9738

Diag. Cht. No. 1000-4

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. MI-80-1-78

Office No. H-9738

LOCALITY

State Virginia and North Carolina

General Locality Off False Cape

Locality Cape Henry to Currituck Beach

1978

CHIEF OF PARTY
Melvin J. Umbach

LIBRARY & ARCHIVES

DATE February 13, 1979

☆ U.S. GOV. PRINTING OFFICE: 1976—669-441

9738

Area 21
Chart
12200
13

NOAA FORM 77-28 (11-72)

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

HYDROGRAPHIC TITLE SHEET

REGISTER NO.

H-9738

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.

MI-80-1-78

State VIRGINIA AND NORTH CAROLINA

General locality ~~NORTH ATLANTIC OCEAN~~ OFF FALSE CAPE

Locality ~~BETWEEN~~ CAPE HENRY, ~~VIRGINIA AND~~ to CURRITUCK BEACH, ~~NORTH CAROLINA~~

Scale 1:80,000 Date of survey FEB 9 thru MAR 21, 1978

Instructions dated DECEMBER 8, 1977 Project No. OPR-D103-MI-78

Vessel NOAA SHIP MT MITCHELL S222 (VESNO 2220)

Chief of party CAPT MELVIN J. UMBACH, NOAA

Surveyed by SEE REMARKS

Soundings taken by echo sounder, ~~hand lead, pole~~ ECHO SOUNDER

Graphic record scaled by RW, FS, RK, PS

Graphic record checked by TB

Protracted by N/A Automated plot by ~~MT MITCHELL S222~~ CALCOMP ~~HYDROPLOT SYSTEM~~ 618 PLOTTER (MC)

Verification by N/A

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

REMARKS: LCDR G. MILLS, LT D. WALTZ, LTjg M. HENDERSON, ENS P. DAUGHERTY, ENS T. RULON, ENS W. PRINGLE, ENS M. MURPHY, ENS T. BAINBRIDGE

Appd. to Standards WJT 5-14-79

RWW 10/6/92

NOAA FORM 77-28 SUPERSEDES FORM C&GS-537.

☆ U.S. G.P.O. 1972-769-565/519 REG. #6

DESCRIPTIVE REPORT

TO

ACCOMPANY

HYDROGRAPHIC AND BATHYMETRIC SURVEY H-9738

MI-80-1-78

1:80,000 SCALE

OFFSHORE ATLANTIC OCEAN, VIRGINIA AND NORTH CAROLINA

FEBRUARY 9, 1978 to MARCH 21, 1978

NOAA SHIP MT MITCHELL S222

MELVIN J. UMBACH

CAPTAIN, NOAA

COMMANDING

TABLE OF CONTENTS

✓= Misc. items removed from the D.R. and filed in the cahier

A. PROJECT

This survey, MI-80-1-78 (H-9738), was conducted by the NOAA SHIP MT MITCHELL S222 as a portion of the Atlantic Seaboard Area Project (ASAP) OPR-D103 (516)-MI-78. "DELMARVANC" Phase, in accordance with Project Instructions dated 8 December 1977 and changes 1 through 5 dated 16 December 1977, 21 December 1977, 7 February 1978, 6 March 1978 and 9 March 1978, respectively.

B. AREA SURVEYED

This survey was conducted in the Atlantic Ocean Offshore between Cape Henry, Virginia and Currituck Beach, North Carolina, extending approximately from the 20 fathom curve to the 1300 fathom curve. Hydrographic surveying was used from the 20 to the 110 fathom curves with Bathymetric surveying from the 110 fathom curve to the limits of the survey. The limits of the survey are described by lines connecting the following points in a clockwise direction:

(1)	(2)	(3)	(4)	(5)	(6)
36°47'N 74°54'W	36°47'N 74°04'W	36°18'N 74°06'W	36°18'N 75°05'W	36°26'N 75°05'W	36°26'N 74°54'W

This survey was conducted between 9 February 1978 (JD 40) and 21 March 1978 (JD 80).

C. SOUNDING VESSEL

All soundings for this survey were obtained by the NOAA SHIP MT MITCHELL S222 (Vessel Number 2220 for all survey records) utilizing a fully automated hydroplot system.

D. SOUNDING EQUIPMENT AND CORRECTIONS TO ECHO SOUNDINGS

The following equipment was used to obtain soundings for this survey:

Equipment:	Serial No:
Ross Model 5000 Fineline Depth Recorder	1050
Ross Model 4000 Transceiver	1050
Ross Digitizer	1050
Raytheon Universal Graphic Recorder	170
EDO Model 248-1 Transceiver	219
Digitrak Model 261C Digitizer	202

Generally, in depths less than 200 fathoms soundings were obtained by the Ross Fineline Recorder using the Skeg Transducer (antenna distance 32.0 meters). In depths greater than 200 fathoms the Raytheon UGR was used on the Sound Room No. 2 transducer (antenna distance 0.0 meters) the Sound Room No. 1 transducer (antenna distance 0.0), and the skeg trans-

ducer (antenna distance 32.0 meters). The changes were noted in the sounding volume and on the abstract of antenna distances which is included in this report. The digitizing features of both units were used whenever possible; however, during periods of rough seas, the digitizer on the UGR would stop tracking the signal. During these periods soundings were scaled on line and entered manually on the hydroplot controller.

All graphic sounding records were scanned by trained Survey Department personnel and checked by the Officer in Charge. Peaks and deeps considered significant that occurred between soundings were inserted, digitizing errors were corrected, and the effects of the seas were meaned and corrected on the corrector tapes. Scale checks were made on the UGR to ensure proper digitizing. Phase calibration checks on the Ross Fathometer were made at frequent intervals to ensure scale accuracy. Any necessary adjustments were made and noted on the fathogram. Any departure of the trace from the calibration due to phase differences were corrected during the scanning process by survey personnel.

A 2.3 fathom draft correction was used on line and during smooth plotting. Draft changes and the effects of settlement and squat were very small for the depths of this survey and were entered as zero on the TC/TI tape. A printout of this tape accompanies the records along with a copy of settlement and squat versus engine RPM. These corrections were determined on 25 July 1977 on Lake Huron in St. Ignace, Michigan. Data plotted on the smooth field sheets only include the 2.3 fathom draft correction.

Velocity corrections were determined from the salinity and temperature data of four Nansen Casts taken at the following locations:

Station:	Date:	Latitude:	Longitude:
Z1	12 February 1978 (JD 43)	36°35.7'N	74°51.0'W
Z2	12 February 1978 (JD 43)	36°36.0'N	74°41.0'W
Z3	13 February 1978 (JD 44)	36°32.4'N	73°56.2'W
Z4	15 February 1978 (JD 46)	36°30.2'N	74°44.5'W

For depths less than 180 fathoms information from casts Z1, Z2, and Z4 were averaged because they were in good agreement. Data obtained from Z2 and Z3 for deep water were also in good agreement and so were averaged to determine corrections for depths greater that 180 fathoms. These corrections were combined on to one velocity corrector tape. A printout of this tape plus other tables and curves used in its production are included in this report.

This survey was conducted using predicted tides based on daily predictions at Hampton Roads (Sewells Point), Virginia from the 1978 tide tables. Prezoned tide correctors were supplied by the Rockville Tides Branch in change number 3 dated 7 February 1978. Tide correctors were applied to

on line data as follows: 3 hours and no minutes were subtracted from the high and low water times; the high and low water heights were multiplied by a factor of 1.18. A copy of the request for the actual tides in the area surveyed is included with this report.

On February 8, 1978 (JD 39) a vertical cast was taken for the Ross fathometer in calm seas off Little Creek, Virginia in Chesapeake Bay. Velocity corrections were determined from a Nansen Cast taken at the same time and place. The corrections from the vertical cast were small (about 0.2 fathom) for the survey depths and were considered to be zero.

E. HYDROGRAPHIC SHEETS

This survey was plotted on two complot roll plotter sheets by the NOAA SHIP MT MITCHELL Hydroplot System. The skew used was 0,21,60, for both sheets. The survey was plotted off line using an electronic corrector tape, a velocity corrector tape, and the master tape which was generated on line. Soundings on the field sheets are corrected for predicted tides, draft, initial and digitizing errors, and sound velocity. They are not corrected for settlement and squat and instrument error is negligible. The final smooth sheet will be plotted at the Atlantic Marine Center, Norfolk, Virginia. The following tapes will be forwarded with other records to the Atlantic Marine Center:

Master Range-Range Data Tapes
Electronic Corrector Tapes
Parameter Tapes
ASC II Signal Tape
Transducer Corrector/Table Indicating Tape
Velocity Correction Tape

F. CONTROL STATIONS

Control was obtained by 2 Hydrotrac shore stations at the following positions:

Signal No:	Name:	Latitude:	Longitude:
100	CERC #46 (Bodie Island)	35°50'42.753"N	75°33'48.578"W
200	GRAVITY (Sandbridge)	36°40'31.453"N	75°54'56.471"W

Both shore stations were located by personnel from the Atlantic Marine Center, Operations Division and were maintained by ship's personnel.

G. HYDROGRAPHIC POSITION CONTROL

An Odom Offshore Hydrotrac System, operating at a frequency of 1618.65 Khz in the Range-Range mode, provided the position control for this survey.

The following Hydrotrac equipment was used:

	Type:	Serial No:
Ship:	Master Drive Unit Model 700	122
	Receiver Model 700	328
	Coupler	135
	Interface	102
	Linear Amplifier 74-87	537
	Sawtooth Recorder	8502
Station 100:	Slave Drive Unit Model 701	216
	Linear Amplifier	539
	Coupler	131
	Sola Power Supply	752
Station 200:	Slave Drive Unit Model 701	214
	Linear Amplifier	536
	Coupler	133
	Sola Power Supply	754

Hydrotrac calibration was accomplished using three point sextant fixes and comparing observed Hydrotrac range values with computed values obtained from the Hydroplot Calibration Program RK 561. A check fix was also used on each calibration. Only those fixes with an inverse distance of less than 5.0 meters were used on these calibrations.

The calibration area was located 3 miles off Virginia Beach, Virginia. Calibrationfixes varied by less than 0.1 lane during the entire project. At the beginning of each trip the results of several calibration fixes were meaned and these corrections were applied to all positions during each trip. Several times visibility conditions precluded 3 point sextant fixes, and the lane count was established by comparing Hydrotrac values with ranges observed from 2 Del Norte Stations at the following locations:

Signal No:	Stations:	Latitude:	Longitude:	Ser.#:	Type:
210	Dolphin	36°49'55.972"N	75°58'13.745"W	1134	74
240	Cape Henry Lighthouse	36°55'34.335"N	76°00'27.216"W	220	72

Initially, the ships DMU Serial Number was 395 and the Master (Code 78) was Serial Number 1066. These were replaced on JD 55 at 1610 GMT due to water in the Master. The new units' Serial Numbers were DMU-190, Master (Code 76) - 185.

Each Master/DMU pair was calibrated against each remote over a measured

baseline on JD37 (February 6). In addition, the Del Norte system was calibrated using 3 point sextant fixes with a check angle. Correctors determined in this manner varied from -1 to +3 meters.

On JD 40 a buoy was deployed by the ship in order to check the whole lane count in the working area; however, upon return to the site on JD 47 the buoy was missing and therefore not used.

An abstract of all calibration data is included with the records accompanying the survey. The lane count was constantly monitored by trained Survey Department personnel by comparing the Hydrotrac readout with a running count on the sawtooth recorder. No lane jumps occurred while working on this survey. An abstract of the electronic correctors used is included with this report.

H. SHORELINE

There was no shoreline within the limits of this survey.

I. CROSSLINES

Crosslines were run at least 45° to the main scheme sounding lines. Crossline mileage was about 23.6% of the deep main scheme lines and 10% of the shoal main scheme lines. There was excellent agreement between crosslines and main scheme lines with only a small variation in areas of steep slope.

J. JUNCTIONS See Verifier's Report

This survey junctions excellently with H-9677 (MI-80-1-77) to the North and H-9739 (MI-80-2-78) to the south. Contours from this survey continue smoothly to both H-9677 and H-9739.

K. COMPARISON WITH PRIOR SURVEYS See Verifier's Report

Two prior surveys were conducted within the area of this survey H-1721 (1886) and H-5995 (1935). The shoaler depths of H-1721 (20-30 fathoms) agree fairly well with the present survey. However, most of the prior survey soundings from H-1721 deeper than 30 fathoms indicate depths greater than those of the present survey. Likewise, the soundings from H-5995 agree fairly well with this survey on the continental shelf but show discrepancies in the depths greater than 100 fathoms (again generally deeper than the present survey). The probable cause of these disagreements is the increased accuracy of the present electronic positioning equipment and sounding apparatus.

There was one presurvey review item in the survey area. Presurvey Review Item No. 7 is listed as a 17 fathom shoaling reported by the Greek Ship TETI N. at Latitude 36°24'N and Longitude 74°53.5'W. Source in Chart Letter 607 of 1970.

Sounding lines spaced 200 meters apart were used to investigate the area. No evidence of shoaling was found and it is recommended that it be taken from the chart. Concur

L. COMPARISON WITH THE CHART See Verifier's Report

Comparison was made with Chart Number 12200 (1:416,744 scale) 28th Edition (April 3, 1976). Most soundings were in fair agreement on the shelf, generally within 2 fathoms. One prominent discrepancy is a charted 22 fathoms at latitude 36°29.5'N and longitude 74°49.5'W. This survey with 400 meeter line spacing shows a depth of 41 fathoms with no indication of shoaling. In depths greater than 100 fathoms discrepancies ran from 5 to 100 fathoms. As previously mentioned the probable causes of these disagreements is the increased accuracy of the present positioning and sounding equipment. Disregard 22 fms

M. ADEQUACY OF THE SURVEY

This survey is complete and adequate to supersede all prior work for charting this area.

N. AIDS TO NAVIGATION

There were no aids to navigation within the limits of the survey.

O. STATISTICS

Linear Nautical Miles of Main Scheme Hydro	1774.5
Linear Nautical Miles of Crosslines	315.5
Linear Nautical Miles of Development	148.5
Total Linear Nautical Miles of Hydro	2238.5
Total Miscellaneous Miles	789.5
Total Miles	3028.0
Square Miles of Hydrography	1170.0
Total Number of Positions	1587.0
Nansen Casts	4
Bottom Smaples	20

P. MISCELLANEOUS

Some development lines were run in the bathymetric surveying area to better define bottom contours.

Q. RECOMMENDATIONS

None

R. AUTOMATED DATA PROCESSING

The following Hydroplot computer programs were used to complete the processing of the survey:

	Program Name:	Version Date:
RK 111	Range-Range Real Time	01-30-76
RK 201	Grid, Signal, and Lattice Plot	04-18-75
RK 211	Range-Range Non-Real Time Plot	01-15-76
PM 360	Electronic Tape Abstract	02-02-76
AM 500	Predicted Tide Generator	11-10-72
RK 530	Velocity Correction Computations	05-10-76
RK 561	H/R Geodetic Calibration	02-19-75
RK 602	Extended Line Oriented Edition	05-21-75

S. REFERENCE TO REPORTS

None

Respectfully Submitted:

Terri L. Bainbridge

Terri L. Bainbridge
Ensign, NOAA

APPENDIX 2

FIELD TIDE NOTE

FIELD TIDE NOTE

Field tide reduction of soundings was based on predicted tides from Hampton Roads (Sewells Pt), Virginia and were interpolated by a PDP8/E computer utilizing AM 500. All times of both predicted and recorded tides are GMT.

Two Tide Gages were installed at two locations in the project area. Location and period of operation is as follows:

Site:	Location:	Period:
Chesapeake Light Tower (260-0000)	36°54.3'N 75°42.8'W	1976 to present
Duck Pier, (CERC), NC (865-1370)	36°10.8'N 75°45.2'W	January 23, 1978 to present

Chesapeake Light Tower

A bubbler gage was installed and began operation during 1976 field season. At the beginning of the 1978 field season, the gage was serviced, but no levels were run in accordance with verbal orders from Tides Branch, Rockville. The tide observer was contacted every 2 weeks and the gage reportedly worked well during the entire survey period.

Duck Pier (CERC), NC

An ADR gage was installed and began operation January 23, 1978. The staff was installed and leveled on January 23, 1978. The observer was contacted every two weeks and the gage reportedly operated well during the entire survey period.

The Sandbridge tide gage was not installed for this sheet as per verbal instructions from Tides Branch, Rockville.

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SURVEY
NOAA SHIP MT MITCHELL S222
439 West York Street
Norfolk, Virginia 23510

Date : March 21, 1978

Reply to Attn. of:

To : Director, National Ocean Survey (Attn: C331)

From : Harold L. Mills
for Commanding Officer, NOAA SHIP MT MITCHELL S222

Subject: Tidal Data For Survey H-9738

It is requested that verified hourly heights of tides (using Greenwich Mean Time) from the tide gages listed below be forwarded to the Processing Division (CAM 3), Atlantic Marine Center, Norfolk, Virginia 23510.

Gage:	Latitude:	Longitude:
Chesapeake Light Tower (260-0000)	36°54.3'N	75°42.8'W
Duck Pier, CERC, NC (865-1370)	36°10.8'N	75°45.2'W

It is requested that the time and height correctors for each gage be zoned as per Project Instructions for the area described within the following corner points:

(1)	(2)	(3)	(4)	(5)	(6)
36°47'N 74°54'W	36°47'N 74°38'W	36°18'N 74°48'W	36°18'N 75°05'W	36°25'N 75°05'W	36°25'N 74°54'W

This information is requested for the following periods:

February 9, 1978 (JD 40) - March 21, 1978 (JD 80).

APPENDIX 4

ABSTRACT OF CORRECTIONS TO ECHO SOUNDINGS

SETTLEMENT AND SQUAT

MT MITCHELL 1977 Field Season

The settlement and squat test for the MT MITCHELL (S222) was conducted July 25, 1977 on Lake Huron, approximately one-half mile off the Coast Guard pier at St. Ignace, Michigan, using a Zeiss Ni-2 Level (S/N 142936), positioned at the end of the pier. Wave height was one foot and the wind was from 000° at 14 knots. To determine possible water level changes during the test, the height of water on the lee side of the pier was measured before, during, and after the level sightings; no change was observed.

A temporary buoy with a scope of 1.05 was deployed in 105 feet of water one-half mile from the end of the pier, and a series of readings was taken starting and ending no more than a ship's length from the buoy at idle, half, and standard speeds as the ship passed the buoy. Two passes, one port and one starboard, were made perpendicular to the pier at each speed on headings of 240° and 060°, respectively. An initial reading was taken at the beginning of the test with the ship dead in the water alongside the buoy. A portable tide staff (graduated in tenths of feet) was positioned on the center of the fantail cargo hatch cover located amidships to allow a clear line of sight to the onshore observer. The displacement of the staff from the skeg transducer was approximately 3 feet aft. Since all hydrography in Lake Huron was to be recorded using this transducer, the settlement and squat correctors were only determined at one location.

A draft reading of 14.0 feet was taken before the test. The ship was carrying four launches - two Pacific Plastics launches in davits 3 and 4 and two Jensen launches in davits 5 and 6. Settlement and squat was run using both engines and various pitch and rpm combinations as determined from a speed curve established May 1977 offshore Cape Henry, Virginia. The ship carried a full load of fuel and no fuel was transferred during the test.

Included is an abstract of the data obtained, suggested correctors versus ship speed, the graph of ship speed versus settlement and squat correctors, the "C" shot determination of instrument error, and the ship's speed curve.

Respectfully Submitted,

Virginia E. Newell

Virginia E. Newell
LT(jg), NOAA

ORIGINAL

SETTLEMENT AND SQUAT CORRECTORS

July 25, 1977 - Lake Huron

Speed (kts)	Correction (ft)
1	0
2	0
3	0
4	0
5	0.1
6	0.1
7	0.1
8	0.1
9	0.2
10	0.2
11	0.2
12	0.2
13	0.3

Survey No. M1-80-1-78
OPR No. D103-M1-78
L.L. No. SHIPS (FMS)

and echo sounder comparisons

Echo Sounder No. Ross 5000 #1050
Vessel: NOAA ship Mt. Mitchell UESNO 2220

Julian Day	Date (1978)	L.L. Sndg. FATHOMS	L.L. Corr. FATHOMS	L.L. Depth FATHOMS	Echo Sndg. FATHOMS	Echo Sndg. Corr. FATHOMS	Echo Depth * FATHOMS	INSTRUMENT CORRECTION FATHOMS	AVERAGE CORRECT FATHOMS
39	8 Feb								
2200GMT	PORT 1	6.6	+.01	6.61	2.3	3.94	6.24	+.37	
	2	6.6	+.01	6.61	2.3	3.94	6.24	+.37	
	3	6.5	+.01	6.51	2.3	3.94	6.24	+.27	
	4	6.4	+.01	6.41	2.3	3.94	6.24	+.17	
	5	6.4	+.01	6.41	2.3	3.94	6.24	+.17	
									+.27
	STARBOARD 1	6.4	+.01	6.41	2.3	3.94	6.24	+.17	
	2	6.38	+.01	6.39	2.3	3.94	6.24	+.15	
	3	6.25	+.01	6.26	2.3	3.94	6.24	+.02	
	4	6.3	+.01	6.31	2.2	3.94	6.14	+.17	
	5	6.3	+.01	6.31	2.2	3.94	6.14	+.17	
									+.136
					AVERAGE OF PORT & STARBOARD			—	+.203

DRAFT AFT = 14.0 ft = 2.33 fms
DISTANCE from rail to transducer = 3.95 Fms.
VELOCITY CORRECTION = −0.01 fm

Leadline correction measured 8 February 1978 after cast.

At 6 fathoms steel tape = 6.01 fms
At 7 fathoms steel tape = 7.00 fms
∴ Leadline correction = +0.01 fms

Computed by: Mem
Verified by: JBM

* Sdg is apparently referred to Ship's draft.

VERTICAL CAST - LITTLE CREEK, VIRGINIA

8 FEBRUARY 1970 - JD 39

PORT SIDE

223141	00023	00002	097766	022673	006	#1
223211	00023	00003	097792	022651	006	REJECT
223243	00023	00004	097780	022646	006	#2
223300	00023	00005	097740	022691	006	#3
223319	00023	00006	097735	022613	006	#4
223341	00023	00007	097790	022684	006	#5
223429	00023	00008	097790	022692	006	STBD #1
223447	00022	00009	097755	022630	006	#2
223505	00023	00010	097771	022648	006	#3
223526	00022	00011	097768	022643	006	#4
223544	00005	00012	097781	022641	006	#5

(Digital depth from digitizer at 2.2 just before D.P.)

VERTICAL CAST

JD 39

MI-80-1-78

TEX

PORT SIDE

1

REJECT

#2

3

4/5

STBD SIDE

#1

#1

3

4/5

PHASE
CHECK
0-50 FMS

VESSEL =2220

DATE =FEB12 & 15

TIME =1730

LATITUDE = 036/02/57.00

LONGITUDE = 074/48/00.00

TYPE OF OBSERVATION =AVG Z1 + Z4 &Z2

CAST-DEPTH (SURFACE) (M)	TEMP (DEG C)	SALINITY (0/00)	SND VEL (M/SEC)
0000.0	06.22	34.12	1474.80
0010.0	06.20	34.12	1474.89
0020.0	06.23	34.12	1475.17
0030.0	06.30	34.14	1475.64
0050.0	08.48	34.63	1485.09
0075.0	09.90	34.96	1491.20
0100.0	09.60	34.90	1490.43
0150.0	09.95	34.99	1492.65
0200.0	10.32	35.12	1494.97
0300.0	10.18	35.00	1495.95

VELOCITY CORRECTION TABLE OPTIONS:
0) NO TABLE
1) IN FEET
2) IN FATHOMS
3) IN METERS
2
DRAFT = 2.3

ACTUAL DEPTH (SURFACE) MINUS VELOCITY CORRECTION (FM)	VELOCITY CORRECTION (FM)
0002.73	0000.00
0008.15	0000.05
0013.58	0000.09
0021.71	0000.16
0033.83	0000.35
0047.23	0000.61
0067.35	0001.00
0094.14	0001.55
0134.26	0002.44
0187.71	0003.67

VESSEL =2220

DATE =FEB 12 &13 1978

TIME =1500

LATITUDE = 036/33/00.00

LONGITUDE = 074/18/00.00

TYPE OF OBSERVATION =AVG OF Z2 &Z3

CAST-DEPTH (SURFACE) (M)	TEMP (DEG C)	SALINITY (0/00)	SND VEL (M/SEC)
0000.0	16.26	36.06	1512.60
0010.0	14.70	35.76	1507.54
0020.0	13.99	35.64	1505.27
0030.0	15.24	36.33	1510.27
0050.0	13.70	35.78	1504.98
0075.0	13.44	35.71	1504.45
0100.0	12.77	35.65	1502.55
0200.0	10.94	35.30	1497.42
0300.0	10.06	35.14	1495.70
0378.0	08.33	35.11	1490.52
0473.0	06.61	35.08	1485.38
0568.0	05.68	35.06	1483.21
0758.0	04.84	35.05	1482.91
0949.0	04.48	35.03	1484.57
1139.0	04.12	35.00	1486.20
1426.0	03.89	34.98	1490.01
1909.0	03.54	34.98	1496.63
2391.0	03.08	34.96	1502.91

VELOCITY CORRECTION TABLE OPTIONS:
0) NO TABLE
1) IN FEET
2) IN FATHOMS
3) IN METERS
2
DRAFT = 2.3

ACTUAL DEPTH (SURFACE) MINUS VELOCITY CORRECTION (FM)	VELOCITY CORRECTION (FM)
0002.72	0000.01
0008.02	0000.18
0013.33	0000.34
0021.27	0000.60
0033.22	0000.96
0046.50	0001.34
0079.76	0002.27
0133.15	0003.55
0180.73	0004.64
0227.14	0005.53
0278.30	0006.32
0355.14	0007.39
0457.89	0008.81
0560.53	0010.34
0688.88	0012.40
0895.52	0016.29
1153.29	0022.35
1409.67	0029.54

(Let 1 inch equal 4 fathoms for deep water and each equal 0.4 fathom for shoal.)

CORRECTIONS IN DEEP FATHOMS

NOAA FORM 76-21 (10-72) U.S. DEPARTMENT OF COMMERCE NOAA NATIONAL OCEAN SURVEY

VELOCITY CORRECTIONS

Ship NOAA SHIP MT MITCHELL S222

Melvin J. Umbach, Capt. NOAA Corps Comdg.

These corrections are to be used between February 9 1978 and March 21 1978 in the locality between Cape Henry, Virginia and Currituck Beach, North Carolina for hydrographic surveys Nos. MI-80-1-78 (H-9738)

DEPTHS IN FATHOMS

(For deep water add to these figures)

DEEP

DEEP

Shoal

10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190

.2	.4	.6	.8	1.0	1.2	1.4	1.6	1.8	2.0	2.2	2.4	2.6
	4.0	6.0	8.0	10.0	12.0	14.0	16.0	18.0	20.0	22.0	24.0	26.0
	14.0	16.0	18.0	20.0	22.0	24.0	26.0	28.0	30.0			

☆ U.S. GOV. PRINTING OFFICE: 1975—668-

July 5, 1978

U.S. DEPARTMENT OF COMMERCE
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): 865-1371 Duck FRF Pier, N.C.

Period: February 9-March 21, 1978

HYDROGRAPHIC SHEET: H-9738

OPR: 516

Locality: Offshore, east of Duck, North Carolina

Plane of reference (mean ~~lower~~ low water): 20.33 ft.

Height of Mean High Water above Plane of Reference is 3.3 ft.

Remarks: Recommended zoning:

Apply -20 minute time correction and range ratio x0.97.

Don M Spellman

Chief, Tides Branch

H- 9738

VELOCITY CORRECTOR TAPE MI-80-1-78

```
000160 0 0000 0001 001 222000 080178
000304 0 0002
000418 0 0004
000523 0 0006
000622 0 0008
000721 0 0010
000820 0 0012
000919 0 0014
001010 0 0016
001102 0 0018
001350 0 0020
001720 0 0030
001820 0 0040
002250 0 0050
002840 0 0060
003600 0 0070
004350 0 0080
005060 0 0090
005750 0 0100
006340 0 0110
006910 0 0120
007500 0 0130
008030 0 0140
008550 0 0150
009020 0 0160
009450 0 0170
009850 0 0180
010290 0 0190
010700 0 0200
011120 0 0210
011570 0 0220
011980 0 0230
012370 0 0240
012730 0 0250
013080 0 0260
013400 0 0270
013700 0 0280
014000 0 0290
014300 0 0300
014590 0 0310
014920 0 0320
999999 0 0330
```

SIGNAL NAMES LIST
MI-80-1-78 H-9738

100	CERC #46 COE (BODIE ISLAND HYDROTRAC)	AMC OPS DIV
200	GRAVITY (SANDBRIDGE HYDROTRAC)	AMC OPS DIV
210	DOLPHIN (RUDEE INLET DELNORTE)	AMC OPS DIV
215	VIRGINIA BEACH MUNICIPAL WATER TANK	360754 #1054
225	CAVALIER HOTEL CUPOLA	360754 #1045
230	LOOKOUT TOWER	AMC OPS DIV
240	CAPE HENRY LIGHTHOUSE (NEW) DELNORTE	3607611 #1009

SIGNAL TAPE PRINTOUT
MI-80-1-78 H-9738

100	4	35	50	42753	075	33	48578	250	0000	161865
200	4	36	40	31453	075	54	56471	250	0000	161865
210	4	36	49	55972	075	58	13745	250	0000	000000
215	4	36	50	31980	075	59	23523	139	0000	000000
225	4	36	52	08381	075	59	02012	139	0000	000000
230	4	36	53	35796	075	59	18187	139	0000	000000
240	4	36	55	34335	076	00	27216	250	0000	000000

APPROVAL SHEET

MI-80-1-78

H-9738

The field work on this Hydrographic Survey was under my daily supervision. The boat sheet and records have been reviewed and approved by me.

Melvin J. Umbach
Captain, NOAA
Commanding

NOAA FORM 76–155
(11–72)

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

GEOGRAPHIC NAMES

SURVEY NUMBER

H-9738

Name on Survey	A ON CHART NO.	B ON PREVIOUS SURVEY NO.	C ON U.S. QUADRANGLE MAPS	D FROM LOCAL INFORMATION	E ON LOCAL MAPS	F P.O. GUIDE OR MAP	G RAND MCNALLY ATLAS	H U.S. LIGHT LIST	K	
CAPE HENRY (TITLE)										1
CURRITUCK BEACH (TITLE)										2
FALSE CAPE (TITLE)										3
										4
										5
										6
										7
										8
										9
										10
										11
										12
										13
										14
										15
										16
										17
						APPROVED				18
						Chas. E. Harrington				19
						CHIEF GEOGRAPHER – C3X5				20
						19 MARCH 1979				21
										22
										23
										24
										25

NOAA FORM 76–155 SUPERSEDES C&GS 197

NOAA FORM 77-27 (5-77) | U. S. DEPARTMENT OF COMMERCE NOAA | HYDROGRAPHIC SURVEY NUMBER

HYDROGRAPHIC SURVEY STATISTICS

H-9738

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

RECORD DESCRIPTION	AMOUNT	RECORD DESCRIPTION	AMOUNT
SMOOTH SHEET	1	BOAT SHEETS & PRELIMINARY OVERLAYS	2
DESCRIPTIVE REPORT	1	SMOOTH OVERLAYS: POS. ARC, EXCESS (1-pos. 1-excess)	2

DESCRIPTION	DEPTH RECORDS	HORIZ. CONT. RECORDS	PRINTOUTS	TAPE ROLLS	PUNCHED CARDS	ABSTRACTS/ SOURCE DOCUMENTS
ENVELOPES	≡					1-misc. data
CAHIERS			1 (with fathos)			
VOLUMES	2					
BOXES						

T-SHEET PRINTS (*List*)

SPECIAL REPORTS (*List*)

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			1627
POSITIONS CHECKED	51	45	
POSITIONS REVISED		10	
SOUNDINGS REVISED		17	
SOUNDINGS ERRONEOUSLY SPACED		0	
SIGNALS (CONTROL) ERRONEOUSLY PLOTTED		0	
	TIME – HOURS		
CRITIQUE OF FIELD DATA PACKAGE (PRE-VERIFICATION)			
VERIFICATION OF CONTROL		3	
VERIFICATION OF POSITIONS		16	
VERIFICATION OF SOUNDINGS		65	
COMPILATION OF SMOOTH SHEET		10	
APPLICATION OF TOPOGRAPHY		0	
APPLICATION OF PHOTOBATHYMETRY		0	
JUNCTIONS		2	
COMPARISON WITH PRIOR SURVEYS & CHARTS		5	
VERIFIER'S REPORT		5	
OTHER			
TOTALS		106	106

Pre-Verification by J. B. Wilson, S. Kelly	*Beginning Date* 05/03/78	*Ending Date* 05/11/78
Verification by R. Keene, J. S. Bradford	*Beginning Date* 10/13/78	*Ending Date* 01/29/79
Verification Check by G. Irelethen	*Time (Hours)* 2	*Date* 01/30/79
Marine Center Inspection by Hydrographic Inspection Team (AMC)	*Time (Hours)* 10	*Date* 01/31/79
Quality Control Inspection by K. W. Wellman	*Time (Hours)* 32	*Date* 3-16-79
Requirements Evaluation by [illegible] Reviews 16 hr 3/29/79	*Time (Hours)* 1	*Date* 4/5/79

REGISTRY 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 REQUIRED_____ INITIALS_____

REMARKS:

REGISTRY NO. H-9738

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 REQUIRED_____ INITIALS_____

REMARKS:

ATLANTIC MARINE CENTER
VERIFIER'S REPORT

REGISTRY NO. H-9738 FIELD NO. MI-80-1-78

Atlantic Ocean, Virginia/North Carolina, Continental Slope
Southeast of Chesapeake Bay Entrance

SURVEYED: February 9 through March 21, 1978

SCALE: 1:80,000 PROJECT NO.: OPR-D103-MI-78

SOUNDINGS: Ross Fineline Recorder Model 5,000 and Raytheon Universal Graphic Recorder

CONTROL: Odom Offshore Hyrotrac System (Range-Range)

Chief of Party ..... Melvin J. Umbach
Surveyed by ..... G. Mills
..... D. Waltz
..... M. Henderson
..... P. Daugherty
..... T. Rudon
..... W. Pringle
..... M. Murphy
..... T. Bainbridge
Automated Plot by ..... CALCOMP-618 Plotter (AMC)
Verified and Inked by ..... J. S. Bradford
January 22, 1979

1. Introduction

No unusual problems were encountered during verification. The red changes in the Descriptive Report were made by the verifier. The projection parameters have been revised and inserted in the Descriptive Report.

The correction for antenna distance has been applied where necessary.

2. Control and Shoreline

a. The control is adequately described in Sections F. and G. of the Descriptive Report.

b. There is no shoreline within the survey limits.

3. Hydrography

a. Depths at crossings are in good agreement.

b. The standard depth curves are adequately delineated.

c. The development of the bottom configuration and investigation of the least depths are considered adequate with the following exceptions:

(1) A reduction of line spacing in the area of latitude 36°24.0', longitude 74°40.0' would have been beneficial for better delineation of the bathymetric contours.

(2) Three charted depths, that disagree with the present survey as much as 166 fathoms, were not investigated (see Section 6).

4. Condition of Survey

The sounding records, field sheets and accompanying overlays, hydrographic records, and the Descriptive Report are adequate and conform to the requirements of the Hydrographic Manual.

5. Junctions

H-9677	(1977)	1:80,000	to the north
H-9739	(1978)	1:80,000	to the south

Adequate junctions were effected with the two above mentioned surveys. (See Q.C. Report-item 2)

No contemporary survey junctions with the present survey to the east or west; however, present depths are in general agreement with charted depths.

6. Comparison With Prior Surveys

a. H-1721	(1886)	1:200,000	
H-5995	(1935-37)	1:120,000	with Ad. Wk.

These most recent prior surveys, taken together, cover the area common to the present survey. Comparison between the above prior surveys H-5995 and the present survey ~~shows the prior surveys to be generally deeper.~~ reveals .... (See Q.C. Report-item 3)

The three most noticeable differences are:

Prior Survey	Depth	Location	H-9738 Depth
H-1721	191 fathoms	LAT 36°18.7' LONG 74°47.0'	112-113 ~~79~~ fathoms
H-5995	894 fathoms	LAT 36°31.6' LONG 74°28.5'	1060 fathoms
H-5995	1018 fathoms	LAT 36°44.0' LONG 74°24.2'	981 fathoms

~~These depths and other depths east of the 100 fathom curve are from 60 to 150 fathoms deeper.~~ Irregular bottom configuration, slope of the Continental Shelf, and improved equipment and accuracy of survey techniques are probable causes for the differences.

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

b. (See Q.C. Report - item 6)

7. Comparison With Chart #12200 (~~28~~ 29th Edition, April ~~3~~ 9, 197~~6~~ 7)

(See Q.C. Report - item 4)

a. Hydrography

The charted hydrography originates with previously discussed prior surveys and supplemented with depths that are believed to be taken from a U. S. Navy Survey.

The present survey is adequate to supersede the charted hydrography except for the following:

(1) Submerged wreck located at latitude 36°30.0', longitude 74°47.0' was not investigated and should be retained as charted.

(2) Submerged wreck located at latitude 36°43.8', longitude 74°45.0' was not investigated and should be retained as charted.

(3) Rep 17 fathoms reported by the Greek Ship TET1 N. at latitude 36°24.0', longitude 74°53.5'. This area was investigated and no evidence of shoaling was found. It is recommended that this feature be deleted from the chart.

b. Aids to Navigation

There are no aids to navigation within limits of the present survey.

8. Compliance With Instructions

The survey adequately complies with the Project Instructions.

9. Additional Field Work

This survey is considered to be a good basic survey and no additional work is recommended.

APPROVAL SHEET
FOR
SURVEY H-9738

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: 3/1/79

Signed: [signature]

Title: Chief, Verification Branch

Inspection Report
H-9738

Any verification errors regarding procedures and presentation of survey data detected during inspection by the Hydrographic Inspection Team have been corrected before submission for administrative approval. HIT comments regarding quality of field work, compliance with instructions, and adequacy of the survey have been incorporated within the Verifier's Report.

Examined and Approved:
Hydrographic Inspection Team
Date: January 31, 1979

Robert A. Trauschke, CDR, NOAA
Chief, Processing Division

absent
Carl W. Fisher, CDR, NOAA
Chief, Operations Division

R. D. Sanocki
Technical Assistant
Processing Division

C. Douglas Mason, LT, NOAA
Chief, Electronic Data
Processing Branch

Harry R. Smith
Team Leader
Verification Branch

Approved/Forwarded

Robert C. Munson
RADM, NOAA
Director, Atlantic Marine
Center

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

OA/C352:KWW

March 16, 1979

TO: A. J. Patrick
Chief, Hydrographic Surveys Division

THRU: Chief, Quality Control Branch

FROM: K. W. Wellman
Quality Evaluator

SUBJECT: Quality Control Report for H-9738 (1978), Virginia and North Carolina, Off False Cape, Cape Henry to Currituck Beach

A quality control inspection of H-9738 was accomplished to monitor the survey for obvious deficiencies with respect to data acquisition, delineation of the bottom, determination of least depths and navigation hazards, junctions, decisions and actions by the verifier, and cartographic presentation of data.

In general, the present survey was found to conform to National Ocean Survey standards and requirements except as discussed in the Verifier's Report, the HIT Report, and as follows:

1. During verification, some depth curves were distorted in a manner inconsistent with the most likely natural bottom configuration. Such unnatural deviations of the depth curves should be avoided during the processing of future surveys.

2. Reference section 5 of the Verifier's Report:

The junction between the present survey and H-9677 (1977) on the north was not completed during verification as implied in the Verifier's Report. During quality control inspection, it was necessary to reconcile some of the depth curves within the common area and to ink the junctional note on H-9677. Such necessary additional work should have been discussed in the referenced section of the Verifier's Report. (See the memorandum dated March 21, 1977, from the Office of Marine Surveys and Maps entitled "Verifier's Report Format.")

3. Section 6-a of the Verifier's Report is supplemented by the following:

. . . reveals good general agreement of depths; i.e., within $\pm$ 1 fathom; in general depths less than 100 fathoms. Comparison with the sparse

development on the survey of 1886, however, reveals depth differences of as much as ± 10 fathoms in depths less than 100 fathoms. In general depths exceeding 100 fathoms, depth differences were noted to range to as much as ± 166 fathoms.

4. Reference section L of the Descriptive Report and section 7 of the Verifier's Report:

During field work and verification, the survey was compared with an obsolete edition of chart 12200. This is in contravention of the requirement that the survey be compared with ". . . the latest edition . . ." of the chart current at the time of the survey. (See sections 5.3.4(L) and 6.3.10 of the Hydrographic Manual.) During verification, the 29th Edition of chart 12200 (April 9, 1977) should have been used rather than the 28th Edition. During quality control inspection, it was determined that the 29th Edition of the chart had not been revised within the area covered by the present survey. Accordingly, the referenced section of the Verifier's Report has been revised to indicate that the 29th Edition of chart 12200 was considered and superseded within the common area.

5. The formal Tide Approval Note was not included in the Descriptive Report during verification. It was therefore necessary to request the approval note during quality control inspection. (See section 6.6(5) of the Hydrographic Manual--Fourth Edition.)

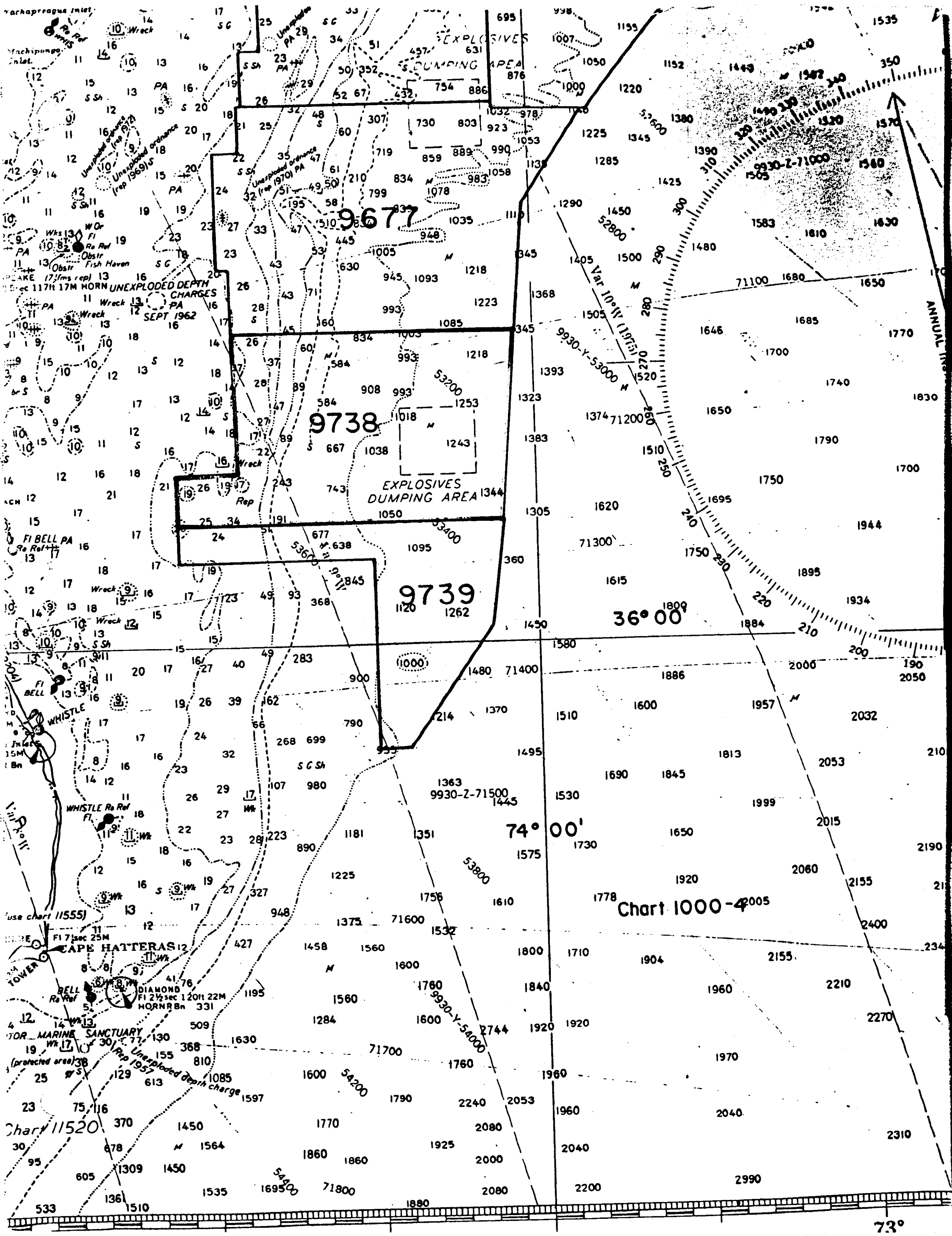
6. A comparison between the present survey and F.E. No. 17 (1957) W.D. was not accomplished during verification. Such a comparison was effected during the quality control inspection of the present survey.

Section 6 of the Verifier's Report is supplemented by the following:

b. F.E. No. 17 (1957) W.D. 1:40,000

The development on this F.E. covers a portion of the southwest corner of the present survey area. There are no conflicts between present depths and cleared effective depths within the common area.

cc:
C35
C351



9677
9738
9739
EXPLOSIVES DUMPING AREA
UNEXPLODED DEPTH CHARGES PA SEPT 1962
Unexploded ordnance (rep 1969)
Unexploded ordnance (rep 1970) PA
CAPE HATTERAS
DIAMOND Fl 2½sec 120ft 22M HORN R Bn
MONITOR MARINE SANCTUARY (protected area)
Unexploded depth charge Rep 1957
Chart 11520
(use chart 11555)
Chart 1000-4
36° 00'
74° 00'
73°
9930-Z-71000
9930-Z-71500
9930-Y-53000
9930-Y-54000
Var 10°W (1975)
ANNUAL
WHISTLE
Fl BELL PA
Fish Haven
Wreck

FORM C&GS-8352
(3-25-63)

NAUTICAL CHART DIVISION

RECORD OF APPLICATION TO CHARTS

FILE WITH DESCRIPTIVE REPORT OF SURVEY NO. H-9738

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
RA 12200	6/8/79	Bill Wanket	Full ~~Part Before~~ After Verification Review Inspection Signed Via
(1109)			Drawing No. 45
13003	7/17/80	Barbara Lortz	Full ~~Part Before~~ After Verification Review Inspection Signed Via
(1000)			Drawing No. #57 applied thru reduction of
			Chart 12200 #45
			Full Part Before After Verification Review Inspection Signed Via
			Drawing No.
			Full Part Before After Verification Review Inspection Signed Via
			Drawing No.
			Full Part Before After Verification Review Inspection Signed Via
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			Drawing No.
			Full Part Before After Verification Review Inspection Signed Via
			Drawing No.

FORM C&GS-8352 SUPERSEDES ALL EDITIONS OF FORM C&GS-975.

USCOMM-DC 8558-P63