

H12481

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: H12481

**LOCALITY**

State: Connecticut

General Locality: Long Island Sound

Sub-locality: Offshore Approaches to New Haven, CT

**2012**

CHIEF OF PARTY  
CDR Lawrence T. Krepp

LIBRARY & ARCHIVES

Date:

**HYDROGRAPHIC TITLE SHEET**

**H12481**

**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: **Offshore Approaches to New Haven, CT**

Scale: **40000**

Dates of Survey: **10/10/2012 to 11/06/2012**

Instructions Dated: **06/13/2012**

Project Number: **OPR-B370-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**

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. Revisions and Red notes were generated during office processing. The processing branch concurs with all information and recommendations in the DR unless otherwise noted. Page numbering may be interrupted or non-sequential. All pertinent records for this survey, including the Descriptive Report, are archived at the National Geophysical Data Center (NGDC) and can be retrieved via <http://www.ngdc.noaa.gov/>.*

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## Descriptive Report to Accompany Survey H12481

Project: OPR-B370-TJ-12

Locality: Long Island Sound

Sublocality: Offshore Approaches to New Haven, CT

Scale: 1:40000

October 2012 - November 2012

**NOAA Ship *Thomas Jefferson***

Chief of Party: CDR Lawrence T. Krepp

### A. Area Surveyed

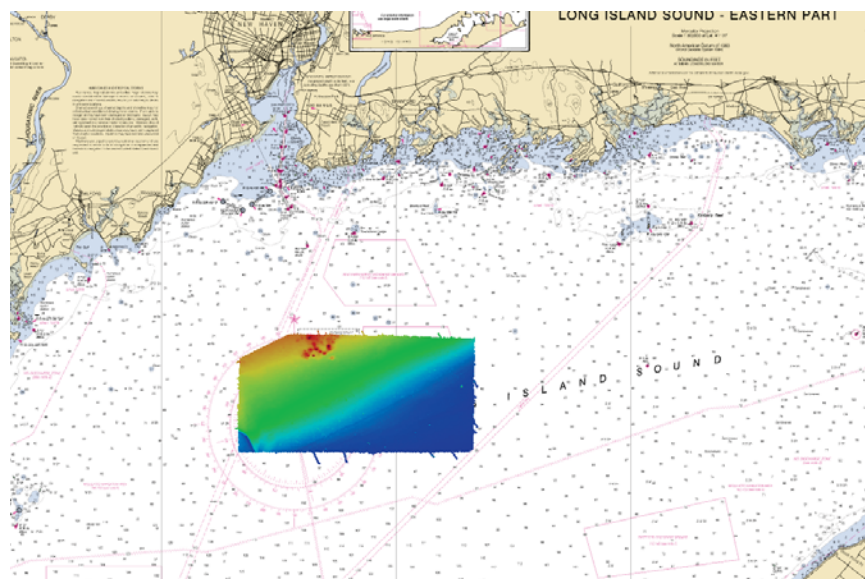
This survey was conducted in Eastern Long Island Sound in the vicinity of New Haven, CT

#### A.1 Survey Limits

Data was acquired within the following survey limits:

Northeast Limit	Southwest Limit
41.0925194444 N 72.7770972222 W	41.0925194444 N 72.943875 W

*Table 1: Survey Limits*



*Figure 1: Survey Limits of H12481 on Chart 12354*

Due to time constraints, we were not able to complete the entirety of the sheet.

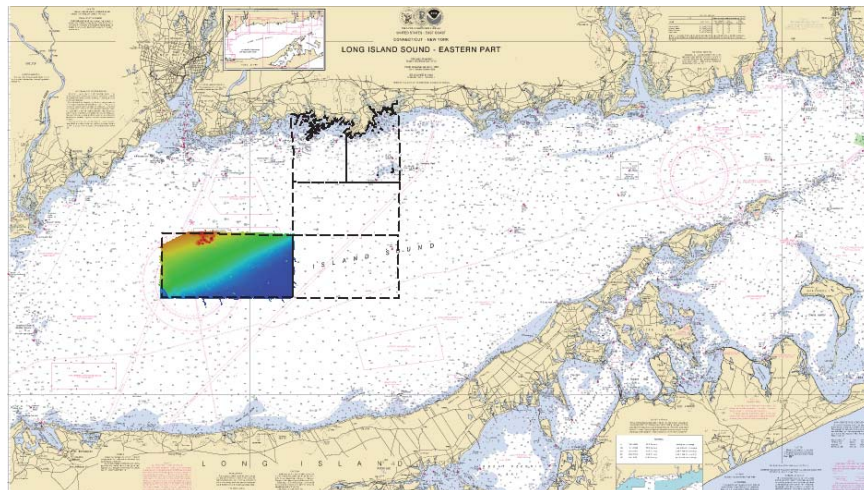
## **A.2 Survey Purpose**

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 in New York and Connecticut. This project will cover approximately 138 nm<sup>2</sup> of which 120 nm<sup>2</sup> are critical survey areas as designated in the NOAA Hydrographic Survey Priorities, 2011 edition.

## **A.3 Survey Quality**

The entire survey is adequate to supersede previous data.

## **A.4 Survey Coverage**



*Figure 2: Combined Surface on Chart 12354*

Survey Coverage was in accordance with the requirements in the Project Instructions and the HSSD.

## A.5 Survey Statistics

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

	<b>HULL ID</b>	<i>S-222</i>	<i>HSL 3101</i>	<i>HSL 3102</i>	<i>Total</i>
<b>LNM</b>	<b>SBES Mainscheme</b>	0	0	0	0
	<b>MBES Mainscheme</b>	643.64	108.16	13.20	765.00
	<b>Lidar Mainscheme</b>	0	0	0	0
	<b>SSS Mainscheme</b>	0	0	0	0
	<b>SBES/MBES Combo Mainscheme</b>	0	0	0	0
	<b>SBES/SSS Combo Mainscheme</b>	0	0	0	0
	<b>MBES/SSS Combo Mainscheme</b>	0	0	0	0
	<b>SBES/MBES Combo Crosslines</b>	29.54	0	0	29.54
	<b>Lidar Crosslines</b>	0	0	0	0
<b>Number of Bottom Samples</b>					0
<b>Number of DPs</b>					0
<b>Number of Items Items Investigated by Dive Ops</b>					0
<b>Total Number of SNM</b>					28.12

Table 2: Hydrographic Survey Statistics



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

<i>Survey Dates</i>
10/10/2012
10/11/2012
10/16/2012
10/17/2012
10/18/2012
10/19/2012
10/20/2012
10/21/2012
10/31/2012
11/04/2012
11/05/2012
11/06/2012

*Table 3: Dates of Hydrography*

## **A.6 Shoreline**

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

## **A.7 Bottom Samples**

Bottom Samples were acquired in accordance with the Project Instructions or the HSSD.

# **B. Data Acquisition and Processing**

## **B.1 Equipment and Vessels**

Refer to the Data Acquisition and Processing Report (DAPR) for a complete description of data acquisition and processing systems, survey vessels, quality control procedures and data processing methods. Additional information to supplement sounding and survey data, and any deviations from the DAPR are discussed in the following sections.

### B.1.1 Vessels

The following vessels were used for data acquisition during this survey:

<b>Hull ID</b>	<i>S-222</i>	<i>HSL 3101</i>	<i>HSL3102</i>
<b>LOA</b>	208 feet	31 feet	31 feet
<b>Draft</b>	15 feet	5.2 feet	5.2 feet

*Table 4: Vessels Used*

MBES and backscatter data were collected across all three vessels

### B.1.2 Equipment

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

<b>Manufacturer</b>	<b>Model</b>	<b>Type</b>
Reson	Seabat 7125 ROV	MBES
Reson	Seabat 7125 SV1	MBES
Applanix	POS MV	Positioning and Attitude System
Seabird	19+	Conductivity, Temperature and Depth Sensor
Brooks Ocean	Moving Vessel Profiler	Sound Speed System
Trimble	DSM212L	Positioning System

*Table 5: Major Systems Used*

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

## B.2 Quality Control

### B.2.1 Crosslines

The Thomas Jefferson (and her survey launches) collected 29.54 linear nautical miles of MBES crosslines, equating to 3.47% of mainscheme MBES data. Crosslines were compared to mainscheme using a difference surface, created in CARIS BathyDataBASE. Using the difference surface, every instance of overlap was evaluated. The mean was 0.016m and the standard deviation was 0.052 m. Survey H12481 complies with section 5.2.4.3 of the HSSD (2012 ed). Of 1.14 million nodes, 7 varied by more than one meter.

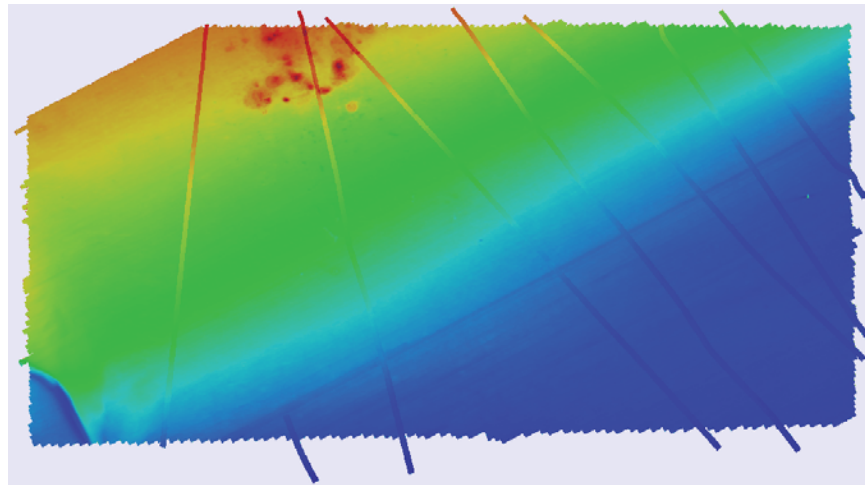


Figure 3: A view of all mainscheme and crosslines for H12481.

**B.2.2 Uncertainty**

The following survey specific parameters were used for this survey:

<b>Measured</b>	<b>Zoning</b>
0.102meters	0meters

Table 6: Survey Specific Tide TPU Values

Hull ID	Measured - CTD	Measured - MVP	Surface
S222	0meters/second	1meters/second	0.2meters/second
3101 and 3102	4meters/second	0meters/second	0.2meters/second

Table 7: Survey Specific Sound Speed TPU Values

Values listed were input for all lines processed using ERS techniques. For all lines utilizing TCARI, the values were left at 0.

Total Propagated Uncertainty values for survey H12481 were derived from a combination of fixed values for equipment and vessel characteristics, as well as field assigned values for water level and sound speed uncertainties. Uncertainty stemming from survey equipment and vessel configuration were set by the field unit in accordance with the NOAA Field Procedure Manual (ed 2011), Appendix 4, table 4.9. Sound speed uncertainty was based on the frequency and location of CTD casts, in accordance with the guidance set by Appendix 4 of the FPM. Tidal uncertainties were provided by NOAA's Center for Operational Oceanographic Products and Services (CO-OPS), and were applied to depth soundings using a Tidal Constituent and Residual Interpolator (TCARI) grid. TCARI automatically calculates the error associated with water level interpolation, which is then included in the CARIS HDCS lines. For this reason, no Tidal

Uncertainties values were entered into the Tide Value section of the CARIS Compute TPU function. A cumulative uncertainty value was propagated to each CARIS grid node using the supplied sensor, vessel, water level, and sound speed uncertainties.

Total Propagated Uncertainty was then evaluated to ensure compliance with section 5.1.3 of 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 the 50cm grids 22,673,343 nodes were evaluated and 100% were within IHO uncertainty. For the 2m grid 376,303,544 nodes were evaluated and 100% were within IHO uncertainty.

Lines 122\_1330, 125\_1352, 126\_1503, 127\_1236, and 125\_1415 from DN293 were calculated with the TCARI function only due to lack of associated POS data.

### B.2.3 Junctions

There were a total of 5 contemporary surveys that junction with Survey H12481.

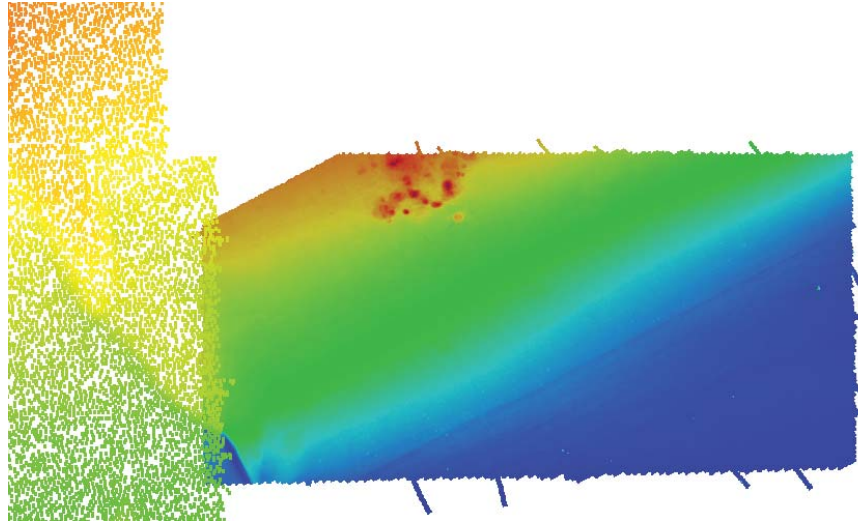
The following junctions were made with this survey:

Registry Number	Scale	Year	Field Unit	Relative Location
H11044	1:10000	2001	NOAA Ship Rude	W
H12438	1:40000	2012	NOAA Ship THOMAS JEFFERSON	S
H12480	1:20000	2012	NOAA Ship THOMAS JEFFERSON	E
H11011	1:1000	2000	NOAA Ship RUDE	N
H11043	1:10000	2001	NOAA Ship RUDE	N

*Table 8: Junctioning Surveys*

### H11044

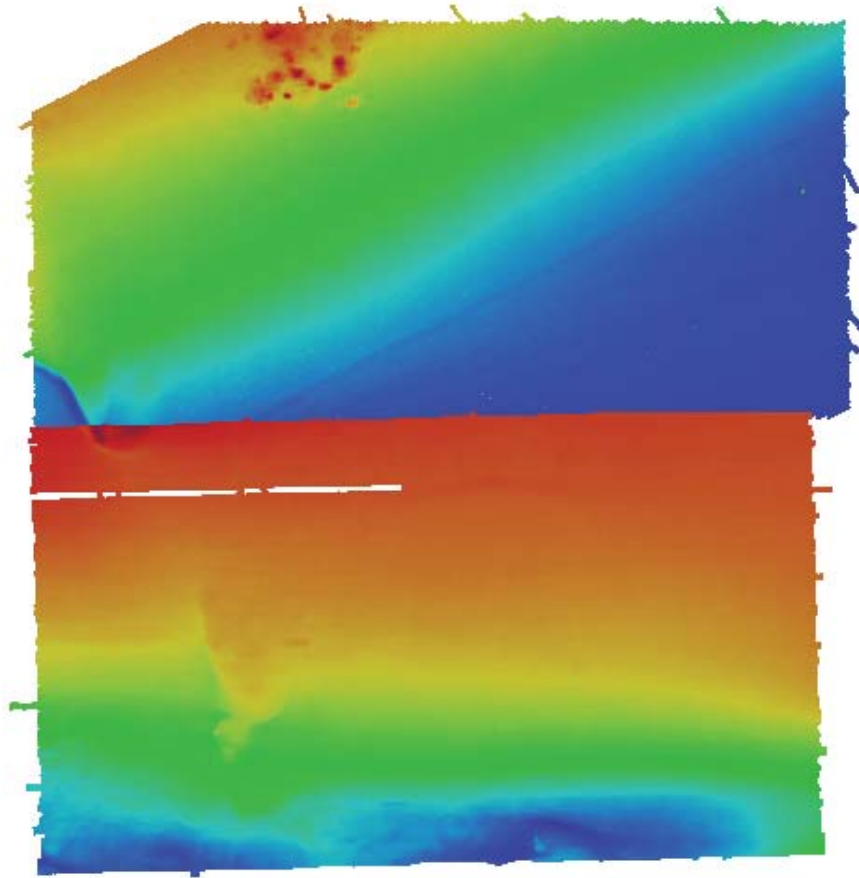
H11044 was given to us as an XYZ file. It was imported into BDB at a 0.0005 decimal degree resolution and then a difference surface was generated. The mean difference was -33.6cm with a standard deviation of 24.2cm.



*Figure 4: Junction of H11044 and H12481.*

#### H12438

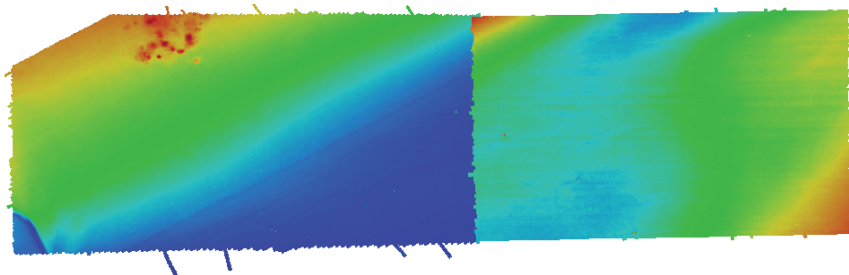
The difference between survey H12481 and H12438 ranged from 4 m to -0.8 m. The mean was 5.2 cm, and the standard deviation was 8.4 cm.



*Figure 5: Junction of H12438 and H12481.*

### H12480

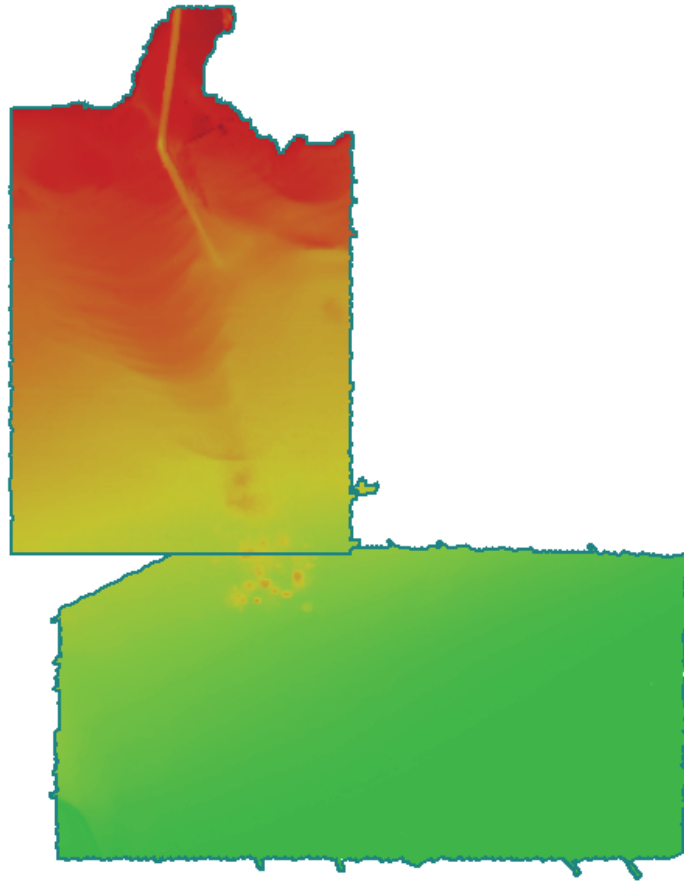
The difference between survey H12481 and H12480 ranged from -2.4 m to 0.3 m. The mean was 2 cm, and the standard deviation was 4.5 cm.



*Figure 6: Junction of H12480 and H12481.*

H11011

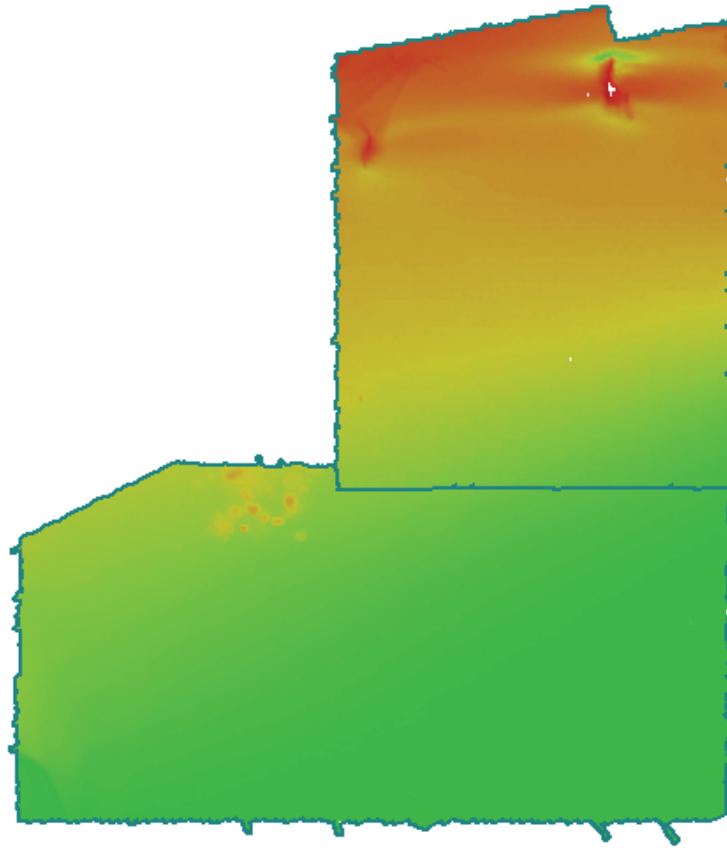
This surface was sent to us as an XYZ file. This file was imported into BDB at a 0.0005 decimal degree resolution surface. A difference surface was then computed. The mean difference was 7.4cm with a standard deviation of 35.3cm.



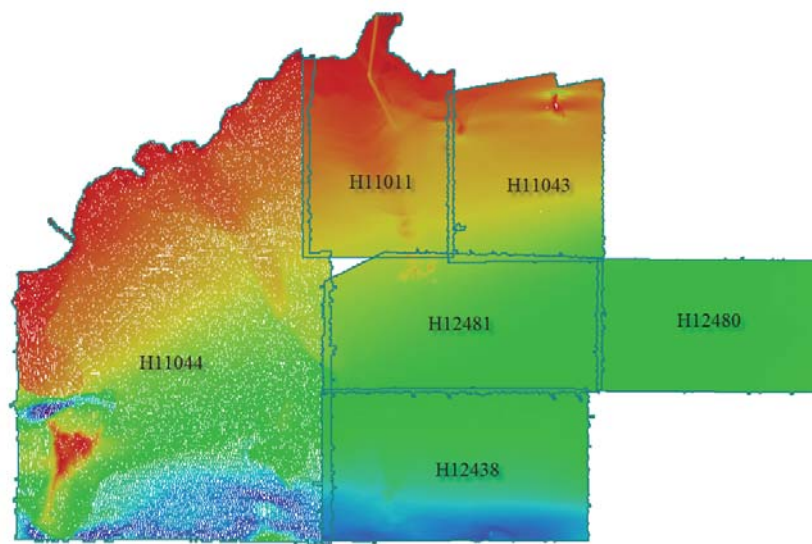
*Figure 7: Junction of H12481 and H11011*

H11043

This surface was sent to us as an XYZ file. This file was imported into BDB at a 0.0005 decimal degree resolution surface. A difference surface was then computed. The mean difference was 26.9cm with a standard deviation of 13.3cm.



*Figure 8: Junction of H12481 and H11043*



*Figure 9: H12481 and all associated junctions.*



## **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: On S-222 MVP casts were conducted every 20-30 minutes while acquiring. On HSL 3101 and 3102, CTD casts were conducted every 2-3 hours.

## **B.2.8 Coverage Equipment and Methods**

All equipment and survey methods were used as detailed in the DAPR.

## **B.3 Echo Sounding Corrections**

### **B.3.1 Corrections to Echo Soundings**

All data reduction procedures conform to those detailed in the DAPR.

### **B.3.2 Calibrations**

All sounding systems were calibrated as detailed in the DAPR.

## B.4 Backscatter

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: NOAA Field Profile, 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
H12481_2m_Final	CUBE	2 meters	18 meters - 31.42 meters	NOAA_2m	Object Detection
H12481_50cm_Final	CUBE	0.5 meters	14.89 meters - 20 meters	NOAA_0.5m	MBES TracklineSBES Set Line Spacing
481_Final_Combined_CUBE_MLLW	CUBE	2 meters	14.89 meters - 31.42 meters	NOAA_2m	Complete MBES

*Table 9: CARIS Surfaces*

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 a 1m for depths 18m and greater.

## 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
Hew Haven, CT	846-5705
New London, CT	846-1490

*Table 10: NWLON Tide Stations*

There was no Water Level file associated with this survey.

File Name	Status
B370TJ2012.tc	Final

*Table 11: Tide Correctors (.zdf or .tc)*

A request for final approved tides was sent to N/OPS1 on 11/08/2012. The final tide note was received on 11/14/2012.

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

VDatum

#### Ellipsoid to Chart Datum Separation File:

2012\_B340\_VDatum\_Ellip\_MLLW.xyz

Crosslines with and without SBETs applied were compared using Pydro's Time Series Comparison tool. Statistics for Crosslines were: N,mean,stdev = 66183,0.049,0.049. See Appendix V for the interim deliverable memo and resulting VDATUM approval memo. The majority of H12481 was processed to the ellipsoid and used the OPS provided VDATUM separation model to reduce data to MLLW. Lines 122\_1330, 125\_1352, 126\_1503, 127\_1236, 125\_1415 from day number 293 did not have GPS tides applied and instead were processed with TCARI tides.

## 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:

<b>HVCR Site ID</b>	<b>Base Station ID</b>
CTDA	CTDA
CTGU	CTGU
NYCI	NYCI
NYRH	NYRH
MOR5	MOR5
ZNY1	ZNY1
CTGA	CTGA
CTNE	CTNE
CTBR	CTBR
RDVI	RDVI
CTGR	CTGR
MOR6	MOR6

*Table 12: CORS Base Stations*

The following DGPS Stations were used for horizontal control:

DGPS Stations
Moriches, NY
Acushnet, MA

Table 13: 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	LNМ Date	NM Date
12354	1:80000	43	09/2010	08/24/2010	09/04/2010

Table 14: Largest Scale Raster Charts

#### 12354

In general, surveyed soundings are within 2-3ft of charted soundings. The largest exception to this is within a dumping ground located within the northern section of the sheet. Charted soundings within the dumping ground range from 60 to 70 feet. However, this survey found several areas of shoaling with the shoalest area having a least depth of 49ft (Figure 10).

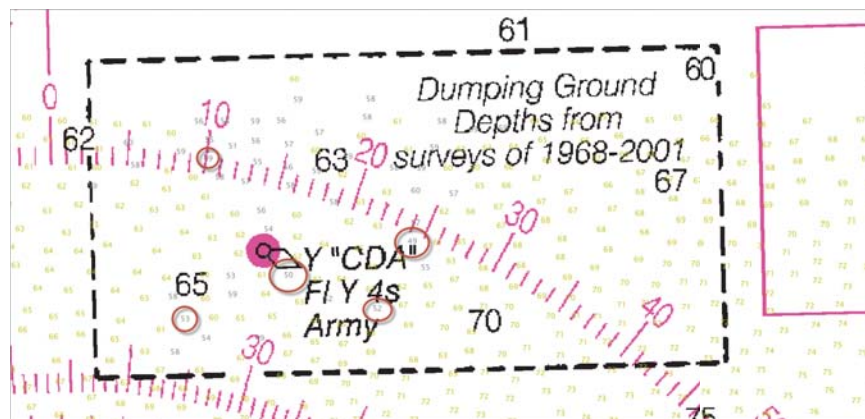


Figure 10: Areas of shoaling within dumping ground

### D.1.2 Electronic Navigational Charts

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

ENC	Scale	Edition	Update Application Date	Issue Date	Preliminary?
US4NY1GM	1:80000	20	06/14/2011	05/03/2012	NO

*Table 15: Largest Scale ENC's*

#### US4NY1GM

There are no significant differences between this ENC and raster chart 12354. See discussion for 12354 comparison.

### D.1.3 AWOIS Items

No AWOIS items exist for this survey.

### D.1.4 Charted Features

No charted features exist for this survey.

### D.1.5 Uncharted Features

A wreck not previously charted was discovered. Refer to Final Feature File for more information.

### D.1.6 Dangers to Navigation

The following DTON reports were submitted to the processing branch:

DTON Report Name	Date Submitted
DTON Report1	2013-03-08

*Table 16: DTON Reports*

Danger to Navigation Reports are included in Appendix I of this report.

### **D.1.7 Shoal and Hazardous Features**

A dumping ground on the northern side of the sheet was found to have depths much shoaler than charted.

### **D.1.8 Channels**

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

## **D.2 Additional Results**

### **D.2.1 Shoreline**

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

### **D.2.2 Prior Surveys**

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

### **D.2.3 Aids to Navigation**

Aids to navigation (ATONs) exist for this survey, but were not investigated. Y "CDA" was not verified.

### **D.2.4 Overhead Features**

Overhead features do not exist for this survey.

### **D.2.5 Submarine Features**

A cable area and a submarine cable are charted within the survey limits. No indication of a cable within the cable area was seen in the data and any cables are assumed to be properly buried. The submarine cable was visible at extreme exaggeration.

### **D.2.6 Ferry Routes and Terminals**

No ferry routes or terminals exist for this survey.

**D.2.7 Platforms**

No platforms exist for this survey.

**D.2.8 Significant Features**

No significant features exist for this survey.

**D.2 Construction and Dredging**

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



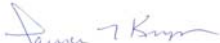


## E. Approval Sheet

As Chief of Party, Field operations for this hydrographic survey were conducted under my direct supervision, with frequent personal checks of progress and adequacy. I have reviewed the attached survey data and reports.

All field sheets, this Descriptive Report, and all accompanying records and data are approved. All records are forwarded for final review and processing to the Processing Branch.

The survey data meets or exceeds requirements as set forth in the NOS Hydrographic Surveys and Specifications Deliverables Manual, Field Procedures Manual, Standing and Letter Instructions, and all HSD Technical Directives. These data are adequate to supersede charted data in their common areas. This survey is complete and no additional work is required with the exception of deficiencies noted in the Descriptive Report.

<b>Approver Name</b>	<b>Approver Title</b>	<b>Approval Date</b>	<b>Signature</b>
Matthew Weiss	Sheet Manager	03/06/2013	
LT William Winner	Field Operations Officer	03/06/2013	
CDR Lawrence Krepp	Commanding Officer	03/06/2013	

## F. Table of Acronyms

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

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

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


APPENDIX I  
TIDES AND WATERLEVELS



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

February 25, 2013

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

FROM: Jeffrey Ferguson   
Chief, Hydrographic Surveys Division

SUBJECT: Vertical Datum Transformation Technique,  
OPR-B370-TJ-12, Long Island Sound, NY

Hydrographic surveys H12479 & H12481 are 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 memos from December 3, 2012, Subject "H12479 Interim Deliverables" & "H12481 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 II

# SUPPLEMENTAL SURVEY RECORDS AND COORESPONDENCE

**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](mailto:castle.e.parker@noaa.gov)>

Physical Scientist - Hydrographic Team Lead

Atlantic Hydrographic Branch

NOAA Office of Coast Survey



## APPENDIX III

### FEATURES REPORT

DTONS - 1

AWOIS - 2

WRECK - 0

MARITIME BOUNDARIES - 0

# H12481 DtoNs

**Registry Number:** H12481  
**State:** Connecticut  
**Locality:** Long Island Sound  
**Sub-locality:** Offshore Approaches to New Haven, CT  
**Project Number:** OPR-B370-TJ-12  
**Survey Date:** 10/10/2012 - 11/06/2012

## Charts Affected

Number	Edition	Date	Scale (RNC)	RNC Correction(s)*
12354	44th	05/01/2012	1:80,000 (12354_1)	USCG LNM: 12/10/2013 (12/10/2013) CHS NTM: None (11/29/2013) NGA NTM: 12/4/1999 (12/21/2013)
12300	47th	05/01/2008	1:400,000 (12300_1)	[L]NTM: ?
13006	34th	05/01/2007	1:675,000 (13006_1)	[L]NTM: ?
5161	13th	10/01/2003	1:1,058,400 (5161_1)	[L]NTM: ?
13003	49th	04/01/2007	1:1,200,000 (13003_1)	[L]NTM: ?

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

## Features

No.	Name	Feature Type	Survey Depth	Survey Latitude	Survey Longitude	AWOIS Item
1.1	49 ft Sounding	Shoal	14.89 m	41° 08' 51.8" N	072° 52' 51.0" W	---

**1 - DTON**

## 1.1) 49 ft Sounding

### DANGER TO NAVIGATION

#### Survey Summary

**Survey Position:** 41° 08' 51.8" N, 072° 52' 51.0" W  
**Least Depth:** 14.89 m (= 48.84 ft = 8.139 fm = 8 fm 0.84 ft)  
**TPU ( $\pm 1.96\sigma$ ):** THU (TPEh) [None] ; TVU (TPEv) [None]  
**Timestamp:** 2012-311.00:00:00.000 (11/06/2012)  
**Dataset:** H12481\_Features\_For\_Pydro.000  
**FOID:** 0\_0000095835 00001(FFFE0001765B0001/1)  
**Charts Affected:** 12354\_1, 12300\_1, 13006\_1, 5161\_1, 13003\_1

#### Remarks:

[None]

#### Feature Correlation

Source	Feature	Range	Azimuth	Status
H12481_Features_For_Pydro.000	0_0000095835 00001	0.00	000.0	Primary

#### Hydrographer Recommendations

[None]

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

49ft (12354\_1)

8fm (12300\_1, 13006\_1, 13003\_1)

14.9m (5161\_1)

#### S-57 Data

**Geo object 1:** Sounding (SOUNDG)  
**Attributes:** SORDAT - 20121106  
 SORIND - US,US,graph,H12481  
 TECSOU - 3:found by multi-beam

## Office Notes

SAR: DtoN #1 49ft SOUND verified as submitted to NDB as a Danger.

COMPILE: Chart 49ft DtoN as sounding at survey position.

### Feature Images

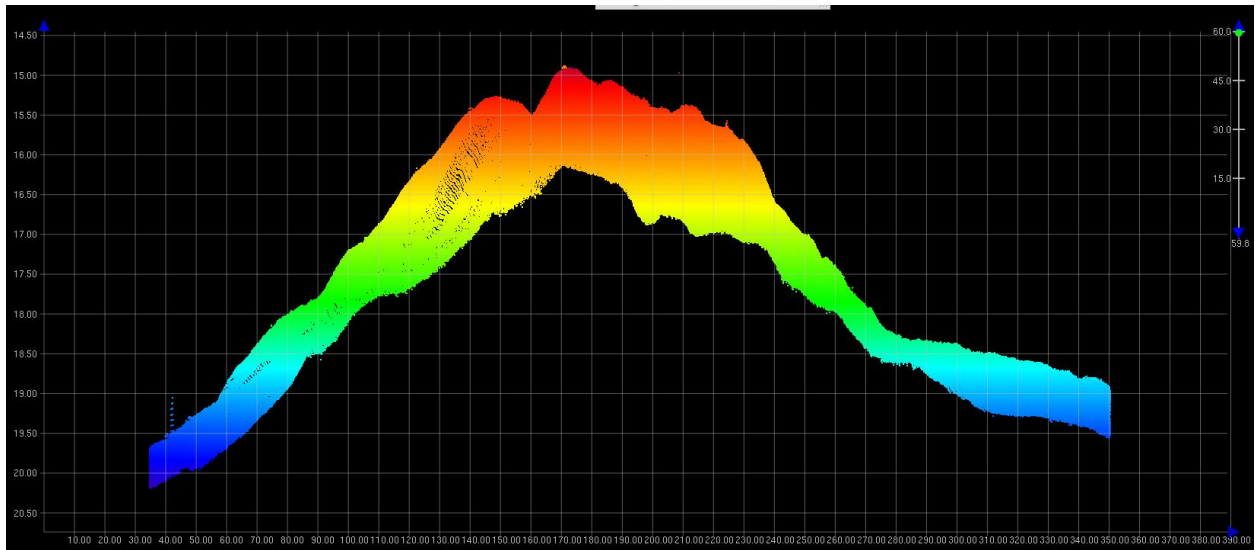


Figure 1.1.1

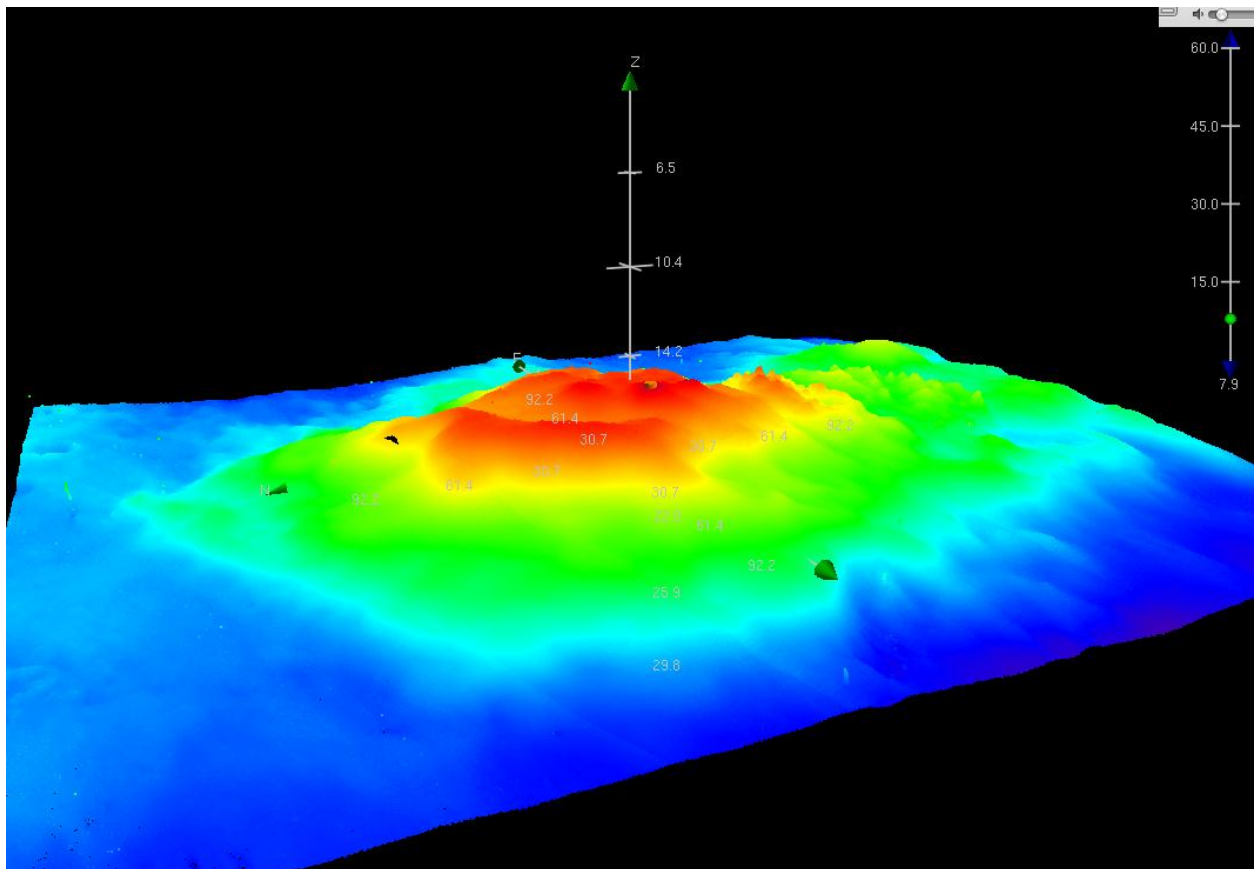


Figure 1.1.2

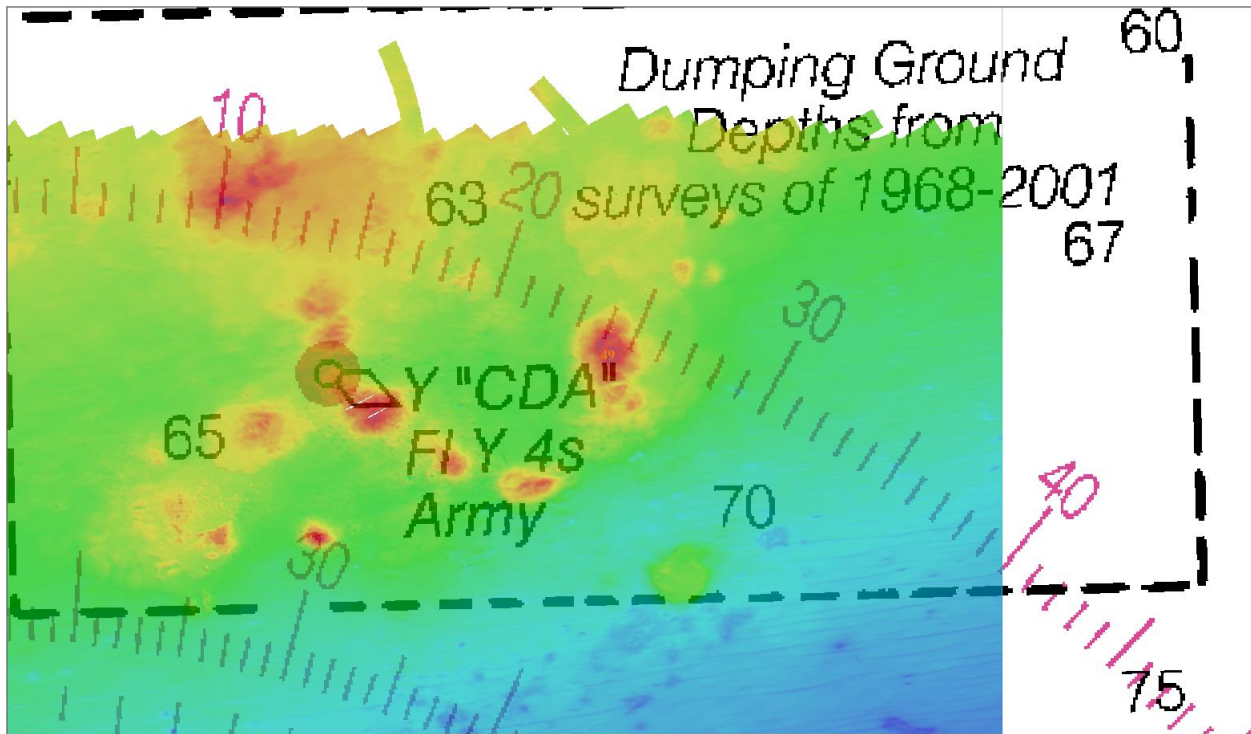


Figure 1.1.3

# H12481 AWOIS

**Registry Number:** H12481  
**State:** Connecticut  
**Locality:** Long Island Sound  
**Sub-locality:** Offshore Approaches to New Haven, CT  
**Project Number:** OPR-B370-TJ-12  
**Survey Date:** 10/10/2012 - 11/06/2012

## Charts Affected

Number	Edition	Date	Scale (RNC)	RNC Correction(s)*
12354	44th	05/01/2012	1:80,000 (12354_1)	USCG LNM: 12/10/2013 (12/10/2013) CHS NTM: None (11/29/2013) NGA NTM: 12/4/1999 (12/21/2013)
12300	47th	05/01/2008	1:400,000 (12300_1)	[L]NTM: ?
13006	34th	05/01/2007	1:675,000 (13006_1)	[L]NTM: ?
5161	13th	10/01/2003	1:1,058,400 (5161_1)	[L]NTM: ?
13003	49th	04/01/2007	1:1,200,000 (13003_1)	[L]NTM: ?

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

## Features

No.	Name	Feature Type	Survey Depth	Survey Latitude	Survey Longitude	AWOIS Item
1.1	UNKNOWN	AWOIS	[no data]	[no data]	[no data]	---



**1 - AWOIS**

## 1.1) AWOIS #12211 - UNKNOWN

### No Primary Survey Feature for this AWOIS Item

**Search Position:** 41° 08' 21.5" N, 072° 56' 28.6" W  
**Historical Depth:** 20.12 m  
**Search Radius:** 100  
**Search Technique:** SSS, MB  
**Technique Notes:** [None]

#### History Notes:

HISTORY

H11044/01-- OPR-B340-RU; UNCHARTED WRECK LOCATED. SWMB DEPTH OF 66 FEET IN LAT. 41-08-21.542N, LONG. 72-56-28.592W. EVALUATOR DOES NOT RECOMMEND CHARTING DUE TO THE PRESENCE OF SHOALER FEATURES AND DEPTHS IN THE AREA. (ENT 2/11/04, SJV)

### Survey Summary

**Charts Affected:** 12354\_1, 12300\_1, 13006\_1, 5161\_1, 13003\_1

#### Remarks:

[None]

### Feature Correlation

Source	Feature	Range	Azimuth	Status
AWOIS_EXPORT	AWOIS # 12211	0.00	000.0	Primary
H12481_Features_For_Pydro.000	0_0000095836 00001	8.45	218.5	Secondary (grouped)

### Hydrographer Recommendations

[None]

### S-57 Data

[None]

## Office Notes

Chart AWOIS item 12211, a 62 ft wreck as sounding.

# H12481 WRECK

**Registry Number:** H12481  
**State:** Connecticut  
**Locality:** Long Island Sound  
**Sub-locality:** Offshore Approaches to New Haven, CT  
**Project Number:** OPR-B370-TJ-12  
**Survey Date:** 10/10/2012 - 11/06/2012

## Charts Affected

Number	Edition	Date	Scale (RNC)	RNC Correction(s)*
12354	44th	05/01/2012	1:80,000 (12354_1)	USCG LNM: 12/10/2013 (12/10/2013) CHS NTM: None (11/29/2013) NGA NTM: 12/4/1999 (12/21/2013)
12300	47th	05/01/2008	1:400,000 (12300_1)	[L]NTM: ?
13006	34th	05/01/2007	1:675,000 (13006_1)	[L]NTM: ?
5161	13th	10/01/2003	1:1,058,400 (5161_1)	[L]NTM: ?
13003	49th	04/01/2007	1:1,200,000 (13003_1)	[L]NTM: ?

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

## Features

No.	Name	Feature Type	Survey Depth	Survey Latitude	Survey Longitude	AWOIS Item
1.1	78 ft wreck	Wreck	23.72 m	41° 07' 33.6" N	072° 47' 11.6" W	---

**1 - WRECK**

## 1.1) 78 ft wreck

### Survey Summary

**Survey Position:** 41° 07' 33.6" N, 072° 47' 11.6" W  
**Least Depth:** 23.72 m (= 77.83 ft = 12.971 fm = 12 fm 5.83 ft)  
**TPU ( $\pm 1.96\sigma$ ):** THU (TPEh) [None] ; TVU (TPEv) [None]  
**Timestamp:** 2012-311.00:00:00.000 (11/06/2012)  
**Dataset:** H12481\_Features\_For\_Pydro.000  
**FOID:** 0\_ 0000095837 00001(FFFE0001765D0001)  
**Charts Affected:** 12354\_1, 12300\_1, 13006\_1, 5161\_1, 13003\_1

**Remarks:**

WRECKS/remrks: Object is a wreck, found by Reson 7125 MBES and reduced to MLLW using verified tide levels and finalized TCARI grids.

### Feature Correlation

Source	Feature	Range	Azimuth	Status
H12481_Features_For_Pydro.000	0_ 0000095837 00001	0.00	000.0	Primary

### Hydrographer Recommendations

Chart Wreck

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

- 78ft (12354\_1)
- 13fm (12300\_1, 13006\_1, 13003\_1)
- 24m (5161\_1)

### S-57 Data

**Geo object 1:** Wreck (WRECKS)  
**Attributes:** CATWRK - 1:non-dangerous wreck  
 NINFOM - submerged wreck  
 QUASOU - 6:least depth known  
 SORDAT - 20121106  
 SORIND - US,US,graph,H12481

TECSOU - 3:found by multi-beam

VALSOU - 23.722 m

WATLEV - 3:always under water/submerged

## Office Notes

SAR: Confirmed with 100% SWMB

COMPILE: Chart 77.8 ft wreck at survey position.

### Feature Images

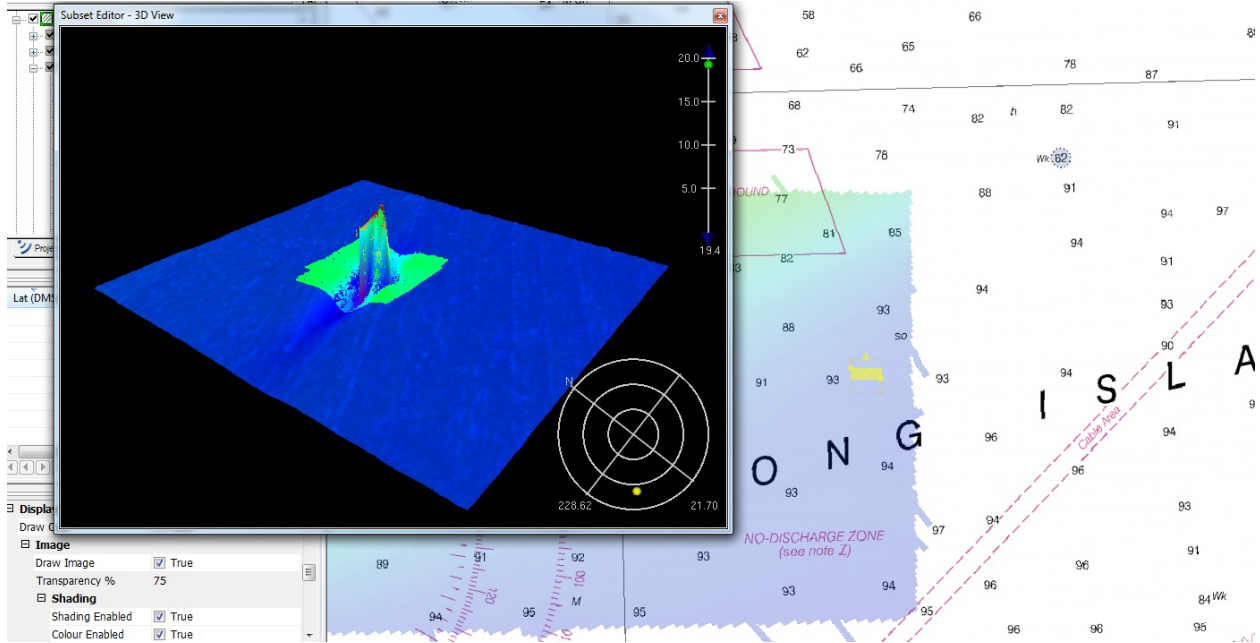


Figure 1.1.1



APPROVAL PAGE

H12481

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

- H12481\_DR.pdf
- Collection of depth varied resolution BAGS
- Processed survey data and records
- H12481\_GeoImage.pdf

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

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

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