

# 9668

Diag. Cht. No. 1210-3

NOAA FORM 76-35A

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

## DESCRIPTIVE REPORT (HYDROGRAPHIC)

Type of Survey .... Hydrographic.....  
Field No. .... WH-10-9-76.....  
Office No..... H-9668.....

### LOCALITY

State ..... Massachusetts.....  
General Locality .. Buzzards Bay.....  
Locality ..... Hamlin Point to Weepecket.....  
Islands .....

1976

CHIEF OF PARTY  
J. W. Carpenter

### LIBRARY & ARCHIVES

DATE ..... July 11, 1980.....

★ U.S. GOV. PRINTING OFFICE: 1978-666-172

*Great*  
CMT  
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3229 (P)  
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**HYDROGRAPHIC TITLE SHEET**

H-9668

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.

WH-10-9-76

State MASSACHUSETTS

General locality BUZZARDS BAY

Locality HAMLIN POINT TO ~~WEEPECKT ISLANDS~~  
~~NAUSHON ISLAND AND WOODS HOLE~~

Scale 1:10,000 Date of survey Oct. 6, 76 - June 22, 77

Instructions dated JANUARY 13, 1976 & MAR. 16, 77 Project No. OPR-503-WH-76,77

Vessel NOAA Ship WHITING LAUNCHES 1202, 1203, and 1206

Chief of party CDR. J.W. CARPENTER

Surveyed by ENS: G. BARONE, D. GOODRICH, N. KONCHUBA, R. MANDZI

Soundings taken by echo sounder, hand lead, pole Raytheon DE-723D, echo-sounder

Graphic record scaled by WHITING Personnel

Graphic record checked by DWY, DRT, JBG Verification Branch ~~AMC~~ (AMC)

Protracted by \_\_\_\_\_ Automated plot by HYDROPLOT  
Xynetics 1201 Plotter (AMC)

Soundings penciled by \_\_\_\_\_

Soundings in ~~fathoms~~ feet at MLW ~~MLW~~

REMARKS: Greenwich Mean  
ALL TIMES ARE COORDINATED UNIVERSAL TIME Notes and changes made  
by verifier during verification in red ink, by Quality Evaluator  
in black

"Misc data is filed with the field records"

App'd. WSI 8-24-81

RWD

XWW 10/4/91

DESCRIPTIVE REPORT

WH-10-9-76

H-9668

A. PROJECT

This project began in the spring of 1976 with the WHITING and PIERCE surveying the Buzzards Bay area. Field work was completed by the WHITING in the 1977 field season. Work was conducted under project instructions dated January 13, 1976, and supplemented by changes No. 1, 2, and 3, dated January 16, 23, and April 14<sup>5</sup>, 1976 respectively. Additional work during 1977 was conducted under project instructions dated March 16<sup>5</sup>, 1977, and supplemented by changes; No. 1, 2, 3, and 4, dated April 12, 12, May 2, and April 24, 1977 respectively. This survey was conducted from October 6, 1976 through June 22, 1977.

B. AREA SURVEYED

The area was surveyed using the WHITING'S automated launches on the following Julian days; 280, 286, 287, 290, 291 in 1976 and 160, 163, 164, 165, 166, 167, 171, 172, and 173 in 1977. The sheets covered an area in the southeast corner of Buzzards Bay Massachusetts, from the vicinity of ~~Tarpaulin Cove on Naushon Island~~ <sup>Wespeck Islands</sup> north to West Falmouth harbor. The overall ~~sheet~~ <sup>survey is inshore of</sup> has the following limits. *one mile south*

<del>41°32.8' N</del>	<del>70°48.5' W</del>	41°35.0' N	70°38.6' W
		41°35.1' N	70°41.4' W
<del>41°36.9' N</del>	<del>70°38.8' W</del>	41°33.5' N	70°40.6' W
		41°31.0' N	70°45.7' W
<del>41°32.5' N</del>	<del>70°35.8' W</del>	41°29.5' N	70°45.5' W
<del>41°28.5' N</del>	<del>70°45.3' W</del>		

The bottom is generally sandy and the adjacent coastline is irregular with many exposed rocks and foul areas inshore. The primary traffic in this area is seasonal, recreational boating, with some commercial traffic in the vicinity of Woods Hole.

C. SOUNDING VESSEL *Note: EDP identification numbers for Lch's 1202 and 1206 are the same, likewise for Lch's 1203 and 1207*

WHITING launch 1206 (2932) was equipped with the Hydroplot system and performed all survey operations during 1976. Bottom samples for the area were collected by WHITING launch 1207 (2931).

WHITING launches 1202 (2932) and 1203 (2934) both equipped with the Hydroplot system, performed all survey operations during 1977.

Due to the rocky, irregular nature of the shoreline, close-in

soundings were difficult to obtain. Groundings, often with rudder and propeller damage, were frequent when running shoreline.

D. SOUNDING EQUIPMENT AND CORRECTIONS TO ECHO SOUNDINGS /

Echo sounders used on WHITING launches were Raytheon model DE-723 D's. Fathometer S/N 37010 was used in 1206, 1203 and S/N 37018 was used in 1207, 1202. Fathometer operators performed frequent initial settings, A-F checks, and stylus-arm length checks. Fathometers generally performed well except a malfunction at the beginning of JD 287, 1976, which caused the loss of one day's operation. No other fathometer problems were noted.\*

*Both fathometers have history of malfunctions. As described in Q.C. Report of 11-9-79 returned from Rockville dated Jan. 26, 1979. Power supply malfunction*

Bar checks were conducted daily as sea state permitted and averages from these were compiled in direct comparison logs and velocity corrections computed in accordance with the Hydro Manual. As a check, comparisons were made with two TDC casts made earlier in the 1976 field season. Because of a 20 day difference, the TDC casts were not used but showed good agreement with the bar check abstracts (0.2 ft difference).

Settlement and squat data for 1206 was determined by WHITING personnel for OPR-503 during the 1976 field season. Data for 1207 was furnished by the NOAA Ship Mt. Mitchell, taken in January 1976. Correctors for launches 1202, 1203 were determined by WHITING personnel on May 7, 1977, State Dock, Brunswick GA. Values for settlement and squat are abstracted in the appendix and applied on the TC/TI tape furnished with this survey. *No draft correction noted*

E. HYDROGRAPHIC SHEETS'

Field sheets were prepared by WHITING personnel using a Houston Instrument DP-3 plotter, S/N 4858-13. Program RK 201 was used for the grid and lattice at a scale of 1:10,000 and a skew of 28°. The field work was done using program RK 111 (Range/Range real time hydroplot) and later replotted with program RK 211 (Non-real time plot). Field sheets are plotted with predicted tides. Tide corrections are based on predicted tides from Newport, RI with correctors applied in accordance with the project instructions. These values were furnished as preliminary correctors by Tides Branch, Rockville, MD. Velocity corrections have been applied. Field sheets have been divided into two areas for ease in plotting, clarity, and efficiency. The main sheets have been divided horizontally into a North and South sheet with a development overlay for each. Work conducted in 1976 was devoted entirely to main scheme on the South sheet. The work in 1977 completed the main scheme and concentrated on developing suspected hazardous areas on both North and South sheets.

F. CONTROL STATIONS

All control stations on this survey were established or recovered by Photo Party 62, using third order specifications or better. The only exception is Station CAD ecc., established in Quissett Harbor for Ra/Az. Station CAD was recovered but did not give a full view

of the Harbor. A point was measured from Station CAD with a steel tape and then cut in to third order specifications. Station CAD ecc. is referred to as Station MAN in the sounding volume.

Two stations, West Island Tower and Angel were used during the 1976 field season. Only one additional station, Butler Pt., was used during 1977. A complete listing of stations is included in the appendices.

G. HYDROGRAPHIC POSITION CONTROL

Main scheme hydrography was run on courses of 0° and 180° with perpendicular crosslines. Shoreline was run on various courses as close as possible. With the exception of Quissett Harbor, position control was established using the Del Norte system in a range/range configuration. The 1977 main scheme hydrography was run on courses 315° and 145°.

Field calibrations were obtained using three point sextant fixes with check angles. Angles were input into the computer, which computed an inverse distance between the fix and check fix and compared the average fix to the observed Del Norte readings, using program RK 561. Daily calibrations are included in the accordion file folder and an abstract of positions included in the appendices following this report, as is an abstract of correctors. In addition, every two weeks the system was calibrated along a baseline of known length in accordance with the procedures described in the Del Norte manual. It should be noted that DMU's and Master units were calibrated and used in pairs. The following is a list of these calibrated units:

<u>Julian Day</u>	<u>DMU</u>	<u>MASTER</u>	<u>VESSEL</u>
(1976)			
280,286,287, 290,291	181	250	2932 (1206)
294	180	278	2931 (1207)
(1977)			
160,163,164, 165,166,167, 171,172	182	1067	2932 (1202)
164,165,166, 171,172,173	179	281	2931 (1203)

Due to the geographic area of Quissett Harbor, a range/azimuth set-up was necessary. Launch 1203 was used with the Hydroplot system on-line to record time, depth, and range from the azimuth station. Marks were given over the radio to the shore party. On shore, the remote station was set up next to the theodolite on Station CAD ecc., which initialed on a control station (NAT) down the beach. Initial setting was checked frequently to avoid rerunning lines. In a few cases where erroneous positions were found due to interference, it was necessary to interpolate by time and course an accurate position.

#### H. SHORELINE ✓

Shoreline was taken from shoreline manuscripts TP-00772 (Jan.75), TP-00773 (Jan.5,76), and TP-00774 (Dec.75). Shoreline manuscripts were provided by Operations Division, Atlantic Marine Center. Field edit was done by Photo Party 62, Robert Tibbits, Chief of Party, and verification of this work has been received by the WHITING.

CLASS I TP00772 of 1974-77, CLASS I TP00773 of 1974-77, CLASS I TP00774 of 1974-77

#### I. CROSSLINES ✓

During the 1976-1977 field seasons, 22 miles of crosslines were run perpendicular to the main scheme. This amounted to 10.4% of total main scheme run. Agreement was generally excellent with small differences probably accountable to predicted tides and irregular bottom features.

#### J. JUNCTIONS ✓

This survey junctions with contemporary surveys WH-10-8-76, H-9646 to the south; PE 10-3-76, H-9661 to the <sup>west</sup> ~~west~~; PE 20-1-76, H-9615 to the north, and H-8170 in the area of Woods Hole. The junction with 10-8-76 was basically a continuance of main scheme lines cut short by the limits of the boat sheet. Overlap was somewhat limited but provided excellent bottom representation. The junction with PE 10-3-76 provided a better overlap of soundings with excellent agreement of 1 foot or less in 30 feet of water or shoaler. Because of the sloping bottom some 2-3 foot differences were noted in deeper water. H-9615 and H-8170 which junction to the north and south provided excellent comparisons with only a few discrepancies in shoal areas on H-8170.\* This is understandable considering the extreme irregularity of the bottom. \* See Q.C. Report, para 3.

#### K. COMPARISONS WITH PRIOR SURVEYS ✓ *See Verifiers Report*

This survey was compared with prior surveys; H-2268 (1896), H-2317 (1897), and H-2316 (1897). For the most part the prior surveys are two to three feet shoaler. The depth contours on H-2268, along-shore and in the vicinity of Weepecket Island, show good agreement except they are displaced by this two to three foot difference. H-2317 showed good agreement off Penzance, and one to three feet shoaler off Uncatena Is. and Gunning Pt.. Quissett Harbor and near-shore approaches appeared to be one to two feet deeper in this prior survey. This two to three foot difference in the eighty years between surveys can probably be attributed to changes in the ocean water table.

Upon completion of the main scheme in the 1977 field season, developments were run to investigate presurvey review items, dashed circle items, and any unusual items found on the main scheme. A standard grid pattern with 50 meter spacing was used and splits were run as necessary. The area of this survey proved to be boulder-

strewn, especially inshore, where rock pinnacles were common. This should be taken into account when charting. The following items were investigated.

PRESURVEY REVIEW ITEMS

PSI #13

*Development '3'*

On JD 164 an extensive development was run in the vicinity of 41° 31' 44"N, 70° 43' 23"W, known locally as Weepecket Rock. A least depth of 10.0 feet, one before 5054 was located and is an excellent position check with the charted 10 foot PSI item. <sup>from C&E Report</sup> The Engineers' Report, Part 1 of 1906, which <sup>changes the</sup> reports a 2 foot sounding in this area was unavailable. For this reason divers were sent to investigate. A leadline depth of 8.5 feet was noted approximately 51 meters NE. <sup>from H-2317 (1897)</sup> This feature was reported by divers to be a ridge of rocks running roughly north-south. Due to limited time and strong currents, a complete investigation of this feature was not practical. Due to the significance of this sounding a wire drag would be desirable. Any documentation from the Engineers' Report of 1906 could be invaluable. <sup>at Lat 41° 31' 44.06" Long. 70° 43' 24.04" in excess level 1'; another 10 ft sounding was located at Lat. 41° 31' 42.93" Long. 70° 43' 24.38" (Pos. 5054+5) \*\* leadline depth is 8 ft at Lat 41° 31' 43.72" Long. 70° 43' 23.00" (Pos. 5260) The 8 ft plotted on the sheet was located on</sup> PSI #56 <sup>near the hydro at 41° 31' 43.47 Long. 70° 43' 23.36" (Pos. 2781) Recommend charting the 8 ft.</sup>

*(Origin LNM 43/73 and 45/73)*

The rock reported to exist in the immediate vicinity of latitude 41° 32.5'N, 70° 39.9'W, was not found. This development found no evidence to support this report but it did reveal that the Quisset Harbor channel is narrow and foul very close to either side. <sup>(Development #12) Shaltest sounding in this area is a 4ft. (6,5316) Lat. 41° 32' 30.6" Long. 70° 39' 51.76"</sup> Rock is not considered to be in channel

*See Q.C. Report, para 9.*

PSI #16

This development was run to investigate two rocks from H-2316 (1897) in the vicinity of 41° 34' 45"N, 70° 38' 45"W. These 3 foot and 4 foot <sup>covered</sup> rocks were from a sounding line falling in depths of 8 feet and 10 feet. It was suggested there may have been an error in positioning or depth. This development did not reveal any such features in this area. Due to this inshore, sloping, irregular bottom, retention as charted is recommended. <sup>There are two 5 ft soundings (2nd 4 ft out of 1158) that could be rocks, these are at 41° 34' 39.97" 70° 38' 42.54" and Lat 41° 34' 38.32" Long. 70° 38' 42.14"</sup> <sup>concur</sup>

DASHED CIRCLE ITEMS

*See V.R. para, 6.a.*

Development #1

This development was run in the vicinity of 41° 31' 31"N, 70° 44' 48"W to investigate a charted 42 foot sounding. A least depth of 39 feet was found at this location. It is recommended the charted sounding be changed. <sup>at Lat. 41° 31' 30.50" Long. 70° 44' 47.08" concur</sup> <sup>\* \* \* From H-3556 (1913-15) W.D. deleted</sup>

Development #2

from H-2268 (1896)

The charted 27<sup>A</sup> foot depth at 41° 31' 31"N, 70° 43' 58"W, was developed and a least depth of 28<sup>B</sup> feet was found at this location. It is recommended the charted sounding be changed. <sup>Lat 41° 31' 30.59" Long 70° 43' 59.51"</sup>  
*Pos # 5015 + 4* *concur* *deleted*

Development #4

The 3<sup>RK</sup> foot sounding at 41° 30' 37"N, 70° 43' 19"W, was not disproved. <sup>50</sup> found. A 4 foot sounding <sup>50</sup> 53 meters <sup>west</sup> east of this position was located, one before position 5101. This is an inshore area and was noted as foul. Recommend retention as charted. <sup>Lat 41° 30' 31.95" Long 70° 43' 21.81"</sup>  
*\* from prior survey H-2268 (1896)* *retaining* *charted 3RK carried forward from H-2668 (1896)*

Development #5

A search for the charted 16 foot sounding at 41° 30' 51"N, 70° 43' 16"W, revealed a development least depth of 14 feet, approximately 20 meters NE of this location, <sup>the</sup> three out from position 304. Recommend changing charted depth to 14 feet surveyed depth. <sup>concur</sup>  
*5082 at Lat 41° 30' 53.89" Long 70° 43' 13.42" Another 14 ft sounding was located at Lat 41° 30' 51.40" Long 70° 43' 13.33"*  
*\* from prior survey H-2268 (1896)*

Development #6

This development was run to investigate a 30 foot charted item at 41° 31' 15"N, 70° 42' 59"W. A least depth of 27<sup>B</sup> feet was found two out from position 5075. Of more significance is a 267 foot depth 60 meters to the southeast, five out from position 373 on the main scheme. Recommend charting 28 foot depth at survey location. <sup>Lat 41° 31' 12.39" Long 70° 42' 56.97" this 28 is in excess level 2. At Lat 41° 31' 13.53" Long 70° 42' 57.58"</sup>  
*A least depth was found three out from 5075 a 25 ft sounding at Lat 41° 31' 12.69" Long 70° 42' 57.45"*  
*\* from prior survey H-2268 (1896)* *concur*

Development #8

The charted 30<sup>35</sup> foot depth at 41° 32' 21"N, 70° 41' 40"W, was verified, <sup>not feature</sup> not found. A very prominent <sup>not feature</sup> bank was found in this development, one before 1307. A line was rerun to confirm this and was again located one out from position 1310, with a least depth of 35 feet. A least depth of 34 feet was noted one before 511 on the main scheme. <sup>at Lat. 41° 32' 19.02" Long 70° 41' 45.55"</sup>  
*\*\*\* at Lat. 41° 32' 18.91" Long 70° 41' 45.06"* *\*\*\*\* at Lat. 41° 32' 20.60" Long 70° 41' 40.55"*  
*Chart 34-foot depth*

Development #9

This development investigated a 26<sup>27\*</sup> foot charted depth at 41° 32' 31"N, 70° 41' 15"W. A least depth of 28<sup>7</sup> feet three before position 5149, 54 meters east of the charted location was found. <sup>at Lat. 41° 32' 30.90" Long 70° 41' 17.50"</sup>  
*It is recommended the charted depth be retained.* *Recommend charting the 27 ft. depth from present survey information.*  
*See Verifier's Report, para. 6b3.*

Development #10

(Origin H-3391 WD (1912-14))  
There was no evidence of a charted 30 foot sounding at 41° 32' 43"N, 70° 40' 45"W. The least depth located was a 35 foot sounding at position 5162. This would appear to be part of a small ridge as supported by the 35 foot soundings at position 5159 and 5163. Although this prominent 30<sup>30</sup> 7 foot feature was not located on the main scheme or development, it is recommended the sounding remain as charted. <sup>at Lat 41° 32' 39.99" Long 70° 40' 44.89"</sup>  
*\*\*\* at Lat 41° 32' 40.41" Long 70° 40' 42.72" Concur* *See V.R. para. 6. b. 1.*

Development #11

A 25 foot depth, four out from position 5179 was found approx-  
*\* at Lat 41° 32' 28.38" Long 70° 40' 31.43"*



imately 52 meters SE of the charted depth at 41° 32' 32"N, 70° 40' 32"W. It is recommended the more significant depth of 25 feet replace the charted 28 foot sounding. Another 25 ft sounding was located at Lat. 41° 32' 33.37" Long. 70° 40' 35.41" (Pos # 5175 + 2). <sup>28 foot from H-6742(942)</sup> ~~was not developed is shallowest depth in this area.~~ <sup>concur A 21 ft depth 100 meters S.E that</sup>  
Development #12a

This development was run in conjunction with development #13 to investigate a charted 32 foot ~~depth~~ <sup>see recommendation below</sup> at 41° 32' 58"N, 70° 40' 13"W. 51 meters NW of this location a 32 foot depth was found one before position 5335. ~~Retention as charted is recommended.~~ <sup>at Lat. 41° 32' 57.98 Long. 70° 40' 14.78 this 32 was put in excess level 1 to plot 28 ft as described below. However another 32 ft sounding was located at Lat 41° 32' 57.67" Long. 70° 40' 15.70" (Pos # 5187 + 2) from H-5335 (1912-4) W.D.</sup>  
Development #13

This development was run to investigate a 32 foot <sup>from H-3391(1912-4) W.D.</sup> charted item at 41° 32' 58"N, 70° 40' 13"W. A least depth of 30 feet, one before position 5190 <sup>was located 97 meters NNW of this location.</sup> A least depth by divers of 29 <sup>feet</sup> was determined on JD 165. It is recommended the 29 <sup>foot</sup> depth be charted as surveyed. <sup>at Lat. 41° 33' 00.16" Long. 70° 40' 13.70" put in excess level 1 to plot 28 ft. shall depth from leadline (dive) located at Lat 41° 32' 59.79" Long. 70° 40' 13.04" (Pos # 5259) described as Rock concur</sup>  
Development #17

The charted 12 foot <sup>From prior survey H-2317 (1897)</sup> feature at 41° 33' 29"N, 70° 39' 34"W, ~~was not found.~~ <sup>verified</sup> A least depth of 11 feet was located three out from position 1288, 80 meter SE of the charted location. The 12 foot sounding was ~~not improved~~ <sup>verified</sup> but it is recommended the 11 foot sounding be charted. <sup>at Lat 41° 33' 28.27" Long. 70° 39' 31.60". A 12 ft sounding was located at Lat 41° 33' 27.05" Long 70° 39' 35.39" (Pos # 819 + 2) on this same development. CONCUR</sup>  
Development #19

This development was run to investigate a charted 18 foot <sup>from prior survey H-2317 (1897)</sup> sounding at 41° 33' 41"N, 70° 39' 46"W, located a 17 foot sounding <sup>at Lat 41° 33' 40.65" Long 70° 39' 43.90</sup> approximately 10 meters east of this location. It is recommended that the 17 foot sounding supersede the 18 foot sounding. <sup>Another 17 foot sounding was located at Lat. 41° 33' 41.94" Long. 70° 39' 41.01" concur.</sup>  
Development #20

This development was run to investigate an 11 foot <sup>from prior survey H-2317 (1897)</sup> item at 41° 33' 44"N, 70° 39' 33"W. A least depth of 11 feet, five out from position 1259 <sup>was found 26 meters west of this location.</sup> Retain as charted <sup>at Lat 41° 33' 43.47" Long 70° 39' 30.07"; another 11 foot sounding at Lat 41° 33' 49.64" replace with present survey depths Long 70° 39' 33.94"</sup>  
Development #21a

This development was run to investigate a 9 foot charted item <sup>from prior survey H-2317(1897)</sup> at 41° 34' 11"N, 70° 39' 38"W. A least depth of 11 feet, two out from 1418 was found 47 meters SW of this location. Retention as charted is recommended. <sup>at Lat 41° 34' 07.60 Long 70° 39' 41.85" Another 11 ft sounding was located at (Pos # 1222 + 2) Lat. 41° 34' 10.04" Long 70° 39' 38.74" The shallowest depth in this area appears to be a 10 ft sounding located at Lat 41° 34' 13.32" Long. 70° 39' 31.32" (Pos # 1243) Recommend changing this depth to the next present survey.</sup>  
Development #22

This development was run to investigate a 10 foot charted depth <sup>from H-2317(1897)</sup> at 41° 34' 13"N, 70° 39' 24"W. A least depth of 10 feet, 15 meters SE of this location was found three out from position 1257. A 9 ft sounding <sup>was found at Lat 41° 34' 18.05" Long. 70° 39' 18.62" (Pos # 1247 + 2), another 9 ft was found at Lat 41° 34' 09.44" Long. 70° 39' 19.89". An 8 ft sounding was found at Lat 41° 34' 12.96 Long. 70° 39' 27.27". Recommend charting the 9 ft. present survey sounding.</sup>  
Development #22

Retention as charted is recommended.

Development #23

This development was run to investigate a charted 12 foot item at 41° 34' 26"N, 70° 40' 04"W. A least depth of 11 feet, 35 meters SE, one before position 991, was found on the main scheme. Recommend charting at 11 foot survey location. a 10 ft sounding at Lat 41° 34' 25.68 Long 70° 40' 02.66 (Pos #1211+5). See 23A also.

unidentified source

Development #24

A least depth of 27 feet at 41° 34' 48"N, 70° 39' 15"W, was not found. A 30 foot depth at position 1196, 60 meters NE was the least depth but of no significance. Retention as charted is recommended. Lat 41° 34' 49.08 Long 70° 39' 07.51"

from prior survey H-2316 (1897)

Development #25

The charted 12 foot depth at 41° 34' 44"N, 70° 38' 55"W, was not found. A 14 foot sounding two and four out from 1183, was the least depth of this development. It is 27 meters south of the charted depth. It is recommended the charted depth be retained. Pos #1178 has a 13 foot sounding at Lat 41° 34' 42.24 Long 70° 38' 51.21"

from prior survey H-2317 (1897)

EVALUATION OF DEVELOPMENTS 14, 15, 16, 18

At the end of JD 164, a positioning problem occurred. The estimated X,Y coordinates appeared to be wrong for these developments and were changed by the OIC as noted in the sounding volume. As a result these developments were run approximately 140 meters SE of their prescribed location. The following is an evaluation based on main scheme and crossline data.

Development #14

A 27 foot depth, 40 meters east of a 26 foot charted item at 41° 33' 09"N, 70° 40' 03.5"W, was located on the main scheme. Retention as charted is recommended. at Lat 41° 33' 08.89 Long 70° 40' 01.16. Pos 735+5 Pos # 735+8 at Pos # 5258 (Lat. 41° 33' 01.79 Long. 70° 39' 55.46" is a dive on this item with reduced depth of 28 ft described as Rock. This item is south of the 27 ft in Excess Level 14 27ft discussed above.

long depth from H-3391 (1924) WLD

No evidence of a 23 foot sounding at 41° 33' 00"N, 70° 39' 26.5"W. Retention as charted is recommended. This is an area of 26 ft depths on the present survey. The general trend of deeper depths on the present survey (163) in areas of Sand or Mud bottom would explain the difference. Recommend charting the present survey depth in this area.

from H-2317 (1897) carried forward

Development #16

No evidence of a 24 foot sounding at 41° 33' 11"N, 70° 39' 45"W. Retention as charted is recommended. 24 foot depth carried forward

from H-2317 (1897) 09

Development #18

A 18 foot depth 47 meters NE of the 18 foot charted item at

from H-2317 (1897)

41° 33' 32"N, 70° 39' 48"W, was located on the main scheme. Retention as charted is recommended. An 18 ft depth was located at Lat. 41° 33' 32.20" Long. 70° 39' 45.82" Pos # 80774. ~~Recommended plotting the 18 ft depth from soundings chart, with 18 carried forward.~~

Development #7

A 21 foot <sup>(100)</sup> sounding at 41° 32' 05"N, 70° 42' 19"W, was added from H-6742, 1942 and developed extensively. The least depth found was a 24 foot sounding approximately 64 meters south of this location, <sup>three</sup> two out from position 5120. Retention of charted soundings is recommended. Lat 41° 32' 03.49" Long. 70° 42' 18.98" / this 24 is in excess level "f" while another 24 located at Lat 41° 32' 03.24" Long 70° 42' 18.11" (Pos # 511275) is plotted at Excess level "0"

ADDITIONAL INVESTIGATIONS

Development #21b

This development was run to further clarify a shoal off <sup>[depths from H-2317(1897)]</sup> Gunning Pt. A least depth of 12 feet, one before position 1435 was located at 41° 34' 04"N, 70° 39' 30"W. Charting is not recommended. <sup>Position #156977 at Lat 41° 34' 06.77" Long. 70° 39' 26.90" ~~is~~ a 3 ft sounding was located in the vicinity of this development. Recommend plotting the 3 ft from present survey</sup>

Development #21c

This development was run to investigate a spike in 14 feet of water. Three subsequent lines all located this feature with a least depth of 3 feet, three out from position 15910, at 41° 34' 00.7"N, 70° 39' 24"W. Recommend charting at this survey location. <sup>of 6 concus 28.59 H-2317 has a rock covered by 1 ft @ MLW in this area that should be charted. Additional work on H-2317(1897) done in 1905 located this rock and obtained the 1 foot least depth over it. The present position of this rock is 30 meters east of the prior position. The present position has been accepted and the more conservative prior depth has been carried forward.</sup>

This development is one of three run in the vicinity of red nun "4" marking the shoal area off Gunning Pt. A ~~least~~ <sup>12.2</sup> depth of 12 feet, <sup>one</sup> one out from position 1543 was found at 41° 34' 23.5"N, 70° 39' 58.5"W. Charting is not recommended. <sup>The least depth ~~is~~ a 10ft sounding at Lat 41° 34' 25.68" Long. 70° 40' 02.66" concus should be charted.</sup>

Development #23b

This development was run to the southwest of development 23. A least depth of 13 feet, four out from position 1526 was found at 41° 34' 21"N, 70° 40' 13"W. Due to the significance of development 23, charting is ~~not~~ recommended. This depth should be charted in conjunction with the least depth from development #23 ~~if practical~~.

Development #26

This development was run to investigate a <sup>31</sup> foot depth at <sup>from prior survey H-237 (1897)</sup> 41° 34' 43"N, 70° 39' 27"W, two out from position 1083 on the main scheme. A 31 foot depth <sup>24</sup> five out from position 1377 was found at this exact location. A 31 foot depth was also found at 41° 34' 40"N, 70° 39' 27"W, seven out from position 1377. Charting is ~~not~~ <sup>54</sup> recommended. Charting is recommended ~~if practical~~.

Development #27

This development showed a least depth of 28<sup>2</sup> feet at 41°35'03<sup>02.78</sup>"N, 70°39'31<sup>30.66</sup>"W, at position 1357. Charting is ~~not~~ recommended.

Development #27a

This development revealed a least depth of 39 feet at 41°34'08<sup>07.83</sup>"N, 70°40'28<sup>01</sup>"W, position 1495. ~~Charting is not recommended.~~ 35 ft found 100 m. NE, chart present survey information.

Development #28

This development revealed three large rocks, ~~outside the 18-foot depth contour.~~

16 feet, two out from position 1474, 41°34'10<sup>18</sup>"N, 70°40'00<sup>62</sup>"W  
15<sup>15</sup> feet, five out from position 1459, 41°34'09<sup>18</sup>"N, 70°39'52<sup>04</sup>"W  
16 feet, one before position 1453, 41°34'05<sup>18</sup>"N, 70°39'54<sup>04</sup>"W  
Charting is ~~not~~ recommended, <sup>however</sup> a visual inspection was done <sup>to verify</sup> these ~~as~~ rocks. <sup>or drift</sup>

Development #30

A 15<sup>6</sup> foot depth one out from position 835 on the main scheme at 41°47'30<sup>33</sup>"N, 70°45'30<sup>32</sup>"W, was the reason for this investigation. A development least depth of 14 feet was found approximately 40 meters SW, four out from position 1602. <sup>\*\*</sup> Charting is ~~not~~ recommended. <sup>\*\*</sup> at Lat. 41°33'47.64" long. 70°39'49.71" 14 Ft.

Development #31

A 29<sup>6</sup> foot depth found on the main scheme at 41°33'25"N, 70°40'05"W, <sup>Pos # 749 + 8</sup> was the reason for this development. No similar depths were found in this area. A development least depth of 23 feet at 41°33'25<sup>24.90</sup>"N, 70°39'52<sup>37.51</sup>"W, was a considerable distance inshore. Recommend charting 29<sup>6</sup> foot depth at survey location. A 25 ft sounding was located at Lat 41°33'21.46" long. 70°40'02.52" (Pos # 100012) this would appear to be a stony with possible cause of too high gain on the depth recorder, however it is in an area with numerous spikes on bathogram.

Development #32

Least depth 24<sup>3</sup> feet, four out from position 1652 at 41°32'26<sup>25</sup>"N, 70°41'00<sup>40, 59.76</sup>"W. This is a huge rock protruding 15 feet from the normal bottom contour. A least depth of 24<sup>3</sup> feet at this same location was determined by divers. <sup>\*</sup> Recommend charting at this survey location. <sup>\*</sup> Pos # 5577 (Lat: 41°32'26.29" long 70°40'59.87")

Development #34

This development showed nothing significant except a 20 foot sounding at 41°31'30<sup>72</sup>"N, 70°43'26<sup>25.85</sup>"W. This area has an irregular bottom and is in the immediate vicinity of Weepecket Rock. Charting is not recommended. There is a 15 ft sounding located at Lat. 41°31'40.54" long. 70°43'26.47" (Pos # 50021) and a 11 ft sounding located at Lat. 41°31'40.87" long 70°43'24.41" (Pos # 5028+7) this all seems to report of the same feature described in P.S.I # 73 development 3.

Development #35

Dev. #35

This development was run to investigate a 34<sup>5</sup> foot depth at 41°31'07.5"N, 70°44'20"W, found on the main scheme. <sup>186 ft</sup> No similar soundings were found in this area. A development least depth of 38 feet at 41°31'36"N, 70°44'16"W, two before position 1698<sup>1</sup> is of no significance. Recommend charting of 34<sup>5</sup> foot depth. <sup>at Lat. 41°31'34.60" Long. 70°44'16.49"</sup> ~~Another 38 sounding at Lat. 41°31'38.14" Long. 70°44'18.85" (Pos #1687+4).~~

Development #36

A <sup>2</sup> foot depth at 41°31'13"N, 70°44'08"W, three out from position 1812 was the least depth of this <sup>12.97</sup> inshore development. This area is charted as very foul and was verified by this development. Charting at survey location is recommended. ~~Another 4 ft sounding was located at Lat. 41°31'12.18" Long. 70°44'06.24"~~

Development #37

This development was run to investigate a 10 foot sounding <sup>from C. of E. Report</sup> at 41°30'48"N, 70°44'16"W, and to clarify a foul area to the east of Weepeket Island. A <sup>1961</sup> 98 foot sounding three out from position 1781 was found at this exact location. Charting at survey location is recommended. <sup>at Lat. 41°30'47.74" Long. 70°44'15.84" concu</sup> ~~1961 was a 2 ft sounding at 41°30'48"N, 70°44'16"W~~

Development #38

This development was run to investigate a 42<sup>3</sup> foot depth found on the main scheme at 41°31'02.5"N, 70°44'48.5"W, <sup>4.35</sup> two out from position 127. A development least depth of 43<sup>2</sup> feet, 4 out from position 1707 also fell at this exact location. This depth is 166 meters south of a 41 foot charted depth. It is recommended that the surveyed depth be charted. <sup>at Lat. 41°31'02.33" Long. 70°44'49.89"</sup> 41 ft. from H-3556 (1913-15) W.D. carried forward.

Development #39

This development was run to investigate a 43<sup>1</sup> foot depth, 1 out from position 984 at 41°31'01.3"N, 70°45'03"W. A least depth of 43 feet, 2 before 18674 was 30 meters east of this location. Recommend charting at survey location. <sup>at Lat. 41°31'01.30" Long. 70°45'01.73</sup> ~~This 43 ft depth is in area of uncharted 41 ft on H-3556 (1913-15). The 41 ft was carried forward from the wire drag survey.~~

Development #40

This development was run to investigate a 44<sup>1</sup> foot depth, 4 out from position 113 at 41°31'27"N, 70°44'54.5"W, found on the main scheme. This development did not confirm this sounding. Charting is not recommended due to the significance of the 39 foot depth of development #1. It is believed that this may be a stray and not a valid depth. <sup>at Lat. 41°31'26.71" Long. 70°44'54.50"</sup> ~~This was changed to a raw depth of 27.7 during verification.~~

Development #41

This development was run to investigate a 34<sup>5</sup> foot sounding at 41°30'54"N, 70°43'28.5"W. A 35 foot and 36<sup>1</sup> foot sounding, 2 and 1 before position 5367 are adjacent to the above position. These soundings reveal a small shoal outside the 36 foot depth contour and charting is recommended. <sup>at Lat. 41°30'53.48" Long. 70°43'30.12" <sup>\*) excess level</sup></sup>

Development #43

This development was run to clarify the bottom contour between Weepecket and Naushon Island. There were no discrepancies noted. A least depth of 20<sup>18.74</sup> feet at 41°30'19"N, 70°44'19"W, position 5545, was found. Not recommended for charting. <sup>51</sup>There is a deep area in this development with a deep depth of 65ft at Lat 41°30'23.91" Long 70°44'19.31".

Development #44

Chart present survey information

This development was run to clarify a sloping irregular bottom southwest of Weepecket Island. The most significant depth was 152 feet at 41°30'28.8"N, 70°44'36.5"W, one before 5480. ~~Not~~ recommended for charting. An 18ft sounding at Lat 41°30'26.82" Long 70°44'40.27" is a possible side echo of the like however in an area of 22ft depths.

Development #45

Rock awash, MLW, at 41°30'36"N, 70°44'49"W, located one before 5499. This is an excellent check with the T-sheet. <sup>44.46</sup>Concur

Development #46

This development was run to investigate a rocky, boulder-strewn area off Naushon Island. A least depth of 8 feet at 41°30'04.5"N, 70°44'49.5"W, was located two out from position 5429. <sup>in excess level</sup>Not recommended for charting. A <sup>62</sup>8 was located at Lat 41°30'04.54" Long 70°44'49.86" (Pos 5401+). An 8ft sounding was located further offshore at Lat 41°30'03.40" Long 70°44'51.70" (Pos 5427+5)

Development #47

This development revealed a least depth of 37 feet at 41°30'13.5"N, 70°45'00.5"W, at position 5515. Not recommended for charting. <sup>18</sup>is in general area of 37ft to 38ft contours depths.

Development #48

This development was run due west of development #46. There are no significant features with all depths outside the 36 foot depth contour. <sup>62</sup>There was a deep area delineated by this development a depth of 62ft was located so Lat 41°30'03.21" Long 70°45'07.59". (Pos 5410+)

Development #49

This development was run to clarify an irregular sloping bottom. A least depth at 41° 29' 52.5"N, 70° 45' 01.7"W, position 5441 was found to be 8 feet. Because <sup>50</sup>of this inshore <sup>41</sup>foul area, charting is not recommended, <sup>11</sup>except as may be practical in regards to chart scale.

Development #50

A least depth of 4 feet at 41° 29' 44"N, 70° 45' 07"W, at position 5445, was the least depth of this inshore foul area. <sup>12.24</sup>Not recommended for charting. A <sup>3</sup>Rock covered by 3ft lies just south of the Aft at Lat 41°29'43.67" Long 70°45'07.42" (Pos 5441)

L. COMPARISON WITH CHART

This survey was compared with chart 13230 (formerly C&GS 249), Jan. 22, 1977, Ed. corrected through Notice to Mariners #52, 1976,

1:40,000. The agreement with the chart is very good with differences of 2 feet or less throughout the survey area. The only discrepancies were south of the Weepecket Islands where a few soundings were found to be three to four feet deeper than those charted. All charted or surveyed discrepancies are discussed under section K. \* see Verifiers Report

M. ADEQUACY OF SURVEY /

This survey is sufficiently complete and adequate to warrant its use to supersede all prior surveys for charting, with the recommendations for charting as noted previously in Section K of this report.

N. AIDS TO NAVIGATION /

There were eight buoys located in this survey area. A comparison with the Coast Guard Light List (1977) and the latest edition of chart 13230 showed good agreement. Six of these marked the Quissett Harbor channel. As indicated in the development of this area, Quissett Harbor channel is narrow and foul on both sides, discretion is advised when navigating this area. Weepecket Rock Buoy 8, and Hamlin Pt. Rock Buoy 4 were also positioned properly at the time of this survey.

The Manisee is a seasonal ferry which runs between New Bedford and Martha's Vineyard via Woods Hole.

O. STATISTICS

Miles Hydro 1207 <sup>6</sup>	82.4
Miles Hydro, 1202	171.4
Miles Hydro, 1203	29.2
Total Miles Hydro	283.0
Total Square Miles	13.2
Percentage Crosslines	10.4%
Number of Positions, 1207 <sup>6</sup>	540
Number of Positions, 1202	1420
Number of Positions, 1203	656
Sub-Total Number of Positions	2616
Bottom Samples 1207	27
Total Number of Positions	<u>2643</u>
Tide Gages	3

P. MISCELLANEOUS

NONE

Q. RECOMMENDATIONS

There are no major recommendations for this survey. All discrepancies and investigations with accompanying recommendations are included in section K.

A fathogram spike plotted as <sup>6</sup> feet at <sup>17.93"</sup> 41°31'18" N, 70°42'40" W, one out from position 411. This feature is supported by a <sup>10"</sup> 167 foot depth at 41°31'18" N, 70°42'42" W, five out from position 438. Because of a weak fathogram trace an accurate least depth was never determined. Additional investigations are recommended. *Concur*  
*The spike did not appear on the second trace and is not considered valid, however the additional work recommended should be done.*

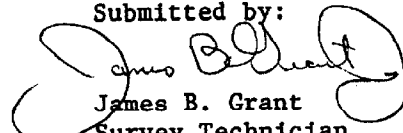
R. AUTOMATED DATA PROCESSING

	<u>Version Date</u>	
RK 111	1-30-76	Range-Range Real-time hydroplot
RK 201	4-18-75	Grid, Signal Lattice Plot
RK 211	1-15-76	Range-Range Non real-time plot
RK 300	2-5-76	Utility Computations
RK 330	5-4-76	Data Reformat and check
RK 407	10-23-75	Geodetic Inverse Direct Computation
RK 410	8-3-73	Geodetic 3 Point Fix
AM 500	11-10-72	Predicted Tide Generator
RK 530	5-10-76	Layer Corrections for Velocity
AM 602	5-21-75	Elinore-Line Oriented Editor



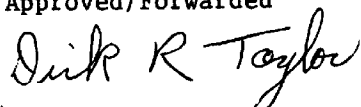
Approval Sheet

Submitted by:

  
James B. Grant  
Survey Technician  
NOAA Ship WHITING

Supervision of field and office work on this hydrographic survey was continuous on a day to day basis to ensure completeness of the survey and that all work was done in accordance with the instructions.

Approved/Forwarded

  
for John W. Carpenter  
CDR., NOAA  
Commanding Officer, NOAA Ship WHITING

WH-10-9-76,77

SIGNAL TAPE

005	6	41	35	00950	070	49	27429	139	0000	000000	WEST IS TR	✓ 1949
007	6	41	40	35480	070	42	59940	139	0000	000000	BUT, 1977	
011	6	41	37	51087	070	41	40931	139	0000	000000	CLEVELAND LDGE	
027	6	41	34	10410	070	38	53700	139	0000	000000	CAPE CODDER HOTEL N. CUPLA	
											TRIANGULATION NAME	FALMOUTH, CAPE CODDER HOTEL, ✓
033	6	41	31	33071	070	39	43352	139	0000	000000	WOOD HL WTR T	LOWER CUPLA, 1932
											TRIANGULATION NAME	WOODS HOLE, YELLOW
021	6	41	36	15171	070	38	57000	139	0000	000000	CHASS (TWR)	STONE TOWER, 1928 REC. 1918 1939
116	6	41	38	30252	070	53	12307	139	0000	000000	FHAVEN WTR TR	
126	6	41	32	24234	070	55	50761	139	0000	000000	RD HILL LT (RADOME)	
136	6	41	30	43663	070	59	07018	139	0010	000000	BARNEYS JOY, RM4	
✓ 140	6	41	35	00950	070	49	27429	139	0014	000000	WEST IS TOWER	✓
174	6	41	23	47128	071	02	02492	139	0000	000000	BUZZARDS BAY TR	
236	6	41	38	29282	070	45	56313	139	0000	000000	ANGLE	1910-1934
244	6	41	37	51087	070	41	40931	139	0000	000000	CLEVELAND LDGE	
246	6	41	30	56423	070	39	20291	139	0000	000000	NOBSKA PT LTHS	1904 1943
											TRIANGULATION NAME	NOBSKA POINT LIGHTHOUSE, 1904
039	6	41	32	24014	070	39	56840	139	0000	000000	NAT, 1977	
041	6	41	32	26025	070	39	22299	139	0000	000000	CAD ECC	1976

FIELD TIDE NOTE

Field tide reduction of soundings were based on predicted tides from Newport Rhode Island, corrected for the area using the preliminary zoning and correctors supplied by Tides Branch, Rockville, Maryland. These correctors were interpolated by a PDP 8/E computer using program AM-500. Values of 22 minutes to low water, 12 minutes to high water, and a ratio of 1.11 were applied to all tides in this area. All times of both predicted and recorded tides are GMT. Tides were recorded at three sites to control hydrography. Type of gage and period of operation were as follows:

<u>SITE</u>	<u>TYPE OF GAGE</u>	<u>LOCATION</u>	<u>DATES OF OPERATION</u>
Kettle Cove	Metercraft s/n 7601-7536-33	70 46.6' W 41 28.7' N	1 Sept.-20 Oct. 1976
Uncatena Island	Unavailable	70 42.5' W 41 31.1' N	4 Oct.-20 Oct. 1976
Penzance 844-7909	Metercraft s/n 7603-686-68	70 41.3' W 41 31.5' N	7 June-10 July 1977
Quissett Harbor (staff) 844-7909	Gas purged	70 39.2' W 41 32.6' N	16 June-24 June 1977

Marigrams and leveling records have been sent to the Oceanographic Division C331. Smooth tides and zoning have been requested from Rockville and will be forwarded to the Atlantic Marine Center for application to smooth sheets.

U.S. DEPARTMENT OF COMMERCE  
August 29, 1978 NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION  
NATIONAL OCEAN SURVEY

TIDE NOTE FOR HYDROGRAPHIC SHEET

Processing Division: Atlantic Marine Center:

Hourly heights are approved for

Tide Station Used (NOAA Form 77-12): 844-7685 Chappaquoyt Point, Ma.

Period: October 6-17, 1976 and June 9-22, 1977.

HYDROGRAPHIC SHEET: H-9668

OPR: 503

Locality: Buzzards Bay, Massachusetts

Plane of reference (mean ~~lower~~ low water): 3.77 ft. (1976)  
2.96 ft. (1977)

Height of Mean High Water above Plane of Reference is  
3.9 ft.

Remarks: Zone direct.

Don M. Spillman  
Chief, Tides Branch

APPROVAL SHEET  
FOR  
SURVEY H-9668 (1976)

- A. All revisions and additions made on the smooth sheet during verification have been entered in the magnetic tape records for this survey. A new final position printout has/~~has not~~ been made. A new final sounding printout has/~~has not~~ been made.
- B. The verified smooth sheet has been inspected, is complete, and meets the requirements of the Hydrographic Manual. Exceptions are listed in the Verifier's Report.

Date:

6/19/80

Signed:



Title:

Chief, Verification Branch



HYDROGRAPHIC SURVEY STATISTICS

H-9668

RECORDS ACCOMPANYING SURVEY: To be completed when survey is registered.

RECORD DESCRIPTION		AMOUNT	RECORD DESCRIPTION		AMOUNT	
SMOOTH SHEET		1	BOAT SHEETS & PRELIMINARY OVERLAYS 4 parts		1	
DESCRIPTIVE REPORT		1	SMOOTH OVERLAYS: POS. ARG, EXCESS		4	
DESCRIP-TION	DEPTH RECORDS	HORIZ. CONT. RECORDS	PRINTOUTS	TAPE ROLLS	PUNCHED CARDS	ABSTRACTS/SOURCE DOCUMENTS
ENVELOPES						1-misc. data
CAHIERS	2-with raw printouts					
VOLUMES	3					
BOXES			1-Smooth (2 parts)			

T-SHEET PRINTS (List)

SPECIAL REPORTS (List) 1- Cht. mark-up

OFFICE PROCESSING ACTIVITIES

The following statistics will be submitted with the cartographer's report on the survey

PROCESSING ACTIVITY	AMOUNTS		
	PRE-VERIFICATION	VERIFICATION	TOTALS
POSITIONS ON SHEET			2643
POSITIONS CHECKED		40	
POSITIONS REVISED		10	
SOUNDINGS REVISED		60	
SOUNDINGS ERRONEOUSLY SPACED		-	
SIGNALS (CONTROL) ERRONEOUSLY PLOTTED		-	
	TIME - HOURS		
CRITIQUE OF FIELD DATA PACKAGE (PRE-VERIFICATION)	2		
VERIFICATION OF CONTROL		-	
VERIFICATION OF POSITIONS		92	
VERIFICATION OF SOUNDINGS		124	
COMPILATION OF SMOOTH SHEET		124	
APPLICATION OF TOPOGRAPHY		50	
APPLICATION OF PHOTOBATHYMETRY		-	
JUNCTIONS		40	
COMPARISON WITH PRIOR SURVEYS & CHARTS		40	
VERIFIER'S REPORT		26	
OTHER			
<b>TOTALS</b>	<b>2</b>	<b>496</b>	<b>498</b>
Pre-Verification by P. Niland	Beginning Date 7/14/78	Ending Date 7/14/78	
Verification by P. Niland, F. Laminson, L. Cram	Beginning Date 7/14/78	Ending Date 4/10/80	
Verification Check by Harry R. Smith	Time (Hours) 8	Date 4/12/80	
Marine Center Inspection by Hydrographic Inspection Team (AMC)	Time (Hours) 40	Date 8/3/80	
Quality Control Inspection by R.W. DeKazarian	Time (Hours) 190 hrs	Date 11/4/80	
Requirements Evaluation by D. Damschroder	Time (Hours) 4	Date 4/17/81	

R. A. Meyer 1/28/81 32 hours

Reg. No. \_\_\_\_\_

The Computer and Excess Sounding Cards for this survey have not been corrected to reflect the changes made to the Computer Card and Excess Card Printouts at this time of the review.

When the cards have been updated to reflect the final results of the survey the following shall be completed:

CARDS CORRECTED

DATE \_\_\_\_\_ TIME REQ'D \_\_\_\_\_ INITIALS \_\_\_\_\_

REMARKS:

Reg. No. \_\_\_\_\_

The magnetic tape containing the data for this survey has not been corrected to reflect the changes made during evaluation and review.

When the magnetic tape has been updated to reflect the final results of the survey, the following shall be completed:

MAGNETIC TAPE CORRECTED

DATE \_\_\_\_\_ TIME REQ'D. \_\_\_\_\_ INITIALS \_\_\_\_\_

REMARKS:



ATLANTIC MARINE CENTER  
VERIFIER'S REPORT

REGISTRY NO.: H-9668

FIELD NO.: WH-10-9-76

Massachusetts, Buzzards Bay, Hamlin Point to ~~Kettle Cove~~ Weepecket Islands

SURVEYED: October 6, 1976 through June 2, 1977

SCALE: 1:10,000

PROJECT NO: OPR- 503

SOUNDINGS: DE-723 D Fathometer and  
Leadline

CONTROL: Range Range  
(Del-Norte) Range-Azimuth  
(Del-Norte and Theodite)

Chief of Party . . . . .	J. W. Carpenter
Surveyed by . . . . .	G. Barone
. . . . .	D. Goodrich
. . . . .	N. Konchuba
. . . . .	R. Mandzi
Automated Plot by . . . . .	Xynetics 1201 Plotter (AMC)
Verified and Inked by . . . . .	<i>L.G. Cram</i> L.G. Cram
Date . . . . .	10 April, 1980

I. Introduction:

a. Unusual problems that were encountered as follows:

1. The lack of notes in the sounding volumes and the incomplete nature of the notes that were found on raw data printouts detracted from the completeness of the survey.
2. Both fathometers S/N 37010 and S/N 37018 used on this survey have histories of malfunctioning as described in the Quality Control Report from National Ocean Survey Headquarters for survey H-9679.
3. Detached positions on rocks both submerged and awash were noted in an incomplete manner on raw data printouts. This led to confusion as to the number and position of rocks when comparing these features with the shoreline maps.

4. The velocity corrections were scaled from graphs in error, all velocity corrections were changed during verification. *This information is filed with the field records.*

b. Notes and changes were made in red ink in the Descriptive Report by the verifier during verification.

## 2. Control and Shoreline

a. The source of control is adequately described in sections "F" and "G" of the Descriptive Report. ~~Additional information can be found in section 6 of the Descriptive Report and the Control Report accompanying this survey.~~  
\* Not forward with records.

b. Shoreline for this survey was transferred from Class I unreviewed photogrammetric manuscripts TP-00772, TP-00773 and TP-00774 of 1974-77.

## 3. Hydrography                      See Q.C. Report, para 1.

a. The agreement at crossings on this survey is adequate; depths agree within the limits prescribed by the Hydrographic Manual.

b. The standard depth curves could be drawn in their entirety with the exception of the 6 and 0 foot curves. Dashed curves, supplemental curves and brown curves were used to better delineate some features. There were some problems in areas of irregular bottom and highly developed areas in that the deeper soundings in excess could not always be included in the curves. The congestion of shoaler soundings precluded bringing these soundings to the zero excess level and in most cases they were within one foot of the shoaler soundings.

c. This survey is considered adequate to delineate the bottom configuration and to determine least depths only when consideration is given to the supplemental data from the two wire-drag surveys in the area, and the prior surveys. ~~Five~~ <sup>Several</sup> detached soundings and hangs were carried forward to the present survey. These are all highly reliable items and with the equipment available to the field unit it was not possible nor practical to verify the existence of these items. Some shoal soundings and rocks were carried forward to the present survey from the prior surveys and shoreline maps. For discussion of these items see sections 5, ~~and 6~~ <sup>and 7</sup> of this report.

## 4. Condition of the Survey

The smooth sheet and accompanying overlays, hydrographic records and reports comply with the requirements of the Hydrographic Manual with the exceptions listed in section I. of this report and the following:

a. The electronic control correctors for data collected in 1976 were not possible to verify. The Descriptive Report shows 0 correctors for this work. The calibration abstracts when provided from the field have varying correctors without times as to when the calibration took place. The 1977 electronic control correctors were in line with the day to day calibrations, but in both years no base line calibrations were made available to the verifier.

b. The photogrammetric manuscripts used for shoreline on this survey are incomplete. Comparison was made with photogrammetric manuscripts T-12474, T-12475 and T-12946 of 1962, 1963. There are over 150 rocks on these manuscripts that are not verified or disproven by the present survey. Transfer of the offshore rocks to the smooth sheet were made in color.

c. The field unit did not fully develop all features on this survey, some examples are as follows:

(1) A 63-ft. depth in the vicinity of latitude  $41^{\circ}30'37''$ , longitude  $70^{\circ}43'48''$ .

(2) The shoal area in the vicinity of latitude  $41^{\circ}31'08''$ , longitude  $70^{\circ}44'09''$ . See d. below

(3) The 30-ft depth in the vicinity of latitude  $41^{\circ}33'54''$ , longitude  $70^{\circ}40'10''$ .

d. The system of sounding lines run in the area of Weepecket Islands is not in accordance with the Hydrographic Manual as lines were run parallel to the contours. The line spacing in some areas exceed the amount as laid down by Project Instructions and the Hydrographic Manual. See Q.C. Report, para 2.

e. The field sheets did not always reflect the <sup>observed</sup> ~~true~~ depths or nature of features that exist in any given area. That is, some shoal soundings shown on the field sheet that were not investigated by the field unit. It turned out that these were scanning errors. An example exists in the vicinity of latitude  $41^{\circ}32'33''$ , longitude  $70^{\circ}42'32''$ , where the field sheet has an undeveloped 31 when in fact it was found upon examination of the field records to be 46-ft. depth.

f. A large number of transfers of rocks and soundings have been made to the smooth sheet from copies of documents, with scales of 1:20,000 and 1:5,000. The transfers should be checked against original documents to ensure the accuracy of these items by Quality Control Branch.

g. NOAA Form 76-40, Nonfloating Aids or Landmarks for Charts, had not been submitted with the survey records.

#### 5. Junctions

Adequate junctions were made with the following surveys:

H-9661	(1976)	to the northeast
H-9615	(1976)	to the north
H-9646	(1976)	to the southwest
H-8170	(1954)	to the south

See Q.C. Report, para 3.

The junction made with H-8170 (1954) to the south was in the area of Woods Hole. All curves were brought into coincidence except for two areas. One of these is in the vicinity of latitude  $41^{\circ}31'29''$ , longitude  $70^{\circ}42'31''$ . This is in the area of the 30 ft. curve. The density of the hydrography on H-8170 (1954) at 1:5,000 scale precluded the drawing of coincidental curves on the present survey. A similar problem presented itself in the vicinity of latitude  $41^{\circ}32'10''$ , longitude  $70^{\circ}42'20''$ , where the field unit did an extensive development on a 20 ft. rock charted from H-8170 (1954). It is recommended that the curves in these areas be charted from H-8170 (1954). The agreement between this junctional survey is good with some differences of 2 ft., which may be attributable to bottom change. There were some soundings transferred from H-8170 (1954) in ~~brown~~ <sup>red</sup> (junctional color) to better delineate the shoal in the vicinity of latitude  $41^{\circ}32'10''$ , longitude  $70^{\circ}42'20''$ .

6. Comparison with Prior Survey

a.	H-2268	1:10,000	(1896)	H-2318	1:20,000	(1897)
	H-2316	1:10,000	(1897)	H-2320	1:20,000	(1897)
	H-2317	1:10,000	(1897)-1905)			
	H-3184	1:20,000	(1910)			
	H-6742	1:20,000	(1942)			
	T-12474	<del>(1963)</del>	1:10,000	> from 1961 photos, not field edited, Class II		
	T-12475	<del>(1963)</del>	1:10,000			
	T-12946	<del>(1962)</del>	61-62) 1:20,000			
		496				

These are the most recent prior surveys in this area that provide complete coverage.

In general, the present survey is from 0 to 3 ft. deeper than the prior surveys. A break down of this agreement shows that about 75% of the soundings agree within 0 to 1 ft. and about 25% are from 2 to 3 ft. deeper on the present survey. The bottom configuration and general depths are in fair agreement with these prior surveys. However, large differences were noted when comparing the earlier prior surveys (1896-97) to the later prior surveys of 1910 and 1942. These differences amounted to \* 20 ft. in some cases with the earlier prior surveys being shoaler. An example is in the present northern survey area where prior survey H-2316 (1897) and H-~~3184 (1910)~~ 2317 (1897) overlap. These large differences are attributable to depth measurement errors on these prior surveys. \* lat. 41°35', long. 70°40'. These shoaler depths on H-2316 and 2317 of 1897 were possibly spoil deposits and were discredited by H-3184 (1910) in the common area.

It is reasonable to attribute some amount of the differences to natural causes as three of the prior surveys were done prior to 1900. On the other hand, there has been a fair amount of man made changes such as the Cape Cod Canal with the dump site for the canal less than half a mile north of the survey area. There appears to be some erosion taking place in some areas on this survey (up to 30 meters). This is most in evidence in the vicinity of latitude 41°30'40", longitude 70°44'25", where there has been a eroding of an island into two separate islands. The present survey and prior survey reveal that the bottom in this area consists of mud and sand with frequent outcroppings of boulders and rocks. \* Weepecket Islands

Three rocks covered by 3 and 4 feet respectively were added to the smooth sheet from H-2316 (1897) in the vicinity of latitude 41°34'45" longitude 70°38'45". These rocks were listed under Presurvey Review Item number 16 and are adequately discussed by the hydrographer in the Descriptive Report, section "K", page 5.

Two rocks were added to the survey from H-2317 (1897) and one of these in the vicinity of latitude 41°33'12", longitude 70°39'40" is covered by 2 ft. The shoalest depths in this area are 8 feet. Recommend retaining these rocks as charted. The other rock is in the vicinity of latitude 41°32'37", longitude 70°39'40", and is covered by 4 ft. The shoalest depth from the present survey is 7 feet.

Numerous submerged rocks and rocks awash were added to the survey from the above listed T-sheets. Generally, the rocks that were added were those that were the most prominent and were not located by the present hydrography nor the topography. There are some rocks that were not carried forward because of scale limitations; rocks from the present survey and the prior T-sheets caused a crowded condition. These rocks fall within the perimeter of rocks existing seaward and are close to the High Water Line. With the addition of the rocks described above to supplement the present survey, the present survey is adequate to supersede the prior surveys in the common area. See Q.C. Report, para 2. Attention is also directed to the various items addressed in paragraphs 6, 7, and 8 in the Q.C. Report.

b. Wire Drag Surveys

H-3391 (1912-14) W.D. 1:20,000

H-3556 (1913-15) W.D. 1:20,000

H-3391 (1912-14) W.D. This wire-drag survey covers the northeastern portion of the present survey. There were ~~two~~ soundings described as detached soundings carried forward to the present survey. <sup>a few</sup>

1. A 30 ft. detached depth, at latitude  $41^{\circ}32'43''$ , longitude  $70^{\circ}40'44''$ , in a present survey depth of 37 ft.

2. A 26 ft. detached depth, at latitude  $41^{\circ}33'09''$ , longitude  $70^{\circ}40'03''$ , in a present survey depth of 27 ft.

3. A 25 ft. sounding in latitude  $41^{\circ}32.5'$ , longitude  $70^{\circ}41.2'$ , originating with H-3391 W.D., is considered disproved by H-6742 (1942).

There were two apparent conflicts between the present survey depths and the wire-drag survey effective depths. One is a effective depth of 32 ft. in approximate latitude  $41^{\circ}33'00''$ , longitude  $70^{\circ}40'15''$ . The least depth from the present survey is <sup>\*</sup>28 ft. The other is a effective <sup>cleared</sup> depth of 28 ft. in approximate latitude  $41^{\circ}33'15''$ , longitude  $70^{\circ}40'08''$ . The least depth from the present survey is 27 ft.

<sup>08"</sup> The 26 foot has been carried forward, see para b.2. above.  
\* The 28 ft is on the extreme limit of swept area. No conflicts exists. See para k of D.R., Items 12 and 13a.

H-3556 (1913-15) W.D. covers a small portion of the present survey to the southwest. Three wire-drag detached depths were carried forward to the smooth sheet from this survey and one wire-drag detached sounding was superseded.

1. A 41 ft. detached sounding that was uncharted was carried forward at latitude  $41^{\circ}31'05''$ , longitude  $70^{\circ}45'10''$ , to the present survey. Least depth in this area is 43 ft, ~~From the present survey.~~

2. A 40 ft. detached sounding that was charted at latitude  $41^{\circ}31'24''$  longitude  $70^{\circ}44'38''$ , was carried forward to the present survey, Least depth in this area is 44 ft, ~~From the present survey.~~

3. A 42 ft. detached sounding charted at latitude  $41^{\circ}31'31''$ , longitude  $70^{\circ}44'48''$ , was superseded by a ~~40~~<sup>39</sup> ft. depth on the present survey.

4. A 41 ft. detached depth charted at latitude  $41^{\circ}31'09''$ , longitude  $70^{\circ}44'51''$ , was carried forward to the present survey. Least depth in this area is 46 ft, ~~From the present survey.~~

The Descriptive Report for H-3<sup>5</sup>56 (1913-15) W.D. was not available and the A&D sheet (smooth sheet) provided to verification was monochromatic copy of an original that was color and number coded so it was not possible at this time to compare effective drag depths with the present survey.

No conflicts exist between the present survey depths and the effective wire drag depths.

7. Comparison with Chart #13230 (28th Edition, January 22, 1977)

a. Hydrography

The charted hydrography originates with the previously discussed prior surveys with the exception of items listed below, no further consideration is required.

There were approximately 50 developments run on Presurvey Review Items and other features on this survey. All but one of these have been adequately addressed under section "K" of the Descriptive Report.

The one item not addressed or developed by the field is Presurvey Review Item number 14, described as a obstruction (25 ft. reported) located at latitude  $41^{\circ}33'42''$ , longitude  $70^{\circ}40'15''$ . The shoalest depth from the present survey in this area is 38 ft. found on regular line spacing. Recommend retention as charted.  
(Origin LNM 47/70)

There were numerous items that were charted for which no source was available during verification. A generalized list follows:

1. Two sunken rocks in the vicinity of latitude  $41^{\circ}34'23''$ , longitude  $70^{\circ}38'39''$ . See Q.C. Report, para 6.
2. A rock awash in the vicinity of latitude  $41^{\circ}34'20''$ , longitude  $70^{\circ}38'40''$ .  
from T-12496 (1961-62) See Q.C. Report, para 7.
3. The groins<sup>^</sup> in the vicinity of latitude  $41^{\circ}34'15''$ , longitude  $70^{\circ}38'45''$  do not appear on the present survey with the same configuration as those charted. See Q.C. Report, para 8.
4. There are four groins in the vicinity of latitude  $41^{\circ}33'56''$ , longitude  $70^{\circ}39'15''$ . The present survey has only two groins in this area. The shoreline appears to have built up in this area almost to have completely covered two of these groins. Two piers (addressed as groins) have been carried forward from T-5743 (1938-41)
5. There are numerous piers and groins in the vicinity of latitude  $41^{\circ}32'20''$ , longitude  $70^{\circ}39'30''$  (Quissett Harbor). Several items have been carried forward from T-5744 (1948), piers from T-12496 (1961-62) and several remaining items possibly originate from an air photo revision of 1966 photos.  
A detailed comparison with these charted features and the present survey was most difficult because of the chart scale difference. The chart was at 1:40,000 scale and the present survey is 1:10,000 scale. It is assumed that a great deal of generalization has taken place in respect to shape, number and size of rocks, piers, etc. on the chart due to the scale, but to what extent it is not possible to determine.

The present survey is adequate to supersede the charted information with the retention of the items listed in this report and when attention is given to the charted items coming from sources not readily ascertainable at the time of verification.

#### b. Aids to Navigation

The aids to navigation appear to adequately mark the intended features on this survey.

#### 8. Compliance with Instructions

This survey complies with the Project Instructions with the exception of paragraph 4.10, "verification of charted features."


## 9. Additional Field Work

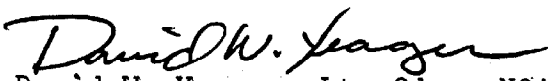
This an adequate basic survey. Additional work is recommended only if it desirable to update the wire drag information and on the recommendation made under section Q of the Descriptive Report, and to clarify the topographic information.


INSPECTION REPORT  
H-9668

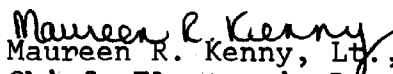
The completed survey has been inspected by the Hydrographic Inspection Team with regard to survey coverage, delineation of depth contours, development of critical depths, cartographic symbolization and verification or disproval of charted data. The verification report has presented the facts accurately and properly, the procedures used were appropriate, and the recommendations are logical and justifiable. The survey records do not comply with National Ocean Survey requirements, this is noted in the Verification Report. The team notes in particular the inadequate notes on field data malfunctioning of the fathometers and the lack of information regarding electronic correctors used during the 1976 survey work. The Hydrographic Inspection Team concurs with the verifier's finding actions and recommendations.


Examined and Approved:  
Hydrographic Inspection Team  
Date: June 3, 1980

  
Karl Wm. Kieninger, Cdr., NOAA  
Chief, Processing Division


  
David W. Yeager, Lt. Cdr., NOAA  
Field Procedures Officer  
Operations Division

  
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Maureen R. Kenny, Lt., NOAA  
Chief, Electronic Data  
Processing Branch

  
B.J. Stephenson  
Team Leader  
Verification Branch

Examined and Approved:

  
Richard H. Houlder  
R. Adm, NOAA  
Director, Atlantic Marine Center





UNITED STATES DEPARTMENT OF COMMERCE  
National Oceanic and Atmospheric Administration  
NATIONAL OCEAN SURVEY  
Rockville, Md. 20852

OA/C352:RWD

November 4, 1980

TO: Glen R. Schaefer *GRS*  
Chief, Hydrographic Surveys Division

THRU: Chief, Quality Control Branch *gm*

FROM: R. W. DerKazarian *Rw.Derkazarian*  
Quality Evaluator

SUBJECT: Quality Control Report for H-9668 (1976-77), Massachusetts,  
Buzzards Bay, Hamlin Point to Weepecket Islands

A quality control inspection of H-9668 was accomplished to monitor the survey for adequacy with respect to data acquisition, delineation of the bottom, determination of least depths, navigational hazards, junctions, sounding line crossings, smooth plotting, shoreline transfer, decisions and actions taken by the verifier, and the cartographic presentation of data. Revisions and additions to the smooth sheet, plus helpful comments made to the verifier, are identified on a one-half scale copy of the survey to be furnished the verifier. In general, the survey was found to conform to the National Ocean Survey's standards and requirements except as stated in the Verifier's Report, the HIT Report, and as follows:

1. The following supplements paragraphs 3.b and c of the Verifier's Report:

Hydrography in the area north of Hamlin Point in the vicinity of latitude  $41^{\circ}34'45''N$ , longitude  $70^{\circ}38'40''W$  and in the vicinity of latitude  $41^{\circ}33'55''N$ , longitude  $70^{\circ}39'10''W$  is considered deficient in the development of the bottom configuration.

In Quissett Harbor, latitude  $41^{\circ}32'27''N$ , longitude  $70^{\circ}39'26''W$ , the graphic depth record indicates deeper passage than the selected soundings shown on the smooth sheet. The 6- and 12-foot depth curves have been shown to indicate this channel.

Quissett Harbor should have been surveyed at a larger scale to properly determine the bottom configuration and ascertain its least depths.

2. The following supplements paragraphs 4.b, f, and 6.a (last paragraph) of the Verifier's Report:



A comparison between various topographic manuscripts, both prior and contemporary, in common with the area of the present survey reveals differences with respect to the positions and numbers of rocks alongshore. The presentation of these foreshore features as shown on the smooth sheet represents an office compilation of this topographic detail which adequately serves the purpose intended.

3. The following supplements paragraph 5 of the Verifier's Report:

An adequate junction was effected during quality evaluation with H-8170 (1954). The curves on H-8170 (1954) and the present survey have been brought into coincidence after some deeper depths were deleted on H-8170. These depths and the 2-foot differences addressed in the Verifier's Report are attributed to soundings obtained on a slope in a rugged area and should not be regarded as a significant change in the bottom.

4. The following supplements paragraph 6.a of the Verifier's Report:

Two charted 3-foot depths from prior survey H-2317 (1897) have not been disproved by the present survey and have been carried forward (Quissett Harbor) in the vicinity of buoy N"6" in latitude  $40^{\circ}32.29'N$ , longitude  $70^{\circ}39.72'W$ , and buoy C"7" in latitude  $40^{\circ}32.44'N$ , longitude  $70^{\circ}39.63'W$ . The 3-foot depth at buoy N"6" has a charted Rk description. The origin of the note Rk is not readily ascertainable. This description should be retained as charted.

A charted rock covered 1 foot at MLW from additional work of 1905 applied to prior survey H-2317 (1897) was verified by the present survey in latitude  $41^{\circ}34'01''N$ , longitude  $70^{\circ}29'29''W$ , approximately 30 meters east of its prior position. The present survey obtained a fathometer least depth of 3 feet on this feature; however, the more conservative prior least depth was carried forward to the present survey.

5. The following is added to paragraph 6 of the Verifier's Report:

c.	T-5743 (1938-1941)	1:10,000
	T-5744 (1948)	1:10,000
	<u>T-5745 (1940)</u>	<u>1:10,000</u>

These prior topographic surveys fall within the common area of the present survey. Several items not disproved or verified by the present survey have been carried forward during quality evaluation.

6. The two sunken rocks in latitude  $41^{\circ}34'23''N$ , longitude  $70^{\circ}38'39''W$  addressed in paragraph 7.a.1 of the Verifier's Report are charted from a rock that uncovers 1 foot and a rock awash at MLW on prior survey H-2317 (1897). These rocks fall in the vicinity of two rocks shown on the smooth

sheet. Another feature, an islet depicted on TP-00772 approximately 250 meters north of the rocks, in latitude 41°34'32"N, longitude 70°38'34"W is approximately 50 meters from an islet shown on the prior survey. The differences between the prior and present locations of the above features are attributed to less accurate prior survey methods. The prior items should be deleted from the chart and present survey information should be charted.

7. The rock awash charted in latitude 41°34'20"N, longitude 70°38'40"W addressed in paragraph 7.a.2 of the Verifier's Report originates with prior survey H-2317 (1897) as a rock that uncovers 3 feet at MLW. This rock falls within the foul limit line delineated on the present survey. Because the dangerous nature of the area is adequately represented by present survey information, this rock has not been carried forward to the smooth sheet from the prior survey.

8. The items addressed in the Verifier's Report paragraphs 7.a.3, 4, and 5 in latitude 41°34'15"N, longitude 70°38'45"W, in the vicinities of latitude 41°33'56"N, longitude 70°39'15"W, and latitude 41°32'20"N, longitude 70°39'30"W (Quissett Harbor) respectively, originate with T-12496 (1961-62), T-5743 (1938), T-5744 (1948), and possibly with an air photo revision from 1966 photographs. Several items have been carried forward during quality evaluation and it is recommended that this information be retained as charted.

9. An investigation on the present survey that covers the approach to Quissett Harbor indicates the existence of numerous dangerous rocks in the area. However, a detailed development of the marked channel in the vicinity of latitude 41°32.5'N, longitude 70°39.9'W reveals a continuity of depths where a labeled rock reported is noted on chart 13229 (Presurvey Review item 56). It is recommended the note be removed from the chart.

cc:  
OA/C351



**UNITED STATES DEPARTMENT OF COMMERCE**  
**National Oceanic and Atmospheric Administration**  
NATIONAL OCEAN SURVEY  
Rockville, Md. 20852

JUL 14 1981

OA/C351:SRE

TO: OA/CAM - Richard H. Houlder

FROM: ~~F/OA/C3~~ - Roger F. Lanier

SUBJECT: H-9668 (1976-77), OPR-503-WH-76/77, Massachusetts, Buzzards Bay, Hamlin Point to Weepecket Islands, Report of Compliance with Project Instructions

The smooth sheet and Descriptive Report for the subject survey have been examined. In addition to the Quality Control Report, dated November 4, 1980 (copy attached), and the Hydrographic Survey Inspection Team Report, dated June 3, 1980, the following is submitted:

1. Presurvey Review item 14, an obstruction (25-feet reported), was not investigated as required.

2. Although adequately investigated, no final recommendation was made by the hydrographer as to the disposition of Presurvey Review item 56, a reported rock. A recommendation was made by the quality control evaluator.

Except as noted, the survey is complete and adequate for the purposes intended and is in compliance with Project Instructions OPR-503-WH-76/77, dated January 13, 1976, and March 15, 1977.

Attachment

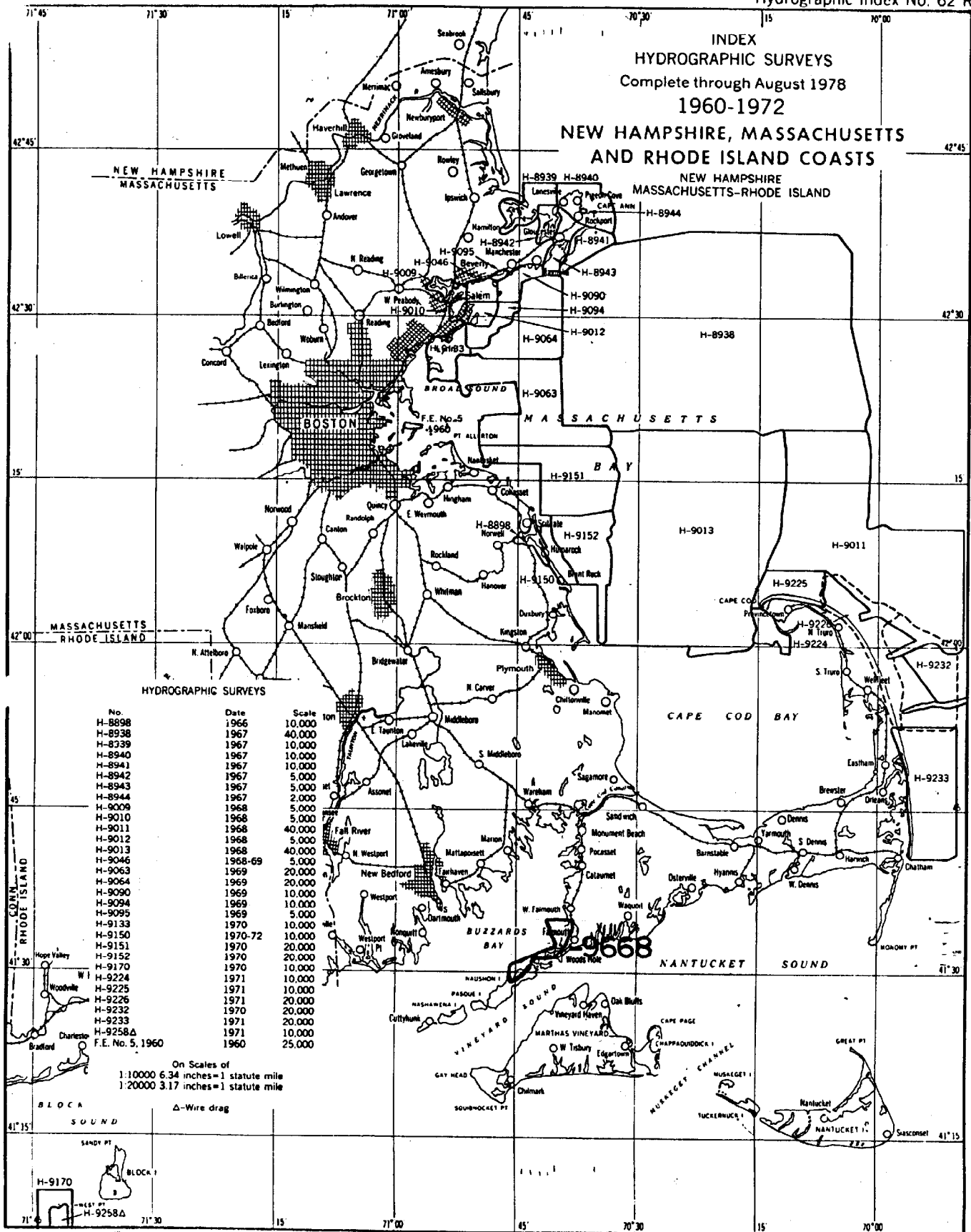
cc:  
OA/C352 w/o att.



**10TH ANNIVERSARY 1970-1980**  
**National Oceanic and Atmospheric Administration**  
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DEPARTMENT OF COMMERCE  
National Oceanic and Atmospheric Administration  
National Ocean Survey  
Rockville, Maryland

Hydrographic Index No. 62 R



HYDROGRAPHIC SURVEYS

No.	Date	Scale
H-8898	1966	10,000
H-8938	1967	40,000
H-8939	1967	10,000
H-8940	1967	10,000
H-8941	1967	10,000
H-8942	1967	5,000
H-8943	1967	5,000
H-8944	1967	2,000
H-9009	1968	5,000
H-9010	1968	5,000
H-9011	1968	40,000
H-9012	1968	5,000
H-9013	1968	40,000
H-9046	1968-69	5,000
H-9063	1969	20,000
H-9064	1969	20,000
H-9090	1969	10,000
H-9094	1969	10,000
H-9095	1969	5,000
H-9133	1970	10,000
H-9150	1970-72	10,000
H-9151	1970	20,000
H-9152	1970	20,000
H-9170	1970	10,000
H-9224	1971	10,000
H-9225	1971	10,000
H-9226	1971	20,000
H-9232	1971	20,000
H-9233	1971	20,000
H-9258Δ	1971	10,000
F.E. No. 5, 1960	1960	25,000

On Scales of  
1:10000 6.34 inches=1 statute mile  
1:20000 3.17 inches=1 statute mile

Δ-Wire drag

