

H12415

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: H12415

LOCALITY

State: New York

General Locality: Long Island Sound

Sub-locality: Offshore of Smithtown Bay, NY

2012

CHIEF OF PARTY
CDR Lawrence T. Krepp

LIBRARY & ARCHIVES

Date:

HYDROGRAPHIC TITLE SHEET

H12415

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: **Offshore of Smithtown Bay, NY**

Scale: **10000**

Dates of Survey: **06/09/2012 to 06/27/2012**

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:

Verification by: **Atlantic Hydrographic Branch**

Soundings Acquired in: **meters at Ellipsoidally Referenced Survey**

H-Cell Compilation Units: ***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 H12415

Project: OPR-B340-TJ-12

Locality: Long Island Sound

Sublocality: Offshore of Smithtown Bay, NY

Scale: 1:10000

June 2012 - June 2012

NOAA Ship *Thomas Jefferson*

Chief of Party: CDR Lawrence T. Krepp

A. Area Surveyed

This hydrographic survey (registry number H12415) covers an area approximately 19 square nautical miles, in Long Island Sound offshore of Smithtown Bay, NY. Coverage requirements as per Hydrographic Survey Letter Instructions OPR-B340-TJ-12 Long Island Sound Change 1, dated 8 May 2012, were met using object detection multibeam echosounder and backscatter data collected in accordance with the National Ocean Service Hydrographic Surveys Specifications and Deliverables Manual (HSSD), dated April 2012.

A.1 Survey Limits

Data was acquired within the following survey limits:

Northeast Limit	Southwest Limit
41.0255833333 N	40.97285 N
73.2129 W	73.3434 W

Table 1: Survey Limits

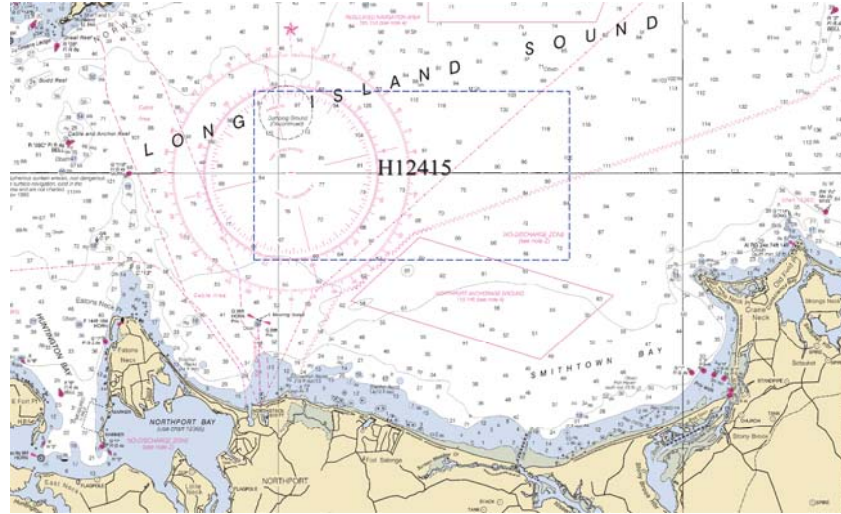


Figure 1: H12415 Survey Limits

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.

This hydrographic survey was completed as specified by 'Hydrographic Survey Letter Instructions OPR-B340-TJ-12 Long Island Sound, NY Change 1', dated 8 May 2012. No additional work is needed to complete this survey. No changes significant to navigation have been noted and it is recommended that this survey receive normal processing priority.

A.4 Survey Coverage

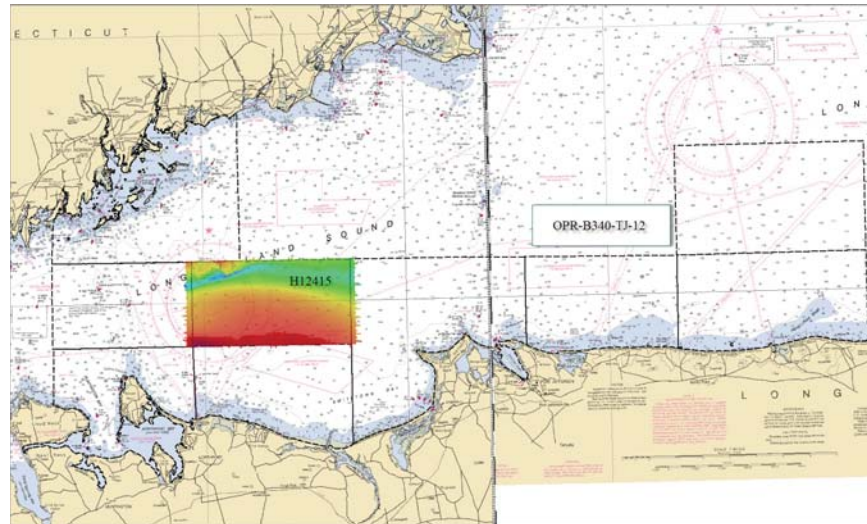


Figure 2: H12415 Survey Coverage within Project Area

Survey coverage was generally in accordance with the requirements in the Project Instructions and the HSSD April 2012. There are, however, 8 holidays in the 50cm object detection CUBE BASE surface. While one holiday is due to a ship steering error, most were formed after cleaning out schools of fish captured in the sonar data during post-processing. The surrounding bathymetry and backscatter at each holiday was examined by the hydrographer, and no evidence of significant features were found.

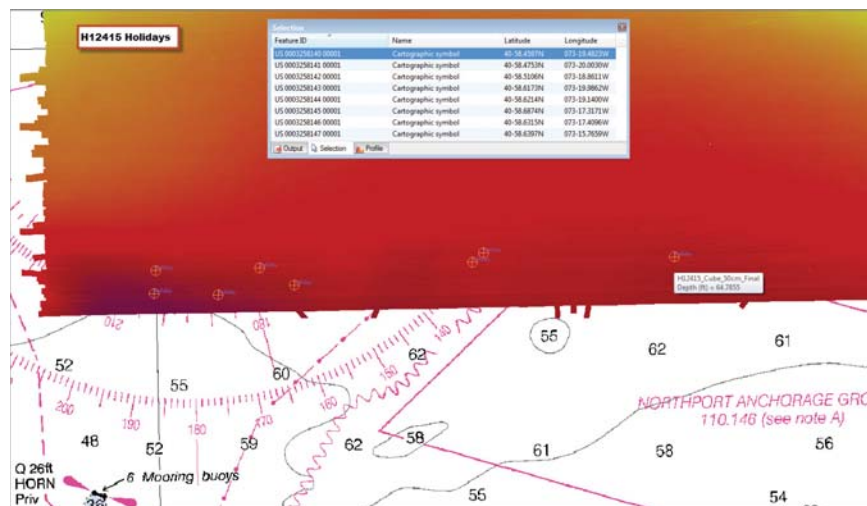


Figure 3: H12415 Holidays

A.5 Survey Statistics

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

	HULL ID	S222	Total
LNM	SBES Mainscheme	0	0
	MBES Mainscheme	647.88	647.88
	Lidar Mainscheme	0	0
	SSS Mainscheme	0	0
	SBES/MBES Combo Mainscheme	0	0
	SBES/SSS Combo Mainscheme	0	0
	MBES/SSS Combo Mainscheme	0	0
	SBES/MBES Combo Crosslines	28.49	28.49
	Lidar Crosslines	0	0
	Number of Bottom Samples		
Number of DPs			0
Number of Items Items Investigated by Dive Ops			0
Total Number of SNM			20.54

Table 2: Hydrographic Survey Statistics

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

<i>Survey Dates</i>
06/09/2012
06/10/2012
06/11/2012
06/12/2012
06/13/2012
06/19/2012
06/20/2012
06/21/2012
06/22/2012
06/23/2012
06/24/2012
06/27/2012

Table 3: Dates of Hydrography

A.6 Shoreline

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

A.7 Bottom Samples

The initial bottom sample locations were modified by HSD Ops after we received the Project Instructions. This modification removed a large amount of bottom samples. We sampled based on the modified locations.

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>S-222</i>
LOA	208 feet
Draft	14 feet

Table 4: Vessels Used

B.1.2 Equipment

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

Manufacturer	Model	Type
Applanix	POSMV	Vessel Attitude System
Applanix	POSMV	Positioning System
Brook Ocean	MVP100	Sound Speed System
Reson	7125	MBES

Table 5: Major Systems Used

Data were acquired by NOAA Ship Thomas Jefferson, S-222. NOAA Ship Thomas Jefferson acquired Reson 7125 MBES soundings, and sound velocity profiles. Vessel configurations, equipment operation, and data acquisition and processing were consistent with specifications described in the DAPR.

B.2 Quality Control

B.2.1 Crosslines

MBES cross-lines totaling 28.5 LNM, approximately 4.2% of total hydrography, were acquired during the course of the survey. As per email dated 10 Sept, 2009 from AHB located 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 on cross-lines compared with mainscheme data is 0.27m (in position 41-00.46'N, 073-13.43'W). Throughout the entire data set, the mean standard deviation was 0.04m, whereas the maximum standard deviation was 0.45m. The regions of highest standard deviation are found at the reported features found throughout the survey area, and are described in detail in the Final Feature File.

B.2.2 Uncertainty

The following survey specific parameters were used for this survey:

Measured	Zoning
10.2centimeters	0meters

Table 6: Survey Specific Tide TPU Values

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

Table 7: Survey Specific Sound Speed TPU Values

Tidal values listed above were input for all lines reduced using Ellipsoidally Referenced Survey (ERS) techniques. All but four lines were processed this way. The four remaining lines were reduced using TCARI. These four lines are: DN 163: 479_1643, 479_1703; DN 171: 459_1240; DN 174: 416_1851. For all TCARI lines, Tidal Uncertainty values were zeros for both values.

CO-OPS provided tide uncertainty values for the TCARI surface and the VDATUM solution as part of the Total Propagated Uncertainty (TPU) calculation performed within CARIS HIPS and SIPS. TPU is calculated and written to each line's HDCS file (CARIS processed data format). When surfaces are created, an uncertainty child layer is created. This child layer represents the amount of uncertainty for individual nodes in the surface based on a combination of a priori values from equipment vendors, values determined from environmental observation in the field, and from automated empirical analysis of data in real-time. Once all investigated features have been reviewed and least depths have been designated, surfaces are finalized. In finalization, the standard deviation for each node in the surface is multiplied by 1.96 to provide the 95% (2-sigma) confidence value for the node. This 2-sigma standard deviation is compared to the computed Total Vertical Uncertainty (TVU) for each node. The larger of the two values is retained as the finalized Uncertainty for each node. Uncertainty is reported in meters. IHO has established allowable TVU values for each order of survey. This survey meets IHO Order I TVU requirements in 99.99% of nodes in the final surface.

B.2.3 Junctions

H12415 was compared with H12412, H12489, H12414, and H12416 from the same project. This project also junctioned with H11045. However, no usable surface for this survey was included with the project instructions.

The following junctions were made with this survey:

Registry Number	Scale	Year	Field Unit	Relative Location
H12412	1:10000	2012	NOAA Ship THOMAS JEFFERSON	W
H12489	1:10000	2012	NOAA Ship THOMAS JEFFERSON	NW
H12414	1:10000	2012	NOAA Ship THOMAS JEFFERSON	S
H12488	1:10000	2012	NOAA Ship THOMAS JEFFERSON	E

Table 8: Junctioning Surveys

H12412

The junction with H12412 was compared using a difference surface in CARIS Bathy DataBase. The surveys had a mean difference of -0.033m and a standard deviation of 0.098m.

H12489

The junction with H12412 was compared using a difference surface in CARIS Bathy DataBase. The surveys had a mean difference of -0.102m and a standard deviation of 0.081m.

H12414

The junction with H12414 was compared using a difference surface in CARIS Bathy DataBase. The surveys had a mean difference of -0.018m and a standard deviation of 0.057m.

H12488

The junction with H12488 was compared using a difference surface in CARIS Bathy DataBase. The surveys had a mean difference of -0.080m and a standard deviation of 0.260m.

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 SVP issues

There are noticeable sound velocity issues throughout the survey. Different applications were tried (eg. Nearest in Time, Nearest in Distance Within Time); however none resolved the sound velocity issues.

B.2.7 Sound Speed Methods

Sound Speed Cast Frequency: The ship used a Moving Vessel Profiler with casts occurring approximately every 30 minutes. Sound speed profiles were analyzed for data quality, concatenated and then applied to the bathymetry using the "nearest in time" mode in Caris HIPS and SIPS.

No zoning was conducted to account for this. The cast frequency was increased to reduce SV issues.

B.2.8 Coverage Equipment and Methods

99.67% of all nodes 0-20m met the density requirements of at least 5 pings per node for Object Detection MBES at 50cm grid resolution. 99.99% of all nodes greater than 18m met density requirements of at least 5 pings per node at the 2m grid resolution.

B.3 Echo Sounding Corrections

B.3.1 Corrections to Echo Soundings

HDCS sounding data were reduced to mean lower low (MLLW) primarily with a VDATUM solution. Select lines were processed using TCARI when issues with ERS processing did not allow for an SBET solution. See the Vertical and Horizontal Control Section for more information.

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: NOAAProfileField.xml v.5.2

B.5.2 Surfaces

The following CARIS surfaces were submitted to the Processing Branch:

Surface Name	Surface Type	Resolution	Depth Range	Surface Parameter	Purpose
H12415_MB_2m_MLLW_Combined	CUBE	2 meters	0 meters - 50 meters	NOAA_2m	Complete MBES
H12415_MB_2m_MLLW_Final	CUBE	2 meters	18 meters - 50 meters	NOAA_2m	Complete MBES
H12415_MB_50cm_MLLW_Final	CUBE	0.5 meters	0 meters - 20 meters	NOAA_0.5m	Object Detection

Table 9: CARIS Surfaces

C. Vertical and Horizontal Control

Additional information discussing the vertical or horizontal control for this survey can be found in the accompanying HVCR.

C.1 Vertical Control

The vertical datum for this project is Mean Lower Low Water.

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 07/01/2012. The final tide note was received on 07/31/2012.

Non-Standard Vertical Control Methods Used:

VDatum

Ellipsoid to Chart Datum Separation File:

2012_B340_VDatum_Ellip_MLLW.txt

Crosslines with and without SBETs applied were compared using Pydro's Time Series Comparison tool. Stats were: N,mean,stdev = 81041,-0.067,0.048. See Appendix V for the interim deliverable memo and resulting VDATUM approval memo. The majority of H12415 was processed to the ellipsoid and used the OPS provided VDATUM separation model to reduce data to MLLW.

The remaining lines from H12415 did not have GPS tides applied and instead were processed with TCARI tides:

S-222: DN 163 Line Numbers 479_1643 and 479_1703; DN 171 Line Number 459_1240; DN 174 Line Number 416_1851

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

The following CORS Stations were used for horizontal control:

HVCR Site ID	Base Station ID
Brookfield	CTBR
Palisades	LAMT
Groton	CTGR
Dover	DEDO
Queens	NYQN
Guilford	CTGU
Moriches 6	MOR6
New York WAAS 1	ZNY1
Central Islip	NYCI
Riverhead	NYRH
Valhalla	NYVH
Darien	CTDA

Table 13: CORS Base Stations

The following DGPS Stations were used for horizontal control:

DGPS Stations
Moriches, NY (293 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
12363	1:80000	41	02/2010	10/02/2012	10/06/2012
12364	1:40000	39	09/2012	10/02/2012	10/06/2012
12365	1:20000	27	09/2012	10/06/2012	10/02/2012
12368	1:20000	27	06/2006	10/02/2012	10/06/2012

Table 15: Largest Scale Raster Charts

12363

In areas of H12415 where 12363 was the largest scale chart, soundings generally agreed within three feet.

12364

In areas of H12415 where 12364 was the largest scale chart, soundings generally agreed within three feet. However, on chart 12364_21, in an area illustrated by figure 4 near the NE corner of H12415, surveyed soundings were found to be generally 10 feet deeper than charted depths.

The pipeline surveyed in H12415 was found to be approximately 60 meters to the NW of the charted pipeline. See figure 5.

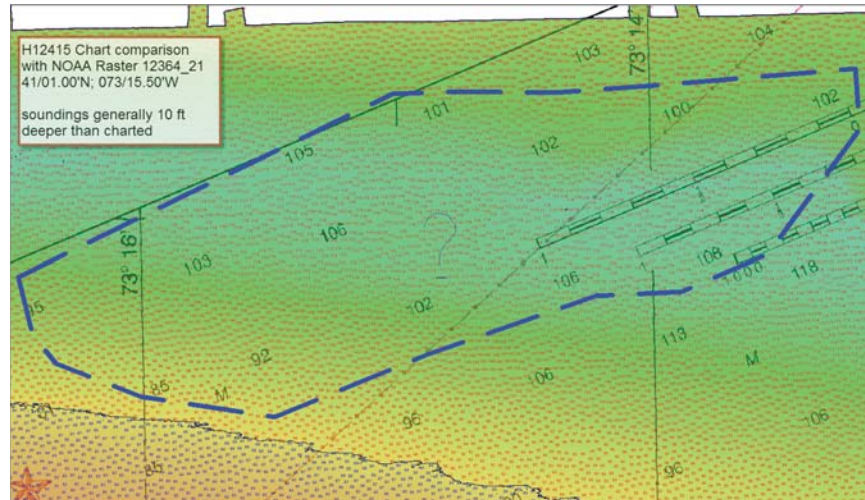


Figure 4: H12415 sounding comparison with NOAA Raster Chart 12364_21

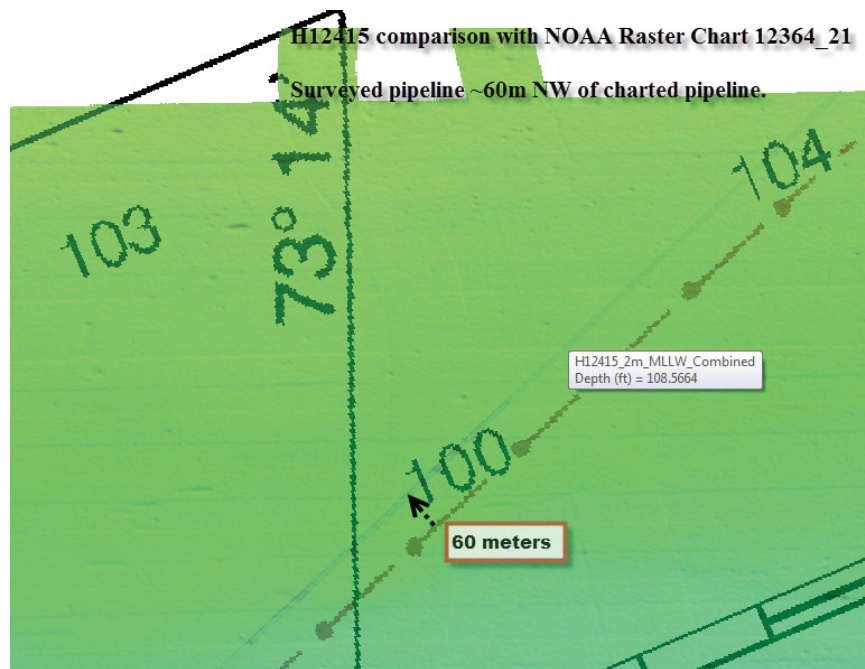


Figure 5: Mispositioned pipeline on NOAA Raster Chart 12364_21

12365

In areas of H12415 where 12365 was the largest scale chart, soundings generally agreed within three feet. However, in an area illustrated by figure 6 near the SW corner of H12415, the 60 ft charted contour has shifted approximately 180 meters to the NW.

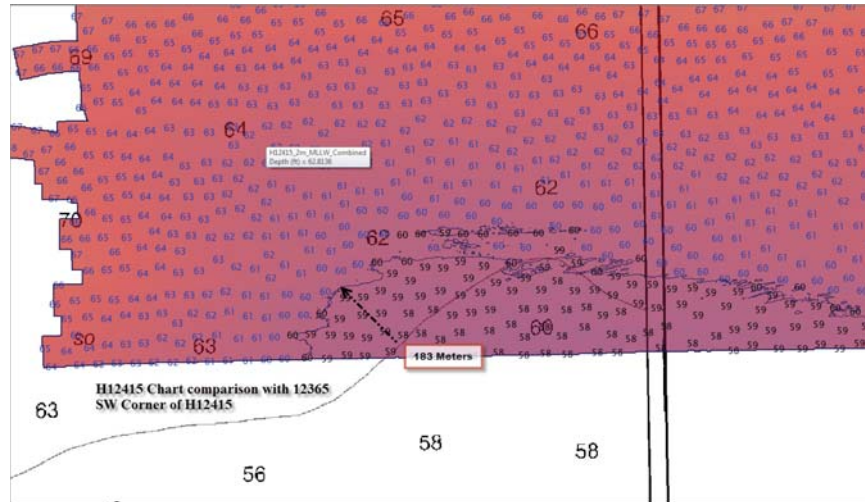


Figure 6: Shifted contour on NOAA Raster Chart 12365

12368

In areas of H12415 where 12365 was the largest scale chart, soundings generally agreed within three feet. However, in an area illustrated by figure 7 near the NW corner of H12415, the 90 ft charted contour has shifted approximately 263 meters to the W, 130 meters to the SW, and 145 to the N. Surveyed soundings near a 95 ft charted sounding in the NW region of the sheet are seven feet shoaler than charted, as illustrated by figure 7 as well.

In the western region of H12415, a 115 ft charted sounding has been mispositioned over 108 ft surveyed soundings. A 90 ft contour has shifted 140 meters to the south as well. See figure 8.

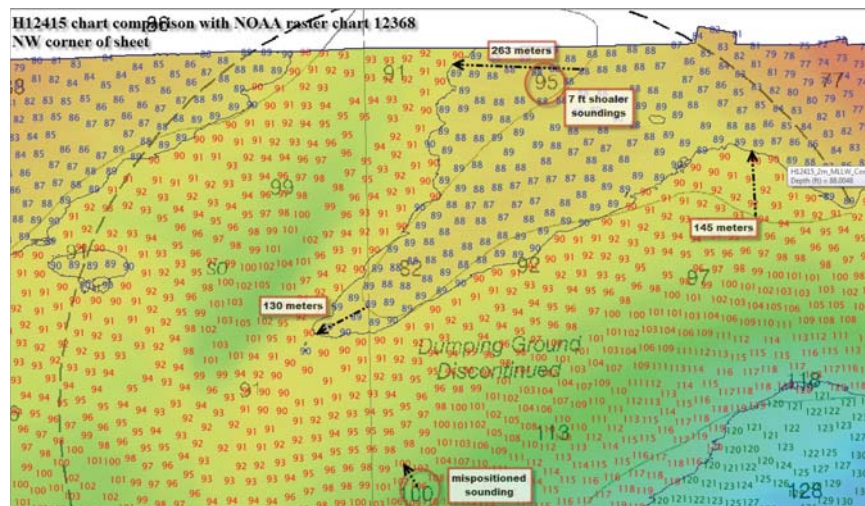


Figure 7: Chart comparison with NOAA Raster Chart 12368 in NW corner of H12415

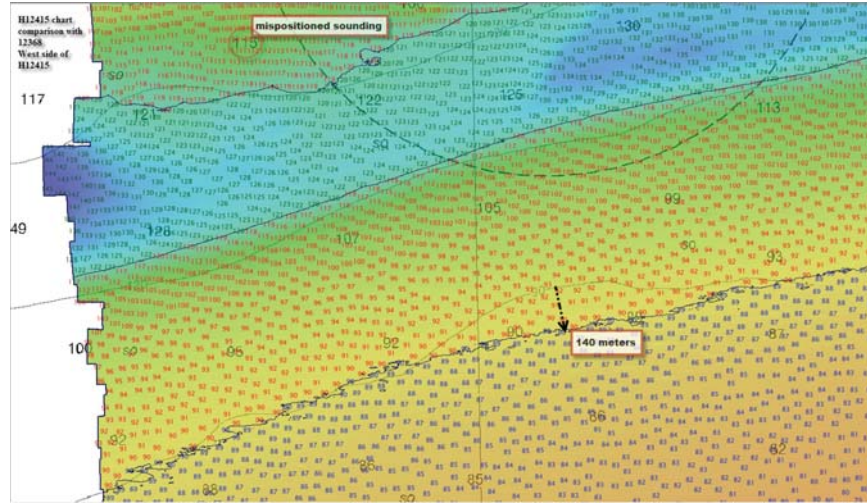


Figure 8: Mispositioned sounding and shifted contour on NOAA Raster Chart 12365

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?
US4NY13M	1:80000	15	07/27/2012	07/27/2012	NO
US5CN10M	1:40000	4	07/24/2012	07/27/2012	NO
US5NY14M	1:20000	17	09/25/2012	09/25/2012	NO
US5CN11M	1:20000	22	07/11/2012	07/11/2012	NO

Table 16: Largest Scale ENC's

US4NY13M

In areas of H12415 where US4NY13M was the largest scale ENC, soundings generally agreed within three feet.

US5CN10M

See discussion on comparison of NOAA Raster Chart 12364_21.

US5NY14M

See discussion on comparison of NOAA Raster Chart 12365.

US5CN11M

See discussion on comparison of NOAA Raster Chart 12368.

D.1.3 AWOIS Items

Number of AWOIS Items Addressed: 1

Number of AWOIS Items Not Addressed: 0

AWOIS item #1760, a reported but uncharted wreck, was disproved by searching the entire 1km search radius. No evidence of this wreck was found. It is recommended to update the AWOIS database.

D.1.4 Charted Features

No charted features exist for this survey.

D.1.5 Uncharted Features

Three uncharted wrecks and one uncharted obstruction were found on H12415. See the Final Feature File (H12415_FFF.000) for more information regarding positions, depths, and corresponding images.

D.1.6 Dangers to Navigation

The following DTON reports were submitted to the processing branch:

DTON Report Name	Date Submitted
H12415_DToN_1	2013-01-09

Table 17: DTON Reports

This wreck was submitted as a DTON due to its location within a prescribed anchorage area. Danger to Navigation Reports are included in Appendix I of this report.

D.1.7 Shoal and Hazardous Features

No shoals or potentially hazardous features exist for this survey.

D.1.8 Channels

The northern extent of the designated Northport Anchorage Ground lies within the southern portion of the H12415 survey limits. While all charted soundings agreed with surveyed soundings within two feet, an uncharted wreck was discovered within the designated anchorage. See Figure 9 and refer to the Final Feature File for more information.

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

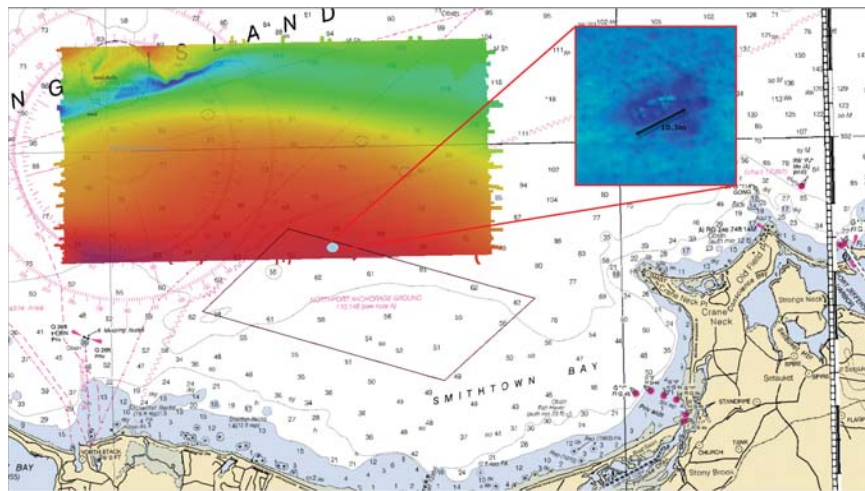


Figure 9: 10m wreck discovered in Northport Anchorage Grounds

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

No prior survey comparisons exist for this survey.

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

A pipeline and submarine cable run across H12415. The pipeline was observed to be mispositioned as much as 60m. See the chart comparison discussions above for more information.

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



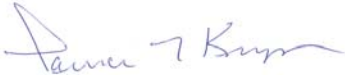
There is no present or planned construction or dredging within the survey limits.

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.

Approver Name	Approver Title	Approval Date	Signature
Anthony Klemm, LTJG/NOAA	Sheet Manager	02/08/2013	 LTJG/NOAA
William Winner, LT/NOAA	Field Operations Officer	02/08/2013	 William E Winner
Lawrence Krepp, CDR/NOAA	Commanding Officer	02/08/2013	 Lawrence Krepp

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
NATIONAL OCEAN SERVICE
Office of Coast Survey
Silver Spring, Maryland 20910-3282

August 2, 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 H12415 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 29, 2012, Subject "H12415 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.





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

TIDE NOTE FOR HYDROGRAPHIC SURVEY

DATE : July 20, 2012

HYDROGRAPHIC BRANCH: Atlantic
HYDROGRAPHIC PROJECT: OPR-B340-TJ-2012
HYDROGRAPHIC SHEET: H12415

LOCALITY: Offshore of Smithown Bay, NY
TIME PERIOD: June 09 - June 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.tc" as the final grid for project OPR-B340-TJ-2012, Registry No. H12415, during the time period between June 09 and June 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.T
HOMAS.1365860
250**

Digitally signed by
HOVIS.GERALD.THOMAS.1365860250
DN: c=US, o=U.S. Government, ou=DoD,
ou=PKI, ou=OTHER,
cn=HOVIS.GERALD.THOMAS.136586025
0
Date: 2012.07.30 15:46:38 -04'00'

CHIEF, PRODUCTS AND SERVICES BRANCH

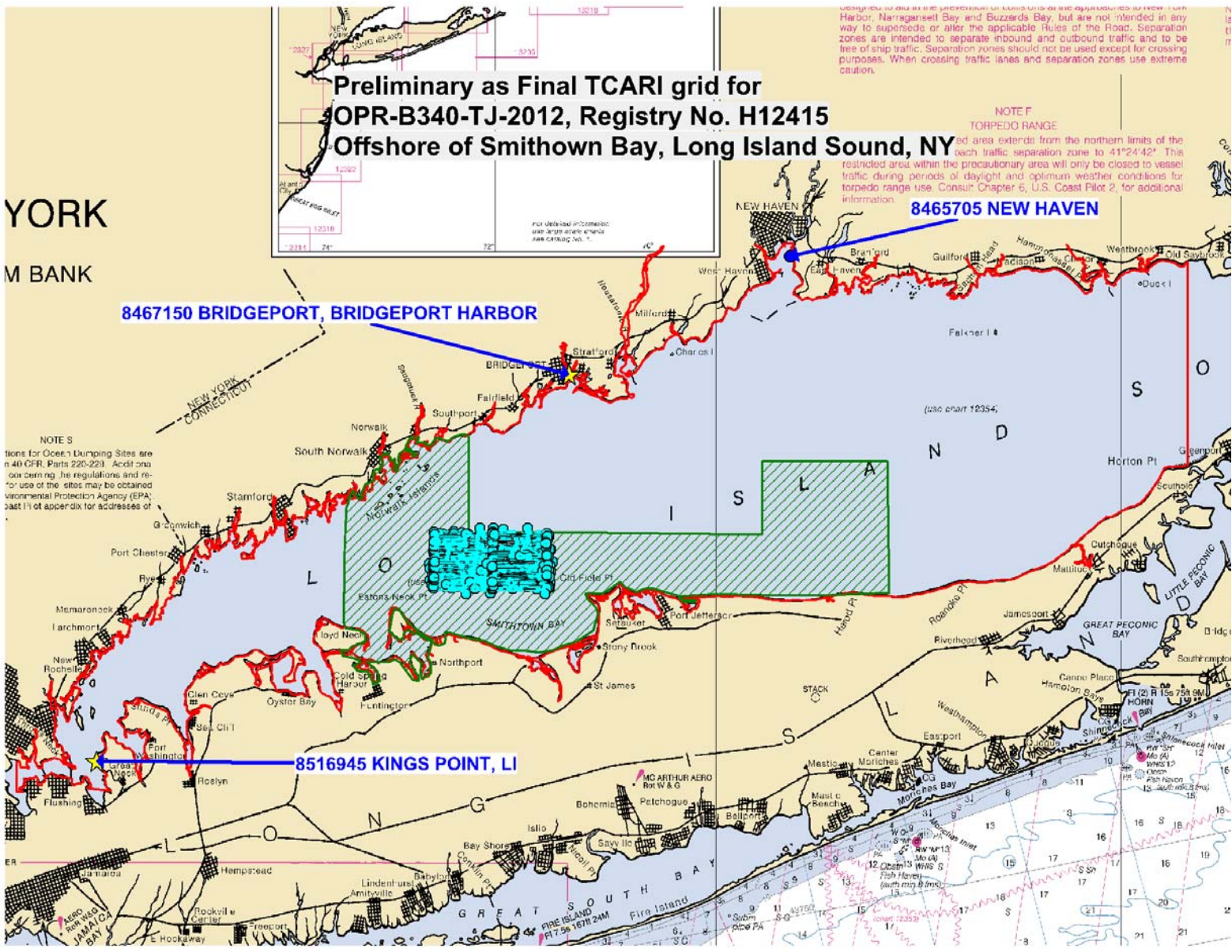


**Preliminary as Final TCARI grid for
 8467150 BRIDGEPORT, BRIDGEPORT HARBOR
 8516945 KINGS POINT, LI**

Use of this area as a precautionary area is not intended in any way to supersede or alter the applicable Rules of the Road. Separation zones are intended to separate inbound and outbound traffic and to be free of ship traffic. Separation zones should not be used except for crossing purposes. When crossing traffic lanes and separation zones use extreme caution.

**NOTE F
 TORPEDO RANGE**
 This restricted area extends from the northern limits of the each traffic separation zone to 41°24'42". This restricted area within the precautionary area will only be closed to vessel traffic during periods of daylight and optimum weather conditions for torpedo range use. Consult Chapter 6, U.S. Coast Pilot 2, for additional information.

**NEW YORK
 LONG ISLAND SOUND**



APPENDIX II

SUPPLEMENTAL SURVEY RECORDS AND CORRESPONDENCE

Subject: Re: Crossline comparison

From: Chris van Westendorp <Christiaan.VanWestendorp@noaa.gov>

Date: Thu, 10 Sep 2009 13:00:35 -0400

To: "mark.blankenship" <Mark.Blankenship@noaa.gov>

CC: LCDR Rick Brennan <Richard.T.Brennan@noaa.gov>, Castle Parker <Castle.E.Parker@noaa.gov>, Edward Owens <Edward.Owens@noaa.gov>, LT Jasper Schaer <jasper.schaer@noaa.gov>, CDR Shep Smith <Shep.Smith@noaa.gov>, Daniel Wright <Daniel.Wright@noaa.gov>

Mark,

Per 5.1.4.3 of the HSSD, AHB authorizes TJ to use the Standard Deviation layer to conduct surface difference comparison and analysis on future survey submissions of multibeam data. This meets the crossline comparison requirement laid out in HSSD.

Please let me know if you have any questions or need for further clarification.

R/

LCDR Chris van Westendorp, NOAA

mark.blankenship wrote:

Chris,

You mentioned in the meeting today that AHB was not going to require the multiple CUBE surface comparison, instead allowing us to use a single surface standard deviation layer to do our checks with. Is there any memo coming out for that?

Mark

LCDR Chris van Westendorp <christiaan.vanwestendorp@noaa.gov>

Atlantic Hydrographic Branch

NOAA OCS

Subject: Re: Bottom Sample submission

From: Gene Parker <Castle.E.Parker@noaa.gov>

Date: Mon, 31 Jan 2011 11:47:48 -0500

To: "ops.thomas.jefferson" <OPS.Thomas.Jefferson@noaa.gov>

Good day Mark,

Submit both. HSSD specifies both in two areas of the document. First one needs to comply with HSSD; if the TJ wants to make the Hob file, then they have gone beyond the minimum requirements. If the TJ doesn't do it, then AHB would have to as long as the BS is within the Pydro PSS. Reference HSSD Section 8.2 S57 Feature File, paragraph 6:

The S-57 feature file contains all the attributed information on specific objects that cannot be portrayed in a simple depth grid. Features to include in the S-57 feature file include; wrecks, obstructions, shoreline, rocks, islets, oil platforms, nature of seabed (bottom samples) and all other objects that may need to be compiled to a navigational product and require additional information that cannot be included in the BAG.

The Pydro PSS is in lieu of the S57 format file.

We could make the hob from the table, but since the TJ has done this, submit both the Hob file and the table contained in DR Appendix 5. Place the Hob file in the PSS directory which has contained all features in NOAA PSS format as in the past. If the TJ is going to submit the hob file, the source would be the table, so HSSD specifies delivery of both. If the TJ only submitted the table, AHB would have to generate the feature objects. If the TJ creates the hob file, then submit it.

gene

ops.thomas.jefferson wrote:

Gene,

We will be submitting .HOB files for the bottom samples in addition to the summary table found in the supplemental survey records and correspondence section of the DR. It is my understanding that the table is only used to create the .HOB anyways. A recommendation will need to be made that either the table either be omitted or be used in place of the .hob file. Only the summary table is mention in the HSSD april 2010 version. If there are any other issues with this idea please let us know.

Mark

Castle Eugene Parker <castle.e.parker@noaa.gov>

Physical Scientist - Hydrographic Team Lead

Atlantic Hydrographic Branch

NOAA Office of Coast Survey



Marilyn Schluter - NOAA Federal <marilyn.l.schluter@noaa.gov>

NOAA Hydrographic Surveys H12415, H12430, H12437, H12438

4 messages

Marilyn Schluter - NOAA Federal <marilyn.l.schluter@noaa.gov>

Thu, Mar 21, 2013 at 3:57 PM

To: ruth.pierpont@oprhp.state.ny.us, Christina Rieth <crieth@mail.nysed.gov>

Cc: bruce.terrell@noaa.gov, Marc.S.Moser@noaa.gov, Todd.A.Haupt@noaa.gov, frank.cantelas@noaa.gov,

Abigail.Higgins@noaa.gov, Castle.E.Parker@noaa.gov, marilyn.l.schluter@noaa.gov, Brian.Jordan@boemre.gov, Lawrence Krepp - NOAA Federal <Lawrence.T.Krepp@noaa.gov>

Dear Sir/Madam,

The National Oceanic and Atmospheric Administration's Office of Coast Survey (OCS) may have previously contacted you regarding hydrographic surveys in **Block Island Sound** and **Long Island Sound, NY**. These surveys have been completed. The complete Descriptive Reports for these surveys are available for your review on NOAA's public ftp web site. Please provide any comments regarding these surveys (please reference the survey numbers **H12415, H12430, H12437, H12438**) within 30 days to:

LT Abigail Higgins

Chief, Atlantic Hydrographic Branch

Work: [757-441-6746](tel:757-441-6746) Ext.200

Fax: [757-441-6601](tel:757-441-6601)

E-Mail: Abigail.Higgins@noaa.gov

439 W. York St.

Norfolk, VA 23510

If we have not received a response in 30 days, we will assume that these surveys do not include any data of sufficient historical significance (for instance, an historic shipwreck whose location should not be made public knowledge) to warrant special data handling, and will forward this data for our standard nautical charting process.

You will need to have Winzip compression utility installed on your computer to access these files. The following link

<http://www.winzip.com/downwz.htm> will take you to the Winzip free evaluation site where you can register for Winzip and access the files.

To access this information follow this link <ftp://205.156.4.84/4SHPO> to NOAA's public ftp web site and select the aforementioned surveys (**H12415, H12430, H12437, H12438**).

The "Key" for these surveys (i.e. to remove the encryption from the .zip files) is:
B340_NY_4617

Regards,

Marilyn Schlüter, Data Manager
NOAA/Atlantic Hydrographic Branch
[757-441-6746](tel:757-441-6746) Ext.113
439 W. York St.
Norfolk, VA 23510

Abigail Higgins - NOAA Federal <abigail.higgins@noaa.gov>
To: Marilyn Schluter - NOAA Federal <marilyn.l.schluter@noaa.gov>

Thu, Mar 21, 2013 at 3:58 PM

Thank you! :)
[Quoted text hidden]
--

LT Abigail Higgins, NOAA
Chief, Atlantic Hydrographic Branch
439 W York Street
Norfolk, VA 23510
[757-441-6746](tel:757-441-6746) x200

Christina Rieth <CRIETH@mail.nysed.gov>
To: Marilyn Schluter - NOAA Federal <marilyn.l.schluter@noaa.gov>

Mon, Mar 25, 2013 at 7:57 AM

Dear Ms. Schluter,

Thank you for the opportunity to review these reports. At this time, the New York State Museum has reviewed the reports under Section 233 of NYS Education Law and has no concerns. Thank you again for allowing us the opportunity to comment.

Sincerely,

Christina Rieth
New York State Museum

Christina B. Rieth, Ph.D.
State Archaeologist and Director,
Cultural Resource Survey Program
New York State Museum
Cultural Education Center 3122
Albany, New York 12230
Phone: [\(518\)402-5975](tel:5184025975), Fax: [\(518\)486-2149](tel:5184862149)
Email: crieth@mail.nysed.gov
http://www.nysm.nysed.gov/research_collections/

>>> Marilyn Schluter - NOAA Federal <marilyn.l.schluter@noaa.gov> 3/21/2013 3:57 PM >>>
[Quoted text hidden]

Marilyn Schluter - NOAA Federal <marilyn.l.schluter@noaa.gov>
To: Christina Rieth <CRIETH@mail.nysed.gov>

Mon, Mar 25, 2013 at 8:59 AM

Thank you, Ms. Rieth, for responding to these requests so quickly. I wish I could send them all at once, but I generally have to send them as they come in, so there will probably be more. Thanks again for your help and patience.

Marilyn
[Quoted text hidden]

APPENDIX III

SURVEY FEATURES REPORT

AWOIS - one
Dangers to Navigation - one
Maritime Boundary - none
Wrecks - two

H12415 AWOIS

Registry Number: H12415
State: New York
Locality: Long Island Sound
Sub-locality: Offshore of Smithtown Bay, NY
Project Number: OPR-B340-TJ-12
Survey Date: 06/09/2012 - 06/27/2012

Charts Affected

Number	Edition	Date	Scale (RNC)	RNC Correction(s)*
12368	28th	06/01/2013	1:20,000 (12368_1)	USCG LNM: 12/31/2013 (1/21/2014) CHS NTM: None (12/27/2013) NGA NTM: None (2/1/2014)
12364	39th	09/01/2012	1:40,000 (12364_20)	USCG LNM: 10/8/2013 (2/4/2014) CHS NTM: None (12/27/2013) NGA NTM: 5/10/1997 (2/15/2014)
12363	41st	02/01/2010	1:80,000 (12363_1)	USCG LNM: 2/4/2014 (2/4/2014) CHS NTM: None (12/27/2013) NGA NTM: 5/10/1997 (2/15/2014)
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	THOS TOMLINSON	AWOIS	[no data]	[no data]	[no data]	---

1 - AWOIS

1.1) AWOIS #1760 - THOS TOMLINSON

No Primary Survey Feature for this AWOIS Item

Search Position: 41° 00' 00.3" N, 073° 19' 58.4" W
Historical Depth: [None]
Search Radius: 1000
Search Technique: [None]
Technique Notes: [None]

History Notes:

DESCRIPTION

24 NO.4944; CARGO; 422 GT; SUNK 8/3/42 BY MARINE CASUALTY; POSITION I

ACCURACY 3-5 MILES

61

Survey Summary

Charts Affected: 12368_1, 12364_20, 12363_1, 12300_1, 13006_1, 5161_1, 13003_1

Remarks:

[None]

Feature Correlation

Source	Feature	Range	Azimuth	Status
AWOIS_EXPORT	AWOIS # 1760	0.00	000.0	Primary
H12415_AWOIS.000	US 0000127388 00001	0.00	000.0	Secondary (grouped)

Hydrographer Recommendations

[None]

S-57 Data

[None]

Office Notes

SAR: AWOIS Item #1760 (wreck) was not observed in the MBES data. AWOIS item was covered with complete coverage MB. AWOIS listed positional accuracy was 3-5 miles. Do not concur with field unit's recommendation to delete from AWOIS databased, rather update with H12315 results. Update AWOIS database with information stating complete coverage MB did not observe or document the wreck.

Compile: Update AWOIS database for item 1760.

H12415 Danger to Navigation

Registry Number: H12415
State: New York
Locality: Long Island Sound
Sub-locality: Offshore of Smithtown Bay, NY
Project Number: OPR-B340-TJ-12
Survey Date: 06/09/2012 - 06/27/2012

Charts Affected

Number	Edition	Date	Scale (RNC)	RNC Correction(s)*
12364	39th	09/01/2012	1:40,000 (12364_21)	USCG LNM: 1/21/2014 (2/4/2014) CHS NTM: None (12/27/2013) NGA NTM: None (2/15/2014)
12363	41st	02/01/2010	1:80,000 (12363_1)	USCG LNM: 2/4/2014 (2/4/2014) CHS NTM: None (12/27/2013) NGA NTM: 5/10/1997 (2/15/2014)
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	Small wreck 2	Wreck	18.89 m	40° 58' 30.2" N	073° 15' 38.2" W	---

1 - DTON

1.1) Small wreck 2

Survey Summary

Survey Position: 40° 58' 30.2" N, 073° 15' 38.2" W
Least Depth: 18.89 m (= 61.97 ft = 10.328 fm = 10 fm 1.97 ft)
TPU ($\pm 1.96\sigma$): THU (TPEh) [None] ; TVU (TPEv) [None]
Timestamp: 2012-179.00:00:00.000 (06/27/2012)
Dataset: H12415_Wrecks.000
FOID: US 0000127309 00001(02260001F14D0001)
Charts Affected: 12364_21, 12363_1, 12300_1, 13006_1, 5161_1, 13003_1

Remarks:

WRECKS/remrks: Wreck found using object detection Reson 7125 MBES. Soundings processed to the Ellipsoid, and reduced to MLLW using VDatum.

Feature Correlation

Source	Feature	Range	Azimuth	Status
H12415_Wrecks.000	US 0000127309 00001	0.00	000.0	Primary

Hydrographer Recommendations

Chart wreck.

Cartographically-Rounded Depth (Affected Charts):

62ft (12364_21, 12363_1)

10 ¼fm (12300_1, 13006_1, 13003_1)

18.9m (5161_1)

S-57 Data

Geo object 1: Wreck (WRECKS)
Attributes: CATWRK - 2:dangerous wreck
 EXPSOU - 1:within the range of depth of the surrounding depth area
 NINFOM - add WRECK
 QUASOU - 6:least depth known
 SORDAT - 20120627

SORIND - US,US,graph,H12415

TECSOU - 3:found by multi-beam

VALSOU - 18.887 m

WATLEV - 3:always under water/submerged

Office Notes

SAR: Verified in MBES. DTON #1.

COMPILE: Chart Dton#1, a 61.97 ft wreck at survey position.

Feature Images

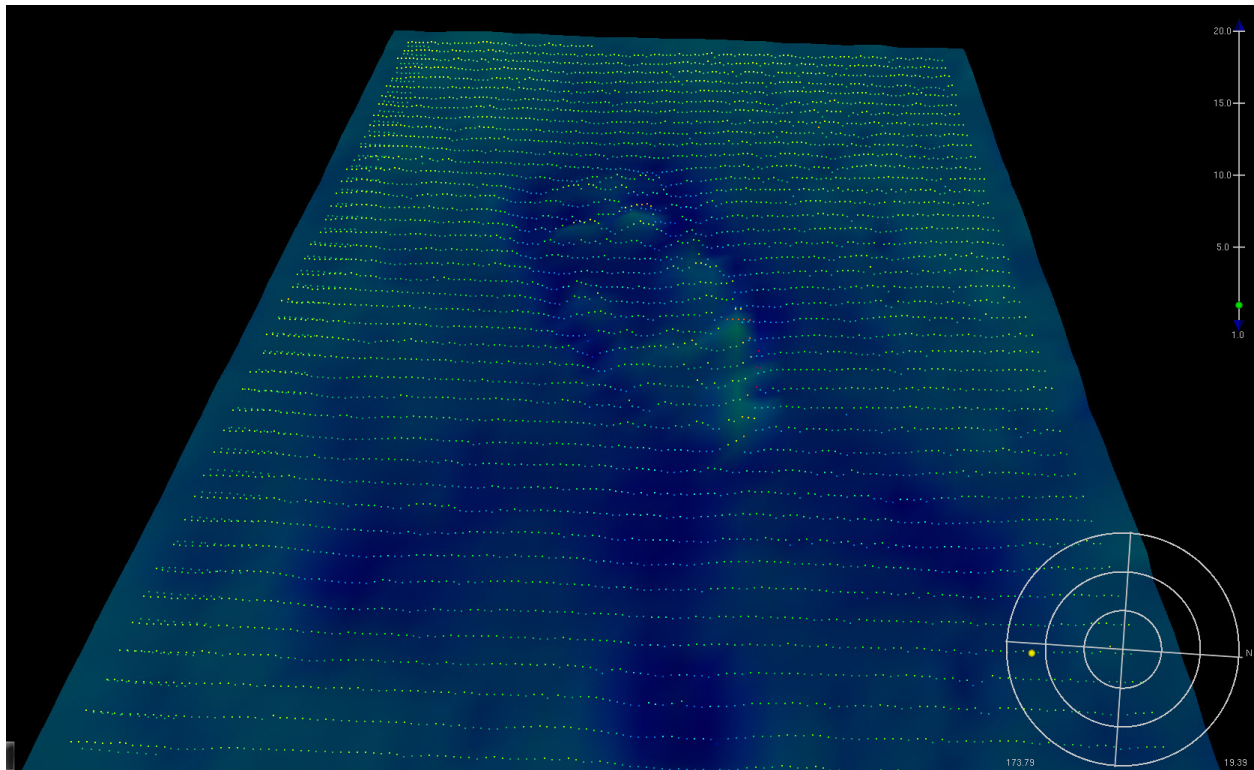


Figure 1.1.1

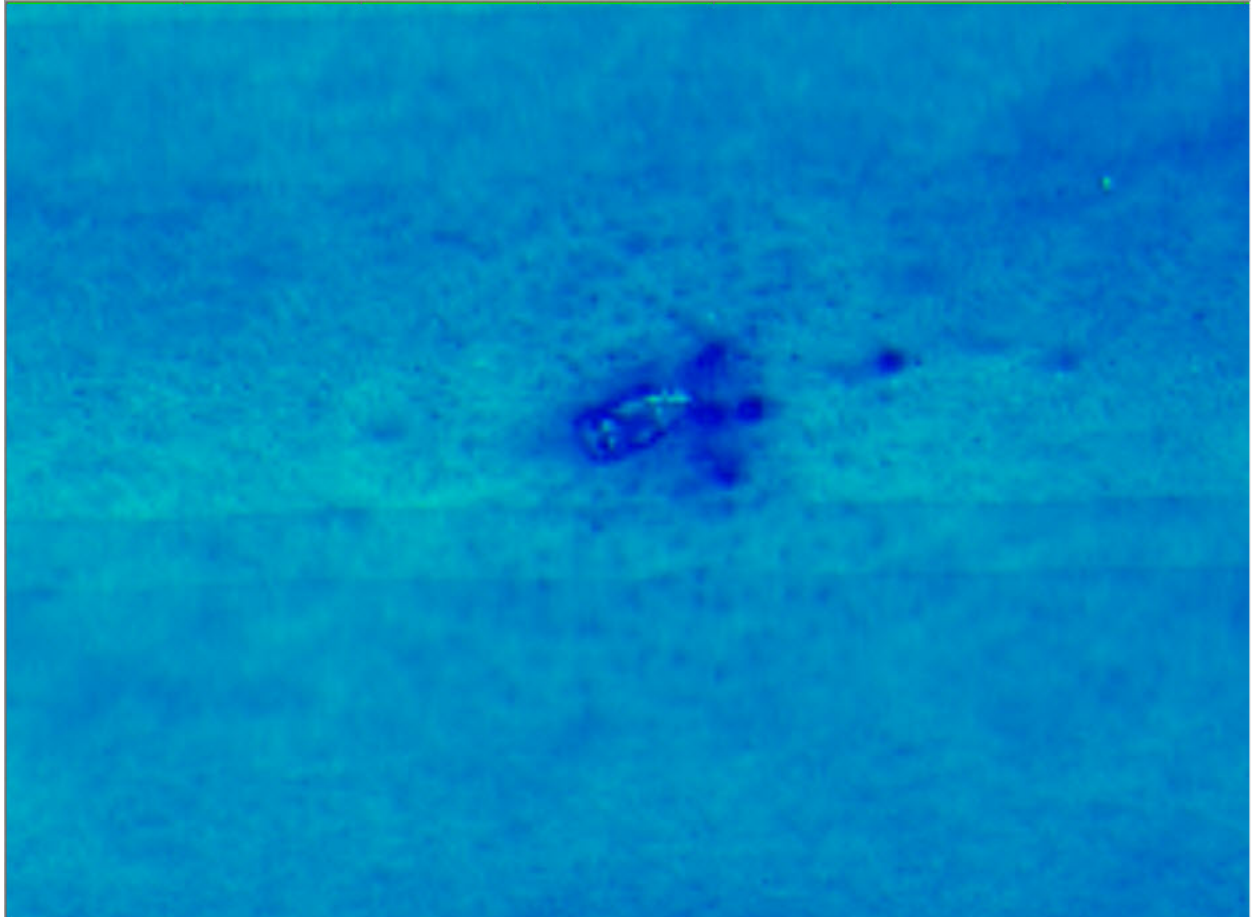


Figure 1.1.2

H12415 Wrecks

Registry Number: H12415
State: New York
Locality: Long Island Sound
Sub-locality: Offshore of Smithtown Bay, NY
Project Number: OPR-B340-TJ-12
Survey Date: 06/09/2012 - 06/27/2012

Charts Affected

Number	Edition	Date	Scale (RNC)	RNC Correction(s)*
12364	39th	09/01/2012	1:40,000 (12364_21)	USCG LNM: 1/21/2014 (2/4/2014) CHS NTM: None (12/27/2013) NGA NTM: None (2/15/2014)
12363	41st	02/01/2010	1:80,000 (12363_1)	USCG LNM: 2/4/2014 (2/4/2014) CHS NTM: None (12/27/2013) NGA NTM: 5/10/1997 (2/15/2014)
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	76 ft wreck	Wreck	23.28 m	41° 00' 04.9" N	073° 15' 01.9" W	---
1.2	74.98 ft wreck	Wreck	22.85 m	40° 59' 36.2" N	073° 14' 10.9" W	---

1 - Wreck

1.1) 76 ft wreck

Survey Summary

Survey Position: 41° 00' 04.9" N, 073° 15' 01.9" W
Least Depth: 23.28 m (= 76.38 ft = 12.731 fm = 12 fm 4.38 ft)
TPU ($\pm 1.96\sigma$): THU (TPEh) [None] ; TVU (TPEv) [None]
Timestamp: 2012-179.00:00:00.000 (06/27/2012)
Dataset: H12415_Wrecks.000
FOID: US 0000127459 00001(02260001F1E30001)
Charts Affected: 12364_21, 12363_1, 12300_1, 13006_1, 5161_1, 13003_1

Remarks:

WRECKS/remrks: Wreck found with Reson 7125 object detection MBES. Soundings processed to the Ellipsoid, and reduced to MLLW by VDatum.

Feature Correlation

Source	Feature	Range	Azimuth	Status
H12415_Wrecks.000	US 0000127459 00001	0.00	000.0	Primary

Hydrographer Recommendations

Chart wreck.

Cartographically-Rounded Depth (Affected Charts):

76ft (12364_21, 12363_1)

12fm (12300_1, 13006_1, 13003_1)

23m (5161_1)

S-57 Data

Geo object 1: Wreck (WRECKS)
Attributes: CATWRK - 1:non-dangerous wreck
 EXPSOU - 1:within the range of depth of the surrounding depth area
 NINFOM - add WRECK
 QUASOU - 6:least depth known
 SORDAT - 20120627

SORIND - US,US,graph,H12415

TECSOU - 3:found by multi-beam

VALSOU - 23.282 m

WATLEV - 3:always under water/submerged

Office Notes

SAR: Verified in MBES

COMPILE: Chart 76.38 ft wreck at survey position.

Feature Images

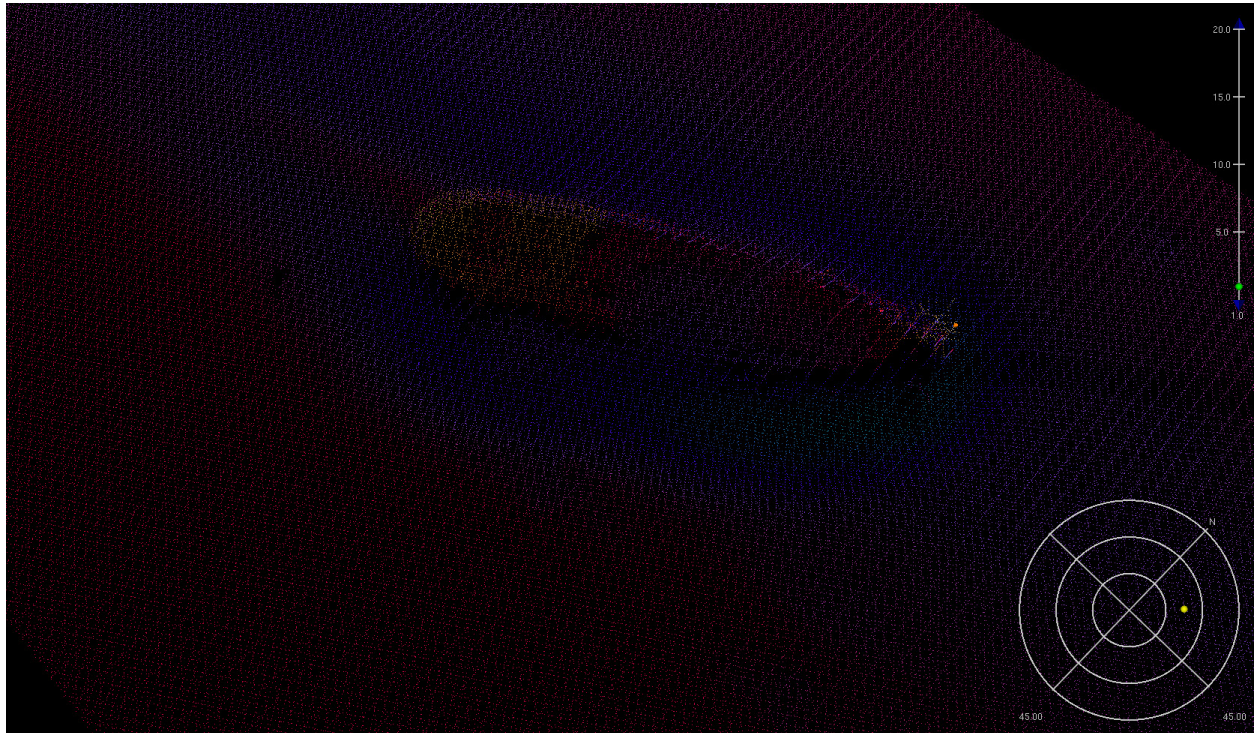


Figure 1.1.1

1.2) 74.98 ft wreck

Survey Summary

Survey Position: 40° 59' 36.2" N, 073° 14' 10.9" W
Least Depth: 22.85 m (= 74.98 ft = 12.497 fm = 12 fm 2.98 ft)
TPU ($\pm 1.96\sigma$): THU (TPEh) [None] ; TVU (TPEv) [None]
Timestamp: 2012-179.00:00:00.000 (06/27/2012)
Dataset: H12415_Wrecks.000
FOID: US 0000127465 00001(02260001F1E90001)
Charts Affected: 12364_21, 12363_1, 12300_1, 13006_1, 5161_1, 13003_1

Remarks:

WRECKS/remrks: Wreck found with Reson 7125 object detection MBES. Soundings processed to the Ellipsoid, and reduced to MLLW by VDatum.

Feature Correlation

Source	Feature	Range	Azimuth	Status
H12415_Wrecks.000	US 0000127465 00001	0.00	000.0	Primary

Hydrographer Recommendations

Chart wreck.

Cartographically-Rounded Depth (Affected Charts):

75ft (12364_21, 12363_1)

12fm (12300_1, 13006_1, 13003_1)

23m (5161_1)

S-57 Data

Geo object 1: Wreck (WRECKS)
Attributes: CATWRK - 1:non-dangerous wreck
 EXPSOU - 1:within the range of depth of the surrounding depth area
 NINFOM - add WRECK
 QUASOU - 6:least depth known
 SORDAT - 20120627

SORIND - US,US,graph,H12415

TECSOU - 3:found by multi-beam

VALSOU - 22.854 m

WATLEV - 3:always under water/submerged

Office Notes

SAR: Verified in MBES

COMPILE: Chart 74.98 ft wreck at survey position.

Feature Images

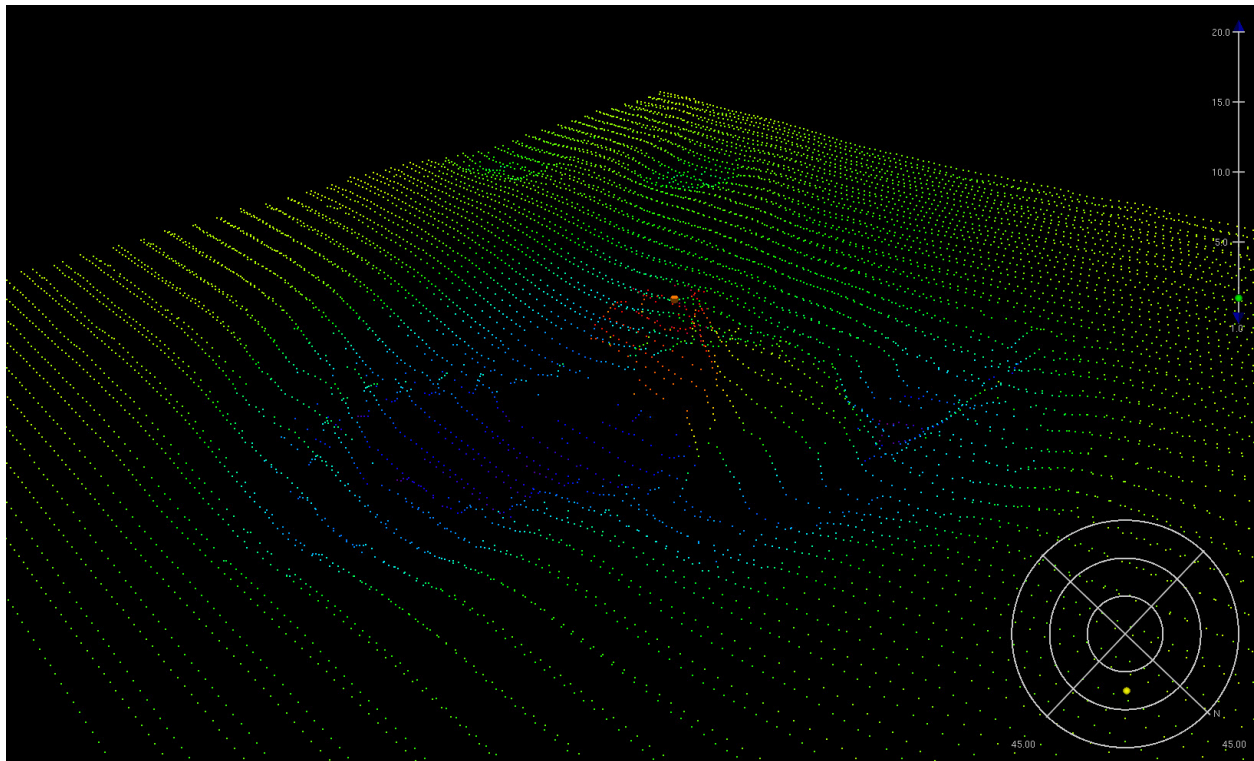


Figure 1.2.1

APPROVAL PAGE

H12415

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

- H12415_DR.pdf
- Collection of depth varied resolution BAGS
- Processed survey data and records
- H12415_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