

H11079

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: **H11079**

LOCALITY

State: Massachusetts

General Locality: South Coast of Massachusetts

Sub-locality: Great Round Shoal

2004

CHIEF OF PARTY
CDR Emily B. Christman, NOAA

LIBRARY & ARCHIVES

DATE

HYDROGRAPHIC TITLE SHEET

H11079

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: **Massachusetts**

General Locality: **South Coast of Massachusetts**

Sub-Locality: **Great Round Shoal**

Scale: **1:20,000** Date of Survey: **8/26/04 to 11/02/04**

Instructions Dated: **06/17/04** Project Number: **S-B904-TJ-04**

Vessel: **NOAA Ship THOMAS JEFFERSON, S-222**

Chief of Party: **CDR Emily B. Christman, NOAA**

Surveyed by: **THOMAS JEFFERSON Personnel**

Soundings by: **Reson 8101 mutlibeam echosounder**
Reson 8125 multibeam echosounder

Graphic record scaled by: **N/A**

Graphic record checked by: **N/A**

Protracted by: **N/A** Automated Plot: **N/A**
Hewlett Packard Design Jet 2500 CP (office)

Verification by: **Atlantic Hydrographic Branch Personnel**

Soundings in: ***Feet* Meters at MLLW**

Remarks: ***Red, bold, italic notes in descriptive report were made during office processing.***

- 1) All Times are UTC.***
- 2) This is a Navigable Area Hydrographic Survey.***
- 3) Projection is UTM Zone 19.***

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**Data Filed with original field records.*

DESCRIPTIVE REPORT

to accompany
HYDROGRAPHIC SURVEY H11079

Scale of Survey: 1:20,000

Year of Survey: 2004

NOAA Ship THOMAS JEFFERSON
CDR Emily B. Christman, Commanding

A. AREA SURVEYED

This hydrographic survey was conducted in accordance with Hydrographic Survey Letter Instructions* for project S-B904-TJ-04, South Massachusetts Coast, Massachusetts. The original instructions are dated June 17, 2004.

This Descriptive Report pertains to sheet "D" of project S-B904-TJ-04. The assigned registry number for this sheet is H11079, as prescribed in the Letter Instructions. Due to poor weather conditions, acquisition was curtailed and 'blocked off' for an area with full multibeam echosounder coverage and partial side scan sonar coverage. Hydrographic data cleaning system (HDCS) side scan sonar and multibeam echosounder data acquired outside of this 'blocked' area were deleted.

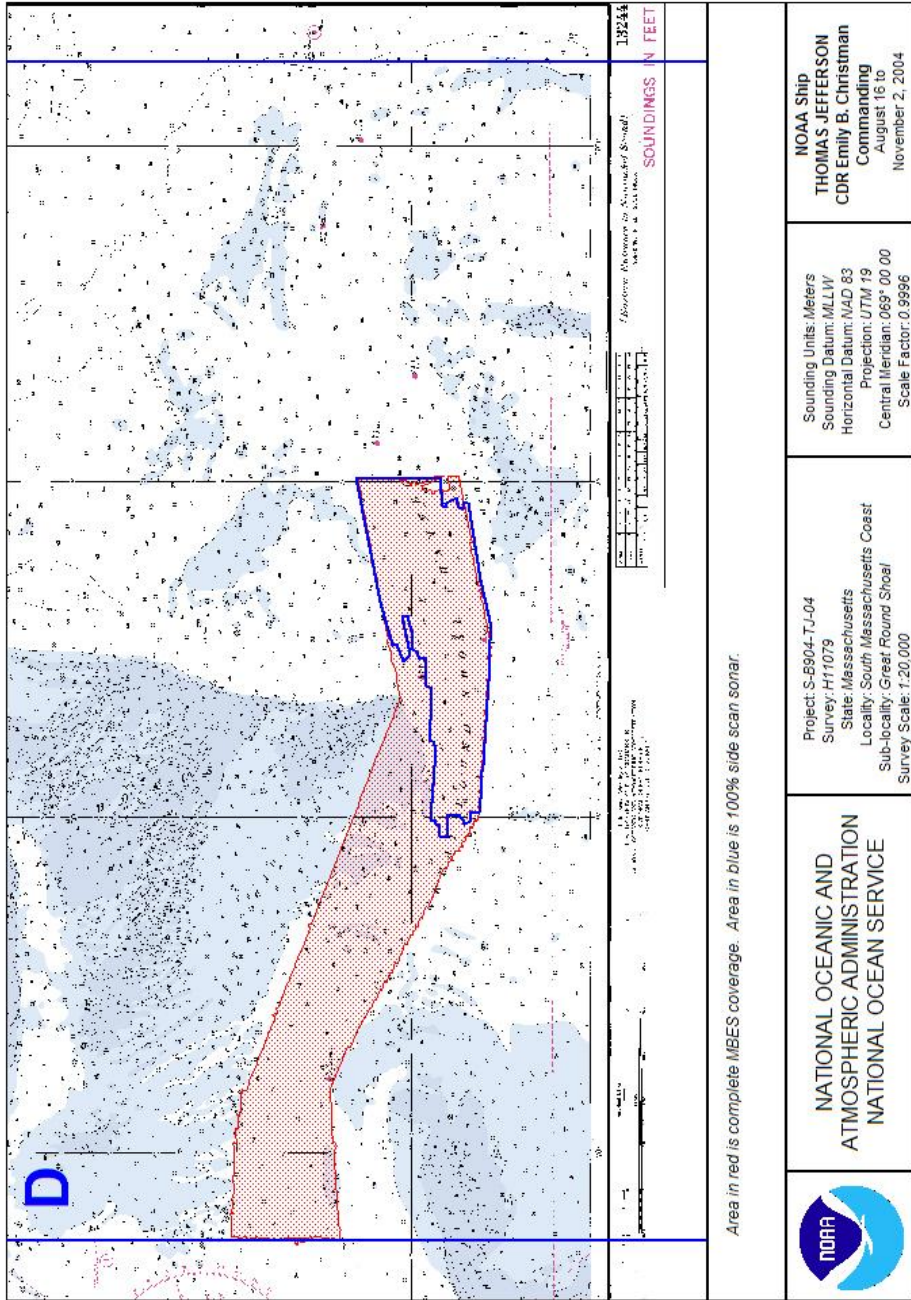
This project responds to requests from the U.S. Coast Guard and includes Quicks Hole, Edgartown Harbor and Great Round Shoal Channel. Quicks Hole is the only passage between Vinyard Sound and Buzzards Bay eastward of Cuttyhunk available for vessels of over 10-foot draft. This passage is narrow and tidal currents can approach a velocity of 3 knots. The latest hydrographic survey was accomplished in this passage in 1976 (Northern half).

Edgartown Harbor is an important destination for ferries both inter-island and those bound to and from Massachusetts mainland. Great Round Shoal Channel is used mainly by fishing vessels transiting between New Bedford to Georges Bank. This channel was last surveyed in 1957.

For complete survey limits, see the chartlet on the following page.

**Data Filed with original field records.*

Figure 1: Complete Survey Limits & Data Coverage



B. DATA ACQUISITION AND PROCESSING

EQUIPMENT *See also the Evaluation Report.*

Data were acquired by NOAA Ship THOMAS JEFFERSON, NOAA Launch 1005 and Launch 1014. Both launches are NOAA standard 8.5-meter aluminum Jensen vessels with a 0.5-meter transducer draft. NOAA Ship THOMAS JEFFERSON is a 63.4-meter hydrographic survey vessel with an average transducer draft of 4.6 meters.

THOMAS JEFFERSON acquired side scan sonar (SSS) data with a towed Klein 5000 system.

Launch 1005 acquired multibeam echosounder (MBES) data with a keel-mounted RESON Seabat 8101 shallow-water multibeam system.

Launch 1014 acquired MBES bathymetry data with a RESON Seabat 8125 shallow-water multibeam system.

All platforms acquired positioning and attitude data with an on-board TSS POS/MV (version 3) GPS-aided inertial navigation system. Refer to the 2004 Fall Data Acquisition and Processing Report (DAPR*) for details related to each individual vessel.

Sound velocity data were acquired by both platforms. Launches 1014 and 1005 each used a Sea-Bird SBE19+ SEACAT conductivity, temperature, and depth profiler.

There were no vessel configurations or changes to the Ship Vessel File (HVF) for this survey that are not included in the 2004 Fall DAPR. There were no survey-specific equipment problems on either survey launch. For all other acquisition or processing details related to this survey, refer to the 2004 Fall DAPR.

**Data Filed with original field records.*

QUALITY CONTROL

Side Scan Sonar Quality Control

There were no major faults with the SSS system which affected data integrity. Full side scan sonar coverage was not attained for the entire sheet due to time limitations. Full 100% SSS data* were acquired over the Eastern portion of this survey only. These data were acquired by THOMAS JEFFERSON. Daily confidence checks were performed by observing sand waves and other features in these data. *Concur.*

**Data Filed with original field records*

Shallow Water Multibeam Quality Control

There were no major faults with the MBES system which affected data integrity. Daily confidence checks examining the internal consistency of the MBES data* were made by comparing overlapping lines. Refer to this project's DAPR for detailed discussion of MBES system calibrations, data acquisition, and data processing.

MBES data were acquired over a period of 38 days. During this time there was very obvious movement of the sandwaves, horizontally and vertically (see figure 2). This survey is being submitted now rather than continuing acquisition next year due to this rapid bottom change in the survey area. Poor weather conditions caused the premature end of acquisition for the year. One area in the Eastern part of the sheet has minor gaps in MBES coverage. This MBES data gap overlaps the area of 100% SSS coverage. The hydrographer recommends updating the nautical charts based on the available data. *Concur.*

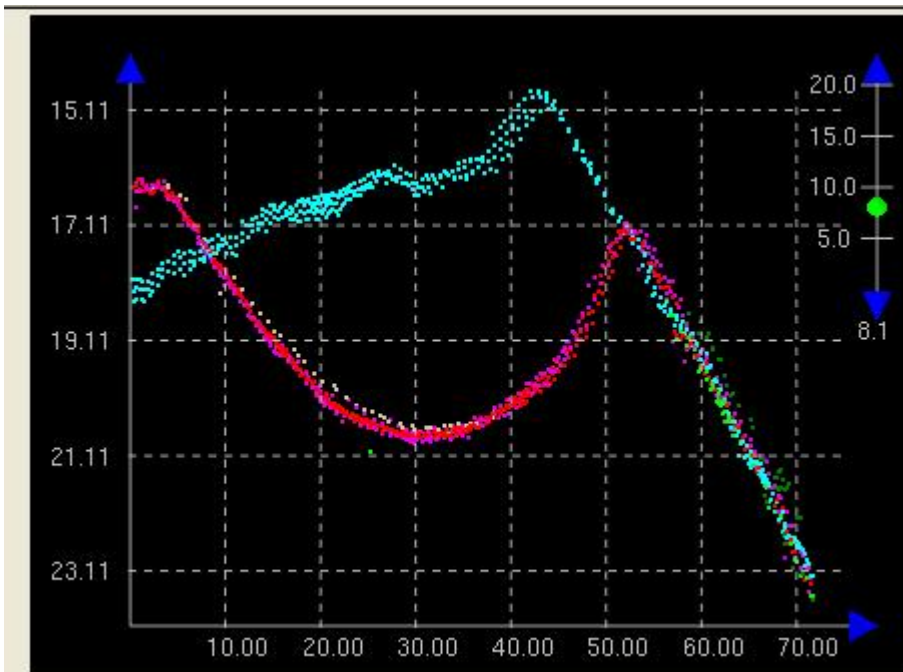


Figure 2: Bottom change on crest of sandwave over period of 21 days.

Crosslines *See also the Evaluation Report.*

Thirty nine nautical miles of crosslines (about 6% of the 565 nm of mainscheme MBES data) were acquired. No traditional crossline comparison was performed on the multibeam data because quality control procedures have been incorporated into the depth and uncertainty models produced by CARIS 5.4. Crosslines compared favorably for data acquired in a similar time period. Those main scheme data acquired significantly after the crosslines were acquired showed minor differences. No significant portion of this survey is without significant sandwaves. *Concur. No DTONs were found during office processing.*

Junctions

This survey does not junction with any contemporary surveys. *Concur.*

CORRECTIONS TO ECHO SOUNDING



All methods or instruments used were as described in the project DAPR. All sound velocity casts are included in the Pydro PSS. Sound velocity correctors were applied based on distance and time (four hours).

C. VERTICAL AND HORIZONTAL CONTROL

VERTICAL CONTROL

The tidal datum for this project is Mean Lower Low Water (MLLW). No temporary tide gauge was installed for this survey. The Nantucket, MA (844-9103) tide gauge was used for this survey.

A Request for Approved Tides letter was sent to N/OPS1 on November 5, 2004 (Appendix IV*). Verified tides from the N/OPS1 CO-OPS website for Nantucket, MA (844-9130) were downloaded and applied to all sounding data using preliminary zoning. Refer to the Fall 2004 DAPR for a summary of the methods used to determine, evaluate, and apply tide corrections to sounding data. *Verified tides using final tide zoning were re-applied by AHB.*

HORIZONTAL CONTROL

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

Horizontal position was determined using the Global Positioning System (GPS) corrected by U.S. Coast Guard differential GPS (DGPS) beacon stations. The primary DGPS beacon used for this survey was Acushnet (site ID = 772, transmission frequency = 306). Launch 1005 switched to Moriches, NY (site ID = 803, transmission frequency = 293) while solving POS/MV issues. No data were acquired while repairing the POS/MV. No horizontal control stations were established for this survey.

Horizontal dilution of precision (HDOP) was monitored daily on the ship and both launches. That value did not exceed 4.00, and adequate satellite coverage was maintained throughout the survey period.

D. RESULTS AND RECOMMENDATIONS *See also the Evaluation Report.*

CHART COMPARISON *See also the Evaluation Report.*

There are eight charts affected by this survey:

Table 1: Affected Charts

Number	Version	Edition Date	Scale
13244	39 th Ed.	03/30/2002	1:40,000
13237	39 th Ed.	05/01/2003	1:80,000
12300	44 th Ed.	07/01/2004	1:400,000
13200	33 rd Ed.	01/19/2002	1:400,000
13009	30 th Ed.	08/01/2002	1:500,000
13006	31 st Ed.	06/01/2003	1:675,000
5161	13 th Ed.	10/01/2003	1:1,058,400
13003	47 th Ed.	06/01/2003	1:1,200,000

General Agreement with Charted Soundings, Features, and Notes

Surveyed soundings showed significant change in some areas. Even the relatively brief period from the start and end of acquisition showed significant change. *Concur.*

Item Investigation Reports

Three Dangers to Navigation (Dton) were submitted November 8, 2004 for this survey in two separate e-mails (see Appendix I). There were no assigned AWOIS items for this survey. Four uncharted items are discussed in Appendix I. Some SSS contacts were selected to the East of this survey area but were not resolved. Although these SSS contacts are incorporated in the Pydro PSS, they are not addressed in this report, because they are outside the blocked survey area. *Concur.*

ADDITIONAL RESULTS

Prior Surveys

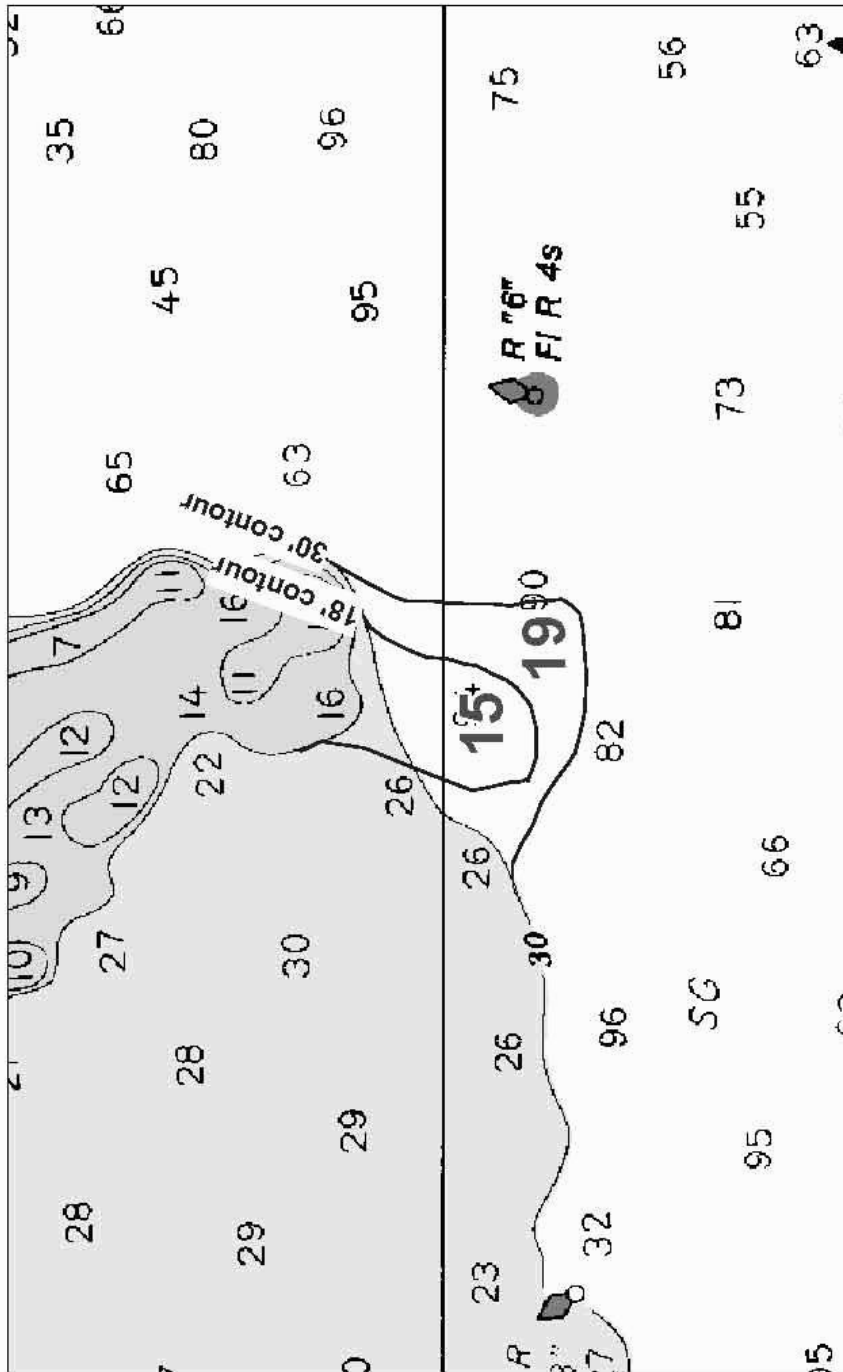
The survey overlaps two prior surveys:

Survey	Scale	Year
H08171	25,000	1954
H08409	20,000	1956

H11079 DToN Rev1

Subject: H11079 DToN Rev1
From: Marc Moser <marc.s.moser@noaa.gov>
Date: Mon, 08 Nov 2004 14:22:08 -0500
To: _NOS OCS MCD Navigation Dangers <mcd.dton@noaa.gov>
CC: Lyn Preston <Lyn.Preston@noaa.gov>, Emily B Christman
<Emily.B.Christman@noaa.gov>

Attached is the H11079 Dton including chartlet with suggested 18' and 30' contour changes.



11/8/2004
Rev. 1

NOAA Ship THOMAS JEFFERSON
DTON for H11079, S-B904-TJ-04
Great Round Shoal
including suggested changes for 18' and 30' contours

H11079 DtoNs

Registry Number: H11079
State: Massachusetts
Locality: South Coast of Massachusetts
Sub-locality: Great Round Shoal Channel
Project Number: S-B904-TJ-04
Survey Dates: 08/29/2004 - 10/10/2004

Charts Affected

Number	Version	Date	Scale
13244	40th Ed.	07/01/2005	1:40000
13237	39th Ed.	05/01/2003	1:80000
12300	45th Ed.	03/01/2005	1:400000
13200	34th Ed.	12/01/2005	1:400000
13009	31st Ed.	10/01/2004	1:500000
13006	32nd Ed.	02/01/2005	1:675000
5161	13th Ed.	10/01/2003	1:1058400
13003	48th Ed.	10/01/2004	1:1200000

Features

No.	Name	Feature Type	Survey Depth	Survey Latitude	Survey Longitude	AWOIS Item
1.1	2543/4	Shoal	4.73 m	041° 24' 56.538" N	69° 53' 27.539" W	---
1.2	520/93	Shoal	3.77 m	041° 25' 03.525" N	69° 53' 38.389" W	---
1.3	893/1	Shoal	5.89 m	041° 24' 54.771" N	69° 53' 16.095" W	---

1.1) Profile/Beam - 2543/4 from h11079 / 1005_mb / 2004-284 / 648_1410**DANGER TO NAVIGATION****Survey Summary**

Survey Position: 041° 24' 56.538" N, 69° 53' 27.539" W
Least Depth: 4.73 m
Timestamp: 2004-284.14:14:51.027 (10/10/2004)
Survey Line: h11079 / 1005_mb / 2004-284 / 648_1410
Profile/Beam: 2543/4
Charts Affected: 13244_1, 13237_1, 12300_1, 13200_1, 13009_1, 13006_1, 5161_1, 13003_1

Remarks:

Shoaling by shifting sand waves. Dton submitted 11/8/2004.

Feature Correlation

Address	Feature	Range	Azimuth	Status
h11079/1005_mb/2004-284/648_1410	2543/4	0.00	000.0	Primary

Hydrographer Recommendations

Chart as per digital data. Modify 30 foot contour.

Cartographically-Rounded Depth (Affected Charts):

15ft (13244_1, 13237_1)

2 ½fm (12300_1, 13200_1, 13009_1, 13006_1, 13003_1)

4.7m (5161_1)

S-57 Data

Geo object 1: Sounding (SOUNDG)

Attributes: INFORM - Shoaling by shifting sand waves. Dton submitted 11/8/2004.


Office Notes

Concur with clarification. The 15 ft. sounding is presently charted on chart 13244, 40th Ed. Jul/05. A 14 ft sounding located 3.6 mm at chart scale from this surveyed position takes charting precedence over the 15 ft sounding. Chart a 14 foot sounding in 41-24-59.241N Latitude, 69-53-31.813W Longitude.

1.2) Profile/Beam - 520/93 from h11079 / 1005_mb / 2004-283 / 615_2004

DANGER TO NAVIGATION

Survey Summary

Survey Position: 041° 25' 03.525" N, 69° 53' 38.389" W 
Least Depth: 3.77 m
Timestamp: 2004-283.20:04:57.983 (10/09/2004)
Survey Line: h11079 / 1005_mb / 2004-283 / 615_2004
Profile/Beam: 520/93
Charts Affected: 13244_1, 13237_1, 12300_1, 13200_1, 13009_1, 13006_1, 5161_1, 13003_1

Remarks:

Shoaling created by shifting sand waves. Dton submitted 11/8/2004.

Feature Correlation

Address	Feature	Range	Azimuth	Status
h11079/1005_mb/2004-283/615_2004	520/93	0.00	000.0	Primary

Hydrographer Recommendations

Chart per digital. Modify 30 foot contour.

Cartographically-Rounded Depth (Affected Charts):

12ft (13244_1, 13237_1)

2fm (12300_1, 13200_1, 13009_1, 13006_1, 13003_1)

3.7m (5161_1)

S-57 Data

Geo object 1: Sounding (SOUNDG)

Attributes: INFORM - Shoaling created by shifting sand waves. Dton submitted 11/8/2004.


Office Notes

Concur. The shoal depth has been applied to chart 13244, 40th Ed. Jul/05, retain as charted.

1.3) Profile/Beam - 893/1 from h11079 / 1005_mb / 2004-242 / 647_1838

DANGER TO NAVIGATION

Survey Summary

Survey Position: 041° 24' 54.771" N, 69° 53' 16.095" W 
Least Depth: 5.89 m
Timestamp: 2004-242.18:58:04.222 (08/29/2004)
Survey Line: h11079 / 1005_mb / 2004-242 / 647_1838
Profile/Beam: 893/1
Charts Affected: 13244_1, 13237_1, 12300_1, 13200_1, 13009_1, 13006_1, 5161_1, 13003_1

Remarks:

Shoaling created by shifting sand waves. Dton submitted 11/8/2004.

Feature Correlation

Address	Feature	Range	Azimuth	Status
h11079/1005_mb/2004-242/647_1838	893/1	0.00	000.0	Primary

Hydrographer Recommendations

Chart per digital. Modify 18 and 30 foot contour.

Cartographically-Rounded Depth (Affected Charts):

19ft (13244_1, 13237_1)

3 ¼fm (12300_1, 13200_1, 13009_1, 13006_1, 13003_1)

5.9m (5161_1)

S-57 Data

Geo object 1: Sounding (SOUNDG)

Attributes: INFORM - Shoaling created by shifting sand waves. Dton submitted 11/8/2004.

Office Notes



Concur. The shoal depth has been applied to chart 13244, 40th Ed. Jul/05, retain as charted.

H11079 Features Report

Registry Number: H11079
State: Massachusetts
Locality: South Coast of Massachusetts
Sub-locality: Great Round Shoal Channel
Project Number: S-B904-TJ-04
Survey Dates: 08/26/2004 - 08/29/2004

Charts Affected

Number	Version	Date	Scale
13241	16th Ed.	11/01/2005	1:40000
13244	40th Ed.	07/01/2005	1:40000
13237	39th Ed.	05/01/2003	1:80000
12300	45th Ed.	03/01/2005	1:400000
13200	34th Ed.	12/01/2005	1:400000
13009	31st Ed.	10/01/2004	1:500000
13006	32nd Ed.	02/01/2005	1:675000
5161	13th Ed.	10/01/2003	1:1058400
13003	48th Ed.	10/01/2004	1:1200000

Features

No.	Name	Feature Type	Survey Depth	Survey Latitude	Survey Longitude	AWOIS Item
1.1	start rips	Sounding	[None]	041° 24' 58.388" N	69° 52' 44.288" W	---
1.2	end rips	Sounding	[None]	041° 24' 33.269" N	69° 54' 28.566" W	---
1.3	6300/99	Sounding	34.72 m	041° 24' 33.367" N	69° 54' 38.669" W	---
1.4	3261/117	Sounding	22.32 m	041° 24' 51.471" N	69° 50' 39.911" W	---
1.5	259/81	Sounding	22.44 m	041° 24' 16.917" N	69° 54' 54.751" W	---

1.1) Profile/Beam - 3/1 from h11079 / 1005_dp / 2004-239 / 08262004

Survey Summary 

Survey Position: 041° 24' 58.388" N, 69° 52' 44.288" W
Least Depth: [None]
Timestamp: 2004-239.16:28:06.000 (08/26/2004)
DP Dataset: h11079 / 1005_dp / 2004-239 / 08262004
Profile/Beam: 3/1
Charts Affected: 13244_1, 13237_1, 12300_1, 13200_1, 13009_1, 13006_1, 5161_1, 13003_1

Remarks:

Start point of tide rips observed in area.

Feature Correlation

Address	Feature	Range	Azimuth	Status
h11079/1005_dp/2004-239/08262004	3/1	0.00	000.0	Primary

Hydrographer Recommendations

Chart per digital data.

S-57 Data

Geo object 1: Water turbulence (WATTUR)
Attributes: CATWAT - 4:tide rips

Office Notes

Concur. Defer to MCD Chart Update Services Branch for final recommendation of charting of tidal rip notations.

1.2) Profile/Beam - 2/1 from h11079 / 1005_dp / 2004-240 / 08272004

Survey Summary

Survey Position: 041° 24' 33.269" N, 69° 54' 28.566" W
Least Depth: [None]
Timestamp: 2004-240.13:38:02.000 (08/27/2004)
DP Dataset: h11079 / 1005_dp / 2004-240 / 08272004
Profile/Beam: 2/1
Charts Affected: 13244_1, 13237_1, 12300_1, 13200_1, 13009_1, 13006_1, 5161_1, 13003_1

Remarks:

Tide rips observed.

Feature Correlation

Address	Feature	Range	Azimuth	Status
h11079/1005_dp/2004-240/08272004	2/1	0.00	000.0	Primary

Hydrographer Recommendations

Chart per digital data.

S-57 Data

Geo object 1: Water turbulence (WATTUR)
Attributes: CATWAT - 4:tide rips

Office Notes

Concur. Defer to MCD Chart Update Services Branch for final recommendation of charting of tidal rip notations.

1.3) Profile/Beam - 6300/99 from h11079 / 1005_mb / 2004-240 / 676_1354

Survey Summary



Survey Position: 041° 24' 33.367" N, 69° 54' 38.669" W
Least Depth: 34.72 m
Timestamp: 2004-240.14:08:43.516 (08/27/2004)
Survey Line: h11079 / 1005_mb / 2004-240 / 676_1354
Profile/Beam: 6300/99
Charts Affected: 13244_1, 13237_1, 12300_1, 13200_1, 13009_1, 13006_1, 5161_1, 13003_1

Remarks:

Possible item identified with 100%sss and MBES.

Feature Correlation

Address	Feature	Range	Azimuth	Status
h11079/1005_mb/2004-240/676_1354	6300/99	0.00	000.0	Primary
h11079/s222_100/2004-240/103_1717	0001	15.26	267.4	Secondary

Hydrographer Recommendations

Chart per digital data.

S-57 Data

Geo object 1: Sounding (SOUNDG)
Attributes: INFORM - Possible item identified with 100%sss and MBES.


Office Notes



Do not concur, ~~there is~~ no feature present. Chart present survey soundings in the common area.

1.4) Profile/Beam - 3261/117 from h11079 / 1014_mb / 2004-242 / 052_1919

Survey Summary

Survey Position: 041° 24' 51.471" N, 69° 50' 39.911" W 

Least Depth: 22.32 m

Timestamp: 2004-242.19:30:05.874 (08/29/2004)

Survey Line: h11079 / 1014_mb / 2004-242 / 052_1919

Profile/Beam: 3261/117

Charts Affected: 13244_1, 13237_1, 12300_1, 13200_1, 13009_1, 13006_1, 5161_1, 13003_1

Remarks:

Rock identified with 100% SSS and RESON 8125 MBES.

Feature Correlation

Address	Feature	Range	Azimuth	Status
h11079/1014_mb/2004-242/052_1919	3261/117	0.00	000.0	Primary
h11079/s222_100/2004-242/002_1916	0001	10.02	356.5	Secondary

Hydrographer Recommendations

Chart per digital data.

Cartographically-Rounded Depth (Affected Charts):

73ft (13244_1, 13237_1)

12fm (12300_1, 13200_1, 13009_1, 13006_1, 13003_1)

22m (5161_1)

S-57 Data

Geo object 1: Sounding (SOUNDG)


Office Notes



Do not concur. A rock is present in both multibeam and sss, but is of insignificant height compared to surrounding soundings. Chart present survey soundings in the common area.

1.5) Profile/Beam - 259/81 from h11079 / 1005_mb / 2004-240 / 670_1605

Survey Summary

Survey Position: 041° 24' 16.917" N, 69° 54' 54.751" W 
Least Depth: 22.44 m
Timestamp: 2004-240.16:23:28.646 (08/27/2004)
Survey Line: h11079 / 1005_mb / 2004-240 / 670_1605
Profile/Beam: 259/81
Charts Affected: 13241_1, 13244_1, 13237_1, 12300_1, 13200_1, 13009_1, 13006_1, 5161_1, 13003_1

Remarks:

Items identified with 100% SSS and RESON 8101 MBES. Near RW"GRC" buoy (possible buoy block).

Feature Correlation

Address	Feature	Range	Azimuth	Status
h11079/1005_mb/2004-240/670_1605	259/81	0.00	000.0	Primary
h11079/s222_100/2004-242/100_1231	0001	5.60	304.3	Secondary
h11079/s222_100/2004-242/100_1231	0004	28.56	326.6	Secondary

Hydrographer Recommendations

Chart per digital data.

Cartographically-Rounded Depth (Affected Charts):

73ft (13241_1, 13244_1, 13237_1)

12fm (12300_1, 13200_1, 13009_1, 13006_1, 13003_1)

22m (5161_1)

S-57 Data

Geo object 1: Sounding (SOUNDG)


Office Notes



Do not concur. Feature is present in mb and sss, is not the nearby buoy block, but is of insignificant height compared with nearby depths. Chart present survey soundings in the common area.

The survey area was previously surveyed with only lead lines and single beam echosounder data without the aid of differential GPS. Note that survey acquisition for these prior surveys were also hampered by bad weather. This present survey is adequate to supersede all charted depths in the common area. *Concur.*

Aids to Navigation and Other Detached Positions

Aids to navigation were positioned with detached positions. These aids to navigation were within 50 meters of charted positions. *Concur.*  *Refer to Marine Chart Division (MCD) Update Services Branch for charting recommendations for Aids to Navigation.*

Bridges and Overhead Cables

There were no bridges or overhead cables in the survey area to be considered. *Concur.*

Ferry Routes

There were no ferry routes in the survey area to be considered. *Concur.*

Submarine Cables and Pipelines

There were no submarine cables or pipelines in the survey area to be considered. *Concur.*

E. APPROVAL SHEET

**S-B904-TJ-04
South Massachusetts Coast, MA**

**Great Round Shoal
Survey Registry No. H11079**

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

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

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

- SEPARATES TO ACCOMPANY PROJECT S-B904-TJ-04, SHEET D, H11079
- DATA ACQUISITION AND PROCESSING REPORT (*dated <pending>; submitted <pending>*)
- HORIZONTAL AND VERTICAL CONTROL REPORT (*dated <pending>; submitted <pending>*)

Respectfully Submitted:



LT Marc S. Moser, NOAA
Field Operations Officer

Approved and Forwarded:



CDR Emily B. Christman, NOAA
Commanding Officer



TIDE NOTE FOR HYDROGRAPHIC SURVEY

DATE: March 1, 2005

HYDROGRAPHIC BRANCH: Atlantic
HYDROGRAPHIC PROJECT: S-B904-TJ-2004
HYDROGRAPHIC SHEET: H11079

LOCALITY: Great Round Shoal Channel, MA

TIME PERIOD: August 26 - November 2, 2004

TIDE STATION USED: 844-9130 Nantucket Island, MA
Lat. $41^{\circ} 17.1'N$ Lon. $70^{\circ} 05.8'W$

PLANE OF REFERENCE (MEAN LOWER LOW WATER): 0.000 meters
HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 0.985 meters

REMARKS: RECOMMENDED ZONING

Use zone(s) identified as: SCM159, SCM160, SCM164, SCM165,
NA314, NA332, NA333, NA334, NA334A, NA352, NA353, NA354,
NA355, NA356, NA374, NA375 & NA376

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 new 1983-2001 National Tidal Datum
Epoch (NTDE).

Thomas V. Mero 3/8/05

CHIEF, REQUIREMENTS AND DEVELOPMENT DIVISION




ATLANTIC HYDROGRAPHIC BRANCH EVALUATION REPORT FOR H11079 (2004)

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 Equipment

The following software was used to process and review data at the Atlantic Hydrographic Branch (AHB):

CARIS HIPS/SIPS version 6.0 service pack 2
CARIS BASE Editor 1.0
CARIS HOM 3.3 service pack 3
PYDRO, version 6.4.9 HF 12
dKart Inspector 5.0 build 707 

B.2 Crosslines

The field unit acquired the required amount of cross line data for quality assurances and system assessment as specified in the NOS Hydrographic Surveys Specifications and Deliverables (NOS HHSSD), 2003 Edition, but did not perform the traditional CARIS Checkline QC. In lieu of the Checkline QC, visual inspection of the Standard Deviation layer in BASE Surface was performed. This method does not technically meet the conventional standards set forth in the NOS HHSSD. However, an OCS and Hydrographic Surveys Division (HSD) memorandum from Captain Parsons, dated 12/11/03, has given approval that NOAA field units vary from the established procedures and documentation with respect to CARIS HIPS 5.4 BASE Surface processing methods.

B.3 HOM Processing

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

H-Cell layers and attributes

One H-cell was created covering the entire survey area for chart 13244 at a 1:40,000 scale. H-cell layers in CARIS HOM are organized as follows:

Layer 100	Sounding Objects, survey scale
Layer 200	Skin of the Earth
Layer 300	Seabed area (Bottom Descriptions or Characteristics)
Layer 310	Tide Rip Notations
Layer 600	Metadata Objects



Attributes:

Inform: H11079, S-B904-TJ-04, NOAA Ship Thomas Jefferson, CDR Emily B. Christman
 SorDat: 20041102
 SorInd: US,US,graph,H11079

H-Cell generation

In the office a 2m combined finalized BASE surface was created from the multibeam data using 0.5m, 1.0m and 2.0m office generated BASE surfaces at 1:20000 survey scale. Survey scale sounding data set is normally extracted from the survey surface at the survey scale of 1:20000. The 1:20000 scale sounding set was not used because the sounding density could not account for the environmental variability of the survey area. As a result, a sounding data set was extracted from the 2m combined finalized surface with a sounding spacing of 5mm at 1:10000 scale.

Shoal biased chart scale sounding compilation was accomplished through the CARIS HOM sounding suppression routine using the table (0,999, 20m). However, the sounding suppression routine could not properly attribute soundings due to the dramatic environmental variability of the survey area and left areas devoid of soundings. As a result, chart scale soundings were selected, edited and finalized by hand in areas of dramatic environmental variability. Soundings were checked for conflicts, corrected to remove conflicts, and edited to allow for proper sounding compilation placement with respect to existing charted depths outside the survey area.

Seabed classified s (seafloor descriptors or characteristics) were transferred to the H-cell from the raster chart. Bottom samples that were classified as seabed area with the acronym NATSUR are visible in the H-cell as an S-57 object: NATSUR (nature of surface) - IE - mud, sand, rock. However, those seafloor descriptions that were classified seabed area with the acronym NATQUA are NOT visible in the  cell as a separate S-57 object, thus you do not know where an area is classified hard, etc. In the H-cell: NATQUA (nature of surface – qualifying terms) IE – hard, soft, sticky.

Contour and Depth Area Feature Objects

Contours were created for this H-Cell based on HSD H-Cell Specifications (December 2006) ~~which has yet to be approved.~~ A single depth area was created covering the entirety of the survey area ranging in depth from 0m to 999m.

H-Cell Processing

Before the M file was exported to S-57 format, the file was converted from metric to NOAA chart values. This conversion renames the DRVAL1 and DRVAL2 attributes (for depth areas) and VALDCO attributes (for the contours) from the metric equivalent values to the standard NOAA chart contour values to accommodate NOAA traditional rounding standards on charts. ~~This renaming convention assures all soundings fall on the shoal side of the properly charted contour.~~

Soundings during HOM processing were selected with the CARIS GIS Environmental Variable set to a metric scale (-1,-1,T) to accommodate millimeter precision of the sounding value. This environmental variable was reset to NOAA standard charting values (0,0,N) to convert the metric sounding values to whole feet.

The completed H-Cell was exported as a Base Cell File (ENC.000) in S-57 format with all values in metric units. The metric equivalent ENC.000 file was then converted to NOAA chart values (ENC_CU.000) with all values measured in feet.

dKart Inspector

The final ENC_CU.000 file was examined using dKart Inspector. Warnings received were all inconsequential. The DSPM.HUNI and DSPM.DUNI were reported to have illegal values, but these errors were expected as originating during ENC conversion to NOAA chart values, so they can be ignored. Reported by dKart was the warning a seabed area has inconsistent qualifiers between natsur and natqua. This result was expected as one seabed area brought forward from the chart was classified hard. The classification 'hard' has no nature of surface attribute to accompany the natqua 'hard' so the natsur used is 'unknown'. ~~This will generate a warning every time.~~ This warning should be recorded among those that can be ignored in future surveys.

C. VERTICAL AND HORIZONTAL CONTROL

Office processing of this survey as an ENC required translating the datum to meet S-57 ENC requirements. During CARIS HOM processing the horizontal geodetic datum was translated from the survey datum (NAD UTM Zone 19) to Latitude and Longitude (LLDG) World Geodetic System-84 (WGS-84) prior to exporting the HOM file to the S-57 format. The S-57 ENC format serves as the exchange file submitted to the Marine Chart Division.



Final tides were received at AHB in March, 2005 and reapplied to the survey during office processing.

D. RESULTS AND RECOMMENDATIONS

D.1. CHART COMPARISONS

13244 40th Ed., Jul. /05


Corrected through NM Jul. 30/05

Corrected through LNM Jul. 26/05



Hydrography

The charted hydrography originates with prior surveys and requires no further consideration. The hydrographer makes adequate chart comparisons in Section D. of the Descriptive Report. The following should be noted:

1) It is recommended an additional notation Tide Rips be charted in 41°24'54.114"N Latitude, 69°53'08.886"W Longitude. 

2) It is recommended an additional notations Sand Waves be charted in 41°25'30.601"N Latitude, 69°54'57.673"W Longitude and 41°25'09.063"N Latitude, 69°54'55.320"W Longitude.

3) The Great Round Shoal is a natural feature that changes frequently and rapidly. Observations from the field unit show that the shape and least depth of this shoal changed dramatically over a 21 day period (H11079 Descriptive Report, Pg 4, Figure 2). The office processor recommends adding a note to the chart alerting the mariner of this hazard to navigation. Defer final charting recommendations to Marine Chart Division, Update Services Branch.

4) Evidence of shoaling was observed in the vicinity of 41°25-09.089" N, 69°55-28.897" W. The 30 foot contour has migrated approximately 500m to the south. The office processor recommends charting present survey soundings in the common area.

5) A charted 30-foot shoal in the vicinity of 41°25-55.687" N, 70°00'19.723" W has migrated out of the survey area, leaving only two small regions shoaler than 30 feet. These shoals are located in the vicinity of 41°25-57.019" N, 70°00-18.618" W and 41°25-58.692" N, 70°00'05.265" W. The office processor recommends charting present survey soundings in the common area.

It is also recommended the 60 ft and 120 ft contours be added to this chart. The addition of these depth contours would assist in navigation and help better define the

environmental variability of the area. In addition, the recommended locations of the two tide rip notations correspond with areas with deep soundings below 120 ft., so the addition of the 60 and 120 ft contours would highlight and bring the attention of the mariner to such areas of concern.

Comparison with Prior Surveys

A comparison with prior surveys was not done during office processing in accordance with section 4. of the memorandum titled "Changes to Hydrographic Survey Processing", dated May 24, 1995.

Junctions

There were no surveys to junction with H11079.

Adequacy of Survey

Except as noted above, the present survey is adequate to supersede the charted hydrography within the common area. This is an adequate hydrographic/multibeam/side scan sonar survey. No additional field work is recommended.

Bryan Chauveau

Bryan Chauveau
Physical Scientist
Verification of Data
Evaluation and Analysis Report

APPROVAL SHEET
H11079

The completed survey has been inspected with regard to survey coverage, delineation of depth curves, development of critical depths, cartographic symbolization, and verification or disproof 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 NOS requirements except where noted in the Evaluation Report.

Bryan Chauveau

Date: 2/5/07

Bryan Chauveau
Physical Scientist,
Atlantic Hydrographic Branch

All final products have undergone a comprehensive review as per the Atlantic Hydrographic Branch Processing Manual and are verified to be accurate and complete except where noted in the Evaluation Report.

Date: _____

Helen Stewart
Physical Scientist,
Atlantic Hydrographic Branch

I have reviewed the Base Cell files, accompanying data, and reports. This survey and accompanying Marine Chart Division deliverables meet or exceed NOS requirements and standards for products in support of nautical charting except where noted in the Evaluation Report.

Approved: _____ Date: _____
Commander P. Tod Schattgen, NOAA
Chief, Atlantic Hydrographic Branch