H12485

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

DESCRIPTIVE REPORT

Type of Survey:	Navigable Area
Registry Number:	H12485

LOCALITY

State(s):	Connecticut
General Locality:	Long Island Sound
Sub-locality:	Joshua Cove to Mansfield Pt

2013

CHIEF OF PARTY
Commander Lawrence T. Krepp, NOAA

LIBRARY & ARCHIVES

Date:

U.S. DEPARTMENT OF COMMERCE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION	REGISTRY NUMBER:
HYDROGRAPHIC TITLE SHEET	**H12485**

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(s):	**Connecticut**
General Locality:	**Long Island Sound**
Sub-Locality:	**Joshua Cove to Mansfield Pt**
Scale:	**10000**
Dates of Survey:	**04/20/2013 to 05/13/2013**
Instructions Dated:	**02/13/2013**
Project Number:	**OPR-B370-TJ-13**
Field Unit:	**NOAA Ship *Thomas Jefferson***
Chief of Party:	**Commander Lawrence T. Krepp, NOAA**
Soundings by:	**Multibeam Echo Sounder**
Imagery by:	
Verification by:	**Atlantic Hydrographic Branch**
Soundings Acquired in:	**meters at Mean Lower Low Water**

Remarks:

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

Table of Contents

List of Tables

List of Figures

Descriptive Report to Accompany Survey H12485

Project: OPR-B370-TJ-13

Locality: Long Island Sound

Sublocality: Joshua Cove to Mansfield Pt

Scale: 1:10000

April 2013 - May 2013

NOAA Ship *Thomas Jefferson*

Chief of Party: Commander Lawrence T. Krepp, NOAA

A. Area Surveyed

The area surveyed is in the central coastal waters of Long Island Sound, located approximately 7.5 nautical miles southeast of New Haven CT. located between Branford Cove and Sachem Head. This survey is referred to as Sheet 3: Joshua Cove to Mansfield Point within the project instructions dated 2/21/2013.

A.1 Survey Limits

Data were acquired within the following survey limits:

Northwest Limit	Southeast Limit
41° 15" 40.4' N 72° 52" 5.6' W	41° 12" 0.5' N 72° 43" 6.9' W

Table 1: Survey Limits

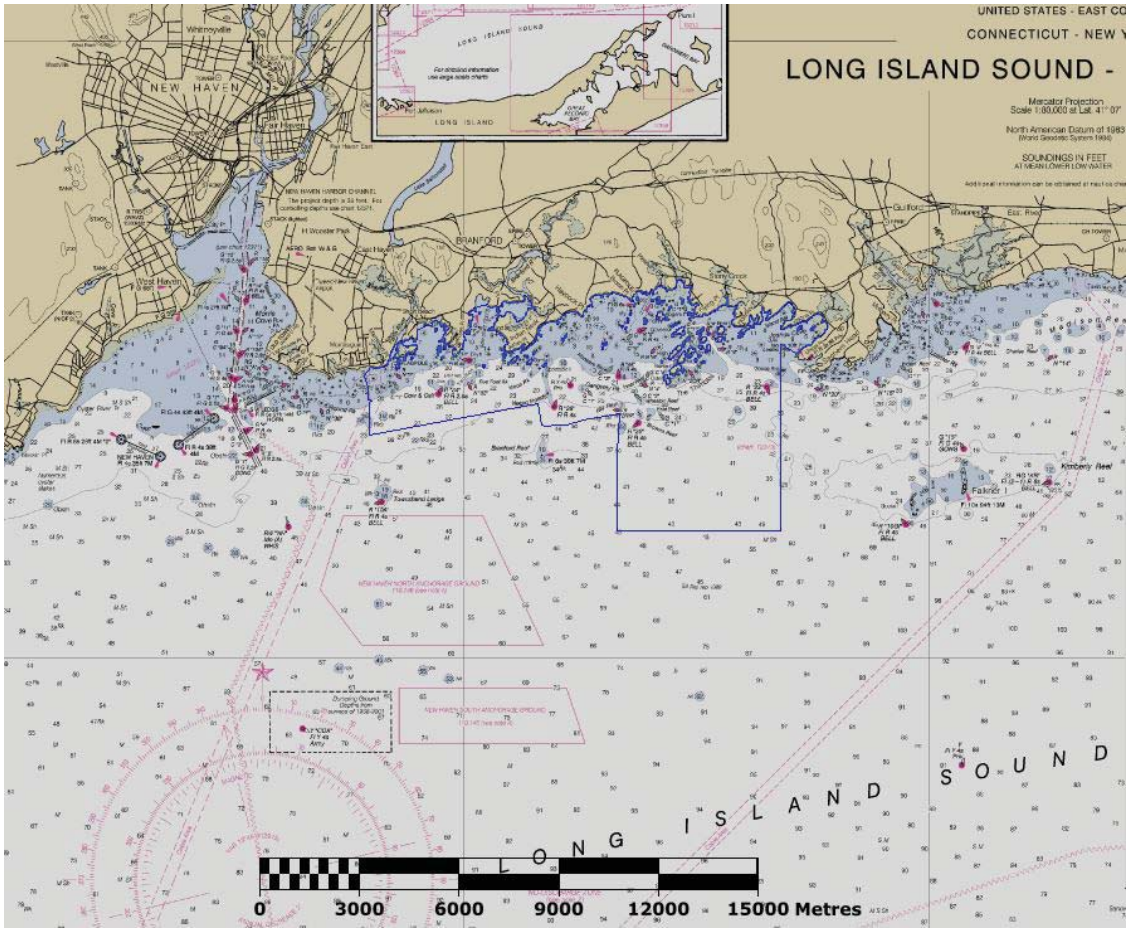


Figure 1: H12485 survey location.

Survey Limits were acquired in accordance with the requirements in the Project Instructions and the HSSD.

A.2 Survey Purpose

This project is being conducted in support of NOAA's Office of Coast Survey to provide contemporary hydrographic data in order to update the nautical charting products and reduce the survey backlog within the area. In addition, data from this project will support the Long Island Sound Seafloor Mapping Initiative in New York and Connecticut.

A.3 Survey Quality

The entire survey is adequate to supersede previous data.

Object detection multibeam coverage was obtained in the survey area with few gaps in coverage. There are 10 holidays larger than 3 nodes across for survey H12485. These areas were deemed unsafe at the time of acquisition, causing gaps in coverage. Additionally, holidays in the alongtrack direction were caused by an unknown error in the Reson 7125 sonar processing unit. For a full listing of holiday locations, see

H12485_Holidays.Hob in Appendix II. Density for survey H12485, when gridded to a 50 cm resolution, contained 173,242,424 nodes, 99.3% of which contained at least 5 pings.

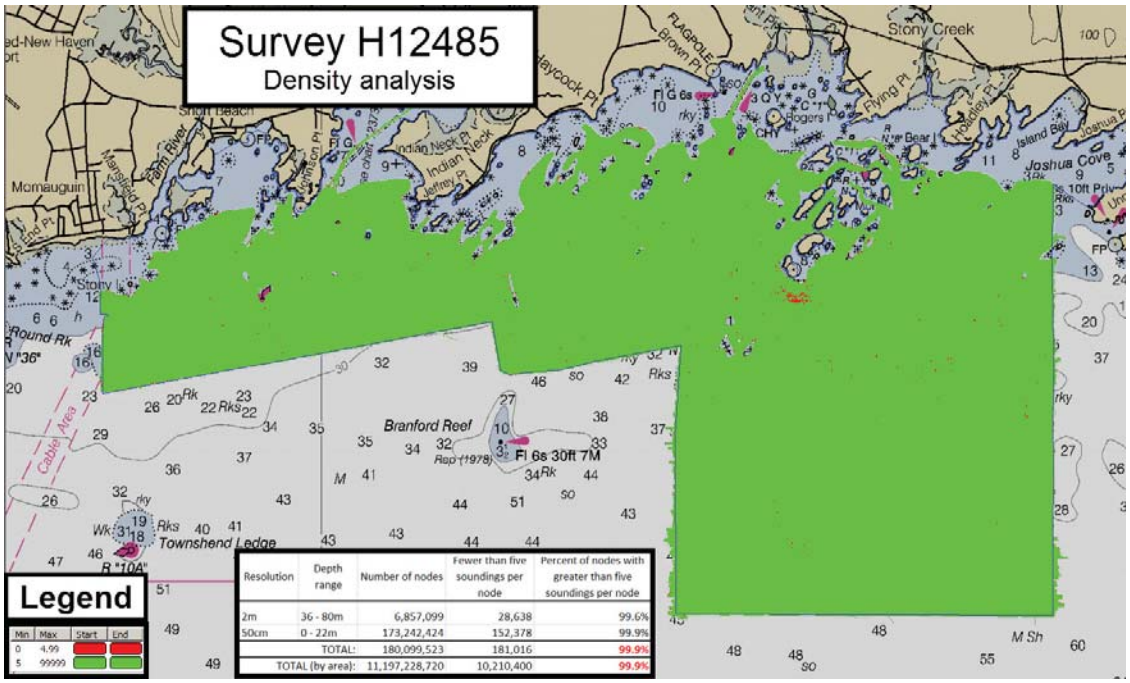


Figure 3: Survey H12485 surface filtered to show nodes with more than 5 pings (green), and those that are less (red).

A.4 Survey Coverage

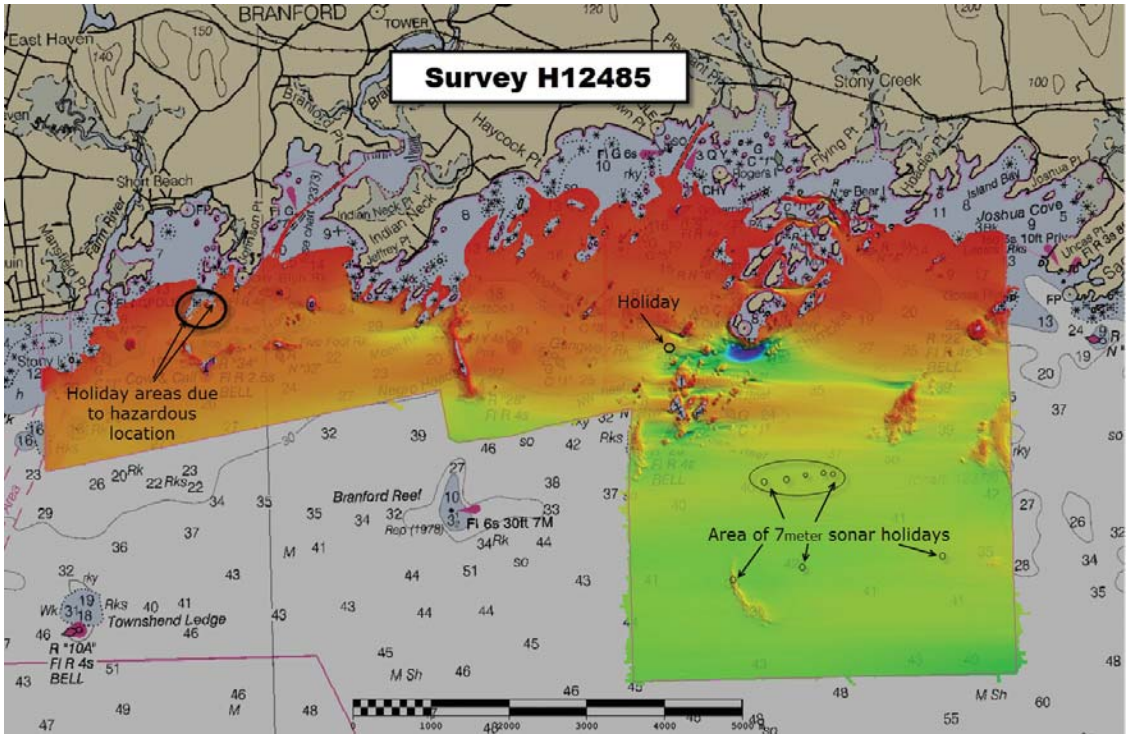


Figure 2: Survey H12485 coverage Showing areas where there are holidays containing more than 3 nodes across.

Survey coverage was in accordance with the Project Instructions and the HSSD.

A.5 Survey Statistics

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

	HULL ID	*3101*	*3102*	*S-222*	*Total*
LNM	**SBES Mainscheme**	0	0	0	0
	MBES Mainscheme	397.6	251.7	573.4	1222.7
	Lidar Mainscheme	0	0	0	0
	SSS Mainscheme	0	0	0	0
	SBES/MBES Combo Mainscheme	0	0	0	0
	SBES/SSS Combo Mainscheme	0	0	0	0
	MBES/SSS Combo Mainscheme	0	0	0	0
	SBES/MBES Combo Crosslines	0.36	36.06	13.00	49.423
	Lidar Crosslines	0	0	0	0
Number of Bottom Samples					13
Number AWOIS Items Investigated					5
Number Maritime Boundary Points Investigated					0
Number of DPs					0
Number of Items Items Investigated by Dive Ops					0
Total Number of SNM					12.63

Table 2: Hydrographic Survey Statistics

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

Survey Dates	Julian Day Number
04/20/2013	110
04/21/2013	111
04/22/2013	112
04/23/2013	113
04/24/2013	114
05/02/2013	122
05/03/2013	123
05/04/2013	124
05/05/2013	125
05/06/2013	126
05/07/2013	127
05/08/2013	128
05/09/2013	129
05/10/2013	130
05/11/2013	131
05/12/2013	132
05/13/2013	133

Table 3: Dates of Hydrography

B. Data Acquisition and Processing

B.1 Equipment and Vessels

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

B.1.1 Vessels

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

Hull ID	***S-222***	***HSL 3101***	***HSL 3102***
LOA	208 feet	31 feet	31 feet
Draft	15 feet	5.2 feet	5.2 feet

Table 4: Vessels Used

Data were acquired by NOAA Ship Thomas Jefferson and Hydrographic Survey Launch 3101 and Hydrographic Survey Launch 3102.

B.1.2 Equipment

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

Manufacturer	**Model**	**Type**
Applanix	POS MV v4	Positioning and Attitude System
Rolls Royce-Brooke Ocean Technologies	Moving Vessel Profiler	Sound Speed System
Seabird	SBE 19 plus	Conductivity, Temperature and Density Sensor
Reson	7125 SV1	MBES
Reson	7125 ROV	MBES
AML Oceanographic	AML Smart SV & T Probe	Sound Speed System
Reson	SVP 70	Sound Speed System
Trimble	SPS351	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

Crosslines, acquired for this survey, totalled 4.04% of mainscheme acquisition.

A total of 49.4 nautical miles of crosslines, or 4.04% of all survey lines, were run for the purpose of analyzing survey accuracy. Crosslines were run in a direction perpendicular to main scheme lines across the entire surveyed area, providing a good representation for analysis of consistency. All crosslines were used for crossline comparisons. An 1m CUBE surface was created using strictly mainsheme lines, while a second 1m CUBE surface was created using only crosslines. The two surface were then differenced. The mean was 0.00 m and the standard deviation was 0.11 m. See figure 5 below. Survey H12485 complies with section 5.2.4.3 of the HSSD.

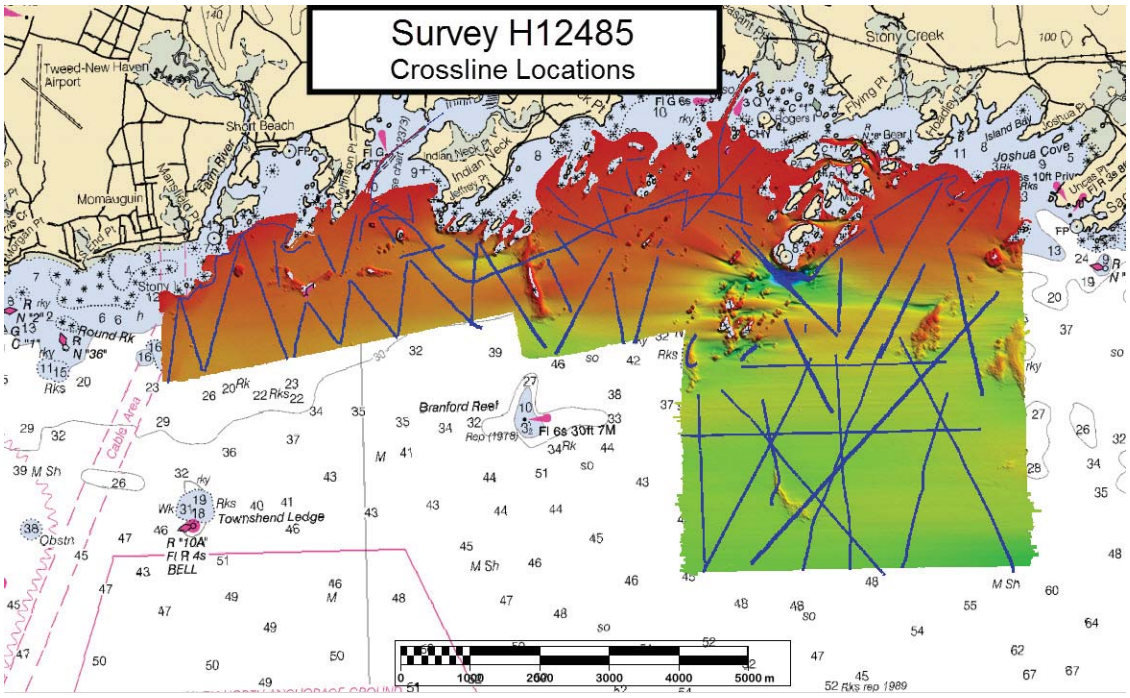


Figure 4: survey H12485 Crossline locations.

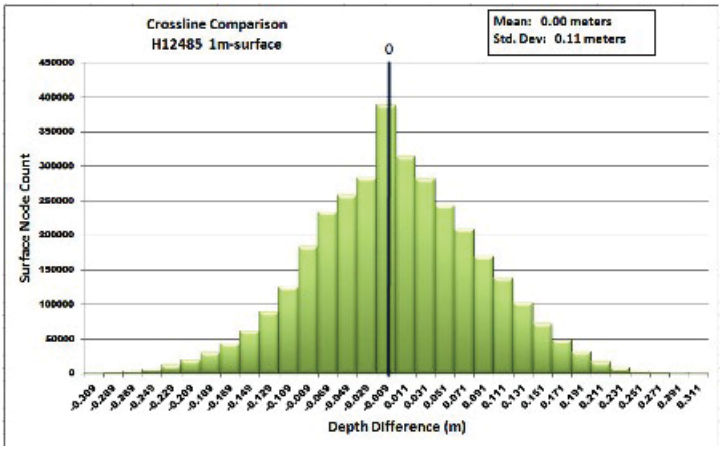


Figure 5: Survey H12485 crossline comparison statistical graph.

B.2.2 Uncertainty

The following survey specific parameters were used for this survey:

Measured	Zoning
0 meters	0.102 meters

Table 6: Survey Specific Tide TPU Values

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

Table 7: Survey Specific Sound Speed TPU Values

Uncertainty values for survey H12485 were derived using a combination of a priori values for equipment and vessel characteristics, as well as field assigned values for water level and sound speed uncertainties. The priori values for survey equipment and vessel configuration were set in accordance with Appendix 4, table 4.9 of the NOAA Field Procedure Manual (ed 2013). Sound speed uncertainties were 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.

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 maximum allowable uncertainty for each node versus the total amount of uncertainty acquired using the equation: -Uncertainty/(0.5^2 +((Depth*0.013)^2)^0.5) was calculated, resulting in the ratio between the actual uncertainty used and the maximum allowed uncertainty for each node. The resulting 'IHO_ratio' layer was filtered using a colour map to show any areas where actual uncertainty exceeded the maximum allowed uncertainty. See figure 6. The IHO layer(s) were then statistically computed in CARIS Hip/Sips then exported into an Excel spread sheet for a comparative breakdown for each acquisition platform. For the 50cm grids 174,308,242 nodes were evaluated and 99.9% were within IHO uncertainty. For the 2m grid 59,583 nodes were evaluated and 99.3% were within IHO uncertainty. The IHO uncertainty values were within the total allowed amount of error for all depths. See figure 7 below for a comparative breakdown for each acquisition platform.

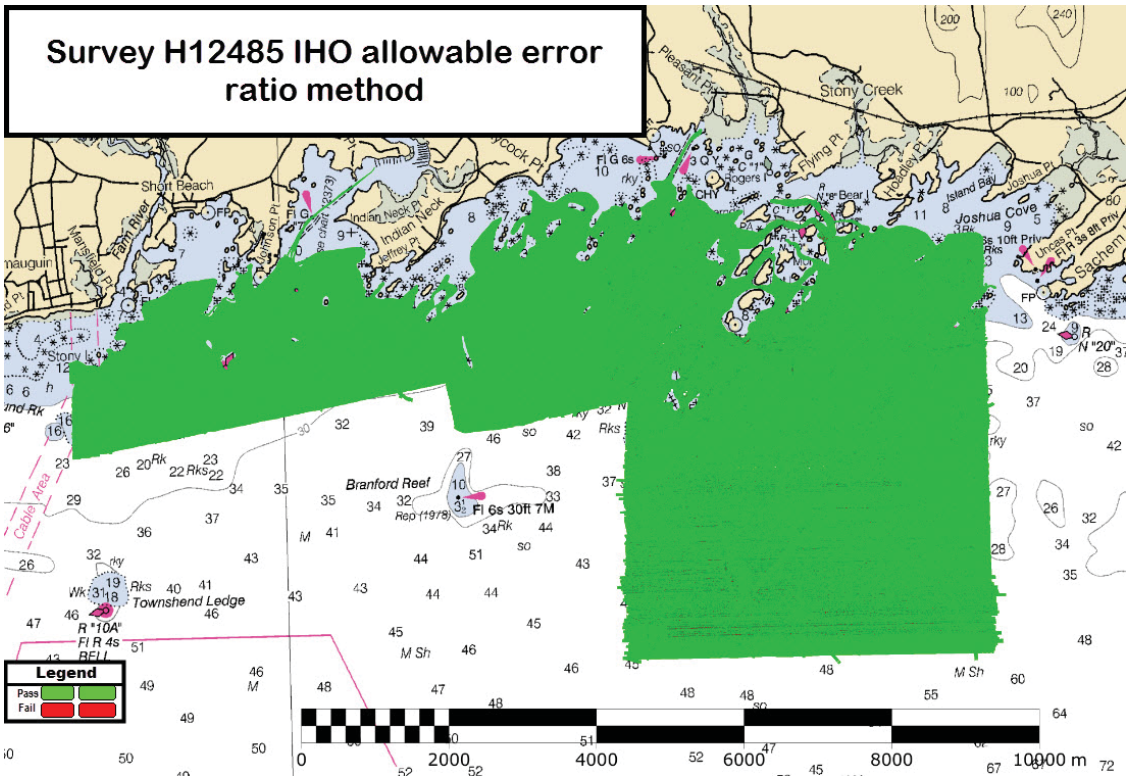


Figure 6: Survey H12485 IHO uncertainty. Green nodes pass and red nodes fail IHO Order 1 compliance.

Resolution (m) Fieldsheet		Depth range (m)	IHO Order	Number of nodes	Nodes satisfying IHO accuracy	Percent nodes satisfying IHO accuracy
50 cm	West	0 - 20m	Order 1	57,594,328	57,594,328	100.0%
50 cm	East	0 - 20m	Order 1	57,049,610	56,956,236	99.8%
50 cm	South	0 - 20m	Order 1	59,664,304	59,566,148	99.8%
2m	East	18 - 40	Order 1	59,583	59,140	99.3%
			TOTAL:	174,367,825	174,175,852	99.9%
			TOTAL (by area):	43,815,393	43,765,738	99.9%

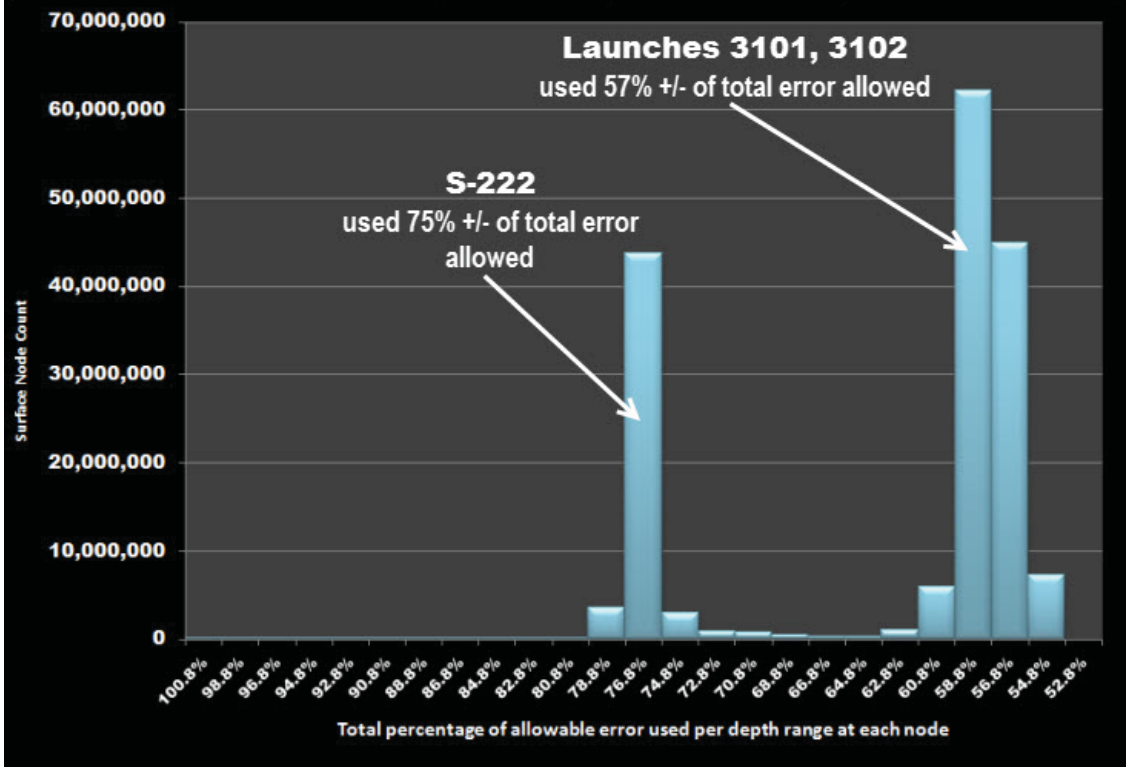


Figure 7: Survey H12485 Total Vertical Uncertainty, ratio method shown in graph, broken down by acquisition platform and grid resolution. Noting the percentage starts at 50% and ends at 100% across the bottom. The left hand scale is total node count.

B.2.3 Junctions

Two junction comparisons were completed for survey H12485 (Figure 8). No concurrent junctions exist with this survey. To facilitate the comparison of charted contour depth curves, survey H12485 1 meter surface was opened in CARIS Bathy Database and transformed into a select sounding point layer cloud. From this point cloud, a 4 meter surface was generated from a Triangular Irregular Network (TIN) building a continuous model over the survey area, from which contour depth bands were generated. Depth comparisons were performed using the CARIS difference surface (at the 1 meter resolution), from which descriptive statistics were generated then exported to an Excel spreadsheet.

Multibeam data was also examined in CARIS Subset Editor, along with the cursor Tool Tip for consistency and agreement. Data for surveys H12479 and H12484 was not made available for junction comparisons.

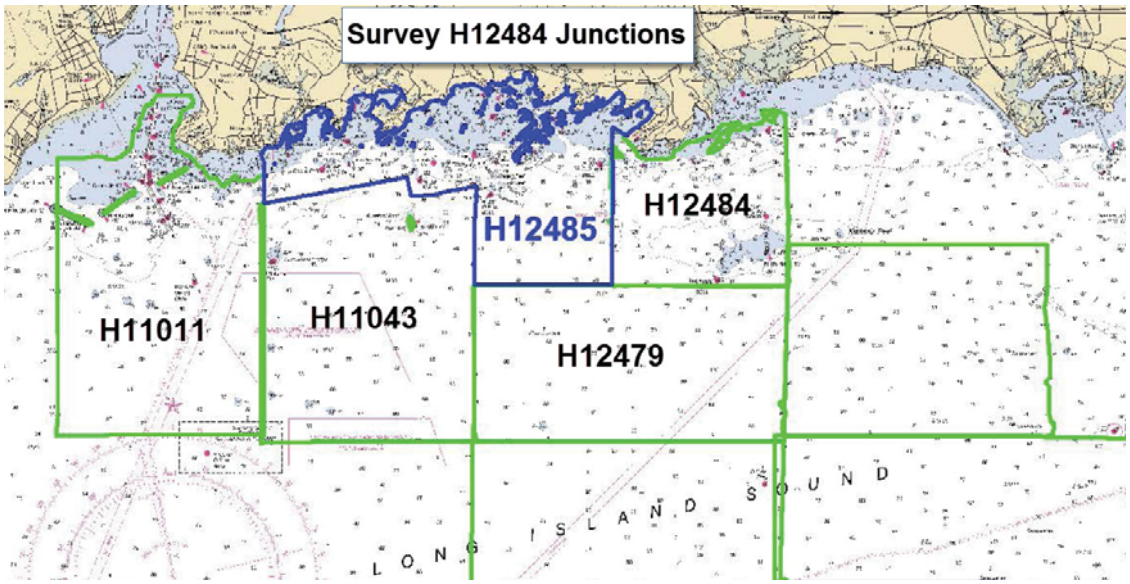


Figure 8: Survey H12485 with adjoining surveys.

The following junctions were made with this survey:

Registry Number	Scale	Year	Field Unit	Relative Location
H11011	1:10000	2000	NOAA Ship RUDE	W
H11043	1:10000	2001	NOAA Ship RUDE	SW
H12479	1:10000	2012	NOAA Ship THOMAS JEFFERSON	S
H11484	1:10000	2012	NOAA Ship THOMAS JEFFERSON	E

Table 8: Junctioning Surveys

H11011

Survey H11011 was completed in the fall of 2000. At the time, NOAA ship RUDE and her launch comprised of Single Beam Echo Sounding and Side Scan Sonar imagery. There was some limited usage of a shallow water multibeam echo sounder system, over in the western part of the assigned sheet mostly covering the main entrance into New Haven. The area of overlap consisted of approximately 1,035 meters long and only 80 meters wide sparsely populated with data points originated from a SBES. Data from survey H11011 compared relatively well with survey H12485 with a minimum difference of -0.2 meters and a maximum difference of 0.7meters, with a mean of 0.1 meters.

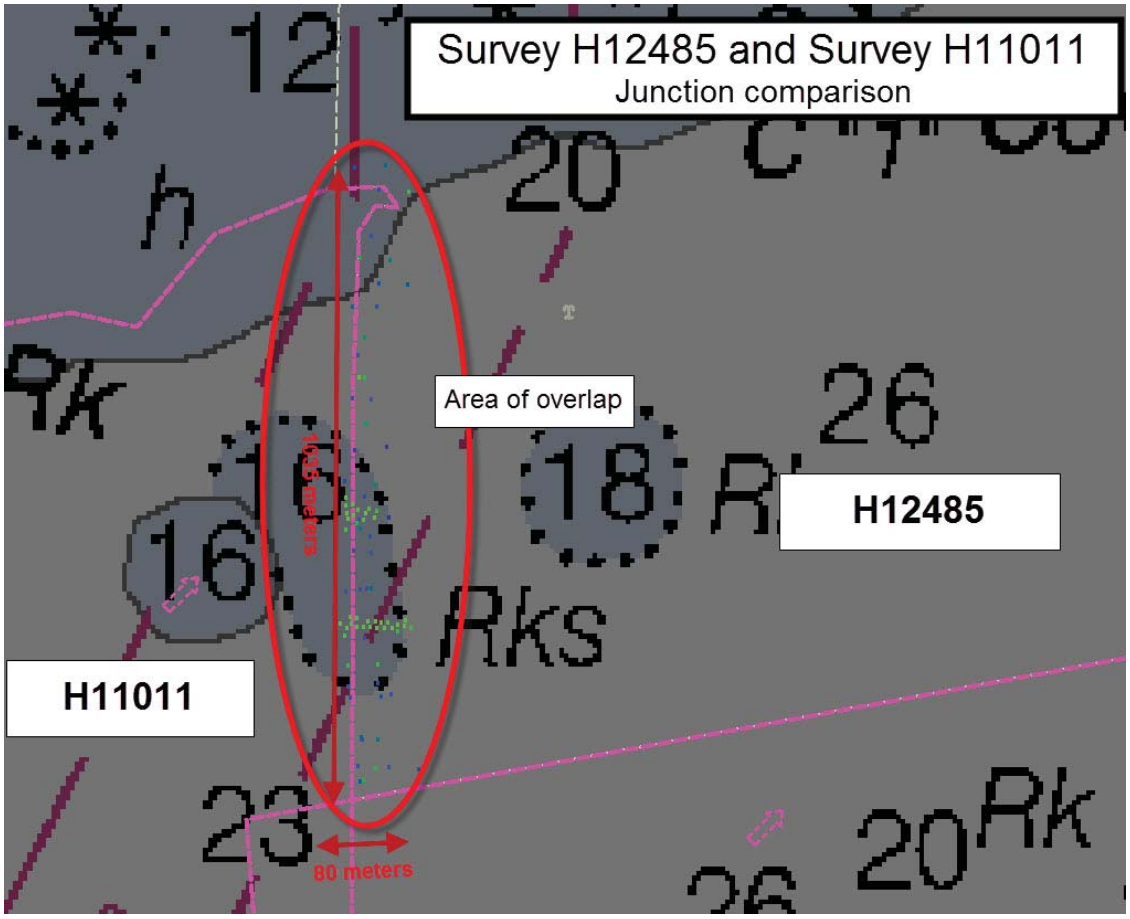


Figure 9: Survey H12485 with junction survey H11011.

H11043

Survey H12485 was acquired approximately 11 years after survey H11043. On average there are 100 meters of overlap between the two surveys spanning the entire length of the junction (Figure 10). At the northern junction between the surveys, a difference of 1 to 2 meters was noted. This difference can be attributed to shifting sand ridges and the temporal difference between the surveys acquisition.
Difference surface analysis showed depth differences averaging 0.3 meters, making survey H12485 deeper, with a standard deviation of 0.3 meters (Figure 11).

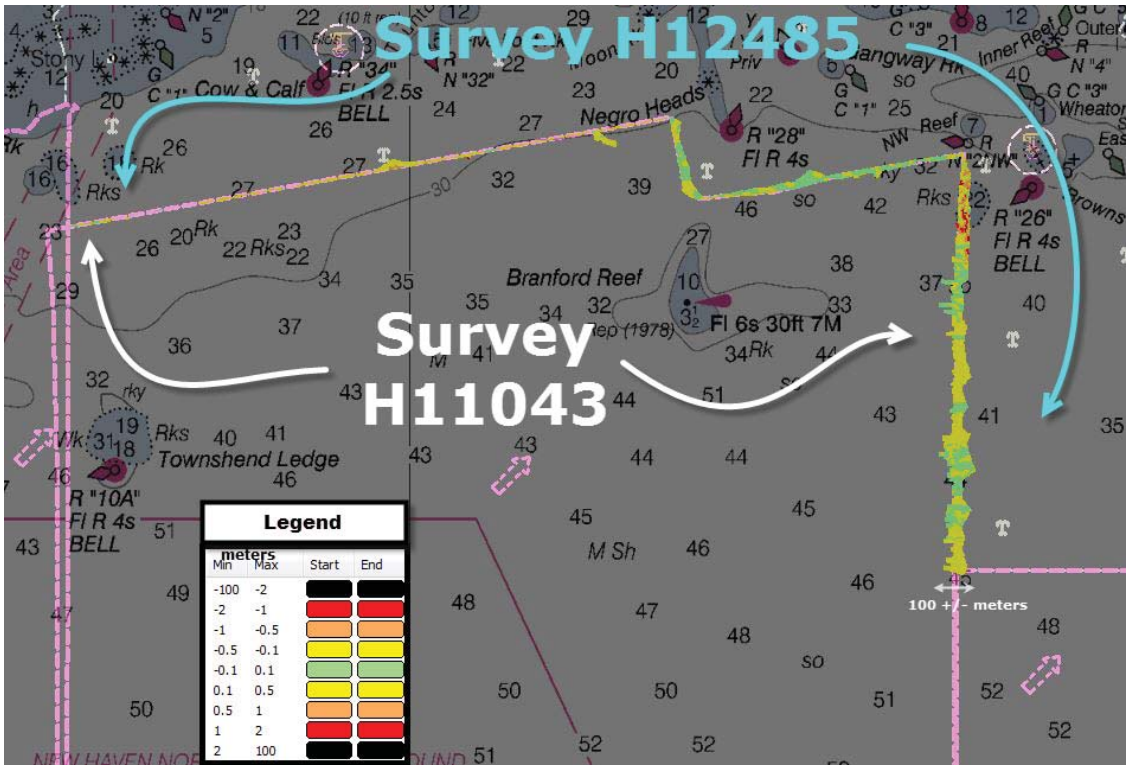


Figure 10: Survey H12485 and junction H11043.

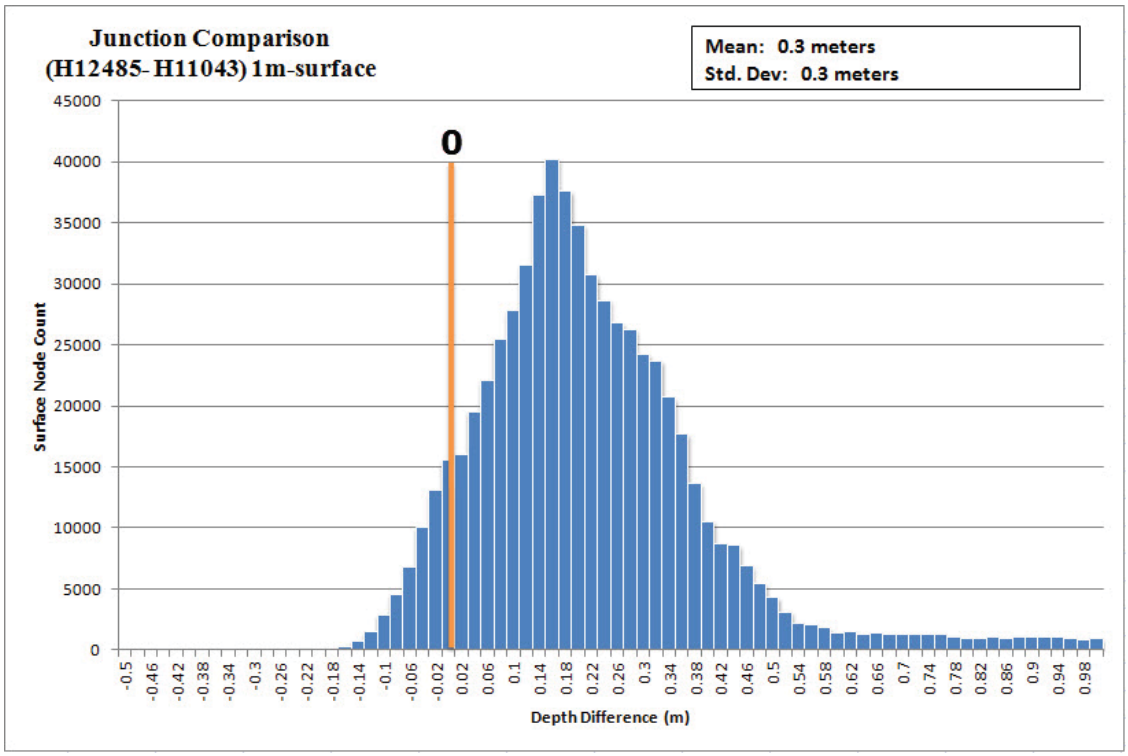


Figure 11: Survey H12485 and junction H11043 difference surface statistics in meters.

H12479

Data for surveys H12479 was not made available for junction comparisons.

H11484

Data for survey H12484 was not made available for junction comparisons.

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

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

B.2.6 Factors Affecting Soundings

Sound Speed Artifacts

Despite best efforts to conduct sufficient sound velocity casts distributed both spatially and temporally throughout the survey area, some instances of sub-optimal sound velocity correction occurred. As a result, sound velocity related artifacts can be found in CARIS Base surfaces which can be seen as a "slight smile or frown". Survey H12485 was found to be an area of very dynamic tidal currents and mixing of masses of fresh water from the Farm and Branford rivers draining into a basin. Sound speed artifacts occurred at no specific geographical location or time and were observed in data acquired by launch 3101 and 3102. All vertical offsets due to sound velocity artifacts that was observed were to be within IHO Special Order tolerances which ranged from 0.1m to 0.2m across all measured depths. To address these sound velocity issues the hydrographer rejected the outermost beams obviously in error in an attempt to produce CUBE surfaces that best represent the seafloor. This technique eliminated many, but not every sound velocity related artifact.

DN111 Launch 3101 took a sound velocity cast, located at 41-14-14.52N, 72-73-49.89W at 16:52 UTC. This location proving to be warmed by the sun faster than other areas acquired that day. From that cast the first two data points sampled are suspect. Nearby casts during the duration of survey H12485 proved to concur with most other samples nearby. During the process of compiling all data acquired including concatenating each survey platform, this sample point(s) were missed on initial inspection for agreement. Final processing creating the grids, software used the cast location and suspect data points creating a "rippling" effect in the surface, including a minor offset between 0.1m to 0.2meters on the same lines. See figure 12 and 13 for artifacts and locations affected.

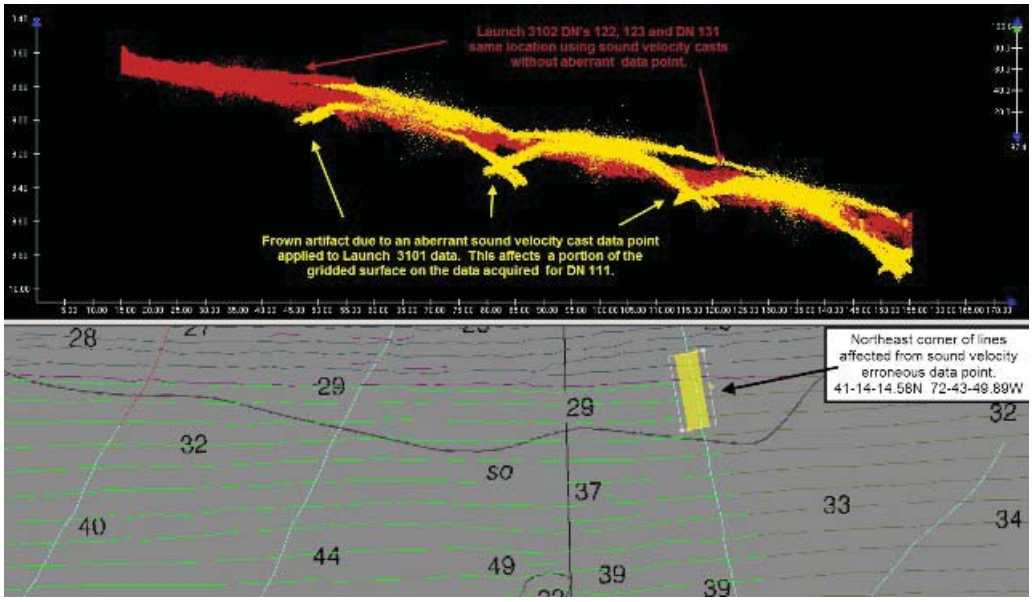


Figure 12: Survey H12485 sound velocity artifacts from cast taken at 41-14-14.52N 72-43-49.89W on DN111 at 16:52 UTC.

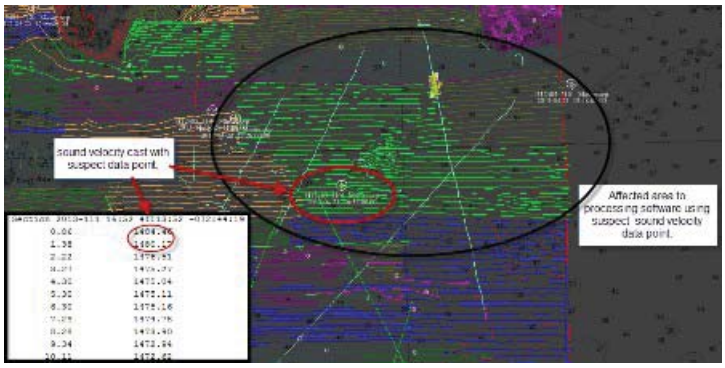


Figure 13: Survey H12485 area affected by cast taken at 41-14-14.52N 72-43-49.89W on DN111 at 16:52 UTC.

B.2.7 Sound Speed Methods

Sound Speed Cast Frequency: Sound speed profiles were measured in accordance with the HSSDM 2013. On survey launches, (3101 and 3102) casts were acquired using with a 'Seabird SBE19 plus' at least once every 4 hours while acquiring data. Sound speed profiles acquired on survey vessel Thomas Jefferson (S-222) using the 'Rolls Royce-Brooke-Ocean' MVP 100 approximately every 30 to 60 minutes with efforts made to evenly distribute the casts spatially and temporally throughout the survey area. All CTD casts were collected into one survey wide concatenated file for each acquisition platform and applied to multibeam data in CARIS using nearest in distance within a time of 4 hours per vessel. Additional discussion of sound speed methods can be found in the OPR-D370-TJ-13 DAPR.

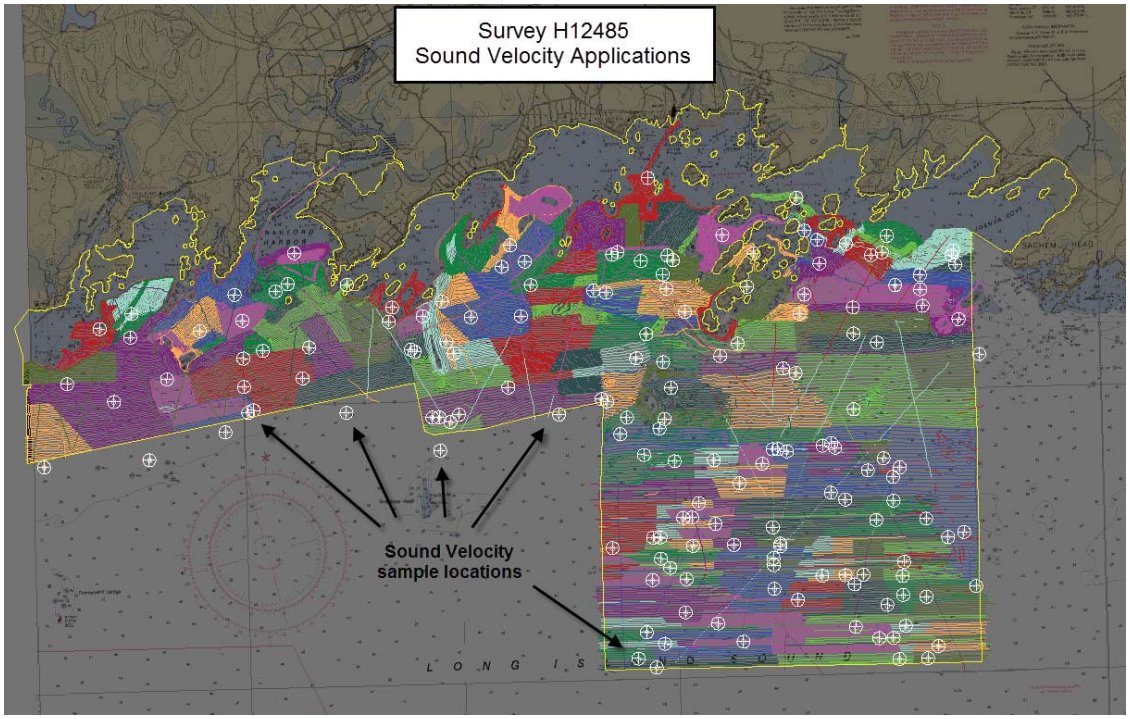


Figure 14: Distribution and Application of all sound speed profiles used in survey H12485.

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

Raw backscatter was logged as a 7k file and has been sent to the Atlantic Hydrographic Processing Branch. One line per vessel, per day was processed aboard the Thomas Jefferson in order to assess and ensure quality. No deficiencies were noted.

B.5 Data Processing

B.5.1 Software Updates

The following software updates occurred after the submission of the DAPR:

Manufacturer	Name	Version	Service Pack	Hotfix	Installation Date	Use
Caris	HIPS/SIPS	8.04	N/A		07/15/2013	Processing
Caris	Bathy DataBASE	4.09			04/09/2014	Processing

Table 9: Software Updates

The following Feature Object Catalog was used: NOAA Extended Attribute Files V# 5.3.2

B.5.2 Surfaces

The following surfaces and/or BAGs were submitted to the Processing Branch:

Surface Name	Surface Type	Resolution	Depth Range	Surface Parameter	Purpose
H12485_West_MBES_MLLW_50cm_Final	CUBE	50 centimeters	0.00 meters - 22.00 meters	NOAA_0.5m	Object Detection
H12485_East_ MBES_MLLW_50cm_Final	CUBE	50 centimeters	0.00 meters - 22.00 meters	NOAA_0.5m	Object Detection
H12485_East_ MBES_MLLW_2m_Final	CUBE	2 meters	18 meters - 40 meters	NOAA_2m	Complete MBES
H12485_South_MBES_MLLW_50cm_Final	CUBE	50 centimeters	0.00 meters - 22.00 meters	NOAA_0.5m	Object Detection

Table 10: Submitted Surfaces

B.5.3 VDatum ERS testing and analysis

Survey H12485 was tasked to recommend a vertical transformation technique (VDatum ERS or Tidal Package) using crossline data as the control. During data processing, failures in the Caris software suite made application of GPS Tide and VDatum data impossible. With many hours of trouble shooting the software with the vendor and Atlantic Hydrographic Branch personnel, it was finally deemed "unsuccessful" at checking the VDatum model. The soundings were reduced to MLLW using TCARI tides. For this reason,

survey H12485 was reduced to MLLW using TCARI Tides, and no analysis of the VDatum separation model was conducted.

C. Vertical and Horizontal Control

Per section 5.1.2.3 of the FPM, no Horizontal and Vertical Control Report has been generated for Survey H12485.

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
New London, CT	8461490
New Haven, CT	8465705

Table 11: NWLON Tide Stations

File Name	Status
H12485_8465705_final.tid	Final Approved
H12485_8461490_final.tid	Final Approved

Table 12: Water Level Files (.tid)

File Name	Status
B370TJ2013.tc	Final

Table 13: Tide Correctors (.zdf or .tc)

A request for final approved tides was sent to N/OPS1 on 05/14/2013. The final tide note was received on 05/24/2014.

C.2 Horizontal Control

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

The projection used for this project is UTM zone 18 North.

The following PPK methods were used for horizontal control:

Smart Base

The following CORS Stations were used for horizontal control:

HVCR Site ID	Base Station ID
CTNE	CTNE
CTBR	CTBR
ZNY1	ZNY1
MOR5	MOR5
CTGU	CTGU
NYRH	NYRH
CTGR	CTGR
CTDA	CTDA
RVDI	RVDI
NYCI	NYC
MOR6	MOR6

Table 14: CORS Base Stations

The following DGPS Stations were used for horizontal control:

DGPS Stations
Moriches, New York (293 kHz)

Table 15: USCG DGPS Stations

D. Results and Recommendations

D.1 Chart Comparison

Chart comparison procedures were followed as outlined in 4.5 of the FPM and section 8.1.4, D.1 of the HSSD ed. 2013, utilizing CARIS HIPS and SIPS and Bathy Database software programs. To facilitate the comparison of charted contour depth curves, Electronic chart US5CN15M was opened in CARIS Bathy Database and transformed into a select sounding point layer cloud. From this point cloud, a 12 meter surface was generated from a triangular irregular network (TIN) building a continuous model over the survey area, from which contour depth bands were generated and compared. Comparison of Raster charts and multibeam data was also examined in CARIS Subset Editor, along with the cursor Tool Tip for consistency and agreement.

The electronic and raster versions of the relevant charts used during the comparison were reviewed to ensure that all USCG Local Notice to Mariners (LNM) issued during survey acquisition, impacting the survey area, were applied and addressed by this survey.

D.1.1 Raster Charts

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

Chart	Scale	Edition	Edition Date	LNM Date	NM Date
12354	1:80000	44	05/2012	02/11/2014	12/04/1999
12373	1:20000	15	06/2005	02/15/2014	02/15/2014

Table 16: Largest Scale Raster Charts

12354

Chart 12354 is completely covered by larger scale Chart 12373 within the boundaries of survey H12485, therefore a raster chart comparison has been performed only with Chart 12373. The Hydrographer recommends updating all contours and soundings with the digital data from survey H12485.

12373

Soundings from survey H12845 generally agreed with charted depths within 1.5 to 2 feet, with only isolated discrepancies as described below. Charted contours agreed with survey soundings in general, the 18 foot contour shifted northward approximately 200 meters near Branford harbor, 200m south near Haycock point, and over 830 meters northward towards Blackstone rocks. (See figure 15).

The areas with the greatest difference between charted soundings and survey H12485 is in the channels around the island chain "The Thimbles" , "Browns Reef", "East Reef" and "Wheaton Reef". These differences can be attributed to modern positioning techniques and object detection multibeam completely covering the seafloor. A charted dangerous underwater rock located at 41-14-23.5N 72-45-25.0W was found to be 78.7 ft and is attributed in the H12485_Final_Feature_File.hob.
Description of specific feature investigations and shoreline data are included in the H12485_Final_Feature_File.hob and submitted with this survey.

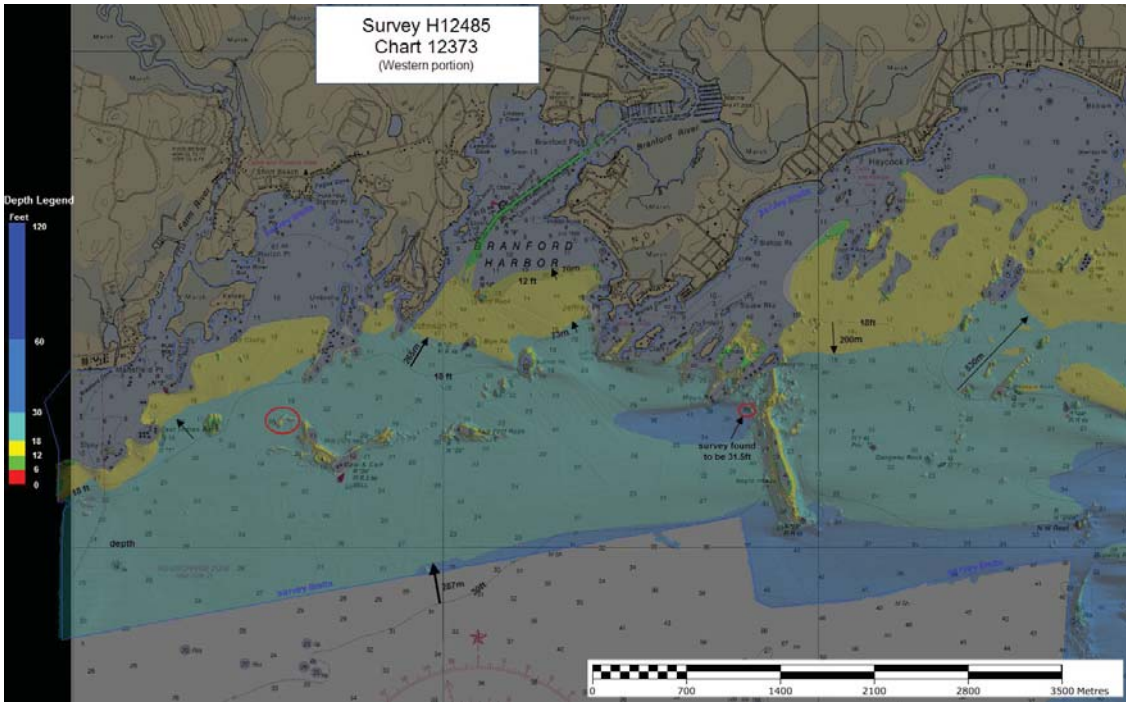


Figure 15: Survey H12485 chart 12373 (Western portion), chart comparison.

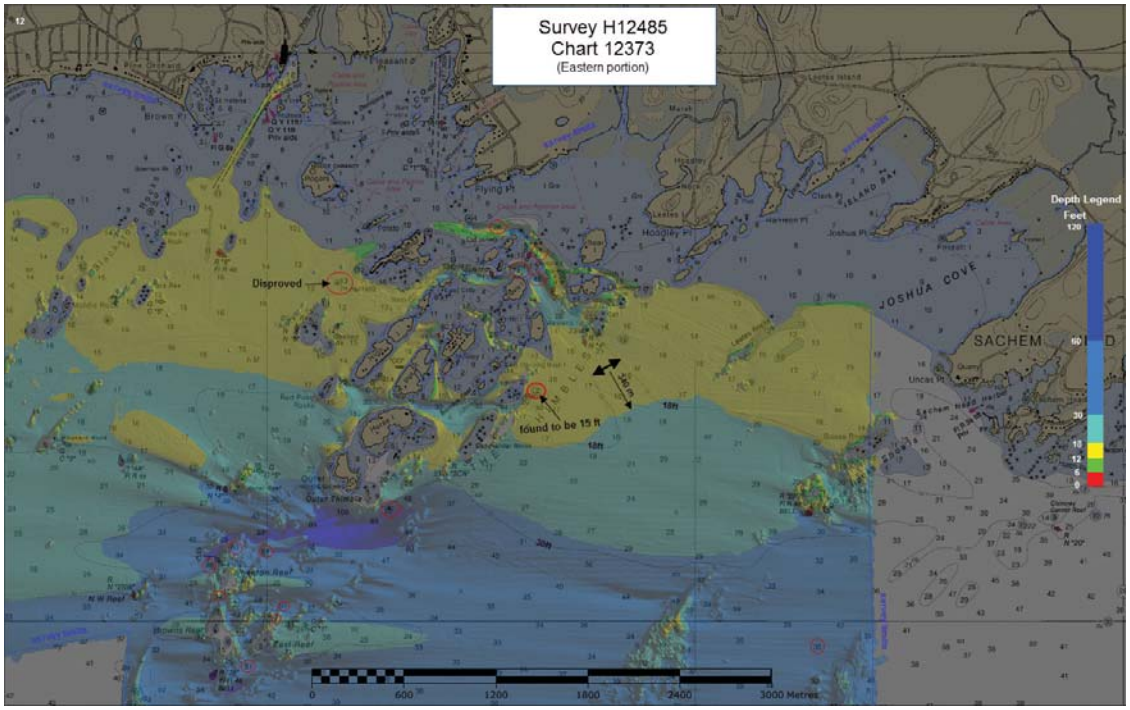


Figure 16: Survey H12485 chart 12373 (Eastern portion), chart comparison.

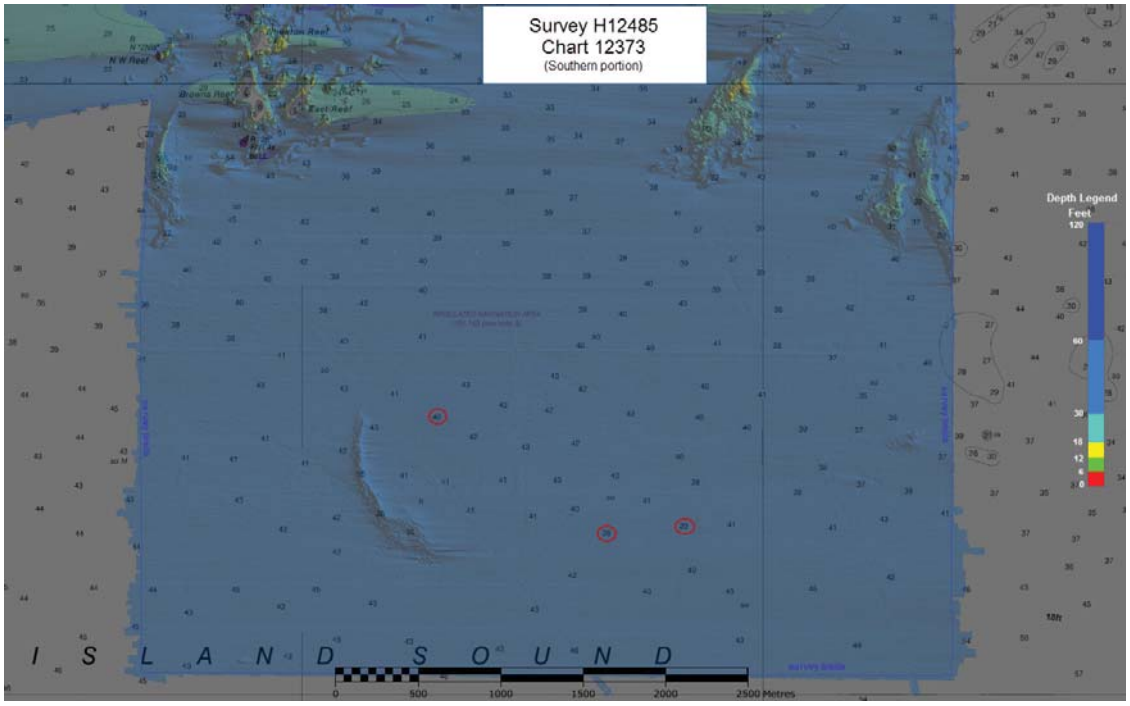


Figure 17: Survey H12485 chart 12373 (Southern portion), chart comparison.

D.1.2 Electronic Navigational Charts

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

ENC	Scale	Edition	Update Application Date	Issue Date	Preliminary?
US5CN15M	1:20000	9	07/10/2012	11/01/2013	NO

Table 17: Largest Scale ENCs

US5CN15M

Surveyed depths from H12485 are generally 2 feet shoaler to 2 feet deeper than charted overall. These differences can be found mostly in the entrances to harbors, channels and the main area south of the island chain named "The Thimbles". Surveyed depths greater than 12 to 20 feet deeper can be found around the passages or channels around the northern and southern ends of "The Thimbles" island chain. The area south of Wheaton Reef is covered by sand, which appears to have migrated since the area was last surveyed. The amount of differences in features over the area that survey H12485 covers when compared to ENC US5CN15M is expansive. Because of this, only a few items are discussed in this section. The Hydrographer recommends updating all contours and soundings with the digital data from survey H12485. For a more complete list refer to the H12485_Final_Feature_File.hob.

Figure 19 depicts the difference in feet between H12485 and ENC US5CN15M.

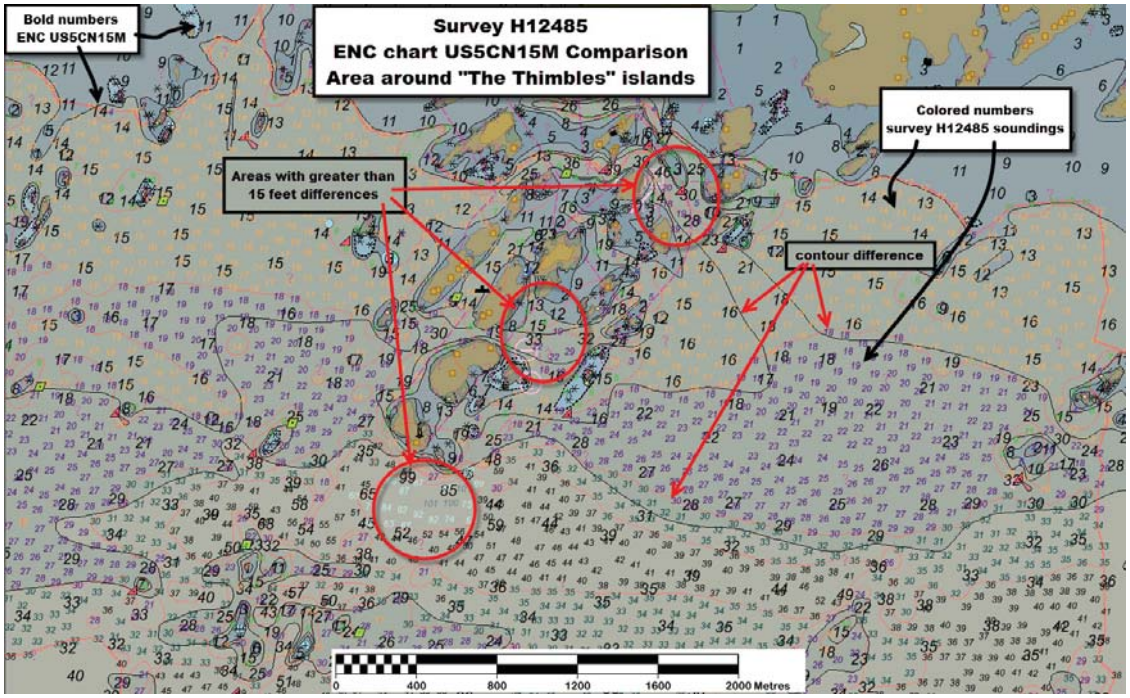


Figure 18: Survey H12485 and Electronic Navigation Chart US5CN15M comparison around the island chain "The Thimbles" in feet.

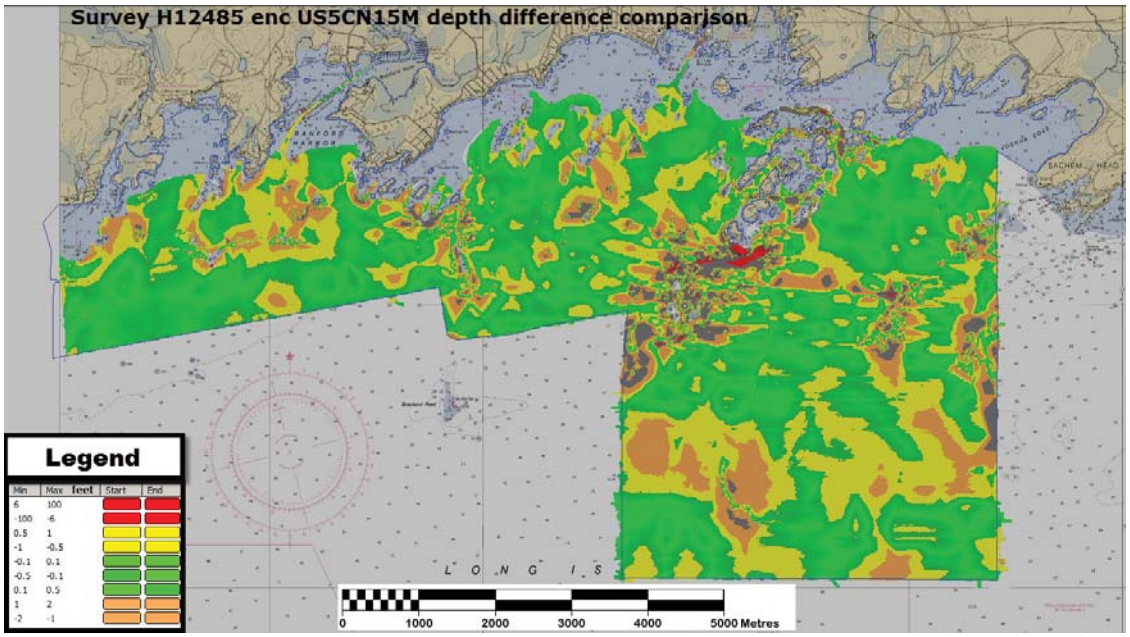


Figure 19: Survey H12485 and Electronic Navigation Chart US5CN15M difference surface comparison in feet.

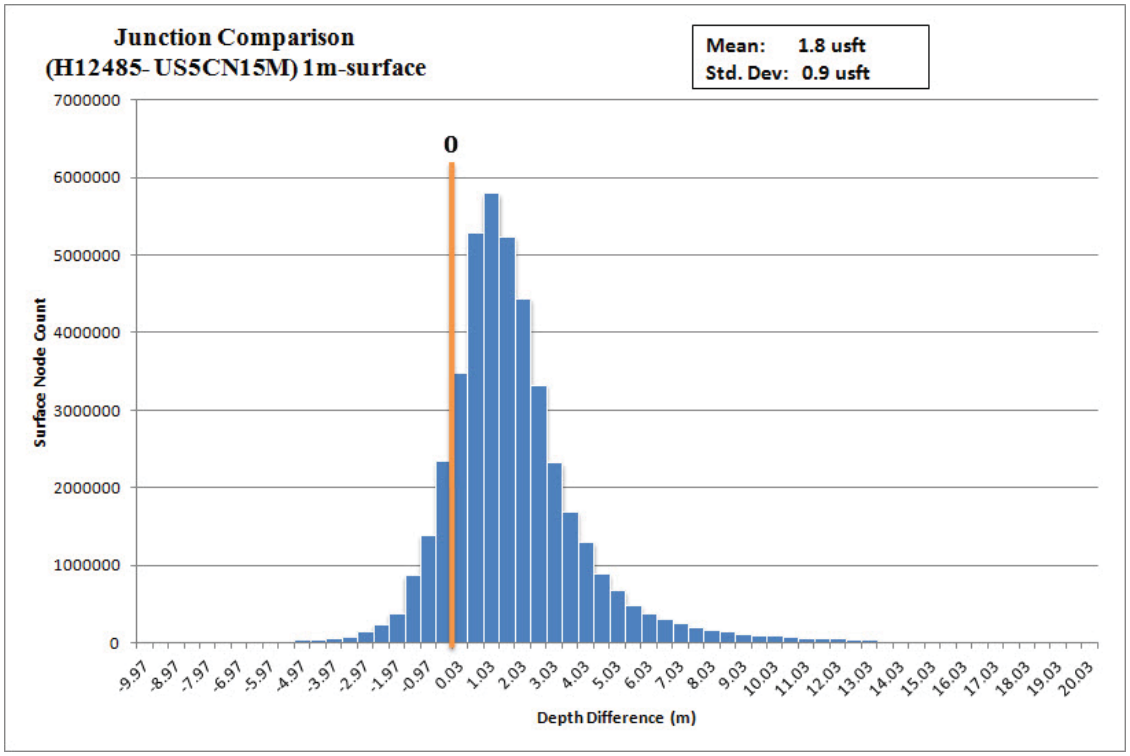


Figure 20: Survey H12485 and Electronic Navigation Chart US5CN15M difference surface comparison statistics in feet.

D.1.3 AWOIS Items

There are five full investigation items within survey H12485 limits. For more detailed information, refer to the H12485_FFF.hob file attached with this report.

AWOIS item 15006:
The AWOIS database lists #15006 as "Visible Wreck" added in 1938. This item was not addressed due to being inshore of Navigable Area Limit Line (NALL).

AWOIS item 15005:
The AWOIS database lists #15005 as "Visible Wreck no source data found" added to chart 12373 in 1969. This item was not addressed using survey launches due to being inshore of Navigable Area Limit Line (NALL). This item is charted in close proximity to Rogers Island. No visible evidence was found while transiting to and from areas within survey H12485 limits as photographs were taken from different locations while completing MBES data and limited shoreline verification. Because of the lack of data covering the area reported to contain the wreck, the hydrographer recommends retaining the charted wreck symbol, and is in the H12485_FFF.hob file with a description of "Not Addressed".

AWOIS item 15007:
The AWOIS database lists #15007 as "Wreck added to chart 217 (No historical chart 217 was found to exist. The hydrographer suspects number is juxtaposed. Proper chart is 12373) in 1938 ship reported to have run-aground on Browns Reef". This item was addressed with MBES up to a safe navigable area limit line for the

launch. Visual investigation at low tide showed no evidence of the wreck remaining. A void in multibeam data consisting of 90 meters wide by approximately 276 meters long due to the reef creating a hazardous environment for the launch to acquire data. It is because of this void that the hydrographer recommended that AWOIS item # 15007 be classified as "not addressed" . The cartographic symbol representing AWOIS #15007 as depicted in the Project Reference File (PRF) has been included in the H12485_FFF.hob File with a description of "Not Addressed".

AWOIS item 10941:
The AWOIS database lists #10941 as "" NM38/61-- LONG ISLAND SOUND-BRANFORD HARBOR-BUOY DISCONTINUED-OBSTRUCTION: BRANFORD HARBOR WRECK LIGHTED BUOY ""WR1"" (41-14-30N 72-50-20W) HAS BEEN DISCONTINUED." The search radius for the AWOIS item 10941 ensconces a rocky outcrop area surrounding the "Cow and Calf" shoal leaving a 60 meter by 100 meter void. This item was addressed with MBES up to a safe navigable area limit line. Boulders were located within the search radius at 41-14-25.76N 72-50-18.00W with a least depth of 2.399 meters. It is recommended that AWOIS item # 10941 be removed from the AWOIS database and updated with findings from survey H12485 and reclassified as an underwater rock. The cartographic symbol representing AWOIS #10941 as depicted in the Project Reference File (PRF) has been included in the H12485_FFF.hob File with a description of "Delete" and the boulder as "New underwater rock".

AWOIS item 7861:
The AWOIS database lists #7861 as a dangerous submerged rock Position Approximate (rep 1990) reported via letter to NOS in 1990 from Ronald A. Knapp. Author also reported that the boat drew 1.8 meters draft when it hit the uncharted rock. In his letter to NOS, the author also named the feature as "Marge's Rock" when submitted copies of the letter to the U.S. Coast Guard which released a notice to mariners numbered 48/90. It is recommended that the dangerous submerged rock be removed from the charts and that the AWOIS database and chart be updated with findings from survey H12485. Two Obstructions were found within the search radius and have been included in the H12485_Final_Feature_File.hob with a description of "New" and "Updated".

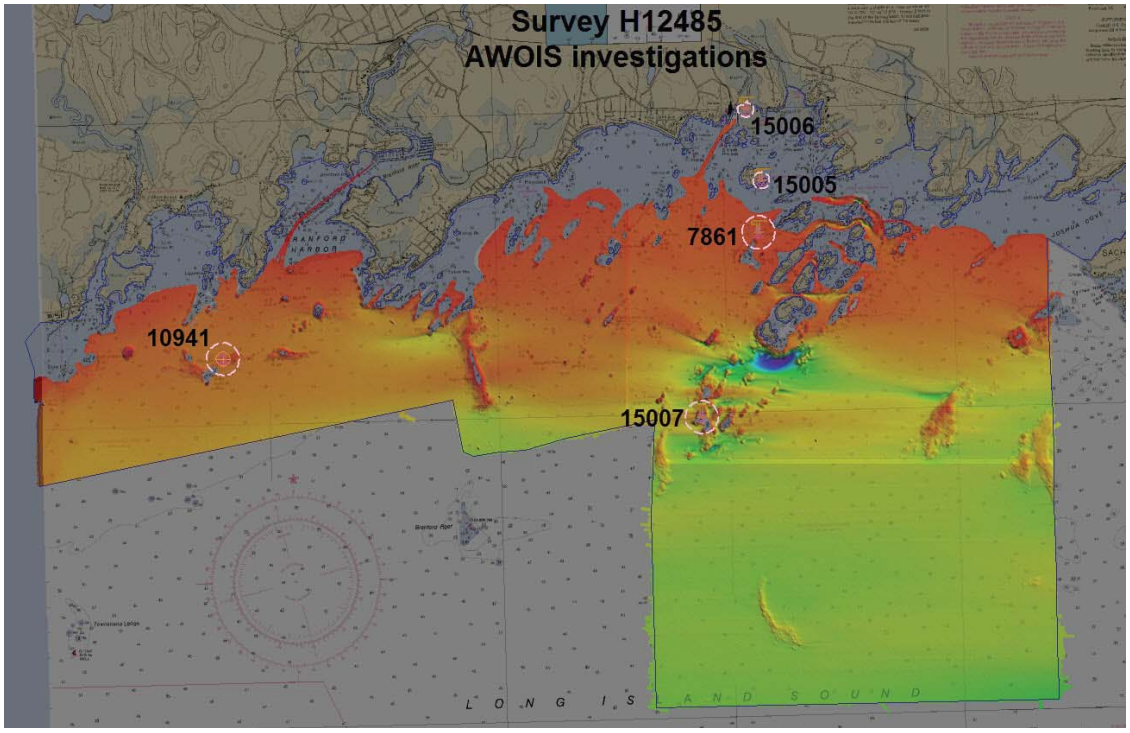


Figure 21: Survey H12485 AWOIS locations.

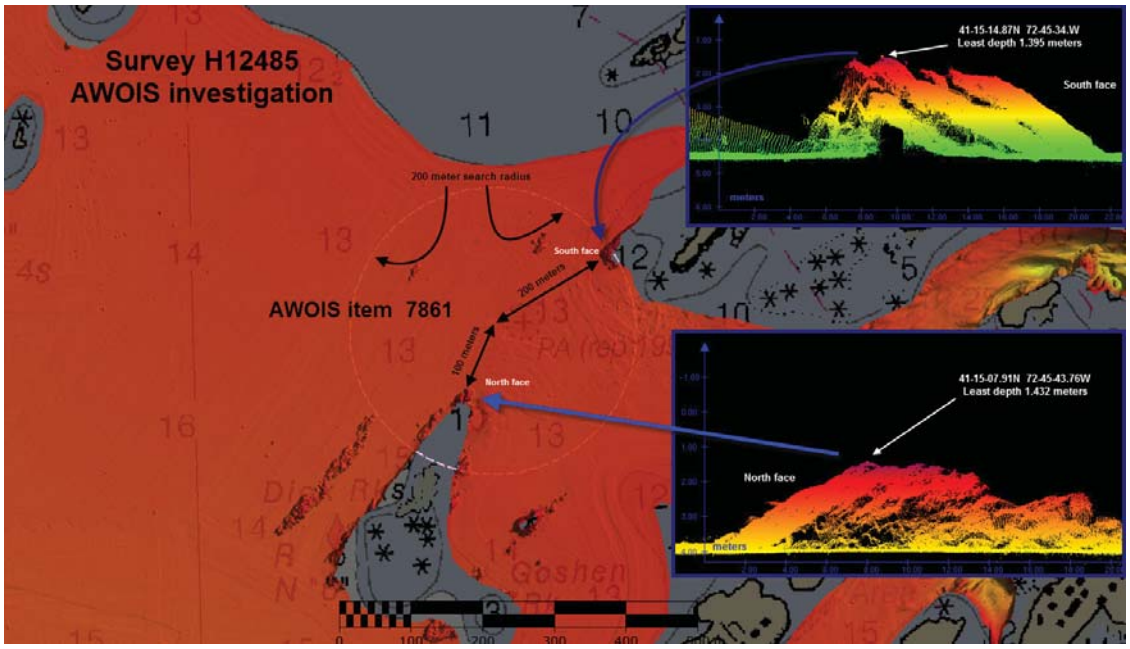


Figure 22: Survey H12485 AWOIS investigation of item 7861

D.1.4 Maritime Boundary Points

No Maritime Boundary Points were assigned for this survey.

D.1.5 Charted Features

There is one sounding not assigned to survey H12485 located in Branford Harbor, south of Indian Neck point, (41-15-14N, 72-49-18W), reported 1999, was not investigated due to being in shore of the Navigable Area Limit Line.

D.1.6 Uncharted Features

No uncharted features exist for this survey.

D.1.7 Dangers to Navigation

No Danger to Navigation Reports were submitted for this survey.

D.1.8 Shoal and Hazardous Features

All charted shoals within the sheet limits of H12485 were covered with 100% MBES and are detailed in Section D.1.1 - Raster Chart comparison.

D.1.9 Channels

There are three maintained channels withins the limits of survey H12485. At the time of the survey, Branford Harbor Channel was found to be deeper than charted as surveyed up to Branford Point. Full 100 foot width was not investigated beyond Branford point due to the depth being too shallow for the survey launch. See figure 23.

A privately maintained channel for a gravel terminal located at Juniper Point was found to be shoaler than charted by approximately 2 feet at this time of the survey with a width of approximately 80 feet. Located on the terminal structure are range line markers with lights to guide barge traffic in the channel. Refer to the H12485_Final_Feature_File.hob for more information. The hydrographer recommends a more current remotely captured data on this area due to the expansion of the terminal. See figure 24.

Stony Creek Channel was not addressed during the survey due to being inshore of the Navigable Area Limit Line.

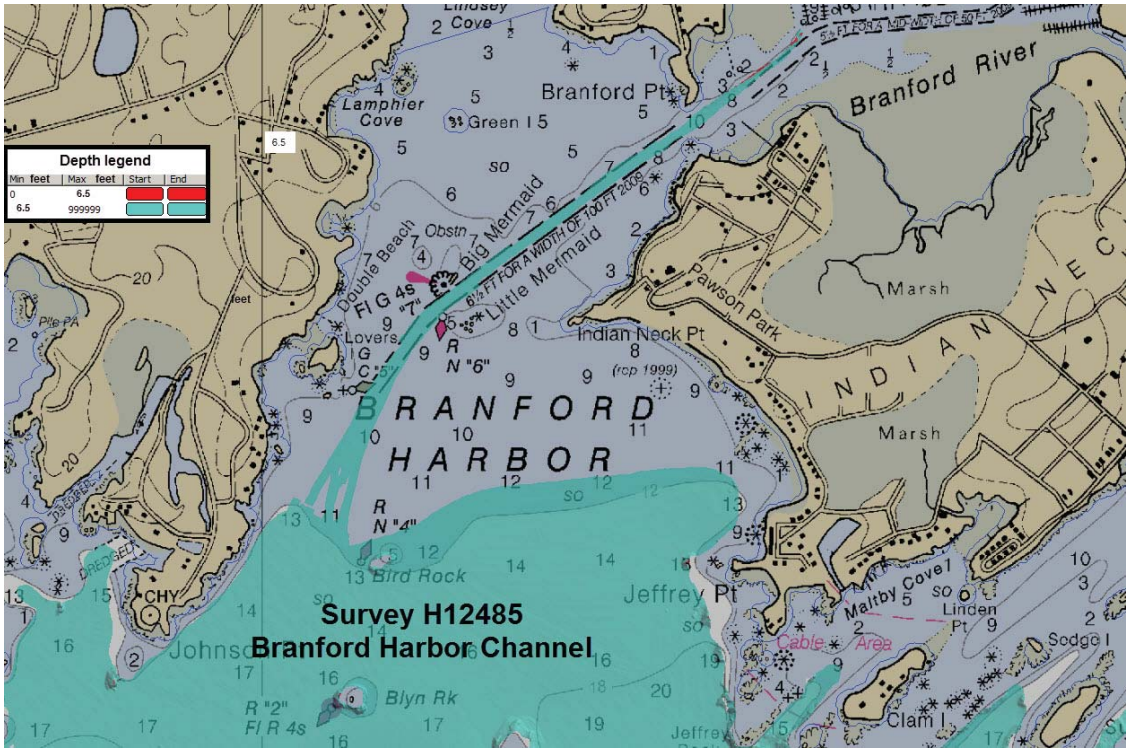


Figure 23: Survey H12485 Branford Harbor Channel.

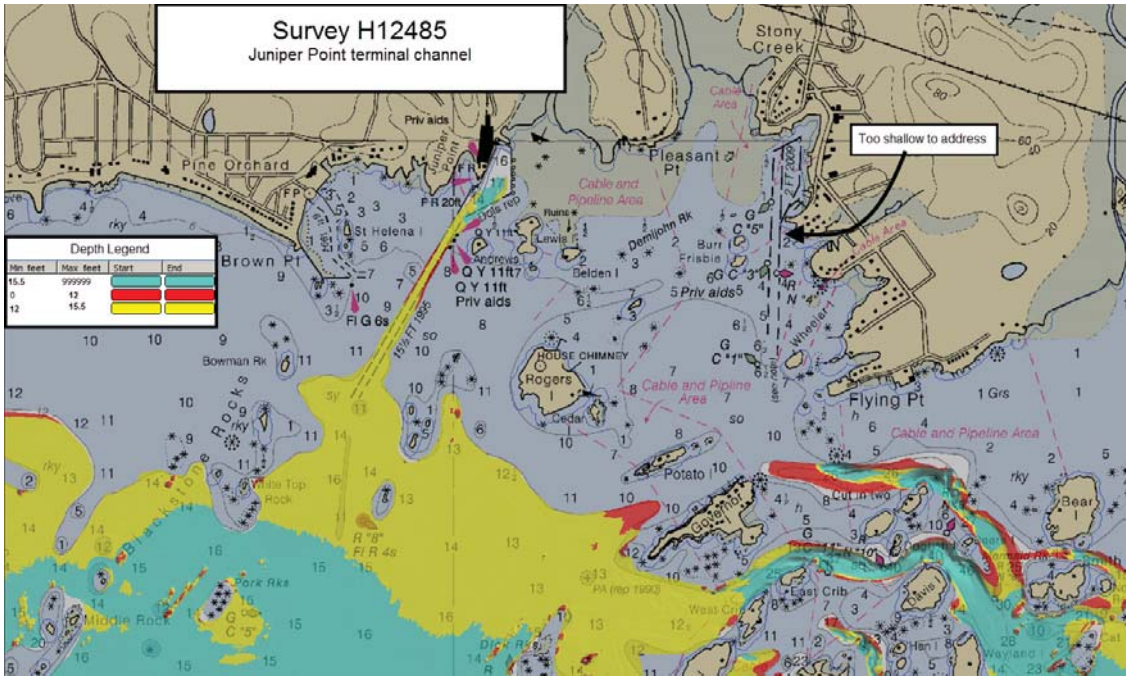


Figure 24: Survey H12485 Juniper point terminal channel.

D.1.10 Bottom Samples

Thirteen (13) bottom samples were acquired for survey H12485. Approximate sample locations were included in the Project Reference file (PRF) provided by the Hydrographic Surveys Division (HSD). The final sampling plan used the provided locations, with some modification of position to better characterize changes in bottom type delineated in the multibeam data. Of the thirteen samples taken, one proved to have a hard bottom with no material from three attempts.

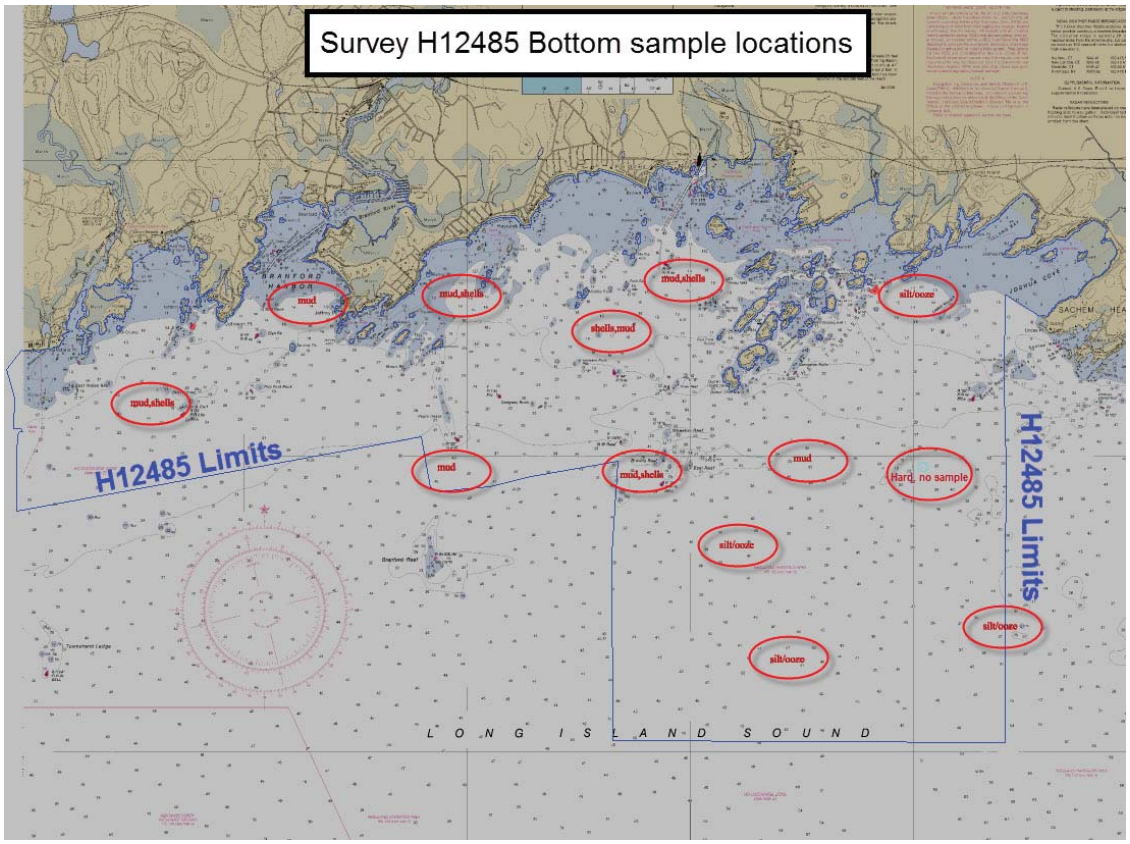


Figure 25: Survey H12485 bottom sample locations and type.

D.2 Additional Results

D.2.1 Shoreline

Shoreline Source
Limited shoreline verification was accomplished using the PRF and Composite Source File (CSF) provided with the Project Instructions. The PRF contains the limits of the assigned survey area, junction survey outlines, proposed bottom sample locations and a selection of features assigned for investigation. The CSF contains additional features for investigation, as well as other features derived from multiple sources, including NOAA charts, lidar surveys, and photogrammetry. From these two projectwide files, the hydrographer created an Assigned Feature File (AFF), which is a subset of the features specifically assigned for investigation. Both PRF and CSF are S-57 attributed datasets in .000 file format.

Shoreline Verification
Limited shoreline verification was conducted near predicted low water in accordance with the applicable sections of NOAA HSSD and FPM. All assigned features safe to approach were addressed as required, with S-57 attribution, and recorded in the H12485_Final_Feature_File to best represent the features at chart scale. This file also includes any new features found in the field, as well as recommendations to delete features disproved during the survey. The HYPACK target files acquired in the field with notes for attributions were are converted into a comma delimited text file using an EXCEL spreadsheet, then imported into CARIS BathyDataBase. During the importation process, the timestamp attached to the HYPACK target file was stripped, which required all timestamps to be re-entered manually. Manual re-entry was found to be a time prohibitive endevor. At the time of this report, the H12485_Final_Feature_File did not have every time stamp entered to each feature. Submitted with this survey is a copy of the original HYPACK target files before any edits or conversions into EXCEL spreadsheet were made.

D.2.2 Prior Surveys

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

D.2.3 Aids to Navigation

Survey H12485 included forty nine (49) aid to navigation (ATONs). All the ATON's position was visually checked in the field against the digital raster chart and was found to serve its intended purpose, with the exception of "Thimble Shoals Buoy #8. This buoy was found approximately 61 meters south of raster chart location. The buoy was located at 41-15-14.75N, 72-44-47.93W.

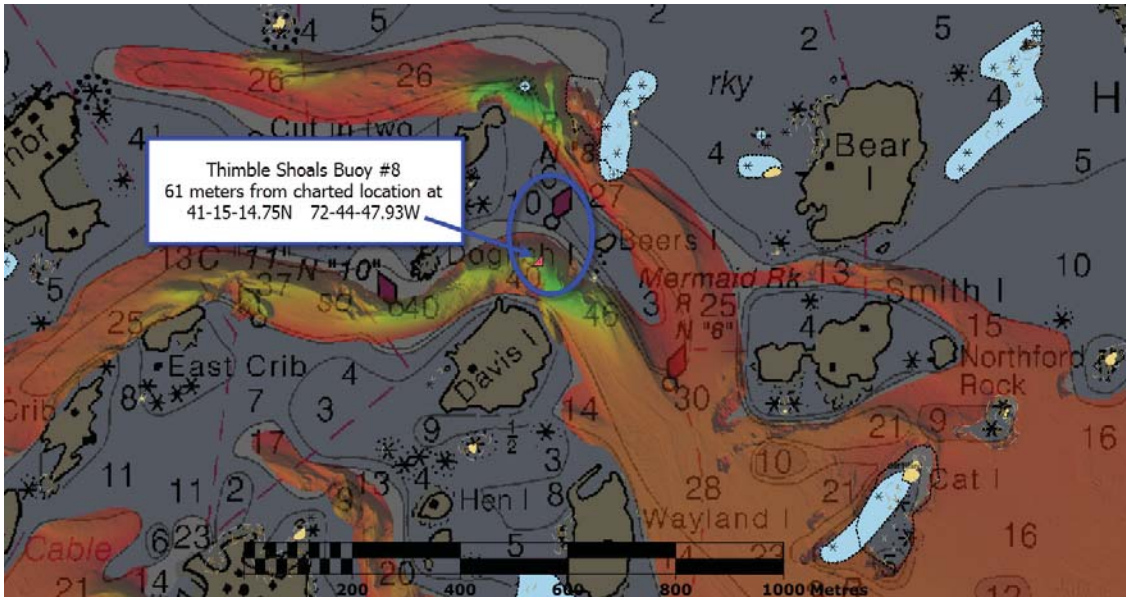


Figure 26: Survey H12485 found Thimble Shoals buoy #8 to be 61 meters away from charted location.

D.2.4 Overhead Features

No overhead features exist for this survey.

D.2.5 Submarine Features

There are seven charted cable areas within the survey limits of H12485. No visible indication of cables was evident in the MBES data in the charted cable areas. While completing shoreline verification, posted warning cable area signs were evident along and in the island chain named "The Thimbles" and were posted within the limits the charted cable delineation. For more detailed information, refer to the H12485_FFF.hob file attached with this report. The Hydrographer recommends retaining the cable areas as charted.

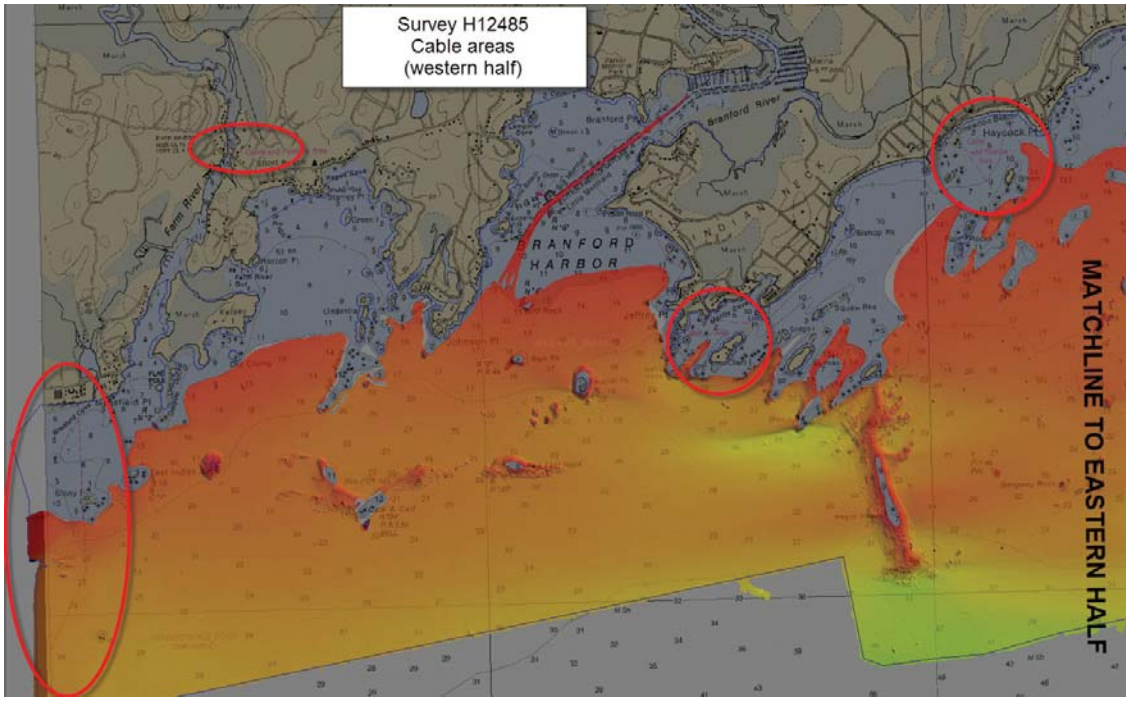


Figure 27: Cable and pipeline areas within survey H12485 limits, Western half shown.

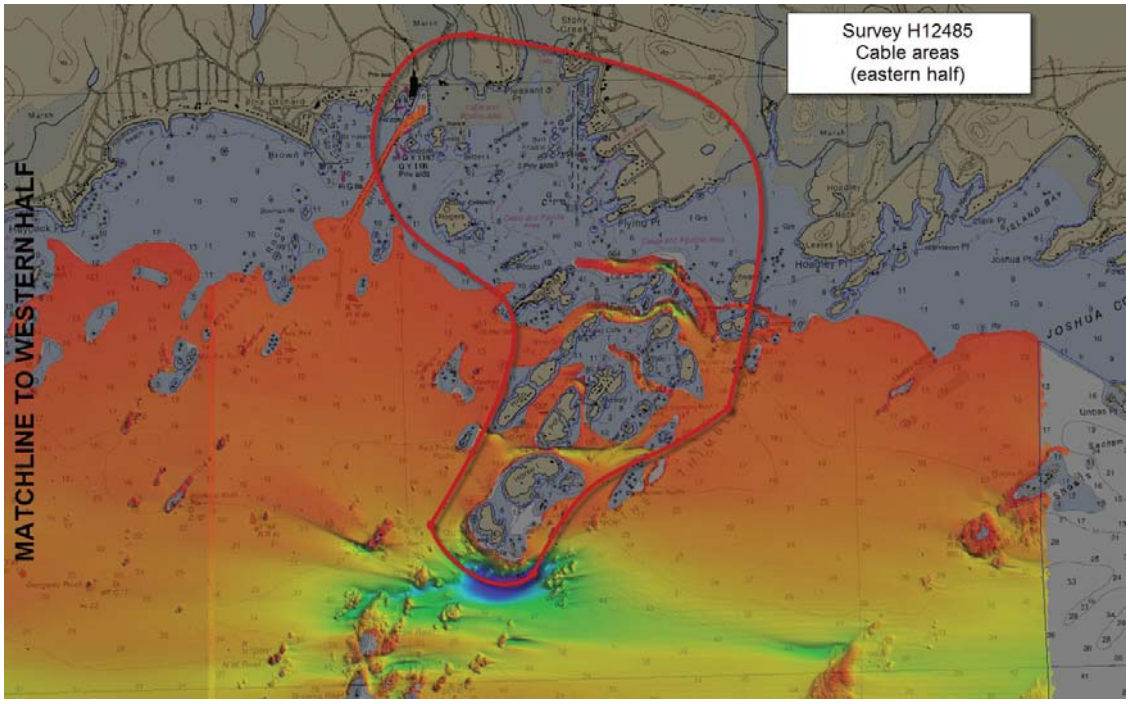


Figure 28: Cable and pipeline areas within survey H12485 limits, Eastern half shown.

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.2.9 Construction and Dredging

A gravel distribution terminal located off of Juniper point known as "Tilcon Connecticut" has been modified since the last update of the chart. While completing limited shoreline acquisition for survey H12485, it was noticed that the shore line features did not match the chart nor do the privately maintained range lines or daymarks. The hydrographer recommends another survey detailing that location and updating the chart. At the time of the survey H12485, the NOAA ship Thomas Jefferson did not have equipment to attribute the changes efficiently.

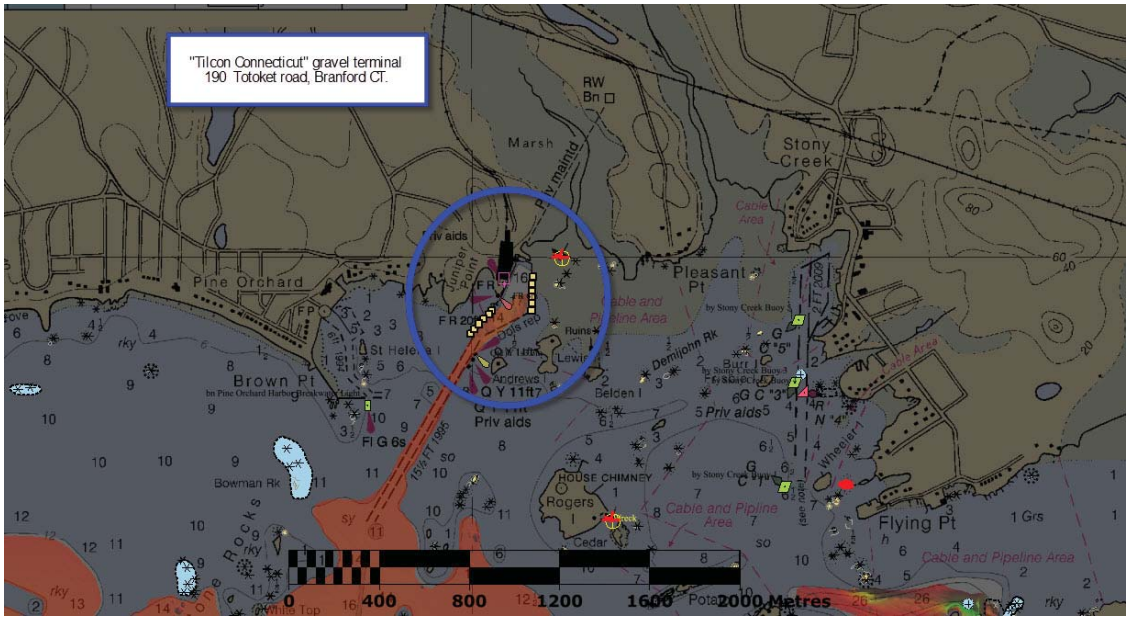


Figure 29: Area located within Survey H12485 recommended re-digitized to update chart.

E. Approval Sheet

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

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

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

Approver Name	Approver Title	Approval Date	Signature
CDR James M. Crocker, NOAA	Chief of Party	05/21/2014	Digitally signed by James Crocker DN: cn=James Crocker, o=CO, NOAA Ship Thomas Jefferson, ou=CDR/NOAA, email=james.m.crocker@noaa.gov, c=US Date: 2014.08.04 11:18:02 -04'00'
LT Megan Guberski, NOAA	Field Operations Officer	05/21/2014	Megan R. Guberski LT NOAA
Peter G. Lewit	Chief Survey Technician	05/21/2014	Peter Lewit
Todd A. Walsh	Sheet Manager	05/21/2014	Todd A. Walsh

F. Table of Acronyms

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

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

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

APPENDIX I

TIDES AND WATER LEVELS

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

May 15, 2013

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

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

SUBJECT: Request for Approved Tides/Water Levels

Please provide the following data:

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

Transmit data to the following:

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

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

Project No.:	OPR-B370-TJ-13
Registry No.:	H12485
State:	Connecticut
Locality:	Long Island Sound
Sublocality:	Joshua Cove to Mansfield Pt

Attachments containing:

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

cc: MOA-TJ

Year_DOY	Min Time	Max Time
2013_110	17:19:34	19:58:38
2013_111	08:15:53	23:59:22
2013_112	12:20:13	23:59:51
2013_113	12:54:22	20:59:48
2013_114	12:10:35	19:04:10
2013_122	12:24:47	22:59:18
2013_123	12:16:23	21:03:01
2013_124	12:55:17	19:25:39
2013_125	11:25:33	20:15:57
2013_126	11:55:36	20:31:26
2013_127	11:48:41	21:15:07
2013_128	11:43:53	21:15:44
2013_129	13:07:42	22:12:27
2013_130	10:15:15	23:24:42
2013_131	10:21:31	23:42:37
2013_132	10:49:31	23:35:40
2013_133	11:20:23	23:58:56

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

TIDE NOTE FOR HYDROGRAPHIC SURVEY

DATE : May 24, 2013

HYDROGRAPHIC BRANCH: Atlantic
HYDROGRAPHIC PROJECT: OPR-B370-TJ-2013
HYDROGRAPHIC SHEET: H12485

LOCALITY: Joshua Cove to Mansfield Pt, Long Island Sound, CT
TIME PERIOD: April 20 - May 13, 2013

TIDE STATION USED: New London, CT 8461490
Lat.41° 21.7′ N Long. 72° 5.4' 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: New Haven, CT 8465705
Lat. 41°17.0' N Long. 72° 54.5' W
PLANE OF REFERENCE (MEAN LOWER LOW WATER): 0.000 meters
HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 1.946 meters

REMARKS: RECOMMENDED GRID

Please use the TCARI grid "B370TJ2013" as the final grid for project OPR-B370-TJ-2013, H12485, during the time period between April 20 - May 13, 2013.

Refer to attachments for grid information.

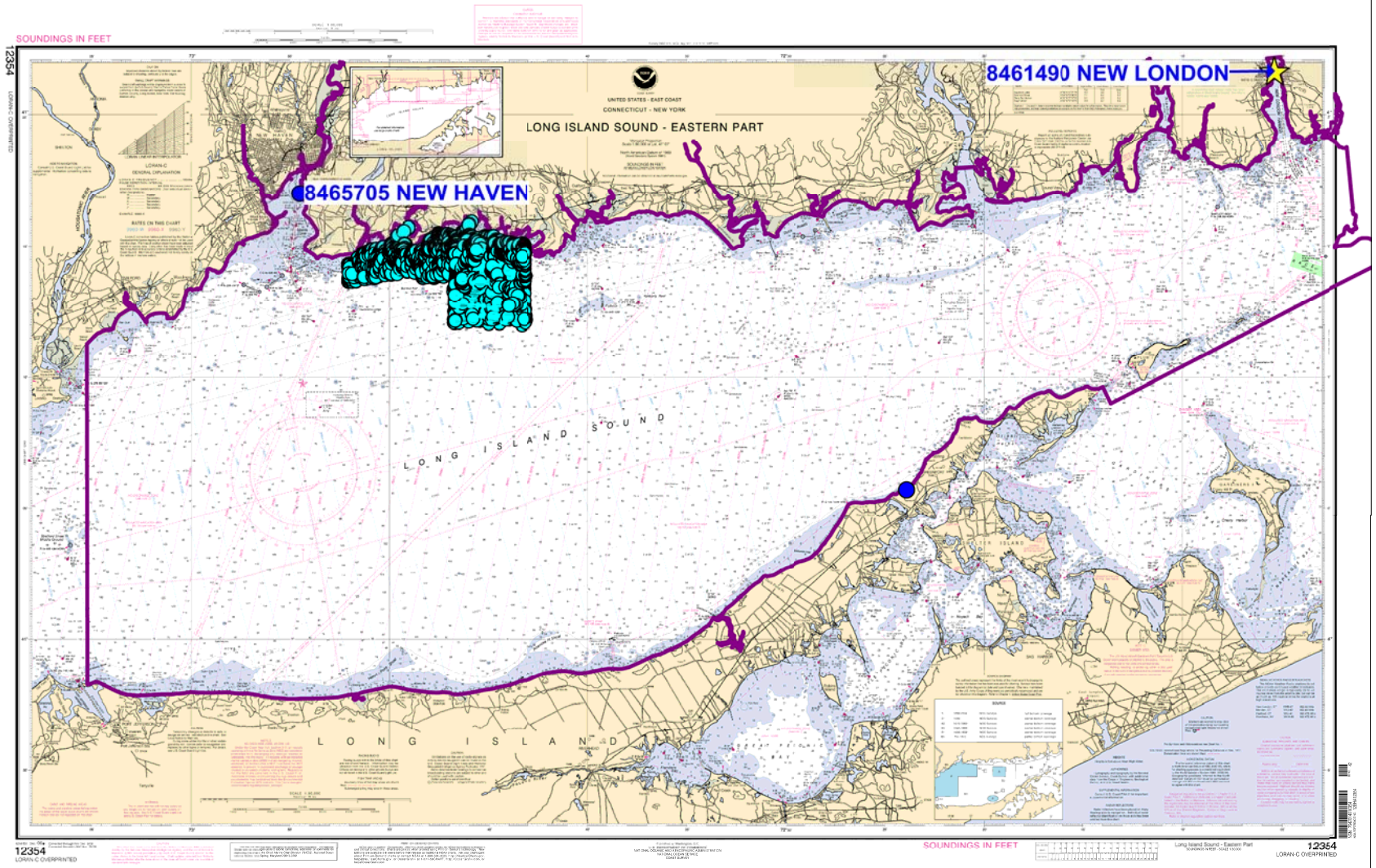
Note 1: Provided time series data are tabulated in metric units (meters), relative to MLLW and on Greenwich Mean Time on the 1983-2001 National Tidal Datum Epoch (NTDE).

HOVIS.GERALD.THOMAS.1365860250

Digitally signed by HOVIS.GERALD.THOMAS.1365860250
DN: c=US, o=U.S. Government, ou=DoD, ou=PKI, ou=OTHER, cn=HOVIS.GERALD.THOMAS.1365860250
Date: 2013.05.31 12:00:52 -04'00'

CHIEF, PRODUCTS AND SERVICES BRANCH

Preliminary as Final TCARI Grid for
OPR-B370-TJ-2013, H12485
Joshua Cove to Mansfield Pt, Long Island Sound, CT



APPENDIX II

SUPPLEMENTAL SURVEY RECORDS AND COORESPONDENCE

Eileen Pye - NOAA Federal <eileen.o.pye@noaa.gov>

H12485 USCG Buoy Position

3 messages

Eileen Pye - NOAA Federal <eileen.o.pye@noaa.gov> Fri, Feb 6, 2015 at 1:42 PM
To: Matthew Jaskoski - NOAA Federal <matthew.jaskoski@noaa.gov>

Sir,

In Survey H12485, the field unit discovered the red nun buoy "8" to be off position by 61 meters. There is no evidence of correspondence with the USCG in regards to this.

The buoy is charted in the USCG Light List at 41-15-16.395N 072-44-47.212W. The field unit has the buoy positioned in the Final Feature File at 41-15-14.574N 072-44-47.929W.

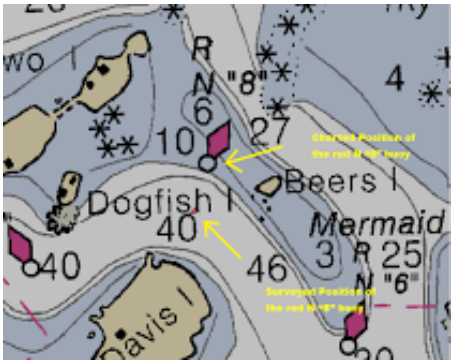
See attached images of the buoy positioning in relation to the chart and the field picture of the buoy.

--
Very Respectfully,

Ensign Eileen Pye, NOAA
Atlantic Hydrographic Branch
439 W. York St.
Norfolk, VA 23510

3 attachments

H12485_feature file 071 Red conical 8 bouy.JPG
6647K



USCG_ATON_04.png
290K

USCG_ATON_05.png
128K

Matthew Jaskoski - NOAA Federal <matthew.jaskoski@noaa.gov> Wed, Feb 11, 2015 at 3:25 PM
To: Meghan McGovern - NOAA Federal <meghan.mcgovern@noaa.gov>
Cc: Eileen Pye - NOAA Federal <eileen.o.pye@noaa.gov>

Hey Meghan,
See below, I'm not certain if TJ passed this along already while they we in the area. They noted it in the DR but didn't include any correspondence in appendix 2 with you or the USCG. The area shown is east of Branford, CT, near Flying Pt. I would appreciate if you could pass this along your contacts at District 1.

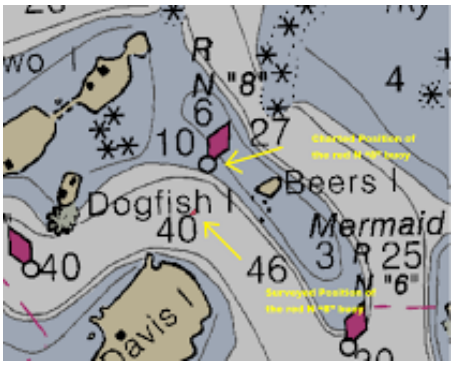
regards,
Jasko

Lieutenant Commander Matthew Jaskoski, NOAA
Chief, Atlantic Hydrographic Branch
439 W. York St.
Norfolk, VA 23510
Office: 757-441-6746 x200
Cell: 757-647-3356
[Quoted text hidden]

---

3 attachments

H12485_feature file 071 Red conical 8 bouy.JPG
6647K



USCG_ATON_04.png
290K

USCG_ATON_05.png
128K

Meghan McGovern - NOAA Federal <meghan.mcgovern@noaa.gov> Wed, Feb 11, 2015 at 3:47 PM
To: Matthew Jaskoski - NOAA Federal <matthew.jaskoski@noaa.gov>
Cc: Eileen Pye - NOAA Federal <eileen.o.pye@noaa.gov>

Will do, thanks.

V/r,
meghan
[Quoted text hidden]
--

Meghan McGovern, LT/NOAA
Office of Coast Survey
Navigation Services Division
28 Tarzwell Drive
Narragansett, RI 02882
Tel: 401-782-3252
Cell: 401-545-0174
Fax: 401-782-3292
nauticalcharts.noaa.gov

Matthew Wilson - NOAA Federal <matthew.wilson@noaa.gov>

Danger to Navigation - H12485 Report #1

1 message

Matthew Wilson - NOAA Federal <matthew.wilson@noaa.gov> Wed, Jun 24, 2015 at 7:45 AM
To: OCS NDB - NOAA Service Account <ocs.ndb@noaa.gov>
Cc: Castle Parker - NOAA Federal <castle.e.parker@noaa.gov>, Matthew Jaskoski - NOAA Federal <matthew.jaskoski@noaa.gov>, Michael Gonsalves - NOAA Federal <michael.gonsalves@noaa.gov>, Meghan McGovern - NOAA Federal <meghan.mcgovern@noaa.gov>

Good Day,

Please find attached a zip file for survey H12485 DtoN Report #1 for submission to the Marine Chart Division (MCD).

The Dangers to Navigation were found during survey review at the Atlantic Hydrographic Branch (AHB). All soundings have been verified during the review.

The contents of the attached WinZip file were generated at AHB. The attached zip file contains a DtoN Letter (PDF) and a Pydro XML file.

If you have any questions, please direct them back to me, by email or phone (757-441-6746 x205).

Thank you for your assistance in this matter.

–

Respectfully,

Matthew J. Wilson
Physical Scientist, NOAA Office of Coast Survey
Atlantic Hydrographic Branch
matthew.wilson@noaa.gov
office (757) 441-6746 x205
cell (703) 638-3608

H12485_Dton#1.zip
3019K

APPENDIX III

FEATURES REPORT

DTONS - 9
AWOIS - 1
WRECK -0
MARITIME BOUNDARIES - 0

H12485_Features Report

Registry Number: H12485

State: Connecticut

Locality: Long Island Sound

Sub-locality: Joshua Cove to Mansfield Pt

Project Number: OPR-B370-TJ-13

Survey Date: 04/20/2013 - 05/13/2013

Charts Affected

Number	Edition	Date	Scale (RNC)	RNC Correction(s)*
12372	34th	11/01/2006	1:40,000 (12372_16) 1:20,000 (12372_15)	[L]NTM: ?
12373	15th	06/01/2005	1:20,000 (12373_1)	[L]NTM: ?
12354	42nd	12/01/2006	1:80,000 (12354_1)	[L]NTM: ?
12300	47th	05/01/2008	1:400,000 (12300_1)	[L]NTM: ?
13006	34th	05/01/2007	1:675,000 (13006_1)	[L]NTM: ?
5161	13th	10/01/2003	1:1,058,400 (5161_1)	[L]NTM: ?
13003	49th	04/01/2007	1:1,200,000 (13003_1)	[L]NTM: ?

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

Features

No.	Name	Feature Type	Survey Depth	Survey Latitude	Survey Longitude	AWOIS Item
1.1	AWOIS 10941 - Dangerous underwater rock, least depth 8 feet	Rock	2.40 m	41° 14' 25.8" N	072° 50' 18.0" W	10941
2.1	DTON - 14 foot rock	Rock	4.20 m	41° 14' 23.6" N	072° 50' 55.0" W	---
2.2	DTON - 13 foot rock	Rock	4.12 m	41° 14' 26.0" N	072° 47' 14.5" W	---
2.3	DTON - 16 foot rock	Rock	4.89 m	41° 14' 16.0" N	072° 47' 00.8" W	---
2.4	DTON - Dangerous underwater rock, least depth 24 feet	Rock	7.34 m	41° 13' 43.9" N	072° 46' 20.4" W	---
2.5	DTON - 20 foot rock	Rock	6.19 m	41° 14' 16.6" N	072° 46' 14.0" W	---
2.6	DTON - Dangerous underwater rock, least depth 6 feet	Rock	2.01 m	41° 14' 29.9" N	072° 45' 20.7" W	---
2.7	DTON - Dangerous underwater rock, least depth 5 feet	Rock	1.61 m	41° 14' 59.1" N	072° 44' 54.6" W	---
2.8	DTON - Dangerous underwater rock, least depth 5 feet	Rock	1.45 m	41° 15' 07.3" N	072° 44' 37.0" W	---
2.9	DTON - 21 foot rock	Rock	6.41 m	41° 14' 17.9" N	072° 43' 42.2" W	---

1.1) AWOIS 10941 - Dangerous underwater rock, least depth 8 feet

Feature for AWOIS Item #10941

Search Position:	41° 14' 25.8" N, 072° 50' 18.0" W
Historical Depth:	2.40 m
Search Radius:	200
Search Technique:	Type: OBSTRUCTION, Itemstatus: ASSIGNED, Searchtype: FULL, Technique: S2 MBES
Technique Notes:	

History Notes:

History

" NM38/61-- LONG ISLAND SOUND-BRANFORD HARBOR-BUOY DISCONTINUED-OBSTRUCTION: BRANFORD HARBOR WRECK LIGHTED BUOY ""WR1"" (41-14-30N 72-50-20W) HAS BEEN DISCONTINUED. NOTE: THE CORPS OF ENGINEERS ADVISES THAT THE OBSTRUCTION WHICH THE BUOY MARKED CONSISTED OF BOULDERS LOCATED 1 060 YARDS 197 DEGS. FROM THE HOUSE JOHNSON POINT AND HAVE A LEAST DEPTH OF 10 FEET OF WATER OVER THEM AT MLW. APPROXIMATE POSITION OF BOULDERS: 41-14-26N 72-50-24W. (ENT 3/28/01 SJV)"

Survey Summary

Survey Position:	41° 14' 25.8" N, 072° 50' 18.0" W
Least Depth:	2.40 m (= 7.87 ft = 1.312 fm = 1 fm 1.87 ft)
TPU (±1.96σ):	**THU (TPEh)** [None] ; **TVU (TPEv)** [None]
Timestamp:	2013-133.00:00:00.000 (05/13/2013)
Dataset:	H12485_DR features.000
FOID:	0_ 0005334646 00001(FFFE005166760001)
Charts Affected:	12373_1, 12372_16, 12354_1, 12300_1, 13006_1, 5161_1, 13003_1

Remarks:

UWTROC/remrks: Feature found by complete multibeam. Rock may be AWOIS #10941.

Feature Correlation

Source	Feature	Range	Azimuth	Status
H12485_DR features.000	0_ 0005334646 00001	0.00	000.0	Primary

Hydrographer Recommendations

add to chart

Cartographically-Rounded Depth (Affected Charts):

8ft (12373_1, 12372_16, 12354_1)

1 ¼fm (12300_1, 13006_1, 13003_1)

2.4m (5161_1)

S-57 Data

Geo object 1:	Underwater rock / awash rock (UWTROC)
Attributes:	EXPSOU - 2:shoaler than range of depth of the surrounding depth area
	NINFOM - Add rock
	QUASOU - 6:least depth known
	SORDAT - 20130513
	SORIND - US,US,graph,H12485
	TECSOU - 3:found by multi-beam
	VALSOU - 2.399 m
	WATLEV - 3:always under water/submerged

Office Notes

SAR: Feature ensonified with complete coverage MBES. Feature found within the search radius of AWOIS #10941 and is significant and verified as per survey data. Defer the final charting disposition to AHB Compile Team. Image added by SAR reviewer.

Compile: Concur. Delete charted dangerous underwater rock (boulders 10 ft rep), add dangerous underwater rock, least depth 8 feet in present survey position.

Feature Images

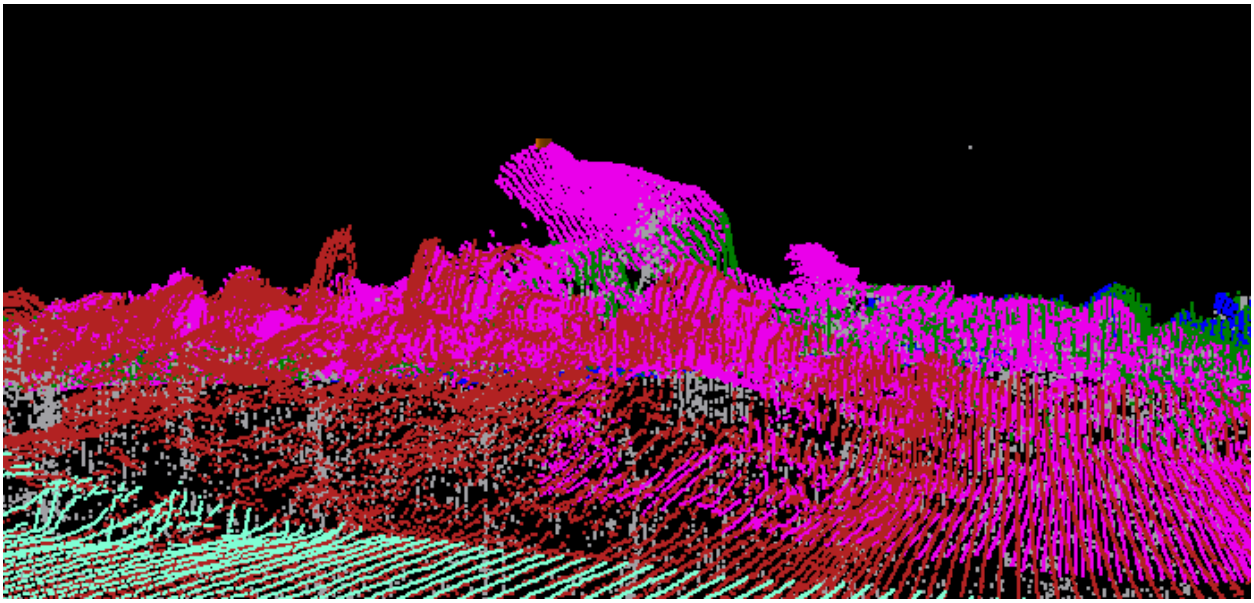


Figure 1.1.1

2.1) DTON - 14 foot rock

DANGER TO NAVIGATION

Survey Summary

Survey Position:	41° 14' 23.6" N, 072° 50' 55.0" W
Least Depth:	4.20 m (= 13.77 ft = 2.295 fm = 2 fm 1.77 ft)
TPU (±1.96σ):	**THU (TPEh)** [None] ; **TVU (TPEv)** [None]
Timestamp:	2013-133.00:00:00.000 (05/13/2013)
Dataset:	H12485_DR features.000
FOID:	0_ 0005334883 00001(FFFE005167630001)
Charts Affected:	12373_1, 12372_16, 12354_1, 12300_1, 13006_1, 5161_1, 13003_1

Remarks:

[None]

Feature Correlation

Source	Feature	Range	Azimuth	Status
H12485_DR features.000	0_ 0005334883 00001	0.00	000.0	Primary

Hydrographer Recommendations

[None]

Cartographically-Rounded Depth (Affected Charts):

14ft (12373_1, 12372_16, 12354_1)

2 ¼fm (12300_1, 13006_1, 13003_1)

4.2m (5161_1)

S-57 Data

Geo object 1:	Underwater rock / awash rock (UWTROC)
Attributes:	NINFOM - Add rock
	QUASOU - 6:least depth known
	SORDAT - 20130513
	SORIND - US,US,graph,H12485

TECSOU - 3:found by multi-beam

VALSOU - 4.197 m

WATLEV - 3:always under water/submerged

Office Notes

SAR: Rock verified via ODMB.

COMPILATION: Concur. Delete charted 14 foot rock. Add a 14 foot rock in the present survey position.

2.2) DTON - 13 foot rock

DANGER TO NAVIGATION

Survey Summary

Survey Position:	41° 14' 26.0" N, 072° 47' 14.5" W
Least Depth:	4.12 m (= 13.50 ft = 2.251 fm = 2 fm 1.50 ft)
TPU (±1.96σ):	**THU (TPEh)** [None] ; **TVU (TPEv)** [None]
Timestamp:	2013-133.00:00:00.000 (05/13/2013)
Dataset:	H12485_DR features.000
FOID:	0_ 0005334884 00001(FFFE005167640001)
Charts Affected:	12373_1, 12372_16, 12354_1, 12300_1, 13006_1, 5161_1, 13003_1

Remarks:

[None]

Hydrographer Recommendations

[None]

Cartographically-Rounded Depth (Affected Charts):

13ft (12373_1, 12372_16, 12354_1)

2 ¼fm (12300_1, 13006_1, 13003_1)

4.1m (5161_1)

S-57 Data

Geo object 1:	Underwater rock / awash rock (UWTROC)
Attributes:	NINFOM - Add rock
	QUASOU - 6:least depth known
	SORDAT - 20130513
	SORIND - US,US,graph,H12485
	TECSOU - 3:found by multi-beam
	VALSOU - 4.116 m
	WATLEV - 3:always under water/submerged

Office Notes

SAR: Feature added by SAR reviewer. Feature was ensonified by object detect MBES and is considered significant. Defer the final charting disposition to AHB Compile Team.

COMPILATION: Concur. Delete charted 13 foot rock. Add a 13 foot rock in the present survey position.

Feature Images

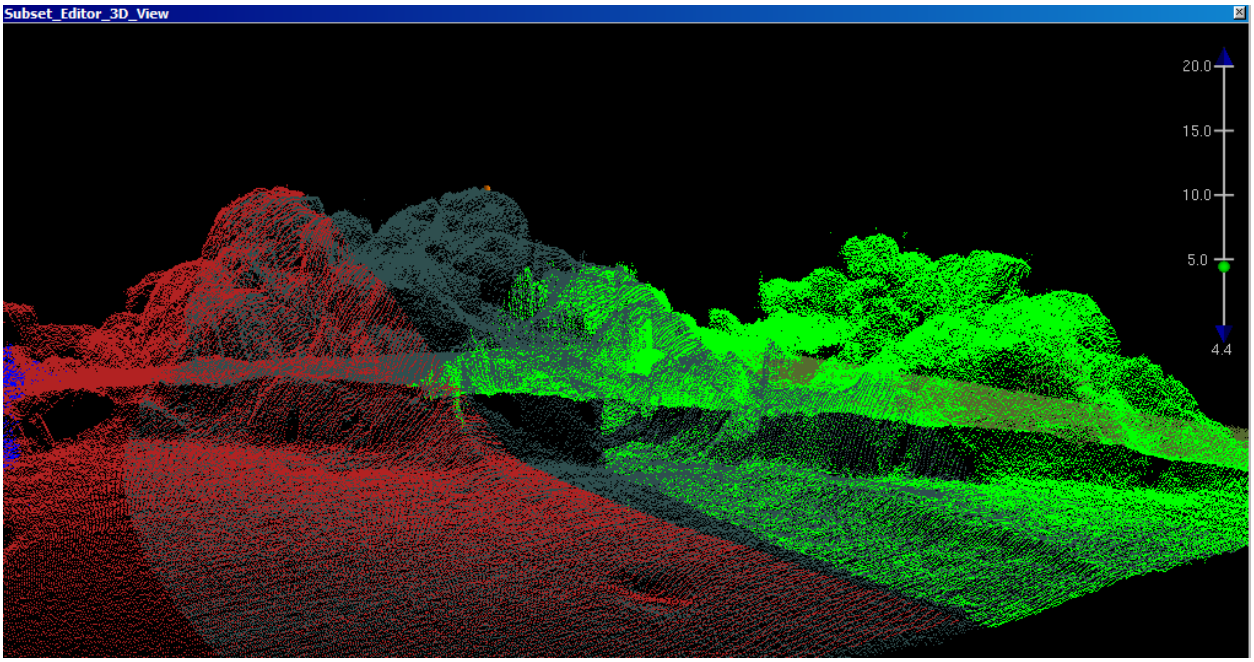


Figure 2.2.1

2.3) DTON - 16 foot rock

DANGER TO NAVIGATION

Survey Summary

Survey Position: 41° 14' 16.0" N, 072° 47' 00.8" W

Least Depth: 4.89 m (= 16.04 ft = 2.673 fm = 2 fm 4.04 ft)

TPU (±1.96σ): **THU (TPEh)** [None] ; **TVU (TPEv)** [None]

Timestamp: 2013-133.00:00:00.000 (05/13/2013)

Dataset: H12485_DR features.000

FOID: 0_ 0005334881 00001(FFFE005167610001)

Charts Affected: 12373_1, 12372_16, 12354_1, 12300_1, 13006_1, 5161_1, 13003_1

Remarks:

[None]

Feature Correlation

Source	Feature	Range	Azimuth	Status
H12485_DR features.000	0_ 0005334881 00001	0.00	000.0	Primary

Hydrographer Recommendations

[None]

Cartographically-Rounded Depth (Affected Charts):

16ft (12373_1, 12372_16, 12354_1)

2 ½fm (12300_1, 13006_1, 13003_1)

4.9m (5161_1)

S-57 Data

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

Attributes: NINFOM - Add rock

QUASOU - 6:least depth known

SORDAT - 20130513

SORIND - US,US,graph,H12485

TECSOU - 3:found by multi-beam

VALSOU - 4.888 m

WATLEV - 3:always under water/submerged

Office Notes

SAR: Feature added by SAR reviewer. Feature ensonified with object detect MBES. Feature is considered significant. Defer the final charting disposition to AHB compile team. Compile: Agree with SAR.

COMPILATION: Concur. Delete charted 16 foot rock. Add a 16 foot rock in the present survey position.

Feature Images

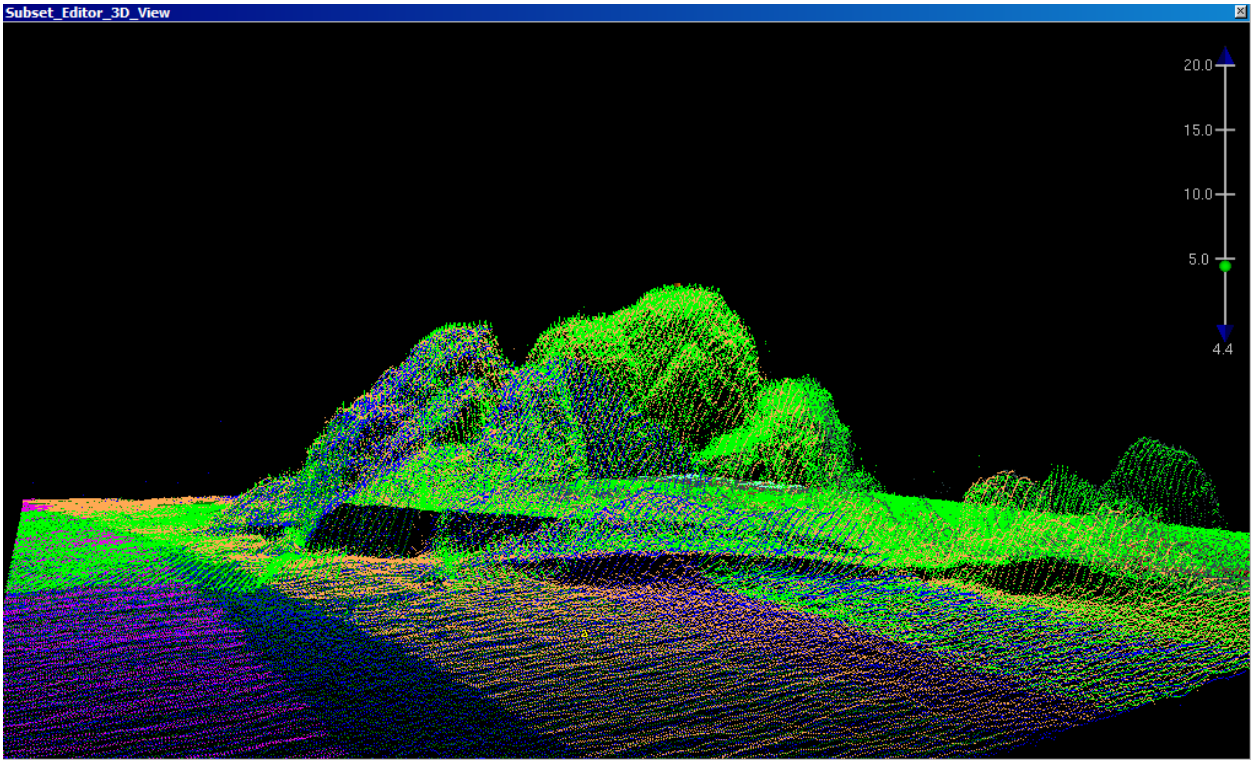


Figure 2.3.1

2.4) DTON - Dangerous underwater rock, least depth 24 feet

DANGER TO NAVIGATION

Survey Summary

Survey Position:	41° 13' 43.9" N, 072° 46' 20.4" W
Least Depth:	7.34 m (= 24.07 ft = 4.012 fm = 4 fm 0.07 ft)
TPU (±1.96σ):	**THU (TPEh)** [None] ; **TVU (TPEv)** [None]
Timestamp:	2013-133.00:00:00.000 (05/13/2013)
Dataset:	H12485_DR features.000
FOID:	0_ 0005334880 00001(FFFE005167600001)
Charts Affected:	12373_1, 12372_16, 12354_1, 12300_1, 13006_1, 5161_1, 13003_1

Remarks:

[None]

Feature Correlation

Source	Feature	Range	Azimuth	Status
H12485_DR features.000	0_ 0005334880 00001	0.00	000.0	Primary

Hydrographer Recommendations

[None]

Cartographically-Rounded Depth (Affected Charts):

24ft (12373_1, 12372_16, 12354_1)

4fm (12300_1, 13006_1, 13003_1)

7.3m (5161_1)

S-57 Data

Geo object 1:	Underwater rock / awash rock (UWTROC)
Attributes:	NINFOM - Add rock
	QUASOU - 6:least depth known
	SORDAT - 20130513
	SORIND - US,US,graph,H12485

TECSOU - 3:found by multi-beam

VALSOU - 7.337 m

WATLEV - 3:always under water/submerged

Office Notes

SAR: Rock verified via ODMB.

COMPILATION: Concur. Delete charted dangerous 24 foot rock. Add a dangerous 24 foot rock in the present survey position.

2.5) DTON - 20 foot rock

DANGER TO NAVIGATION

Survey Summary

Survey Position: 41° 14' 16.6" N, 072° 46' 14.0" W

Least Depth: 6.19 m (= 20.31 ft = 3.386 fm = 3 fm 2.31 ft)

TPU (±1.96σ): **THU (TPEh)** [None] ; **TVU (TPEv)** [None]

Timestamp: 2013-133.00:00:00.000 (05/13/2013)

Dataset: H12485_DR features.000

FOID: 0_ 0005334882 00001(FFFE005167620001)

Charts Affected: 12373_1, 12372_16, 12354_1, 12300_1, 13006_1, 5161_1, 13003_1

Remarks:

[None]

Feature Correlation

Source	Feature	Range	Azimuth	Status
H12485_DR features.000	0_ 0005334882 00001	0.00	000.0	Primary

Hydrographer Recommendations

[None]

Cartographically-Rounded Depth (Affected Charts):

20ft (12373_1, 12372_16, 12354_1)

3 ¼fm (12300_1, 13006_1, 13003_1)

6.2m (5161_1)

S-57 Data

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

Attributes: NINFOM - Add rock

QUASOU - 6:least depth known

SORDAT - 20130513

SORIND - US,US,graph,H12485

TECSOU - 3:found by multi-beam

VALSOU - 6.192 m

WATLEV - 3:always under water/submerged

Office Notes

SAR: rock verified with MB data. Submitted as DtoN by AHB. Compile: Agree with SAR.

COMPILATION: Concur. Delete charted 20 foot rock. Add a 20 foot rock in the present survey position.

2.6) DTON - Dangerous underwater rock, least depth 6 feet

DANGER TO NAVIGATION

Survey Summary

Survey Position:	41° 14' 29.9" N, 072° 45' 20.7" W
Least Depth:	2.01 m (= 6.59 ft = 1.099 fm = 1 fm 0.59 ft)
TPU (±1.96σ):	**THU (TPEh)** [None] ; **TVU (TPEv)** [None]
Timestamp:	2013-133.00:00:00.000 (05/13/2013)
Dataset:	H12485_DR features.000
FOID:	0_ 0005334885 00001(FFFE005167650001)
Charts Affected:	12372_15, 12373_1, 12372_16, 12354_1, 12300_1, 13006_1, 5161_1, 13003_1

Remarks:

[None]

Feature Correlation

Source	Feature	Range	Azimuth	Status
H12485_DR features.000	0_ 0005334885 00001	0.00	000.0	Primary

Hydrographer Recommendations

[None]

Cartographically-Rounded Depth (Affected Charts):

6ft (12372_15, 12373_1, 12372_16, 12354_1)

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

2.0m (5161_1)

S-57 Data

Geo object 1:	Underwater rock / awash rock (UWTROC)
Attributes:	NINFOM - Add rock
	QUASOU - 6:least depth known
	SORDAT - 20130513
	SORIND - US,US,graph,H12485

TECSOU - 3:found by multi-beam

VALSOU - 2.009 m

WATLEV - 3:always under water/submerged

Office Notes

SAR: Rock verified via ODMB.

COMPILATION: Concur. Delete charted dangerous 6 foot rock. Add a dangerous 6 foot rock in the present survey position.

2.7) DTON - Dangerous underwater rock, least depth 5 feet

DANGER TO NAVIGATION

Survey Summary

Survey Position:	41° 14' 59.1" N, 072° 44' 54.6" W
Least Depth:	1.61 m (= 5.27 ft = 0.879 fm = 0 fm 5.27 ft)
TPU (±1.96σ):	**THU (TPEh)** [None] ; **TVU (TPEv)** [None]
Timestamp:	2013-133.00:00:00.000 (05/13/2013)
Dataset:	H12485_DR features.000
FOID:	0_ 0005334886 00001(FFFE005167660001)
Charts Affected:	12372_15, 12373_1, 12372_16, 12354_1, 12300_1, 13006_1, 5161_1, 13003_1

Remarks:

[None]

Feature Correlation

Source	Feature	Range	Azimuth	Status
H12485_DR features.000	0_ 0005334886 00001	0.00	000.0	Primary

Hydrographer Recommendations

[None]

Cartographically-Rounded Depth (Affected Charts):

5ft (12372_15, 12373_1, 12372_16, 12354_1)

0 ¾fm (12300_1, 13006_1, 13003_1)

1.6m (5161_1)

S-57 Data

Geo object 1:	Underwater rock / awash rock (UWTROC)
Attributes:	NINFOM - Add rock
	QUASOU - 6:least depth known
	SORDAT - 20130513
	SORIND - US,US,graph,H12485

TECSOU - 3:found by multi-beam

VALSOU - 1.607 m

WATLEV - 3:always under water/submerged

Office Notes

SAR: Rock verified via ODMB.

COMPILATION: Concur. Delete charted dangerous 5 foot rock. Add a dangerous 5 foot rock in the present survey position.

2.8) DTON - Dangerous underwater rock, least depth 5 feet

DANGER TO NAVIGATION

Survey Summary

Survey Position:	41° 15' 07.3" N, 072° 44' 37.0" W
Least Depth:	1.45 m (= 4.77 ft = 0.795 fm = 0 fm 4.77 ft)
TPU (±1.96σ):	**THU (TPEh)** [None] ; **TVU (TPEv)** [None]
Timestamp:	2013-133.00:00:00.000 (05/13/2013)
Dataset:	H12485_DR features.000
FOID:	0_ 0005334887 00001(FFFE005167670001)
Charts Affected:	12372_15, 12373_1, 12372_16, 12354_1, 12300_1, 13006_1, 5161_1, 13003_1

Remarks:

[None]

Feature Correlation

Source	Feature	Range	Azimuth	Status
H12485_DR features.000	0_ 0005334887 00001	0.00	000.0	Primary

Hydrographer Recommendations

[None]

Cartographically-Rounded Depth (Affected Charts):

5ft (12372_15, 12373_1, 12372_16, 12354_1)

0 ¾fm (12300_1, 13006_1, 13003_1)

1.4m (5161_1)

S-57 Data

Geo object 1:	Underwater rock / awash rock (UWTROC)
Attributes:	NINFOM - Add rock
	QUASOU - 6:least depth known
	SORDAT - 20130513
	SORIND - US,US,graph,H12485

TECSOU - 3:found by multi-beam

VALSOU - 1.453 m

WATLEV - 3:always under water/submerged

Office Notes

SAR: Rock verified via ODMB.

COMPILATION: Concur. Delete charted dangerous 5 foot rock. Add a dangerous 5 foot rock in the present survey position.

2.9) DTON - 21 foot rock

DANGER TO NAVIGATION

Survey Summary

Survey Position: 41° 14' 17.9" N, 072° 43' 42.2" W

Least Depth: 6.41 m (= 21.03 ft = 3.504 fm = 3 fm 3.03 ft)

TPU (±1.96σ): **THU (TPEh)** [None] ; **TVU (TPEv)** [None]

Timestamp: 2013-133.00:00:00.000 (05/13/2013)

Dataset: H12485_DR features.000

FOID: 0_ 0005334878 00001(FFFE0051675E0001)

Charts Affected: 12373_1, 12372_16, 12354_1, 12300_1, 13006_1, 5161_1, 13003_1

Remarks:

[None]

Feature Correlation

Source	Feature	Range	Azimuth	Status
H12485_DR features.000	0_ 0005334878 00001	0.00	000.0	Primary

Hydrographer Recommendations

[None]

Cartographically-Rounded Depth (Affected Charts):

21ft (12373_1, 12372_16, 12354_1)

3 ½fm (12300_1, 13006_1, 13003_1)

6.4m (5161_1)

S-57 Data

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

Attributes: NINFOM - Add rock

QUASOU - 6:least depth known

SORDAT - 20130513

SORIND - US,US,graph,H12485

TECSOU - 3:found by multi-beam

VALSOU - 6.409 m

WATLEV - 3:always under water/submerged

Office Notes

SAR: rocky area with least depth confirmed. submitted as DtoN by AHB.

COMPILATION: Concur. Delete charted 21 foot rock. Add a 21 foot rock in the present survey position.

APPROVAL PAGE

H12485

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

- H12485_DR.pdf
- Collection of depth varied resolution BAGS
- Processed survey data and records
- H12485_GeoImage.pdf

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

Approved:_____

Lieutenant Commander Matthew Jaskoski, NOAA
Chief, Atlantic Hydrographic Branch