

F00643

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

DESCRIPTIVE REPORT

Type of Survey: Navigable Area

Registry Number: F00643

LOCALITY

State(s): Rhode Island

General Locality: Narragansett Bay, RI

Sub-locality: Conimicut Point Reach

2014

CHIEF OF PARTY
LTjg Andrew R. Clos

LIBRARY & ARCHIVES

Date:

HYDROGRAPHIC TITLE SHEET

F00643

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

State(s): **Rhode Island**

General Locality: **Narragansett Bay, RI**

Sub-Locality: **Conimicut Point Reach**

Scale: **10000**

Dates of Survey: **07/21/2014 to 07/23/2014**

Instructions Dated: **06/27/2014**

Project Number: **S-B904-NRT5-14**

Field Unit: **Navigation Response Team 5**

Chief of Party: **LTjg Andrew R. Clos**

Soundings by: **Multibeam Echo Sounder**

Imagery by: **Side Scan Sonar**

Verification by: **Pacific Hydrographic Branch**

Soundings Acquired in: **meters at Mean Lower Low Water**

Remarks:

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

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Descriptive Report to Accompany Survey F00643

Project: S-B904-NRT5-14

Locality: Narragansett Bay, RI

Sublocality: Conimicut Point Reach

Scale: 1:10000

July 2014 - July 2014

Navigation Response Team 5

Chief of Party: LTjg Andrew R. Clos

A. Area Surveyed

This survey was conducted in Narragansett Bay, in the vicinity of Conimicut Point Reach.

A.1 Survey Limits

Data were acquired within the following survey limits:

Northwest Limit	Southeast Limit
41° 43' 52.84" N 71° 22' 18.25" W	41° 42' 52.64" N 71° 20' 16.34" W

Table 1: Survey Limits

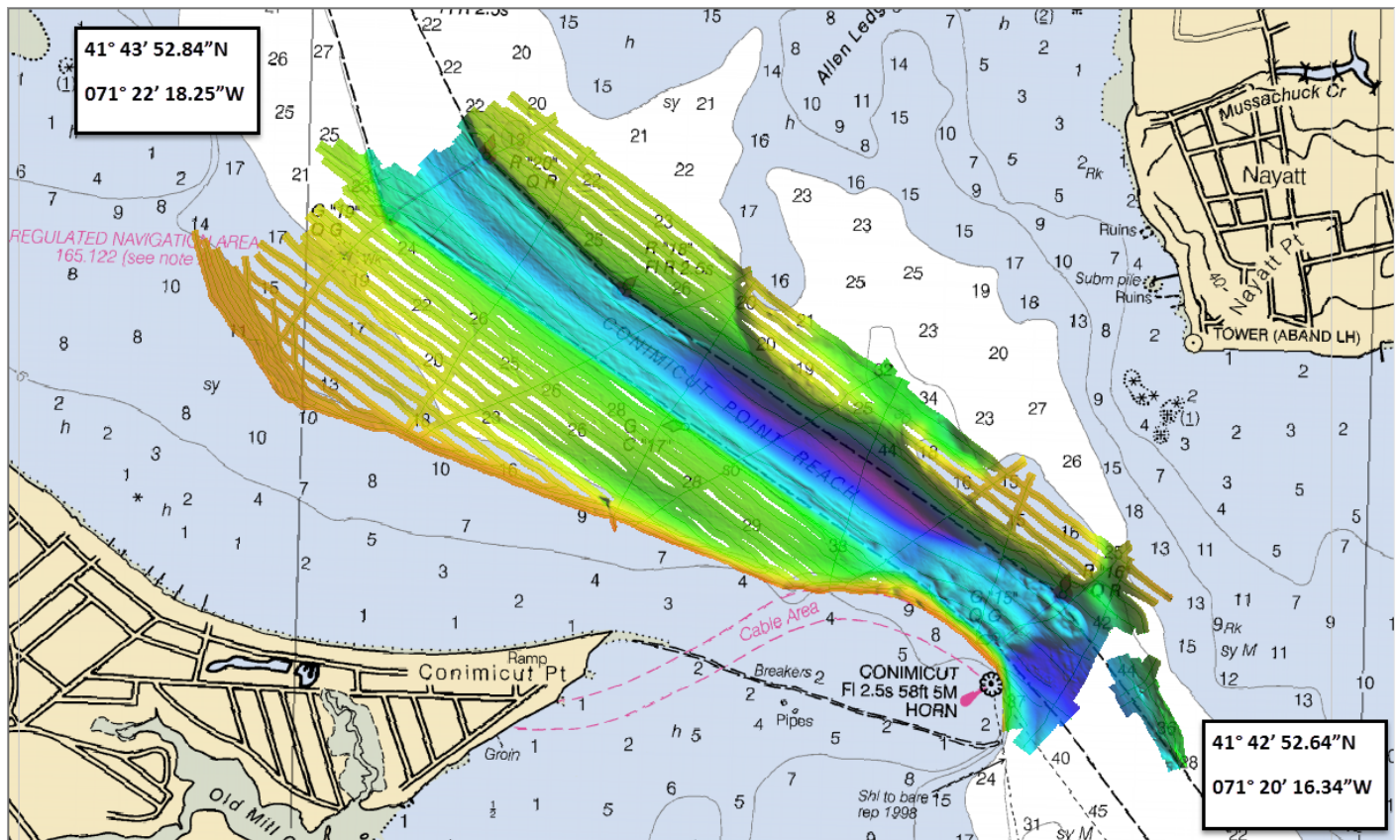


Figure 1: F00643 Survey Area.

The four meter curve was reached for the entire survey, except for a small portion just southeast of Conimicut Light. Due to the proximity of the rip rap around the light, the jetty to the south of the survey area, and shallow water to the west, the vessel could not be safely maneuvered to reach the four meter curve. See figure 2 below.

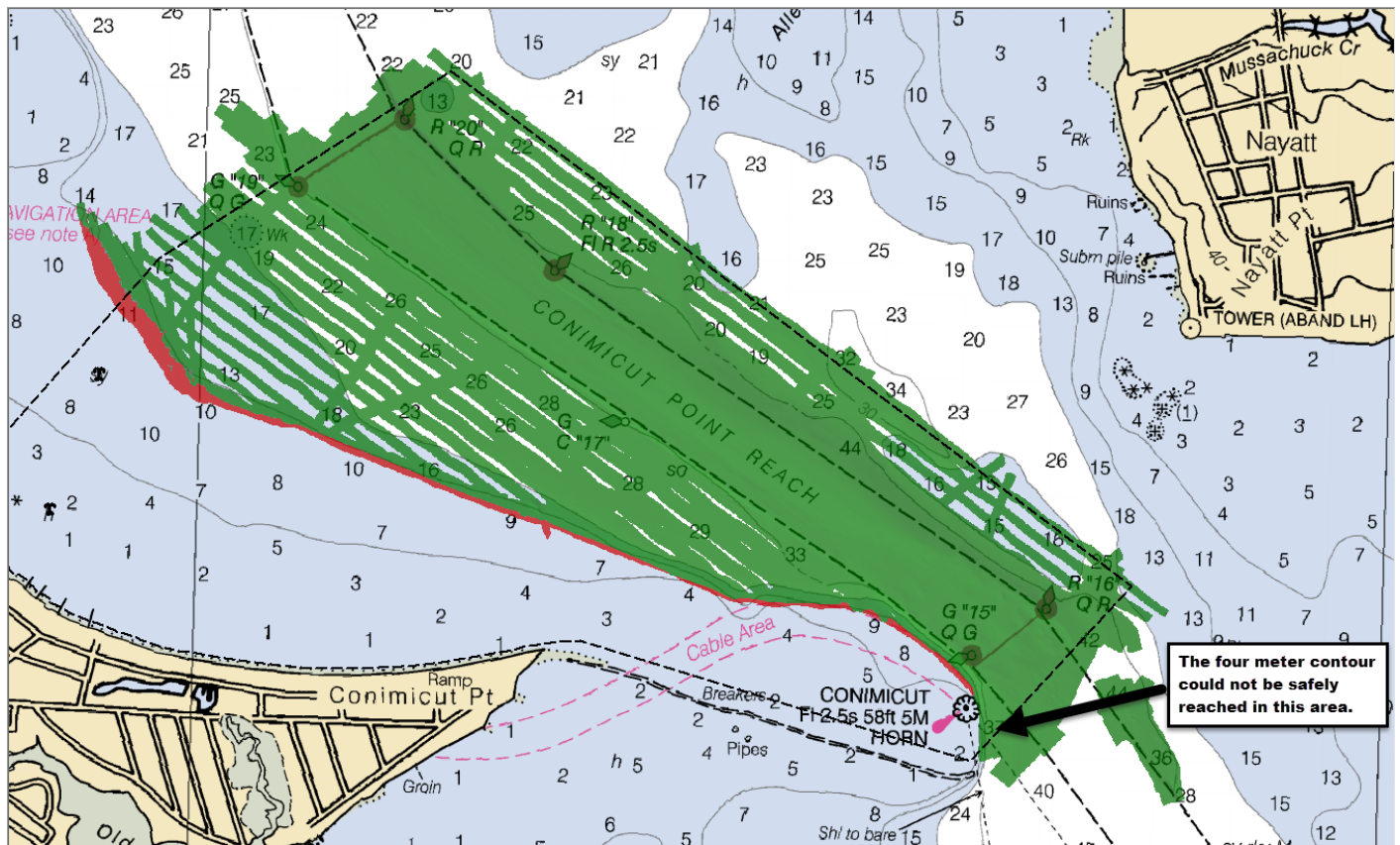


Figure 2: Red areas indicate where the four meter contour was reached.

A.2 Survey Purpose

The purpose of this project is to provide contemporary surveys to update National Ocean Service (NOS) nautical charting products. This survey was conducted at the request of the Northeast Marine Pilots Association to investigate the possibility of deeper water being found to the south of the maintained channel. If deeper water is present south of the channel, the pilots will request that AtoNs be moved and the channel widened to provide a better location for large vessels to safely meet or pass each other.

A.3 Survey Quality

The entire survey is adequate to supersede previous data.

A.4 Survey Coverage

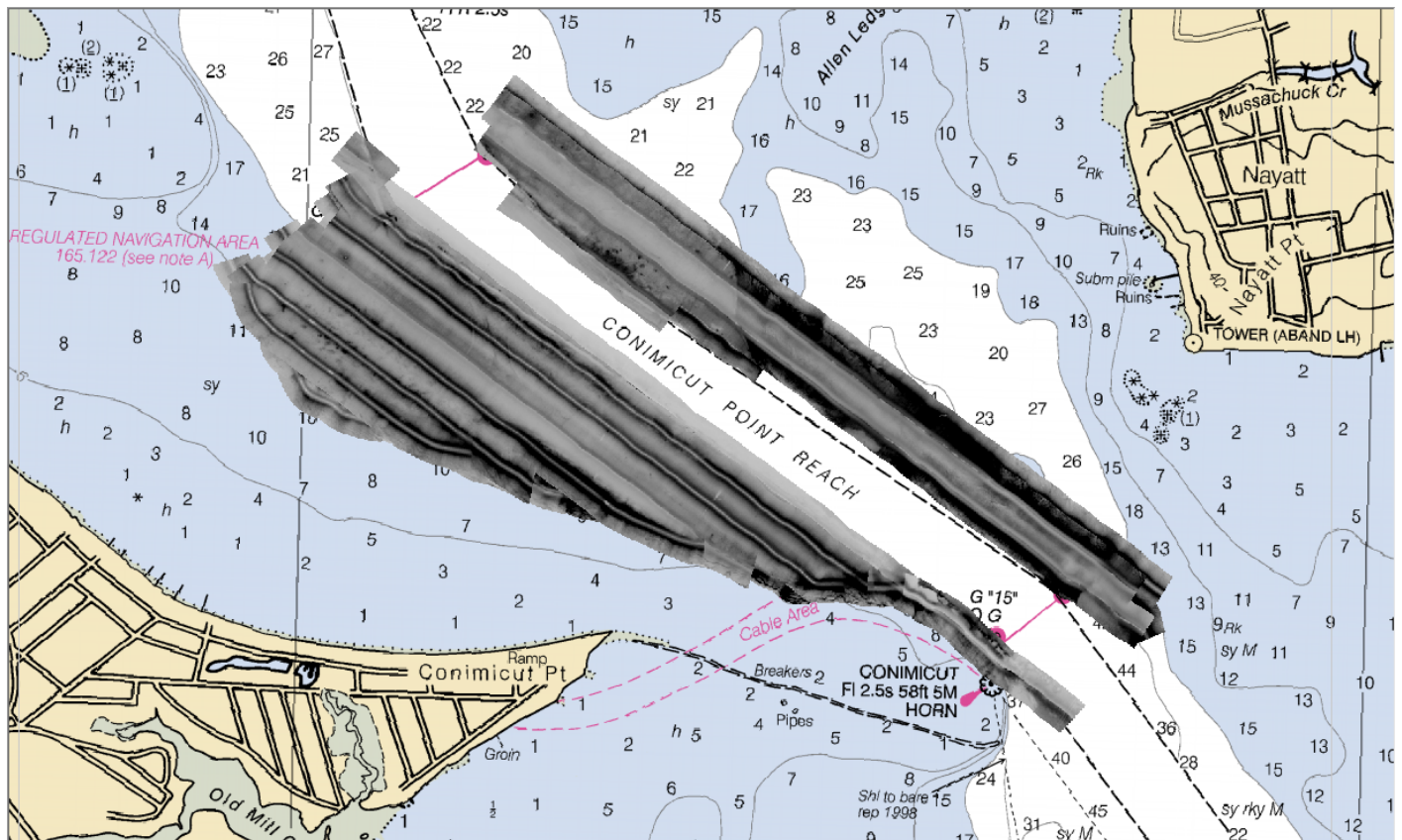


Figure 3: Side scan coverage area for F00643.

During acquisition of main scheme data on F00643, a feature was noticed just southeast of the survey area and close to the maintained channel. After analysis, the feature was determined to be real, but its least depth falls within the range of the surrounding depths and poses no hazard to navigation. For more information, please refer to the Final Feature .hob file.

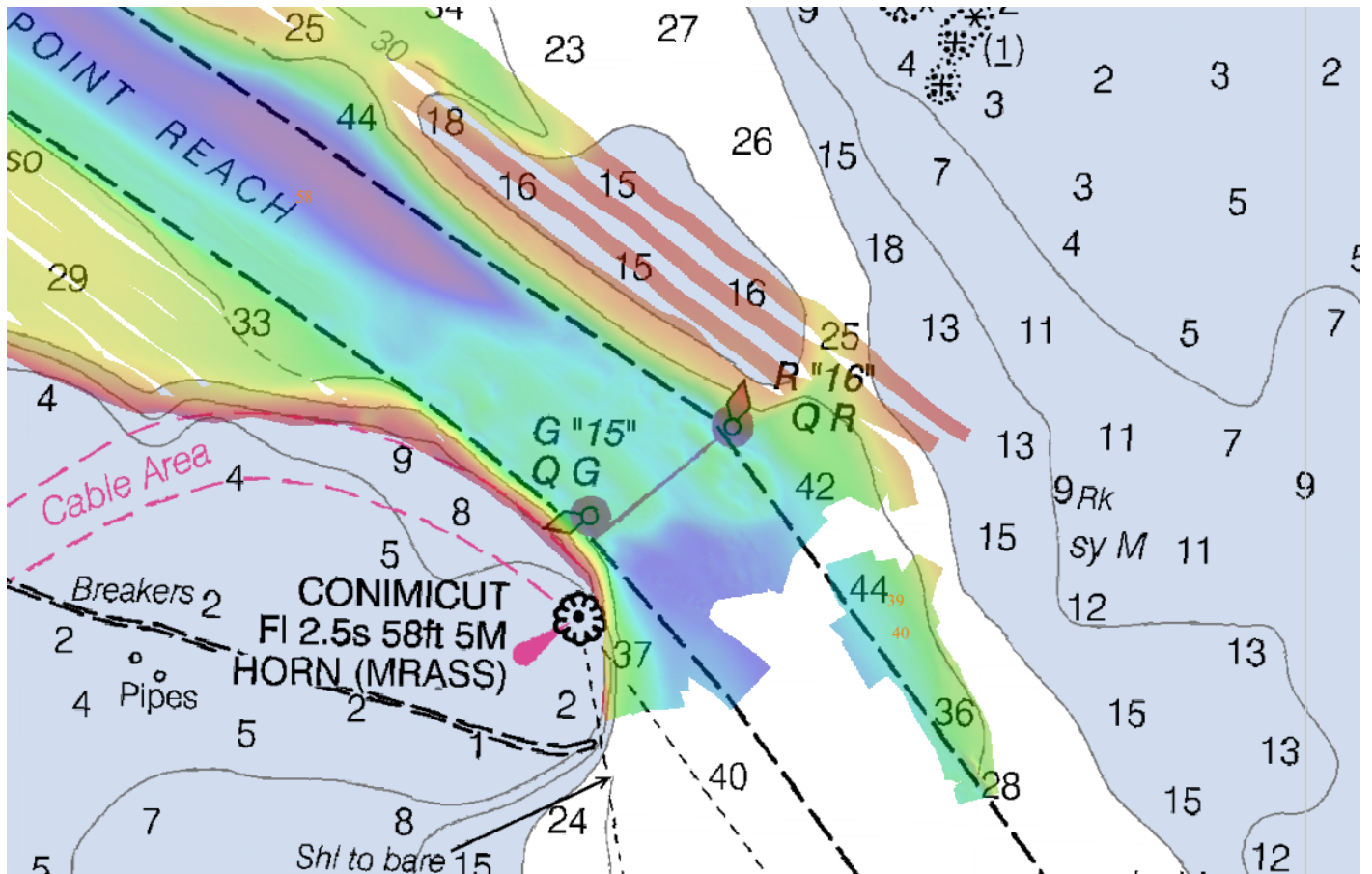


Figure 4: Additional MBES data acquired outside of the assigned survey area.

The Final Feature file is not appended to this report.

A.5 Survey Statistics

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

	HULL ID	<i>S3002</i>	<i>Total</i>
LNM	SBES Mainscheme	0	0
	MBES Mainscheme	13.34	13.34
	Lidar Mainscheme	0	0
	SSS Mainscheme	0	0
	SBES/SSS Mainscheme	0	0
	MBES/SSS Mainscheme	15.88	15.88
	SBES/MBES Crosslines	3.78	3.78
	Lidar Crosslines	0	0
Number of Bottom Samples			2
Number of AWOIS Items Investigated			1
Number Maritime Boundary Points Investigated			0
Number of DPs			0
Number of Items Investigated by Dive Ops			0
Total SNM			0

Table 2: Hydrographic Survey Statistics

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

Survey Dates	Day of the Year
07/21/2014	202
07/22/2014	203
07/23/2014	204

Table 3: Dates of Hydrography

B. Data Acquisition and Processing

B.1 Equipment and Vessels

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

B.1.1 Vessels

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

Hull ID	<i>S3002</i>
LOA	33 feet
Draft	0.75 meters

Table 4: Vessels Used



Figure 5: S3002

S3002 acquired towed side scan data with concurrent multibeam, attitude data and bottom samples.

B.1.2 Equipment

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

Manufacturer	Model	Type
Kongsberg	EM3002	MBES
Edgetech	4125	SSS
Applanix	POS M/V V5	Positioning and Attitude System
Trimble	SPS361	Positioning System
Sea-Bird Electronics	SBE 19+	Conductivity, Temperature, and Depth Sensor
AML	Micro X	Sound Speed System

Table 5: Major Systems Used

B.2 Quality Control

B.2.1 Crosslines

Crosslines acquired for this survey totaled 13% of mainscheme acquisition.

S3002 acquired 3.78 linear nautical miles of MBES cross lines, equating to 12.9% of mainscheme MBES data. Crosslines were compared to mainscheme using a difference surface, created in CARIS BathyDataBase. Using the difference surface, every instance of overlap was evaluated. The mean was 0.04 meters and the standard deviation was 0.02 meters. Survey F00643 complies with section 5.2.4.3 of the HSSD (2013 ed).

B.2.2 Uncertainty

Hull ID	Measured - CTD	Measured - MVP	Surface
S3002	2 meters/second	N/A meters/second	.5 meters/second

Table 6: Survey Specific Sound Speed TPU Values

F00643 utilized a TCARI grid, which includes uncertainty values for each node. Therefore, TPU values in CARIS were left at zero during TPU calculation.

Total Propagated Uncertainty was then evaluated to ensure compliance with section 5.1.3 of NOAA's Hydrographic Survey Specification and Deliverables (HSSD). First, the maximum allowable uncertainty for each node was calculated. Second, the ratio between actual uncertainty and maximum allowed uncertainty was found for each node. The resulting 'Order_1a' layer was filtered using a color map to show any areas where actual uncertainty exceeded the maximum allowed uncertainty. Statistics were computed for the 50cm BASE surface and of the 5,828,916 nodes, zero fell outside acceptable levels.

During office review the following stats were calculated for the 50cm Final BASE surface: 99.9 % nodes pass (5,828,491 out of 5,828,508 nodes)

B.2.3 Junctions

No junctions were assigned for this survey.

There are no contemporary surveys that junction with this survey.

B.2.4 Sonar QC Checks

Sonar system quality control checks were conducted as detailed in the quality control section of the DAPR.

B.2.5 Equipment Effectiveness

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

B.2.6 Factors Affecting Soundings

There were no other factors that affected corrections to soundings.

B.2.7 Sound Speed Methods

Sound Speed Cast Frequency: CTD casts were typically taken every two to three hours in the deepest area being surveyed at the time. The sound velocity profiles were applied to the MBES lines in CARIS using the "nearest in time," method.

Sound speed profiles in the area are most greatly affected by diurnal heating and cooling, and salinity fluctuations from the ebb and flood of the tide. "Nearest in time," provided the best results in this survey area.

B.2.8 Coverage Equipment and Methods

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

B.3 Echo Sounding Corrections

B.3.1 Corrections to Echo Soundings

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

B.3.2 Calibrations

All sounding systems were calibrated as detailed in the DAPR.

B.4 Backscatter

Raw Backscatter was logged in the .all file. Backscatter was not processed by the field unit.

B.5 Data Processing

B.5.1 Software Updates

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

Manufacturer	Name	Version	Service Pack	Hotfix	Installation Date	Use
Caris	HIPS/SIPS	8	1	10	01/16/2015	Processing

Table 7: Software Updates

The following Feature Object Catalog was used: NOAA Profile V_5_3_2

All MBES and side scan data were converted and processed using a CARIS HIPS and SIPS 8.1.7. After acquisition was completed, data cleaning and additional processing was carried out on a different computer running CARIS HIPS and SIPS 8.1.10. No errors or anomalies were noticed when making this transition.

The Hydro Systems Inventory contained in Appendix I of the DAPR notes the software versions used on each computer.

B.5.2 Surfaces

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

Surface Name	Surface Type	Resolution	Depth Range	Surface Parameter	Purpose
F00643_MB_50cm_MLLW	CUBE	0.5 meters	0 meters - 20.12 meters	NOAA_0.5m	Object Detection
F00643_MB_50cm_MLLW_Final	CUBE	0.5 meters	2.79 meters - 20.14 meters	NOAA_0.5m	Object Detection
F00643_1m_100	SSS Mosaic	1 meters	0 meters - 22 meters	N/A	100% SSS
F00643_1m_200	SSS Mosaic	1 meters	0 meters - 22 meters	N/A	200% SSS
F00643_MB_4m_MLLW	CUBE	4 meters	0 meters - 20.05 meters	NOAA_4m	MBES TracklineSBES Set Line Spacing
F00643_MB_4m_MLLW_Final	CUBE	4 meters	2.83 meters - 20.05 meters	NOAA_4m	MBES TracklineSBES Set Line Spacing

Table 8: Submitted Surfaces

In the shallow portions of the sheet, outside of the channel, survey coverage requirements were fulfilled by acquiring "200% SSS with concurrent Set Line Spacing MBES." Within the channel and at the extreme nearshore area in the southwest, object detection MBES coverage was acquired. Therefore, both a 4 meter CUBE surface, and a 50 centimeter CUBE surface are included.

Density statistics were calculated for the 50cm BASE surface. 97.42% of all nodes contained 5 or more soundings. Areas with the lowest sounding density occurred inside the channel at water depths greater than 16 meters where ping rate was slowest.

C. Vertical and Horizontal Control

Per section 5.1.2.3 of the FPM, no Horizontal and Vertical Control Report has been generated for Survey F00643.

C.1 Vertical Control

The vertical datum for this project is Mean Lower Low Water.

Standard Vertical Control Methods Used:

TCARI

The following National Water Level Observation Network (NWLON) stations served as datum control for this survey:

Station Name	Station ID
Conimicut Light, RI	845-2944
Quonset Point, RI	845-4049

Table 9: NWLON Tide Stations

File Name	Status
8452944	Final Approved
8454094	Final Approved

Table 10: Water Level Files (.tid)

File Name	Status
B904NRT52014_Rev.tc	Final

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

A request for final approved tides was sent to N/OPS1 on 08/13/2014. The final tide note was received on 08/27/2014.

CO-OPS accepted the preliminary TCARI grid as the final grid for survey F00643. Verified tides were downloaded and applied to the bathymetry using the Pydro Fetch Tides tool.

See attached Tide Note dated August 14, 2014.

C.2 Horizontal Control

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

The projection used for this project is UTM-19N.

The following PPK methods were used for horizontal control:

Smart Base

For more information regarding SBETs for this survey, refer to the SBET processing log.

The following CORS Stations were used for horizontal control:

HVCR Site ID	Base Station ID
URIL	URIL
ACU5	ACU5
XMTS	XMTS
CTPU	CTPU
CTGR	CTGR
CTMA	CTMA
NPRI	NPRI
MOR5	MOR5

Table 12: CORS Base Stations

The following DGPS Stations were used for horizontal control:

DGPS Stations
Moriches, NY (293kHz)

Table 13: USCG DGPS Stations

D. Results and Recommendations

D.1 Chart Comparison

F00643 was compared to affected RNC and ENC products by creating a high density sounding layer in CARIS BathyDataBase and comparing charted water depths with surveyed soundings.

D.1.1 Raster Charts

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

Chart	Scale	Edition	Edition Date	LNM Date	NM Date
13224	1:20000	40	04/2013	03/21/2015	03/21/2015

Table 14: Largest Scale Raster Charts

13224

Raster chart 13224 agreed very well with F00643. Surveyed soundings generally agreed with charted depths to within 1 foot.

D.1.2 Electronic Navigational Charts

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

ENC	Scale	Edition	Update Application Date	Issue Date	Preliminary?
US5RI23M	1:20000	23		01/12/2015	NO

Table 15: Largest Scale ENC's

US5RI23M

Electronic chart US5RI23M agreed very well with F00643. Surveyed soundings generally agreed with charted depths to within 1 foot.

D.1.3 AWOIS Items

One assigned feature was investigated by F00643 and found to be charted accurately. For more information, refer to the final feature file: F00643_FFF.hob.

The AWOIS item was #14540. See attached Feature Report. F00643_FFF.hob is not appended to this report.

D.1.4 Maritime Boundary Points

No Maritime Boundary Points were assigned for this survey.

D.1.5 Charted Features

No charted features exist for this survey.

D.1.6 Uncharted Features

Just outside of the assigned survey area, to the southeast, a potential feature was noticed in MBES data during acquisition. This area was thoroughly investigated with multibeam and the feature was developed. For more information, refer to the final feature file: F00643_FFF.hob.

F00643_FFF.hob is not appended to this report.

D.1.7 Dangers to Navigation

No Danger to Navigation Reports were submitted for this survey.

D.1.8 Shoal and Hazardous Features

No shoals or potentially hazardous features exist for this survey.

D.1.9 Channels

Survey F00643 was conducted at the request of the Northeast Marine Pilots Association to investigate Conimicut Point Reach and determine if sufficient water depths exist outside of the channel to justify widening the channel at this location. F00643 confirmed control depths within the channel and found that soundings outside of the channel appear to be accurately depicted on the chart.

D.1.10 Bottom Samples

In total, 2 bottom samples were collected and these results were compared to charted bottom types. For more details, see the final feature file: F00643_FFF.hob.

F00643_FFF.hob is not appended to this report.

D.2 Additional Results

D.2.1 Shoreline

Limited shoreline verification was performed and all features included in the CSF and falling within the survey limits were verified. One feature was inshore of the 12 foot contour (near shore limit) and could not be verified.

D.2.2 Prior Surveys

No prior survey comparisons exist for this survey.

D.2.3 Aids to Navigation

All ATONs were observed to be on station and serving their intended purpose during the acquisition phase of F00643. Observations were only made during day time, so no assessment of light functionality was made. No changes are necessary to charted ATONs.

D.2.4 Overhead Features

No overhead features exist for this survey.

D.2.5 Submarine Features

No submarine features exist for this survey.

There is a cable area that is partially within the limits of this survey. There is no evidence of cables in the area covered by the survey.

D.2.6 Ferry Routes and Terminals

No ferry routes or terminals exist for this survey.

D.2.7 Platforms

No platforms exist for this survey.

D.2.8 Significant Features

No significant features exist for this survey.

D.2.9 Construction and Dredging

The channel is dredged regularly and in all areas surveyed depths are equal to or deeper than tabulated depths on raster chart 13224.

D.2.10 New Survey Recommendation

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

D.2.11 Inset Recommendation


No new insets are recommended for this area.

E. Approval Sheet

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

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

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

Approver Name	Approver Title	Approval Date	Signature
Andrew R. Clos	Sheet Manager	02/19/2016	

F. Table of Acronyms

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

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

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



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

TIDE NOTE FOR HYDROGRAPHIC SURVEY

DATE : August 14, 2014

HYDROGRAPHIC BRANCH: Pacific

HYDROGRAPHIC PROJECT: S-B904-NRT5-2014

HYDROGRAPHIC SHEET: F00643

LOCALITY: Conimicut Point Reach, Narragansett Bay, RI

TIME PERIOD: July 14 to July 23, 2014

TIDE STATION USED: Conimicut Light, RI 845-2944

Lat. 41° 43.0' N Long. 71° 20.6' W

PLANE OF REFERENCE (MEAN LOWER LOW WATER): 0.000 meters

HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 1.322 meters

TIDE STATION USED: Quonset Point, RI 845-4049

Lat. 41° 35.2' N Long. 71° 24.7' W

PLANE OF REFERENCE (MEAN LOWER LOW WATER): 0.000 meters

HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 1.174 meters

REMARKS: RECOMMENDED GRID

Please use the TCARI grid "B904NRT52014_Rev.tc" as the final grid for project S-B904-NRT5-2014, F00642, during the time period between July 14 and July 23, 2014.

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).

Note 2: Due to inaccurate shoreline around Narragansett Bay, RI, survey track lines fall outside of the TCARI grid boundaries in some areas. TCARI will extrapolate the tide corrector to cover these soundings

HOVIS.GERALD
D.THOMAS.JR.
1365860250

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ou=DoD, ou=PKI, ou=OTHER,
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CHIEF, PRODUCTS AND SERVICES BRANCH



**Preliminary as Final TCARI grid for
S-B904-NRT5-2014 (Revised), F00643
Conimicut Point Reach, Narragansett Bay, RI**

8452944 CONIMICUT LIGHT, NARRAGANSETT BAY

8454049 QUONSET POINT



F00643 Feature Report

Registry Number: F00643
State: Rhode Island
Locality: Narragansett Bay
Sub-locality: Conimicut Point Reach
Project Number: S-B904-NRT5-14
Survey Date: 07/23/2014

Charts Affected

Number	Edition	Date	Scale (RNC)	RNC Correction(s)*
13224	40th	04/01/2013	1:20,000 (13224_1)	USCG LNM: 12/15/2015 (5/17/2016) CHS NTM: None (4/29/2016) NGA NTM: 11/2/2002 (5/28/2016)
13221	57th	02/01/2008	1:40,000 (13221_2) 1:40,000 (13221_1)	[L]NTM: ?
13006	34th	05/01/2007	1:675,000 (13006_1)	[L]NTM: ?
5161	13th	10/01/2003	1:1,058,400 (5161_1)	[L]NTM: ?
13003	49th	04/01/2007	1:1,200,000 (13003_1)	[L]NTM: ?

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

Features

No.	Feature Type	Survey Depth	Survey Latitude	Survey Longitude	AWOIS Item
1.1	Wreck	5.48 m	41° 43' 35.8" N	071° 21' 55.8" W	---

1 - New Features

1.1) 0_ 000040168 00001 / F00643_Feature_Report_Office.000

Survey Summary

Survey Position: 41° 43' 35.8" N, 071° 21' 55.8" W
Least Depth: 5.48 m (= 17.97 ft = 2.995 fm = 2 fm 5.97 ft)
TPU ($\pm 1.96\sigma$): THU (TPEh) [None] ; TVU (TPEv) [None]
Timestamp: 2014-204.00:00:00.000 (07/23/2014)
Dataset: F00643_Feature_Report_Office.000
FOID: 0_ 000040168 00001(FFFE00009CE80001)
Charts Affected: 13224_1, 13221_1, 13221_2, 13006_1, 5161_1, 13003_1

Remarks:

WRECKS/remrks: Wreck confirmed by MBES, with new least depth.

Hydrographer Recommendations

Update least depth of charted wreck.

Arithmetically-Rounded Depth (Unit-wise Affected Charts):

18ft (13224_1, 13221_1, 13221_2)

3fm (13006_1, 13003_1)

5.5m (5161_1)

S-57 Data

Geo object 1: Wreck (WRECKS)
Attributes: CATWRK - 2:dangerous wreck
 EXPSOU - 2:shoaler than range of depth of the surrounding depth area
 QUASOU - 6:least depth known
 SORDAT - 20140723
 SORIND - US,US,graph,F00643
 TECSOU - 3:found by multi-beam
 VALSOU - 5.477 m
 WATLEV - 3:always under water/submerged

Feature Images

[Image file C:\Users\Fernando.Ortiz\Desktop\tempf00643\17Ft_Wreck_2d3d.bmp does not exist.]

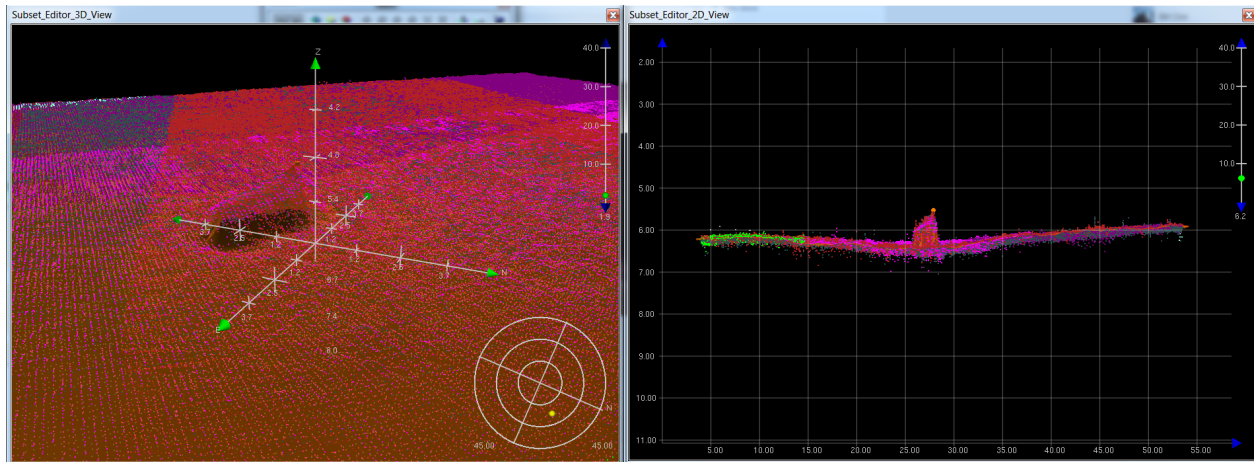


Figure 1.1.1

Office Notes

Concur.

APPROVAL PAGE

F00643

Data meet or exceed current specifications as certified by the OCS survey acceptance review process. Descriptive Report and survey data except where noted are adequate to supersede prior surveys and nautical charts in the common area.

The following products will be sent to NCEI for archive

- F00643_DR.pdf
- Collection of depth varied resolution BAGS
- Processed survey data and records
- F00643_GeoImage.pdf

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

Approved: _____

Peter Holmberg

Cartographic Team Lead, Pacific Hydrographic Branch

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

Approved: _____

CDR Benjamin K. Evans, NOAA

Chief, Pacific Hydrographic Branch