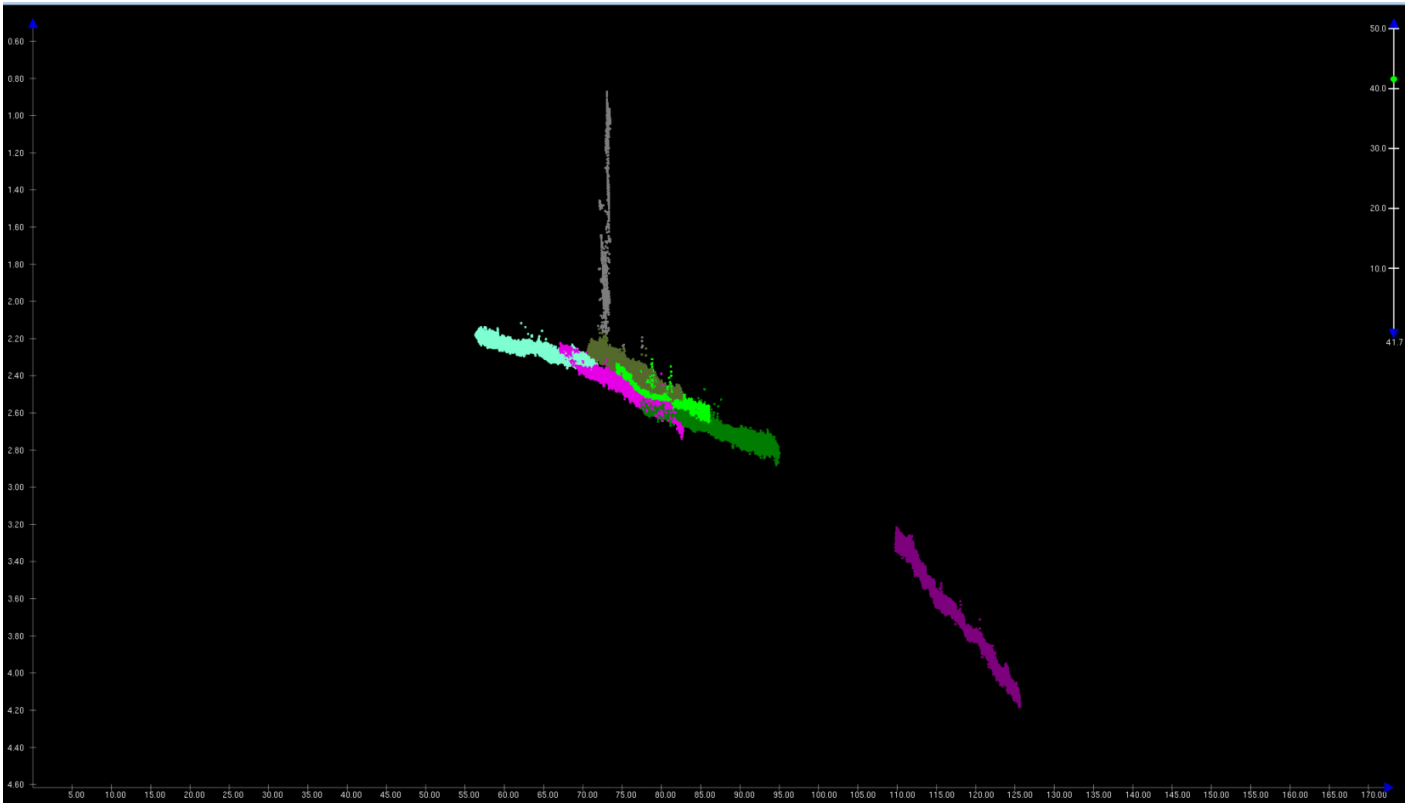

Figure 22: Crab pot line soundings rejected

B.2.7 Sound Speed Methods

Sound Speed Cast Frequency: As close to every 2 hours as possible.

A total of 34 casts were taken during the 8 days of surveying. Real time sound speed was collected continuously at the multibeam transducer.

B.2.8 Coverage Equipment and Methods

200% SSS with concurrent multibeam was used to achieve object detection requirements.

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

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

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	11.4.27

Table 10: Primary bathymetric data processing software

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

Manufacturer	Name	Version
QPS	Fledermaus	7.10.2
CARIS	HIPS and SIPS	11.4.27

Table 11: Primary imagery data processing software

The following Feature Object Catalog was used: Caris_Support_Files_2022v2.

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
H13533_MB_50cm_MLLW_Final	CARIS Raster Surface (CUBE)	0.5 meters	-1.29 meters - 13.76 meters	NOAA_0.5m	Complete MBES
H13533_MB_50cm_MLLW	CARIS Raster Surface (CUBE)	0.5 meters	-1.29 meters - 13.76 meters	NOAA_0.5m	Complete MBES
H13533_SSSAB_1m_400kHz_1of2	SSS Mosaic	1 meters	-	N/A	100% SSS
H13533_SSSAB_1m_400kHz_2of2	SSS Mosaic	1 meters	-	N/A	200% SSS
H13533_MBAB_2m_S3009_300kHz_1of1	MB Backscatter Mosaic	2 meters	-	N/A	Complete MBES

Table 12: Submitted Surfaces

The multibeam surface was analyzed using the HydrOffice QC Tools Grid QA feature and the results are shown below. Density requirements for H13533 were achieved with at least 99% of surface nodes containing five or more soundings as required by HSSD Section 5.2.2.3.

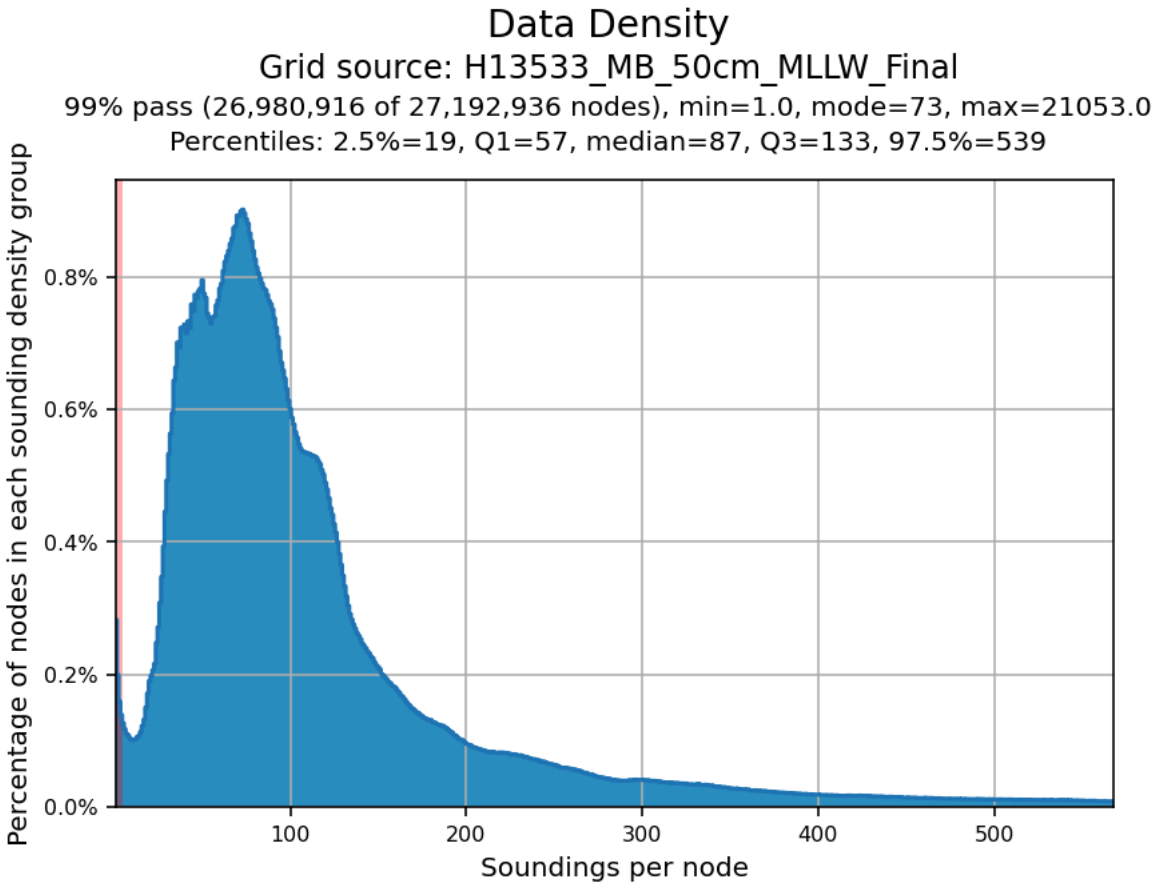

Figure 23: Pydro derived plot showing density of nodes in compliance with HSSD standards

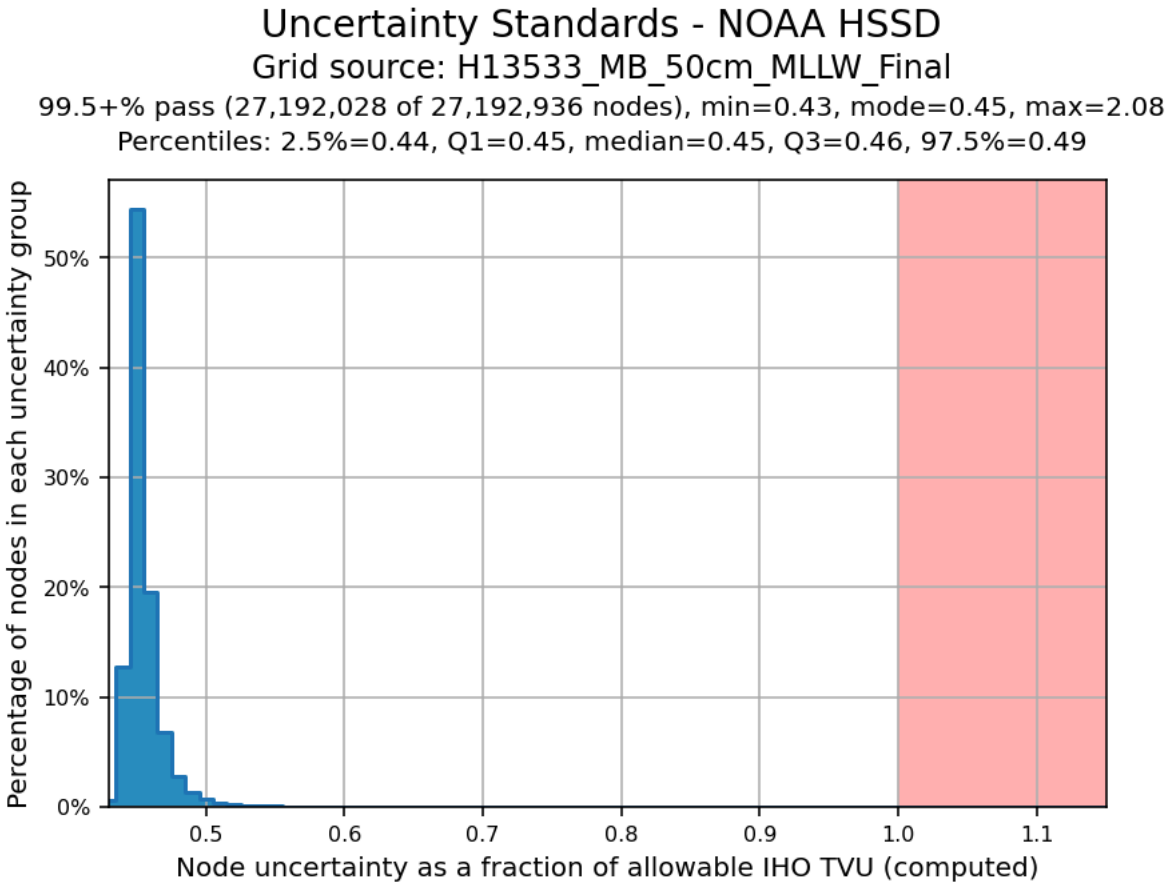

Figure 24: Pydro derived plot showing TVU compliance of H13533 surface

C. Vertical and Horizontal Control

Per FPM section 5.2.2.1.3, a HVCR report was not filed as horizontal and vertical control stations were not established by the field party for this survey. POSPAC data was logged to create a statistical best estimate of trajectory file (SBET) to improve horizontal positioning. Vertical control was established with ERS via VDATUM.

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-G911_NRTFB-23_NAD83-MLLW

Table 13: ERS method and SEP file

Sounding elevations relative to the ellipsoid were collected through Ellipsoidal Referenced Survey (ERS) with post-processing of the daily logged POSPac data to create a statistical best estimate of trajectory (SBET) file, as detailed in the DAPR. All of H13533 meets HSSD vertical accuracy requirements.

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 17.

The following PPK methods were used for horizontal control:

- RTX

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 between H13533 and ENC US5SSICD, US5SSICC, and US5GA12M. For the majority of the survey area, soundings are generally in agreement with charted depths. Although, there are spots in the ICW that are shoal, especially in the northern section of the ICW in Jekyll Creek, providing narrow passage for boaters. More info can be found below in the channels section. All data from H13533 should supersede charted data.

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
US5GA12M	1:40000	28	02/13/2023	02/13/2023
US5SSICC	1:10000	2	01/29/2024	01/29/2024
US5SSICD	1:10000	2	01/29/2024	01/29/2024

Table 14: Largest Scale ENCs

D.1.2 Shoal and Hazardous Features

No shoals or potentially hazardous features exist for this survey.

D.1.3 Charted Features

Significant charted features are included in the Final Feature File.

D.1.4 Uncharted Features

Two new wrecks were discovered during the course of H13533. One located at 31.035057N, 81.430657W warranted discussion for DTON. After discussion with the Army Corp, it was not significant enough to be a danger to navigation and both should be charted as non dangerous wrecks. Details can be found in the Final Feature File. Correspondence with USACE can be found in Appendix II supplemental records.

D.1.5 Channels

The project area includes a section of the ICW with shoaling occuring within Jekyll Creek up to 1.1 m in depth. This area was most recently dredged in 2019 and the survey data still supports the controlling depth of 3 feet at MLLW. Shoaling in this area is a known issue to USACE. Lack of sustainable and environmentally acceptable disposal areas limits dredging in this area. All data from H13533 should supersede charted data.

Figure 25: Shoal area in Jekyll Creek ICW

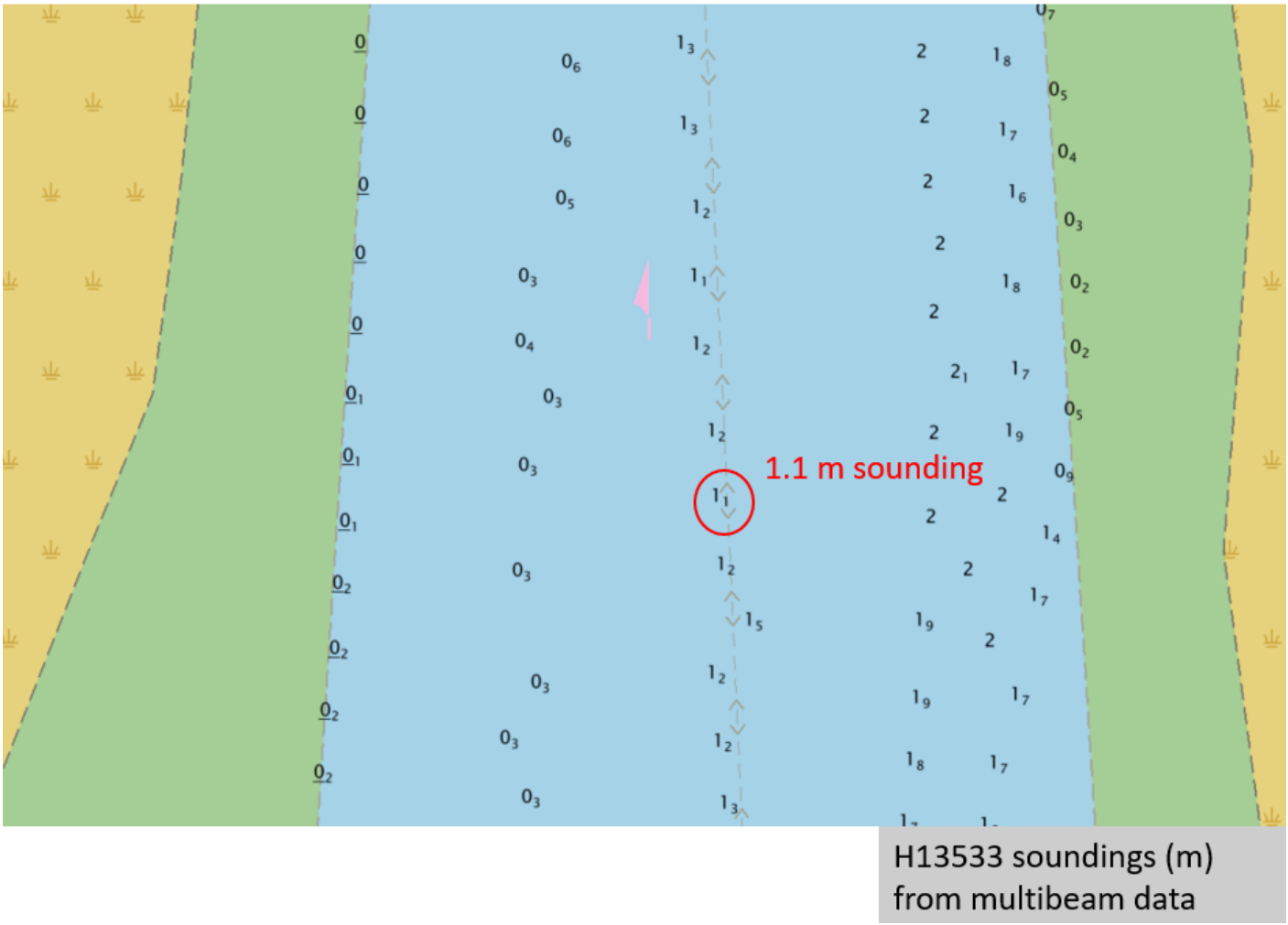

Figure 26: Soundings from ICW in Jekyll Creek north of the bridge on ENC US5SSICD

D.2 Additional Results

D.2.1 Aids to Navigation

One ATON (Jekyll Light 29) was found to not exist during acquisition. It was reported destroyed in LNM 07522023 on 12/27/23. It is now reported fixed week 10/2024.

D.2.2 Maritime Boundary Points

No Maritime Boundary Points were assigned for this survey.

D.2.3 Bottom Samples

A total of 5 bottom samples were acquired for H13533. The most common bottoms types were mud and silt.

D.2.4 Overhead Features

All overhead features were examined visually and determined to be accurate.

D.2.5 Submarine Features

No submarine features exist for this survey.

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

No abnormal seafloor or environmental conditions exist for this survey.

D.2.9 Construction and Dredging

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

D.2.10 New Survey Recommendations

H13532 is an adjacent area planned to be completed in 2024.

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.

Approver Name	Approver Title	Approval Date	Signature
James Kirkpatrick	Chief of Party	04/09/2024	KIRKPATRICK.JAMES.LEROY.IV.1400487398 Digitally signed by KIRKPATRICK.JAMES.LEROY.IV.1400487398 Date: 2024.05.19 15:08:45 -04'00'

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