

**H10563**

NOAA FORM 76-35A

U.S. DEPARTMENT OF COMMERCE  
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION  
NATIONAL OCEAN SERVICE

**DESCRIPTIVE REPORT**

Type of Survey ..... **HYDROGRAPHIC /  
SIDE SCAN SONAR** .....

Field No. .... **WH-10-7-94** .....

Registry No. .... **H-10563** .....

**LOCALITY**

State ..... **MASSACHUSETTS** .....

General Locality ..... **VINEYARD SOUND** .....

Sublocality ..... **LUCAS SHOAL** .....

19 94

CHIEF OF PARTY

..... **CDR. J. D. WILDER, NOAA** .....

**LIBRARY & ARCHIVES**

DATE ..... **JAN 22 1996** .....

**HYDROGRAPHIC TITLE SHEET**

H-10563

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

FIELD NO.

WH-10-7-94

State Massachusetts

General locality Vineyard Sound

Locality Lucas Shoal and Vicinity

Scale 1:10,000 Date of Survey Aug. 21, 94 - Sept. 9, 94

Instructions dated FEBRUARY 23, 1993 Project No. OPR-B616-WH

Vessel NOAA SHIP WHITING S-329 EDP#2930

Chief of Party CDR JOHN D. WILDER

Surveyed by CDR. J.D. WILDER, LCDR S.R. BARNUM, LT W.G. KITT, LTJG E.W. BERKOWITZ, ENS K. PAVELLE, ENS J. MICHALSKI, ENS C. PARRISH, F.R. CRUZ, J. GASKIN, M. CISTERNELLI, B.C. DETRICH

Soundings taken by echo sounder DSF-6000N

Graphic record scaled by WHITING SURVEY PERSONNEL

Graphic record checked by WHITING SURVEY PERSONNEL

Protracted by N/A Automated plot by ENCAO NOVAJET III PLOTTER - (AHB) HP 7959B, BRUNING - (FIELD)

Verification by ATLANTIC HYDROGRAPHIC BRANCH PERSONNEL

Soundings in MLLW DATUM AND DEPTHS IN UNITS OF METERS FEET

REMARKS: TIME ZONE USED, 0 (UTC)

200% SIDE SCAN COVERAGE

NOTES IN THE ORIGINAL DESCRIPTIVE REPORT WERE MADE IN RED INK DURING OFFICE PROCESSING.

*DSR 12-17-96  
1-24-96*

*AWOIS and Surf ✓ RWD 1/24/96*

DESCRIPTIVE REPORT TO ACCOMPANY  
HYDROGRAPHIC SURVEY  
OPR-B616-RU/WH  
WH-10-7-94  
1994  
H-10563

NOAA SHIP WHITING  
CDR John D. Wilder, NOAA  
Commanding Officer

**A. PROJECT**

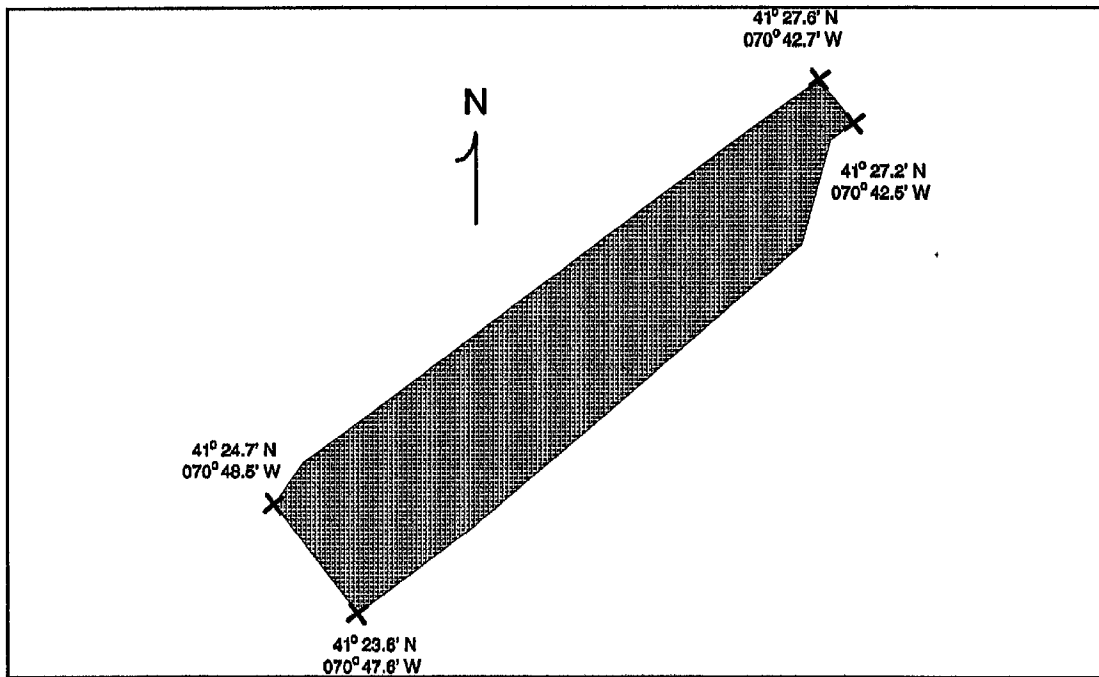
Project OPR-B616-RU/WH is a multi-year project encompassing Buzzards Bay Nantucket Sound, and Vineyard Sound, Massachusetts. WHITING is conducting basic hydrographic surveys along a corridor in Nantucket and Vineyard Sounds, with 200 percent side scan sonar (SSS) bottom coverage to the five-meter depth curve and continued echosounder coverage to the two-meter depth curve.

Project OPR-B616-RU/WH is divided into thirteen survey sheets. The survey described in this report was designated "F" Sheet, Lucas Shoal, and assigned field sheet number WH-10-7-94 and registry number H-10563.

Survey operations were conducted in accordance with Hydrographic Project Instructions OPR-B616-RU/WH, Buzzards Bay, Nantucket and Vineyard Sounds, Massachusetts, dated February 23, 1994, Change NO. 1 dated March 9, 1994 and change NO. 2 dated August 4, 1994. The Whiting also had verbal approval from Lt. John Humphrey, N/CG241 to change the southern and the southwest limits to the 60-foot contour. Survey H-10563 is registered as a 1:10,000 scale and all data acquired meet the accuracy requirements for a 1:10,000 scale survey.

**B. AREA SURVEYED**

Hydrographic survey H-10563 covers Lucas Shoal and the surrounding area. The figure that follows shows the approximate survey area.



WH-10-7-94, SHEET F, H-10563

Survey operations began on August 21, 1994 (DN 233) and ended on September 9, 1994 (DN 252). Data were acquired on the following days:

<u>DN</u>	<u>Date</u>
233	August 21, 1994
235	August 23, 1994
238	August 26, 1994
239	August 27, 1994
240	August 28, 1994
241	August 29, 1994
242	August 30, 1994
243	August 31, 1994
244	September 1, 1994
245	September 2, 1994
250	September 7, 1994
251	September 8, 1994
252	September 9, 1994

**C. SURVEY VESSELS**

NOAA launch 1014 (VESNO 2932), launch 1015 (VESNO 2931), and NOAA Ship WHITING (VESNO 2930) were used for side scan sonar and sounding-data acquisition.

No unusual vessel configurations were used.

D. AUTOMATED DATA ACQUISITION AND PROCESSING - SEE ALSO EVALUATION REPORT

Survey data acquisition and processing were accomplished using the HDAPS system with the software listed on the next page:

<u>Program</u>	<u>Version</u>	<u>HDAPS Date</u>
BACKUP	2.00	27-Oct-93
BASELINE	1.14	07-Apr-93
BIGABST	2.07	01-Oct-93
BIGAUTOST	3.01	01-Feb-93
BLKEDIT	2.02	11-Mar-93
CARTO	2.13	29-Mar-94
CLASSIFY	1.05	22-Nov-93
CONTACT	2.34	29-Mar-94
CONVERT	3.63	26-Jul-94
DAS_SURV	6.70	01-Apr-94
DIAGNOSE	3.04	16-Mar-94
DISC_UTIL	1.00	01-Feb-93
DP	2.15	25-Jul-94
DPCONVERT	1.01	07-Jun-94
DSNEDITS	1.02	26-Jul-94
EXCESS	4.31	17-Aug-94
FILESYS	3.24	01-Apr-94
GRAFEDIT	1.06	16-Nov-93
HIPSTIC	1.01	28-Jul-93
HPRAZ	1.26	22-May-93
INVERSE	2.01	07-Apr-93
LISTDATA	1.02	19-Apr-93
LOADNEW	2.10	18-Feb-94
LSTAWOIS	3.07	29-Mar-94
MAINMENU	1.20	02-Nov-93
MAN_DATA	2.01	07-Apr-93
NEWPOST	6.12	05-Jul-94
PLOTALL	2.30	17-Aug-94
POINT	2.10	24-Sep-93
PREDICT	2.01	07-Apr-93
PRESURV	7.09	15-Jun-94
PRINTOUT	4.04	26-Jul-94
QUICK	2.05	01-Apr-94
RAMSAVER	1.02	07-Apr-93
REAPPLY	2.11	21-Apr-94
RECOMP	1.02	01-Feb-93
SCANNER	1.00	10-Jul-93
SELPRINT	2.05	07-Jun-94
SYMBOLS		01-Feb-93
VERSIONS	1.00	24-Nov-93
ZOOMEDIT	2.30	24-Aug-94

Program SHIPDIM (version 1.2) was used for DGPS performance checks. Sound velocity corrections were determined using programs CAT (version 2.00) and VELOCITY (version 2.10).

There were no nonstandard automated acquisition or processing

methods used.

#### E. SIDE SCAN SONAR EQUIPMENT

Side scan sonar (SSS) operations were conducted using an EG&G model 260 slant-range corrected SSS recorder and an EG&G 272-T dual-channel, single-frequency towfish. The towfish was operated on the 100-kHz frequency and was configured with a 20° beam depression. Serial numbers (S/N) for the side scan sonar equipment used throughout the survey are listed below:

<u>Vessel</u>	<u>SSS Towfish S/N</u>	<u>260 Recorder S/N</u>
WHITING (2930)	016699	016670
Launch 1014 (2932)	016630	016671
Launch 1015 (2931)	016835	016942

On WHITING, the SSS towfish was deployed from a Reuland winch (model number 8377-XF5461A, S/N 814861A-1) using armored cabling in conjunction with an A-frame on the stern. The armored cable was connected to the SSS recorder via a slip-ring assembly.

On launches 1014 and 1015, the SSS towfish was deployed using a Superwinch Model W115 in conjunction with an adjustable davit arm on the stern of each launch. The SSS towfish was towed with vinyl-coated Kevlar cable and was connected to the recorder via a slip ring assembly.

Side scan sonar data were collected utilizing the 75-meter range and 100-meter scales. In order to acquire the required 200% SSS coverage, main-scheme lines were run at a spacing of 60 and 75-meters. Adequate coverage was determined by producing an 'A' and 'B' swath plot and ensuring 100% coverage on each plot. Main scheme lines were split or re-run in all areas where 200% coverage was questionable due to a degraded sonargram. Degraded sonargrams were usually caused by surface noise or propeller wash in shallow water areas.

The SSS towfish was maintained at a height off the bottom of 8 to 20 percent of the range scale in use. SSS operations were limited to a speed-over-ground of 6.0 knots.

Confidence checks were performed on a routine basis, primarily by noting changes in bottom texture on the outer edges of the sonargram.

All significant contacts were measured off the sonargrams and entered into an HDAPS contact table. WHITING hydrographers determined contact heights, positions, and cross-reference correlations using the HDAPS Contact Utility Program. The items were then further examined by echosounder investigation. Refer to Section N. and Separate V for more information. *DATA FILED WITH FIELD RECORDS*

## F. SOUNDING EQUIPMENT

Raytheon Digital Survey Fathometer (DSF) 6000N echo sounders were used to measure bottom depths during the survey. The DSF 6000N produced a graphic record of the high frequency (100 kHz) and low frequency (24 kHz) bottom depths. Digital depths from the high frequency and low frequency beams were recorded by the HDAPS acquisition system. High frequency depths were selected as the primary depths and are shown on the sounding plots. Echograms were carefully reviewed for significant features along the track line. Any features on the graphic record that were not selected as primary soundings were manually inserted.

Electronic technicians performed accuracy checks and preventive maintenance on all of the DSF-6000N echosounders used. As a result, the echosounder on WHITING (S/N A112N), launch 1014 (S/N C076), and launch 1015 (S/N A105N) operated throughout the survey period without any major problems.

## G. CORRECTIONS TO SOUNDINGS

Sound velocity profiles of the water column were determined using a Seacat Conductivity, Temperature and Depth (CTD) profiler (model SBE-19, S/N 286). The CTD's annual calibration was performed on December 17, 1993.

A Data Quality Assurance (DQA) test was performed during each CTD cast by using a hydrometer and a thermometer to measure the density and temperature of a surface water sample. Program CAT compared these values to the Seacat's surface values to confirm that the velocity probe was working properly. There were no variations in instrument initials.

After each CTD cast, programs CAT (version 2.00) and VELOCITY (version 2.10) were used to process the data, to select significant data points, and to create a corrector table for each vessel. The velocity correctors were manually entered into each HDAPS velocity table. Velocity profile data are in the Separates submitted with this survey. Three velocity casts were conducted for H-10563 in 1994:

<u>DN</u>	<u>Vel.Table#</u>	<u>Latitude</u>	<u>Longitude</u>	<u>Depth</u>
233	36 & 37	41 25'57" N	070 45'56" W	28.0M
238	40 & 41	41 26'15" N	070 45'45" W	31.3M
249	42 & 43	41 25'03" N	070 43'39" W	37.4M

All sounding corrections were applied to both the narrow (100 kHz) and wide (24 kHz) DSF-6000N beams.

Bar checks were performed on launch 1014 and launch 1015 in accordance with the requirements stated in the Field Procedures

Manual (FPM). No corrections to soundings were applied based on bar check data.

Leadlines were made on April 10, 1993. Calibrations were performed on March 17, 1994 and the leadline error was negligible. A leadline/DSF-6000N comparison was performed on WHITING on June 26, 1994 (DN 177) and on July 20, 1994 (DN 201). On average, the leadline reading was less than 0.1 meters deeper than the high frequency digitized reading and less than 0.2 meters shoaler than the low frequency digitized reading. No corrections for the differences were applied to the survey data. All leadline/DSF-6000N comparisons performed during H-10563-498 are on file at AHS. DATA FILED WITH FIELD RECORDS

The correction for the static draft for launches 1014 and 1015 is 0.55 meters, as measured on July 28, 1993. The correction for WHITING's static draft is 3.2 meters, a historical value that WHITING divers confirmed by pneumatic depth gauge on May 20, 1993.

Settlement and squat measurements for launch 1014 (Offset Table 2) and launch 1015 (Offset Table 1) were conducted and correctors determined on April 4, 1994. The correctors were applied in real time throughout the survey. Settlement and squat measurements for WHITING (Offset Table 9) were conducted and correctors determined on November 10, 1993. The settlement and squat correctors were applied to the sounding data in real time on each survey platform. Settlement and squat corrector tables are in Separate IV.

For data acquired by WHITING, the HDAPS data acquisition computer logged heave data from a Datawell b/v heave, roll, and pitch sensor (HIPPY, S/N 19109-C). Heave correctors were applied in post-processing. Heave correctors were applied during post processing for launches 1014 and 1015 by manually scanning the echograms.

The tidal datum for this project is Mean Lower Low Water. The operating tide station at Newport, Rhode Island (845-2660) served as the reference station for predicted tides. The Survey area falls within two tide correction zones, the zones were averaged and the following corrections were applied:

	<u>Time Correction</u>	<u>Height Ratio</u>
High Water:	0 hr +48 min	x0.70
Low Water:	0 hr +48 min	x0.70

Tidal data used during data acquisition were taken from Table 2 of the East Coast of North and South America Tide Tables and were applied to the digital data during acquisition by HDAPS. Digital tidal data were received on floppy disk from N/CG24, Hydrographic Surveys Branch.



WHITING installed and leveled two ADR tide gauges for datum control on H-10563: one at the Vineyard Haven, MA (844-8157) and one at Cape Higgon, MA (844-8533). NOAA Ship Rude installed and leveled a tide gauge at Menemsha, Ma (844-8725). The tide note is on file at AHS. The request for smooth tides was submitted to the Product and Services Branch, N/OES231, Datums Section, on September 15, 1994. APPROVED TIDES AND ZONING WERE APPLIED DURING OFFICE PROCESSING

#### H. CONTROL STATIONS - SEE ALSO EVALUATION REPORT

The horizontal datum for this project is the North American Datum of 1983 (NAD 83). Two B-order horizontal control stations were used as DGPS reference stations for this survey: Montauk Point, New York and Portsmouth Harbor, New Hampshire. The adjusted NAD 83 positions, computed by GPS methods are as follows:

	<u>Latitude</u>	<u>Longitude</u>	<u>Frequency</u>
Montauk Point	41°04'02.088"N	071°51'38.484"W	293 kHz
Portsmouth Harbor	43°04'15.066"N	070°42'36.804"W	288 kHz

#### I. HYDROGRAPHIC POSITION CONTROL

A Differential Global Positioning System (DGPS) was used as the navigation system for this survey. WHITING used two Ashtech Sensor GPS receivers with two Communications Systems International, Inc. (CSI) model MBX1 differential radio receivers supplying correctors for DGPS navigation. Launches 1014 and 1015 used a similar system, but with only one Ashtech/CSI set each. Ashtech receivers were initialized by HDAPS and CSI receivers were initialized with CSI firmware via controls on the front of each unit. On board WHITING, only one DGPS receiver drawer sent navigational output to HDAPS; the secondary drawer was used in conjunction with the primary drawer for DGPS performance checks.

DGPS positioning was accomplished in accordance with the FPM, section 3.4. Horizontal Dilution of Precision (HDOP) limits were computed as required in section 3.4.2 of the FPM. The HDOP limits for a 1:10,000 scale survey for the Montauk Point and Portsmouth Harbor beacons were 3.4 and 2.6, respectively.

The serial numbers of the Ashtech Sensor and MBX1 receivers used are as follows:

	<u>Device</u>	<u>Serial Number</u>
WHITING (Primary)	Ashtech Sensor CSI MBX1	700417B1193 1081
WHITING (Secondary)	Ashtech Sensor CSI MBX1	700417B1194 1079
Launch 1014	Ashtech Sensor CSI MBX1	700417B1203 1078
Launch 1015	Ashtech Sensor CSI MBX1	700417B1191 1080

DGPS performance checks for WHITING were conducted using the program SHIPDIM. SHIPDIM uses the two reference station method as described in the FPM, section 3.4.5. All DGPS performance checks confirmed that WHITING's DGPS positioning systems were operating properly. Performance checks for each launch's DGPS positioning system were conducted with each launch securely housed in WHITING's davits. Simultaneous HDAPS positions were compared between WHITING and each launch; an offset in distance and azimuth was then calculated between the ship and each launch system. A summary of the DGPS performance checks is in Separate III.\*

DGPS antenna offsets and laybacks were measured on March 19, 1993 for WHITING, and on July 28, 1993 for launches 1014 and 1015. Offsets and laybacks were measured using the 100 kHz (high frequency) echosounder transducer as the reference. Antenna heights were also measured on the same respective dates shown above, using the water line as the reference. The offsets and laybacks were applied by HDAPS on-line. A minimum of four satellites were used during survey H-10563(1:10,000), providing altitude unconstrained positioning.

Offsets and laybacks for WHITING's SSS towfish A-frame were measured on July 27, 1992 using the forward 100 kHz (high frequency) transducer as the reference. The A-frame height was measured from the water line on the same date.

Offset, layback, and height corrections for each launch's SSS aft towing boom were measured on July 28, 1993, and verified on April 5, 1994.

All offset, layback, and height data were applied by HDAPS on-line. These data are on file at AHS.\* Correctors from offset table 1 were applied to all data acquired from launch 1015's stern mount. Correctors from offset table 2 were applied to all

data acquired from launch 1014's stern mount. Correctors from offset table 3 were applied to all data acquired from launch 1015's bow mount. Correctors from offset table 9 were applied to all data acquired from WHITING.

#### J. SHORELINE

The shoreline was not examined.

#### K. CROSSLINES

Fourteen nautical miles of crosslines were run on H-10563. This amounted to 16 percent of the total linear nautical miles of main-scheme lines needed for 100 percent coverage.

Crosslines and main-scheme agreement, with predicted tides applied, was good. Most soundings agreed to within 0.2 meters with no errors greater than 0.4 meters.

#### L. JUNCTIONS - SEE ALSO EVALUATION REPORT

Survey H-10563 junctions with current survey H-10556 (WH-10-6-94) at the northeast end of survey H-10563. The agreement between field sheets is within 0.0 to 0.4 meters.

#### M. COMPARISONS WITH PRIOR SURVEYS - SEE ALSO EVALUATION REPORT

As depicted on the prior surveys, the bottom in the Lucas Shoal area is irregular; echosounder and SSS records showed significant sand waves.

Survey H-10563 soundings were compared with prior surveys H-8905 (1966, scale 1:20,000) and H-8903 (1966, scale 1:10,000). Both prior surveys were referenced to NAD 27. For comparison purposes, a datum shift was applied to H-10563 in accordance with section 7.4 of the FPM (NADCON, version 1.01, January 9, 1989). Comparisons were made between survey H-10563 soundings plotted at predicted MLLW and both prior survey sounding sheets plotted at MLW.

Sounding comparisons between both prior surveys and H-10563 were within 0.2 meters with current depths being shoaler than prior survey depths. The only significant difference in depth soundings was found near buoy "LS" at the prior 3.7 meter sounding. This area was developed with 30 meter line spacing. The shoalest depth found in the immediate vicinity was 6.6 meters at LAT 41°24'56" LON 70°45'33". Depth contours also matched very well between the prior surveys except for the southwest end of Middle Ground Shoal which has migrated to the southwest.

N. ITEM INVESTIGATIONS - SEE ALSO SECTION D. OF THE EVALUATION REPORT.

<u>Section</u>	<u>Contact #</u>	<u>Status</u>
N1.	504.09S	Echosounder least depth
N2.	504.18S	Echosounder least depth

WHITING located two items during 200% SSS coverage which warranted further investigation. The two items were further investigated by running echosounder investigation lines centered over each contact's average SSS position. The sonagrams reveal that these contacts are rocks. The lines were run at a speed of 2.5 knots or slower, often times with the launch at idle, adrift over the rock. Below is a summary of the results of these investigations.

N1. Contact #504.09S

Latitude: 41° 25' 07.182" N  
Longitude: 070° 44' 57.057" W  
Cross Reference: 519.31P  
Position #: 1157, DN 251  
Least depth: 18.1 meters (<sup>APPROVED</sup> predicted tides) (59 FT)  
Recommendation: Do not chart, shoaler soundings are in vicinity CONCUR

N2. Contact #504.18S

Latitude: 41° 25' 06.991" N  
Longitude: 070° 44' 58.263" W  
Cross Reference: 497.03S  
Position #: 3332, DN 252 <sup>APPROVED</sup>  
Least depth: 16.7 meters (predicted tides) (54 FT)  
Recommendation: Chart as rock with known least depth of 16.7m (54 FT) ✓  
IN ABOVE LOCATION

O. COMPARISON WITH THE CHART - SEE ALSO EVALUATION REPORT

Sounding from chart 13233 (14th ed., November 28/92, 1:20,000) were compared to H-10563 soundings. Ninety one percent of the soundings compared were within 1.0 meters with an average difference between soundings of 0.0 meters. Areas where prior survey soundings were 1.0 meters or more shoaler than current soundings were developed with 30-meter line spacing. Generally, current survey depths were shoaler than prior survey depths. CONCUR

P. ADEQUACY OF SURVEY - SEE ALSO EVALUATION REPORT

This survey is considered complete, and the data acquired are adequate to supersede all prior surveys of the common area.

**Q. AIDS TO NAVIGATION**

Lucas Shoal green/red striped can buoy "LS" was positioned by launch 1015 on DN 241. The computed position for this buoy agrees with the charted position. THIS AID TO NAVIGATION APPEARS

ADEQUATE TO SERVE ITS INTENDED PURPOSE.

**R. STATISTICS**

Number of Positions.....	1856
Main-scheme Sounding Lines (Nautical Miles).....	174.46
Crosslines (Nautical Miles).....	14.10
Square Nautical Miles Surveyed.....	5.6
Days of Production.....	13
Detached Positions.....	3
Bottom Samples.....	26
Tide Stations Installed.....	3
Current Stations.....	0
Number of CTD Casts.....	3
Magnetic Stations.....	0

**S. MISCELLANEOUS - SEE ALSO EVALUATION REPORT**

Bottom samples for the survey area were acquired in accordance with the Project Instructions. As specified in the Project Instructions, the samples were taken on an approximate grid spacing of 1000 meters square. Oceanographic log sheets for H-10563 are submitted with the data for this survey. Bottom samples were not submitted to the Smithsonian Institution.

No anomalies in either tide or current and/or unusual magnetic variations were encountered in the survey area.

**T. RECOMMENDATIONS - SEE ALSO SECTION P. OF THE EVALUATION REPORT.**

Recommendations concerning specific items are located in section N of this report.

**U. REFERRAL TO OTHER REPORTS**

None

Submitted By:

Eric W. Berkowitz  
Lieutenant (Junior Grade), NOAA

Joel T. Michalski  
Ensign, NOAA

NOAA SHIP WHITING  
ITEM INVESTIGATION REPORT  
OPR-B616-WH

SURVEY H-10563 FIELD SHEET WH-10-7-94 F (6)

ITEM NUMBER 504.09 P

CHART NO. (largest scale) 13233, 14<sup>TH</sup> ED NOV 28/92, 13229 25<sup>TH</sup> ED. JUNE 1993

DESCRIPTION OR CROSS REFERENCE(S): 519.31P

AWOIS POS: L 41° ' \_\_\_\_\_ " N  
(NAD 83) λ 070° ' \_\_\_\_\_ " W

SSS POS: L 41° ' \_\_\_\_\_ " N  
λ 070° ' \_\_\_\_\_ " W

E 117365

N 18759

METHOD OF INVESTIGATION: (circle)

Echosounder

Diver

Other (specify) \_\_\_\_\_

DIVE DATA: Divers Berkowitz Pavelle Quinn

Time of Dive (UTC): Commenced \_\_\_\_\_ Completed \_\_\_\_\_

Current Slack 0.5 kts 1 kt 1.5+ kts Bottom Type S Sh M P

Visibility 0 1 2 3 4 5 6 7 8 9 >10

INVESTIGATION NOTES:

POSITION: Date/DN 9-8-94 / 251 Time (UTC) 18:05:39 Fix # 1157

Easting 117361.4 Northing 18765.8

Latitude 41° 25' 07.182" N Longitude 070° 44' 57.057" W

LORAN C: W 14 X 25 Y 43 Z 60

(LORAN for AWOIS only. GRI = 9960, N.E. United States.)

LEAST Date/DN \_\_\_\_\_ / \_\_\_\_\_ Time (UTC) \_\_\_\_\_

DEPTH: Method Pneumogauge Leadline DSF-6000N

S/N 138921 30 8406714N A105N A106N A112N 6076 A109N

Measured Depth: 1. \_\_\_\_\_ 2. \_\_\_\_\_ 3. \_\_\_\_\_ Avg. 17.7 m ft

Uncorrected Depth: 17.7 meters

Tide Corrector: -0.4 meters

Draft Corrector: 0.6 meters

Velocity Corrector: 0.2 meters

CORRECTED LEAST DEPTH: 18.1 meters

(59 FT)

Recorder EWB

Checked by \_\_\_\_\_

SEE SECTION N-1, PAGE 10 OF THIS REPORT FOR CHARTING RECOMMENDATION

NOAA SHIP WHITING  
ITEM INVESTIGATION REPORT  
OPR-B616-WH

SURVEY H-10563 FIELD SHEET WH-10-7-94 F (6)  
ITEM NUMBER 504.185  
CHART NO. (largest scale) 13233 14<sup>TH</sup> ED NOV 28/92, 13229 25<sup>TH</sup> ED. JUNE 1993

DESCRIPTION OR CROSS REFERENCE(S): 497.035

AWOIS POS: L 41° ' " N SSS POS: L 41° ' " N  
(NAD 83) λ 070° ' " W λ 070° ' " W

E 117318  
N 18749

METHOD OF INVESTIGATION: (circle)

Echosounder Diver Other (specify) \_\_\_\_\_

DIVE DATA: Divers Berkowitz Pavelle Quinn  
Time of Dive (UTC): Commenced \_\_\_\_\_ Completed \_\_\_\_\_  
Current Slack 0.5 kts 1 kt 1.5+ kts Bottom Type S Sh M P  
Visibility 0 1 2 3 4 5 6 7 8 9 >10

INVESTIGATION NOTES:

POSITION: Date/DN 9-9-94 1252 Time (UTC) 134309 Fix # 3332  
Easting 117333.4 Northing 18759.8  
Latitude 41° 25' 06.991" N Longitude 070° 44' 58.263" W  
LORAN C: W 14 X 25 Y 43 Z 60  
(LORAN for AWOIS only. GRI = 9960, N.E. United States.)

LEAST DEPTH: Date/DN                     /                     Time (UTC)                       
Method Pneumogauge Leadline DSF-6000N  
S/N 138921 30 8406714N A105N A106N A112N C076

Measured Depth: 1. \_\_\_\_\_ 2. \_\_\_\_\_ 3. \_\_\_\_\_ Avg. 16.7 m ft

Uncorrected Depth: 16.7 meters  
Tide Corrector: -0.89 meters  
Draft Corrector: 0.6 meters  
Velocity Corrector: 0.2 meters  
CORRECTED LEAST DEPTH: 16.76 meters  
(54 FT)

Recorder EWB Checked by \_\_\_\_\_

SEE SECTION N.2., PAGE 10, OF THIS REPORT FOR CHARTING RECOMMENDATION



HDAPS SETUP PARAMETERS '94  
LAUNCH 1014

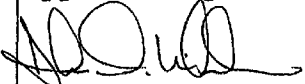
POSITIONING

DGPS REF STA	POSITION	FREQUENCY	HDOP
MONTAUK POINT	41 04'02.088N 71 51'38.484W	293KHz	3.4
PORTSMOUTH	43 04'15.066N 70 42'36.804W	288KHz	2.6

APPROVAL SHEET  
FIELD EXAMINATION SURVEY  
OPR-B616-RU/WH  
WH-10563-1-93  
1994  
H-10563

The data for this survey were acquired and checked under my daily supervision. Position and sounding accuracy meet the requirements specified in the Hydrographic Manual, the Hydrographic Survey Guidelines, and the Field Procedures Manual for Hydrographic Surveying. This survey is adequate, in the areas fully surveyed, for the intended purpose of delineating bottom topography and determining depths and identifying all potential dangers to navigation.

Approved By:



John D. Wilder  
Commander, NOAA  
Commanding Officer



UNITED STATES DEPARTMENT OF COMMERCE  
National Oceanic and Atmospheric Administration  
NATIONAL OCEAN SERVICE  
Office of Ocean and Earth Sciences  
Silver Spring, Maryland 20910

### TIDE NOTE FOR HYDROGRAPHIC SURVEY

DATE: March 23, 1995

HYDROGRAPHIC SECTION: Atlantic

HYDROGRAPHIC PROJECT: OPR-B616

HYDROGRAPHIC SHEET: H-10563

LOCALITY: Lucas Shoal, Vineyard Sound, Massachusetts

TIME PERIOD: August 21 - September 9, 1994

TIDE STATION USED: 844-8533 Cape Higgon, Martha's Vineyard, Ma.  
Lat.  $41^{\circ} 24.6'N$  Lon.  $70^{\circ} 42.7'W$

PLANE OF REFERENCE (MEAN LOWER LOW WATER): 2.02 ft.  
HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 2.7 ft.

TIDE STATION USED: 844-8725 Menemsha Harbor, Ma.  
Lat.  $41^{\circ} 21.3'N$  Lon.  $70^{\circ} 46.0'W$

PLANE OF REFERENCE (MEAN LOWER LOW WATER): 2.05 ft.  
HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 2.9 ft.

#### REMARKS: RECOMMENDED ZONING

1. Northeast of a line between points  $41^{\circ} 28.0'N$ ,  $70^{\circ} 45.4'W$  and  $41^{\circ} 26.5'N$ ,  $70^{\circ} 41.2'W$ , (Paul Pt.), apply a +15 minute time correction and a x0.76 range ratio to heights using Cape Higgon, Martha's Vineyard, Ma. (844-8533).
2. Northeast of a line between points  $41^{\circ} 27.5'N$ ,  $70^{\circ} 46.1'W$  and  $41^{\circ} 25.1'N$ ,  $70^{\circ} 42.5'W$ ; and southwest of a line between points  $41^{\circ} 28.0'N$ ,  $70^{\circ} 45.4'W$  and  $41^{\circ} 26.5'N$ ,  $70^{\circ} 41.2'W$ , (Paul Pt.), times are direct, and apply a X0.88 range ratio to heights using Cape Higgon, Martha's Vineyard, Ma. (844-8533).



page 2 of 2

H-10563 (continued)

3. Southwest of a line between points  $41^{\circ} 27.5'N$ ,  $70^{\circ} 46.1'W$  and  $41^{\circ} 25.1'N$ ,  $70^{\circ} 42.5'W$ ; and northeast of a line between points  $41^{\circ} 26.6'N$ ,  $70^{\circ} 48.6'W$ , and  $41^{\circ} 23.8'N$ ,  $70^{\circ} 43.8'W$ , times and heights are direct using Cape Higgon, Martha's Vineyard, Ma. (844-8533).
4. Southwest of a line between points  $41^{\circ} 26.6'N$ ,  $70^{\circ} 48.6'W$ , and  $41^{\circ} 23.8'N$ ,  $70^{\circ} 43.8'W$ , times and heights are direct using Menemsha Harbor, Ma. (844-8725).

**Note:** Times are tabulated in Greenwich Mean Time.

  
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CHIEF, DATUMS SECTION

GEOGRAPHIC NAMES

H-10563

Name on Survey	Source of Name											No.
	A	B	C	D	E	F	G	H	K			
	ON CHART NO.	ON PREVIOUS SURVEY NO.	ON U.S. QUADRANGLE MAPS	FROM LOCAL INFORMATION	ON LOCAL MAPS	P.O. GUIDE OR MAP	GRAND McNALLY ATLAS	U.S. LIGHT LIST				
LUCAS SHOAL	X											1
MASSACHUSETTS (title)	X											2
VINEYARD SOUND	X											3
												4
												5
												6
												7
												8
												9
												10
												11
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												23
												24
												25

Approved:

*Charles E. Huntington*  
Chief Geographer-N/CG225

OCT 21 1994

01/10/96

HYDROGRAPHIC SURVEY STATISTICS  
REGISTRY NUMBER: H-10563

NUMBER OF CONTROL STATIONS 2

NUMBER OF POSITIONS 1856

NUMBER OF SOUNDINGS 11040

	TIME-HOURS	DATE COMPLETED
PREPROCESSING EXAMINATION	41	12/01/94
VERIFICATION OF FIELD DATA	60	12/06/95
QUALITY CONTROL CHECKS	15	
EVALUATION AND ANALYSIS	7	
FINAL INSPECTION	3	12/19/95
COMPILATION	47	01/10/96
TOTAL TIME	173	
ATLANTIC HYDROGRAPHIC BRANCH APPROVAL		12/20/95

ATLANTIC HYDROGRAPHIC BRANCH  
EVALUATION REPORT FOR H-10563 (1994)

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.

**D. AUTOMATED DATA ACQUISITION AND PROCESSING**

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

AUTOCAD, Release 12  
QUICKSURF, version 5.1  
Hydrographic Processing System  
Microstation, version 5.0  
NADCON, version 2.10

The smooth sheet was plotted using an ENCAD NovaJet III plotter.

**H. CONTROL STATIONS**

Horizontal control used for this survey during data acquisition is based upon the North American Datum of 1983 (NAD 83). Office processing of this survey is based on these values.

To place this survey on the NAD 27, move the projection lines 0.397 seconds (12.258 meters or 1.23 mm at the scale of the survey) north in latitude, and 1.892 seconds (43.934 meters or 4.39 mm at the scale of the survey) east in longitude.

**L. JUNCTIONS**

H-10556 (1994) to the east

A standard junction was effected between the present survey and survey ~~H-10563~~ (1994).  
*10556*

There are no junctional surveys to the north, west, or south. Present survey depths are in harmony with the charted hydrography to the north, west and south.

**M. COMPARISON WITH PRIOR SURVEYS**

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

- O. COMPARISON WITH CHARTS    13218 (32<sup>nd</sup> Edition, Jun 26/93)  
   13229 (24<sup>th</sup> Edition, Oct 5/91)  
   13230 (39<sup>th</sup> Edition, Mar 27/93)  
   13233 (14<sup>th</sup> Edition, Nov 28/92)

The charted hydrography originates with prior surveys and requires no further consideration. The hydrographer makes adequate chart comparisons in section O. of the Descriptive Report.

The present survey is adequate to supersede the charted hydrography within the common area.

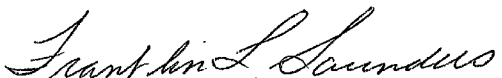
P. ADEQUACY OF SURVEY


This is an adequate hydrographic/side scan sonar survey. No additional work is recommended.

S. 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.

**WHITING Processing Team**

  
 \_\_\_\_\_  
 Franklin L. Saunders  
 Cartographic Technician

  
 \_\_\_\_\_  
 Norris A. Wike  
 Cartographer



APPROVAL SHEET  
H-10563

Initial Approvals:

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. The digital data have been completed and all revisions and additions made to the smooth sheet during survey processing have been entered in the magnetic tape record for this survey. A final sounding printout of the survey has been made. The survey records and digital data comply with NOS requirements except where noted in the Evaluation Report.

Richard H. Whitfield Date: 12-20-95  
Richard H. Whitfield  
Cartographer  
Atlantic Hydrographic Branch

I have reviewed the smooth sheet, accompanying data, and reports. This survey and accompanying digital data meet or exceed NOS requirements and standards for products in support of nautical charting except where noted in the Evaluation Report.

Nicholas E. Perugini Date: 12-20-95  
Nicholas E. Perugini, CDR, NOAA  
Chief, Atlantic Hydrographic Branch

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Final Approval:

Approved: Andrew A. Armstrong III Date: 1-22-96  
Andrew A. Armstrong III  
Captain, NOAA  
Chief, Hydrographic Surveys Division

MARINE CHART BRANCH  
**RECORD OF APPLICATION TO CHARTS**

FILE WITH DESCRIPTIVE REPORT OF SURVEY NO. H-10563

**INSTRUCTIONS**

A basic hydrographic or topographic survey supersedes all information of like nature on the uncorrected chart.

1. Letter all information.
2. In "Remarks" column cross out words that do not apply.
3. Give reasons for deviations, if any, from recommendations made under "Comparison with Charts" in the Review.

CHART	DATE	CARTOGRAPHER	REMARKS
13229	1/3/96	Robert Hill	Full <del>Part Before</del> After Marine Center Approval Signed Via Drawing No.
13230	1/4/96	Robert Hill	Full <del>Part Before</del> After Marine Center Approval Signed Via Drawing No.
13233	1/5/96	Robert Hill	Full <del>Part Before</del> After Marine Center Approval Signed Via Drawing No.
13229E	2/5/96	Dan Slack	Full <del>Part Before</del> After Marine Center Approval Signed Via Drawing No. 26
13218	2/6/96	Dan Slack	Full <del>Part Before</del> After Marine Center Approval Signed Via Drawing No. 70 THRU CH. 13229E
13230	3/11/96	Dan Slack	Full <del>Part Before</del> After Marine Center Approval Signed Via Drawing No. 52 THRU CH. 13229E
13233	3/15/96	Dan Slack	Full <del>Part Before</del> After Marine Center Approval Signed Via Drawing No. 16
			Full Part Before After Marine Center Approval Signed Via Drawing No.
			Full Part Before After Marine Center Approval Signed Via Drawing No.
			Full Part Before After Marine Center Approval Signed Via Drawing No.
			Full Part Before After Marine Center Approval Signed Via Drawing No.