H13614

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

DESCRIPTIVE REPORT

Type of Survey:	Navigable Area
Registry Number:	H13614

LOCALITY

State(s):	Ohio
General Locality:	Lake Erie
Sub-locality:	Entrance to Lorain Harbor

2022

CHIEF OF PARTY
Matthew J. Jaskoski, CDR/NOAA

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Date:

U.S. DEPARTMENT OF COMMERCE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION	REGISTRY NUMBER:
HYDROGRAPHIC TITLE SHEET	**H13614**

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):	**Ohio**
General Locality:	**Lake Erie**
Sub-Locality:	**Entrance to Lorain Harbor**
Scale:	**5000**
Dates of Survey:	**09/20/2022 to 10/03/2022**
Instructions Dated:	**08/02/2022**
Project Number:	**OPR-W386-TJ-22**
Field Unit:	**NOAA Ship *Thomas Jefferson***
Chief of Party:	**Matthew J. Jaskoski, CDR/NOAA**
Soundings by:	**Multibeam Echo Sounder (MBES)**
Imagery by:	**Multibeam Echo Sounder Backscatter**
Verification by:	**Atlantic Hydrographic Branch**
Soundings Acquired in:	**meters at Low Water Datum IGLD-1985**

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, LWD - IGLD 1985. 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 H13614

Project: OPR-W386-TJ-22

Locality: Lake Erie

Sublocality: Entrance to Lorain Harbor

Scale: 1:5000

September 2022 - October 2022

NOAA Ship *Thomas Jefferson*

Chief of Party: Matthew J. Jaskoski, CDR/NOAA

A. Area Surveyed

Survey H13614, located in Lake Erie, OH at the Entrance to Lorain Harbor, was conducted in accordance with coverage requirements set forth in the Project Instructions (PI) OPR-W386-TJ-22.

A.1 Survey Limits

Data were acquired within the following survey limits:

Northwest Limit	Southeast Limit
41° 32' 15.93" N 82° 16' 37.91" W	41° 31' 3.92" N 81° 59' 8.29" W

Table 1: Survey Limits

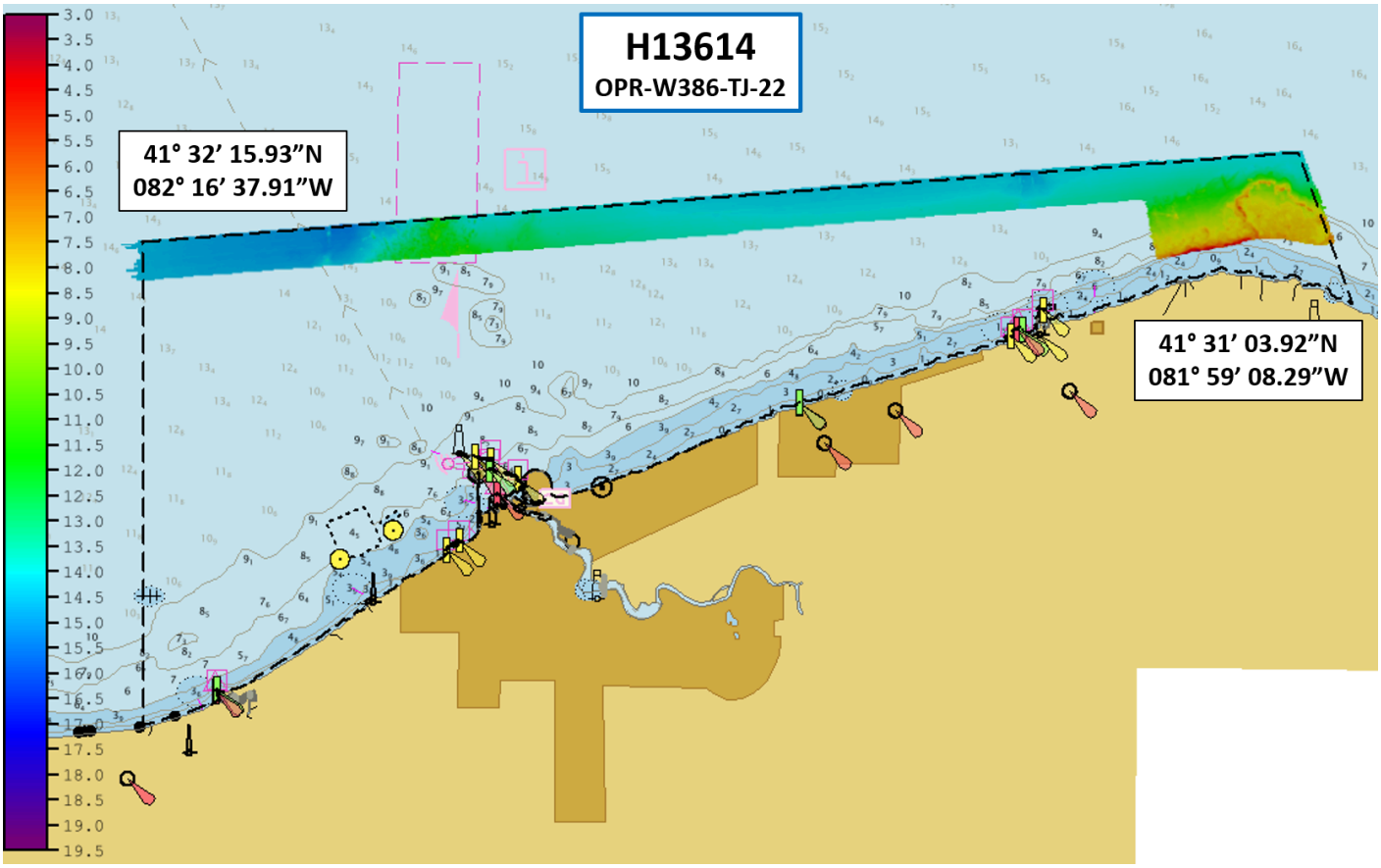


Figure 1: The survey layout for H13614 plotted over ENC US4OH01M. The survey limits are represented by the black outline and MBES coverage is represented in color.

Survey data were acquired in accordance with the requirements set forth by the PI and the Hydrographic Survey Specifications and Deliverables (HSSD) dated March 2022. The survey area is approximately 6.5 square nautical miles; survey data for H13614 did not extend to the survey limits set forth by the PI due to operational time constraints (Figure 1).

A.2 Survey Purpose

The Port of Cleveland is one of the largest ports on the Great Lakes and ranks within the top 50 ports in the United States. Roughly 13 million tons of cargo are transported through Cleveland Harbor each year supporting over 20,000 jobs and $3.5 billion in annual economic activity [1]. This project will provide modern bathymetric data for the Cleveland area. The project area was identified as 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. Most of this area has not been surveyed since the 1940s, and experiences significant vessel traffic.

Conducting a modern bathymetric survey in this area will identify hazards and changes to the seafloor, provide critical data for updating National Ocean Service (NOS) nautical charting products and improve maritime safety. Survey data from this project is intended to supersede all prior survey data in the common area.

1. https://www.portofcleveland.com/

A.3 Survey Quality

The entire survey is adequate to supersede previous data.

Complete coverage requirements were met utilizing 100% MBES coverage as specified by the 2022 HSSD. Data acquired in H13614 meet survey quality standards specified in the 2022 HSSD, including NOAA allowable uncertainty (see Section B.2.2) and density requirements (see Section B.5.2). Crosslines were not acquired due to operational time constraints (see Section B.2.1).

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	Complete Coverage (Refer to HSSD Section 5.2.2.3)
All waters in survey area	Acquire backscatter data during all multibeam data acquisition (Refer to the HSSD Section 6.2)

Table 2: Survey Coverage

Survey coverage is in accordance with requirements listed in Table 2 and in the 2022 HSSD. Coverage requirements were met with 100% MBES.

Coverage did not extend to the sheet limits; only a small portion of the survey coverage was acquired to the inshore limit of hydrography, the Navigable Area Limit Line (NALL). Survey coverage did not reach the sheet limits or NALL due to operational time constraints (Figure 2).

Two holidays exist within the survey area. One holiday is outside the sheet limits and covered by 100% SSS from sheet H13609; no indications of significant features were observed. The second holiday occurs within the sheet limits. Neither holiday was acquired due to operational time constraints (Figure 3).

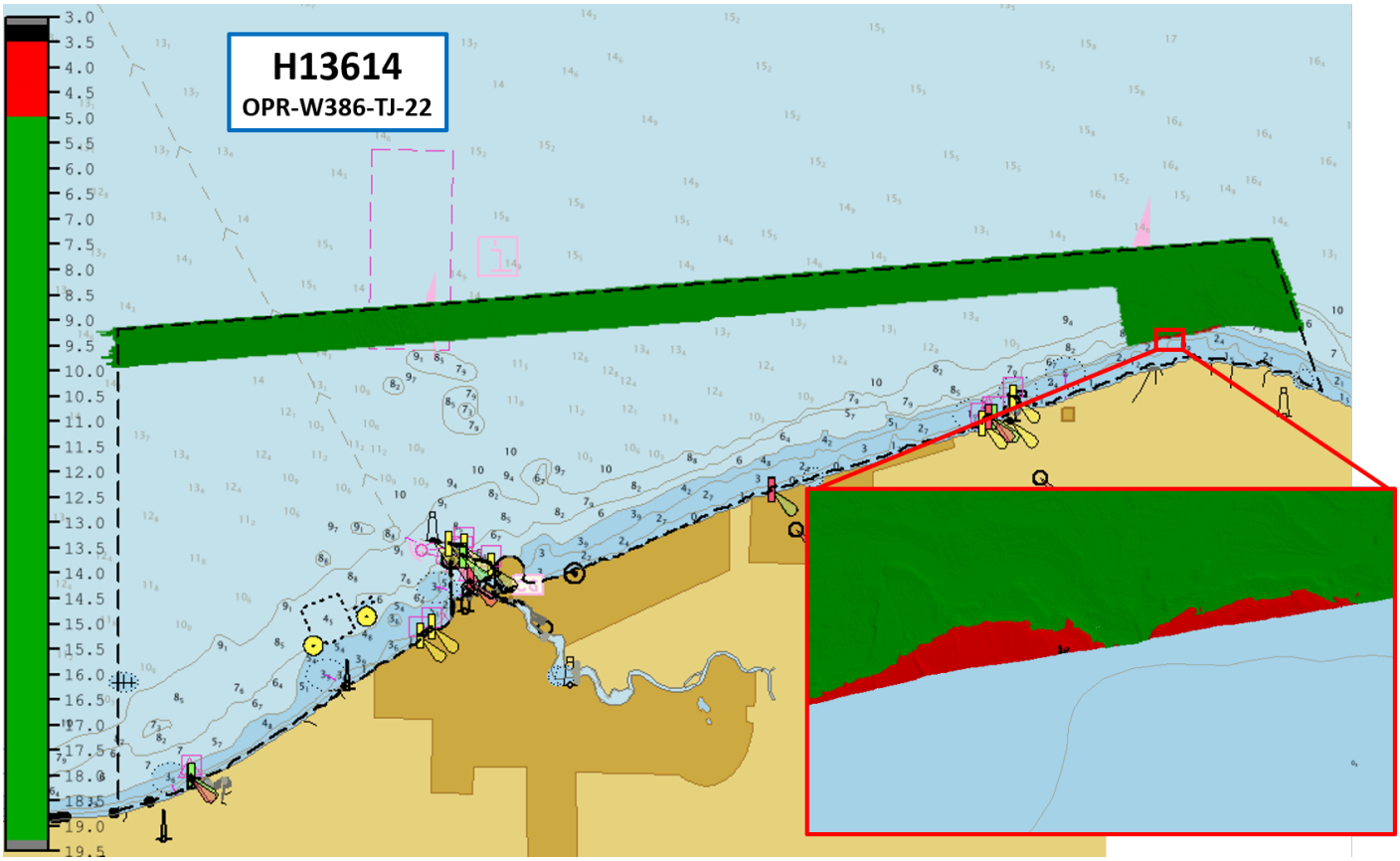


Figure 2: The overview shows where the survey coverage did not meet the assigned sheet limits, outlined in black. The inset shows where the survey coverage meets the NALL.

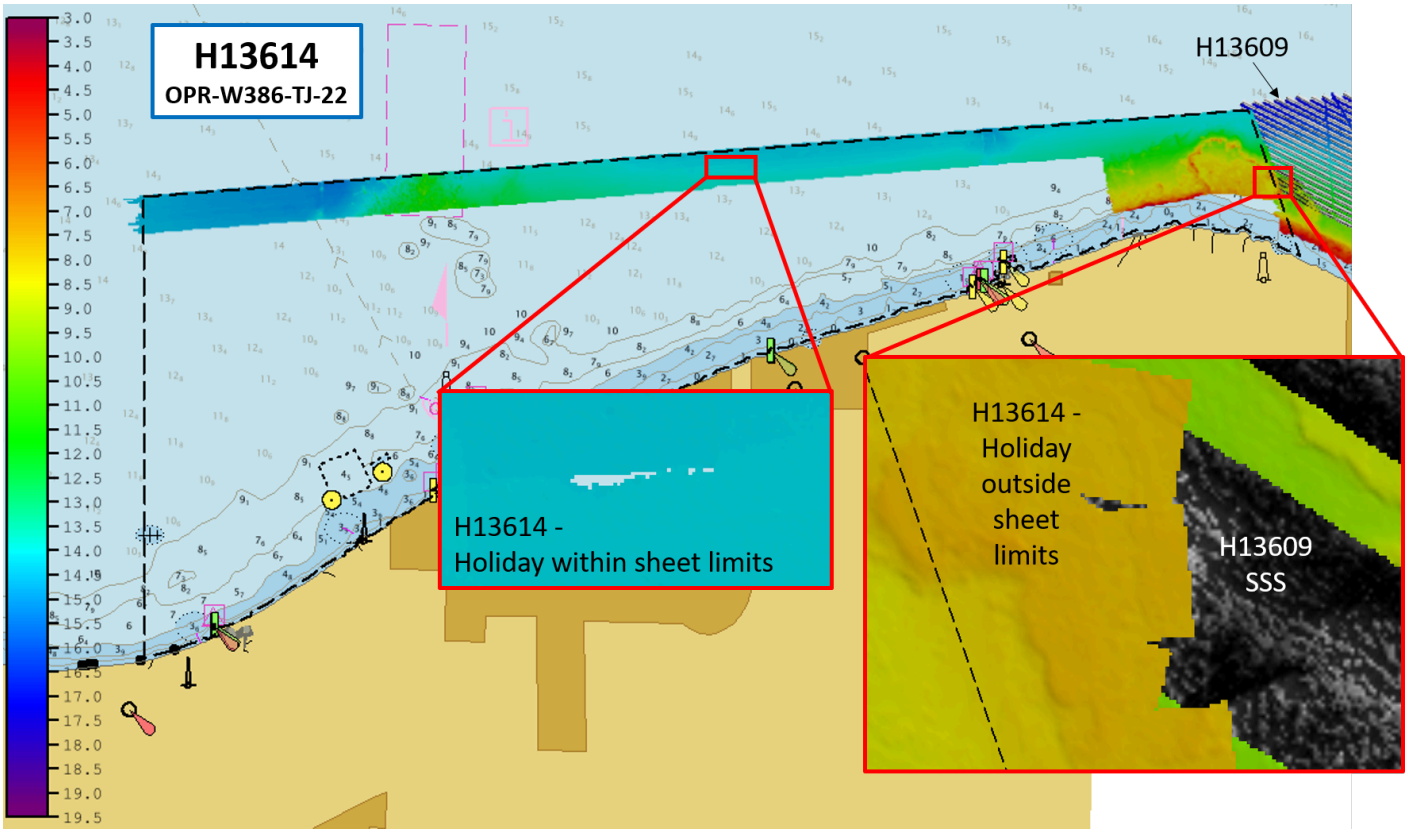


Figure 3: Holidays in H13614 multibeam coverage

A.6 Survey Statistics

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

	HULL ID	*S-222*	*2903*	*Total*
LNM	**SBES Mainscheme**	0.0	0.0	0.0
	MBES Mainscheme	269.01	104.31	373.32
	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	0.0	0.0	0.0
	SBES/MBES Crosslines	0.0	0.0	0.0
	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				6.51

Table 3: Hydrographic Survey Statistics

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

Survey Dates	Day of the Year
09/20/2022	263
09/23/2022	266

Survey Dates	Day of the Year
09/24/2022	267
09/27/2022	270
09/28/2022	271
10/03/2022	276

Table 4: Dates of Hydrography

Thomas Jefferson departed Lake Erie working grounds on 10/3/2022. Holidays and additional data were not acquired due to strict operational time constraints.

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	*S222*	*2903*
LOA	63.4 meters	8.5 meters
Draft	4.6 meters	1.2 meters

Table 5: Vessels Used

Figure 4: NOAA Ship Thomas Jefferson

Figure 5: Thomas Jefferson Launch 2903

B.1.2 Equipment

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

Manufacturer	Model	Type
Kongsberg Maritime	EM 2040	MBES
Kongsberg Maritime	EM 2040	MBES Backscatter
Applanix	POS MV 320 v5	Positioning and Attitude System
Teledyne RESON	SVP 70	Sound Speed System
Valeport	Thru-Hull SVS	Sound Speed System
Sea-Bird Scientific	SBE 19plus V2	Conductivity, Temperature, and Depth Sensor
AML Oceanographic	MVP200	Conductivity, Temperature, and Depth Sensor

Table 6: Major Systems Used

Vessel configurations, equipment operations, data acquisition, and processing were consistent with specifications described in the DAPR.

B.2 Quality Control

B.2.1 Crosslines

Crosslines were not acquired due to operational time constraints. After reviewing crossline comparison results and junction results from previous surveys this field season, the hydrographer is confident that no systematic issues or offsets exist with data collected by S-222 and 2903 for H13614. Data collected by the two platforms are in agreement with each other.

B.2.2 Uncertainty

The following survey specific parameters were used for this survey:

Method	Measured	Zoning
ERS via VDATUM	0.0 meters	0.045 meters

Table 7: Survey Specific Tide TPU Values.

Hull ID	Measured - CTD	Measured - MVP	Measured - XBT	Surface
S222	N/A meters/second	4 meters/second	N/A meters/second	0.2 meters/second
2903	4 meters/second	N/A meters/second	N/A meters/second	0.2 meters/second

Table 8: Survey Specific Sound Speed TPU Values.

The bathymetric surface's uncertainty layer is compliant with 2022 HSSD uncertainty standards. One-hundred percent of all nodes pass uncertainty standards (Figure 6).

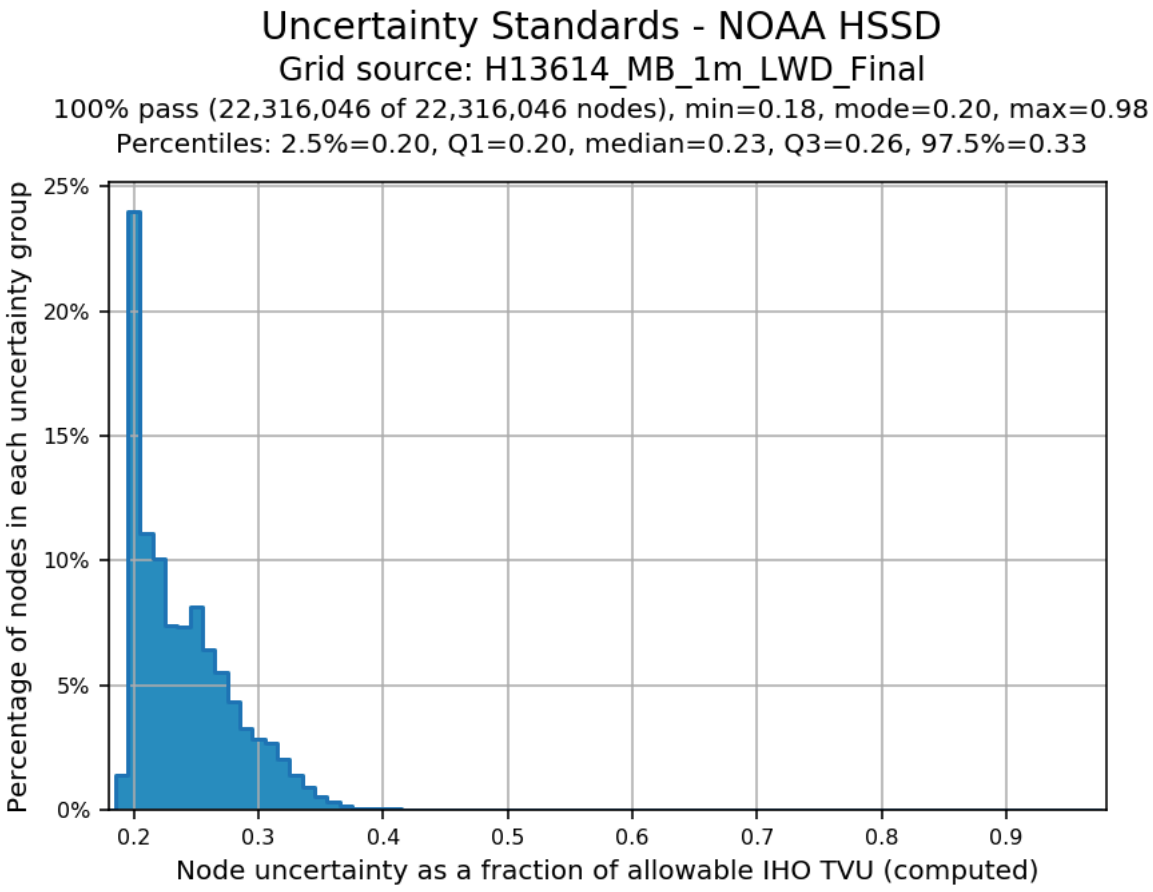


Figure 6: H13614 uncertainty standards

B.2.3 Junctions

Survey H13614 junctions with two contemporary surveys conducted by NOAA Ship Thomas Jefferson within project OPR-W386-TJ-22 (Figure 7).

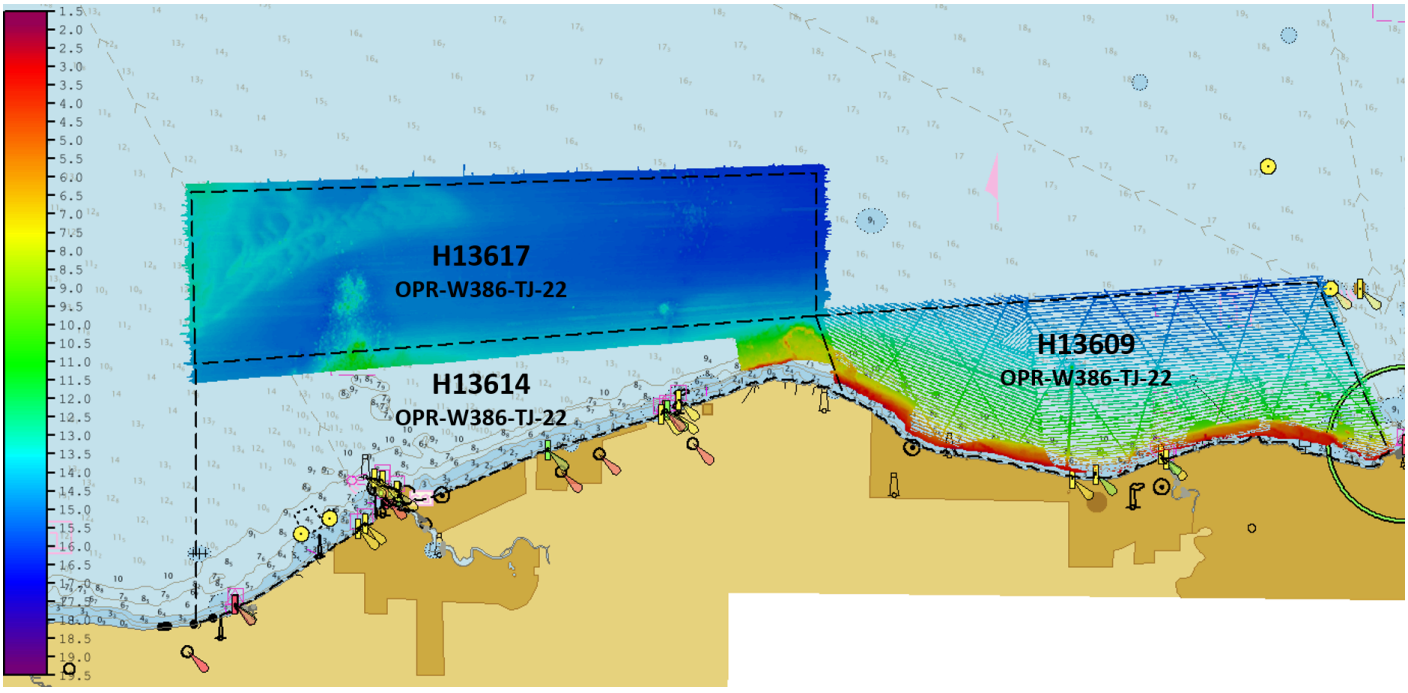


Figure 7: H13614 junctions with H13617 and H13609 from OPR-W386-TJ-22

The following junctions were made with this survey:

Registry Number	Scale	Year	Field Unit	Relative Location
H13609	1:5000	2022	Thomas Jefferson	E
H13617	1:10000	2022	Thomas Jefferson	N

Table 9: Junctioning Surveys

H13609

The eastern edge of sheet H13614 junctions with sheet H13609. A 1m SR CUBE surface of H13614 data and a 1m SR CUBE surface of H13609 data were differenced (Figure 8). The mean difference between bathymetric surface nodes was 0.03 m with a standard deviation of 0.04 m (Figure 9). One-hundred percent

of nodes are compliant with fraction of allowable error standards (Figure 10). Statistics and visual inspection indicate that surveys H13614 and H13609 are in general agreement.

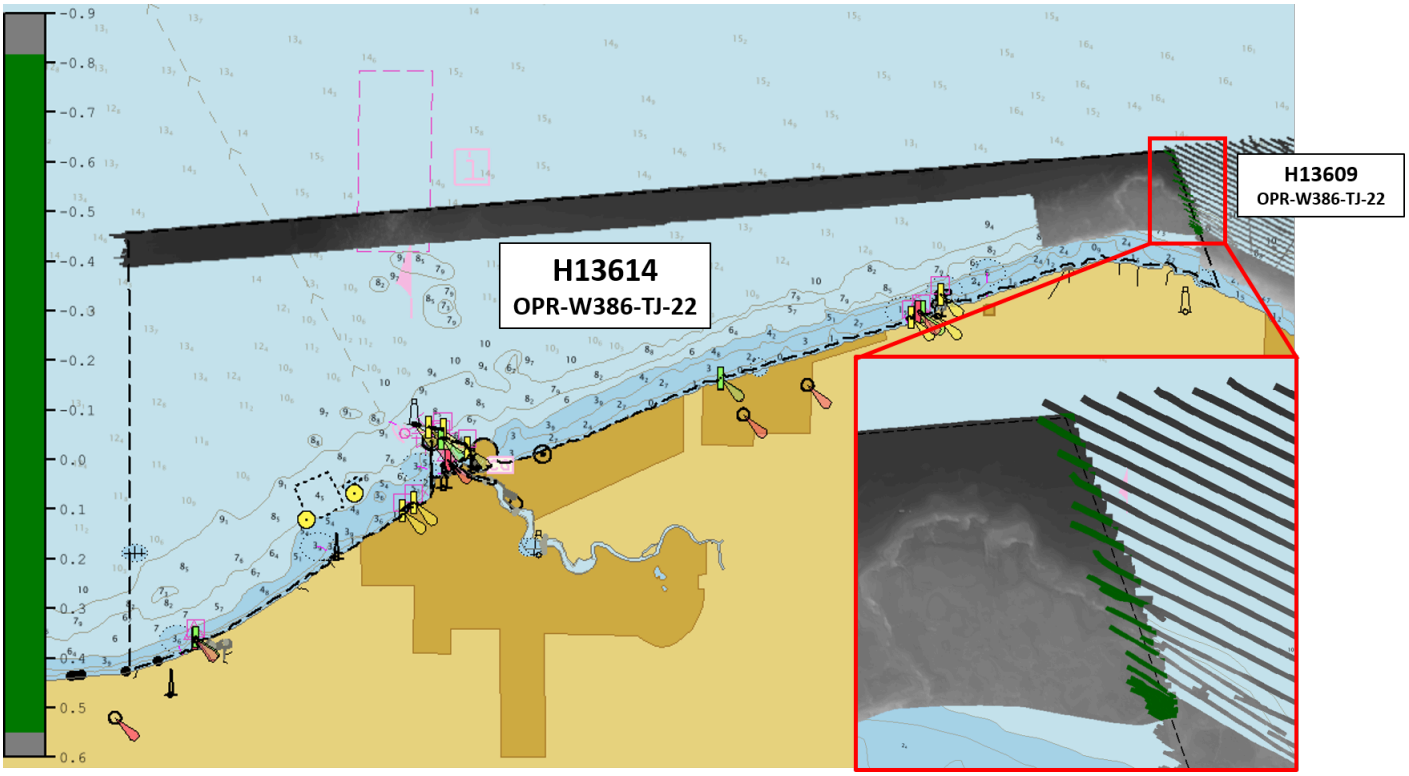
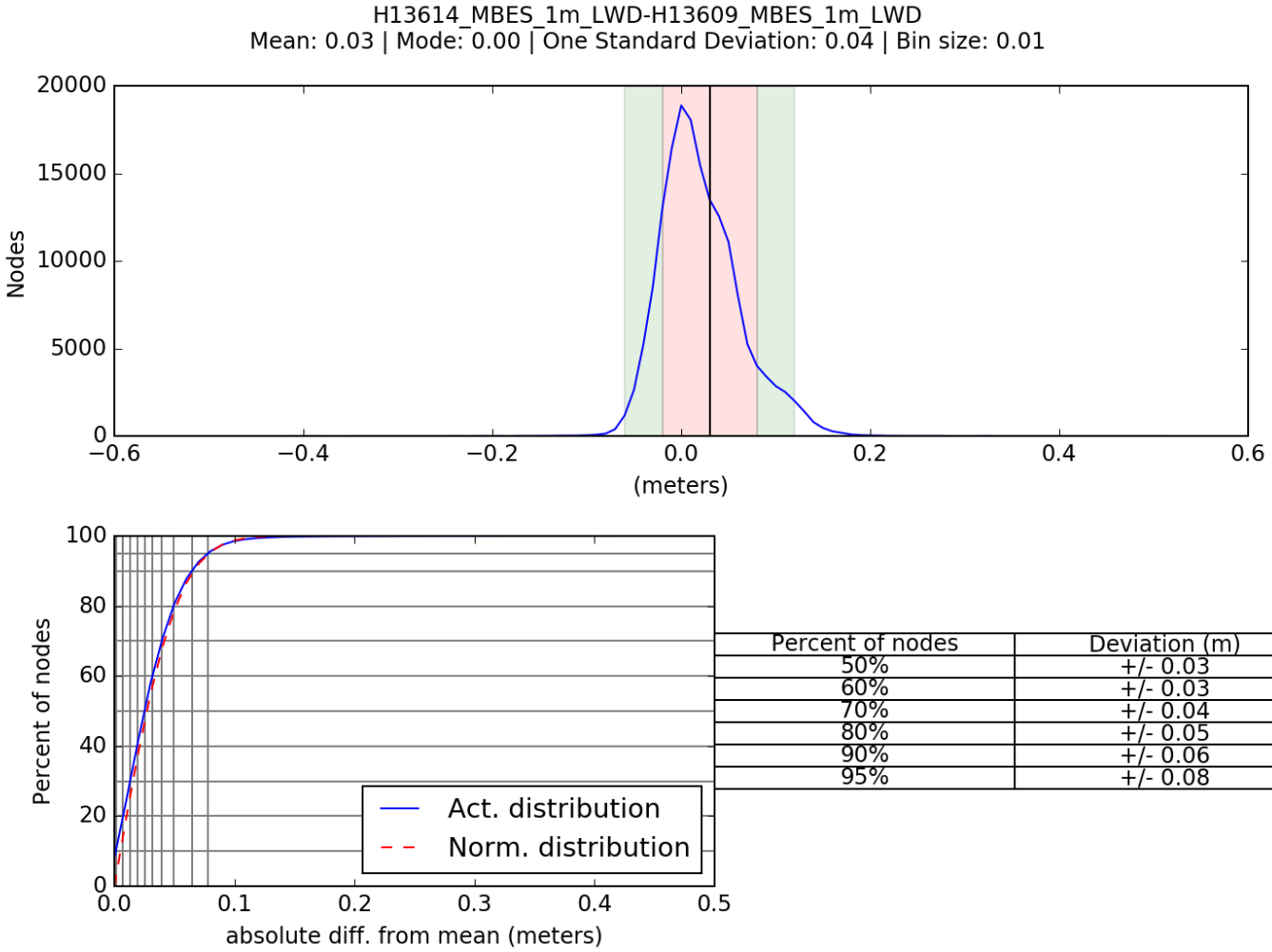


Figure 8: Fraction of allowable error surface difference comparison in color between H13614 and H13609



Percent of nodes	Deviation (m)
50%	+/- 0.03
60%	+/- 0.03
70%	+/- 0.04
80%	+/- 0.05
90%	+/- 0.06
95%	+/- 0.08

Figure 9: H13614 and H13609 surface difference comparison statistics

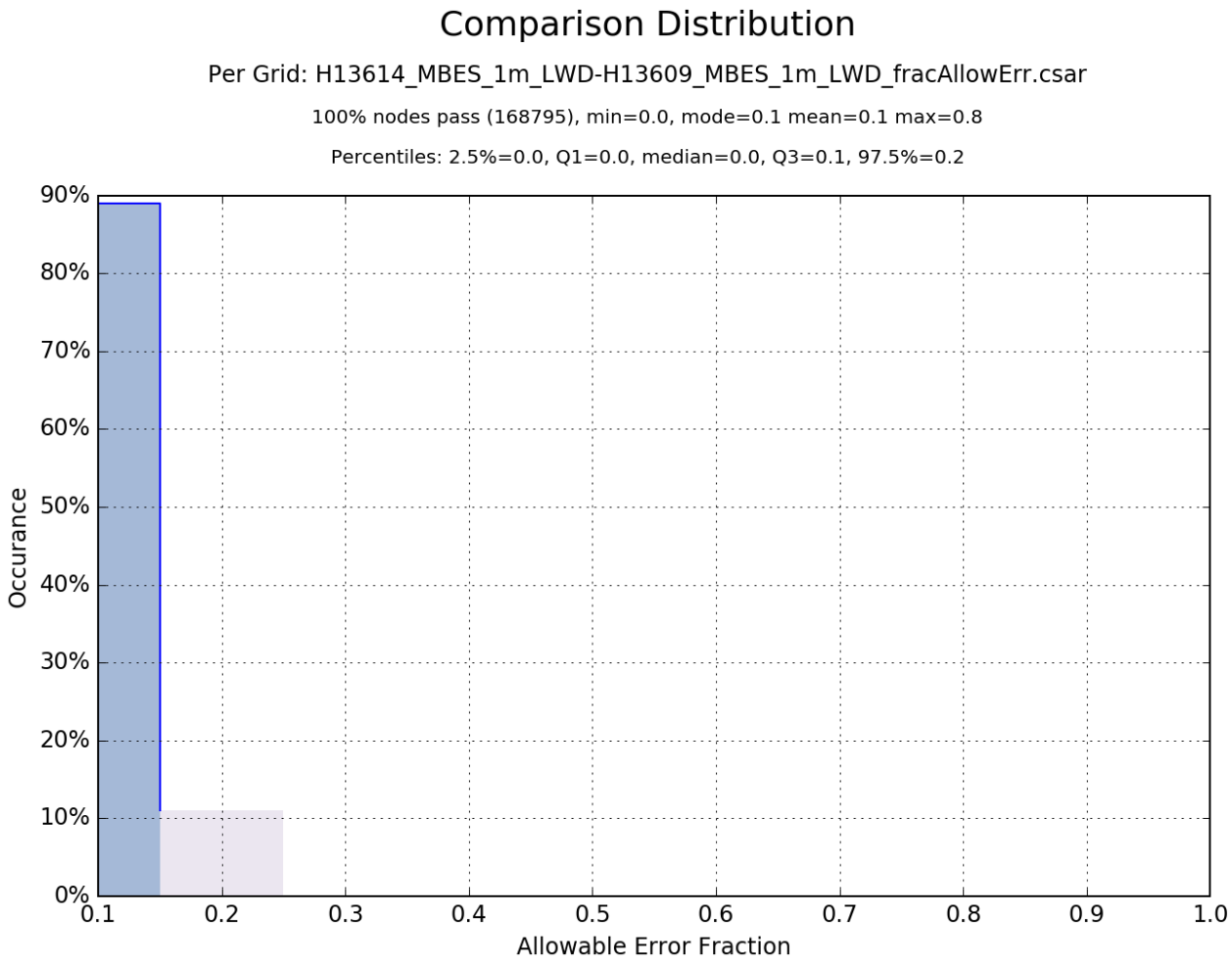


Figure 10: H13614 and H13609 fraction of allowable error statistics

H13617

Refer to survey H13617 Descriptive Report for junction analysis.

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

There were no conditions or deficiencies that affected equipment operational effectiveness.

B.2.6 Factors Affecting Soundings

There were no other factors that affected corrections to soundings.

B.2.7 Sound Speed Methods

Sound Speed Cast Frequency: Static conductivity, temperature, and depth (CTD) casts were conducted at the start of acquisition each day and at a minimum of one every four hours during acquisition using an MVP 200 and Sea-bird Seacat 19+ V2 CTD. Cast frequency was increased in areas where a change in surface sound speed greater than two meters per second existed. All sound speed methods were used as detailed in the DAPR.

A total of 37 sound speed profiles were collected as part of acquisition of H13614 and display good spatial diversity (Figure 11). Three of these casts were located outside of the sheet limits, not more than 145 meters away, from the assigned survey limits, and display profiles representative of the area. All sound speed profile data were concatenated into a master file for the sheet. MBES data were corrected by applying profiles nearest in distance in time (4 hours) using this master file.

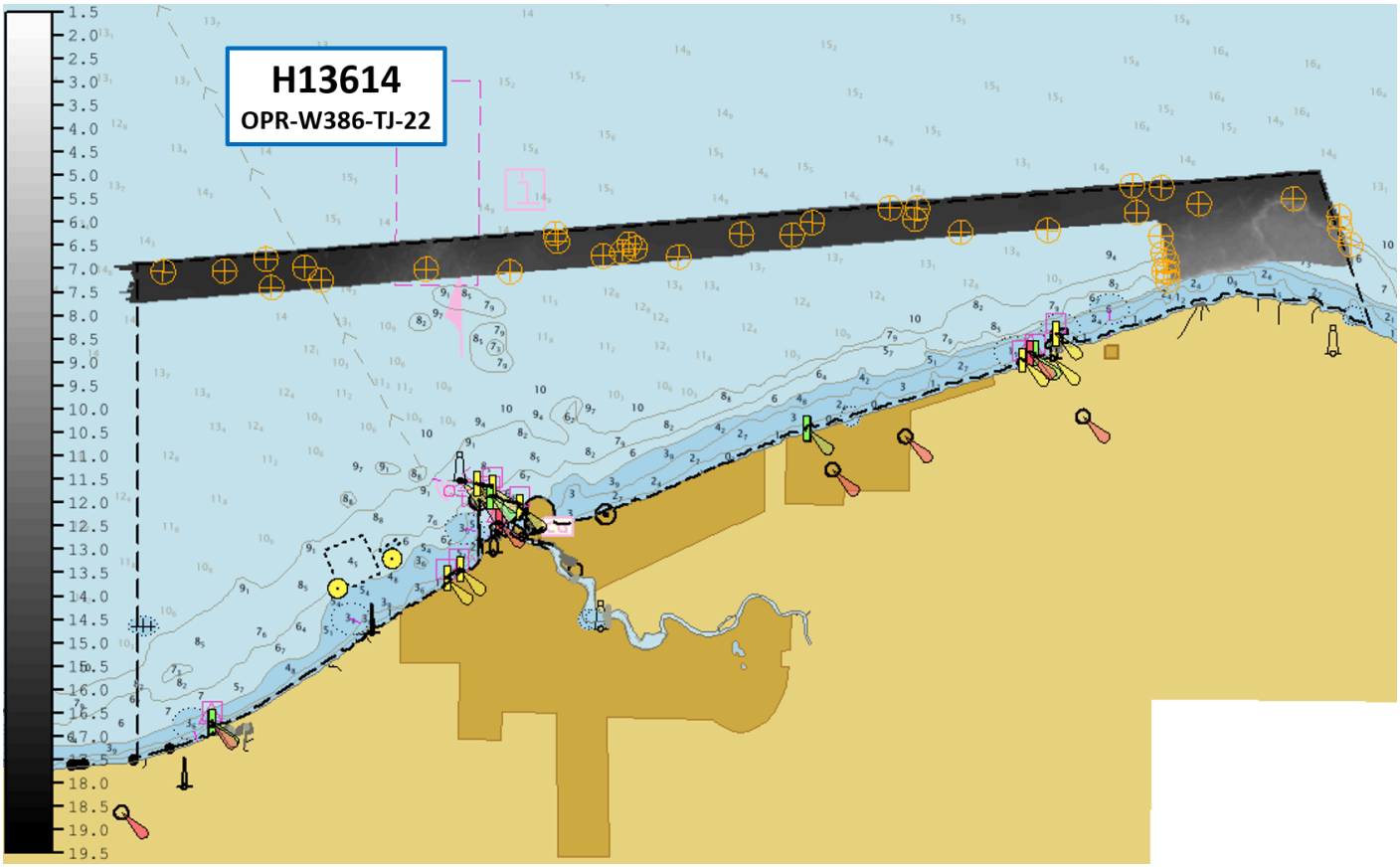


Figure 11: Overview shows all sound speed casts collected on H13614, shown as orange targets.

B.2.8 Coverage Equipment and Methods

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

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. Raw MBES backscatter was flagged as part of the .all file from the Kongsberg EM2040 systems. Backscatter was processed in QPS Fledermaus GeoCoder Toolbox (FMGT) software, and the exported geotiffs are included in the final processed data submission package (Figures 12 and 13).

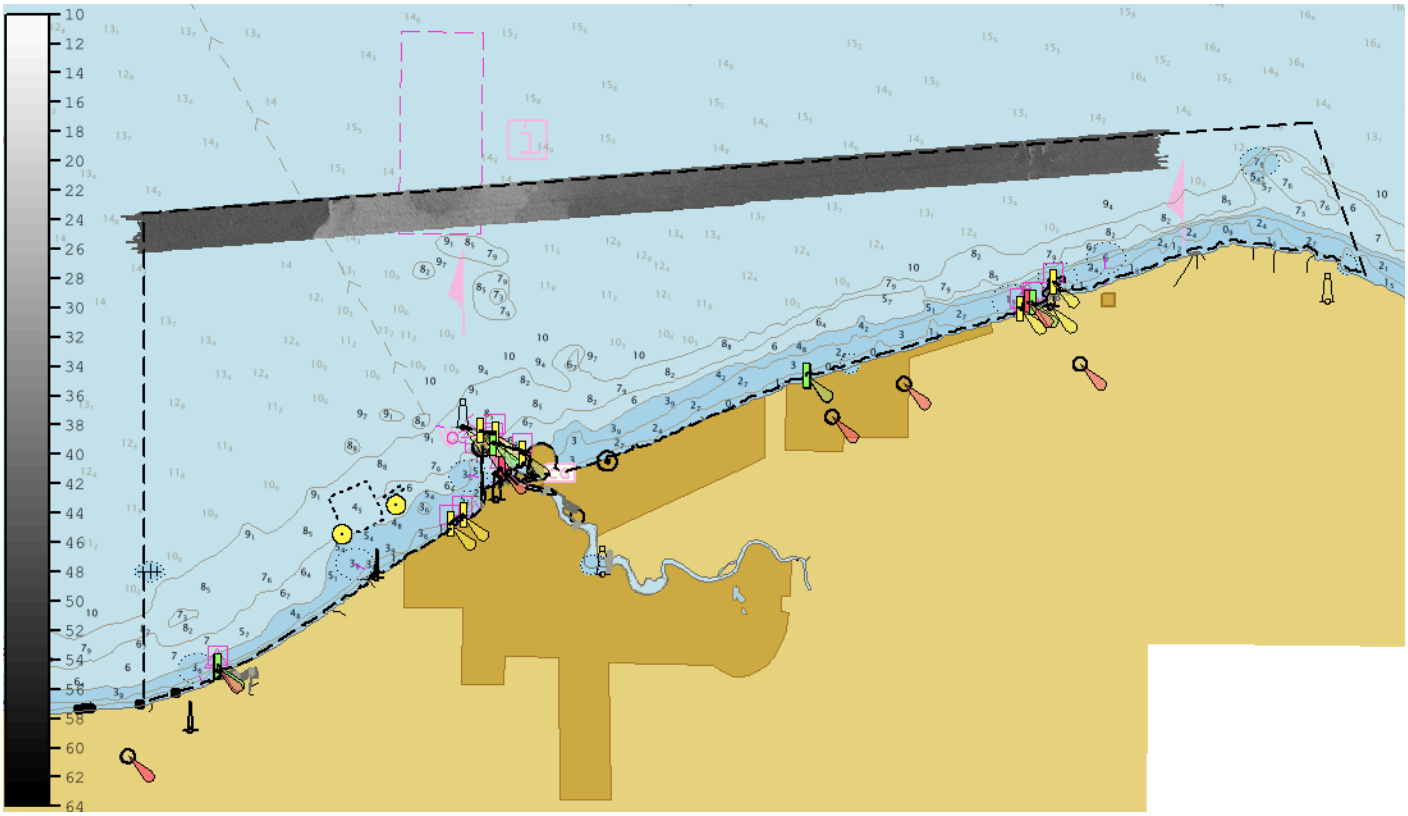


Figure 12: Backscatter mosaic (300kHz) from data acquired by S-222.

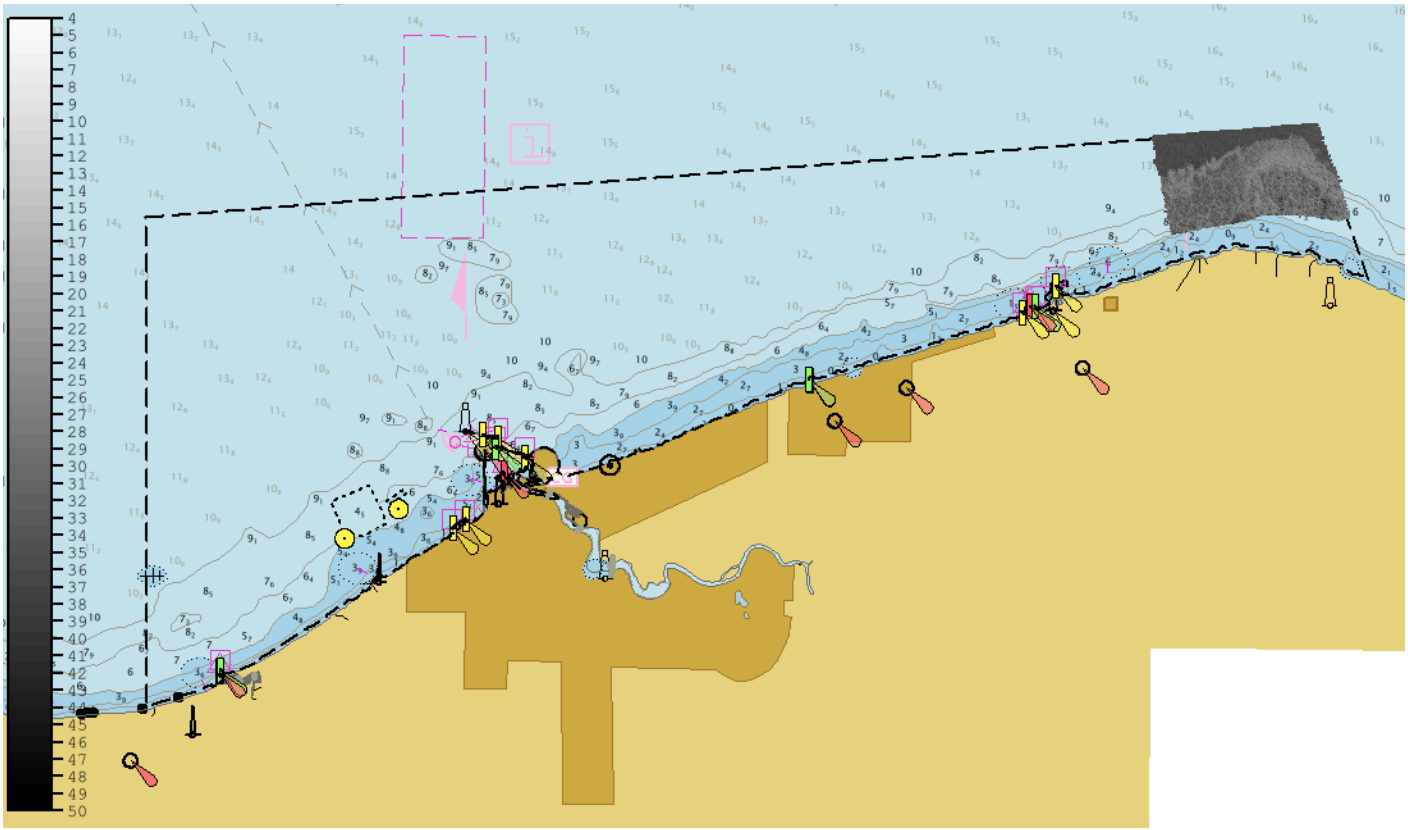


Figure 13: Backscatter mosaic (300kHz) from data acquired by 2903.

B.5 Data Processing

B.5.1 Primary Data Processing Software

The following Feature Object Catalog was used: NOAA Profile Version 2022.

Feature Object Catalog NOAA Profile Version 2022 was used for all S-57 attribution in the Final Feature File (FFF). All other software were used as detailed 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
H13614_MB_1m_LWD	CARIS Raster Surface (CUBE)	1 meters	3.2 meters - 15.7 meters	NOAA_1m	Complete MBES
H13614_MB_1m_LWD_Final	CARIS Raster Surface (CUBE)	1 meters	3.2 meters - 15.7 meters	NOAA_1m	Complete MBES
H13614_MBAB_2m_S222_300kHz_1of2	MB Backscatter Mosaic	2 meters	-	N/A	Complete MBES
H13614_MBAB_2m_2903_300kHz_2of2	MB Backscatter Mosaic	2 meters	-	N/A	Complete MBES

Table 10: Submitted Surfaces

H13614_MB_1m_LWD_Final uncertainty layer is resolved from the maximum of H13614_MB_1m_LWD nodal TVU and standard deviation values. Complete Coverage requirements were met by 100% MBES coverage as specified under section 5.2.2.2 of the 2022 HSSD. There are two holidays present in the combined coverage achieved (see Section A.4). Visible gaps exist in the bathymetric surface, but are not large enough to meet the definition of a holiday. All bathymetric grids for H13614 meet density requirements per the 2022 HSSD (Figure 14).

A total of three fliers remain as detected by NOAA's QC Tool Flier Finder available in the Pydro XL-19 suite. The hydrographer reviewed the flagged grid nodes, considers them to be accurate representations of the lake bed, and has retained them in the final delivered surfaces.

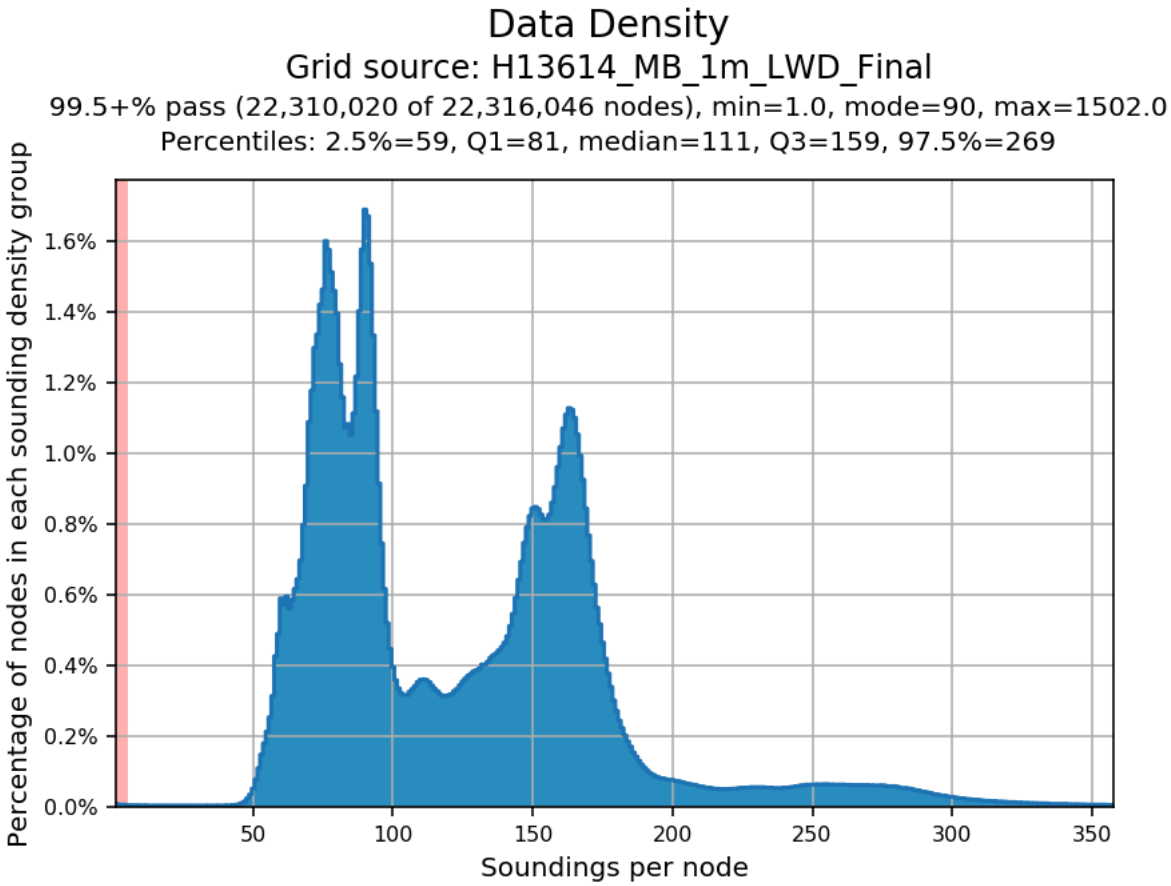


Figure 14: H13614 data density

C. Vertical and Horizontal Control

Field installed tide and GPS stations were not utilized for this survey. There is no HVCR report included with the submission of H13612.

C.1 Vertical Control

The vertical datum for this project is Low Water Datum IGLD-1985.

ERS Datum Transformation

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

Method	Ellipsoid to Chart Datum Separation File
ERS via VDATUM	OPR-W386-TJ-22_NAD83_2011_VDatum_LWD_IGLD85

Table 11: ERS method and SEP file

All soundings submitted for H13614 are reduced to LWD IGLD-85 using VDatum techniques as outlined in the DAPR.

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.

RTK

Trimble PP-RTX service was used with an Applanix POS MV v5 system and POSPac MMS software for ERS control in accordance with the HSSD for H13614 MBES data from S-222 and 2903.

WAAS

The Wide Area Augmentation System (WAAS) was used for real-time horizontal control during data acquisition on S-222 and 2903.

D. Results and Recommendations

D.1 Chart Comparison

Surveyed soundings and contours were compared against previously charted data on ENC US4OH01M. Depth contours, depth areas, and soundings differ in the vicinity of Avon Point, OH. Charted 7.3 m and 9.1 m contours are generally 100-150 m north of equivalent surveyed soundings (Figure 15).

Several sounding discrepancies exist. The yellow box shows a surveyed 8.2 m shoal sounding in a charted 9.1 - 36.5 m depth area (Figure 15). The blue box shows where surveyed soundings are deeper than charted soundings by greater than 2.5 meters (Figure 15). Additionally, the blue box shows an approximately 85 m horizontal discrepancy between the charted sounding and similar surveyed sounding. The hydrographer does not believe the surveyed soundings pose a hazard to navigation.

Depth values in the remainder of the sheet were found to be in general agreement with previously charted soundings. Four newly discovered features are included in the FFF and all data acquired on H13614 are recommended to supersede prior data.

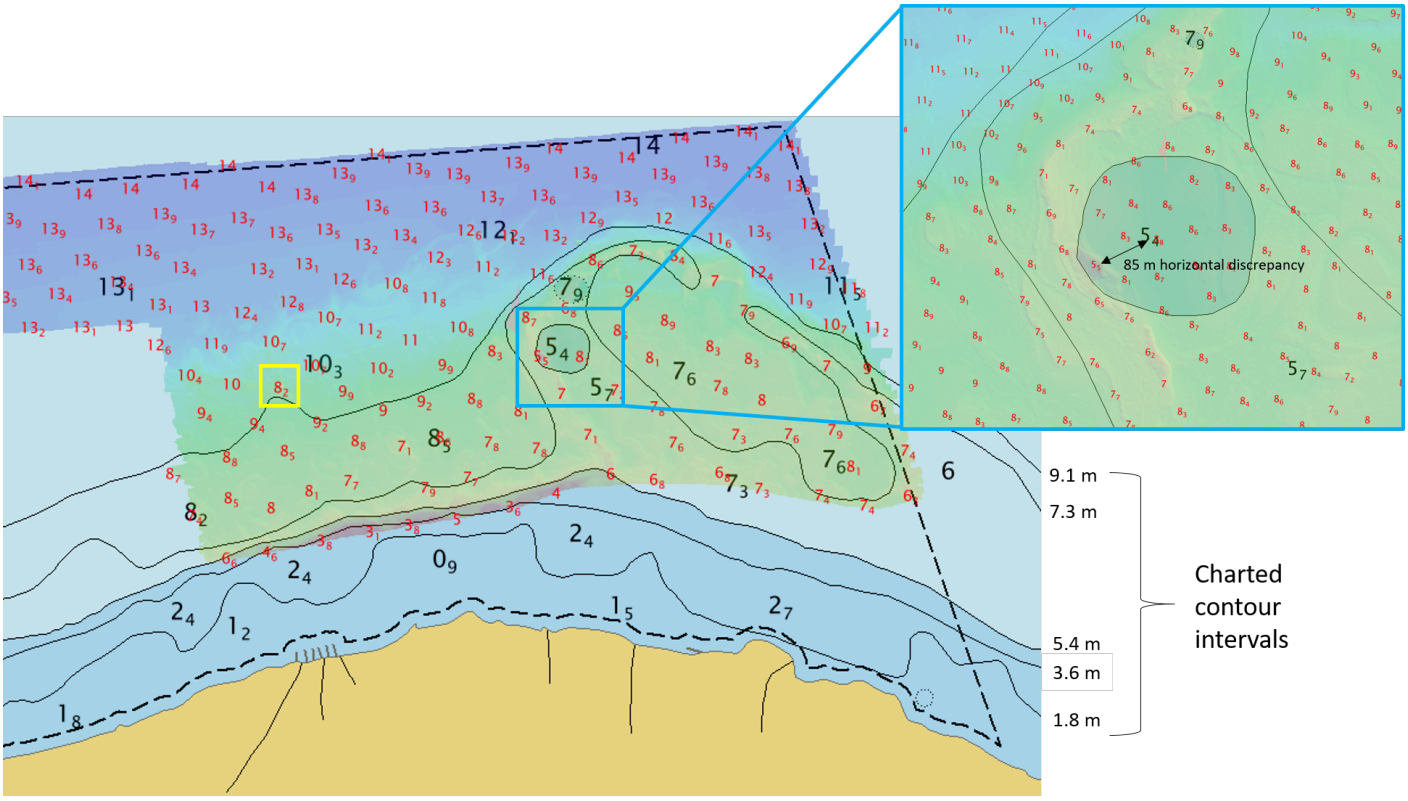


Figure 15: H13614 data overlaid on ENC US4OH01M. Surveyed soundings are shown in red and charted soundings are shown in black.

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
US4OH01M	1:80000	16	04/27/2018	05/15/2020

Table 12: Largest Scale ENCs

D.1.2 Shoal and Hazardous Features

One sounding in the vicinity of Avon Point, OH is shallower than the charted depth area; surveyed sounding is 8.2 m in a depth area where DRVAL1 equals 9.1 m (see Section D.1). The hydrographer does not believe the surveyed sounding poses a hazard to navigation.

One newly discovered feature has a least depth shallower than its charted depth area; least depth is 8.9 m in a depth area where DRVAL1 equals 9.1 m. Reference the FFF for more information.

D.1.3 Charted Features

A total of 119 charted features were assigned for investigation, and 118 were not addressed due to operational time constraints and inability to acquire data to the sheet limits. One dangerous wreck is recommended for delete; reference the FFF for more information.

D.1.4 Uncharted Features

Four uncharted features were investigated as part of acquisition on H13614 and are recommended for charting. Reference the FFF for more information.

D.1.5 Channels

Channels, designated anchorages, precautionary areas, safety fairways, traffic separation schemes, pilot boarding areas, and/or channel and range lines exist within the survey limits, but were not investigated.

D.2 Additional Results

D.2.1 Aids to Navigation

No Aids to navigation (ATONs) exist for this survey.

D.2.2 Maritime Boundary Points

No Maritime Boundary Points were assigned for this survey.

D.2.3 Bottom Samples

Bottom samples were assigned for this survey, but were not acquired due to operational time constraints.

D.2.4 Overhead Features

No overhead features exist for this survey.

D.2.5 Submarine Features

Submarine features exist for this survey, but were not investigated due to operational time constraints.

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

Due to discrepancies in surveyed and charted soundings, it is recommended to acquire complete coverage MBES up to the NALL for the area not covered within the sheet limits, especially around Avon Point, OH (Figure 17).

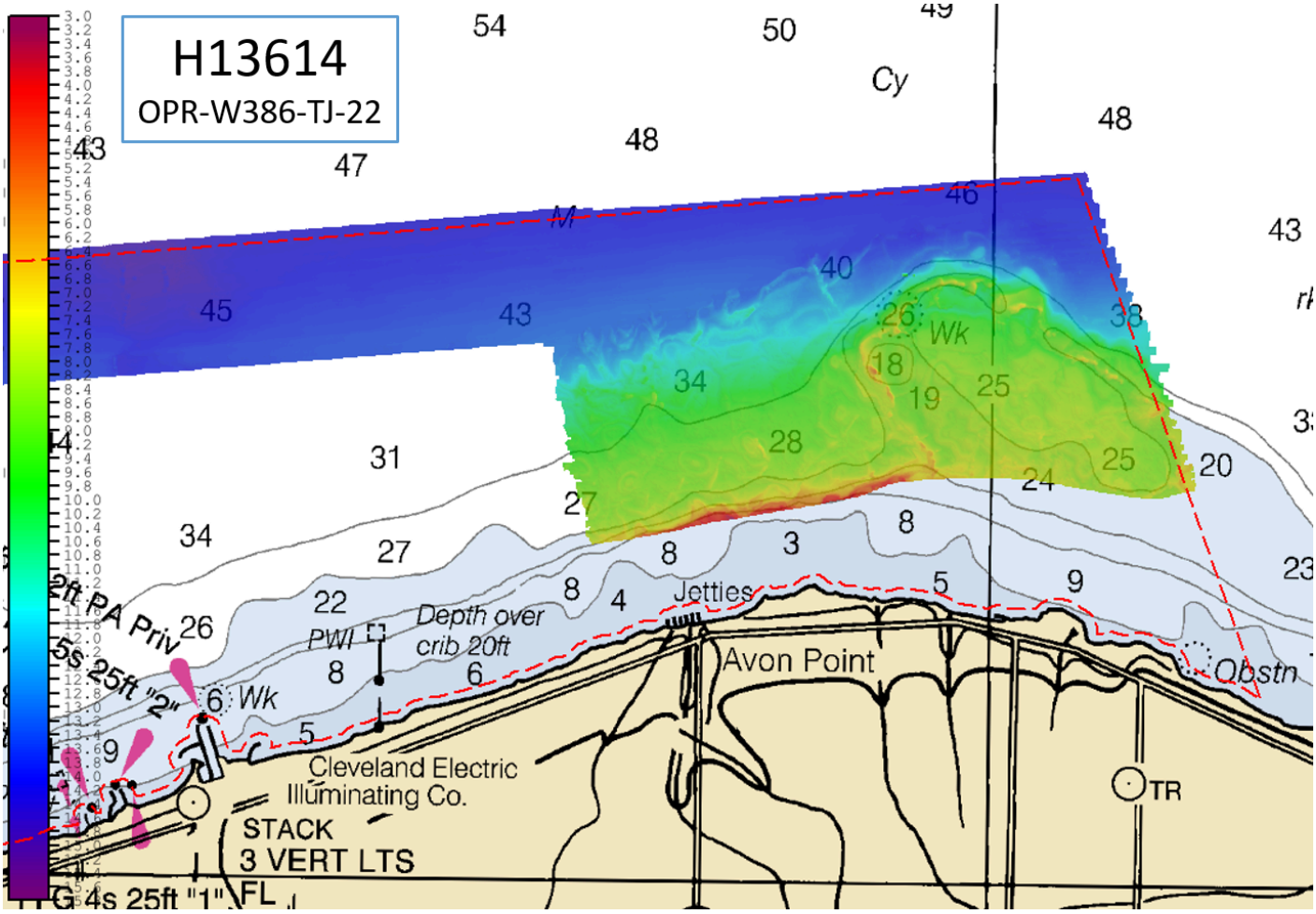


Figure 16: Recommended new survey in the vicinity of Avon Point, OH to be acquired up to the original sheet limits, outlined in red. Acquired MBES is represented in color overlaid on RNC 14826.

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
Matthew J. Jaskoski, CDR/NOAA	Chief of Party	10/24/2022	JASKOSKI.MATTHEW.JACOB.1275636262 2022.10.24 08:25:06 -04'00'
Michelle M. Levano, LT/NOAA	Operations Officer	10/24/2022	Digitally signed by LEVANO.MICHELLE.MARIE.1516645888 Date: 2022.10.24 09:18:34 -04'00'
Erin K. Cziraki	Chief Survey Technician	10/24/2022	CZIRAKI.ERIN.KAYE.1550015338 Digitally signed by CZIRAKI.ERIN.KAYE.1550015338 Date: 2022.10.24 09:42:05 -04'00'
Sydney M. Catoire, LT/NOAA	Sheet Manager	10/24/2022	CATOIRE.SYDNEY.MARIE.1120060623 Digitally signed by CATOIRE.SYDNEY.MARIE.1120060623 Date: 2022.10.24 08:20:45 -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