NOAA FORM 76-35A

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

DESCRIPTIVE REPORT

Type of Survey SIDE SCAN SONAR

Field No. RU-10-5-94

Registry No. FE-406

LOCALITY

State MASSACHUSETTS

General Locality BUZZARDS BAY

Sublocality 1.5 NM NNW OF PASQUE ISLAND

19 94

CHIEF OF PARTY
LCDR D. R. HERLIHY, NOAA

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NOAA FORM 77-28 (11-72)

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

REGISTER NO.

FE-406

HYDROGRAPHIC TITLE SHEET

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

FIELD NO.

RU-10-5-94

State: Massachusetts

General locality: Buzzards Bay

Locality: 1.5 NM NNW of Pasque Island

Scale: 1:10,000 Date of survey: September 14 - 26, 1994

Instructions dated: February 23, 1994 Project No.: OPR-B616-RU-94

Vessel: NOAA Ship RUDE

Chief of party: LCDR D.R. Herlihy

Surveyed by: LCDR D.R. Herlihy, ENS T.A. Haupt, ENS S.R. Williams & ST E.T. Hardison

Soundings taken by:(echo sounder,hand lead,pole): Raytheon DSF-6000N Echosounder

Graphic record scaled by: DRH, TAH, SRW & ETH

Graphic record checked by: DRH, TAH, SRW & ETH

Protracted by: N/A Automated plot by: ZATA Plotter (AHS)

Verification by: Atlantic Hydrographic Section Personnel

Soundings in (fathoms, feet, or meters at MLW or MLLW): Meters at MLLW

REMARKS: All times recorded in UTC.

The DSF-6000N was used as the primary sounding instrument, however, as warranted, the SEABAT 9001 shallow-water multi-beam sonar system was employed for distinct item investigations and is documented as such.

Notes in the Descriptive Report were made in red during office processing

7/19/95 DSC AWOIS + SURF ✓ RWD 8/95

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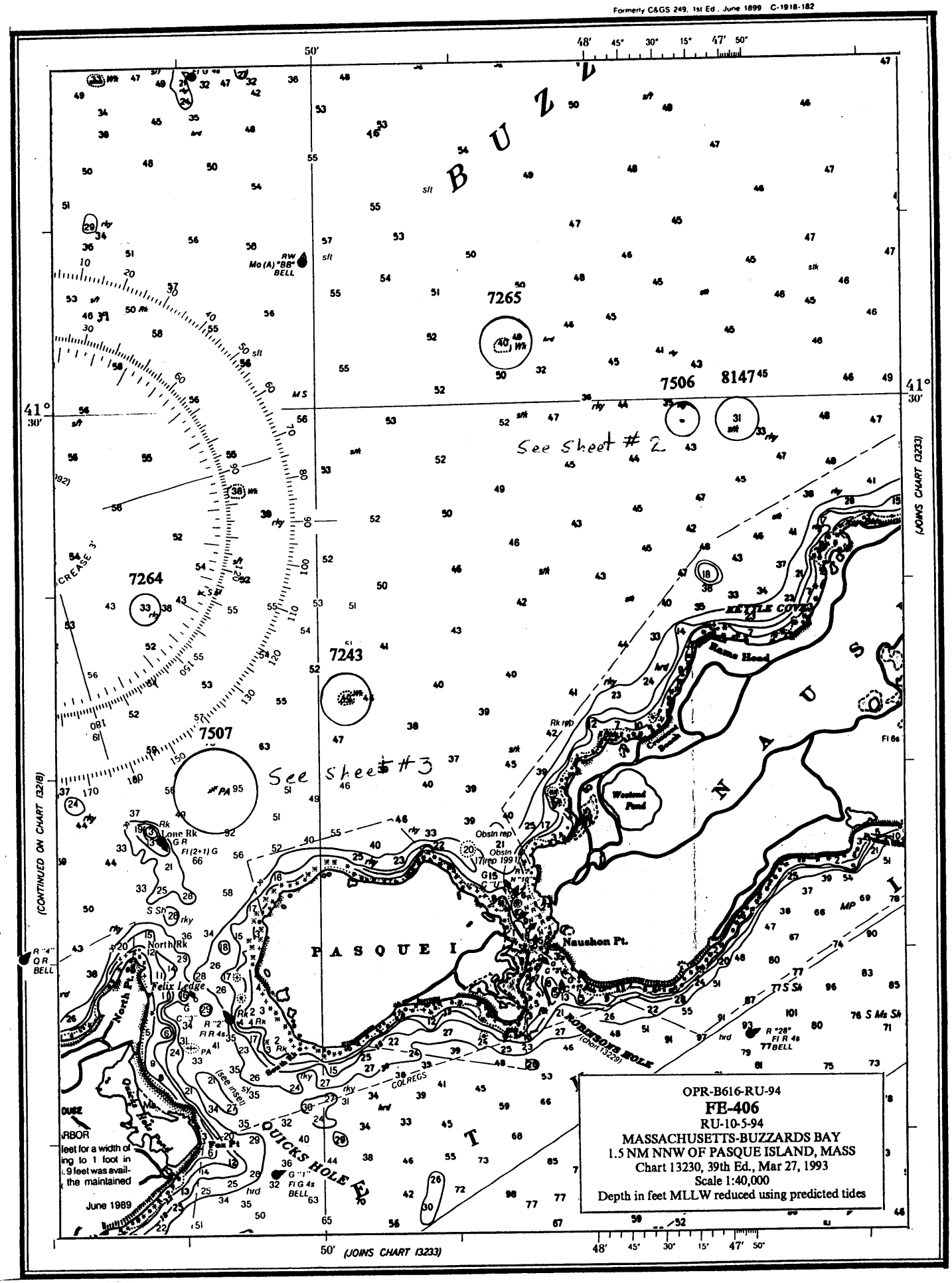


OPR-B616-RU-94

FE-406

RU-10-5-94

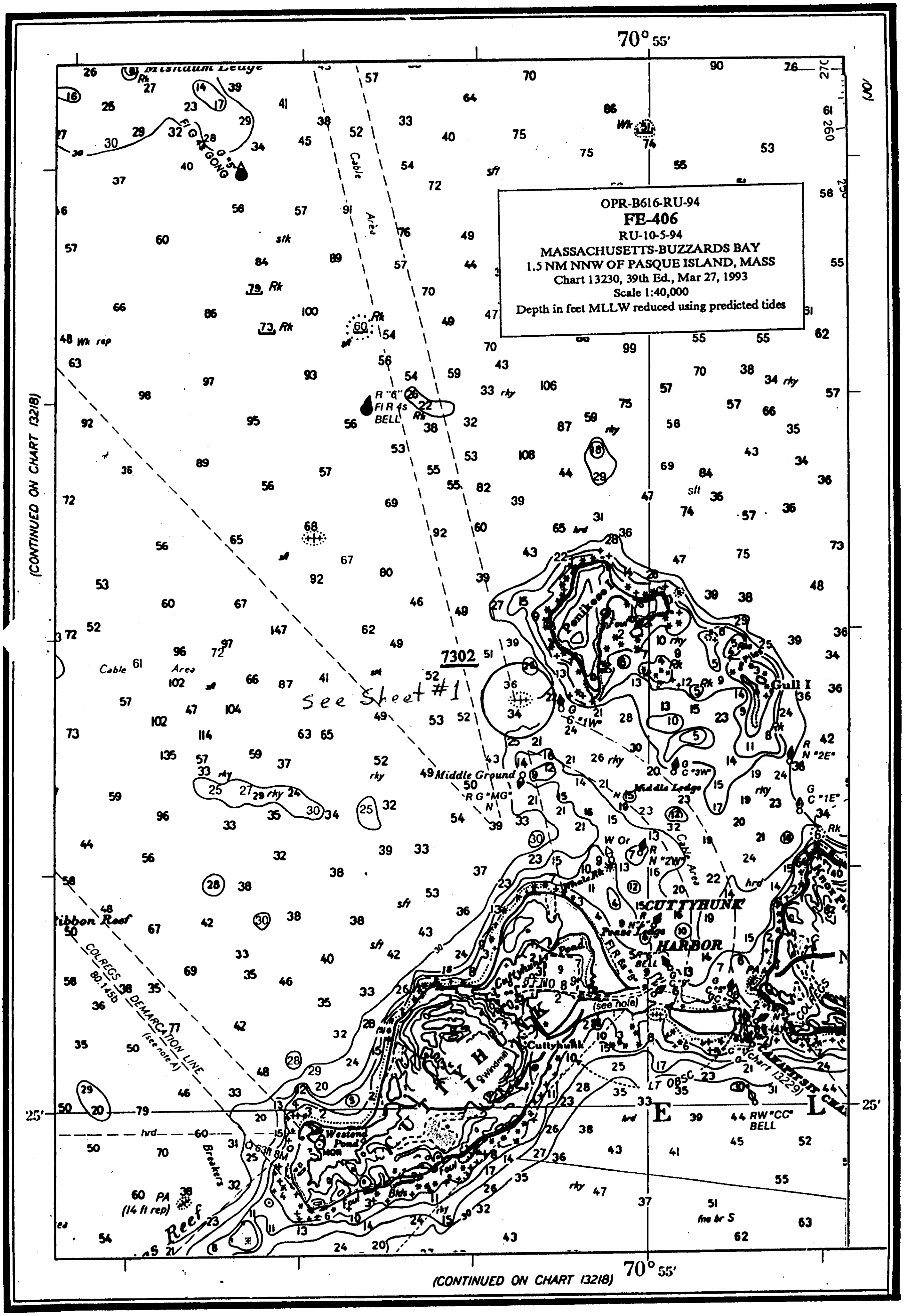
MASSACHUSETTS-BUZZARDS BAY

1.5 NM NNW OF PASQUE ISLAND, MASS

Chart 13230, 39th Ed., Mar 27, 1993

Scale 1:40,000

Depth in feet MLLW reduced using predicted tides


OPR-B616-RU-94
FE-406
RU-10-5-94
MASSACHUSETTS-BUZZARDS BAY
1.5 NM NNW OF PASQUE ISLAND, MASS
Chart 13230, 39th Ed., Mar 27, 1993
Scale 1:40,000
Depth in feet MLLW reduced using predicted tides
70° 55'
25'
(CONTINUED ON CHART 13218)
(CONTINUED ON CHART 13218)
See Sheet #1
7302
Cable Area
Middle Ground
Middle Ledge
Penikese I
Gull I
CUTTYHUNK
HARBOR
Whale Rk
Pease Ledge
Cuttyhunk
Westend Pond
Windmill
Breakers
Reef
Ribbon Reef
COLREGS DEMARCATION LINE 80.145b (see note A)
COLREGS
Fl G 4s GONG
R "6" Fl R 4s BELL
RW "CC" BELL
(see note)
(Chart 13229)

A. PROJECT

A.1 This field examination was conducted in accordance with Hydrographic Project Instructions OPR-B616-RU/WH, Buzzards Bay, Nantucket and Vineyard Sounds, Massachusetts.

A.2 The original instructions are dated February 23, 1994.

A.3 There has been one change to these instructions:

- Change No. 1 dated March 15, 1994

A.4 This Descriptive Report covers seven unrelated AWOIS items (7243, 7264, 7265, 7302, 7506, 7507 & 8147) located outside the main navigation corridor in Buzzards Bay, but within the sheet layout of project OPR-B616-RU/WH as specified by the Project Instructions.

A.5 This portion of project OPR-B616-RU/WH responds to the requirement of identifying potential hazards and/or obstructions which are located in close proximity to primary survey areas.

B. AREA SURVEYED

The seven AWOIS items covered by this report are randomly located within Buzzards Bay as defined by the following parameters:

Item	Latitude	Longitude	Search Radius
7243	41°28'25.580"N	070°49'47.910"W	200 Meters
7264	41°28'55.580"N	070°51'16.120"W	100 Meters
7265	41°30'20.180"N	070°48'37.710"W	200 Meters
7302	41°26'42.380"N	070°55'44.120"W	300 Meters
7506	41°29'53.680"N	070°47'05.610"W	100 Meters
7507	41°28'02.400"N	070°50'48.860"W	400 Meters
8147	41°29'52.880"N	070°46'53.110"W	150 Meters

Data collection for this field examination began on September 14, 1994 (DN 257) and concluded on September 26, 1994 (DN 269).

C. SURVEY VESSELS

C.1 The following was the only vessel used during this survey:

Vessel	EDP Number	Primary Function
NOAA Ship RUDE (S590)	9040	Hydrography, Side Scan Operations and SEABAT Investigations

C.2 During the ship's January 1994 dry-dock period, RUDE was outfitted with a pivoting armature to carry the transducers for the Reson SEABAT 9001 shallow-water multi-beam sonar system. This armature was mounted on the port side of the ship, approximately midway along the ship's length. The arm was designed to be detachable and ride in a cradle on the boat deck when not in use for extended periods. Since the transducers were not designed for permanent deployment, the arm was typically installed only when the SEABAT system was to be used, and rotated into the down, or operating position, only during times of data acquisition.

D. AUTOMATED DATA ACQUISITION AND PROCESSING

D.1 All HDAPS data acquisition and processing for the entire period (DN 257 - 269) of this survey were accomplished with the following software versions:

Program	Version	Program	Version
BACKUP	2.00	LSTAWOIS	3.07
BLKEDIT	2.02	MAN_DATA	2.01
CARTO	2.15	NEWPOST	6.12
CLASSIFY	1.05	PLOTALL	2.30
CONTACT	2.41	PREDICT	2.01
DAS_SURV	6.74	PRESURV	7.09
DP	2.15	QUICK	2.05
EXCESS	4.31	RAMSAVER	1.02
FILESYS	3.27	REAPPLY	2.11
GRAFEDIT	1.06	ZOOMEDIT	2.30

D.2 Other software includes program **VELOCITY 2.10**, dated March 15, 1994, which generates sound velocity corrector tables for HDAPS data, including the program's **REFRACT** option, which corrects SEABAT multiple slant range depths for sound velocity and position of soundings (cross track distance) for refraction.

D.3 SEABAT multi-beam data were acquired exclusively on the SEABAT 9001 data acquisition 486 personal computer, using the Coastal Oceanographics **HYPACK** software package (Version 1.0, dated March 1, 1994), receiving gyro and predicted tide input from HDAPS and direct heave/roll/pitch data from the Datawell HRP sensor and positioning input from the Ashtech GPS receivers. SEABAT data was processed on one of two personal computers equipped with the NOAA **LSTDRUD** (Version 2.2, dated July 15, 1994) post-processing software. A single least depth was generated for each SEABAT investigation and later entered into HDAPS via the **MANUAL DATA ENTRY** program.

E. SONAR EQUIPMENT

E.1 Side scan sonar operations were conducted using an EG&G Model 260 image corrected side scan sonar recorder and a Model 272-T single frequency towfish. All side scan operations were conducted from the RUDE (vessel # 9040). The following side scan equipment was utilized on the dates specified:

Equipment Type	Serial Number	Dates Used
Recorder	12106	257 - 265
Towfish	16700	257 - 265

E.2 The side scan sonar towfish was configured with a 20° beam depression, which is the normal setting and yields the best beam correction.

E.3 The 100 kHz frequency was used throughout this field examination.

E.4 a. In order to maximize area coverage and provide optimal contact resolution, the 100-meter range scale was used for five of the six AWOIS items (7243, 7264, 7265, 7506, & 7507) requiring side scan sonar coverage (echo sounder development only for item 8147), with the 75-meter range scale used for the remaining item (7302).

There were a couple of isolated areas where the sea floor rose up sharply, causing the side scan coverage to narrow. These areas of reduced coverage were easily recognized because the on-line swath plot would "neck down" leaving "holidays", or areas with no overlap between adjoining swaths. To compensate for this lack of coverage, holiday coverage was run to fill in these gaps. All side scan coverage was ultimately checked with smooth plots to ensure proper overlap between adjoining lines.

The current Field Procedures Manual (FPM) specification was used to determine maximum line spacing with Differential GPS positioning:

$$LS_{max} = 2RS - 2EPE_{max}$$

where: RS = range scale

EPE = expected position error

For a 1:10,000-scale survey, a maximum EPE of 15 meters is permitted. Using this value in the equation above, a maximum line spacing of 170 meters for RS = 100 meters and 120 meters for RS = 75 meters is authorized. Data collected with an EPE of 15 or greater was either rejected or smoothed in the post-processing phase of the survey, therefore the maximum line spacing was never exceeded. In addition, in order to maximize surveying efficiency, the actual line spacing used for the 100-meter and 75-meter range scales was 160 meters and 110 meters respectively. These line spacings were chosen to give an added margin on coverage, and to allow an even number of development lines to be run between each set of mainscheme lines.

A few erroneous Expected Position Error (EPE) values in excess of 15 meters may be seen in the raw data printouts, most typically ranging between 408.2 and 409.2. These values were not considered in the line spacing calculations shown above due to their acceptable corresponding Horizontal Dilution of Precision (HDOP) values. These excessive EPE values were

investigated in the HDAPS **Graphic Sounding Edit** program and consistently found to be erroneous when accompanied by an acceptable HDOP value. The high EPE values appear to be caused by an HDAPS software deficiency.

b. Confidence checks were obtained by noting recognizable bottom characteristics at the edges of the sonar range scale. Features such as sand waves, lobster pots and trawl door scours were commonly used for this purpose.

c. Side scan percent coverage varied by item, based on AWOIS requirements and whether or not an item was located prior to completing the required coverage:

Item	Required Coverage	Actual Coverage
7243	200%	200%
7264	200%	200%
7265	200%	140% [1]
7302	200%	200% [2]
7506	400%	400%
7507	200%	120% [3]

[1] Item located prior to completing required coverage.

[2] Excluding approximately 5-10% of the AWOIS search radius deemed too shoal/hazardous for ship operations.

[3] Item located prior to completing required coverage.

d. A few small areas of the bottom within the given AWOIS search radii for this field examination consisted of soft silt and sand. Due to the inherent characteristics of this bottom composition and the lack of contacts found there, there are small segments of data with gaps between confidence checks. It is the opinion of the hydrographer that this data is acceptable due to confidence checks seen before and after these barren areas.

Except as noted above, all side scan sonar records acquired during this field examination were clear with excellent returns. There was one occasion when the side scan sonar towfish became entangled in a lobster trap buoy line, temporarily whiting out the sonagram. Following this occurance, the towfish was brought on board and inspected, with all affected data being subsequently rejected and re-run.

e. The towfish was deployed exclusively from the stern during this field examination.

E.5 All significant side scan sonar contacts were delineated by echo sounder development, with the most critical being further investigated using the SEABAT 9001 multi-beam sonar system. The data for these investigations are summarized in the Development Abstract and SEABAT Development Addendum in Section N of this report.

E.6 Overlap was checked on line using the real-time swath plot, with the edited swath plot used to identify holidays.

F. SOUNDING EQUIPMENT

F.1 All traditional hydrographic soundings were acquired using a Raytheon Model 6000N Digital Survey Fathometer (DSF-6000N, s/n A107).

F.2 Diver least depth determinations were conducted utilizing a 3-D Instruments, Inc. precision direct drive depth gauge:

0 - 140 fsw (feet salt water) S/N 8606822N

This gauge was checked each day it was used by comparing it with a leadline. Depths recorded by the leadline varied with that recorded from the pneumatic depth gauge at times by more than the allowed 0.5 feet. This disparity can be attributed to wire angles in the leadline (approximately 10°), choppy sea states and significant currents on the day dive operations were conducted. Calibration and check documentation for this equipment is found in Separate IV. filed with the original field records

F.3 There were no faults in sounding equipment which affected the accuracy or quality of the data.

F.4 Both high (100 kHz) and low (24 kHz) frequency sounding data were recorded during data acquisition. Only high frequency soundings were plotted.

F.5 As authorized by the Project Instructions, the Reson SEABAT 9001 shallow-water multi-beam sonar system was used to determine precise least depths over significant contacts discovered during routine side scan sonar operations.

The Reson SEABAT 9001 produces sixty 1.5 degree beams per swath, yielding an included swath angle of 90 degrees and a swath width which is approximately twice the surrounding water depth. The system operates at a frequency of 455 kHz and updates at a rate of 7 times per second in 25 meters of water, thus acquiring 420 soundings per second. SEABAT slant ranges and quality factors for each of the 60 beams are acquired through the Coastal Oceanographics **HYPACK** data acquisition system on an IBM-compatible 486 personal computer.

Prior to beginning SEABAT data collection on OPR-B616-RU/WH, a RUDE SEABAT-specific offset table/file was created to define the physical relationship between the various components that comprise the system, including the SEABAT transducer head, Hippy sensor and GPS antenna. In addition, this offset file contains heave, roll and pitch biases determined during a "Patch Test" conducted in Buzzards Bay on July 1, 1994. A copy of the SEABAT offset table is contained in Separate III. *

During post-processing using the **LSTDRUD** software, SEABAT position and Hippy data are first viewed graphically and edited as necessary for data quality. Once this has been accomplished, the software attaches a position to each of the SEABAT data records. The various heading, Hippy and sound velocity refraction correctors are then applied to the SEABAT slant range values to create a data record for each individual SEABAT beam, 60 data records for each SEABAT swath. The 60 records contain computed positions and depths, cross track distances and beam quality codes. After this expanded file is created, the data are viewed graphically in three different perspectives to check the consistency of the sounding data, with the option of editing any erroneous or questionable soundings that may exist.

Once the sounding data has been reviewed and edited as necessary, the **LSTDRUD** software selects a subset of the approximate 14,000 minimum depths contained within the total data set being processed, following which a file containing the 15 least depths found within the subset of 14,000 minimum depths is generated. It is from this file that the single least depth for each SEABAT investigation was obtained for manual data entry into HDAPS.

A summary of all SEABAT investigations conducted for this field examination is contained in the SEABAT 9001 Development Addendum in Section N. Copies of all 15 least depth listings for these investigations are included in Separate V. *

* Data filed with the original field records

G. CORRECTIONS TO SOUNDINGS

G.1 a. The velocity of sound through water was determined using an Odom Digibar Sound Velocity Probe (s/n 169). A Data Quality Assurance Test was conducted before each velocity cast to ensure the meter was operating within tolerance. Velocity casts were conducted weekly for this field examination.

All data were processed using program **VELOCITY,** version 2.10. Computed velocity correctors were entered into the HDAPS sound velocity table and re-applied during post-processing to both high and low frequency soundings. SEABAT sound velocity and refraction correctors were generated through the **REFRACT** subroutine and applied during post-processing.

Sound velocity correctors applied to this survey were obtained from the following casts:

Cast Number	Date	Latitude	Longitude	HDAPS Table	Applied to Days
33	257	41°30.9'N	070°49.7'W	33	257 - 259
34	262	41°27.9'N	070°50.7'W	34	262 - 265
35	269	41°28.8'N	070°52.6'W	35	269 - 269

b. There was no variation in the DSF-6000N instrument initial.

c. No instrument correctors to the DSF-6000N were required.

d. A dual leadline comparison with the DSF-6000N was conducted during special project S-B902 in Long Island Sound:

DN 160 at 41°00'25"N and 070°32'59"W (27 ft depths)

The greatest variation between leadline and DSF soundings was 0.1 meters. Considering the ship's motion and the wire angle in the leadline from current (approximately 5°), this is excellent agreement and provides an adequate check that the echo sounder was functioning properly. Data from these comparisons can be found in Separate IV. *

* Data filed with original field records

Two types of lead line were used during the leadline to DSF-6000N comparison. The starboard leadline was a steel surveyor's tape graduated in feet with a fixed 5 lb weight at its end. A leadline corrector of 0.0 was assumed for this leadline. The port leadline was a traditional leadline made of cotton tiller with a stainless steel cable core. This lead line had a corrector of 0.0 up to its 30-foot mark, yielding an average leadline corrector of 0.0 to be applied in the comparison with the DSF-6000N.

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

f. During the ship's winter 1994 dry-dock period, an exact vertical measurement was taken from the DSF transducer to a fixed point on the bridge wing. After the ship was re-floated, the height above the waterline was determined for this point. The ship's static draft was thereby calculated to be exactly 2.12 meters (7.0 feet). This draft corrector was applied to all sounding data via the HDAPS offset table.

g. Settlement and squat correctors for the RUDE were determined on the Elizabeth River, Norfolk, Virginia on March 3, 1993. An observer, stationed with a level on a pier, measured changes in relative height by sighting to a staff held at the longitudinal position of the ship's transducer. The ship steamed directly toward and then away from the observer. The toward and away runs were averaged and applied to soundings through the HDAPS offset table.

h. Heave data were acquired by a Datawell heave, roll and pitch sensor (s/n 19128-C), and were applied to HDAPS soundings in real time. Only heave corrections were applied to the plotted soundings. Heave, roll and pitch correctors were collected on line and applied to all SEABAT soundings during post-processing.

See Separate IV for data records. *

G.2 There were no unusual or unique methods or instruments used for correcting echo soundings.

G.3 Generally, sound velocity correctors resulting from weekly velocity casts were re-applied to the HDAPS data acquired that entire week. Section G.1.a. gives the periods during which each set of velocity cast correctors were used.

* Data filed with the original field records

G.4 The pneumatic depth gauge used on dive investigations for this field examination was calibrated by Instruments East, Inc., Norfolk, VA. on February 2, 1994. Corrector data from the calibration was not applied to measured depths because it was less than 0.1 meters.

A system check was performed on the day the pneumatic depth gauge was employed, as a means of ensuring the validity of the gauge's measurements. These system checks are included in Separate IV. Hydrographic Survey Guideline No. 55 mandates that agreement between the leadline and observed gauge values must not exceed 0.5 feet. However, there were occasions when observed readings did exceed this limit. On these occasions, the observed wire angle of the leadline and pneumatic depth gauge hose was unavoidably excessive and, therefore, the comparison values were viewed with suspicion. As a result, no correctors were applied to measured pneumatic depth gauge values.

G.5 Generally, sea conditions greater than one meter affected the graphic sounding record, creating a trace of constant peaks and deeps. Application of heave correctors to raw echo soundings appeared to accurately represent true depths.

G.6 a. The tidal datum for this project is Mean Lower Low Water. The operating tide station at Newport, Rhode Island (845-2660) served as direct control for datum determination. This station also served as the reference station for predicted tides. Data for predicted tides were provided on floppy disk before the start of the project.

b. Tidal data used during data acquisition were obtained from Table 2 of the East Coast of North and South America Tide Predictions, and applied to the digital tide data using HDAPS software. The subordinate station for predicted tides was:

NO.	PLACE	POSITION	TIME		HEIGHT	
			High Water	Low Water	High Water	Low Water
1105	Penikese Island	41°27'N 70°55'W	+0 17	+0 16	*0.97	*0.97

Tidal correctors were applied on line using HDAPS predicted tide table 9 for the month of September. ~~*~~
Approved tides and zoning were applied during office processing

c. Zoning for this project is consistent with the Project Instructions.

A request for smooth tides was mailed on October 4, 1994.

H. CONTROL STATIONS See Also The Evaluation Report

H.1 The horizontal datum for this field examination is the North American Datum of 1983 (NAD 83).

H.2 This field examination was conducted exclusively using Differential GPS, which precluded the need for shore-based horizontal control stations.

H.3 No horizontal control stations were used or established for this field examination.

H.4 No horizontal control stations were used or established for this field examination.

H.5 Verification of horizontal control was not necessary as no shore-based horizontal control stations were used.

H.6 There are no photogrammetric problems, positioning problems or unconventional survey methods pertinent to this field examination.

I. HYDROGRAPHIC POSITION CONTROL

I.1 This field examination was conducted exclusively using Differential GPS positioning.

I.2 Accuracy requirements were met as specified by the Hydrographic Manual and Field Procedures Manual (FPM). The Horizontal Dilution of Precision (HDOP) and Expected Position Error (EPE) specified by the FPM were monitored during on-line data collection. When these values exceeded the allowable limits (HDOP = 3.35, EPE = 15), survey operations were suspended until the Differential GPS improved. If the positioning degraded beyond the acceptable limits while on line, the data were either smoothed or rejected, depending on the extent of the affected data.

I.3 Control Equipment:

Differential GPS:

Unit A	Unit B
Ashtech GPS Sensor	Ashtech GPS Sensor
s/n 700417B1083	s/n 700417B1003
Firmware Version 1E11D-P	Firmware Version 1E11D-P
Magnavox MX50R	Magnavox MX50R
DGPS Receiver s/n 078	DGPS Receiver s/n 160

I.4 Correctors were received from both the Montauk, New York and Portsmouth, New Hampshire radio beacons during the course of this field examination.

I.5 The Differential GPS system requires no calibrations to its equipment from outside sources. However, to check the position accuracy of the DGPS system, a daily performance check was conducted. The Shipboard Data Integrity Monitor (version 1.2), or "SHIPDIM", program was utilized to conduct these performance checks.

Section 3.4.5 of the FPM states that a DGPS performance check may be conducted using "SHIPDIM" when "two independent reference beacons are receivable, and two remote receivers are available on the ship. Each remote receives correctors from a different reference, then the computed positions are compared." The computed inverse between the check receiver and the reference receiver must not exceed delta P_{max}, where:

$$\text{delta } P_{max} = \text{SQRT } [\ (EPE)^2 + (ECR)^2\ ]$$

delta P_{max} = Maximum allowable inverse distance between the DGPS and check position

EPE = Expected Position Error of the DGPS position

ECR = Error Circle Radius of the check position

"SHIPDIM" compares four sample positions from both the check and reference receivers. Three of the four checks must be less than the delta P_{max} for a successful performance check.

I.6 No calibration data were required to be applied to the raw positioning data as DGPS was the primary positioning system.

I.7 a. There were no unusual methods used to calibrate or operate the electronic positioning equipment.

b. No shipboard DGPS malfunctions were experienced during the times of hydrography for this field examination.

c. During times of heavy rains and/or thunderstorms, the ship would experience periods of intermittent service from either the Montauk, New York or the Portsmouth, New Hampshire radio beacons, or both, depending on the location of the degraded weather at the time. During such instances, control would be switched to the reference beacon sending the strongest, most interference-free signal. If both the Montauk and Portsmouth beacons were experiencing periods of degraded weather, the survey operations were suspended until such time as service from one or both beacons had resumed.

d. During the periods when local weather affected the DGPS radio beacons as described in section I.6.c, the on-line positioning would unexpectedly "drop out". These instantaneous outages were associated only with weather related beacon interference. During times of poor satellite coverage or geometry, there would be a steady deterioration of the HDOP which could be continuously monitored. Such weather-related outages could occur often, sometimes every few minutes, making it nearly impossible to begin or complete a survey line. The duration of these outages ranged from a few minutes to half an hour.

e. No systematic errors were detected which required adjustments.

f. Antenna positions were corrected for offset and layback, and referenced to the position of the DSF-6000N transducer. These correctors were located in the HDAPS offset table, and applied on line to the positioning algorithm. A copy of the HDAPS Offset Table #1 is contained in Separate III. ~~*~~
Data filed with the original field records

g. Offset and layback distances for the A-frame (tow point) were located in the HDAPS offset table and applied on line. These offsets, along with the cable length, towfish height and depth of water, were used by the HDAPS system to compute the

position of the towfish. A copy of HDAPS Offset Table #1 is contained in Separate III.*
Data filed with the original field records

J. SHORELINE

No shoreline is contained within the boundaries of this field examination.

K. CROSSLINES

No crosslines were required due to the nature of these AWOIS item investigations.

L. JUNCTIONS

No junction comparisons were required due to the nature of these AWOIS item investigations.

M. COMPARISON WITH PRIOR SURVEYS See Also The Evaluation Report

A comparison with prior surveys will be performed by the Atlantic Hydrographic Section as part of the office verification process.

N. ITEM INVESTIGATION REPORTS

N.1.1 Area of Investigation

AWOIS 7243

Buzzards Bay

Reported Position:

41°28'25.58"N
070°49'47.91"W

Datum: NAD27

Reported Depths: Wreck hung and cleared to 40 feet, 45-foot fathometer tracing (FE194WD/63); 50 foot depths exist in the vicinity (H9646/76-77)

Feature: Wreck - Fishing Vessel

N.2.1 Description and Source of Item

AWOIS 7243 is the wreck of a fishing vessel reported sunk northeast of Quicks Hole with 36 feet of water over its hull in position 41°28'20"N and 070°49'58"W (NM20/49). During wire drag survey FE194WD/63 (FE1/64WD), the wreck was hung and cleared to 40 feet, with the hydrographer at the time recommending charting a wreck cleared to 40 feet in position 41°28'25.2"N and 070°49'49.8"W.

N.3.1 Survey Requirements

This item required 200% side scan coverage, echo sounder development and diver investigation.

N.4.1 Method of Investigation

Two hundred percent side scan coverage was achieved over the entire AWOIS 7243 search radius. One side scan contact (13.58P) was found within the search radius, which was later the subject of an echo sounder development, SEABAT investigation and diver least depth determination.

N.5.1 Results of Investigation

AWOIS 7243 was logged on side scan sonar as contact 13.58P and was found by divers to be the scattered, highly deteriorated remains of a wreck. The most significant object, a possible engine block, rises approximately three feet above the generally flat, sandy surrounding bottom. It was on top of this object that a pneumatic depth gauge reading of 13.8 (45-ft) meters (corrected for ~~predicted tides~~) was taken in position 41°28'23.308"N and 070°49'48.937"W. ↖ Approved Tides

N.6.1 Comparison with Prior Surveys

A comparison with prior surveys will be performed by the Atlantic Hydrographic Section as part of the office verification process.

N.7.1 Comparison with Chart and Charting Recommendations

Largest scale chart of this portion of the survey area:

Chart 13230
"Buzzards Bay"
39th ed. March 27, 1993
Scale: 1:40,000

AWOIS 7243, the wreck of a fishing boat charted in position 41°28'25.58"N and 070°49'47.91"W, was located and found to have a ~~predicted~~ Approved tide corrected least depth by pneumatic depth gauge of 13.8 meters (45.3 feet) in position 41°28'23.308"N and 070°49'48.937"W.

Given its deteriorated state, with no portion rising more than three feet above the bottom, it is the recommendation of the hydrographer that this item be charted as a ~~non~~ dangerous wreck in position 41°28'23.308"N and 070°49'48.937"W. Concur ✓ Chart as a wreck with a least Depth of 13.8 meters (45 Feet) See sheet 3 of 3 (13.8 W/K)

N.1.2 Area of Investigation

AWOIS 7264

Buzzards Bay

Reported Position:
41°28'55.58"N
070°51'16.12"W

Datum: NAD27

Reported Depths: 33-foot echo sounder depth located within general depths of 51-53 feet.

Feature: 33-Foot Sounding

N.2.2 Description and Source of Item

AWOIS 7264 is a 33-foot echo sounder depth discovered in position 41°28'55.2"N and 070°51'18.0"W during the search of a 37-foot hang on wire drag survey FE194WD/63 (FE1/64WD). Later, a 35-foot depth was located within general depths of 51-53 feet during survey H9615/76.

N.3.2 Survey Requirements

This item required 200% side scan coverage, echo sounder development and diver investigation.

N.4.2 Method of Investigation

Two hundred percent side scan coverage was achieved over the entire AWOIS 7264 search radius. Of the two side scan contacts found within the search radius, only one (60.13P) yielded a least depth during echo sounder and SEABAT investigations in the reported 33-foot depth range. However, during the development of contact 60.13P, two additional significant echo sounder spikes were logged in the vicinity. Contact 60.13P and the shoalest of the two new spikes were developed with echo sounder, SEABAT and diver investigations. Since the second new spike was approximately 0.4 to 0.5 meters deeper than either contact 60.13P or the shoalest spike, it was only developed by echo sounder and SEABAT.

N.5.2 Results of Investigation

Side scan sonar contact 60.13P was found by divers to be a large singular rock, located in a generally flat, sandy bottom, with a pneumatic depth gauge least depth of 10.10 meters (33.1 feet) in position 41°28'58.452"N and 070°51'14.865"W. The shoalest of the two spikes discovered during the development of contact 60.13P was found by divers to be a large rock located at the top of a rocky crest, with an identical pneumatic depth gauge least depth of 10.10 meters (33.1 feet) in position 41°28'57.042"N and 070°51'18.106"W.

N.6.2 Comparison with Prior Surveys

A comparison with prior surveys will be performed by the Atlantic Hydrographic Section as part of the office verification process.

N.7.2 Comparison with Chart and Charting Recommendations

Largest scale chart of this portion of the survey area:

Chart 13230
"Buzzards Bay"
39th ed. March 27, 1993
Scale: 1:40,000

AWOIS 7264, a 33-foot shoal sounding charted in position 41°28'55.58"N and 070°51'16.12"W, was found to exist in the form of two ~~predicted~~ Approved tide corrected 33.1 least depth objects, one a rock on top of a rocky crest in position 41°28'57.042"N

and 070°51'18.106"W, and the other a nearby large, singular rock in position 41°28'58.452"N and 070°51'14.865"W.

It is the recommendation of the hydrographer that the 33-foot sounding currently charted in position 41°28'55.58"N and 070°51'16.12"W, be slightly modified to reflect the positions stated above for one or both of the 33-foot depths verified during this field examination. Delete the charted 33-ft Sounding. Chart Rocks with a depth of 10m (33-ft) in Lat 41°28'58.0"N, 70°51'16.5"W and a danger curve (10 RKs)

Concur ✓ ✓

N.1.3 Area of Investigation

AWOIS 7265
Buzzards Bay
Reported Position:
41°30'20.18"N
070°48'37.71"W
Datum: NAD27 83
Reported Depths: Wreck reported with 37 feet of water over it (NM20/46); 51-52 foot depths in the vicinity (H9615/76).
Feature: Wreck

N.2.3 Description and Source of Item

AWOIS 7265 is a wreck first reported in NM20/46 with 37 feet of water over it. It was later hung and cleared with 40 feet during wire drag survey FE194WD/63 (FE1/64WD), with the hydrographer recommending charting a wreck cleared to 40 feet in position 41°30'19.8"N and 070°48'39.6"W

N.3.3 Survey Requirements

This item required 200% side scan coverage, echo sounder development and diver investigation.

N.4.3 Method of Investigation

Two hundred percent side scan coverage was not necessary over the entire AWOIS 7265 search radius, as the two contacts (65.52P and 71.56S) logged during the first 100% coverage were easily recognizable as that of a wreck, which was verified with a third and best hit (74.43P) on the first line of the second 100% coverage. The wreck was later developed with echo sounder, SEABAT and diver investigation.

N.5.3 Results of Investigation

AWOIS 7265 was logged on side scan sonar as contacts 65.52P, 71.56S and 74.43P, and found by divers to be the scattered, highly deteriorated remains of a wreck. The most significant object located was a steel box which rose approximately three feet off the bottom, near the front of the wreck. It was on top of this box that the ~~predicted~~ Approved tide corrected pneumatic depth gauge reading of 14.4 meters (47.2 feet) was obtained in position 41°30'18.190"N and 070°48'37.145"W.

N.6.3 Comparison with Prior Surveys

A comparison with prior surveys will be performed by the Atlantic Hydrographic Section as part of the office verification process.

N.7.3 Comparison with Chart and Charting Recommendations

Largest scale chart of this portion of the survey area:

Chart 13230
"Buzzards Bay"
39th ed. March 27, 1993
Scale: 1:40,000

AWOIS 7265, a wreck charted in position 41°30'20.18"N and 070°48'37.71"W, was located and found to have ~~a predicted~~ an Approved tide corrected least depth by pneumatic depth gauge of 14.4 meters (47.2 feet) in position 41°30'18.190"N and 070°48'37.145"W.

Given its deteriorated state, with no portion rising more than three feet above the bottom, it is the recommendation of the hydrographer that this item be charted as a non-dangerous wreck in position 41°30'18.190"N and 070°48'37.145"W. Do Not Concur

Chart as 14 WK (47-ft) with a Danger curve

N.1.4 Area of Investigation See Also The Evaluations Report

AWOIS 7302
Buzzards Bay
Reported Position:
41°26'42.38"N
070°55'44.12"W
Datum: NAD27
Reported Depths: 34 to 35-foot depths exist in the vicinity.
Feature: Wreck - Sailing Vessel

N.2.4 Description and Source of Item

AWOIS 7302 is the wreck of a sailing vessel reported sunk with its mast exposed in position approximate 41°26'42"N and 070°55'46"W, 0.4 NM north of Cuttyhunk Island (LNM34/88 - 1ST CGD).

N.3.4 Survey Requirements

This item required 200% side scan coverage, echo sounder development and diver investigation.

N.4.4 Method of Investigation

Two hundred percent side scan coverage was achieved over the entire AWOIS 7302 search radius, except approximately 10% of the eastern edge of the search radius deemed too shoal and dangerous for ship operations. A total of 21 significant contacts were found within the search radius, of which 10 constituted multiple hits on the same item, resulting in the identification of 16 composite contacts requiring further investigation. All 16 composite contacts were echo sounder developed, with the 6 most significant warranting additional SEABAT investigations. No diver investigations were conducted on this item.

N.5.4 Results of Investigation

All 16 composite contacts identified within the AWOIS 7302 search radius displayed the type of side scan return characteristic of naturally occurring features common to this geographic area, such as ledges, rocky crests and singular

boulders. Further echo sounder and SEABAT developments supported the conclusion that none of these contacts represented the wreck of a sailing vessel. As such, no diver investigations were conducted on this item.

N.6.4 Comparison with Prior Surveys

A comparison with prior surveys will be performed by the Atlantic Hydrographic Section as part of the office verification process.

N.7.4 Comparison with Chart and Charting Recommendations

Largest scale chart of this portion of the survey area:

Chart 13230
"Buzzards Bay"
39th ed. March 27, 1993
Scale: 1:40,000

AWOIS 7302, the wreck of a sailing vessel charted in position 41°26'42.38"N and 070°55'44.12"W, was found not to exist within that portion (90%) of the search radius covered during this field examination. ~~It is therefore the recommendation of the hydrographer that the currently charted wreck symbol be relocated to a position within that portion of the AWOIS search radius not covered during this investigation.~~ RWD 8/95

See also the Evaluation Report

N.1.5 Area of Investigation

AWOIS 7506
Buzzards Bay
Reported Position:
41°29'53.68"N
070°47'05.61"W
Datum: NAD27
Reported Depths: Obstruction noted at 43 feet in surrounding depths of 44 to 46 feet (H9646/76-77)
Feature: Obstruction

N.2.5 Description and Source of Item See Also Section N. of The Evaluation Report

AWOIS 7506 is an obstruction noted at 43 feet in surrounding water depths of 44 to 46 feet during survey H9646/76-77, but was not addressed in the descriptive report, nor was a hydro development shown on the survey. A submerged feature in position 41°29'53.3"N and 070°47'07.5"W was scaled off of survey H9646 (1:10,000). In addition, a 36-foot depth was located approximately 300 meters to the east, which coincides with a charted 31-foot sounding (see AWOIS 8147 ~~below~~). pg 26-27

N.3.5 Survey Requirements

This item required 400% side scan coverage and echo sounder development.

N.4.5 Method of Investigation

Four hundred percent side scan coverage was achieved over the entire AWOIS 7506 search radius. A total of 12 side scan contacts were found, six inside the search radius (of which two were double hits on the same object) and six outside the search radius (of which two were also double hits on the same object). Echo sounder developments were conducted on all four composite contacts located inside the search radius, and three of the four composite contacts located outside the search radius. Since only one contact (77.48S) displayed a least depth in the correct depth range during echo sounder development, it was the only subject of follow-up SEABAT and diver investigations.

N.5.5 Results of Investigation

AWOIS 7506 was logged on side scan sonar as contact 77.48S, and found by divers to be a large, singular rock with an ~~predicted~~ Reported tide corrected pneumatic depth gauge reading of 11.67 meters (38.04 feet), located in a generally flat, sandy bottom just outside the stated search radius in position 41°29'52.358"N and 070°47'00.106"W.

N.6.5 Comparison with Prior Surveys

A comparison with prior surveys will be performed by the Atlantic Hydrographic Section as part of the office verification process.

N.7.5 Comparison with Chart and Charting Recommendations

Largest scale chart of this portion of the survey area:

Chart 13230
"Buzzards Bay"
39th ed. March 27, 1993
Scale: 1:40,000

AWOIS 7506, an unknown obstruction noted at 43 feet in position 41°29'53.68"N and 070°47'05.61"W, was found to be a large, singular rock with ~~a predicated~~ an Approved tide corrected least depth by pneumatic depth gauge of 11.67 meters (38.04 feet) in position 41°29'52.358"N and 070°47'00.106"W.

Since no charted sounding is currently associated with this item, it is the recommendation of the hydrographer that a 38-foot (11.7m) ~~sounding~~ rock be charted in position 41°29'52.358"N and 070°47'00.106"W. Concur

N.1.6 Area of Investigation

AWOIS 7507

Buzzards Bay

Reported Position:

41°28'02.40"N
070°50'48.86"W

Datum: NAD27

Reported Depths: Barge reported sunk in 126 feet of water (NM49/67). Echo sounder depth over barge determined to be 96 feet (H9646/76-77).

Feature: Wreck - Barge

N.2.6 Description and Source of Item

AWOIS 7507 is the wreck of a barge reported sunk in 126 feet of water in position approximate 41°27'54"N and 070°50'49.8"W (NM49/67). During survey H9646/76-77, indications of a non-dangerous sunken wreck were found in position 41°28'02.02"N and 070°50'50.75"W, with an echo sounder depth over the wreck determined to be 96 feet.

N.3.6 Survey Requirements

This item required 200% side scan coverage, echo sounder development and diver investigation.

N.4.6 Method of Investigation

Two hundred percent side scan coverage was not necessary over the entire AWOIS 7507 search radius, as the only contact (26.50S) logged within the search radius during the first 100% coverage was easily recognizable as that of a large barge, which was verified with a second hit (52.50S) on the first line of the second 100% coverage. The wreck was later developed with echo sounder and SEABAT investigations. Due to its unmistakable sonar return, least depth in excess of 90 feet, and the ability to verify the echo sounder least depth with SEABAT, no diver investigation was conducted on this item.

N.5.6 Results of Investigation

AWOIS 7507, the wreck of a barge charted in position 41°28'02.40"N and 070°50'48.86"W, was found to exist with an echo sounder least depth of 29.1 meters (95.45 feet) in position 41°28'01.876"N and 070°50'48.607"W.

N.6.6 Comparison with Prior Surveys

A comparison with prior surveys will be performed by the Atlantic Hydrographic Section as part of the office verification process.

N.7.6 Comparison with Chart and Charting Recommendations

Largest scale chart of this portion of the survey area:

Chart 13230
"Buzzards Bay"
39th ed. March 27, 1993
Scale: 1:40,000

AWOIS 7507, the wreck of a barge charted in position 41°28'02.40"N and 070°50'48.86"W, was located and found to have ~~a predicted~~ an Approved tide corrected least depth by echo sounder of 29.1 meters (95.45 feet) in position 41°28'01.876"N and 070°50'48.607"W.

It is the recommendation of the hydrographer that the non-dangerous wreck symbol currently charted for this barge be relocated to position 41°28'01.876"N and 070°50'48.607"W. Concur
Deleted the charted Wreck PA. Chart a wreck with a depth of 29 m (95-ft) (29$_{95}$ wk)

N.1.7 Area of Investigation

AWOIS 8147
Buzzards Bay
Reported Position:
41°29'52.88"N
070°46'53.11"W
Datum: NAD27
Reported Depths: 31-foot sounding (H3556WD/1913-15); 36-foot depth located approximately 100 meters to the southeast.
Feature: 31-Foot Sounding

N.2.7 Description and Source of Item

AWOIS 8147 is a 31-foot sounding in surrounding rocky bottom scaled from wire drag survey H3556WD/1913-15 in position 41°29'52.5"N and 070°46'55.0"W. During survey H9646/76-77, the 31-foot sounding was not developed, but a 36-foot depth was discovered on a basic survey line approximately 100 meters to the southeast.

N.3.7 Survey Requirements

This item required echo sounder development only.

N.4.7 Method of Investigation

The entire AWOIS 8147 search radius was developed by echo sounder using a maximum line spacing of 10 meters, with individual spikes discovered in the stated depth range split down further to 5 meters and delineated with SEABAT.

N.5.7 Results of Investigation

AWOIS 8147, a 31-foot sounding charted in position 41°29'52.88"N and 070°46'53.11"W, was found by echo sounder, and confirmed by SEABAT, to be a large rock located in

generally rocky surroundings, with a least depth of 9.6 meters (31.5 feet) in position 41°29'53.577"N and 070°46'53.509"W.

N.6.7 Comparison with Prior Surveys

A comparison with prior surveys will be performed by the Atlantic Hydrographic Section as part of the office verification process.

N.7.7 Comparison with Chart and Charting Recommendations

Largest scale chart of this portion of the survey area:

Chart 13230
"Buzzards Bay"
39th ed. March 27, 1993
Scale: 1:40,000

AWOIS 8147, a 31-foot sounding charted in position 41°29'52.88"N and 070°46'53.11"W, was located and found to be a large rock with ~~a predicted~~ an Approved tide corrected least depth by echo sounder of 9.6 meters (31.5 feet) in position 41°29'53.577"N and 070°46'53.509"W.

It is the recommendation of the hydrographer that the ~~position of the~~ currently charted 31-foot sounding be ~~adjusted to~~ deleted ~~position 41°29'53.577"N and 070°46'53.509"W.~~ and a rock with a least depth of 9.6 m (31-ft) be charted at Lat 41° 29' 53.577" N Long. 70° 46' 53.509" W. (9.6 RK) Concur

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Information pertaining to hydrographic development of significant side scan sonar contacts, including SEABAT 9001 multi-beam sonar investigations, is contained in the following Development Abstract and SEABAT Development Addendum.

NOAA Ship RUDE
OPR-B616-RU-94

DEVELOPMENT ABSTRACT
FE-406

DEV	Side Scan Contact Number	Hydro Dev Positions	Least Depth (m)	LD Pos	Geographic Position	Remarks
7243/1	13.58P	285-298	14.45	296.2	41°28'23.467"N 70°49'49.281"W	
7243/2	13.58P	469-470	~~14.1~~ 13.8	~~469.2~~ 12303	41°28'23.~~211~~ 303"N 70°49'48.~~773~~ 937"W	Dive 264/3 See SEABAT Addendum
7264/1	60.20S	353-370	10.76	363.1	41°28'57.178"N 70°51'15.869"W	See SEABAT Addendum
7264/2	N/A	371-392	10.21	~~375.6~~ 12301	41°28'56.905"N 70°51'18.180"W	Dive 264/1 See SEABAT Addendum
7264/3	58.07S	393-398	11.70	~~397.4~~ 57.4	41°28'57.~~715~~"N .174 70°51'~~22.077~~"W 21.430	
7264/4	57.20S	399-408	~~13.0~~ 12.9	403.1	41°29'00.990"N 70°51'15.146"W	
7264/5	60.20S	455-460	10.44	459.3	41°28'57.612"N 70°51'18.378"W	
7264/6	60.13P	461-468	11.10	465.2	41°28'59.564"N 70°51'15.193"W	
7264/7	60.13P	483-494	10.30	~~483.2~~ 12302	41°28'58.404"N 70°51'14.973"W	Dive 264/2 See SEABAT Addendum
7265/1	74.43P	265-284	14.64	~~279.2~~ 12304	41°30'18.~~327~~"N 70°48'36.~~951~~"W	Dive 264/4 See SEABAT Addendum
7265/2	74.43P	471-474	14.8	473.2	41°30'18.427"N 70°48'37.145"W	
7506/1	81.32P	179-192	13.23	183.2	41°29'53.268"N 70°47'05.973"W	
7506/2	79.05P	193-202	13.24	193.1	41°29'55.542"N 70°47'02.785"W	
7506/3	77.48S	203-212	13.21	212.0	41°29'53.695"N 70°46'55.729"W	
7506/4	77.48S	227-234	~~12.7~~ 11.7	~~229.1~~ 12305	41°29'52.~~199~~ 338"N 70°47'00.072"W	Dive 264/5 See SEABAT Addendum

DEV	Side Scan Contact Number	Hydro Dev Positions	Least Depth (m)	LD Pos	Geographic Position	Remarks
7506/5	77.58P	235-242	13.04	~~235.2~~ 193.1	41°29'55.891"N [542] 70°46'59.715"W [7.02]	
7506/6	87.08P	243-248	13.6	247.0	41°29'52.431"N 70°47'05.090"W	
7506/7	87.29P	249-254	12.7	249.2	41°29'51.495"N 70°46'59.443"W	
7506/8	91.27P	255-264	12.9	255.0	41°29'51.228"N 70°47'04.638"W	
7506/9	77.48S	475-482	12.1	477.2	41°29'52.261"N 70°47'00.158"W	
7507/1	52.50S	299-346	29.1	325.2	41°28'01.876"N 70°50'48.607"W	See SEABAT Addendum
7507/2	39.25P	347-352	18.43	347.2	41°28'12.509"N 70°51'04.469"W	
7507/3	52.50S	449-454	29.5	453.2	41°28'01.607"N 70°50'48.874"W	
8147/1	N/A	213-226	10.7	215.3	41°29'54.323"N 70°46'54.081"W	See SEABAT Addendum
8147/2	N/A	154-158	9.6	157.3	41°29'53.577"N 70°46'53.509"W	See SEABAT Addendum
7302/1	422.31S	495-502	9.43	499.6	41°26'35.679"N 70°55'47.411"W	See SEABAT Addendum
7302/2	UNKNOWN	503-504	9.03	~~504.0~~ 503.5	41°26'34.451"N 70°55'46.556"W	See SEABAT Addendum
7302/3	429.07S	505-512	7.86	~~509.3~~ 13012	41°26'37.201"N 70°55'45.462"W	See SEABAT Addendum
7302/4	410.28S	513-524	8.53	517.2	41°26'42.087"N 70°55'43.690"W	See SEABAT Addendum
7302/5	409.12P	525-534	10.31	529.2	41°26'48.422"N 70°55'53.836"W	

DEV	Side Scan Contact Number	Hydro Dev Positions	Least Depth (m)	LD Pos	Geographic Position	Remarks
7302/6	410.13P	535-546	8.~~6~~4	543.1	41°26'43.683"N 70°55'42.688"W	
7302/7	410.23S	547-550	8.~~6~~5	547.1	41°26'43.647"N 70°55'42.598"W	See SEABAT Addendum
7302/8	409.20S	551-556	~~12.2~~ 10.0	~~555.0~~ 439,6	41°26'44.~~603~~"N 70°55'5~~1~~0.~~172~~"W	.814 .069
7302/9	411.27P	557-558	~~8.5~~ 7.9	~~557.2~~ ~~411~~ 411,3	41°26'~~38.394~~"N 70°55'~~32.940~~"W	37,577 33,564
7302/10	419.19S	559-562	~~8.0~~ 7.8	559.4	41°26'37.146"N 70°55'45.449"W	
7302/11	428.43P	563-564	~~6.1~~ 5.9	563.3	41°26'32.976"N 70°55'42.560"W	
7302/12	418.14S	565-566	~~10.9~~ 9.9	~~566.0~~ 509,2	41°26'~~38.058~~"N 70°55'~~47.160~~"W	37.916 46.871
7302/13	415.12P	567-568	~~11.0~~ 10.8	567.3	41°26'47.348"N 70°55'48.066"W	
7302/14	422.15S	569-570	8.~~7~~5	570.0	41°26'36.251"N 70°55'45.167"W	
7302/15	422.00S	571-574	~~8.0~~ 7.8	~~571.2~~ 13015	41°26'35.9~~40~~33"N 70°55'45.~~632~~789"W	See SEABAT Addendum
7302/16	439.33P	575-576	~~11~~.4 10	~~575.2~~ 531,1	41°26'47.~~441~~"N 70°55'5~~2~~1.~~843~~"W	.222 .150

NOAA SHIP RUDE	SEABAT 9001 DEVELOPMENT ADDENDUM	PAGE 1 OF 1
OPR-B616-RU-94	FE-406	RU-10-5-94

AWOIS	CONTACT	FILE	VELCAST	FIX #	DN	GMT	RAW DEPTH	TIDE CORR.	* LEAST DEPTH	LATITUDE	LONGITUDE
7264	n/a	2656445M	94262132	13001	265	180139	10.5	-0.2	10.~~3~~2	41°28'56.938"N	070°51'18.029"W
7264	60.13P	2656626M	94262132	13002	265	182429	10.5	-0.1	10.~~4~~3	41°28'58.430"N	070°51'14.797"W
7264	n/a	26960158	94269130	13003	269	164301	11.8	-1.0	10.~~8~~7	41°28'57.198"N	070°51'16.003"W
7243	13.58P	2646210M	94262132	13004	264	171522	14.3	-0.2	14.1	41°28'23.267"N	070°49'48.847"W
7265	74.43P	26463864	94262132	13005	264	174451	14.9	-0.1	14.8	41°30'18.330"N	070°48'37.090"W
7506	77.48S	2646476M	94262132	13006	264	180448	12.1	-0.1	12.0	41°29'52.271"N	070°47'00.133"W
7507	52.50S	2655978M	94262132	13007	265	164918	29.7	-0.5	29.~~2~~1	41°28'01.870"N	070°50'48.491"W
8147	n/a	2646540M	94262132	13008	264	181022	10.7	-0.1	10.6	41°29'54.343"N	070°46'53.966"W
8147	n/a	2696237M	94269130	13009	269	172641	10.7	-0.9	9.~~8~~6	41°29'53.597"N	070°46'53.535"W
7302	422.31S	2696620M	94269130	13010	269	182731	11.6	-0.8	10.~~8~~7	41°26'37.705"N	070°55'51.710"W
7302	n/a	26968021	94269130	13011	269	185357	10.8	-0.7	10.~~1~~0	41°26'36.377"N	070°55'49.597"W
7302	429.07S	26969127	94269130	13012	269	191224	8.3	-0.6	7.~~7~~6	41°26'37.126"N	070°55'45.376"W
7302	410.28S	2697153M	94269130	13013	269	195231	8.9	-0.5	8.~~4~~3	41°26'41.926"N	070°55'43.531"W
7302	410.23S	26975959	94269130	13014	269	210619	8.9	-0.3	8.~~6~~5	41°26'43.677"N	070°55'42.628"W
7302	422.00S	26980148	94269130	13015	269	221612	8.2	-0.2	~~8.0~~ 7.8	41°26'35.927"N	070°55'45.590"W

NOTE: ALL DEPTHS ARE IN METERS.

* Changes due to smooth Tide application

0. COMPARISON WITH THE CHART See Also The Evaluation Report

0.1 Charts affected by this survey are:

Chart 13230 "Buzzards Bay" 39th ed. 27 March 1993 Scale: 1:40,000	Chart 13218 "Block Island to Martha's Vineyard" 32st ed. 26 June 1993 Scale 1:80,000

Chart 13229 SC
"South Coast of Cape Cod and Buzzards Bay"
25th ed. 27 March 1993
Scale: 1:40,000

0.2 On October 4, 1994, a Danger to Navigation Report was sent to the Commander, First Coast Guard District, outlining charting discrepancies found during this field examination. *See ~~Appendix~~ I for a complete copy of the Danger to Navigation Report, the details of which are summarized below:

* Appended To This Report

REPORT OF DANGER TO NAVIGATION

* THESE UPDATED DEPTHS AFFECT THE FOLLOWING CHARTS:

Chart 13229 (25th ed. 27 March 93)
Chart Scale 1:40,000

Chart 13230 (39th ed. 27 March 93)
Chart Scale 1:40,000

Chart 13218 (31st ed. 26 June 93)
Chart Scale 1:80,000

** DEPTH (MLLW)(m)	LATITUDE	LONGITUDE
27.2 ~~27~~ ~~28~~ ft 8.3	41°-26'-42.1"N	070°-55'-43.7"W
27.6 ~~28~~ ft 8.4	41°-26'-43.7"N	070°-55'-42.7"W
25.9 ~~28~~ ft 7.9	41°-26'-37.6"N	070°-55'-33.6"W
19.4 ~~20~~ ft 5.9	41°-26'-33.0"N	070°-55'-42.6"W
21.0 ~~22~~ ft 6.4	41°-26'-32.4"N	070°-55'-45.5"W

*** Updated depths should be viewed as preliminary information, subject to office review.**

**** Depths reduced to MLLW using ~~predicted~~ Approved tides.**

DELETE THIS DEPTH FROM THE FOLLOWING CHARTS: Chart 13229 (25th ed. 27 March 93) Chart Scale 1:40,000 Chart 13230 (39th ed. 27 March 93) Chart Scale 1:40,000		
DEPTH (MLLW)	LATITUDE	LONGITUDE
25 ft	41°-26'-33.0"N	070°-55'-47.20"W

O.3 The overall correlation between charted soundings and survey depths is excellent, with average differences of approximately one to two feet, except as noted above.

O.4 The correlation between charted shoal areas and corresponding depths from this survey is also excellent, with average differences of approximately one to two feet, except as noted above.

O.5 No recommendations based on the results of this survey.

P. ADEQUACY OF SURVEY See Also The Evaluation Report

P.1 All items investigated during this field examination are addressed. Concur

P.2 This field examination is complete and contains no substandard data. Concur

Q. AIDS TO NAVIGATION

Q.1 RUDE conducted no correspondence with the U.S. Coast Guard regarding floating aids to navigation.

Q.2 There are no floating aids to navigation within the boundaries of the AWOIS search radii that comprise this field examination. Concur

Q.3 There are no aids to navigation within the boundaries of the AWOIS search radii that comprise this field examination. Concur

Q.4 No bridges, overhead cables or overhead pipelines are located within the boundaries of this field examination. Concur

Q.5 No pipelines or designated ferry routes are located within the boundaries of this field examination. Concur

Q.6 No ferry terminals are located within the survey areas. Concur

R. STATISTICS

R.1 a.	Number of Positions	599
b.	Lineal Nautical Miles of Sounding Lines	
	- nautical miles of survey with the use of the side scan sonar	11.5
	- nautical miles of survey without the use of the side scan sonar	21.0
R.2 a.	Square Nautical Miles of Hydrography	n/a
b.	Days of Production	7
c.	Detached Positions	0
d.	Bottom Samples	0
e.	Tide Stations	1
f.	Current Stations	0
g.	Velocity Casts	3
h.	Magnetic Stations	0
i.	XBT drops	0

S. MISCELLANEOUS See Also The Evaluation Report

S.1 a. No evidence of silting was found during this field examination.

b. No evidence of unusual submarine features was found during this field examination.

c. No evidence of anomalous tidal conditions was found during this field examination.

d. No observations of unusual currents were recorded during this field examination.

e. No evidence of magnetic anomalies was found during this field examination.

S.2 No bottom samples were required for this field examination.

T. RECOMMENDATIONS

T.1 There are no known inadequacies with this field examination and no additional field work is required.

T.2 RUDE is aware of no construction or dredging that will affect results of this field examination.

T.3 No further investigation of the survey area is recommended.

U. REFERRAL TO REPORTS

No reports have been published which are not contained within this Descriptive Report.

APPENDIX III

LIST OF HORIZONTAL CONTROL STATIONS

No horizontal control stations were needed for this field examination as Differential GPS was employed exclusively for all positioning control. The geographic positions for the two Differential GPS radio beacons used during this field examination are as follows:

Montauk Point, N.Y.	41°01'02.05"N 071°51'38.27"W
Portsmouth, N.H.	43°04'12.00"N 070°42'30.00"W

APPENDIX I

DANGER TO NAVIGATION REPORTS

Danger to Navigation Report is attached.

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
Office of NOAA Corps Operations
NOAA Ship RUDE S-590
439 W. York Street
Norfolk, VA 23510-1114

October 4, 1994

Commander
First Coast Guard District
Aids To Navigation Office
408 Atlantic Avenue
Boston, Massachusetts 02110-3350

Dear Sir:

During the course of NOAA Ship RUDE's investigation of a sunken wreck in Buzzards Bay between Penikese and Cuttyhunk Islands, several sounding discrepancies were found on chart 13230 **(39th ed. 27 March 93)**. It is requested that information concerning these discrepancies be published in the Local Notice to Mariners.

Updated depths (five additions and one deletion) are outlined in the attached tables. These items should be viewed as preliminary information subject to office review. In addition, there is a chartlet enclosed with the boundaries of the survey area outlined.

The survey soundings were determined during preliminary hydro investigation using a Raytheon DSF-6000 survey fathometer. The depths have been reduced to Mean Lower Low Water (MLLW) by applying predicted tide corrections. The horizontal datum is NAD 83.

This investigation was performed in support of the following field examination:

Hydrographic Survey Registry Number....FE-406
State.....Massachusetts
General Locality.....Buzzards Bay
Locality.....1.5 NM NNW of Pasque Island
Project Number.....B616-RU-94
Surveyed by.....NOAA Ship RUDE

REPORT OF DANGER TO NAVIGATION

* THESE UPDATED DEPTHS AFFECT THE FOLLOWING CHARTS:

Chart 13229 (25th ed. 27 March 93)
Chart Scale 1:40,000

Chart 13230 (39th ed. 27 March 93)
Chart Scale 1:40,000

Chart 13218 (31st ed. 11 January 92)
Chart Scale 1:80,000

** DEPTH (MLLW)	LATITUDE	LONGITUDE
28 ft	41°-26'-42.1"N	070°-55'-43.7"W
28 ft	41°-26'-43.7"N	070°-55'-42.7"W
28 ft	41°-26'-37.6"N	070°-55'-33.6"W
20 ft	41°-26'-33.0"N	070°-55'-42.6"W
22 ft	41°-26'-32.4"N	070°-55'-45.5"W

* **Updated depths should be viewed as preliminary information, subject to office review.**

** **Depths reduced to MLLW using predicted tides.**

DELETE THIS DEPTH FROM THE FOLLOWING CHARTS:

Chart 13229 (24th ed. 27 March 93)
Chart Scale 1:40,000

Chart 13230 (39th ed. 27 March 93)
Chart Scale 1:40,000

DEPTH (MLLW)	LATITUDE	LONGITUDE
25 ft	41°-26'-33.0"N	070°-55'-47.20"W

Please contact either of the following personnel for further information:

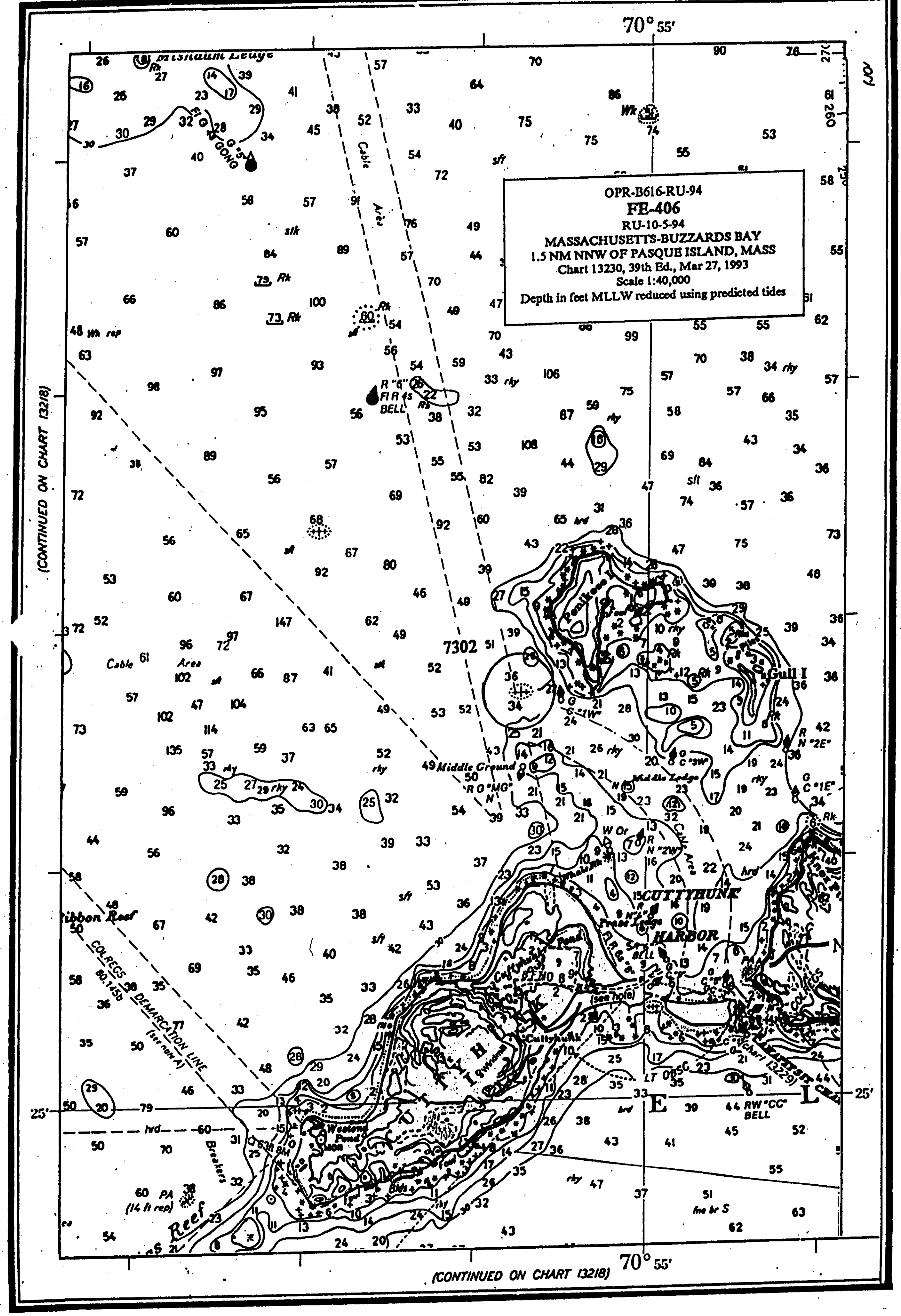
Commanding Officer
NOAA Ship RUDE
16 Sconticut Neck Rd.
#244
Fairhaven, MA. 02719
508-979-0600

Chief, Atlantic Hydrographic Section
Atlantic Marine Center
439 W. York St.
Norfolk, VA. 23510
804-441-6746

Sincerely,

Daniel R. Herlihy

Daniel R. Herlihy
Lieutenant Commander, NOAA
Commanding Officer, NOAA Ship RUDE



OPR-B616-RU-94
FE-406
RU-10-5-94
MASSACHUSETTS-BUZZARDS BAY
1.5 NM NNW OF PASQUE ISLAND, MASS
Chart 13230, 39th Ed., Mar 27, 1993
Scale 1:40,000
Depth in feet MLLW reduced using predicted tides
70° 55′
25′
(CONTINUED ON CHART 13218)
7302
Middle Ground
Middle Ledge
Gull I
CUTTYHUNK
HARBOR
Cuttyhunk
Ribbon Reef
Breakers
Reef
COLREGS DEMARCATION LINE
Cable Area
BELL

OPR-B616-RU-94
FE-406
DIVE INVESTIGATION REPORT
AWOIS 7264
SSS Contact Unknown
DIVE 264/1

DATE: September 21, 1994 DN: 264

DIVEMASTER\TENDER - ST HARDISON DIVERS - LCDR HERLIHY

COXSAIN\TENDER - CB PRINGLE - ENS WILLIAMS

VISIBILITY: 10 FEET CURRENT: 0.5 KTS

MAXIMUM DEPTH: 54 FEET BOTTOM TIME: 21 MIN.

METHOD OF POSITION DETERMINATION: DETACHED POSITION

HDAPS POSITION: 12002 PNEUMATIC DEPTH GAUGE FIX: 12301

EASTING: 58188.0 NORTHING: 53586.2

LATITUDE: 041°28'57.042"N LONGITUDE: 070°51'18.106"W

AVERAGE LEAST DEPTH BY PNEUMATIC DEPTH GAUGE:	11.2 meters
TIME OF READING:	1427 UTC
PNEUMATIC DEPTH GAUGE CORRECTOR:	0.0 meters
PREDICTED TIDAL ZONE CORRECTOR:	-1.1 meters
LEAST DEPTH DETERMINED AT MLLW	10.1 meters

NARRATIVE REPORT: The object of this dive was a ridge crest encountered while performing a contact development in search of a pinnacle associated with SSS Contact 60.13P.

The dive buoy was dropped in position E=58186.3 and N=53582.0, taken from HDAPS fix number 375.6. Divers descended to find a boulder field. The shoalest of the boulders was chosen for the center of a 15 meter circle search of the area. Results of the search indicated that the central boulder was the shoalest in the area and a pneumogage least depth was obtained on top of this boulder. The circle search did not reveal an approximate 3.0-meter ridge drop-off as indicated on the fathometer trace.

OPR-B616-RU-94
FE-406
DIVE INVESTIGATION REPORT
AWOIS 7264
SSS Contact 60.13P
DIVE 264/2

DATE: September 21, 1994 DN: 264

DIVEMASTER\TENDER - ST HARDISON DIVERS - LCDR HERLIHY

COXSAIN\TENDER - CB PRINGLE - ENS WILLIAMS

VISIBILITY: 10 FEET CURRENT: 0.5 KTS

MAXIMUM DEPTH: 46 FEET BOTTOM TIME: 14 MIN.

METHOD OF POSITION DETERMINATION: DETACHED POSITION

HDAPS POSITION: 12006 PNEUMATIC DEPTH GAUGE FIX: 12302

EASTING: 58263.2 NORTHING: 53629.7

LATITUDE: 041°28'58.452"N LONGITUDE: 070°51'14.865"W

AVERAGE LEAST DEPTH BY PNEUMATIC DEPTH GAUGE:	11.0 meters
TIME OF READING:	1458 UTC
PNEUMATIC DEPTH GAUGE CORRECTOR:	0.0 meters
PREDICTED TIDAL ZONE CORRECTOR:	-~~0.9~~ 1.0 meters
LEAST DEPTH DETERMINED AT MLLW:	10.~~1~~ 0 meters

NARRATIVE REPORT: The object of this dive was a rock pinnacle associated with SSS Contact 60.13P.

The dive buoy was dropped in position E=58258.4 and N=53625.5, taken from SSS Contact 60.13P. Divers descended to find a single rock pinnacle extending approximately 2.5 meters above a flat, sandy bottom. A pneumatic depth gauge least depth was obtained at the shoalest point of the pinnacle.

OPR-B616-RU-94
FE-406
DIVE INVESTIGATION REPORT
AWOIS 7243
SSS Contact 13.58P
DIVE 264/3

DATE: September 21, 1994 DN: 264

DIVEMASTER\TENDER - ST HARDISON DIVERS - LCDR HERLIHY

COXSAIN\TENDER - CB PRINGLE - ENS WILLIAMS

VISIBILITY: 10 FEET CURRENT: 0.5 KTS

MAXIMUM DEPTH: 50 FEET BOTTOM TIME: 14 MIN.

METHOD OF POSITION DETERMINATION: DETACHED POSITION

HDAPS POSITION: 12008 PNEUMATIC DEPTH GAUGE FIX: 12303

EASTING: 60256.7 NORTHING: 52545.3

LATITUDE: 041°28'23.308"N LONGITUDE: 070°49'48.937"W

AVERAGE LEAST DEPTH BY PNEUMATIC DEPTH GAUGE:	14.2 meters
TIME OF READING:	1637 UTC
PNEUMATIC DEPTH GAUGE CORRECTOR:	0.0 meters
PREDICTED TIDAL ZONE CORRECTOR:	-0.4 meters
LEAST DEPTH DETERMINED AT MLLW:	13.8 meters

NARRATIVE REPORT: The object of this dive was a possible wreck associated with SSS Contact 13.58P and developed by echosounder with HDAPS Fixes 285-298.

The dive buoy was dropped in position E=60248.7 and N=52550.2, taken from HDAPS Fix 295.2. Divers descended to find bits of wreckage and debris. A circle search of the area indicated that a metal engine block was the shoalest object in the vicinity. The surrounding area is a relatively flat, sandy bottom and none of the wreckage extends more than one meter above the bottom. A pneumatic depth gauge least depth was obtained on top of the engine block.

OPR-B616-RU-94
FE-406
DIVE INVESTIGATION REPORT
AWOIS 7265
SSS Contact 74.43P
DIVE 264/4

DATE: September 21, 1994 DN: 264

DIVEMASTER\TENDER - ST HARDISON DIVERS - ENS HAUPT

COXSAIN\TENDER - CB PRINGLE - ENS WILLIAMS

VISIBILITY: 7 FEET CURRENT: 0.5 KTS

MAXIMUM DEPTH: 55 FEET BOTTOM TIME: 19 MIN.

METHOD OF POSITION DETERMINATION: DETACHED POSITION

HDAPS POSITION: 12011 PNEUMATIC DEPTH GAUGE FIX - 12304

EASTING: 61921.5 NORTHING: 56089.7

LATITUDE: 041°30'18.190"N LONGITUDE: 070°48'37.145"W

AVERAGE LEAST DEPTH BY PNEUMATIC DEPTH GAUGE: 14.4 meters

TIME OF READING: 1853 UTC

PNEUMATIC DEPTH GAUGE CORRECTOR: 0.0 meters

PREDICTED TIDAL ZONE CORRECTOR: 0.0 meters

LEAST DEPTH DETERMINED AT MLLW: 14.4 meters

NARRATIVE REPORT: The object of this dive was a possible wreck associated with SSS Contact 74.43P and developed by echosounder with HDAPS Fixes 265-284.

The dive buoy was dropped in position E=61922.7 and N=56092.4, taken from HDAPS Fix 267.2. Divers descended to find bits of wreckage and scattered debris. A circle search of the area indicated that a metal box was the shoalest object in the vicinity. The surrounding area is relatively flat, sandy bottom and none of the wreckage extends more than one meter above the bottom. A pneumatic depth gauge least depth was obtained on top of the metal box.

OPR-B616-RU-94
FE-406
DIVE INVESTIGATION REPORT
AWOIS 7506
SSS Contact 77.48S
DIVE 264/5

DATE: September 21, 1994 DN: 264

DIVEMASTER\TENDER - ST HARDISON DIVERS - ENS HAUPT

COXSAIN\TENDER - CB PRINGLE - ENS WILLIAMS

VISIBILITY: 10 FEET CURRENT: 0.5 KTS

MAXIMUM DEPTH: 55 FEET BOTTOM TIME: 10 MIN.

METHOD OF POSITION DETERMINATION: DETACHED POSITION

HDAPS POSITION: 12024 PNEUMATIC DEPTH GAUGE FIX - 12305

EASTING: 64172.4 NORTHING: 55293.7

LATITUDE: 041°29'52.358"N LONGITUDE: 070°47'00.106"W

AVERAGE LEAST DEPTH BY PNEUMATIC DEPTH GAUGE: 11.7 meters

TIME OF READING: 1944 UTC

PNEUMATIC DEPTH GAUGE CORRECTOR: 0.0 meters

PREDICTED TIDAL ZONE CORRECTOR: -0.6 meters

LEAST DEPTH DETERMINED AT MLLW: 11.1 meters

NARRATIVE REPORT: The object of this dive was a rock pinnacle associated with SSS Contact 77.48S and developed by echosounder with HDAPS Fixes 227-234.

The dive buoy was dropped in position E=64173.2 and N=55288.8, taken from HDAPS Fix 229.1. Divers descended to find one large pinnacle rock. The surrounding area consists of a relatively flat, sandy bottom. A pneumatic depth gauge least depth was obtained on the shoalest point of the rock pinnacle.

APPENDIX VII

APPROVAL SHEET

LETTER OF APPROVAL

REGISTRY NO. FE-406

This report and the accompanying field sheets are respectfully submitted.

Field operations contributing to the accomplishment of field examination FE-406 were conducted under my direct supervision with frequent personal checks of progress and adequacy. This report and field sheets have been closely reviewed and are considered complete and adequate for nautical charting.

Daniel R. Herlihy

Daniel R. Herlihy, LCDR, NOAA
Commanding Officer
NOAA Ship RUDE

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: November 9, 1994

MARINE CENTER: Atlantic

HYDROGRAPHIC PROJECT: OPR-B616

HYDROGRAPHIC SHEET: FE-406

LOCALITY: Massachusetts, Buzzards Bay 1.5 Nautical Miles NNW of Pasque Island

TIME PERIOD: September 14 - 26, 1994

TIDE STATION USED: 844-8248 Penikese Island, Ma.
Lat. 41° 27.0'N Lon. 70° 55.3'W

PLANE OF REFERENCE (MEAN LOWER LOW WATER): 2.64 ft.

HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 3.6 ft.

REMARKS: RECOMMENDED ZONING

1. West of 70° 50.0'W times and heights are direct on Penikese Island, Ma. (844-8248).
2. East of 70° 50.0'W, times are direct, and apply a X1.04 range ratio to heights using Penikese Island, Ma. (844-8248).

Note: Times are tabulated on Greenwich Mean Time.

CHIEF, DATUMS SECTION

NOAA FORM 76-155
(11-72)

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

GEOGRAPHIC NAMES

SURVEY NUMBER

FE-406

Name on Survey	A ON CHART NO. 13230	B ON PREVIOUS SURVEY NO.	C ON U.S. QUADRANGLE MAPS	D FROM LOCAL INFORMATION	E ON LOCAL MAPS	F P.O. GUIDE OR MAP	G RAND MCNALLY ATLAS	H U.S. LIGHT LIST	K	
BUZZARDS BAY (title)	X									1
MASSACHUSETTS (title)	X									2
PASQUE ISLAND (title)	X									3
										4
										5
										6
										7
										8
										9
										10
										11
										12
										13
										14
										15
				Approved:						16
										17
				Charles L. Harrington						18
				Chief Geographer - N/CG2x5						19
				NOV - 2 1994						20
										21
										22
										23
										24
										25

NOAA FORM 76-155 SUPERSEDES C&GS 197

07/18/95

HYDROGRAPHIC SURVEY STATISTICS
REGISTRY NUMBER: FE-406

NUMBER OF CONTROL STATIONS	2
NUMBER OF POSITIONS	599
NUMBER OF SOUNDINGS	1830

	TIME-HOURS	DATE COMPLETED
PREPROCESSING EXAMINATION	51	10/31/94
VERIFICATION OF FIELD DATA	65.50	03/22/95
QUALITY CONTROL CHECKS	19	
EVALUATION AND ANALYSIS	25	
FINAL INSPECTION	24	06/12/95
COMPILATION	8	07/06/95
TOTAL TIME	193	

ATLANTIC HYDROGRAPHIC BRANCH APPROVAL 07/17/95

ATLANTIC HYDROGRAPHIC BRANCH
EVALUATION REPORT FOR FE-406 (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.

Three page-size 1:10,000 scale smooth plots were generated during office processing. These plots are considered the smooth sheets for this survey and are attached to this report.

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. The smooth sheet has been annotated with ticks showing the computed mean shift between the NAD 83 and the North American Datum of 1927 (NAD 27).

To place the smooth plots on the NAD 27, move the projection lines 0.387 seconds (11.936 meters or 1.19 mm at the scale of the survey) north in latitude and 1.879 seconds (43.586 meters or 4.36 mm at the scale of the survey) east in longitude.

M. COMPARISON WITH PRIOR SURVEYS

M.1. Hydrographic

H-2267	(1896)	1:10,000
H-2320	(1897)	1:20,000
H-9645	(1976-unreviewed)	1:10,000
H-9646	(1976-unreviewed)	1:10,000
H-9615	(1976)	1:20,000

M.1.a. Prior surveys H-2267 (1896) and H-2320 (1897) were not available for comparison.

M.1.b. Prior survey H-9645 (1976-unreviewed) is common to sheet 1 of 3. The prior survey is in good agreement with the present survey; present survey soundings vary plus or minus (±) 0^3 to 0^9 m (1 to 3 ft). These differences can be

attributed to natural changes in the bottom configuration and more accurate surveying techniques.

M.1.c. Prior survey H-9646 (1976-unreviewed) is common to sheets 2 and 3 of 3. Prior survey soundings on sheet 2 of 3 are in good agreement with the prior survey with scattered soundings varying plus or minus (±) 0^3 m (1-ft). Present survey soundings on sheet 3 of 3 are in agreement with prior survey soundings. These differences can be attributed to natural changes in the bottom configuration and more accurate surveying techniques.

M.1.d. Prior survey H-9615 (1976) is common to the northwest portions of sheets 2 and 3 of 3. The prior hydrography is in good agreement with the present survey with depths varying plus or minus (±) 0^3 m (1-ft). These differences are attributed to natural changes and bottom configuration.

The present survey is considered adequate to supersede the prior surveys within the common area.

M.2. Wire Drag

FE-194WD (1963) 1:40,000

Prior wire drag survey FE-194WD (1963) is common to sheets 2 and 3 of 3. Adequate discussions and charting recommendations for these AWOIS items can be found in section N., pages 15 through 20 of the Descriptive Report.

There are no conflicts between the present survey depths and the prior wire drag survey effective clearance depths.

The present survey is considered adequate to supersede the prior wire drag survey in the common areas.

N. ITEM INVESTIGATIONS

N.1.4. Automated Wreck and Obstruction Information System (AWOIS) Item #7302, a charted dangerous submerged wreck, in

Latitude 41°26'42.38"N, Longitude 70°55'44.12"W, originates with Local Notice to Mariners 34 of 1988 (LNM34/88). Approximately 90% of the required search area was investigated by the field unit using side scan sonar and fathometer with negative results. The field unit was not able to investigate the entire search area because of shallow water. A telephone conversation with Mr.* Don Lynch (508-999-3880) on June 27, 1995 established that there is no hazard in the charted location. Mr. Lynch dove on the sunken vessel for the insurers and stated that the vessel had burned to the bilges, only minimal wreckage was left, and removed the floating wooden mast. It is recommended that the dangerous submerged wreck be removed from the chart. It is also recommended that a rock with a depth of 5.9 m (19-ft) in Latitude 41°26'32.98"N, Longitude 70°55'42.56"W be charted as shown on the present survey. See sheet 1 of 3. * Seq-Tow Southern Mass. (Salvage Company) RWD 8/95

N.1.5. AWOIS item #7506, an uncharted submerged obstruction with a depth of 13.1 meters (43-ft) in Latitude 41°29'53.68"N, Longitude 70°47'05.61"W, originates with prior survey H-9646 (1976-unreviewed). The item was investigated by the present survey using side scan sonar and fathometer developments and is considered disproved. No change in charting status is recommended. See sheet 2 of 3. Chart present survey data. RWD 8/95

O. COMPARISON WITH CHARTS 13218 (32nd Edition, Jun 26/93)
13229SC (25th Edition, Mar 27/93)
13230 (39th Edition, Mar 27/93)

The charted hydrography originates with the previously discussed prior surveys and unascertainable sources which require no further consideration. Attention is directed to the following:

A charted 43-ft (13.1 m) sounding, in Latitude 41°28'56.0"N, Longitude 70°51'32.5"W, originates with an unascertainable source. This sounding lies outside the limits of the area surveyed, sheet 3 of 3, and was not investigated by the field unit. During office processing it was noted that this sounding is charted on the latest edition of chart 13230; however, it is not shown on the latest editions of charts

13218 or 13229SC. It is recommended that the charting disposition of this sounding be examined by charting personnel and a consistent charting decision be made concerning the sounding.

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

P. ADEQUACY OF SURVEY

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

S. MISCELLANEOUS

Chart compilation using the present survey data was done by Atlantic Hydrographic Branch personnel in Norfolk, Virginia. Compilation data will be forwarded upon completion of the project.

RUDE Processing Team

Maxine Fetterly
Cartographic Technician
Verification of Field Data

Robert R. Hill Jr.
Cartographer
Evaluation and Analysis

APPROVAL SHEET
FE-406

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 disproval 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: 7-17-95
Richard H. Whitfield
Cartographer
Atlantic Hydrographic Branch

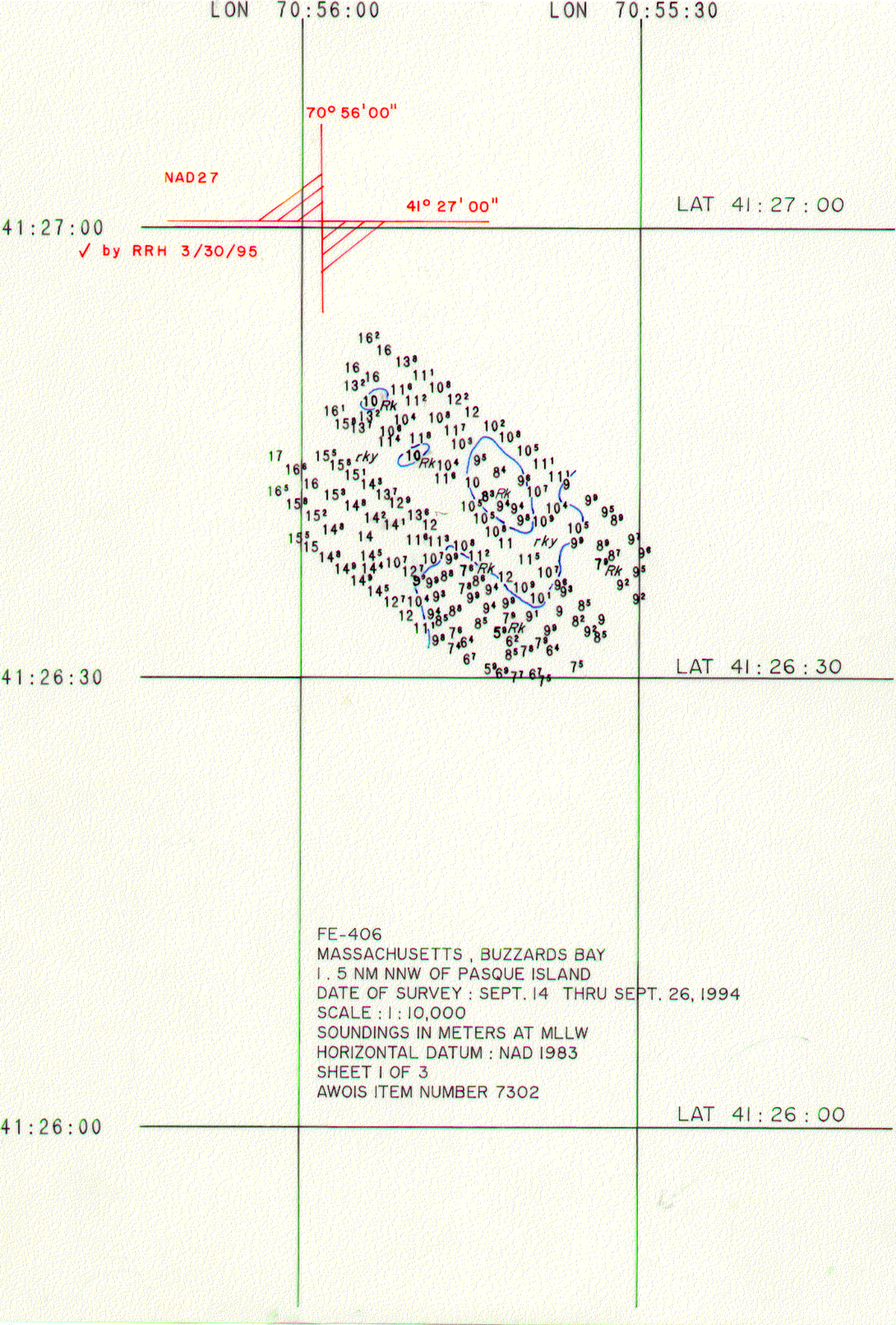
I have reviewed the smooth sheet, accompanying data, and reports. This survey and accompanying digital data meet or exceed NOS requirements and standards for products in support of nautical charting except where noted in the Evaluation Report.

Nicholas E. Perugini Date: 7-17-95
Nicholas E. Perugini, CDR, NOAA
Chief, Atlantic Hydrographic Branch

****

Final Approval:

Approved: Andrew A. Armstrong III Date: 7-19-95
Andrew A. Armstrong III
Captain, NOAA
Chief, Hydrographic Surveys Division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NAD27
41° 27' 00"
LAT 41:27:00
41:27:00
✓ by RRH 3/30/95
LAT 41:26:30
41:26:30
FE-406
MASSACHUSETTS , BUZZARDS BAY
1.5 NM NNW OF PASQUE ISLAND
DATE OF SURVEY : SEPT. 14 THRU SEPT. 26, 1994
SCALE : 1 : 10,000
SOUNDINGS IN METERS AT MLLW
HORIZONTAL DATUM : NAD 1983
SHEET 1 OF 3
AWOIS ITEM NUMBER 7302
LAT 41:26:00
41:26:00

LON 70:49:00

LON 70:48:30

LON 70:48:00

LON 70:47:30

LON 70:47:00

LAT 41:30:30

LAT 41:30:30

FE-406
MASSACHUSETTS , BUZZARDS BAY
1. 5 NM NNW OF PASQUE ISLAND
DATE OF SURVEY : SEPT. 14 THRU SEPT. 26, 1994
SCALE : 1 : 10,000
SOUNDINGS IN METERS AT MLLW
HORIZONTAL DATUM : NAD 1983
SHEET 2 OF 3
AWOIS ITEM NUMBERS 7265 , 7506 & 8147

LAT 41:30:00

LAT 41:30:00

LAT 41:29:30

70° 48' 30"

NAD 27

41° 29' 30"

✓ by RRH 3/30/95

LAT 41:29:30

LON 70:51:30 | LON 70:51:00 | LON 70:50:30 | LON 70:50:00 | LON 70:49:30

LAT 41:29:00

LAT 41:28:30

LAT 41:28:00

70° 51' 00"

NAD 27

41° 28' 30"

✓ by RRH 3/30/95

FE-406
MASSACHUSETTS , BUZZARDS BAY
1 . 5 NM NNW OF PASQUE ISLAND
DATE OF SURVEY : SEPT. 14 THRU SEPT. 26, 1994
SCALE : 1 : 10,000
SOUNDINGS IN METERS AT MLLW
HORIZONTAL DATUM : NAD 1983
SHEET 3 OF 3
AWOIS ITEM NUMBERS 7243 , 7264 & 7507

NOAA FORM 75-96
(10-83)

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

MARINE CHART BRANCH

RECORD OF APPLICATION TO CHARTS

FILE WITH DESCRIPTIVE REPORT OF SURVEY NO. FE-406

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 E	7/27/95	L. Ahuna PS	Full ~~Part Before~~ After Marine Center Approval Signed Via
			Drawing No. 26, Then H-OW6
13230	7/28/95	L. Ahuna PS	Full ~~Part Before~~ After Marine Center Approval Signed Via
			Drawing No. 51 Then 13229 E #26
13218	8-2-95	Paul Spence PS	Full ~~Part Before~~ After Marine Center Approval Signed Via
			Drawing No. 70 THRU 13229 PAGE "E"
13233	8/1/95	L. Ahuna PS	Full ~~Part Before~~ After Marine Center Approval Signed Via
			Drawing No. 16, Then CHT 13230 DRAWING #51
13			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.
			Full Part Before After Marine Center Approval Signed Via
			Drawing No.
			Full Part Before After Marine Center Approval Signed Via
			Drawing No.

SUPERSEDES C&GS FORM 8352 WHICH MAY BE USED.