H13806

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

DESCRIPTIVE REPORT

Type of Survey:	Navigable Area
Registry Number:	H13806

LOCALITY

State(s):	New York
General Locality:	Eastern Lake Ontario, NY
Sub-locality:	Chaumont Bay

2023

CHIEF OF PARTY
LTJG Mark Meadows

LIBRARY & ARCHIVES

Date:

U.S. DEPARTMENT OF COMMERCE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION	REGISTRY NUMBER:
HYDROGRAPHIC TITLE SHEET	**H13806**

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):	**New York**
General Locality:	**Eastern Lake Ontario, NY**
Sub-Locality:	**Chaumont Bay**
Scale:	**10000**
Dates of Survey:	**07/11/2023 to 08/24/2023**
Instructions Dated:	**07/06/2023**
Project Number:	**S-V927-NRTNL-23**
Field Unit:	**NOAA Navigation Response Team - New London**
Chief of Party:	**LTJG Mark Meadows**
Soundings by:	**Multibeam Echo Sounder**
Imagery by:	**Multibeam Echo Sounder Backscatter**
Verification by:	**Pacific 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 18N, LWD IGLD85. 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 H13806

Project: S-V927-NRTNL-23

Locality: Eastern Lake Ontario, NY

Sublocality: Chaumont Bay

Scale: 1:10000

July 2023 - August 2023

NOAA Navigation Response Team - New London

Chief of Party: LTJG Mark Meadows

A. Area Surveyed

The survey area covers Chaumont Bay, the largest freshwater bay in the world. Located within Lake Ontario, nearby the St. Lawrence River, and adjacent to Chaumont, NY.

A.1 Survey Limits

Data were acquired within the following survey limits:

Northwest Limit	Southeast Limit
44° 4' 18.59" N 76° 16' 39.33" W	43° 58' 29.08" N 76° 7' 28.66" W

Table 1: Survey Limits

Survey limits were acquired in accordance with the requirements in the Project Instructions and the HSSD.

A.2 Survey Purpose

The data from this project will help support the Great Lakes Restoration Initiative’s habitat mapping program. It will also provide modern bathymetry for updating National Ocean Service nautical charting products, improving the safety of maritime traffic and commerce as well as supporting the Lakebed 2030 global mapping initiative. 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.

The Grid QC tool within QC Tools was used to analyze multibeam echosounder (MBES) data density. The MBES surface meets the HSSD data density requirement.

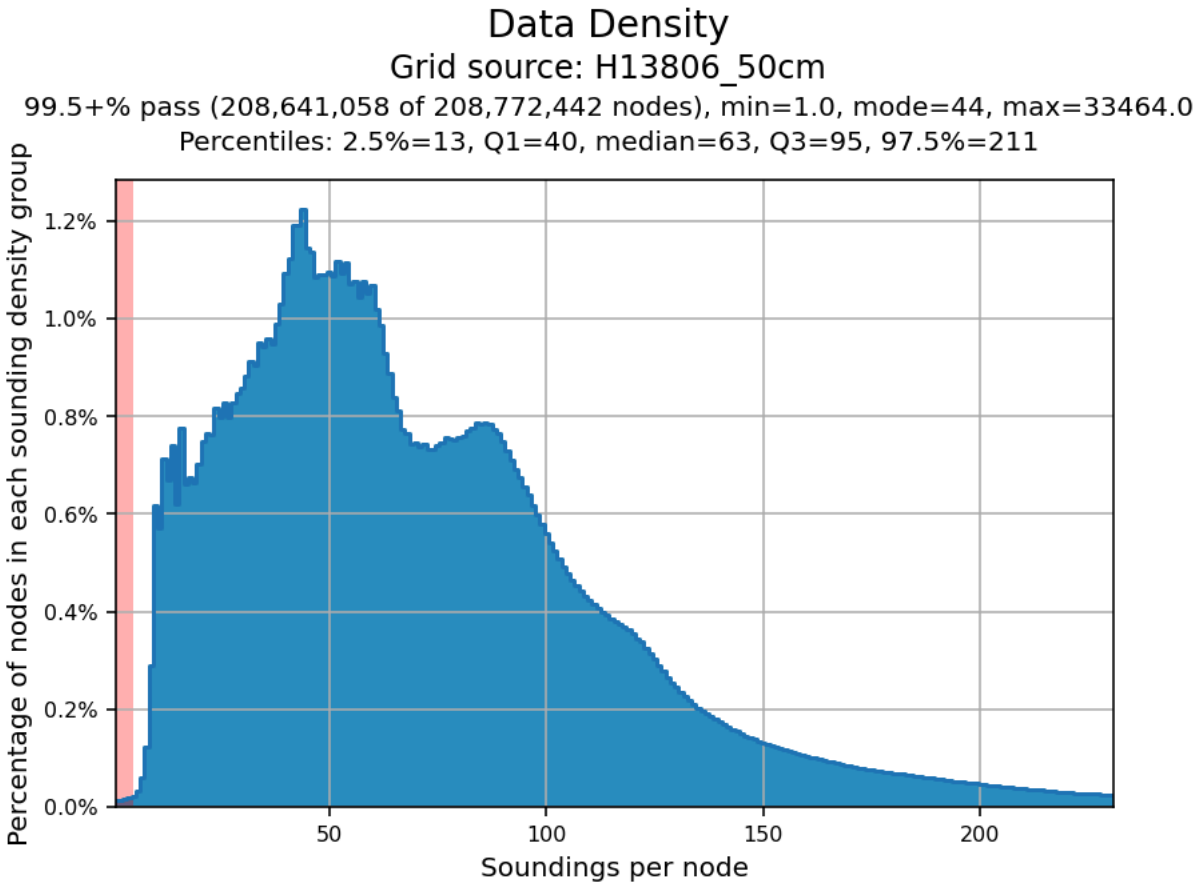


Figure 1: Pydro derived histogram plot showing HSSD object detection compliance of H13806 MBES data within the 50cm CUBE surface.

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

Survey coverage was in accordance with the requirements listed above and in the HSSD with some exceptions. Pydro Explorer's Flier Finder tool found 165 edge fliers, and 3 standard fliers. These were investigated and found to not be real, most in areas covered by seagrass. Pydro Explorer's Holiday Finder found 2274 holidays. These holidays were not able to be addressed in the field due to an issue with the acquisition machine failing, and the team had to use SIS rather than Hypack for realtime acquisition. The holidays are mostly small, and do not appear to contain navigationally significant features. Please see sections B.2.5 and B.2.6 for more information on factors affecting acquisition.

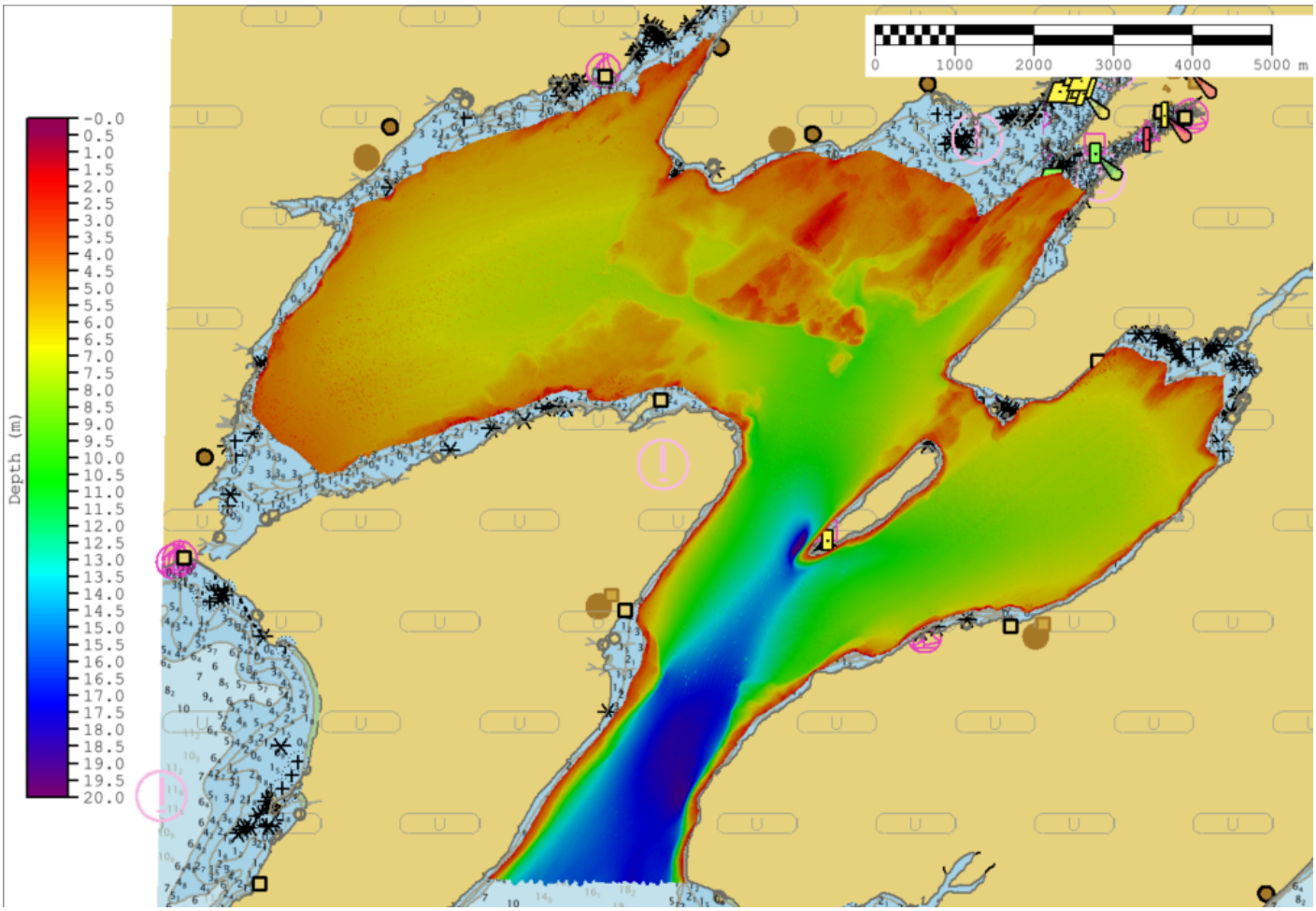


Figure 2: Survey Coverage of H13806.

A.6 Survey Statistics

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

	HULL ID	*S3007*	*Total*
LNM	**SBES Mainscheme**	0.0	0.0
	MBES Mainscheme	1518.7	1518.7
	Lidar Mainscheme	0.0	0.0
	SSS Mainscheme	0.0	0.0
	SBES/SSS Mainscheme	0.0	0.0
	MBES/SSS Mainscheme	0.0	0.0
	SBES/MBES Crosslines	14.233	14.233
	Lidar Crosslines	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			15.43

Table 3: Hydrographic Survey Statistics

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

Survey Dates	Day of the Year
07/11/2023	192
07/12/2023	193
07/13/2023	194
07/14/2023	195
07/15/2023	196
07/16/2023	197
07/17/2023	198
07/18/2023	199
07/19/2023	200
07/20/2023	201
07/21/2023	202
07/22/2023	203
07/23/2023	204
07/25/2023	206
07/26/2023	207
07/27/2023	208
08/08/2023	220
08/12/2023	224
08/13/2023	225
08/14/2023	226
08/15/2023	227
08/16/2023	228
08/17/2023	229
08/19/2023	231
08/20/2023	232
08/21/2023	233
08/22/2023	234
08/23/2023	235
08/24/2023	236

Table 4: Dates of Hydrography

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	***S3007***
LOA	10.38 meters
Draft	0.6 meters

Table 5: Vessels Used

B.1.2 Equipment

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

Manufacturer	**Model**	**Type**
Kongsberg Maritime	EM 2040C	MBES
Applanix	POS MV 320 v5	Positioning and Attitude System
YSI	CastAway-CTD	Conductivity, Temperature, and Depth Sensor
AML Oceanographic	Micro SV-Xchange	Sound Speed System

Table 6: Major Systems Used

B.2 Quality Control

B.2.1 Crosslines

A 4cm CUBE surface was created using only mainscheme lines and a second 4cm CUBE surface was created using only crosslines. These surfaces were then input into the Pydro Tool "Compare Grids". The comparison passed HSSD specifications.

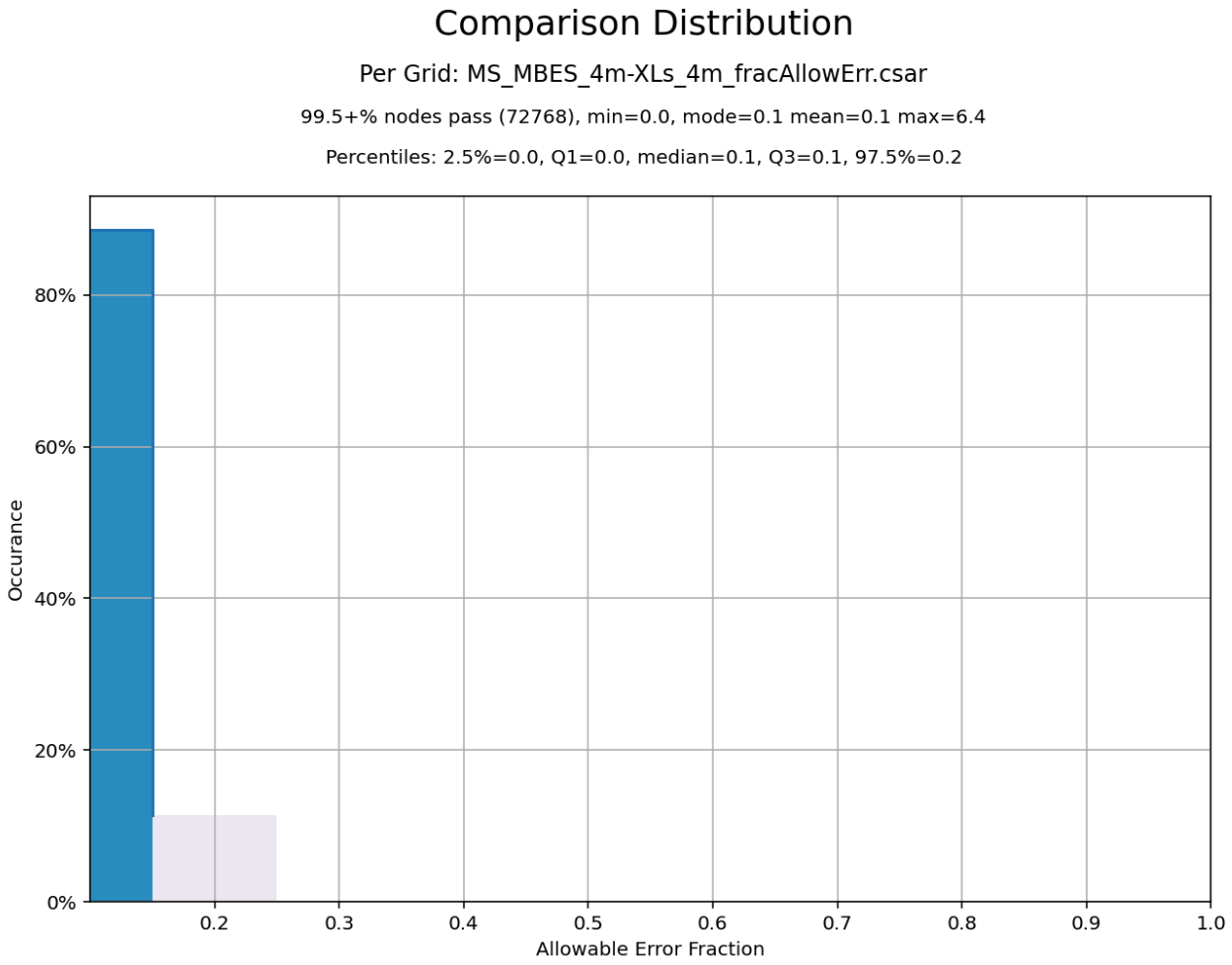
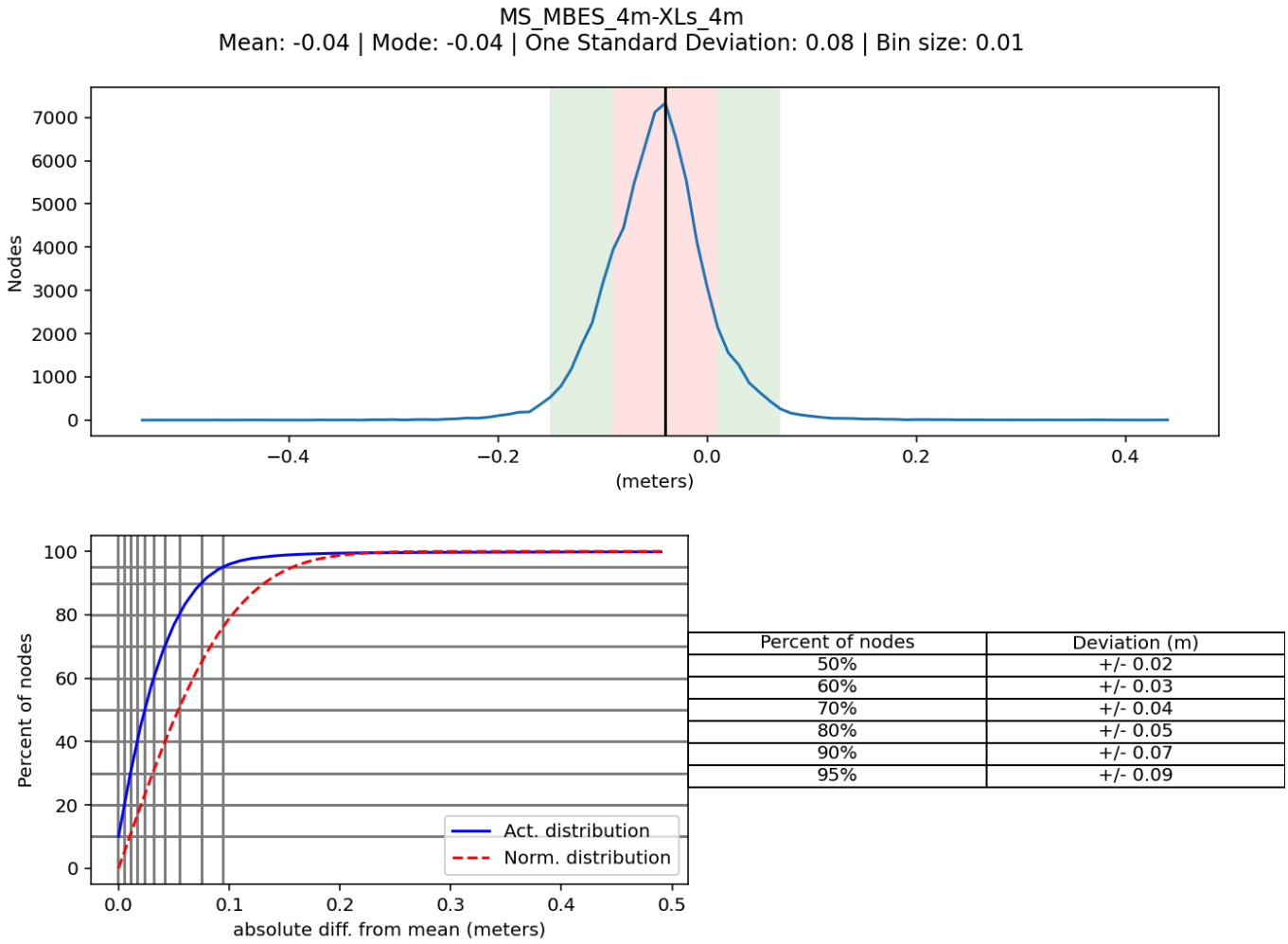


Figure 3: Pydro generated graph showing percentage of nodes that pass the allowable error fraction between mainscheme and crosslines.



Percent of nodes	Deviation (m)
50%	+/- 0.02
60%	+/- 0.03
70%	+/- 0.04
80%	+/- 0.05
90%	+/- 0.07
95%	+/- 0.09

Figure 4: Pydro generated graph showing deviations between mainscheme and crosslines.

B.2.2 Uncertainty

The following survey specific parameters were used for this survey:

Method	Measured	Zoning
ERS via VDATUM	0.0 meters	0.044 meters

Table 7: Survey Specific Tide TPU Values.

Hull ID	Measured - CTD	Measured - MVP	Measured - XBT	Surface
S3007	2 meters/second	0 meters/second	0 meters/second	0.2 meters/second

Table 8: Survey Specific Sound Speed TPU Values.

Total Propagated Uncertainty (TPU) values for H13806 were derived from a combination of fixed values for equipment and vessel characteristics, as well as field assigned values for sound speed uncertainties. The uncertainty for the VDatum model was provided to the field units. A visual inspection of the Uncertainty layer revealed the areas of higher uncertainty occur in the outer beams, and a visual inspection of the Density layer revealed the areas of lowest density are in the deepest areas of the survey.

In addition to the usual a priori estimates of uncertainty, some real time and post processed uncertainty sources were also incorporated into the depth estimates of the survey. Real-time uncertainties from the Kongsberg MBES sonars were incorporated and applied during post processing. Uncertainties associated with vessel roll, pitch, gyro, navigation, and heave were applied during post-processing. All of the aforementioned uncertainties were applied in CARIS. As stated, H13806 is an ellipsoidally referenced survey (ERS) and the tidal component was accomplished with a separation model.

B.2.3 Junctions

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

Acquisition Machine Failure

On August 9th, the acquisition machine that hosts Hypack, Sound Speed Manager, Castaway, and PosView had a hardware issue and would no longer turn on. While the team waited for a technician to fix the issue, a back-up method was devised that allowed the team to survey. However, this new set-up did not allow the use of Hypack, the normal method of acquiring data in realtime. While the team could survey, it was not as efficient, and holiday hunting was limited in capability. This resulted in more holidays than normal since the

repair to the acquisition machine was not successful while the team was on location and only fixed when the team was back in New London.

B.2.6 Factors Affecting Soundings

Seagrass

Chaumont bay has several areas that are covered in seagrass. These areas caused a lot of noise in the data, and while in some locations the noise can be easily cleaned, in others, the seagrass could not be easily dissected from the seafloor. In those instances the noisy data was removed and a holiday created.

B.2.7 Sound Speed Methods

Sound Speed Cast Frequency: At least once every 4 hours.

SVP casts were taken at least once every four hours in the deepest water nearest to the survey area being worked on. The SVP casts were applied to the MBES lines in CARIS using the "nearest in distance within time of 4 hours" method.

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.

B.5 Data Processing

B.5.1 Primary Data Processing Software

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

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
H13806_MB_50cm_LWD	CARIS Raster Surface (CUBE)	0.5 meters	0.348 meters - 19.826 meters	NOAA_0.5m	Object Detection
H13806_MB_50cm_LWD_Final	CARIS Raster Surface (CUBE)	0.5 meters	0.519 meters - 19.826 meters	NOAA_0.5m	Object Detection

Table 9: Submitted Surfaces

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 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	S-V927-NRTNL-23_NAD83(2011)-LWD_IGLD85

Table 10: ERS method and SEP file

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 18.

The following PPK methods were used for horizontal control:

- Smart Base
- RTX

The following CORS Stations were used for horizontal control:

HVCR Site ID	Base Station ID
KINGSTON	KNGS
HAILESBORO	NYHL
POTSDAM	NYPD
ROME	NYRM
WATERLOO	NYWL
OSWEGO PORT AUTHO	OSPA

Table 11: CORS Base Stations

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

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
US5NY27M	1:30000	9	07/08/2022	10/24/2022

Table 12: Largest Scale ENCs

D.1.2 Shoal and Hazardous Features

There are some rocky mounds located within the sheet limits, however, they are charted correctly and no DTON report was created for this survey.

D.1.3 Charted Features

All charted features are discussed in the FFF. Most features were not addressed due to time constraints caused by equipment malfunction issues.

Charted soundings and H13806 soundings are similar in value.

D.1.4 Uncharted Features

Some uncharted features do exist for this survey and are discussed further within the FFF.

D.1.5 Channels

No channels exist within the survey limits.

D.2 Additional Results

D.2.1 Aids to Navigation

All ATONs were found to be on station and serving their intended purpose.

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

No overhead features exist for this survey.

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

There are two unique features found within the survey grounds. On the seafloor of Chaumont Bay there are some small depressions scattered around. These markings could be anthropogenic or natural, but further investigation would be required to find out. Another unique feature are glacial striations on the underwater rocks. These rocks show clear patterns of glacial movements in the past.

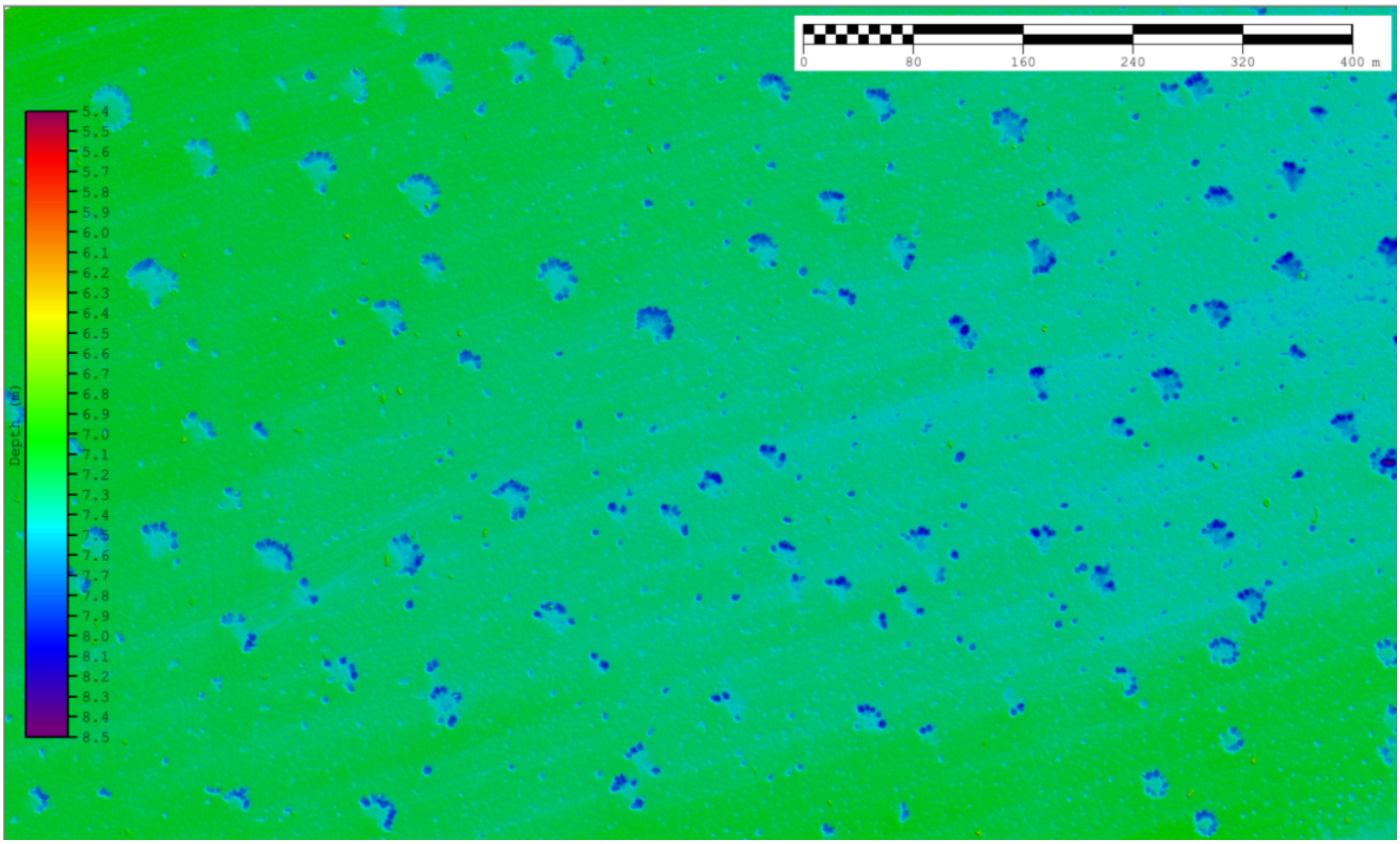


Figure 5: Small depressions of unknown origin.

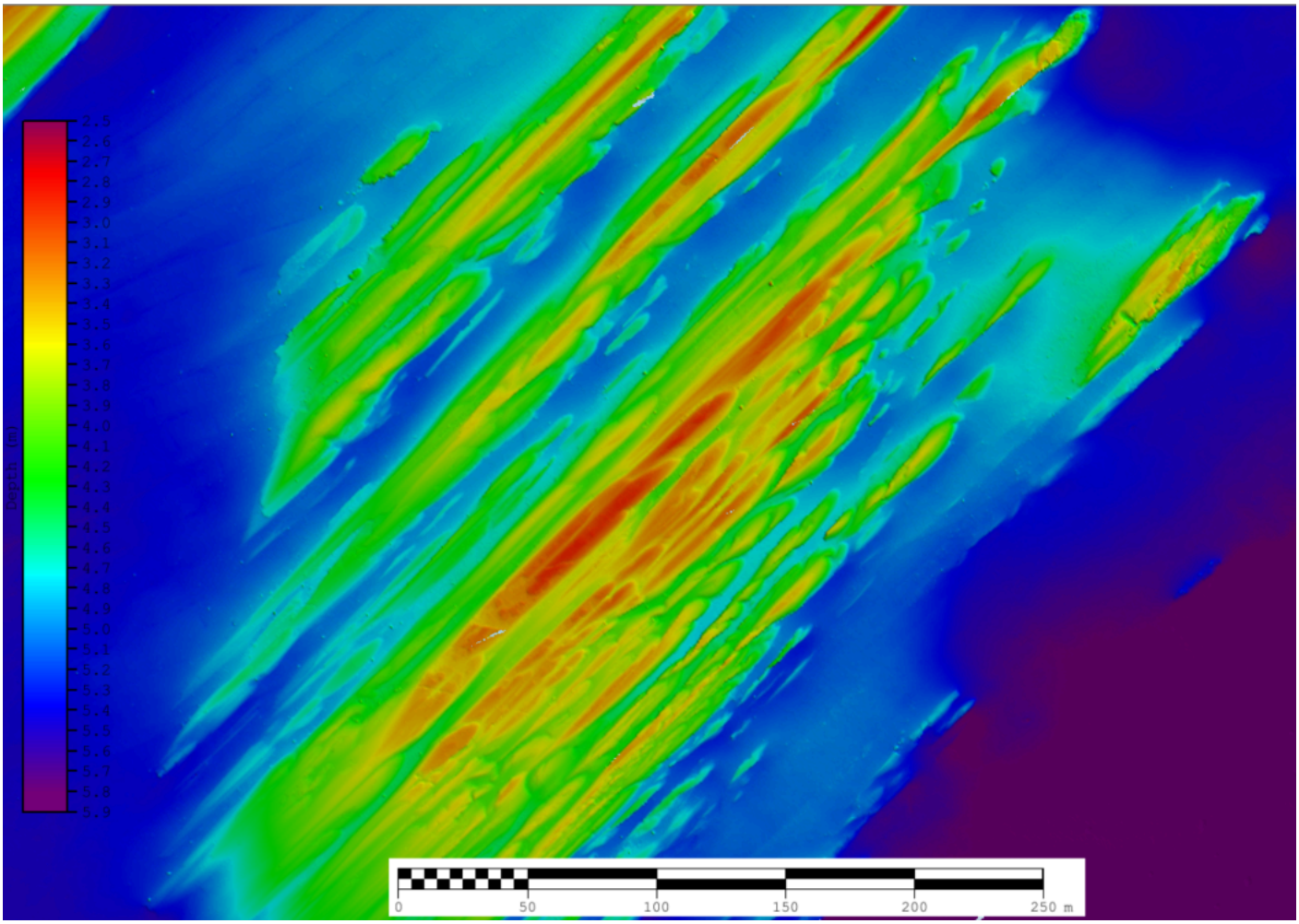


Figure 6: Evidence of glacial striations on underwater rocks.

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.

Approver Name	Approver Title	Approval Date	Signature
LTJG Mark Meadows	Chief of Party	03/13/2024	MEADOWS.MARK.JUDE.1571877895 Digitally signed by MEADOWS.MARK.JUDE.1571877895 Date: 2024.03.19 12:31:32 -04'00'
PST Michael Bloom	Sheet Manager	03/13/2024	BLOOM.MICHAEL.GRAHAM.1029463049 Digitally signed by BLOOM.MICHAEL.GRAHAM.1029463049 Date: 2024.03.13 14:08:45 -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