

**H12013**

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: H12013

**LOCALITY**

State: Connecticut

General Locality: Eastern Long Island Sound

Sub-locality: The entrance to the Connecticut River

**2009**

CHIEF OF PARTY  
**CDR P. Tod Schattgen**  
NOAA

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DATE

**HYDROGRAPHIC TITLE SHEET**

**H12013**

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: **Eastern Long Island Sound**

Sub-Locality: **The entrance to the Connecticut River**

Scale: **1:10,000**

Date of Survey: **19 April 2009 to 17 May 2009**

Instructions Dated: **3 March 2009**

Project Number: **OPR-B370-TJ-09**

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

Chief of Party: **CDR P. Tod Schattgen, NOAA**

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

Soundings by: **Reson 7125, 8125 multibeam echosounder  
and Klein 5000 Side Scan SONAR**

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

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

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

Verification by:

Soundings in: ***Feet* ~~Meters~~ at MLLW**

Remarks: ***Bold, Italic, Red notes in the Descriptive Report were made during office processing.***  
***1) All Times are in UTC.***  
***2) This is a Navigable Area Hydrographic Survey.***  
***3) Projection is NAD83, UTM Zone 18.***

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**Descriptive Report to Accompany Hydrographic Survey H12013**

Project OPR-B370-TJ-09  
 Eastern Long Island Sound  
 The entrance of the Connecticut River  
 Scale 1:10,000  
 19 April 2009 – 17 May 2009  
 NOAA Ship *Thomas Jefferson*

**A AREA SURVEYED**

This hydrographic survey was completed as specified by *Hydrographic Survey Letter Instructions OPR-370-TJ-09\**, dated 3 March 2009. The approximate corners of the survey area are listed in table 1. The north-west corner of the area given in the letter instructions is connected with the river and was left for a future survey of the river.

*\*Filed with original field records.*

Northeastern Limit	Southeastern Limit	Northwestern Limit	Southwestern Limit
41°17'43.5" N 072°14'30.4" W	41°15'22.5" N 072°14'30.4" W	41°16'34.0" N 072°20'30.0" W	41°14'01.0" N 072°20'30.0" W

*Table 1: area surveyed.*

Data acquisition was conducted from 19 April to 17 May, 2009.

The purpose of this project is to detect hazards to navigation and to provide updated bathymetry. This project responds to a request from the Northeast Marine Pilots Association for contemporary hydrographic surveys to update the nautical charts in the Eastern Long Island Sound. The current vintage of hydrography dates back to as early as 1883 in the northern part of the project area. Petroleum and coal products constitute the bulk of the goods transported through Long Island Sound.

	Linear Nautical Miles
Single beam mainscheme only	N/A
Multibeam mainscheme only	462.1
Side Scan Sonar mainscheme only	243.3
Crosslines	15.3
Developments	3
Shoreline/nearshore investigations	N/A
Number of Bottom Samples	16
Number of AWOIS items investigated	0

*Table 2: Hydrographic Survey Statistics.*

The survey limits of H12013 (Figure 1) are shown on the following page.

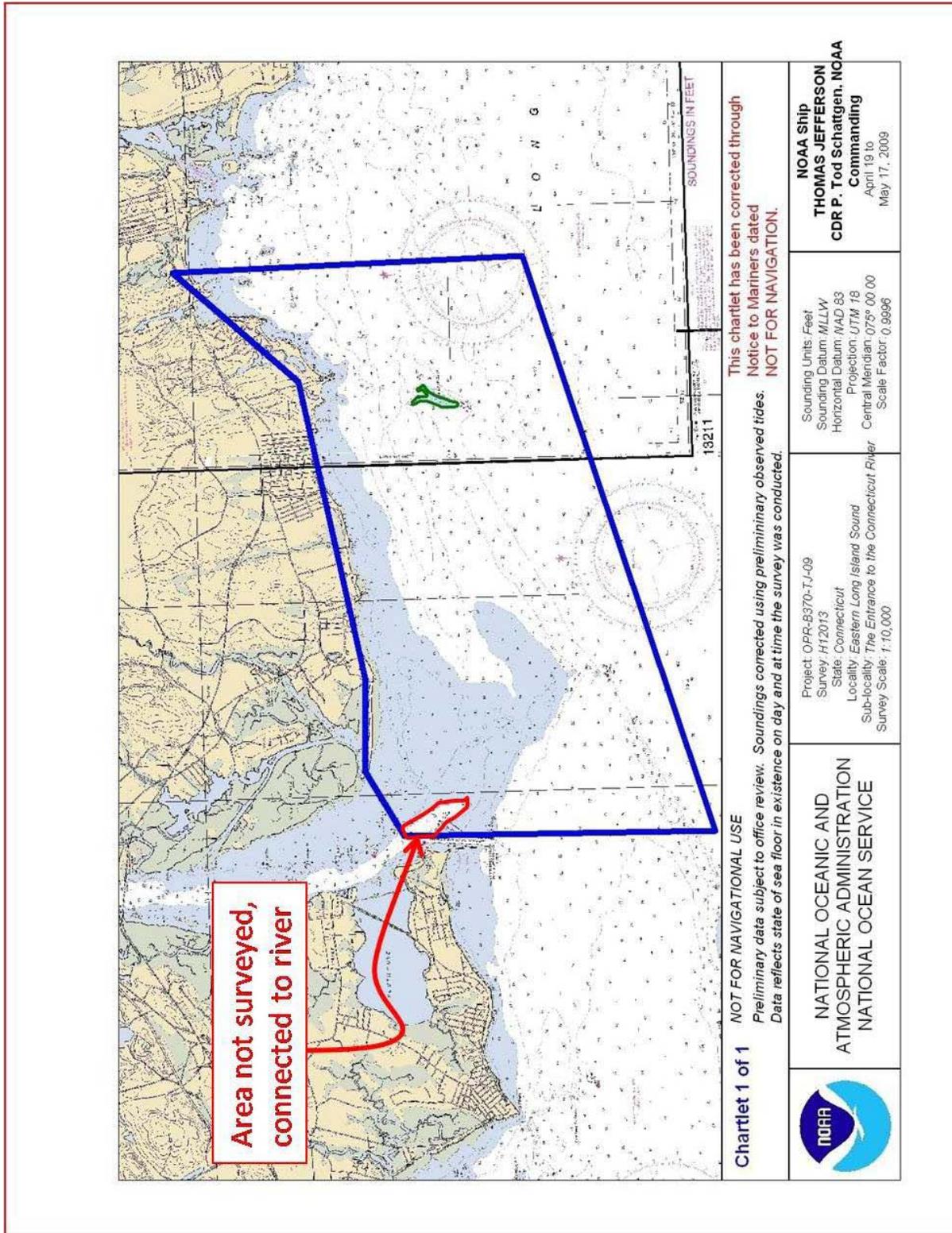


Figure 1: Survey H12013 Limits

<b>Date</b>	<b>Julian date</b>	<b>Date</b>	<b>Julian day</b>
April 19	109	May 7	127
April 20	110	May 11	131
April 22	112	May 12	132
April 30	120	May 13	133
May 1	121	May 14	134
May 2	122	May 16	136
May 5	125	May 17	137
May 6	126		

*Table 3. Dates of multibeam data acquisition in calendar and Julian days.*

## **B DATA ACQUISITION AND PROCESSING**

Refer to *OPR-B370-TJ-09 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 included in this descriptive report.

### **B 1 EQUIPMENT AND VESSELS**

Data were acquired by NOAA Ship *Thomas Jefferson* and survey launches *3101* and *3102*. Ship *Thomas Jefferson* acquired Reson 7125 multibeam echosounder soundings and sound velocity profiles. Launch *3101* acquired Klein 5000 side scan data, Reson 8125 multibeam data, sound velocity profiles and bottom samples. Launch *3102* collected Klein 5000 side scan, Reson 7125 multibeam data 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 System Certification and Calibration**

Refer to NOAA Ship *Thomas Jefferson DAPR* and *Hydrographic Systems Readiness Report (HSRR)\** for a complete description of system integration and initial calibration results for equipment and sensors used for this survey. *\*Filed with original field records.*

#### **B 2.2 Sounding Coverage**

As per the Letter Instructions, in depth greater than 20 meters, data collection was conducted using complete coverage multibeam. In these depths, bathymetry coverage was monitored by creating a BASE surface with a two meter resolution. Coverage over any AWOIS items were monitored by creating BASE surfaces with a one meter resolution over the prescribed radius. In depths less than 20 meters 200% side scan SONAR data were collected with multibeam bathymetry stripes. In these areas, significant contacts found in the side scan record were developed using object detection multibeam echo sounding data. The area around and north of Hatchett Reef had many contacts therefore was entirely developed with object detection multibeam.

**B 2.3 Crosslines**

Multibeam echosounder cross-lines totaling 15.3 lineal nautical miles, comprising 3.3 percent of the mainscheme multi beam data were acquired. This is short of the minimum of 4 percent described in the *Specifications and Deliverables*. During acquisition we underestimated the exceptionally large quantity of closely spaced, mainscheme multibeam development lines in the shoal area east of Saybrook Outer Bar Channel.

Crosslines were examined using the standard deviation layer of the BASE surface and the results indicate some systematic errors between platforms. Sources of error could include positioning inputs, tidal zoning, dynamic draft and/or static draft measurement error. See section 2.5, Systematic errors below. A crossline to mainscheme difference surface, *H12013\_Crossline\_Mainscheme\_Difference.csar*, is included in the Descriptive Report/Separates/IVCrossline\_Comparison folder\* submitted with this survey.

*\*Filed with original field records.*

**B 2.4 Junctions and Prior Surveys**

The following contemporary surveys junction with H12013:

<b>Registry #</b>	<b>Scale</b>	<b>Date</b>	<b>Field Party</b>	<b>Junction side</b>
H11442	1:10,000	2005	<i>Thomas Jefferson</i>	east
H12012	1:10,000	2009	<i>Thomas Jefferson</i>	south

*Table 4: junction surveys.*

Survey H12013 is bordered to the south by survey H12012. The surveys match up with less than 20cm difference everywhere but along the large sand waves south of buoy R ‘8’. In this area there are differences in excess of a meter. It appears that there has been generally south-east migration of the sand waves in this area between the times of survey which accounts for the variation.

Survey H12013 is bordered to the east by H11442 surveyed by the *Thomas Jefferson* in 2005. A comparison was made between H12013 and the historic H-Cell (file H11442\_H11225\_CU.000). The minimum depths of the surveys agreed to within 2 feet along the entire border.

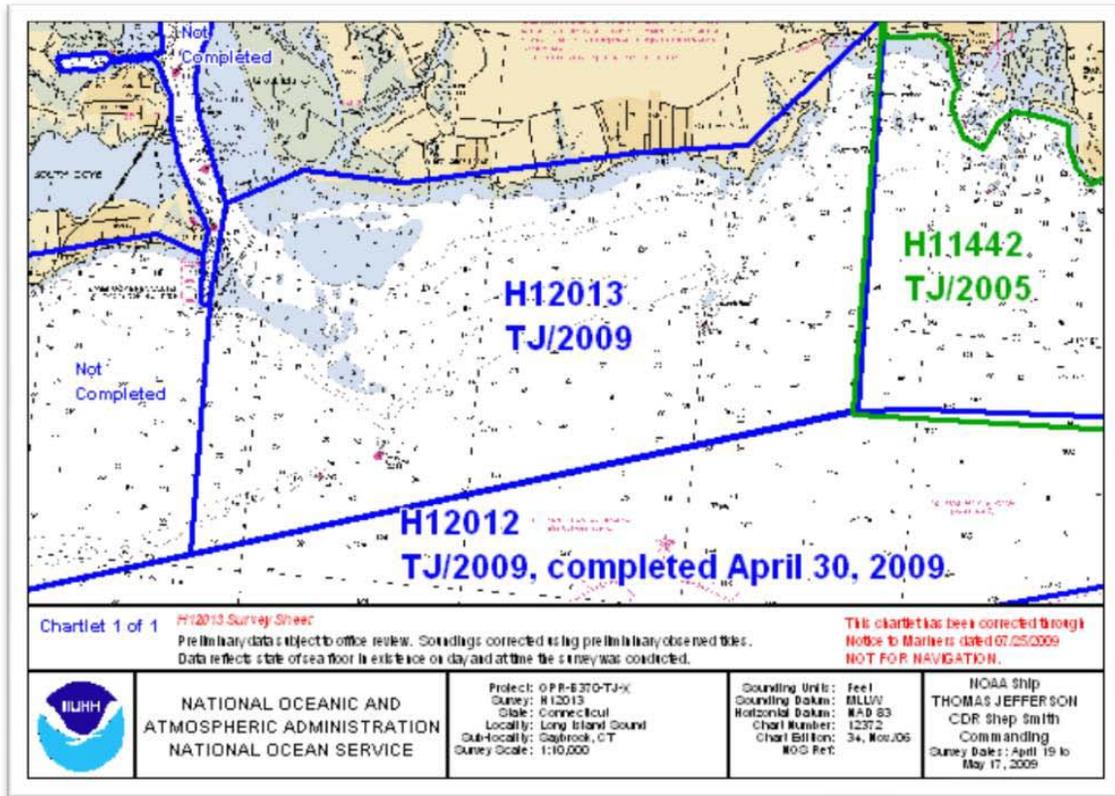


Figure 2: H12013 Junction Surveys.

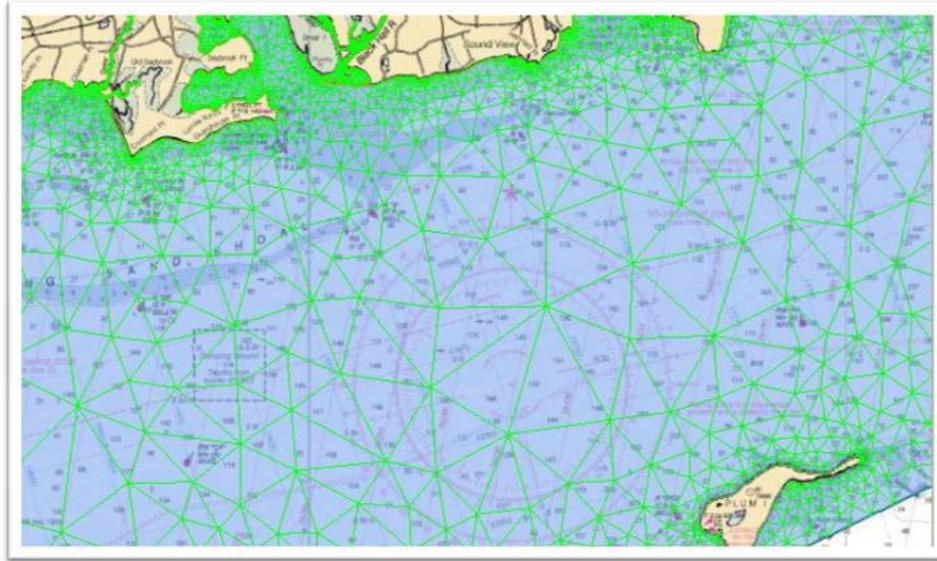
**B 2.5 Systematic Errors**

A fault with the multibeam receiver on the ship’s (S222) Reson 7125 caused a systematic artifact in the MBES data. This artifact appears as an along track ‘ridge’ on either side of nadir, ranging in height from 10cm to 20cm. This error was accounted for in the CARIS vessel configuration (TJ\_S222\_RESON7125.hvf) by adding a 0.200 m value for the Total Propagated Error for the delta draft. This device was replaced subsequent to data acquisition. The data collected by this SONAR head were still within specifications in spite of the fault.

Reson 8125 data from Launch 3101 shows a consistent 15 cm - 20 cm positive bias throughout the survey, as compared to S222 and Launch 3101 (Figure 5). This is apparent in the standard deviation layer of the BASE surface. This bias is within the IHO Order 1 error limits.

**B 3 CORRECTIONS TO ECHO SOUNDINGS**

HDCS sounding data were reduced to mean lower-low water (MLLW) using verified water levels from New London, CT (8461490) and New Haven, CT (8465705). These were adjusted for tidal constituents and residuals provided by CO-OPS and illustrated in Figure 3.



*Figure 3: Final Tide Zoning.*

All other datum reduction procedures conform to those outlined in the DAPR.

All methods and instruments used for sound velocity correction were as described in the DAPR. A table detailing all sound velocity casts is located in Separate II\* of this Descriptive Report.

*\*Filed with original field records.*

**B 4 DATA PROCESSING**

**B 4.1 Total Propagated Error**

For the 2009 field season, Total Propagated Error (TPE) parameters for sound speed and tides are calculated separately for each project. The project-specific parameters for OPR-B370-TJ-09, Survey H12013 are shown in table 5.

Project	Vessel	Tide Values		Sound Speed Values		
		Measured	Zoning	CTD	MVP	Surface
H12013	3101	TCARI	TCARI	4	NA	0.2
	3102	TCARI	TCARI	4	NA	0.2
	S222	TCARI	TCARI	4	1	0.2

*Table 5: TPE Parameters*

These values were calculated for all MBES data immediately following CARIS Merge.

## B 4.2 BASE Surfaces and Mosaics

The Table 6 describes all BASE Surfaces and Mosaics submitted as part of Survey H12013.

*See also H-Cell Report*

<i>Name of Surfaces</i>	<i>Resolution</i>	<i>Type</i>	<i>Purpose</i>
H12013_1_CUBE_1m	1 meter	CUBE	Bathymetry/development
H12013_2_CUBE_1m	1 meter	CUBE	Bathymetry/development
H12013_3_CUBE_1m	1 meter	CUBE	Bathymetry/development
H12013_4_CUBE_1m	1 meter	CUBE	Bathymetry/development
H12013_5_CUBE_1m	1 meter	CUBE	Bathymetry/development
H12013_6_CUBE_1m	1 meter	CUBE	Bathymetry/development
H12013_7_CUBE_1m	1 meter	CUBE	Bathymetry/development
H12013_Combined_CUBE_2m	2 meter	CUBE	Bathymetry/development
H12013_SSS_100_Mosaic	1 meter	Mosaic	Proof of 100% SSS coverage
H12013_SSS_200_Mosaic	1 meter	Mosaic	Proof of 200% SSS coverage
H12013_1m_Combined	1 meter	Mosaic	

*Table 6: Fieldsheets.*

This survey was processed using the Combined Uncertainty and Bathymetry Estimator (CUBE) algorithm. The CUBE configuration was set to 1 meter grid size (NOAA\_1m) coverage for depths less than or equal to 20 meters and 2 meter grids (NOAA\_2m) for depths greater than 20 meters. Refer to the 2009 Data Acquisition and Processing Report, 2008 Field Procedures Manual, and CARIS HIPS/SIPS 6.1 manual for further discussion.

## B 4.3 Data cleaning

The survey data was cleaned using the swath and subset editor tools in CARIS. All areas of the BASE surface that indicated a high standard deviation were examined and cleaned as required such that no residual errors exist in the surface that exceed the IHO order 1 depth accuracy requirements.

## **C     HORIZONTAL AND VERTICAL CONTROL     *See also H-Cell Report***

As per FPM section 5.2.3.2.3 a *HVCR* report was not filed as no horizontal and vertical control stations were established by the field party for this survey. A summary of horizontal and vertical control for this survey follows.

### **C 1.1 Horizontal Control**

The horizontal datum for this project is the North American Datum of 1983 (NAD83). Differential GPS (DGPS) was the sole method of positioning. Differential corrections from the U.S. Coast Guard beacon at Moriches, NY (293 kHz) were as used during this survey.

No horizontal control stations were established by the field party for this survey.

### **C 1.2 Vertical Control**

The vertical datum for this project is Mean Lower-Low Water (MLLW). The operating National Water Level Observation Network (NWLON) stations at New London, CT (8461490) and New Haven, CT (8465705), served as datum control for H12013. Verified tides with final TCARI constituents and residuals were applied to all sounding data.

A request for delivery of final approved (verified) tides for this survey was forwarded to N/OPS1 26 May 2009 in accordance with the FPM and project letter instructions. Final smooth tide letter received 27 May 2009 recommending preliminary TCARI grid "B370TJ2009-TCARI" as the final grid to use.

## **D     RESULTS AND RECOMMENDATIONS     *See also H-Cell Report***

### **D 1 Chart Comparison**

Survey H12013 was compared with chart 13272\_11 (34<sup>th</sup> Ed.; November 4, 2005, 1:40,000), chart 12373 (15<sup>th</sup> Ed.; June 18, 2005, 1:20,000), chart 13274 (14<sup>th</sup> Ed.; September 8, 2007, 1:20,000), 12375 (21<sup>st</sup> Ed.; February 17, 2001, 1:20,000), chart 12354 (42<sup>nd</sup> Ed.; December 9, 2006, 1:80,000), chart 13211 (15<sup>th</sup> Ed.; September 1, 2007, 1:20,000), and chart 13212 (38<sup>th</sup> Ed.; November 1, 2008, 1:20,000). Chart comparisons were performed in *Caris Bathy DataBASE* version 2.3.0.0 and *Mapinfo Professional* version 9.0.2 by overlaying survey-scale excessed soundings over each appropriate chart.

#### **D 1.1 Chart 12372\_11 Comparison            *Concur.***

Soundings from this survey generally agree with this chart to within 2 feet. Exceptions are with the shoal east of the Saybrook Outer Bar Channel where the 12 foot isobath line will need to be adjusted. There are also three uncharted rock outcrops south of Hatchett Reef. In these locations the chart reports soundings more than 10 feet deeper than what was found by this survey. Two of these outcrops were reported as DTONs. The third was not reported as a DTON due to its proximity to the other two. *See Appendix I and H-Cell Report*

#### **D 1.2 Chart 12373 Comparison**

Data from this survey falls outside of the boundary of this chart. No comparison was made.

#### **D 1.3 Chart 12374 Comparison**

Data from this survey falls outside of the boundary of this chart. No comparison was made.

#### **D 1.4 Chart 12375 Comparison            *Concur.***

Soundings from this survey generally agree with this chart to within 2 feet. Differences occur at the shoal east of the Saybrook Outer Bar Channel where the 12 foot isobath should be adjusted. Also there are two points over the eastern end of Long Sand Shoal where the depths measured in this survey are about 5 feet shoal of the soundings on the chart.

#### **D 1.5 Chart 12354 Comparison            *Concur.***

This small scale chart generally agrees with the current survey. There is an exception about 1200 meters south of Hatchett Reef where surveyed rocky outcrops are significantly shoal of the charted sounding. DTONs were reported for two of these contacts. *See Appendix I*

#### **D 1.6 Chart 3211 Comparison            *Concur.***

Soundings from this survey generally agree with this chart to within 2 feet. There are three uncharted rock outcrops south of Hatchett Reef. In these locations the chart reports soundings

more than 10 feet deeper than what was found by this survey. Two of these outcrops were reported as DTONs. The third was not reported as a DTON due to its proximity to the other two. *See Appendix I*

### **D 1.7 Chart 13212 Comparison**

Data from this survey falls outside of the boundry of this chart. No comparison was made.

## **D 2 ADDITIONAL RESULTS**

### **D 2.1 Automated Wreck and Obstruction Information Service (AWOIS) Items**

There were no AWOIS items within the limits of survey H12013. *Concur.*

### **D 2.4 Shoreline**

As per the *Field Procedures Manual (FPM)*, this navigable area survey was not required to go shoal of the 4 meter depth contour. No shoreline verification was done. *Concur.*

### **D 2.5 Charted Features**

### **D 2.6 Charted Pipelines and Cables**

There are no charted pipelines or cables in the survey area. *Concur.*

### **D 2.7 Bridges, Ferry Routes, and Overhead Cables**

There are no ferry routes, bridges, or overhead cable crossings within the limits of the survey. *Concur.*

## **D 3 DANGERS TO NAVIGATION AND SHOALS**

See section D 3.1.

### **D 3.1 Dangers to Navigation**

Two Dangers to Navigation (DTONs) were reported on May 1<sup>st</sup>, 2009. Both were uncharted rock outcrops south of Hatchett Reef. *See Appendix I*

### **D 3.2 Shoals**

There are three significant shoals within the bounds of this survey. The minimum depths over the eastern end of Long Sand Shoal are similar to those already charted. Only minor corrections need to be applied to the chart in this area. Hatchett Reef is also only requires slight chart corrections. The large shoal east of Saybrook Outer Bar Channel has probably moved

significantly since it was last charted. Many soundings need to be updated and changes need to be made to the charted 12 foot contour over this shoal. *Concur.*

#### **D 4 AIDS TO NAVIGATION**

There are four charted Aids to Navigation (ATON) within the survey limits of H12013. Buoys '1' and '6' which mark Hatchett Reef, and 'E' and '8' which mark the eastern approach to the Connecticut River. All four appear to be intact and on station.

#### **D 5 COAST PILOT INFORMATION**

The Hydrographer has no recommendations for changes or addenda to the Coast Pilot.

#### **D 6 MISCELLANEOUS**

##### **Bottom Samples**

16 Bottom samples were collected in accordance with NOAA Hydrographic Survey Specifications and Deliverables. A list of all bottom samples acquired during Survey H12013 is contained in Appendix V and they are described in the Preliminary Smooth Sheet (PSS) file. *Concur. See also H-Cell Report.*

#### **D 7 ADEQUACY OF SURVEY**

This survey is considered complete and adequate to supersede charted depths within the common area.

**E APPROVAL**

As Lead Hydrographer, I have ensured that standard field surveying and processing procedures were followed in producing this examination in accordance with the Office of Coast Survey Hydrographic Surveys Division’s *Field Procedures Manual*, and NOS *Hydrographic Surveys Specifications and Deliverables*. Field operations for this basic hydrographic survey were conducted under my daily supervision with frequent checks of progress and adequacy.

All field sheets, this Descriptive Report, and all accompanying records and data are approved. All records are forwarded for final review and processing to N/CS33, Atlantic Hydrographic Branch.

Survey H12013 is adequate to supersede charted soundings in their common areas.

Listed below are supplemental reports submitted separately that contain additional information relevant to this survey:

<u>Title</u>	<u>Date Sent</u>	<u>Office</u>
Data Acquisition and Processing Report for OPR-B370-TJ-09	09-09-2009	N/CS33

Approved and Forwarded:

  
 Jasper Schaer  
 2009.09.11  
 12:30:14 -04'00'  


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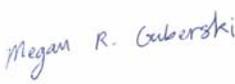
 LT Jasper D. Schaer, NOAA  
 Field Operations Officer


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 CDR P. Tod Schattgen, NOAA  
 Commanding Officer

In addition, the following individual was also responsible for overseeing data acquisition and processing of this survey:

Survey Managers:  
  
 Megan Guberski  
 2009.09.11  
 12:31:47 -04'00'  


---

 LTjg Megan Guberski, NOAA  
 Junior Officer

  
 Doug Wood  
 2009.09.11  
 12:33:10 -04'00'  


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 SST Douglas Wood

**Appendix I**  
**Dangers to Navigation**

# DTON Report

**Registry Number:** H12013  
**State:** Connecticut  
**Locality:** Eastern Long Island Sound  
**Sub-locality:** Saybrook, CT  
**Project Number:** OPR-B370-TJ-09  
**Survey Date:** 05/01/2009

## Charts Affected

Number	Edition	Date	Scale (RNC)	RNC Correction(s)*
12375	21st	02/17/2001	1:20,000 (12375_1)	USCG LNM: 04/08/2008 (05/12/2009) CHS NTM: None (04/24/2009) NGA NTM: 04/24/1999 (05/23/2009)
13211	15th	09/01/2007	1:20,000 (13211_1)	USCG LNM: 12/09/2008 (05/12/2009) CHS NTM: None (04/24/2009) NGA NTM: None (05/23/2009)
12372	34th	11/01/2006	1:40,000 (12372_11)	USCG LNM: 03/10/2009 (10/13/2009) CHS NTM: None (08/28/2009) NGA NTM: 04/24/1999 (10/24/2009)
13209	25th	04/01/2007	1:40,000 (13209_1)	[L]NTM: ?
12354	42nd	12/01/2006	1:80,000 (12354_1)	USCG LNM: 08/04/2009 (10/13/2009) CHS NTM: None (08/28/2009) NGA NTM: 12/04/1999 (10/24/2009)
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	2642/1 - Add 55ft Rock	Rock	16.98 m	41° 15' 19.6" N	072° 15' 15.9" W	---
1.2	738/256 - 69ft Sounding	Rock	21.24 m	41° 15' 07.1" N	072° 16' 18.2" W	---

## **1 - Danger To Navigation**

**1.1) 2642/1 - Add 55ft Rock****DANGER TO NAVIGATION****Survey Summary**

**Survey Position:** 41° 15' 19.6" N, 072° 15' 15.9" W  
**Least Depth:** 16.98 m (= 55.72 ft = 9.286 fm = 9 fm 1.72 ft)  
**TPU ( $\pm 1.96\sigma$ ):** **THU (TPEh)**  $\pm 1.012$  m ; **TVU (TPEv)**  $\pm 0.437$  m  
**Timestamp:** 2009-121.16:35:15.357 (05/01/2009)  
**Survey Line:** h12013 / tj\_s222\_reson7125\_stbd / 2009-121 / 020\_1629  
**Profile/Beam:** 2642/1  
**Charts Affected:** 13211\_1, 12372\_11, 13209\_1, 12354\_1, 12300\_1, 13006\_1, 5161\_1, 13003\_1

**Remarks:**

Uncharted dangerous Rock was acquired with RESON 7125 MBES. Verified water levels and final tide zoning were applied at MLLW and resolved.

**Feature Correlation**

Address	Feature	Range	Azimuth	Status
h12013/tj_s222_reson7125_stbd/2009-121/020_1629	2642/1	0.00	000.0	Primary

**Hydrographer Recommendations**

Chart 55ft dangerous rock.

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

55ft (13211\_1, 12372\_11, 13209\_1, 12354\_1)

9 ¼fm (12300\_1, 13006\_1, 13003\_1)

17.0m (5161\_1)

**S-57 Data**

**Geo object 1:** Underwater rock / awash rock (UWTROC)  
**Attributes:** QUASOU - 6:least depth known  
 SORDAT - 20090517  
 SORIND - US,US,NSURF,H12013

STATUS - 1:permanent

TECSOU - 3:found by multi-beam

VALSOU - 16.982 m

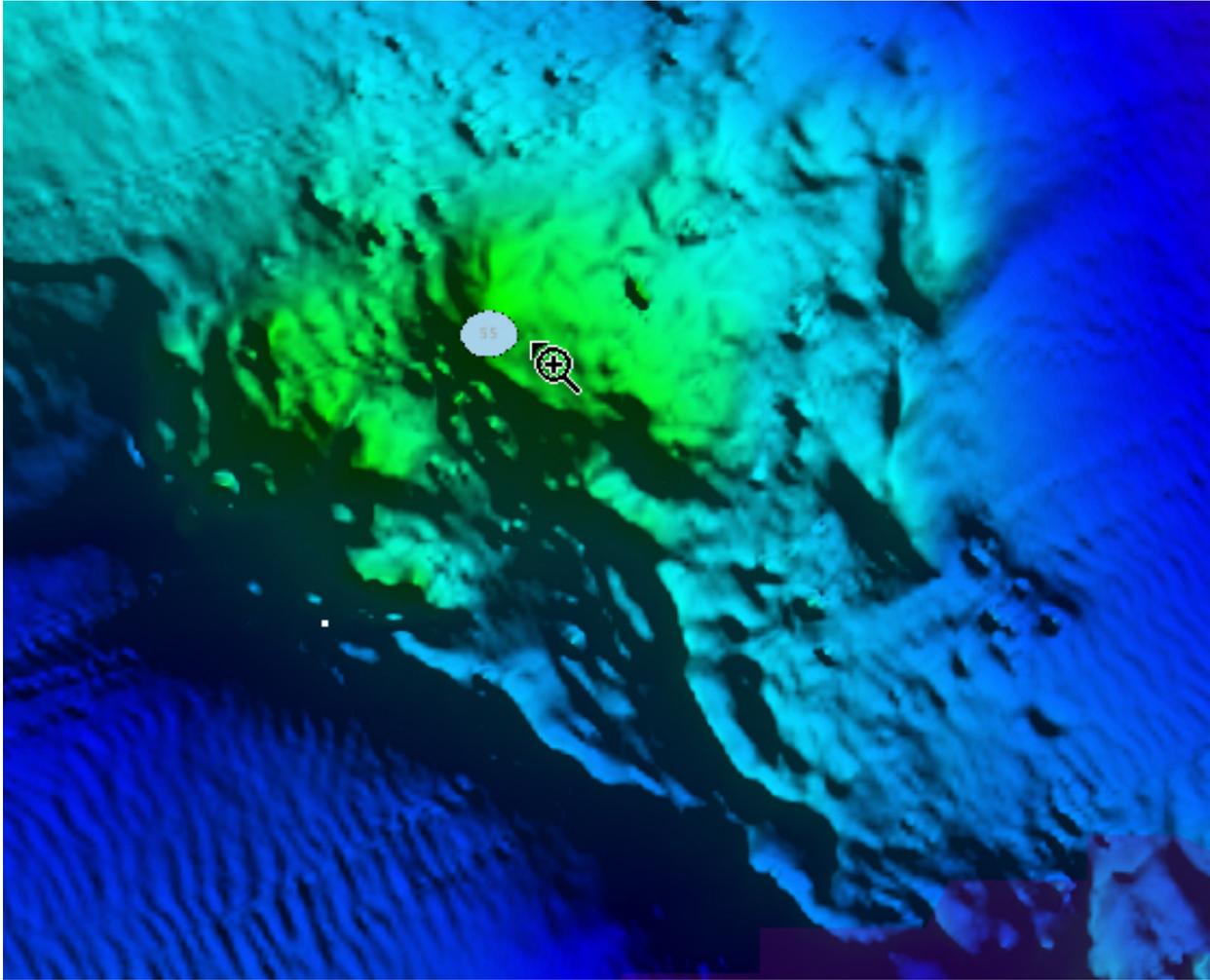
VERDAT - 12:Mean lower low water

WATLEV - 3:always under water/submerged

## Office Notes

Concur with clarification. Submitted as DTON by field unit, but not shown on chart 13211, 15th Edition, LNM 7/17/2010, nor smaller scale charts. Chart dangerous rock with least depth of 55ft at survey location.

## Feature Images



*Figure 1.1.1*

**1.2) 738/256 - 69ft Sounding****DANGER TO NAVIGATION****Survey Summary**

**Survey Position:** 41° 15' 07.1" N, 072° 16' 18.2" W  
**Least Depth:** 21.24 m (= 69.69 ft = 11.615 fm = 11 fm 3.69 ft)  
**TPU ( $\pm 1.96\sigma$ ):** **THU (TPEh)**  $\pm 1.022$  m ; **TVU (TPEv)**  $\pm 0.461$  m  
**Timestamp:** 2009-121.17:25:27.944 (05/01/2009)  
**Survey Line:** h12013 / tj\_s222\_reson7125\_stbd / 2009-121 / 025\_1723  
**Profile/Beam:** 738/256  
**Charts Affected:** 12375\_1, 13211\_1, 12372\_11, 13209\_1, 12354\_1, 12300\_1, 13006\_1, 5161\_1, 13003\_1

**Remarks:**

Uncharted non-dangerous rock was acquired with RESON 7125 MBES. Verified water levels and final tide zoning were applied at MLLW and resolved.

**Feature Correlation**

Address	Feature	Range	Azimuth	Status
h12013/tj_s222_reson7125_stbd/2009-121/025_1723	738/256	0.00	000.0	Primary

**Hydrographer Recommendations**

Chart as 69ft sounding.

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

69ft (12375\_1, 13211\_1, 12372\_11, 13209\_1, 12354\_1)

11fm (12300\_1, 13006\_1, 13003\_1)

21m (5161\_1)

**S-57 Data**

**Geo object 1:** Underwater rock / awash rock (UWTROC)  
**Attributes:** QUASOU - 6:least depth known  
 SORDAT - 20090517  
 SORIND - US,US,NSURF,H12013

STATUS - 1:permanent

TECSOU - 3:found by multi-beam

VALSOU - 21.242 m

VERDAT - 12:Mean lower low water

WATLEV - 3:always under water/submerged

## Office Notes

Concur with clarification. Submitted as DTON by field unit, but not shown on chart 13211, 15th Edition, LNM 7/17/2010, nor smaller scale charts. Chart 69ft sounding at survey location.

## **Appendix II**

### **Survey Features Report**

#### **1. AWOIS Items**

0

#### **2. Charted Features**

2

#### **3. Uncharted Features**

3

# DR Charted

**Registry Number:** H12013  
**State:** Connecticut  
**Locality:** Eastern Long Island Sound  
**Sub-locality:** Saybrook, CT  
**Project Number:** OPR-B370-TJ-09  
**Survey Date:** 05/16/2009

## Charts Affected

Number	Edition	Date	Scale (RNC)	RNC Correction(s)*
13211	15th	09/01/2007	1:20,000 (13211_1)	USCG LNM: 12/09/2008 (05/12/2009) CHS NTM: None (04/24/2009) NGA NTM: None (05/23/2009)
12372	34th	11/01/2006	1:40,000 (12372_11)	USCG LNM: 03/10/2009 (10/13/2009) CHS NTM: None (08/28/2009) NGA NTM: 04/24/1999 (10/24/2009)
12372	34th	11/01/2006	1:40,000 (12372_1)	[L]NTM: ?
13205	38th	02/01/2007	1:80,000 (13205_1)	[L]NTM: ?
12354	42nd	12/01/2006	1:80,000 (12354_1)	USCG LNM: 08/04/2009 (10/13/2009) CHS NTM: None (08/28/2009) NGA NTM: 12/04/1999 (10/24/2009)
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	630/198 - 12ft Rock, revise LD and position	Rock	3.76 m	41° 17' 24.9" N	072° 14' 36.7" W	---
1.2	371/231 - Johns Rock, revise LD and position	Rock	2.02 m	41° 17' 12.5" N	072° 14' 57.6" W	---

**1 - DR\_Charted**

## 1.1) 630/198 - 12ft Rock, revise LD and position

### Survey Summary

**Survey Position:** 41° 17' 24.9" N, 072° 14' 36.7" W  
**Least Depth:** 3.76 m (= 12.33 ft = 2.054 fm = 2 fm 0.33 ft)  
**TPU ( $\pm 1.96\sigma$ ):** **THU (TPEh)**  $\pm 0.980$  m ; **TVU (TPEv)**  $\pm 0.104$  m  
**Timestamp:** 2009-136.20:33:45.329 (05/16/2009)  
**Survey Line:** h12013 / tj\_3101\_reson8125\_mb / 2009-136 / 502\_2033  
**Profile/Beam:** 630/198  
**Charts Affected:** 13211\_1, 12372\_1, 12372\_11, 12354\_1, 13205\_1, 12300\_1, 13006\_1, 5161\_1, 13003\_1

#### Remarks:

Charted 12ft rock surveyed with different least depth and position.

### Feature Correlation

Address	Feature	Range	Azimuth	Status
h12013/tj_3101_reson8125_mb/2009-136/502_2033	630/198	0.00	000.0	Primary

### Hydrographer Recommendations

Revise least depth and position of charted 12ft dangerous rock.

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

12ft (13211\_1, 12372\_1, 12372\_11, 12354\_1, 13205\_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 - 20090517  
 SORIND - US,US,graph,H12013  
 TECSOU - 2,3:found by side scan sonar,found by multi-beam  
 VALSOU - 3.757 m  
 VERDAT - 12:Mean lower low water

WATLEV - 3:always under water/submerged

## **Office Notes**

Concur. Delete charted 12ft dangerous rock. Chart 12ft dangerous rock at survey position.

## 1.2) 371/231 - Johns Rock, revise LD and position

### Survey Summary

**Survey Position:** 41° 17' 12.5" N, 072° 14' 57.6" W  
**Least Depth:** 2.02 m (= 6.62 ft = 1.103 fm = 1 fm 0.62 ft)  
**TPU ( $\pm 1.96\sigma$ ):** **THU (TPEh)**  $\pm 0.980$  m ; **TVU (TPEv)**  $\pm 0.103$  m  
**Timestamp:** 2009-136.20:21:14.461 (05/16/2009)  
**Survey Line:** h12013 / tj\_3101\_reson8125\_mb / 2009-136 / 506\_2020  
**Profile/Beam:** 371/231  
**Charts Affected:** 13211\_1, 12372\_11, 12354\_1, 13205\_1, 12300\_1, 13006\_1, 5161\_1, 13003\_1

#### Remarks:

Johns Rock surveyed at different depth and position.

### Feature Correlation

Address	Feature	Range	Azimuth	Status
h12013/tj_3101_reson8125_mb/2009-136/506_2020	371/231	0.00	000.0	Primary
h12013/tj_3102_klein5000_hull_200/2009-127/525_090507125000	0001	25.51	016.7	Secondary (grouped)
h12013/tj_3101_reson8125_mb/2009-136/506_2020	270/220	27.56	033.0	Secondary (grouped)

### Hydrographer Recommendations

Revise least depth and position of Johns Rock.

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

6ft (13211\_1, 12372\_11, 12354\_1, 13205\_1)

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

2.0m (5161\_1)

### S-57 Data

**Geo object 1:** Underwater rock / awash rock (UWTROC)  
**Attributes:** OBJNAM - Johns Rock  
 QUASOU - 6:least depth known  
 SORDAT - 20090517  
 SORIND - US,US,graph,H12013

TECSOU - 2,3:found by side scan sonar,found by multi-beam

VALSOU - 2.017 m

VERDAT - 12:Mean lower low water

WATLEV - 3:always under water/submerged

## Office Notes

Concur. Delete charted 5ft dangerous rock "Johns Rock". Chart 6ft dangerous rock "Johns Rock" at survey position.

## Feature Images



*Figure 1.2.1*

# DR Uncharted

**Registry Number:** H12013  
**State:** Connecticut  
**Locality:** Eastern Long Island Sound  
**Sub-locality:** Saybrook, CT  
**Project Number:** OPR-B370-TJ-09  
**Survey Dates:** 05/07/2009 - 05/15/2009

## Charts Affected

Number	Edition	Date	Scale (RNC)	RNC Correction(s)*
12375	21st	02/17/2001	1:20,000 (12375_1)	USCG LNM: 04/08/2008 (05/12/2009) CHS NTM: None (04/24/2009) NGA NTM: 04/24/1999 (05/23/2009)
13211	15th	09/01/2007	1:20,000 (13211_1)	USCG LNM: 12/09/2008 (05/12/2009) CHS NTM: None (04/24/2009) NGA NTM: None (05/23/2009)
12372	34th	11/01/2006	1:40,000 (12372_11)	USCG LNM: 03/10/2009 (10/13/2009) CHS NTM: None (08/28/2009) NGA NTM: 04/24/1999 (10/24/2009)
12354	42nd	12/01/2006	1:80,000 (12354_1)	USCG LNM: 08/04/2009 (10/13/2009) CHS NTM: None (08/28/2009) NGA NTM: 12/04/1999 (10/24/2009)
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	0002 - Rock of unknown depth	Rock	[None]	41° 16' 31.2" N	072° 17' 22.7" W	---
1.2	2948/14 - Add 10ft Rock	Rock	3.05 m	41° 15' 47.3" N	072° 19' 05.2" W	---
1.3	7164/3 - Add 21ft Wreck	Wreck	6.55 m	41° 16' 20.5" N	072° 16' 10.2" W	---

## **1 - DR\_UnCharted**

## 1.1) 0002 - Rock of unknown depth

### Survey Summary

**Survey Position:** 41° 16' 31.2" N, 072° 17' 22.7" W  
**Least Depth:** [None]  
**TPU ( $\pm 1.96\sigma$ ):** THU (TPEh) [None] ; TVU (TPEv) [None]  
**Timestamp:** 2009-135.07:15:21 (05/15/2009)  
**Survey Line:** h12013 / tj\_3102\_klein5000\_hull\_200 / 2009-133 / 215\_090513143900  
**Contact/Point:** 0002/1  
**Charts Affected:** 12375\_1, 12372\_11, 12354\_1, 12300\_1, 13006\_1, 5161\_1, 13003\_1

#### Remarks:

Dangerous rock detected in sidescan, but not covered within multibeam coverage. Least depth is not known.

### Feature Correlation

Address	Feature	Range	Azimuth	Status
h12013/tj_3102_klein5000_hull_200/2009-133/215_090513143900	0002	0.00	000.0	Primary

### Hydrographer Recommendations

Chart dangerous rock with unknown depth.

### S-57 Data

**Geo object 1:** Underwater rock / awash rock (UWTROC)  
**Attributes:** QUASOU - 2:depth unknown  
 SORDAT - 20090517  
 SORIND - US,US,graph,H12013  
 TECSOU - 2:found by side scan sonar  
 VERDAT - 12:Mean lower low water  
 WATLEV - 3:always under water/submerged

### Office Notes

Concur. Chart dangerous rock with depth UNKNOWN at the survey location.

## Feature Images



*Figure 1.1.1*

## 1.2) 2948/14 - Add 10ft Rock

### Survey Summary

**Survey Position:** 41° 15' 47.3" N, 072° 19' 05.2" W  
**Least Depth:** 3.05 m (= 10.00 ft = 1.667 fm = 1 fm 4.00 ft)  
**TPU ( $\pm 1.96\sigma$ ):** **THU (TPEh)**  $\pm 0.980$  m ; **TVU (TPEv)**  $\pm 0.104$  m  
**Timestamp:** 2009-132.20:28:55.664 (05/12/2009)  
**Survey Line:** h12013 / tj\_3101\_reson8125\_mb / 2009-132 / 874\_2026  
**Profile/Beam:** 2948/14  
**Charts Affected:** 12375\_1, 12372\_11, 12354\_1, 12300\_1, 13006\_1, 5161\_1, 13003\_1

#### Remarks:

Rock or debris pile.

### Feature Correlation

Address	Feature	Range	Azimuth	Status
h12013/tj_3101_reson8125_mb/2009-132/874_2026	2948/14	0.00	000.0	Primary
h12013/tj_3102_klein5000_hull_200/2009-133/224_090513163300	0001	4.39	204.6	Secondary (grouped)
h12013/tj_3102_klein5000_hull_200/2009-132/052_090512203100	0002	5.69	321.3	Secondary (grouped)

### Hydrographer Recommendations

Chart as dangerous rock.

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

10ft (12375\_1, 12372\_11, 12354\_1)

1 ½fm (12300\_1, 13006\_1, 13003\_1)

3.0m (5161\_1)

### S-57 Data

**Geo object 1:** Underwater rock / awash rock (UWTROC)  
**Attributes:** QUASOU - 6:least depth known  
 SORDAT - 20090517  
 SORIND - US,US,graph,H12013  
 TECSOU - 2,3:found by side scan sonar,found by multi-beam

VALSOU - 3.048 m

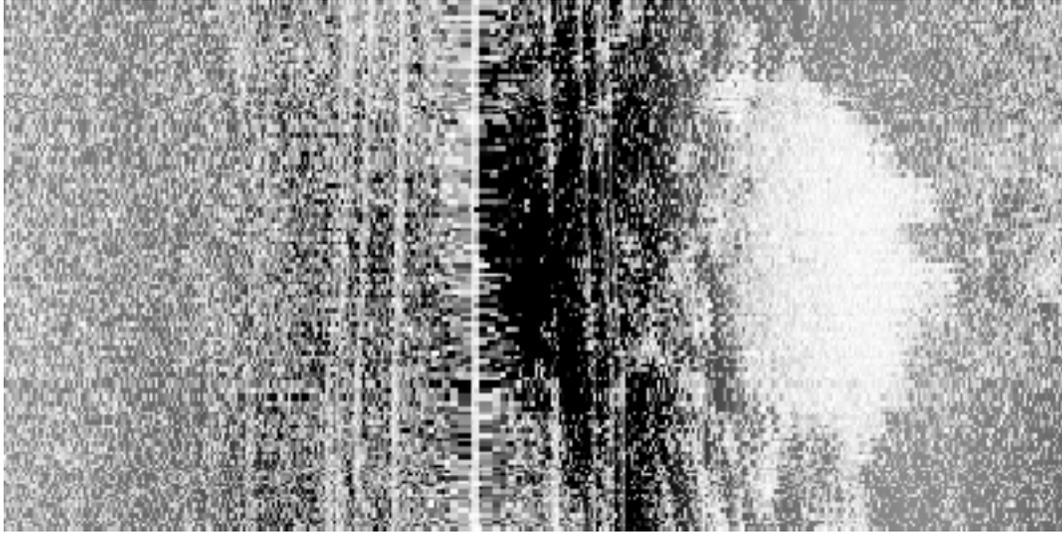
VERDAT - 12:Mean lower low water

WATLEV - 3:always under water/submerged

## **Office Notes**

Concur. Chart dangerous rock with a least depth of 10ft at survey position.

## Feature Images



*Figure 1.2.1*

### 1.3) 7164/3 - Add 21ft Wreck

#### Survey Summary

**Survey Position:** 41° 16' 20.5" N, 072° 16' 10.2" W  
**Least Depth:** 6.55 m (= 21.48 ft = 3.580 fm = 3 fm 3.48 ft)  
**TPU ( $\pm 1.96\sigma$ ):** THU (TPEh)  $\pm 1.000$  m ; TVU (TPEv)  $\pm 0.285$  m  
**Timestamp:** 2009-127.19:09:58.172 (05/07/2009)  
**Survey Line:** h12013 / tj\_3102\_reson7125\_mb\_t / 2009-127 / 103\_1901  
**Profile/Beam:** 7164/3  
**Charts Affected:** 12375\_1, 13211\_1, 12372\_11, 12354\_1, 12300\_1, 13006\_1, 5161\_1, 13003\_1

#### Remarks:

Least depth on what appears to be a wreck. Dimensions 11.6m long, 3.2m wide, azimuth 002 degrees.

#### Feature Correlation

Address	Feature	Range	Azimuth	Status
h12013/tj_3102_reson7125_mb_t/2009-127/103_1901	7164/3	0.00	000.0	Primary
h12013/tj_3102_klein5000_hull_100/2009-120/512_090430185300	0004	1.57	290.2	Secondary (grouped)
h12013/tj_3101_klein5000_sss200/2009-122/503_090502140800	0005	8.85	332.7	Secondary (grouped)

#### Hydrographer Recommendations

Chart as dangerous wreck.

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

21ft (12375\_1, 13211\_1, 12372\_11, 12354\_1)

3 ½fm (12300\_1, 13006\_1, 13003\_1)

6.5m (5161\_1)

#### S-57 Data

**Geo object 1:** Wreck (WRECKS)  
**Attributes:** CATWRK - 2:dangerous wreck  
 QUASOU - 6:least depth known  
 SORDAT - 20090517  
 SORIND - US,US,graph,H12013

TECSOU - 2,3:found by side scan sonar,found by multi-beam

VALSOU - 6.547 m

VERDAT - 12:Mean lower low water

WATLEV - 3:always under water/submerged

## **Office Notes**

Concur. Chart dangerous wreck with a least depth of 21ft at survey position.

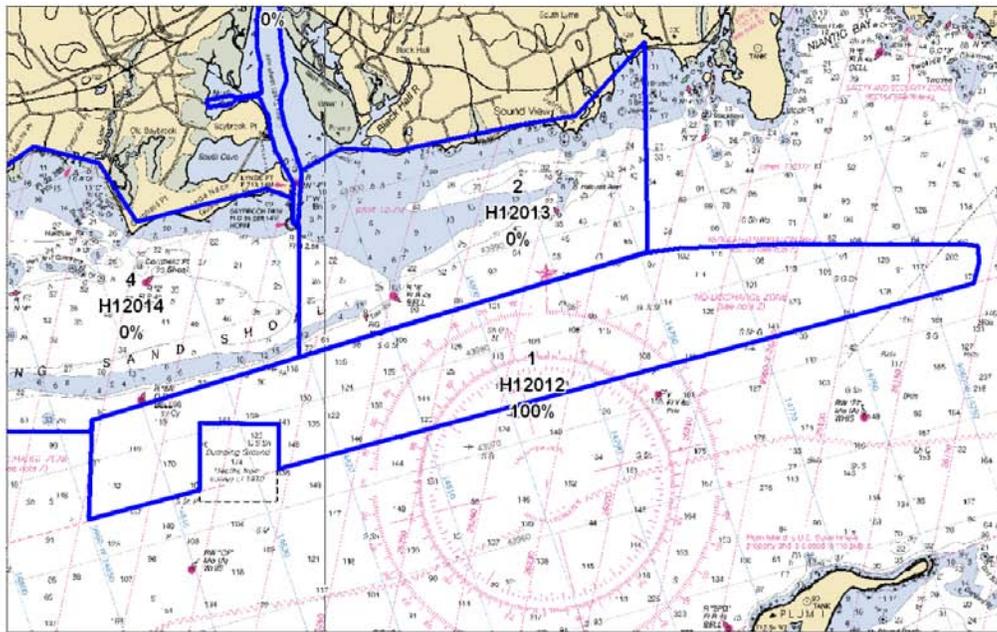
### Feature Images



Figure 1.3.1

# Appendix III

## Progress Sketch



Project	Sheet_Letter	H_num	HQ_Est_SNM	CumIPercCompPrev	CumIPercCompCurMon	SNM_CompCurMo	CumSNMcomp
B370-TJ-09	2	H12013	6	0	0	0	0
B370-TJ-09	5		0	0	0	0	0
B370-TJ-09	7		0	0	0	0	0
B370-TJ-09	6		0	0	0	0	0
B370-TJ-09	3	H12015	1	0	0	0	0
B370-TJ-09	1	H12012	14	0	100	14	14

Progress Sketch OPR-B370-TJ-09  
April, 2009

**Appendix IV**  
**Tides and Water Levels**



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

**TIDE NOTE FOR HYDROGRAPHIC SURVEY**

**DATE :** May 27, 2009

**HYDROGRAPHIC BRANCH:** Atlantic  
**HYDROGRAPHIC PROJECT:** OPR-B370-TJ-2009  
**HYDROGRAPHIC SHEET:** H12013

**LOCALITY:** Saybrook, Eastern Long Island Sound, CT  
**TIME PERIOD:** April 30 - May 17, 2009

**TIDE STATION USED:** 846-1490 New London, CT  
Lat. 41° 21.7' N Long. 72° 05.4' W  
**PLANE OF REFERENCE (MEAN LOWER LOW WATER):** 0.000 meters  
**HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE:** 0.839 meters

**TIDE STATION USED:** 846-5705 New Haven, CT  
Lat. 41° 16.9' N Long. 72° 54.5' W  
**PLANE OF REFERENCE (MEAN LOWER LOW WATER):** 0.000 meters  
**HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE:** 1.949 meters

**REMARKS: RECOMMENDED GRID**

Please use the TCARI grid "B370TJ2009-TCARI" as the final grid for project OPR-B370-TJ-2008, H12013, during the time period between April 30 - May 17, 2009.

**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).

**Peter J. Stone**

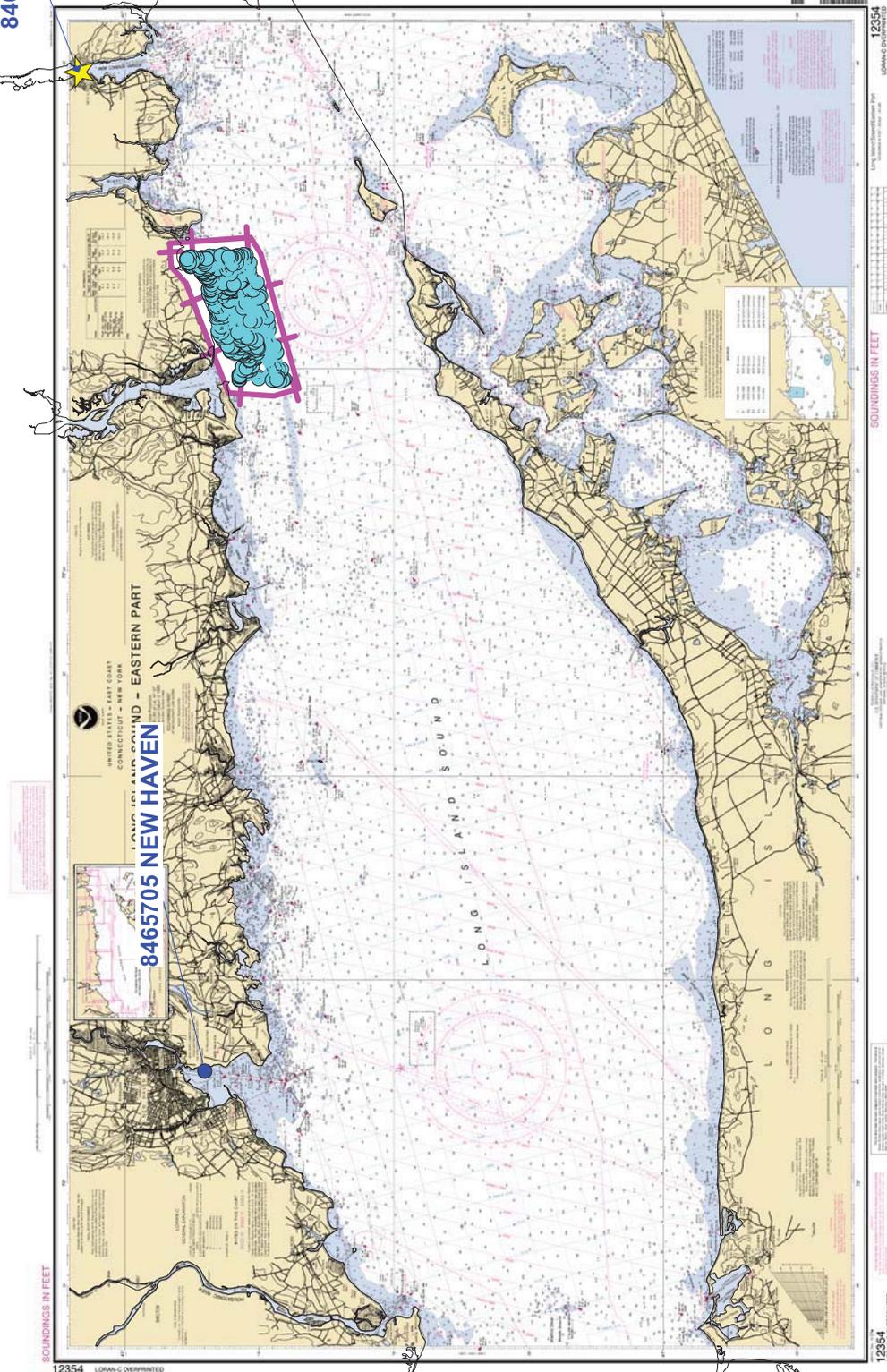
Digitally signed by Peter J. Stone  
DN: cn=Peter J. Stone, o=CO-OPS, ou=NOAA/  
NOS, email=peter.stone@noaa.gov, c=US  
Date: 2009.06.03 12:40:56 -04'00'

CHIEF, OCEANOGRAPHIC DIVISION



# Preliminary as Final TCARI Grid for OPR-B370-TJ-2009, H12013 Eastern Long Island Sound

8461490 NEW LONDON





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

May 27, 2009

MEMORANDUM FOR: Chief, Requirements and Development Division, N/OPS1

FROM: CDR P. Tod Schattgen, 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/NOS/Atlantic Hydrographic Branch  
N/CS33, Building #2  
439 West York Street  
Norfolk, VA 23510  
ATTN: Chief AHB

NOAA Thomas Jefferson  
439 West York Street  
Norfolk, VA 23510  
ATTN: Commanding Officer

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

Project No.: OPR-B370-TJ-09  
Registry No.: H12013  
State: Connecticut  
Locality: Eastern Long Island Sound  
Sublocality: Saybrook, CT

Attachments containing:

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

cc: N/CS33  
MOA/TJ



---

Year_DOY	Min Time	Max Time
2009_120	18:39:43	23:55:41
2009_121	00:07:34	21:06:53
2009_122	19:40:59	23:23:34
2009_125	13:52:19	21:06:21
2009_126	13:26:06	20:48:55
2009_127	13:56:10	20:58:48
2009_131	17:56:36	21:14:12
2009_132	12:40:58	21:01:43
2009_133	13:06:24	20:43:06
2009_134	12:38:01	14:44:33
2009_136	18:00:19	21:03:25
2009_137	12:36:48	20:00:53

## **Appendix V**

### **Supplemental Survey Records & Correspondence**

# H12013 Bottom Samples

**Registry Number:** H12013  
**State:** Connecticut  
**Locality:** Eastern Long Island Sound  
**Sub-locality:** Saybrook, CT  
**Project Number:** OPR-B370-TJ-09  
**Survey Dates:** 04/30/2009 - 05/13/2009

## Charts Affected

Number	Edition	Date	Scale (RNC)	RNC Correction(s)*
12375	21st	02/17/2001	1:20,000 (12375_1)	USCG LNM: 04/08/2008 (05/12/2009) CHS NTM: None (04/24/2009) NGA NTM: 04/24/1999 (05/23/2009)
13211	15th	09/01/2007	1:20,000 (13211_1)	USCG LNM: 12/09/2008 (05/12/2009) CHS NTM: None (04/24/2009) NGA NTM: None (05/23/2009)
12372	34th	11/01/2006	1:40,000 (12372_11)	USCG LNM: 03/10/2009 (10/13/2009) CHS NTM: None (08/28/2009) NGA NTM: 04/24/1999 (10/24/2009)
12354	42nd	12/01/2006	1:80,000 (12354_1)	USCG LNM: 08/04/2009 (10/13/2009) CHS NTM: None (08/28/2009) NGA NTM: 12/04/1999 (10/24/2009)
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	fine Sand	Bottom Sample	[None]	41° 16' 01.9" N	072° 17' 11.4" W	---
1.2	fine Sand/Shells	Bottom Sample	[None]	41° 15' 03.1" N	072° 19' 24.3" W	---
1.3	fine Sand	Bottom Sample	[None]	41° 15' 12.6" N	072° 20' 09.2" W	---
1.4	fine Sand/Shells	Bottom Sample	[None]	41° 14' 49.4" N	072° 20' 22.2" W	---

1.5	Fine Sand	Bottom Sample	[None]	41° 14' 56.3" N	072° 18' 37.5" W	---
1.6	Silt	Bottom Sample	[None]	41° 15' 08.7" N	072° 18' 10.8" W	---
1.7	Silt	Bottom Sample	[None]	41° 15' 38.6" N	072° 17' 40.8" W	---
1.8	Silt/Shells	Bottom Sample	[None]	41° 15' 05.9" N	072° 17' 54.6" W	---
1.9	Sil/Shells	Bottom Sample	[None]	41° 15' 09.8" N	072° 17' 25.1" W	---
1.10	sticky Mud/Shells	Bottom Sample	[None]	41° 15' 58.0" N	072° 18' 41.9" W	---
1.11	fine Sand/Shells	Bottom Sample	[None]	41° 16' 13.0" N	072° 18' 06.8" W	---
1.12	Silt	Bottom Sample	[None]	41° 16' 20.6" N	072° 17' 32.5" W	---
1.13	Mud/Gravel	Bottom Sample	[None]	41° 16' 27.7" N	072° 15' 29.8" W	---

## AHB COMPILATION LOG

General Survey Information	
REGISTRY No.	H12013
PROJECT No.	OPR-B370-TJ-09
FIELD UNIT	NOAA SHIP <i>THOMAS JEFFERSON</i>
DATE OF SURVEY	04/19/2009 - 05/17/2009
LARGEST SCALE CHART	<i>12375_1, edition 21, 20010217, 1:20,000</i>
ADDITIONAL CHARTS	<i>13211_1, edition 15, 20070901, 1:20,000</i>
SOUNDING UNITS	<b>FEET</b>
COMPILER	James J Miller

Source Grids	File Name	
	H:\Compilation\H12013_B370_TJ\AHB_H12013\SAR Final Products\GRIDS	
	H12013_1_CUBE_1m_Final.hns	H12013_AHB_1_CUBE_50cm_Final.hns
	H12013_2_CUBE_1m_Final.hns	H12013_AHB_2_CUBE_50cm_Final.hns
	H12013_3_CUBE_1m_Final.hns	H12013_AHB_3_CUBE_50cm_Final.hns
	H12013_4_CUBE_1m_Final.hns	H12013_2_CUBE_2m_Final.hns
	H12013_5_CUBE_1m_Final.hns	H12013_4_CUBE_2m_Final.hns
	H12013_6_CUBE_1m_Final.hns	H12013_6_CUBE_2m_Final.hns
	H12013_7_CUBE_1m_Final.hns	
Surfaces	File Name	
	H:\Compilation\H12013_B370_TJ\AHB_H12013\COMPILE\Working	
<i>Combined</i>	H12013_4m_Combined.csar	
<i>Interpolated TIN</i>	\Interpolated TIN\H12013_8m_InterpTIN.csar	
<i>Shifted Interpolated TIN</i>	\Shifted Surface\H12013_8m_InterpTIN_Shifted.csar	
Working HOBs	File Name	
	H:\Compilation\H12013_B370_TJ\AHB_H12013\COMPILE\Working\HOB's	
<i>Survey Scale Soundings</i>	H12013_SS_Soundings.hob	
<i>Chart Scale Soundings</i>	H12013_CS_Soundings.hob	
<i>Contour Layer</i>	H12013_Contours.hob	
<i>Feature Layer</i>	H12013_Features	
<i>Meta-Objects Layer</i>	H12013_MetaObjects.hob	
<i>Blue Notes</i>	H12013_BlueNotes.hob	
<i>Contractor Submitted Features</i>	H12013_Pydro_Features.hob	

Meta-Objects Attribution	
Acronym	Value
<b>M_COVR</b>	
CATCOV	1 – coverage available
SORDAT	20090517
SORIND	US,US,graph,H12013
<b>M_QUAL</b>	
CATZOC	6 – zone of confidence U (data not assessed)
INFORM	NOAA Ship Thomas Jefferson
POSACC	10.0m
SORDAT	20090517
SORIND	US,US,graph,H12013
SUREND	20090517
SURSTA	20090419
<b>DEPARE</b>	

[Type text]

This Document is for Office Process use only and is intended to supplement, not supersede or replace, information/recommendations in the Descriptive or Evaluation Reports

DRVALV 1	1.033m
DRVALV2	37.113m
SORDAT	20090517
SORIND	US,US_graph,H12013
<b>M_CSCL</b>	
CSCALE	N/A
SORDAT	N/A
SORIND	N/A

SPECIFICATIONS:

- I. COMBINED SURFACE:
  - a. Number of ESAR Final Grids: 13
  - b. Resolution of Combined (m): 4m
  
- II. SURVEY SCALE SOUNDINGS (SS):
  - a. Attribute Name: Depth
  - b. Selection criteria: Radius, Shoal bias
  - c. Radius value is: mm at map scale
    - i. Use single-defined radius: 1.0
    - ii. Or use radius table file: N/A
  - d. Queried Depth of All Soundings
    - i. Minimum: 1.033m
    - ii. Maximum: 37.113m
  
- III. INTERPOLATED TIN SURFACE:
  - a. Resolution (m): 8m
  - b. Interpolation method: Natural Neighbor
  - c. Shift value: -0.229m (-0.75ft)
  
- IV. CONTOURS:
  - a. Attribute Name: Depth
  - b. Use a Depth List: H12013\_depth\_curves.txt
  - c. Output Options: Create contour lines
    - i. Line Object: DEPCNT
    - ii. Value Attribute: VALDCO
  
- V. FEATURES:
  - a. Total Number of Features: 39
  - b. Number of Insignificant Features: 14
  
- VI. CHART SURVEY SOUNDINGS (CS):
  - a. Number of ENC CS Soundings: 455
  - b. Attribute Name: Depth
  - c. Selection criteria: Radius, Shoal bias
  - d. Radius value is: Distance on the ground (m)
    - i. Use single-defined radius: N/A
    - ii. Or use radius table file: H12013\_CS\_Spacing.txt
  - e. Enable Filter: Interpolated != 1
  - f. Number Survey CS Soundings: 584

VII. Notes:

[Type text]

**ATLANTIC HYDROGRAPHIC BRANCH  
H-CELL REPORT to ACCOMPANY  
SURVEY H12013 (2009)**

This H-Cell Report has been written to supplement and/or clarify the original Descriptive Report and pass critical compilation information to the cartographers in the Marine Chart Division.

**B. DATA ACQUISITION AND PROCESSING**

**B.2 QUALITY CONTROL**

**B.2 H-Cell**

The AHB source depth grid for the survey's nautical chart update product was a combined 4m resolution BASE surface (\*.CSAR) derived from thirteen BASE surfaces of multiple resolutions (0.5m, 1m, and 2m). The survey scale soundings were created from the surface at a single defined radius of one millimeter (at chart scale) at the 1:20,000 chart scale. A TIN was created from the survey scale soundings, from which an interpolated surface was generated. The chart scale soundings were selected from the filtered interpolated surface using a sounding spacing range file at the 1:20,000 chart scale. The chart scale soundings are a subset of the survey scale soundings. The surface model was referenced when selecting the chart scale soundings, to ensure that the selected soundings portrayed the bathymetry within the common area.

Depth contours were created from a shifted interpolated TIN surface of 8m resolution, with the contours in feet (6, 12, 18, 30, 60, and 90 feet). The depth contours are forwarded to MCD for reference only. The contours were utilized during chart scale sounding selection and quality assurance efforts at AHB. The depth contours are incorporated into the SS H-Cell product as per 2009 H-Cell Specifications.

The pre-compilation products or components (Stand Alone \*.HOB files, or SAHOB) are detailed in the H12013 AHB Compilation Log contained within this document. The SAHOB files included depth areas (DEPARE), depth contours (DEPCNT), soundings (SOUNDG), meta-objects (M\_QUAL, M\_COVR), cartographic Blue Notes (\$CSYMB), and features (SBDARE, SNDWAV, UWTROC, and WRECKS).

As dictated by Hydrographic Technical Directive 2008-8, these SAHOB files were combined into two separate files in S-57 format. Both S-57 files were exported from CARIS Bathy DataBase in meters and then processed in CARIS HOM to convert the metric units to feet. The final products are two S-57 files, in Lat/Long NAD-83. One S-57 file contains the chart scale soundings, the meta-objects, the Blue Notes, and the features (H12013\_CS.000), and the other S-57 file contains the depth contours and the survey scale soundings (H12013\_SS.000). Finally,

quality assurance and topology checks were made utilizing CARIS S-57 Composer 2.1 validation checks and DKART Inspector 5.0 validation tests.

H12013 CARIS H-Cell final deliverables include the following products:

H12013_CS.000	1:10,000 Scale	H-Cell with chart scale soundings, meta-objects, blue notes, and features
H12013_SS.000	1:10,000 Scale	H-Cell with survey scale soundings and depth contours

#### **B.2.4 Junctions**

Survey H12013 (2009) junctions with survey H12012 (2009) to the south. Most present survey soundings compare within 1 foot of the junctioning survey soundings from H12012. Surveys H12013 and H12012 were compiled concurrently, and their compilation coverage areas were made to align topologically, such that they do not overlap nor have any intermediary void area.

In addition, most present survey depths compare within 2 feet of the charted hydrography to the east, north, and west.

#### **B.4 DATA PROCESSING**

The following software was used to process data at the Atlantic Hydrographic Branch:

CARIS Bathy DataBase version 2.1/SP1/HF10  
CARIS Bathy DataBase version 2.3/HF16  
CARIS HIPS/SIPS version 7.0/SP1/HF5  
CARIS S-57 Composer version 2.1/HF4  
CARIS HOM version 3.3/SP3/HF8  
DKART Inspector 5.0  
PYDRO 9.10

#### **C. HORIZONTAL AND VERTICAL CONTROL**

The OPR-B370-TJ-09 Horizontal and Vertical Control Report (HVCR) was submitted with survey H12013.

Horizontal control used for this survey during data acquisition is based upon the North American Datum of 1983 (NAD83), UTM Projection Zone 18 North.

## **D. RESULTS AND RECOMMENDATIONS**

### **D.1 CHART COMPARISON**

#### **12375 (21st Edition, Feb/2001)**

Connecticut River – Long Island  
Sound to Deep River  
Corrected through NM 06/29/2010  
Corrected through LNM 07/17/2010  
Scale 1:20,000

#### **13211 (15th Edition, Sep/2007)**

North Shore of Long Island Sound –  
Nianitic Bay and Vicinity  
Corrected through NM 06/29/2010  
Corrected through LNM 07/17/2010  
Scale 1:20,000

### **ENC Comparison**

#### **US5CN30M**

Connecticut River – Long Island  
Sound to Deep River  
Edition 5  
Application Date 2010/06/11  
Issue Date 2010/06/11  
Chart 12375

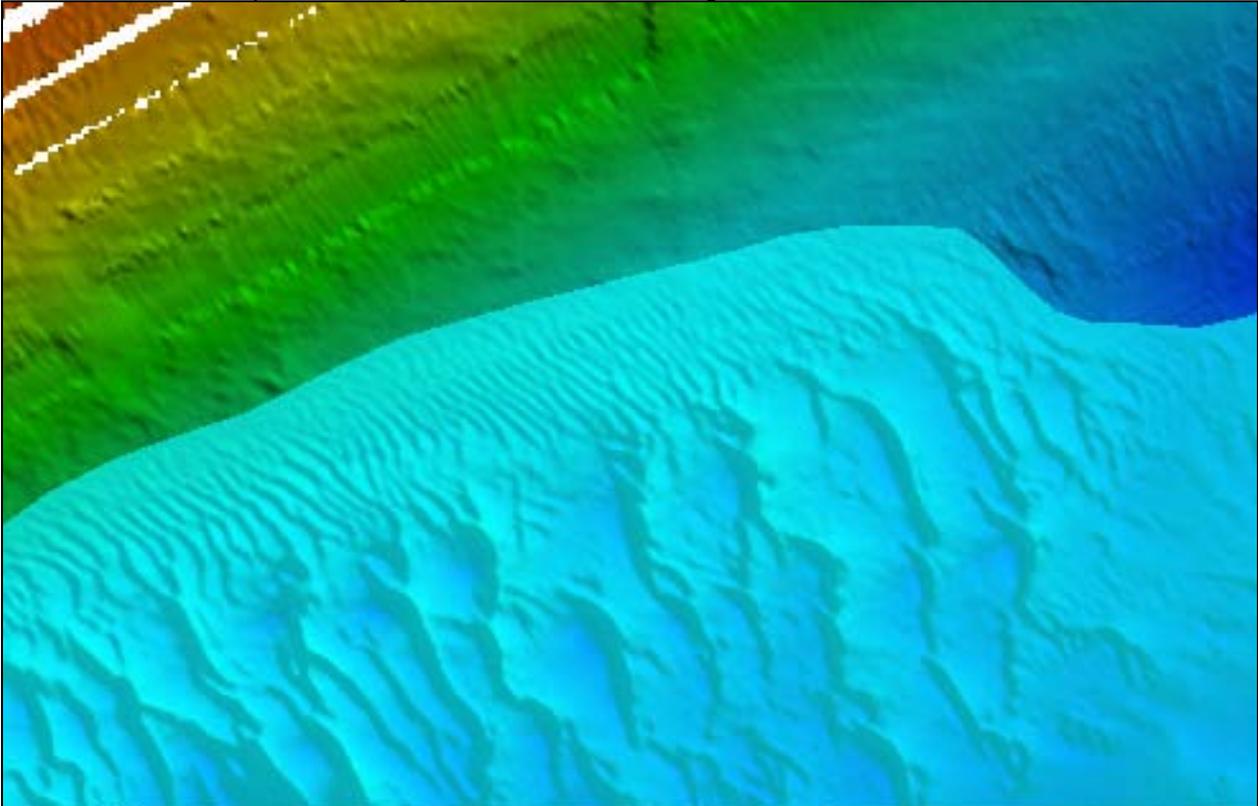
#### **US5CN41M**

North Shore of Long Island Sound –  
Nianitic Bay and Vicinity  
Edition 2  
Application Date 2010/06/29  
Issue Date 2010/06/29  
Chart 13211

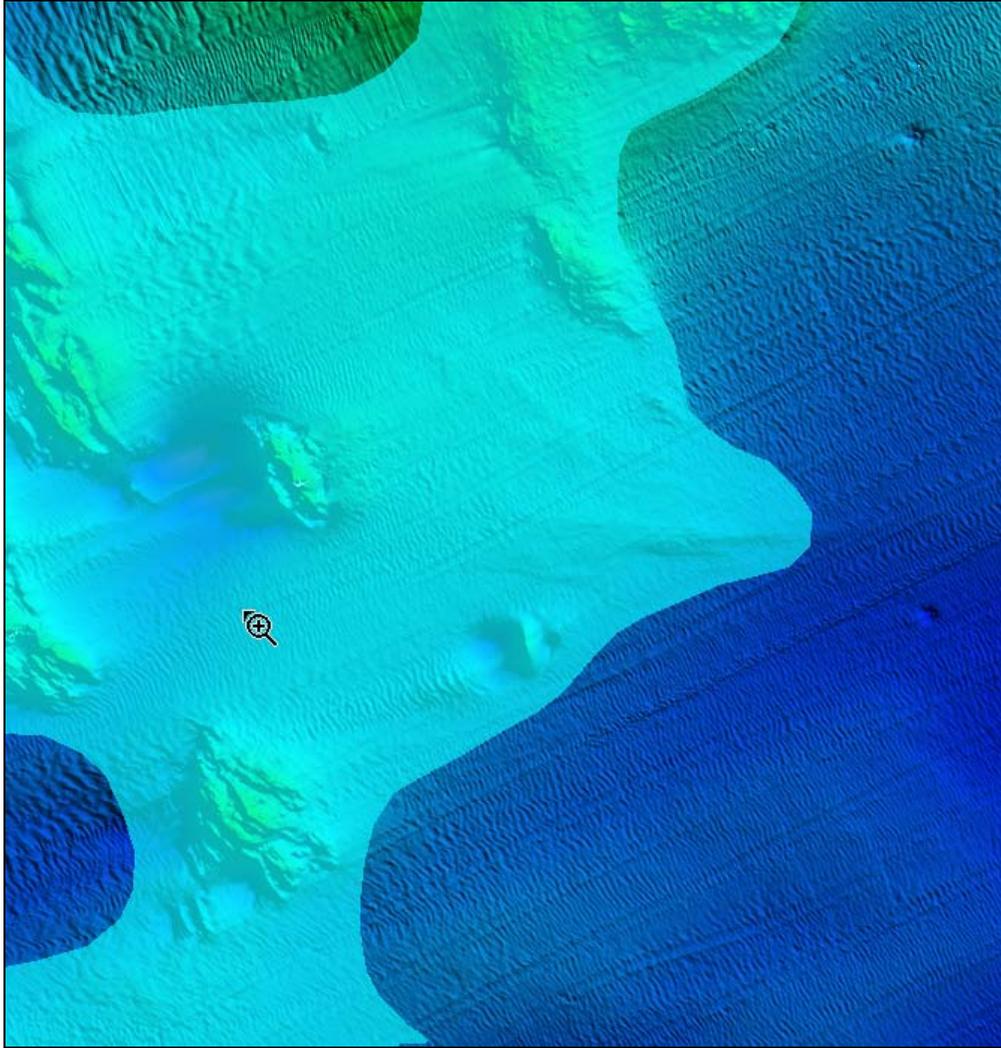
## **D.2 ADDITIONAL RESULTS**

The charted hydrography originates with prior surveys and requires no further consideration. The hydrographer makes adequate chart comparisons and recommendations in section D and Appendix I and II of the Descriptive Report. In addition, the hydrographer recommends that any charted features not specifically addressed either in the H-Cell files or the Blue Notes should be retained as charted. Several H-Cell items were not specifically addressed in the Descriptive Report, and details regarding these items are as follows:

- a. The field unit collected a total of 16 bottom samples. Most charted seabed characteristics were retained as charted, but some of the charted seabed characteristics were superseded by the survey findings.
- b. The H-Cell was compiled to two adjacent and overlapping 1:20,000 scale charts, 12375 and 13211. These two charts display the same level of cartographic detail in most respects. However, chart 13211 displays the 60ft and 90ft depth curves, whereas chart 12375 does not display these two depth curve intervals. The hydrographer recommends that MCD include the 60ft and 90ft contour intervals on future editions of chart 12375.
- c. Several sandwave (SNDWAV) areas were included with the H-Cell. These areas are defined by undulating sandwaves with an amplitude of 1m or more.



- d. Seven rocky seabed areas (SBDARE) were included with the H-Cell. These areas are defined by prominent rocks and rocky seabed.



## **D.6 MISCELLANEOUS**

Chart compilation was completed by Atlantic Hydrographic Branch personnel in Norfolk, Virginia. Compilation data will be forwarded to the Marine Chart Division in Silver Spring, Maryland. See Section D.1 of this report for a list of the Raster Charts and Electronic Navigation Charts (ENC) used for compiling the present survey.

## **D.7 ADEQUACY OF SURVEY**

The present survey is adequate to supersede the charted bathymetry within the common area. Any features not specifically addressed either in the H-Cell files or the Blue Notes should be retained as charted. Refer to the Descriptive Report (section D and Appendices I and II) for further recommendations by the hydrographer.

**APPROVAL SHEET**  
**H12013**

**Initial Approvals:**

The completed survey has been inspected with regard to survey coverage, delineation of depth contours, disposition of critical depths, cartographic symbolization, and verification or disproof of charted data. All revisions and additions made to the H-Cell files during survey processing have been entered in the digital data for this survey. The survey records and digital data comply with National Ocean Service and Office of Coast Survey requirements except where noted in the Descriptive Report and the Evaluation Report.

All final products have undergone a comprehensive review per the Hydrographic Surveys Division Office Processing Manual and are verified to be accurate and complete except where noted.

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**James J. Miller II**  
Hydrographic Survey Intern  
Atlantic Hydrographic Branch

I have reviewed the H-Cell files, accompanying data, and reports. This survey and accompanying Marine Chart Division deliverables meet National Ocean Service requirements and standards for products in support of nautical charting except where noted.

Approved: \_\_\_\_\_  
**Richard T. Brennan**  
Commander, NOAA  
Chief, Atlantic Hydrographic Branch