

H12508

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

DESCRIPTIVE REPORT

Type of Survey: Navigable Area

Registry Number: H12508

LOCALITY

State(s): Connecticut

General Locality: North Shore of Long Island Sound

Sub-locality: Saybrook Outer Bar to Salt Works Bay

2013

CHIEF OF PARTY
Andrew Clos LTJG

LIBRARY & ARCHIVES

Date:

HYDROGRAPHIC TITLE SHEET

H12508

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: **North Shore of Long Island Sound**

Sub-Locality: **Saybrook Outer Bar to Salt Works Bay**

Scale: **10000**

Dates of Survey: **07/30/2013 to 05/29/2014**

Instructions Dated: **05/16/2013**

Project Number: **OPR-B370-NRT5-13**

Field Unit: **Navigation Response Team 5**

Chief of Party: **Andrew Clos LTJG**

Soundings by: **Multibeam Echo Sounder**

Imagery by: **Side Scan Sonar Multibeam Echo Sounder Backscatter**

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

Table of Contents

A. Area Surveyed.....	1
A.1 Survey Limits.....	1
A.2 Survey Purpose.....	2
A.3 Survey Quality.....	2
A.4 Survey Coverage.....	3
A.5 Survey Statistics.....	4
B. Data Acquisition and Processing.....	5
B.1 Equipment and Vessels.....	5
B.1.1 Vessels.....	6
B.1.2 Equipment.....	7
B.2 Quality Control.....	7
B.2.1 Crosslines.....	7
B.2.2 Uncertainty.....	10
B.2.3 Junctions.....	10
B.2.4 Sonar QC Checks.....	12
B.2.5 Equipment Effectiveness.....	12
B.2.6 Factors Affecting Soundings.....	12
B.2.7 Sound Speed Methods.....	12
B.2.8 Coverage Equipment and Methods.....	12
B.2.9 Gaps in along-track MBES Coverage.....	12
B.3 Echo Sounding Corrections.....	13
B.3.1 Corrections to Echo Soundings.....	13
B.3.2 Calibrations.....	13
B.4 Backscatter.....	13
B.5 Data Processing.....	13
B.5.1 Software Updates.....	13
B.5.2 Surfaces.....	14
C. Vertical and Horizontal Control.....	15
C.1 Vertical Control.....	15
C.2 Horizontal Control.....	15
D. Results and Recommendations.....	16
D.1 Chart Comparison.....	16
D.1.1 Raster Charts.....	16
D.1.2 Electronic Navigational Charts.....	17
D.1.3 AWOIS Items.....	18
D.1.4 Maritime Boundary Points.....	18
D.1.5 Charted Features.....	18
D.1.6 Uncharted Features.....	18
D.1.7 Dangers to Navigation.....	19
D.1.8 Shoal and Hazardous Features.....	19
D.1.9 Channels.....	20
D.1.10 Bottom Samples.....	20
D.2 Additional Results.....	20

D.2.1 Shoreline.....	20
D.2.2 Prior Surveys.....	21
D.2.3 Aids to Navigation.....	21
D.2.4 Overhead Features.....	21
D.2.5 Submarine Features.....	22
D.2.6 Ferry Routes and Terminals.....	22
D.2.7 Platforms.....	22
D.2.8 Significant Features.....	22
D.2.9 Construction and Dredging.....	22
D.2.10 New Survey Recommendation.....	22
D.2.11 Recommendation for priority processing.....	22
D.2.12 Inset Recommendation.....	23
E. Approval Sheet.....	24
F. Table of Acronyms.....	25

List of Tables

Table 1: Survey Limits.....	1
Table 2: Hydrographic Survey Statistics.....	4
Table 3: Dates of Hydrography.....	5
Table 4: Vessels Used.....	6
Table 5: Major Systems Used.....	7
Table 6: Junctioning Surveys.....	11
Table 7: Submitted Surfaces.....	14
Table 8: NWLON Tide Stations.....	15
Table 9: Tide Correctors (.zdf or .tc).....	15
Table 10: USCG DGPS Stations.....	16
Table 11: Largest Scale Raster Charts.....	16
Table 12: Largest Scale ENCs.....	17
Table 13: DTON Reports.....	19

List of Figures

Figure 1: Area Surveyed.....	2
Figure 2: Coverage Graphic.....	3
Figure 3: S3002.....	6
Figure 4: Crosslines.....	8
Figure 5: Beam-by-beam Standard Deviation.....	9
Figure 6: Beam-by-beam Mean Difference.....	9
Figure 7: Surface statistics of Mainscheme/Crossline Difference Surface.....	10
Figure 8: H11361.....	11
Figure 9: H12012.....	11
Figure 10: H12013.....	12
Figure 11: Shoreline Features.....	21

Descriptive Report to Accompany Survey H12508

Project: OPR-B370-NRT5-13

Locality: North Shore of Long Island Sound

Sublocality: Saybrook Outer Bar to Salt Works Bay

Scale: 1:10000

July 2013 - May 2014

Navigation Response Team 5

Chief of Party: Andrew Clos LTJG

A. Area Surveyed

The survey extends from Saybrook Outer Bar to Saltworks Bay, and to just south of Long Sand Shoal. In addition, as part of a Dton investigation, the entire length of Long Sand Shoal was developed out to the 30 ft contour on the western end, and the 18 ft contour on the eastern end.

A.1 Survey Limits

Data were acquired within the following survey limits:

Northwest Limit	Southeast Limit
41° 16' 23.03" N 72° 28' 36.14" W	41° 13' 1.86" N 72° 19' 7.45" W

Table 1: Survey Limits

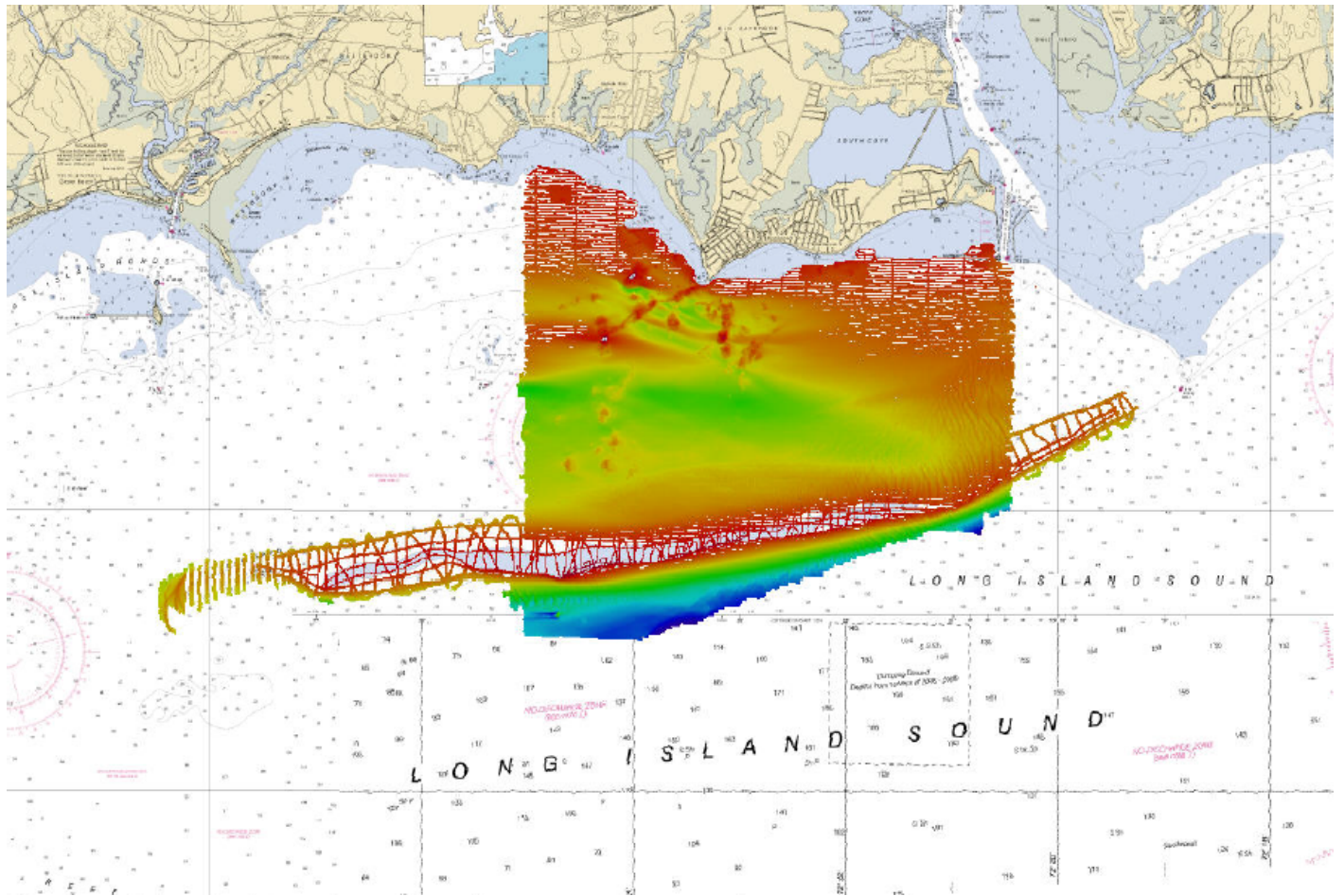


Figure 1: Area Surveyed

During data acquisition it was discovered that Long Sand Shoal had shifted significantly from what was depicted on the chart. In some places depths had changed by over 30 ft. Long Sand Shoal extends past both the west and east limits of the survey sheet. The entire shoal was developed, and submitted as a Dton.

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.

A.4 Survey Coverage

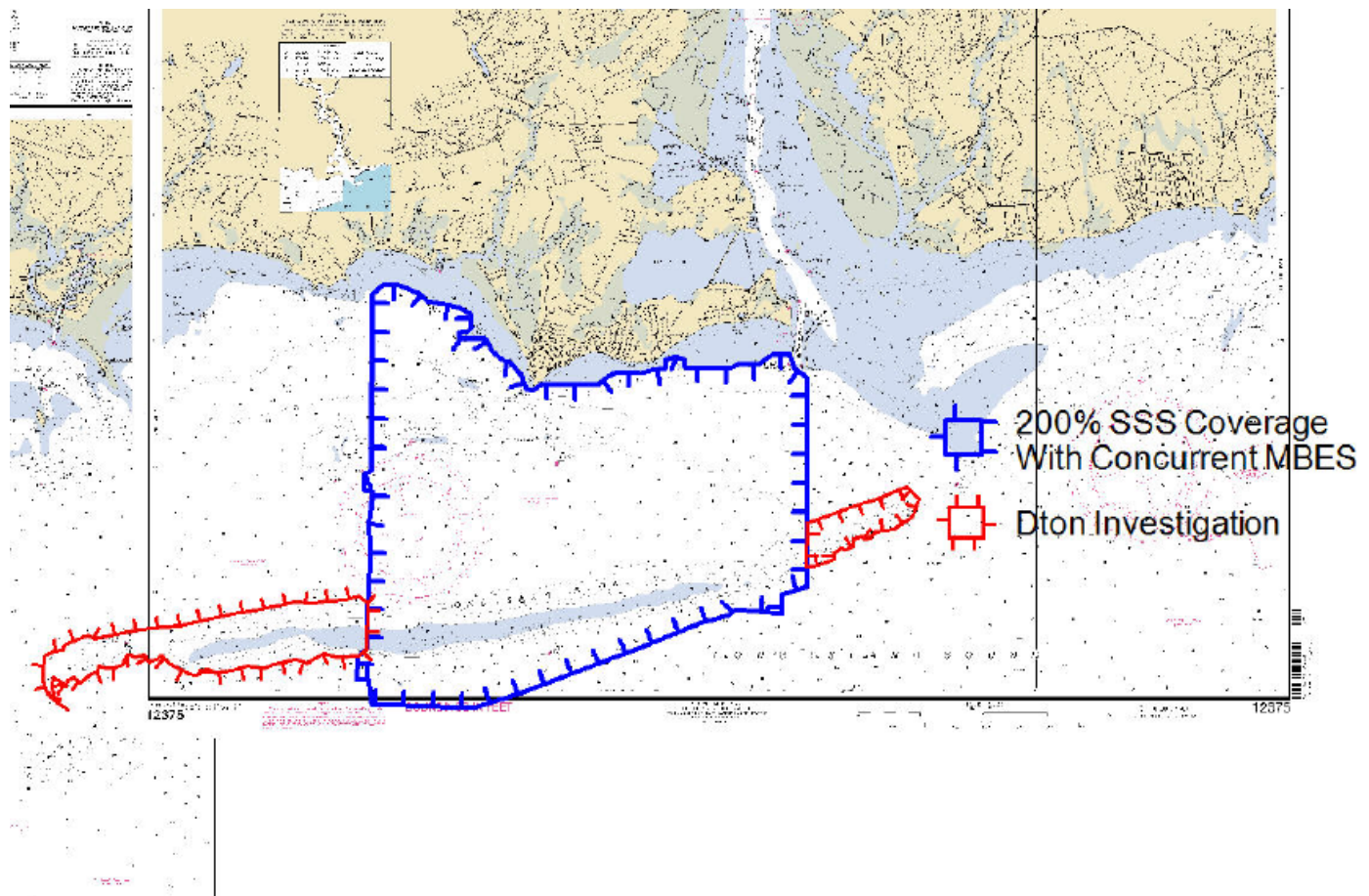


Figure 2: Coverage Graphic

The portions of Long Sand shoal lying outside the sheet boundaries were developed as part of a Dton investigation. Because of the shallow depth, and large extent of the shoal, it was not practical to develop the shoal to Object Detection Standards. MBES lines were run perpendicular to the shoal to develop the general locations of the contours. The line spacing chosen by the hydrographer was felt to be adequate to delineate the hazards of the shoal for the purpose of the Dton report, but was not intended to meet any HSSD coverage specification.

Inside the sheet boundaries, the planned 200% SSS with concurrent MBES lines were acquired over part of the shoal, however, in some areas it was felt unsafe to proceed further with the towfish, so there are some gaps in coverage within the survey limits.

A.5 Survey Statistics

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

	HULL ID	<i>S3002</i>	<i>Total</i>
LNM	SBES Mainscheme	0	0
	MBES Mainscheme	0	0
	Lidar Mainscheme	0	0
	SSS Mainscheme	0	0
	SBES/SSS Mainscheme	0	0
	MBES/SSS Mainscheme	433.23	433.23
	SBES/MBES Crosslines	27.79	27.79
	Lidar Crosslines	0	0
Number of Bottom Samples			21
Number of AWOIS Items Investigated			1
Number Maritime Boundary Points Investigated			0
Number of DPs			0
Number of Items Investigated by Dive Ops			0
Total SNM			9.87

Table 2: Hydrographic Survey Statistics

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

Survey Dates	Day of the Year
07/30/2013	211
07/31/2013	212
08/05/2013	217
08/06/2013	218
08/12/2013	224
08/13/2013	225
08/19/2013	231
08/21/2013	233
08/28/2013	240
09/03/2013	246
09/04/2013	247
09/09/2013	252
09/16/2013	259
09/18/2013	261
09/20/2013	263
11/20/2013	324
05/29/2014	149

Table 3: Dates of Hydrography

382.95 LNM of Mainscheme MS MBES/SSS Combo, 33.82 LNM of MBES/SBES Crosslines and 137.31 LNM of Mainscheme MBES (developments) were calculated during office processing. Crosslines totaled 8.8% of mainscheme.

B. Data Acquisition and Processing

B.1 Equipment and Vessels

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

B.1.1 Vessels

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

Hull ID	<i>S3002</i>
LOA	30 feet
Draft	1 meters

Table 4: Vessels Used



Figure 3: S3002

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
Trimble	DSM 212	Positioning System
Kongsberg	EM3002	MBES
Edgetech	4125	SSS
Digibar	Digibar Pro	Sound Speed System
Seabird	19 Plus	Conductivity, Temperature, and Depth Sensor

Table 5: Major Systems Used

B.2 Quality Control

B.2.1 Crosslines

Crosslines acquired for this survey totaled 6% of mainscheme acquisition.

27.8 nautical miles of crosslines were acquired, which amounts to 6.4% of mainscheme mileage. The 8% required for set line spacing was not achieved because the crosslines were planned based on the planned mainscheme lines. During the course of the survey, however, many miles of developments were acquired which caused the percentage to fall below the target of 8%. Overall, the mainscheme/crossline agreement is good, however, there are some intersections that have a noticeable vertical shift. The crossline/mainscheme agreement was evaluated by creating a base surface using mainscheme lines only. A Caris QC report was then generated, comparing the crossline data to the reference surface. Beam-by-beam statistics were computed. The standard deviation of the crosslines beams with respect to the mainscheme reference surface shows the expected curve, with standard deviation increasing as the beams move away from nadir. The standard deviations indicate that the sounding TVU fall well within IHO Order 1a uncertainty requirements. A plot of the beam-by-beam mean values shows an even scattering around a zero mean, except for an increasing trend in the outer beams on the starboard side. The reason for this is not known, however, the largest deviation is less than three centimeters. Additionally, a difference surface was created between the mainscheme-only surface, and the crossline-only surface. The Caris surface statistics tool was used, and showed the difference surface had a mean value of 0.0, and a standard deviation of .11 meters. Overall, the crossline analysis indicates good data quality, and vertical sounding uncertainty falling well within IHO order 1a requirements.

Some of the crossline/mainscheme junctions show a vertical offset up to around 15 cm. Analysis of the data suggests that these are tide artifacts. Offsets of similar magnitude can be seen between adjacent mainscheme lines that were collected on different days. It is possible that there are local dynamic tidal effects caused by the presence of Long Sand Shoal that are not adequately modeled in the TCARI grid. Local wind setup not measured by the controlling tide gauges is another possible cause.

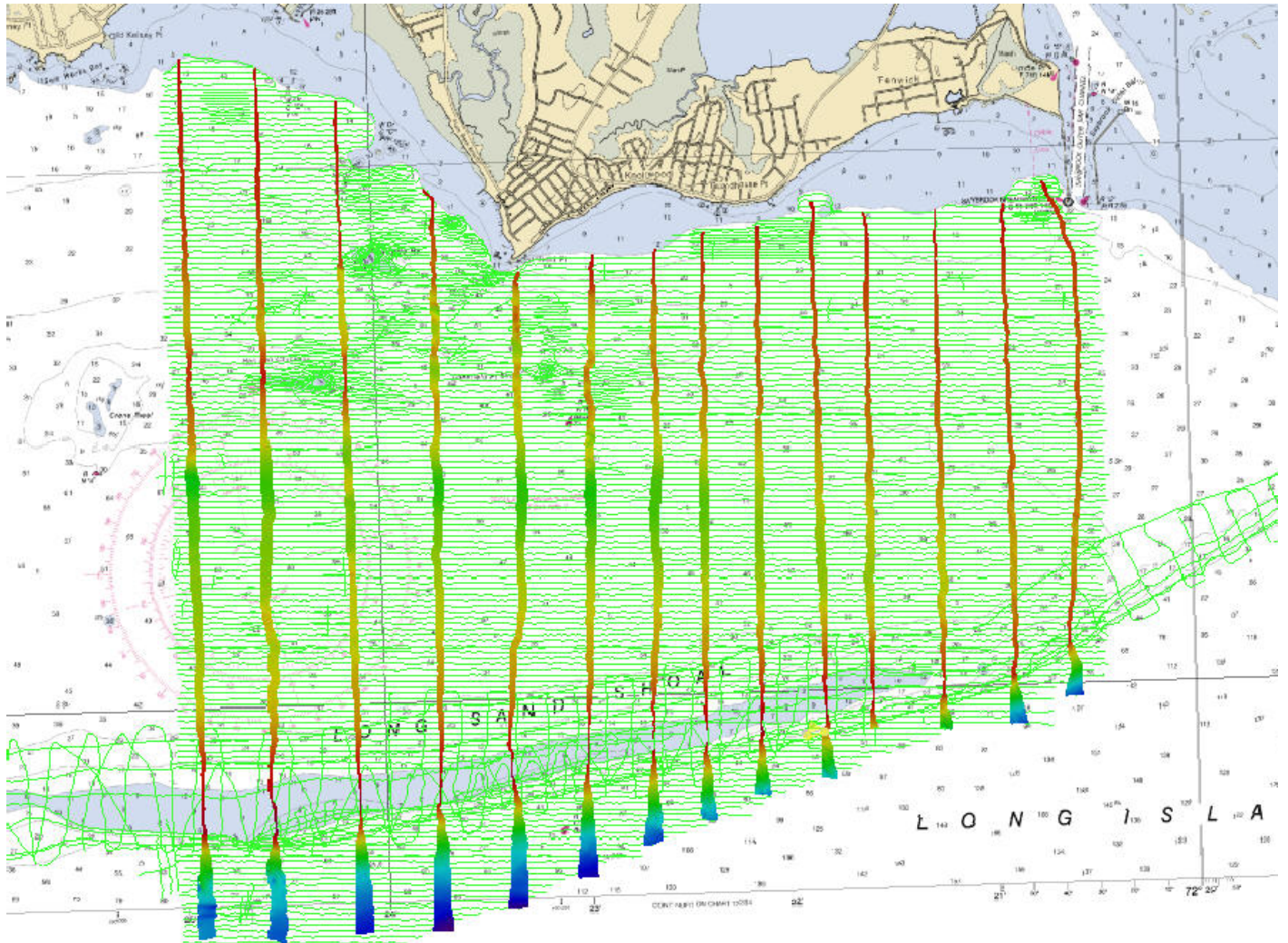


Figure 4: Crosslines

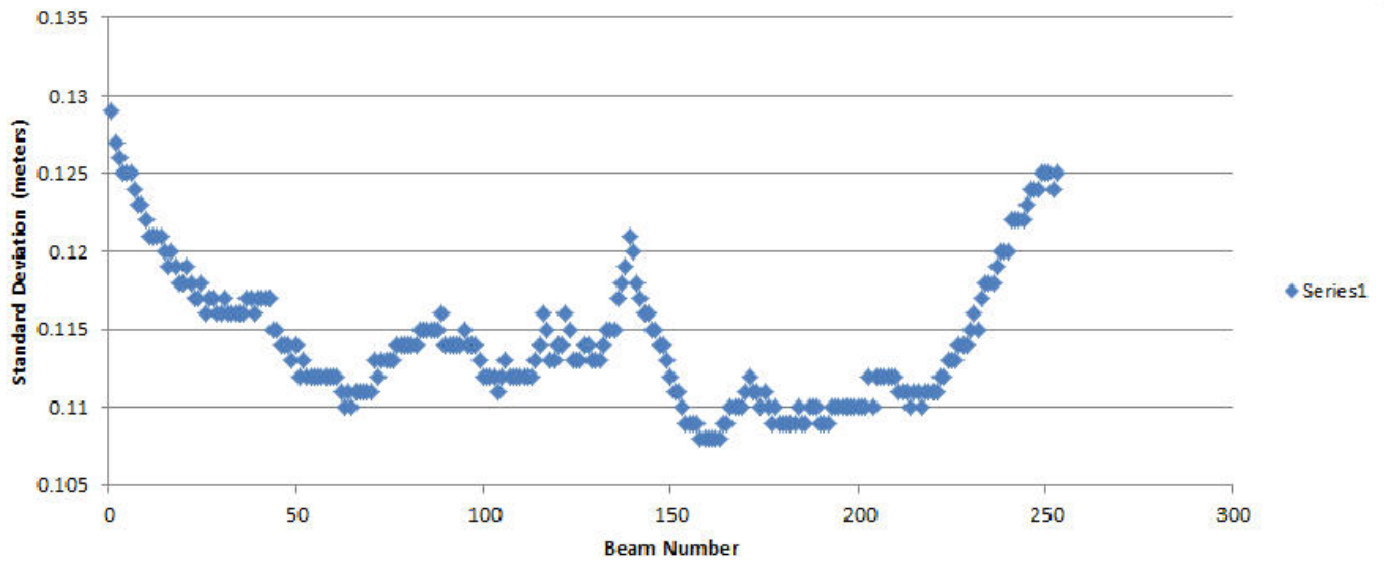


Figure 5: Beam-by-beam Standard Deviation

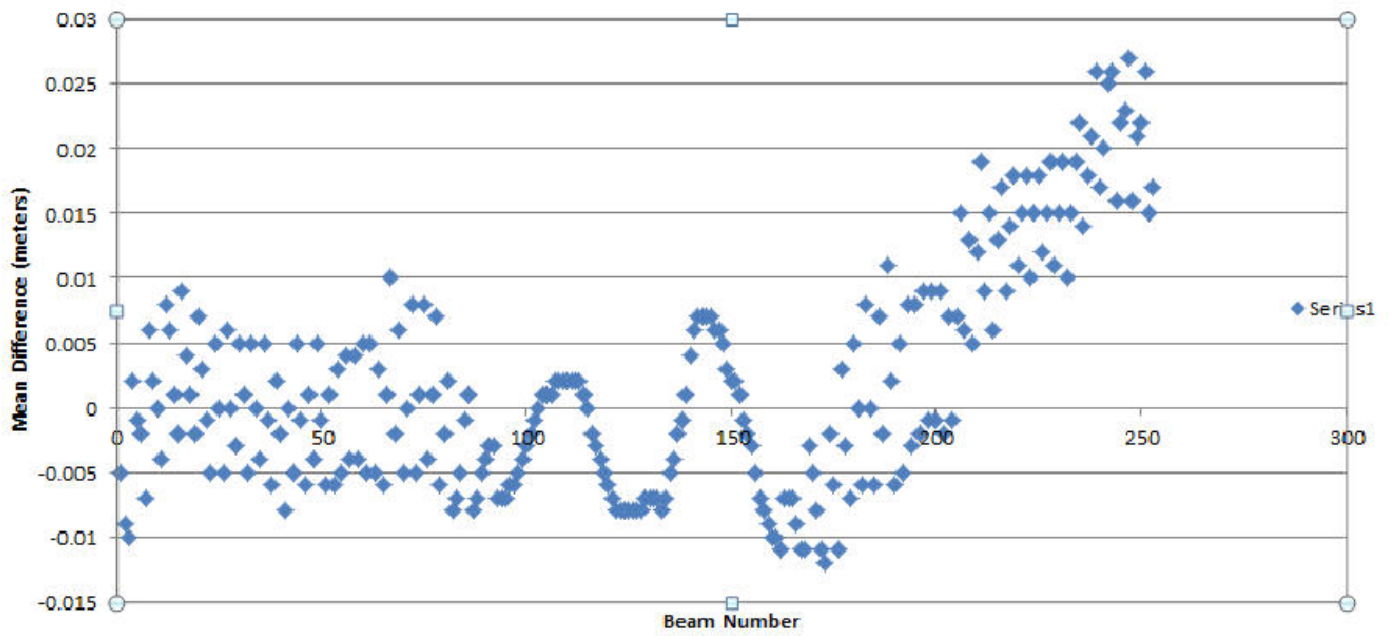


Figure 6: Beam-by-beam Mean Difference

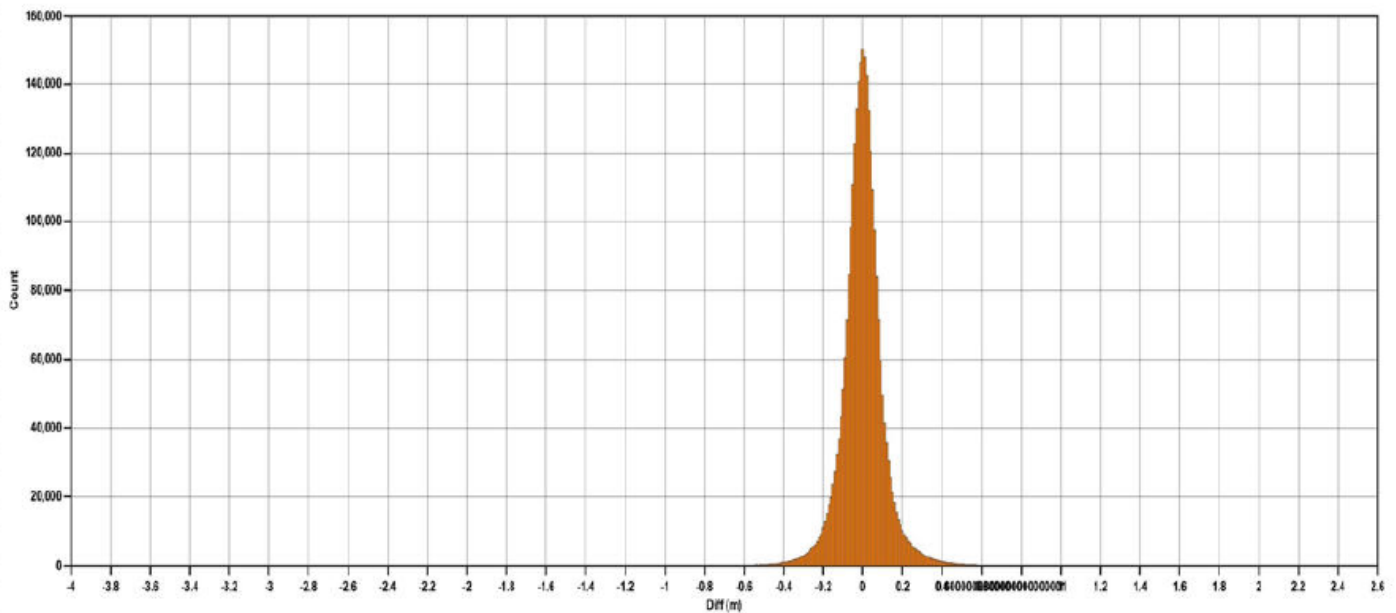


Figure 7: Surface statistics of Mainscheme/Crossline Difference Surface.

Crosslines totaled 8.8% of the mainscheme lines, which meets the 8% requirement for set line spacing multibeam. The crosslines obtained have excellent geographic distribution and compared favorably to the mainscheme lines with differences falling within vertical error budgets. NOAA does not use IHO uncertainty standards. Where the field references IHO standards, the statement should be amended to read "TVU falls within NOAA's "Complete Coverage" vertical uncertainty budgets as assigned for this survey."

B.2.2 Uncertainty

An IHO layer was created for the CUBE surfaces to highlight nodes where the IHO TVU was exceeded. For all surfaces, less than 1% of nodes failed to meet IHO Order 1a TVU requirements.

B.2.3 Junctions

BAGs from the most recent adjacent surveys were downloaded from NGDC. Difference surfaces were created, and statistics were computed using the Caris "Compute Statistics" tool. The results of each comparison are discussed below.

The following junctions were made with this survey:

Registry Number	Scale	Year	Field Unit	Relative Location
H11361	1:10000	2004	NOAA Ship THOMAS JEFFERSON	SW
H12012	1:10000	2009	NOAA Ship THOMAS JEFFERSON	S
H12013	1:10000	2009	NOAA Ship THOMAS JEFFERSON	E

Table 6: Junctioning Surveys

H11361

Data agreement was best for H11361, although it was the oldest survey junction analyzed. The mean difference was less than 1 cm, with a standard deviation of 20 cm. The good agreement is likely due the area being deeper, and less dynamic. The other two junctions are in dynamic areas with significant sand wave formations, which makes a meaningful comparison difficult.

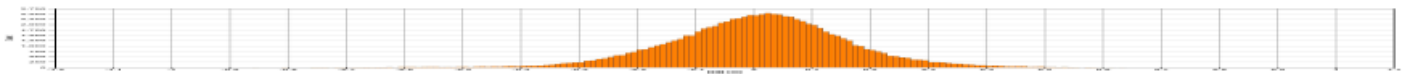


Figure 8: H11361

H12012

The mean difference between H12508 and H12012 in the area of overlap is .1 meters. The standard deviation is .6 meters. There are extensive sandwaves in this area, making a meaningful comparison difficult. Significant sandwave movement was observed within the time span of data acquisition for H12508.

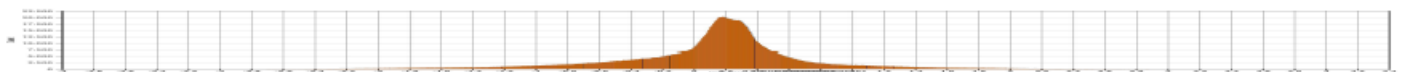


Figure 9: H12012

H12013

The mean difference between H12508 and H12013 in the area of overlap is .2 meters. The standard deviation is .8 meters. There are extensive sandwaves in this area, making a meaningful comparison difficult. Significant sandwave movement was observed within the time span of data acquisition for H12508.

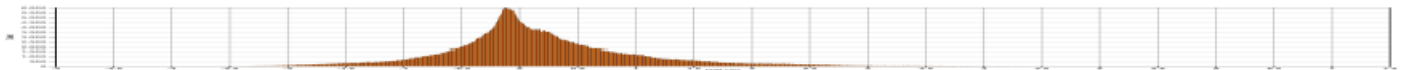


Figure 10: H12013

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

There were no other factors that affected corrections to soundings.

B.2.7 Sound Speed Methods

Sound Speed Cast Frequency: SVP casts were typically taken every two hours in the deepest area being surveyed at the time.

B.2.8 Coverage Equipment and Methods

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

The static offsets from the RP to the transducer in the DAPR don't match the HVF. The X and Y offset values are reversed from what is shown in the HVF (both in SVP 1 and TPU Offsets) and the Z value is listed as negative in the DAPR, but positive for all entries in the HVF. The dynamic draft table reported in the DAPR is from 2012 and does not match any of the latest speed or draft values in the HVF which are from 2013 DN 176. Also, the values reported in the DAPR don't match any of the other entries in the HVF which date back to 2008. The data quality does not appear to be affected by these inconsistencies, which appear to be simple documentation errors.

B.2.9 Gaps in along-track MBES Coverage.

After MBES acquisition was complete, it was noticed there several small along-track holidays existed in the MBES data. After some analysis, it was determined that the gaps were caused by the SIS acquisition software automatically breaking, and beginning a new file mid-line. It appears that the file size was limited

to 30 minutes of acquisition. When this was exceeded, SIS would end the file and create a new file. During the transition, a few seconds of data were lost, resulting in a holiday. This limit seemed to be related to acquisition time, rather than file size. All of these holidays fall within continuous 200% SSS coverage, and after review, the hydrograher is confident no significant features were missed.

B.3 Echo Sounding Corrections

B.3.1 Corrections to Echo Soundings

Problems were encountered with the logging and application of TrueHeave files. Due to frequent crashing of the acquisition computer, and consequently the TrueHeave file logging being cut short, it was not possible to apply TrueHeave to several MBES lines. Realtime heave was used for these lines instead. The files affected are listed below:

0038_20130730_202515_S3002.all
0095_20130805_161722_S3002.all
0099_20130805_182659_S3002.all
0099_20130805_175953_S3002.all
0218_20130819_200537_S3002.all
0286_20130903_153248_S3002.all

B.3.2 Calibrations

All sounding systems were calibrated as detailed in the DAPR.

B.4 Backscatter

Raw Backscatter was logged as part of the Kongsberg .all file. The backcatter was converted, and a mosaic was created as a QC check, but no additional processing was performed.

B.5 Data Processing

B.5.1 Software Updates

There were no software configuration changes after the DAPR was submitted.

The following Feature Object Catalog was used: NOAA Profile V_5_3

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
H12508_1m	CUBE	1 meters	-	NOAA_1m	MBES TracklineSBES Set Line Spacing
H12508_1m_Final	CUBE	1 meters	0 meters - 20 meters	NOAA_1m	MBES TracklineSBES Set Line Spacing
H12508_2m	CUBE	2 meters	-	NOAA_2m	MBES TracklineSBES Set Line Spacing
H12508_2m_Final	CUBE	2 meters	18 meters - 40 meters	NOAA_2m	MBES TracklineSBES Set Line Spacing
H12508_50cm	CUBE	0.5 meters	-	NOAA_0.5m	MBES TracklineSBES Set Line Spacing
H12508_SSS_Mosaic_100	SSS Mosaic	1 meters	-	N/A	100% SSS
H12508_SSS_Mosaic_200	SSS Mosaic	1 meters	-	N/A	200% SSS

Table 7: Submitted Surfaces

Per HSSD 5.2.2.3, only a four meter grid is required, however, the sounding density easily supports Complete Coverage gridding requirements. Therefore, one and two meter surfaces are being submitted. A 50 cm grid, H12508_50cm, is also being submitted, but is not intended to fulfill any submission requirement.

The 50cm grid was required for the AWOIS investigation as stated in the Project Instructions.

C. Vertical and Horizontal Control

No HorCon or VerCon operations were required for this survey.

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	8461490
New Haven	8465705

Table 8: NWLON Tide Stations

There was no Water Level file associated with this survey.

File Name	Status
B370NRT52013.tc	Final

Table 9: Tide Correctors (.zdf or .tc)

A request for final approved tides was sent to N/OPS1 on 06/30/2014. The final tide note was received on 07/17/2014.

The Tide Note is attached.

C.2 Horizontal Control

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

The projection used for this project is Universal Transverse Mercator(UTM) - Zone 18.

The Moriches, NY beacon was manually selected in the Trimble DSM212, it was not changed during the project.

The following DGPS Stations were used for horizontal control:

DGPS Stations
Moriches, NY 293 kHz

Table 10: USCG DGPS Stations

D. Results and Recommendations

D.1 Chart Comparison

The chart comparisons were performed using multiple methods. For each charted contour, the base surface generated by the survey was filtered to only show areas shallower than that contour. Doing so highlights areas where contours have shifted significantly, and isolated shoals. Shoal biased selected sounding layers were also created, and carefully compared to charted soundings to identify areas with depths that would be unexpected by the mariner based on charted depths.

D.1.1 Raster Charts

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

Chart	Scale	Edition	Edition Date	LNLM Date	NM Date
12374	1:20000	1	09/2007	01/28/2014	02/01/2014
12375	1:20000	1	10/2010	01/28/2014	02/08/2014

Table 11: Largest Scale Raster Charts

12374

The only survey data lying within the bounds of chart 12374 are the western portions of the Long Sand Shoal Dton investigation. Long Sand Shoal had shifted, resulting in significant disagreement with charted soundings. There were depths of less than 25 ft, 150 meters seaward of the charted 30 ft contour. There are discrepancies of similar magnitude with the 18 ft contour. At the time of this chart comparison, however, the data from the Dton investigation had been applied to the chart, so the discrepancies do not exist in the most recent chart version.

12375

Long Sand Shoal is one of the most prominent features on chart 12375. During the course of the survey the shoal was found to have shifted significantly, especially in the western portions. The entire shoal was developed out to the 30 ft contour, and submitted as a DTON. The most current version of chart 12375 has had the DTON survey data applied, but only in the western portion of Long Sand Shoal. West of 72-22-23.03W, the contours and soundings are based on the new survey data, and so agree almost perfectly. East of 72-22-23.03W where the discrepancies were not as large, however, the chart does not appear to have been updated. Here the survey data shows that the contours have shifted seaward up to 60 meters in some places.

On the western portion of the survey area, between Long Sand Shoal and the Hen and Chickens, there are several uncharted rocky shoals with depths significantly shoaler than the charted depths. Two of the most navigationally significant shoals were submitted as DTONs, and have already been applied to the chart, but there are several others that deserve attention. They are discussed in the Shoals and Hazardous Features section.

A very small area in the southern portion of the survey also falls on Chart 12372_11, Scale 1:40,000. Three additional shoals and one submerged rock were submitted as DTONs during the Office processing.

D.1.2 Electronic Navigational Charts

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

ENC	Scale	Edition	Update Application Date	Issue Date	Preliminary?
US5CN16M	1:20000	8	10/03/2013	10/03/2013	NO
US5CN30M	1:20000	11	01/27/2014	01/27/2014	NO

Table 12: Largest Scale ENC's

US5CN16M

Comparing US5CN16M to raster chart 12374, it was noticed that there are some discrepancies in the placement of depth contours around the western end of Long Sand Shoal. Although, the contours and depths appear to have been updated to include the submitted DTON, there are some small deviations from the raster.

US5CN30M

US5CN30M was compared to the raster chart 12375. Aside from some very slight differences in contour position, no discrepancies were found.

A very small area in the southern portion of the survey also falls on ENC US5CN20M, Scale 1:40,000.

D.1.3 AWOIS Items

A single AWOIS item, # 6818, was assigned inside the survey area - The wreck of the James Sheridan. The wreck was fully developed with MBES. The charted position of the wreck is accurate. The least depth measured by the current survey was slightly deeper than the charted depth of the wreck, so it is recommend to retain the wreck as it is presently charted.

The wreck position was updated to the surveyed position; however the charted least depth was retained.

D.1.4 Maritime Boundary Points

No Maritime Boundary Points were assigned for this survey.

D.1.5 Charted Features

A Position Approximate wreck is charted at 41-13-54.244N, 72-20-53.625W. The area surrounding the charted position of the wreck was developed with MBES. No signs of the wreck were visible in the MBES data. It is recommended for deletion.

D.1.6 Uncharted Features

Within the survey area, one wreck, two submerged rocks, and one obstruction were recommended for charting.

There is an uncharted wreck at 41-15-43.377N, 72-20-41.016W near the entrance to Saybrook Outer Bar Channel. Possibly a sunken barge.

The two submerged rocks were submitted as Dtons.

One pile-like obstruction was recommended for charting at 41-13-45.219N, 72-22-37.481W.

Note:

This survey area contains numerous uncharted rocks and rocky shoals that meet the HSSD criteria for significant features. The Pacific Hydrographic Branch was consulted, and at their direction no natural features, including significant rocks and rocky shoals, were included in the Final Features File. Every significant feature was carefully reviewed to ensure that it was adequately developed, and that its least depth was accurately represented in the BASE surface. However, only features appearing to be man made obstructions, or those which were determined to be Dtons, were recommended for charting, and included in the Final Features File.

D.1.7 Dangers to Navigation

The following DTON reports were submitted to the processing branch:

DTON Report Name	Date Submitted
H12508_Dton_1	2013-08-26
H12508_Dton_2	2014-01-14

Table 13: DTON Reports

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

Three additional shoals and one submerged rock were submitted as DTONs during office review. The DTON Report is attached.

D.1.8 Shoal and Hazardous Features

On the western portion of the survey area, between Long Sand Shoal and the Hen and Chickens, there are several uncharted rocky shoals with depths significantly shoaler than the charted depths. Two of the most navigationally significant shoals were submitted as Dtons, and have already been applied to the chart, but there are several others that deserve attention:

At 41-14-18.49N, 72-24-37.49W, there is an uncharted rocky shoal with a least depth of 27 ft under a charted 32 ft sounding.

At 41-14-19.71N, 72-24-15.30W, there is an uncharted rocky shoal with a least depth of 28 ft under a charted 36 ft sounding.

At 41-14-41.61N, 72-24-16.59W, there is an uncharted rocky shoal with a least depth of 30 ft under a charted 38 ft sounding.

Between the Hen and Chickens and Halftide Rock, there are several uncharted rocky shoals:

At 41-15-31.08N, 72-24-22.44W, there is an uncharted rocky shoal with a least depth of 22 ft near a charted 37 ft sounding.

At 41-15-29.71N, 72-24-31.83W, there is an uncharted rocky shoal with a least depth of 26 ft seaward of the 30 ft contour. The closest charted sounding is 33 ft.

At 41-15-26.06N, 72-24-41.27W, there is an uncharted rocky shoal with a least depth of 29 ft, seaward of the 30 ft contour, and near a charted 34 ft sounding.

At 41-15-19.97N, 72-24-18.72W, there is an uncharted rocky shoal with a least depth of 15 ft 120 meters seaward of the 18 ft curve.

On the north side of Halftide Rock the contours do not accurately depict the shoal. Rocky shoaling with a least depth of 8 ft extends 50 meters seaward of the 18 ft curve.

Between Cornfield Pt Shoal and red buoy "2", there is a charted shoal, with least depth of 29 ft. The surveyed least depth on this shoal is 18 ft.

At 41-15-21.87N 72-22-40.90W, there is an uncharted rocky shoal with a least depth of 24 ft seaward of the 30 ft contour.

Southeast of Old Kelsey Pt, there is an uncharted submerged rock with a least depth of 11 ft near a charted 15 ft sounding.

D.1.9 Channels

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

D.1.10 Bottom Samples

Twenty-one bottom samples were acquired during the survey. The samples were taken with a clamshell style bottom sampler. The bottom type samples were classified, photographed, and then discarded back into the water. The positions of the samples were captured with Hypack targets.

D.2 Additional Results

D.2.1 Shoreline

Two assigned shoreline features exist within the survey limits, Hen and Chickens Rock, and Halftide Rock. MBES was acquired around the exposed rocks as close as was considered safe. No Detached Positions were taken. The positions of both rocks are accurately charted.

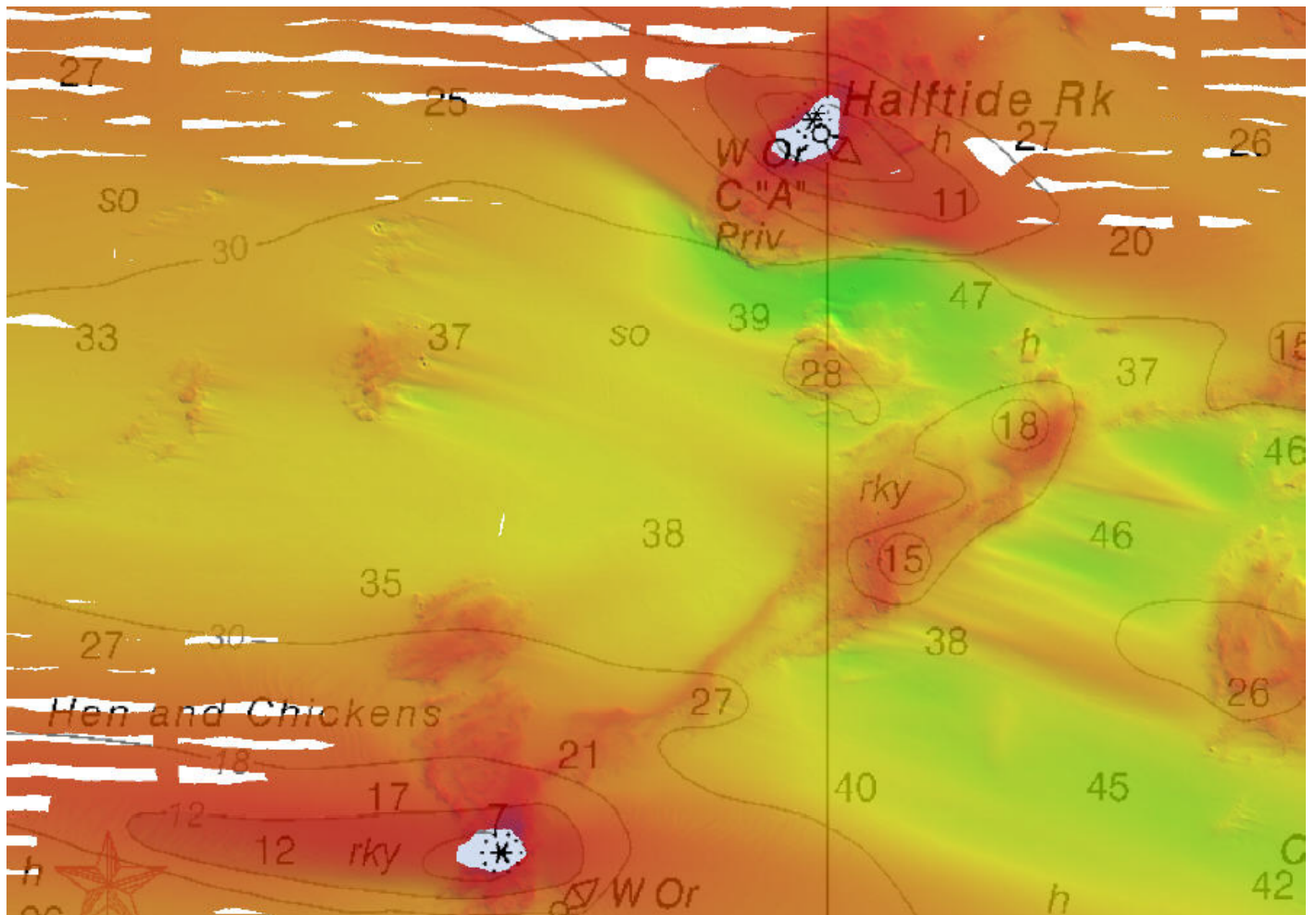


Figure 11: Shoreline Features

There were three assigned features in the survey limits. The AWOIS item discussed in Section D.1.3 is the third.

D.2.2 Prior Surveys

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

D.2.3 Aids to Navigation

All Atons in the survey area appear to be on station, and serving their intended purpose.

D.2.4 Overhead Features

No overhead features exist for this survey.

D.2.5 Submarine Features

No submarine features exist for this survey.

D.2.6 Ferry Routes and Terminals

A ferry route exists between Saybrook Point in Old Saybrook, and Plum Island, but was not investigated.

D.2.7 Platforms

No platforms exist for this survey.

D.2.8 Significant Features

Sand waves are a prominent feature in this survey area. Five meter high sandwaves exist in the southwest portion of the survey area, south of Long Sand Shoal. Smaller sandwaves exist north of the shoal. It is interesting to note that the direction of sandwave propagation appears to change in different parts of the survey area. On the western portion of the survey area, north of Long Sand Shoal, the sand waves appear to be developing from a west-to-east current, and just south of Long Sand Shoal, the direction seems to reverse, the sandwaves appearing to be created by an east-to-west current. The sandwaves in the eastern portion of the survey area, north of Long Sand Shoal, have a symmetrical shape, and do not suggest a prevailing current direction. In some areas, the sandwaves appear to be propagating quickly. Movement of up to 10 meters can be seen by comparing survey lines acquired on different days.

Moderate tide artifacts were observed on some survey days. It is likely that Long Sand Shoal creates a tidal and current dynamic in the area that is not accounted for in the TCARI grid.

D.2.9 Construction and Dredging

No present or planned construction or dredging exist within the survey limits.

D.2.10 New Survey Recommendation

No new surveys or further investigations are recommended for this area.

D.2.11 Recommendation for priority processing

Although the most dangerous and navigationally significant features have been submitted as Dtons, many more uncharted shoals and chart discrepancies exist within the survey area. The hydrographer recommends that this survey be given priority in the processing queue, to hasten the new survey data reaching the chart.

D.2.12 Inset Recommendation

No new insets are recommended for this area.

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, 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.

Report Name	Report Date Sent
Data Acquisition and Processing Report	2014-11-24
Coast Pilot Report	2014-11-24

Approver Name	Approver Title	Approval Date	Signature
LTJG Andrew Clos	Chief of Party	11/24/2014	

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 Station
CTD	Conductivity Temperature Depth
CEF	Chart Evaluation File
CSF	Composite Source File
CST	Chief Survey Technician
CUBE	Combined Uncertainty and Bathymetry Estimator
DAPR	Data Acquisition and Processing Report
DGPS	Differential Global Positioning System
DP	Detached Position
DR	Descriptive Report
DTON	Danger to Navigation
ENC	Electronic Navigational Chart
ERS	Ellipsoidal Referenced Survey
ERZT	Ellipsoidally Referenced Zoned Tides
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
TPE	Total Propagated Error
TPU	Topside Processing Unit
USACE	United States Army Corps of Engineers
USCG	United States Coast Guard
UTM	Universal Transverse Mercator
XO	Executive Officer
ZDA	Global Positioning System timing message
ZDF	Zone Definition File



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

PROVISIONAL TIDE NOTE FOR HYDROGRAPHIC SURVEY

DATE : July 14, 2014

HYDROGRAPHIC BRANCH: Pacific

HYDROGRAPHIC PROJECT: OPR-B370-NRT5-2014

HYDROGRAPHIC SHEET: H12508_REV

LOCALITY: Saybrook Outer Bar to Salt Works Bay, CT

TIME PERIOD: July 30, 2013 - May 29, 2014

TIDE STATION USED: 846-1490 New London, CT

Lat. 41° 21.6'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: 846-5705 New Haven, CT

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 "B370NRT52013.tc" as the final grid for project OPR-B370-NRT5-2013, H12508_REV, during the period between July 30, 2013 and May 29, 2014.

Refer to attachments for zoning 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).

Note 2: Annual leveling for New Haven, CT (846-5705) was not completed in FY13. A review of the verified leveling records from October 2002 - 2012 shows the tide station benchmark network to be stable within an allowable 0.009 m tolerance. This Tide Note may be used as final stability verification for survey OPR-B370-NRT5-2013, H12508_REV. CO-OPS will immediately provide a revised Tide Note should subsequent leveling records indicate any benchmark network stability movement beyond the allowable 0.009 m tolerance.

HOVIS.GERALD.T
HOMAS.136586
0250

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: 2014.07.17 14:03:56 -04'00'

CHIEF, PRODUCTS AND SERVICES BRANCH



**Preliminary as Final TCARI Grid for OPR-B370-NRT5-2013, H12508 (REVISED)
Saybrook Outer Bar to Salt Works Bay, Eastern Long Island Sound, CT**

8461490 NEW LONDON

8465705 NEW HAVEN



H12508 Dton Long Sand Shoal

Registry Number: H12508
State: Connecticut
Locality: North Shore of Long Island Sound
Sub-locality: Saybrook Outer Bar to Salt Works Bay
Project Number: S-B370-NRT5-12
Survey Dates: 08/12/2013 - 08/21/2013

Remarks:

During data acquisition for hydrographic survey H12508 significant discrepancies were observed between the survey data and the charted depths along large sections of Long Sand Shoal. In some places the current depths are more than 30 ft shoaler than charted, and the contours have shifted seaward by over 300 meters. The most significant discrepancies to the shoal are found west of $72^{\circ} 24.00' W$. Long Sand Shoal is a popular location for recreational fishing, and the presence of depths of less than four feet where the chart indicates depths of greater than 30 feet creates a significant hazard, even for small recreational fishing vessels.

Because of the large spatial extent of the shoal, it was not feasible to obtain complete bathymetric coverage. Instead, crosslines were run perpendicular to the shoal to reestablish the general location of the depth contours, and then development lines were run along the estimated 6, 12, 18, and 30 ft contours in an attempt to further develop them. A survey scale sounding plot was generated, and is included with this report. In addition, contour lines were digitized by hand along the 6, 12, 18, and 30 ft contours, taking into account NOAA rounding, and are also included.

Preliminary TCARI tides have been applied.

Hydrographer Recommendations:

Update contour lines and soundings to reflect current survey data.

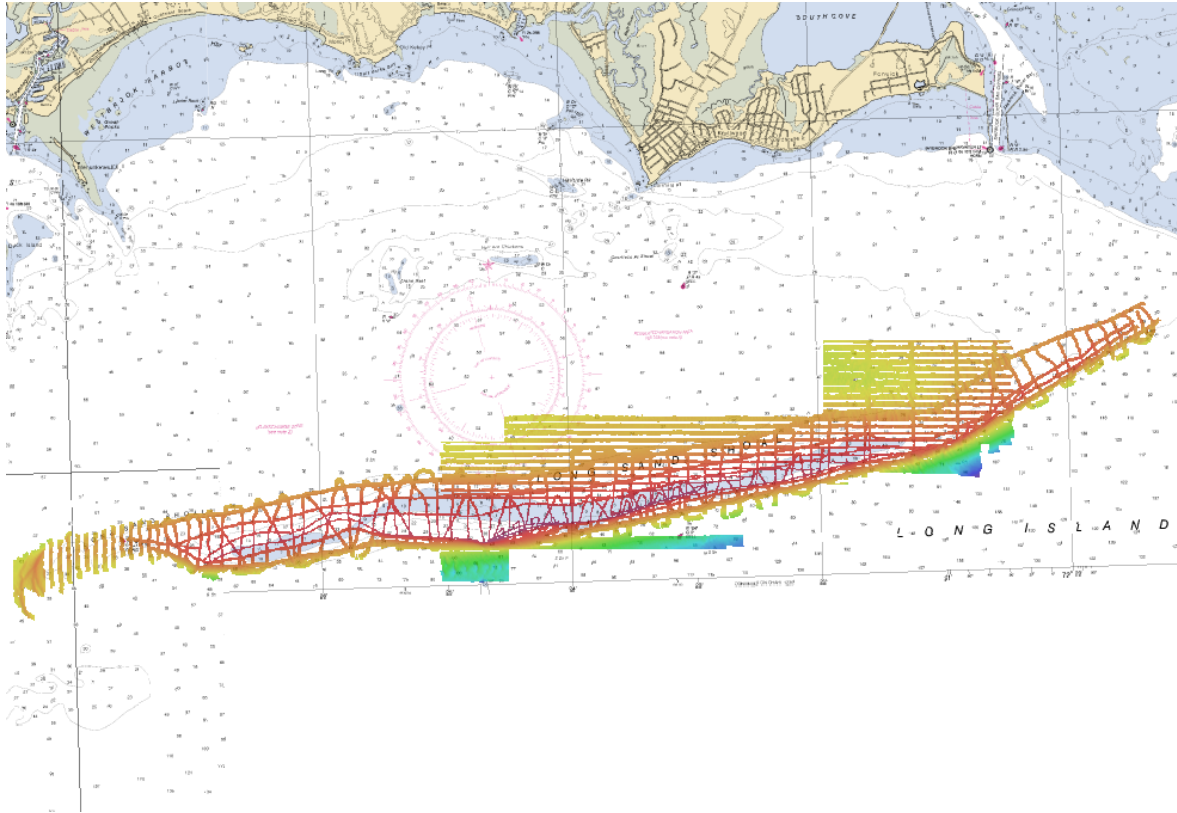


Figure 1: Long Sand Shoal

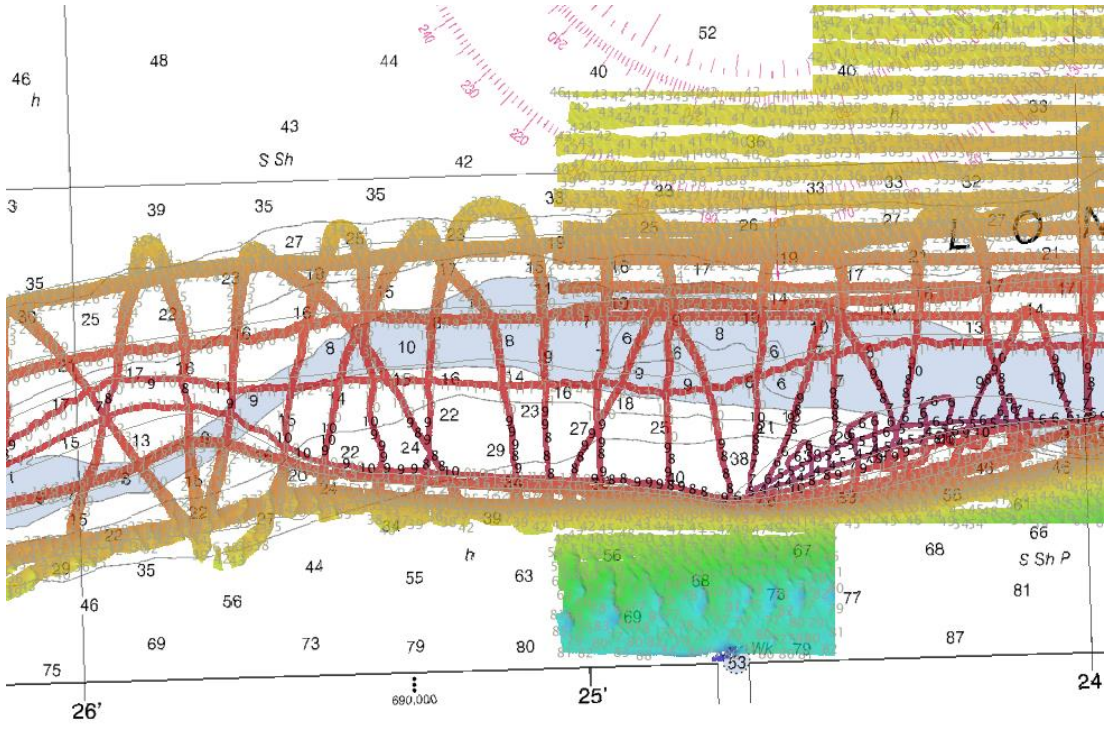


Figure 2: Area of greatest depth discrepancy.

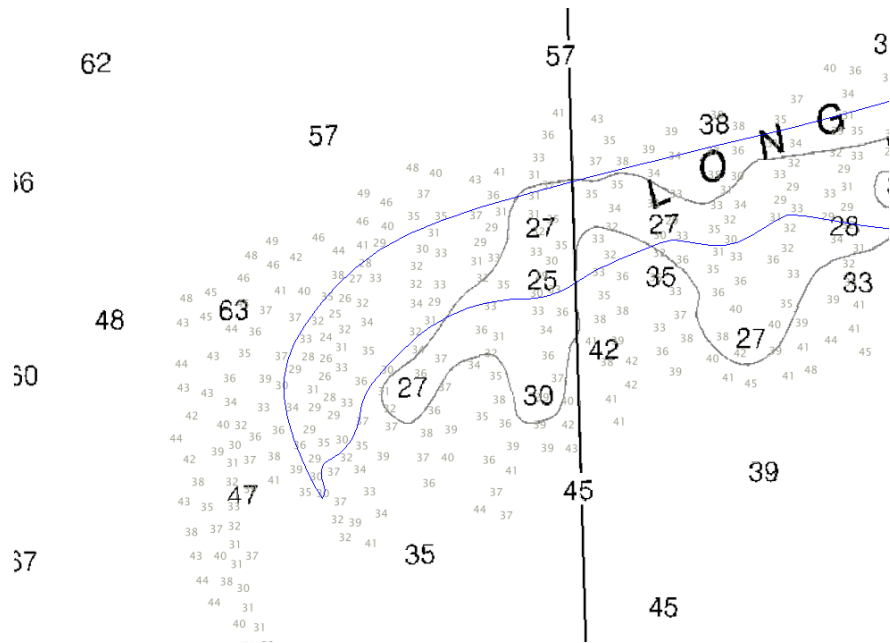


Figure 3: Western edge of 30 ft contour has migrated 150 meters to the west.

H12508 Dton Report

Registry Number: H12508
State: Connecticut
Locality: North Shore of Long Island Sound
Sub-locality: Saybrook Outer Bar to Salt Works Bay
Project Number: OPR-B370-NRT5-13
Survey Date: 09/19/2013

Charts Affected

Number	Edition	Date	Scale (RNC)	RNC Correction(s)*
12375	22nd	10/01/2010	1:20,000 (12375_1)	USCG LNM: 6/25/2013 (10/1/2013) CHS NTM: None (8/30/2013) NGA NTM: 4/24/1999 (10/12/2013)
12372	34th	11/01/2006	1:40,000 (12372_11)	[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.	Feature Type	Survey Depth	Survey Latitude	Survey Longitude	AWOIS Item
1.1	Rock	11.98 m	41° 14' 33.1" N	072° 24' 60.0" W	---
1.2	Rock	11.21 m	41° 14' 39.5" N	072° 24' 42.1" W	---

1 - Dangers To Navigation

1.1) Profile/Beam 301/139 / 0529_20130919_144737_s3002

DANGER TO NAVIGATION

Survey Summary

Survey Position: 41° 14' 33.1" N, 072° 24' 60.0" W
Least Depth: 11.98 m (= 39.31 ft = 6.552 fm = 6 fm 3.31 ft)
TPU ($\pm 1.96\sigma$): **THU (TPEh)** ± 1.970 m ; **TVU (TPEv)** ± 0.195 m
Timestamp: 2013-262.14:48:00.083 (09/19/2013)
Survey Line: h12508 / nrt5_s3002_em3002 / 2013-262 / 0529_20130919_144737_s3002
Profile/Beam: 301/139
Charts Affected: 12375_1, 12372_11, 12354_1, 12300_1, 13006_1, 5161_1, 13003_1

Remarks:

Uncharted submerged rock with a least depth of 39 ft in an area with charted depths greater than 50 ft. Developed with MBES. Final Tides have been applied.

Feature Correlation

Source	Feature	Range	Azimuth	Status
0529_20130919_144737_s3002	301/139	0.00	000.0	Primary
20130904173008	120182	20.78	113.1	Secondary (grouped)
20130904173008	120181	64.21	070.4	Secondary (grouped)

Hydrographer Recommendations

Chart submerged rock.

Cartographically-Rounded Depth (Affected Charts):

39ft (12375_1, 12372_11, 12354_1)

6 ½fm (12300_1, 13006_1, 13003_1)

12.0m (5161_1)

S-57 Data

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

Attributes: QUASOU - 1:depth known

SORDAT - 20131120

SORIND - US,US,graph,H12508

TECSOU - 3:found by multi-beam

VALSOU - 11.982 m

WATLEV - 3:always under water/submerged

Feature Images

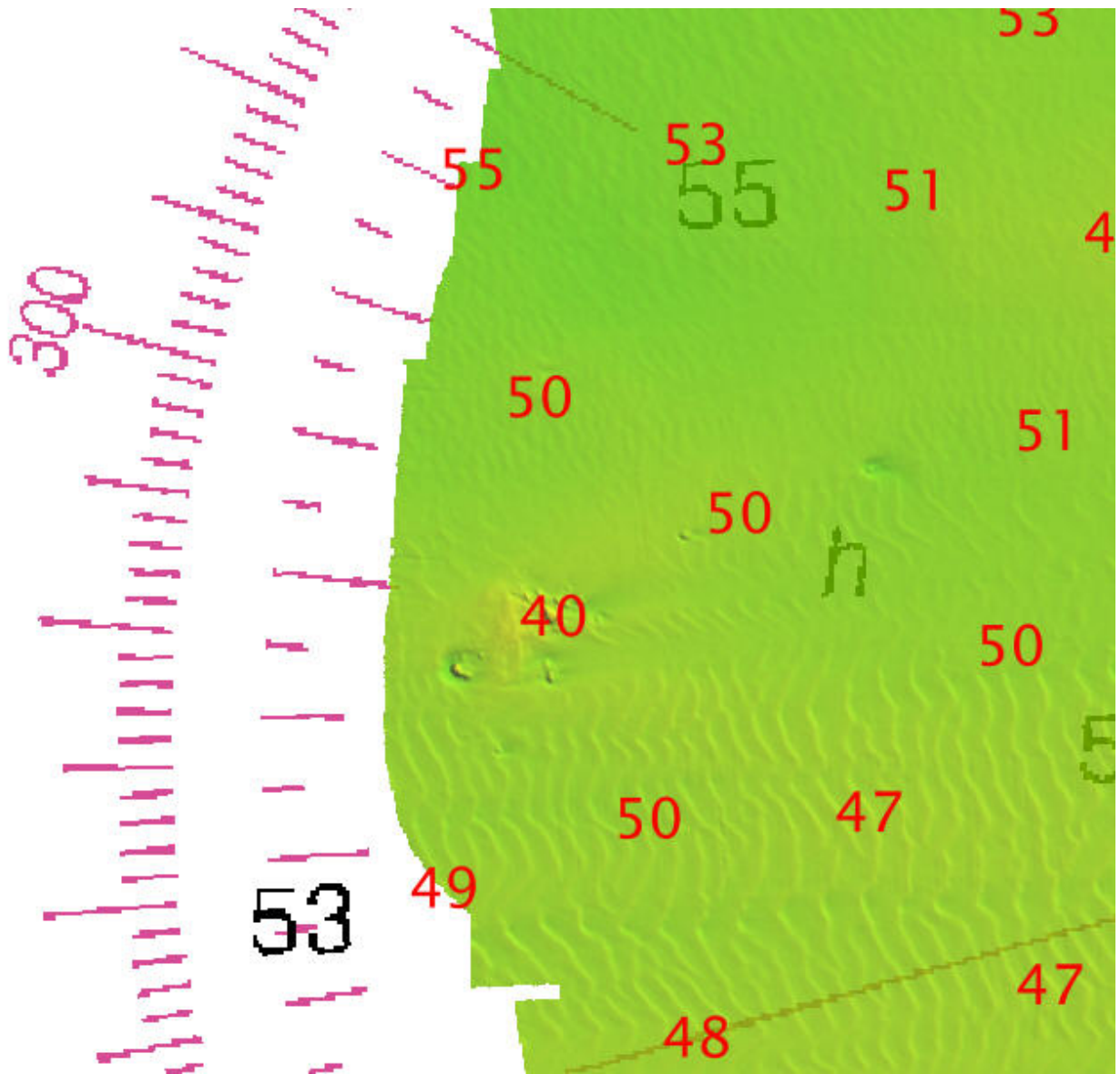


Figure 1.1.1



Figure 1.1.2

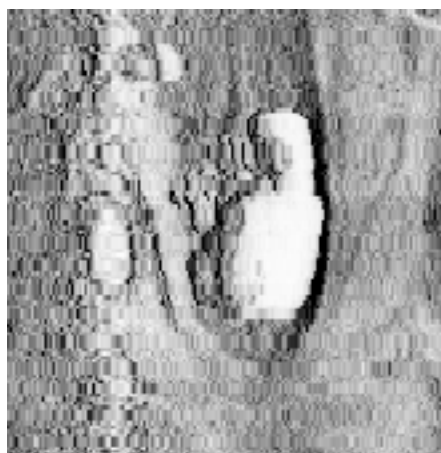


Figure 1.1.3

1.2) Profile/Beam 179/149 / 0532_20130919_145231_s3002

DANGER TO NAVIGATION

Survey Summary

Survey Position: 41° 14' 39.5" N, 072° 24' 42.1" W
Least Depth: 11.21 m (= 36.76 ft = 6.127 fm = 6 fm 0.76 ft)
TPU ($\pm 1.96\sigma$): **THU (TPEh)** ± 1.971 m ; **TVU (TPEv)** ± 0.196 m
Timestamp: 2013-262.14:52:44.839 (09/19/2013)
Survey Line: h12508 / nrt5_s3002_em3002 / 2013-262 / 0532_20130919_145231_s3002
Profile/Beam: 179/149
Charts Affected: 12375_1, 12372_11, 12354_1, 12300_1, 13006_1, 5161_1, 13003_1

Remarks:

Uncharted submerged rock rising approximately 4 meters above surrounding sea floor. A least depth of 37 feet was measured with MBES directly under a charted 53 ft sounding. Final Tides have been applied.

Feature Correlation

Source	Feature	Range	Azimuth	Status
0532_20130919_145231_s3002	179/149	0.00	000.0	Primary
20130812133641	116960	19.17	103.6	Secondary (grouped)
20130812141307	116967	23.30	271.2	Secondary (grouped)

Hydrographer Recommendations

Chart submerged rock.

Cartographically-Rounded Depth (Affected Charts):

37ft (12375_1, 12372_11, 12354_1)

6fm (12300_1, 13006_1, 13003_1)

11.2m (5161_1)

S-57 Data

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

Attributes: QUASOU - 1:depth known

SORDAT - 20131120

SORIND - US,US,graph,H12508

TECSOU - 3:found by multi-beam

VALSOU - 11.205 m

WATLEV - 3:always under water/submerged

Feature Images

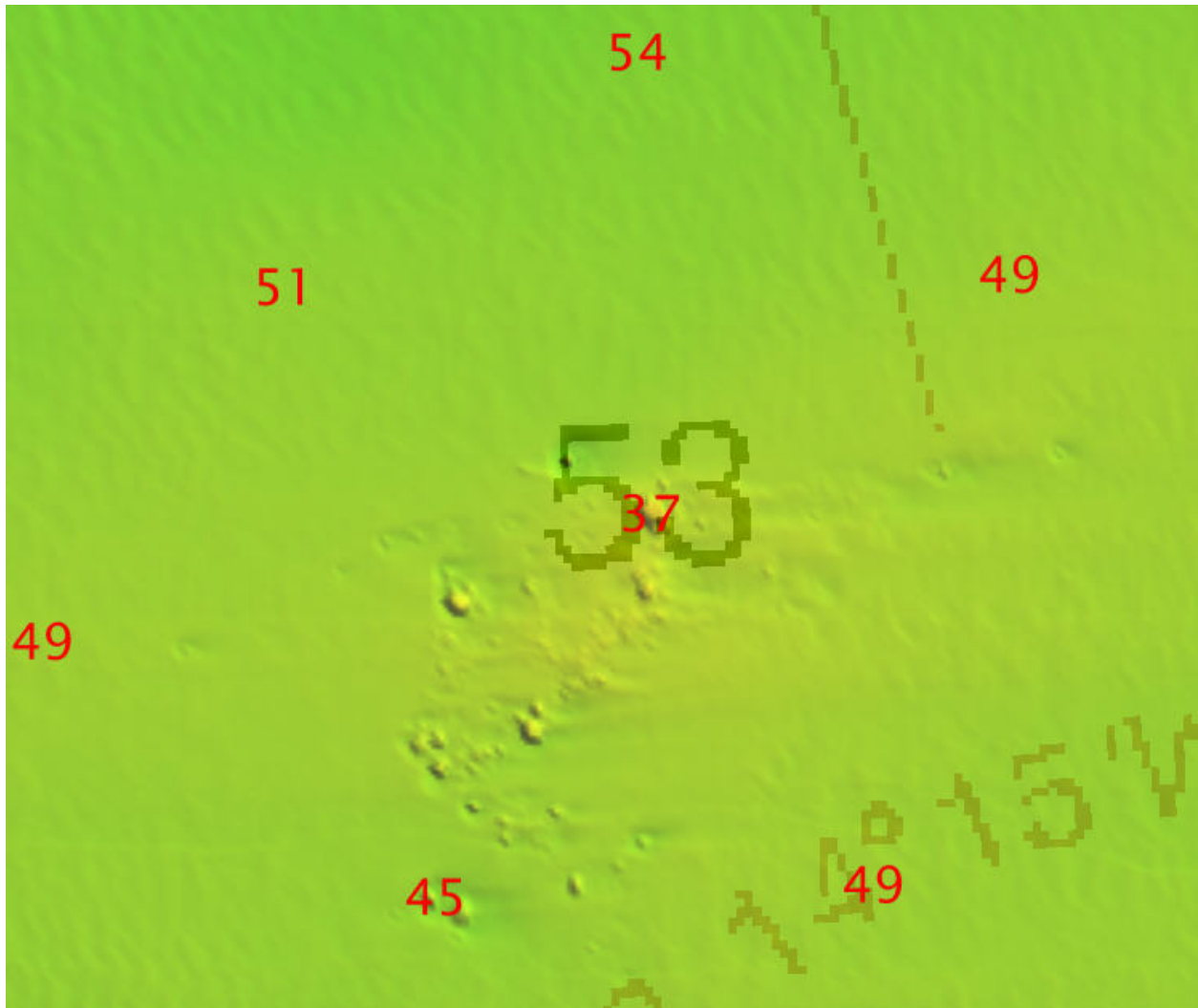


Figure 1.2.1

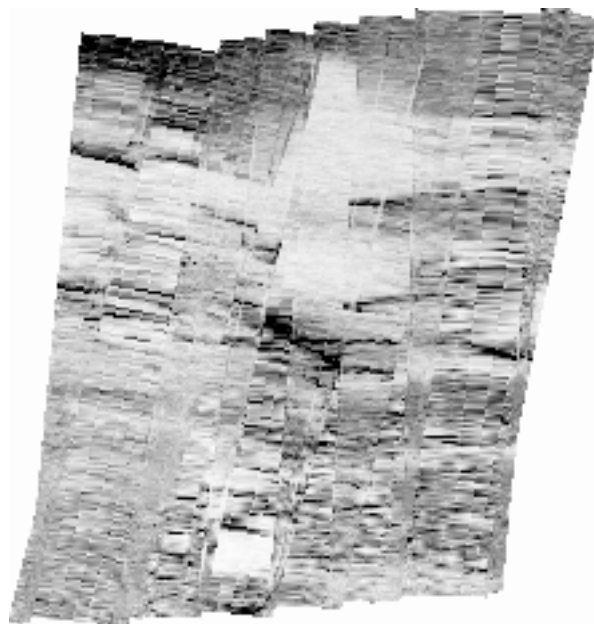


Figure 1.2.2 SIPS mosaic

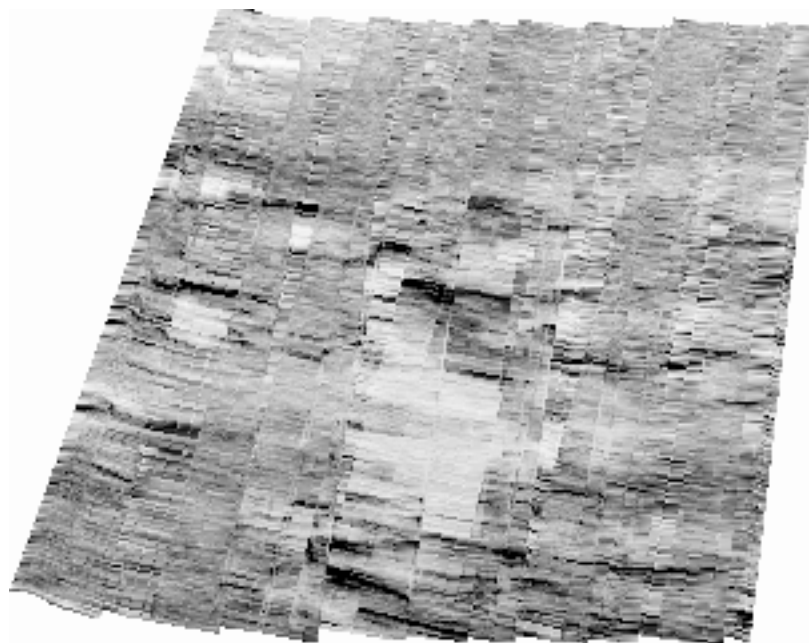


Figure 1.2.3 SIPS mosaic

H12508 Office DTON Report

Registry Number: H12508
State: Connecticut
Locality: North Shore of Long Island Sound
Sub-locality: Saybrook Outer Bar to Salt Works Bay
Project Number: OPR-B370-NRT5-12
Survey Dates: 07/30/2013 - 05/29/2013

Charts Affected

Number	Edition	Date	Scale (RNC)	RNC Correction(s)*
12375	21st	02/17/2001	1:20,000 (12375_1)	[L]NTM: ?
12372	34th	11/01/2006	1:40,000 (12372_11)	[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.	Feature Type	Survey Depth	Survey Latitude	Survey Longitude
1.1	Rock	6.35 m	41° 15' 31.2" N	072° 24' 20.4" W
1.2	Shoal	5.29 m	41° 15' 19.2" N	072° 23' 35.5" W
1.3	Shoal	4.10 m	41° 15' 21.8" N	072° 23' 08.5" W
1.4	Shoal	5.42 m	41° 15' 08.0" N	072° 23' 08.0" W

1 - Dangers To Navigation

1.1) US 0000066304 00001 / H12508_Office_DTONs.000

DANGER TO NAVIGATION

Survey Summary

Survey Position: 41° 15' 31.2" N, 072° 24' 20.4" W
Least Depth: 6.35 m (= 20.83 ft = 3.472 fm = 3 fm 2.83 ft)
TPU (±1.96σ): **THU (TPEh)** [None] ; **TVU (TPEv)** [None]
Timestamp: 2014-149.00:00:00.000 (05/29/2014)
Dataset: H12508_Office_DTONs.000
FOID: US 0000066304 00001(0226000103000001)
Charts Affected: 12375_1, 12372_11, 12354_1, 12300_1, 13006_1, 5161_1, 13003_1

Remarks:

[None]

Feature Correlation

Source	Feature	Range	Azimuth	Status
H12508_Office_DTONs.000	US 0000066304 00001	0.00	000.0	Primary

Hydrographer Recommendations

Significant rock identified during SAR - Submit as DTON

Cartographically-Rounded Depth (Affected Charts):

21ft (12375_1, 12372_11, 12354_1)
 3 ½fm (12300_1, 13006_1, 13003_1)
 6.3m (5161_1)

S-57 Data

Geo object 1: Underwater rock / awash rock (UWTROC)
Attributes: QUASOU - 6:least depth known
 SORDAT - 20140529
 SORIND - US,US,graph,H12508
 TECSOU - 3:found by multi-beam

VALSOU - 6.350 m

WATLEV - 3:always under water/submerged

1.2) US 0000066305 00001 / H12508_Office_DTONs.000

DANGER TO NAVIGATION

Survey Summary

Survey Position: 41° 15' 19.2" N, 072° 23' 35.5" W
Least Depth: 5.29 m (= 17.36 ft = 2.893 fm = 2 fm 5.36 ft)
TPU (±1.96σ): **THU (TPEh)** [None] ; **TVU (TPEv)** [None]
Timestamp: 2014-149.00:00:00.000 (05/29/2014)
Dataset: H12508_Office_DTONs.000
FOID: US 0000066305 00001(0226000103010001/1)
Charts Affected: 12375_1, 12372_11, 12354_1, 12300_1, 13006_1, 5161_1, 13003_1

Remarks:

[None]

Feature Correlation

Source	Feature	Range	Azimuth	Status
H12508_Office_DTONs.000	US 0000066305 00001	0.00	000.0	Primary

Hydrographer Recommendations

Top of rocky shoal identified during SAR - Submit as DTON

Cartographically-Rounded Depth (Affected Charts):

17ft (12375_1, 12372_11, 12354_1)
 2 ¾fm (12300_1, 13006_1, 13003_1)
 5.3m (5161_1)

S-57 Data

Geo object 1: Sounding (SOUNDG)
Attributes: QUASOU - 6:least depth known
 SORDAT - 20140529
 SORIND - US,US,graph,H12508
 TECSOU - 3:found by multi-beam

1.3) US 0000066306 00001 / H12508_Office_DTONs.000

DANGER TO NAVIGATION

Survey Summary

Survey Position: 41° 15' 21.8" N, 072° 23' 08.5" W
Least Depth: 4.10 m (= 13.45 ft = 2.242 fm = 2 fm 1.45 ft)
TPU ($\pm 1.96\sigma$): THU (TPEh) [None] ; TVU (TPEv) [None]
Timestamp: 2014-149.00:00:00.000 (05/29/2014)
Dataset: H12508_Office_DTONs.000
FOID: US 0000066306 00001(0226000103020001/1)
Charts Affected: 12375_1, 12372_11, 12354_1, 12300_1, 13006_1, 5161_1, 13003_1

Remarks:

[None]

Feature Correlation

Source	Feature	Range	Azimuth	Status
H12508_Office_DTONs.000	US 0000066306 00001	0.00	000.0	Primary

Hydrographer Recommendations

Top of rocky shoal identified during SAR - Submit as DTON

Cartographically-Rounded Depth (Affected Charts):

- 13ft (12375_1, 12372_11, 12354_1)
- 2 ¼fm (12300_1, 13006_1, 13003_1)
- 4.1m (5161_1)

S-57 Data

Geo object 1: Sounding (SOUNDG)
Attributes: QUASOU - 6:least depth known
 SORDAT - 20140529
 SORIND - US,US,graph,H12508
 TECSOU - 3:found by multi-beam

1.4) US 0000066307 00001 / H12508_Office_DTONs.000

DANGER TO NAVIGATION

Survey Summary

Survey Position: 41° 15' 08.0" N, 072° 23' 08.0" W
Least Depth: 5.42 m (= 17.78 ft = 2.963 fm = 2 fm 5.78 ft)
TPU ($\pm 1.96\sigma$): THU (TPEh) [None] ; TVU (TPEv) [None]
Timestamp: 2014-149.00:00:00.000 (05/29/2014)
Dataset: H12508_Office_DTONs.000
FOID: US 0000066307 00001(0226000103030001/1)
Charts Affected: 12375_1, 12372_11, 12354_1, 12300_1, 13006_1, 5161_1, 13003_1

Remarks:

[None]

Feature Correlation

Source	Feature	Range	Azimuth	Status
H12508_Office_DTONs.000	US 0000066307 00001	0.00	000.0	Primary

Hydrographer Recommendations

Top of rocky shoal identified during SAR - Submit as DTON

Cartographically-Rounded Depth (Affected Charts):

18ft (12375_1, 12372_11, 12354_1)

3fm (12300_1, 13006_1, 13003_1)

5.4m (5161_1)

S-57 Data

Geo object 1: Sounding (SOUNDG)
Attributes: QUASOU - 6:least depth known
 SORDAT - 20140529
 SORIND - US,US,graph,H12508
 TECSOU - 3:found by multi-beam

H12508 Feature Report

Registry Number: H12508
State: Connecticut
Locality: North Shore of Long Island Sound
Sub-locality: Saybrook Outer Bar to Salt Works Bay
Project Number: OPR-B370-NRT5-12
Survey Dates: 07/30/2013 - 05/29/2013

Charts Affected

Number	Edition	Date	Scale (RNC)	RNC Correction(s)*
12375	21st	02/17/2001	1:20,000 (12375_1)	[L]NTM: ?
12372	34th	11/01/2006	1:40,000 (12372_11)	[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.	Feature Type	Survey Depth	Survey Latitude	Survey Longitude	AWOIS Item
1.1	Wreck	16.10 m	41° 13' 15.6" N	072° 24' 42.8" W	---
1.2	Wreck	15.12 m	41° 14' 38.9" N	072° 23' 01.9" W	---
1.3	Wreck	9.74 m	41° 15' 21.6" N	072° 22' 49.7" W	---
1.4	Wreck	13.39 m	41° 14' 35.7" N	072° 22' 00.8" W	---
1.5	Wreck	[None]	41° 13' 54.2" N	072° 20' 53.7" W	---
1.6	Wreck	4.44 m	41° 15' 43.4" N	072° 20' 41.0" W	---

1 - Wrecks

1.1) US 0000058447 00001 / H12508_FFF_Office.000

Survey Summary

Survey Position: 41° 13' 15.6" N, 072° 24' 42.8" W
Least Depth: 16.10 m (= 52.82 ft = 8.804 fm = 8 fm 4.82 ft)
TPU ($\pm 1.96\sigma$): THU (TPEh) [None] ; TVU (TPEv) [None]
Timestamp: 2014-149.00:00:00.000 (05/29/2014)
Dataset: H12508_FFF_Office.000
FOID: US 0000058447 00001(02260000E44F0001)
Charts Affected: 12375_1, 12372_11, 12354_1, 12300_1, 13006_1, 5161_1, 13003_1

Remarks:

WRECKS/remrks: AWOIS Item 6818. Developed with MBES. The wreck is accurately charted. A least depth of 55 ft. was measured, which is slightly deeper than the charted depth of 53 ft. The hydrographer cannot guarantee the least depths of any small protrusions from the wreck were captured.

Feature Correlation

Source	Feature	Range	Azimuth	Status
H12508_FFF_Office.000	US 0000058447 00001	0.00	000.0	Primary

Hydrographer Recommendations

Hydrographer recommends that the more conservative depth of 53 ft be retained.

Cartographically-Rounded Depth (Affected Charts):

53ft (12375_1, 12372_11, 12354_1)

8 $\frac{3}{4}$ fm (12300_1, 13006_1, 13003_1)

16.1m (5161_1)

S-57 Data

Geo object 1: Wreck (WRECKS)
Attributes: CATWRK - 2:dangerous wreck
 QUASOU - 7:least depth unknown, safe clearance at value shown
 SORDAT - 20140529
 SORIND - US,US,graph,H12508
 VALSOU - 16.100 m

WATLEV - 3:always under water/submerged

Office Notes

Office Notes: Concur with clarification. Retain charted, shoaler depth, but update position.

1.2) US 0000066151 00001 / H12508_FFF_Office.000

Survey Summary

Survey Position: 41° 14' 38.9" N, 072° 23' 01.9" W
Least Depth: 15.12 m (= 49.61 ft = 8.268 fm = 8 fm 1.61 ft)
TPU ($\pm 1.96\sigma$): THU (TPEh) [None] ; TVU (TPEv) [None]
Timestamp: 2014-149.00:00:00.000 (05/29/2014)
Dataset: H12508_FFF_Office.000
FOID: US 0000066151 00001(0226000102670001)
Charts Affected: 12375_1, 12372_11, 12354_1, 12300_1, 13006_1, 5161_1, 13003_1

Remarks:

[None]

Feature Correlation

Source	Feature	Range	Azimuth	Status
H12508_FFF_Office.000	US 0000066151 00001	0.00	000.0	Primary

Hydrographer Recommendations

Chart distributed remains of wreck

Cartographically-Rounded Depth (Affected Charts):

49ft (12375_1, 12372_11, 12354_1)
 8 ¼fm (12300_1, 13006_1, 13003_1)
 15.1m (5161_1)

S-57 Data

Geo object 1: Wreck (WRECKS)
Attributes: CATWRK - 3:distributed remains of wreck
 QUASOU - 6:least depth known
 SORDAT - 20140529
 SORIND - US,US,graph,H12508
 TECSOU - 3:found by multi-beam
 VALSOU - 15.121 m

WATLEV - 3:always under water/submerged

Office Notes

Office Notes: Chart Wreck identified during SAR.

1.3) US 0000066148 00001 / H12508_FFF_Office.000

Survey Summary

Survey Position: 41° 15' 21.6" N, 072° 22' 49.7" W
Least Depth: 9.74 m (= 31.96 ft = 5.326 fm = 5 fm 1.96 ft)
TPU (±1.96σ): THU (TPEh) [None] ; TVU (TPEv) [None]
Timestamp: 2014-149.00:00:00.000 (05/29/2014)
Dataset: H12508_FFF_Office.000
FOID: US 0000066148 00001(0226000102640001)
Charts Affected: 12375_1, 12372_11, 12354_1, 12300_1, 13006_1, 5161_1, 13003_1

Remarks:

[None]

Feature Correlation

Source	Feature	Range	Azimuth	Status
H12508_FFF_Office.000	US 0000066148 00001	0.00	000.0	Primary

Hydrographer Recommendations

Chart dangerous wreck

Cartographically-Rounded Depth (Affected Charts):

32ft (12375_1, 12372_11, 12354_1)

5 ¼fm (12300_1, 13006_1, 13003_1)

9.7m (5161_1)

S-57 Data

Geo object 1: Wreck (WRECKS)
Attributes: CATWRK - 2:dangerous wreck
 QUASOU - 6:least depth known
 SORDAT - 20140529
 SORIND - US,US,graph,H12508
 TECSOU - 3:found by multi-beam
 VALSOU - 9.740 m

WATLEV - 3:always under water/submerged

Office Notes

Office Notes: Chart wreck identified during SAR.

1.4) US 0000066046 00001 / H12508_FFF_Office.000

Survey Summary

Survey Position: 41° 14' 35.7" N, 072° 22' 00.8" W
Least Depth: 13.39 m (= 43.94 ft = 7.324 fm = 7 fm 1.94 ft)
TPU ($\pm 1.96\sigma$): THU (TPEh) [None] ; TVU (TPEv) [None]
Timestamp: 2014-149.00:00:00.000 (05/29/2014)
Dataset: H12508_FFF_Office.000
FOID: US 0000066046 00001(0226000101FE0001)
Charts Affected: 12375_1, 12372_11, 12354_1, 12300_1, 13006_1, 5161_1, 13003_1

Remarks:

[None]

Feature Correlation

Source	Feature	Range	Azimuth	Status
H12508_FFF_Office.000	US 0000066046 00001	0.00	000.0	Primary

Hydrographer Recommendations

Chart distributed remains of wreck

Cartographically-Rounded Depth (Affected Charts):

44ft (12375_1, 12372_11, 12354_1)

7 ¼fm (12300_1, 13006_1, 13003_1)

13.4m (5161_1)

S-57 Data

Geo object 1: Wreck (WRECKS)
Attributes: CATWRK - 3:distributed remains of wreck
 QUASOU - 6:least depth known
 SORDAT - 20140529
 SORIND - US,US,graph,H12508
 TECSOU - 3:found by multi-beam
 VALSOU - 13.394 m

WATLEV - 3:always under water/submerged

Office Notes

Office Notes: Chart wreck identified during SAR.

1.5) US 0000029787 00001 / H12508_FFF_Office.000

Survey Summary

Survey Position: 41° 13' 54.2" N, 072° 20' 53.7" W
Least Depth: [None]
TPU (±1.96σ): THU (TPEh) [None] ; TVU (TPEv) [None]
Timestamp: 2001-048.00:00:00.000 (02/17/2001)
Dataset: H12508_FFF_Office.000
FOID: US 0000029787 00001(02260000745B0001)
Charts Affected: 12375_1, 12372_11, 12354_1, 12300_1, 13006_1, 5161_1, 13003_1

Remarks:

WRECKS/remrks: AWOIS 12419. This charted PA wreck was not assigned, but the area was developed with MBES. No features were found.

Feature Correlation

Source	Feature	Range	Azimuth	Status
H12508_FFF_Office.000	US 0000029787 00001	0.00	000.0	Primary

Hydrographer Recommendations

Delete charted PA Wreck.

S-57 Data

Geo object 1: Wreck (WRECKS)
Attributes: CATWRK - 1:non-dangerous wreck
 QUASOU - 2:depth unknown
 SORDAT - 20010217
 SORIND - US,US,graph,Chart 12375
 WATLEV - 3:always under water/submerged

Office Notes

Office Notes: Concur.

1.6) US 0000029791 00001 / H12508_FFF_Office.000

Survey Summary

Survey Position: 41° 15' 43.4" N, 072° 20' 41.0" W
Least Depth: 4.44 m (= 14.57 ft = 2.429 fm = 2 fm 2.57 ft)
TPU ($\pm 1.96\sigma$): **THU (TPEh)** [None] ; **TVU (TPEv)** [None]
Timestamp: 2014-149.00:00:00.000 (05/29/2014)
Dataset: H12508_FFF_Office.000
FOID: US 0000029791 00001(02260000745F0001)
Charts Affected: 12375_1, 12372_11, 12354_1, 12300_1, 13006_1, 5161_1, 13003_1

Remarks:

WRECKS/remrks: Uncharted obstruction. Approximately 20 meters long, 7 meters wide, and rising 1 meter above surrounding seafloor. Appears to be manmade. Possibly a sunken barge.

Feature Correlation

Source	Feature	Range	Azimuth	Status
H12508_FFF_Office.000	US 0000029791 00001	0.00	000.0	Primary

Hydrographer Recommendations

Chart wreck.

Cartographically-Rounded Depth (Affected Charts):

14ft (12375_1, 12372_11, 12354_1)

2 ¼fm (12300_1, 13006_1, 13003_1)

4.4m (5161_1)

S-57 Data

Geo object 1: Wreck (WRECKS)
Attributes: CATWRK - 2:dangerous wreck
 QUASOU - 6:least depth known
 SORDAT - 20140529
 SORIND - US,US,graph,H12508
 TECSOU - 3:found by multi-beam

VALSOU - 4.442 m

WATLEV - 3:always under water/submerged

Office Notes

Office Notes: Concur.

Feature Images

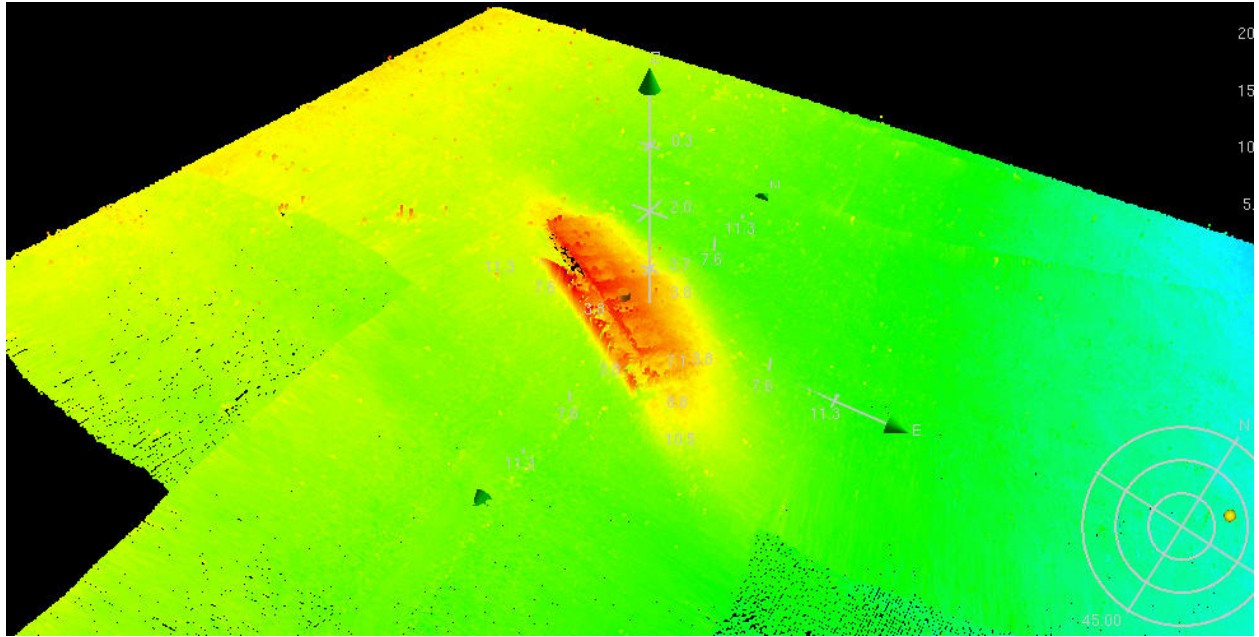


Figure 1.7.1

APPROVAL

PAGE H1508

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

- H12508_DR.pdf
- Collection of depth varied resolution BAGS
- Processed survey data and records
- H12508_GeoImage.pdf

The survey evaluation and verification has been conducted according current OCS Specifications.

Approved: _____

Annie Raymond

Physical Scientist, Pacific Hydrographic Branch

The survey has been approved for dissemination and usage of updating NOAA's suite of nautical charts.

Approved: _____

CDR Benjamin K. Evans, NOAA

Chief, Pacific Hydrographic Branch