

F00545

NOAA FORM 76-35A  U.S. DEPARTMENT OF COMMERCE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION NATIONAL OCEAN SURVEY  <b>DESCRIPTIVE REPORT</b>	
<i>Type of Survey:</i>	<b>Field Examination</b>
<i>Registry Number:</i>	<b>F00545</b>
<b>LOCALITY</b>	
<i>State:</i>	<b>Massachusetts</b>
<i>General Locality:</i>	<b>Massachusetts Bay</b>
<i>Sub-locality:</i>	<b>Minots Ledge</b>
<b>2007</b>	
CHIEF OF PARTY <b>LT(jg) Matthew Jaskoski, NOAA</b>	
DATE	LIBRARY & ARCHIVES

NOAA FORM 77-28 (11-72)	U.S. DEPARTMENT OF COMMERCE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION	REGISTRY NUMBER:  <b>F00545</b>
<h2 style="margin: 0;">HYDROGRAPHIC TITLE SHEET</h2>		
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:	<b>Massachusetts</b>	
General Locality:	<b>Massachusetts Bay</b>	
Sub-Locality:	<b>Minots Ledge</b>	
Scale:	<b>1:5,000</b>	Date of Survey: <b>06/13/07 to 09/14/2007</b>
Instructions Dated:	<b>07/11/07</b>	Project Number: <b>OPR-A397-NRT5-07</b>
Change No.1 Dated:	<b>N/A</b>	
Change No.2 Dated:	<b>N/A</b>	
Vessel:	<b>NOAA NRT-5, S3002</b>	
Chief of Party:	<b>LT(jg) Matthew Jaskoski, NOAA</b>	
Surveyed by:	<b>NOAA Navigation Response Team 5 Personnel</b>	
Soundings by:	<b>Kongsberg Simrad EM 3000 multibeam sonar</b>	
	<b>Odom Echotrac CV/200</b>	
Graphic record checked by:	<b>N/A</b>	
Protracted by:	<b>N/A</b>	Automated Plot: <b>N/A</b>
Verification by:	<b>Atlantic Hydrographic Branch Personnel</b>	
Soundings in:	<b>Meters <i>F</i>et at MLLW</b>	
Remarks: <b>1) All Times are UTC.</b> <b>2) This is a Basic Navigable Area Hydrographic Survey.</b> <b>3) Projection is UTM Zone 19.</b> <i>Red, bold italic notes in Descriptive Report were made during Branch processing.</i>		

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**DESCRIPTIVE REPORT**  
to accompany  
HYDROGRAPHIC SURVEY F00545

Scale of Survey: 1:5,000  
Year of Survey: 2007  
NOAA Navigation Response Team 5  
LT(jg) Matthew Jaskoski, OIC

## A. AREA SURVEYED

This hydrographic survey was conducted in accordance with Hydrographic Survey Letter Instructions for project OPR-A397-NRT5-07, F00545 Boston, MA. The original instructions are dated July 11, 2007 \*.

This Descriptive Report pertains to an area of approximately 0.429 SNM of Massachusetts Bay, approximately 1.5 NM NE of Cohasset Harbor. The assigned registry number for this sheet is F00545, as prescribed in the Letter Instructions. *Concur.*

The purpose of the field examination was to provide high resolution imagery to the USCG of the immediate vicinity of Minots Ledge Light in support of determining the location and extent of the wreckage of a historic lighthouse. This project is also in support of updating the National Ocean Service (NOS) nautical charts. *Concur.*

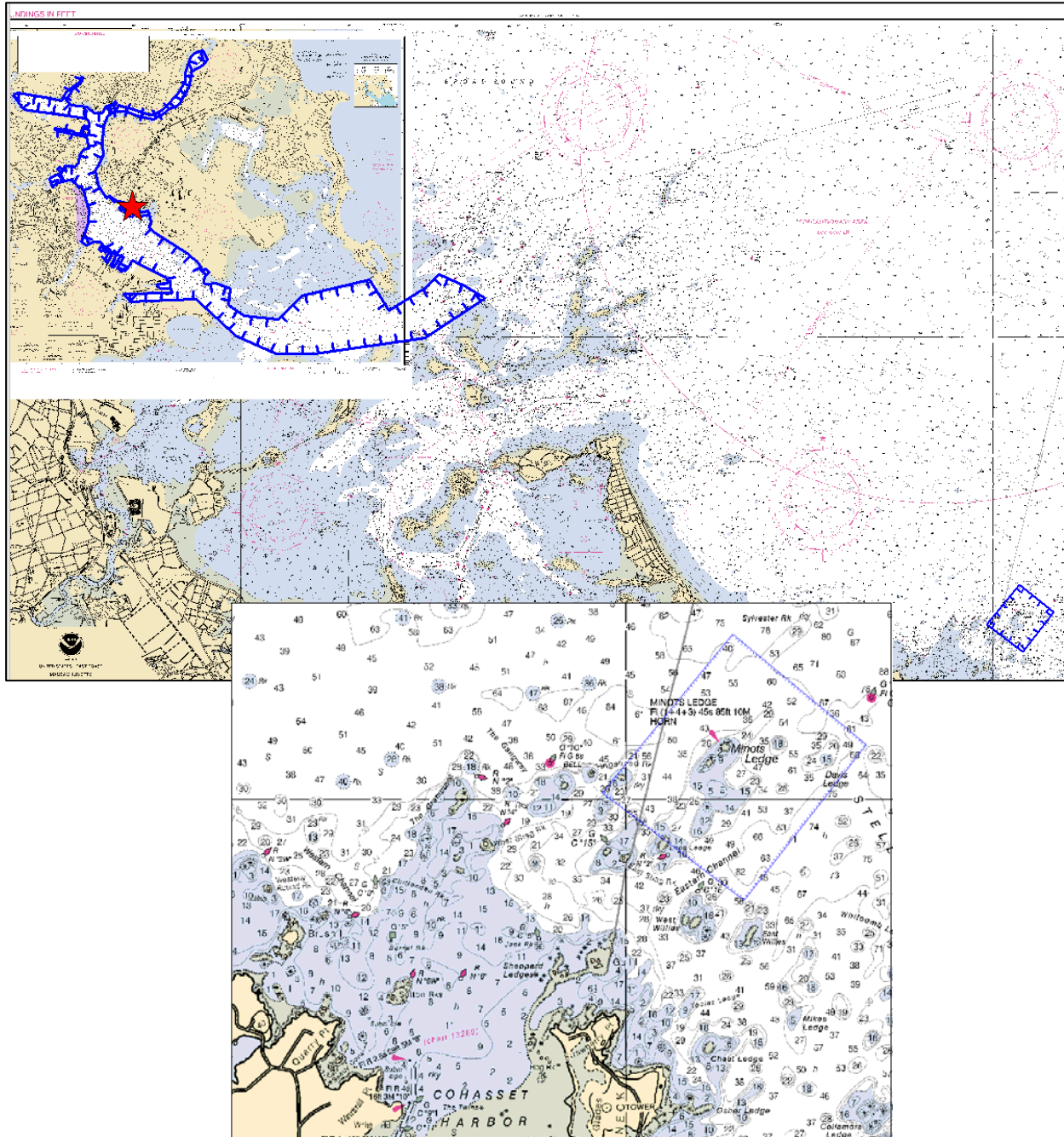
For complete survey limits, see figure A-1 on the following page.

Linear nautical miles of single beam only sounding lines - mainscheme only	14.6
Linear nautical miles of multibeam only sounding lines - mainscheme only	21.1
Linear nautical miles of side scan sonar only lines - mainscheme only	14.6
Linear nautical miles of any combination of the above techniques	50.5
Linear nautical miles of crosslines from single beam and multibeam combined	6.5
Linear nautical miles of developments other than mainscheme lines	0.0
Linear nautical miles of shoreline/nearshore investigation	0.0
Number of bottom samples collected	0
Number of items investigated that required additional time/effort in the field beyond the above survey operations	0.0
Total square nautical miles	0.429

Dates of acquisition: June 13, 2007 to September 14, 2007

*\* Filed with original field records*

Figure A-1: Outline of survey area



## **B. DATA ACQUISITION AND PROCESSING**

### **B.1 EQUIPMENT**

Data were acquired by NOAA NRT-5 S3002. NOAA Survey Vessel S3002 is a 9.12-meter aluminum SeaArk outboard driven vessel with an average multibeam transducer draft of 1.3 meters.

NOAA S3002 acquired both bathymetry and imagery data. Side scan sonar data were acquired with a towed Klein 3000 sonar system. Bathymetry data were acquired with both an Odom Echotrac C/V 200 (VBES) and a Kongsberg Simrad EM 3000 multibeam echosounder (MBES). Positioning and attitude were determined with a TSS POS/MV 320 (version 4) GPS aided inertial navigation system. *Concur.*

No unusual vessel configurations or problems were encountered. Refer to the 2007 Data Acquisition and Processing Report (DAPR)\* for detailed equipment and vessel configuration information. Expenditures

### **B.2 QUALITY CONTROL**

#### **B.2.1 Side Scan Sonar Quality Control**

Daily confidence checks were made by observing the outer ranges of the side scan sonar images. A good check consisted of distinguishing linear contacts across the entire range of the side scan trace. No unusual problems were encountered. *Concur.*

200% SSS bottom coverage was collected for this survey project at 75 m range scale. A mosaic was created at 1 meter resolution for submission (Table B-2). *Concur.*

#### **B.2.2 Multibeam Echosounder Quality Control**

Multibeam echosounder data were acquired at 100% coverage for SSS contact development, and areas deemed navigationally significant by the hydrographer. Multibeam data were gathered over shoal areas were safely practicable. Data from DN 2007-198 showed signs of a heave artifact, this error was on the order of 0.2m and was within IHO order 1 allowable sounding error. Data from DN 2007-198 line 009\_1318 showed signs of sounding error and was removed from the dataset. Other than the above, there were no faults with the MBES system which effected data integrity. For detailed discussion of MBES system calibrations, data acquisition, and data processing refer to this project's DAPR. *Concur.*

*\*Filed with original field records.*

### B.2.3 Total Propagated Error

Total Propagated Error (TPE) parameters for sound speed and tide data for F00545 are shown in table B-1. Total tide error was provided by CO-Ops as 0.13, the 1- $\sigma$  value applied in post-processing was 0.065. Sound speed TPE values were used in accordance with HSTP guidelines regarding frequency of surface and water column sound speed measurements. **Concur.**

Table B-1. Total Propagated Error parameters.

<b>Total Propagated Error Values</b>			
Tide Values		Sound Speed Values	
Measured	Zoning	Measured	Surface
0.00	0.065	4.0	0.2

### B.2.4 Fieldsheets and Navigation Surfaces

A Caris HIPS CUBE surface was created for all MBES data using “shallow” cube parameters. Uncertainty weighted surfaces were created for all bathymetry data. Surfaces were created at 5m resolution for VBES data and 0.75m resolution for MBES data. Based on Caris generated QC reports (see sec B.2.5), beams 1-4 and 126-127 were filtered out of the processed data, and are not included in the surface computation. Finalized CUBE surfaces are included in the digital preliminary smooth sheet. Table B-2 lists all surfaces submitted with this survey. **Concur.**

### B.2.5 Single Beam Quality Control

Portions of single-beam data showed significant differences in depth from MBES data and those single-beam data collected concurrently with MBES data. This discrepancy was not consistent over the course of any one VBES line, and may be due, in part, to the nature of the bathymetry, the substratum, and the beam footprint of the VBES. However, the cause of the data discrepancy could not be definitively determined in post-processing. Single-beam data collected concurrently with MBES data showed no signs of this discrepancy. Other than the above, there were no unusual events associated with the collection of the Single Beam data for this project. **Concur with clarification. There is a time correction difference between the VBES and MBES. This error was not reconciled by the field.**

Refer to this project’s DAPR\* for detailed discussion of VBES system calibrations, data acquisition, and data processing.

**\*Filed with original field records.**



Table B-2: F00545 bathymetry surface, and mosaic resolutions.

<b>F00545 Bathymetry surfaces and SSS mosaic</b>			
Fieldsheet	Surface/Mosaic Name	Grid Type	Resolution
F00545	F00545_MBES_CUBE_75cm	CUBE	0.75m
F00545	F00545_MBES_CUBE_75cm_Final	CUBE	0.75m
F00545	F00545_MBES_BASE_75cm	Uncertainty Weighted	0.75m
F00545	F00545_MBES_BASE_75cm_final	Uncertainty Weighted	0.75m
F00545	F00545_VBES_BASE_5m	Uncertainty Weighted	5.00m
F00545	F00545_VBES_BASE_5m_Final	Uncertainty Weighted	5.00m
F00545	F00545_1m	SSS Mosaic	1.00m

**B.2.6 Crosslines**

Approximately 6.5 linear NM of crosslines were acquired, this is 15% of the combined MBES and VBES mainscheme bathymetry linear NM. A total of 2.07 linear NM of MBES crosslines were run; this was approximately 10% of the total linear NM of MBES lines run. A visual examination of approximately 10% of crossline-mainsheme common areas showed general agreement between crosslines and mainscheme lines to within 1-2 feet. With the exception of the outermost beams (1-4 and 126-127), all beams met 90% order oneness based on the Caris generated quality control report (fig B-1) all outermost beams were filtered out of the dataset. Please refer to the separates section of this report for Caris generated QC tables. A total of 4.45 linear NM of VBES crosslines were run; this was approximately 21% of the total linear NM of VBES mainscheme lines run. Visual comparison of common areas showed general agreement to within 1-2 feet between crosslines and mainscheme VBES lines. For a list of all crosslines acquired for this project, tabulated by DN and line file name, please refer to the processing logs \* located in the separates section of this report. *Concur.*

**B.2.7 Junctions**

There were no contemporary surveys that junction with F00545, nor were any prior surveys included in the project instructions.

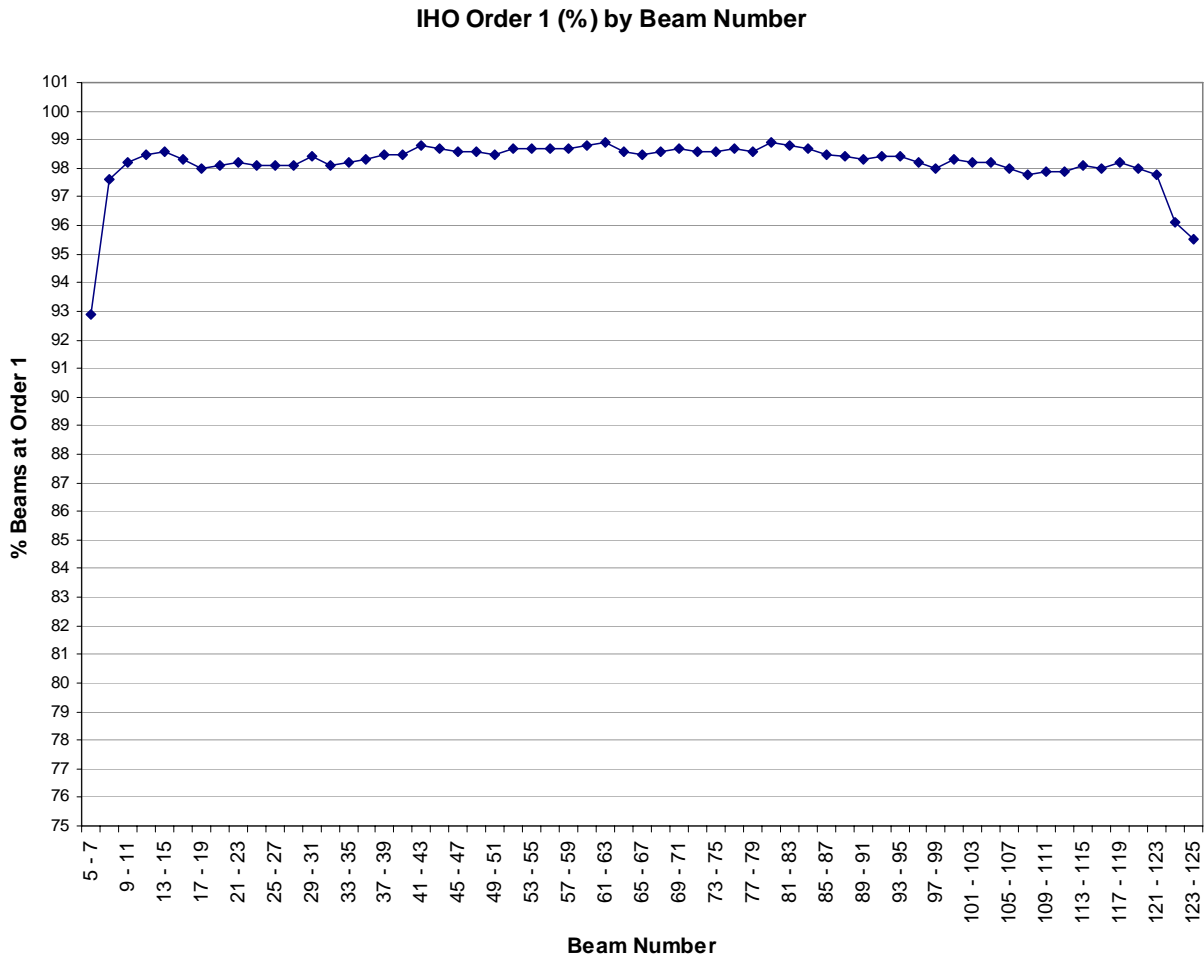
*Concur with clarification. The project instructions do not list any junction surveys, however, survey H10993 (TJ 2003- OPR-A-397-TJ-03) is within common area.*

**B.3 CORRECTIONS TO ECHO SOUNDING**

All methods or instruments used were as described in the project DAPR\*. All sound velocity casts are included in the digital preliminary smooth sheet. *Concur.*

*\*Filed with original field records.*

Figure B-1: Caris QC report, IHO order oneness v Beam Number. Beams 1-4 and 126-126 rejected.



## **C. VERTICAL AND HORIZONTAL CONTROL**

### **C.1 VERTICAL CONTROL**

The tidal datum for this project is Mean Lower Low Water (MLLW). The operating National Water Level Observation Network (NWLON) station at Boston (844-3970) served as datum control for the survey area. *Concur.*

A Request for Approved Tides was sent to N/OPS1 on September 24, 2007 (Appendix III). Verified tides from the N/OPS1 CO-OPS website were downloaded and applied to all sounding data. *Concur.*

### **C.2 HORIZONTAL CONTROL**

The horizontal datum used for this survey is the North American Datum of 1983 (NAD 83), projected using UTM zone 19. *Concur.*

Sounding positional control was determined using the Global Positioning System (GPS) corrected by U.S. Coast Guard differential GPS (DGPS) beacon stations. The DGPS beacon used for this survey was Acushnet, MA. No horizontal control stations were established for this survey. *Concur.*

Horizontal dilution of precision (HDOP) was monitored during acquisition, and did not exceed 4.00. Adequate satellite coverage was maintained throughout the survey period. *Concur.*

## D. RESULTS AND RECOMMENDATIONS

### D.1 CHART COMPARISON

According to the Project instructions, the charts affected by this survey are:

<i>Chart Number</i>	<i>Edition</i>	<i>Edition Date</i>	<i>Raster (.kap) Date</i>
13270	62nd	2006-June	6/22/2007
13269	10th	2007-February	6/22/2007
13267	34th	2007-May	6/22/2007

<i>ENC Cell Name</i>	<i>Edition</i>	<i>Update Application Date</i>	<i>Issue Date</i>
US5MA15M	6th	2007-05-04	2007-05-04

#### ***Concur.***

#### **D.1.1 General Agreement with Charted soundings**

Sounding data generally agreed with charted depths to within 1-2 feet, significant differences from charted depths are addressed in Appendices II of this report as well as in the digital preliminary smooth sheet.

#### **D.1.2 AWOIS Items and Significant Contacts**

There were no AWOIS items assigned within the survey limits of F00545. ***Concur.***

#### **D.1.3 Dangers to Navigation**

There were no DToNs submitted for survey F00545. See Appendix I. ***Concur.***

#### **D.1.4 Charted Features**

Hydrographer recommended changes to charted items are listed in Appendix II of this report as well as in the digital preliminary smooth sheet. All charted items not specifically addressed in Appendix II are recommended to be retained as charted by the hydrographer. ***Concur.***

### **D.1.5 Charting Recommendations**

Hydrographer recommendations for specific items are included in Appendix II of this report as well as in the digital preliminary smooth sheet. Survey F00545 is complete and adequate to supersede charted soundings in their common areas. *Concur.*

## **D.2 ADDITIONAL RESULTS**

### **D.2.1 Aids to Navigation**

There was one AToN within the survey limits of F00545. The AToN (Minots Ledge Light) was found to be in agreement with its charted location. The hydrographer has no recommended changes to the charted AToN. See Appendix V, section V.3 of this report. *Concur.*

### **D.2.2 Bridges and Overhead Cables**

There were no bridges or overhead cables within the survey limits of F00545. *Concur.*

### **D.2.3 Submarine Cables and Pipelines**

There are no charted submarine cable areas or pipelines within the survey limits of F00545. *Concur.*

**E. APPROVAL SHEET****OPR-A397  
Massachusetts Bay  
Massachusetts****Minots Ledge  
Survey Registry No. F00545**

Field operations for this survey were conducted under my daily supervision with frequent checks of progress and adequacy. All field sheets, bathymetry models, this Descriptive Report, and all accompanying records and data are approved.

Submitted in association with this descriptive report has been a series of reports and data:

OPR-A397-NRT5-07 horizontal and vertical control report (submitted with this survey)  
2007 Data Acquisition and Processing Report (submitted with this survey)

This survey is adequate to supersede all prior surveys in common areas, and for application to the relevant NOS nautical charts.

Respectfully,

---

LT(jg) Matthew Jaskoski, NOAA  
OIC NRT-5

## **APPENDIX I**

### **DANGERS TO NAVIGATION REPORT**

There were no DToNs on this sheet.

## **APPENDIX II**

### **SURVEY FEATURES REPORT**



# F00545 Survey Report

**Registry Number:** F00545  
**State:** Massachusetts  
**Locality:** Massachusetts Bay  
**Sub-locality:** Minots Ledge  
**Project Number:** OPR-A397-NRT5-07  
**Survey Dates:** 07/17/2007 - 04/24/2008

## Charts Affected

Number	Edition	Date	Scale (RNC)	RNC Correction(s)*
13269	10th	02/01/2006	1:10,000 (13269_1)	USCG LNM: 08/29/2006 (05/20/2008) CHS NTM: None (04/25/2008) NGA NTM: None (05/31/2008)
13270	62nd	06/01/2006	1:25,000 (13270_1)	[L]NTM: ?
13267	32nd	12/01/2004	1:80,000 (13267_1)	[L]NTM: ?
13260	39th	06/01/2003	1:378,838 (13260_1)	[L]NTM: ?
13200	34th	12/01/2005	1:400,000 (13200_1)	[L]NTM: ?
13009	32nd	07/01/2006	1:500,000 (13009_1)	[L]NTM: ?
13006	33rd	04/01/2006	1:675,000 (13006_1)	[L]NTM: ?
5161	13th	10/01/2003	1:1,058,400 (5161_1)	[L]NTM: ?
13003	48th	10/01/2004	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	0001 Minot's Ledge Light	Lighted structure	[None]	42° 16' 10.9" N	070° 45' 33.1" W	---
1.2	3009/21 23' Sounding	Rock	7.19 m	42° 15' 56.7" N	070° 45' 30.5" W	---
2.1	2482/114 23' Rock	Rock	6.97 m	42° 15' 41.5" N	070° 45' 33.8" W	---
2.2	---	GP	[None]	42° 16' 04.0" N	070° 45' 23.9" W	---
2.3	---	GP	[None]	42° 16' 15.8" N	070° 45' 24.6" W	---

## **1 - Charted Features**

## 1.1) 0001 Minot's Ledge Light

### Survey Summary

**Survey Position:** 42° 16' 10.9" N, 070° 45' 33.1" W  
**Least Depth:** [None]  
**TPU ( $\pm 1.96\sigma$ ):** THU (TPEh) [None] ; TVU (TPEv) [None]  
**Timestamp:** 2007-206.09:27:01 (07/25/2007)  
**Survey Line:** f00545 / 3002sss500k / 2007-176 / sonar\_data070625124500  
**Contact/Point:** 0001/1  
**Charts Affected:** 13269\_1, 13270\_1, 13267\_1, 13260\_1, 13200\_1, 13009\_1, 13006\_1, 5161\_1, 13003\_1

#### Remarks:

The object is Minots Ledge Light.

### Feature Correlation

Address	Feature	Range	Azimuth	Status
f00545/3002sss500k/2007-176/sonar_data070625124500	0001	0.00	000.0	Primary
ChartGPs - ENC US5MA15M	AToN 1	9.80	252.2	Secondary (grouped)

### Hydrographer Recommendations

Retain as charted.

### S-57 Data

**Geo object 1:** Light (LIGHTS)  
**Attributes:** SORDAT - 20070725

### Office Notes

Concur.

## 1.2) 3009/21 23' Sounding

### Survey Summary

**Survey Position:** 42° 15' 56.7" N, 070° 45' 30.5" W  
**Least Depth:** 7.19 m (= 23.60 ft = 3.933 fm = 3 fm 5.60 ft)  
**TPU ( $\pm 1.96\sigma$ ):** **THU (TPEh)**  $\pm 1.964$  m ; **TVU (TPEv)**  $\pm 0.194$  m  
**Timestamp:** 2007-198.15:07:12.460 (07/17/2007)  
**Survey Line:** f00545 / s3002\_mbes / 2007-198 / 021\_1500  
**Profile/Beam:** 3009/21  
**Charts Affected:** 13269\_1, 13270\_1, 13267\_1, 13260\_1, 13200\_1, 13009\_1, 13006\_1, 5161\_1, 13003\_1

#### Remarks:

The area was covered with 200% Klein 3000 SSS, 100% Simrad EM3000 MBES, final tides applied. The object is a rock, LD shallower than charted sounding.

### Feature Correlation

Address	Feature	Range	Azimuth	Status
f00545/s3002_mbes/2007-198/021_1500	3009/21	0.00	000.0	Primary

### Hydrographer Recommendations

The hydrographer recommends a representative sounding be charted.

#### Cartographically-Rounded Depth (Affected Charts):

23ft (13269\_1, 13270\_1, 13267\_1)

3  $\frac{3}{4}$ fm (13260\_1, 13200\_1, 13009\_1, 13006\_1, 13003\_1)

7.2m (5161\_1)

### S-57 Data

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

**Attributes:** INFORM - F00545, rocky area  
 QUASOU - 6:least depth known  
 SORDAT - 20070717  
 SORIND - US,US,nsurf,F00545  
 TECSOU - 3:found by multi-beam

VALSOU - 7.192 m

VERDAT - 12:Mean lower low water

WATLEV - 3:always under water/submerged

### **Office Notes**

Concur with clarification. Chart 'rky' to represent rocky area with a least depth known of 23.60ft.

## **2 - New Features**

## 2.1) 2482/114 23' Rock

### Survey Summary

**Survey Position:** 42° 15' 41.5" N, 070° 45' 33.8" W  
**Least Depth:** 6.97 m (= 22.88 ft = 3.813 fm = 3 fm 4.88 ft)  
**TPU ( $\pm 1.96\sigma$ ):** **THU (TPEh)**  $\pm 1.966$  m ; **TVU (TPEv)**  $\pm 0.202$  m  
**Timestamp:** 2007-198.16:43:42.732 (07/17/2007)  
**Survey Line:** f00545 / s3002\_mbes / 2007-198 / 031\_1635  
**Profile/Beam:** 2482/114  
**Charts Affected:** 13269\_1, 13270\_1, 13267\_1, 13260\_1, 13200\_1, 13009\_1, 13006\_1, 5161\_1, 13003\_1

#### Remarks:

The area was covered with 200% Klein 3000 SSS, 100% Simrad EM3000 MBES, final tides applied. The object is a large rock outcrop, LD shallower than charted soundings in the area.

### Feature Correlation

Address	Feature	Range	Azimuth	Status
f00545/s3002_mbes/2007-198/031_1635	2482/114	0.00	000.0	Primary

### Hydrographer Recommendations

The hydrographer recommends a representative sounding be charted.

#### Cartographically-Rounded Depth (Affected Charts):

23ft (13269\_1, 13270\_1, 13267\_1)

3  $\frac{3}{4}$ fm (13260\_1, 13200\_1, 13009\_1, 13006\_1, 13003\_1)

7.0m (5161\_1)

### S-57 Data

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

**Attributes:** INFORM - F00545, rocky area  
 QUASOU - 6:least depth known  
 SORDAT - 20070717  
 SORIND - US,US,nsurf,F00545  
 TECSOU - 3:found by multi-beam

VALSOU - 6.973 m

VERDAT - 12:Mean lower low water

WATLEV - 3:always under water/submerged

## Office Notes

Concur with clarification. Chart 'rky' to represent surrounding rocky area with least depth known 22.88ft.



## 2.2) GP No. - 1 from ChartGPs - Digitized

### Survey Summary

**Survey Position:** 42° 16' 04.0" N, 070° 45' 23.9" W  
**Least Depth:** [None]  
**TPU ( $\pm 1.96\sigma$ ):** THU (TPEh) [None] ; TVU (TPEv) [None]  
**Timestamp:** 2008-115.13:15:07 (04/24/2008)  
**GP Dataset:** ChartGPs - Digitized  
**GP No.:** 1  
**Charts Affected:** 13269\_1, 13270\_1, 13267\_1, 13260\_1, 13200\_1, 13009\_1, 13006\_1, 5161\_1, 13003\_1

#### Remarks:

[None]

### Feature Correlation

Address	Feature	Range	Azimuth	Status
ChartGPs - Digitized	1	0.00	000.0	Primary

### Hydrographer Recommendations

[None]

### S-57 Data

**Geo object 1:** Seabed area (SBDARE)  
**Attributes:** NATQUA - 10:hard

### Office Notes

Chart 'rky' to represent surrounding rocky area.

## 2.3) GP No. - 2 from ChartGPs - Digitized

### Survey Summary

**Survey Position:** 42° 16' 15.8" N, 070° 45' 24.6" W  
**Least Depth:** [None]  
**TPU ( $\pm 1.96\sigma$ ):** THU (TPEh) [None] ; TVU (TPEv) [None]  
**Timestamp:** 2008-115.14:10:59 (04/24/2008)  
**GP Dataset:** ChartGPs - Digitized  
**GP No.:** 2  
**Charts Affected:** 13269\_1, 13270\_1, 13267\_1, 13260\_1, 13200\_1, 13009\_1, 13006\_1, 5161\_1, 13003\_1

#### Remarks:

[None]

### Feature Correlation

Address	Feature	Range	Azimuth	Status
ChartGPs - Digitized	2	0.00	000.0	Primary

### Hydrographer Recommendations

[None]

### S-57 Data

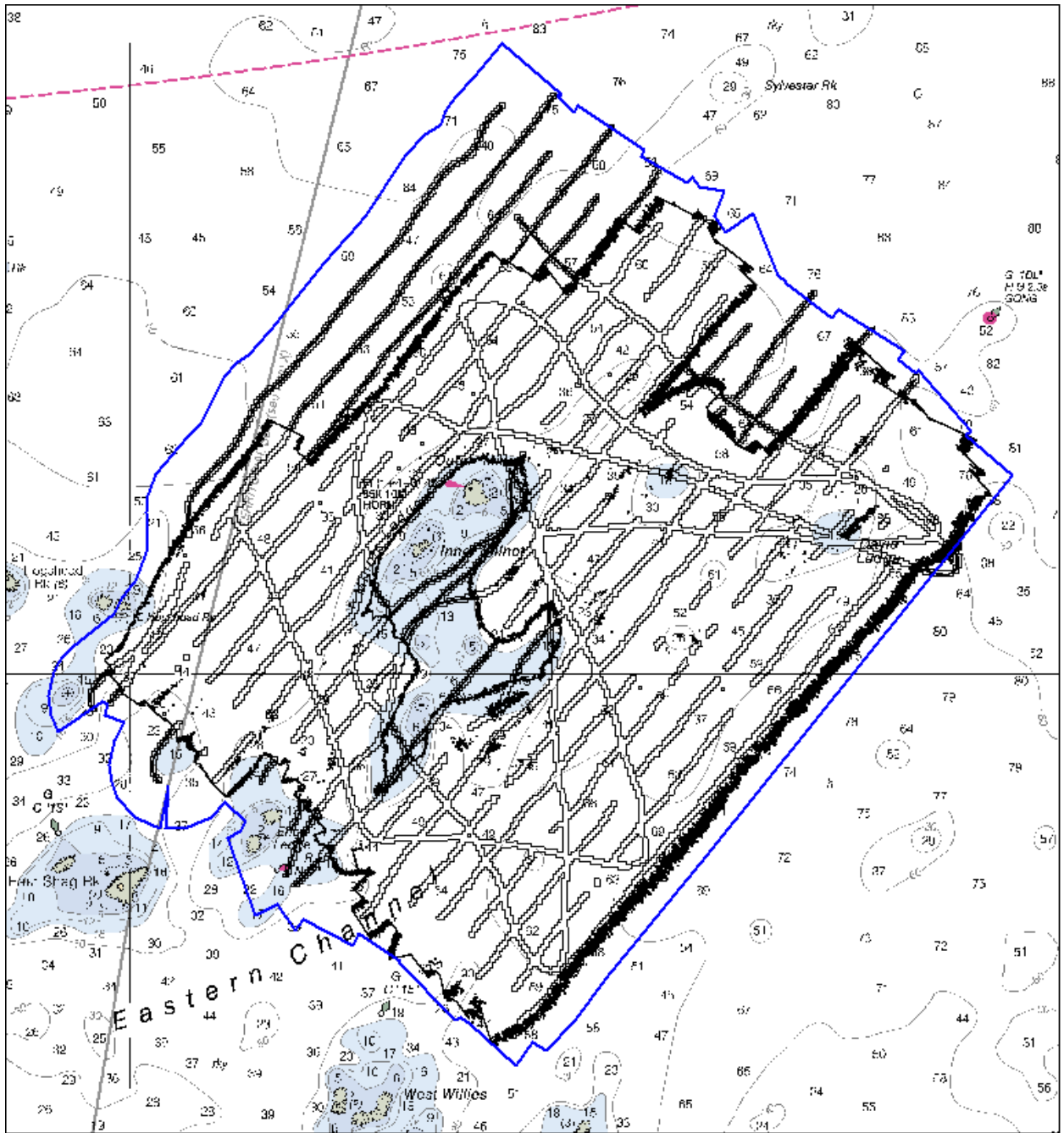
**Geo object 1:** Seabed area (SBDARE)  
**Attributes:** NATSUR - 9:rock

### Office Notes

Chart 'rky' to represent surrounding rocky area.

# APPENDIX III

## PROGRESS SKETCH



## **APPENDIX IV**

### **TIDES AND WATER LEVELS**



UNITED STATES DEPARTMENT OF COMMERCE  
National Oceanic and Atmospheric Administration  
NOAA NRT-5 (N/CS53x5)  
3 Chapel Ave, Port Liberte, c/o USACE  
Jersey City, NJ 07305

September 24, 2007

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

FROM: LTjg Matthew Jaskoski, NOAA NRT-5 (N/CS53x5)

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

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

Project No.: OPR-A397-NRT5-07  
Registry No.: F00545  
State: Massachusetts  
Locality: Massachusetts Bay  
Sublocality: Minots Ledge

Attachments containing:

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

cc: N/CS33



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Year_DOY	Min Time	Max Time
2007_176	11:56:43	13:00:13
2007_177	11:43:23	13:09:17
2007_180	04:42:00	04:49:00
2007_198	12:05:07	17:14:02
2007_257	12:51:10	13:40:56

**APPENDIX V**  
**SUPPLEMENTAL SURVEY RECORDS AND CORRESPONDENCES**

**V.1. COAST PILOT REPORT, NOAA FORM 77-6**

No corrections or additions required.

**V.2. BOTTOM SAMPLE, NOAA FORM 75-44**

No bottom samples were taken.

**V.3. AIDS TO NAVIGATION, NOAA FORM 76-40**

There was one AToN within the limits of F00545. The AToN (Minots Ledge Light) was found to be in agreement with its charted location. The hydrographer has no recommended changes to the charted AToN.

From [Chris Hare <Christopher.Hare@noaa.gov>](mailto:Christopher.Hare@noaa.gov)

Sent Thursday, March 22, 2007 9:53 am

To [Matthew Jaskoski <Matthew.Jaskoski@noaa.gov>](mailto:Matthew.Jaskoski@noaa.gov)

Cc

Bcc

Subject [Fwd: Minot's Ledge Survey]

Attachments [Minot's Briefing Paper.doc](#)

30K [Minot's Ledge Chartlet.pdf](#)

252K

Matt,

Here is Frank Cantelas's email on the Minot's Ledge Lighthouse.

Chris

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

Subject: Minot's Ledge Survey

Date: Tue, 06 Mar 2007 10:28:40 -0500

From: Frank Cantelas <Frank.Cantelas@noaa.gov>

Organization: NOAA Ocean Exploration

To: Christopher Hare <Christopher.Hare@noaa.gov>, Bill Thiesen  
<William.H.Thiesen@uscg.mil>

Chris,

It was good to talk with you about the project in Boston and the possible involvement of the NRT. As I mentioned, the area of interest is Minot's Ledge Lighthouse, about 5 miles south of the entrance to Boston Harbor. Its actually about 1.5 miles from the entrance to Cohasset, a small harbor to the south. I've been working with Bill Theisen, in the USCG Historians Office, to help arrange mapping the site location. The plan is to find the remains of the 1850 lighthouse built on Minot's Ledge that was knocked down in a storm on 1851. The archaeological assessment of the site will take place the week of June 17th. It would be helpful to have the area surveyed before this date in order to use the information to plan the archaeological research. However, I understand that the NRT may not be in the area until later in the summer. It will still be critical to have the hydrographic survey information in order to understand why the light collapsed and what happened to it over the last 150 years. The attached one-pager and chart describe the project in more detail along with a request for a survey of the area. Please let me know if you have any questions. My contact information follows.

Thanks

Frank

--

Frank J. Cantelas  
Maritime Archaeologist  
NOAA Office of Ocean Exploration  
SSMC3, 10th Floor, 10144  
1315 East West Highway  
Silver Spring, MD 20910  
Phone: 301-734-1017



From "[Mastone, Victor \(EEA\)](mailto:Victor.Mastone@state.ma.us)" <[Victor.Mastone@state.ma.us](mailto:Victor.Mastone@state.ma.us)>

Sent Monday, August 6, 2007 11:59 am

To [Bert Ho](mailto:Bert.Ho@noaa.gov) <[Bert.Ho@noaa.gov](mailto:Bert.Ho@noaa.gov)> , "[Thiesen, William Dr](mailto:William.H.Thiesen@uscg.mil)" <[William.H.Thiesen@uscg.mil](mailto:William.H.Thiesen@uscg.mil)> , [Keith.Meverden@wisconsinhistory.org](mailto:Keith.Meverden@wisconsinhistory.org)

Cc [Frank Cantelas](mailto:Frank.Cantelas@noaa.gov) <[Frank.Cantelas@noaa.gov](mailto:Frank.Cantelas@noaa.gov)> , [Matthew Jaskoski](mailto:Matthew.Jaskoski@noaa.gov) <[Matthew.Jaskoski@noaa.gov](mailto:Matthew.Jaskoski@noaa.gov)> , [Lawrence T Krepp](mailto:Lawrence.T.Krepp@noaa.gov) <[Lawrence.T.Krepp@noaa.gov](mailto:Lawrence.T.Krepp@noaa.gov)> , [Matt Wingate](mailto:matt.wingate@noaa.gov) <[matt.wingate@noaa.gov](mailto:matt.wingate@noaa.gov)> , [Christopher Hare](mailto:Christopher.Hare@noaa.gov) <[Christopher.Hare@noaa.gov](mailto:Christopher.Hare@noaa.gov)>

Bcc

Subject RE: Minots Ledge chartlets

Burt,

Thanks for sending this. Still in the field on another project, so I'll take a detailed look later.

Vic

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

From: Bert Ho [<mailto:Bert.Ho@noaa.gov>]

Sent: Monday, August 06, 2007 8:14 AM

To: Thiesen, William Dr; Mastone, Victor (EEA);

[Keith.Meverden@wisconsinhistory.org](mailto:Keith.Meverden@wisconsinhistory.org)

Cc: Frank Cantelas; Matthew Jaskoski; Lawrence T Krepp; Matt Wingate;

Christopher Hare

Subject: Minots Ledge chartlets

To Vic, Bill, and Keith,

Sorry for the delay on these images. Here are a series of chartlets for the area around Minot's Ledge. With the pole-mounted multibeam, we obviously had to be wary of the rocks surrounding the lighthouse. You'll notice where we deemed it unsafe to survey directly on top of some of the shoaler areas, however, we covered the ledge with side scan. These chartlets show our coverage, but details will be more difficult to see. If you have time, I will show you the data through CARIS in San Diego, unless you have post processing programs you prefer.

Let me know if you have any questions and again, sorry for the delay.

-Bert

BERT HO

NOAA/NOS/OCS/NSD/NRB/NRT-5-Northeast

[bert.ho@noaa.gov](mailto:bert.ho@noaa.gov)

(718)702-8974 cell 1

(850)443-7058 cell 2

[www.noaa.gov](http://www.noaa.gov)

From "[Thiesen, William Dr](mailto:William.H.Thiesen@uscg.mil)" <[William.H.Thiesen@uscg.mil](mailto:William.H.Thiesen@uscg.mil)>

Sent Monday, August 6, 2007 3:07 pm

To [Bert.Ho@noaa.gov](mailto:Bert.Ho@noaa.gov)

Cc [Frank Cantelas <Frank.Cantelas@noaa.gov>](mailto:Frank.Cantelas@noaa.gov) , [Matthew Jaskoski <Matthew.Jaskoski@noaa.gov>](mailto:Matthew.Jaskoski@noaa.gov) , [Lawrence T Krepp <Lawrence.T.Krepp@noaa.gov>](mailto:Lawrence.T.Krepp@noaa.gov) , [Matt Wingate <matt.wingate@noaa.gov>](mailto:matt.wingate@noaa.gov) , [Keith.Meverden@wisconsinhistory.org](mailto:Keith.Meverden@wisconsinhistory.org) , [Christopher Hare <Christopher.Hare@noaa.gov>](mailto:Christopher.Hare@noaa.gov) , "[Mastone, Victor \(EEA\)" <Victor.Mastone@state.ma.us>](mailto:Victor.Mastone@state.ma.us)

Bcc

Subject RE: Minots Ledge chartlets

Thanks Bert:

The more information we get the better! We'll look forward to seeing the results in greater detail in San Diego. Thanks again and we'll look forward to seeing you then.

Best,  
Bill T

William H. Thiesen  
Atlantic Area Historian  
Commander (Ae), Coast Guard Atlantic Area  
431 Crawford Street, Portsmouth, VA 23704  
Office: 757-398-6643 Fax: 757-391-8109  
Web: <http://www.uscg.mil/history>

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Sent: Monday, August 06, 2007 8:14 AM

To: Thiesen, William Dr; Mastone, Victor (EEA); [Keith.Meverden@wisconsinhistory.org](mailto:Keith.Meverden@wisconsinhistory.org)

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Let me know if you have any questions and again, sorry for the delay.

-Bert

BERT HO  
NOAA/NOS/OCS/NSD/NRB/NRT-5-Northeast  
[bert.ho@noaa.gov](mailto:bert.ho@noaa.gov)  
(718)702-8974 cell 1  
(850)443-7058 cell 2  
[www.noaa.gov](http://www.noaa.gov)

**ATLANTIC HYDROGRAPHIC BRANCH  
EVALUATION REPORT to Accompany  
Survey F00545 (2007)**

This Evaluation Report has been written to supplement and/or clarify the original Descriptive Report. Sections in this report refer to the corresponding sections of the Descriptive Report.

**B. DATA ACQUISITION AND PROCESSING**

**B.1 DATA PROCESSING**

The following software was used to process data at the Atlantic Hydrographic Branch:

HSTP PYDRO version 8.6 r2361  
CARIS HIPS/SIPS version 6.1 SP1 HF 1-6  
CARIS Bathymetry Manager version 2.1 HF 1-13  
DKART INSPECTOR, version 5.0 Build 732 SP1  
CARIS HOM version 3.3 HF 8  
CARIS S57 Composer version 1.0 HF 1

**B.2. QUALITY CONTROL**

**B.2.1. H-Cell**

AHB created and finalized a depth grid at 75 centimeter resolution. This finalized grid was used to create a product surface grid with a resolution of three meters. The survey scale selected soundings were extracted from the 75 centimeter resolution at a scale of 1:5,000. The selected sounding set is approximately 10 to 20 times the number of charted depths at the largest scale chart available scale 1:10,000. The chart scale selected soundings are a subset of the survey scale selected soundings and sounding spacing is representative to the appropriate largest scale in the area. The surface model was referenced when selecting the chart scale soundings, to ensure that the selected soundings portrayed the bathymetry within the common area.

Depth curves were created from a three meter product surface grid. The three meter grid resolution product surface was generated at a scale of 1:5,000, generalization radius of 100 meters with no defocusing. The depth curves are forwarded to MCD for reference only. The curves were utilized during chart scale sounding selection and quality assurance efforts at AHB. The depth curves are incorporated into the S57 Blue Note deliverable.

The pre-compilation products or components (Stand Alone HOB files (SAHOB)) are detailed in the Pre-Compile Process Log attached at the end of this document. The SAHOB files included sounding selections (SOUNDG), features (SBDARE), depth curves (DEPCNT), meta objects (M\_COVR, M\_QUAL), depth areas (DEPARE), and

cartographic Blue Notes. The individual SAHOB files were inserted into one BASE Manager feature layer and exported to S57 format in order to create the H-Cell deliverable.

The completed H-Cell was exported as an H-Cell File (ENC 0.00) in S-57 format with all values in metric units. The metric equivalent ENC.000 file was then converted to NOAA chart units (ENC\_CU.000) with all values measured in feet following NOAA sounding rounding rules.

Chart compilation was performed by Atlantic Hydrographic Branch personnel in Norfolk, Virginia. Compilation data will be forwarded to Marine Chart Division, Silver Spring, Maryland.

The F00545 CARIS H-Cell final deliverables include the following products:

US5F00545_CU.000	1:10,000 Scale	F00545 H-Cell with Chart Scale Selected Soundings
US5F00545_SS.000	1:10,000 Scale	F00545 Selected Soundings (Survey Scale)
US5F00545_BlueNotes.000	1:10,000 Scale	F00545 Cartographic Notes and Depth Curves

### **B.2.2. Junctions**

Survey F00545 (2007) junctions with survey H10992 of 2003, in the same area. H10993 is already applied to the largest scale chart, Chart 13269. Present survey soundings are in agreement with the exception of a few isolated areas. F00545 data is more recent and should be used to supersede common depth areas of survey H10993.

## **C. VERTICAL AND HORIZONTAL CONTROL**

Final vertical correction processing was completed by the field unit with no additional correction required by Atlantic Hydrographic Branch. The field unit applied verified water levels in conjunction with the preliminary tidal zoning, which was accepted and approved by N/OPSI CO-OPS as the final zoning for F00545. Sounding datum is Mean Lower Low Water (MLLW). Vertical datum is Mean High Water (MHW).

Horizontal control used for this survey during data acquisition is based upon the North American Datum of 1983 (NAD83), UTM projection zone 19. Office ENC processing of this survey required translating the datum to meet S-57 ENC requirements.

## **D. RESULTS AND RECOMMENDATIONS**

### **D.1 CHART COMPARISON**

13269 (10th Edition, 02/06)  
 Corrected through NM 02/18/2006  
 Corrected through LNM 02/11/2006  
 Scale 1:10,000

13270 (62<sup>nd</sup> Edition, 06/06)  
Corrected through NM 06/24/2006  
Corrected through LNM 06/13/2006  
Scale 1:25,000

13267 (34<sup>th</sup> Edition, 05/06)  
Corrected through NM 05/26/2007  
Corrected through LNM 05/15/2007  
Scale 1:80,000

### **ENC Comparison**

US5MA15M  
Cohasset and Scituate Harbors  
Edition 10  
Update Application Date 2007-06-14  
Issue Date 2007-06-14  
References: Chart 13269

#### **D.1.1 Hydrography**

The charted hydrography originates with prior surveys and requires no further consideration. The hydrographer makes adequate chart comparisons in section “D” and Appendix 1&2 of the Descriptive Report.

#### **D.2. ADDITIONAL RESULTS**

##### **D.2.1. Aids to Navigation**

No aids were positioned by the field.

#### **D.3. MISCELLANEOUS**

Chart compilation was done by Atlantic Hydrographic Branch personnel, in Norfolk, Virginia. Compilation data will be forwarded to Marine Chart Division, Silver Spring, Maryland. See Section D.1. of this report for a list of the Raster Charts and Electronic Navigation Charts (ENC) used for compiling the present survey:

#### **D.4. ADEQUACY OF SURVEY**

The present survey is adequate to supersede the charted bathymetry within the common area. Any features not specifically addressed either in the H-Cell BASE Cell File or the Blue Notes should be retained as charted. Refer to the Descriptive Report for further recommendations by the hydrographer.

## AHB PRE-COMPILATION PROCESS

REGISTRY No.	F00545
PROJECT No.	OPR-A937-NRT5-07
FIELD UNIT	NRT 5
PRE-COMPILER	Bridget Williams
LARGEST SCALE CHART	F00545, Chart 13269, edition 10, 20060201
CHART SCALE	1: 10,000
SURVEY SCALE	1: 5,000
DATE OF SURVEY	06/25/2007-09/14/2007
CONTENT REVIEW DATE	June 17, 2008

<b>Components</b>	<b>File Names</b>
<i>Product Surface</i>	PS_F00545_5k_100mrad_3mres.hns
<i>Shifted Surface</i>	PS_F00545_5k_100mrad_3mres_Shifted.hns
<i>Contour Layer</i>	F00545_Contours
<i>Survey Scale Soundings</i>	F00545_SS_Soundings.hob
<i>Chart Scale Soundings</i>	F00545_CS_Soundings.hob
<i>ENC Retain Soundings</i>	N/A
<i>Feature Layer</i>	F00545_Features.hob
<i>Meta-Objects Layer</i>	F00545_MetaObjects.hob
<i>Blue Notes</i>	F00545_BlueNotes.hob

### SPECIFICATIONS:

- I. COMBINED SURFACE: N/A
  - a. Fieldsheet Location: H:\Compilation\F00545\_A397-NRT5\AHB\_F00545\E-SAR Final Products\GRIDS
- II. PRODUCT SURFACE (SOUNDINGS): N/A
  - a. SOUNDINGS DERIVED FROM: AHB\_F00545\_CUBE\_75cm\_Final
  - b. Depth
    - i. Minimum: 4.233 m
    - ii. Maximum: 24.017 m
- PRODUCT SURFACE (CONTOURS):
  - a. Scale: 1:5000
  - b. Radius: 100 m
  - c. Resolution: 5 m
- III. SHIFTED SURFACE:
 

Single Shift Value: -0.229 [-0.229m (feet), ( $\leq$  10 fathoms)]  
[-1.374 m (> 10 fathoms)]
- IV. CONTOUR LAYER:
  - a. Use a Depth List: F00545\_NOAA\_depth\_curves\_list.txt  
Depth List: 0.914, 1.829, 3.658, 5.486, 9.144, 18.288, 27.432
  - b. Output Options:
    - i. Create contour lines:

1. Line Object: DEPCNT
2. Value Attribute: VALDCO

- V. SOUNDING SELECTION:
- a. Selection Criteria:
    - i. Radius
    - ii. Shoal biased
    - iii. Use Single-Defined Radius: 10 distance on ground (m)
    - iv. Filter: Not applied

- VI. FEATURES:
- a. Brought in from Survey  
Total No. 10
  - b. Brought in from ENC  
ENC: US5MA15M  
Total No. 0

- VII. META-OBJECTS:
- a. M\_COVR attributes

Acronym	Value
INFORM	F00545
SORDAT	20070914
CATCOV	1
SORIND	US,US,survey,F00545

- b. M\_QUAL attributes

Acronym	Value
CATZOC	A2
INFORM	F00545, OPR-A397-NRT5-07, NRT 5
POSACC	10
SORDAT	20070914
SORIND	US,US,survey,F00545
SUREND	20070914
SURSTA	20070613
TECSOU	3 multibeam

- c. DEPARE attributes

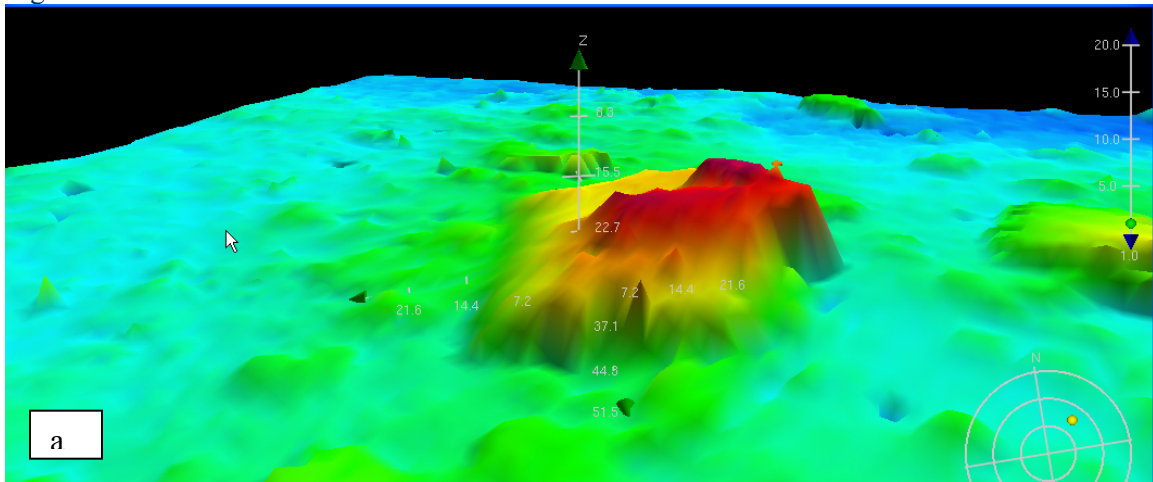
Acronym	Value
DRVALV 1	3.500m
DRVALV2	25.000m
SORDAT	20070914
SORIND	US,US,nsurf,F00545
INFORM	F00545

- VIII. NOTES:

Sounding Attribution:

QUASOU: 1: Depth Known TECSOU: 3: found by multibeam SORDAT: 20070914 SORIND: US,US,nsurf,F00545
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Figure 1.



Rock with least depth of 17ft, located at latitude 42-15-53.99N, longitude 070-45-45.43W (a). Chart 13269, edition 10, 20060201; the current sounding is at 27ft, the new sounding is depicted in red (b).



**APPROVAL SHEET**  
**F00545**

**Initial Approvals:**

The completed survey has been inspected with regard to survey coverage, delineation of depth curves, representation of critical depths, cartographic symbolization, and verification or disproval of charted data. All revisions and additions made to the H-Cell files during survey processing have been entered in the digital data for this survey. The survey records and digital data comply with National Ocean Service and Office of Coast Survey requirements except where noted in the Descriptive Report and the Evaluation Report.

All final products have undergone a comprehensive reviews per the Hydrographic surveys Division Office Processing Manual and are verified to be accurate and complete except where noted.

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**Bridget E. Williams**  
Hydrographic Intern  
Atlantic Hydrographic Branch

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**Edward A. Owens**  
Physical Scientist  
Atlantic Hydrographic Branch

I have reviewed the H-Cell files, accompanying data, and reports. This survey and accompanying Marine Chart Division deliverables meet National Ocean Service requirements and standards for products in support of nautical charting except where noted.

Approved: \_\_\_\_\_  
**Shepard Smith**  
Lieutenant Commander, NOAA  
Chief, Atlantic Hydrographic Branch