

F00603

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: F00603

LOCALITY

State: Maine

General Locality: Boon Island, ME

Sub-locality: Vicinity of Boon Island

2011

CHIEF OF PARTY
CDR Lawrence T. Krepp

LIBRARY & ARCHIVES

Date:

HYDROGRAPHIC TITLE SHEET

State: Maine

General Locality: Boone Island, ME

Locality: Vicinity of Boon Island

Scale: 1:80,000 Date of Survey: 05 Oct 2011 - 05 Oct 2011

Instructions Dated: 09/30/2011 Project Number: S-A916-TJ-11

Vessels: Thomas Jefferson

Chief of Party: CDR Lawrence T. Krepp

Surveyed by: Thomas Jefferson personnel

Soundings by: Multibeam Echo Sounder

Graphic record scaled by: N/A

Graphic record checked by: N/A

Protracted by: N/A Automated plot by: N/A

Verification by: **Atlantic Hydrographic Branch**

Soundings in: Feet: _____ Fathoms: _____ Meters: X at MLW: _____ MLLW: X

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

Remarks: All times are in UTC
UTM Zone 19

Table of Contents

A. Area Surveyed.....	1
A.1 Survey Limits.....	1
A.2 Survey Purpose.....	2
A.3 Survey Quality.....	2
A.4 Survey Coverage.....	3
A.5 Survey Statistics.....	4
A.6 Shoreline.....	5
A.7 Bottom Samples.....	5
B. Data Acquisition and Processing.....	5
B.1 Equipment and Vessels.....	5
B.1.1 Vessels.....	5
B.1.2 Equipment.....	5
B.2 Quality Control.....	6
B.2.1 Crosslines.....	6
B.2.2 Uncertainty.....	7
B.2.3 Junctions.....	9
B.2.4 Sonar QC Checks.....	9
B.2.5 Equipment Effectiveness.....	9
B.2.6 Factors Affecting Soundings.....	10
B.2.7 Sound Speed Methods.....	10
B.2.8 Coverage Equipment and Methods.....	10
B.3 Echo Sounding Corrections.....	11
B.3.1 Corrections to Echo Soundings.....	11
B.3.2 Calibrations.....	11
B.4 Backscatter.....	11
B.5 Data Processing.....	12
B.5.1 Software Updates.....	12
B.5.2 Surfaces.....	12
C. Vertical and Horizontal Control.....	13
C.1 Vertical Control.....	13
C.2 Horizontal Control.....	13
D. Results and Recommendations.....	14
D.1 Chart Comparison.....	14
D.1.1 Raster Charts.....	14
D.1.2 Electronic Navigational Charts.....	16
D.1.3 AWOIS Items.....	17
D.1.4 Charted Features.....	17
D.1.5 Uncharted Features.....	17
D.1.6 Dangers to Navigation.....	18
D.1.7 Shoal and Hazardous Features.....	18
D.1.8 Channels.....	18
D.2 Additional Results.....	18
D.2 Construction and Dredging.....	20

D.2.1 Shoreline.....	18
D.2.2 Prior Surveys.....	19
D.2.3 Aids to Navigation.....	19
D.2.4 Overhead Features.....	19
D.2.5 Submarine Features.....	19
D.2.6 Ferry Routes and Terminals.....	19
D.2.7 Platforms.....	19
D.2.8 Significant Features.....	19
E. Approval Sheet.....	21
F. Table of Acronyms.....	22

List of Tables

Table 1: Survey Limits.....	1
Table 2: Hydrographic Survey Statistics.....	4
Table 3: Dates of Hydrography.....	4
Table 4: Vessels Used.....	5
Table 5: Major Systems Used.....	5
Table 6: Survey Specific Tide TPU Values.....	7
Table 7: Survey Specific Sound Speed TPU Values.....	7
Table 8: CARIS Surfaces.....	12
Table 9: NWLON Tide Stations.....	13
Table 10: Water Level Files (.tid).....	13
Table 11: Tide Correctors (.zdf or .tc).....	13
Table 12: USCG DGPS Stations.....	14
Table 13: Largest Scale Raster Charts.....	14
Table 14: Largest Scale ENCs.....	16

List of Figures

Figure 1: F00603 Assigned Survey Limits.....	2
Figure 2: F00603 Survey Area.....	3
Figure 3: F00603 Standard Deviation Layer.....	6
Figure 4: F00603 Standard Deviation Statistics.....	7
Figure 5: F00603 Uncertainty Surface.....	8
Figure 6: Nodes meeting IHO Order 1 standards.....	9
Figure 7: F00603 Final Tide Zoning.....	11
Figure 8: Survey depths around the charted 209 ft sounding.....	15
Figure 9: Survey depths around the charted 166 ft sounding.....	15
Figure 10: Survey depths around the charted 151 ft sounding.....	16
Figure 11: Survey depths around the charted 243 ft sounding.....	16
Figure 12: F00603 survey area with respect to ENC US4ME01M.....	17
Figure 13: Uncharted Obstruction.....	18
Figure 14: Overview of Rock Formations in the F00603 survey area.....	20

Descriptive Report to Accompany Survey F00603

Project: S-A916-TJ-11

Locality: Boon Island, ME

Sublocality: Vicinity of Boon Island

Scale: 1:40000

October 2011 - October 2011

NOAA Ship *Thomas Jefferson*

Chief of Party: CDR Lawrence T. Krepp

A. Area Surveyed

The area surveyed during F00603 is in the vicinity of Boon Island, ME. A square survey area was assigned around the Safety Zone defined by Code of Federal Regulations, Title 33, Part 165, Subpart F, 165.141; which established a 1000 yard safety zone around the stern section of EMPIRE KNIGHT. The areas immediately surrounding the stern section of EMPIRE KNIGHT were imaged with side scan sonar and bathymetry was acquired by multibeam echosounder. Survey data were acquired within the sheet limits as defined in the Project Instructions and in accordance to Hydrographic Surveys Specifications and Deliverables Manual (HSSDM) dated April 2011, except as noted in section A.4 below.

A.1 Survey Limits

Data was acquired within the following survey limits:

Northeast Limit	Southwest Limit
43.1103944444 N	43.0927694444 N
70.4360305556 W	70.461725 W

Table 1: Survey Limits

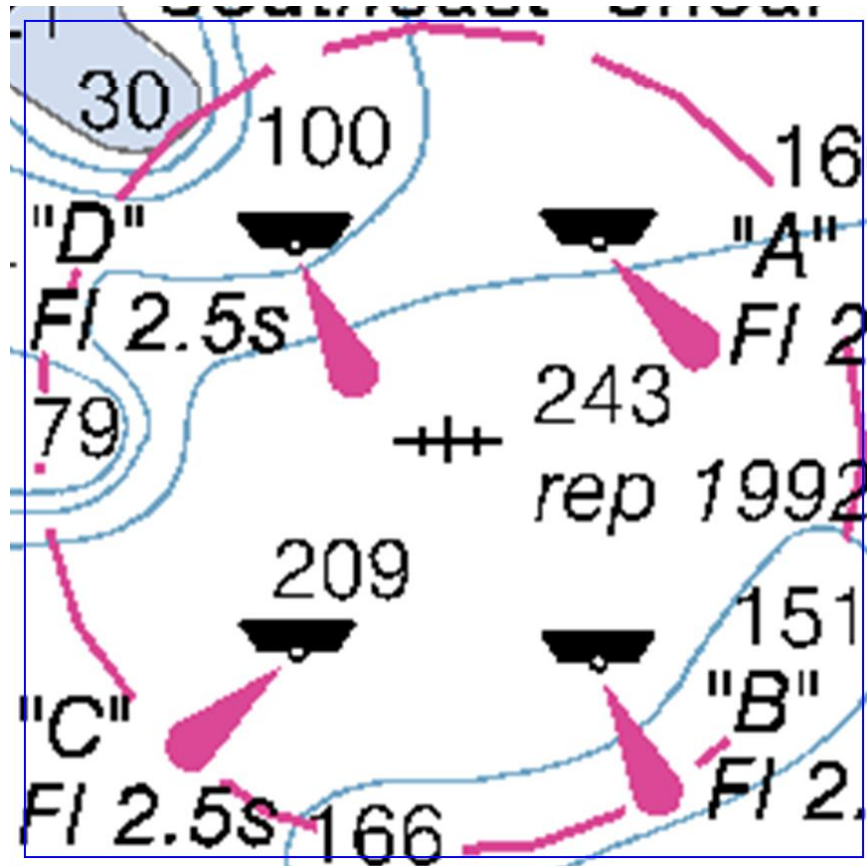


Figure 1: F00603 Assigned Survey Limits

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

A.2 Survey Purpose

This project responds to a request from USCG LCDR Dave Sherry, Incident Management Division Chief and Steve Lehmann, NOAA OR&R, for the NOAA Ship Thomas Jefferson to perform a wreck investigation on the Empire Knight to determine the current position and provide updated imagery. This project will also provide a contemporary survey to update the National Ocean Service (NOS) nautical charting products and will cover approximately 1nm² of category three survey area as designated in the NOAA Hydrographic Survey Priorities, 2010 edition.

A.3 Survey Quality

The entire survey is adequate to supersede previous data.

A.4 Survey Coverage

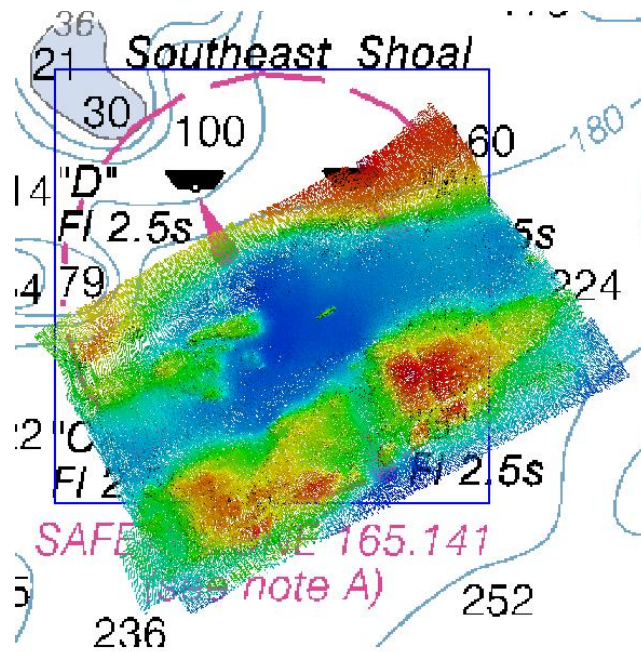


Figure 2: F00603 Survey Area

The full survey limits were not covered. This survey focused on the portion of the wreck located southeast of Boone Island as shown in Figure 2. Figure 2 shows the multibeam bathymetry coverage acquired during this survey. Because the exact position of the wreckage was unknown prior to arrival at the survey grounds, approval to modify the assigned sheet limits was not obtained from Hydrographic Surveys Division, Operations Branch (HSD Ops), prior to commencement of survey operations.

A.5 Survey Statistics

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

	HULL ID	S222	Total
LNM	SBES Mainscheme	0	0
	MBES Mainscheme	8.19	8.19
	Lidar Mainscheme	0	0
	SSS Mainscheme	0	0
	SBES/MBES Combo Mainscheme	0	0
	SBES/SSS Combo Mainscheme	0	0
	MBES/SSS Combo Mainscheme	14.82	14.82
	SBES/MBES Combo Crosslines	0.96	0.96
	Lidar Crosslines	0	0
	Number of Bottom Samples		
Number of DPs			0
Number of Items Items Investigated by Dive Ops			0
Total Number of SNM			1

Table 2: Hydrographic Survey Statistics

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

<i>Survey Dates</i>
10/05/2011

Table 3: Dates of Hydrography

Survey lines were acquired in orthogonal directions during the wreck investigation. While orthogonal lines were acquired to provide better imagery and bathymetry of the wreck, these lines were also used for quality control in lieu of traditional crosslines. However, the orthogonal survey lines do not fully intersect all mainscheme survey lines, and therefore not all survey lines received the same level of quality control analysis.

A.6 Shoreline

There were no shoreline investigation requirements assigned for F00603.

A.7 Bottom Samples

There were no bottom sampling requirements for F00603.

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>S222</i>
LOA	208 feet
Draft	4.6 meters

Table 4: Vessels Used

Data were acquired by NOAA Ship Thomas Jefferson. NOAA Ship Thomas Jefferson acquired Reson 7125 multibeam echosounder soundings, sound velocity profiles, and Klein 5000 side scan sonar imagery.

B.1.2 Equipment

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

Manufacturer	Model	Type
Applanix	POS/MV	Positioning System
Brook Ocean Technology	MVP 100	Sound Speed System
Klein	5000	SSS
Reson	7125	SBES

Table 5: Major Systems Used

B.2 Quality Control

B.2.1 Crosslines

As per the HSSD 2011, Section 5.2.4.3 the quality control check was done using the standard deviation layer of the survey's BASE surface. Areas of unusually high standard deviation were investigated and resolved in processing, except where caused by areas of high bathymetric relief or the presence of features.

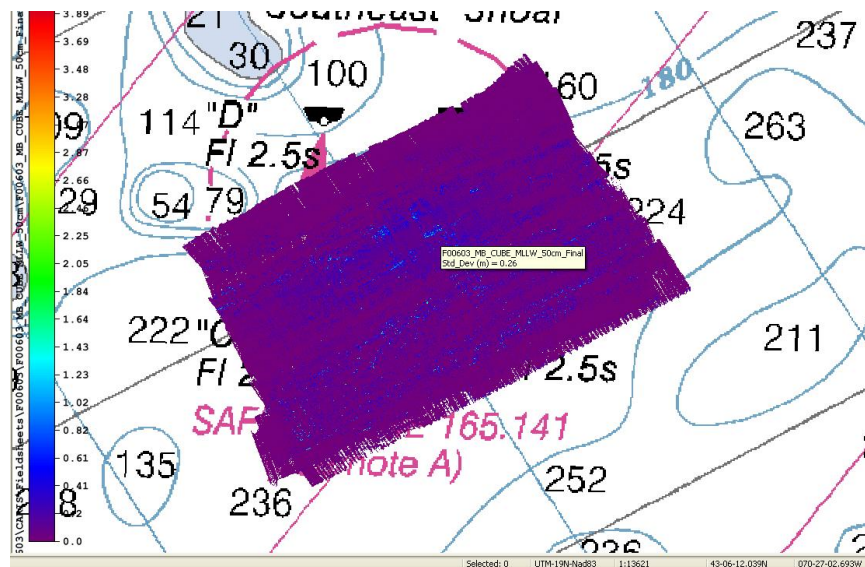


Figure 3: F00603 Standard Deviation Layer

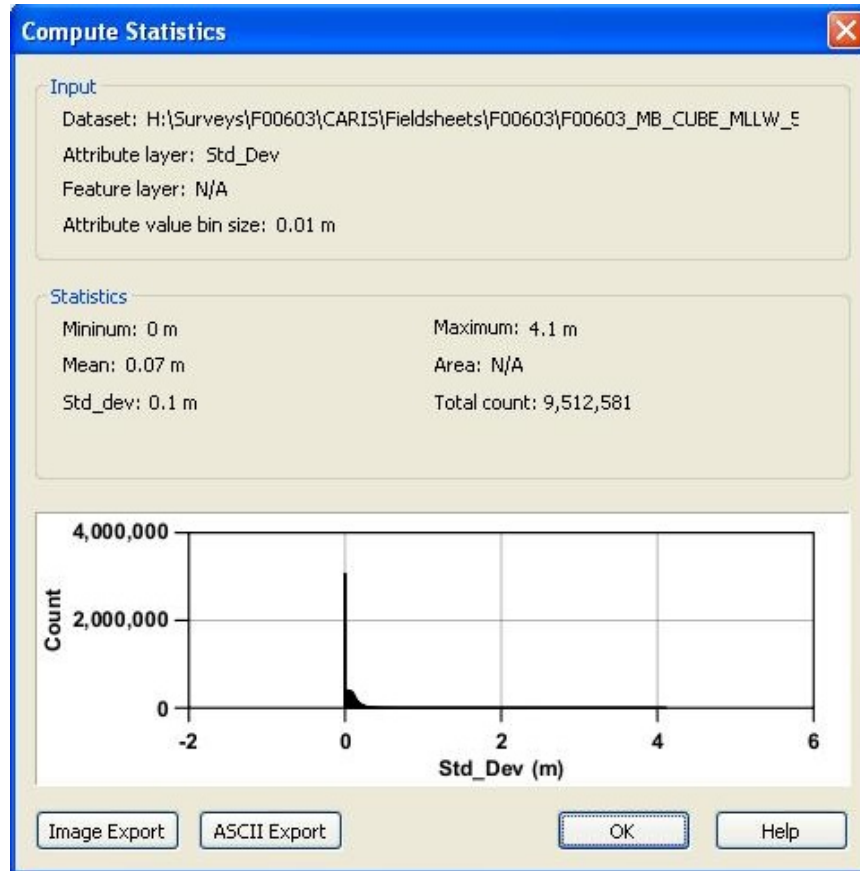


Figure 4: F00603 Standard Deviation Statistics

B.2.2 Uncertainty

The following survey specific parameters were used for this survey:

Measured	Zoning
0.00meters	0.085meters

Table 6: Survey Specific Tide TPU Values

Hull ID	Measured - CTD	Measured - MVP	Surface
S222	4meters/second	1meters/second	0.200meters/second

Table 7: Survey Specific Sound Speed TPU Values

NOAA National Ocean Service (NOS), Center for Operational Oceanographic Products and Services (CO-OPS) provides tide uncertainty values for NOAA hydrographic surveys. The CO-OPS provided value is a combination of uncertainty from the tide measurement at the tide stations and the uncertainty of zoning. The combined uncertainty value is provided to the field units at the 95% confidence interval, or 2-sigma standard deviations. CARIS HIPS processing software calculates uncertainty values at 1-sigma standard deviation,

therefore, the standard practice aboard NOAA Ship Thomas Jefferson is to divide the CO-OPS provided values by 1.96 and to enter the value into the zoning uncertainty field when calculating Total Propagated Uncertainty (TPU). Insufficient tidal information was available to allow CO-OPS to determine the tidal uncertainty for this project within the time provided. The zoning uncertainty value of 0.085m used during OPR-B363_TJ-11 was applied to data from S-A916-TJ-11 F00603, in the absence of a value specifically calculated for the survey area. The Zoning Uncertainty value used for this survey is listed in Table 6.

TPU is calculated and written to each line's HDCS file (CARIS processed data format). When surfaces are created, an uncertainty child layer is created. This child layer represents the amount of uncertainty for individual nodes in the surface based on a combination of a priori values from equipment vendors, values determined from environmental observation in the field, and from automated empirical analysis of data in real-time. Once all investigated features have been reviewed and least depths have been designated, surfaces are finalized. In finalization, the standard deviation for each node in the surface is multiplied by 1.96 to provide the 95% (2-sigma) confidence value for the node. This 2-sigma standard deviation is compared to the computed Total Vertical Uncertainty (TVU) for each node. The larger of the two values is retained as the finalized Uncertainty for each node. Uncertainty is reported in meters. See Figure 5 for a representation of the Uncertainty for the finalized bathymetry grid for F00603.

IHO has established allowable TVU values for each order of survey. This survey meets IHO Order I TVU requirements in over 98% of nodes in the final surface. See Figure 6 for the statistical distribution of nodes that meet or exceed the IHO TVU requirements (Zero and Positive values indicate that IHO Order 1 requirements were met).

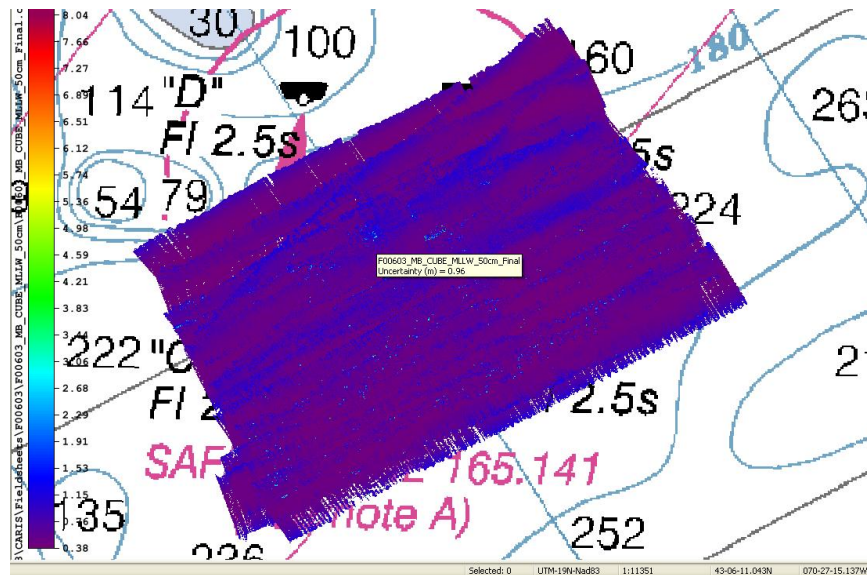


Figure 5: F00603 Uncertainty Surface

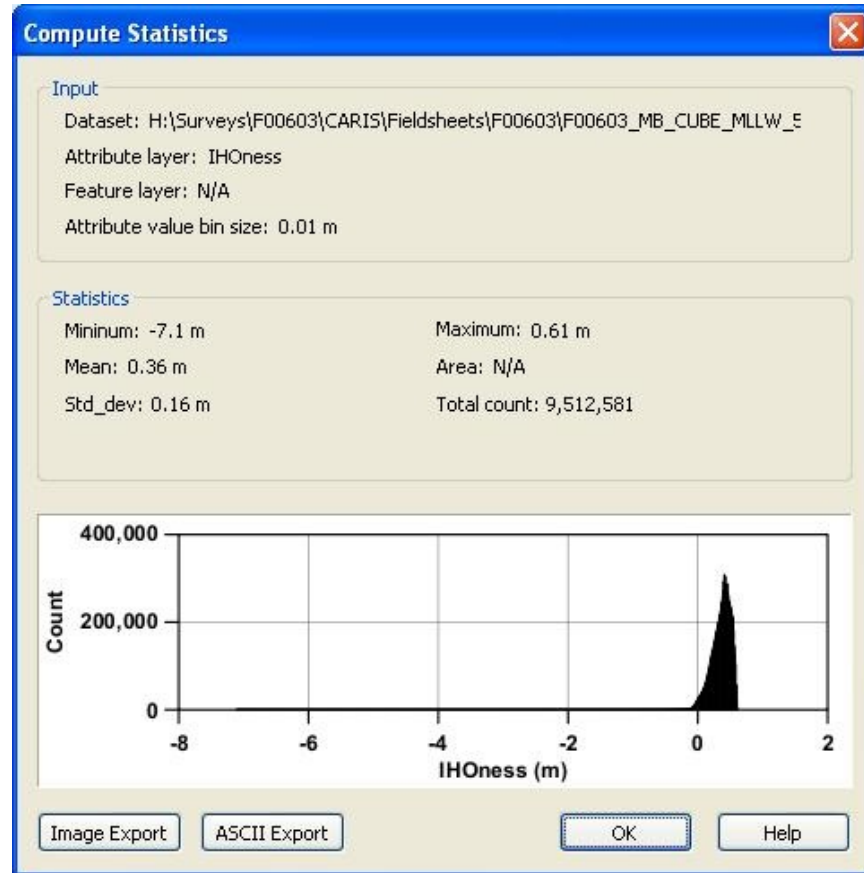


Figure 6: Nodes meeting IHO Order 1 standards

B.2.3 Junctions

There are no contemporary surveys that junction with this survey.

B.2.4 Sonar QC Checks

Refer to NOAA Ship Thomas Jefferson's DAPR and for a complete description of system integration and initial calibration results for equipment and sensors for this survey.

B.2.5 Equipment Effectiveness

B.2.5.1 Height off bottom of towed sidescan sonar

Sidescan sonar imagery was acquired during the survey in an attempt to obtain clear imagery of the wreckage of Empire Knight. Due to the depths in the survey area and the areas of high relief, it was difficult to safely deploy the sidescan sonar to depths necessary to meet HSSD requirements. Care was taken to lower the sidescan sonar as close as possible to the wreck site, but actual depths achieved seldom met spec.

B.2.6 Factors Affecting Soundings

B.2.6.1 Weak sonar return over soft sediment

The wreckage of the stern section of Empire Knight is located in a relatively deep basin filled with soft sediments. Surrounding the wreck site to the SE, S, SW, and W are large rock outcrops. The Reson Seabat 7125 ROV system on Thomas Jefferson does not have sufficient dynamic range to perform well in areas with strong and weak sonar reflectors in the same general vicinity. The results of having both rock and soft sediment in the working grounds, is a poor signal to noise ratio in soft sediment areas. This poor signal to noise ration results in random noise within approximately 0.5m of the actual seafloor. This noise is readily apparent in the point cloud data, but does not occur in high enough densities to significantly affect the depth determinations. The noise does , however, contribute to higher Node Standard Deviation and Uncertainty in the gridded surfaces. Uncertainty averages approximately 20 - 40 cm higher in the areas where soft sediment is prevalent.

B.2.7 Sound Speed Methods

Sound Speed Cast Frequency: Typically, Moving Vessel Profiler (MVP) casts are taken approximately once an hour. Due to entanglement hazards of towing the sidescan sonar and the MVP at the same time, the MVP was not deployed during sidescan operations. Upon arriving on scene at the survey area, multibeam was used to locate the wreck and recon the surrounding water. During the multibeam operations, two MVP casts were taken, approximately one hour apart. After the initial recon of the area was complete, the MVP was brought aboard and the sidescan sonar was deployed to acquire imagery. Additional MVP casts were not taken for approximately seven hours while sidescan operations were in progress. Once sidescan operations were complete, the MVP was again deployed. Two additional casts were taken during the last few hours of multibeam development of the wreck. These final MVP casts were also approximately one hour apart.

B.2.8 Coverage Equipment and Methods

Systems and methods for meeting survey coverage requirements were as described in the DAPR, except that more sidescan and multibeam data were acquired than necessary to meet minimum coverage requirements. These additional data densities were due to the investigative nature of the survey. The resultant sidescan coverage is essentially 300% coverage and multibeam sounding density is high enough to support 50cm resolution grids in the vicinity of the Empire Knight wreck, rather than 4m resolution grids that are normally required for surveys in this depth range.

B.3 Echo Sounding Corrections

B.3.1 Corrections to Echo Soundings

HDCS sounding data were corrected to mean lower low water (MLLW) using verified tides from Fort Point, ME (8423898) using the A916TJ2011CORP.zdf zoning file.

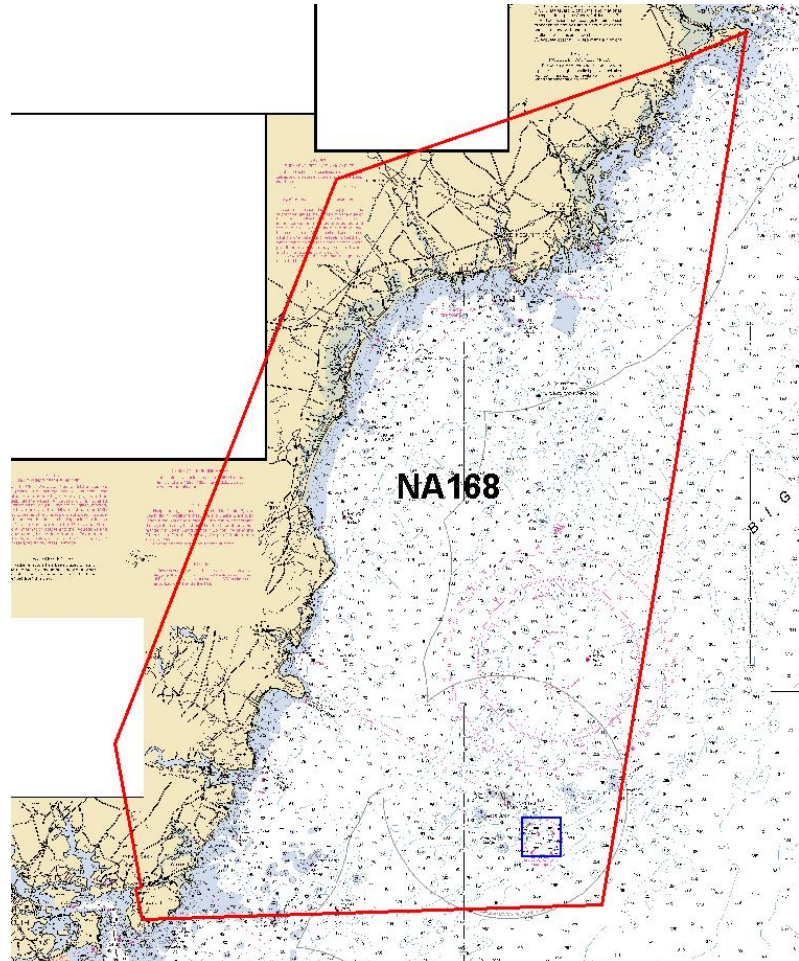


Figure 7: F00603 Final Tide Zoning

B.3.2 Calibrations

All sounding systems were calibrated as detailed in the DAPR.

B.4 Backscatter

Backscatter was not collected for this survey.

B.5 Data Processing

B.5.1 Software Updates

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

The following Feature Object Catalog was used: NOAA_Profile_Field.xml

The CARIS applications HIPS/SIPS, BathyDataBase (BDB), and others use S-57 format to define features by attributes and attribute values. NOAA has customized these files to add non-IHO sanctioned attributes to allow additional information to be conveyed from the field unit to the processing branches and to Marine Charting Division. The field unit further customized these files to make certain attributes mandatory when creating features and feature reports. The NOAA_Profile_Field.xml file is included in Appendix III of this report.

B.5.2 Surfaces

The following CARIS surfaces were submitted to the Processing Branch:

Surface Name	Surface Type	Resolution	Depth Range	Surface Parameter	Purpose
0603_MB_CUBE_MLLW_50cm_Fin	CUBE	0.5 meters	43.79 meters - 82.52 meters	NOAA_0.5m	Object Detection
F00603_Mosaic_100	SSS Mosaic	1 meters	0 meters - 0 meters	N/A	100% SSS
F00603_Mosaic_200	SSS Mosaic	1 meters	0 meters - 0 meters	N/A	200% SSS
F00603_Mosaic_300	SSS Mosaic	1 meters	0 meters - 0 meters	N/A	300% SSS

Table 8: CARIS Surfaces

C. Vertical and Horizontal Control

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

C.1 Vertical Control

The vertical datum for this project is Mean lower low water.

Standard Vertical Control Methods Used:

Discrete Zoning

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

Station Name	Station ID
Fort Point	8423898

Table 9: NWLON Tide Stations

File Name	Status
8423898.tid	Final Approved

Table 10: Water Level Files (.tid)

File Name	Status
A916TJ2011CORP.zdf	Final

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

A request for final approved tides was sent to N/OPS1 on 11/22/2011. The final tide note was received on 11/30/2011.

Preliminary zoning was accepted as final.

C.2 Horizontal Control

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

The following DGPS Stations were used for horizontal control:

DGPS Stations
Brunswick, ME (316kHz)

Table 12: USCG DGPS Stations

D. Results and Recommendations

D.1 Chart Comparison

D.1.1 Raster Charts

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

Chart	Scale	Edition	Edition Date	LNLM Date	NM Date
13286	1:80000	31	06/2011	04/03/2012	04/14/2012

Table 13: Largest Scale Raster Charts

13286

Soundings charted on Chart# 13286 are in relative agreement with survey soundings. There are 4 charted soundings that are completely inside the survey area, 209ft, 166 ft, 151 ft, and 243ft. Slightly shoal depths are found 240m to the west of the charted 209ft sounding. The charted 166ft sounding has shoal depths approximately 180m to the south and 314m to the east. The charted 151ft sounding has shoal depths approximately 200m to the west. There is an obstruction in the immediate vicinity of the charted 243ft sounding with a least depth of approximately 219 ft and a least depth on the wreck of approximately 194 ft (See the feature report for exact survey depths).

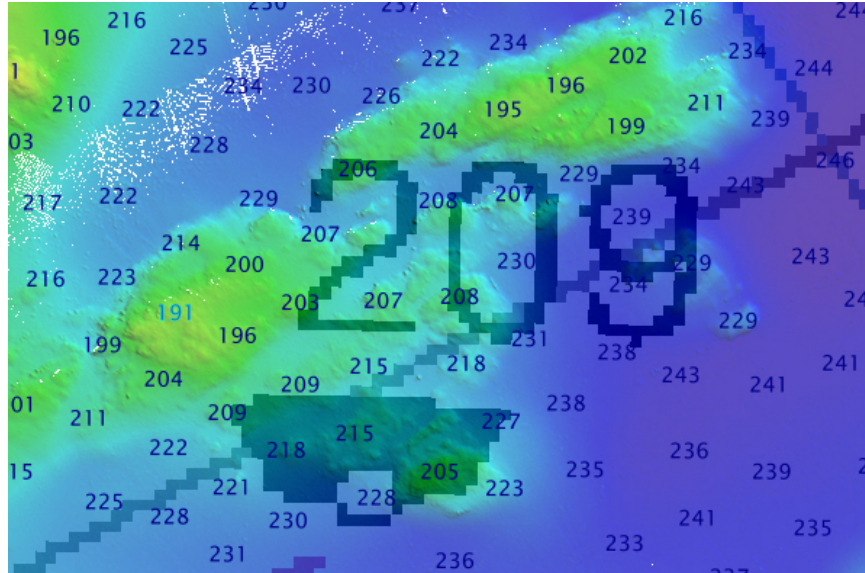


Figure 8: Survey depths around the charted 209 ft sounding

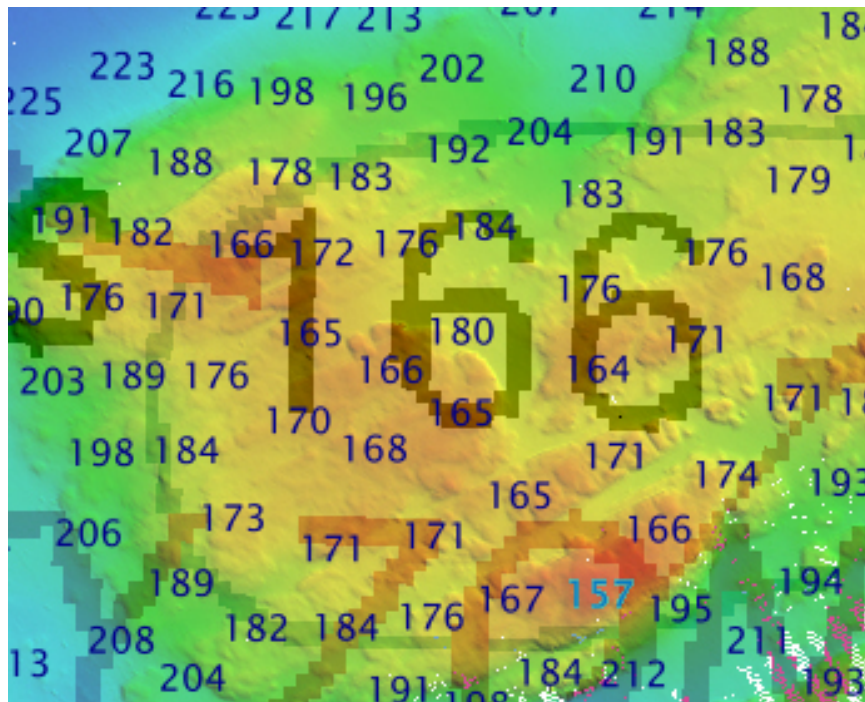


Figure 9: Survey depths around the charted 166 ft sounding

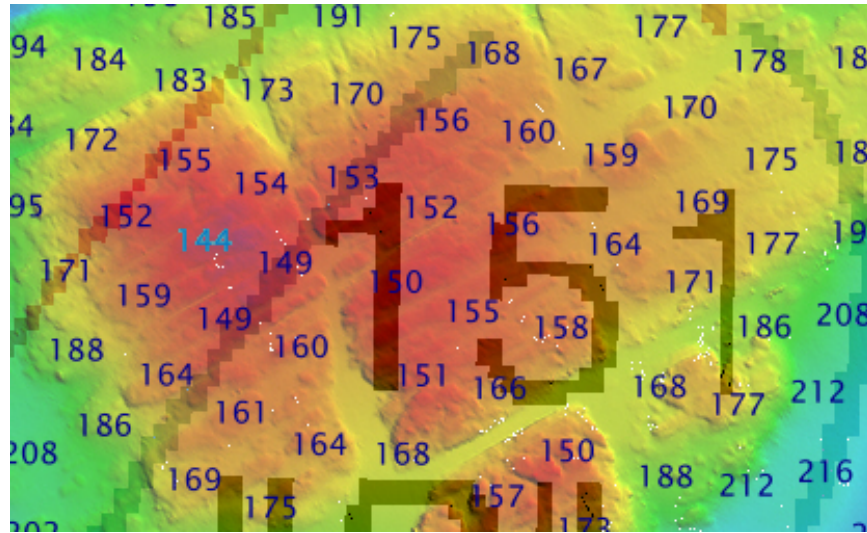


Figure 10: Survey depths around the charted 151 ft sounding

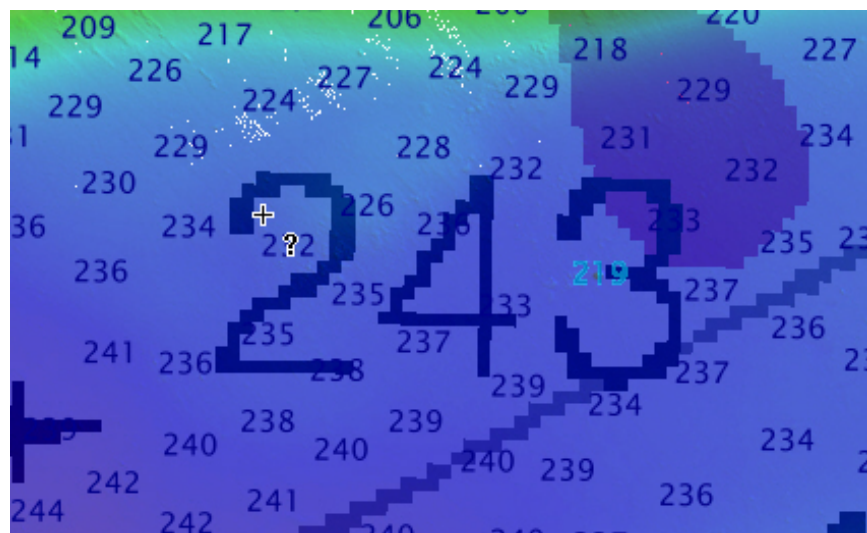


Figure 11: Survey depths around the charted 243 ft sounding

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?
US4ME01M	1:80000	8	05/23/2011	05/23/2011	NO

Table 14: Largest Scale ENC's

US4ME01M

The survey area is south of this ENC. No comparison could be made.



Figure 12: F00603 survey area with respect to ENC US4ME01M

D.1.3 AWOIS Items

Number of AWOIS Items Addressed: 1

Number of AWOIS Items Not Addressed: 0

Consult the F00603 feature report located in Appendix II for detailed information about the AWOIS item investigated.

D.1.4 Charted Features

Other than AWOIS #2190, there were no features labeled PA, ED, PD, or Rep which needed investigation.

D.1.5 Uncharted Features

Refer to the F00603 uncharted feature report located in appendix II for detailed information about the uncharted obstruction located approximately 300m northeast of the Empire Knight's surveyed position.

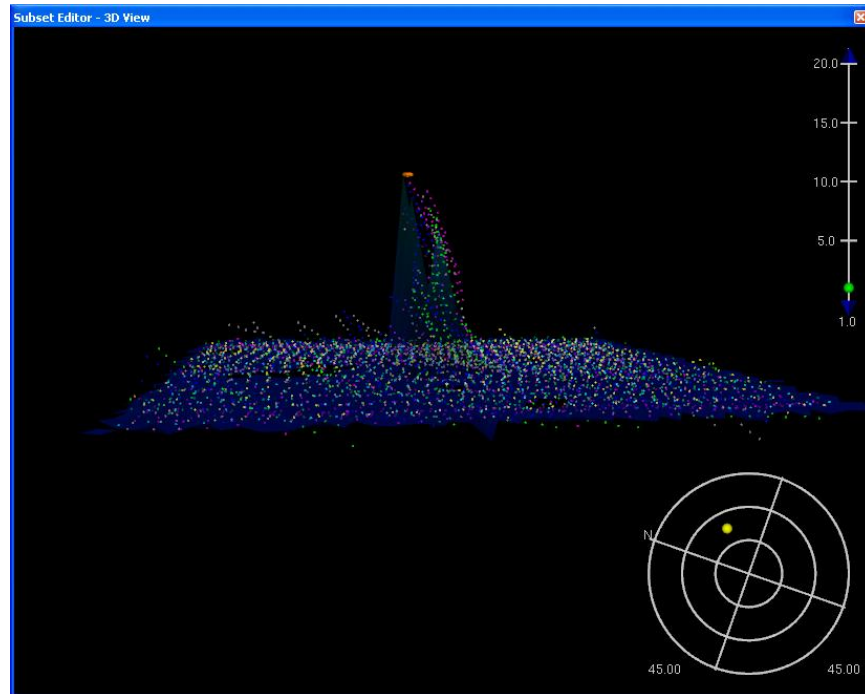


Figure 13: Uncharted Obstruction

D.1.6 Dangers to Navigation

No Danger to Navigation Reports were submitted for this survey.

D.1.7 Shoal and Hazardous Features

There are no shoals in the area surveyed.

D.1.8 Channels

No USACE maintained channels exist within the limits of F00603.

D.2 Additional Results

D.2.1 Shoreline

There were no shoreline verification requirements for this survey.

D.2.2 Prior Surveys

Results of prior surveys are represented by charted features and soundings as discussed in chart comparisons above.

D.2.3 Aids to Navigation

No ATONs were assigned for verification for this survey. No ATONs were located in the area surveyed.

D.2.4 Overhead Features

There are no bridges or overhead cable crossings within the limits of F00603.

D.2.5 Submarine Features

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

D.2.6 Ferry Routes and Terminals

There are no ferry routes within the limits of F00603.

D.2.7 Platforms

There are no platforms within the limits of F00603.

D.2.8 Significant Features

Along the south-southeast edge of the survey there is a large rock outcrop. The rock outcrop is oriented in a general southwest to northeast direction with grooves or striations trending in the same general direction. At regular intervals, the rock outcrop is fractured in a north-northwest to south-southeast direction, almost orthogonal to the trend of the outcrop. To the north of the large outcrop is a deeper flat plain with soft sediment. An additional rocky area is found to the northwest. This secondary outcrop is less defined, but a groove or striation trending in the same southwest to northeast direction is evident.

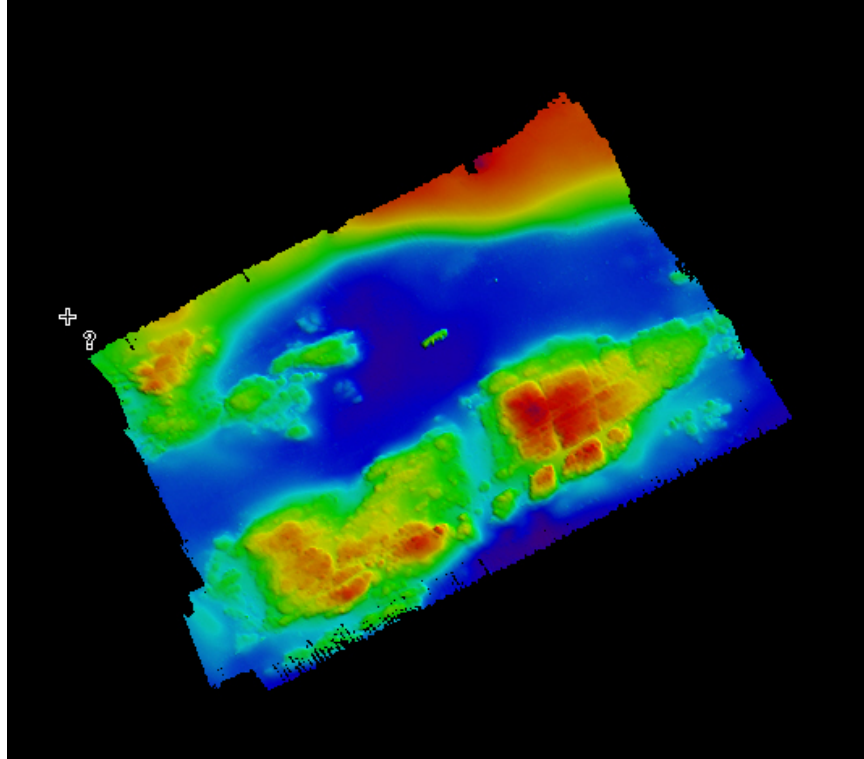


Figure 14: Overview of Rock Formations in the F00603 survey area

D.2 Construction and Dredging

No construction or dredging was observed within the limits of survey F00603.


E. Approval Sheet

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

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

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

Report Name	Report Date Sent
F00603 Descriptive Report (preliminary) - LCDR Dave Sherry, USCG	2012-04-17
TJ-2011-DAPR - LCDR Dave Sherry, USCG	2012-04-17
F00603 Raw Data - LCDR Dave Sherry, USCG	2012-04-17
F00603 Processed Data - LCDR Dave Sherry, USCG	2012-04-17
F00603 - Surfaces and Mosaics	2012-04-17

Approver Name	Approver Title	Approval Date	Signature
CDR Lawrence T. Krepp	Chief of Party	04/12/2012	
LT Michael Davidson	Field Operations Officer	04/12/2012	 Digitally signed by Michael C. Davidson Date: 2012.04.12 23:44:46 -04'00'

F. Table of Acronyms

Acronym	Definition
AFF	Assigned Features File
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	Discrete Position
DR	Descriptive Report
DTON	Danger to Navigation
ENC	Electronic Navigational Chart
ERS	Ellipsoidal Referenced Survey
ERZT	Ellipsoidally Referenced Zoned Tides
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
HSSDM	Hydrographic Survey Specifications and Deliverables Manual

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

Acronym	Definition
PRF	Project Reference File
PS	Physical Scientist
PST	Physical Science Technician
RNC	Raster Navigational Chart
RTK	Real Time Kinematic
SBES	Singlebeam Echosounder
SBET	Smooth Best Estimate and Trajectory
SNM	Square Nautical Miles
SSS	Side Scan Sonar
ST	Survey Technician
SVP	Sound Velocity Profiler
TCARI	Tidal Constituent And Residual Interpolation
TPU	Total 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

APPENDIX I

Tides and Water Levels



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

November 22, 2011

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

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

SUBJECT: Request for Approved Tides/Water Levels

Please provide the following data:

1. Tide Note
2. Final zoning in MapInfo and .MIX format
3. Six Minute Water Level data (Co-ops web site)

Transmit data to the following:

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

Atlantic Hydrographic Branch, N/CS33
439 W York St
Norfolk, VA 23510

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

Project No.: OPR-A916-TJ-11
Registry No.: F00603
State: Maine
Locality: Boon Island, ME
Sublocality: Vininity of Boon Island

Attachments containing:

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

cc: MOA-TJ
NC/S33



Year_DOY	Min Time	Max Time
2011_278	16:14:54	17:43:06



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

TIDE NOTE FOR HYDROGRAPHIC SURVEY

DATE : November 28, 2011

HYDROGRAPHIC BRANCH: Atlantic
HYDROGRAPHIC PROJECT: S-A916-TJ-2011
HYDROGRAPHIC SHEET: F00603

LOCALITY: Vicinity of Boon Island, Boon Island, ME
TIME PERIOD: October 5, 2011

TIDE STATION USED: 842-3898 Fort Point, NH
Lat.43° 04.30'N Long. 70° 42.70' W
PLANE OF REFERENCE (MEAN LOWER LOW WATER): 0.000 meters
HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 2.735 meters

REMARKS: RECOMMENDED ZONING

Preliminary zoning is accepted as the final zoning for project S-A916-TJ-2011, F00603 on October 5, 2011.

Please use the zoning file A916TJ2011CORP submitted with the project instructions for S-A916-TJ-2011. Zone NA168 is the applicable zone for F00603.

Refer to attachments for zoning information.

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

**Gerald
Hovis**

Digitally signed by Gerald Hovis
DN: cn=Gerald Hovis, o=Center for
Operational Oceanographic Products
and Services, ou=NOAA/NOS/CO-OPS/
OD/PSB, email=gerald.hovis@noaa.gov,
c=US
Date: 2011.11.30 12:27:22 -05'00'

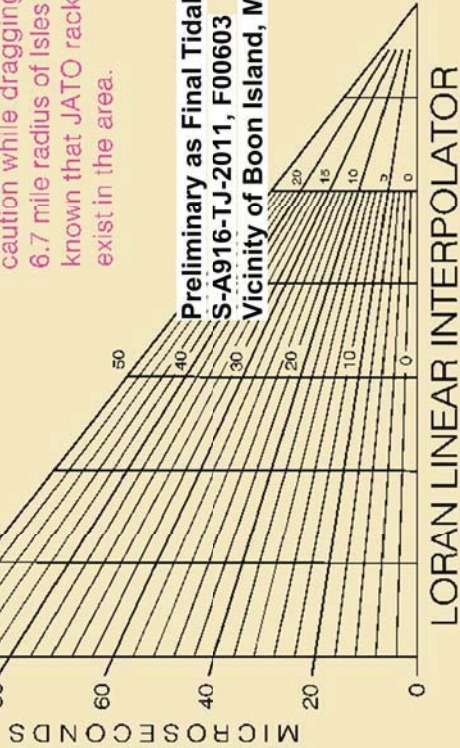
CHIEF, PRODUCTS AND SERVICES BRANCH



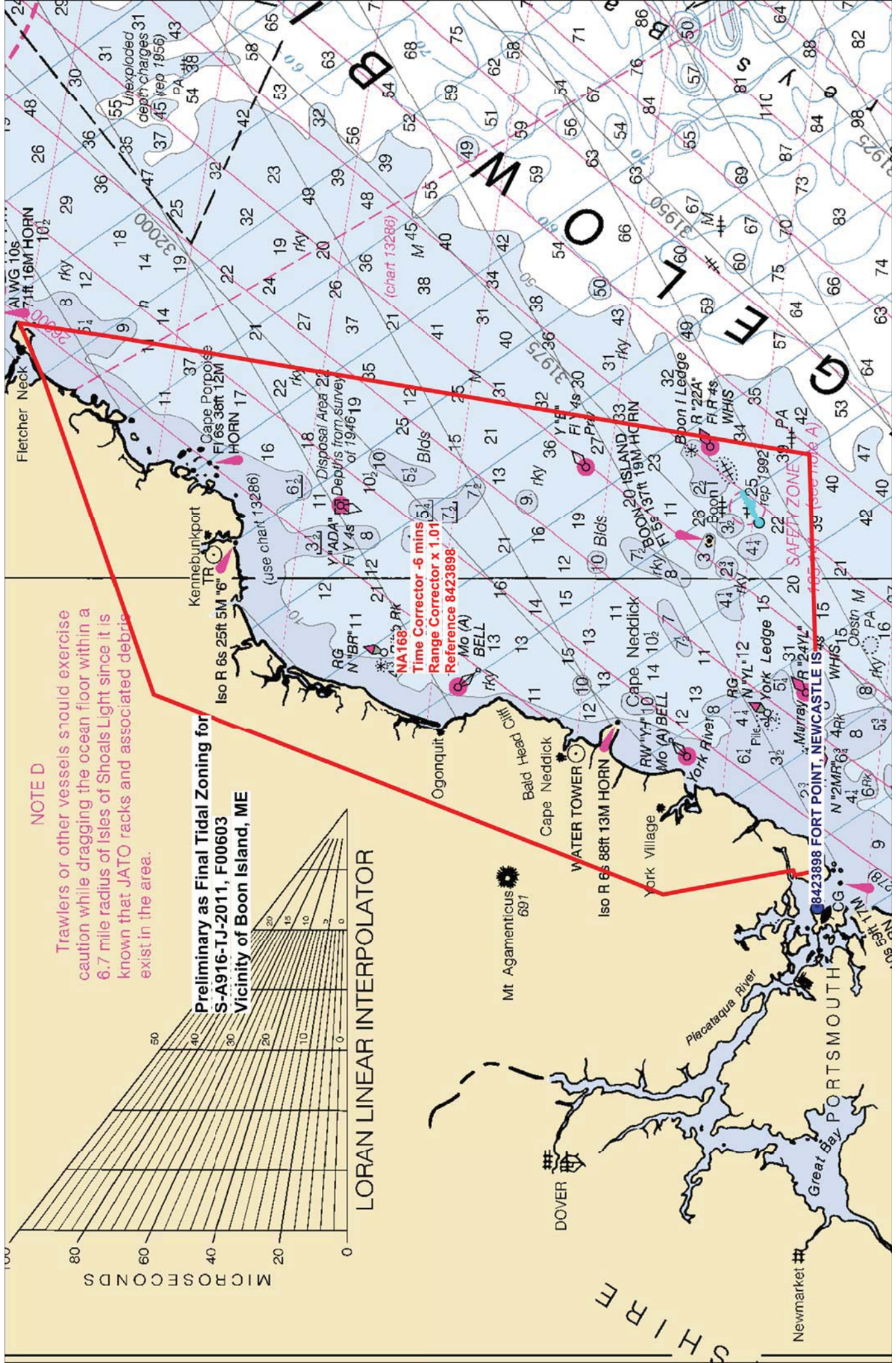
NOTE D

Trawlers or other vessels should exercise caution while dragging the ocean floor within a 6.7 mile radius of Isles of Shoals Light since it is known that JATO racks and associated debris exist in the area.

Preliminary as Final Tidal Zoning for S-A916-TJ-2011, F00603 Vicinity of Boon Island, ME



LORAN LINEAR INTERPOLATOR



APPENDIX II

Supplemental Survey Records and Correspondence

From <Michael.Davidson@noaa.gov>



Sent Tuesday, November 22, 2011 10:16 am

To final.tides@noaa.gov

Cc co.thomas.jefferson@noaa.gov , ops.thomas.jefferson@noaa.gov , Corey Allen <Corey.Allen@noaa.gov> , richard.t.brennan@noaa.gov , chiefst.thomas.jefferson@noaa.gov

Subject F00603 Request for Tides

Attachments [F00603_Final_Tides_Reqeust.zip](#)

30K

Attached is the Request for Tides package for OPR-A916-TJ-11
F00603 - Vicinity of Boon Island, ME.

V/R,
Mike

--

LT Michael C. Davidson
Operations Officer
NOAA Ship Thomas Jefferson
439 W York St
Norfolk, VA 23510
757-647-0187 (ship's cell)
808-434-2706 (ship's iridium)
ops.thomas.jefferson@noaa.gov



Michael Davidson <michael.davidson@noaa.gov>

Final Tide Note for S-A916-TJ-2011, F00603

1 message

Lijuan Huang <Lijuan.Huang@noaa.gov>

Wed, Nov 30, 2011 at 5:02 PM

Reply-To: Lijuan.Huang@noaa.gov

To: "co.thomas.jefferson" <CO.Thomas.Jefferson@noaa.gov>, _OMAO MOA OPS Thomas Jefferson <OPS.Thomas.Jefferson@noaa.gov>, _OMAO MOA Tides Thomas Jefferson <Thomas.Jefferson.Tides@noaa.gov>

Cc: "_NOS.CO-OPS.HPT" <NOS.COOPS.HPT@noaa.gov>, Corey.Allen@noaa.gov, Richard.T.Brennan@noaa.gov



DATE: 11/30/2011

MEMORANDUM FOR: CDR Larry Krepp
Commanding Officer, NOAA Ship Thomas Jefferson

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

SUBJECT: Delivery of Tide Requirements for Hydrographic Surveys

This is notification that the preliminary tidal zoning is accepted as the final zoning for survey project S-A916-TJ-2011, Registry No. F00603 on October 5, 2011. The accepted reference station for Registry No. F00603 is Fort Point, NH (842-3898)

Included with this memo is a Tide Note in .PDF format, stating the preliminary tidal zoning has been accepted as the final zoning.

--
Name: Lijuan Huang
Title: IMSG Contractor
Organization: NOAA/NOS/CO-OPS
Address: 1305 East-West Highway
N/OPS3, Sta. 7342, SSMC4
Silver Spring, MD 20910-3218
Email: lijuan.huang@noaa.gov
Phone: [1-301-713-2890](tel:1-301-713-2890) x192

F00603.pdf
704K



Michael Davidson <michael.davidson@noaa.gov>

RE: S-A916-TJ-11 Survey F00603 Empire Knight

1 message

Sherry, David LCDR <David.M.Sherry@uscg.mil>

Fri, Oct 7, 2011 at 11:15 AM

To: Michael.Davidson@noaa.gov

Cc: Steve.Lehmann@noaa.gov, Brent.Pounds@noaa.gov

Mike - thanks again for having me aboard. I'll work with your POC we have listed as well on the right format/paperwork to submit for the reimbursement process under the PRFA. Also, I'll purchase a 500 GB drive as discussed and ship to you for your return to Norfolk. Thanks for all your work on this.

Have a good inport break,

r/Dave

-----Original Message-----

From: Michael.Davidson@noaa.gov [mailto:Michael.Davidson@noaa.gov]

Sent: Wednesday, October 05, 2011 2:44 PM

To: Brent.Pounds@noaa.gov; Sherry, David LCDR

Subject: S-A916-TJ-11 Survey F00603 Empire Knight

At approximately 0800 on October 5, 2011, NOAA Ship Thomas Jefferson began survey operations on S-A916-TJ-11 Survey F00603. The ship is acquiring multibeam echosounder (MBES) data, Sidescan sonar (SSS) data, and if time permits, MBES backscatter and water column data over the wreck site. It is anticipated that survey operations will be complete by approximately 1600 on October 5, 2011.

LCDR Sherry, this email also serves as documentation of the agreement that has been made regarding data availability and submission. Thomas Jefferson personnel will provide a copy of the raw data and any preliminary processed data that can be made available prior to your departure from the ship upon arrival in Boston. Once the data has been processed and the Descriptive Report has been written, a full survey submission will be sent to you containing all processed data and final reports. I will contact you prior to packaging the data to determine if you would like the raw data included on the same drive.

If either of you have questions about the survey operations, please do not hesitate to contact me.

Thank you for your time.

V/R,
Mike

--

LT Michael C. Davidson
Operations Officer
NOAA Ship Thomas Jefferson
439 W York St
Norfolk, VA 23510
ops.thomas.jefferson@noaa.gov
757-647-0187 (ship's cell)
808-434-2706 (ship' Iridium)

APPENDIX III

Feature Report

AWOIS: ONE

DtoNs: NONE

MARITIME BOUNDARY: NONE

WRECKS: ONE(Discussed in AWOIS)

F00603 Feature Report

Registry Number: F00603
State: Maine
Locality: Boon Island
Sub-locality: Vicinity of Boon Island
Project Number: S-A916-TJ-11
Survey Date: 10/05/11

Charts Affected

Number	Edition	Date	Scale (RNC)	RNC Correction(s)*
13286	30th	03/01/2004	1:80,000 (13286_1)	[L]NTM: ?
13278	26th	06/01/2005	1:80,000 (13278_1)	[L]NTM: ?
13260	40th	05/01/2007	1:378,838 (13260_1)	[L]NTM: ?
13009	33rd	05/01/2007	1:500,000 (13009_1)	[L]NTM: ?
13006	34th	05/01/2007	1:675,000 (13006_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	Wreck AWOIS 2190 LD 56.76m	Wreck	56.76 m	43° 06' 11.3" N	070° 27' 04.6" W	2190

1 - S57DR_AWOIS

1.1) Wreck AWOIS 2190 LD 56.76m

Primary Feature for AWOIS Item #2190

Search Position: 43° 06' 19.0" N, 070° 27' 09.0" W
Historical Depth: [None]
Search Radius: 800
Search Technique: MB, VB, SSS
Technique Notes: Indications for records and Steve Lehmann, OR, are that the wreck broke into two primary pieces centered around the above AWOIS position as provided by Steve. Survey may be extended beyond AWOIS radius and/or survey limits as necessary to fully resolve the wreck positions.

History Notes:

HISTORY

NM 9/44

NM 16/44

DESCRIPTION

24 NO.203; CARGO, 7244 GT,SUNK 2/11/44 BY SUBMARINE; POSITION ACCURACY 1 MILE; MARKED BY BOON ISLAND WRECK BUOY 22R; POS. LAT. 43-07-00N, LONG. 70-25-39W.

27 NO. 792; FTR., 7244 FT, SUNK 2/11/44, MAY HAVE BROKEN UP

Survey Summary

Survey Position: 43° 06' 11.3" N, 070° 27' 04.6" W
Least Depth: 56.76 m (= 186.22 ft = 31.037 fm = 31 fm 0.22 ft)
TPU ($\pm 1.96\sigma$): THU (TPEh) [None] ; TVU (TPEv) [None]
Timestamp: 2011-278.00:00:00.000 (10/05/2011)
Dataset: F00603_CS.000
FOID: US 0000074068 00001(0226000121540001)
Charts Affected: 13278_1, 13286_1, 13260_1, 13009_1, 13006_1, 13003_1

Remarks:

WRECKS/remrks: AWOIS #2190 was investigated with Reson 7125 multibeam and Klein 5000 side scan sonar. The AWOIS description says there are two parts to this wreck. Only one section was investigated and found. The wreck section found is about 260 meters to the southeast of its charted position. Soundings were corrected to MLLW with verified tides and final zoning.

Feature Correlation

Source	Feature	Range	Azimuth	Status
F00603_CS.000	US 0000074068 00001	0.00	000.0	Primary
AWOIS_EXPORT	AWOIS # 2190	257.40	157.3	Secondary (grouped)

Hydrographer Recommendations

Move the charted wreck position to the current wreck position.

Cartographically-Rounded Depth (Affected Charts):

186ft (13278_1, 13286_1)

31fm (13260_1, 13009_1, 13006_1, 13003_1)

S-57 Data

Geo object 1: Wreck (WRECKS)

Attributes:

CATWRK - 1:non-dangerous wreck

EXPSOU - 2:shoaler than range of depth of the surrounding depth area

INFORM - AWOIS 2190 - "Empire Knight"

NINFOM - Add wreck

OBJNAM - Empire Knight

QUASOU - 6:least depth known

SORDAT - 20111005

SORIND - US,US,graph,F00603

TECSOU - 2,3:found by side scan sonar,found by multi-beam

VALSOU - 56.761 m

WATLEV - 3:always under water/submerged

Office Notes

SAR: Item verified in multibeam and side scan data. The imagery appears to show an entire vessel and no other wreckage was found within a 700-meter radius.

Compile: Chart Wreck

Feature Images



Figure 1.1.1

APPROVAL PAGE

F00603

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

The following products will be sent to NGDC for archive

- F00603_DR.pdf
- Collection of depth varied resolution BAGS
- Processed survey data and records
- F00603_GeoImage.pdf

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

Approved for: _____

LT Abigail Higgins

Chief, Atlantic Hydrographic Branch