

F00836

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

DESCRIPTIVE REPORT

Type of Survey: Navigable Area

Registry Number: F00836

LOCALITY

State(s): New York

General Locality: East River, NY

Sub-locality: Flushing Bay

2021

CHIEF OF PARTY
LTJG Nicholas Azzopardi

LIBRARY & ARCHIVES

Date:

HYDROGRAPHIC TITLE SHEET

F00836

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: **East River, NY**

Sub-Locality: **Flushing Bay**

Scale: **5000**

Dates of Survey: **08/04/2021 to 08/04/2021**

Instructions Dated: **07/30/2021**

Project Number: **S-B920-NRTNL-21**

Field Unit: **NOAA Navigation Response Team - New London**

Chief of Party: **LTJG Nicholas Azzopardi**

Soundings by: **Multibeam Echo Sounder**

Imagery by:

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 18N, 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

A. Area Surveyed	1
A.1 Survey Limits.....	1
A.2 Survey Purpose.....	1
A.3 Survey Quality.....	2
A.4 Survey Coverage.....	3
A.6 Survey Statistics.....	4
B. Data Acquisition and Processing	6
B.1 Equipment and Vessels.....	6
B.1.1 Vessels.....	6
B.1.2 Equipment.....	8
B.2 Quality Control.....	8
B.2.1 Crosslines.....	8
B.2.2 Uncertainty.....	9
B.2.3 Junctions.....	11
B.2.4 Sonar QC Checks.....	11
B.2.5 Equipment Effectiveness.....	12
B.2.6 Factors Affecting Soundings.....	12
B.2.7 Sound Speed Methods.....	12
B.2.8 Coverage Equipment and Methods.....	13
B.3 Echo Sounding Corrections.....	13
B.3.1 Corrections to Echo Soundings.....	13
B.3.2 Calibrations.....	14
B.4 Backscatter.....	14
B.5 Data Processing.....	14
B.5.1 Primary Data Processing Software.....	14
B.5.2 Surfaces.....	14
C. Vertical and Horizontal Control	15
C.1 Vertical Control.....	15
C.2 Horizontal Control.....	15
D. Results and Recommendations	16
D.1 Chart Comparison.....	16
D.1.1 Electronic Navigational Charts.....	16
D.1.2 Shoal and Hazardous Features.....	16
D.1.3 Charted Features.....	19
D.1.4 Uncharted Features.....	19
D.1.5 Channels.....	19
D.2 Additional Results.....	19
D.2.1 Aids to Navigation.....	19
D.2.2 Maritime Boundary Points.....	19
D.2.3 Bottom Samples.....	19
D.2.4 Overhead Features.....	19
D.2.5 Submarine Features.....	19
D.2.6 Platforms.....	20

D.2.7 Ferry Routes and Terminals.....	20
D.2.8 Abnormal Seafloor or Environmental Conditions.....	20
D.2.9 Construction and Dredging.....	20
D.2.10 New Survey Recommendations.....	20
D.2.11 ENC Scale Recommendations.....	20
E. Approval Sheet.....	21
F. Table of Acronyms.....	22

List of Tables

Table 1: Survey Limits.....	1
Table 2: Survey Coverage.....	3
Table 3: Hydrographic Survey Statistics.....	5
Table 4: Dates of Hydrography.....	5
Table 5: Vessels Used.....	6
Table 6: Major Systems Used.....	8
Table 7: Survey Specific Tide TPU Values.....	9
Table 8: Survey Specific Sound Speed TPU Values.....	10
Table 9: Primary bathymetric data processing software.....	14
Table 10: Submitted Surfaces.....	15
Table 11: ERS method and SEP file.....	15
Table 12: Largest Scale ENCs.....	16

List of Figures

Figure 1: Survey equipment installed on TANB.....	2
Figure 2: Pydro derived histogram plot showing HSSD object detection compliance of F00836 MBES data within the VR CUBE surface.....	3
Figure 3: Survey Coverage of F00836 overlaid on ENC US5NY12M.....	4
Figure 4: USCG TANB getting outfitted with MIST kit.....	7
Figure 5: Pydro generated graph showing comparison between mainscheme and crosslines in F00836.....	9
Figure 6: Pydro generated graph showing 99.5+% of nodes pass NOAA uncertainty standards within F00836 VR surface.....	11
Figure 7: SVP locations in search area.....	13
Figure 8: Buoy being removed from the water.....	17
Figure 9: Buoy with chain being placed on deck after removal.....	18

Descriptive Report to Accompany Survey F00836

Project: S-B920-NRTNL-21

Locality: East River, NY

Sublocality: Flushing Bay

Scale: 1:5000

August 2021 - August 2021

NOAA Navigation Response Team - New London

Chief of Party: LTJG Nicholas Azzopardi

A. Area Surveyed

The survey area is east of Rikers Island, west of College Point, and north of LaGuardia Airport. Vessels coming from Flushing Bay going north to connect to East River Channel go through this survey area.

A.1 Survey Limits

Data were acquired within the following survey limits:

Northwest Limit	Southeast Limit
40° 47' 36.74" N 73° 51' 57.65" W	40° 47' 9.83" N 73° 51' 24.52" W

Table 1: Survey Limits

Survey limits were defined as a search radius of 0.5nm around the buoy's assigned location, however, the buoy was found before the full radius was completed and the search was no longer required to continue.

A.2 Survey Purpose

The United States Coast Guard (USCG) requested the Office of Coast Survey to help location a missing buoy that sank after it was struck by a tug. The buoy sank near the assigned location of 40°47'18.277"N - 073°51'42.831"W. The USCG was unsuccessful in locating the sunken buoy and requested that NRT-NL investigate and help locate the missing buoy using a .5 NM search radius around the buoy's assigned location. The survey was only required to continue until the sunken buoy was located.



Figure 1: Survey equipment installed on TANB.

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.

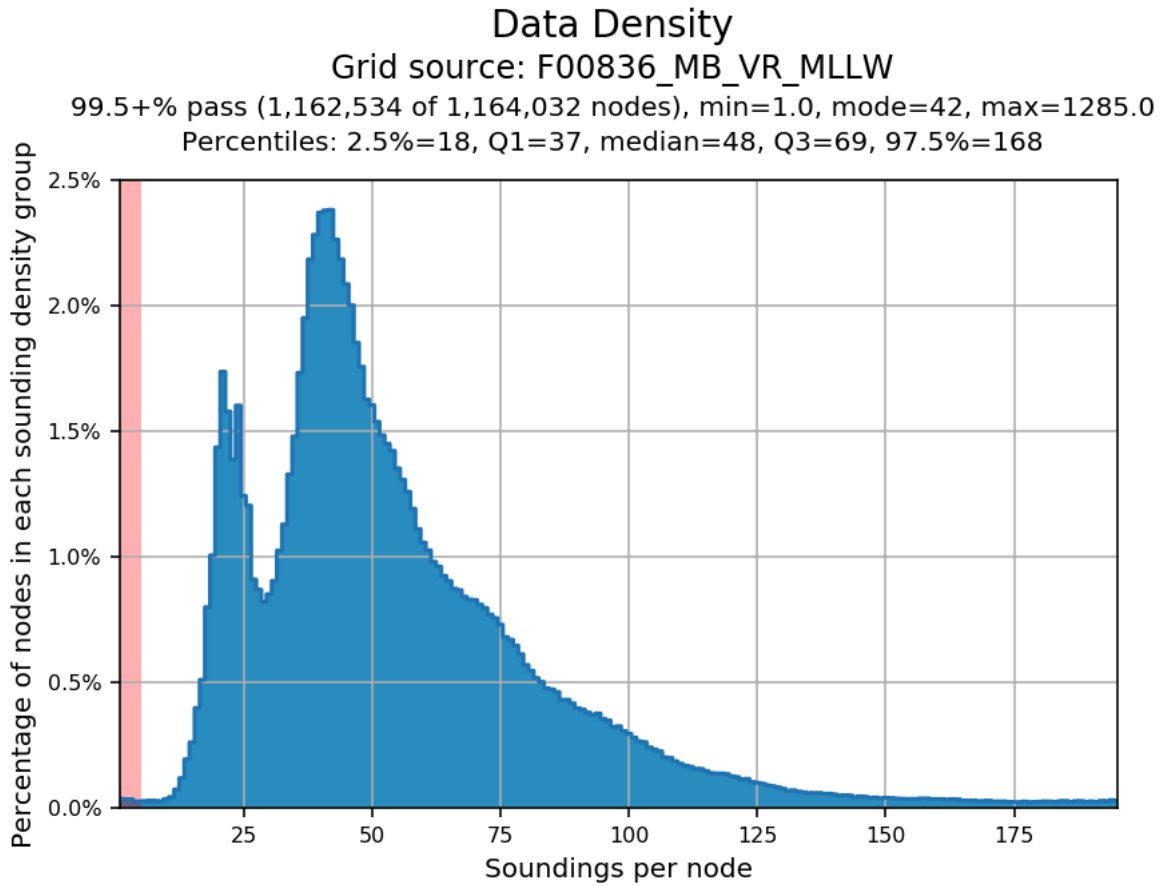


Figure 2: Pydro derived histogram plot showing HSSD object detection compliance of F00836 MBES data within the VR CUBE surface.

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. There are three holidays located in the sheet, each was investigated and found to not be dangerous. Pydro Explorer's flier finder found one flier, which is on a buoy block for a charted buoy.

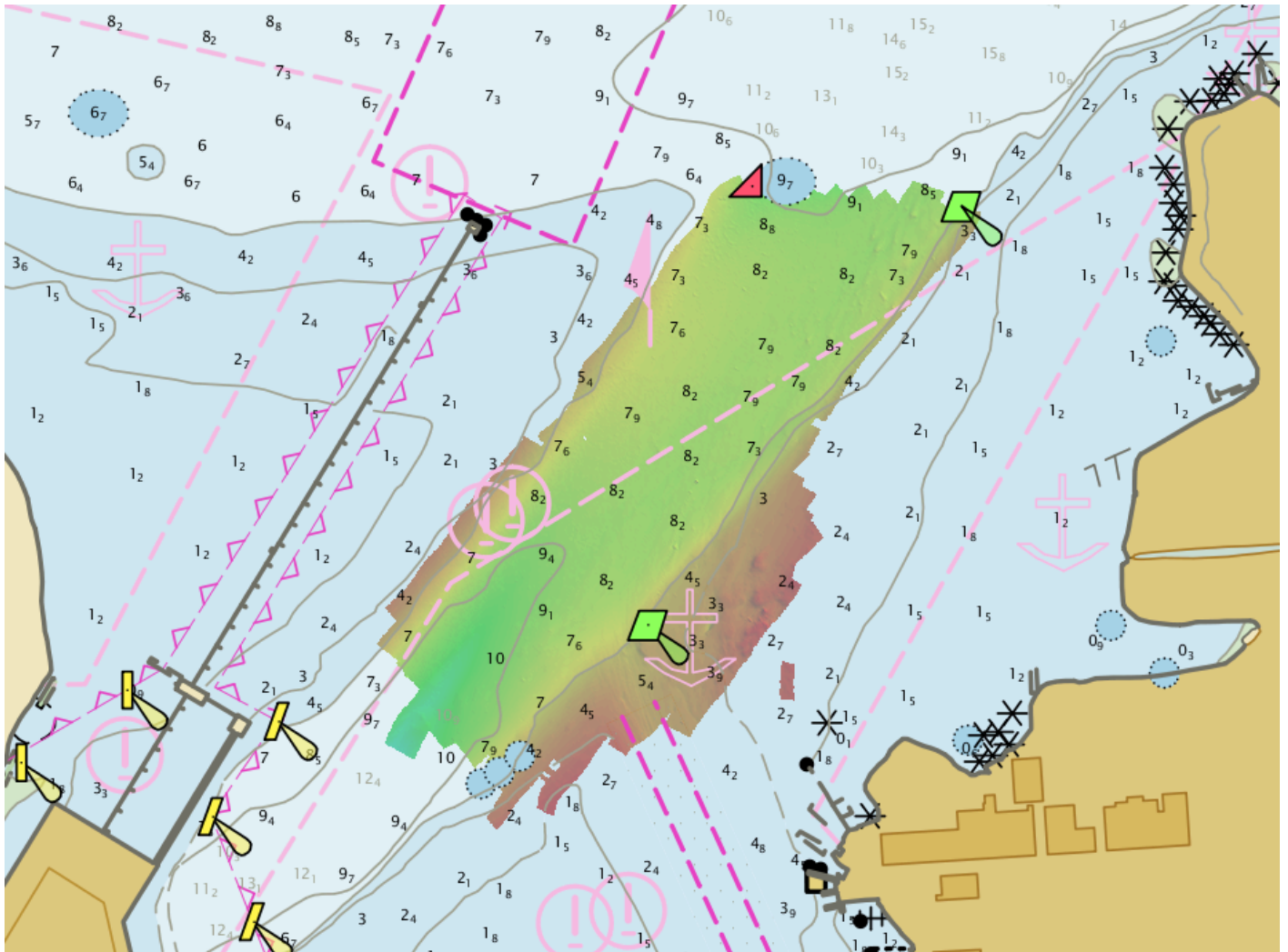


Figure 3: Survey Coverage of F00836 overlaid on ENC US5NY12M.

A.6 Survey Statistics

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

	HULL ID	<i>MIST</i>	<i>Total</i>
LNM	SBES Mainscheme	0	0
	MBES Mainscheme	7.84	7.84
	Lidar Mainscheme	0	0
	SSS Mainscheme	0	0
	SBES/SSS Mainscheme	0	0
	MBES/SSS Mainscheme	0	0
	SBES/MBES Crosslines	0.768	0.768
	Lidar Crosslines	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			0.08

Table 3: Hydrographic Survey Statistics

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

Survey Dates	Day of the Year
08/04/2021	216

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	<i>26144</i>
LOA	29.5 feet
Draft	2.3 feet

Table 5: Vessels Used



Figure 4: USCG TANB getting outfitted with MIST kit.

B.1.2 Equipment

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

Manufacturer	Model	Type
Teledyne RESON	SeaBat T20-P	MBES
Applanix	POS MV Surfmaster	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

A 50cm CUBE surface was created using only mainscheme lines and a second 50cm CUBE surface was created using only crosslines. These surfaces were then input into the Pydro Tool "Compare Grids". The comparison passed HSSD specifications.

Comparison Distribution

Per Grid: MS_only_50cm-XL_50cm_fracAllowErr.csar

99.5+% nodes pass (216802), min=0.0, mode=0.1 mean=0.1 max=4.0

Percentiles: 2.5%=0.0, Q1=0.0, median=0.0, Q3=0.1, 97.5%=0.2

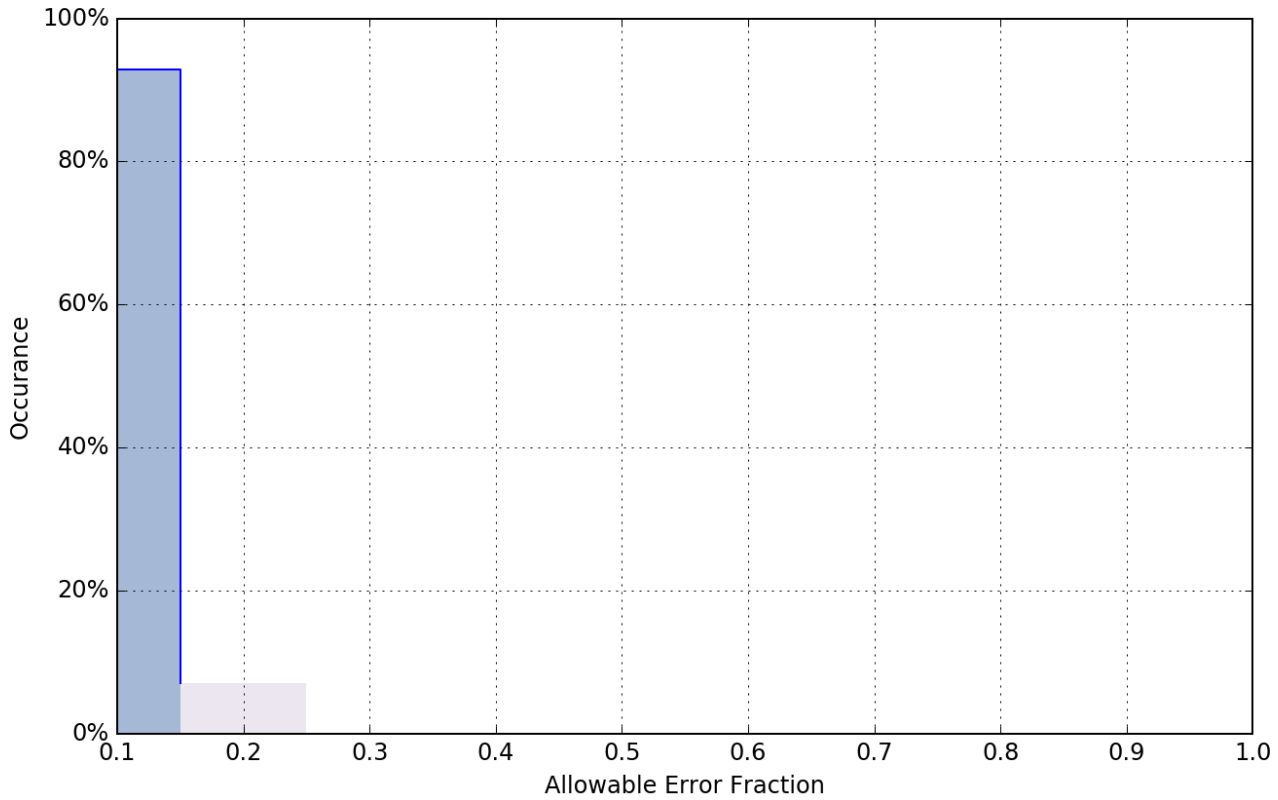


Figure 5: Pydro generated graph showing comparison between mainscheme and crosslines in F00836.

B.2.2 Uncertainty

The following survey specific parameters were used for this survey:

Method	Measured	Zoning
ERS via VDATUM	0 meters	0.092 meters

Table 7: Survey Specific Tide TPU Values.

Hull ID	Measured - CTD	Measured - MVP	Measured - XBT	Surface
USCG 26144	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 F00836 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 in the Project Instructions. 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. For F00836, 99.5+% of nodes passed NOAA uncertainty standards.

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 sonar 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, F00836 is an ellipsoidally referenced survey (ERS) and the tidal component was accomplished with a separation model.

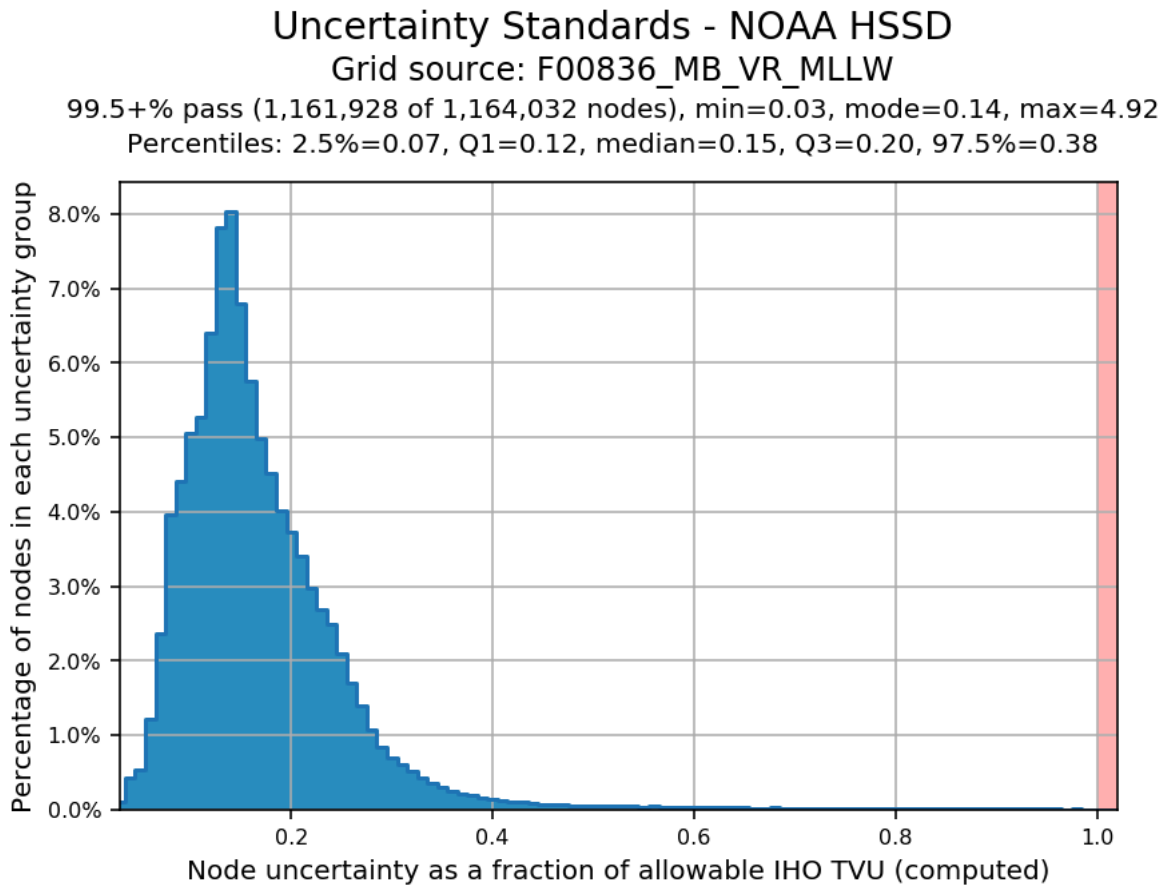


Figure 6: Pydro generated graph showing 99.5+% of nodes pass NOAA uncertainty standards within F00836 VR surface.

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

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: At least once every 4 hours.

Two casts were taken at the search area, see figure below.

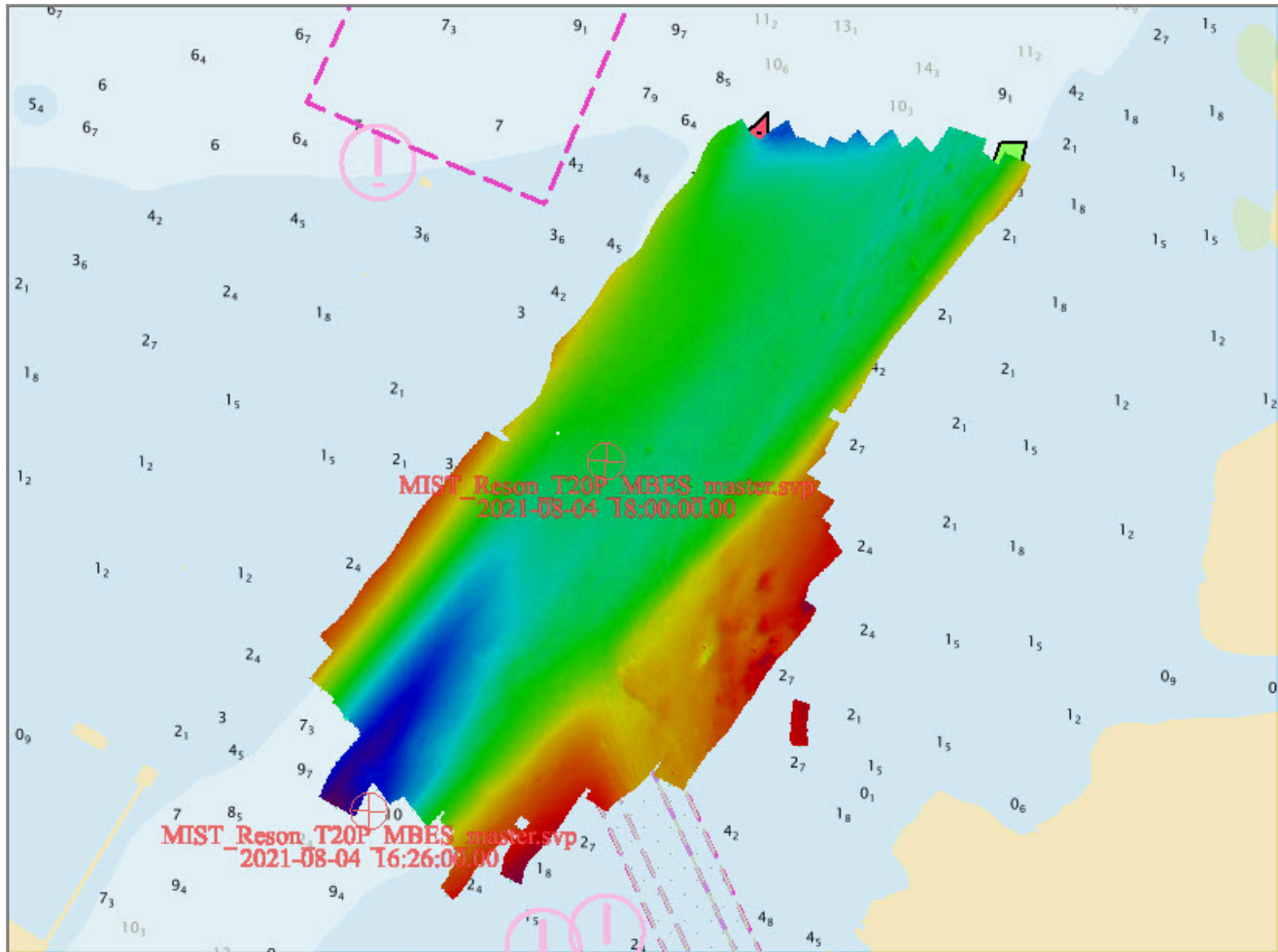


Figure 7: SVP locations in search area.

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.

The MRU Alignment Std Dev. values assigned to the HVF were higher than typical (1.0 degrees) for survey launch uncertainty estimates, which resulted in bloated grid uncertainties. In contrast to what is published in the DAPR, the HVF MRU Alignment values for gyro, pitch, and roll were all adjusted

in review to more closely match typical survey launch MRU alignment standard deviation values (0.3 degrees), which resulted in more typical grid uncertainties for submission to the NBS.

B.3.2 Calibrations

All sounding systems were calibrated as detailed in the DAPR.

B.4 Backscatter

Backscatter was not acquired for this survey.

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	11.3.18

Table 9: Primary bathymetric data processing software

The following Feature Object Catalog was used: NOAA Profile Version 2020..

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
F00836_MB_VR_MLLW	CARIS VR Surface (CUBE)	Variable Resolution	2.5 meters - 12.8 meters	NOAA_VR	Object Detection

Surface Name	Surface Type	Resolution	Depth Range	Surface Parameter	Purpose
F00836_MB_VR_MLLW_Final	CARIS VR Surface (CUBE)	Variable Resolution	2.5 meters - 12.8 meters	NOAA_VR	Object Detection

Table 10: 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 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-B920_VDatum Limits_100m_NAD83-MLLW_geoid12b.csar

Table 11: 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:

- 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

There is no Chart Comparison requirement for this project according to the PIs.

D.1.1 Electronic Navigational Charts

The following are the largest scale ENC's, which cover the survey area:

ENC	Scale	Edition	Update Application Date	Issue Date
US5NY1DF	1:10000	1	NaN/NaN/NaN	07/20/2021

Table 12: Largest Scale ENC's

D.1.2 Shoal and Hazardous Features

The MIST was sent to find a buoy that had sunk after being struck and determine if it got dragged into the shipping channel. The search was a success and the buoy was found to be located in the channel as feared. However, the USCG quickly removed the buoy from the channel, including its block and chain. For more information, please see the Supplemental Survey Records Correspondence folder.



Figure 8: Buoy being removed from the water.



Figure 9: Buoy with chain being placed on deck after removal.

D.1.3 Charted Features

Charted features exist for this survey, but were not investigated.

D.1.4 Uncharted Features

During the search for the sunken buoy three uncharted features were found on the seafloor. These features were not determined to be dangers to navigation but have been included in the FFF.

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

Aids to navigation (ATONs) exist for this survey, but were not investigated.

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

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

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

D.2.11 ENC Scale Recommendations


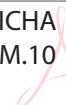
No new ENC scales are recommended for this area.

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 Nicholas Azzopardi	Chief of Party	08/26/2021	 Digitally signed by AZZOPARDI.NICHOLAS.JAME S.1539165093 Date: 2021.08.27 10:37:12 -04'00'
PST Michael Bloom	Sheet Manager	08/26/2021	BLOOM.MICHAEL.GRAHAM.1029463049  Digitally signed by BLOOM.MICHAEL.GRAHAM.1029463049 M.1029463049 Date: 2021.08.27 10:26:32 -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