H12013

NOAA FORM 76-35A

U.S. DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL OCEAN SURVEY

DESCRIPTIVE REPORT

Type of Survey: Navigable Area

Registry Number: H12013

LOCALITY

State: Connecticut

General Locality: Eastern Long Island Sound

Sub-locality: The entrance to the Connecticut River

2009

CHIEF OF PARTY
CDR P. Tod Schattgen
NOAA

LIBRARY & ARCHIVES

DATE

NOAA FORM 77-28 (11-72) U.S. DEPARTMENT OF COMMERCE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION	REGISTRY NUMBER:
HYDROGRAPHIC TITLE SHEET	**H12013**

INSTRUCTIONS: The Hydrographic Sheet should be accompanied by this form, filled in as completely as possible, when the sheet is forwarded to the Office.

State:	**Connecticut**
General Locality:	**Eastern Long Island Sound**
Sub-Locality:	**The entrance to the Connecticut River**
Scale:	**1:10,000**
Date of Survey:	**19 April 2009 to 17 May 2009**
Instructions Dated:	**3 March 2009**
Project Number:	**OPR-B370-TJ-09**
Vessel:	**NOAA Ship *Thomas Jefferson***
Chief of Party:	**CDR P. Tod Schattgen, NOAA**
Surveyed by:	***Thomas Jefferson* Personnel**
Soundings by:	**Reson 7125, 8125 multibeam echosounder and Klein 5000 Side Scan SONAR**
Graphic record scaled by:	**N/A**
Graphic record checked by:	**N/A**
Protracted by:	**N/A** Automated Plot: **N/A**
Verification by:	
Soundings in:	**Meters at MLLW**

Remarks:
1) All Times are in UTC.
2) This is a Navigable Area Hydrographic Survey.
3) Projection is NAD83, UTM Zone 18.

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Descriptive Report to Accompany Hydrographic Survey H12013

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

A AREA SURVEYED

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

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

Table 1: area surveyed.

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

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

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

Table 2: Hydrographic Survey Statistics.

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

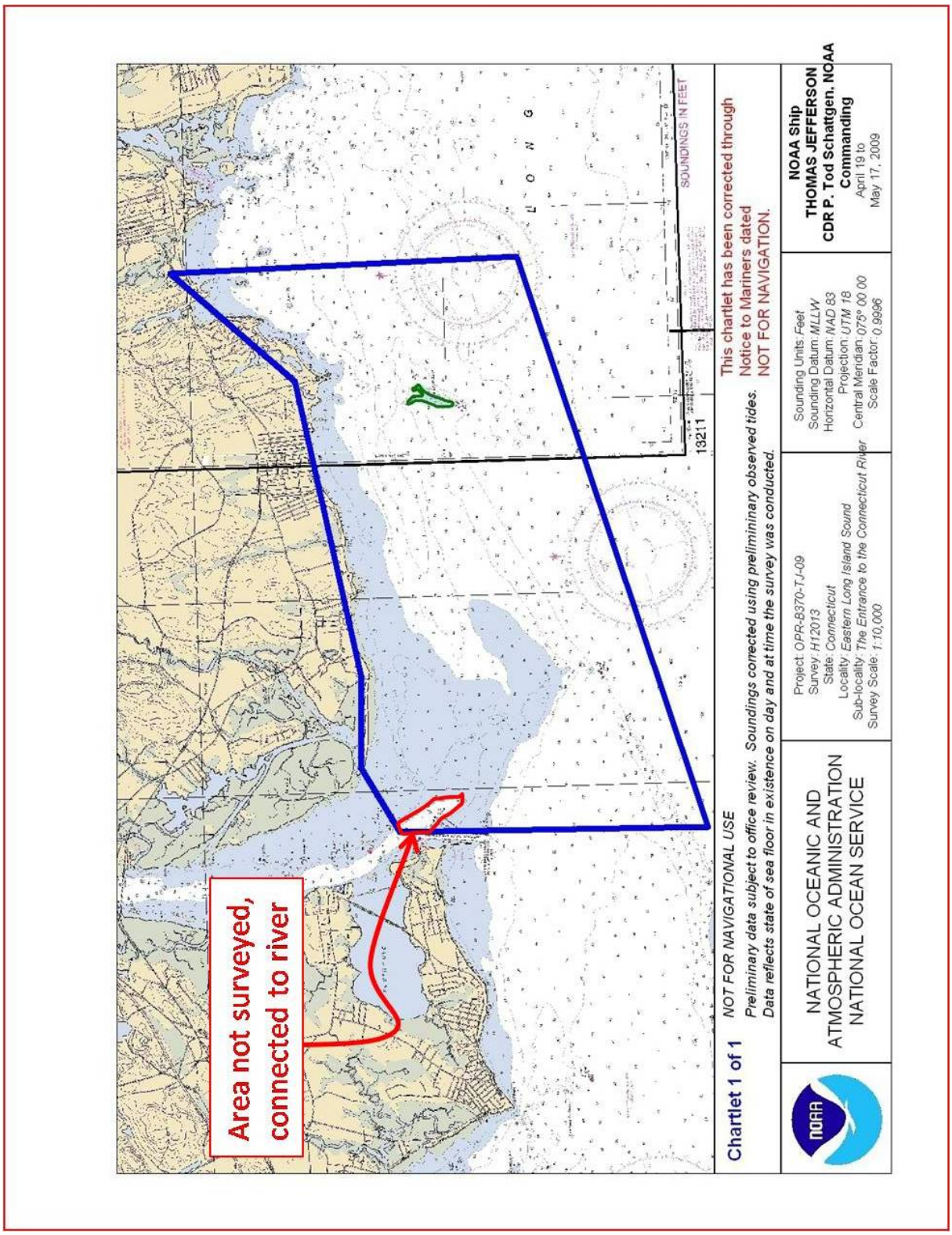


Figure 1: Survey H12013 Limits

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

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

B DATA ACQUISTION AND PROCESSING

Refer to *OPR-B370-TJ-09 Data Acquisition and Processing Report (DAPR)* for a complete description of data acquisition and processing systems, survey vessels, quality control procedures and data processing methods. Additional information to supplement sounding and survey data, and any deviations from the *DAPR* are included in this descriptive report.

B 1 EQUIPMENT AND VESSELS

Data were acquired by NOAA Ship *Thomas Jefferson* and survey launches *3101* and *3102.* Ship *Thomas Jefferson* acquired Reson 7125 multibeam echosounder soundings and sound velocity profiles. Launch *3101* acquired Klein 5000 side scan data, Reson 8125 mulitbeam data, sound velocity profiles and bottom samples. Launch *3102* collected Klein 5000 side scan, Reson 7125 multibeam data and sound velocity profiles. Vessel configurations, equipment operation and data acquisition and processing were consistent with specifications described in the *DAPR*.

B 2 QUALITY CONTROL

B 2.1 System Certification and Calibration

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

B 2.2 Sounding Coverage

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

B 2.3 Crosslines

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

Crosslines were examined using the standard deviation layer of the BASE surface and the results indicate some systematic errors between platforms. Sources of error could include positioning inputs, tidal zoning, dynamic draft and/or static draft measurement error. See section 2.5, Systematic errors below. A crossline to mainscheme difference surface, *H12013_Crossline_Mainscheme_Difference.csar*, is included in the Descriptive Report/Separates/IVCrossline_Comparison folder submitted with this survey.

B 2.4 Junctions and Prior Surveys

The following contemporary surveys junction with H12013:

Registry #	Scale	Date	Field Party	Junction side
H11442	1:10,000	2005	*Thomas Jefferson*	east
H12012	1:10,000	2009	*Thomas Jefferson*	south

Table 4: junction surveys.

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

Survey H12013 is bordered to the east by H11442 surveyed by the *Thomas Jefferson* in 2005. A comparison was made between H12013 and the historic H-Cell (file H11442_H11225_CU.000). The minimum depths of the surveys agreed to within 2 feet along the entire border.

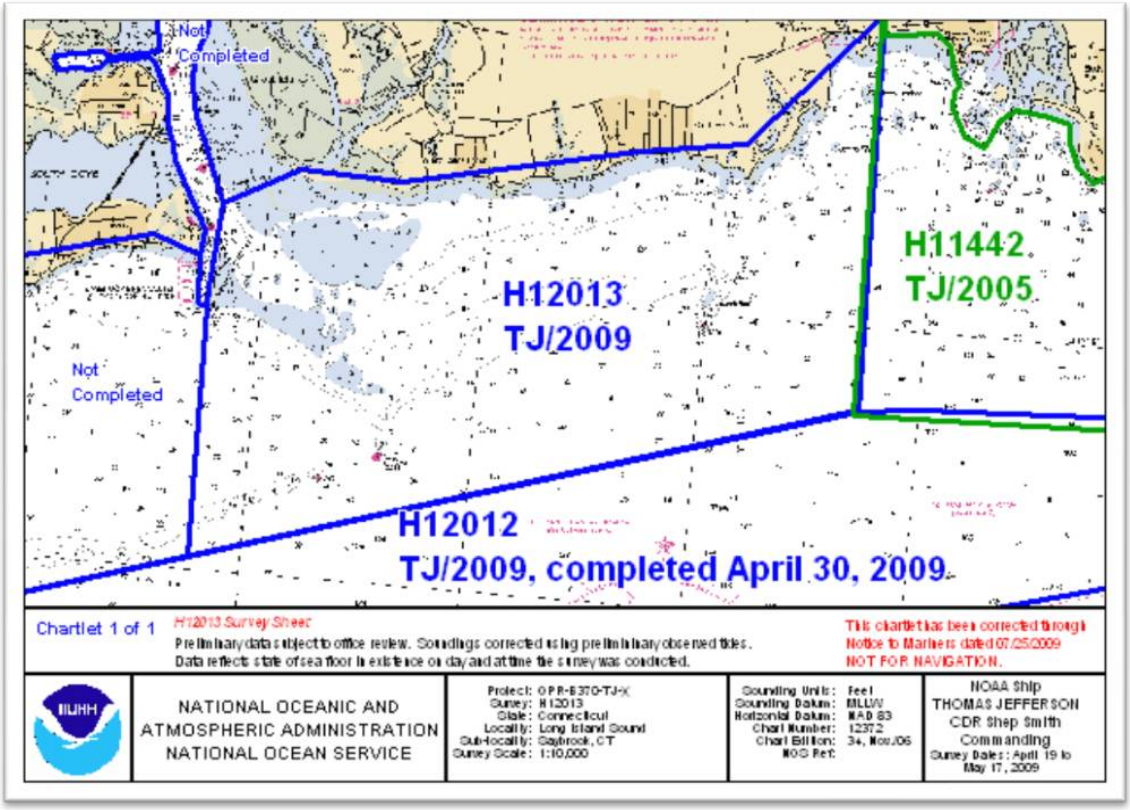


Figure 2: H12013 Junction Surveys.

B 2.5 Systematic Errors

A fault with the multibeam receiver on the ship's (S222) Reson 7125 caused a systematic artifact in the MBES data. This artifact appears as an along track 'ridge' on either side of nadir, ranging in height from 10cm to 20cm. This error was accounted for in the CARIS vessel configuration (TJ_S222_RESON7125.hvf) by adding a 0.200 m value for the Total Propagated Error for the delta draft. This device was replaced subsequent to data acquisition. The data collected by this SONAR head were still within specifications in spite of the fault.

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

B 3 CORRECTIONS TO ECHO SOUNDINGS

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

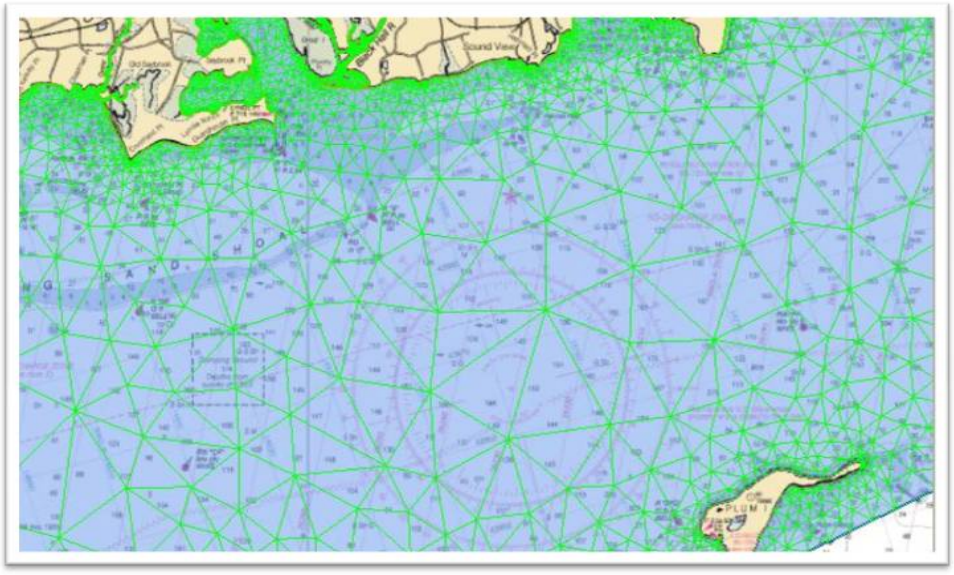


Figure 3: Final Tide Zoning.

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

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

B 4 DATA PROCESSING

B 4.1 Total Propagated Error

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

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

Table 5: TPE Parameters

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

B 4.2 BASE Surfaces and Mosaics

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

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

Table 6: Fieldsheets.

This survey was processed using the Combined Uncertainty and Bathymetry Estimator (CUBE) algorithm. The CUBE configuration was set to 1 meter grid size (NOAA_1m) coverage for depths less than or equal to 20 meters and 2 meter grids (NOAA_2m) for depths greater than 20 meters. Refer to the 2009 Data Acquisition and Processing Report, 2008 Field Procedures Manual, and CARIS HIPS/SIPS 6.1 manual for further discussion.

B 4.3 Data cleaning

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

C HORIZONTAL AND VERTICAL CONTROL

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

C 1.1 Horizontal Control

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

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

C 1.2 Vertical Control

The vertical datum for this project is Mean Lower-Low Water (MLLW). The operating National Water Level Observation Network (NWLON) stations at New London, CT (8461490) and New

Haven, CT (8465705), served as datum control for H12013. Verified tides with final TCARI constituents and residuals were applied to all sounding data.

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

D RESULTS AND RECOMMENDATIONS

D 1 Chart Comparison

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

D 1.1 Chart 12372_11 Comparison

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

D 1.2 Chart 12373 Comparison

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

D 1.3 Chart 12374 Comparison

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

D 1.4 Chart 12375 Comparison

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

D 1.5 Chart 12354 Comparison

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

D 1.6 Chart 3211 Comparison

Soundings from this survey generally agree with this chart to within 2 feet. There are three uncharted rock outcrops south of Hatchett Reef. In these locations the chart reports soundings more than 10 feet deeper than what was found by this survey. Two of these outcrops were reported as DTONs. The third was not reported as a DTON due to its proximity to the other two.

D 1.7 Chart 13212 Comparison

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

D 2 Additional Results

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

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

D 2.4 Shoreline

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

D 2.5 Charted Features

D 2.6 Charted Pipelines and Cables

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

D 2.7 Bridges, Ferry Routes, and Overhead Cables

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

D 3 Dangers to Navigation and Shoals

See section D 3.1.

D 3.1 Dangers to Navigation

Two Dangers to Navigation (DTONs) were reported on May 1st, 2009. Both were uncharted rock outcrops south of Hatchett Reef.

D 3.2 Shoals

There are three significant shoals within the bounds of this survey. The minimum depths over the eastern end of Long Sand Shoal are similar to those already charted. Only minor corrections need to be applied to the chart in this area. Hatchett Reef is also only requires slight chart corrections. The large shoal east of Saybrook Outer Bar Channel has probably moved significantly since it was last charted. Many soundings need to be updated and changes need to be made to the charted 12 foot contour over this shoal.

D 4 Aids to Navigation

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

D 5 Coast Pilot Information

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

D 6 Miscellaneous

Bottom Samples

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

D 7 Adequacy of Survey

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

E APPROVAL

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

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

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

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

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

Approved and Forwarded:

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

LT Jasper D. Schaer, NOAA
Field Operations Officer

CDR P. Tod Schattgen, NOAA
Commanding Officer

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

Survey Managers:

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

LTjg Megan Guberski, NOAA
Junior Officer

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

SST Douglas Wood

Appendix I

Dangers to Navigation

None

H12013_DTON_REPORT

Registry Number: H12013

State: Connecticut

Locality: Eastern Long Island Sounc

Sub-locality: Saybrook, CT

Project Number: OPR-B370-TJ-09

Survey Date: 05/01/2009

Charts Affected

Number	Edition	Date	Scale (RNC)	RNC Correction(s)*
12375	21st	02/17/2001	1:20,000 (12375_1)	USCG LNM: 04/08/2008 (05/12/2009) CHS NTM: None (04/24/2009) NGA NTM: 04/24/1999 (05/23/2009)
13211	15th	09/01/2007	1:20,000 (13211_1)	USCG LNM: 12/09/2008 (05/12/2009) CHS NTM: None (04/24/2009) NGA NTM: None (05/23/2009)
12372	34th	11/01/2006	1:40,000 (12372_11)	[L]NTM: ?
13209	25th	04/01/2007	1:40,000 (13209_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.	Feature Type	Survey Depth	Survey Latitude	Survey Longitude	AWOIS Item
1.1	Rock	17.13 m	41° 15' 19.6" N	072° 15' 15.9" W	---
1.2	Rock	21.04 m	41° 15' 07.1" N	072° 16' 18.2" W	---

1 - Danger To Navigation

1.1) Profile/Beam - 2642/1 from h12013 / tj_s222_reson7125_stbd / 2009-121 / 020_1629

DANGER TO NAVIGATION

Survey Summary

Survey Position:	41° 15' 19.6" N, 072° 15' 15.9" W
Least Depth:	17.13 m (= 56.21 ft = 9.368 fm = 9 fm 2.21 ft)
TPU (±1.96σ):	**THU (TPEh)** ±1.001 m ; **TVU (TPEv)** ±0.122 m
Timestamp:	2009-121.16:35:15.357 (05/01/2009)
Survey Line:	h12013 / tj_s222_reson7125_stbd / 2009-121 / 020_1629
Profile/Beam:	2642/1
Charts Affected:	13211_1, 12372_11, 13209_1, 12354_1, 12300_1, 13006_1, 5161_1, 13003_1

Remarks:

Uncharted dangerous Rock was acquired with RESON 7125MBES. Verified water levels and final tide zoning were applied at MLLW and respolved the sounding to 17.13m (56.21 feet)

Feature Correlation

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

Hydrographer Recommendations

[None]

Cartographically-Rounded Depth (Affected Charts):

56ft (13211_1, 12372_11, 13209_1, 12354_1)

9 ¼fm (12300_1, 13006_1, 13003_1)

17.1m (5161_1)

S-57 Data

Geo object 1:	Underwater rock / awash rock (UWTROC)
Attributes:	QUASOU - 6:least depth known
	SORDAT - 20090517

SORIND - US,US,NSURF,H12013

TECSOU - 3:found by multi-beam

VALSOU - 17.133 m

VERDAT - 12:Mean lower low water

WATLEV - 3:always under water/submerged

1.2) Profile/Beam - 738/256 from h12013 / tj_s222_reson7125_stbd / 2009-121 / 025_1723

DANGER TO NAVIGATION

Survey Summary

Survey Position: 41° 15' 07.1" N, 072° 16' 18.2" W

Least Depth: 21.04 m (= 69.04 ft = 11.506 fm = 11 fm 3.04 ft)

TPU (±1.96σ): **THU (TPEh)** ±1.002 m ; **TVU (TPEv)** ±0.137 m

Timestamp: 2009-121.17:25:27.944 (05/01/2009)

Survey Line: h12013 / tj_s222_reson7125_stbd / 2009-121 / 025_1723

Profile/Beam: 738/256

Charts Affected: 12375_1, 13211_1, 12372_11, 13209_1, 12354_1, 12300_1, 13006_1, 5161_1, 13003_1

Remarks:

Uncharted dangerous Rock was acquired with RESON 7125 MBES. Verified water levels and final tide zoning were applied at MLLW and resolved the sounding to 12.04m (69.04 feet)

Feature Correlation

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

Hydrographer Recommendations

[None]

Cartographically-Rounded Depth (Affected Charts):

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

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

21m (5161_1)

S-57 Data

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

Attributes: QUASOU - 6:least depth known

SORDAT - 20090517

SORIND - US,US,NSURF,H12013

TECSOU - 3:found by multi-beam

VALSOU - 21.042 m

VERDAT - 12:Mean lower low water

WATLEV - 3:always under water/submerged

Appendix II

Survey Features Report

1. Charted Features

2. New Features

3. AWOIS items

H12013 Feature Report

Registry Number: H12013

State: Connecticut

Locality: Eastern Long Island Sound

Sub-locality: Saybrook, CT

Project Number: OPR-B370-TJ-09

Survey Dates: 19 April, 2009 - 17 May, 2009

Charts Affected

Number	Edition	Date	Scale (RNC)	RNC Correction(s)*
12375	21st	02/17/2001	1:20,000 (12375_1)	USCG LNM: 04/08/2008 (05/12/2009) CHS NTM: None (04/24/2009) NGA NTM: 04/24/1999 (05/23/2009)
13211	15th	09/01/2007	1:20,000 (13211_1)	USCG LNM: 12/09/2008 (05/12/2009) CHS NTM: None (04/24/2009) NGA NTM: None (05/23/2009)
12372	34th	11/01/2006	1:40,000 (12372_11) 1:40,000 (12372_1)	[L]NTM: ?
13209	25th	04/01/2007	1:40,000 (13209_1)	[L]NTM: ?
13205	38th	02/01/2007	1:80,000 (13205_1)	[L]NTM: ?
12354	42nd	12/01/2006	1:80,000 (12354_1)	[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	19166/11	Rock	7.54 m	41° 16' 42.1" N	072° 15' 10.2" W	---
1.2	386/121	Rock	2.79 m	41° 17' 01.8" N	072° 15' 09.8" W	---
1.3	2311/1	Rock	4.41 m	41° 17' 32.5" N	072° 14' 36.9" W	---
1.4	527/183	Rock	4.95 m	41° 16' 40.6" N	072° 15' 17.4" W	---

1.5	1925/179	Rock	2.51 m	41° 16' 13.5" N	072° 15' 50.7" W	---
1.6	371/231	Rock	2.02 m	41° 17' 12.5" N	072° 14' 57.6" W	---
2.1	0001	Rock	[None]	41° 16' 49.6" N	072° 16' 01.2" W	---
2.2	0001	Rock	[None]	41° 15' 40.2" N	072° 19' 08.3" W	---
2.3	0009	Rock	[None]	41° 17' 02.1" N	072° 15' 18.4" W	---
2.4	0004	Rock	[None]	41° 17' 02.4" N	072° 15' 24.4" W	---
2.5	0001	Rock	[None]	41° 16' 54.7" N	072° 15' 30.7" W	---
2.6	995/61	Rock	8.89 m	41° 16' 39.7" N	072° 15' 08.1" W	---
2.7	4047/1	Shoal	3.21 m	41° 17' 13.3" N	072° 15' 13.0" W	---
2.8	6235/180	Rock	1.86 m	41° 17' 20.6" N	072° 15' 07.3" W	---
2.9	2200/114	Rock	3.98 m	41° 17' 08.9" N	072° 15' 13.7" W	---
2.10	874/22	Rock	2.79 m	41° 17' 35.5" N	072° 14' 37.4" W	---
2.11	1201/223	Rock	1.03 m	41° 17' 33.6" N	072° 14' 38.1" W	---
2.12	4657/235	Rock	2.32 m	41° 16' 56.2" N	072° 15' 26.4" W	---
2.13	8785/190	Rock	1.67 m	41° 16' 48.7" N	072° 15' 38.7" W	---
2.14	16073/237	Shoal	2.69 m	41° 16' 53.1" N	072° 16' 09.3" W	---
2.15	1994/7	Rock	2.63 m	41° 17' 01.8" N	072° 15' 27.2" W	---
2.16	9255/239	Rock	3.04 m	41° 16' 41.3" N	072° 15' 43.7" W	---
2.17	391/178	Rock	2.31 m	41° 16' 41.7" N	072° 15' 47.5" W	---
2.18	14363/24	Rock	4.00 m	41° 16' 43.4" N	072° 15' 44.0" W	---
2.19	10505/7	Rock	2.14 m	41° 17' 32.2" N	072° 14' 40.4" W	---
2.20	571/24	Rock	3.51 m	41° 17' 04.3" N	072° 15' 15.7" W	---
2.21	76/11	Rock	1.57 m	41° 16' 59.2" N	072° 15' 27.3" W	---
2.22	2470/69	Rock	1.95 m	41° 17' 05.5" N	072° 15' 20.5" W	---
2.23	10078/1	Rock	2.05 m	41° 16' 30.3" N	072° 17' 22.7" W	---
2.24	2948/14	Obstruction	3.05 m	41° 15' 47.3" N	072° 19' 05.2" W	---
2.25	212/78	Rock	7.07 m	41° 16' 48.8" N	072° 14' 30.2" W	---
2.26	619/73	Rock	3.97 m	41° 16' 37.2" N	072° 15' 47.5" W	---
2.27	2594/172	Rock	3.54 m	41° 16' 38.2" N	072° 15' 49.9" W	---
2.28	241/34	Rock	4.64 m	41° 16' 44.9" N	072° 15' 45.9" W	---
2.29	219/122	Rock	8.11 m	41° 16' 45.1" N	072° 14' 37.2" W	---
2.30	7346/274	Shoal	6.51 m	41° 15' 13.5" N	072° 19' 38.8" W	---
2.31	2407/244	Rock	9.02 m	41° 16' 35.7" N	072° 15' 24.3" W	---
2.32	Wreck	Wreck	6.55 m	41° 16' 20.5" N	072° 16' 10.2" W	---
2.33	4139/36	Rock	11.40 m	41° 16' 34.0" N	072° 15' 05.9" W	---
2.34	4097/511	Rock	9.98 m	41° 16' 33.6" N	072° 15' 10.6" W	---

2.35	22198/160	Rock	13.50 m	41° 15' 47.0" N	072° 15' 36.8" W	---
2.36	2376/96	Rock	15.92 m	41° 15' 54.7" N	072° 14' 55.6" W	---
2.37	23145/202	Rock	7.35 m	41° 16' 39.2" N	072° 15' 22.6" W	---
2.38	1358/222	Shoal	3.91 m	41° 16' 48.7" N	072° 15' 21.0" W	---
2.39	600/10	Rock	2.34 m	41° 16' 49.2" N	072° 15' 25.6" W	---
2.40	667/240	Rock	2.16 m	41° 17' 06.0" N	072° 15' 18.1" W	---
2.41	767/3	Rock	2.62 m	41° 15' 59.4" N	072° 16' 02.2" W	---
2.42	557/150	Rock	1.56 m	41° 16' 05.6" N	072° 15' 59.6" W	---
2.43	4944/1	Shoal	3.18 m	41° 16' 47.1" N	072° 15' 35.4" W	---
2.44	334/146	Rock	2.58 m	41° 16' 09.6" N	072° 15' 50.3" W	---
2.45	1759/170	Rock	12.60 m	41° 15' 39.8" N	072° 15' 52.2" W	---
2.46	154/179	Rock	18.23 m	41° 15' 50.8" N	072° 15' 06.1" W	---
2.47	1401/3	Rock	3.50 m	41° 17' 00.3" N	072° 15' 23.9" W	---
2.48	269/29	Rock	4.81 m	41° 16' 10.0" N	072° 15' 48.2" W	---
2.49	487/3	Rock	4.36 m	41° 15' 53.8" N	072° 16' 00.7" W	---
2.50	4805/62	Rock	13.42 m	41° 15' 35.3" N	072° 16' 00.5" W	---
2.51	703/105	Rock	13.56 m	41° 15' 53.5" N	072° 15' 15.4" W	---
2.52	105/180	Rock	16.72 m	41° 15' 12.3" N	072° 16' 08.4" W	---
2.53	10270/167	Rock	15.60 m	41° 15' 23.0" N	072° 16' 13.5" W	---
2.54	336/124	Rock	3.00 m	41° 16' 30.7" N	072° 17' 10.4" W	---
2.55	988/229	Rock	5.94 m	41° 16' 02.2" N	072° 18' 31.2" W	---
2.56	5519/47	Rock	4.96 m	41° 16' 07.3" N	072° 18' 28.4" W	---
3.1	2642/1	Rock	16.98 m	41° 15' 19.6" N	072° 15' 15.9" W	---
3.2	738/256	Rock	21.24 m	41° 15' 07.1" N	072° 16' 18.2" W	---

1 - Charted Features

1.1) 19166/11

Survey Summary

Survey Position: 41° 16' 42.1" N, 072° 15' 10.2" W

Least Depth: 7.54 m (= 24.72 ft = 4.120 fm = 4 fm 0.72 ft)

TPU (±1.96σ): **THU (TPEh)** ±0.981 m ; **TVU (TPEv)** ±0.113 m

Timestamp: 2009-125.18:05:07.019 (05/05/2009)

Survey Line: h12013 / tj_3101_reson8125_mb / 2009-125 / 102_1743

Profile/Beam: 19166/11

Charts Affected: 13211_1, 12372_11, 12354_1, 12300_1, 13006_1, 5161_1, 13003_1

Remarks:

Sounding on a rock.

Feature Correlation

Address	Feature	Range	Azimuth	Status
h12013/tj_3101_reson8125_mb/2009-125/102_1743	19166/11	0.00	000.0	Primary

Hydrographer Recommendations

[None]

S-57 Data

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

Attributes:

QUASOU - 6:least depth known

SORDAT - 20090517

SORIND - US,US,NSURF,H12013

TECSOU - 3:found by multi-beam

VALSOU - 7.535 m

VERDAT - 12:Mean lower low water

WATLEV - 3:always under water/submerged

1.2) 386/121

Survey Summary

Survey Position: 41° 17' 01.8" N, 072° 15' 09.8" W

Least Depth: 2.79 m (= 9.14 ft = 1.523 fm = 1 fm 3.14 ft)

TPU (±1.96σ): **THU (TPEh)** ±0.980 m ; **TVU (TPEv)** ±0.103 m

Timestamp: 2009-131.19:45:19.844 (05/11/2009)

Survey Line: h12013 / tj_3101_reson8125_mb / 2009-131 / 126_1944

Profile/Beam: 386/121

Charts Affected: 13211_1, 12372_11, 12354_1, 12300_1, 13006_1, 5161_1, 13003_1

Remarks:

Least depth on a charted 10' rock.

Feature Correlation

Address	Feature	Range	Azimuth	Status
h12013/tj_3101_reson8125_mb/2009-131/126_1944	386/121	0.00	000.0	Primary

Hydrographer Recommendations

Update chart with 9' sounding.

S-57 Data

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

Attributes:

QUASOU - 6:least depth known

SORDAT - 20091517

SORIND - US,US,NSURF,H12013

TECSOU - 3:found by multi-beam

VALSOU - 2.785 m

VERDAT - 12:Mean lower low water

WATLEV - 3:always under water/submerged

1.3) 2311/1

Survey Summary

Survey Position: 41° 17' 32.5" N, 072° 14' 36.9" W

Least Depth: 4.41 m (= 14.48 ft = 2.413 fm = 2 fm 2.48 ft)

TPU (±1.96σ): **THU (TPEh)** ±0.980 m ; **TVU (TPEv)** ±0.108 m

Timestamp: 2009-132.14:19:43.922 (05/12/2009)

Survey Line: h12013 / tj_3101_reson8125_mb / 2009-132 / 841_1418

Profile/Beam: 2311/1

Charts Affected: 13211_1, 12372_1, 12372_11, 12354_1, 13205_1, 12300_1, 13006_1, 5161_1, 13003_1

Remarks:

Rock, least depth may be shoal of safe SONAR range.

Feature Correlation

Address	Feature	Range	Azimuth	Status
h12013/tj_3101_reson8125_mb/2009-132/841_1418	2311/1	0.00	000.0	Primary

Hydrographer Recommendations

[None]

S-57 Data

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

Attributes: SORIND - US,US,NSURF,H12013

VALSOU - 4.413 m

WATLEV - 3:always under water/submerged

1.4) 527/183

Survey Summary

Survey Position: 41° 16' 40.6" N, 072° 15' 17.4" W

Least Depth: 4.95 m (= 16.23 ft = 2.705 fm = 2 fm 4.23 ft)

TPU (±1.96σ): **THU (TPEh)** ±0.980 m ; **TVU (TPEv)** ±0.104 m

Timestamp: 2009-133.20:40:10.920 (05/13/2009)

Survey Line: h12013 / tj_3101_reson8125_mb / 2009-133 / 901_2039

Profile/Beam: 527/183

Charts Affected: 13211_1, 12372_11, 12354_1, 12300_1, 13006_1, 5161_1, 13003_1

Remarks:

Least depth on a charted 12' rock.

Feature Correlation

Address	Feature	Range	Azimuth	Status
h12013/tj_3101_reson8125_mb/2009-133/901_2039	527/183	0.00	000.0	Primary
h12013/tj_3101_klein5000_sss200/2009-122/502_090502135700	0002	20.58	322.3	Secondary (grouped)
h12013/tj_3101_klein5000_sss200/2009-122/503_090502140800	0002	26.59	163.9	Secondary (grouped)
h12013/tj_3102_reson7125_mb_t/2009-127/188_1921	2062/402	26.78	226.0	Secondary (grouped)
h12013/tj_3102_klein5000_hull_100/2009-120/513_090430193100	0009	40.13	156.4	Secondary (grouped)
h12013/tj_3102_klein5000_hull_100/2009-120/512_090430185300	0003	46.10	090.1	Secondary (grouped)
h12013/tj_3102_klein5000_hull_100/2009-120/513_090430193100	0005	53.63	087.8	Secondary (grouped)
h12013/tj_3101_klein5000_sss200/2009-122/503_090502140800	0003	54.02	100.3	Secondary (grouped)
h12013/tj_3102_klein5000_hull_100/2009-120/513_090430193100	0004	54.84	100.4	Secondary (grouped)
h12013/tj_3101_reson8125_mb/2009-125/187_1933	3730/94	58.92	157.4	Secondary (grouped)

Hydrographer Recommendations

Chart 16' sounding

S-57 Data

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

Attributes: SORDAT - 20090517

SORIND - US,US,NSURF,H12013

VALSOU - 4.946 m

WATLEV - 3:always under water/submerged

Feature Images

Figure 1.4.1

1.5) 1925/179

Survey Summary

Survey Position: 41° 16' 13.5" N, 072° 15' 50.7" W

Least Depth: 2.51 m (= 8.23 ft = 1.372 fm = 1 fm 2.23 ft)

TPU (±1.96σ): **THU (TPEh)** ±0.980 m ; **TVU (TPEv)** ±0.103 m

Timestamp: 2009-133.18:04:38.943 (05/13/2009)

Survey Line: h12013 / tj_3101_reson8125_mb / 2009-133 / 953_1803

Profile/Beam: 1925/179

Charts Affected: 12375_1, 13211_1, 12372_11, 12354_1, 12300_1, 13006_1, 5161_1, 13003_1

Remarks:

Rocky shoal.

Feature Correlation

Address	Feature	Range	Azimuth	Status
h12013/tj_3101_reson8125_mb/2009-133/953_1803	1925/179	0.00	000.0	Primary
h12013/tj_3102_klein5000_hull_100/2009-120/501_090430134800	0007	44.36	225.7	Secondary (grouped)
h12013/tj_3102_klein5000_hull_100/2009-120/501_090430134800	0006	66.60	207.6	Secondary (grouped)
h12013/tj_3102_klein5000_hull_100/2009-120/501_090430134800	0008	77.45	181.4	Secondary (grouped)
h12013/tj_3102_klein5000_hull_100/2009-120/502_090430133800	0017	85.51	238.6	Secondary (grouped)
h12013/tj_3102_klein5000_hull_100/2009-120/502_090430133800	0009	92.28	210.6	Secondary (grouped)
h12013/tj_3102_klein5000_hull_100/2009-120/502_090430133800	0010	127.75	207.9	Secondary (grouped)
h12013/tj_3102_klein5000_hull_100/2009-120/502_090430133800	0003	127.77	208.0	Secondary (grouped)
h12013/tj_3102_klein5000_hull_100/2009-120/503_090430133100	0002	127.80	208.6	Secondary (grouped)

Hydrographer Recommendations

Remove 9' sounding at 41.27, -072.26, replace with a 8' sounding over least depth.

S-57 Data

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

Attributes: QUASOU - 6:least depth known

SORDAT - 20090517

SORIND - US,US,NSURF,H12013

TECSOU - 3:found by multi-beam

VALSOU - 2.510 m

VERDAT - 12:Mean lower low water

WATLEV - 3:always under water/submerged

Feature Images

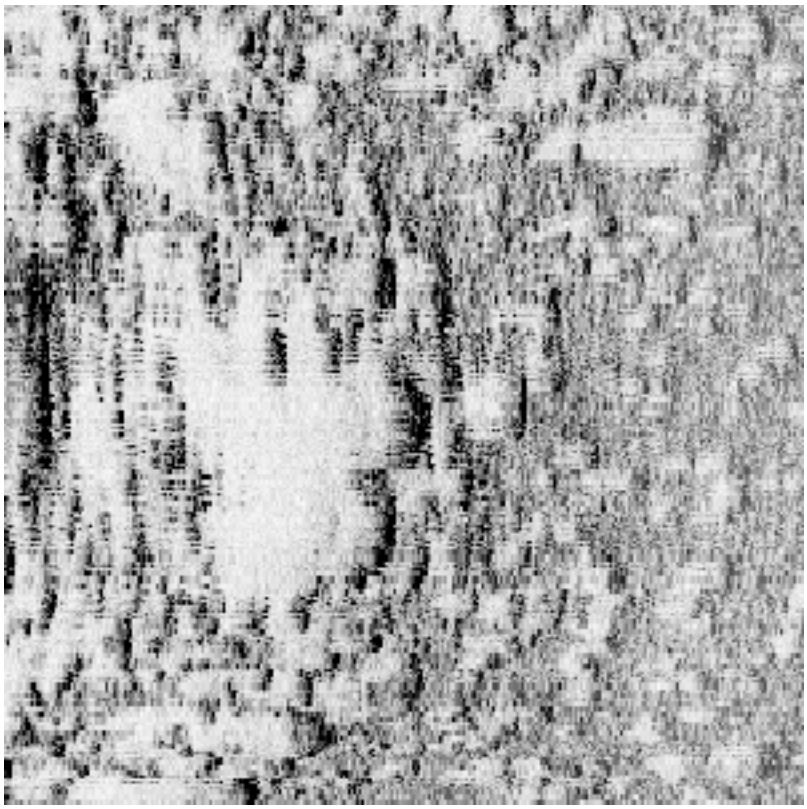


Figure 1.5.1

1.6) 371/231

Survey Summary

Survey Position: 41° 17' 12.5" N, 072° 14' 57.6" W

Least Depth: 2.02 m (= 6.62 ft = 1.103 fm = 1 fm 0.62 ft)

TPU (±1.96σ): **THU (TPEh)** ±0.980 m ; **TVU (TPEv)** ±0.103 m

Timestamp: 2009-136.20:21:14.461 (05/16/2009)

Survey Line: h12013 / tj_3101_reson8125_mb / 2009-136 / 506_2020

Profile/Beam: 371/231

Charts Affected: 13211_1, 12372_11, 12354_1, 13205_1, 12300_1, 13006_1, 5161_1, 13003_1

Remarks:

Charted as 5' rock.

Feature Correlation

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

Hydrographer Recommendations

Updated chart with 6' sounding.

S-57 Data

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

Attributes: SORIND - US,US,NSURF,H12013

VALSOU - 2.017 m

WATLEV - 3:always under water/submerged

2 - New Features

2.1) 0001

Survey Summary

Survey Position: 41° 16' 49.6" N, 072° 16' 01.2" W

Least Depth: [None]

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

Timestamp: 2009-124.01:14:37 (05/04/2009)

Survey Line: h12013 / tj_3101_klein5000_sss200 / 2009-122 / 509_090502181700

Contact/Point: 0001/1

Charts Affected: 12375_1, 13211_1, 12372_11, 12354_1, 12300_1, 13006_1, 5161_1, 13003_1

Remarks:

Field of rocks.

Feature Correlation

Address	Feature	Range	Azimuth	Status
h12013/tj_3101_klein5000_sss200/2009-122/509_090502181700	0001	0.00	000.0	Primary
h12013/tj_3101_reson8125_mb/2009-126/178_1352	12895/237	87.33	291.3	Secondary (grouped)
h12013/tj_3101_reson8125_mb/2009-137/095_1403	213/231	107.06	338.0	Secondary (grouped)

Hydrographer Recommendations

Chart 7' sounding over least depth, and adjust 12' contour to include field of rocks.

S-57 Data

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

Attributes: QUASOU - 6:least depth known

SORDAT - 20090517

SORIND - US,US,NSURF,H12013

TECSOU - 3:found by multi-beam

VERDAT - 12:Mean lower low water

WATLEV - 3:always under water/submerged

Feature Images

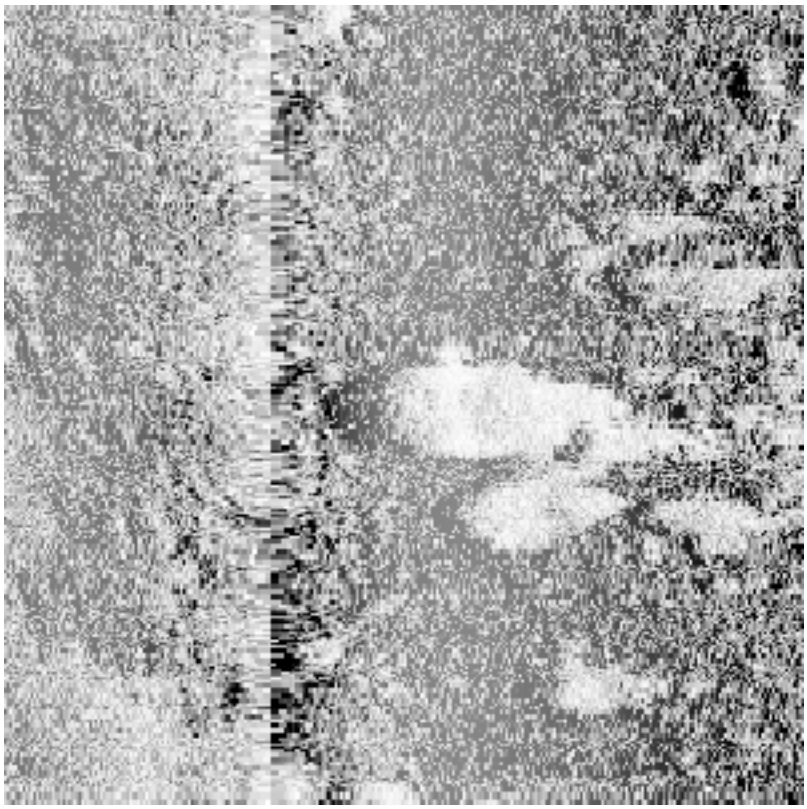


Figure 2.1.1

2.2) 0001

Survey Summary

Survey Position: 41° 15' 40.2" N, 072° 19' 08.3" W

Least Depth: [None]

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

Timestamp: 2009-134.12:54:37 (05/14/2009)

Survey Line: h12013 / tj_3102_klein5000_hull_200 / 2009-132 / 052_090512203100

Contact/Point: 0001/1

Charts Affected: 12375_1, 12372_11, 12354_1, 12300_1, 13006_1, 5161_1, 13003_1

Remarks:

Side Scan contact with no correlating bathymetry.

Feature Correlation

Address	Feature	Range	Azimuth	Status
h12013/tj_3102_klein5000_hull_200/2009-132/052_090512203100	0001	0.00	000.0	Primary
h12013/tj_3102_klein5000_hull_200/2009-132/052_090512202500	0001	0.81	013.7	Secondary (grouped)

Hydrographer Recommendations

Obtain nadir beam bathymetry over object.

S-57 Data

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

Attributes: QUASOU - 2:depth unknown

SORIND - US,US,NSURF,H12013

TECSOU - 2:found by side scan sonar

Feature Images

Figure 2.2.1

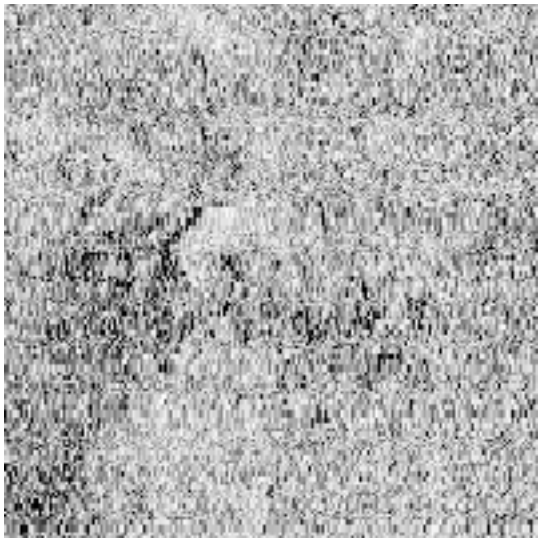


Figure 2.2.2

2.3) 0009

Survey Summary

Survey Position: 41° 17' 02.1" N, 072° 15' 18.4" W

Least Depth: [None]

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

Timestamp: 2009-135.05:57:49 (05/15/2009)

Survey Line: h12013 / tj_3102_klein5000_hull_200 / 2009-133 / 205_090513132300

Contact/Point: 0009/1

Charts Affected: 13211_1, 12372_11, 12354_1, 12300_1, 13006_1, 5161_1, 13003_1

Remarks:

No bathymetry is correlated with this contact.

Feature Correlation

Address	Feature	Range	Azimuth	Status
h12013/tj_3102_klein5000_hull_200/2009-133/205_090513132300	0009	0.00	000.0	Primary
h12013/tj_3102_klein5000_hull_200/2009-133/201_090513131300	0004	6.66	173.7	Secondary (grouped)

Hydrographer Recommendations

[None]

S-57 Data

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

Attributes: QUASOU - 2:depth unknown

SORIND - US,US,NSURF,H12013

TECSOU - 2:found by side scan sonar

WATLEV - 3:always under water/submerged

Feature Images

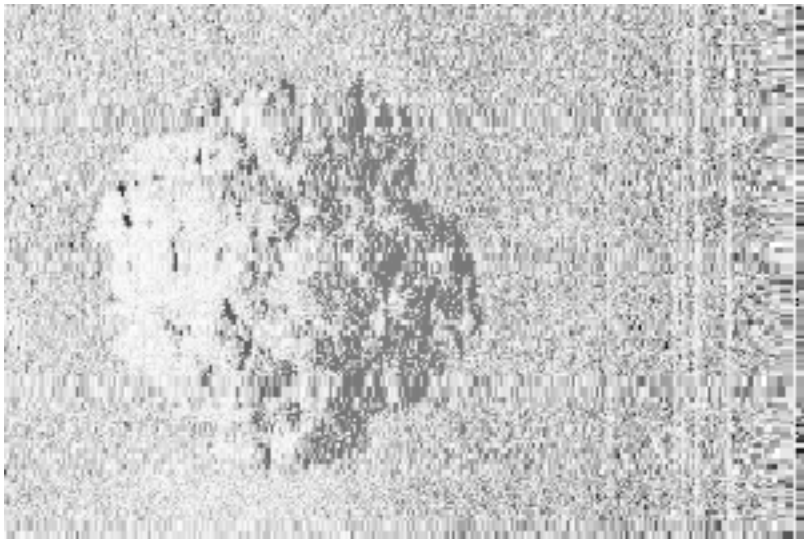


Figure 2.3.1

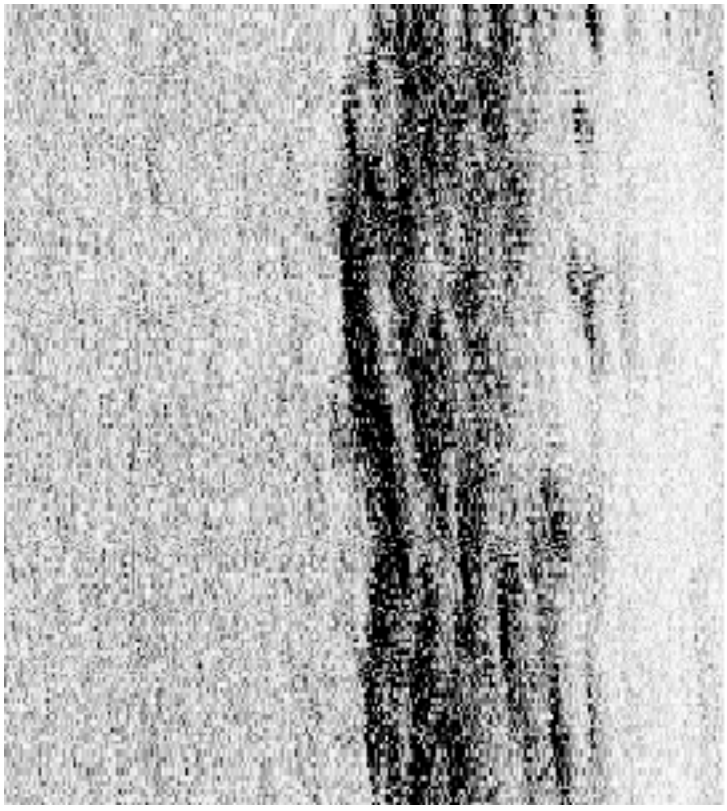


Figure 2.3.2

2.4) 0004

Survey Summary

Survey Position: 41° 17' 02.4" N, 072° 15' 24.4" W

Least Depth: [None]

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

Timestamp: 2009-135.06:13:16 (05/15/2009)

Survey Line: h12013 / tj_3102_klein5000_hull_200 / 2009-133 / 207_090513133600

Contact/Point: 0004/1

Charts Affected: 13211_1, 12372_11, 12354_1, 12300_1, 13006_1, 5161_1, 13003_1

Remarks:

No batrymetry associated with this contact

Feature Correlation

Address	Feature	Range	Azimuth	Status
h12013/tj_3102_klein5000_hull_200/2009-133/207_090513133600	0004	0.00	000.0	Primary

Hydrographer Recommendations

Collect bathymetry over contact

S-57 Data

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

Attributes: QUASOU - 2:depth unknown

SORIND - US,US,NSURF,H12013

TECSOU - 2:found by side scan sonar

WATLEV - 3:always under water/submerged

Feature Images

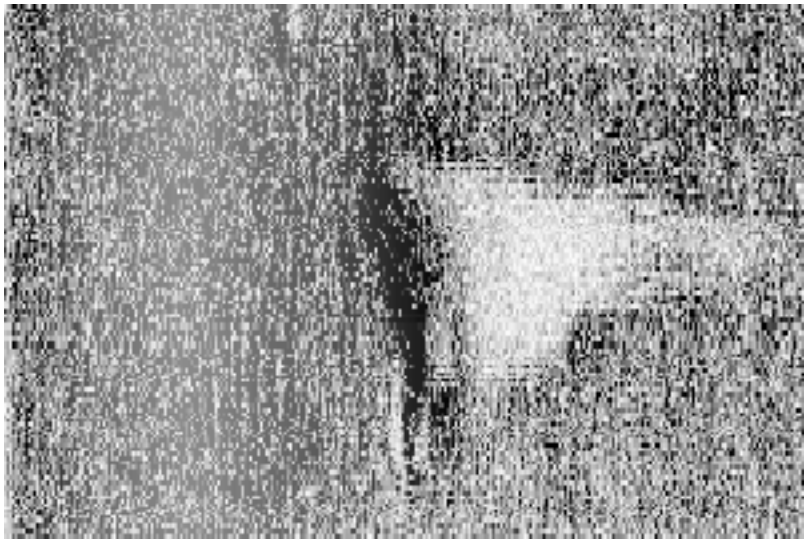


Figure 2.4.1

2.5) 0001

Survey Summary

Survey Position: 41° 16' 54.7" N, 072° 15' 30.7" W

Least Depth: [None]

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

Timestamp: 2009-135.06:17:10 (05/15/2009)

Survey Line: h12013 / tj_3102_klein5000_hull_200 / 2009-133 / 208_090513133200

Contact/Point: 0001/1

Charts Affected: 12375_1, 13211_1, 12372_11, 12354_1, 12300_1, 13006_1, 5161_1, 13003_1

Remarks:

Side scan contact with no associated bathymetry.

Feature Correlation

Address	Feature	Range	Azimuth	Status
h12013/tj_3102_klein5000_hull_200/2009-133/208_090513133200	0001	0.00	000.0	Primary

Hydrographer Recommendations

Recommend acquiring bathymetry over object.

S-57 Data

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

Attributes: QUASOU - 2:depth unknown

SORIND - US,US,NSURF,H12013

TECSOU - 2:found by side scan sonar

WATLEV - 3:always under water/submerged

Feature Images

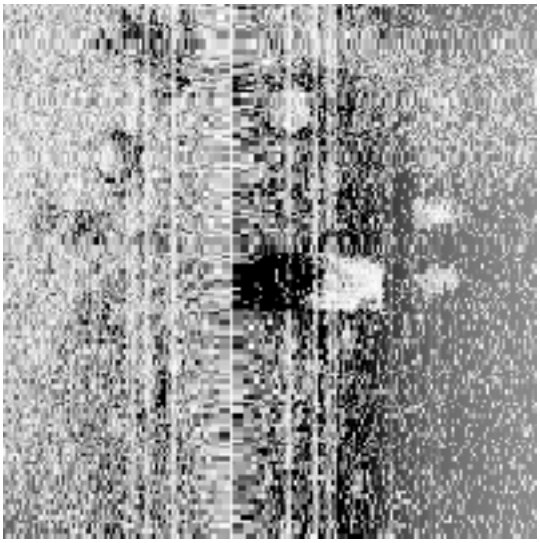


Figure 2.5.1

2.6) 995/61

Survey Summary

Survey Position: 41° 16' 39.7" N, 072° 15' 08.1" W

Least Depth: 8.89 m (= 29.18 ft = 4.863 fm = 4 fm 5.18 ft)

TPU (±1.96σ): **THU (TPEh)** ±0.981 m ; **TVU (TPEv)** ±0.105 m

Timestamp: 2009-125.17:12:40.165 (05/05/2009)

Survey Line: h12013 / tj_3101_reson8125_mb / 2009-125 / 101_1711

Profile/Beam: 995/61

Charts Affected: 13211_1, 12372_11, 12354_1, 12300_1, 13006_1, 5161_1, 13003_1

Remarks:

Rocky area.

Feature Correlation

Address	Feature	Range	Azimuth	Status
h12013/tj_3101_reson8125_mb/2009-125/101_1711	995/61	0.00	000.0	Primary
h12013/tj_3101_reson8125_mb/2009-125/184_1620	3235/137	45.26	007.2	Secondary (grouped)
h12013/tj_3101_klein5000_sss200/2009-122/530_090502123400	0001	59.46	008.9	Secondary (grouped)
h12013/tj_3102_reson7125_mb_t/2009-127/126_1800	961/507	67.20	350.4	Secondary (grouped)
h12013/tj_3101_klein5000_sss200/2009-121/280_090501152400	0007	68.70	347.4	Secondary (grouped)

Hydrographer Recommendations

Sounding is shoal of surrouding depths, but well reflected by current charted soundings. Recommend charting as rock only if current soundings are updated.

S-57 Data

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

Attributes: QUASOU - 6:least depth known

SORDAT - 20091517

SORIND - US,US,NSURF,H12013

TECSOU - 3:found by multi-beam

VALSOU - 8.893 m

VERDAT - 12:Mean lower low water

WATLEV - 3:always under water/submerged

2.7) 4047/1

Survey Summary

Survey Position: 41° 17' 13.3" N, 072° 15' 13.0" W

Least Depth: 3.21 m (= 10.54 ft = 1.757 fm = 1 fm 4.54 ft)

TPU (±1.96σ): **THU (TPEh)** ±0.980 m ; **TVU (TPEv)** ±0.107 m

Timestamp: 2009-126.13:29:28.941 (05/06/2009)

Survey Line: h12013 / tj_3101_reson8125_mb / 2009-126 / 177_1326

Profile/Beam: 4047/1

Charts Affected: 13211_1, 12372_11, 12354_1, 12300_1, 13006_1, 5161_1, 13003_1

Remarks:

Sounding, not known as least depth. Possibly part of breakwater. Therefore not S57 atributes assigned.

Feature Correlation

Address	Feature	Range	Azimuth	Status
h12013/tj_3101_reson8125_mb/2009-126/177_1326	4047/1	0.00	000.0	Primary

Hydrographer Recommendations

Recommend further development by RSD

S-57 Data

[None]

2.8) 6235/180

Survey Summary

Survey Position: 41° 17' 20.6" N, 072° 15' 07.3" W

Least Depth: 1.86 m (= 6.12 ft = 1.019 fm = 1 fm 0.12 ft)

TPU (±1.96σ): **THU (TPEh)** ±0.980 m ; **TVU (TPEv)** ±0.103 m

Timestamp: 2009-126.13:31:18.352 (05/06/2009)

Survey Line: h12013 / tj_3101_reson8125_mb / 2009-126 / 177_1326

Profile/Beam: 6235/180

Charts Affected: 13211_1, 12372_11, 12354_1, 12300_1, 13006_1, 5161_1, 13003_1

Remarks:

Shoal rock located on the 12' contour and not well reflected by surrounding chart soundings.

Feature Correlation

Address	Feature	Range	Azimuth	Status
h12013/tj_3101_reson8125_mb/2009-126/177_1326	6235/180	0.00	000.0	Primary

Hydrographer Recommendations

Chart as sounding.

S-57 Data

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

Attributes: SORDAT - 20090517

SORIND - US,US,NSURF,H12013

VALSOU - 1.864 m

WATLEV - 3:always under water/submerged

2.9) 2200/114

Survey Summary

Survey Position: 41° 17' 08.9" N, 072° 15' 13.7" W

Least Depth: 3.98 m (= 13.05 ft = 2.176 fm = 2 fm 1.05 ft)

TPU (±1.96σ): **THU (TPEh)** ±0.980 m ; **TVU (TPEv)** ±0.103 m

Timestamp: 2009-126.13:27:56.584 (05/06/2009)

Survey Line: h12013 / tj_3101_reson8125_mb / 2009-126 / 177_1326

Profile/Beam: 2200/114

Charts Affected: 13211_1, 12372_11, 12354_1, 12300_1, 13006_1, 5161_1, 13003_1

Remarks:

Feature Correlation

Address	Feature	Range	Azimuth	Status
h12013/tj_3101_reson8125_mb/2009-126/177_1326	2200/114	0.00	000.0	Primary

Hydrographer Recommendations

Chart dangerous rock

S-57 Data

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

Attributes:

QUASOU - 6:least depth known

SORDAT - 20090517

SORIND - US,US,NSURF,H12013

TECSOU - 3:found by multi-beam

VALSOU - 3.979 m

VERDAT - 12:Mean lower low water

WATLEV - 3:always under water/submerged

2.10) 874/22

Survey Summary

Survey Position: 41° 17' 35.5" N, 072° 14' 37.4" W

Least Depth: 2.79 m (= 9.15 ft = 1.524 fm = 1 fm 3.15 ft)

TPU (±1.96σ): **THU (TPEh)** ±0.980 m ; **TVU (TPEv)** ±0.104 m

Timestamp: 2009-126.13:40:52.801 (05/06/2009)

Survey Line: h12013 / tj_3101_reson8125_mb / 2009-126 / 177_1339

Profile/Beam: 874/22

Charts Affected: 13211_1, 12372_1, 12372_11, 12354_1, 13205_1, 12300_1, 13006_1, 5161_1, 13003_1

Remarks:

Sounding on rock not known as least depth.

Feature Correlation

Address	Feature	Range	Azimuth	Status
h12013/tj_3101_reson8125_mb/2009-126/177_1339	874/22	0.00	000.0	Primary

Hydrographer Recommendations

Chart rock

S-57 Data

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

Attributes:

QUASOU - 1:depth known

SORDAT - 20090517

SORIND - US,US,NSURF,H12013

TECSOU - 3:found by multi-beam

VALSOU - 2.788 m

VERDAT - 12:Mean lower low water

WATLEV - 3:always under water/submerged

2.11) 1201/223

Survey Summary

Survey Position: 41° 17' 33.6" N, 072° 14' 38.1" W

Least Depth: 1.03 m (= 3.39 ft = 0.565 fm = 0 fm 3.39 ft)

TPU (±1.96σ): **THU (TPEh)** ±0.980 m ; **TVU (TPEv)** ±0.103 m

Timestamp: 2009-126.13:41:14.604 (05/06/2009)

Survey Line: h12013 / tj_3101_reson8125_mb / 2009-126 / 177_1339

Profile/Beam: 1201/223

Charts Affected: 13211_1, 12372_1, 12372_11, 12354_1, 13205_1, 12300_1, 13006_1, 5161_1, 13003_1

Remarks:

Soundin on rock not known as least depth.

Feature Correlation

Address	Feature	Range	Azimuth	Status
h12013/tj_3101_reson8125_mb/2009-126/177_1339	1201/223	0.00	000.0	Primary
h12013/tj_3102_klein5000_hull_200/2009-133/200_090513124800	0003	26.96	333.2	Secondary (grouped)

Hydrographer Recommendations

chart rock

S-57 Data

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

Attributes:

QUASOU - 1:depth known

SORDAT - 20090517

SORIND - US,US,NSURF,H12013

TECSOU - 3:found by multi-beam

VALSOU - 1.033 m

VERDAT - 12:Mean lower low water

WATLEV - 3:always under water/submerged

Feature Images

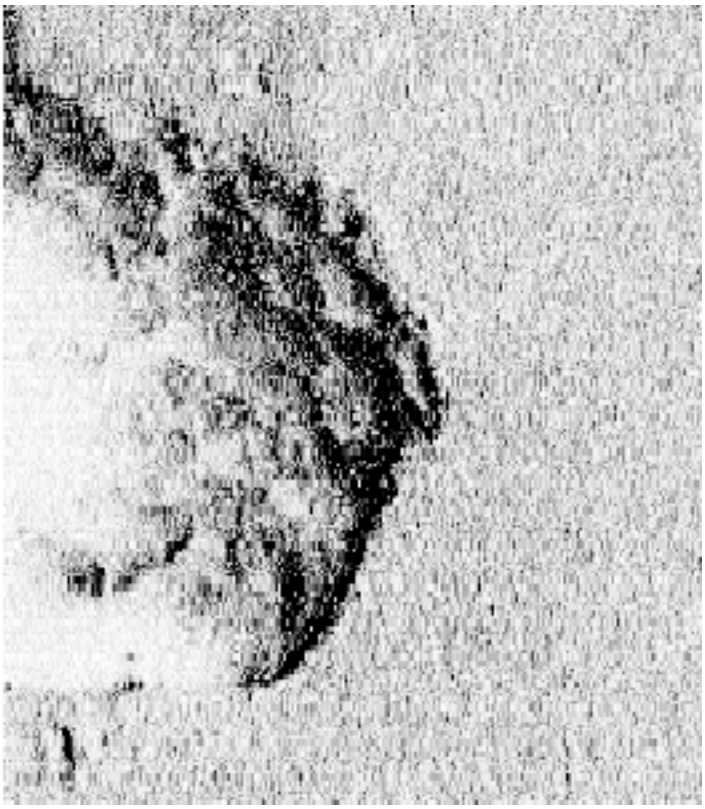


Figure 2.11.1

2.12) 4657/235

Survey Summary

Survey Position: 41° 16' 56.2" N, 072° 15' 26.4" W

Least Depth: 2.32 m (= 7.61 ft = 1.269 fm = 1 fm 1.61 ft)

TPU (±1.96σ): **THU (TPEh)** ±0.980 m ; **TVU (TPEv)** ±0.104 m

Timestamp: 2009-126.13:57:56.514 (05/06/2009)

Survey Line: h12013 / tj_3101_reson8125_mb / 2009-126 / 178_1352

Profile/Beam: 4657/235

Charts Affected: 13211_1, 12372_11, 12354_1, 12300_1, 13006_1, 5161_1, 13003_1

Remarks:

Least depth for a rocky area.

Feature Correlation

Address	Feature	Range	Azimuth	Status
h12013/tj_3101_reson8125_mb/2009-126/178_1352	4657/235	0.00	000.0	Primary
h12013/tj_3101_reson8125_mb/2009-126/178_1352	4413/231	22.82	085.8	Secondary (grouped)
h12013/tj_3102_klein5000_hull_200/2009-133/205_090513132300	0008	43.03	048.4	Secondary (grouped)

Hydrographer Recommendations

Chart as dangerous rock or expand 6' contour

S-57 Data

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

Attributes: SORDAT - 20090517

SORIND - US,US,NSURF,H12013

VALSOU - 2.321 m

WATLEV - 3:always under water/submerged

2.13) 8785/190

Survey Summary

Survey Position: 41° 16' 48.7" N, 072° 15' 38.7" W

Least Depth: 1.67 m (= 5.48 ft = 0.914 fm = 0 fm 5.48 ft)

TPU (±1.96σ): **THU (TPEh)** ±0.980 m ; **TVU (TPEv)** ±0.103 m

Timestamp: 2009-126.14:02:14.608 (05/06/2009)

Survey Line: h12013 / tj_3101_reson8125_mb / 2009-126 / 178_1352

Profile/Beam: 8785/190

Charts Affected: 12375_1, 13211_1, 12372_11, 12354_1, 12300_1, 13006_1, 5161_1, 13003_1

Remarks:

Least depth on a rock.

Feature Correlation

Address	Feature	Range	Azimuth	Status
h12013/tj_3101_reson8125_mb/2009-126/178_1352	8785/190	0.00	000.0	Primary

Hydrographer Recommendations

Chart dangerous rock, or bring 6' contour south of sounding.

S-57 Data

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

Attributes:

QUASOU - 6:least depth known

SORDAT - 20090517

SORIND - US,US,NSURF,H12013

TECSOU - 3:found by multi-beam

VALSOU - 1.671 m

VERDAT - 12:Mean lower low water

WATLEV - 3:always under water/submerged

2.14) 16073/237

Survey Summary

Survey Position: 41° 16' 53.1" N, 072° 16' 09.3" W

Least Depth: 2.69 m (= 8.84 ft = 1.473 fm = 1 fm 2.84 ft)

TPU (±1.96σ): **THU (TPEh)** ±0.980 m ; **TVU (TPEv)** ±0.105 m

Timestamp: 2009-126.14:09:50.274 (05/06/2009)

Survey Line: h12013 / tj_3101_reson8125_mb / 2009-126 / 178_1352

Profile/Beam: 16073/237

Charts Affected: 12375_1, 13211_1, 12372_11, 12354_1, 12300_1, 13006_1, 5161_1, 13003_1

Remarks:

Sounding, not known as least depth.

Feature Correlation

Address	Feature	Range	Azimuth	Status
h12013/tj_3101_reson8125_mb/2009-126/178_1352	16073/237	0.00	000.0	Primary

Hydrographer Recommendations

Change 10' charted sounding to 9'.

S-57 Data

[None]

2.15) 1994/7

Survey Summary

Survey Position:	41° 17' 01.8" N, 072° 15' 27.2" W
Least Depth:	2.63 m (= 8.65 ft = 1.441 fm = 1 fm 2.65 ft)
TPU (±1.96σ):	**THU (TPEh)** ±0.980 m ; **TVU (TPEv)** ±0.105 m
Timestamp:	2009-126.13:55:08.875 (05/06/2009)
Survey Line:	h12013 / tj_3101_reson8125_mb / 2009-126 / 178_1352
Profile/Beam:	1994/7
Charts Affected:	13211_1, 12372_11, 12354_1, 12300_1, 13006_1, 5161_1, 13003_1

Remarks:

Least depth on a rock.

Feature Correlation

Address	Feature	Range	Azimuth	Status
h12013/tj_3101_reson8125_mb/2009-126/178_1352	1994/7	0.00	000.0	Primary

Hydrographer Recommendations

Adjust 12' contour, or chart rock

S-57 Data

Geo object 1:	Underwater rock / awash rock (UWTROC)
Attributes:	QUASOU - 6:least depth known
	SORDAT - 20090517
	SORIND - US,US,NSURF,H12013
	TECSOU - 3:found by multi-beam
	VALSOU - 2.635 m
	WATLEV - 3:always under water/submerged

2.16) 9255/239

Survey Summary

Survey Position: 41° 16' 41.3" N, 072° 15' 43.7" W

Least Depth: 3.04 m (= 9.96 ft = 1.661 fm = 1 fm 3.96 ft)

TPU (±1.96σ): **THU (TPEh)** ±0.980 m ; **TVU (TPEv)** ±0.104 m

Timestamp: 2009-126.19:30:00.393 (05/06/2009)

Survey Line: h12013 / tj_3101_reson8125_mb / 2009-126 / 189_1922

Profile/Beam: 9255/239

Charts Affected: 12375_1, 13211_1, 12372_11, 12354_1, 12300_1, 13006_1, 5161_1, 13003_1

Remarks:

Rocky shoal.

Feature Correlation

Address	Feature	Range	Azimuth	Status
h12013/tj_3101_reson8125_mb/2009-126/189_1922	9255/239	0.00	000.0	Primary
h12013/tj_3101_reson8125_mb/2009-126/189_1922	9374/81	24.64	049.0	Secondary (grouped)
h12013/tj_3101_klein5000_sss200/2009-122/506_090502155000	0003	25.70	355.4	Secondary (grouped)
h12013/tj_3102_klein5000_hull_100/2009-120/515_090430204500	0014	28.80	001.1	Secondary (grouped)
h12013/tj_3101_reson8125_mb/2009-137/600_1448	7408/153	31.23	357.3	Secondary (grouped)
h12013/tj_3102_klein5000_hull_100/2009-120/515_090430204500	0013	31.27	345.5	Secondary (grouped)
h12013/tj_3102_klein5000_hull_100/2009-120/515_090430204500	0007	37.23	010.6	Secondary (grouped)
h12013/tj_3102_klein5000_hull_100/2009-120/515_090430204500	0012	37.71	346.9	Secondary (grouped)
h12013/tj_3101_reson8125_mb/2009-137/600_1448	7468/32	45.22	014.6	Secondary (grouped)
h12013/tj_3102_klein5000_hull_100/2009-120/515_090430204500	0015	45.93	017.4	Secondary (grouped)
h12013/tj_3101_reson8125_mb/2009-136/104_2046	3229/189	55.17	338.1	Secondary (grouped)
h12013/tj_3102_klein5000_hull_100/2009-120/528_090430203300	0003	59.03	347.2	Secondary (grouped)
h12013/tj_3101_reson8125_mb/2009-136/104_2046	3319/142	65.88	001.0	Secondary (grouped)
h12013/tj_3101_reson8125_mb/2009-137/064_1307	1226/20	71.68	314.3	Secondary (grouped)
h12013/tj_3101_reson8125_mb/2009-137/064_1307	1224/139	79.08	317.2	Secondary (grouped)
h12013/tj_3101_klein5000_sss200/2009-122/506_090502155000	0004	84.97	315.5	Secondary (grouped)

Hydrographer Recommendations

chart 10' sounding over shoal area.

S-57 Data

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

Attributes:

QUASOU - 6:least depth known

SORDAT - 20090517

SORIND - US,US,NSURF,H12013

TECSOU - 3:found by multi-beam

VALSOU - 3.037 m

VERDAT - 12:Mean lower low water

WATLEV - 3:always under water/submerged

2.17) 391/178

Survey Summary

Survey Position: 41° 16' 41.7" N, 072° 15' 47.5" W

Least Depth: 2.31 m (= 7.58 ft = 1.264 fm = 1 fm 1.58 ft)

TPU (±1.96σ): **THU (TPEh)** ±0.980 m ; **TVU (TPEv)** ±0.103 m

Timestamp: 2009-127.15:07:38.646 (05/07/2009)

Survey Line: h12013 / tj_3101_reson8125_mb / 2009-127 / 124_1507

Profile/Beam: 391/178

Charts Affected: 12375_1, 13211_1, 12372_11, 12354_1, 12300_1, 13006_1, 5161_1, 13003_1

Remarks:

Least depth over a rocky shoal.

Feature Correlation

Address	Feature	Range	Azimuth	Status
h12013/tj_3101_reson8125_mb/2009-127/124_1507	391/178	0.00	000.0	Primary
h12013/tj_3101_reson8125_mb/2009-127/124_1507	449/238	21.07	257.3	Secondary (grouped)
h12013/tj_3102_klein5000_hull_100/2009-109/506_090419192100	0001	28.28	167.3	Secondary (grouped)
h12013/tj_3101_reson8125_mb/2009-127/125_1508	901/1	28.84	169.8	Secondary (grouped)
h12013/tj_3101_klein5000_sss200/2009-122/507_090502170900	0001	30.25	166.1	Secondary (grouped)

Hydrographer Recommendations

Update chart with 7' rock

S-57 Data

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

Attributes: QUASOU - 6:least depth known

SORDAT - 20090517

SORIND - US,US,NSURF,H12013

TECSOU - 3:found by multi-beam

VALSOU - 2.311 m

VERDAT - 12:Mean lower low water

WATLEV - 3:always under water/submerged

2.18) 14363/24

Survey Summary

Survey Position: 41° 16' 43.4" N, 072° 15' 44.0" W

Least Depth: 4.00 m (= 13.12 ft = 2.187 fm = 2 fm 1.12 ft)

TPU (±1.96σ): **THU (TPEh)** ±0.980 m ; **TVU (TPEv)** ±0.104 m

Timestamp: 2009-131.20:35:54.125 (05/11/2009)

Survey Line: h12013 / tj_3101_reson8125_mb / 2009-131 / 180_2024

Profile/Beam: 14363/24

Charts Affected: 12375_1, 13211_1, 12372_11, 12354_1, 12300_1, 13006_1, 5161_1, 13003_1

Remarks:

Least depth on a rock.

Feature Correlation

Address	Feature	Range	Azimuth	Status
h12013/tj_3101_reson8125_mb/2009-131/180_2024	14363/24	0.00	000.0	Primary
h12013/tj_3101_reson8125_mb/2009-126/190_2005	1022/161	15.84	272.0	Secondary (grouped)
h12013/tj_3101_reson8125_mb/2009-137/600_1443	2826/5	17.64	017.0	Secondary (grouped)

Hydrographer Recommendations

Chart as 13' sounding

S-57 Data

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

Attributes:

SORDAT - 20090517

SORIND - US,US,NSURF,H12013

VALSOU - 4.000 m

WATLEV - 3:always under water/submerged

2.19) 10505/7

Survey Summary

Survey Position: 41° 17' 32.2" N, 072° 14' 40.4" W

Least Depth: 2.14 m (= 7.03 ft = 1.172 fm = 1 fm 1.03 ft)

TPU (±1.96σ): **THU (TPEh)** ±0.980 m ; **TVU (TPEv)** ±0.103 m

Timestamp: 2009-132.14:42:11.875 (05/12/2009)

Survey Line: h12013 / tj_3101_reson8125_mb / 2009-132 / 801_1434

Profile/Beam: 10505/7

Charts Affected: 13211_1, 12372_1, 12372_11, 12354_1, 13205_1, 12300_1, 13006_1, 5161_1, 13003_1

Remarks:

Rock, sounding not known as least depth

Feature Correlation

Address	Feature	Range	Azimuth	Status
h12013/tj_3101_reson8125_mb/2009-132/801_1434	10505/7	0.00	000.0	Primary

Hydrographer Recommendations

Not navigationally significant due to nearby 5' sounding.

S-57 Data

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

Attributes:

QUASOU - 1:depth known

SORDAT - 20090517

SORIND - US,US,NSURF,H12013

TECSOU - 3:found by multi-beam

VALSOU - 2.144 m

WATLEV - 3:always under water/submerged

2.20) 571/24

Survey Summary

Survey Position: 41° 17' 04.3" N, 072° 15' 15.7" W

Least Depth: 3.51 m (= 11.50 ft = 1.917 fm = 1 fm 5.50 ft)

TPU (±1.96σ): **THU (TPEh)** ±0.980 m ; **TVU (TPEv)** ±0.104 m

Timestamp: 2009-132.14:35:00.885 (05/12/2009)

Survey Line: h12013 / tj_3101_reson8125_mb / 2009-132 / 801_1434

Profile/Beam: 571/24

Charts Affected: 13211_1, 12372_11, 12354_1, 12300_1, 13006_1, 5161_1, 13003_1

Remarks:

Least depth on a rock.

Feature Correlation

Address	Feature	Range	Azimuth	Status
h12013/tj_3101_reson8125_mb/2009-132/801_1434	571/24	0.00	000.0	Primary

Hydrographer Recommendations

Chart as dangerous rock.

S-57 Data

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

Attributes:

QUASOU - 6:least depth known

SORDAT - 20091517

SORIND - US,US,NSURF,H12013

TECSOU - 3:found by multi-beam

VALSOU - 3.506 m

WATLEV - 3:always under water/submerged

2.21) 76/11

Survey Summary

Survey Position: 41° 16' 59.2" N, 072° 15' 27.3" W

Least Depth: 1.57 m (= 5.14 ft = 0.856 fm = 0 fm 5.14 ft)

TPU (±1.96σ): **THU (TPEh)** ±0.980 m ; **TVU (TPEv)** ±0.103 m

Timestamp: 2009-132.16:29:55.104 (05/12/2009)

Survey Line: h12013 / tj_3101_reson8125_mb / 2009-132 / 807_1629

Profile/Beam: 76/11

Charts Affected: 13211_1, 12372_11, 12354_1, 12300_1, 13006_1, 5161_1, 13003_1

Remarks:

Primary and secondary soundings over a rocky shoal. Sounding not known as least depth. Unable to acquire least depth due to irreconsilable differences between launch draft and rock.

Feature Correlation

Address	Feature	Range	Azimuth	Status
h12013/tj_3101_reson8125_mb/2009-132/807_1629	76/11	0.00	000.0	Primary
h12013/tj_3102_klein5000_hull_200/2009-133/206_090513133000	0002	23.30	277.6	Secondary (grouped)
h12013/tj_3101_reson8125_mb/2009-126/178_1352	3378/9	23.93	318.2	Secondary (grouped)
h12013/tj_3101_reson8125_mb/2009-132/807_1629	481/121	33.47	116.8	Secondary (grouped)
h12013/tj_3102_klein5000_hull_200/2009-133/207_090513133600	0001	34.30	119.2	Secondary (grouped)
h12013/tj_3101_reson8125_mb/2009-137/634_1247	1119/81	38.07	167.6	Secondary (grouped)
h12013/tj_3102_klein5000_hull_200/2009-133/207_090513133600	0003	38.84	171.7	Secondary (grouped)

Hydrographer Recommendations

Chart as rky area, with a dangerous rock over 5' sounding.

S-57 Data

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

Attributes: QUASOU - 6:least depth known

SORDAT - 20090517

SORIND - US,US,NSURF,H12013

TECSOU - 3:found by multi-beam

VALSOU - 1.566 m

VERDAT - 12:Mean lower low water

WATLEV - 3:always under water/submerged

Feature Images

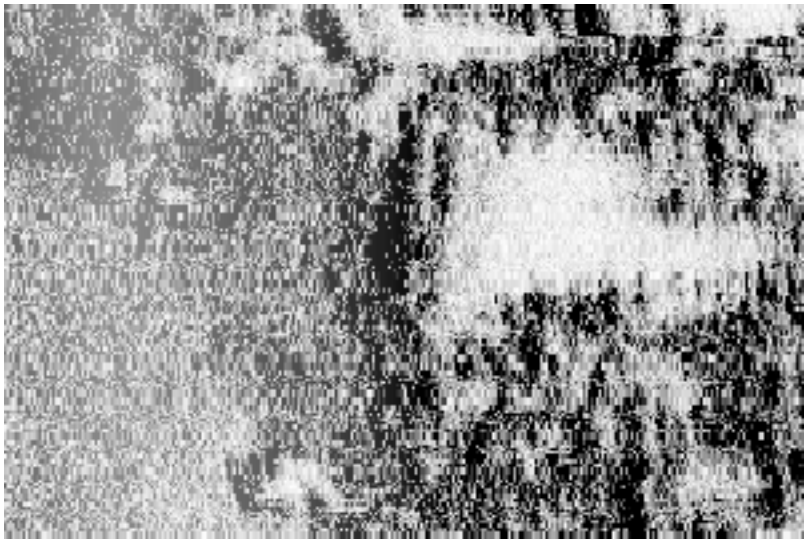


Figure 2.21.1

2.22) 2470/69

Survey Summary

Survey Position: 41° 17' 05.5" N, 072° 15' 20.5" W

Least Depth: 1.95 m (= 6.40 ft = 1.067 fm = 1 fm 0.40 ft)

TPU (±1.96σ): **THU (TPEh)** ±0.980 m ; **TVU (TPEv)** ±0.103 m

Timestamp: 2009-132.16:31:48.335 (05/12/2009)

Survey Line: h12013 / tj_3101_reson8125_mb / 2009-132 / 807_1629

Profile/Beam: 2470/69

Charts Affected: 13211_1, 12372_11, 12354_1, 12300_1, 13006_1, 5161_1, 13003_1

Remarks:

Least depth on a rock.

Feature Correlation

Address	Feature	Range	Azimuth	Status
h12013/tj_3101_reson8125_mb/2009-132/807_1629	2470/69	0.00	000.0	Primary

Hydrographer Recommendations

Chart as dangerous rock.

S-57 Data

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

Attributes:

QUASOU - 6:least depth known

SORDAT - 20090517

SORIND - US,US,NSURF,H12013

TECSOU - 3:found by multi-beam

VALSOU - 1.952 m

WATLEV - 3:always under water/submerged

2.23) 10078/1

Survey Summary

Survey Position: 41° 16' 30.3" N, 072° 17' 22.7" W

Least Depth: 2.05 m (= 6.71 ft = 1.119 fm = 1 fm 0.71 ft)

TPU (±1.96σ): **THU (TPEh)** ±0.980 m ; **TVU (TPEv)** ±0.104 m

Timestamp: 2009-132.18:21:10.170 (05/12/2009)

Survey Line: h12013 / tj_3101_reson8125_mb / 2009-132 / 815_1812

Profile/Beam: 10078/1

Charts Affected: 12375_1, 12372_11, 12354_1, 12300_1, 13006_1, 5161_1, 13003_1

Remarks:

Sounding on a rock, not known as least depth.

Feature Correlation

Address	Feature	Range	Azimuth	Status
h12013/tj_3101_reson8125_mb/2009-132/815_1812	10078/1	0.00	000.0	Primary
h12013/tj_3102_klein5000_hull_200/2009-133/215_090513143900	0002	27.84	178.5	Secondary (grouped)

Hydrographer Recommendations

Chart 6' sounding with contour, or chart dangerous rock symbol.

S-57 Data

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

Attributes:

QUASOU - 1:depth known

SORDAT - 20090517

SORIND - US,US,NSURF,H12013

TECSOU - 3:found by multi-beam

VALSOU - 2.046 m

VERDAT - 12:Mean lower low water

WATLEV - 3:always under water/submerged

Feature Images

Figure 2.23.1

2.24) 2948/14

Survey Summary

Survey Position: 41° 15' 47.3" N, 072° 19' 05.2" W

Least Depth: 3.05 m (= 10.00 ft = 1.667 fm = 1 fm 4.00 ft)

TPU (±1.96σ): **THU (TPEh)** ±0.980 m ; **TVU (TPEv)** ±0.104 m

Timestamp: 2009-132.20:28:55.664 (05/12/2009)

Survey Line: h12013 / tj_3101_reson8125_mb / 2009-132 / 874_2026

Profile/Beam: 2948/14

Charts Affected: 12375_1, 12372_11, 12354_1, 12300_1, 13006_1, 5161_1, 13003_1

Remarks:

Rock or debris pile.

Feature Correlation

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

Hydrographer Recommendations

Chart as dangerous rock.

S-57 Data

Geo object 1: Obstruction (OBSTRN)

Attributes: SORIND - US,US,NSURF,H12013

VALSOU - 3.048 m

WATLEV - 3:always under water/submerged

Feature Images

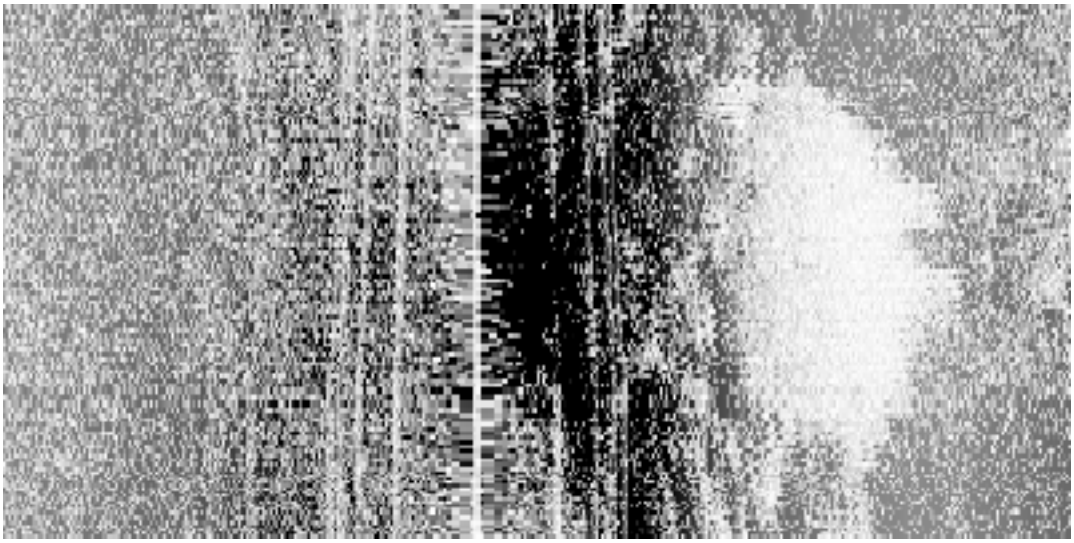


Figure 2.24.1

2.25) 212/78

Survey Summary

Survey Position: 41° 16' 48.8" N, 072° 14' 30.2" W

Least Depth: 7.07 m (= 23.19 ft = 3.865 fm = 3 fm 5.19 ft)

TPU (±1.96σ): **THU (TPEh)** ±0.981 m ; **TVU (TPEv)** ±0.104 m

Timestamp: 2009-132.13:35:22.204 (05/12/2009)

Survey Line: h12013 / tj_3101_reson8125_mb / 2009-132 / 908_1334

Profile/Beam: 212/78

Charts Affected: 13211_1, 12372_1, 12372_11, 12354_1, 13205_1, 12300_1, 13006_1, 5161_1, 13003_1

Remarks:

Least depth on a rock. Not known as least depth. Suggest referencing OPR-B370-TJ-05 H11250 for possible least depth in juction data.

Feature Correlation

Address	Feature	Range	Azimuth	Status
h12013/tj_3101_reson8125_mb/2009-132/908_1334	212/78	0.00	000.0	Primary
h12013/tj_3101_reson8125_mb/2009-132/908_1334	197/73	6.57	251.1	Secondary (grouped)
h12013/tj_3101_klein5000_sss100/2009-110/783_090420135600	0003	36.40	179.7	Secondary (grouped)
h12013/tj_3101_reson8125_mb/2009-132/908_1334	130/225	37.18	230.8	Secondary (grouped)
h12013/tj_3102_reson7125_mb_t/2009-121/783_1751	30/507	84.23	164.9	Secondary (grouped)

Hydrographer Recommendations

Chart as rock.

S-57 Data

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

Attributes:

QUASOU - 1:depth known

SORDAT - 20090517

SORIND - US,US,NSURF,H12013

TECSOU - 3:found by multi-beam

VALSOU - 7.068 m

VERDAT - 12:Mean lower low water

WATLEV - 3:always under water/submerged

2.26) 619/73

Survey Summary

Survey Position: 41° 16' 37.2" N, 072° 15' 47.5" W

Least Depth: 3.97 m (= 13.04 ft = 2.173 fm = 2 fm 1.04 ft)

TPU (±1.96σ): **THU (TPEh)** ±0.980 m ; **TVU (TPEv)** ±0.103 m

Timestamp: 2009-137.13:07:54.423 (05/17/2009)

Survey Line: h12013 / tj_3101_reson8125_mb / 2009-137 / 064_1307

Profile/Beam: 619/73

Charts Affected: 12375_1, 13211_1, 12372_11, 12354_1, 12300_1, 13006_1, 5161_1, 13003_1

Remarks:

Least depth over a rocky shoal.

Feature Correlation

Address	Feature	Range	Azimuth	Status
h12013/tj_3101_reson8125_mb/2009-137/064_1307	619/73	0.00	000.0	Primary
h12013/tj_3101_klein5000_sss200/2009-122/505_090502150800	0003	21.76	015.9	Secondary (grouped)
h12013/tj_3102_klein5000_hull_100/2009-120/528_090430203300	0002	28.00	013.4	Secondary (grouped)
h12013/tj_3101_reson8125_mb/2009-137/064_1307	502/236	31.84	045.7	Secondary (grouped)
h12013/tj_3101_reson8125_mb/2009-137/064_1307	752/10	33.40	230.5	Secondary (grouped)

Hydrographer Recommendations

Chart 13' sounding over shoal area.

S-57 Data

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

Attributes: QUASOU - 6:least depth known

SORDAT - 20090517

SORIND - US,US,NSURF,H12013

TECSOU - 3:found by multi-beam

VALSOU - 3.974 m

VERDAT - 12:Mean lower low water

WATLEV - 3:always under water/submerged

Feature Images

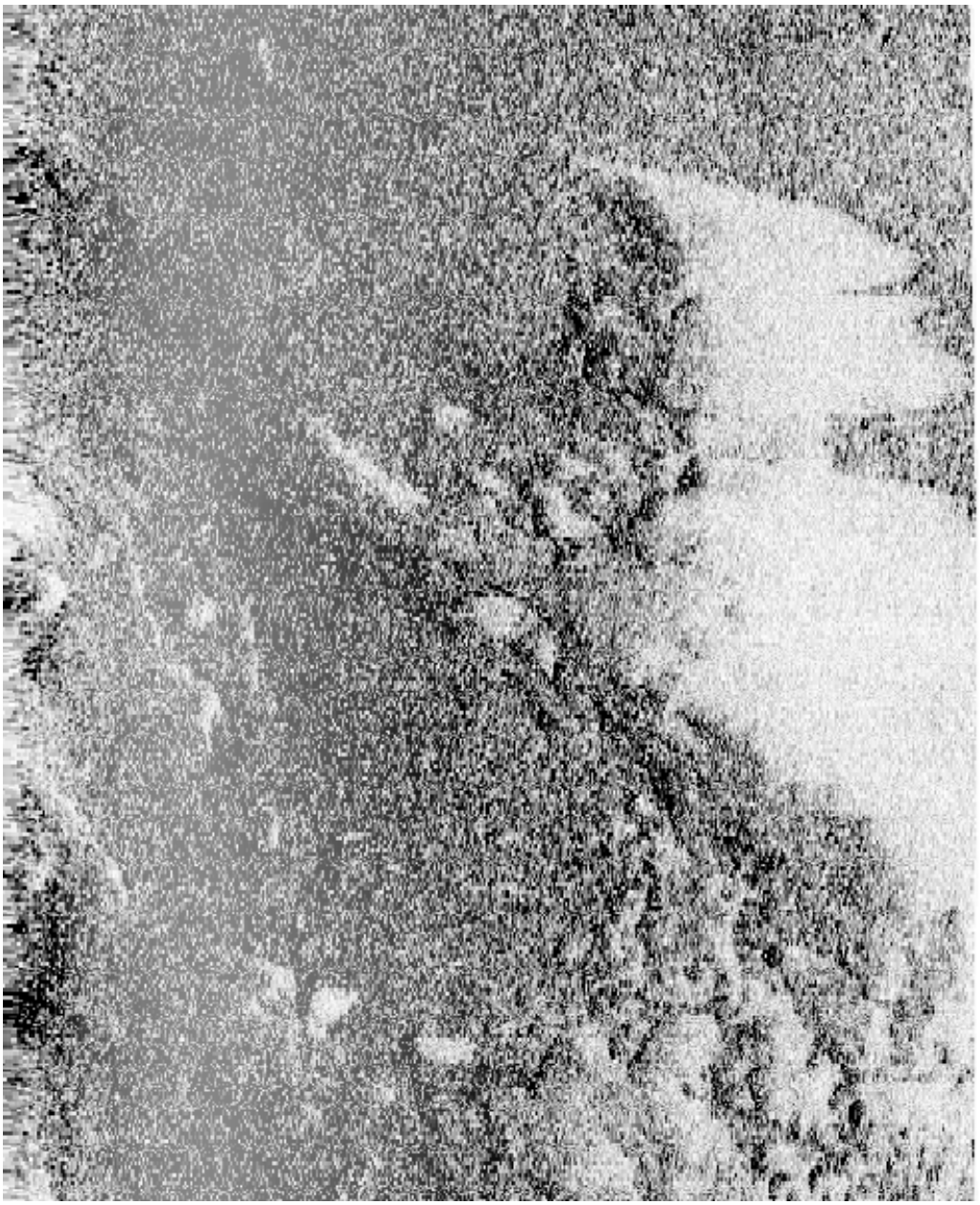


Figure 2.26.1

2.27) 2594/172

Survey Summary

Survey Position: 41° 16' 38.2" N, 072° 15' 49.9" W

Least Depth: 3.54 m (= 11.63 ft = 1.938 fm = 1 fm 5.63 ft)

TPU (±1.96σ): **THU (TPEh)** ±0.980 m ; **TVU (TPEv)** ±0.103 m

Timestamp: 2009-137.14:32:45.081 (05/17/2009)

Survey Line: h12013 / tj_3101_reson8125_mb / 2009-137 / 600_1429

Profile/Beam: 2594/172

Charts Affected: 12375_1, 13211_1, 12372_11, 12354_1, 12300_1, 13006_1, 5161_1, 13003_1

Remarks:

Least depth on a rocky shoal.

Feature Correlation

Address	Feature	Range	Azimuth	Status
h12013/tj_3101_reson8125_mb/2009-137/600_1429	2594/172	0.00	000.0	Primary
h12013/tj_3102_klein5000_hull_100/2009-120/515_090430204500	0018	15.81	266.2	Secondary (grouped)
h12013/tj_3101_reson8125_mb/2009-137/600_1448	7913/179	16.87	272.9	Secondary (grouped)
h12013/tj_3102_klein5000_hull_100/2009-120/515_090430204500	0009	22.15	189.5	Secondary (grouped)
h12013/tj_3102_klein5000_hull_100/2009-120/515_090430204500	0017	44.80	251.0	Secondary (grouped)
h12013/tj_3102_klein5000_hull_100/2009-120/515_090430204500	0020	50.67	146.2	Secondary (grouped)
h12013/tj_3102_klein5000_hull_100/2009-120/515_090430204500	0019	58.01	177.3	Secondary (grouped)
h12013/tj_3101_reson8125_mb/2009-137/600_1429	2882/112	69.37	238.4	Secondary (grouped)
h12013/tj_3102_klein5000_hull_100/2009-120/515_090430204500	0016	70.04	237.3	Secondary (grouped)
h12013/tj_3102_klein5000_hull_100/2009-120/515_090430204500	0008	71.07	237.4	Secondary (grouped)
h12013/tj_3101_reson8125_mb/2009-137/600_1437	3694/230	74.03	217.5	Secondary (grouped)
h12013/tj_3101_reson8125_mb/2009-126/189_1922	9699/13	82.68	233.5	Secondary (grouped)

Hydrographer Recommendations

Chart 11' sounding over area.

S-57 Data

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

Attributes:

QUASOU - 6:least depth known

SORDAT - 20090517

SORIND - US,US,NSURF,H12013

TECSOU - 3:found by multi-beam

VALSOU - 3.545 m

VERDAT - 12:Mean lower low water

WATLEV - 3:always under water/submerged

Feature Images

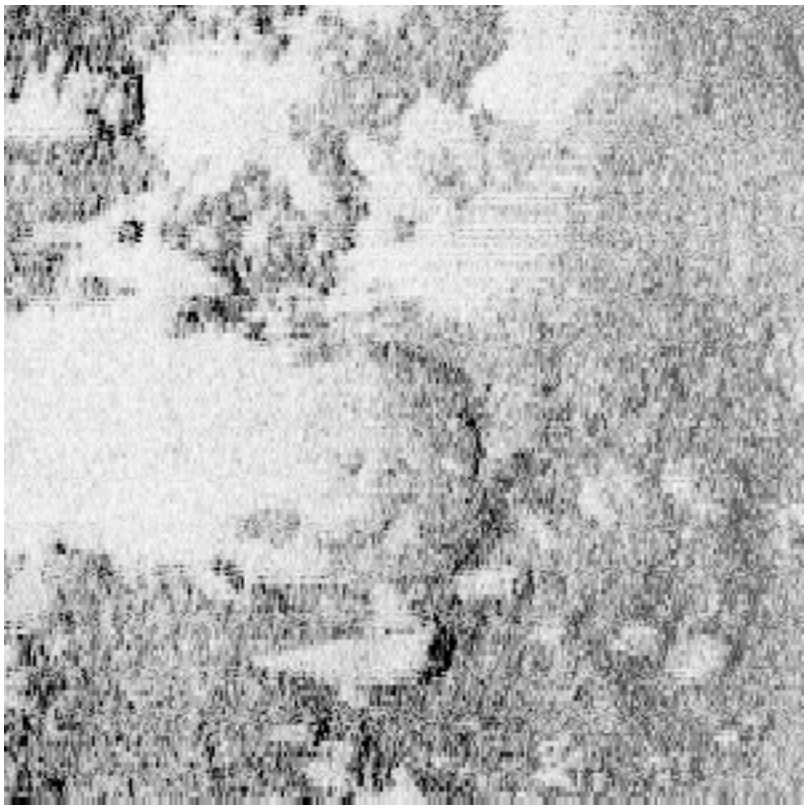


Figure 2.27.1

2.28) 241/34

Survey Summary

Survey Position: 41° 16' 44.9" N, 072° 15' 45.9" W

Least Depth: 4.64 m (= 15.23 ft = 2.539 fm = 2 fm 3.23 ft)

TPU (±1.96σ): **THU (TPEh)** ±0.980 m ; **TVU (TPEv)** ±0.104 m

Timestamp: 2009-137.14:49:03.981 (05/17/2009)

Survey Line: h12013 / tj_3101_reson8125_mb / 2009-137 / 600_1448

Profile/Beam: 241/34

Charts Affected: 12375_1, 13211_1, 12372_11, 12354_1, 12300_1, 13006_1, 5161_1, 13003_1

Remarks:

Least depth over a rocky shoal.

Feature Correlation

Address	Feature	Range	Azimuth	Status
h12013/tj_3101_reson8125_mb/2009-137/600_1448	241/34	0.00	000.0	Primary
h12013/tj_3101_reson8125_mb/2009-127/191_1444	17215/15	8.99	346.4	Secondary (grouped)
h12013/tj_3101_reson8125_mb/2009-127/191_1444	16927/128	25.31	052.4	Secondary (grouped)
h12013/tj_3102_klein5000_hull_100/2009-109/506_090419192100	0006	26.79	043.8	Secondary (grouped)
h12013/tj_3101_reson8125_mb/2009-127/191_1444	16846/225	35.34	050.5	Secondary (grouped)
h12013/tj_3102_klein5000_hull_100/2009-109/505_090419195100	0004	49.03	060.8	Secondary (grouped)

Hydrographer Recommendations

Not navigationally significant.

S-57 Data

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

Attributes: SORDAT - 20090517

SORIND - US,US,NSURF,H12013

VALSOU - 4.643 m

WATLEV - 3:always under water/submerged

2.29) 219/122

Survey Summary

Survey Position: 41° 16' 45.1" N, 072° 14' 37.2" W

Least Depth: 8.11 m (= 26.62 ft = 4.436 fm = 4 fm 2.62 ft)

TPU (±1.96σ): **THU (TPEh)** ±0.981 m ; **TVU (TPEv)** ±0.103 m

Timestamp: 2009-137.12:39:06.604 (05/17/2009)

Survey Line: h12013 / tj_3101_reson8125_mb / 2009-137 / 601_1238

Profile/Beam: 219/122

Charts Affected: 13211_1, 12372_11, 12354_1, 13205_1, 12300_1, 13006_1, 5161_1, 13003_1

Remarks:

Least depth on a rock. Surrounding depths 28 - 34'

Feature Correlation

Address	Feature	Range	Azimuth	Status
h12013/tj_3101_reson8125_mb/2009-137/601_1238	219/122	0.00	000.0	Primary
h12013/tj_3101_klein5000_sss200/2009-121/280_090501152400	0003	2.66	208.4	Secondary
h12013/tj_3101_klein5000_sss100/2009-110/782_090420134500	0001	3.23	244.1	Secondary
h12013/tj_3101_klein5000_sss200/2009-121/280_090501152400	0006	23.59	167.9	Secondary (grouped)
h12013/tj_3101_klein5000_sss200/2009-121/279_090501151400	0005	29.21	306.8	Secondary (grouped)

Hydrographer Recommendations

Chart as dangerous rock

S-57 Data

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

Attributes: QUASOU - 6:least depth known

SORDAT - 20091705

SORIND - US,US,NSURF,H12013

TECSOU - 3:found by multi-beam

VALSOU - 8.113 m

VERDAT - 12:Mean lower low water

WATLEV - 3:always under water/submerged

Feature Images

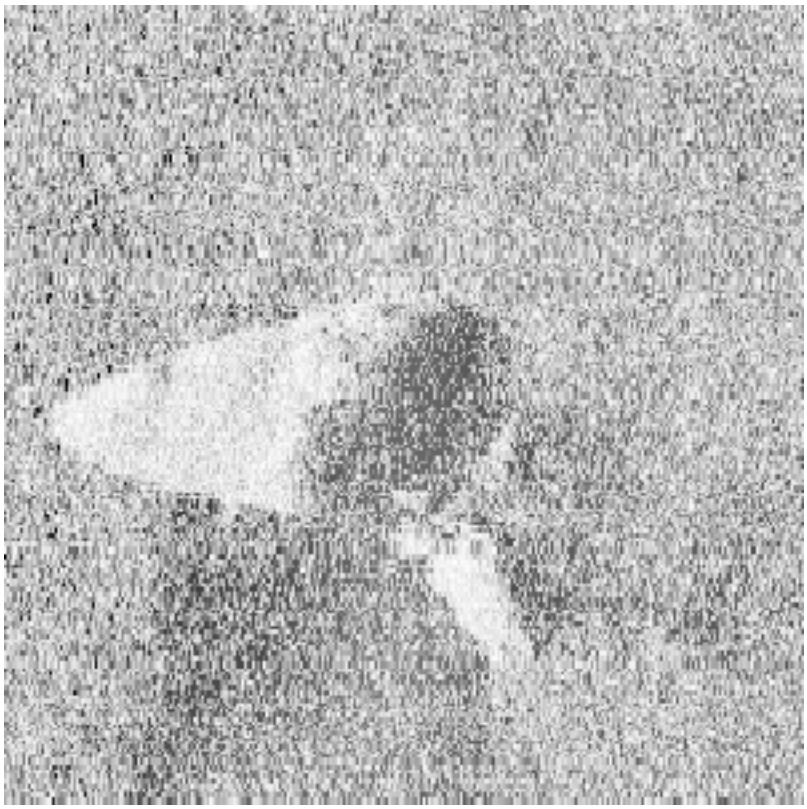


Figure 2.29.1

2.30) 7346/274

Survey Summary

Survey Position: 41° 15' 13.5" N, 072° 19' 38.8" W

Least Depth: 6.51 m (= 21.35 ft = 3.558 fm = 3 fm 3.35 ft)

TPU (±1.96σ): **THU (TPEh)** ±0.999 m ; **TVU (TPEv)** ±0.283 m

Timestamp: 2009-122.18:10:51.113 (05/02/2009)

Survey Line: h12013 / tj_3102_reson7125_mb_t / 2009-122 / 174_1804

Profile/Beam: 7346/274

Charts Affected: 12375_1, 12372_11, 12354_1, 12300_1, 13006_1, 5161_1, 13003_1

Remarks:

Several side scan contacts and least depths over the sharp crest of a sand wave.

Feature Correlation

Address	Feature	Range	Azimuth	Status
h12013/tj_3102_reson7125_mb_t/2009-122/174_1804	7346/274	0.00	000.0	Primary
h12013/tj_3101_klein5000_sss200/2009-121/299_090501165600	0001	44.88	312.8	Secondary (grouped)
h12013/tj_3102_reson7125_mb_t/2009-122/174_1804	7015/203	62.06	118.9	Secondary (grouped)
h12013/tj_3102_reson7125_mb_t/2009-122/154_1753	5190/209	63.91	026.5	Secondary (grouped)
h12013/tj_3101_klein5000_sss100/2009-112/764_090422132000	0001	68.39	025.3	Secondary (grouped)
h12013/tj_3102_reson7125_mb_t/2009-122/174_1804	6811/164	99.58	119.2	Secondary (grouped)
h12013/tj_3101_klein5000_sss100/2009-112/765_090422130900	0001	159.69	127.6	Secondary (grouped)
h12013/tj_3101_klein5000_sss100/2009-112/765_090422130900	0002	183.38	106.4	Secondary (grouped)

Hydrographer Recommendations

Possibly chart a 21' sounding over the area.

S-57 Data

Geo object 1: Seabed area (SBDARE)

Attributes: INFORM - Sand wave

NATSUR - 4:sand

SORDAT - 20090517

SORIND - US,US,NSURF,H12013

WATLEV - 3:always under water/submerged

Feature Images

Figure 2.30.1

2.31) 2407/244

Survey Summary

Survey Position: 41° 16' 35.7" N, 072° 15' 24.3" W

Least Depth: 9.02 m (= 29.59 ft = 4.931 fm = 4 fm 5.59 ft)

TPU (±1.96σ): **THU (TPEh)** ±0.999 m ; **TVU (TPEv)** ±0.284 m

Timestamp: 2009-127.18:44:15.742 (05/07/2009)

Survey Line: h12013 / tj_3102_reson7125_mb_t / 2009-127 / 102_1841

Profile/Beam: 2407/244

Charts Affected: 13211_1, 12372_11, 12354_1, 12300_1, 13006_1, 5161_1, 13003_1

Remarks:

Least depth for a group of rocks.

Feature Correlation

Address	Feature	Range	Azimuth	Status
h12013/tj_3102_reson7125_mb_t/2009-127/102_1841	2407/244	0.00	000.0	Primary
h12013/tj_3102_klein5000_hull_100/2009-120/511_090430184100	0002	57.27	007.2	Secondary (grouped)
h12013/tj_3102_reson7125_mb_t/2009-127/185_1827	3759/512	59.11	006.9	Secondary (grouped)
h12013/tj_3101_klein5000_sss200/2009-122/530_090502123400	0003	59.47	007.0	Secondary (grouped)
h12013/tj_3101_reson8125_mb/2009-125/101_1646	18874/5	63.01	001.5	Secondary (grouped)
h12013/tj_3101_reson8125_mb/2009-125/101_1646	18922/162	77.34	341.6	Secondary (grouped)
h12013/tj_3101_klein5000_sss200/2009-122/530_090502123400	0004	105.78	337.8	Secondary (grouped)
h12013/tj_3101_klein5000_sss200/2009-121/280_090501152400	0009	118.24	339.2	Secondary (grouped)
h12013/tj_3102_reson7125_mb_t/2009-127/127_1818	3121/55	122.57	018.1	Secondary (grouped)
h12013/tj_3101_reson8125_mb/2009-125/102_1743	17872/175	129.76	063.1	Secondary (grouped)
h12013/tj_3101_klein5000_sss200/2009-122/502_090502135700	0003	137.15	051.3	Secondary (grouped)

Hydrographer Recommendations

Update sounding at 41.2762, -072.2564 to 29'

S-57 Data

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

Attributes:

QUASOU - 6:least depth known

SORDAT - 20090517

SORIND - US,US,NSURF,H12013

TECSOU - 3:found by multi-beam

VALSOU - 9.018 m

VERDAT - 12:Mean lower low water

WATLEV - 3:always under water/submerged

Feature Images

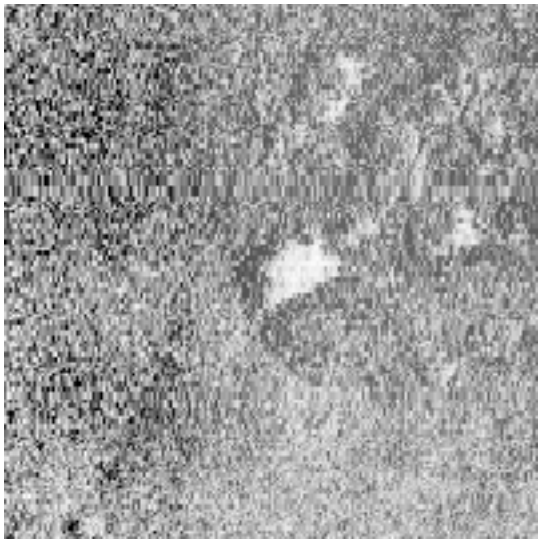


Figure 2.31.1

2.32) Wreck

Survey Summary

Survey Position: 41° 16' 20.5" N, 072° 16' 10.2" W

Least Depth: 6.55 m (= 21.48 ft = 3.580 fm = 3 fm 3.48 ft)

TPU (±1.96σ): **THU (TPEh)** ±1.000 m ; **TVU (TPEv)** ±0.285 m

Timestamp: 2009-127.19:09:58.172 (05/07/2009)

Survey Line: h12013 / tj_3102_reson7125_mb_t / 2009-127 / 103_1901

Profile/Beam: 7164/3

Charts Affected: 12375_1, 13211_1, 12372_11, 12354_1, 12300_1, 13006_1, 5161_1, 13003_1

Remarks:

Least depth on what appears to be a sunken barge.

Feature Correlation

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

Hydrographer Recommendations

Chart as non-dangerous wreck.

S-57 Data

Geo object 1: Wreck (WRECKS)

Attributes:

CATWRK - 1:non-dangerous wreck

QUASOU - 6:least depth known

SORDAT - 20090517

SORIND - US,US,NSURF,H12013

TECSOU - 3:found by multi-beam

VALSOU - 6.547 m

VERDAT - 12:Mean lower low water

WATLEV - 3:always under water/submerged

Feature Images

Figure 2.32.1

2.33) 4139/36

Survey Summary

Survey Position: 41° 16' 34.0" N, 072° 15' 05.9" W

Least Depth: 11.40 m (= 37.40 ft = 6.233 fm = 6 fm 1.40 ft)

TPU (±1.96σ): **THU (TPEh)** ±1.000 m ; **TVU (TPEv)** ±0.288 m

Timestamp: 2009-127.17:33:45.855 (05/07/2009)

Survey Line: h12013 / tj_3102_reson7125_mb_t / 2009-127 / 123_1729

Profile/Beam: 4139/36

Charts Affected: 13211_1, 12372_11, 12354_1, 12300_1, 13006_1, 5161_1, 13003_1

Remarks:

Least depth on a rock.

Feature Correlation

Address	Feature	Range	Azimuth	Status
h12013/tj_3102_reson7125_mb_t/2009-127/123_1729	4139/36	0.00	000.0	Primary
h12013/tj_3101_klein5000_sss200/2009-121/280_090501152400	0004	2.18	085.5	Secondary
h12013/tj_3101_klein5000_sss200/2009-121/279_090501151400	0003	2.22	192.4	Secondary
h12013/tj_3101_klein5000_sss100/2009-110/782_090420134500	0002	21.16	155.7	Secondary (grouped)
h12013/tj_3102_reson7125_mb_t/2009-127/124_1735	793/356	22.84	141.1	Secondary (grouped)
h12013/tj_3102_reson7125_mb_t/2009-127/123_1729	4164/277	26.26	306.4	Secondary (grouped)

Hydrographer Recommendations

Chart 37' dangerous rock

S-57 Data

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

Attributes: QUASOU - 6:least depth known

SORDAT - 20090517

SORIND - US,US,NSURF,H12013

TECSOU - 3:found by multi-beam

VALSOU - 11.398 m

VERDAT - 12:Mean lower low water

WATLEV - 3:always under water/submerged

Feature Images

Figure 2.33.1

2.34) 4097/511

Survey Summary

Survey Position: 41° 16' 33.6" N, 072° 15' 10.6" W

Least Depth: 9.98 m (= 32.76 ft = 5.460 fm = 5 fm 2.76 ft)

TPU (±1.96σ): **THU (TPEh)** ±1.000 m ; **TVU (TPEv)** ±0.287 m

Timestamp: 2009-127.17:48:34.660 (05/07/2009)

Survey Line: h12013 / tj_3102_reson7125_mb_t / 2009-127 / 125_1744

Profile/Beam: 4097/511

Charts Affected: 13211_1, 12372_11, 12354_1, 12300_1, 13006_1, 5161_1, 13003_1

Remarks:

Least depth of a rocky outcropping.

Feature Correlation

Address	Feature	Range	Azimuth	Status
h12013/tj_3102_reson7125_mb_t/2009-127/125_1744	4097/511	0.00	000.0	Primary
h12013/tj_3101_klein5000_sss200/2009-121/280_090501152400	0008	14.88	116.0	Secondary (grouped)
h12013/tj_3101_klein5000_sss100/2009-110/782_090420134500	0004	17.64	163.8	Secondary (grouped)
h12013/tj_3102_reson7125_mb_t/2009-127/125_1744	4073/250	20.20	126.7	Secondary (grouped)

Hydrographer Recommendations

Chart 32' sounding

S-57 Data

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

Attributes:

QUASOU - 6:least depth known

SORDAT - 20090517

SORIND - US,US,NSURF,H12013

TECSOU - 3:found by multi-beam

VALSOU - 9.985 m

WATLEV - 3:always under water/submerged

Feature Images

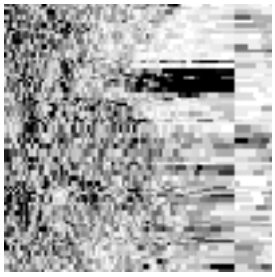


Figure 2.34.1

2.35) 22198/160

Survey Summary

Survey Position: 41° 15' 47.0" N, 072° 15' 36.8" W

Least Depth: 13.50 m (= 44.29 ft = 7.382 fm = 7 fm 2.29 ft)

TPU (±1.96σ): **THU (TPEh)** ±1.000 m ; **TVU (TPEv)** ±0.408 m

Timestamp: 2009-120.20:02:09.217 (04/30/2009)

Survey Line: h12013 / tj_s222_reson7125_stbd / 2009-120 / 002_1927

Profile/Beam: 22198/160

Charts Affected: 12375_1, 13211_1, 12372_11, 12354_1, 12300_1, 13006_1, 5161_1, 13003_1

Remarks:

Least depth on a rocky shoal.

Feature Correlation

Address	Feature	Range	Azimuth	Status
h12013/tj_s222_reson7125_stbd/2009-120/002_1927	22198/160	0.00	000.0	Primary

Hydrographer Recommendations

Change 45' sounding at 41.2632, -07.22600 to a 44' sounding.

S-57 Data

Geo object 1: Seabed area (SBDARE)

Attributes: NATSUR - 9:rock

SORDAT - 20090517

SORIND - US,US,NSURF,H12013

WATLEV - 3:always under water/submerged

2.36) 2376/96

Survey Summary

Survey Position: 41° 15' 54.7" N, 072° 14' 55.6" W

Least Depth: 15.92 m (= 52.22 ft = 8.703 fm = 8 fm 4.22 ft)

TPU (±1.96σ): **THU (TPEh)** ±1.000 m ; **TVU (TPEv)** ±0.410 m

Timestamp: 2009-120.22:06:47.615 (04/30/2009)

Survey Line: h12013 / tj_s222_reson7125_stbd / 2009-120 / 005_2203

Profile/Beam: 2376/96

Charts Affected: 13211_1, 12372_11, 12354_1, 13205_1, 12300_1, 13006_1, 5161_1, 13003_1

Remarks:

Sounding over a rocky shoal. Not well reflected by charted soundings.

Feature Correlation

Address	Feature	Range	Azimuth	Status
h12013/tj_s222_reson7125_stbd/2009-120/005_2203	2376/96	0.00	000.0	Primary
h12013/tj_3101_klein5000_sss200/2009-121/270_090501130500	0013	29.60	107.9	Secondary (grouped)
h12013/tj_s222_reson7125_stbd/2009-121/917_2105	489/76	32.81	244.5	Secondary (grouped)
h12013/tj_s222_reson7125_stbd/2009-121/917_2105	490/75	33.00	243.7	Secondary (grouped)
h12013/tj_s222_reson7125_stbd/2009-121/917_2105	490/76	33.10	243.9	Secondary (grouped)
h12013/tj_s222_reson7125_stbd/2009-121/918a1803	571/21	33.67	110.1	Secondary (grouped)
h12013/tj_s222_reson7125_stbd/2009-120/005_2203	2261/111	33.67	242.4	Secondary (grouped)
h12013/tj_3101_klein5000_sss200/2009-121/270_090501130500	0003	34.05	093.6	Secondary (grouped)
h12013/tj_3101_klein5000_sss200/2009-121/270_090501130500	0012	47.33	083.4	Secondary (grouped)
h12013/tj_3101_klein5000_sss200/2009-121/270_090501130500	0009	51.98	200.0	Secondary (grouped)
h12013/tj_3101_klein5000_sss200/2009-121/270_090501130500	0008	56.32	226.1	Secondary (grouped)
h12013/tj_s222_reson7125_stbd/2009-121/918a1803	361/64	68.65	198.8	Secondary (grouped)
h12013/tj_s222_reson7125_stbd/2009-121/918a1803	361/65	68.68	198.7	Secondary (grouped)
h12013/tj_s222_reson7125_stbd/2009-121/918a1803	361/66	68.75	198.6	Secondary (grouped)
h12013/tj_s222_reson7125_stbd/2009-121/918a1803	361/67	68.79	198.5	Secondary (grouped)
h12013/tj_s222_reson7125_stbd/2009-121/918a1803	361/68	68.81	198.5	Secondary (grouped)
h12013/tj_s222_reson7125_stbd/2009-121/918a1803	361/70	68.89	198.4	Secondary (grouped)
h12013/tj_s222_reson7125_stbd/2009-121/918a1803	361/72	69.00	198.1	Secondary (grouped)
h12013/tj_s222_reson7125_stbd/2009-121/918a1803	361/73	69.03	198.1	Secondary (grouped)

h12013/tj_3101_klein5000_sss100/2009-109/772_090419195000	0002	71.54	191.4	Secondary (grouped)
h12013/tj_s222_reson7125_stbd/2009-121/918a1803	355/94	71.89	197.2	Secondary (grouped)
h12013/tj_s222_reson7125_stbd/2009-120/004_2111	21019/254	75.23	205.3	Secondary (grouped)
h12013/tj_3101_klein5000_sss200/2009-121/270_090501130500	0011	91.61	213.5	Secondary (grouped)
h12013/tj_3101_klein5000_sss200/2009-121/270_090501130500	0002	91.89	212.7	Secondary (grouped)
h12013/tj_s222_reson7125_stbd/2009-120/006_2326	2058/6	92.46	009.1	Secondary (grouped)
h12013/tj_3101_klein5000_sss100/2009-109/772_090419195000	0001	106.81	215.4	Secondary (grouped)
h12013/tj_s222_reson7125_stbd/2009-120/004_2111	21207/239	111.54	220.7	Secondary (grouped)
h12013/tj_3101_klein5000_sss200/2009-121/270_090501130500	0010	114.15	221.6	Secondary (grouped)
h12013/tj_3101_klein5000_sss200/2009-121/270_090501130500	0001	115.98	222.1	Secondary (grouped)

Hydrographer Recommendations

Chart a 53' sounding over least depth.

S-57 Data

Geo object 1: Seabed area (SBDARE)

Attributes: NATSUR - 9:rock

SORDAT - 20090517

SORIND - US,US,NSURF,H12013

WATLEV - 3:always under water/submerged

Feature Images

Figure 2.36.1

2.37) 23145/202

Survey Summary

Survey Position: 41° 16' 39.2" N, 072° 15' 22.6" W

Least Depth: 7.35 m (= 24.10 ft = 4.017 fm = 4 fm 0.10 ft)

TPU (±1.96σ): **THU (TPEh)** ±0.981 m ; **TVU (TPEv)** ±0.106 m

Timestamp: 2009-125.19:16:51.303 (05/05/2009)

Survey Line: h12013 / tj_3101_reson8125_mb / 2009-125 / 103_1855

Profile/Beam: 23145/202

Charts Affected: 13211_1, 12372_11, 12354_1, 12300_1, 13006_1, 5161_1, 13003_1

Remarks:

Least depth on a rock.

Feature Correlation

Address	Feature	Range	Azimuth	Status
h12013/tj_3101_reson8125_mb/2009-125/103_1855	23145/202	0.00	000.0	Primary

Hydrographer Recommendations

Chart as rock.

S-57 Data

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

Attributes:

QUASOU - 6:least depth known

SORDAT - 20090517

SORIND - US,US,NSURF,H12013

TECSOU - 3:found by multi-beam

VALSOU - 7.346 m

VERDAT - 12:Mean lower low water

WATLEV - 3:always under water/submerged

2.38) 1358/222

Survey Summary

Survey Position: 41° 16' 48.7" N, 072° 15' 21.0" W

Least Depth: 3.91 m (= 12.83 ft = 2.139 fm = 2 fm 0.83 ft)

TPU (±1.96σ): **THU (TPEh)** ±0.980 m ; **TVU (TPEv)** ±0.104 m

Timestamp: 2009-126.19:16:55.605 (05/06/2009)

Survey Line: h12013 / tj_3101_reson8125_mb / 2009-126 / 121_1915

Profile/Beam: 1358/222

Charts Affected: 13211_1, 12372_11, 12354_1, 12300_1, 13006_1, 5161_1, 13003_1

Remarks:

Least depth in a rocky area.

Feature Correlation

Address	Feature	Range	Azimuth	Status
h12013/tj_3101_reson8125_mb/2009-126/121_1915	1358/222	0.00	000.0	Primary
h12013/tj_3102_klein5000_hull_200/2009-127/521_090507131200	0002	26.99	064.3	Secondary (grouped)
h12013/tj_3101_reson8125_mb/2009-136/104_2046	1360/56	43.69	031.0	Secondary (grouped)
h12013/tj_3102_klein5000_hull_100/2009-120/528_090430203300	0006	76.98	000.5	Secondary (grouped)
h12013/tj_3101_reson8125_mb/2009-137/061_1301	1830/42	85.13	008.0	Secondary (grouped)
h12013/tj_3102_klein5000_hull_100/2009-120/514_090430195400	0005	102.66	003.9	Secondary (grouped)
h12013/tj_3102_klein5000_hull_100/2009-120/514_090430195400	0002	103.91	001.5	Secondary (grouped)
h12013/tj_3101_reson8125_mb/2009-137/061_1301	1992/65	109.16	025.8	Secondary (grouped)
h12013/tj_3102_klein5000_hull_100/2009-120/528_090430203300	0001	125.07	031.8	Secondary (grouped)
h12013/tj_3101_reson8125_mb/2009-137/064_1307	2914/141	125.08	046.6	Secondary (grouped)
h12013/tj_3102_klein5000_hull_100/2009-120/528_090430203300	0005	132.35	032.2	Secondary (grouped)
h12013/tj_3101_klein5000_sss200/2009-122/505_090502150800	0001	134.71	030.4	Secondary (grouped)

Hydrographer Recommendations

chart 12' sounding and indicate rocky area

S-57 Data

Geo object 1: Sounding (SOUNDG)

Attributes: QUASOU - 1:depth known

TECSOU - 3:found by multi-beam

VERDAT - 12:Mean lower low water

Feature Images

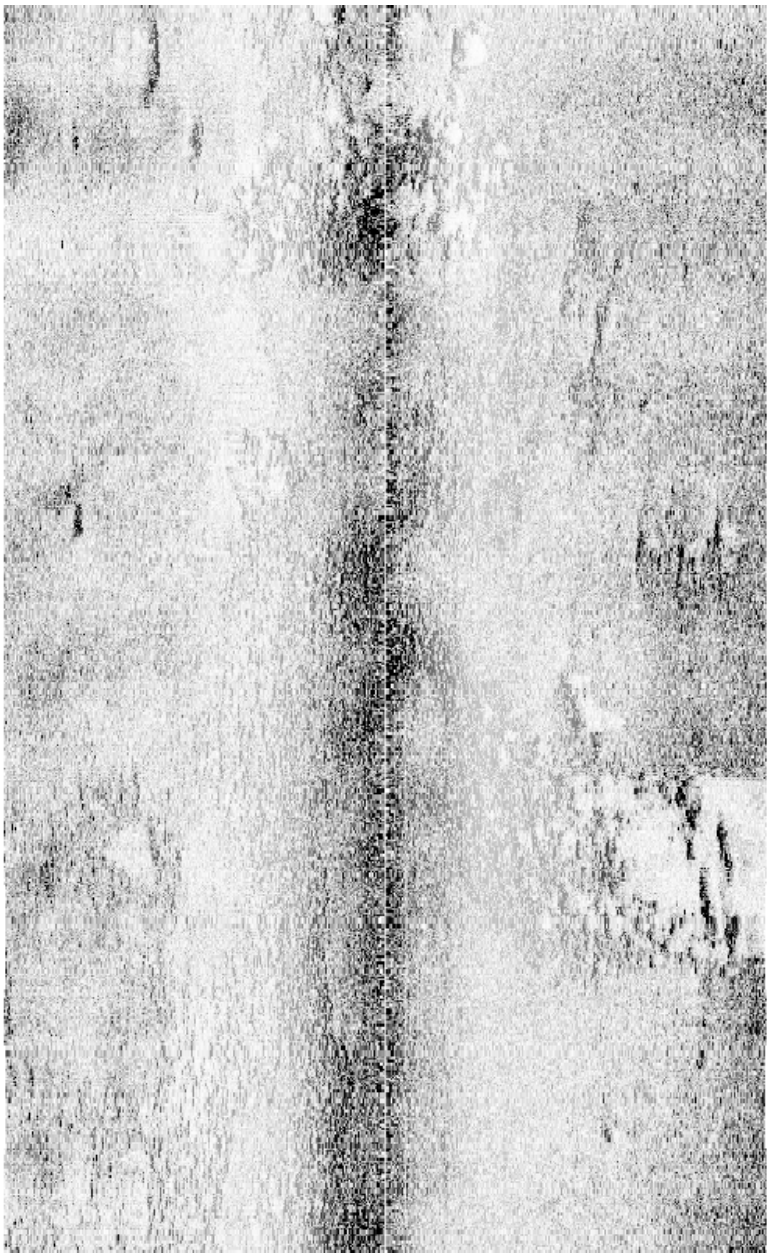


Figure 2.38.1

2.39) 600/10

Survey Summary

Survey Position: 41° 16' 49.2" N, 072° 15' 25.6" W

Least Depth: 2.34 m (= 7.69 ft = 1.281 fm = 1 fm 1.69 ft)

TPU (±1.96σ): **THU (TPEh)** ±0.980 m ; **TVU (TPEv)** ±0.105 m

Timestamp: 2009-127.14:02:10.359 (05/07/2009)

Survey Line: h12013 / tj_3101_reson8125_mb / 2009-127 / 123_1401

Profile/Beam: 600/10

Charts Affected: 13211_1, 12372_11, 12354_1, 12300_1, 13006_1, 5161_1, 13003_1

Remarks:

Least depth over a rocky shoal.

Feature Correlation

Address	Feature	Range	Azimuth	Status
h12013/tj_3101_reson8125_mb/2009-127/123_1401	600/10	0.00	000.0	Primary
h12013/tj_3101_reson8125_mb/2009-131/179_1756	49621/130	31.86	184.5	Secondary (grouped)
h12013/tj_3101_reson8125_mb/2009-127/121_1402	555/36	40.28	021.0	Secondary (grouped)
h12013/tj_3102_klein5000_hull_200/2009-133/201_090513131300	0005	40.93	266.6	Secondary (grouped)
h12013/tj_3101_reson8125_mb/2009-127/120_1357	633/215	41.05	288.5	Secondary (grouped)
h12013/tj_3102_klein5000_hull_200/2009-133/201_090513131300	0006	43.05	017.6	Secondary (grouped)
h12013/tj_3102_klein5000_hull_100/2009-109/506_090419192100	0003	43.63	017.3	Secondary (grouped)
h12013/tj_3102_klein5000_hull_100/2009-109/505_090419195100	0003	50.66	022.4	Secondary (grouped)
h12013/tj_3101_klein5000_sss200/2009-122/532_090502205100	0003	56.82	215.2	Secondary (grouped)
h12013/tj_3102_klein5000_hull_100/2009-120/515_090430204500	0002	82.97	024.9	Secondary (grouped)
h12013/tj_3102_klein5000_hull_200/2009-127/521_090507131200	0001	93.33	021.4	Secondary (grouped)

Hydrographer Recommendations

chart 7' dangerous rock.

S-57 Data

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

Attributes:

QUASOU - 6:least depth known

SORDAT - 20090517

SORIND - US,US,NSURF,H12013

TECSOU - 3:found by multi-beam

VALSOU - 2.343 m

VERDAT - 12:Mean lower low water

WATLEV - 3:always under water/submerged

2.40) 667/240

Survey Summary

Survey Position: 41° 17' 06.0" N, 072° 15' 18.1" W

Least Depth: 2.16 m (= 7.09 ft = 1.181 fm = 1 fm 1.09 ft)

TPU (±1.96σ): **THU (TPEh)** ±0.980 m ; **TVU (TPEv)** ±0.104 m

Timestamp: 2009-132.16:28:05.333 (05/12/2009)

Survey Line: h12013 / tj_3101_reson8125_mb / 2009-132 / 845_1627

Profile/Beam: 667/240

Charts Affected: 13211_1, 12372_11, 12354_1, 12300_1, 13006_1, 5161_1, 13003_1

Remarks:

Two large rocks. Neither depth is a known least depth. Both rocks are approx. 36m inshore of a shoal area.

Feature Correlation

Address	Feature	Range	Azimuth	Status
h12013/tj_3101_reson8125_mb/2009-132/845_1627	667/240	0.00	000.0	Primary
h12013/tj_3101_reson8125_mb/2009-132/845_1627	272/1	30.63	295.9	Secondary (grouped)

Hydrographer Recommendations

Chart a 7' sounding over the area

S-57 Data

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

Attributes: SORDAT - 20080517

SORIND - US,US,NSURF,H12013

VALSOU - 2.160 m

WATLEV - 3:always under water/submerged

2.41) 767/3

Survey Summary

Survey Position: 41° 15' 59.4" N, 072° 16' 02.2" W

Least Depth: 2.62 m (= 8.60 ft = 1.433 fm = 1 fm 2.60 ft)

TPU (±1.96σ): **THU (TPEh)** ±0.980 m ; **TVU (TPEv)** ±0.105 m

Timestamp: 2009-133.18:46:16.231 (05/13/2009)

Survey Line: h12013 / tj_3101_reson8125_mb / 2009-133 / 938_1845

Profile/Beam: 767/3

Charts Affected: 12375_1, 13211_1, 12372_11, 12354_1, 12300_1, 13006_1, 5161_1, 13003_1

Remarks:

Least depth on a rock, with nearby 10' soundings.

Feature Correlation

Address	Feature	Range	Azimuth	Status
h12013/tj_3101_reson8125_mb/2009-133/938_1845	767/3	0.00	000.0	Primary
h12013/tj_3102_klein5000_hull_100/2009-120/501_090430134800	0002	3.85	008.8	Secondary (grouped)
h12013/tj_3102_klein5000_hull_100/2009-120/501_090430134800	0025	4.62	018.7	Secondary (grouped)
h12013/tj_3102_klein5000_hull_100/2009-120/501_090430134800	0022	26.33	340.6	Secondary (grouped)
h12013/tj_3102_klein5000_hull_100/2009-120/501_090430134800	0021	52.86	335.9	Secondary (grouped)

Hydrographer Recommendations

Change 11' sounding at 41.266, -072.266 to a 8' sounding, possibly adjust 12' contour West to fully include rock.

S-57 Data

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

Attributes: QUASOU - 6:least depth known

SORDAT - 20090517

SORIND - US,US,NSURF,H12013

TECSOU - 3:found by multi-beam

VALSOU - 2.621 m

VERDAT - 12:Mean lower low water

WATLEV - 3:always under water/submerged

Feature Images

Figure 2.41.1

2.42) 557/150

Survey Summary

Survey Position: 41° 16' 05.6" N, 072° 15' 59.6" W

Least Depth: 1.56 m (= 5.12 ft = 0.854 fm = 0 fm 5.12 ft)

TPU (±1.96σ): **THU (TPEh)** ±0.980 m ; **TVU (TPEv)** ±0.103 m

Timestamp: 2009-133.17:23:58.921 (05/13/2009)

Survey Line: h12013 / tj_3101_reson8125_mb / 2009-133 / 968_1723

Profile/Beam: 557/150

Charts Affected: 12375_1, 13211_1, 12372_11, 12354_1, 12300_1, 13006_1, 5161_1, 13003_1

Remarks:

Series of soundings over Hatchett Reef, not known as least depth for reef.

Feature Correlation

Address	Feature	Range	Azimuth	Status
h12013/tj_3101_reson8125_mb/2009-133/968_1723	557/150	0.00	000.0	Primary
h12013/tj_3102_reson7125_mb_t/2009-126/914_1941	779/512	47.26	332.8	Secondary (grouped)
h12013/tj_3102_reson7125_mb_t/2009-127/195_1939	3869/512	86.19	291.3	Secondary (grouped)

Hydrographer Recommendations

Remove 6' sounding at 41.268, -072.266 and adjust 6' contour on East side of reef

S-57 Data

Geo object 1: Seabed area (SBDARE)

Attributes: NATSUR - 9:rock

SORDAT - 20090517

SORIND - US,US,NSURF,H12013

WATLEV - 3:always under water/submerged

Geo object 2: Underwater rock / awash rock (UWTROC)

Attributes: QUASOU - 1:depth known

SORDAT - 20090517

SORIND - US,US,NSURF,H12013

TECSOU - 3:found by multi-beam

VALSOU - 1.562 m

VERDAT - 12:Mean lower low water

WATLEV - 3:always under water/submerged

2.43) 4944/1

Survey Summary

Survey Position: 41° 16' 47.1" N, 072° 15' 35.4" W

Least Depth: 3.18 m (= 10.43 ft = 1.739 fm = 1 fm 4.43 ft)

TPU (±1.96σ): **THU (TPEh)** ±0.980 m ; **TVU (TPEv)** ±0.105 m

Timestamp: 2009-137.13:25:46.022 (05/17/2009)

Survey Line: h12013 / tj_3101_reson8125_mb / 2009-137 / 074_1320

Profile/Beam: 4944/1

Charts Affected: 12375_1, 13211_1, 12372_11, 12354_1, 12300_1, 13006_1, 5161_1, 13003_1

Remarks:

Group of soundings satisfied by updating the sounding at 41.2790, -072.2599

Feature Correlation

Address	Feature	Range	Azimuth	Status
h12013/tj_3101_reson8125_mb/2009-137/074_1320	4944/1	0.00	000.0	Primary
h12013/tj_3102_klein5000_hull_200/2009-133/205_090513132300	0002	2.69	333.6	Secondary (grouped)
h12013/tj_3102_klein5000_hull_200/2009-133/205_090513132300	0003	14.94	355.0	Secondary (grouped)
h12013/tj_3102_klein5000_hull_200/2009-133/201_090513131300	0008	39.93	111.1	Secondary (grouped)
h12013/tj_3101_klein5000_sss200/2009-122/506_090502155000	0006	48.12	340.9	Secondary (grouped)
h12013/tj_3102_klein5000_hull_100/2009-120/515_090430204500	0005	71.96	273.2	Secondary (grouped)
h12013/tj_3102_klein5000_hull_200/2009-133/205_090513132300	0004	72.09	277.8	Secondary (grouped)
h12013/tj_3101_reson8125_mb/2009-137/075_1329	510/109	72.09	275.2	Secondary (grouped)
h12013/tj_3102_klein5000_hull_100/2009-120/515_090430204500	0006	81.28	270.1	Secondary (grouped)
h12013/tj_3102_klein5000_hull_100/2009-120/515_090430204500	0011	95.97	326.5	Secondary (grouped)
h12013/tj_3102_klein5000_hull_100/2009-120/515_090430204500	0004	96.01	326.2	Secondary (grouped)
h12013/tj_3101_reson8125_mb/2009-137/600_1429	4395/200	97.54	327.6	Secondary (grouped)
h12013/tj_3101_klein5000_sss200/2009-122/506_090502155000	0005	97.97	327.5	Secondary (grouped)
h12013/tj_3101_klein5000_sss200/2009-122/532_090502205100	0001	103.53	252.4	Secondary (grouped)

Hydrographer Recommendations

Update sounding to 15'

S-57 Data

Geo object 1: Sounding (SOUNDG)

Attributes: SORIND - US,US,NSURF,H12013

Feature Images

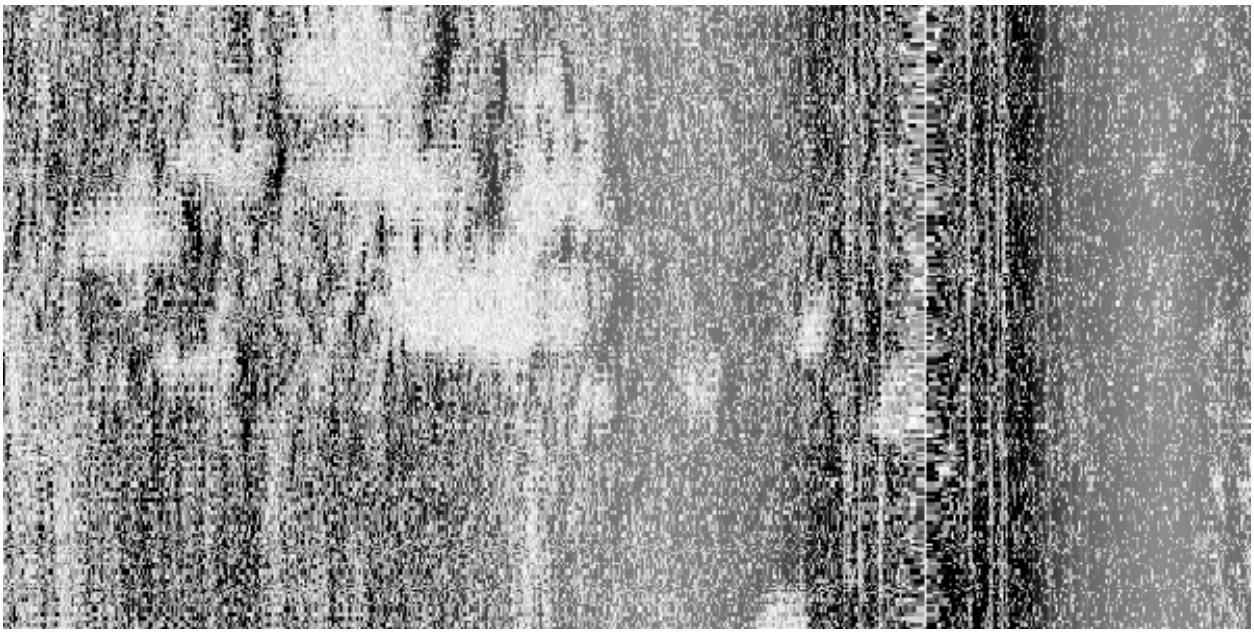


Figure 2.43.1

2.44) 334/146

Survey Summary

Survey Position: 41° 16' 09.6" N, 072° 15' 50.3" W

Least Depth: 2.58 m (= 8.45 ft = 1.409 fm = 1 fm 2.45 ft)

TPU (±1.96σ): **THU (TPEh)** ±0.999 m ; **TVU (TPEv)** ±0.283 m

Timestamp: 2009-127.16:46:36.291 (05/07/2009)

Survey Line: h12013 / tj_3102_reson7125_mb_t / 2009-127 / 117_1646

Profile/Beam: 334/146

Charts Affected: 12375_1, 13211_1, 12372_11, 12354_1, 12300_1, 13006_1, 5161_1, 13003_1

Remarks:

Multiple contacts on the South and East sides of Hatchett Reef located outside the currently charted 12' contour, with least depths of less than 12'.

Feature Correlation

Address	Feature	Range	Azimuth	Status
h12013/tj_3102_reson7125_mb_t/2009-127/117_1646	334/146	0.00	000.0	Primary
h12013/tj_3102_klein5000_hull_100/2009-120/501_090430134800	0010	1.98	281.2	Secondary (grouped)
h12013/tj_3102_klein5000_hull_100/2009-120/501_090430134800	0005	2.07	281.9	Secondary (grouped)
h12013/tj_3102_klein5000_hull_100/2009-120/501_090430134800	0012	45.13	015.8	Secondary (grouped)
h12013/tj_3102_klein5000_hull_100/2009-120/501_090430134800	0013	115.34	023.8	Secondary (grouped)
h12013/tj_3101_reson8125_mb/2009-133/927_1750	1424/96	138.33	033.6	Secondary (grouped)
h12013/tj_3102_klein5000_hull_100/2009-120/501_090430134800	0014	139.07	032.8	Secondary (grouped)
h12013/tj_3102_klein5000_hull_100/2009-120/501_090430134800	0016	199.37	031.7	Secondary (grouped)
h12013/tj_3102_klein5000_hull_100/2009-120/502_090430133800	0006	242.28	023.8	Secondary (grouped)
h12013/tj_3102_klein5000_hull_100/2009-120/501_090430134800	0018	250.57	030.9	Secondary (grouped)
h12013/tj_3102_klein5000_hull_100/2009-120/501_090430134800	0017	250.99	021.7	Secondary (grouped)
h12013/tj_3102_klein5000_hull_100/2009-120/502_090430133800	0002	252.17	021.6	Secondary (grouped)
h12013/tj_3102_klein5000_hull_100/2009-120/501_090430134800	0019	297.49	027.6	Secondary (grouped)
h12013/tj_3101_reson8125_mb/2009-133/928_1755	897/12	408.81	029.6	Secondary (grouped)
h12013/tj_3101_reson8125_mb/2009-133/928_1755	896/19	409.01	029.5	Secondary (grouped)
h12013/tj_3101_reson8125_mb/2009-133/934_1841	458/240	490.73	032.1	Secondary (grouped)
h12013/tj_3102_klein5000_hull_100/2009-120/501_090430134800	0003	492.91	032.0	Secondary (grouped)
h12013/tj_3102_klein5000_hull_100/2009-120/501_090430134800	0024	493.85	032.1	Secondary (grouped)

Hydrographer Recommendations

Adjust contour to include the area.

S-57 Data

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

Attributes: SORIND - US,US,NSURF,H12013

VALSOU - 2.576 m

WATLEV - 3:always under water/submerged

Feature Images

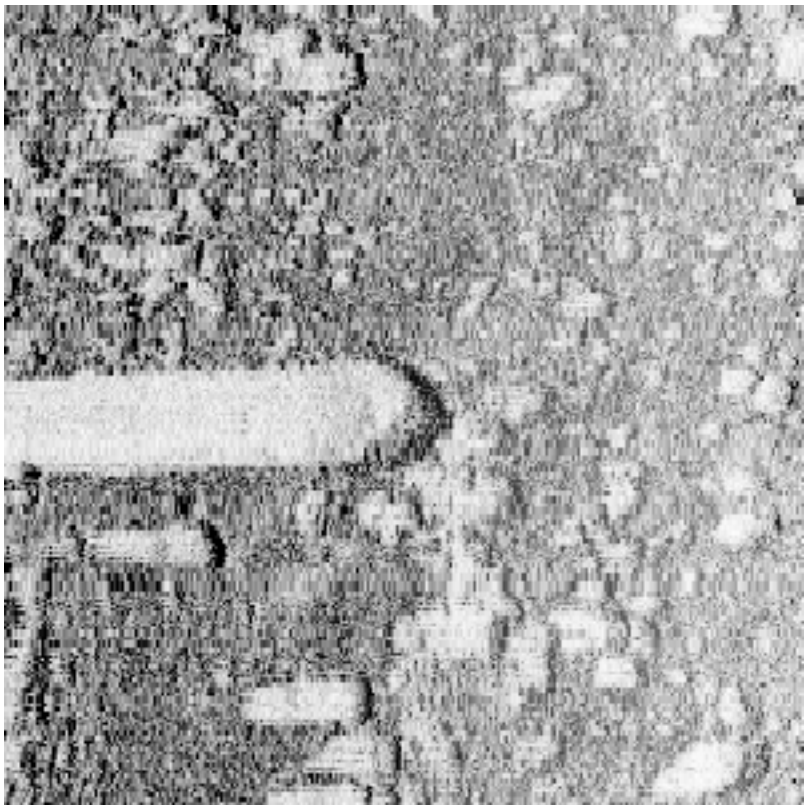


Figure 2.44.1

2.45) 1759/170

Survey Summary

Survey Position: 41° 15' 39.8" N, 072° 15' 52.2" W

Least Depth: 12.60 m (= 41.33 ft = 6.888 fm = 6 fm 5.33 ft)

TPU (±1.96σ): **THU (TPEh)** ±1.000 m ; **TVU (TPEv)** ±0.408 m

Timestamp: 2009-121.19:01:26.000 (05/01/2009)

Survey Line: h12013 / tj_s222_reson7125_stbd / 2009-121 / 904_1858

Profile/Beam: 1759/170

Charts Affected: 12375_1, 13211_1, 12372_11, 12354_1, 12300_1, 13006_1, 5161_1, 13003_1

Remarks:

Contacts on a rocky shoal.

Feature Correlation

Address	Feature	Range	Azimuth	Status
h12013/tj_s222_reson7125_stbd/2009-121/904_1858	1759/170	0.00	000.0	Primary
h12013/tj_3101_klein5000_sss200/2009-121/271_090501132300	0003	4.87	119.4	Secondary
h12013/tj_3101_klein5000_sss100/2009-109/773_090419200400	0005	5.88	072.3	Secondary (grouped)
h12013/tj_3101_klein5000_sss200/2009-121/270_090501130500	0014	112.97	019.6	Secondary (grouped)
h12013/tj_3101_klein5000_sss200/2009-121/270_090501130500	0004	113.71	019.2	Secondary (grouped)
h12013/tj_3101_klein5000_sss100/2009-109/772_090419195000	0006	197.30	336.9	Secondary (grouped)

Hydrographer Recommendations

Replace 45' sounding at 41.259,-072.265 with a 41' sounding

S-57 Data

Geo object 1: Seabed area (SBDARE)

Attributes: NATSUR - 9:rock

SORDAT - 20090517

SORIND - US,US,NSURF,H12013

WATLEV - 3:always under water/submerged

Geo object 2: Underwater rock / awash rock (UWTROC)

Attributes:

QUASOU - 6:least depth known

SORDAT - 20090517

SORIND - US,US,NSURF,H12013

TECSOU - 3:found by multi-beam

VALSOU - 12.596 m

VERDAT - 12:Mean lower low water

WATLEV - 3:always under water/submerged

Feature Images

Figure 2.45.1

2.46) 154/179

Survey Summary

Survey Position: 41° 15' 50.8" N, 072° 15' 06.1" W

Least Depth: 18.23 m (= 59.81 ft = 9.969 fm = 9 fm 5.81 ft)

TPU (±1.96σ): **THU (TPEh)** ±1.001 m ; **TVU (TPEv)** ±0.412 m

Timestamp: 2009-122.20:08:46.731 (05/02/2009)

Survey Line: h12013 / tj_s222_reson7125_stbd / 2009-122 / 940_2008

Profile/Beam: 154/179

Charts Affected: 13211_1, 12372_11, 12354_1, 12300_1, 13006_1, 5161_1, 13003_1

Remarks:

Least depth on a rock.

Feature Correlation

Address	Feature	Range	Azimuth	Status
h12013/tj_s222_reson7125_stbd/2009-122/940_2008	154/179	0.00	000.0	Primary
h12013/tj_3101_klein5000_sss100/2009-109/772_090419195000	0005	18.75	257.7	Secondary (grouped)

Hydrographer Recommendations

Chart dangerous rock.

S-57 Data

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

Attributes:

QUASOU - 6:least depth known

SORDAT - 20090517

SORIND - US,US,NSURF,H12013

TECSOU - 3:found by multi-beam

VALSOU - 18.231 m

VERDAT - 12:Mean lower low water

WATLEV - 3:always under water/submerged

Feature Images

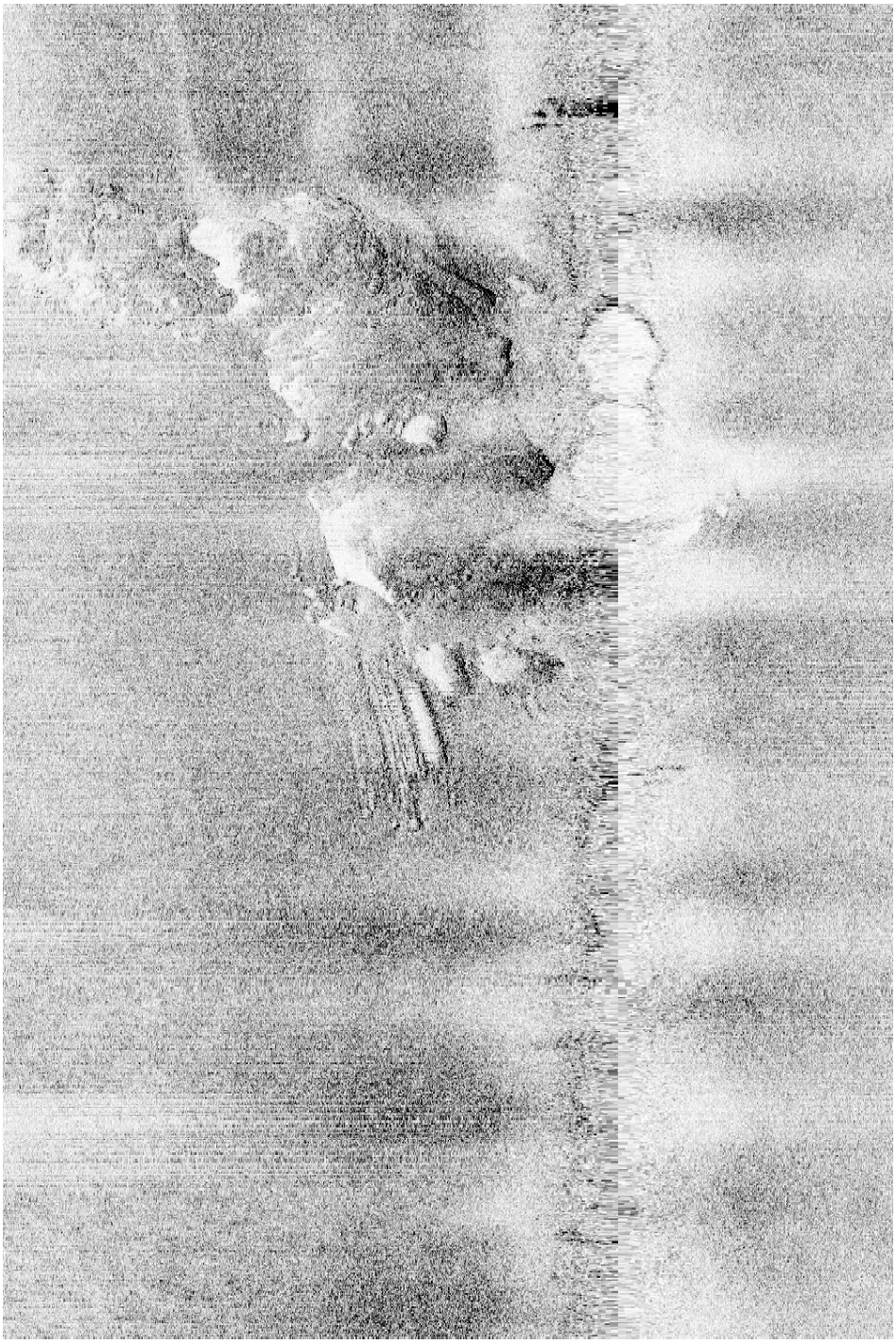


Figure 2.46.1

2.47) 1401/3

Survey Summary

Survey Position: 41° 17' 00.3" N, 072° 15' 23.9" W

Least Depth: 3.50 m (= 11.50 ft = 1.917 fm = 1 fm 5.50 ft)

TPU (±1.96σ): **THU (TPEh)** ±0.980 m ; **TVU (TPEv)** ±0.107 m

Timestamp: 2009-132.16:26:43.350 (05/12/2009)

Survey Line: h12013 / tj_3101_reson8125_mb / 2009-132 / 806_1625

Profile/Beam: 1401/3

Charts Affected: 13211_1, 12372_11, 12354_1, 12300_1, 13006_1, 5161_1, 13003_1

Remarks:

Sounding not known as least depth.

Feature Correlation

Address	Feature	Range	Azimuth	Status
h12013/tj_3101_reson8125_mb/2009-132/806_1625	1401/3	0.00	000.0	Primary

Hydrographer Recommendations

Chart 11' sounding

S-57 Data

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

Attributes:

QUASOU - 2:depth unknown

SORDAT - 20090517

SORIND - US,US,NSURF,H12013

TECSOU - 3:found by multi-beam

VALSOU - 3.505 m

WATLEV - 3:always under water/submerged

2.48) 269/29

Survey Summary

Survey Position: 41° 16' 10.0" N, 072° 15' 48.2" W

Least Depth: 4.81 m (= 15.78 ft = 2.630 fm = 2 fm 3.78 ft)

TPU (±1.96σ): **THU (TPEh)** ±0.980 m ; **TVU (TPEv)** ±0.105 m

Timestamp: 2009-133.18:29:54.593 (05/13/2009)

Survey Line: h12013 / tj_3101_reson8125_mb / 2009-133 / 931_1829

Profile/Beam: 269/29

Charts Affected: 12375_1, 13211_1, 12372_11, 12354_1, 12300_1, 13006_1, 5161_1, 13003_1

Remarks:

Least depth on a rock.

Feature Correlation

Address	Feature	Range	Azimuth	Status
h12013/tj_3101_reson8125_mb/2009-133/931_1829	269/29	0.00	000.0	Primary
h12013/tj_3102_klein5000_hull_100/2009-120/501_090430134800	0009	2.25	235.7	Secondary
h12013/tj_3102_klein5000_hull_100/2009-120/502_090430133800	0008	3.37	303.3	Secondary (grouped)
h12013/tj_3102_klein5000_hull_100/2009-120/501_090430134800	0011	51.42	031.9	Secondary (grouped)
h12013/tj_3102_klein5000_hull_100/2009-120/502_090430133800	0015	51.55	030.3	Secondary (grouped)

Hydrographer Recommendations

Adjust 18' contour to include this area.

S-57 Data

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

Attributes: QUASOU - 6:least depth known

SORDAT - 20090517

SORIND - US,US,NSURF,H12013

TECSOU - 3:found by multi-beam

VALSOU - 4.809 m

VERDAT - 12:Mean lower low water

WATLEV - 3:always under water/submerged

Feature Images

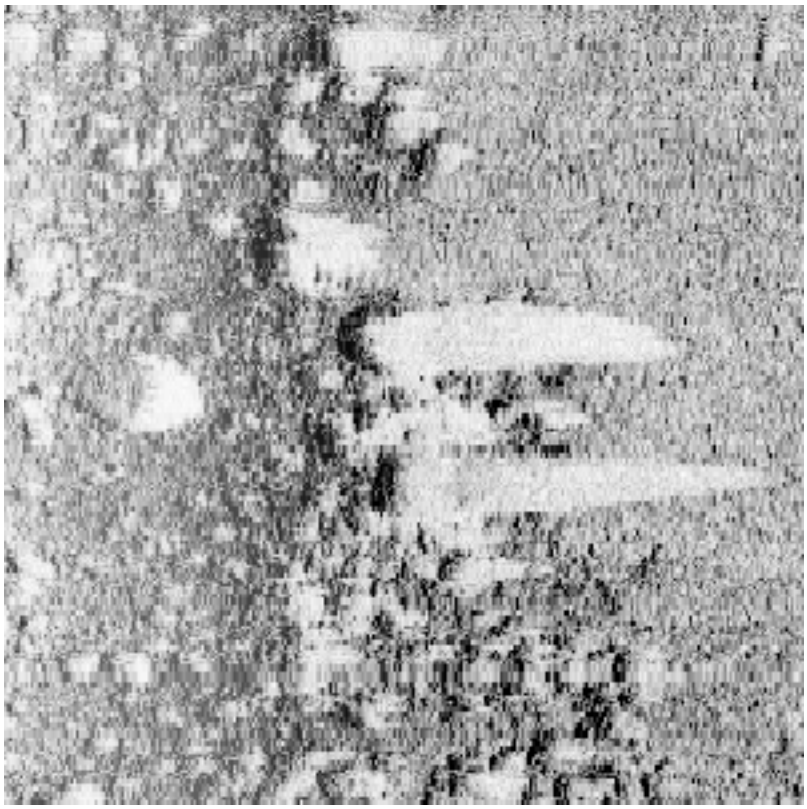


Figure 2.48.1

2.49) 487/3

Survey Summary

Survey Position: 41° 15' 53.8" N, 072° 16' 00.7" W

Least Depth: 4.36 m (= 14.31 ft = 2.385 fm = 2 fm 2.31 ft)

TPU (±1.96σ): **THU (TPEh)** ±0.980 m ; **TVU (TPEv)** ±0.108 m

Timestamp: 2009-133.18:26:08.863 (05/13/2009)

Survey Line: h12013 / tj_3101_reson8125_mb / 2009-133 / 930_1825

Profile/Beam: 487/3

Charts Affected: 12375_1, 13211_1, 12372_11, 12354_1, 12300_1, 13006_1, 5161_1, 13003_1

Remarks:

Sounding located over a charted 16'

Feature Correlation

Address	Feature	Range	Azimuth	Status
h12013/tj_3101_reson8125_mb/2009-133/930_1825	487/3	0.00	000.0	Primary
h12013/tj_3102_klein5000_hull_100/2009-120/501_090430134800	0023	1.15	352.6	Secondary
h12013/tj_3102_klein5000_hull_100/2009-120/501_090430134800	0004	1.29	042.5	Secondary
h12013/tj_3102_klein5000_hull_100/2009-120/502_090430133800	0001	2.55	020.1	Secondary
h12013/tj_3101_klein5000_sss100/2009-110/777_090420124200	0001	2.71	149.8	Secondary
h12013/tj_3102_klein5000_hull_200/2009-127/915_090507145300	0001	3.52	270.4	Secondary
h12013/tj_3101_klein5000_sss100/2009-110/777_090420124200	0002	14.52	356.0	Secondary
h12013/tj_3102_klein5000_hull_100/2009-120/502_090430133800	0004	16.64	353.1	Secondary
h12013/tj_3102_klein5000_hull_100/2009-120/501_090430134800	0020	23.39	340.6	Secondary
h12013/tj_3101_klein5000_sss200/2009-121/274_090501140600	0003	40.80	000.0	Secondary
h12013/tj_3102_klein5000_hull_100/2009-120/502_090430133800	0005	44.84	023.2	Secondary

Hydrographer Recommendations

Replace 16' sounding with an 14' sounding.

S-57 Data

Geo object 1: Seabed area (SBDARE)

Attributes:	NATSUR - 9:rock
	SORDAT - 20090517
	SORIND - US,US,NSURF,H12013
	WATLEV - 3:always under water/submerged
Geo object 2:	Underwater rock / awash rock (UWTROC)
Attributes:	QUASOU - 6:least depth known
	SORDAT - 20090517
	SORIND - US,US,NSURF,H12013
	TECSOU - 3:found by multi-beam
	VALSOU - 4.362 m
	VERDAT - 12:Mean lower low water
	WATLEV - 3:always under water/submerged

Feature Images

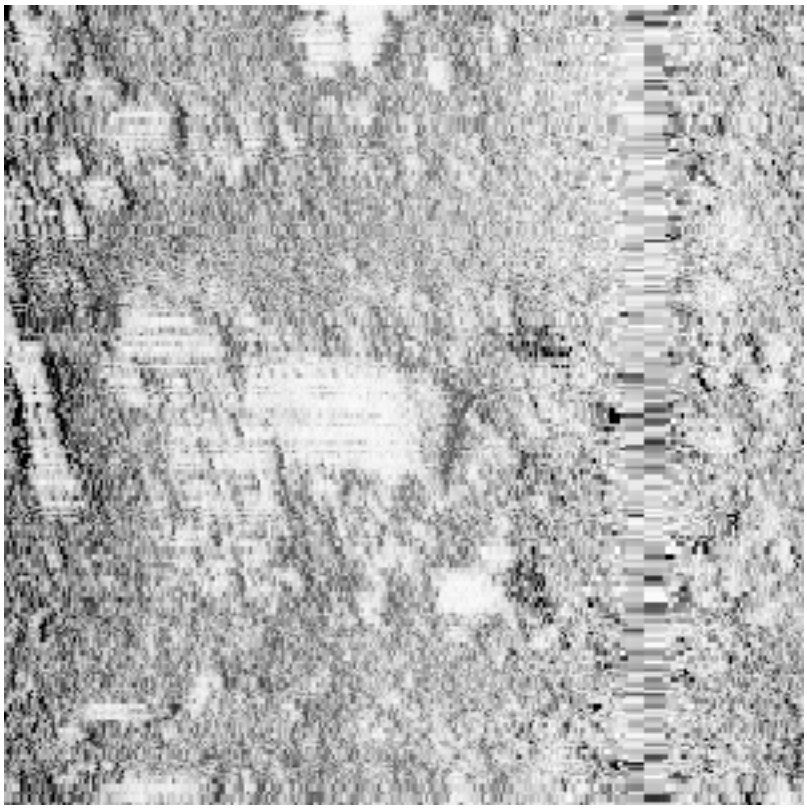


Figure 2.49.1

2.50) 4805/62

Survey Summary

Survey Position: 41° 15' 35.3" N, 072° 16' 00.5" W

Least Depth: 13.42 m (= 44.03 ft = 7.339 fm = 7 fm 2.03 ft)

TPU (±1.96σ): **THU (TPEh)** ±1.000 m ; **TVU (TPEv)** ±0.288 m

Timestamp: 2009-121.15:02:32.549 (05/01/2009)

Survey Line: h12013 / tj_3102_reson7125_mb_t / 2009-121 / 773_1450

Profile/Beam: 4805/62

Charts Affected: 12375_1, 13211_1, 12372_11, 12354_1, 12300_1, 13006_1, 5161_1, 13003_1

Remarks:

Least depths, and associated side scan contacts, over a rock ridge that are uniformly shoal of charted soundings.

Feature Correlation

Address	Feature	Range	Azimuth	Status
h12013/tj_3102_reson7125_mb_t/2009-121/773_1450	4805/62	0.00	000.0	Primary
h12013/tj_3101_klein5000_sss200/2009-121/270_090501130500	0015	2.45	313.8	Secondary
h12013/tj_3101_klein5000_sss200/2009-121/270_090501130500	0006	3.24	339.9	Secondary
h12013/tj_s222_reson7125_stbd/2009-120/004_2111	14563/121	46.52	009.4	Secondary
h12013/tj_3101_klein5000_sss100/2009-109/773_090419200400	0004	49.16	017.1	Secondary
h12013/tj_3101_klein5000_sss200/2009-121/271_090501132300	0008	110.21	147.3	Secondary (grouped)
h12013/tj_3101_reson8125_mb/2009-133/920_2007	285/98	178.25	164.3	Secondary (grouped)
h12013/tj_3101_klein5000_sss100/2009-109/774_090419202200	0006	180.51	155.7	Secondary (grouped)
h12013/tj_3101_reson8125_mb/2009-133/920_2007	195/61	181.26	151.8	Secondary (grouped)
h12013/tj_3101_reson8125_mb/2009-133/920_2007	420/59	201.99	182.2	Secondary (grouped)
h12013/tj_3101_klein5000_sss100/2009-109/774_090419202200	0005	204.61	185.3	Secondary (grouped)
h12013/tj_3101_klein5000_sss200/2009-121/272_090501133600	0007	239.16	183.5	Secondary (grouped)
h12013/tj_3101_klein5000_sss200/2009-121/272_090501133600	0006	267.17	181.2	Secondary (grouped)
h12013/tj_3102_reson7125_mb_t/2009-121/775_1529	6568/179	268.62	180.7	Secondary (grouped)
h12013/tj_3101_klein5000_sss100/2009-109/775_090419203700	0005	270.37	180.4	Secondary (grouped)
h12013/tj_3101_klein5000_sss200/2009-121/272_090501133600	0005	286.64	193.6	Secondary (grouped)
h12013/tj_3102_reson7125_mb_t/2009-121/775_1529	6416/54	287.10	192.9	Secondary (grouped)
h12013/tj_3101_klein5000_sss200/2009-121/273_090501135100	0002	316.52	168.8	Secondary (grouped)
h12013/tj_3102_reson7125_mb_t/2009-127/100_1521	2126/161	351.72	178.3	Secondary (grouped)

h12013/tj_3101_klein5000_sss100/2009-109/776_090419205700	0005	352.56	179.5	Secondary (grouped)
h12013/tj_3102_klein5000_hull_100/2009-120/503_090430132100	0001	505.67	175.8	Secondary (grouped)

Hydrographer Recommendations

Updated soundings in the area to reflect least depths over the ridge.

S-57 Data

Geo object 1: Seabed area (SBDARE)

Attributes: NATSUR - 9:rock

SORDAT - 20090517

SORIND - US,US,NSURF,H12013

WATLEV - 3:always under water/submerged

Feature Images

Figure 2.50.1

2.51) 703/105

Survey Summary

Survey Position: 41° 15' 53.5" N, 072° 15' 15.4" W

Least Depth: 13.56 m (= 44.49 ft = 7.416 fm = 7 fm 2.49 ft)

TPU (±1.96σ): **THU (TPEh)** ±1.000 m ; **TVU (TPEv)** ±0.408 m

Timestamp: 2009-121.19:05:19.986 (05/01/2009)

Survey Line: h12013 / tj_s222_reson7125_stbd / 2009-121 / 913_1904

Profile/Beam: 703/105

Charts Affected: 13211_1, 12372_11, 12354_1, 12300_1, 13006_1, 5161_1, 13003_1

Remarks:

Least depth on a rocky shoal.

Feature Correlation

Address	Feature	Range	Azimuth	Status
h12013/tj_s222_reson7125_stbd/2009-121/913_1904	703/105	0.00	000.0	Primary
h12013/tj_s222_reson7125_stbd/2009-120/002_1927	23813/253	22.28	108.2	Secondary
h12013/tj_3101_klein5000_sss100/2009-109/774_090419202200	0001	30.38	101.5	Secondary

Hydrographer Recommendations

Chart as 44' sounding.

S-57 Data

Geo object 1: Seabed area (SBDARE)

Attributes: NATSUR - 9:rock

SORDAT - 20090517

SORIND - US,US,NSURF,H12013

WATLEV - 3:always under water/submerged

2.52) 105/180

Survey Summary

Survey Position: 41° 15' 12.3" N, 072° 16' 08.4" W

Least Depth: 16.72 m (= 54.85 ft = 9.141 fm = 9 fm 0.85 ft)

TPU (±1.96σ): **THU (TPEh)** ±1.001 m ; **TVU (TPEv)** ±0.410 m

Timestamp: 2009-121.17:24:10.840 (05/01/2009)

Survey Line: h12013 / tj_s222_reson7125_stbd / 2009-121 / 025_1723

Profile/Beam: 105/180

Charts Affected: 12375_1, 13211_1, 12372_11, 13209_1, 12354_1, 12300_1, 13006_1, 5161_1, 13003_1

Remarks:

Least depth on a rock.

Feature Correlation

Address	Feature	Range	Azimuth	Status
h12013/tj_s222_reson7125_stbd/2009-121/025_1723	105/180	0.00	000.0	Primary

Hydrographer Recommendations

Chart as dangerous rock.

S-57 Data

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

Attributes: QUASOU - 6:least depth known

SORDAT - 20090517

SORIND - US,US,NSURF,H12013

TECSOU - 3:found by multi-beam

VALSOU - 16.717 m

WATLEV - 3:always under water/submerged

2.53) 10270/167

Survey Summary

Survey Position: 41° 15' 23.0" N, 072° 16' 13.5" W

Least Depth: 15.60 m (= 51.19 ft = 8.532 fm = 8 fm 3.19 ft)

TPU (±1.96σ): **THU (TPEh)** ±1.000 m ; **TVU (TPEv)** ±0.409 m

Timestamp: 2009-120.23:05:07.807 (04/30/2009)

Survey Line: h12013 / tj_s222_reson7125_stbd / 2009-120 / 007_2246

Profile/Beam: 10270/167

Charts Affected: 12375_1, 13211_1, 12372_11, 13209_1, 12354_1, 12300_1, 13006_1, 5161_1, 13003_1

Remarks:

Side scan contacts and least depths over a rocky shoal. Charted soudnings are not representative of least depths found on the current survey.

Feature Correlation

Address	Feature	Range	Azimuth	Status
h12013/tj_s222_reson7125_stbd/2009-120/007_2246	10270/167	0.00	000.0	Primary
h12013/tj_3101_klein5000_sss100/2009-109/772_090419195000	0009	107.94	100.8	Secondary (grouped)
h12013/tj_3101_klein5000_sss200/2009-121/270_090501130500	0017	121.66	159.7	Secondary (grouped)
h12013/tj_s222_reson7125_stbd/2009-120/006_2326	8411/224	133.50	102.2	Secondary (grouped)
h12013/tj_s222_reson7125_stbd/2009-120/005_2203	9731/217	137.63	158.4	Secondary (grouped)
h12013/tj_3101_klein5000_sss200/2009-121/270_090501130500	0016	142.84	151.6	Secondary (grouped)
h12013/tj_3101_klein5000_sss100/2009-109/772_090419195000	0008	149.08	155.0	Secondary (grouped)
h12013/tj_3101_klein5000_sss200/2009-121/270_090501130500	0018	170.72	160.8	Secondary (grouped)
h12013/tj_3101_klein5000_sss200/2009-121/270_090501130500	0007	177.66	149.4	Secondary (grouped)
h12013/tj_s222_reson7125_stbd/2009-121/009_0127	6845/3	181.96	297.3	Secondary (grouped)
h12013/tj_s222_reson7125_stbd/2009-120/005_2203	10107/253	182.87	120.4	Secondary (grouped)
h12013/tj_3101_klein5000_sss200/2009-121/270_090501130500	0019	193.66	122.1	Secondary (grouped)
h12013/tj_s222_reson7125_stbd/2009-121/010_0200	5929/92	208.91	003.5	Secondary (grouped)
h12013/tj_s222_reson7125_stbd/2009-122/930_2041	414/230	226.41	137.0	Secondary (grouped)
h12013/tj_3101_klein5000_sss100/2009-109/773_090419200400	0003	229.06	136.8	Secondary (grouped)
h12013/tj_3101_klein5000_sss200/2009-121/271_090501132300	0002	248.07	150.0	Secondary (grouped)
h12013/tj_s222_reson7125_stbd/2009-120/004_2111	12226/83	321.91	101.4	Secondary (grouped)
h12013/tj_3101_klein5000_sss200/2009-121/270_090501130500	0020	331.25	104.4	Secondary (grouped)

h12013/tj_s222_reson7125_stbd/2009-120/003_2016	9146/168	361.15	109.5	Secondary (grouped)
h12013/tj_s222_reson7125_stbd/2009-120/003_2016	9210/48	364.80	105.3	Secondary (grouped)
h12013/tj_3101_klein5000_sss100/2009-109/772_090419195000	0010	374.88	075.4	Secondary (grouped)
h12013/tj_s222_reson7125_stbd/2009-120/006_2326	9197/256	378.70	076.5	Secondary (grouped)
h12013/tj_s222_reson7125_stbd/2009-120/004_2111	11939/166	384.85	092.8	Secondary (grouped)
h12013/tj_s222_reson7125_stbd/2009-120/004_2111	11974/6	390.04	097.1	Secondary (grouped)
h12013/tj_3101_klein5000_sss200/2009-121/271_090501132300	0007	390.32	108.4	Secondary (grouped)
h12013/tj_3101_klein5000_sss200/2009-121/271_090501132300	0001	390.60	108.3	Secondary (grouped)
h12013/tj_3101_klein5000_sss100/2009-109/773_090419200400	0002	393.12	096.8	Secondary (grouped)
h12013/tj_3101_klein5000_sss200/2009-121/272_090501133600	0008	458.37	146.5	Secondary (grouped)
h12013/tj_3101_klein5000_sss100/2009-109/774_090419202200	0007	462.87	123.8	Secondary (grouped)
h12013/tj_3101_reson8125_mb/2009-134/803_1337	7582/2	464.38	148.6	Secondary (grouped)
h12013/tj_3101_klein5000_sss200/2009-121/273_090501135100	0001	468.81	146.4	Secondary (grouped)
h12013/tj_3101_klein5000_sss100/2009-109/775_090419203700	0002	484.33	124.5	Secondary (grouped)
h12013/tj_3101_klein5000_sss100/2009-109/775_090419203700	0004	488.75	151.0	Secondary (grouped)
h12013/tj_3102_reson7125_mb_t/2009-126/017_2019	1573/308	490.99	124.9	Secondary (grouped)
h12013/tj_3101_klein5000_sss100/2009-109/774_090419202200	0008	535.48	101.7	Secondary (grouped)
h12013/tj_s222_reson7125_stbd/2009-122/929_2030	1221/2	556.53	097.5	Secondary (grouped)
h12013/tj_s222_reson7125_stbd/2009-120/002_1927	16701/238	586.60	094.3	Secondary (grouped)
h12013/tj_3101_klein5000_sss100/2009-109/773_090419200400	0007	594.28	094.2	Secondary (grouped)
h12013/tj_3102_reson7125_mb_t/2009-121/775_1529	9114/4	685.39	103.3	Secondary (grouped)
h12013/tj_3101_klein5000_sss100/2009-109/775_090419203700	0001	699.74	102.1	Secondary (grouped)

Hydrographer Recommendations

Add a 50' sounding over primary feature, and update charted soudings over the area to better reflect the least depths of the shoal. Chart area as rky

S-57 Data

Geo object 1: Seabed area (SBDARE)

Attributes: NATSUR - 9:rock

SORDAT - 20090517

SORIND - US,US,NSURF,H12013

WATLEV - 3:always under water/submerged

Feature Images

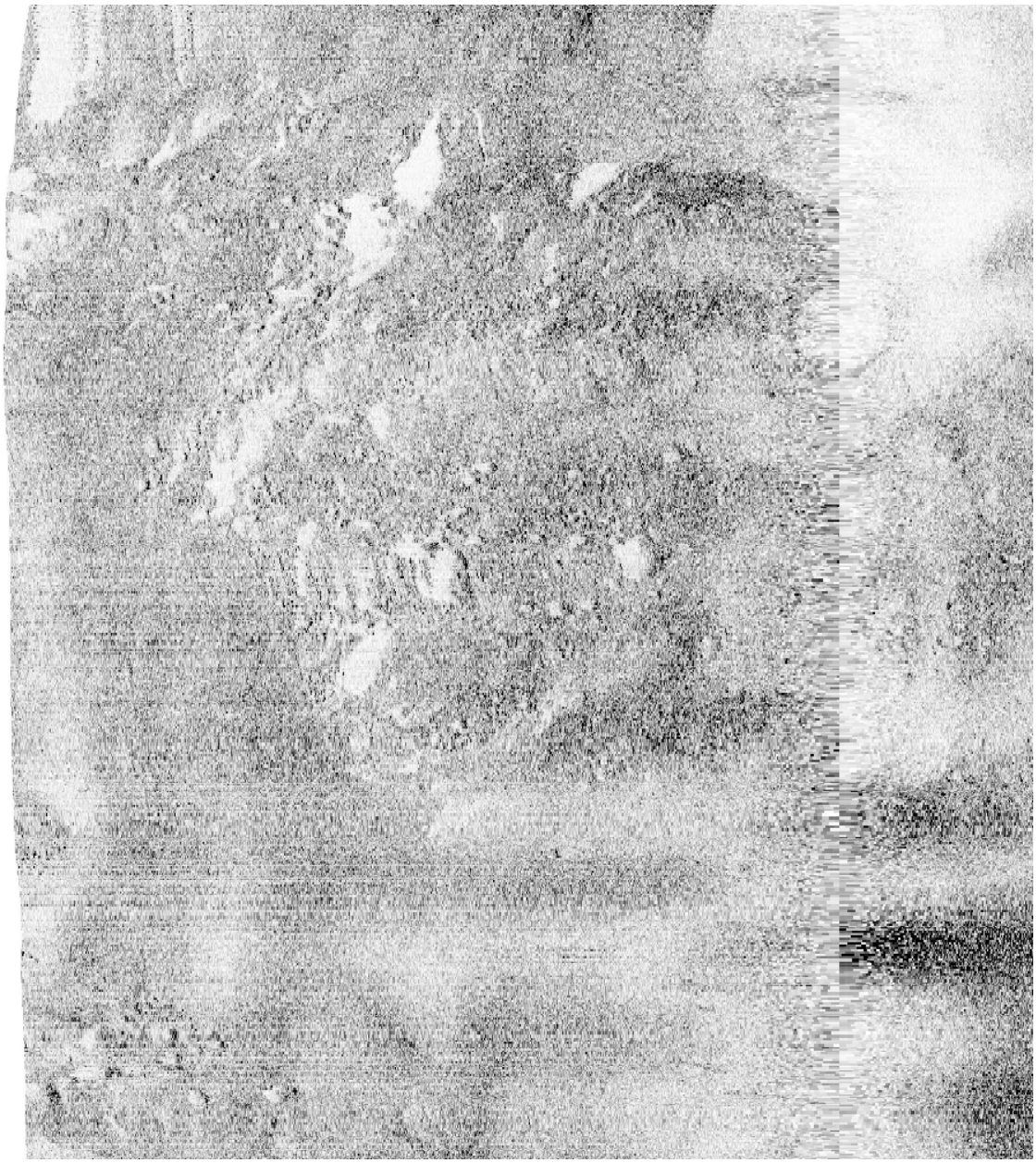


Figure 2.53.1

2.54) 336/124

Survey Summary

Survey Position: 41° 16' 30.7" N, 072° 17' 10.4" W

Least Depth: 3.00 m (= 9.86 ft = 1.643 fm = 1 fm 3.86 ft)

TPU (±1.96σ): **THU (TPEh)** ±0.980 m ; **TVU (TPEv)** ±0.103 m

Timestamp: 2009-137.16:00:50.506 (05/17/2009)

Survey Line: h12013 / tj_3101_reson8125_mb / 2009-137 / 061_1600

Profile/Beam: 336/124

Charts Affected: 12375_1, 12372_11, 12354_1, 12300_1, 13006_1, 5161_1, 13003_1

Remarks:

Least depth on a rock just outside the 12' contour.

Feature Correlation

Address	Feature	Range	Azimuth	Status
h12013/tj_3101_reson8125_mb/2009-137/061_1600	336/124	0.00	000.0	Primary
h12013/tj_3101_klein5000_sss200/2009-122/532_090502203600	0001	1.79	146.9	Secondary

Hydrographer Recommendations

Adjust contour, possibly chart 9' sounding.

S-57 Data

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

Attributes:

QUASOU - 6:least depth known

SORDAT - 20090517

SORIND - US,US,NSURF,H12013

TECSOU - 3:found by multi-beam

VALSOU - 3.005 m

VERDAT - 12:Mean lower low water

WATLEV - 3:always under water/submerged

Feature Images

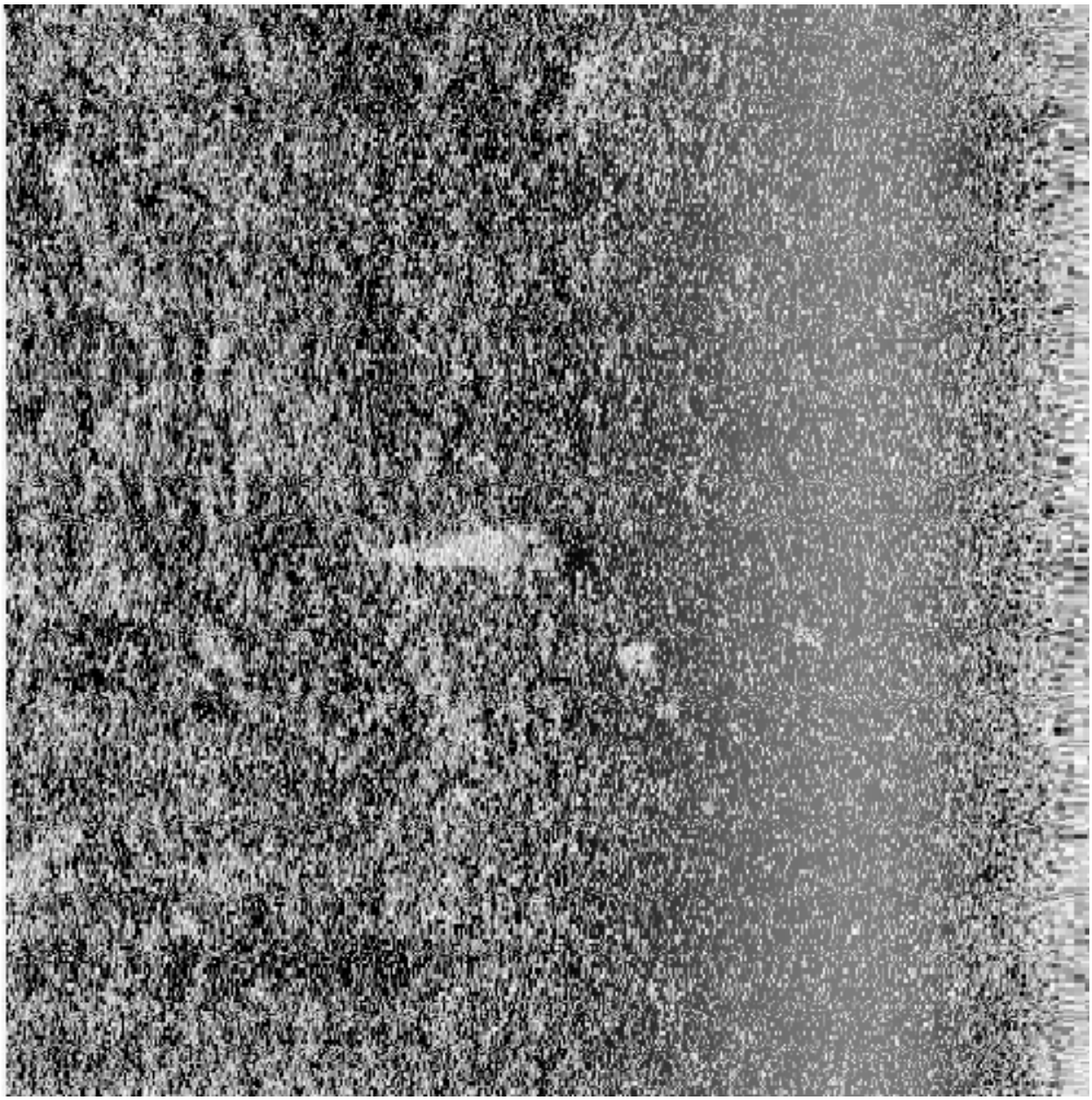


Figure 2.54.1

2.55) 988/229

Survey Summary

Survey Position: 41° 16' 02.2" N, 072° 18' 31.2" W

Least Depth: 5.94 m (= 19.49 ft = 3.249 fm = 3 fm 1.49 ft)

TPU (±1.96σ): **THU (TPEh)** ±0.981 m ; **TVU (TPEv)** ±0.108 m

Timestamp: 2009-127.19:34:58.470 (05/07/2009)

Survey Line: h12013 / tj_3101_reson8125_mb / 2009-127 / 113_1933

Profile/Beam: 988/229

Charts Affected: 12375_1, 12372_11, 12354_1, 12300_1, 13006_1, 5161_1, 13003_1

Remarks:

Sounding over a rock. Not known as least depth.

Feature Correlation

Address	Feature	Range	Azimuth	Status
h12013/tj_3101_reson8125_mb/2009-127/113_1933	988/229	0.00	000.0	Primary
h12013/tj_3101_reson8125_mb/2009-127/198_1923	7201/235	22.62	338.3	Secondary (grouped)

Hydrographer Recommendations

Retain 15' charted sounding or chart as dangerous underwater rock of uncertain depth.

S-57 Data

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

Attributes:

QUASOU - 2:depth unknown

SORDAT - 20090517

SORIND - US,US,NSURF,H12013

TECSOU - 3:found by multi-beam

VALSOU - 5.941 m

VERDAT - 12:Mean lower low water

WATLEV - 3:always under water/submerged

2.56) 5519/47

Survey Summary

Survey Position:	41° 16' 07.3" N, 072° 18' 28.4" W
Least Depth:	4.96 m (= 16.28 ft = 2.713 fm = 2 fm 4.28 ft)
TPU (±1.96σ):	**THU (TPEh)** ±0.980 m ; **TVU (TPEv)** ±0.104 m
Timestamp:	2009-131.20:54:36.206 (05/11/2009)
Survey Line:	h12013 / tj_3101_reson8125_mb / 2009-131 / 180_2050
Profile/Beam:	5519/47
Charts Affected:	12375_1, 12372_11, 12354_1, 12300_1, 13006_1, 5161_1, 13003_1

Remarks:

Sounding on a rocky shoal. Not known as least depth.

Feature Correlation

Address	Feature	Range	Azimuth	Status
h12013/tj_3101_reson8125_mb/2009-131/180_2050	5519/47	0.00	000.0	Primary

Hydrographer Recommendations

Since least depth is not known, chart as dangerous underwater rock of uncertain depth.

S-57 Data

Geo object 1:	Underwater rock / awash rock (UWTROC)
Attributes:	QUASOU - 2:depth unknown
	SORIND - US,US,NSURF,H12013
	TECSOU - 3:found by multi-beam
	VALSOU - 4.961 m
	WATLEV - 3:always under water/submerged

3 - Dangers to Navigation

3.1) 2642/1

DANGER TO NAVIGATION

Survey Summary

Survey Position:	41° 15' 19.6" N, 072° 15' 15.9" W
Least Depth:	16.98 m (= 55.72 ft = 9.286 fm = 9 fm 1.72 ft)
TPU (±1.96σ):	**THU (TPEh)** ±1.012 m ; **TVU (TPEv)** ±0.437 m
Timestamp:	2009-121.16:35:15.357 (05/01/2009)
Survey Line:	h12013 / tj_s222_reson7125_stbd / 2009-121 / 020_1629
Profile/Beam:	2642/1
Charts Affected:	13211_1, 12372_11, 13209_1, 12354_1, 12300_1, 13006_1, 5161_1, 13003_1

Remarks:

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

Feature Correlation

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

Hydrographer Recommendations

[None]

Cartographically-Rounded Depth (Affected Charts):

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

9 ¼fm (12300_1, 13006_1, 13003_1)

17.0m (5161_1)

S-57 Data

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

TECSOU - 3:found by multi-beam

VALSOU - 16.982 m

VERDAT - 12:Mean lower low water

WATLEV - 3:always under water/submerged

3.2) 738/256

DANGER TO NAVIGATION

Survey Summary

Survey Position:	41° 15' 07.1" N, 072° 16' 18.2" W
Least Depth:	21.24 m (= 69.69 ft = 11.615 fm = 11 fm 3.69 ft)
TPU (±1.96σ):	**THU (TPEh)** ±1.022 m ; **TVU (TPEv)** ±0.461 m
Timestamp:	2009-121.17:25:27.944 (05/01/2009)
Survey Line:	h12013 / tj_s222_reson7125_stbd / 2009-121 / 025_1723
Profile/Beam:	738/256
Charts Affected:	12375_1, 13211_1, 12372_11, 13209_1, 12354_1, 12300_1, 13006_1, 5161_1, 13003_1

Remarks:

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

Feature Correlation

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

Hydrographer Recommendations

[None]

Cartographically-Rounded Depth (Affected Charts):

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

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

21m (5161_1)

S-57 Data

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

TECSOU - 3:found by multi-beam

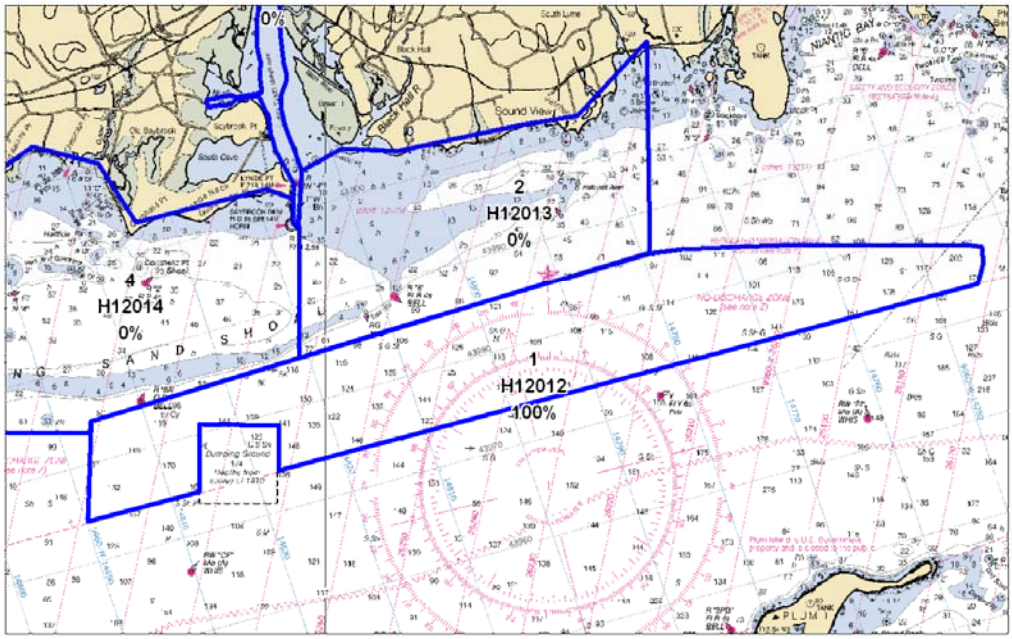
VALSOU - 21.242 m

VERDAT - 12:Mean lower low water

WATLEV - 3:always under water/submerged

Appendix III

Progress Sketch



Project	Sheet_Letter	H_num	HO_Est_SNM	CumlPercCompPrev	CumlPercCompCurMon	SNM_CompCurMon	CumSNMcomp
B370-TJ-09	2	H12013	6	0	0	0	0
B370-TJ-09	5		0	0	0	0	0
B370-TJ-09	7		0	0	0	0	0
B370-TJ-09	6		0	0	0	0	0
B370-TJ-09	3	H12015	1	0	0	0	0
B370-TJ-09	1	H12012	14	0	100	14	14

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

Appendix IV

Tides and Water Levels

1. **Tide Notes**

2. **Request for Approved Tides**

3. **Final Tide Notes**

WATER LEVEL INSTRUCTIONS
OPR-B370-TJ-2009 Eastern Long Island Sound
(02/05/2009 LH)

1.0. TIDES AND WATER LEVELS

1.1. Specifications

Tidal data acquisition, data processing, tidal datum computation and final tidal zoning shall be performed utilizing sound engineering and oceanographic practices as specified in National Ocean Service (NOS) Hydrographic Surveys Specifications and Deliverables (HSSD), dated April 2008, and OCS Field Procedures Manual (FPM), dated May 2008. Specifically reference Chapter 4 of the HSSD and Sections 1.5.8, 1.5.9, 2.4.3, and 3.4.2 of the FPM.

1.2. Vertical Datums

The tidal datums for this project are referenced to Chart Datum, Mean Lower Low Water (MLLW) and Mean High Water (MHW). Soundings are referenced to MLLW and heights of overhead obstructions (bridges and cables) are referenced to MHW.

The operating National Water Level Observation Network (NWLON) stations at New London, CT (8461490) and Bridgeport, CT (8467150) will serve as datum control for the survey area including determination at each subordinate station. Therefore, it is critical that these stations remain in operation during all periods of hydrography.

1.2.1. Water Level Data Acquisition Monitoring

The Commanding Officer (or Team Leader) and the Center for Operational Oceanographic Products and Services (CO-OPS) are jointly responsible for ensuring that valid water level data are collected during periods of hydrography. The Commanding Officer (or Team Leader) is required to monitor the pertinent water level data via the CO-OPS Web site at http://tidesandcurrents.noaa.gov/hydro.shtml, email data transmissions through TIDEBOT, or through regular communications with CO-OPS/Requirements and Development Division (RDD) personnel before and during operations. During traditional non duty hours, the Commanding Officer/Team Leader may contact the Continuous Operational Real-Time Monitoring System (CORMS) watch stander who is available 24 hours/day - 7 days/week for assistance in assessing the status of applicable water level station operation. The CORMS watch stander may be contacted either by phone at 301-713-2540 or by Email: CORMS@noaa.gov. Problems or concerns regarding the acquisition of valid water level data identified by the Commanding Officer/Team Leader shall be communicated with CO-OPS/RDD (Tom Landon, 301-713-2897 ext. 191, Email: Thomas.Landon@noaa.gov on the East Coast) to coordinate the appropriate course of action to be taken such as gauge repair and/or developing contingency plans for hydrographic survey operations. In addition, CO-OPS is required to coordinate with the Commanding Officer/Team Leader before interrupting the acquisition of water level data for any reason during periods of hydrography.

1.2.2. NWLON Water Level Station Operation and Maintenance

The operating water level stations at New London, CT (8461490) and New Haven, CT (8465705) will also provide water level reducers for this project, reiterating the importance of their operation during all periods of hydrography. See Sections 1.1. and 1.2. concerning responsibilities.

No leveling is required at New London, CT (8461490) and New Haven, CT (8465705) by NOAA Ship THOMAS JEFFERSON personnel.

CO-OPS/FOD is responsible for the operation and maintenance of all NWLON primary control stations. If a problem is identified at an NWLON primary control station, FOD shall make all reasonable efforts to repair the malfunctioning station. However, CO-OPS may request assistance from the NOAA ship personnel in the actual repair of the water level station to facilitate a rapid repair. CO-OPS/FOD and the Commanding Officer (or Team Leader) shall maintain the required communications until the repairs to the water level station have been completed.

1.3. Tide Reducer Stations

1.3.1. No subordinate water level stations are required for this project, however, supplemental and/or back-up water level stations may be necessary depending on the complexity of the hydrodynamics and/or the severity of the environmental conditions of the project area. The installation and continuous operation of water level measurement systems (tide gauges) at subordinate station locations is left to the discretion of the Commanding Officer (or Team Leader), subject to the approval of CO-OPS. If the Commanding Officer (or Team Leader) decides to install additional water level stations, then a 30-day minimum of continuous data acquisition is required. For all subordinate stations, data must be collected throughout the entire survey period for which they are applicable, and not less than 30 continuous days. This is necessary to facilitate the computation of an accurate datum reference as per NOS standards.

1.3.1.1 Tide Component Error Estimation

This section is not applicable for this project. Tidal Constituent And Residual Interpolator (TCARI) automatically calculates the error associated with water level interpolation. This error is incorporated into the residual/harmonic solutions and included in the Total Propagated Error (TPE) for the survey.

1.3.2. GOES Satellite Enabled Subordinate Stations

This section is not applicable for this project.

1.3.3. Benchmark Recovery and GPS Requirements

This section is not applicable for this project.

1.3.4. Residual Water Level Station(s) Data

Tidal Constituent And Residual Interpolation (TCARI) method uses harmonic constituents and residuals from historical and operating water level stations to provide precise water level

correction for bathymetric surveys. Download the following water level station(s) data for all periods of survey. Preliminary water level data may be retrieved in one month increments over the Internet from the CO-OPS Home Page at http://tidesandcurrents.noaa.gov/olddata and then clicking on "Preliminary Water Level". Preliminary data are six-minute time series data relative to **Mean Sea Level (MSL)** in metric units on Greenwich Mean Time. The Commanding Officer (or Team Leader) must notify CO-OPS/RDD personnel immediately of any problems concerning the preliminary tides.

The operating stations at New London, CT (8461490) and New Haven, CT (8465705) will provide residuals for this project and must remain in operation during all periods of hydrography.

Station Number	Station Name	Latitude(N)	Longitude(W)
846-1490	**New London, CT**	**41 º 21.7'**	**72 º 05.4'**
846-5705	**New Haven, CT**	**41 º 17.0'**	**72 º 54.5'**

1.4. Tidal Constituent and Residual Interpolation (TCARI)

1.4.1. For hydrography in the area of Eastern Long Island Sound, apply the TCARI grid "B370TJ2009-TCARI.tc" supplied in conjunction with the water level data from Section 1.3.4 to produce a seamless tide correction. Refer to the TCARI Field SOP for detailed TCARI instructions.

1.4.2. This section is not applicable for this project.

1.4.3 TCARI Diagram(s)

A diagram created in Pydro, is provided in digital copy format to assist with the information provided in section 1.4.1.

1.4.4 TCARI Final Solutions

Upon completion of project OPR-B370-TJ-2009, submit a Pydro generated request for smooth tides, with times of hydrography abstract and mid/mif tracklines attached. Forward this request to smooth.tides@noaa.gov . Provide the project number, as well as sheet number, in the subject line of the email.
CO-OPS will review the times of hydrography, final tracklines, and six-minute water level data from all applicable water level gauges. If there are any discrepancies, CO-OPS will make the appropriate adjustments and forward a revised TCARI grid and solutions to the field group and processing branch for final processing.

1.5 TideBot

Preliminary and verified six minute water level time series data may be retrieved from the CO-OPS database via TideBot application. TideBot delivers timely preliminary/verified tidal and Great Lakes six minute water level observations via email to users on a scheduled, recurring basis. To access TideBot through an email account, send an email to TideBot@noaa.gov with the word "help" as the subject. An email reply will be sent with instructions on how to subscribe to TideBot for time series data retrieval.

1.6 Water Level Records

Submit water level data, such as leveling records, field reports, and any other relevant data/reports, including the data downloaded onto diskette/CD within 1 week after the end of each month or the end of hydrography to CO-OPS/RDD. Refer to Section 1.1.

1.6.1 Water level records should be forwarded to the following address:

NOAA/National Ocean Service/CO-OPS
Chief, Requirements and Development Division
N/OPS1 - SSMC4, Station 6531
1305 East-West Highway
Silver Spring, MD 20910

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

May 27, 2009

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

FROM: CDR P. Tod Schattgen, NOAA Ship THOMAS JEFFERSON (MOA-TJ)

SUBJECT: Request for Approved Tides/Water Levels

Please provide the following data:

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

Transmit data to the following:

NOAA/NOS/Atlantic Hydrographic Branch
N/CS33, Building #2
439 West York Street
Norfolk, VA 23510
ATTN: Chief AHB

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

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

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

Attachments containing:

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

cc: N/CS33
MOA/TJ

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

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

TIDE NOTE FOR HYDROGRAPHIC SURVEY

DATE : May 27, 2009

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

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

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

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

REMARKS: RECOMMENDED GRID

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

Refer to attachments for grid information.

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

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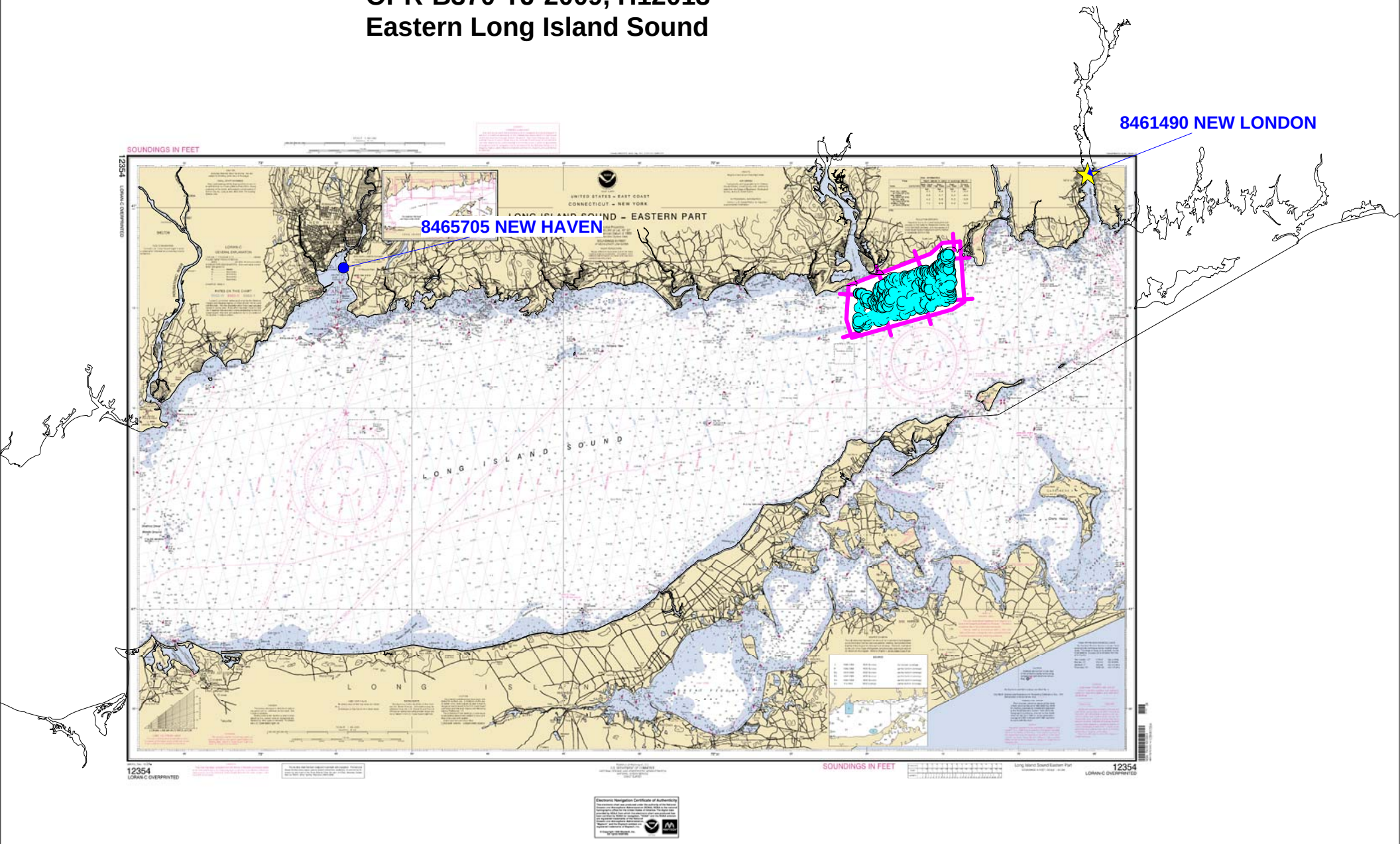
CHIEF, OCEANOGRAPHIC DIVISION

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



Appendix V

Supplemental Survey Records & Correspondence

From Olivia.Hauser@noaa.gov

Sent Thursday, May 1, 2008 3:10 pm

To Christiaan.VanWestendorp@noaa.gov , jasper.schaer@noaa.gov , Daniel.Wright@noaa.gov , Jake.Yoos@noaa.gov , James.Jacobson@noaa.gov , Matthew.Ringel@noaa.gov , Mark.Mcmann@noaa.gov , David.Elliott@noaa.gov , Kathryn.Simmons@noaa.gov , Lucy.Massimillo@noaa.gov , Matthew.Jaskoski@noaa.gov , "Eric M. Moore" <Eric.M.Moore@noaa.gov> , Michael.Davidson@noaa.gov , Stephen.Kuzirian@noaa.gov , "Lynnette V. Morgan" <Lynnette.V.Morgan@noaa.gov>

Cc Mark.Vanwaes@noaa.gov

Bcc

Subject HVCR

Hi FOOs, CSTs and Team Leads,

A recent discussion made me realize that many of you are still creating some sort of Horizontal and Vertical Control Report (HVCR), even if you have not done any active horizontal control or vertical control. If you have not actively set up a tide gauge or a differential beacon, you are not required to write a HVCR. See FPM section "5.2.3.2.3. Horizontal & Vertical Control Report (HVCR)" Please just state that fact in your DR, and place a txt file in a HVCR folder stating there was not a report required for this survey. This lets the branch know that you do not have a report, and saves you from having to re-write, or copy any information into a separate document. Please email me if you have any questions.

Olivia

Sample information	Latitude	Longitude	time	date	description	Nav quality.
Mud Shells	41.27422	-72.2583	20:37:58	5/13/2009	Mud, Shells	QUA 0 74283.106 7 8.05 1.95 8.00 4.00 0.00 0.00 0.00
Gravel, Shells	41.27257	-72.2776	20:50:09	5/13/2009	Gravel, Shells	QUA 0 75013.855 7 7.72 2.28 7.00 4.00 0.00 0.00 0.00
fine Sand	41.26721	-72.2865	21:10:51	5/13/2009	Fine Sand	QUA 0 76255.651 7 7.95 2.05 8.00 4.00 0.00 0.00 0.00
fine Sand/Shells	41.25085	-72.3234	19:31:02	4/30/2009	Fine sand/shel	QUA 0 70264.355 7 8.10 1.90 8.00 4.00 0.00 0.00 0.00
fine Sand	41.25101	-72.3339	19:34:47	4/30/2009	ine shand	QUA 0 70489.117 7 8.11 1.89 8.00 4.00 0.00 0.00 0.00
fine Sand	41.25351	-72.3359	19:47:23	4/30/2009	fine sand	QUA 0 71245.166 7 8.19 1.81 8.00 4.00 0.00 0.00 0.00
fine Sand/Shells	41.24705	-72.3395	19:53:46	4/30/2009	fine sand/shell	QUA 0 71628.490 7 7.91 2.09 7.00 4.00 0.00 0.00 0.00
Gravel/Shells	41.2405	-72.3284	19:59:20	4/30/2009	Gravel/Shells	QUA 0 71962.514 7 7.94 2.06 7.00 4.00 0.00 0.00 0.00
fine Sand	41.24896	-72.3104	20:09:30	4/30/2009	fine sand	QUA 0 72572.421 7 7.99 2.01 7.00 4.00 0.00 0.00 0.00
Silt	41.25242	-72.303	20:09:37	4/30/2009	Silt	QUA 0 72579.621 7 7.99 2.01 7.00 4.00 0.00 0.00 0.00
Silt	41.26073	-72.2947	20:21:14	4/30/2009	Silt	QUA 0 73276.068 7 8.05 1.95 7.00 4.00 0.00 0.00 0.00
Silt/Shells	41.25164	-72.2985	20:25:54	4/30/2009	Silt/shells	QUA 0 73556.112 7 8.07 1.93 7.00 4.00 0.00 0.00 0.00
Silt/Shells	41.25274	-72.2903	20:30:55	4/30/2009	Silt/Shells	QUA 0 73857.595 7 8.09 1.91 7.00 4.00 0.00 0.00 0.00
sticky Mud/Shells	41.26612	-72.3116	20:46:12	4/30/2009	Sticky Mud/Sh	QUA 0 74773.905 7 8.05 1.95 7.00 4.00 0.00 0.00 0.00
fine Sand/shells	41.27028	-72.3019	20:57:10	4/30/2009	fine sand/shell	QUA 0 75431.913 7 8.37 1.63 8.00 4.00 0.00 0.00 0.00
Silt	41.27238	-72.2924	21:03:41	4/30/2009	Silt	QUA 0 75823.097 7 8.35 1.65 8.00 4.00 0.00 0.00 0.00
Mud/Gravel	41.27435	-72.2583	20:39:24	5/1/2009	Mud Gravel	QUA 0 74367.511 7 8.03 1.97 7.00 4.00 0.00 0.00 0.00