

H12438

NOAA Form 76-35A

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

**DESCRIPTIVE REPORT**

Type of Survey: Navigable Area

Registry Number: H12438

**LOCALITY**

State: New York

General Locality: Long Island Sound

Sub-locality: 4 NM North of Herod Pt. Shoal, NY

**2012**

CHIEF OF PARTY CDR  
Lawrence T. Krepp

LIBRARY & ARCHIVES

Date:

**HYDROGRAPHIC TITLE SHEET**

**H12438**

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: **New York**

General Locality: **Long Island Sound**

Sub-Locality: **4 NM North of Herod Pt. Shoal, NY**

Scale: **1:40,000** Date of Survey: **09 May to 30 May 2012**

Instructions Dated: **08 May 2012** Project Number: **OPR-B340-TJ-12**

Vessel: **NOAA Ship *Thomas Jefferson***

Chief of Party: **CDR Lawrence T. Krepp, NOAA**

Surveyed by: ***Thomas Jefferson* Personnel**

Soundings by: **Multibeam Echo Sounder**

Graphic record scaled by: **N/A**

Graphic record checked by: **N/A**

Protracted by: **N/A** Automated Plot: **N/A**

Verification by: ***Atlantic Hydrographic Branch***

Soundings in: **Meters at MLLW**

***The purpose of this survey is to provide contemporary surveys to update National Ocean Service (NOS) nautical charts. All separates are filed with the hydrographic data. Revisions and Rednotes were generated during office processing. The processing branch concurs with all information and recommendations in the DR unless otherwise noted. Page numbering may be interrupted or non-sequential. All pertinent records for this survey, including the Descriptive Report, are archived at the National Geophysical Data Center (NGDC) and can be retrieved via <http://www.ngdc.noaa.gov/>.***

Remarks:  
***1) All Times are in UTC.  
2) This is a Navigable Area Hydrographic Survey.  
3) Projection is NAD83, UTM Zone 18 N.***

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## Descriptive Report to Accompany Survey H12438

Project: OPR-B340-TJ-12

Locality: Long Island Sound Sublocality: 4 NM

North of Herod Pt. Shoal, NY Scale: 1:40000

May 2012 - May 2012

**NOAA Ship *Thomas Jefferson***

Chief of Party: CDR Lawrence T. Krepp

### A. Area Surveyed

Hydrographic survey registry number H12438 covers an area of approximately 29 square nautical miles and is located approximately 4 NM north of Herod Point Shoal, New York. Coverage requirement, as per Hydrographic Survey Letter Instructions OPR-B340-TJ-12, Long Island Sound NY, Change 1; dated May 8, 2012, were met using complete multibeam coverage in accordance with Hydrographic Surveys Specifications and Deliverables Manual (HSSD), dated April 2012. It is recommended that this survey receive normal processing priority.

#### A.1 Survey Limits

Data was acquired within the following survey limits:

Northeast Limit	Southwest Limit
41.0923333333 N	41.0233888889 N
72.7856666667 W	72.9462861111 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

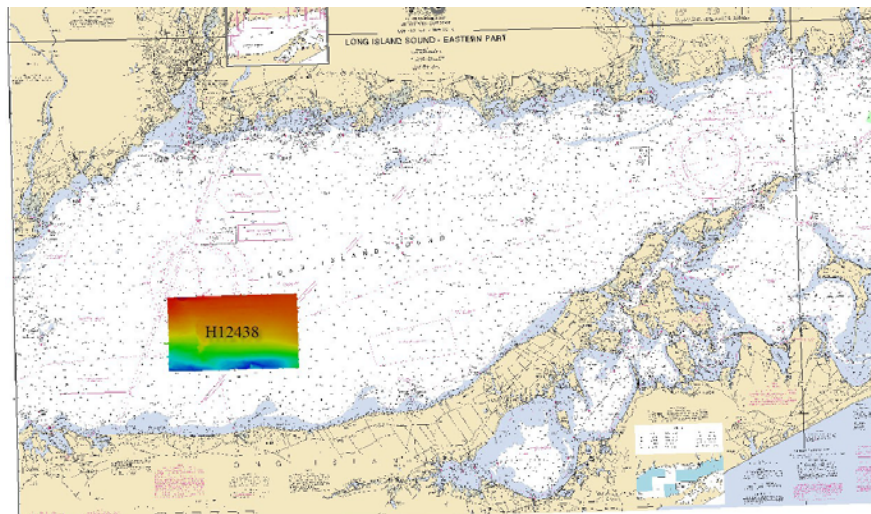
This project is being conducted in support of NOAA's Office of Coast Survey to provide contemporary hydrographic data in order to update the nautical charting products and reduce the survey backlog within the area. In addition, data from this project will support the Long Island Sound Seafloor Mapping Initiative for the States of Connecticut and New York. This project also responds to the Coast Guard proposal to establish six anchorage grounds in Long Island Sound to increase safety for vessels through enhanced voyage planning and also by clearly indicating the location of anchorage grounds for ships proceeding to ports in New York. The USCG is requesting that NOAA confirm that their underwater surveys of Long

Island Sound did not detect any wrecks at all in the locations being proposed for the anchorage areas. Data acquired for this project will be used by partners for species and habitat identification, infrastructure projects, ocean mapping, coastal hazards and geology. Partners include the US Environmental Protection Agency, Connecticut Department of Environmental Protection, the University of Connecticut Marine Science Department, New York Department of Environmental Quality, and other organizations. This project will cover approximately 206 SNM of which 165 SNM are critical survey areas as designated in the NOAA Hydrographic Survey Priorities, 2010 edition.

### A.3 Survey Quality

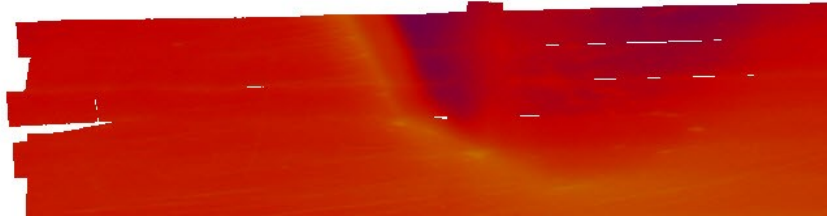
The entire survey is adequate to supersede previous data.

### A.4 Survey Coverage

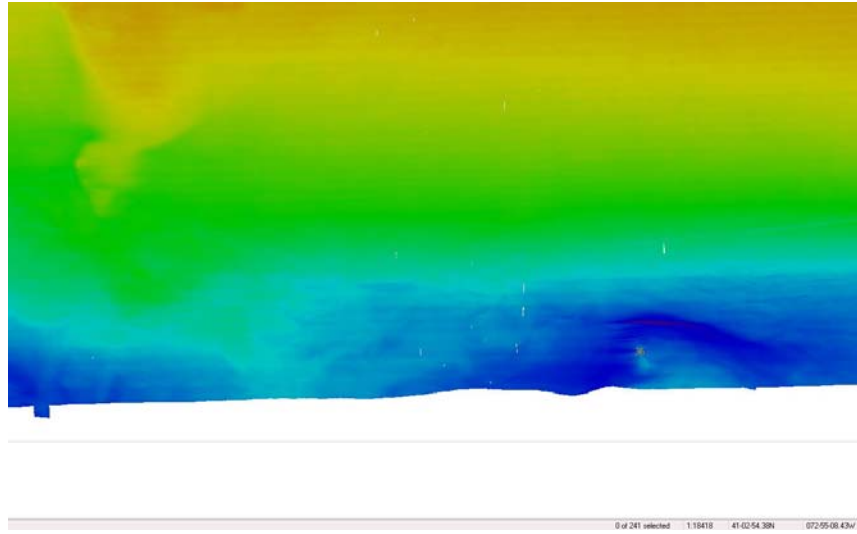


*Figure 1: H12438 Survey Limits*

Five holidays exist in the multibeam coverage of the northwestern section of H12438. These were caused by poor vessel steering during data acquisition and do not occur over any significant features. Several data gaps, which are not characterized as holidays per the HSSD definition, exist in the south central section of the sheet. These gaps were caused by Hypack breaking lines after reaching a certain size; they also do not occur over any significant features.



*Figure 2: H12438 Holidays*



*Figure 3: H12438 data gaps caused by Hypack line breaks*

## A.5 Survey Statistics

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

	<b>HULL ID</b>	<i>S222</i>	<i>3101</i>	<i>Total</i>
<b>LNM</b>	<b>SBES Mainscheme</b>	0	0	0
	<b>MBES Mainscheme</b>	570.31	17.46	587.77
	<b>Lidar Mainscheme</b>	0	0	0
	<b>SSS Mainscheme</b>	0	0	0
	<b>SBES/MBES Combo Mainscheme</b>	0	0	0
	<b>SBES/SSS Combo Mainscheme</b>	0	0	0
	<b>MBES/SSS Combo Mainscheme</b>	0	0	0
	<b>SBES/MBES Combo Crosslines</b>	41.49	0	41.49
	<b>Lidar Crosslines</b>	0	0	0
	<b>Number of Bottom Samples</b>			
<b>Number of DPs</b>				0
<b>Number of Items Items Investigated by Dive Ops</b>				0
<b>Total Number of SNM</b>				29

*Table 2: Hydrographic Survey Statistics*



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

<i>Survey Dates</i>
05/09/2012
05/10/2012
05/15/2012
05/16/2012
05/17/2012
05/18/2012
05/19/2012
05/20/2012
05/21/2012
05/22/2012
05/24/2012
05/30/2012

*Table 3: Dates of Hydrography*

## **A.6 Shoreline**

Shoreline was investigated in accordance with the Project Instructions and the HSSD.

## **A.7 Bottom Samples**

AHB removed the requirement to conduct bottom samples for this sheet based on recent prior surveys.

# **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:

<b>Hull ID</b>	<i>S-222</i>	<i>3101</i>
<b>LOA</b>	208 feet	31 feet
<b>Draft</b>	15 feet	4 feet

*Table 4: Vessels Used*

### B.1.2 Equipment

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

<b>Manufacturer</b>	<b>Model</b>	<b>Type</b>
Reson	7125 ROV	MBES
Reson	7125 SV1	MBES

*Table 5: Major Systems Used*

## B.2 Quality Control

### B.2.1 Crosslines

MBES cross-lines totaling 41.49 LNM, approximately 7.5% of total hydrography, were acquired during this survey. As per email dated 10 Sept, 2009 from AHB in the Descriptive Report, Appendix 5, quality control was performed using the standard deviation layer of the survey's CUBE surface. Areas of unusually high standard deviation were investigated and resolved in processing, except where caused by areas of high bathymetric relief or as described in Section B.5 Data Processing. The maximum standard deviation is 0.3258m. The mean standard deviation for the combined 2m surface is 0.05m.

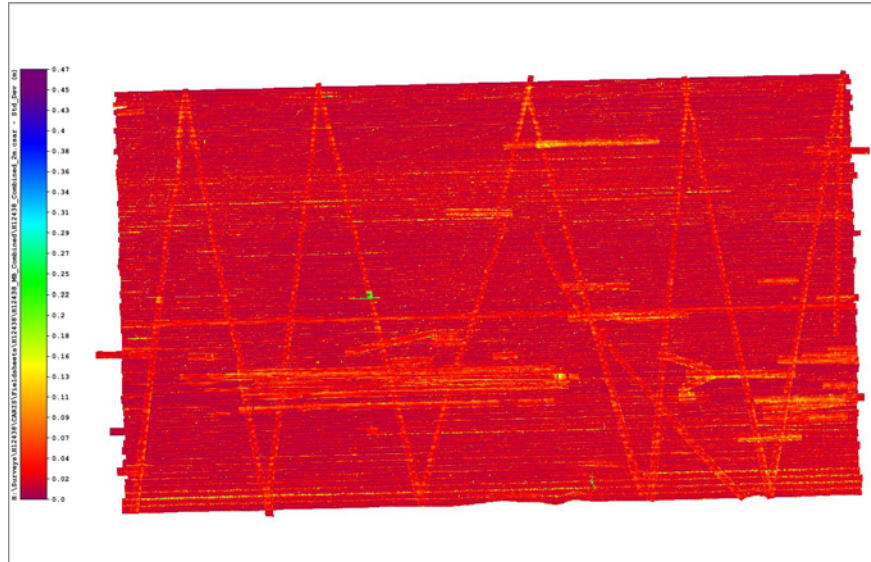


Figure 4: Standard deviation layer for H12438

## B.2.2 Uncertainty

Hull ID	Measured - CTD	Measured - MVP	Surface
S-222		1meters/second	0.2meters/second
3101	4meters/second		0.2meters/second

Table 6: Survey Specific Sound Speed TPU Values

An IHOness examination was performed on the combined 2 meter grid for H12438. This tests whether the uncertainty values are met as specified in HSSD section 5.1.3 Uncertainty Standards. The IHO Publication S-44 is stated as  $\pm \#(a^2+(b*d)^2)$  where: (a) represents that portion of the uncertainty that does not vary with depth; (b) is a coefficient which represents that portion of the uncertainty that varies with depth (b x d) represents that portion of the uncertain that does vary with depth; (d) is the depth; and

The variables a and b shall be defined as follows:

In depths less than 100 meters, a = 0.5 meters and b = 0.013 (IHO Order 1)

Through CARIS processing each node receives the formula computation minus the computed uncertainty of the depth layer. Positive values pass IHO, and negative values fail. Out of 25,870,069 nodes, over 99.9% of them passed IHO Order 1 TVU specifications.

A compliance review for density was performed. This computes basic statistics to assess compliance with NOS Hydrographic Specifications and Deliverables sections 5.1.3 and 5.2.2.1 2012. A filter for the density layer of the combined 2 meter grid was set to a minimum of 0 and maximum of 4. This filtered low density nodes and confirmed that over 99.9% of the soundings for H12438 met the density requirements specified in HSSD.

### B.2.3 Junctions

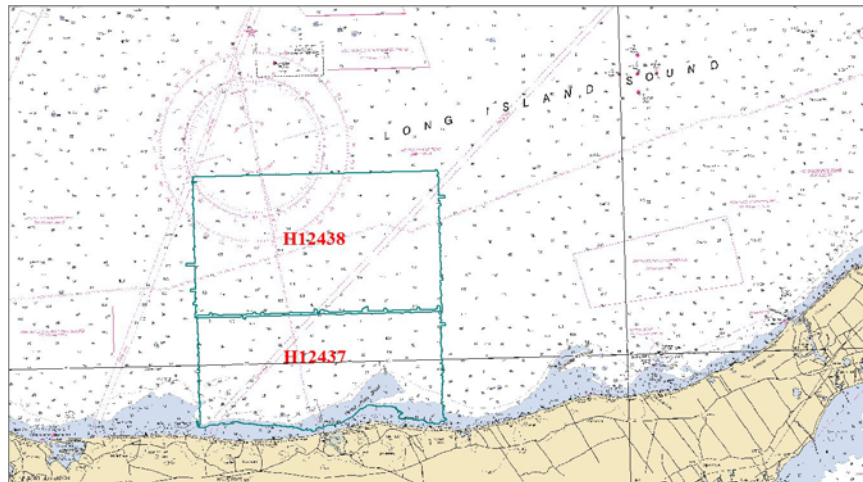
The following junctions were made with this survey:

Registry Number	Scale	Year	Field Unit	Relative Location
H12437	1:40000	2012	NOAA Ship THOMAS JEFFERSON	S
H11044	1:20000	2001		W
H1255	1:10000	2004	NOAA Ship THOMAS JEFFERSON	E

*Table 7: Junctioning Surveys*

#### H12437

Data were collected for H12437 at the same time as H12438. Soundings generally agree within 0.5 meters.



*Figure 4: Junction between H12438 and H12437*

#### H11044

A junction comparison with this survey was not possible due to data not being provided to us in a usable format.

#### H12255

A junction comparison with this survey was not possible due to an error when trying to open the BAG.

## **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**

### **B.2.5.1 None Exist**

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

## **B.2.6 Factors Affecting Soundings**

### **B.2.6.1 None Exist**

There were no other factors that affected corrections to soundings.

## **B.2.7 Sound Speed Methods**

Sound Speed Cast Frequency: Sound speed casts were taken approximately every 30 minutes from S-222 using the ship's Moving Vessel Profiler. On 3101, casts were taken at least twice per day using the Seabird Seacat 19+ CTD.

## **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**

On July 25, 2012, HSD approved H12438 for vertical reduction to chart datum, Mean Lower Low Water (MLLW), using the NOAA published Vertical Datum Transformation (VDatum) Toolset. See Appendix V, OPR-B340-TJ-12\_H12438\_VDatum\_Approval\_Memo\_signed.pdf. All survey lines were processed to the ellipsoid and reduced to chart datum via VDatum.

### B.3.2 Calibrations

A patch test was completed on both launches shortly after arriving to Long Island Sound. Minor differences were seen in the offsets and those values were entered into the HVF for the respective vessels. A new patch test was not performed on S222 and we did not see any biases in the data that needed to be corrected.

### B.4 Backscatter

Backscatter was logged as a s7k file and submitted to the IOCM processing center and/or directly to NGDC, and is not included with the data submitted to the Branch.

## B.5 Data Processing

### B.5.1 Software Updates

There were no software configuration changes after the DAPR was submitted.

The following Feature Object Catalog was used: NOAAProfileField.xml

### B.5.2 Surfaces

The following CARIS surfaces were submitted to the Processing Branch:

Surface Name	Surface Type	Resolution	Depth Range	Surface Parameter	Purpose
H12438_CUBE_MLLW_2m_A_Final	CUBE	2.0 meters	30.94 meters - 43.70 meters	NOAA_2m	Complete MBES
H12438_CUBE_MLLW_2m_B_Final	CUBE	2.0 meters	29.15 meters - 33.91 meters	NOAA_2m	Complete MBES
H12438_CUBE_MLLW_2m_C_Final	CUBE	2.0 meters	26.35 meters - 32.82 meters	NOAA_2m	Complete MBES
H12438_Combined_2m_Final	CUBE	2.0 meters	26.35 meters - 43.70 meters	NOAA_2m	Complete MBES

*Table 8: CARIS Surfaces*

This survey was processed using the Combined Uncertainty and Bathymetry Estimator (CUBE) algorithm. The CUBE configuration was set to NOAA\_2m for all MBES surfaces. Refer to the 2012 Data Acquisition and Processing Report, 2012 Field Procedures Manual, and CARIS HIPS and SIPS User Guide for further discussion. The survey data were cleaned using the swath and subset editor tools in CARIS HIPS.

## 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.

#### Non-Standard Vertical Control Methods Used:

VDatum

#### Ellipsoid to Chart Datum Separation File:

2012\_B340\_VDatum\_Ellip\_MLLW

This project is part of the continued test and evaluation effort for the Ellipsoid Referenced Survey (ERS) initiative. The NOAA Ship Thomas Jefferson is tasked with the ERS specific deliverables as described in Appendix V of this document. The national vertical datum transformation tool, VDATUM, is a key component to ERS. VDATUM, <http://vdatum.noaa.gov/welcome.html>, is a tool developed by NOAA to vertically transform geospatial data among a variety of tidal, orthometric and ellipsoidal vertical datums. The ellipsoid to MLLW separation model for the area that was output from VDATUM was supplied to the field unit with the Project Instructions and project files. This separation model was provided in text file format and is used by CARIS HIPS/SIPS to transform the bathymetry data from the ellipsoid back to chart datum, MLLW. The results of Thomas Jefferson's ERS interim deliverable analysis of the ERS vs TCARI methods were submitted to HSD for a determination of the method to be used for survey submission. HSD recommended that final deliverable grids for this survey should be reduced to MLLW via the ERS method when feasible. All bathymetry data were reduced to MLLW via the ERS methods. The 2012\_B340\_VDatum\_Ellip\_MLLW model was used to reduce this survey from the ellipsoid to Mean Lower-Low Water as described in section B.3.

### C.2 Horizontal Control

The horizontal datum for this project is North American Datum of 1983 (NAD83).

#### The following PPK methods were used for horizontal control:

Smart Base

Position data were processed using Inertially Aided Post Processing Kinematic (IAPPK) methods in POSPac to create Smoothed Best Estimate Trajectory (SBET) files. POSPac Smart Base solutions were used to create the SBETs. The SBETs and associated Root Mean Square (RMS) error data were then applied to the bathymetry data in CARIS HIPS.

The following CORS Stations were used for horizontal control:

<b>HVCR Site ID</b>	<b>Base Station ID</b>
Moriches 6; East Moriches, NY	MOR6
Newington, CT	CTNE
Darien, CT	CTDA
Guilford, CT	CTGU
Moriches 5; East Moriches, NY	MOR5
Central Islip, NY	NYCI
Riverhead, NY	NYRH
New York WAAS 1, NY	ZNY1

*Table 9: CORS Base Stations*

The following DGPS Stations were used for horizontal control:

<b>DGPS Stations</b>
Moriches, NY

*Table 10: USCG DGPS Stations*



## D. Results and Recommendations

### D.1 Chart Comparison

#### D.1.1 Raster Charts

The following are the largest scale raster charts, which cover the survey area:

Chart	Scale	Edition	Edition Date	LNM Date	NM Date
12354	1:80000	44	05/2012	06/05/2012	08/11/2012

*Table 11: Largest Scale Raster Charts*

#### 12354

Data acquired were compared to chart 12354, the largest scale chart for the survey area. Charted soundings generally agree within 1.0 meter.

#### D.1.2 Electronic Navigational Charts

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

ENC	Scale	Edition	Update Application Date	Issue Date	Preliminary?
US4NY1GM	1:80000	20	NaN/NaN/NaN	07/11/2011	NO

*Table 12: Largest Scale ENC's*

#### US4NY1GM

Data acquired for H12438 generally agree with charted soundings within 1.0 meter.

#### D.1.3 AWOIS Items

No AWOIS items exist for this survey.

#### D.1.4 Charted Features

No charted features exist for this survey.

**D.1.5 Uncharted Features**

Four uncharted features were reported. Refer to Final Feature File in Appendix II.

**D.1.6 Dangers to Navigation**

No Danger to Navigation Reports were submitted for this survey.

**D.1.7 Shoal and Hazardous Features**

No shoals or potentially hazardous features exist for this survey.

**D.1.8 Channels**

No channels exist for this survey. There are no designated anchorages, precautionary areas, safety fairways, traffic separation schemes, pilot boarding areas, or channel and range lines within the survey limits.

**D.2 Additional Results****D.2.1 Shoreline**

Shoreline was not assigned in the Hydrographic Survey Project Instructions or Statement of Work.

**D.2.2 Prior Surveys**

Prior survey comparisons exist for this survey, but were not investigated.

**D.2.3 Aids to Navigation**

Aids to navigation (ATONs) do not exist for this survey.

**D.2.4 Overhead Features**

Overhead features do not exist for this survey.

**D.2.5 Submarine Features**

No charted cables or pipelines were observed in this survey. Those charted are assumed to be buried.

**D.2.6 Ferry Routes and Terminals**

No ferry routes or terminals exist for this survey.

**D.2.7 Platforms**

No platforms exist for this survey.

**D.2.8 Significant Features**

No significant features exist for this survey.

**D.2 Construction and Dredging**

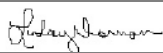


There is no present or planned construction or dredging within the survey limits.

## 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 and Specifications Deliverables Manual, Field Procedures Manual, Standing and 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.

<b>Approver Name</b>	<b>Approver Title</b>	<b>Approval Date</b>	<b>Signature</b>
ENS Lindsey L. Norman	Sheet Manager	10/06/2012	
LT William G. Winner	Field Operations Officer	10/06/2012	
CDR Lawrence T. Krepp	Commanding Officer	10/06/2012	

## F. Table of Acronyms

<b>Acronym</b>	<b>Definition</b>
<b>AFF</b>	Assigned Features File
<b>AHB</b>	Atlantic Hydrographic Branch
<b>AST</b>	Assistant Survey Technician
<b>ATON</b>	Aid to Navigation
<b>AWOIS</b>	Automated Wreck and Obstruction Information System
<b>BAG</b>	Bathymetric Attributed Grid
<b>BASE</b>	Bathymetry Associated with Statistical Error
<b>CO</b>	Commanding Officer
<b>CO-OPS</b>	Center for Operational Products and Services
<b>CORS</b>	Continually Operating Reference Station
<b>CTD</b>	Conductivity Temperature Depth
<b>CEF</b>	Chart Evaluation File
<b>CSF</b>	Composite Source File
<b>CST</b>	Chief Survey Technician
<b>CUBE</b>	Combined Uncertainty and Bathymetry Estimator
<b>DAPR</b>	Data Acquisition and Processing Report
<b>DGPS</b>	Differential Global Positioning System
<b>DP</b>	Detached Position
<b>DR</b>	Descriptive Report
<b>DTON</b>	Danger to Navigation
<b>ENC</b>	Electronic Navigational Chart
<b>ERS</b>	Ellipsoidal Referenced Survey
<b>ERZT</b>	Ellipsoidally Referenced Zoned Tides
<b>FOO</b>	Field Operations Officer
<b>FPM</b>	Field Procedures Manual
<b>GAMS</b>	GPS Azimuth Measurement Subsystem
<b>GC</b>	Geographic Cell
<b>GPS</b>	Global Positioning System
<b>HIPS</b>	Hydrographic Information Processing System
<b>HSD</b>	Hydrographic Surveys Division
<b>HSSDM</b>	Hydrographic Survey Specifications and Deliverables Manual

<b>Acronym</b>	<b>Definition</b>
<b>HSTP</b>	Hydrographic Systems Technology Programs
<b>HSX</b>	Hypack Hysweep File Format
<b>HTD</b>	Hydrographic Surveys Technical Directive
<b>HVCR</b>	Horizontal and Vertical Control Report
<b>HVF</b>	HIPS Vessel File
<b>IHO</b>	International Hydrographic Organization
<b>IMU</b>	Inertial Motion Unit
<b>ITRF</b>	International Terrestrial Reference Frame
<b>LNM</b>	Local Notice to Mariners
<b>LNM</b>	Linear Nautical Miles
<b>MCD</b>	Marine Chart Division
<b>MHW</b>	Mean High Water
<b>MLLW</b>	Mean Lower Low Water
<b>NAD 83</b>	North American Datum of 1983
<b>NAIP</b>	National Agriculture and Imagery Program
<b>NALL</b>	Navigable Area Limit Line
<b>NM</b>	Notice to Mariners
<b>NMEA</b>	National Marine Electronics Association
<b>NOAA</b>	National Oceanic and Atmospheric Administration
<b>NOS</b>	National Ocean Service
<b>NRT</b>	Navigation Response Team
<b>NSD</b>	Navigation Services Division
<b>OCS</b>	Office of Coast Survey
<b>OMAO</b>	Office of Marine and Aviation Operations (NOAA)
<b>OPS</b>	Operations Branch
<b>MBES</b>	Multibeam Echosounder
<b>NWLON</b>	National Water Level Observation Network
<b>PDBS</b>	Phase Differencing Bathymetric Sonar
<b>PHB</b>	Pacific Hydrographic Branch
<b>POS/MV</b>	Position and Orientation System for Marine Vessels
<b>PPK</b>	Post Processed Kinematic
<b>PPP</b>	Precise Point Positioning
<b>PPS</b>	Pulse per second

<b>Acronym</b>	<b>Definition</b>
<b>PRF</b>	Project Reference File
<b>PS</b>	Physical Scientist
<b>PST</b>	Physical Science Technician
<b>RNC</b>	Raster Navigational Chart
<b>RTK</b>	Real Time Kinematic
<b>SBES</b>	Singlebeam Echosounder
<b>SBET</b>	Smooth Best Estimate and Trajectory
<b>SNM</b>	Square Nautical Miles
<b>SSS</b>	Side Scan Sonar
<b>ST</b>	Survey Technician
<b>SVP</b>	Sound Velocity Profiler
<b>TCARI</b>	Tidal Constituent And Residual Interpolation
<b>TPU</b>	Total Propagated Error
<b>TPU</b>	Topside Processing Unit
<b>USACE</b>	United States Army Corps of Engineers
<b>USCG</b>	United States Coast Guard
<b>UTM</b>	Universal Transverse Mercator
<b>XO</b>	Executive Officer
<b>ZDA</b>	Global Positioning System timing message
<b>ZDF</b>	Zone Definition File

APPENDIX I  
TIDES AND WATER LEVEL





18 July 2012

MEMORANDUM TO: Jeffrey Ferguson  
Chief, Hydrographic Surveys Division

FROM: Lawrence T. Krepp, CDR/NOAA  
Commanding Officer

SUBJECT: H12438 Interim Deliverables

As per the project instructions for OPR-B340-TJ-12, NOAA Ship *Thomas Jefferson* was tasked with providing a recommendation on the vertical transformation technique to be used for each sheet. This recommendation is based upon an analysis of crossline data processed with TCARI tidal zoning and VDatum ERS. This analysis was performed using Pydro's Post Acquisition Tools.

### **Crossline Analysis**

Crosslines from H12438 were parallel processed with one set of depths reduced to MLLW via TCARI tidal zoning and the other set reduced via VDatum ERS. Pydro's Post Acquisition Tool "Compare Time Series Data" yielded the following results:

#### File-wise Statistics

-----  
H12438\_NOSBET\_TJ\_S222\_RESON7125\_STBD\_MiddlePD.txt |  
H:\Surveys\H12438\Descriptive Report\Separates\IV\_Crossline\_Comparisons  
- (minus)  
H12438\_SBET\_TJ\_S222\_RESON7125\_STBD\_MiddlePD.txt | H:\Surveys\H12438\Descriptive  
Report\Separates\IV\_Crossline\_Comparisons  
=====  
N,mean,stdev = 90651,0.077,0.044

### **Discussion**

Results of the analysis showed that the mean difference between ERS and TCARI tidal corrections was 7.7cm with a standard deviation of 4.4cm.

### **Recommendation**

Our recommendation is to utilize ERS VDatum for tidal corrections for this survey. The results of the analysis show that there are only minor differences between sounding data reduced to MLLW using TCARI and ERS VDatum. This difference is less than the uncertainty of the VDatum model (10.2cm).





**UNITED STATES DEPARTMENT OF COMMERCE**  
**National Oceanic and Atmospheric Administration**  
National Ocean Service  
Silver Spring, Maryland 20910

**TIDE NOTE FOR HYDROGRAPHIC SURVEY**

**DATE :** June 19, 2012

**HYDROGRAPHIC BRANCH:** Atlantic  
**HYDROGRAPHIC PROJECT:** OPR-B340-TJ-2012  
**HYDROGRAPHIC SHEET:** H12438

**LOCALITY:** 4 NM North of Herod Pt. Shoal, Long Island Sound, NY  
**TIME PERIOD:** May 09 - May 30, 2012

**TIDE STATION USED:** New Haven, CT 846-5705  
Lat. 41° 17.0' N Long. 72° 54.5' W  
**PLANE OF REFERENCE (MEAN LOWER LOW WATER):** 0.000 meters  
**HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE:** 1.946 meters

**TIDE STATION USED:** Bridgeport, CT 846-7150  
Lat. 41° 10.4' N Long. 73° 10.9' W  
**PLANE OF REFERENCE (MEAN LOWER LOW WATER):** 0.000 meters  
**HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE:** 2.129 meters

**Tide STATION USED:** Kings Point, NY 851-6945  
Lat. 40° 48.6' Long. 73° 45.9' W  
**PLANE OF REFERENCE (MEAN LOWER LOW WATER):** 0.000 meters  
**HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE:** 2.268 meters

**REMARKS: RECOMMENDED GRID**

Please use the TCARI grid "B340TJ2012.tc" as the final grid for project OPR-B340-TJ-2012, Registry No. H12438, during the time period between May 09 and May 30, 2012.

**Refer to attachments for grid information.**

**Note 1:** Provided time series data are tabulated in metric units (meters), relative to MLLW and on Greenwich Mean Time on the 1983-2001 National Tidal Datum Epoch (NTDE).

**HOVIS.GERALD.  
THOMAS.13658  
60250**

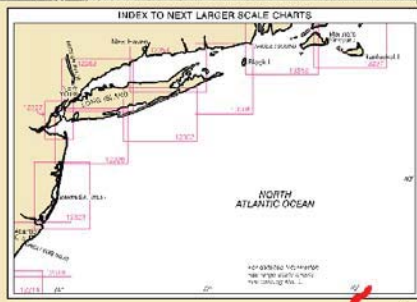
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CHIEF, PRODUCTS AND SERVICES BRANCH





COAST  
NEW YORK  
E FATHOM BANK

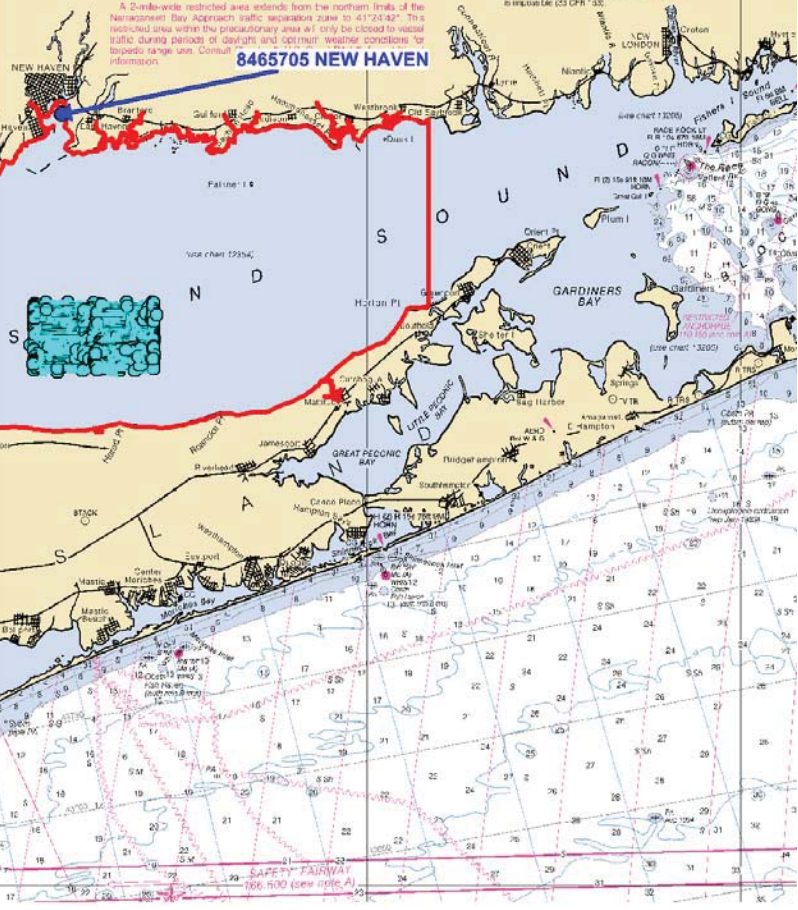
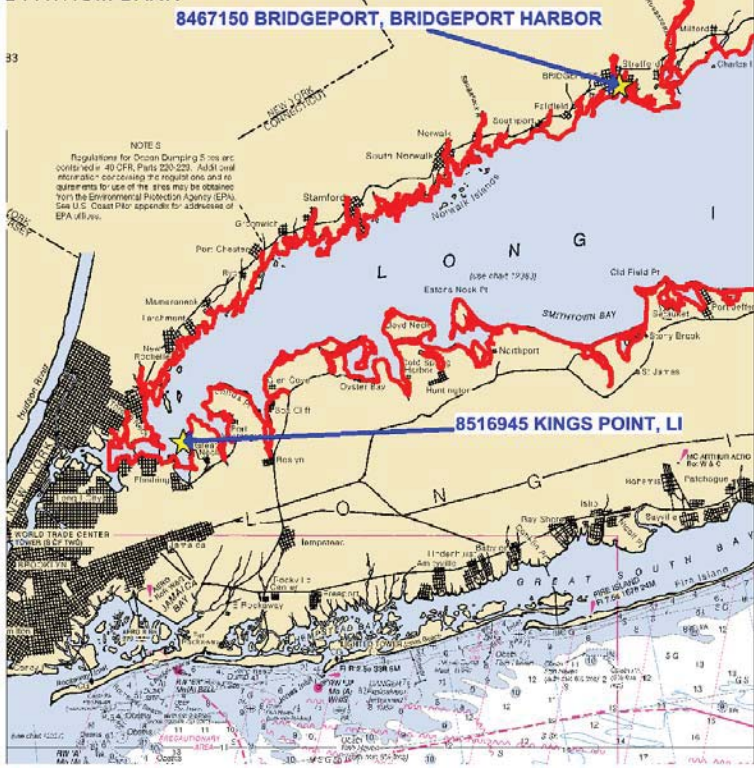


# Preliminary as Final TCARI grid for OPR-B340-TJ-2012, Registry No. H12438 4 NM North of Herod Pt. Shoal, Long Island Sound, NY

**NOTE E**  
TRAFFIC SEPARATION SCHEME  
One-way traffic lanes depicted on this chart are RECOMMENDED for use by vessels operating in accordance with the established traffic lanes, or vessels operating between the Bay and Buzzards Bay and one of the established traffic lanes within the precautionary area. A 2-mile-wide restricted area extends from the northern limits of the Narrowsville Bay Approach traffic separation zone to 41°25'42". This restricted area within the precautionary area is only to be closed to vessel traffic during periods of daylight and optimum weather conditions for torpedo range unit. Consult information.

**NOTE F**  
TORREDO RANGE  
A 2-mile-wide restricted area extends from the northern limits of the Narrowsville Bay Approach traffic separation zone to 41°25'42". This restricted area within the precautionary area is only to be closed to vessel traffic during periods of daylight and optimum weather conditions for torpedo range unit. Consult information.

**PRECAUTIONARY AREAS**  
Traffic within the Precautionary Areas may consist of vessels making new arrivals between operating in accordance with the established traffic lanes, or vessels operating between the Bay and Buzzards Bay and one of the established traffic lanes within the precautionary area. A 2-mile-wide restricted area extends from the northern limits of the Narrowsville Bay Approach traffic separation zone to 41°25'42". This restricted area within the precautionary area is only to be closed to vessel traffic during periods of daylight and optimum weather conditions for torpedo range unit. Consult information.



**NOTE S**  
Regulations for Ocean Dumping 5 are contained in 40 CFR, Parts 220-223. All oil and hazardous materials must be disposed of in accordance with the requirements for use of the area may be obtained from the Environmental Protection Agency (EPA) via the U.S. Coast Pilot appendix for approval of EPA VES.

WORLD TRADE CENTER  
POWER & LIGHT

SAFETY FAIRWAY  
186,500 (see note A)

APPENDIX II

SUPPLEMENTAL SURVEY RECORDS  
AND CORRESPONDENCE



UNITED STATES DEPARTMENT OF COMMERCE  
National Oceanic and Atmospheric Administration  
NATIONAL OCEAN SERVICE  
Office of Coast Survey  
Silver Spring, Maryland 20910-3282

July 25, 2012

MEMORANDUM FOR: CDR Larry Krepp, NOAA  
Commanding Officer, NOAA Ship *Thomas Jefferson*

FROM: Jeffrey Ferguson  
Chief, Hydrographic Surveys Division

SUBJECT: Vertical Datum Transformation Technique,  
OPR-B340-TJ-12, Long Island Sound, NY

Hydrographic survey H12438 is approved for vertical reduction to chart datum, Mean Lower Low Water (MLLW), using the NOAA Vertical Datum Transformation (VDatum) (<http://vdatum.noaa.gov>) derived separation (SEP) model provided on the project CD/DVD.

Approval of VDatum, in lieu of the NOAA Center for Operational Oceanographic Products and Services (CO-OPS) TCARI package as per the Project Instructions, is based on your recommendation and the review of comparison results you included in your memo from July 18, 2012, Subject "H12438 Interim Deliverables".

The results of the data analysis show that ellipsoidally referenced survey (ERS) techniques with VDatum used as the vertical datum reducer to MLLW in this area indicate a better internal consistency of the survey data and produces final sounding values that meet or exceed horizontal and vertical specifications for hydrographic surveys.

The comparison techniques are in line with the procedures that were developed and approved as part of the CSDL Ellipsoidally Referenced Survey (ERS) project. These procedures and deliverables were added to the April 2012 edition of the NOS Hydrographic Surveys Specifications and Deliverables Manual and Field Procedures Manual documents.

You shall include a description of your ERS processing procedures and the comparisons you conducted between ERS and traditional tides in the appropriate Descriptive Report (DR), Horizontal and Vertical Control Report and/or Data Acquisition and Processing Report.

This memo and your memo, shall be included in the supplemental correspondence Appendix of the DR.



APPENDIX III  
FEATURES REPORT

DtonS: NONE

AWOIS: NONE

WRECKS: ONE

MARITIME BOUNDARIES - NONE

# H12438 WRECKS

**Registry Number:** H12438

**State:** New York

**Locality:** Long Island Sound

**Sub-locality:** 4 NM North of Herod Pt. Shoal, NY

**Project Number:** OPR-B340-TJ-12

**Survey Date:** 05/09/2012 to 05/30/2012

## Charts Affected

Number	Edition	Date	Scale (RNC)	RNC Correction(s)*
12354	44th	05/01/2012	1:80,000 (12354_1)	USCG LNM: 1/29/2013 (2/12/2013) CHS NTM: None (11/30/2012) NGA NTM: 12/4/1999 (2/23/2013)
12300	47th	05/01/2008	1:400,000 (12300_1)	[L]NTM: ?
13006	34th	05/01/2007	1:675,000 (13006_1)	[L]NTM: ?
5161	13th	10/01/2003	1:1,058,400 (5161_1)	[L]NTM: ?
13003	49th	04/01/2007	1:1,200,000 (13003_1)	[L]NTM: ?

\* Correction(s) - source: last correction applied (last correction reviewed--"cleared date")

## Features

No.	Name	Feature Type	Survey Depth	Survey Latitude	Survey Longitude	AWOIS Item
1.1	94 foot non dangerous sunken Wreck	Wreck	28.70 m	41° 04' 26.0" N	072° 47' 33.7" W	---

## 1.1) 94 foot non dangerous sunken Wreck

### Survey Summary

**Survey Position:** 41° 04' 26.0" N, 072° 47' 33.7" W  
**Least Depth:** 28.70 m (= 94.15 ft = 15.692 fm = 15 fm 4.15 ft)  
**TPU ( $\pm 1.96\sigma$ ):** THU (TPEh) [None] ; TVU (TPEv) [None]  
**Timestamp:** 2012-151.00:00:00.000 (05/30/2012)  
**Dataset:** H12438\_Wreck.000  
**FOID:** 0\_ 0000043864 00001(FFFE0000AB580001)  
**Charts Affected:** 12354\_1, 12300\_1, 13006\_1, 5161\_1, 13003\_1

**Remarks:**

WRECKS/remrks: This is an uncharted wreck. This wreck was found with Reson 7125 MBES. Data was processed to the ellipsoid and reduced to MLLW using VDATUM.

### Feature Correlation

Source	Feature	Range	Azimuth	Status
H12438_Wreck.000	0_ 0000043864 00001	0.00	000.0	Primary

### Hydrographer Recommendations

Chart a non-dangerous wreck

**Cartographically-Rounded Depth (Affected Charts):**

94ft (12354\_1)  
 15fm (12300\_1, 13006\_1, 13003\_1)  
 29m (5161\_1)

### S-57 Data

**Geo object 1:** Wreck (WRECKS)  
**Attributes:** CATWRK - 1:non-dangerous wreck  
 EXPSOU - 2:shoaler than range of depth of surrounding depth area  
 NINFOM - Add wreck  
 QUASOU - 6:least depth known  
 SORDAT - 20120530



SORIND - US,US,graph,H12438

TECSOU - 3:found by multi-beam

VALSOU - 28.697 m

WATLEV - 3:always under water/submerged

## Office Notes

SAR: The area was ensonified with complete coverage MBES. The feature was verified to be real and hydrographically significant.

Compile: Concur. Add a non-dangerous sunken wreck with a least depth of 94 feet in the present survey position.

### Feature Images

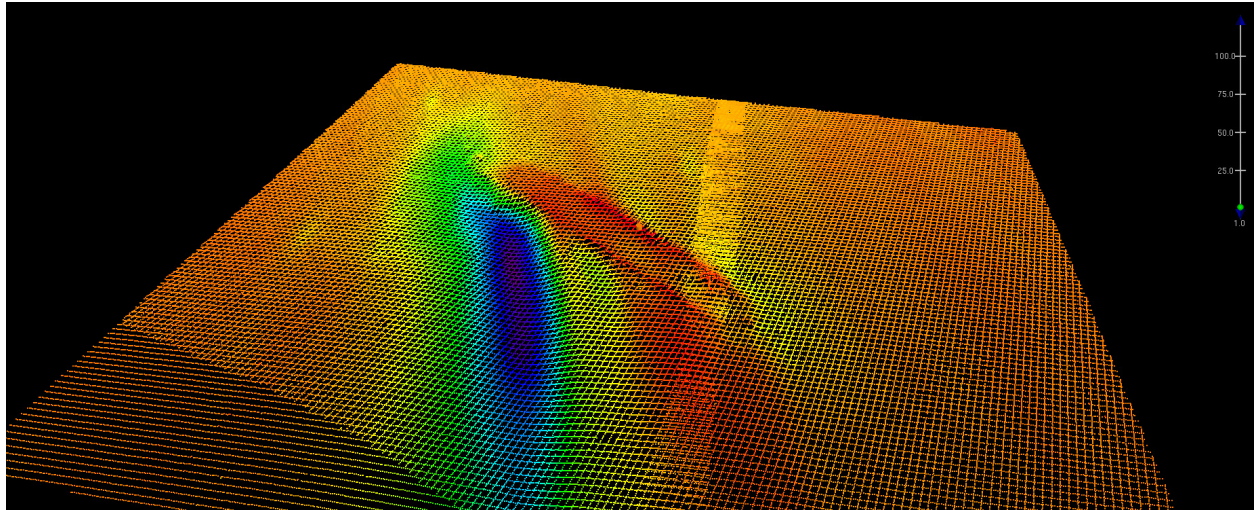


Figure 1.1.1

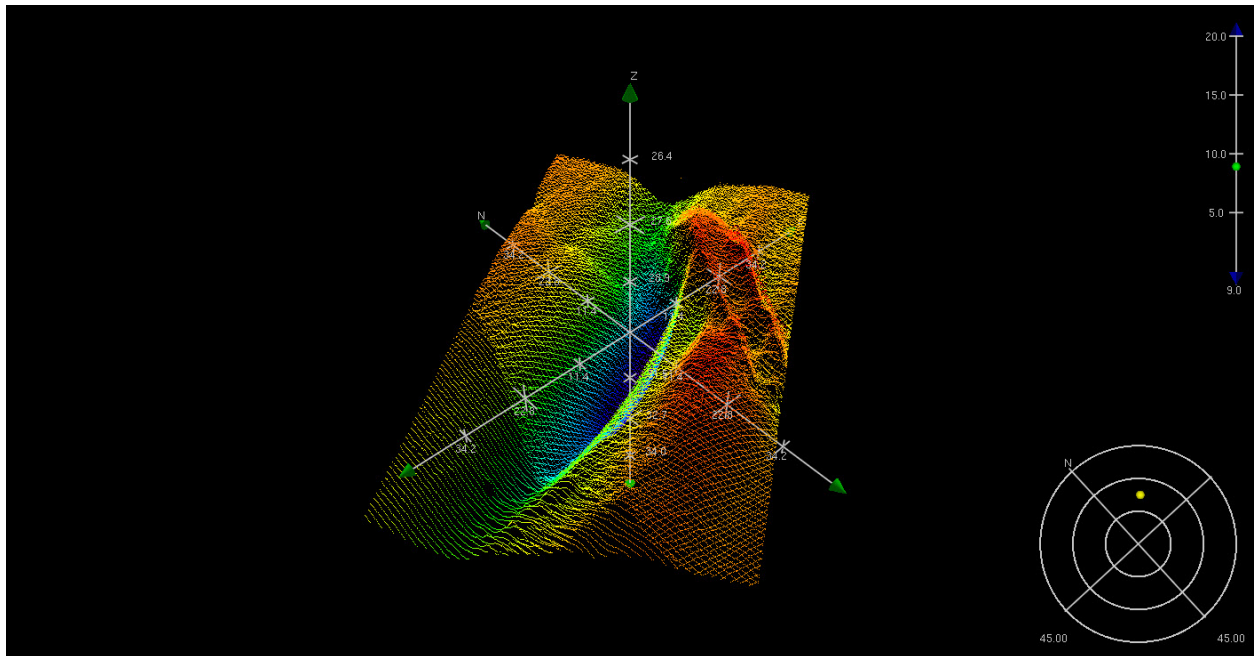
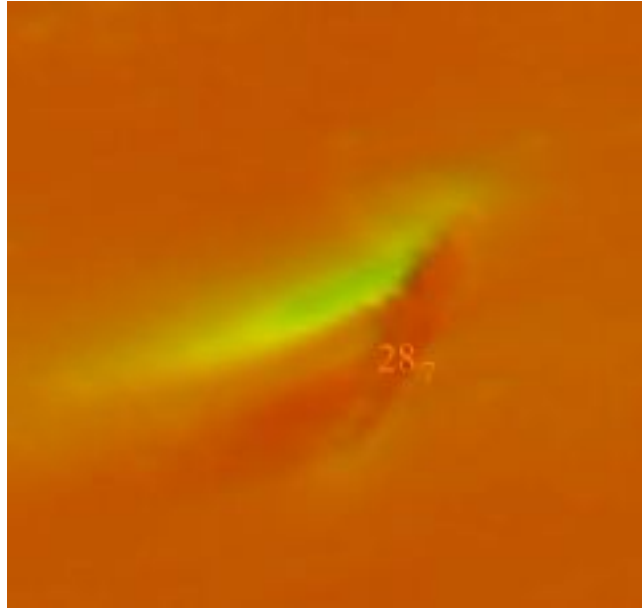


Figure 1.1.2



*Figure 1.1.3*

APPROVAL PAGE

H12438

Data meet or exceed current specifications as certified by the OCS survey acceptance review process. Descriptive Report and survey data except where noted are adequate to supersede prior surveys and nautical charts in the common area.

The following products will be sent to NGDC for archive

- H12438\_DR.pdf
- Collection of depth varied resolution BAGS
- Processed survey data and records
- H12438\_GeoImage.pdf

The survey evaluation and verification has been conducted according to current OCS Specifications, and the survey has been approved for dissemination and usage of updating NOAA's suite of nautical charts.

Approved: \_\_\_\_\_

**LT Abigail Higgins**  
Chief, Atlantic Hydrographic Branch