

8808

Diag. Cht. No. 1232-2.

FORM C&GS-504

U.S. DEPARTMENT OF COMMERCE
ENVIRONMENTAL SCIENCE SERVICES ADMINISTRATION
COAST AND GEODETIC SURVEY

DESCRIPTIVE REPORT

Type of Survey Hydrographic

Field No. EX-20-1-63 Office No. H-8808

● LOCALITY

State North Carolina

General locality Cape Hatteras

Locality Diamond Shoals

1964

CHIEF OF PARTY

G. W. Moore

LIBRARY & ARCHIVES

DATE September 22, 1966

USCOMM-DC 37022-P66

8808

HYDROGRAPHIC TITLE SHEET

H 8808

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.

OPR 438 EX 20-1-63

State North Carolina

General locality Cape Hatteras
~~East Coast North Carolina~~

Locality Diamond Shoals

Scale 1:20,000 Date of survey ~~25 June - Aug. 11, 1963~~ 24 July - 23 Oct. 1964 *see note below.*

Instructions dated 26 April 1963 & 21 April 1964 Project No. OPR 438 H 8808

Vessel Explorer

Chief of party Captain Glenn W. Moore, USCGS

Surveyed by Ships Officers

Soundings taken by echo sounder, hand lead, pole

Graphic record scaled by Ships Personnel

Graphic record checked by Ships Personnel

Protracted by Dan R. Munford

Soundings penciled by Dan R. Munford

Soundings in fathoms feet at MLW MLLW

REMARKS: The work done in 1963 was rerun in 1964, as numerous bottom changes prevented making proper junction with it. Consequently, none of the 1963 work has been plotted on the survey, except some in red near Cape Point, and remains of historical significance to a large extent.
DLW 1/24/72

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DESCRIPTIVE REPORT
To Accompany Hydrographic Survey

Sheet EX-20-1-63
USC&GS Ship EXPLORER
Capt. Glenn W. Moore, Comdg.

A. Project ✓

Hydrography was accomplished in accordance with "Instructions Project OPR-438, Coast of North Carolina" dated 26 April 1963 and "Supplemental Instructions Project OPR-438" dated 21 April 1964.

B. Area Surveyed ✓

This survey covers an area off the East Coast of North Carolina in the vicinity of Diamond Shoals near Cape Hatteras. The survey is bounded on the north by latitude 35° 16.3' N and extends to latitude 35° 06.5' N in the south. The eastern boundary is longitude 75° 15.0' W and the western boundary 75° 35.0' W.

The survey was begun on 25 July 1963 and was suspended on 11 August 1963. It was resumed on 24 July 1964 and continued through 23 October 1964.

Prior surveys of this area were considered to be too old to be of value as far as junctions were concerned.

The sheet covered an area which was covered by survey H-8249, scale 1:20,000, dated 1955.

Junctions were made with contemporary surveys as follows:

H-8810	EX-40-1-63 ⁴	Scale 1:40,000	1962-64 ⁵
H-8809	EX-20-2-63	Scale 1:20,000	1963-64

C. Sounding Vessels ✓

All hydrography was accomplished by the Ship EXPLORER and her launches over a period of two seasons (1963-1964).

For July and August 1963:

Ship EXPLORER - Capt. J. Bull - O. in C. - capital blue day letters.
Launch #1 (old) - Ens. Drosendohl - O. in C. - purple day letters.

1963
work
not
plotted
except
as noted
above.

1963 work
not plotted
← A small
portion of
1963 work
was plotted
in an area
not covered
by 1964
work.
Daw

Launch #2 - LTjg Lewis - O. in C. - brown day letters.
Launch #3 - Ens. Fleming - O. in C. - red day letters.

For July through October 1964:

Ship EXPLORER - Capt. Glenn W. Moore - O. in C. - blue day letters.
Launch #1 (new) - Ens. Dropp - O. in C. - purple day letters.
Replaced old launch #1 July, 1964.
Launch #2 - Ens. Coffin - O. in C. - brown day letters.
Launch #3 - Ens. Vail - O. in C. - red day letters.
Launch #1 (old) - Ens. Vail - O. in C. - red day letters.
Replaced launch #3 - 30 September 1964.

D. Sounding Equipment

For July and August 1963:

	Fathometer	Serial No.
EXPLORER	DE 723	248
Launch #1 (old)	"	255
Launch #2	"	247
Launch #3	"	258

For July through October 1964:

EXPLORER	"	255, 261, 536
Launch #1 (new)	"	258
Launch #2	"	248
Launch #3	"	807
Launch #1 (old)	"	261

Bar checks, leadline comparisons, and phase comparisons were made frequently during the survey. Further information concerning the methods of correction of the fathometers is contained in the EXPLORER "Fathometer and Velocity Correction Report 1964". Frequent Nansen bottle casts were taken for velocity corrections.

E. Smooth Sheet

Information to be supplied by the smooth plotter. No smooth plotting was done on the EXPLORER.

F. Control

A scheme of triangulation was extended through the area in 1962. An Electrotape traverse was used to supplement the horizontal control survey.

Shoran Stations - June through August 1963

PARK Shoran station PARK is a reference mark for triangulation station M. P. 54.5 (N. P. S.), 1962. It is a standard disk set in a six inch diameter concrete

monument and marked M. P. 54.5 No. 1, 1963. The geographic position of the station is:
Lat. $35^{\circ} 12' 21.67''$ N Long. $75^{\circ} 42' 05.01''$ W

DUNE Shoran station DUNE is a standard disk traverse station marked DUNE 1963 set in an eight inch square concrete monument which projects about six inches above the ground. The geographic position of this mark is:
Lat. $35^{\circ} 21' 29.34''$ N Long. $75^{\circ} 30' 00.86''$ W

Shoran Stations - July through October 1964

PARK This station is the same one as was used during the 1963 work.

TAR Shoran TAR situated on the pumped-in sand dune, east of the entrance to the U. S. Navy facility in Buxton, was located by a short base, 970 feet, from Cape Hatteras Shoran "A" Station to shoran station TAR. Cape Hatteras Shoran "A" Station and Cape Hatteras L. H. 1933, Ecc. were occupied. The starting azimuth was obtained from Cape Hatteras L. H. 1933, Ecc. to Cape Hatteras Loran 1948. The geographic position of the station is as follows:
Lat. $35^{\circ} 15' 34.93''$ Long. $75^{\circ} 31' 12.30''$

SAL Station SAL is located in the north end of the surveyed area at latitude $35^{\circ} 31' 53.161''$, longitude $75^{\circ} 28' 23.350''$. It was located by measuring a short base, 180 meters long, from triangulation station "SALVO 1933" to stake "6" and by occupying both stations.

On July 24, 1964 from position 44C, 54C of the Ship EXPLORER one angle (a) was used to supplement shoran control. At Cape Hatteras L. H. Ecc. 1964 the angle to the ship from the loran mast was observed using T2-30657. The initial set into the instrument was $19^{\circ} 25' 06''$ which was the azimuth of line from Cape Hatteras Lighthouse Ecc. 1964 to Loran Mast. These angles were recorded in the sounding volume and in a horizontal direction book.

On August 7, 8, 19, 20, 21, 25, 1964 the same method was used for control in conjunction with shoran station SAL on launch #2.

For further information on shoran stations see EXPLORER "Report on Shoran Corrections 1964", and "Geodetic Field Work, 1964".

Hydrographic stations COW, BAT and APE were taken from the boat sheet

G. Shoreline

To be applied to the smooth sheet after compilation of air-photo manuscripts.

H. Crosslines

Crosslines made up 8% of the sheet hydrography. There was generally good agreement at the crossings. Final comparison will be made by the smooth plotter.

I. Junctions

Junctions made with sheet ^{H-8810(1964-65)} 40-1-6⁴ were in general agreement. Junctions between the launches and between the launch work and the ship hydrography are in general agreement.

The junction made with sheet ^{H-8809(1963-64)} EX-20-2-63 in the region of latitude 35° 15' N and between the longitudinal meridians 75° 28' W and 75° 31' W generally disagrees by 4' to 8' feet. The differences could be due to higher tides than usual because of storm activity. Another possible explanation would be that the control used for sheet EX-20-2-63 consisted of different shoran stations and visual stations. ^{H-8809(1963-64)} When the corrections to the shoran are applied and the positions are adjusted, the discrepancies in the recorded depths may be resolved.

It was found that there were major changes in the area covered by the prior survey H-8249, scale 1:20,000, dated 1955.

J. Comparison with Prior Survey

Prior surveys within this sheet were old and copies were considered to be of no value to the hydrographer. This was pointed out in the instructions for this project dated 26 April 1963, paragraph 17, page 3.

K. Comparison with Chart

It was found that there were a few changes in the charted depths in the Diamond Shoals area of Chart #1232, rev. ^{Nov. 4, 64} 2-17-64. The ~~best~~ smooth sheet, ~~as a general rule,~~ verifies the existence of the charted shoals; however, the depth in several instances are not in agreement, and the size, shape, and location of the shoal has changed. This condition is no doubt due to the constantly shifting sands resulting from storms.

The shoalest sounding ^(in Diamond Shoals) on chart #1232 is $\frac{3}{2}$ feet and this compares to a sounding of 1 $\frac{1}{2}$ feet on the sheet at latitude 35° 09.4' longitude 75° 29.8'. ²

The following are the reported wrecks on this sheet:

Latitude	Longitude	Chart	Depth	Found	Survey Depth
*35 10.29	75 21.52	36 ft.		No YES	72 52
35 09.38	75 18.22	52 ft.		Possible NO	60 79 nearby
35 15.30	75 24.30	60 ft.		No	60 Falls off limits of this survey.
35 08.00	75 21.90	44 48 ft.	nearby	No	60 75 nearby
35 07.40	75 22.20	52 45 ft.	nearby	No	60 81
35 08.40	75 30.80	33 ft.		No	42 33 nearby
35 08.40	75 30.20	18 52 ft.	nearby	No	18

*The one possible wreck was a ~~50~~ 52 ft. sounding in 69 ft. of water.

L. Adequacy of Survey

This survey is considered complete and adequate and supersedes all prior surveys. The basic system of lines were spaced at 200 meters because of the general sloping of the bottom contours. Where shoals were indicated, line spacings were reduced to 100 meters and concentrated developments made to locate the shoalest depth.

As stated in paragraph "K" the area is a mass of shifting sands and a more densely spaced system of lines is not warranted for the tremendous costs involved. Navigation across the shoal is dangerous at any stage of storms or calm waters; therefore, the survey serves primarily a means for scientific study, and this survey satisfies this requirement.

The bottom samples throughout the area of the launch survey were sparsely obtained due to weather conditions. The area surveyed by the ship were obtained by the "Paulson Miniature Pipe Dredge" at spacings of 2/3 mile underway. Each sample obtained was placed in a plastic bag, labeled, and transferred to the Norfolk Regional Officer. - *Samples forwarded to Wash. off.*

M. Aids to Navigation

No new aids to navigation were located. Buoy "R2 dk fl bell" was located for calibration of shoran (see calibration records). Because of the shifting shoal areas and changing channels, no additional aids are recommended across Diamond Shoals.

OUTER DIAMOND SHOAL Ø 35°-08'-07" } Position from Shoran
 LIGHTED BELL BUOY 2 2 75°-23'-06" } Correction Report

N. Statistics

Date	Vessel	No. Positions	Miles of Soundings	
July & Aug. '63	Explorer	299 64	184.5 22.5	1963 work was not plotted on smooth sheet
July - Oct. '64	Explorer	3441	1212.9	
	TOTAL	3505 3740	1236.4 1397.4	
July & Aug. '63	Launch #1 (old)	224	69.3	
July - Oct. '64	"	364	102.2	
	TOTAL	588	171.5	
July & Aug. '63	Launch #2	247 3	65.2	
July - Oct. '64	"	1109	269.6	
	TOTAL	1326 4	334.8	
July & Aug. '63	Launch #3	287 1	67.5	
July - Oct. '64	"	95	19.8	
	TOTAL	372 6	87.3 3	
Sept - Oct. '64	Launch #1 (new)	706	212.7	
TOTAL ON SHEET 1963-64		5715 6592	1817.2 2047.6	Positions miles

Current Observations: Five stations occupied. See "Special Report, Current Observations, June, 1963, EXPLORER" submitted 12 July 1963.

Oceanographic Stations: In accordance with the project instructions, ocean stations were occupied during July 1963. See "Oceanographic Report, Project OPR 438, July 1963, EXPLORER" submitted 21 August 1963.

In accordance with the supplemental instructions for the 1964 season, ocean stations were observed during July 1964. See "Oceanographic Report OPR 438, July 1964, EXPLORER" submitted 2 October 1964.

Bottom Samples: 85

O. Miscellaneous

1. This survey adds more proof to the fact that the bottom is constantly changing in the vicinity of Diamond Shoal. The survey was begun in 1963 season with widely spaced reconnaissance lines that are in acceptable agreement with 1964 survey in the deep water. Changes in depths are noted across the shoal and channels. The 1963 survey has not been rejected, but the entire area of the sheet was surveyed in 1964 season for a complete hydrographic record. The 1963 records should be used for historical reference.

2. The survey of Diamond Shoal was accomplished under severe weather handicap, with the final launch work being completed on the final day of the season. To be certain of complete coverage of the area, a master composite sheet was traced from each boat sheet with the soundings in the color of the launch. The depth curves were drawn on the composite sheet. The smooth plotter will have a ready reference to the numerous boat sheets from this mylar composite sheet.

P. Recommendations

It is recommended that wrecks on the chart be retained until a more positive means of identification is used to prove or disprove their existence.

This survey is recommended as adequate and no further development recommended.

For a complete interpretation of the survey records the following reports are necessary.

<u>Report</u>	<u>Date</u>
Tide Leveling	28 July 1964 8 August 1964 22 October 1964
Tide Station Report	27 July 1964 7 August 1964
Season's Report	1964
Geodetic Field Work, 1964 Field Season	1964
Fathometer Velocity and Correction Report	to be submitted
Oceanographic Report, OPR 438	July 1964
Shoran Correction Report	to be submitted
Special Report, Current Station Observations	June 1963, EXPLORER - 12 July 1963

Respectfully submitted,

Kenneth A. Burke
Ens. K. Burke

LTjg D. P. Van Weele

David P. Van Weele

Approved

Marvin T. Paulson
Marvin T. Paulson

C. O. Ship EXPLORER

for Alan W. Moore

TIDE NOTE
to
Accompany EX 20-1-63

Tide reducers were obtained from both the Portable Tide Gage maintained at Avon Fishing Pier, Avon, North Carolina and the Standard Tide Gage at Virginia Beach, Virginia.

The Avon Fishing Pier Portable Tide Gage is located at latitude 35-20, longitude 75-30, and the Time Meridian is the 60 th. Mean Low Water, as furnished by the Washington Office, was 1.3 feet above Staff Zero. The staff installed on 27 July 1964 was lost, and a new staff was installed on 7 August 1964.

Previous to 8 August 1964 and on 4 October 1964 and 29 September 1964 the Standard Tide Gage at Virginia Beach was referred to Avon, North Carolina. The tide reducers, supplied by the Washington Office, were the following:

- 1) -14 minutes applied to the Virginia Beach hourly heights.
- 2) A factor of 0.8 for the range of tide.

During the 1963 field work no portable tide gage was used, but the standard gage at Virginia Beach was referenced to the area.

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OPR-438

Cape Hatteras

1964

Ship EXPLORER

Station SAL:

Distance (statute miles)

Shoran
Correction

0.0-4.0	-0.04
4.1-9.5	-0.05
9.6-15.1	-0.06
15.2-20.7	-0.07
20.8-26.4	-0.08
26.5-30.0	-0.09

Station TAR:

1.5-4.2	-0.00
4.3-9.7	-0.01
9.8-15.2	-0.02
15.3-20.7	-0.03
20.8-26.2	-0.04
26.3-30.0	-0.05

Station PARK:

0.0-3.8	-0.01
3.9-9.2	-0.02
9.3-14.7	-0.03
14.8-20.2	-0.04
20.3-25.7	-0.05
25.8-30.0	-0.06

OPR-438

Cape Hatteras

1964

Launch 1

Station TAR:

Distance (statute miles)	<i>Sherman</i> Correction
0.0-2.1	-0.06
2.2-5.4	-0.07
5.5-8.8	-0.08
8.9-12.1	-0.09
12.2-15.5	-0.10
15.6-18.7	-0.11
18.8-22.0	-0.12
22.1-25.3	-0.13
25.4-28.6	-0.14

Station PARK:

0.0-3.2	-0.05
3.3-6.7	-0.06
6.8-10.0	-0.07
10.1-13.4	-0.08
13.5-16.8	-0.09
16.9-20.2	-0.10
20.3-23.5	-0.11
23.6-27.0	-0.12

OPR-438

Cape Hatteras

1964

Launch 2

Station SAL:

Distance (statute miles)

Shoran
Correction

0.0-3.2	-0.02
3.3-6.5	-0.03
6.6-9.8	-0.04
9.9-13.1	-0.05
13.2-16.5	-0.06
16.6-19.8	-0.07
19.9-23.1	-0.08
23.2-26.5	-0.09

Station TAR:

August 7 - September 4

0.0-3.4	0.00
3.5-6.7	-0.01
6.8-10.1	-0.02
10.2-13.5	-0.03
13.6-16.9	-0.04
17.0-20.2	-0.05
20.3-23.5	-0.06
23.6-26.9	-0.07

September 5 - September 6

3.7-5.3	0.00
5.4-8.7	-0.01
8.8-12.0	-0.02
12.1-15.4	-0.03
15.5-18.8	-0.04
18.9-22.1	-0.05
22.2-25.5	-0.06
25.6-28.9	-0.07

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OPR-438

Cape Hatteras

1964

Launch 2

Station PARK:

September 5 - September 6

Distance (statute miles)

Shoran
Correction

0.0-2.8	-0.07
2.9-6.1	-0.08
6.2-9.5	-0.09
9.6-12.8	-0.10
12.9-16.1	-0.11
16.2-19.4	-0.12
19.5-22.7	-0.13
22.8-25.9	-0.14

September 18 - September 28

0.0-1.6	-0.03
1.7-4.9	-0.04
5.0-8.3	-0.05
8.4-11.6	-0.06
11.7-14.9	-0.07
15.0-18.1	-0.08
18.2-21.4	-0.09
21.5-24.7	-0.10

September 29 - October 21

7.0-8.6	+0.01
8.7-11.8	0.00
11.9-15.0	-0.01
15.1-18.4	-0.02
18.5-21.6	-0.03
21.7-24.8	-0.04
24.9-28.2	-0.05

13
OPR-438

Cape Hatteras

1964

Launch 2

Station TAR:

September 18 - September 28

Distance (statute miles)

Shoran
Correction

0.0-3.0	0.00
3.1-6.3	-0.01
6.4-9.7	-0.02
9.8-13.0	-0.03
13.1-16.4	-0.04
16.5-19.7	-0.05
19.8-23.1	-0.06
23.2-26.5	-0.07

September 29 - October 21

0.8-2.0	+0.06
2.1-3.9	+0.05
4.0-7.3	+0.04
7.4-10.6	+0.03
10.7-13.9	+0.02
14.0-17.3	+0.01
17.4-20.6	0.00
20.7-24.0	-0.01
24.1-27.3	-0.02

Station PARK:

August 7 - September 4

0.0-3.3	-0.03
3.4-6.6	-0.04
6.7-9.8	-0.05
9.9-13.2	-0.06
13.3-16.5	-0.07
16.6-19.9	-0.08
20.0-23.2	-0.09
23.3-26.6	-0.10

OPR-438

Cape Hatteras

1964

Launch 3

Station TAR:

Distance (statute miles)

Shoran
Correction

0.0-1.0	0.00
1.1-4.4	-0.01
4.5-7.7	-0.02
7.8-11.0	-0.03
11.1-14.3	-0.04
14.4-17.6	-0.05
17.7-21.0	-0.06

Station SAL:

August 7 - September 18

0.0-1.9	-0.06
2.0-5.2	-0.07
5.3-8.6	-0.08
8.7-11.8	-0.09
11.9-15.2	-0.10
15.3-18.5	-0.11
18.6-21.9	-0.12
22.0-25.3	-0.13

September 28 - October 21

0.0-0.8	0.00
0.9-4.1	-0.01
4.2-7.4	-0.02
7.5-10.7	-0.03
10.8-14.1	-0.04
14.2-17.4	-0.05
17.5-20.7	-0.06
20.8-24.1	-0.07

SIGNAL NAMES

to

H-8808(1963-64)

Accompany EX 20-1-63

Four Shoran Stations were used on this survey. They are the following:

<u>SIGNAL</u>	<u>LOCATION</u>	<u>ORIGIN OF STATION</u>
SAL	35-31-53.161 N 75-28-23.350 W	Both stations were located from triangulation stations whose geographic positions were determined by geodetic surveys from prior years.
TAR	35-15-34.93 N 75-31-12.30 W	

See "Geodetic Field Work, 1964 Field Season" for additional information.

PARK	35-12-21.67 N 75-42-05.01 W	Both stations were located during 1963 field season by triangulation and from prior geodetic surveys.
DUNE	35-21-29.34 N 75-30-00.86 W	

NORFOLK HYDROGRAPHIC PROCESSING BRANCH
ADDENDUM
To Accompany

HYDROGRAPHIC SURVEY H-8808 (Ex 20-1-63)

GENERAL

This appears to be a very good basic survey as soundings, with a few exceptions, are in good agreement at crossing considering the irregular and changeable character of the bottom in this area.

There is undoubtedly some position displacement as the ship was unable to obtain accurate positions of some of the Shoran calibration buoys. (See Shoran Correction Report). This factor, combined with the probability of some shifting or dragging of calibration buoys in these turbulent waters caused, what appears to be, some position displacement in the vicinity of Diamond Shoals.

An example of a condition believed to have been caused by dragging of a calibration buoy appears on "q" through "u" days (brown). Shoran corrections on these days differ considerably from the others and cause a shift of what are apparently split lines on the boat sheet to the extent that wide holidays are left on the smooth sheet. This apparent displacement is considered of minor significance because of the rapidly changing bottom in the area concerned. A transparent overlay showing some of this work is being forwarded with the smooth sheet.

1963 SEASONS WORK

In compliance with paragraph "O" of this report, hydrography accomplished during the 1963 field season was not smooth plotted. An effort was made to plot the lines falling in the "Breaker" area at the tip of Cape Hatteras, but the control was too weak and questionable to retain the work.

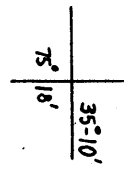
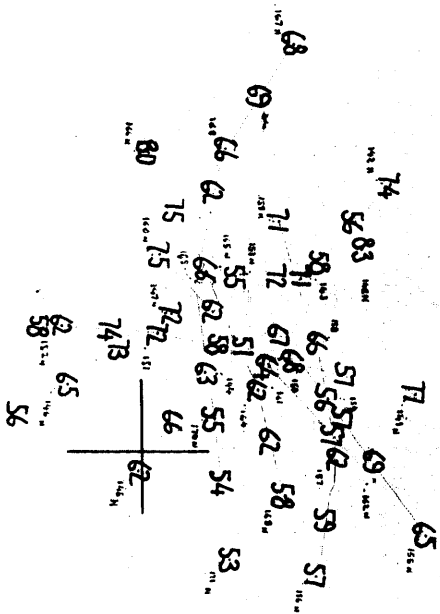
FATHOMETER PROBLEMS

A phase correction of ± 3.0 feet was applicable on all work of fathometer 248, Launch 2, (brown). This correction was entered in the sounding volumes in green and the final soundings appear in the "Office Column".

The fathogram showed a double trace on "q" day (red). The deeper trace checked surrounding hydrography so it was used on the smooth sheet.

Phase corr. possibly erratic and may be as little as 1.5' on some days
Probably malfunction in transducer circuit - separation as much as 10 ft.

continued



OVERLAY No. 1
 EX 20-1-63 H-8808
 EXPLORER
 "N" DAY
 Pos. 142-171

ADDENDUM
continuation

18
* on Diamond Shoals

CROSSING DISCREPANCIES

Lat. 35-11.5' Long. 75-31.1' - Soundings between 13 & 14g (brown) average 4 feet deeper than surrounding hydrography. These soundings were taken about 5 weeks prior to other work and the discrepancy is believed to have been caused by bottom changes. ✓

Lat. 35-12.0 Long. 75-31.3' - Soundings on 24 to 25f (br) are about 7 feet deeper than those on 24 to 25s (br). Probably caused by bottom changes. ✓

CHART COMPARISON


Except for the discrepancies listed above, soundings at crossings were in good agreement considering the irregular and changeable character of the bottom. ✓

In the locality of Lat. 35-09' Long. 75-20' the bottom contains numerous sand waves. Many of the deeps could not be shown at the scale of the smooth sheet. ✓

A comparison with chart 1232 shows some shifting of depth curves and smooth sheet depths are generally deeper beyond the limits of Diamond Shoals. ✓

Lat. 35-10.3 Long. 75-21.5 - Position 149M (blue) shows a shoal depth of 52 feet at the location of a wire drag item with a charted depth of 36 feet. ✓

Development lines 142 through 171N (bl), which fall slightly South of the wreck charted at Lat. 35-09.4' & Long. 75-18.2', are being submitted on a smooth overlay. No trace of the wreck was found.

Respectfully submitted,

Hugh L. Proffitt
Supvr. Carto-Tech.

Norfolk, Va.
April 26, 1966

TIDE NOTE FOR HYDROGRAPHIC SHEET

May 23, 1966

~~Nautical Chart Division~~ Atlantic Marine Center

Plane of reference approved in
32 volumes of sounding records for

HYDROGRAPHIC SHEET H 8808

Locality: Cape Hatteras, North Carolina

Chief of Party: M. T. Paulson 1963-64

Plane of reference is mean low water

Tide Station Used (Form C&GS-681):

Hampton Roads, Virginia
Virginia Beach, Virginia
Avon, North Carolina

Height of Mean High Water above Plane of Reference is as follows:

2.5 ft. Hampton Roads, Va.
3.4 " Virginia Beach, Va.
2.8 " Avon, N. C.

Remarks NOTE: Tide reducers for the positions listed below have been revised in red and verified.

<u>Vol.</u>	<u>Pos.</u>	<u>Vol.</u>	<u>Pos.</u>	
2	1B to 64B	21	1d to 31d	(Only the soundings applied to H-8808(1964) have been corrected)
15	92b to 113b 1c to 37c	29	1f to 21f 10g to 57g	

Note: Tide corrections applicable only to the 1963 season. 1963 season was not smooth plotted. See paragraph "O" (Miscellaneous) of the Descriptive Report with reference to the 1963 season.

J. M. Seymour
Chief, Tides and Currents Branch

HYDROGRAPHIC SURVEY STATISTICS
HYDROGRAPHIC SURVEY NO. 8808

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

RECORD DESCRIPTION		AMOUNT	RECORD DESCRIPTION		AMOUNT	
SMOOTH SHEET		1	BOAT SHEETS <i>Ad. Boat Sheets</i>		2 8	
DESCRIPTIVE REPORT		1	OVERLAYS <i>(Rough)</i>		1	
DESCRIPTION	DEPTH RECORDS	HORIZ. CONT. RECORDS	PRINTOUTS	TAPE ROLLS	PUNCHED CARDS	ABSTRACTS/ SOURCE DOCUMENTS
ENVELOPES						
CAHIERS						
VOLUMES	32					
BOXES						

T-SHEET PRINTS (*List*)

SPECIAL REPORTS (*List*)

1-Shoran Correction Report
1-Vol. Shoran Calibration (*see Vols. H-8809*)

OFFICE PROCESSING ACTIVITIES

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

PROCESSING ACTIVITY	AMOUNTS			
	PRE-VERIFICATION	VERIFICATION	REVIEW	TOTALS
POSITIONS ON SHEET				
POSITIONS CHECKED				
POSITIONS REVISED				
DEPTH SOUNDINGS REVISED				
DEPTH SOUNDINGS ERRONEOUSLY SPACED				
SIGNALS ERRONEOUSLY PLOTTED OR TRANSFERRED				
	TIME (MANHOURS)			
TOPOGRAPHIC DETAILS				
JUNCTIONS				
VERIFICATION OF SOUNDINGS FROM GRAPHIC RECORDS				
SPECIAL ADJUSTMENTS				
ALL OTHER WORK				
TOTALS				
PRE-VERIFICATION BY	BEGINNING DATE		ENDING DATE	
VERIFICATION BY	BEGINNING DATE		ENDING DATE	
REVIEW BY	BEGINNING DATE		ENDING DATE	

Hydrographic Surveys (Chart Division)

HYDROGRAPHIC SURVEY NO. H-8808

Records accompanying survey: Smooth sheets 1;
 boat sheets 10; sounding vols. 24 *; wire drag vols. 0
 Descriptive Reports 1; graphic recorder envelopes 9 *
 special reports, etc.
 * 1963 work not included

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

Number of positions on sheet	.....	5715 *
Number of positions checked	.....	13
Number of positions revised	.....	8
Number of positions revised (refers to depth only)	.....
Number of soundings/erroneously spaced	.....
Number of signals erroneously plotted or transferred	.....
Topographic details	Time	.....
Junctions	Time	.....
Verification of soundings from graphic record	Time	..... 13 hrs.
Special adjustments	Time	.....

Verification by Walter Schupell Total time Date 8/24/66

Reviewed by Fannie B. Powers Time 2:31 Date 11-10-71
Corrections of the Inspector 53 hrs 2-2-72

Inspected by Dale E. Westbrock Time 37 hrs. Date 1/24/72
Carstens 4 hrs. 2/2/72

OFFICE OF MARINE SURVEYS AND MAPS

MARINE CHART DIVISION

HYDROGRAPHIC SURVEY REVIEW

REGISTRY NO. H-8808

FIELD NO. EX-20-1-63

North Carolina, Cape Hatteras, Diamond Shoals

SURVEYED: July 24, 1964 - October 23, 1964

SCALE: 1:20,000

PROJECT NO.: OPR-438

SOUNDINGS: DE-723 Depth Recorders

CONTROL: Shoran

Chief of Party.....	G. W. Moore
Surveyed by.....	R. T. Coffin
.....	R. H. Rudy
.....	K. F. Burke
.....	J. E. Dropp
.....	C. Andreasen
.....	D. R. Rich
.....	E. N. Vail
.....	P. L. Richardson
Protracted by.....	D. R. Munford
Soundings Plotted by.....	D. R. Munford
Verified and Inked by.....	A. K. Schugeld
Reviewed by.....	F. B. Powers
.....	Date: November 9, 1971
Inspected by.....	D. E. Westbrook

1. Description of the Area

This survey covers Diamond Shoals, an area off the coast of North Carolina in the vicinity of Cape Hatteras.

The bottom on Diamond Shoals is characterized by numerous irregular sand ridges and troughs. The Shoals extend to the southeast of Cape Point. Southwest of Diamond Shoals the bottom slopes gradually to maximum depths of 63 feet. Northeast of the Shoals, several sand ridges with depths of less than 60 ft. rise from depths as deep as 100 ft. The predominate bottom characteristic is sand.

2. Control and Shoreline

The origin of control is adequately covered in Part F of the Descriptive Report.

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The shoreline originates with reviewed photogrammetric manuscripts T-12440 and T-12442 of 1963.

3. Hydrography

A. Depths at crossings are generally in good agreement. Several soundings were not plotted because differences of from 4-7 feet were apparent between these soundings and the adjacent work. These differences can be attributed to changes in bottom during the survey.

B. The usual depth curves are adequately delineated. Dashed and brown curves have been added to define important submarine features.

C. The development of the bottom configuration and the investigation of least depths are considered adequate. Although the maximum line spacing as set forth in the project instructions was exceeded in several instances, notably in the vicinity of lat. $35^{\circ}12'$, long. $75^{\circ}30.5'$, it is deemed justifiable in this extremely dangerous area. In addition, the chart does not show soundings in this vicinity because of the changability of the bottom.

A portion of the work done in 1963 was plotted in red in the vicinity of Cape Point to fill in a holiday left by the 1964 work. The remaining portion of the 1963 work is considered superseded by the 1964 work and was not plotted.

4. Condition of the Survey

The field work, sounding records, smooth plotting and Descriptive Report are adequate and conform to the requirements of the Hydrographic Manual. The verifier, however, did not enter his time on the Form 946 as prescribed.

5. Junctions

Adequate junctions were affected with H-8809 (1963-64) on the north and with H-8810 (1964-65) on the northeast, east, and southeast.

Differences of up to 3-ft. in the junction between the present survey and H-9104 (1970) on the south are believed to be caused by a changing bottom over the six-year period between surveys. These differences necessitated a butt junction to be made, with soundings from the present survey being retained in the overlapping area. A few soundings from H-9104 were superseded as a result.

No contemporary survey junctions with the present survey on the west. However, present survey depths in that area are in general harmony with charted depths.

6. Comparison with Prior Surveys

- A. H-237 (1849-50), 1:400,000
 H-674 (1849), 1:200,000
 H-686 (1859), 1:200,000
 H-767 (1860), 1:500,000
H-1721 (1886), 1:200,000

These small scale surveys lack sufficient reliable information for a comparison of any cartographic value with the present survey.

- B. H-244 (1850), 1:20,000
 H-538 (1856), 1:40,000
H-1135 (1871-72), 1:20,000

A comparison between the prior and present surveys reveals major differences in the shoreline and bottom. The shoreline north of Cape Point has receded as much as 930 meters and accreted some 720 meters west of it. In some instances depths have deepened as much as 17 feet on the present survey and others have shoaled 21 feet. The shallow 4-5 foot sand ridges appearing on H-1135 (1871-72) are now 17-25 feet depths. These differences are attributed to natural changes in the bottom and together with differences in survey methods - leadline on the prior work versus depth recorder sounding on the present survey.

- C. H-1136 (1872), 1:40,000
H-2127 (1892), 1:40,000

The sparse soundings on these early reconnaissance surveys do not provide a satisfactory basis for comparison with the present survey.

- D. H-2092 (1891), 1:20,000
 H-2184 (1894), 1:20,000
H-2471 (1900), 1:40,000

A comparison between the prior and present depths reveals changes in the shoreline and bottom. The present survey shoreline north of Cape Point has receded as much as 500 meters since 1891, while accretion of as much as 740 meters has occurred west of it. In some areas depths have deepened as much as 24 feet, and in other areas depths have shoaled from 8 to 22 feet. A comparison with H-2184 (1894) indicates that a general smoothing of the bottom features is taking place (deepening of shoals and shoaling in the deeper depths). These changes are attributed to the natural shifting of sand and sediments due to current action and differences in survey methods, leadline on the prior work versus depth recorder sounding on the present survey.

The outer shoals (eastern portion of the present survey) appear to be much more stable than those nearer shore. Many features on H-2471 in this area appear very similar in depth and shape to those on the present survey.

E. H-4176 (1921), 1:5,000

This survey covers a very small portion of the present survey.. Comparison between the prior and present surveys reveals changes in the shoreline and bottom. The shoreline in the vicinity of lat. 35°15', long. 75° 31.2' has receded as much as 150 meters since 1921. The present depths are generally 1 to 6 feet deeper than the prior depths in some areas, while other areas are 1 to 6 feet shoaler. These differences are attributed to natural changes in the bottom.

F. H-8249 (1955), 1:20,000

This survey is unverified as of November 9, 1971. A comparison with the present survey indicates random changes have occurred over most of the common area.

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

G. WIRE-DRAG SURVEY H-8351 W.D. (1955) 1:40,000

Two detached areas on this wire drag investigation fall within the limits of the present survey. A 40-foot hang on a wreck shown on this wire-drag survey in lat. 35°10.24', long. 75°21.50' has been brought forward to the present survey. This hang was verified by a 52-foot sounding on the present survey which is a definite wreck trace on the graphic depth record.

Two sonar contacts of 61 feet and 64 feet on this wire-drag survey in the vicinity of lat. 35°09.50', long. 75°18.20' were also brought forward to the present survey as soundings. These contacts were not positively identified, but a wreck had been reported in the immediate vicinity. The possibility that a wreck exists in this area has not been disproved.

7. Comparison with Chart 1232 latest print date November 21, 1970

A. Hydrography

The charted hydrography originates with the previously discussed prior surveys and the boat sheets (Bp-52735-37) of H-8249 (unverified) which

require no further consideration, supplemented by the partial application of depths from the boat sheet and verified smooth sheet of the present survey.

Attention is directed to the following:

(1) The cleared by 36-foot wreck charted in lat. $35^{\circ}10.29'$, long. $75^{\circ}21.52''$ and the cleared by 52-foot wreck charted in lat. $35^{\circ}09.41'$, long. $75^{\circ}18.25'$ are from information shown on H-8351 W.D. (1955) and should be retained on the chart.

Except as noted above, the present survey is adequate to supersede the charted hydrography within the common area.

B. Aids to Navigation

The only floating aid to navigation located on the present survey is in substantial agreement with its charted position and adequately marks the feature intended.

The Diamond Shoal Light located on the present chart in lat. $35^{\circ}09.2'$, long. $75^{\circ}17.9'$ was charted subsequent to the date of the present survey from information published in Notice to Mariners 20 and 46 of 1966.

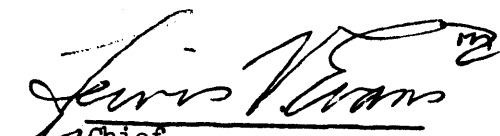
8. Compliance with Instruction

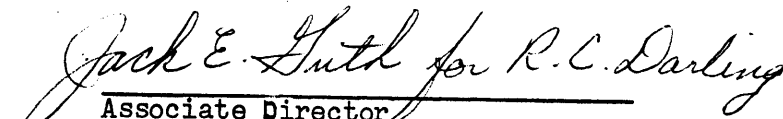
The survey adequately complies with the Project Instructions except in a minor way as noted in Part 3C of this review.

9. Additional Field Work

This is a good basic survey and no additional field work is recommended.

Examined and approved


 Chief
 Marine Chart Division


 Associate Director
 Office of Marine Surveys and Maps

Items for Future Presurvey Review

The bottom is considered adequately developed on the present survey. Significant changes of as much as 20 feet in some portions of the bottom were noticed since the prior surveys. The major changes are attributed to the changeable character of the area.

Position index lat. 350 long 0754
Bottom change 4
Use index 0
Resurvey cycle 50 yrs.

Position index lat. 350 long 0753
Bottom change 7
Use index 0
Resurvey cycle 50 yrs.

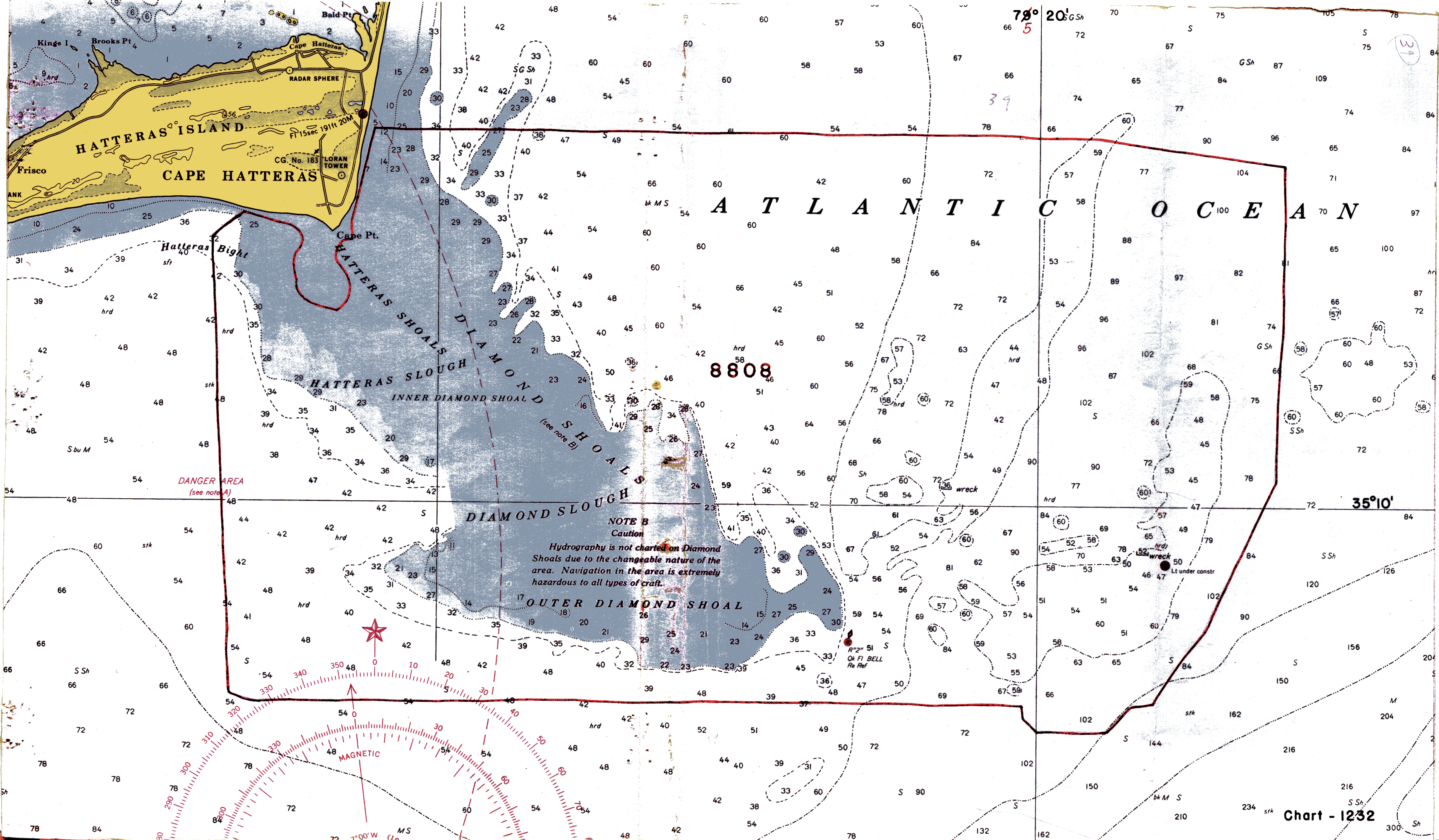
Position index lat. 350 long 0752
Bottom change 3
Use index 2
Resurvey cycle 50 yrs.

Position index lat. 351 long 0754
Bottom change 7
Use index 0
Resurvey cycle 50 yrs.

Position index lat. 351 long 0753
Bottom change 7
Use index 0
Resurvey cycle 50 yrs.

Position index lat. 351 long 0752
Bottom change 3
Use index 2
Resurvey cycle 50 yrs.

72° 20' 5



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DANGER AREA
(see note A)

NOTE B
Caution
Hydrography is not charted on Diamond Shoals due to the changeable nature of the area. Navigation in the area is extremely hazardous to all types of craft.

MAGNETIC

Chart - 1232

RECORD OF APPLICATION TO CHARTS

FILE WITH DESCRIPTIVE REPORT OF SURVEY NO. H-8808

INSTRUCTIONS

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

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

CHART	DATE	CARTOGRAPHER	REMARKS
1000	2/14/67	F. Pavlat	Exam. Full Part Before After Verification Review Inspection Signed Via Drawing No. <i>No corrections</i>
1232	3/21/67	O. Svendsen	Full Part Before After Verification Review Inspection Signed Via Drawing No. 27 <i>No corr (Examined for critical corrections only)</i>
1109	5-9-67	H. dearden Radde	Full Part Before After Verification Review Inspection Signed Via Drawing No. <i>32 Exam. thru chart 1232 drawing No 27</i> <i>No corr</i>
1110	6-8-67	J.T. Callahan	Full Part Before After Verification Review Inspection Signed Via Drawing No. 25 <i>NO CORRECT. applied thru drawing 1232 # 27</i>
1001	9-15-67	J. H. Muel	Full Part Before After Verification Review Inspection Signed Via Drawing No. <i>No corr, Exam thru 1109 Aug # 32</i>
1232	6-23-72	B. Fenwick	Full Part Before After Verification Review Inspection Signed Via Drawing No.
1000	7-19-73	John R. Bailey	Full Part Before After Verification Review Inspection Signed Via Drawing No. Applied thru Drawing 1232 # 31
1110	11-14-72	R.A. Lillis	Full Part Before After Verification Review Inspection Signed Via Drawing No. 31
1109	1-9-73 4/17/73	B. Fenwick	Full Part Before After Verification Review Inspection Signed Via Drawing No.
1000	7-19-73	J. Bailey	Full Part Before After Verification Review Inspection Signed Via Drawing No. <i>30 Fully Applied thru Drwg. 1109 # 34</i>
1001	5-7-74	R.A. Lillis	Fully applied after Verif. Review & Insp