

6441

6441

Form 504
Rev. April 1935

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY

DESCRIPTIVE REPORT

~~XXXXXX~~

Hydrographic

Sheet No. H 6441

State Massachusetts

LOCALITY

Offshore Block Island to

Nantucket Shoals

South of Nantucket Shoals

193 9

CHIEF OF PARTY

F. S. Borden

DEPARTMENT OF COMMERCE
U. S. COAST AND GEODETIC SURVEY

REG. NO. H 6441

HYDROGRAPHIC TITLE SHEET

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. 122

REGISTER NO. H 6441

State Massachusetts

General locality Offshore, Block Island to Nantucket Shoals

Locality South of Nantucket Shoals

Scale 1:120,000 Date of survey June 10 - July 30, 1939

Vessel OCEANOGRAPHER

Chief of Party F. S. Borden

Surveyed by Ship's Officers

Protracted by J. C. Mathisson and H. W. D. Hunter

Soundings penciled by H. W. D. Hunter

Soundings in fathoms ^{and sixths} / feet

Plane of reference Mean Low Water

Subdivision of wire dragged areas by

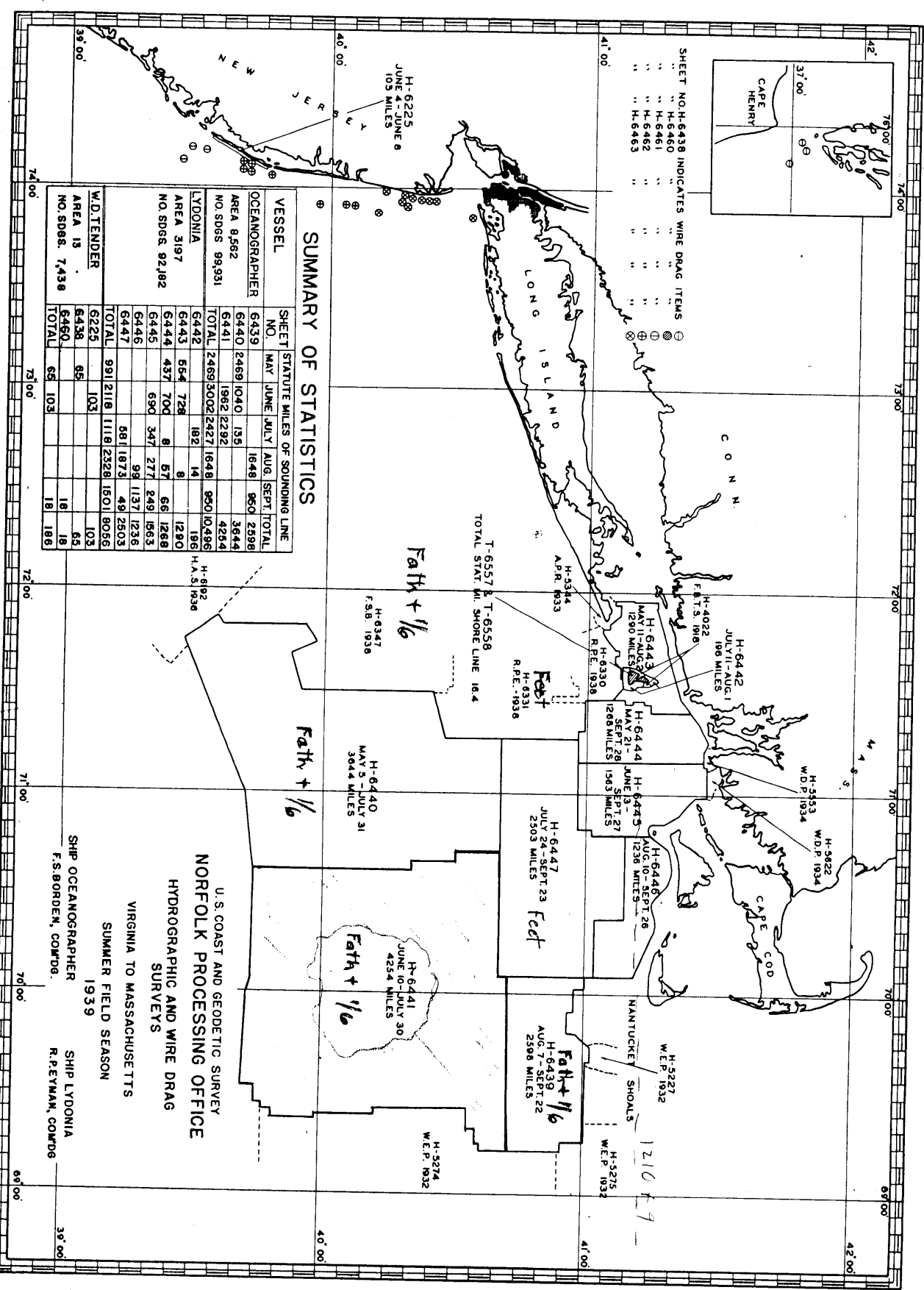
Inked by

Verified by

Instructions dated March 4, 1938

Remarks:

RWW 9/15/92



SHEET NO. H-6438 INDICATES WIRE DRAG ITEMS

- ⊖ H-6460
- ⊖ H-6461
- ⊖ H-6462
- ⊖ H-6463

SUMMARY OF STATISTICS

VESSEL	SHEET STATUTE MILES OF SOUNDING LINE					TOTAL	
	NO.	MAY	JUNE	JULY	AUG.		SEPT.
OCEANOGRAPHER	6439				1648	960	2598
AREA 8,562	6440	2469	1040	135			3644
	6441		1962	1232			4254
NO. 5065 99,931	TOTAL	2469	3002	2427	1648	960	10,496
LYDONIA	6442			182	14		196
AREA 5197	6443	564	728	8			1290
NO. 5066 92,182	6444	437	700	8	57	66	1268
	6445		690	347	277	249	1663
	6446			99	1137	1236	2472
	6447		581	1873	49	2503	4866
W.D. TENDER	TOTAL	991	2118	1118	2328	1501	8056
AREA 13	6450						103
NO. 5068 7,436	TOTAL	65	103				168

U. S. COAST AND GEODETIC SURVEY
 NORFOLK PROCESSING OFFICE
 HYDROGRAPHIC AND WIRE DRAG SURVEYS
 VIRGINIA TO MASSACHUSETTS
 SUMMER FIELD SEASON
 1939

SHP OCEANOGRAPHER
 F. S. BORDEN, COM'DG.

SHP LYDONIA
 R. REYMAN, COM'DG.

Fath + 1/6
 H-6347
 F.S.B. 1938

Fath + 1/6
 H-6440
 MAY 5 - JULY 31
 3044 MILES

Fath + 1/6
 H-6441
 JUNE 10 - JULY 30
 4224 MILES

H-5274
 W.E.P. 1932

T-6557 & T-6558
 TOTAL STAT. M. SHORE LINE 16.4

Fath
 H-6331
 R.P.E. 1938

Fath
 H-6447
 JULY 24 - SEPT 23
 2503 MILES

Fath + 1/6
 H-6459
 AUG 7 - SEPT 22
 2506 MILES

H-5314
 APR. 1933

H-6443
 MAY 11 - AUG. 27
 1290 MILES

H-6444
 MAY 21 - SEPT 27
 1563 MILES

H-6445
 JUNE 3 - SEPT 27
 1236 MILES

NANTUCKET SHOALS
 H-5272
 W.E.P. 1932

H-5275
 W.E.P. 1932

H-4022
 F.B.T.S. 1918

H-6442
 JULY 14 - AUG. 1
 196 MILES

H-5453
 W.D.P. 1934

H-5822
 W.D.P. 1934

H-5822
 W.D.P. 1934

H-5822
 W.D.P. 1934

CAPE COD

1210 Fath

CAPE HENRY

CAPE HENRY

CAPE HENRY

CAPE HENRY

CAPE HENRY

DESCRIPTIVE REPORT
TO ACCOMPANY
SHEET H-6441

DATE OF INSTRUCTIONS

The work on this sheet was done in accordance with Instructions, Project HT. 207 dated May 16, 1936, and Supplemental Instructions, Project HT. 207, dated March 4, 1938.

LIMITS

This sheet covers the offshore area south of Nantucket Shoals between Latitudes $39^{\circ} 42'$ and $40^{\circ} 42'$ and Longitudes $69^{\circ} 20'$ and $70^{\circ} 40'$. The limits of this sheet are outlined in red on the attached sketch. This sheet joins Sheet H-6440⁽¹⁹³⁹⁾ to the west, Sheets H-6439⁽¹⁹³⁹⁾ and H-6447⁽¹⁹³⁹⁾ to the north and Sheet H-5274⁽¹⁹³²⁾ to the east.

SURVEY METHODS

This survey was controlled by R.A.R. using sono-radio buoys located by taut wire-sun azimuth traverse and by additional sono-radio buoys off the line located by bombed distances to buoys on the traverse line. In all 10 sono-radio buoys were used.

Soundings were taken with the Dorsey No. 3 Fathometer, Supplemented by the Hughes Recorder on M day to V day inclusive and on Z day. The initial on the Dorsey No. 3 Fathometer was set at 14 feet.

SMOOTH PLOTTING

Theoretical Velocities of sound in sea water as given in the British Admiralty tables were used for the R.A.R. distances on this sheet. The velocities for the distances were computed from the lowest temperature and the corresponding salinity in each serial inside the 100 fathom curve, the bottom temperature and salinity between the 100 and the 300 fathom curves and from the temperature and salinity for 300 fathoms beyond that depth. The "cold front" temperature used inside the 100 fathoms curve occurred at depths varying from 10 to 25 fathoms below the surface.

The velocities were plotted on overlays (one for each trip) of the boat sheet at the positions where the serials were taken, and curves of equal velocity were then drawn. Over these sheets were placed overlays on which the buoys were located. From each buoy used for the trip radial lines were drawn along which average velocities from the buoy were plotted and then through these points average velocity curves were drawn. These sheets were then laid over the boat sheet and the velocity taken off for each position for the buoy concerned.

For the location of the off-lying sono buoys HOG and OLE, a projection was made on an aluminum mounted sheet, scale 1:120,000, and the buoys that had been located by taut wire-sun azimuth traverse plotted.

From these positions the theoretical distances were swung to obtain the locations of the buoys bombed in. Buoy HOG was located entirely by bomb distances. Buoy OLE was tied to Buoy NAN in the traverse line by a taut wire line and bombed distance arcs swung to other buoys to determine its position along this taut wire distance arc.

Distance circles were drawn for each sono buoy at intervals of 10 seconds corresponding to a velocity of 1480 M/S. These circles were drawn with pencil. Distance arcs to the positions were drawn with colored ink, each sono buoy having a distinctive color. Gyro bearings to buoys are shown by a black dashed line.

The distance arcs for the positions were plotted in seconds, each distance being corrected to the uniform velocity of 1480 M/S. For example, position 87F, the distance from buoy NAN of 17.05 seconds at a velocity of 1474 M/S had a correction of $-.07$ seconds. The distance was plotted as 16.98 seconds.

The sounding lines were dead reckoned on tracing paper and superimposed over the bomb arcs. For small differences the arcs were assumed to be correct but were rejected in the records where they were obviously in error. Gyro bearings were corrected to true bearings shown in the records with red pencil.

Due to the fact that temperatures differed considerably between the inshore and offshore limits of the sheet it was decided that velocity corrections computed from mean temperature curves in accordance with Field Memorandum No. 3, 1936, would not be satisfactory. For instance, the temperature at the bottom in 35 fathoms differed considerably from the temperature at 35 fathoms in a depth of 60 fathoms. Dividing the sheet in areas would not be satisfactory due to the discrepancy in corrections at the junctions of the areas. The corrections were computed as follows. The mean temperature and salinity from the surface to the bottom for each serial taken were computed and mean temperature-depth curves and mean salinity depth curves plotted, the depth taken as the depth at the point the serial was taken. The curves were drawn by trips. The temperature and salinity were then taken off these curves for every 5 fathoms to 100 fathoms, every 10 fathoms between 100 and 200 fathoms and every 200 fathoms for greater depths. The velocities and factors for the corrections were then computed from these mean temperatures and salinities. These computations are being submitted with other miscellaneous data related to the work on this project.

The initial of the fathometer was set at 14 feet and daily corrections applied to the fathometer soundings for draft. This was considered to be a straight line as the draft changed due to fuel and water consumption. Draft readings were taken as conditions permitted. This correction was combined with the velocity correction and entered in the sounding records under the heading T S & D.

No settlement or index correction was applied as observations for the

index correction indicated that this correction was approximately the same as the settlement correction but with opposite sign.

Tide, velocity and draft corrections were applied to soundings up to 200 fathoms and velocity corrections only for depths greater than 200 fathoms.

Soundings were plotted in fathoms and feet (the line under the foot digit being omitted) to 100 fathoms and in fathoms for greater depths. Inked in fathoms and sixths to 60 fms. Fathoms beyond.

In the deep water area there were instances where soundings could be obtained only with the Hughes Recorder. Where the soundings were scaled from the Hughes, that fact was noted in the sounding record. The depths scaled by Lieut. (j.g.) J.C. Mathisson when plotting the deep water area of the sheet were entered in the record with blue pencil.

The bottom characteristics were recorded on the temperature form. For convenience they have been entered on page 2 of Sounding Volume No. 1.

COMPARISON WITH ADJOINING SURVEYS

Junctions with sheets H-6447⁽¹⁹³⁹⁾ and H-6439⁽¹⁹³⁷⁾ to the north and sheets H-6440⁽¹⁹³⁹⁾ to the west are satisfactory. At the junction with sheet H-5274⁽¹⁹³²⁾ to the east a strip approximately ten miles wide was overlapped. The agreement here was satisfactory to approximately the 100 fathom curve but beyond that was erratic. In places the agreement is satisfactory but in others there appears to be a considerable displacement of sounding lines. Par. 4, rev.

COMPARISONS WITH PREVIOUS SURVEYS

A comparison with chart 1108 shows a fair agreement in the shoal part of the sheet but for the deep water the soundings on the chart are too few to show the irregularities of the depth curves.

DISCREPANCIES

In general the crossings on this sheet are satisfactory. On steep slopes in deep water there are discrepancies up to 30 fathoms probably due to slight displacement of sounding lines.

Respectfully submitted,

Approved
 James S. Bonden
 Chief of Party.

John H. Brittain
 John H. Brittain
 Norfolk Processing Office

H6441

STATISTICS FOR SHEET H-6441
OCEANOGRAPHER 1939
PROJECT HT 207

<u>Letter</u> <u>Day</u>	<u>Date</u>	<u>Statute</u> <u>Miles</u>	<u>Soundings</u>	<u>Positions</u>	<u>Volume</u> <u>Number</u>
A	June 10	178	1898	121	1
B	" 11	222	2212	135	1 & 2
C	" 18	71	732	62	2
D	" 19	263	2397	166	2 & 3
E	" 20	196	1895	130	3 & 4
F	" 21	246	2247	143	4 & 5
G	" 22	40	363	34	5
H	" 23	257	1735	146	5 & 6
J	" 24	244	1865	141	6 & 7
K	" 25	245	2350	147	7 & 8
L	July 6	22	240	21	8
M	" 7	242	2228	141	8 & 9
N	" 8	221	2063	137	9
P	" 9	197	1931	120	9 & 10
Q	" 11	264	2417	158	10 & 11
R	" 12	181	1512	113	11 & 12
S	" 13	164	1403	94	12
T	" 23	44	490	41	12 & 13
U	" 24	32	370	36	14
V	" 25	167	980	110	14
W	" 26	179	1982	126	14 & 15
X *	" 27	136	1369	87	15
Y	" 28	214	2068	133	16
Z	" 29	179	1501	152	16 & 17
AA	" 30	31	284	15	17
<hr/>					
TOTALS					
FOR					
SHEET		4235	38,482	2709	

Total square statute miles 4,595

* Positions 1 to 15 X Plotted as 1 to 15 A, Sheet H-6439 and added to statistics of that sheet.

Field Records Section (Charts)

HYDROGRAPHIC SHEET NO. **H6441**

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

Number of positions on sheet	.....	4235
Number of positions checked	.....	17
Number of positions revised	.....	0
Number of soundings recorded	.....	38,482
Number of soundings revised	.....	61
Number of soundings erroneously spaced	.....	0
Number of signals erroneously plotted or transferred	.....	0

Date: 10/22/40

Verification by J. A. M^c Cormick

Time: 177½ hrs.

Review by

J. A. M^c Cormick

10/23/40

Time: 12½ hrs.

HYDROGRAPHIC SURVEY NO. H6441

Smooth Sheet One

Boat Sheet One

Records; Sounding 17 Vols., Wire Drag ___ Vols., Bomb 9 Vols.

Descriptive Report Yes

Title Sheet Yes

List of Signals Yes

Landmarks for Charts (Form 567) _____

Statistics Yes

Approved by Chief of Party Yes

Recoverable Station Cards (Form 524) None

Special Chart for Lighthouse Service No
(Circular Nov.30, 1933)

Hydrography: Total Days 25; Last Date July 30, 1939

Remarks _____

Remarks

Decisions

	Remarks	Decisions
1		
2		
3	Near $40^{\circ}/69^{\circ}35'$ } see Veatch & Smith Map. G.N.S. 1000.1	
4		$40^{\circ}/70^{\circ}10'$ }
5		
6		
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8		
9		
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25		
26		
27		

GEOGRAPHIC NAMES

Survey No. **H6441**

Name on Survey

On Chart No. On previous survey No. On U. S. quadrangle Maps From local information On local Maps P. O. Guide or Map Rand McNally Atlas U. S. Light List

	A	B	C	D	E	F	G	H	K
Block Island									1
Nantucket Shoals									2
Veatch Canyon									3
Atlantis Canyon									4
									5
									6
									7
									8
									9
									10
									11
									12
									13
									14
									15
									16
									17
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									22
									23
									24
									25
									26
									27

Names underlined in red approved
by L. Heck on 7/25/40

MEMORANDUM

IMMEDIATE ATTENTION

SURVEY
 DESCRIPTIVE REPORT
 PHOTOSTAT OF

No. H **H6441**
~~XXXX~~

received June 26, 1940
 registered July 8, 1940
 verified
 reviewed
 approved

This is forwarded in order that your attention may be directed to the matters as indicated below. Please initial in column 3 as an acknowledgement that your attention has been thus directed. The complete original records are available if desired. If you cannot give this your immediate attention, please initial, note, and forward to the next section marked, calling for the records at your convenience.

ROUTE		Initial	Attention called to
20			
22			
24			
25			
26			
30			
40			
62			
63			
82			
83			
88			
90			
80	Capt. Borden	B/B	

RETURN TO

82	T. B. Reed
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✓ JBR

RAC
HRE.

TIDE NOTE FOR HYDROGRAPHIC SHEET

July 15, 1940

Division of Hydrography and Topography:

✓ Division of Charts: Attention: Mr. H. R. Edmonston.

Tide Reducers are approved in
17 volumes of sounding records for

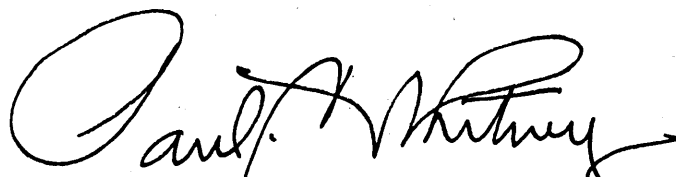
HYDROGRAPHIC SHEET 6441

Locality Offshore, Block Island to Nantucket Shoals. ✓

Chief of Party: F. S. Borden in 1939
Plane of reference is mean low water reading
2.8 ft. on tide staff at Block Island ✓
11.4 ft. below B.M. 2

Height of mean high water above plane of reference is 3.0 feet.

Condition of records satisfactory except as noted below:



Chief, Division of Tides and Currents.

VERIFIER'S REPORT OF HYDROGRAPHIC SURVEY NO. H-6441 (1939)

Verified and Inked by J. A. McCormick

Date Oct. 22, 1940.

1. The descriptive report was consulted and appropriate action taken. ✓
2. Soundings originating with the survey and mentioned in the descriptive report have been verified, including latitude and longitude.
3. All references to survey sheets mentioned in the descriptive report include the registry number and year. ✓
4. Geographic names of hydrographic features are in slanting lettering and of topographic features in vertical lettering.
5. All items effecting the plotting of the survey which are entered in the remarks columns of the sounding records were noted and check marked. In all cases appropriate action was taken. ✓
6. All positions verified instrumentally were check marked in the sounding records. ✓
7. All critical soundings are clear and legible. ✓
8. The metal protractor has been checked within the last three months. ✓
9. The protracting and plotting of all bad crossings were verified. ✓
10. All detached positions locating critical soundings, rocks or buoys were verified.
11. The boat sheet was compared with the smooth sheet. ✓
12. The spacing of soundings as recorded in the records was closely followed. ✓
13. The bottom characteristics were shown on outstanding shoals.
14. The reduction and plotting of doubtful soundings were checked. ✓

15. The transfer of contemporary topographic information was carefully examined.
16. All junctions were transferred. ✓
17. The notation "JOINS H " was added for all contemporary adjoining ✓
or overlapping sheets now registered.
18. The depth curves have been drawn to include the significant depths. ✓
19. All triangulation stations and transfer of topographic and hydrographic
signals were checked by the field party.
20. Heights of rocks were checked against range of tide.
21. Rocks transferred from topographic survey have a dotted curve where
shown thereon.
22. Unnecessary pencil notes have been removed. ✓
23. Objects on which signals are located and which fall outside of the
low water line have been described on the sheet.
24. The low water line and delineation of shoal areas have been properly
shown (see letter of October 20, 1934).
25. Degree and minutes values and symbols have been checked. ✓
26. Source of shoreline and signals (When not given in report).
27. Depth curves were satisfactory. ~~except as follows:~~

28. Sounding line crossings were satisfactory. ~~except as follows:~~

29. Junctions with contemporary surveys were satisfactory except as follows: See par. 4, review.

30. Condition of sounding records was satisfactory. ~~except as follows:~~

31. The protracting was satisfactory. ~~except as follows:~~

32. The field plotting of soundings was satisfactory. ~~except as follows:~~

33. Notes to reviewer:

DIVISION OF CHARTS

Section of Field Records

REVIEW OF HYDROGRAPHIC SURVEY NO. 6441 (1939) FIELD NO. 122

Massachusetts; South of Nantucket Shoal
Surveyed in June - July 1939, Scale 1:120,000
Instructions dated March 4, 1938 (OCEANOGRAPHER)

Soundings:
Dorsey III Fathometer
Hughes Recorder

Control:
R.A.R.

Chief of Party - F. S. Borden.
Surveyed by - Officers of Ship OCEANOGRAPHER.
Protracted by - J. C. Mathisson; H. W. D. Hunter.
Soundings plotted by - H. W. D. Hunter.
Verified and inked by - J. A. McCormick.
Reviewed by - J. A. McCormick, Oct. 23, 1940.
Inspected by - H. R. Edmonston.

1. Shoreline and Signals.

The nearest shoreline is well beyond the limits of the smooth sheet. Sono radio buoys were located by taut wire, sun azimuth traverse.

2. Depth Curves.

In accordance with present charting practice for this area, depth curves are shown at 20, 30, 40, 50, 100, 500 and 1000 fathoms. Those beyond 20 fathoms have been left in pencil in order to facilitate possible revision when the more detailed bottom contouring is accomplished for the special Coastal Slope charts.

3. Sounding Line Crossings.

Discrepancies at sounding line crossings are not excessive for a survey of this type.

4. Junctions with Contemporary Surveys.

- a. A satisfactory junction was made with H-6447 (1939) on the northwest. H-5274 (1932) on the east was overlapped approximately ten miles. As stated in the descriptive report, page 3, agreement is satisfactory approximately to the 100-fathom curve but numerous differences exist beyond. Satisfactory transition from one survey to the other is accomplished simply by superseding entirely this overlapping portion of H-5274.

- b. Junctions with H-6439 (1939) on the northeast and H-6440 (1939) on the west will be considered in the reviews of those surveys.

5. Comparison with Prior Surveys.

H-101 (1844), 1:400,000; H-406 (1853) 1:400,000;
H-670 (1859) 1:400,000; H-1458a (1880) 1:1,200,000;
H-1498a (1881-83) 1:1,200,000; H-1531 (1881-83) 1:1,200,000;
H-1782 (1887) 1:300,000; H-1837 (1888) 1:400,000;
H-2654 (1903) 1:80,000; H-2920a (1882-87) 1:1,200,000;
H-2958 (1908) 1:200,000; H-3201 (1910) 1:80,000.

None of these surveys approaches the intensity of development of the present survey. H-1782 and H-1837, which are two of the better developed, have soundings spaced 2 miles apart on lines at intervals of 3 to 10 miles. Several of the other surveys show only a few track soundings. H-2654 and H-3201 show depths 2 to 5 fathoms shoaler than those of the present survey in the vicinity of the Light Vessel. An outstanding instance is the 15 fathom depth (charted) in latitude $40^{\circ}42.7'$, long. $69^{\circ}23.5'$ on H-2654 as compared with 17 to 25 fathoms on the present survey. However, the old surveys furnish a surprisingly good delineation of the area as a whole; much better than has been found to be the case farther to the westward. Shoaler soundings such as the 15 already mentioned are not considered of sufficient accuracy either in depth or position to warrant their retention. Accordingly all information in the common area from older surveys is superseded by the present survey.

6. Comparison with Chart 3076 (New Print of April 18, 1940)
Chart 1107 (New Print of Dec. 15, 1939)
Chart 1108 (New Print of Aug. 17, 1940)

a. Hydrography.

Depths now charted in the area covered by the present survey are from surveys discussed in the foregoing paragraphs. Depth curves were revised from advance information forwarded by the present field party and are substantially as shown on the smooth sheet.

b. Aids to Navigation.

The position determined on the present survey for Nantucket Shoals Light Vessel is approximately 0.7 mile south of the charted position. No position was obtained for the station buoy.

7. Condition of Survey.

Satisfactory.

8. Compliance with Instructions for the Project.

Satisfactory.

9. Additional Field Work Recommended.

None.

10. Superseded Surveys.

H-101	in part	H-1782	in part
H-406	" "	H-1837	" "
H-670	" "	H-2654	" "
H-1458a	" "	H-2920a	" "
H-1498a	" "	H-2958	" "
H-1531	" "	H-3201	" "

Examined and approved:



Thos. B. Reed,
Chief, Section of Field Records.



Chief, Section of Field Work.



Chief, Division of Charts.



Chief, Division of H. & T.

Applied to chart 1108
Applied to chart 1107
" " " 70
" " " 3076

Feb. 25, 1941 G.H.S.
April 9, 1941 F.M.
July 23, 1941 F.M.A.
Feb. 19, 1948 D.H.B.