

H12411

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: H12411

LOCALITY

State: Connecticut

General Locality: Long Island Sound

Sub-locality: Approaches to Norwalk, CT

2012

CHIEF OF PARTY
CDR Lawrence T. Krepp

LIBRARY & ARCHIVES

Date:

HYDROGRAPHIC TITLE SHEET

H12411

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: **Connecticut**

General Locality: **Long Island Sound**

Sub-Locality: **Approaches to Norwalk, CT**

Scale: **10000**

Dates of Survey: **08/28/2012 to 09/27/2012**

Instructions Dated: **05/08/2012**

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

Field Unit: **NOAA Ship *Thomas Jefferson***

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

Soundings by: **Multibeam Echo Sounder**

Imagery by: **Multibeam Echo Sounder Backscatter**

Verification by: **Atlantic Hydrographic Branch**

Soundings Acquired in: **meters at Mean Lower Low Water**

Remarks:

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. Any revisions to the Descriptive Report (DR) generated during office processing are shown in bold red italic text. The processing branch maintains the DR as a field unit product, therefore, all information and recommendations within the body of the DR are considered preliminary unless otherwise noted. The final disposition of surveyed features is represented in the OCS nautical chart update products. All pertinent records for this survey, including the DR, are archived at the National Geophysical Data Center (NGDC) and can be retrieved via <http://www.ngdc.noaa.gov/>.

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Descriptive Report to Accompany Survey H12411

Project: OPR-B340-TJ-12

Locality: Long Island Sound

Sublocality: Approaches to Norwalk, CT

Scale: 1:10000

August 2012 - September 2012

NOAA Ship *Thomas Jefferson*

Chief of Party: CDR Lawrence T. Krepp

A. Area Surveyed

Hydrographic survey registry number H12411 covers an area of approximately 9.6 square nautical miles, including the approaches to and entrance channel of Norwalk, Connecticut. Coverage requirements, as per Hydrographic Survey Letter Instructions OPR-B340-TJ-12, Long Island Sound NY, Change 1; dated May 8, 2012, were met using object detection and 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
41.0908333333 N	41.0255 N
73.3526666667 W	73.459 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

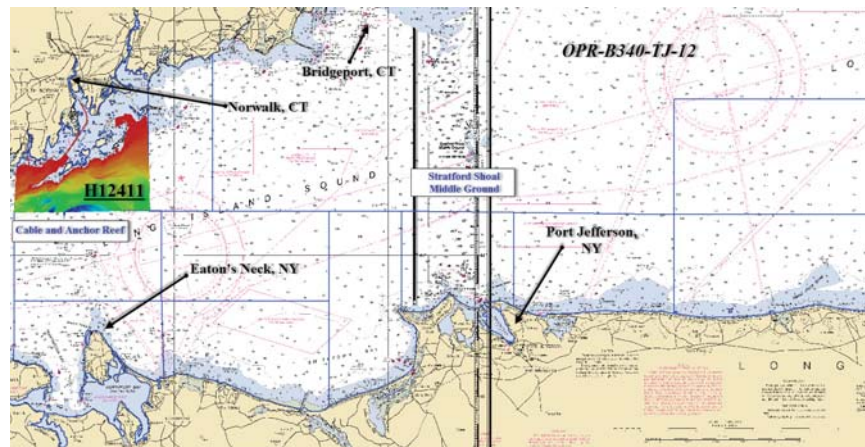


Figure 1: H12411 Survey Limits

A few holidays exist in H12411. Most are the result of not completing the surface from the surveyed 12-foot contour to the rest of the collected data. The rest are from poor vessel steering or a delay in sonar range adjustment with varying water depth.

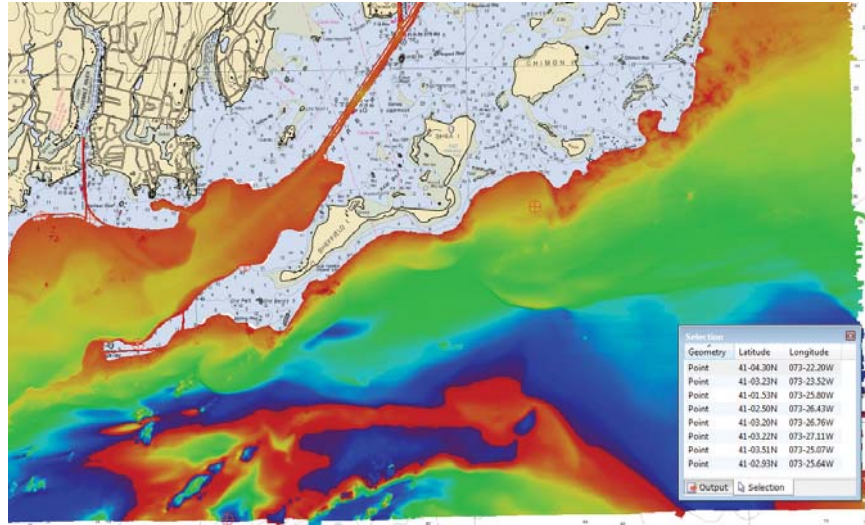


Figure 2: H12411 Holidays

A.5 Survey Statistics

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

	HULL ID	S-222	3101	3102	Total
LNM	SBES Mainscheme	0	0	0	0
	MBES Mainscheme	235.55	234.53	304.95	775.03
	Lidar Mainscheme	0	0	0	0
	SSS Mainscheme	0	0	0	0
	SBES/MBES Combo Mainscheme	0	0	0	0
	SBES/SSS Combo Mainscheme	0	0	0	0
	MBES/SSS Combo Mainscheme	0	0	0	0
	SBES/MBES Combo Crosslines	11.05	2.51	17.75	31.31
	Lidar Crosslines	0	0	0	0
	Number of Bottom Samples				16
Number of DPs				0	
Number of Items Items Investigated by Dive Ops				0	
Total Number of SNM				9.6	

Table 2: Hydrographic Survey Statistics

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

<i>Survey Dates</i>
08/28/2012
08/29/2012
08/30/2012
09/05/2012
09/06/2012
09/07/2012
09/08/2012
09/09/2012
09/10/2012
09/11/2012
09/12/2012
09/13/2012
09/18/2012
09/19/2012
09/20/2012
09/27/2012

Table 3: Dates of Hydrography

A.6 Shoreline

Of the 218 assigned features within the limits of H12411, 210 of them were in areas too shallow to be safely developed by the TJ's survey vessels. These features were not addressed.

A.7 Bottom Samples

Twenty bottom samples were assigned for this survey as per the OPR-B340-TJ-12_Updated_Bottom_Samples.hob file provided by AHB, dated 24 May 2012. Only sixteen samples were collected. The four samples that were not collected were in the northeastern section of the survey area.

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>3102</i>	<i>3101</i>	<i>S-222</i>
LOA	31 feet	31 feet	208 feet
Draft	5 feet	5 feet	14 feet

Table 4: Vessels Used

S-222, HSL 3101, and HSL 3102 collected multibeam, sound velocity, and attitude data. HSL 3102 collected bottom samples.

B.1.2 Equipment

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

Manufacturer	Model	Type
Reson	7125 SV1	MBES
Reson	7125 ROV	MBES
Applanix	POS/MV	Positioning and Attitude System
Seabird	SBE 19+	Conductivity, Temperature and Depth Sensor
Brooke Ocean	MVP 100	Sound Speed System

Table 5: Major Systems Used

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

B.2 Quality Control

B.2.1 Crosslines

MBES crosslines totaling 31.3 LNM, approximately 4.1% of mainscheme, were acquired during this survey. A difference surface was created for crosslines and mainscheme then analyzed. Of 590,567 nodes, 590,445 of them agreed within one meter. The depth range for this surface ranged from -16.433 meters to 4.749 meters. The mean was -0.157 meters, and the standard deviation was 0.148 meters. As per the email dated 10 Sept 2009 from AHB in Appendix V, 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.

B.2.2 Uncertainty

The following survey specific parameters were used for this survey:

Measured	Zoning
0.102meters	0.00meters
0meters	0meters

Table 6: Survey Specific Tide TPU Values

Hull ID	Measured - CTD	Measured - MVP	Surface
3102	4meters/second		0.2meters/second
3101	4meters/second		0.2meters/second
S-222		1meters/second	0.2meters/second

Table 7: Survey Specific Sound Speed TPU Values

The values in the first row of the table are the values that were used for all ERS processing. This value was the uncertainty of the associated VDatum Separation model. The second row of data were used for all TCARI lines. See spreadsheet H12411_Lines_with_Problems.xlsx for a listing of lines that used TCARI.

Total Propagated Uncertainty was evaluated to ensure compliance with NOAA's Hydrographic Survey Specification and Deliverables (HSSD). First the maximum allowable uncertainty for each node was calculated. Second the actual uncertainty for each node was subtracted from the maximum allowed uncertainty. The resulting 'IHOness' layer was filtered to show any areas where actual uncertainty exceeded the maximum allowed uncertainty. For both the 50cm grid and the 2m grid submitted for H12411, 100% were within IHO Order 1 uncertainty.

A density compliance review was conducted for H12411 by computing statistics for the grids in HIPS. For both the 50cm and 2m grids, greater than 95% of all nodes had 5 or more soundings.

B.2.3 Junctions

Two contemporary junction surveys were acquired by the TJ during the 2012 field season. A difference surface was created and analyzed for both junctions in CARIS Base Editor. A prior survey, H10565, was analyzed with soundings in a .hob file provided by AHB.

The following junctions were made with this survey:

Registry Number	Scale	Year	Field Unit	Relative Location
H10565	1:10000	1994	Atlantic Hydrographic Party	W
H12489	1:10000	2012	NOAA Ship THOMAS JEFFERSON	E
H12412	1:10000	2012	NOAA Ship THOMAS JEFFERSON	S

Table 8: Junctioning Surveys

H10565

The soundings of the junction between H10565 and H12411 generally agree within 0.5 meters.

H12489

The difference between H12411 and H12489 ranged from -3.886 meters to 0.412 meters. The mean was 0.011 meters, and the standard deviation was 0.065 meters. Out of 230,337 nodes, 230,333 agreed within one meter.

H12412

The difference between H12411 and H12412 ranged from -2.327 meters to 4.728 meters. The mean was -0.015 meters, and the standard deviation was 0.14 meters. Out of 350,014 nodes, 349,305 agreed within one meter.

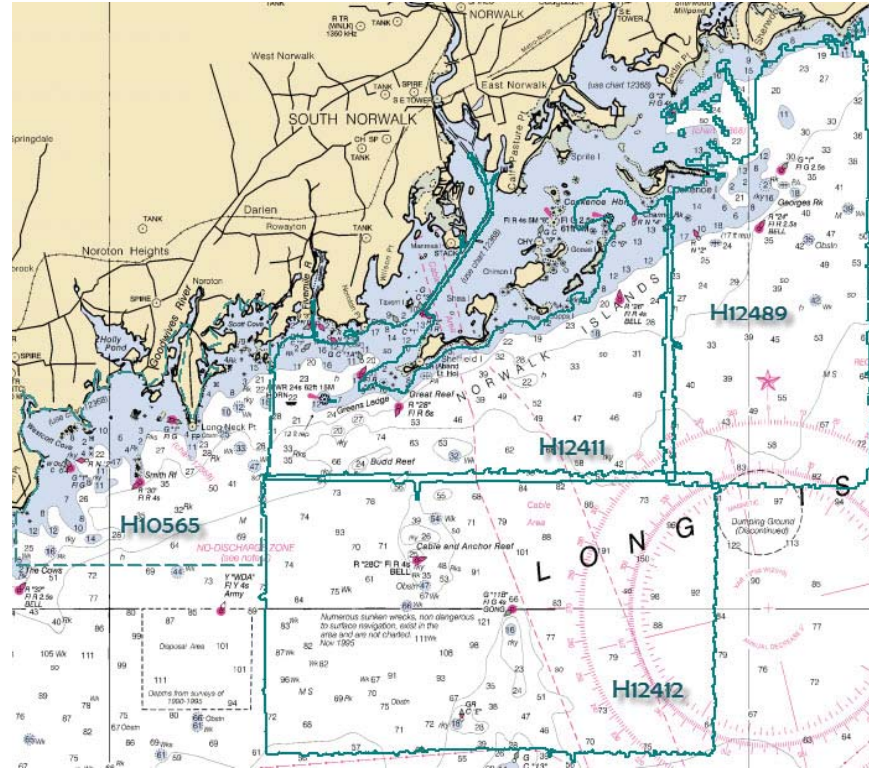


Figure 3: H12411 Junction Surveys

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 every thirty minutes from S-222 using the ship's Moving Vessel Profiler. On 3101 and 3102, casts were taken at least twice per day using the Seabird Seacat 19+ CTD.

Three SVP casts lie more than 100 meters from the survey area. SVP issues were not observed when these casts were applied.

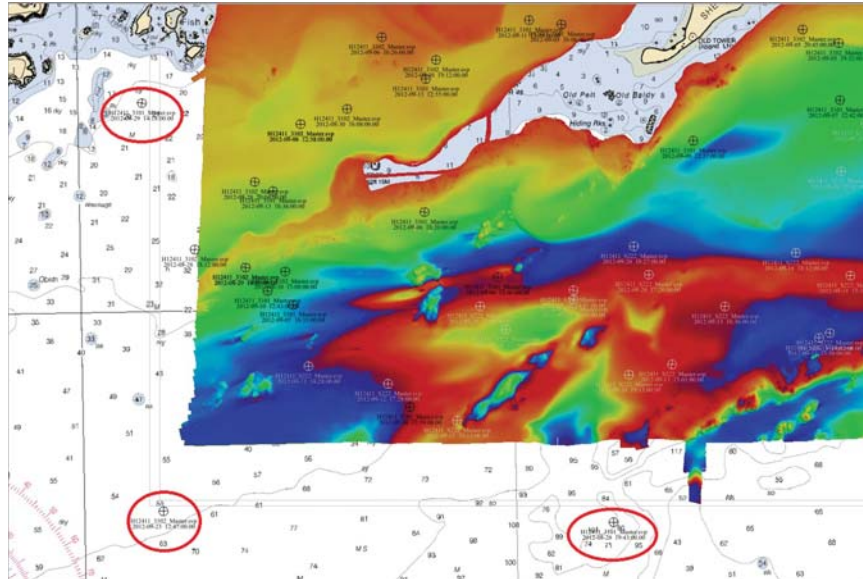


Figure 4: H12411 Casts Outside Survey Area

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

Several lines were reduced using MLLW and several had to have SBETs recomputed using different techniques and different control stations. See H12411_Lines_with_Problems.xlsx

B.3.2 Calibrations

All sounding systems were calibrated as detailed in the DAPR.

B.4 Backscatter

Backscatter was logged as a 7k 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: V5.2

B.5.2 Surfaces

The following CARIS surfaces were submitted to the Processing Branch:

Surface Name	Surface Type	Resolution	Depth Range	Surface Parameter	Purpose
H12411_CUBE_MLLW_2m_Final	CUBE	2 meters	18 meters - 37.76 meters	NOAA_2m	Complete MBES
H12411_CUBE_MLLW_50cm_Final	CUBE	50 centimeters	0.69 meters - 20 meters	NOAA_0.5m	Object Detection
H12411_CUBE_MLLW_2m_Final_Combined	CUBE	2 meters	0.69 meters - 37.76 meters	NOAA_0.5m	Complete MBES

Table 9: CARIS Surfaces

This survey was processed using the Combined Uncertainty and Bathymetry Estimator (CUBE) algorithm. Per section 5.2.2.1 of the NOAA HSSD Manual (2012 ed), all MBES data was gridded according to depth: 0.5m resolution for depths ranging from 0-20m, and 2m for depths 19m and greater.

B.5.3 Insignificant Vertical Offsets

A vertical offset occurs throughout the sheet. It is most pronounced on S-222 DN 263, where the offset is approximately 15-20 centimeters. The offset is within IHO Order 1 specifications.

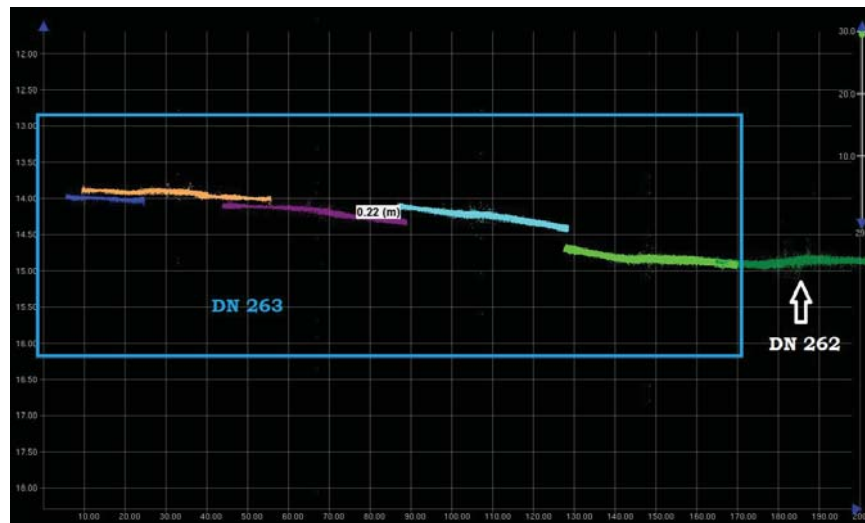


Figure 5: Example of offset observed on DN 263

B.5.4 ERS Surfaces

The survey deliverables do not include surfaces with data reduced to the ellipsoid.

B.5.5 S-222 Improper Beam Forming

An issue with the ship's 7125 ROV data was first discovered during the course of review of H12489. Processed data present with an unusual signature (Figure 6). Initially, it appears as a roll offset over a sand wave area, however the fact that every line presents with a frown to one side and a smile to the other makes that possibility unrealistic. To determine if the data was caused by a failure in the HIPS processing, data was processed within Hypack. Data processed through Hypack also showed the same characteristic. To confirm that this signature was within the raw data, data were processed within Excel assuming no refraction. Data showed the same signature within Excel (Figure 7). Based on this anecdotal evidence, it appears that beam forming was not being performed properly within the ship's 7125 ROV. This characteristic was not seen on other surveys and it was not discovered during the course of acquisition. A look at the data shows that, in general, gaps between lines caused by this improper beam forming did not exceed 15cm and the surface does not present with "stair steps" even on higher exaggeration.

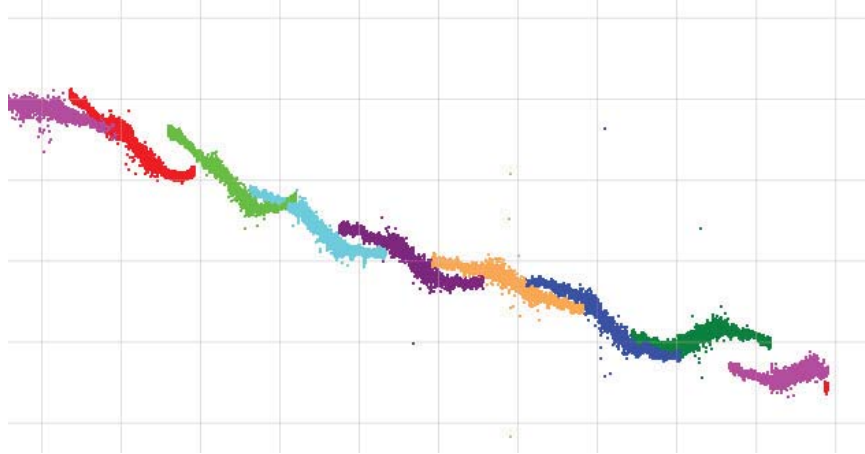


Figure 6: S222 7125 Processed Data

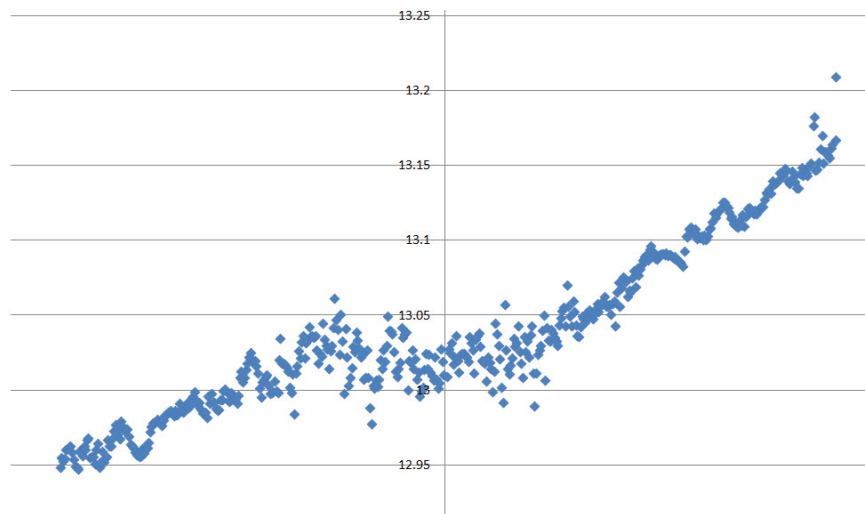


Figure 7: Excel Processed Data

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.

Standard Vertical Control Methods Used:

TCARI

The following National Water Level Observation Network (NWLON) stations served as datum control for this survey:

Station Name	Station ID
Kings Point, NY	8516945
Bridgeport, CT	8467150
New Haven, CT	8465705

Table 10: NWLON Tide Stations

File Name	Status
8516945.tid	Final Approved
8467150.tid	Final Approved
8465705.tid	Final Approved

Table 11: Water Level Files (.tid)

File Name	Status
B340TJ2012_Rev.tc	Final

Table 12: Tide Correctors (.zdf or .tc)

A request for final approved tides was sent to N/OPS1 on 10/01/2012. The final tide note was received on 10/04/2012.

All data have TCARI tides calculated using Verified tides and final TCARI gridding.

Non-Standard Vertical Control Methods Used:

VDatum

Ellipsoid to Chart Datum Separation File:

2012_B340_VDatum_Ellip_MLLW.xyz

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. The majority of bathymetric 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. Line 243_2047 was the only line not processed using ERS.

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
Single Base

The real-time GPS navigation data was overwritten by post-processed SBET data using Smart Base.

The following CORS Stations were used for horizontal control:

HVCR Site ID	Base Station ID
LAMT	Palisades, NY
CTGU	Guilford, CT
NYBR	Brooklyn Pier, Brooklyn, NY
NYQN	Queens, NY
NYCI	Central Islip, NY
ZNY1	New York WAAS 1, New York, NY
MOR6	Moriches 6, East Moriches, NY
NYRH	Riverhead, NY
CTDA	Darien, CT
RVDI	Rocco V. D'Andrea Memorial GPS Station, Riverside, CT

Table 13: CORS Base Stations

PPP was the best solution for a few lines within this survey. Lines were evaluated on a one-by-one basis and reduced using PPP if it turned out to be the best solution (placed the line in line with surrounding lines).

Moriches was broadcasting on reduced power during acquisition for this survey.

The following DGPS Stations were used for horizontal control:

DGPS Stations
Moriches, NY (293 kHz)
Acushnet, MA (306 kHz)

Table 14: 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	LNLM Date	NM Date
12368	1:20000	27	06/2006	12/21/2012	12/21/2012

Table 15: Largest Scale Raster Charts

12368

Charted data is from surveys conducted between 1900 and 1939 and this is evidenced by the changes in the chart. Acquired data generally agree with charted soundings within 3 feet. A few notable exceptions occur throughout the sheet. For example, in the eastern section of the survey sheet, there are three areas where the collected soundings are about 4-5 feet deeper than those charted. Other exceptions are discussed in D.1.7.

Some shifting occurred around the charted 12-foot curve near Sheffield Harbor and southwest of Sheffield Island (Figure 9).

The surveyed 60-foot contour near the charted 32-foot wreck in the south-central section of the survey extends approximately 260 meters to the southwest of the charted contour (Figure 10).

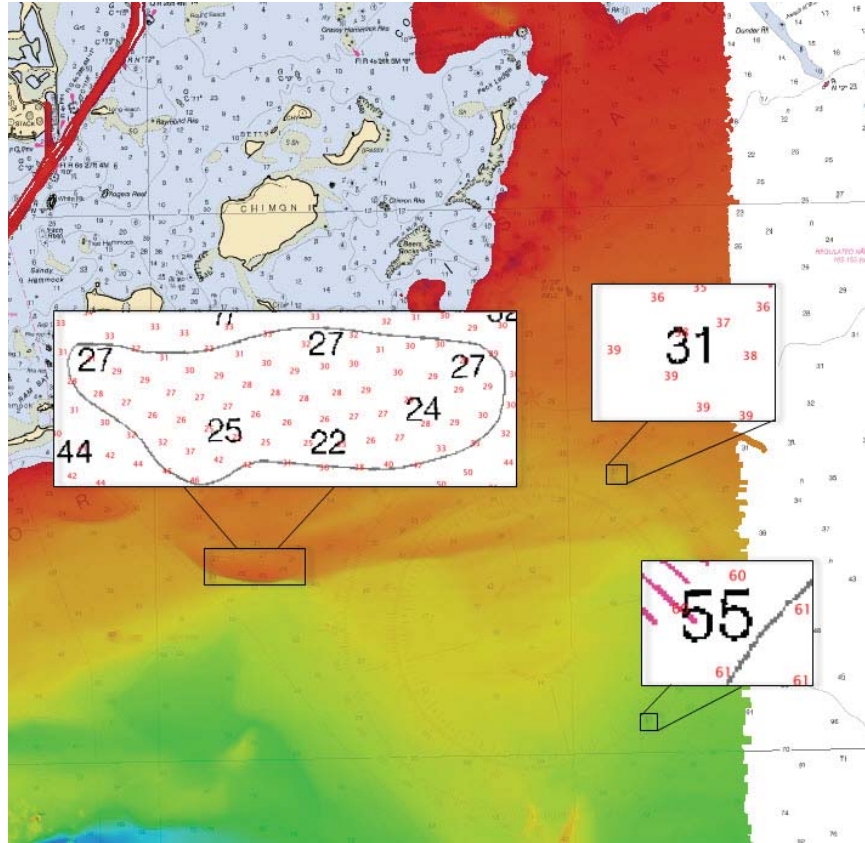


Figure 8: Eastern section of H12411 with three areas of deepening

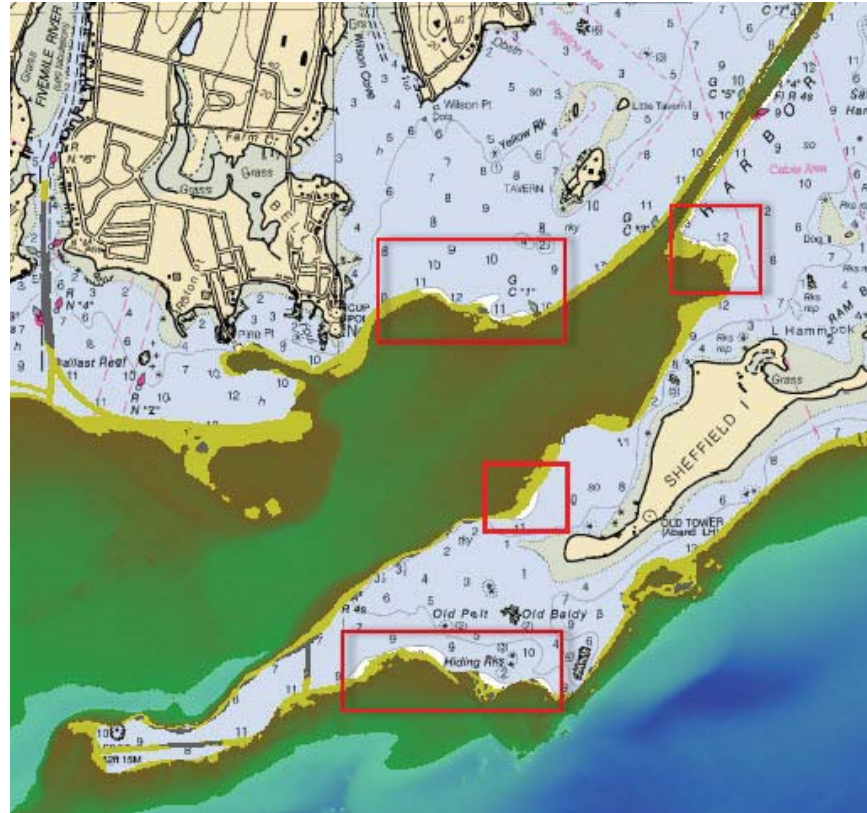


Figure 9: Shift in the 12-foot contour near Sheffield Island. Areas < 4 meters are shown in yellow.

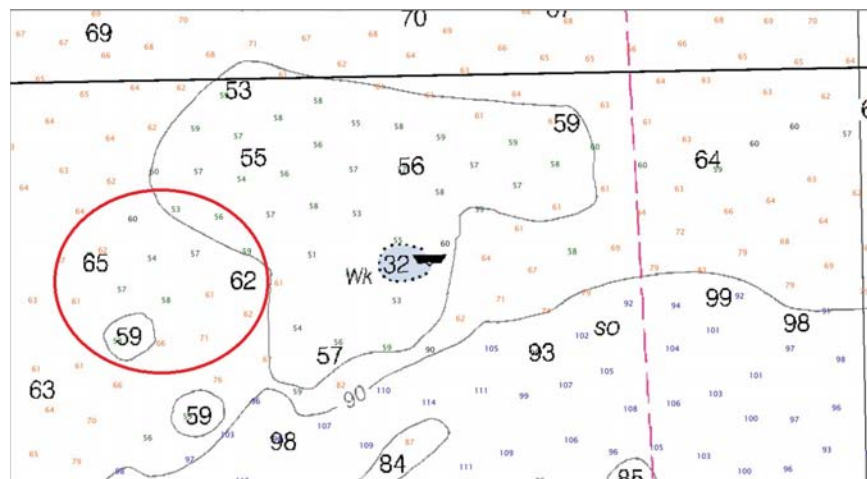


Figure 10: 60-foot contour extending to the southwest.

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?
US5CN11M	1:20000	22	07/11/2012	07/11/2012	NO

Table 16: Largest Scale ENC's

US5CN11M

Collected data generally agree with charted soundings within 3 feet. The exceptions are usually deeper as on the raster chart.

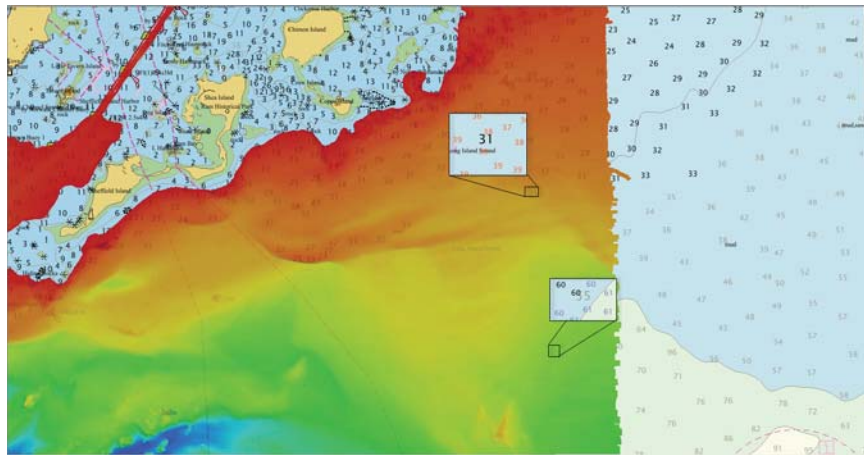


Figure 11: Eastern section of survey with ENC

D.1.3 AWOIS Items

Number of AWOIS Items Addressed: 3

Number of AWOIS Items Not Addressed: 5

Of the 8 assigned AWOIS items for H12411, five of them were in areas too shallow to be safely developed. See Final Feature File for a discussion of those AWOIS items that were investigated.

D.1.4 Charted Features

All charted features containing the label PA, ED, PD, or Rep for this survey were specifically assigned as AWOIS items.

D.1.5 Uncharted Features

59 uncharted features were found in H12411. See Final Feature File for discussion. Of those, 39 are rocky seabed areas that were not previously identified.

D.1.6 Dangers to Navigation

Seven DTONs were found during this survey. Danger to Navigation Reports are included in Appendix I of this report.

D.1.7 Shoal and Hazardous Features

There is a large shoal charted in the southern section of H12411 as "Budd Reef." The charted 30 and 60 foot contours extend beyond the surveyed 30 and 60 foot contours (Figure 12). The surveyed least depth near the charted 48-foot sounding of Budd Reef is approximately 43 feet (See Figure 13). West of Budd Reef, there is a 67-foot sounding; however, the data collected in this area are approximately 10 feet shallower (See Figure 14).

South of Copsps Island, there a significant area outside the 18-foot contour with collected soundings shoaler than 18 feet; the least depth here is 13 feet (Figure 15).

There are three charted shoals in Sheffield Harbor that were not found during the survey. Near the Pine Pt ruins, there is a deeper area charted within the 12-foot contour; near the charted 27-foot sounding, the least depth is 14 feet (Figure 15).

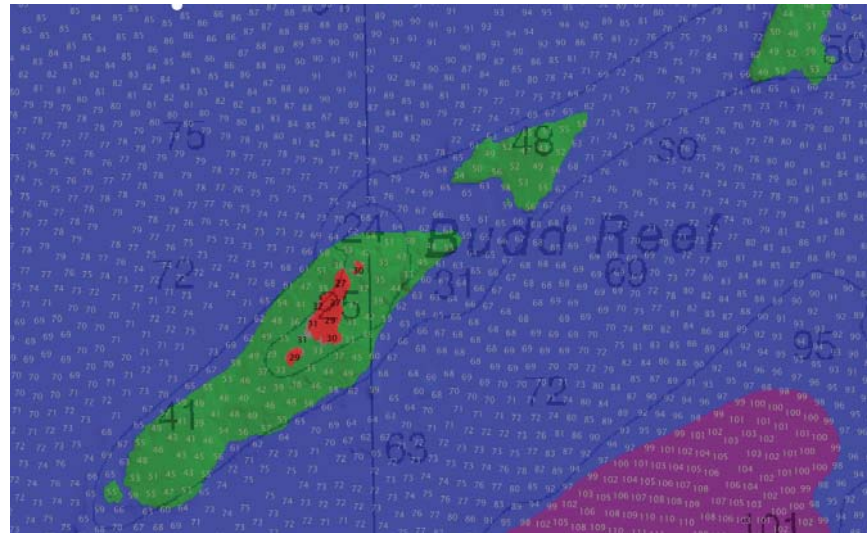


Figure 12: Budd Reef. 30-foot contour is shown in red. 60-foot contour is shown in green.

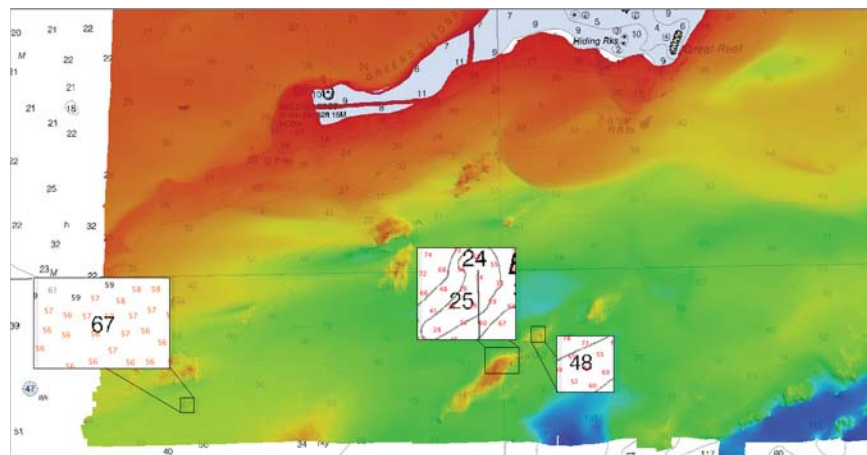


Figure 13: SW Chart Comparison

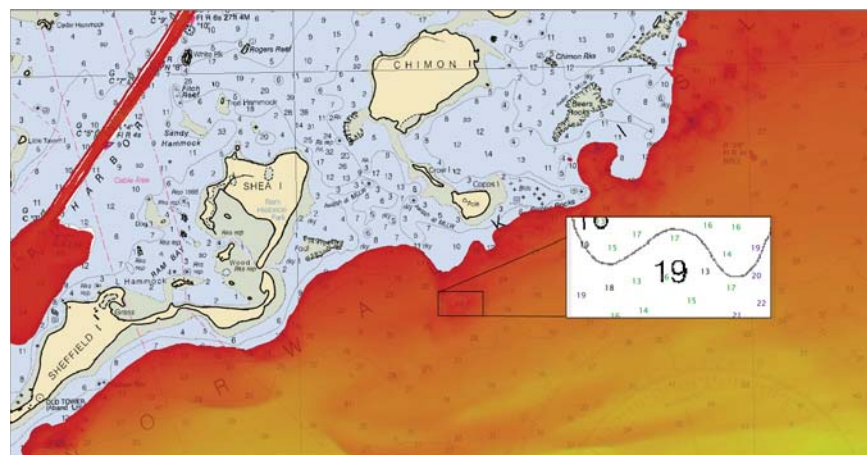


Figure 14: Shoaling south of Copps Island

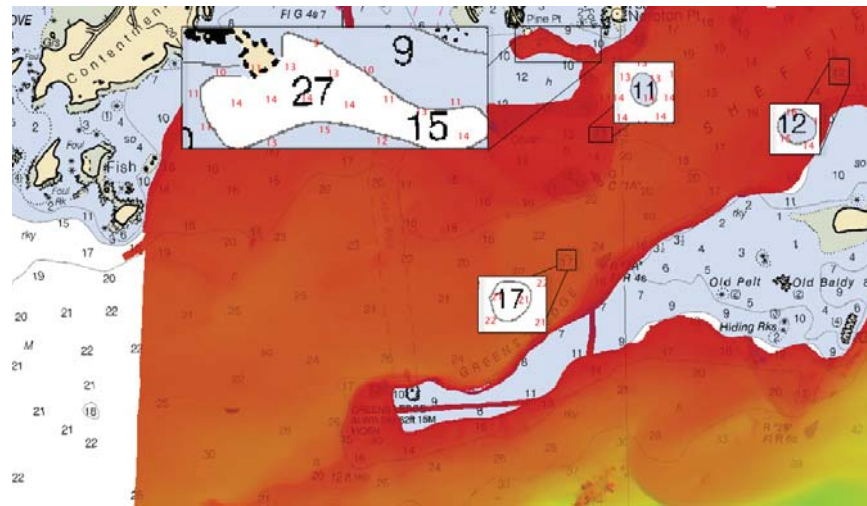


Figure 15: NW Chart Comparison

D.1.8 Channels

Norwalk Harbor Entrance Channel, which is federally maintained, was investigated en route to a portion of the harbor channel which is not maintained (see figure 14). No shoaling below the controlling depths of the federally maintained channel was observed. In the portion of the channel which is not federally maintained, acquired soundings generally agree with those charted within 0.5 meters.

A portion of Fivemile River was also investigated during the survey. No depths shallower than the controlling depth of the channel were found.



Figure 16: Norwalk Harbor Entrance Channel. The portion of the channel which is not maintained by USACE is shown in red.

D.2 Additional Results

D.2.1 Shoreline

The shoreline investigation requirements stated in the Project Instructions include verification of features inshore of the NALL. These features were not developed by the field unit because it was deemed unsafe.

D.2.2 Prior Surveys

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

D.2.3 Aids to Navigation

Greens Ledge Light is charted on the RNC approximately 15 meters southwest of its position on the raster chart (12368). Reconnaissance SSS data suggest the light is more accurately portrayed on the ENC.

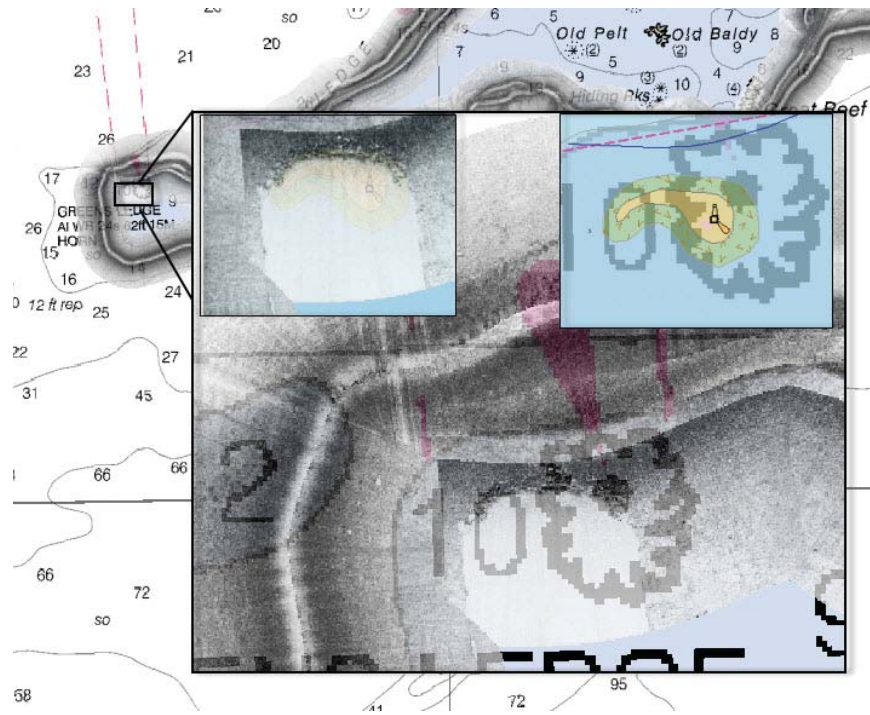


Figure 17: H12411: Greens Ledge with recon SSS data showing true location of light.

D.2.4 Overhead Features

Overhead features do not exist for this survey.

D.2.5 Submarine Features

A total of 8 cable cutouts can be seen south of Sheffield Island. Of those 8, three are visible over the entire extent of the sheet. These cables lie inside the charted cable area.

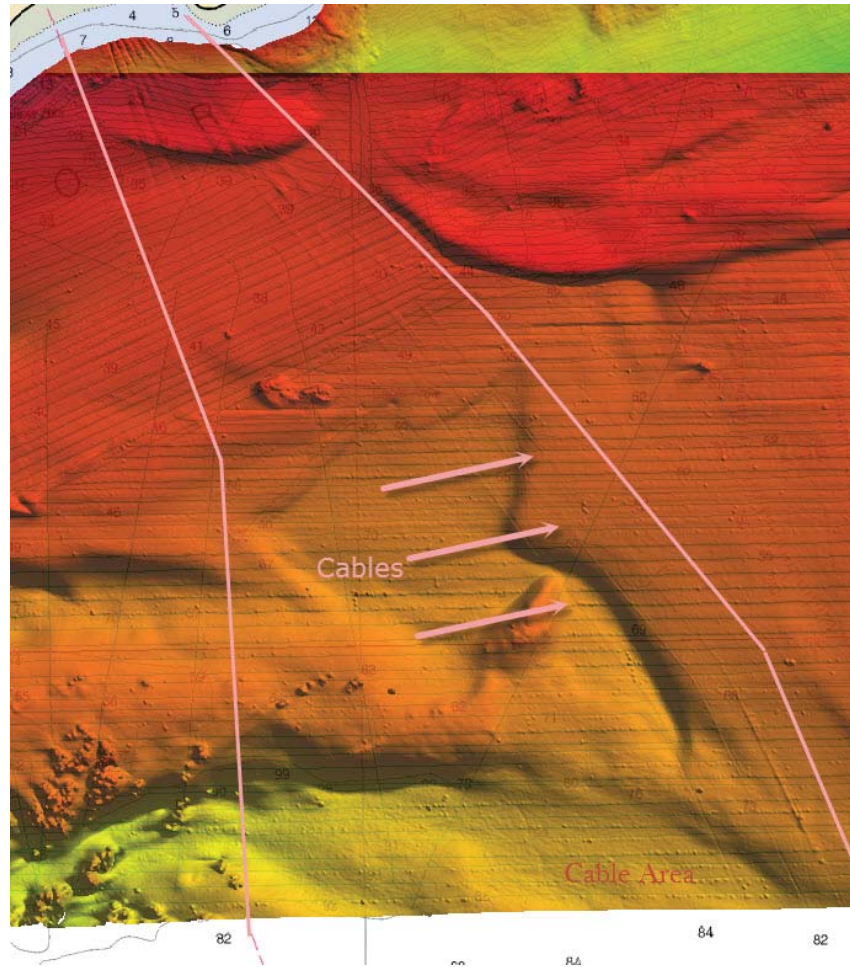


Figure 18: H12411 Cable Area

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

A number of hard reefs were discovered during this survey that are not currently charted or that are charted as individual rocks. These reefs are primarily seen on the SW of the sheet. All of these uncharted areas were included in the Final Feature File as rocky seabed areas.

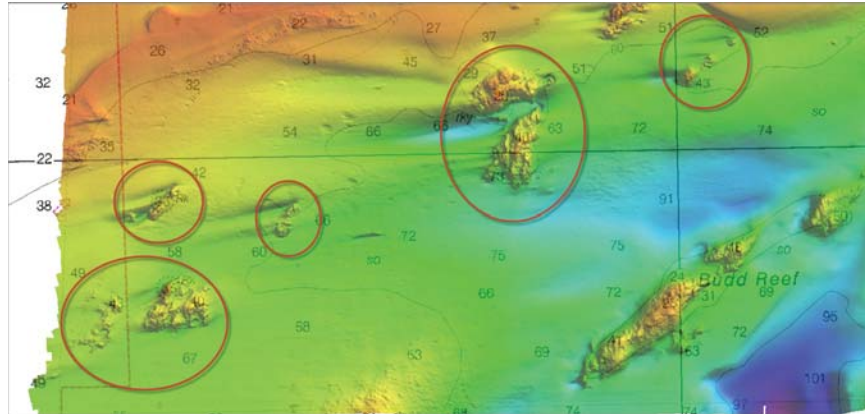


Figure 19: Uncharted reefs

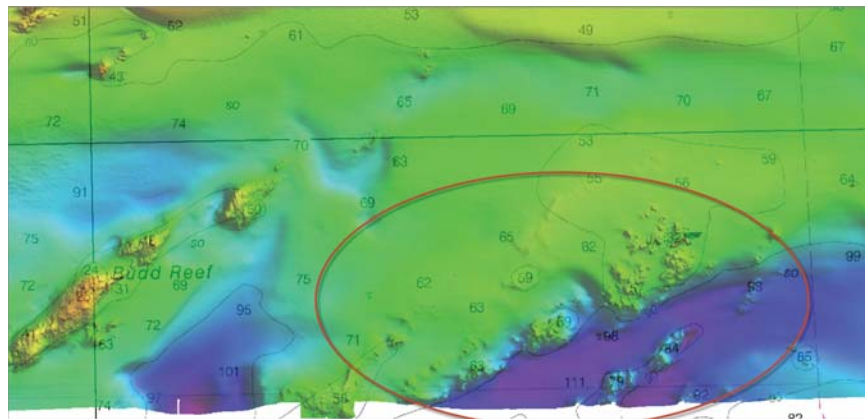


Figure 20: Uncharted reefs

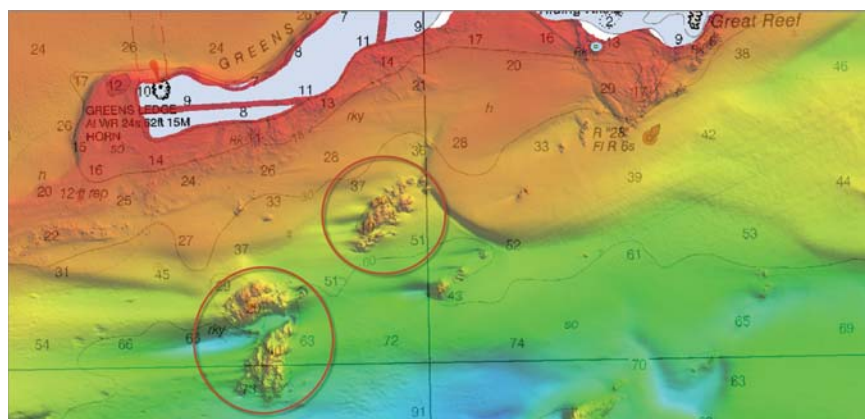


Figure 21: Uncharted reefs

D.2 Construction and Dredging

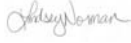


There is no present or planned construction or dredging within the survey limits.

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.

Approver Name	Approver Title	Approval Date	Signature
ENS Lindsey Norman	Sheet Manager	03/20/2013	
LT William Winner	Field Operations Officer	04/19/2013	
CDR Lawrence Krepp	Commanding Officer	04/20/2013	

F. Table of Acronyms

Acronym	Definition
AFF	Assigned Features File
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	Continually 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
ERZT	Ellipsoidally Referenced Zoned Tides
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
HSSDM	Hydrographic Survey Specifications and Deliverables Manual

Acronym	Definition
HSTP	Hydrographic Systems Technology Programs
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	Local Notice to Mariners
LNM	Linear Nautical Miles
MCD	Marine Chart Division
MHW	Mean High Water
MLLW	Mean Lower Low Water
NAD 83	North American Datum of 1983
NAIP	National Agriculture and Imagery Program
NALL	Navigable Area Limit Line
NM	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
PST	Physical Science Technician
RNC	Raster Navigational Chart
RTK	Real Time Kinematic
SBES	Singlebeam Echosounder
SBET	Smooth Best Estimate and Trajectory
SNM	Square Nautical Miles
SSS	Side Scan Sonar
ST	Survey Technician
SVP	Sound Velocity Profiler
TCARI	Tidal Constituent And Residual Interpolation
TPU	Total Propagated Error
TPU	Topside Processing Unit
USACE	United States Army Corps of Engineers
USCG	United States Coast Guard
UTM	Universal Transverse Mercator
XO	Executive Officer
ZDA	Global Positioning System timing message
ZDF	Zone Definition File

APPENDIX I
TIDES AND WATER LEVELS



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NOAA Ship THOMAS JEFFERSON (MOA-TJ)
439 West York St
Norfolk, VA 23510-1145

October 01, 2012

MEMORANDUM FOR: Gerald Hovis, Chief, Products and Services Branch, N/OPS3

FROM: CDR Lawrence T. Krepp, NOAA Ship THOMAS JEFFERSON (MOA-TJ)

SUBJECT: Request for Approved Tides/Water Levels

Please provide the following data:

1. Tide Note
2. Final TCARI grid
3. Six Minute Water Level data (Co-ops web site)

Transmit data to the following:

NOAA Ship THOMAS JEFFERSON (MOA-TJ)
439 West York St
Norfolk, VA 23510-1145

These data are required for the processing of the following hydrographic survey:

Project No.: OPR-B340-TJ-12
Registry No.: H12411
State: Connecticut
Locality: Long Island Sound
Sublocality: Approaches to Norwalk, CT

Attachments containing:

- 1) an Abstract of Times of Hydrography,
- 2) digital MID MIF files of the track lines from Pydro

cc: MOA-TJ



Year_DOY	Min Time	Max Time
2012_241	18:31:58	20:31:41
2012_242	14:22:51	19:23:57
2012_243	13:14:36	20:59:45
2012_249	13:01:06	21:02:44
2012_250	12:47:42	21:14:31
2012_251	12:58:04	21:02:03
2012_252	12:36:01	19:12:02
2012_253	12:53:11	20:58:14
2012_254	12:23:31	20:13:59
2012_255	13:32:11	21:22:41
2012_256	16:03:08	21:36:23
2012_257	12:29:16	23:31:06
2012_262	12:16:47	22:06:38
2012_263	12:54:38	21:45:56
2012_264	12:34:55	20:54:32
2012_267	13:09:29	18:54:24
2012_271	13:06:57	14:07:54



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

TIDE NOTE FOR HYDROGRAPHIC SURVEY

DATE : October 04, 2012

HYDROGRAPHIC BRANCH: Atlantic
HYDROGRAPHIC PROJECT: OPR-B340-TJ-2012
HYDROGRAPHIC SHEET: H12411

LOCALITY: Approaches to Norwalk, Long Island Sound, CT
TIME PERIOD: August 28 - September 27, 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_Rev.tc" as the final grid for project OPR-B340-TJ-2012, Registry No. H12411, during the time period between August 28 and September 27, 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.1365
860250

Digitally signed by
HOVIS.GERALD.THOMAS.1365860250
DN: c=US, o=U.S. Government,
ou=DoD, ou=PKI, ou=OTHER,
cn=HOVIS.GERALD.THOMAS.1365860
250
Date: 2012.10.11 08:27:15 -04'00'

CHIEF, PRODUCTS AND SERVICES BRANCH



APPENDIX II

SUPPLEMENTAL SURVEY RECORDS AND CORRESPONDENCE



8 November 2012

MEMORANDUM TO: Jeffrey Ferguson
Chief, Hydrographic Surveys Division

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

SUBJECT: H12411 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 H12411 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

H12411_Xlines_ERS_Stats_TJ_3102_Reson7125_400KHZ_MiddlePD.txt |
H:\Surveys\H12411\Descriptive Report\Separates\IV_Crossline_Comparisons
- (minus)
H12411_Xlines_TCARI_Stats_TJ_3102_Reson7125_400KHZ_MiddlePD.txt |
H:\Surveys\H12411\Descriptive Report\Separates\IV_Crossline_Comparisons
=====
N,mean,stdev = 113742,0.018,0.044

H12411_Xlines_ERS_Stats_TJ_S222_RESON7125_STBD_MiddlePD.txt |
H:\Surveys\H12411\Descriptive Report\Separates\IV_Crossline_Comparisons
- (minus)
H12411_Xlines_TCARI_Stats_TJ_S222_RESON7125_STBD_MiddlePD.txt |
H:\Surveys\H12411\Descriptive Report\Separates\IV_Crossline_Comparisons
=====
N,mean,stdev = 45607,0.281,0.039

Sensor-wise Statistics

MiddlePD: N,mean,stdev = 159349,0.093,0.126



Discussion

Results of the analysis showed that the mean difference between ERS and TCARI tidal corrections was 9.3cm with a standard deviation of 12.6cm. The overall average is less than the uncertainty associated with the separation model. There was a large difference between the ship and the launches which suggested that there was not a problem with the VDATUM model, but that something specific to the ship was happening. Previous investigation has shown a flaw in the reading of the static draft measurement for the ship. Based on the location of the intake for the ship's waterline measurement, the pitch of the vessel at the time of the reading can drastically change the measurement. There is no practical way of determining this value more accurately as the ship is constantly in motion even when dead in the water. However, we feel confident that ERS sufficiently corrects for this problem.

Recommendation

Our recommendation is to utilize ERS VDatum for tidal corrections for this survey. The results of the analysis indicate that there is not a problem with the VDatum model. We also feel that ERS better accounts for differences seen in static draft and dynamic draft and provides us with more accurate depths.



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

November 14, 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 H12411 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 November 8, 2012, Subject "H12411 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

SURVEY FEATURES REPORT

AWOIS	10
DTONs	13
Maritime Boundary Items	0
Wrecks (see AWOIS and DTON sections)	2

H12411 Feature Report

Registry Number: H12411
State: Connecticut
Locality: Long Island Sound
Sub-locality: Approaches to Norwalk
Project Number: OPR-B340-TJ-12
Survey Dates: 08/28/2014 - 09/27/2014

Charts Affected

Number	Edition	Date	Scale (RNC)	RNC Correction(s)*
12364	38th	07/01/2008	1:40,000 (12364_8) 1:20,000 (12364_9) 1:20,000 (12364_3)	[L]NTM: ?
12368	28th	06/01/2013	1:20,000 (12368_1)	USCG LNM: 12/31/2013 (2/25/2014) CHS NTM: None (12/27/2013) NGA NTM: None (3/1/2014)
12363	40th	06/01/2005	1:80,000 (12363_1)	[L]NTM: ?
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	AWOIS 6804	Rock	10.33 m	41° 01' 45.8" N	073° 27' 12.9" W	6804
1.2	AWOIS 6653	Obstruction	14.39 m	41° 01' 32.8" N	073° 26' 55.2" W	6653
1.3	AWOIS 6441	GP	[None]	41° 02' 18.7" N	073° 26' 48.8" W	6441
1.4	AWOIS 6437	Rock	1.96 m	41° 03' 05.6" N	073° 26' 22.7" W	6437
1.5	AWOIS 7860	GP	[None]	41° 02' 46.2" N	073° 25' 03.3" W	7860
1.6	AWOIS 6805	Wreck	10.62 m	41° 01' 48.4" N	073° 24' 35.3" W	6805
1.7	AWOIS 6467	GP	[None]	41° 04' 20.0" N	073° 24' 28.5" W	6467
1.8	AWOIS 6463	GP	[None]	41° 05' 09.9" N	073° 23' 55.2" W	6463

1.9	AWOIS 6477	GP	[None]	41° 04' 37.7" N	073° 22' 44.0" W	6477
1.10	AWOIS 6477	GP	[None]	41° 04' 34.3" N	073° 22' 43.8" W	---
2.1	DTON 2.2	Rock	5.35 m	41° 02' 14.7" N	073° 26' 49.0" W	---
2.2	DTON 1.3	Rock	3.31 m	41° 02' 24.6" N	073° 26' 24.4" W	---
2.3	DTON 2.4	Rock	8.00 m	41° 02' 15.8" N	073° 26' 22.5" W	---
2.4	DTON 2.6	Rock	7.11 m	41° 02' 18.4" N	073° 25' 45.7" W	---
2.5	DTON 1.1	Rock	1.38 m	41° 02' 33.8" N	073° 25' 35.3" W	---
2.6	DTON 1.5	Rock	2.50 m	41° 02' 34.2" N	073° 25' 18.7" W	---
2.7	DTON 1.6	Rock	2.93 m	41° 02' 41.6" N	073° 25' 12.4" W	---
2.8	DTON 2.9	Rock	8.14 m	41° 02' 52.1" N	073° 23' 48.8" W	---
2.9	DTON 1.7	Rock	3.82 m	41° 03' 12.6" N	073° 23' 19.3" W	---
2.10	DTON 2.12	Wreck	11.93 m	41° 02' 10.4" N	073° 21' 51.3" W	---
2.11	DTON 2.13	Rock	4.19 m	41° 04' 00.4" N	073° 21' 45.7" W	---
2.12	DTON 1.4	Rock	3.33 m	41° 04' 04.7" N	073° 21' 40.2" W	---
2.13	DTON 2.14	Rock	8.40 m	41° 03' 10.1" N	073° 21' 31.9" W	---

1 - AWOIS Features

1.1) AWOIS 6804

Primary Feature for AWOIS Item #6804

Search Position: 41° 01' 45.8" N, 073° 27' 13.2" W
Historical Depth: 10.67 m
Search Radius: 0
Search Technique: [None]
Technique Notes: [None]

History Notes:

HISTORY

H5142/31WD--34 FT SOUNDING IDENTIFIED AS ROCKS CLEARED BY 31 FEET IN LAT 41-01-46.19N, LONG 73-27-14.18W. (ENT 5/88 MSM)
 FE320SS/88--OPR-B660-RU-88; 200% SIDE SCAN SONAR FOR 75M RADIUS; ONE SIGNIFICANT CONTACT FOUND IN 41-01-45.76N, LONG 73-27-13.17W; IRREGULAR ROCKY FEATURE RISING 14 FT. OFF THE BOTTOM WITH AN ECHOSOUNDER LEAST DEPTH OF 35 FT.; HYDROGRAPHER AND EVALUATOR RECOMMENDED CHARTING A SOUNDING OVER A ROCK. (ENTERED MSM 5/90)

Survey Summary

Survey Position: 41° 01' 45.8" N, 073° 27' 12.9" W
Least Depth: 10.33 m (= 33.88 ft = 5.647 fm = 5 fm 3.88 ft)
TPU (±1.96σ): THU (TPEh) [None] ; TVU (TPEv) [None]
Timestamp: 2012-271.00:00:00.000 (09/27/2012)
Dataset: H12411_AWOIS.000
FOID: US 0000669183 00001(0226000A35FF0001)
Charts Affected: 12368_1, 12364_8, 12363_1, 12300_1, 13006_1, 5161_1, 13003_1

Remarks:

[None]

Feature Correlation

Source	Feature	Range	Azimuth	Status
H12411_AWOIS.000	US 0000669183 00001	0.00	000.0	Primary
AWOIS_EXPORT	AWOIS # 6804	5.28	091.0	Secondary (grouped)

Hydrographer Recommendations

[None]

Cartographically-Rounded Depth (Affected Charts):

34ft (12368_1, 12364_8, 12363_1)

5 ½fm (12300_1, 13006_1, 13003_1)

10.3m (5161_1)

S-57 Data

Geo object 1: Underwater rock / awash rock (UWTROC)

Attributes: QUASOU - 6:least depth known
SORDAT - 20120927
SORIND - US,US,graph,H12411
VALSOU - 10.327 m
WATLEV - 3:always under water/submerged

Office Notes

SAR: Rock verified with object detection multibeam. Compile: Chart rock as sounding.

Feature Images

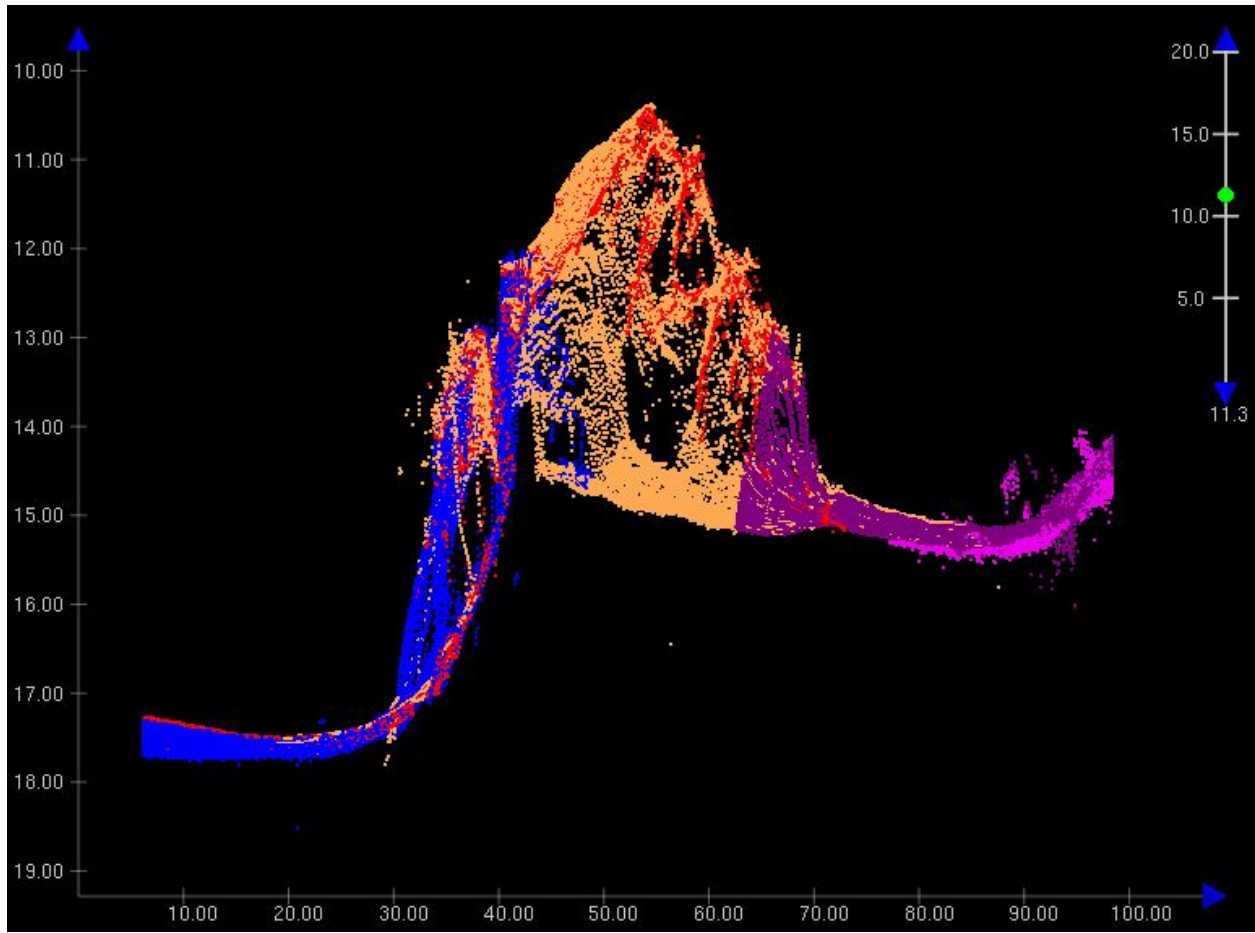


Figure 1.1.1

1.2) AWOIS 6653

Primary Feature for AWOIS Item #6653

Search Position: 41° 01' 32.3" N, 073° 26' 55.4" W
Historical Depth: [None]
Search Radius: 250
Search Technique: [None]
Technique Notes: [None]

History Notes:

HISTORY

H5219/32WD--40FT UNVERIFIED W.D. GROUNDING LAT 41-01-32N, LONG 73-26-57W. (ENT SRB 5/88)

H10354/90-- OPR-B285-AHP; NOT INVESTIGATED. BROUGHT FORWARD. EVALUATOR RECOMMENDS CHARTING AS SURVEYED. (UP 9/8/92, SJV)

Survey Summary

Survey Position: 41° 01' 32.8" N, 073° 26' 55.2" W
Least Depth: 14.39 m (= 47.22 ft = 7.870 fm = 7 fm 5.22 ft)
TPU ($\pm 1.96\sigma$): THU (TPEh) [None] ; TVU (TPEv) [None]
Timestamp: 2012-271.00:00:00.000 (09/27/2012)
Dataset: H12411_AWOIS.000
FOID: US 0000669179 00001(0226000A35FB0001)
Charts Affected: 12368_1, 12364_8, 12363_1, 12300_1, 13006_1, 5161_1, 13003_1

Remarks:

[None]

Feature Correlation

Source	Feature	Range	Azimuth	Status
H12411_AWOIS.000	US 0000669179 00001	0.00	000.0	Primary
AWOIS_EXPORT	AWOIS # 6653	15.40	020.0	Secondary (grouped)

Hydrographer Recommendations

[None]

Cartographically-Rounded Depth (Affected Charts):

47ft (12368_1, 12364_8, 12363_1)

7 ¾fm (12300_1, 13006_1, 13003_1)

14.4m (5161_1)

S-57 Data

Geo object 1: Obstruction (OBSTRN)
Attributes: QUASOU - 6:least depth known
SORDAT - 20120927
SORIND - US,US,graph,H12411
VALSOU - 14.392 m
WATLEV - 3:always under water/
submerged

Office Notes

SAR: Obstruction (AWOIS 6653) verified by multibeam. Compile: Chart obstruction as sounding.

Feature Images

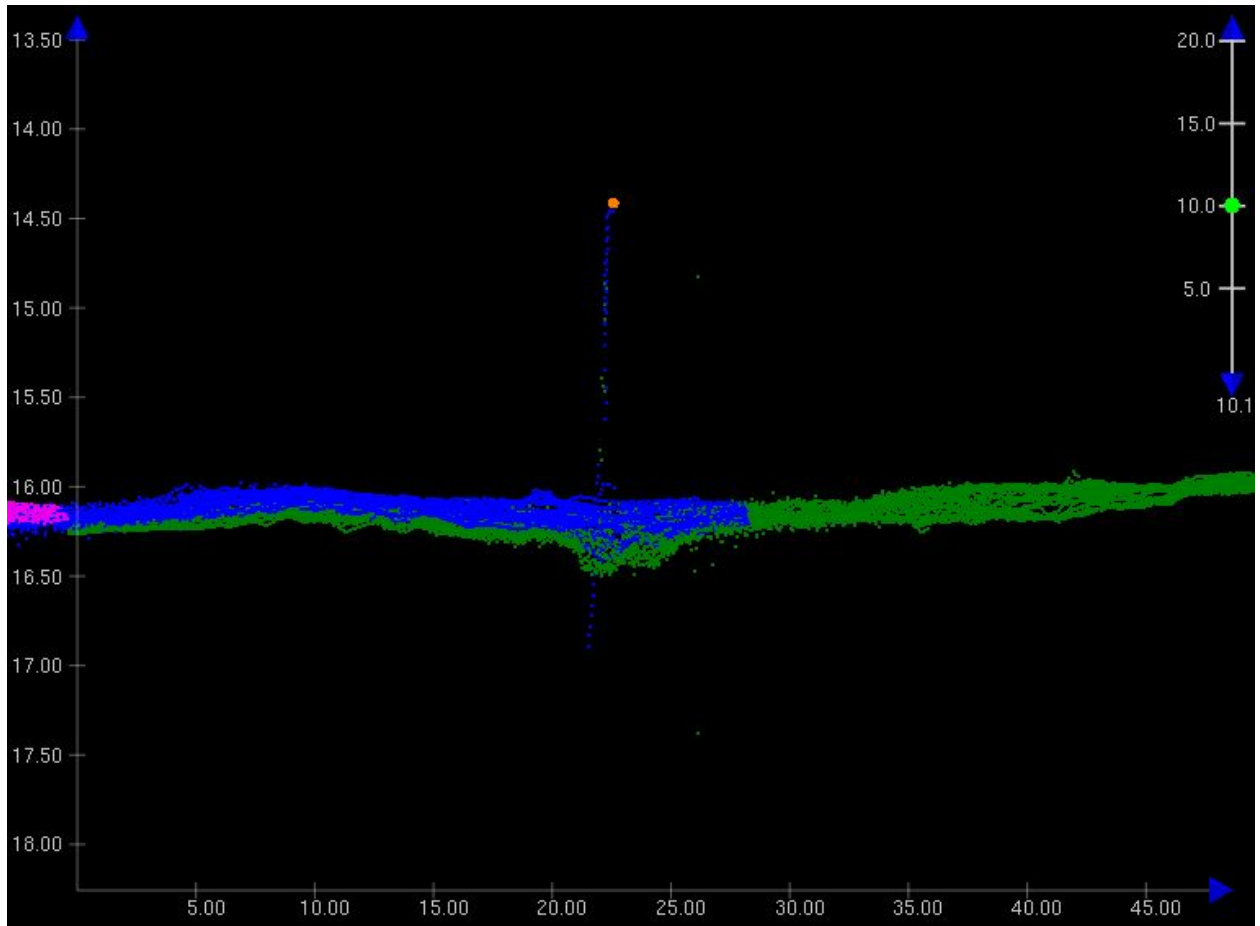


Figure 1.2.1

1.3) AWOIS 6441

Primary Feature for AWOIS Item #6441

Search Position: 41° 02' 18.3" N, 073° 26' 49.4" W
Historical Depth: [None]
Search Radius: 250
Search Technique: S2, SWMB, ES
Technique Notes: [None]

History Notes:

HISTORY
 CL1485/74--USPS; 12FT REPORTED IN LAT 41-02-18N, LONG 73-26-51W. (ENT SRB 5/88)

Survey Summary

Survey Position: 41° 02' 18.7" N, 073° 26' 48.8" W
Least Depth: [None]
TPU (±1.96σ): THU (TPEh) [None] ; TVU (TPEv) [None]
Timestamp: 2012-271.00:00:00.000 (09/27/2012)
Dataset: H12411_AWOIS.000
FOID: US 0000669224 00001(0226000A36280001)
Charts Affected: 12364_9, 12368_1, 12364_8, 12363_1, 12300_1, 13006_1, 5161_1, 13003_1

Remarks:

\$CSYMB/remrks: AWOIS 6441, area developed with ODMB.

Feature Correlation

Source	Feature	Range	Azimuth	Status
H12411_AWOIS.000	US 0000669224 00001	0.00	000.0	Primary
AWOIS_EXPORT	AWOIS # 6441	17.72	050.4	Secondary (grouped)

Hydrographer Recommendations

Delete reported 12ft sounding.

S-57 Data

Geo object 1: Cartographic symbol (\$CSYMB)
Attributes: NINFOM - Delete 12ft sounding
NTXTDS - Chart 12368, ED28, NTM 20140301
SORDAT - 20120927
SORIND - US,US,graph,H12411

Office Notes

SAR: Reported 12ft sounding disproved with object detection multibeam. Compile: Concur, delete reported 12ft sounding.

1.4) AWOIS 6437

Primary Feature for AWOIS Item #6437

Search Position: 41° 03' 04.3" N, 073° 26' 20.4" W
Historical Depth: 2.13 m
Search Radius: 200
Search Technique: ES, SWMB
Technique Notes: [None]

History Notes:

HISTORY

H5221B/33WD--7FT OBSTR(7FT APPEARS TO BE A L.D. NOT AN OBSTR) ì

LAT 41-03-04N, LONG 73-26-22N. (ENT SRB 5/88)

Survey Summary

Survey Position: 41° 03' 05.6" N, 073° 26' 22.7" W
Least Depth: 1.96 m (= 6.44 ft = 1.074 fm = 1 fm 0.44 ft)
TPU ($\pm 1.96\sigma$): THU (TPEh) [None] ; TVU (TPEv) [None]
Timestamp: 2012-271.00:00:00.000 (09/27/2012)
Dataset: H12411_AWOIS.000
FOID: US 0000669149 00001(0226000A35DD0001)
Charts Affected: 12364_9, 12368_1, 12364_8, 12363_1, 12300_1, 13006_1, 5161_1, 13003_1

Remarks:

UWTROC/remrks: Previous history of AWOIS shows it was disproved as an obstruction, however it is still charted as an obstruction. Rock was found, but no evidence of an obstruction was found.

Feature Correlation

Source	Feature	Range	Azimuth	Status
H12411_AWOIS.000	US 0000669149 00001	0.00	000.0	Primary
AWOIS_EXPORT	AWOIS # 6437	65.99	306.4	Secondary (grouped)

Hydrographer Recommendations

Chart rock.

Cartographically-Rounded Depth (Affected Charts):

6ft (12364_9, 12368_1, 12364_8, 12363_1)

1fm (12300_1, 13006_1, 13003_1)

2.0m (5161_1)

S-57 Data

Geo object 1: Underwater rock / awash rock (UWTROC)

Attributes: NINFOM - Add rock

QUASOU - 6:least depth known

SORDAT - 20120927

SORIND - US,US,graph,H12411

VALSOU - 1.964 m

WATLEV - 3:always under water/submerged

Office Notes

SAR: Rock verified with object detection multibeam. Compile: Concur, add rock.

Feature Images

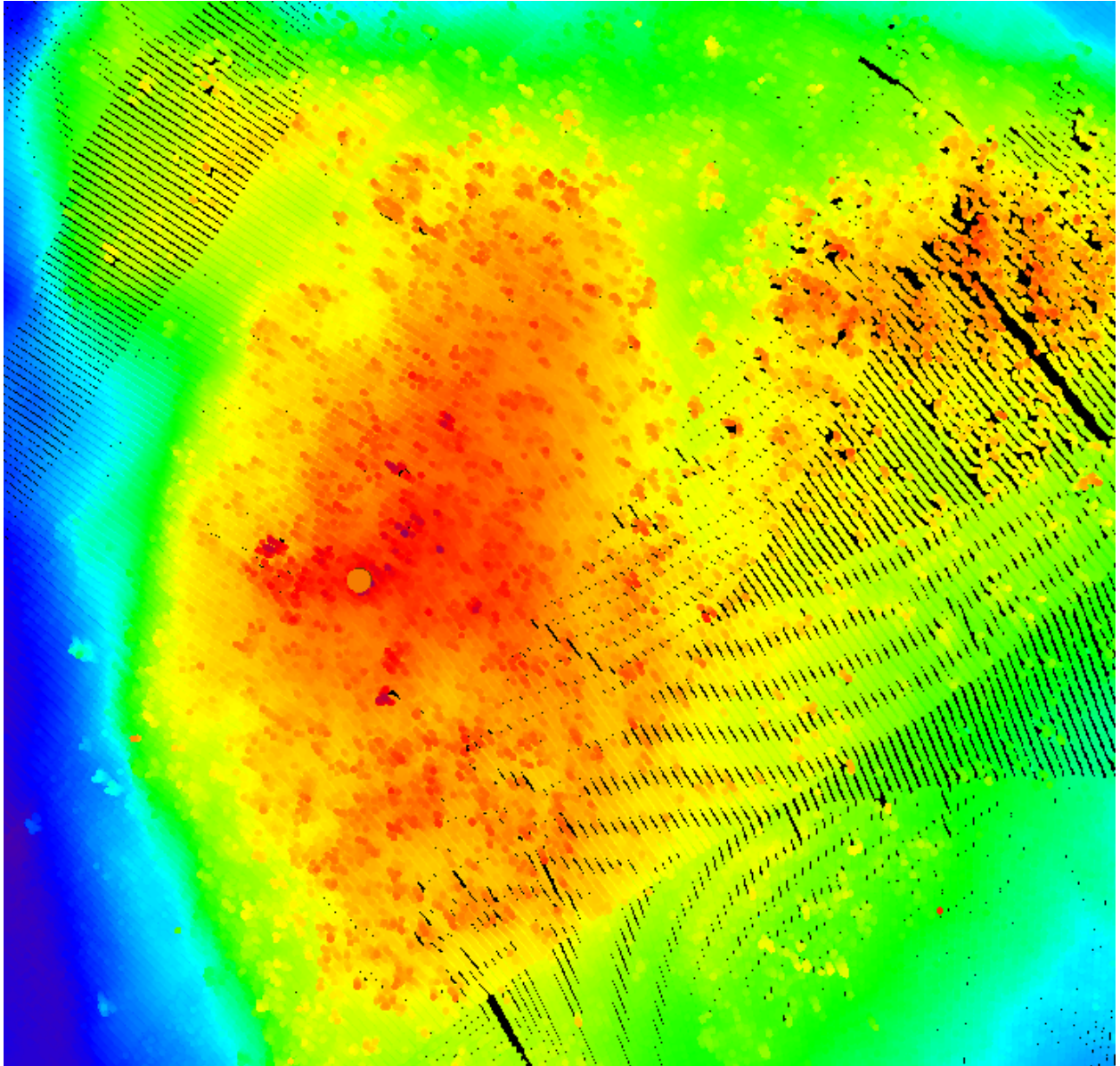


Figure 1.4.1

1.5) AWOIS 7860

Primary Feature for AWOIS Item #7860

Search Position: 41° 02' 46.0" N, 073° 25' 03.4" W
Historical Depth: [None]
Search Radius: 500
Search Technique: [None]
Technique Notes: [None]

History Notes:

DESCRIPTION

195 LORAN C RATES PROVIDED BY MR. RICHARD TARACKA, GREENWICH, CT. POLICE DEPARTMENT, TEL NO 203-622-8020; 9960-X 26805.4, 9960-Y 43998.4; WRECK OF WOODEN CABIN CRUISER IDENTIFIED AS THE DOLPHIN; BUILT IN 1921; SITTING UPRIGHT ON BOTTOM IN 35 FT. OF WATER; 40 FT. LONG; RISES ABOUT 15 FT. OFF THE BOTTOM; SANK IN APPROXIMATELY AUGUST 1990; LAT 41-02-46.00N, LONG 73-25-03.40W (COMPUTED FROM LORAN C RATES). (ENTERED MSD 9/90)

Survey Summary

Survey Position: 41° 02' 46.2" N, 073° 25' 03.3" W
Least Depth: [None]
TPU ($\pm 1.96\sigma$): THU (TPEh) [None] ; TVU (TPEv) [None]
Timestamp: 2012-271.00:00:00.000 (09/27/2012)
Dataset: H12411_AWOIS.000
FOID: US 0000669227 00001(0226000A362B0001)
Charts Affected: 12364_9, 12368_1, 12364_8, 12363_1, 12300_1, 13006_1, 5161_1, 13003_1

Remarks:

\$CSYMB/remrks: AWOIS 7860 was not found. Entire search radius was not able to be searched because it extends beyond the NALL. The history specifically calls out that the wreck is located in 35ft of water, so the area inshore of the NALL should not be considered as part of the search area. Relevant areas of the radius were searched with Reson 7125 ODMB.

Feature Correlation

Source	Feature	Range	Azimuth	Status
H12411_AWOIS.000	US 0000669227 00001	0.00	000.0	Primary
AWOIS_EXPORT	AWOIS # 7860	5.89	022.1	Secondary (grouped)

Hydrographer Recommendations

Delete from chart.

S-57 Data

Geo object 1: Cartographic symbol (\$CSYMB)
Attributes: NINFOM - Delete wreck
 NTXTDS - Chart 12368, ED28, NTM 20140301
 SORDAT - 20120927
 SORIND - US,US,graph,H12411

Office Notes

SAR: Wreck disproved with object detection multibeam. Compile: Concur, delete wreck.

1.6) AWOIS 6805

Primary Feature for AWOIS Item #6805

Search Position: 41° 01' 48.5" N, 073° 24' 35.5" W
Historical Depth: 9.75 m
Search Radius: 100
Search Technique: SD, S2, SWMB, DI
Technique Notes: [None]

History Notes:

HISTORY

CL324/86--COE; SUNKEN TUGBOAT AND BARGE EXIST IN PA LAT 41-01-47N, LONG 73-24-37W IN APPROX. 60 FT OF WATER; APPROX. CLEARANCE 33 FT MLW.

LNM15/86--ABOVE INFO PUBLISHED

BP129251--COE; SURVEY TO LOCATE WKS; NO CORRECTION MADE TO CHARTS FROM THIS SURVEY DUE TO NUMEROUS SOUNDING HOLIDAYS OVER WKS (ENT MSM 5/88)

FE320SS/88--OPR-B660-RU-88; LOCAL DIVERS INFORMED RUDE THAT WRECK IS MARKED BY A SURFACE BUOY; RUDE LOCATED WRECK BY POSITIONING HERSELF ALONGSIDE THE BUOY; ECHOSOUNDER INDICATED AN OBJECT RISING 40 FT. OFF THE BOTTOM IN 70 FT. OF WATER; SIDE SCAN AND DIVER INVESTIGATIONS FOUND A TUG WITH HER STERN RESTING ON THE BARGE; LEAST DEPTH OF 32 FT. TAKEN ON A STANCHION ATOP THE PILOT HOUSE; NO MASTS, SPARS, OR CRANES PROTRUDED ABOVE THE PILOT HOUSE; BOTH WRECKS LAY UPRIGHT; BARGE IS LOADED WITH SCRAP METAL; MOST OF THE HATCHES AND ALL REMOVABLE FIXTURES HAVE BEEN SCAVENGED BY DIVERS; LAT 41-01-48.49N, LONG 73-24-35.52W; LORAN C RATES: 9960-W 15261.7, 9960-X 26798.6, 9960-Y 43989.7, 9960-Z 60036.8; HYDROGRAPHER AND EVALUATOR RECOMMENDED DELETING CHARTED SYMBOL AND ADDING "32WK CELTIC". (UPDATED MSM 5/90)

DESCRIPTION

**** TELECON WITH MR CARL BOUTELIER, CHIEF NAVIGATION BRANCH, COE WALTHAM MA; 5/31/88; TO THE BEST OF HIS RECOLLECTION MR. BOUTILIER BELIEVES THE WKS WERE LOCATED AND DIVED ON; TUG OWNED

BY MR CARL EKLOF OF EKLOF MARINE CORP 718-442-1112; POSSIBLE LITIGATION PENDING.

**** TELECON WITH MR CARL EKLOF JR 5/31/88; NO PLANS TO SALVAGE TUG; NO FURTHER SURVEY OF WKS SINCE 1986.

Survey Summary

Survey Position: 41° 01' 48.4" N, 073° 24' 35.3" W
Least Depth: 10.62 m (= 34.86 ft = 5.809 fm = 5 fm 4.86 ft)
TPU ($\pm 1.96\sigma$): THU (TPEh) [None] ; TVU (TPEv) [None]
Timestamp: 2012-271.00:00:00.000 (09/27/2012)
Dataset: H12411_AWOIS.000
FOID: US 0000669182 00001(0226000A35FE0001)
Charts Affected: 12368_1, 12364_8, 12363_1, 12300_1, 13006_1, 5161_1, 13003_1

Remarks:

WRECKS/remrks: Wrecks found with MBES. Data reduced to MLLW via VDATUM.

Feature Correlation

Source	Feature	Range	Azimuth	Status
H12411_AWOIS.000	US 0000669182 00001	0.00	000.0	Primary
AWOIS_EXPORT	AWOIS # 6805	7.19	121.5	Secondary (grouped)

Hydrographer Recommendations

Update sounding on dangerous wrecks.

Cartographically-Rounded Depth (Affected Charts):

35ft (12368_1, 12364_8, 12363_1)

5 ¾fm (12300_1, 13006_1, 13003_1)

10.6m (5161_1)

S-57 Data

Geo object 1: Wreck (WRECKS)
Attributes: CATWRK - 2:dangerous wreck
 NINFOM - Add wrecks
 QUASOU - 6:least depth known

SORDAT - 20120927

SORIND - US,US,graph,H12411

VALSOU - 10.624 m

WATLEV - 3:always under water/submerged

Office Notes

SAR: Wrecks verified with object detection multibeam. Compile: Concur, add wrecks

Feature Images

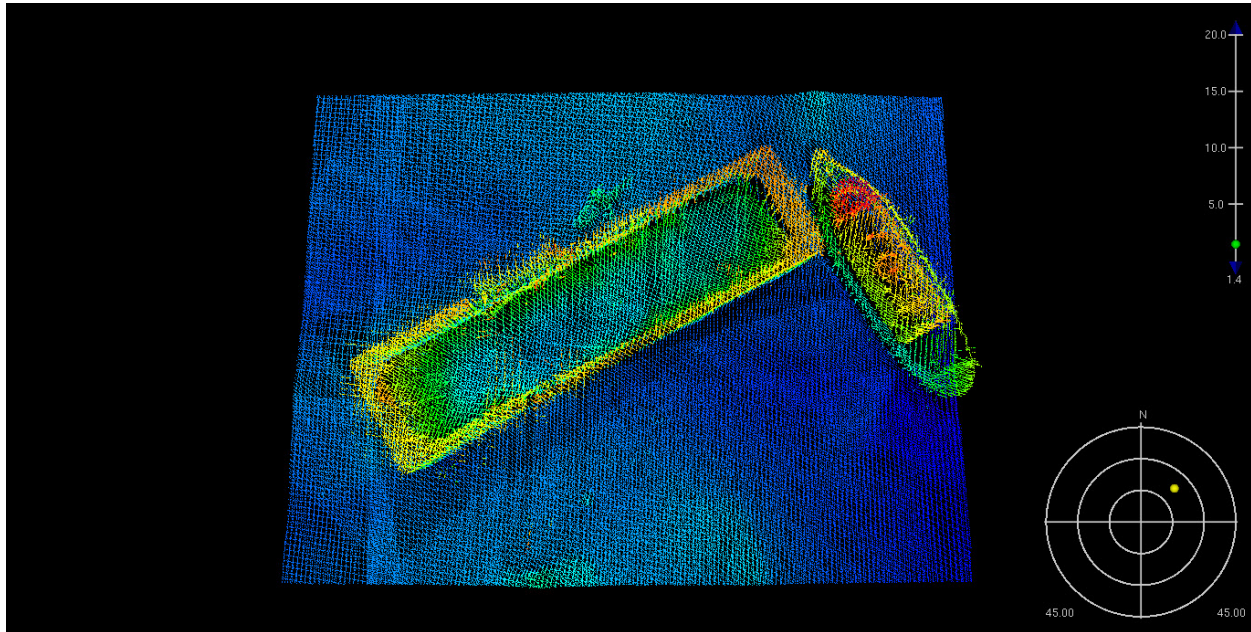


Figure 1.6.1

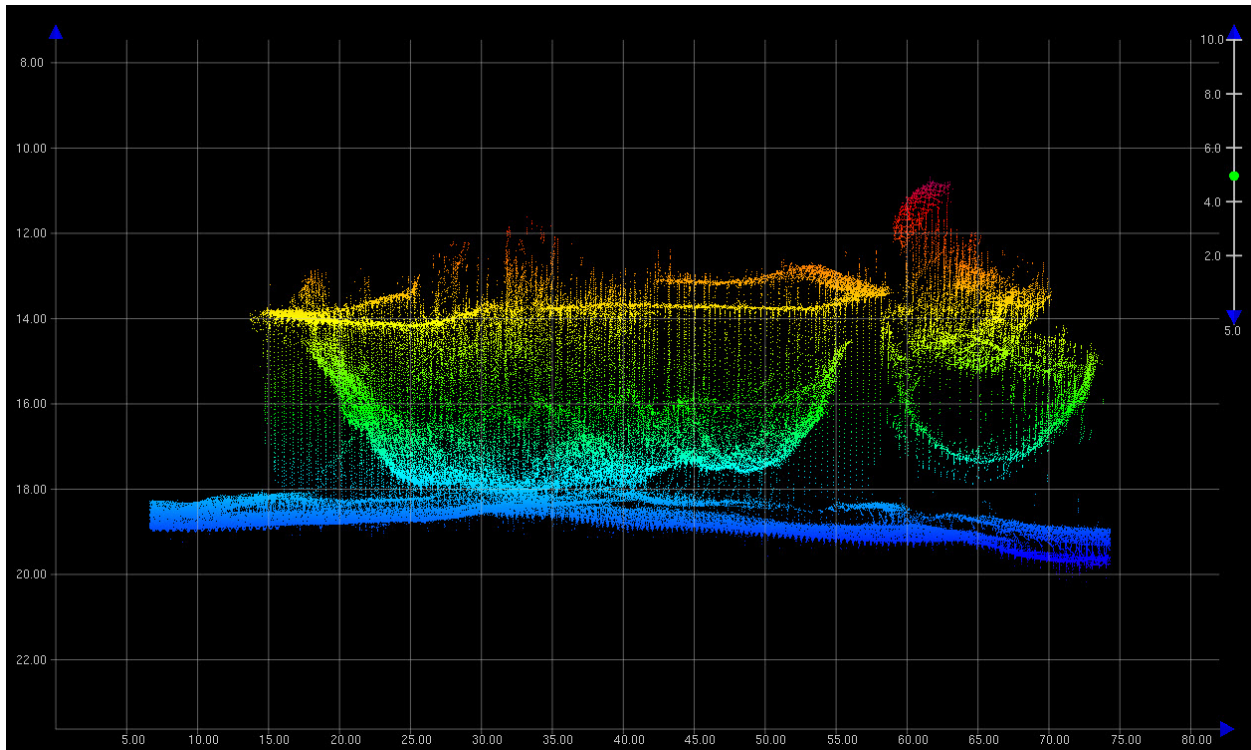


Figure 1.6.2

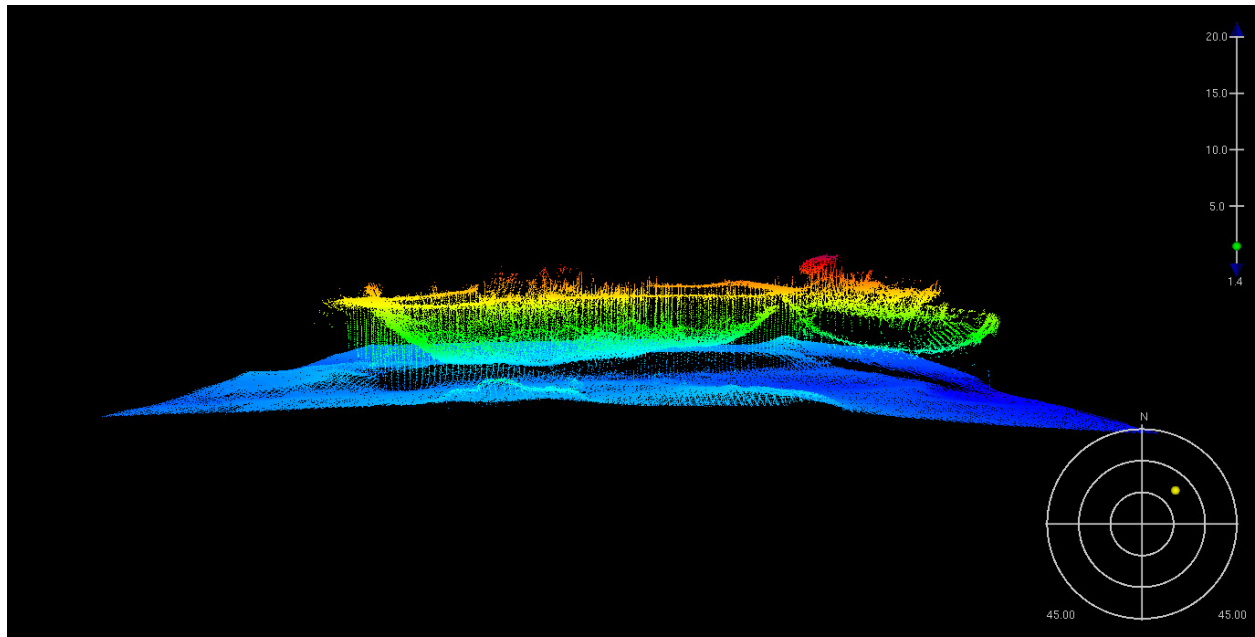


Figure 1.6.3

1.7) AWOIS 6467

Primary Feature for AWOIS Item #6467

Search Position: 41° 04' 21.3" N, 073° 24' 27.4" W
Historical Depth: [None]
Search Radius: 100
Search Technique: [None]
Technique Notes: [None]

History Notes:

SURVEY REQUIREMENT COMMENTS

DETERMINE CONTROLLING DEPTH FROM THE NORTHERN LIMIT OF BASIN TO THE ENTRANCE CHANNEL

HISTORY

CL577/81--COE PERMIT; 18 1/2 FT REP 1978 (ENT SRB 5/88)

Survey Summary

Survey Position: 41° 04' 20.0" N, 073° 24' 28.5" W
Least Depth: [None]
TPU ($\pm 1.96\sigma$): THU (TPEh) [None] ; TVU (TPEv) [None]
Timestamp: 2012-271.00:00:00.000 (09/27/2012)
Dataset: H12411_AWOIS.000
FOID: US 0000669632 00001(0226000A37C00001)
Charts Affected: 12368_1, 12364_8, 12363_1, 12300_1, 13006_1, 5161_1, 13003_1

Remarks:

\$CSYMB/remrks: AWOIS 6467, area developed with MB, data reduced to MLLW via VDATUM.

Feature Correlation

Source	Feature	Range	Azimuth	Status
H12411_AWOIS.000	US 0000669632 00001	0.00	000.0	Primary
AWOIS_EXPORT	AWOIS # 6467	47.05	212.2	Secondary (grouped)

Hydrographer Recommendations

Update controlling depth.

S-57 Data

Geo object 1: Cartographic symbol (\$CSYMB)
Attributes: INFORM - Update reported depth to 2.258m (7ft).
NINFOM - Update reported depth
NTXTDS - Chart 12368, ED28, NTM 20140301
SORDAT - 20120927
SORIND - US,US,graph,H12411

Office Notes

SAR: Least depth sent to MCD as DTON. Compile: Update reported depth to 7ft.

1.8) AWOIS 6463

Primary Feature for AWOIS Item #6463

Search Position: 41° 05' 06.3" N, 073° 23' 58.4" W
Historical Depth: [None]
Search Radius: 150
Search Technique: [None]
Technique Notes: [None]

History Notes:

DETERMINE CONTROLLING DEPTH.

HISTORY

CL842/81--PRIVATE CITIZEN; 5FT REPORTED FROM BUOY C "17" TO ì
 BKW. (ENT SRB 5/88)

Survey Summary

Survey Position: 41° 05' 09.9" N, 073° 23' 55.2" W
Least Depth: [None]
TPU (±1.96σ): THU (TPEh) [None] ; TVU (TPEv) [None]
Timestamp: 2012-271.00:00:00.000 (09/27/2012)
Dataset: H12411_AWOIS.000
FOID: US 0000669633 00001(0226000A37C10001)
Charts Affected: 12364_3, 12368_1, 12364_8, 12363_1, 12300_1, 13006_1, 5161_1, 13003_1

Remarks:

\$CSYMB/remrks: Channel was not fully developed because it was too shallow to survey.

Feature Correlation

Source	Feature	Range	Azimuth	Status
H12411_AWOIS.000	US 0000669633 00001	0.00	000.0	Primary
AWOIS_EXPORT	AWOIS # 6463	133.80	033.7	Secondary (grouped)

Hydrographer Recommendations

[None]

S-57 Data

Geo object 1: Cartographic symbol (\$CSYMB)
Attributes: INFORM - Update reported depth to 1.916m (6ft).
NINFOM - Update reported depth
NTXTDS - Chart 12368, ED28, NTM 20140301
SORDAT - 20120927
SORIND - US,US,graph,H12411

Office Notes

Compile: Update reported depth to 6ft.

1.9) AWOIS 6477

Primary Feature for AWOIS Item #6477

Search Position: 41° 04' 36.3" N, 073° 22' 36.4" W
Historical Depth: [None]
Search Radius: 250
Search Technique: [None]
Technique Notes: [None]

History Notes:

Determine existence and extents of fish stks.

HISTORY

CL1397/81--USPS; FISH STKS REP. IN LAT 41-04-36N, LONG 73-22-38W. i
 (ENT SRB 5/88)

Survey Summary

Survey Position: 41° 04' 37.7" N, 073° 22' 44.0" W
Least Depth: [None]
TPU (±1.96σ): THU (TPEh) [None] ; TVU (TPEv) [None]
Timestamp: 1999-268.00:00:00.000 (09/25/1999)
Dataset: H12411_AWOIS.000
FOID: US 0000669141 00001(0226000A35D50001)
Charts Affected: 12368_1, 12364_8, 12363_1, 12300_1, 13006_1, 5161_1, 13003_1

Remarks:

FSHFAC/remrks: There are a large number of fish stakes in the area. Full AWOIS search radius was not conducted because it falls in areas too shallow to be developed by the launches.

Feature Correlation

Source	Feature	Range	Azimuth	Status
H12411_AWOIS.000	US 0000669141 00001	0.00	000.0	Primary
AWOIS_EXPORT	AWOIS # 6477	131.21	292.4	Secondary (grouped)

Hydrographer Recommendations

Retain fish stakes

S-57 Data

Geo object 1: Fishing facility (FSHFAC)
Attributes: CATFIF - 1:fishing stake
INFORM - Reported
NINFOM - Retain fish stakes
SORDAT - 19990925
SORIND - US,US,graph,chart 12368

Office Notes

SAR: Large number of fish stakes observed in the area but search radius not fully developed, recommend to retain. Compile: Concur, retain fish stakes.

1.10) AWOIS 6477

Survey Summary

Survey Position: 41° 04' 34.3" N, 073° 22' 43.8" W
Least Depth: [None]
TPU ($\pm 1.96\sigma$): THU (TPEh) [None] ; TVU (TPEv) [None]
Timestamp: 1999-268.00:00:00.000 (09/25/1999)
Dataset: H12411_AWOIS.000
FOID: US 0000669142 00001(0226000A35D60001)
Charts Affected: 12368_1, 12364_8, 12363_1, 12300_1, 13006_1, 5161_1, 13003_1

Remarks:

FSHFAC/remrks: There are a large number of fish stakes in the area. Full AWOIS search radius was not conducted because it falls in areas too shallow to be developed by the launches.

Feature Correlation

Source	Feature	Range	Azimuth	Status
H12411_AWOIS.000	US 0000669142 00001	0.00	000.0	Primary

Hydrographer Recommendations

Retain fish stakes

S-57 Data

Geo object 1: Fishing facility (FSHFAC)
Attributes: CATFIF - 1:fishing stake
 INFORM - Reported
 NINFOM - Retain fish stakes
 SORDAT - 19990925
 SORIND - US,US,graph,chart 12368

Office Notes

SAR: Large number of fish stakes observed in the area but search radius not fully developed, recommend to retain. Compile: Concur, retain fish stakes.

2 - Dangers to Navigation

2.1) DTON 2.2

DANGER TO NAVIGATION

Survey Summary

Survey Position: 41° 02' 14.7" N, 073° 26' 49.0" W
Least Depth: 5.35 m (= 17.54 ft = 2.924 fm = 2 fm 5.54 ft)
TPU ($\pm 1.96\sigma$): THU (TPEh) [None] ; TVU (TPEv) [None]
Timestamp: 2012-271.00:00:00.000 (09/27/2012)
Dataset: H12411_DTONs.000
FOID: US 0000669138 00001(0226000A35D20001)
Charts Affected: 12364_9, 12368_1, 12364_8, 12363_1, 12300_1, 13006_1, 5161_1, 13003_1

Remarks:

UWTROC/remrks: Found with MBES. Data reduced to MLLW via VDATUM.

Feature Correlation

Source	Feature	Range	Azimuth	Status
H12411_DTONs.000	US 0000669138 00001	0.00	000.0	Primary

Hydrographer Recommendations

Add rock.

Cartographically-Rounded Depth (Affected Charts):

17ft (12364_9, 12368_1, 12364_8, 12363_1)

2 ¾fm (12300_1, 13006_1, 13003_1)

5.3m (5161_1)

S-57 Data

Geo object 1: Underwater rock / awash rock (UWTROC)
Attributes: NINFOM - Add rock
 QUASOU - 6:least depth known
 SORDAT - 20120927
 SORIND - US,US,graph,H12411

VALSOU - 5.347 m

WATLEV - 3:always under water/submerged

Office Notes

SAR: Rock verified with object detection multibeam. Compile: Concur, add rock.

Feature Images

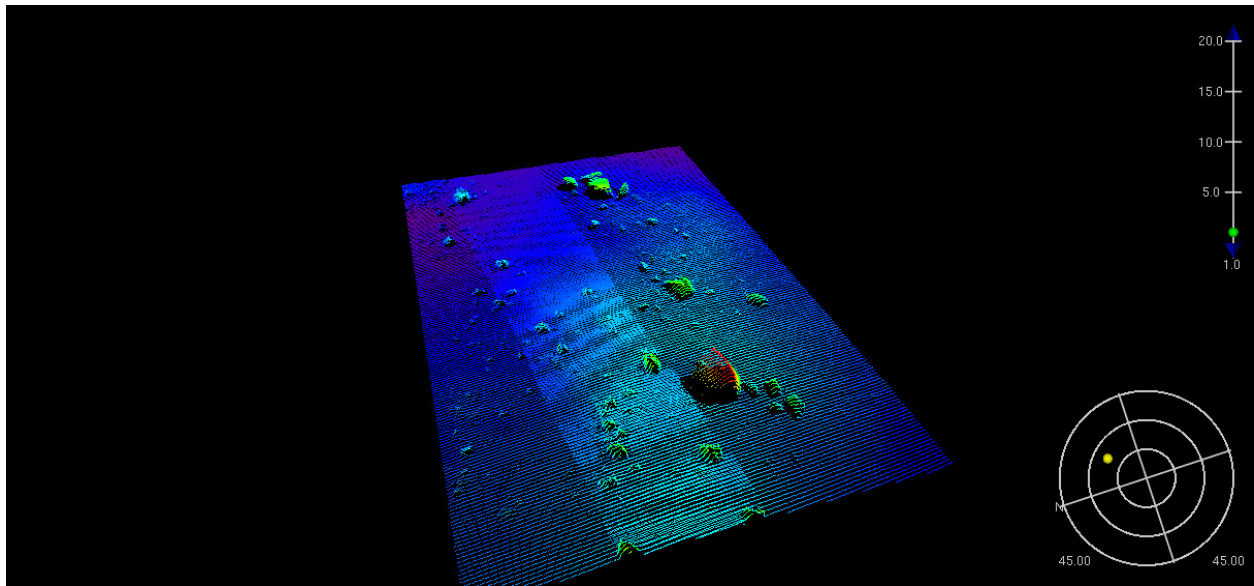


Figure 2.1.1

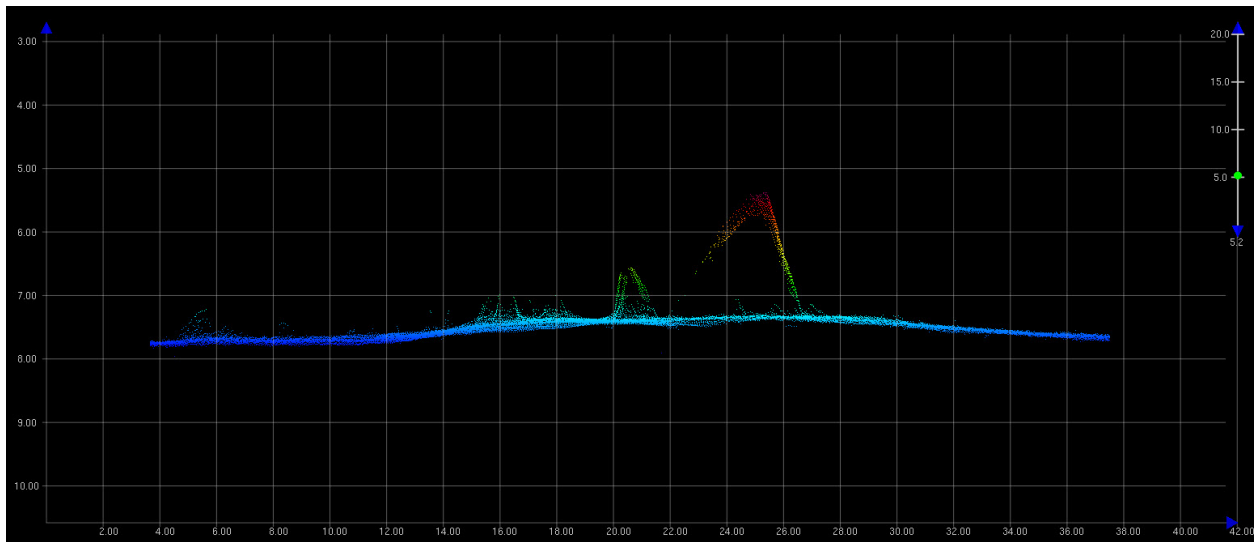


Figure 2.1.2

2.2) DTON 1.3

DANGER TO NAVIGATION

Survey Summary

Survey Position: 41° 02' 24.6" N, 073° 26' 24.4" W
Least Depth: 3.31 m (= 10.87 ft = 1.812 fm = 1 fm 4.87 ft)
TPU ($\pm 1.96\sigma$): THU (TPEh) [None] ; TVU (TPEv) [None]
Timestamp: 2012-271.00:00:00.000 (09/27/2012)
Dataset: H12411_DTONs.000
FOID: US 0000669154 00001(0226000A35E20001)
Charts Affected: 12364_9, 12368_1, 12364_8, 12363_1, 12300_1, 13006_1, 5161_1, 13003_1

Remarks:

UWTROC/remrks: Found with MBES. Data reduced to MLLW via VDATUM.

Feature Correlation

Source	Feature	Range	Azimuth	Status
H12411_DTONs.000	US 0000669154 00001	0.00	000.0	Primary

Hydrographer Recommendations

Add rock.

Cartographically-Rounded Depth (Affected Charts):

11ft (12364_9, 12368_1, 12364_8, 12363_1)
 1 ¾fm (12300_1, 13006_1, 13003_1)
 3.3m (5161_1)

S-57 Data

Geo object 1: Underwater rock / awash rock (UWTROC)
Attributes: QUASOU - 6:least depth known
 SORDAT - 20120927
 SORIND - US,US,graph,H12411

VALSOU - 3.313 m

WATLEV - 3:always under water/submerged

Office Notes

SAR: Rock verified with object detection multibeam. Compile: Chart rock as sounding.

Feature Images

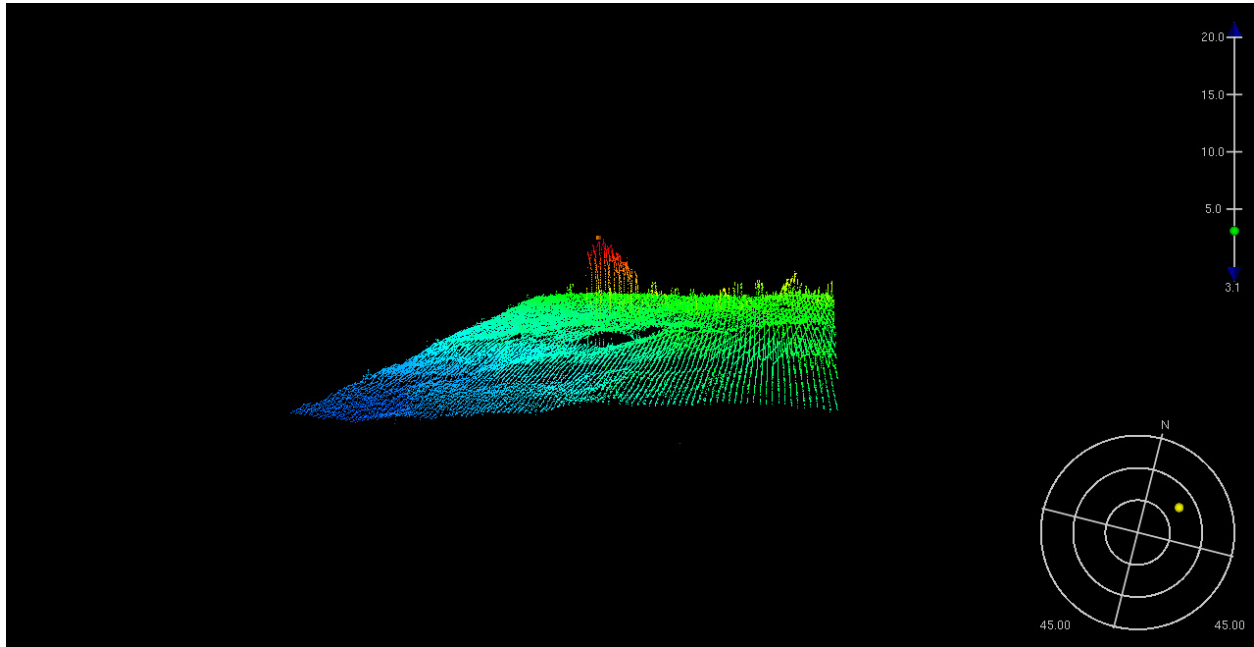


Figure 2.2.1

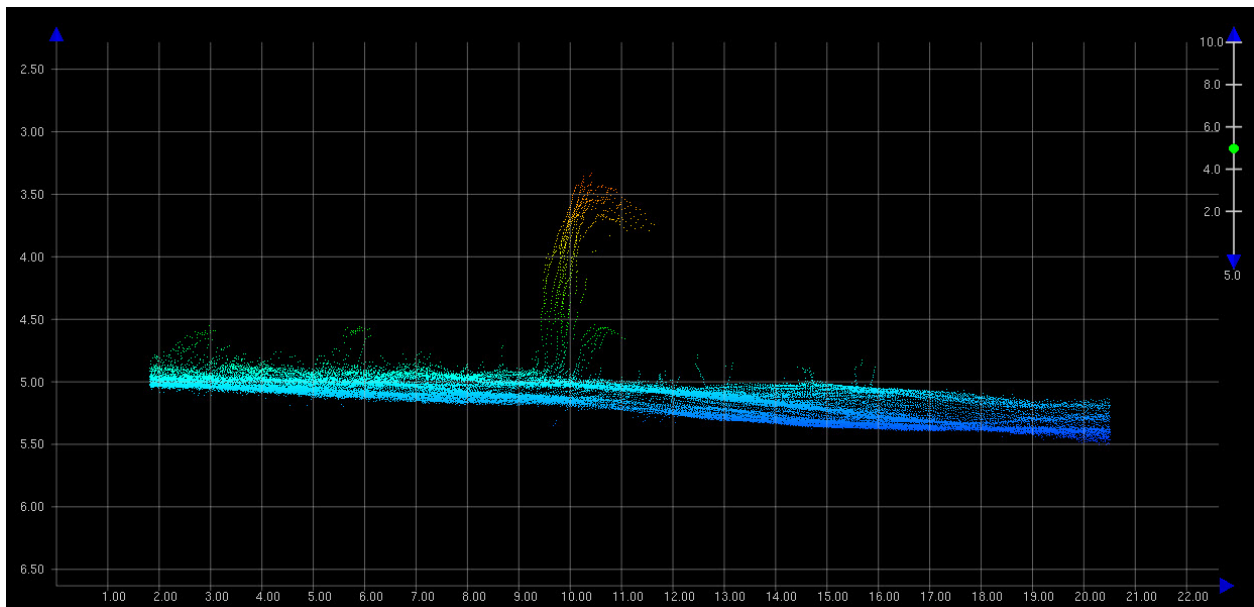


Figure 2.2.2

2.3) DTON 2.4

DANGER TO NAVIGATION

Survey Summary

Survey Position: 41° 02' 15.8" N, 073° 26' 22.5" W
Least Depth: 8.00 m (= 26.26 ft = 4.377 fm = 4 fm 2.26 ft)
TPU ($\pm 1.96\sigma$): THU (TPEh) [None] ; TVU (TPEv) [None]
Timestamp: 2012-271.00:00:00.000 (09/27/2012)
Dataset: H12411_DTONs.000
FOID: US 0000669139 00001(0226000A35D30001)
Charts Affected: 12364_9, 12368_1, 12364_8, 12363_1, 12300_1, 13006_1, 5161_1, 13003_1

Remarks:

UWTROC/remrks: Position is referenced from real-time GPS navigation overwritten by post-processed SBET solution and is on NAD83. Least depth sounding acquired with a Reson 7125 multibeam sonar, referenced to the NAD83 ellipsoid, and reduced to Mean Lower Low Water via VDatum separation model.

Feature Correlation

Source	Feature	Range	Azimuth	Status
H12411_DTONs.000	US 0000669139 00001	0.00	000.0	Primary

Hydrographer Recommendations

Chart rock.

Cartographically-Rounded Depth (Affected Charts):

26ft (12364_9, 12368_1, 12364_8, 12363_1)

4 ¼fm (12300_1, 13006_1, 13003_1)

8.0m (5161_1)

S-57 Data

Geo object 1: Underwater rock / awash rock (UWTROC)

Attributes: QUASOU - 6:least depth known

SORDAT - 20120927

SORIND - US,US,graph,H12411

VALSOU - 8.004 m

WATLEV - 3:always under water/submerged

Office Notes

SAR: Rock verified with object detection multibeam. Compile: Chart rock as sounding.

Feature Images

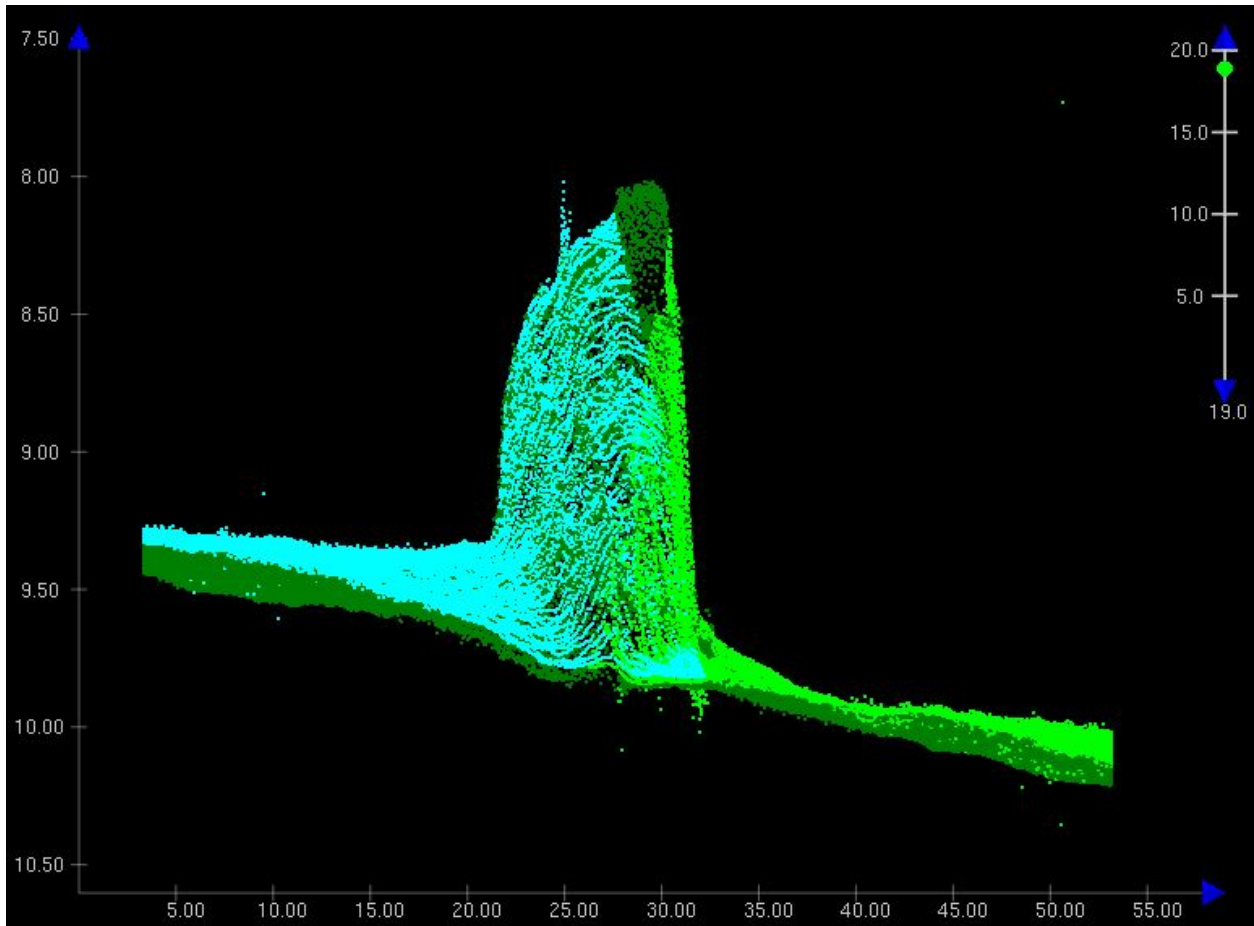


Figure 2.3.1

2.4) DTON 2.6

DANGER TO NAVIGATION

Survey Summary

Survey Position: 41° 02' 18.4" N, 073° 25' 45.7" W
Least Depth: 7.11 m (= 23.34 ft = 3.890 fm = 3 fm 5.34 ft)
TPU ($\pm 1.96\sigma$): THU (TPEh) [None] ; TVU (TPEv) [None]
Timestamp: 2012-271.00:00:00.000 (09/27/2012)
Dataset: H12411_DTONs.000
FOID: US 0000669159 00001(0226000A35E70001)
Charts Affected: 12368_1, 12364_8, 12363_1, 12300_1, 13006_1, 5161_1, 13003_1

Remarks:

UWTROC/remrks: Position is referenced from real-time GPS navigation overwritten by post-processed SBET solution and is on NAD83. Least depth sounding acquired with a Reson 7125 multibeam sonar, referenced to the NAD83 ellipsoid, and reduced to Mean Lower Low Water via VDatum separation model.

Feature Correlation

Source	Feature	Range	Azimuth	Status
H12411_DTONs.000	US 0000669159 00001	0.00	000.0	Primary

Hydrographer Recommendations

Chart rock.

Cartographically-Rounded Depth (Affected Charts):

23ft (12368_1, 12364_8, 12363_1)

3 ¾fm (12300_1, 13006_1, 13003_1)

7.1m (5161_1)

S-57 Data

Geo object 1: Underwater rock / awash rock (UWTROC)

Attributes: QUASOU - 6:least depth known

SORDAT - 20120927

SORIND - US,US,graph,H12411

VALSOU - 7.114 m

WATLEV - 3:always under water/submerged

Office Notes

SAR: Rock verified with object detection multibeam. Compile: Chart rock as sounding.

Feature Images

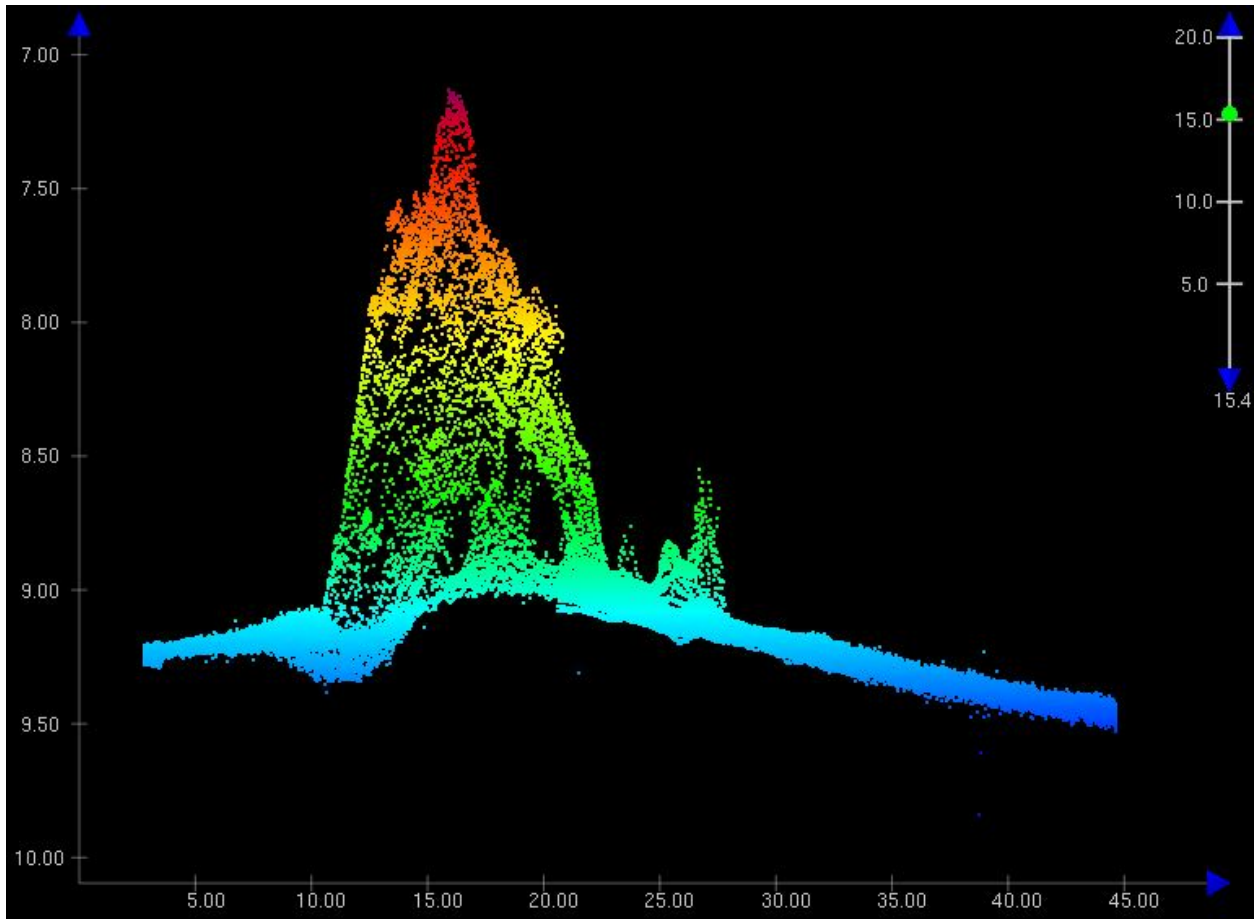


Figure 2.4.1

2.5) DTON 1.1

DANGER TO NAVIGATION

Survey Summary

Survey Position: 41° 02' 33.8" N, 073° 25' 35.3" W
Least Depth: 1.38 m (= 4.52 ft = 0.754 fm = 0 fm 4.52 ft)
TPU ($\pm 1.96\sigma$): THU (TPEh) [None] ; TVU (TPEv) [None]
Timestamp: 2012-271.00:00:00.000 (09/27/2012)
Dataset: H12411_DTONs.000
FOID: US 0000669155 00001(0226000A35E30001)
Charts Affected: 12364_9, 12368_1, 12364_8, 12363_1, 12300_1, 13006_1, 5161_1, 13003_1

Remarks:

UWTROC/remrks: Found with MBES.

Feature Correlation

Source	Feature	Range	Azimuth	Status
H12411_DTONs.000	US 0000669155 00001	0.00	000.0	Primary

Hydrographer Recommendations

Add rock.

Cartographically-Rounded Depth (Affected Charts):

4ft (12364_9, 12368_1, 12364_8, 12363_1)

0 ¾fm (12300_1, 13006_1, 13003_1)

1.4m (5161_1)

S-57 Data

Geo object 1: Underwater rock / awash rock (UWTROC)

Attributes: QUASOU - 6:least depth known
 SORDAT - 20120927
 SORIND - US,US,graph,H12411

VALSOU - 1.379 m

WATLEV - 3:always under water/submerged

Office Notes

SAR: Rock verified with object detection multibeam. Compile: Chart rock as sounding.

Feature Images

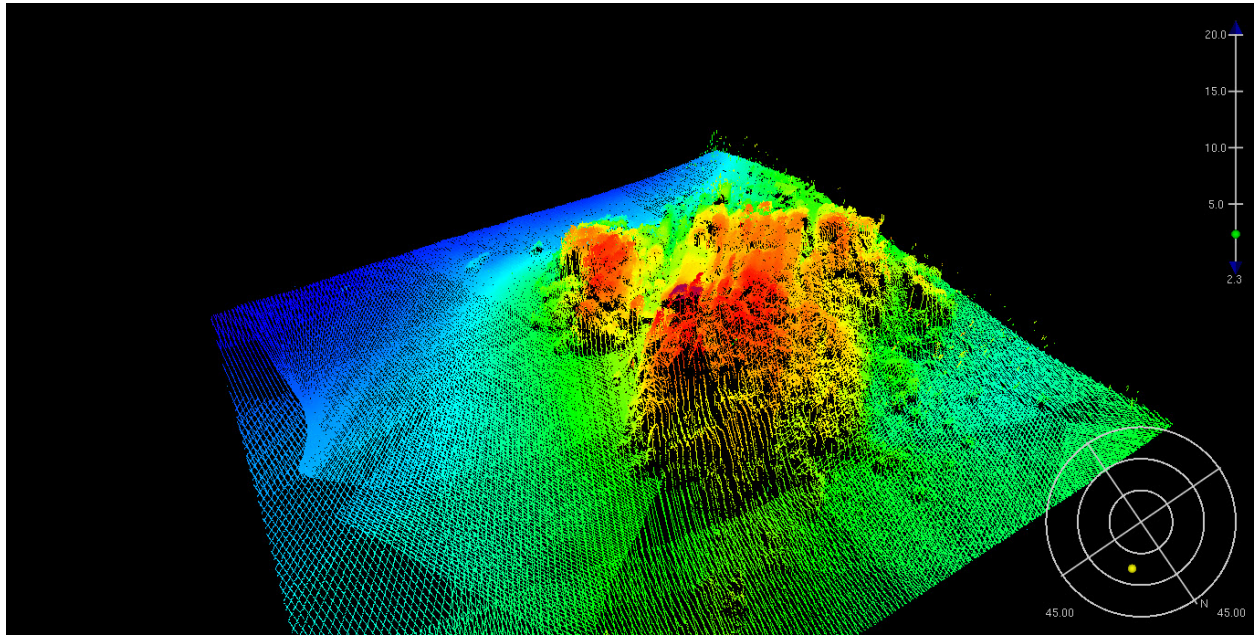


Figure 2.5.1

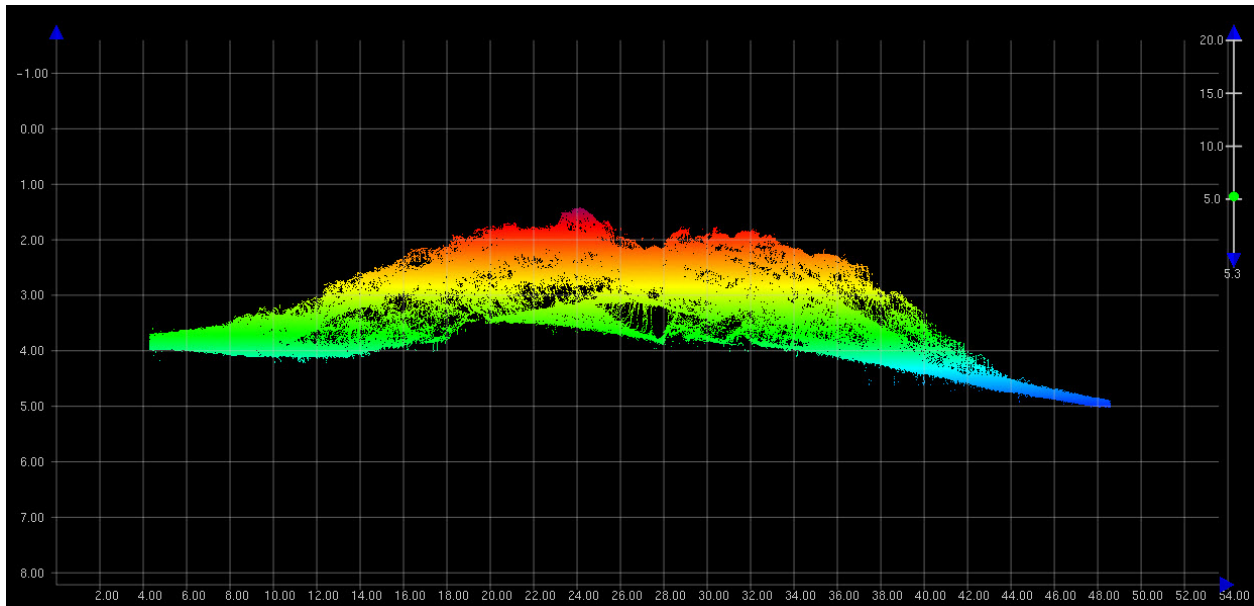


Figure 2.5.2

2.6) DTON 1.5

DANGER TO NAVIGATION

Survey Summary

Survey Position: 41° 02' 34.2" N, 073° 25' 18.7" W
Least Depth: 2.50 m (= 8.20 ft = 1.367 fm = 1 fm 2.20 ft)
TPU ($\pm 1.96\sigma$): THU (TPEh) [None] ; TVU (TPEv) [None]
Timestamp: 2012-271.00:00:00.000 (09/27/2012)
Dataset: H12411_DTONs.000
FOID: US 0000669152 00001(0226000A35E00001)
Charts Affected: 12364_9, 12368_1, 12364_8, 12363_1, 12300_1, 13006_1, 5161_1, 13003_1

Remarks:

UWTROC/remrks: Found with MBES.

Feature Correlation

Source	Feature	Range	Azimuth	Status
H12411_DTONs.000	US 0000669152 00001	0.00	000.0	Primary

Hydrographer Recommendations

Add rock.

Cartographically-Rounded Depth (Affected Charts):

8ft (12364_9, 12368_1, 12364_8, 12363_1)
 1 ¼fm (12300_1, 13006_1, 13003_1)
 2.5m (5161_1)

S-57 Data

Geo object 1: Underwater rock / awash rock (UWTROC)
Attributes: NINFOM - Add rock
 QUASOU - 6:least depth known
 SORDAT - 20120927
 SORIND - US,US,graph,H12411

VALSOU - 2.500 m

WATLEV - 3:always under water/submerged

Office Notes

SAR: Rock verified with object detection multibeam. Compile: Concur, add rock.

Feature Images

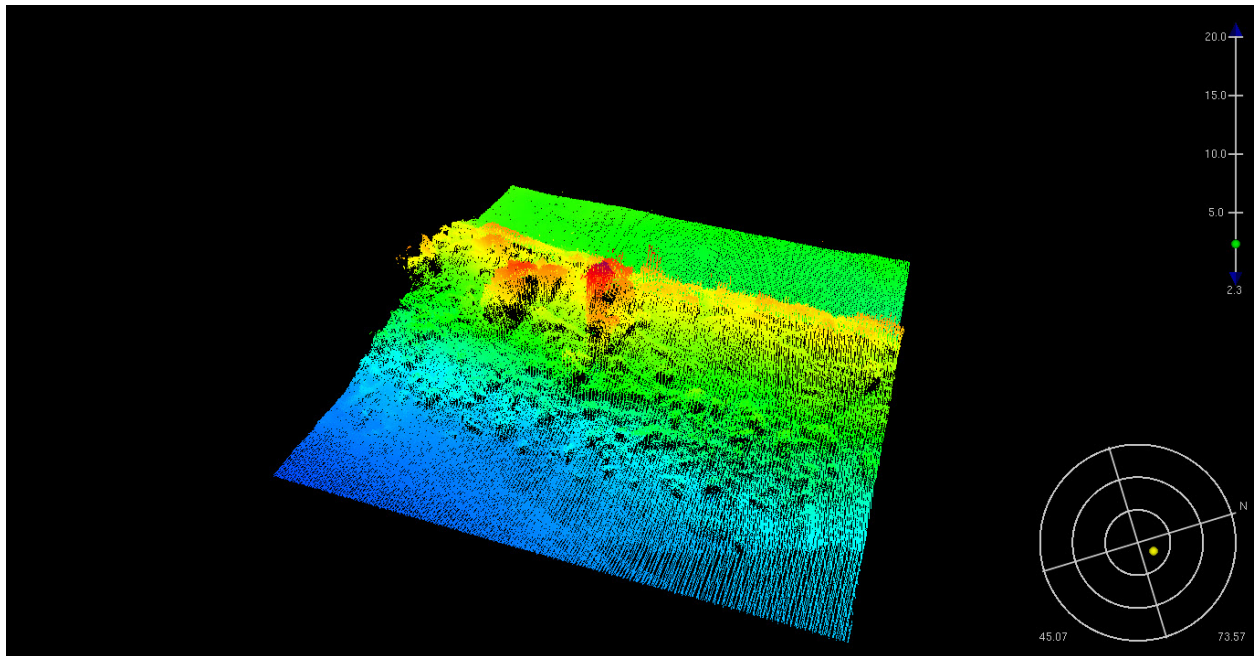


Figure 2.6.1

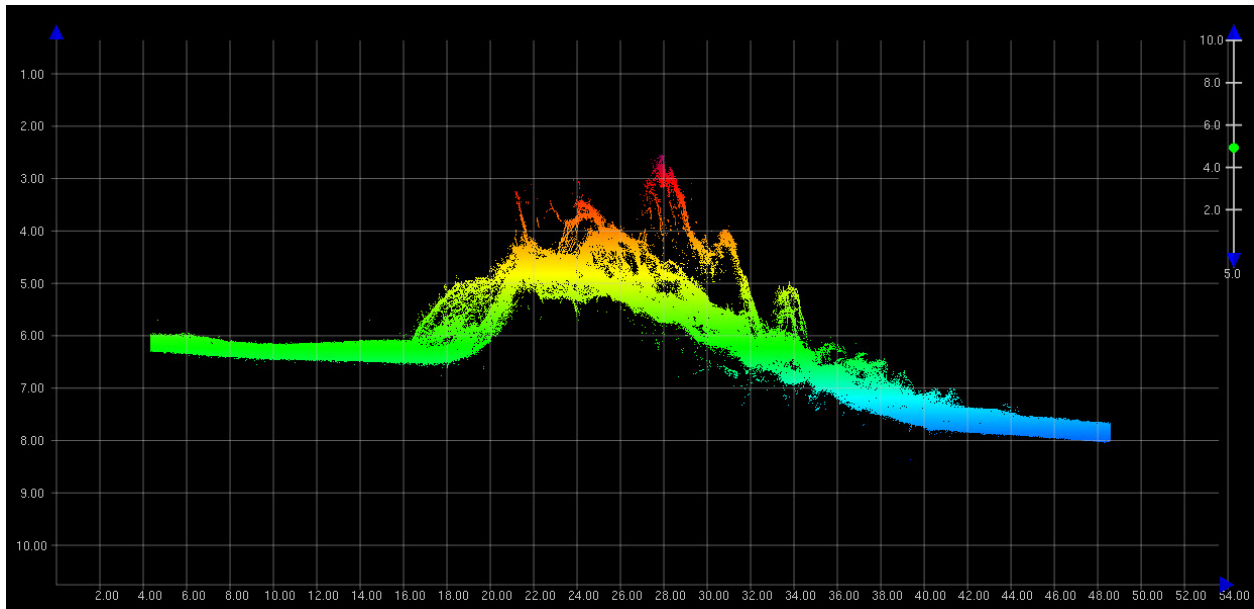


Figure 2.6.2

2.7) DTON 1.6

DANGER TO NAVIGATION

Survey Summary

Survey Position: 41° 02' 41.6" N, 073° 25' 12.4" W
Least Depth: 2.93 m (= 9.63 ft = 1.604 fm = 1 fm 3.63 ft)
TPU ($\pm 1.96\sigma$): THU (TPEh) [None] ; TVU (TPEv) [None]
Timestamp: 2012-271.00:00:00.000 (09/27/2012)
Dataset: H12411_DTONs.000
FOID: US 0000669136 00001(0226000A35D00001)
Charts Affected: 12364_9, 12368_1, 12364_8, 12363_1, 12300_1, 13006_1, 5161_1, 13003_1

Remarks:

UWTROC/remrks: Found with MBES. Data reduced to MLLW via VDATUM.

Feature Correlation

Source	Feature	Range	Azimuth	Status
H12411_DTONs.000	US 0000669136 00001	0.00	000.0	Primary

Hydrographer Recommendations

Add rock.

Cartographically-Rounded Depth (Affected Charts):

9ft (12364_9, 12368_1, 12364_8, 12363_1)

1 ½fm (12300_1, 13006_1, 13003_1)

2.9m (5161_1)

S-57 Data

Geo object 1: Underwater rock / awash rock (UWTROC)
Attributes: NINFOM - Add rock
 QUASOU - 6:least depth known
 SORDAT - 20120927
 SORIND - US,US,graph,H12411

VALSOU - 2.934 m

WATLEV - 3:always under water/submerged

Office Notes

SAR: Rock verified with object detection multibeam. Compile: Concur, add rock.

Feature Images

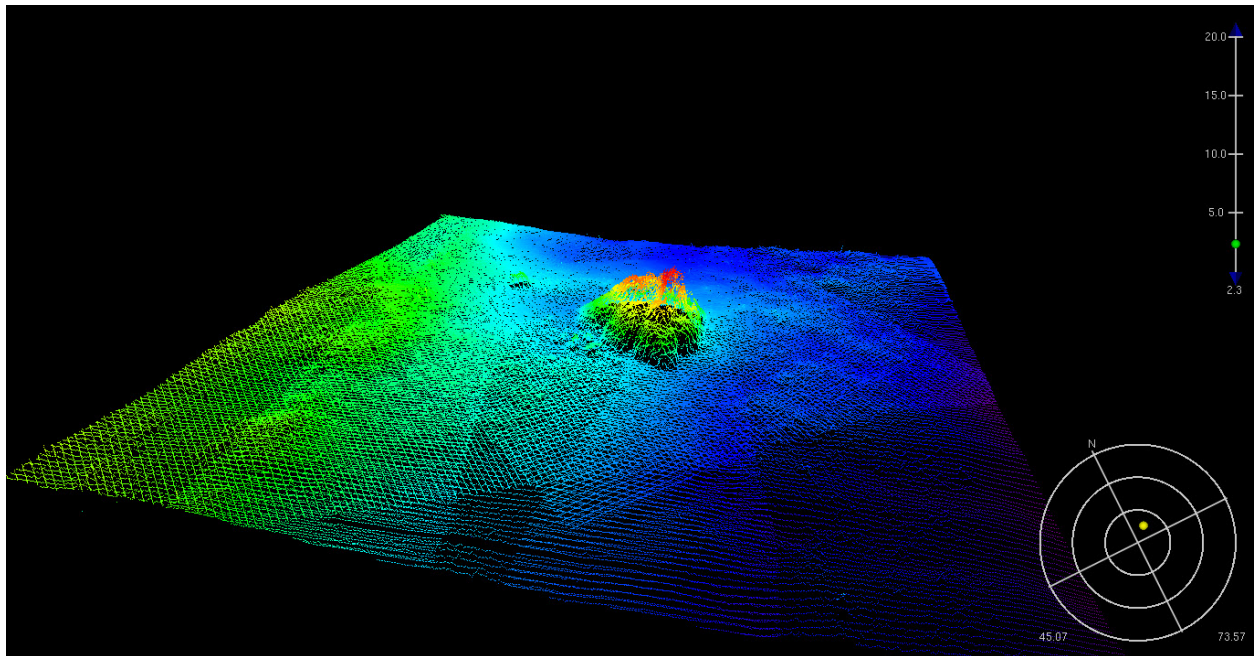


Figure 2.7.1

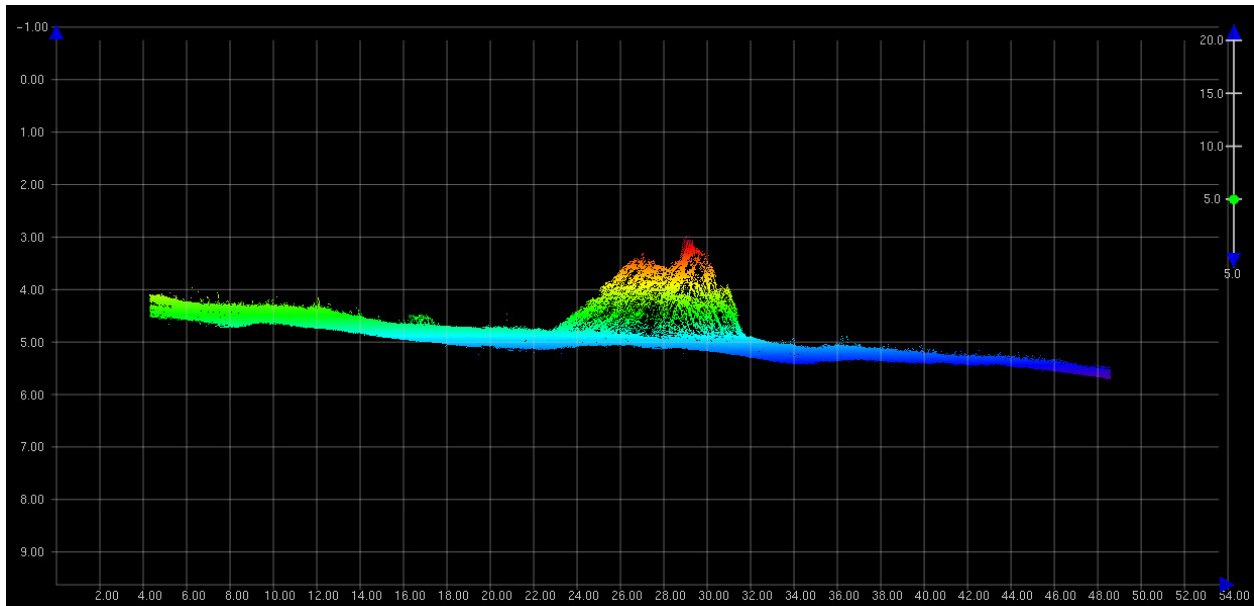


Figure 2.7.2

2.8) DTON 2.9

DANGER TO NAVIGATION

Survey Summary

Survey Position: 41° 02' 52.1" N, 073° 23' 48.8" W
Least Depth: 8.14 m (= 26.71 ft = 4.451 fm = 4 fm 2.71 ft)
TPU ($\pm 1.96\sigma$): THU (TPEh) [None] ; TVU (TPEv) [None]
Timestamp: 2012-271.00:00:00.000 (09/27/2012)
Dataset: H12411_DTONs.000
FOID: US 0000669140 00001(0226000A35D40001)
Charts Affected: 12368_1, 12364_8, 12363_1, 12300_1, 13006_1, 5161_1, 13003_1

Remarks:

UWTROC/remrks: Position is referenced from real-time GPS navigation overwritten by post-processed SBET solution and is on NAD83. Least depth sounding acquired with a Reson 7125 multibeam sonar, referenced to the NAD83 ellipsoid, and reduced to Mean Lower Low Water via VDatum separation model.

Feature Correlation

Source	Feature	Range	Azimuth	Status
H12411_DTONs.000	US 0000669140 00001	0.00	000.0	Primary

Hydrographer Recommendations

Chart rock.

Cartographically-Rounded Depth (Affected Charts):

26ft (12368_1, 12364_8, 12363_1)
 4 ½fm (12300_1, 13006_1, 13003_1)
 8.1m (5161_1)

S-57 Data

Geo object 1: Underwater rock / awash rock (UWTROC)
Attributes: QUASOU - 6:least depth known
 SORDAT - 20120927

SORIND - US,US,graph,H12411

VALSOU - 8.140 m

WATLEV - 3:always under water/submerged

Office Notes

SAR: Rock verified with object detection multibeam. Compile: Chart rock as sounding.

Feature Images

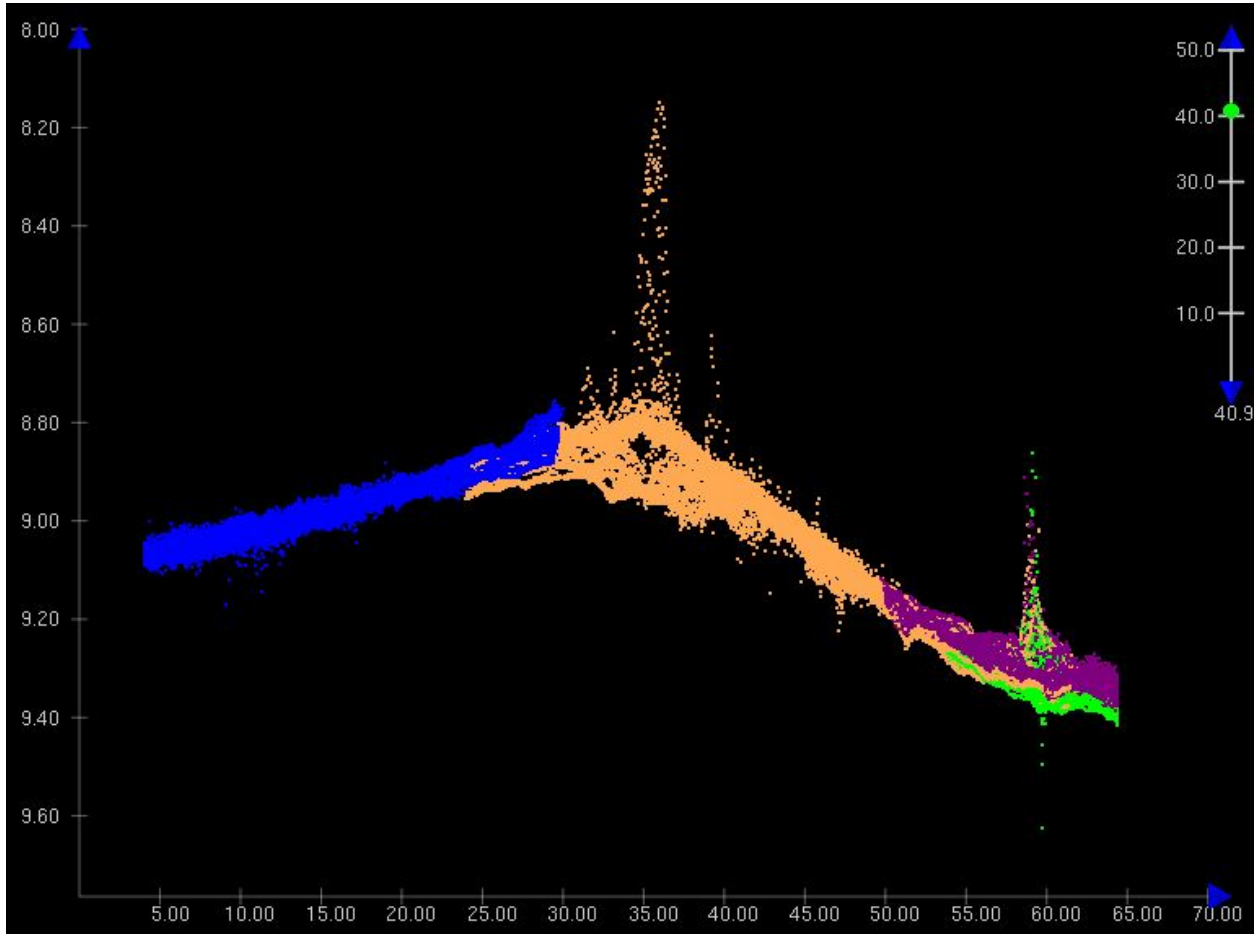


Figure 2.8.1

2.9) DTON 1.7

DANGER TO NAVIGATION

Survey Summary

Survey Position: 41° 03' 12.6" N, 073° 23' 19.3" W
Least Depth: 3.82 m (= 12.54 ft = 2.089 fm = 2 fm 0.54 ft)
TPU ($\pm 1.96\sigma$): THU (TPEh) [None] ; TVU (TPEv) [None]
Timestamp: 2012-271.00:00:00.000 (09/27/2012)
Dataset: H12411_DTONs.000
FOID: US 0000669137 00001(0226000A35D10001)
Charts Affected: 12368_1, 12364_8, 12363_1, 12300_1, 13006_1, 5161_1, 13003_1

Remarks:

UWTROC/remrks: Found with MBES.

Feature Correlation

Source	Feature	Range	Azimuth	Status
H12411_DTONs.000	US 0000669137 00001	0.00	000.0	Primary

Hydrographer Recommendations

Add dangerous rock.

Cartographically-Rounded Depth (Affected Charts):

12ft (12368_1, 12364_8, 12363_1)
 2fm (12300_1, 13006_1, 13003_1)
 3.8m (5161_1)

S-57 Data

Geo object 1: Underwater rock / awash rock (UWTROC)
Attributes: QUASOU - 6:least depth known
 SORDAT - 20120927
 SORIND - US,US,graph,H12411

VALSOU - 3.821 m

WATLEV - 3:always under water/submerged

Office Notes

SAR: Rock verified with object detection multibeam. Compile: Chart rock as sounding.

Feature Images

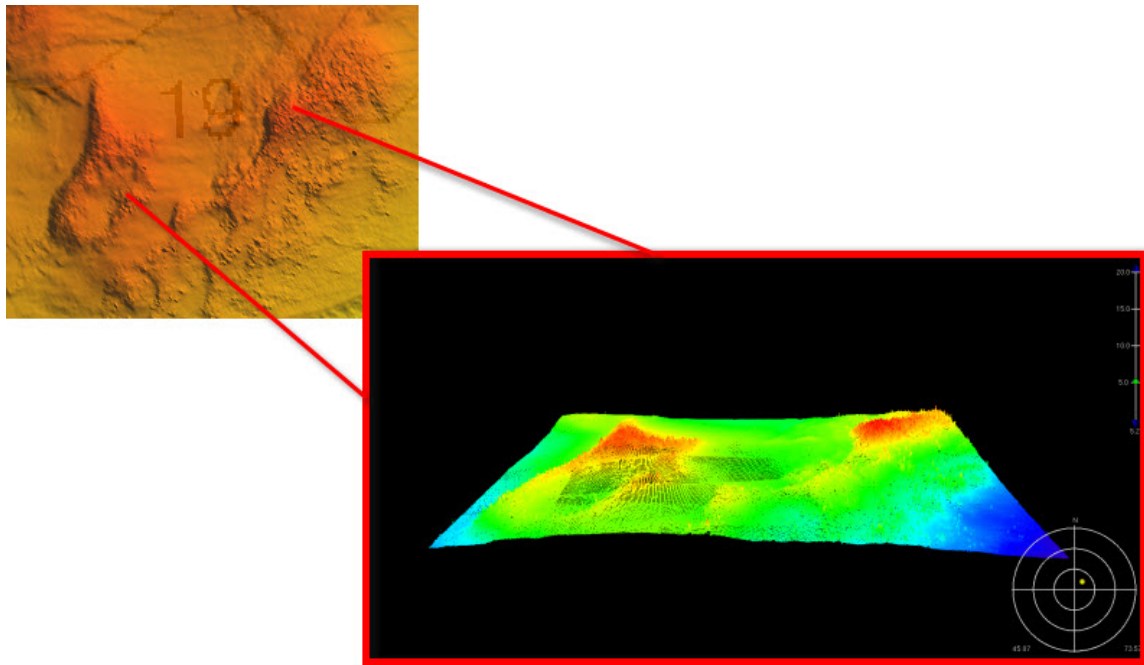


Figure 2.9.1

2.10) DTON 2.12

DANGER TO NAVIGATION

Survey Summary

Survey Position: 41° 02' 10.4" N, 073° 21' 51.3" W
Least Depth: 11.93 m (= 39.15 ft = 6.524 fm = 6 fm 3.15 ft)
TPU ($\pm 1.96\sigma$): THU (TPEh) [None] ; TVU (TPEv) [None]
Timestamp: 2012-271.00:00:00.000 (09/27/2012)
Dataset: H12411_DTONs.000
FOID: US 0000669150 00001(0226000A35DE0001)
Charts Affected: 12368_1, 12364_8, 12363_1, 12300_1, 13006_1, 5161_1, 13003_1

Remarks:

WRECKS/remrks: Uncharted wreck found with Reson 7125 OD MBES. Soundings are processed to the ellipsoid and reduced to MLLW using VDATUM

Feature Correlation

Source	Feature	Range	Azimuth	Status
H12411_DTONs.000	US 0000669150 00001	0.00	000.0	Primary

Hydrographer Recommendations

Chart a wreck

Cartographically-Rounded Depth (Affected Charts):

39ft (12368_1, 12364_8, 12363_1)

6 ½fm (12300_1, 13006_1, 13003_1)

11.9m (5161_1)

S-57 Data

Geo object 1: Wreck (WRECKS)
Attributes: CATWRK - 2:dangerous wreck
 NINFOM - Add wreck
 QUASOU - 6:least depth known

SORDAT - 20120927

SORIND - US,US,graph,H12411

VALSOU - 11.932 m

WATLEV - 3:always under water/submerged

Office Notes

SAR: Wreck verified with object detection multibeam. Compile: Concur, add wreck.

Feature Images

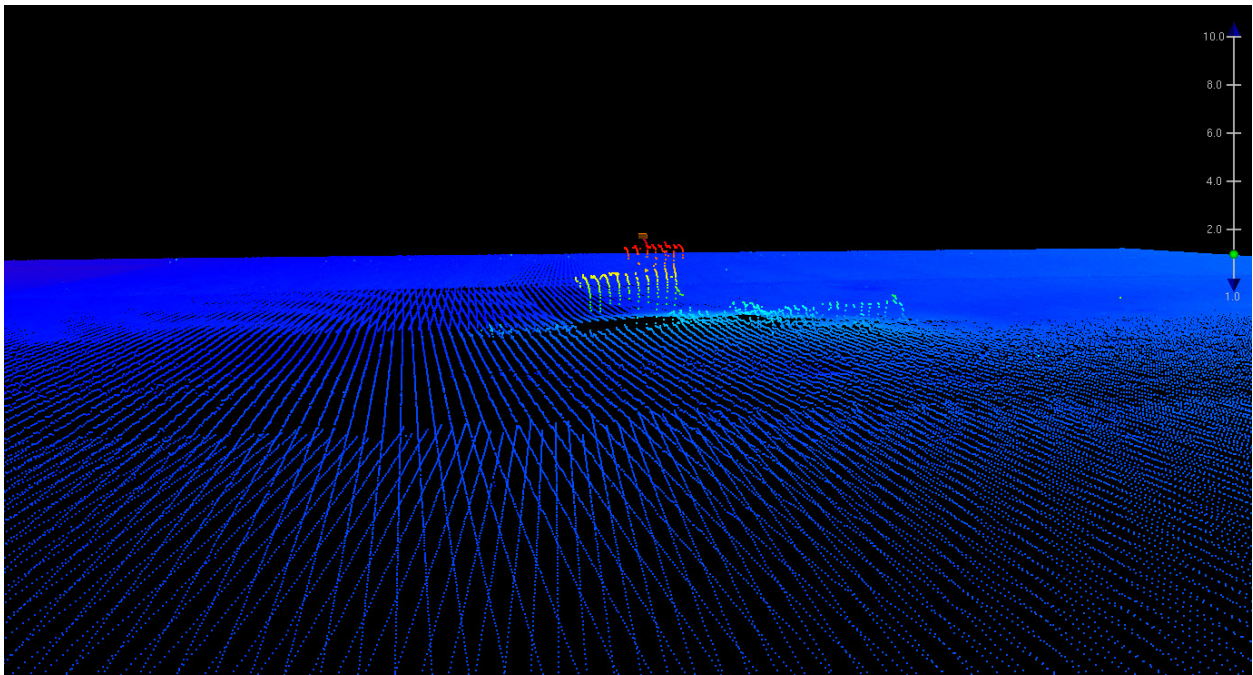


Figure 2.10.1

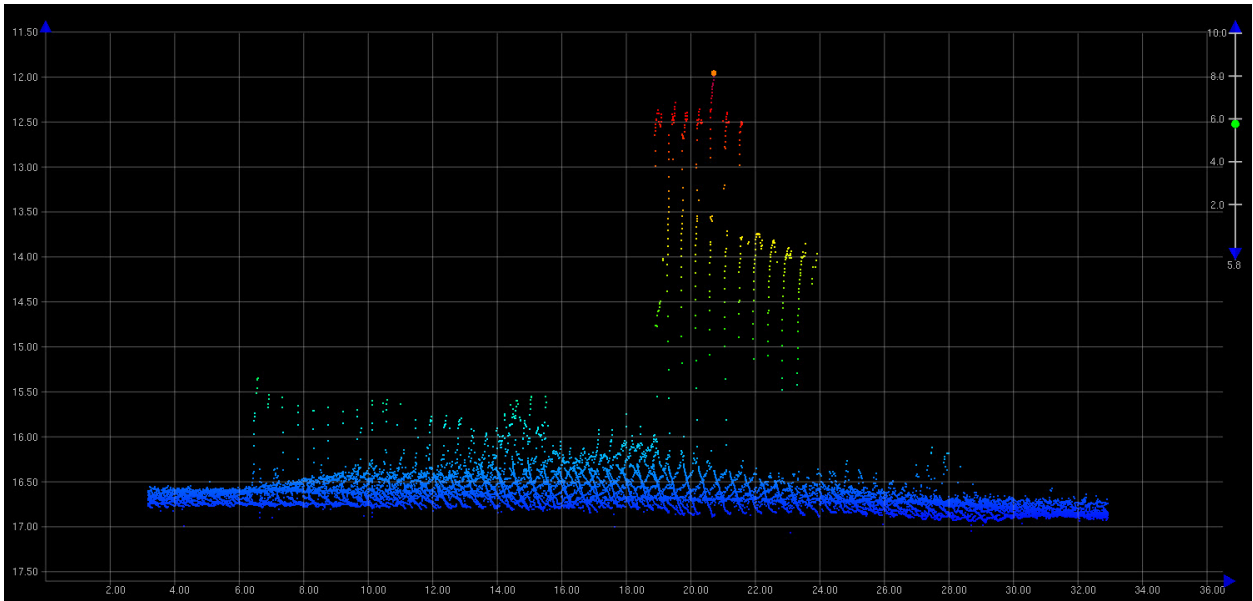


Figure 2.10.2

2.11) DTON 2.13

DANGER TO NAVIGATION

Survey Summary

Survey Position: 41° 04' 00.4" N, 073° 21' 45.7" W
Least Depth: 4.19 m (= 13.75 ft = 2.291 fm = 2 fm 1.75 ft)
TPU ($\pm 1.96\sigma$): **THU (TPEh)** [None] ; **TVU (TPEv)** [None]
Timestamp: 2012-271.00:00:00.000 (09/27/2012)
Dataset: H12411_DTONs.000
FOID: US 0000669143 00001(0226000A35D70001)
Charts Affected: 12368_1, 12364_8, 12363_1, 12300_1, 13006_1, 5161_1, 13003_1

Remarks:

UWTROC/remrks: Found with MBES. Data reduced to MLLW via VDATUM.

Feature Correlation

Source	Feature	Range	Azimuth	Status
H12411_DTONs.000	US 0000669143 00001	0.00	000.0	Primary

Hydrographer Recommendations

Add rock.

Cartographically-Rounded Depth (Affected Charts):

13ft (12368_1, 12364_8, 12363_1)
 2 ¼fm (12300_1, 13006_1, 13003_1)
 4.2m (5161_1)

S-57 Data

Geo object 1: Underwater rock / awash rock (UWTROC)
Attributes: QUASOU - 6:least depth known
 SORDAT - 20120927
 SORIND - US,US,graph,H12411

VALSOU - 4.190 m

WATLEV - 3:always under water/submerged

Office Notes

SAR: Rock verified with object detection multibeam. Compile: Chart rock as sounding.

Feature Images

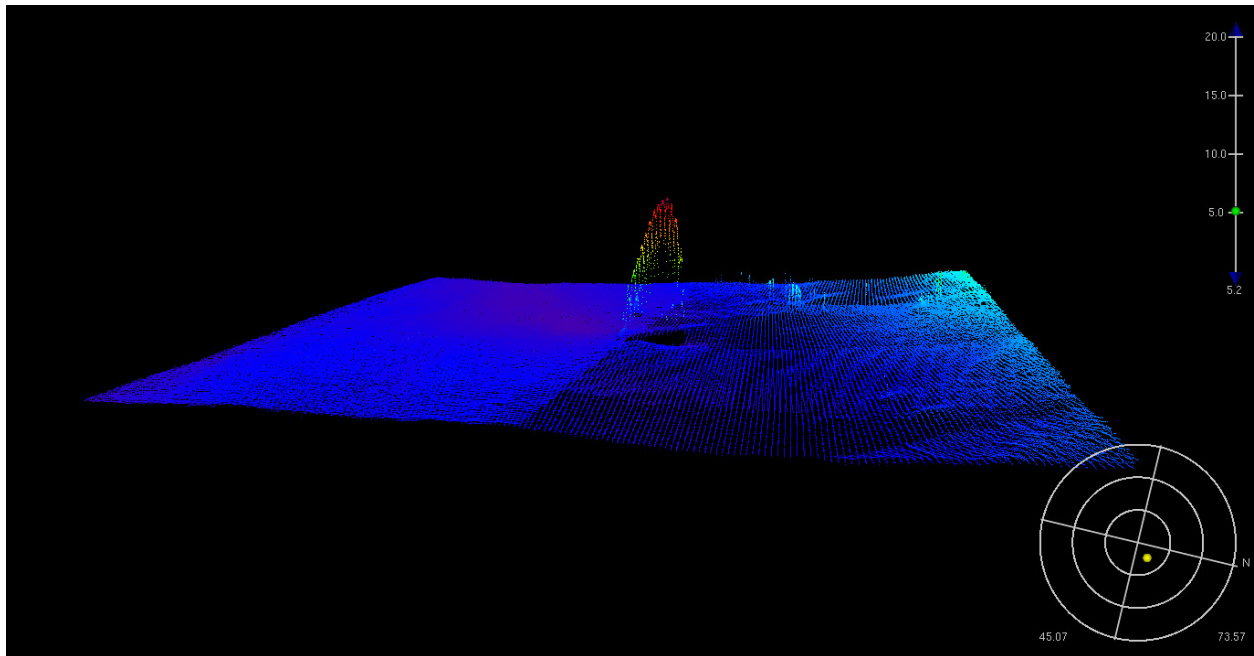


Figure 2.11.1

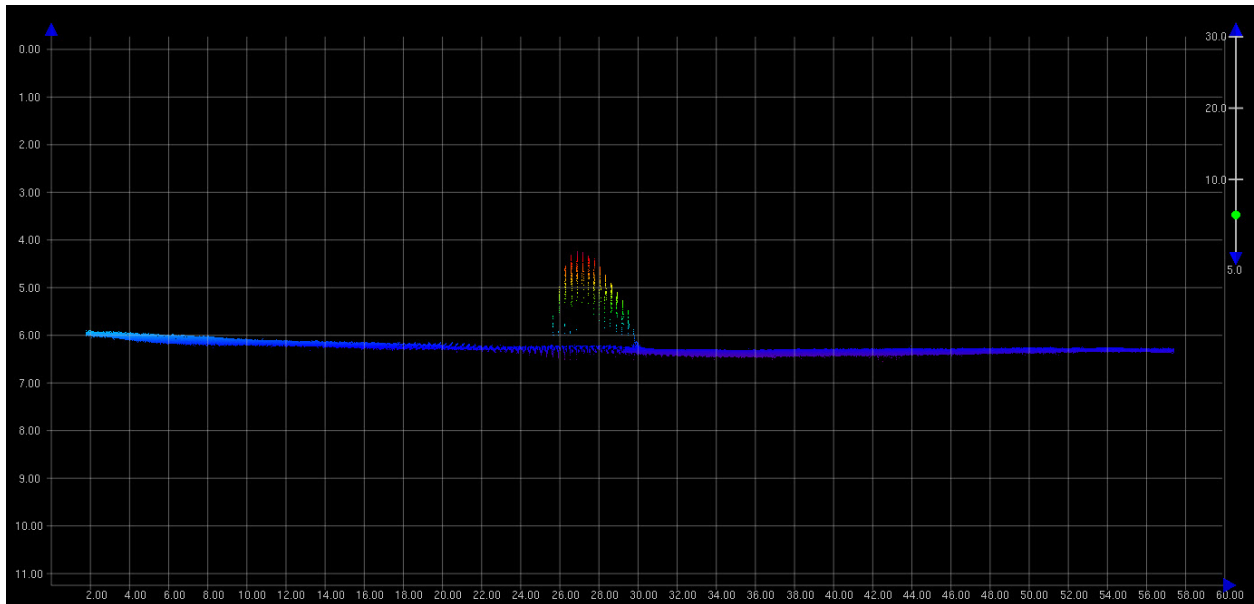


Figure 2.11.2

2.12) DTON 1.4

DANGER TO NAVIGATION

Survey Summary

Survey Position: 41° 04' 04.7" N, 073° 21' 40.2" W
Least Depth: 3.33 m (= 10.93 ft = 1.822 fm = 1 fm 4.93 ft)
TPU ($\pm 1.96\sigma$): THU (TPEh) [None] ; TVU (TPEv) [None]
Timestamp: 2012-271.00:00:00.000 (09/27/2012)
Dataset: H12411_DTONs.000
FOID: US 0000669153 00001(0226000A35E10001)
Charts Affected: 12368_1, 12364_8, 12363_1, 12300_1, 13006_1, 5161_1, 13003_1

Remarks:

UWTROC/remrks: Found with MBES. Data reduced to MLLW via VDATUM.

Feature Correlation

Source	Feature	Range	Azimuth	Status
H12411_DTONs.000	US 0000669153 00001	0.00	000.0	Primary

Hydrographer Recommendations

Add rock.

Cartographically-Rounded Depth (Affected Charts):

11ft (12368_1, 12364_8, 12363_1)

1 ¾fm (12300_1, 13006_1, 13003_1)

3.3m (5161_1)

S-57 Data

Geo object 1: Underwater rock / awash rock (UWTROC)

Attributes: QUASOU - 6:least depth known
 SORDAT - 20120927
 SORIND - US,US,graph,H12411

VALSOU - 3.332 m

WATLEV - 3:always under water/submerged

Office Notes

SAR: Rock verified with object detection multibeam. Compile: Chart rock as sounding.

Feature Images

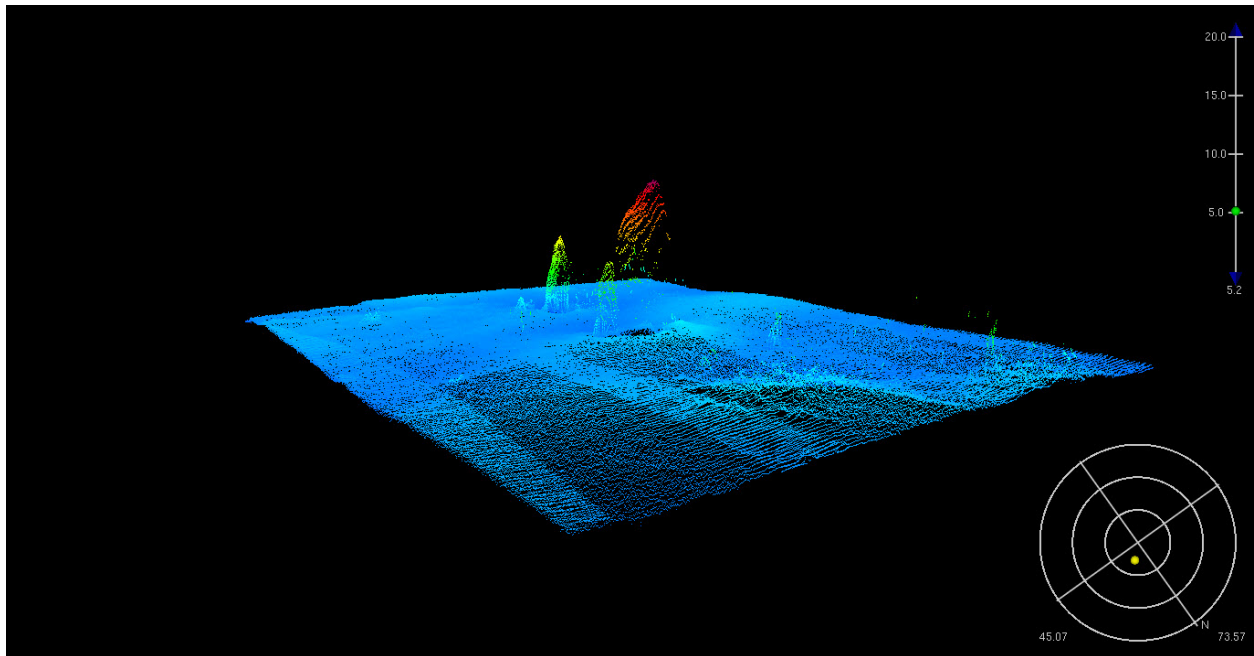


Figure 2.12.1

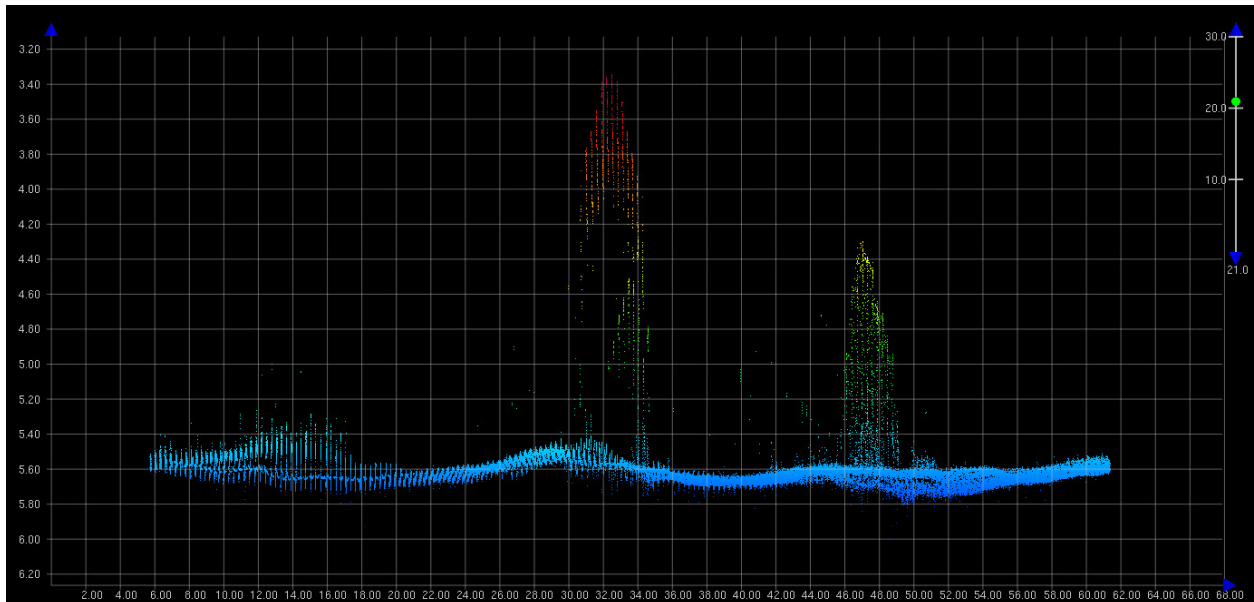


Figure 2.12.2

2.13) DTON 2.14**DANGER TO NAVIGATION****Survey Summary**

Survey Position: 41° 03' 10.1" N, 073° 21' 31.9" W
Least Depth: 8.40 m (= 27.55 ft = 4.592 fm = 4 fm 3.55 ft)
TPU ($\pm 1.96\sigma$): **THU (TPEh)** [None] ; **TVU (TPEv)** [None]
Timestamp: 2012-271.00:00:00.000 (09/27/2012)
Dataset: H12411_DTONs.000
FOID: US 0000669146 00001(0226000A35DA0001)
Charts Affected: 12368_1, 12364_8, 12363_1, 12300_1, 13006_1, 5161_1, 13003_1

Remarks:

UWTROC/remrks: Found with MBES. Data reduced to MLLW via VDATUM.

Feature Correlation

Source	Feature	Range	Azimuth	Status
H12411_DTONs.000	US 0000669146 00001	0.00	000.0	Primary

Hydrographer Recommendations

Add rock.

Cartographically-Rounded Depth (Affected Charts):

27ft (12368_1, 12364_8, 12363_1)

4 ½fm (12300_1, 13006_1, 13003_1)

8.4m (5161_1)

S-57 Data

Geo object 1: Underwater rock / awash rock (UWTROC)

Attributes: QUASOU - 6:least depth known
 SORDAT - 20120927
 SORIND - US,US,graph,H12411

VALSOU - 8.398 m

WATLEV - 3:always under water/submerged

Office Notes

SAR: Rock verified with object detection multibeam. Compile: Chart rock as sounding.

Feature Images

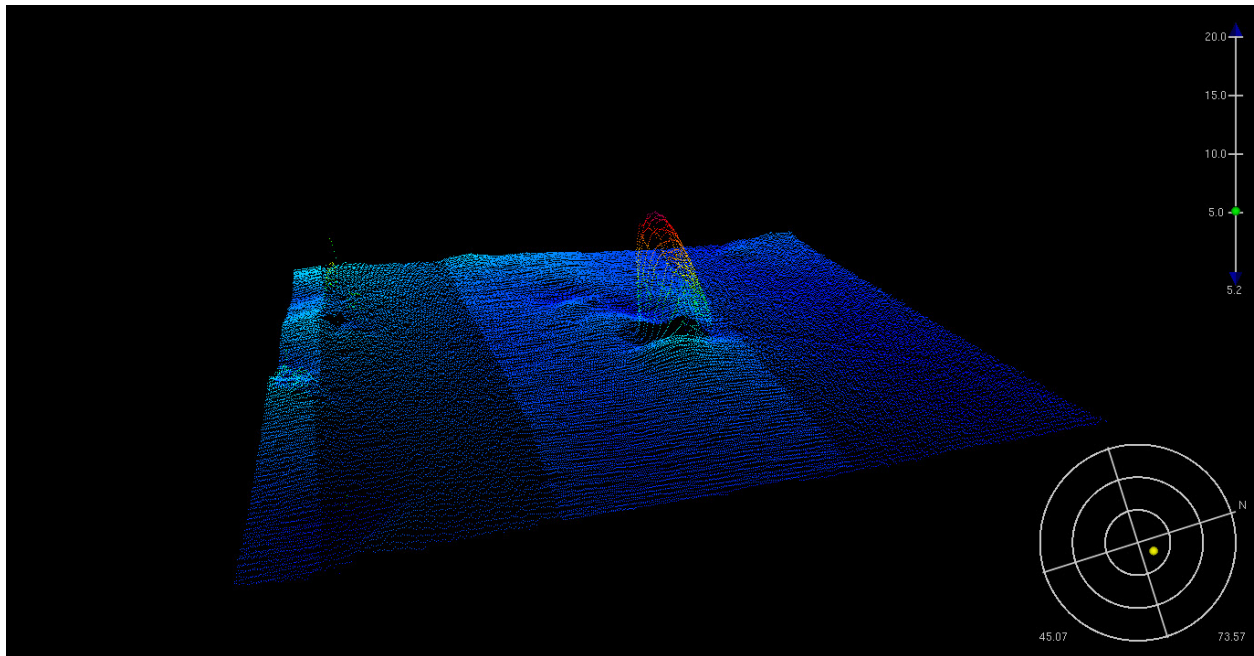


Figure 2.13.1



Figure 2.13.2

APPROVAL PAGE

H12411

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

- H12411_DR.pdf
- Collection of depth varied resolution BAGS
- Processed survey data and records
- H12411_GeoImage.pdf

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

Approved: _____

LCDR Abigail Higgins, NOAA
Chief, Atlantic Hydrographic Branch