

**F00644**

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

**DESCRIPTIVE REPORT**

Type of Survey: Navigable Area

Registry Number: F00644

**LOCALITY**

State(s): Rhode Island

General Locality: Narragansett Bay, RI

Sub-locality: Old Jamestown Bridge

**2014**

CHIEF OF PARTY  
LTjg Andrew R. Clos

LIBRARY & ARCHIVES

Date:

**HYDROGRAPHIC TITLE SHEET**

**F00644**

**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: **Old Jamestown Bridge**

Scale: **10000**

Dates of Survey: **07/23/2014 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/>.*

# Table of Contents

<a href="#">A. Area Surveyed.....</a>	<a href="#">1</a>
<a href="#">A.1 Survey Limits.....</a>	<a href="#">1</a>
<a href="#">A.2 Survey Purpose.....</a>	<a href="#">3</a>
<a href="#">A.3 Survey Quality.....</a>	<a href="#">3</a>
<a href="#">A.4 Survey Coverage.....</a>	<a href="#">4</a>
<a href="#">A.5 Survey Statistics.....</a>	<a href="#">4</a>
<a href="#">B. Data Acquisition and Processing.....</a>	<a href="#">6</a>
<a href="#">B.1 Equipment and Vessels.....</a>	<a href="#">6</a>
<a href="#">B.1.1 Vessels.....</a>	<a href="#">6</a>
<a href="#">B.1.2 Equipment.....</a>	<a href="#">8</a>
<a href="#">B.2 Quality Control.....</a>	<a href="#">8</a>
<a href="#">B.2.1 Crosslines.....</a>	<a href="#">8</a>
<a href="#">B.2.2 Uncertainty.....</a>	<a href="#">8</a>
<a href="#">B.2.3 Junctions.....</a>	<a href="#">9</a>
<a href="#">B.2.4 Sonar QC Checks.....</a>	<a href="#">9</a>
<a href="#">B.2.5 Equipment Effectiveness.....</a>	<a href="#">9</a>
<a href="#">B.2.6 Factors Affecting Soundings.....</a>	<a href="#">9</a>
<a href="#">B.2.7 Sound Speed Methods.....</a>	<a href="#">9</a>
<a href="#">B.2.8 Coverage Equipment and Methods.....</a>	<a href="#">10</a>
<a href="#">B.3 Echo Sounding Corrections.....</a>	<a href="#">10</a>
<a href="#">B.3.1 Corrections to Echo Soundings.....</a>	<a href="#">10</a>
<a href="#">B.3.2 Calibrations.....</a>	<a href="#">10</a>
<a href="#">B.4 Backscatter.....</a>	<a href="#">10</a>
<a href="#">B.5 Data Processing.....</a>	<a href="#">10</a>
<a href="#">B.5.1 Software Updates.....</a>	<a href="#">10</a>
<a href="#">B.5.2 Surfaces.....</a>	<a href="#">11</a>
<a href="#">C. Vertical and Horizontal Control.....</a>	<a href="#">12</a>
<a href="#">C.1 Vertical Control.....</a>	<a href="#">12</a>
<a href="#">C.2 Horizontal Control.....</a>	<a href="#">13</a>
<a href="#">D. Results and Recommendations.....</a>	<a href="#">14</a>
<a href="#">D.1 Chart Comparison.....</a>	<a href="#">14</a>
<a href="#">D.1.1 Raster Charts.....</a>	<a href="#">15</a>
<a href="#">D.1.2 Electronic Navigational Charts.....</a>	<a href="#">15</a>
<a href="#">D.1.3 AWOIS Items.....</a>	<a href="#">15</a>
<a href="#">D.1.4 Maritime Boundary Points.....</a>	<a href="#">16</a>
<a href="#">D.1.5 Charted Features.....</a>	<a href="#">16</a>
<a href="#">D.1.6 Uncharted Features.....</a>	<a href="#">17</a>
<a href="#">D.1.7 Dangers to Navigation.....</a>	<a href="#">17</a>
<a href="#">D.1.8 Shoal and Hazardous Features.....</a>	<a href="#">17</a>
<a href="#">D.1.9 Channels.....</a>	<a href="#">17</a>
<a href="#">D.1.10 Bottom Samples.....</a>	<a href="#">18</a>
<a href="#">D.2 Additional Results.....</a>	<a href="#">18</a>
<a href="#">D.2.1 Shoreline.....</a>	<a href="#">18</a>

<a href="#">D.2.2 Prior Surveys.....</a>	<a href="#">18</a>
<a href="#">D.2.3 Aids to Navigation.....</a>	<a href="#">18</a>
<a href="#">D.2.4 Overhead Features.....</a>	<a href="#">18</a>
<a href="#">D.2.5 Submarine Features.....</a>	<a href="#">18</a>
<a href="#">D.2.6 Ferry Routes and Terminals.....</a>	<a href="#">18</a>
<a href="#">D.2.7 Platforms.....</a>	<a href="#">18</a>
<a href="#">D.2.8 Significant Features.....</a>	<a href="#">19</a>
<a href="#">D.2.9 Construction and Dredging.....</a>	<a href="#">19</a>
<a href="#">D.2.10 New Survey Recommendation.....</a>	<a href="#">19</a>
<a href="#">D.2.11 Inset Recommendation.....</a>	<a href="#">19</a>
<a href="#">E. Approval Sheet.....</a>	<a href="#">20</a>
<a href="#">F. Table of Acronyms.....</a>	<a href="#">21</a>

## List of Tables

<a href="#">Table 1: Survey Limits.....</a>	<a href="#">1</a>
<a href="#">Table 2: Hydrographic Survey Statistics.....</a>	<a href="#">5</a>
<a href="#">Table 3: Dates of Hydrography.....</a>	<a href="#">6</a>
<a href="#">Table 4: Vessels Used.....</a>	<a href="#">6</a>
<a href="#">Table 5: Major Systems Used.....</a>	<a href="#">8</a>
<a href="#">Table 6: Survey Specific Sound Speed TPU Values.....</a>	<a href="#">8</a>
<a href="#">Table 7: Software Updates.....</a>	<a href="#">10</a>
<a href="#">Table 8: Submitted Surfaces.....</a>	<a href="#">11</a>
<a href="#">Table 9: NWLON Tide Stations.....</a>	<a href="#">13</a>
<a href="#">Table 10: Water Level Files (.tid).....</a>	<a href="#">13</a>
<a href="#">Table 11: Tide Correctors (.zdf or .tc).....</a>	<a href="#">13</a>
<a href="#">Table 12: CORS Base Stations.....</a>	<a href="#">14</a>
<a href="#">Table 13: USCG DGPS Stations.....</a>	<a href="#">14</a>
<a href="#">Table 14: Largest Scale Raster Charts.....</a>	<a href="#">15</a>
<a href="#">Table 15: Largest Scale ENCs.....</a>	<a href="#">15</a>

## List of Figures

<a href="#">Figure 1: F00644 Survey Area.....</a>	<a href="#">2</a>
<a href="#">Figure 2: Red areas indicate where the four meter contour was reached.....</a>	<a href="#">3</a>
<a href="#">Figure 3: Side scan and MBES coverage area for F00644.....</a>	<a href="#">4</a>
<a href="#">Figure 4: S3002.....</a>	<a href="#">7</a>
<a href="#">Figure 5: 100% SSS coverage also acquired to help disprove the 31 foot obstruction.....</a>	<a href="#">12</a>
<a href="#">Figure 6: Remaining portions of bridge footings visible in BASE surface.....</a>	<a href="#">17</a>

## Descriptive Report to Accompany Survey F00644

Project: S-B904-NRT5-14

Locality: Narragansett Bay, RI

Sublocality: Old Jamestown Bridge

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 the Jamestown Bridge.

#### A.1 Survey Limits

Data were acquired within the following survey limits:

<b>Northwest Limit</b>	<b>Southeast Limit</b>
41° 31' 50.86" N 71° 24' 47.34" W	41° 31' 28.21" N 71° 23' 31.03" W

*Table 1: Survey Limits*

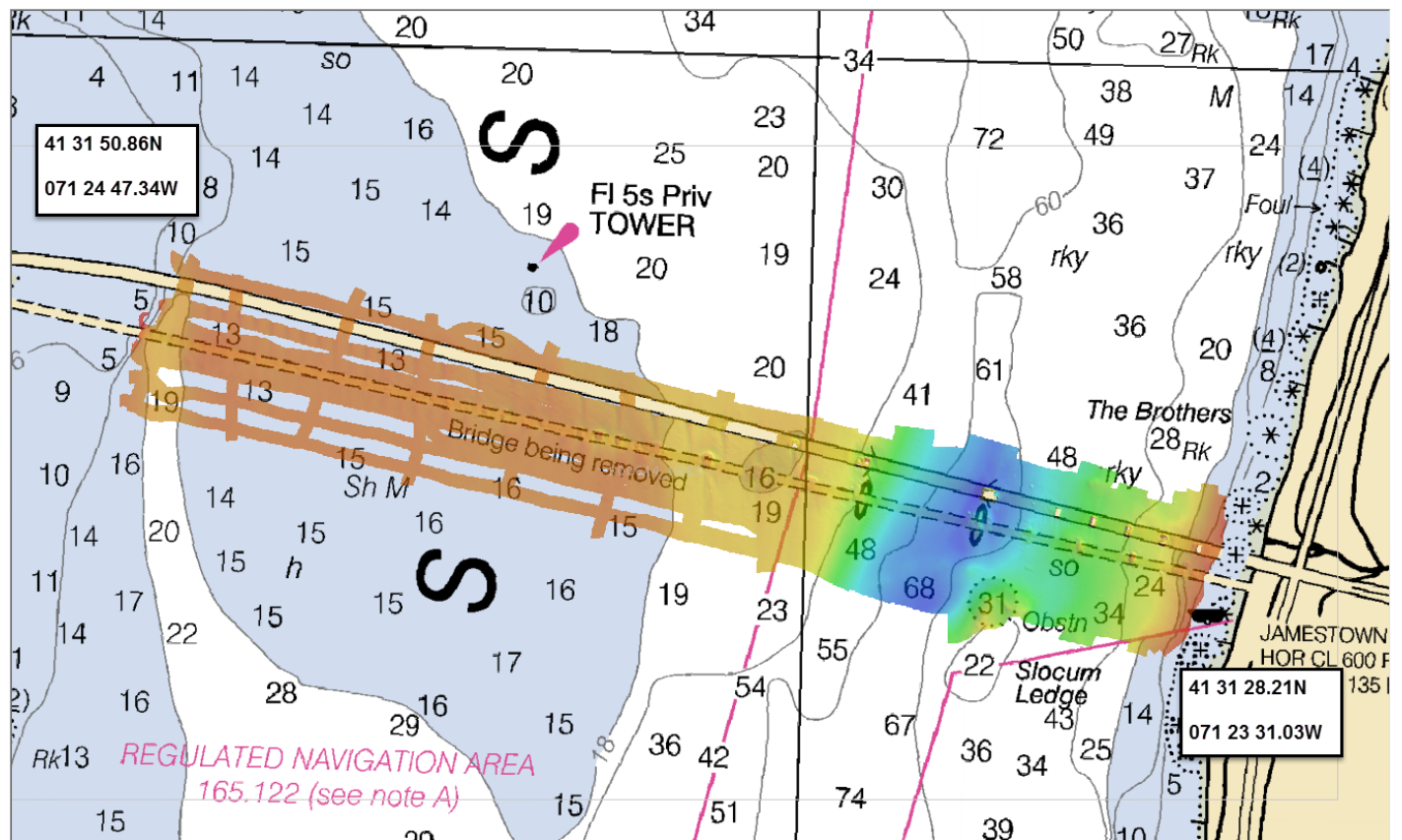


Figure 1: F00644 Survey Area

Survey limits were met, with the exception of the western side of the sheet. Due to nearby obstructions and rapid shoaling, the four meter near shore limit of hydrography was not always reached in this area. See figure 2 below.

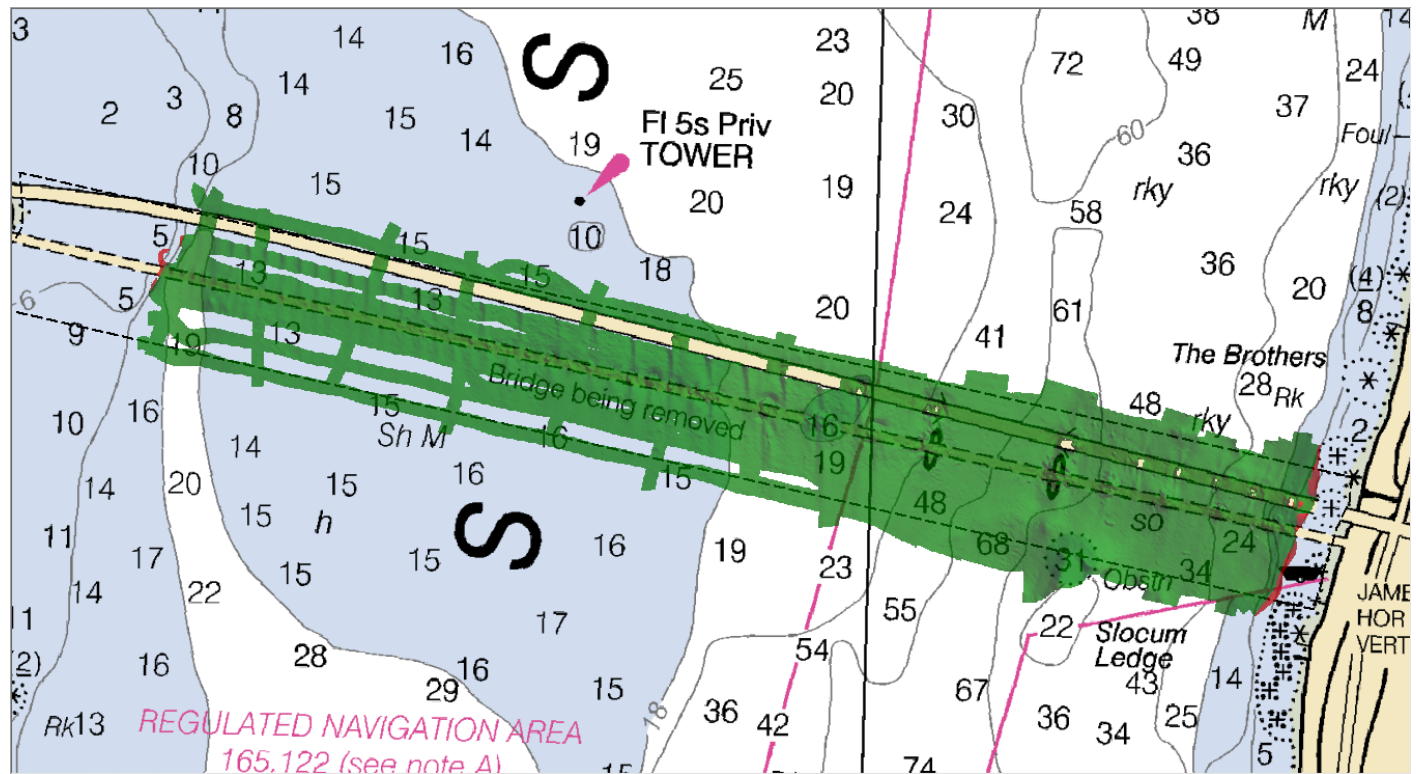


Figure 2: Red areas indicate where the four meter contour was reached.

## 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 Coast Guard Auxiliary to investigate the area where the old Jamestown Bridge once stood. The words "Bridge being removed," and outline of the old bridge still appear on the chart, but the bridge was removed several years ago.

## A.3 Survey Quality

The entire survey is adequate to supersede previous data.

## A.4 Survey Coverage

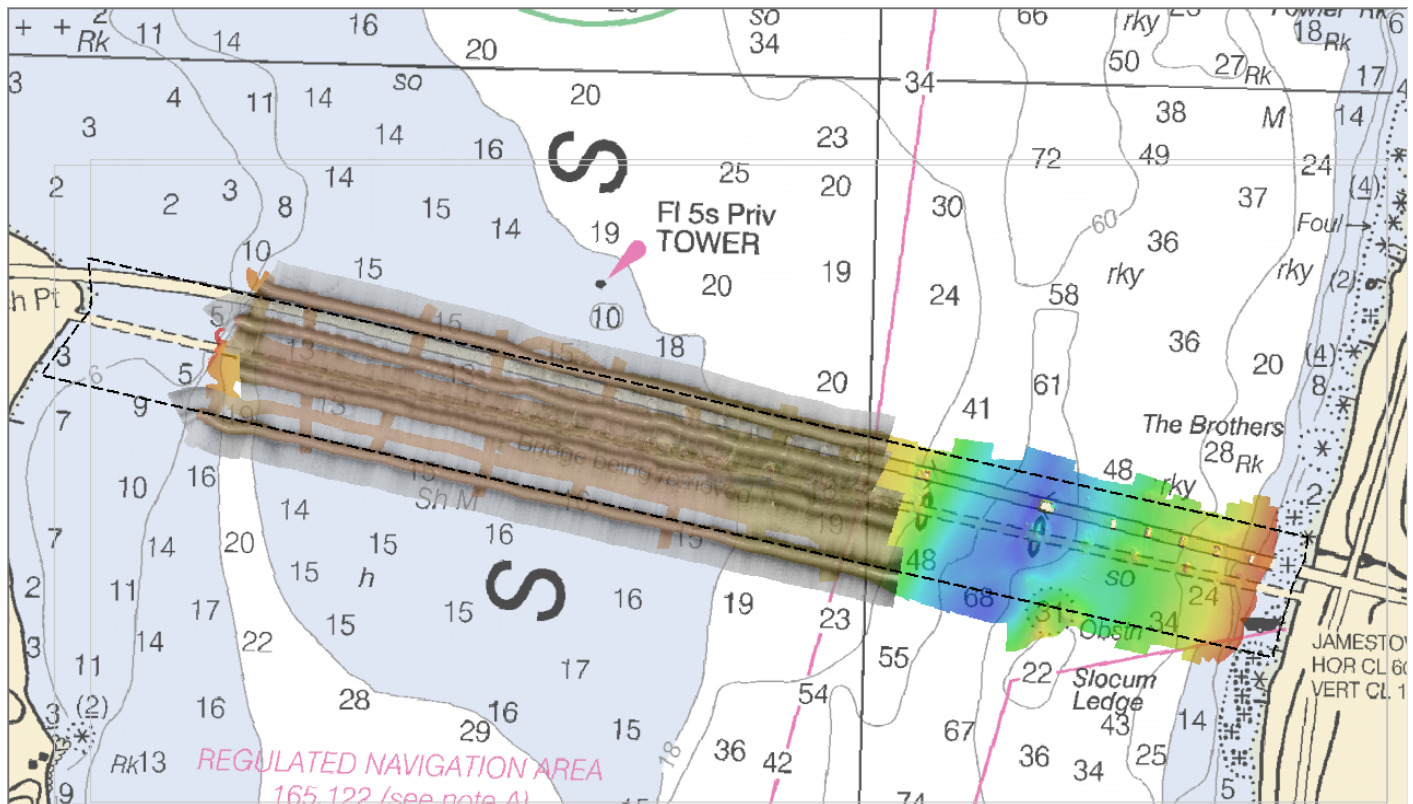


Figure 3: Side scan and MBES coverage area for F00644.

Due to shallow water depths and operations near bridge structures, survey coverage requirements were met using a combination of 200% SSS and Object Detection MBES data.

## A.5 Survey Statistics

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



	<b>HULL ID</b>	<i>S3002</i>	<i>Total</i>
<b>LNM</b>	<b>SBES Mainscheme</b>	0	0
	<b>MBES Mainscheme</b>	5.4	5.4
	<b>Lidar Mainscheme</b>	0	0
	<b>SSS Mainscheme</b>	0	0
	<b>SBES/SSS Mainscheme</b>	0	0
	<b>MBES/SSS Mainscheme</b>	5.9	5.9
	<b>SBES/MBES Crosslines</b>	1.8	1.8
	<b>Lidar Crosslines</b>	0	0
<b>Number of Bottom Samples</b>			0
<b>Number of AWOIS Items Investigated</b>			0
<b>Number Maritime Boundary Points Investigated</b>			0
<b>Number of DPs</b>			0
<b>Number of Items Investigated by Dive Ops</b>			0
<b>Total SNM</b>			0

*Table 2: Hydrographic Survey Statistics*

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

<b>Survey Dates</b>	<b>Day of the Year</b>
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:

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

*Table 4: Vessels Used*



*Figure 4: S3002*

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

## B.1.2 Equipment

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

<b>Manufacturer</b>	<b>Model</b>	<b>Type</b>
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 16% of mainscheme acquisition.

S3002 acquired 1.8 linear nautical miles of MBES cross lines, equating to 15.9% 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 0.07 meters and the standard deviation was 0.085 meters. Survey F00644 complies with section 5.2.4.3 of the HSSD (2013 ed).

### B.2.2 Uncertainty

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

*Table 6: Survey Specific Sound Speed TPU Values*

F00644 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 four meter BASE surface and of the 24,968 nodes, 3 fell outside acceptable levels. This equates to a 99.99% passing rate. Additionally, Order 1a statistics were computed for the 50cm BASE surface and of the 1,486,976 nodes, zero fell outside acceptable levels.

### **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: Due to the small size of this survey, only one CTD cast was taken and it was applied to all MBES data.

### **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
F00644_MB_MLLW_50cm	CUBE	50 centimeters	0 meters - 23.08 meters	NOAA_0.5m	Object Detection
F00644_MB_MLLW_50cm_Final	CUBE	50 centimeters	2.02 meters - 23.08 meters	NOAA_0.5m	Object Detection
F00644_MB_MLLW_4m	CUBE	4 meters	2.03 meters - 22.99 meters	NOAA_4m	MBES TracklineSBES Set Line Spacing
F00644_MB_MLLW_4m_Final	CUBE	4 meters	2.04 meters - 23.01 meters	NOAA_4m	MBES TracklineSBES Set Line Spacing
F00644_1m_100	SSS Mosaic	1 meters	0 meters - 0 meters	N/A	100% SSS
F00644_1m_200	SSS Mosaic	1 meters	0 meters - 0 meters	N/A	200% SSS

*Table 8: Submitted Surfaces*

Survey coverage requirements in the western portion of the sheet were fulfilled by acquiring "200% SSS with concurrent Set Line Spacing MBES." In the eastern portion and nearshore areas, object detection MBES was acquired. Both 4 meter and 50cm MBES surfaces are included. Although a tiny portion of the sheet is deeper than 22 meters with a maximum survey depth of 23.07 meters, sounding density is great enough to support a 50 centimeter BASE surface throughout this area, so only a 50 centimeter BASE surface is submitted to fulfill the Object Detection MBES requirement.

Density statistics were calculated for the 50cm BASE surface. 96.5% of all nodes contained 5 or more soundings. Areas with the lowest sounding density occurred at the edges of the surface and at the deepest portions of the survey area between 18 and 23 meters of water depth.

Note that in addition to Object Detection MBES, 100% SSS coverage was acquired over the 31 foot obstruction in the SE portion of the sheet.

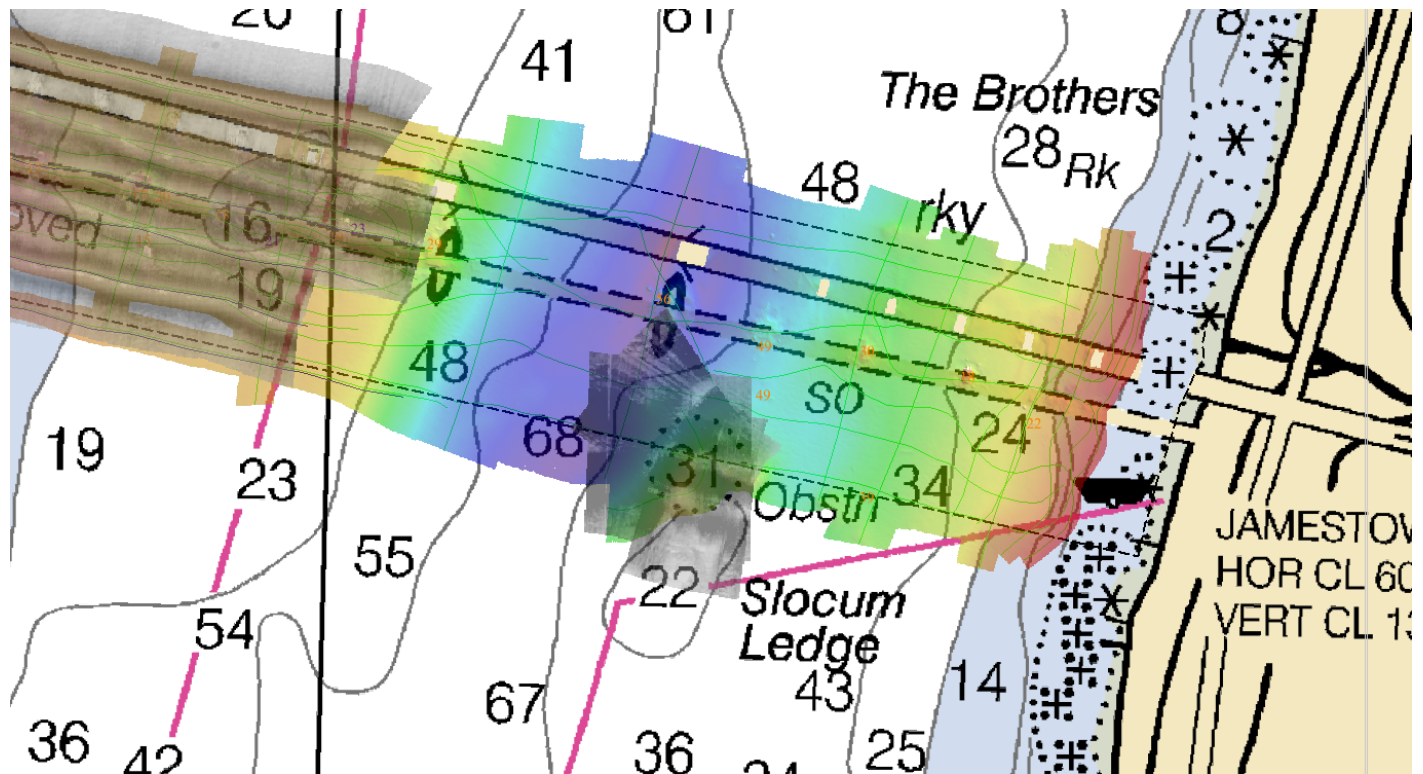


Figure 5: 100% SSS coverage also acquired to help disprove the 31 foot obstruction.

## 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 F00644.

### 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 F00644. 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:

<b>HVCR Site ID</b>	<b>Base Station ID</b>
XTMS	XTMS
URIL	URIL
NPRI	NPRI
CTPU	CTPU
CTGR	CTGR
ACU5	ACU5

*Table 12: CORS Base Stations*

The following DGPS Stations were used for horizontal control:

<b>DGPS Stations</b>
Moriches, NY (293kHz)

*Table 13: USCG DGPS Stations*

## **D. Results and Recommendations**

### **D.1 Chart Comparison**

F00644 was compared to affected RNC and ENC products by creating a high density sounding layer in CARIS BathymetryDataBase 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	LNМ Date	NM Date
13223	1:20000	43	06/2013	06/28/2014	06/28/2014

*Table 14: Largest Scale Raster Charts*

#### 13223

Raster chart 13223 agreed very well with F00644. Surveyed soundings generally agreed with charted depths to within 2 feet.

### D.1.2 Electronic Navigational Charts

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

ENC	Scale	Edition	Update Application Date	Issue Date	Preliminary?
US5RI22M	1:20000	23	07/19/2016	01/27/2015	NO

*Table 15: Largest Scale ENCѕ*

#### US5RI22M

Electronic chart US5RI22M agreed very well with F00644. Surveyed soundings generally agreed with charted depths to within 2 feet.

***The Update Application Date for the ENC US5RI22M version used in this report was not included. The Update Application Date used in survey review for ENC US5RI22M is Nov 2, 2015.***

### D.1.3 AWOIS Items

No AWOIS items were assigned for this survey.

#### **D.1.4 Maritime Boundary Points**

No Maritime Boundary Points were assigned for this survey.

#### **D.1.5 Charted Features**

The primary purpose of this survey was to confirm that the old Jamestown Bridge has been completely removed. F00644 found evidence of remaining bridge footings in the bathymetry, but most of the underwater structure as well as all above-water structures have been removed. Obstruction areas indicating foul ground have been created over the areas where bridge remains are still present. For the portions of the removed bridge that fall inshore of the NALL, SLCONS features have been created. No above water bridge ruins were observed by the field. Refer to the Final Feature File for more information.

Additionally, soundings were designated and 18 obstruction objects have been created for each remaining, significant bridge footing. These features are not submitted as part of the Final Feature File, but are included in a file named F00644\_OldBridge\_Point\_Obstructions.hob. These are included to assist the reviewer if it is decided that certain point obstructions will need to be charted in addition to the foul ground areas.

The hydrographer recommends removing the old bridge and all associated features from the chart.

A charted 31 foot Obstruction in the southeastern portion of the sheet was disproved by this survey. Although soundings between 26 and 50 feet were found in the area, the area is well represented by a contour to the south and soundings should be sufficient to represent the sea floor in this area.

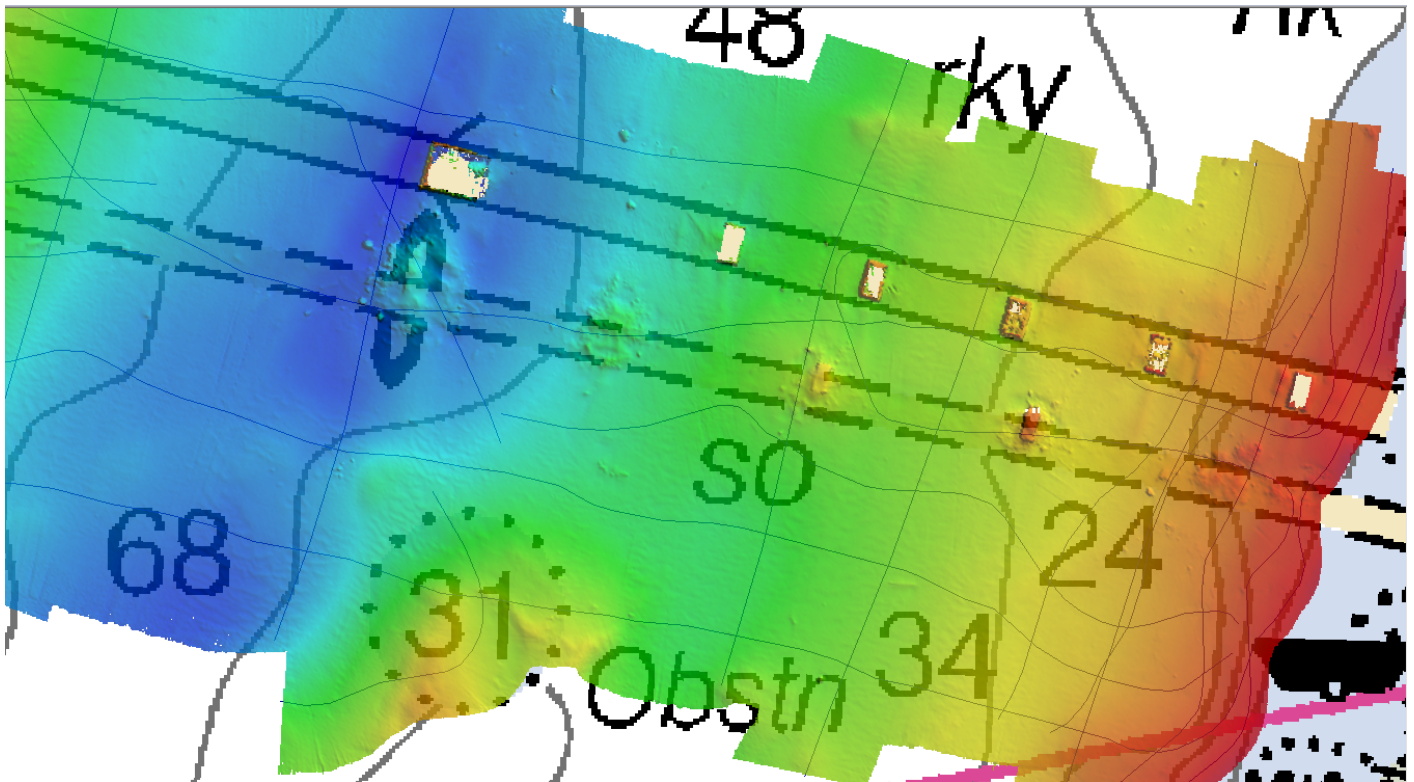


Figure 6: Remaining portions of bridge footings visible in BASE surface.

*The Final Feature File is not included with this report.*

#### D.1.6 Uncharted Features

Refer to the above section and final feature .hob file for descriptions of uncharted obstructions. All uncharted obstructions are likely related to the removal of the old Jamestown Bridge.

#### 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

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

### **D.1.10 Bottom Samples**

No bottom samples were required for this survey.

## **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. Some features were 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**

No Aids to navigation (ATONs) exist for this survey.

*The charted fog signal that was mounted on the abutment of the old bridge has been disproved with the removal of that bridge.*

### **D.2.4 Overhead Features**

The new Jamestown fixed bridge, that was built approximately 70 meters to the north of the old Jamestown Bridge is charted correctly.

### **D.2.5 Submarine Features**

No submarine features exist for this 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**

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

**D.2.10 New Survey Recommendation**

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

**D.2.11 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	02/22/2016	



## F. Table of Acronyms

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

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

<b>Acronym</b>	<b>Definition</b>
<b>PRF</b>	Project Reference File
<b>PS</b>	Physical Scientist
<b>PST</b>	Physical Science Technician
<b>RNC</b>	Raster Navigational Chart
<b>RTK</b>	Real Time Kinematic
<b>SBES</b>	Singlebeam Echosounder
<b>SBET</b>	Smooth Best Estimate and Trajectory
<b>SNM</b>	Square Nautical Miles
<b>SSS</b>	Side Scan Sonar
<b>ST</b>	Survey Technician
<b>SVP</b>	Sound Velocity Profiler
<b>TCARI</b>	Tidal Constituent And Residual Interpolation
<b>TPE</b>	Total Propagated Error
<b>TPU</b>	Topside Processing Unit
<b>USACE</b>	United States Army Corps of Engineers
<b>USCG</b>	United States Coast Guard
<b>UTM</b>	Universal Transverse Mercator
<b>XO</b>	Executive Officer
<b>ZDA</b>	Global Positioning System timing message
<b>ZDF</b>	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:** F00644

**LOCALITY:** Old Jamestown Bridge, 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, F00644, 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**  
**.THOMAS.JR.13**  
**65860250**

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CHIEF, PRODUCTS AND SERVICES BRANCH



**Preliminary as Final TCARI grid for  
S-B904-NRT5-2014 (Revised), F00644  
Old Jamestown Bridge, Narragansett Bay, RI**

**8452944 CONIMICUT LIGHT, NARRAGANSETT BAY**

**8454049 QUONSET POINT**



APPROVAL PAGE

F00644

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

- F00644\_DR.pdf
- Collection of depth varied resolution BAGS
- Processed survey data and records
- F00644\_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