9739

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-80-2-78

Office No. H-9739

LOCALITY

State North Carolina

General Locality Offshore - Atlantic Ocean

Locality Currituck Beach to Oregon Inlet

1978

CHIEF OF PARTY
Melvin J. Umbach

LIBRARY & ARCHIVES

DATE February 5, 1979

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

9739

Area 2 E1.
CHT
12200
13001

FORM C&GS-537
(8-66)

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

HYDROGRAPHIC TITLE SHEET

REGISTER NO. H-9739

FIELD NO. MI-80-2-78

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

State: NORTH CAROLINA

General locality: OFFSHORE- ~~NORTH~~ ATLANTIC OCEAN

Locality: ~~BETWEEN~~ CURRITUCK BEACH ~~AND~~ TO OREGON INLET, ~~NORTH CAROLINA~~

Scale: 1:80,000 Date of survey: FEB 27 thru MAR 25, 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, EM

Graphic record checked by: TR

Protracted by: N/A Automated plot by: MT MITCHELL S222 HYDROPLOT SYSTEM Calcomp 618 AMC J Scott Bradford

Soundings penciled by: N/A

Soundings in fathoms and tenths ~~=feet=~~ at MLW ~~=MLLW=~~

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

Appd. to standards WJT 5-14-79

KWW 10/6/92

USCOMM-DC 37009-P66

DESCRIPTIVE REPORT

TO

ACCOMPANY

HYDROGRAPHIC AND BATHYMETRIC SURVEY H-9739

MI-80-2-78

1:80,000 SCALE

OFFSHORE ATLANTIC OCEAN, NORTH CAROLINA

FEBRUARY 27, 1978 to MARCH 25, 1978

NOAA SHIP MT MITCHELL S222

MELVIN J. UMBACH

CAPTAIN, NOAA

COMMANDING

TABLE OF CONTENTS

✓= Misc. items removed and filed with the field records

A. PROJECT

This survey, MI-80-2-78 (H-9739) 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 Currituck Beach and Oregon Inlet, North Carolina, extending approximately from the 20 fathom curve to the 1350 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)	36°18'N	(2)	36°18'N	(3)	35°45'N	(4)	35°45'N	(5)	36°12'N	(6)	36°12'N
	75°05'W		74°06'W		74°24'W		74°30'W		74°30'W		75°05'W

This survey was conducted between 27 February 1978 (JD 58) and 25 March 1978 (JD 84).

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 Transducer	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 transducer (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 at 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 six Nansen Casts taken at the following locations:

Station:	Date:	Latitude:	Longitude:
Z1	12 February (JD 43)	36°35.7'N	74°51.0"W
Z2	12 February (JD 43)	36°36.0'N	74°41.0'W
Z3	13 February (JD 44)	36°32.4'N	73°56.2'W
Z4	15 February (JD 46)	36°30.2'N	74°44.5'W
BB1	21 March (JD 80)	36°13.3'N	74°46.0'W
BB2	23 March (JD 82)	36°05.5'N	74°01.0'W

Two velocity tables were made from these Nansen Casts. Table 1 applies to data from JD 58 to 60 and Table 2 applies to soundings obtained between JD 80 and JD 84.

Velocity Table 1 was constructed by averaging data from casts Z1, Z2, and Z4 for depths less than 180 fathoms and Z2 and Z3 for depths greater that 180 fathoms. The shelf water slope water interface seems to lie between 100 and 200 fathoms in this area.

Velocity Table 2 used cast BB1 for depths less than 120 fathoms, BB2 for depths from 120 fathoms to 525 fathoms and Z3 below 525 fathoms. Although shear currents from the Gulf Stream prevented sending Nansen bottles deeper than 525 fathoms at site BB2, the salinity and temperature at that depth corresponded well with the cast at Z3. A printout of these velocity tapes plus graphs used in their 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 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 maintained by ship's personnel.

G. HYDROGRAPHIC POSITION CONTROL

An Odum 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 in each calibration. Only those fixes with an inverse distance of less than 5.0 meters were used in these calibrations.

The calibration area was located 3 miles off Virginia Beach, Virginia. Calibration fixes 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:	Name:	Latitude:	Longitude:	Ser No:	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

The ship's DMU serial number was 190 and the Master (Code 76) was serial number 185.

Each Master/DMU pair was calibrated against each remote over a measured baseline on JD 37 (February 6). In addition, the Del Norte system was calibrated using three point sextant fixes with a check angle. Correctors determined in this manner varied from -1 to +3 meters.

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 22.4% of the deep main scheme lines and 7.6% 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

This survey junctions with H-9738 (MI-80-1-78) to the north, H-9243 (1971) to the south and H-9231 (1971) at the southwest tip of the bathymetric part of the survey area. The junction with H-9738 is excellent with contours continuing smoothly across the junction area. H-9243 also junctions very well in depths less than 100 fathoms-the soundings agree within 1 fathom. In deeper depths there is also good agreement, generally less than 4 fathoms except in two areas. Near latitude 36°12.5'N and longitude 74°46'W a series of 5 soundings from H-9243 show depths 20 to 80 fathoms shoaler than the present survey. One probable explanation is the steep slope in that area. South of latitude 35°55'N both H-9243 and H-9231 show depths about 10 fathoms deeper than the present survey depths. A possible explanation for this disagreement in this relatively flat area is slightly incorrect velocity correctors on the older surveys. This area would be affected by Gulf Stream waters.

K. COMPARISON WITH PRIOR SURVEYS

One line from H-1721 (1886) is south of the survey and one is north. Two soundings from the north line near latitude 36°18'N and longitude 75°03'W fall within the survey limits. One sounding (24) is 5 fathoms

deeper than the present survey and the other (20) is 2 fathoms shoaler. This disagreement is attributable to the improved positioning control and sounding equipment of the present survey. There were no presurvey review items in the survey area.

L. COMPARISON WITH THE CHART

Comparison was made with Chart Number 12200 (1:416,744 scale) 28th Edition (April 3, 1976). There were only 4 charted soundings less than 100 fathoms for comparison purposes. Two from prior survey H-1721 were discussed in the previous section. The other two showed agreement within 2 fathoms. Approximately 40% of those deeper than 100 fathoms agreed with 10 fathoms. Most of the remaining depths agreed within 60 fathoms with the new survey showing deeper depths. Two notable discrepancies were 2 charted depths of 1480 fathoms where this survey shows ~~1316~~ 1301 and 1298 fathoms. Most of these errors are attributable to the improved positioning control, sounding equipment and velocity corrections. correct

M. ADEQUACY OF THE SURVEY

This survey is complete and adequate to supersede all prior work for charting the 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	816.7
Linear Nautical Miles of Crosslines	177
Linear Nautical Miles of Development	138
Total Linear Nautical Miles of Hydro	1131.7
Total Miscellaneous Miles	295
Total Miles	1426.7
Square Miles of Hydrography	559
Total Number of Positions	800
Nansen Casts	2
Bottom Samples	7

P. MISCELLANEOUS

Some development lines were run in the bathymetric surveying area to better define bottom contours. The entire survey was plotted off line with velocity tape 1 since velocity tape 2 had not been completed prior to the off line plot.

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:

Timothy D. Rulon

Timothy D. Rulon
Ensign, NOAA

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 27, 1978

Reply to Attn. of:

To : Director, National Ocean Survey (C331)

From : Gerald B. Mill for Commanding Officer, NOAA SHIP MT MITCHELL S222

Subject: Tidal Data For Survey H-9739

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)	35°54.3'N	75°42.8'W
DuckPier, 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)	36°12'N 75°05'W	(2)	36°19'N 75°05'W	(3)	36°19'N 74°47'W	(4)	36°12'N 74°46'W

This information is requested for the following periods:

February 27, 1978 (JD 58) - March 25, 1978 (JD 84).

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

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

VESSEL =2220

DATE =FEB12 & 15

TIME =1730

LATITUDE = 036/02/57.00

LONGITUDE = 074/48/00.00

TYPE OF OBSERVATION =AVG Z1 + Z4 &Z2

VELOCITY TABLE 1
(SHOAL < 180 FM)

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

VELOCITY TABLE 1
(DEEP > 180 FM)

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	1496.68
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

CORRECTIONS IN ~~FEET~~, FATHOMS

VELOCITY TABLE 1

NOAA FORM 75-21 (10-72)

U.S. DEPARTMENT OF COMMERCE
NOAA
NATIONAL OCEAN SURVEY

VELOCITY CORRECTIONS

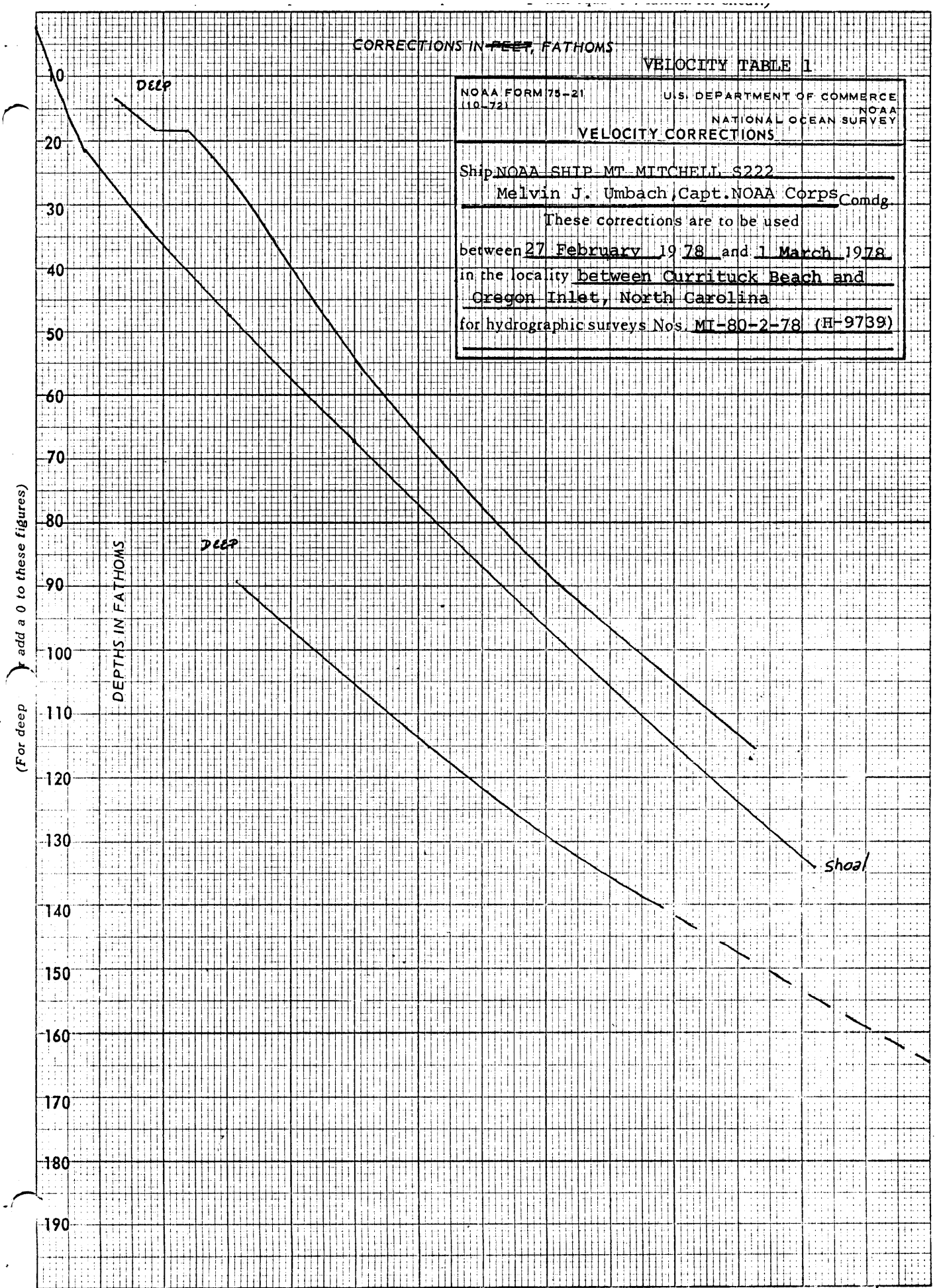
Ship NOAA SHIP MT MITCHELL S222
Melvin J. Umbach, Capt. NOAA Corps Comdg.

These corrections are to be used

between 27 February 19 78 and 1 March 1978

in the locality between Currituck Beach and Oregon Inlet, North Carolina

for hydrographic surveys No's. MT-80-2-78 (H-9739)



☆ U.S. GOV. PRINTING OFFICE: 1975—668-16

VELOCITY TAPE PRINTOUT TABLE I H_9739 MI-80-2-78

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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
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007500 0 0130
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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
```

VESSEL =2220

DATE =21 MARCH 1978

TIME =1430-1500 GMT

LATITUDE = 036/13/18.00

LONGITUDE = 074/46/00.00

TYPE OF OBSERVATION =NANSEN CAST BB-1

VELOCITY TABLE 2
(SHOAL < 120 Fm)

CAST-DEPTH (SURFACE) (M)	TEMP (DEG C)	SALINITY (0/00)	SND VEL (M/SEC)
0000.0	08.15	34.13	1482.37
0010.0	08.05	34.12	1482.14
0020.0	08.04	34.13	1482.27
0030.0	08.57	34.25	1484.61
0050.0	10.05	34.74	1491.06
0075.0	11.05	35.05	1495.44
0100.0	11.64	35.25	1498.18
0150.0	12.35	35.47	1501.72
0200.0	12.18	35.47	1501.95

VELOCITY CORRECTION TABLE OPTIONS:

Ø) 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)
ØØØ2.73	ØØØØ.Ø1
ØØØ8.13	ØØØØ.Ø8
ØØ13.52	ØØØØ.15
ØØ21.6Ø	ØØØØ.27
ØØ33.67	ØØØØ.51
ØØ47.Ø4	ØØØØ.81
ØØ67.Ø5	ØØØ1.3Ø
ØØ93.67	ØØØ2.Ø2
Ø12Ø.28	ØØØ2.75

VESSEL =2220

DATE =2/13,3/23/78

TIME =1400-2130

LATITUDE = 036/14/00.00

LONGITUDE = 073/58/00.00

TYPE OF OBSERVATION =NANSEN CAST BB2 +Z3

VELOCITY TABLE 2
(DEEP > 120 FM)

CAST-DEPTH (SURFACE) (M)	TEMP (DEG C)	SALINITY (0/00)	SND VEL (M/SEC)
0000.0	21.95	36.40	1528.92
0010.0	21.67	36.38	1528.34
0030.0	21.53	36.39	1528.32
0050.0	20.30	36.49	1525.51
0075.0	19.88	36.44	1524.72
0100.0	19.29	36.42	1523.49
0150.0	17.66	36.43	1519.68
0180.0	15.08	36.31	1512.20
0269.0	12.37	36.03	1504.44
0348.0	09.82	35.53	1496.11
0411.0	08.00	35.17	1489.88
0468.0	06.85	35.07	1486.23
0549.0	06.11	34.94	1484.46
0620.0	05.71	34.96	1484.05
0724.0	05.26	34.93	1483.90
0820.0	04.98	34.99	1484.43
0932.0	04.77	34.97	1485.40
1002.0	04.37	34.93	1484.86
1139.0	04.12	35.00	1486.19
1426.0	03.89	34.98	1490.01
1909.0	03.54	34.98	1496.68
2301.0	03.08	34.96	1501.37

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)
0002.71	0000.02
0010.55	0000.39
0021.00	0000.87
0032.78	0001.40
0045.87	0001.98
0065.53	0002.82
0086.55	0003.67
0118.00	0004.76
0162.63	0006.06
0200.57	0006.94
0232.78	0007.54
0269.91	0008.14
0310.86	0008.75
0358.02	0009.44
0411.92	0010.22
0467.96	0011.05
0516.96	0011.81
0572.71	0012.65
0686.80	0014.49
0893.44	0018.37
1127.17	0023.87
1335.90	0029.48

CORRECTIONS IN ~~XXXX~~ FATHOMS

VELOCITY TABLE 2

NOAA FORM 75-21 (10-72)

U.S. DEPARTMENT OF COMMERCE
NOAA
NATIONAL OCEAN SURVEY

VELOCITY CORRECTIONS

Ship NOAA Ship MT MITCHELL S-222

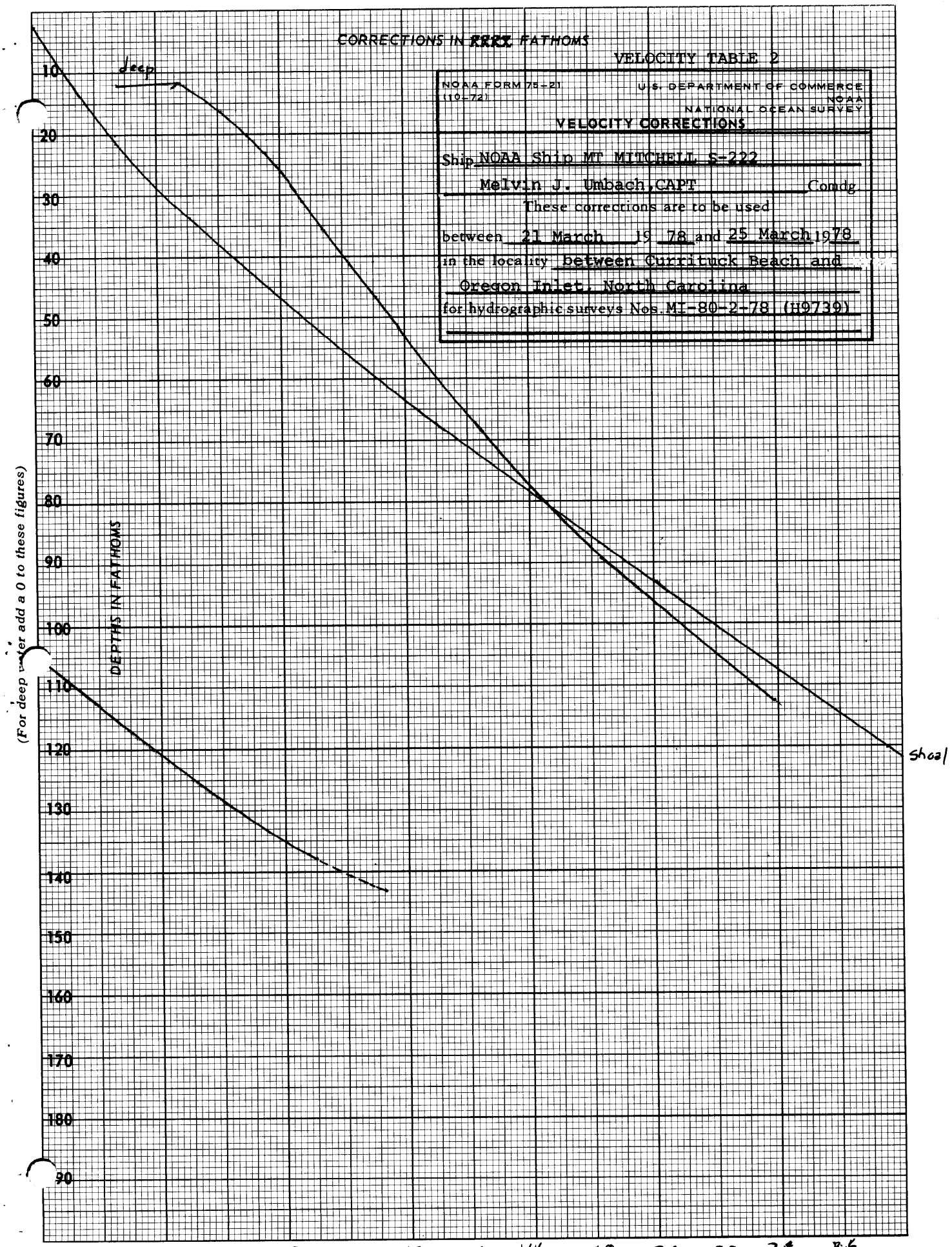
Melvin J. Umbach, CAPT Comdg.

These corrections are to be used

between 21 March 19 78 and 25 March 1978

in the locality between Currituck Beach and Oregon Inlet, North Carolina

for hydrographic surveys Nos. MI-80-2-78 (H9739)



☆ U.S. GOV. PRINTING OFFICE: 1975—668-160

VELOCITY TAPE TABLE 11 H-9739 MI-80-2-78

```
000100 0 0000 0002 001 222000 080278
000232 0 0002
000331 0 0004
000425 0 0006
000515 0 0008
000598 0 0010
000673 0 0012
000749 0 0014
000820 0 0016
000892 0 0018
001110 0 0020
001180 0 0030
001180 0 0040
001420 0 0050
001820 0 0060
002310 0 0070
002950 0 0080
003600 0 0090
004290 0 0100
004950 0 0110
005600 0 0120
006250 0 0130
006850 0 0140
007440 0 0150
008030 0 0160
008550 0 0170
009030 0 0180
009500 0 0190
009910 0 0200
010340 0 0210
010710 0 0220
011110 0 0230
011500 0 0240
011950 0 0250
012350 0 0260
012700 0 0270
013050 0 0280
013350 0 0290
013670 0 0300
013950 0 0310
014170 0 0320
999999 0 0330
```

SIGNAL NAMES LIST
MI-80-2-78 H-9739

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
220	VIRGINIA BEACH MAYFLOWER E. LIGHT	360754 #1052
225	CAVALIER HOTEL CUPOLA	360754 #1045
230	LOOKOUT TOWER	AMC OPS DIV
240	CAPE HENRY LIGHTHOUSE (NEW) DELNORTE	3607611 #1009

SIGNAL TAPE PRINTOUT
MI-80-2-78 H-9739

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
220	4	36	51	44149	075	58	47147	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-80-2-78

H-9739

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. Ambach
Captain, NOAA
Commanding

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 27 - March 25, 1978

HYDROGRAPHIC SHEET: H-9739

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
BS Chief, Tides Branch

NOAA FORM 76-155
(11-72)

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

GEOGRAPHIC NAMES

SURVEY NUMBER

H-9739

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	
CURRITUCK BEACH (TITLE)										1
① OREGON INLET (TITLE)										2
										3
										4
										5
										6
										7
										8
										9
										10
										11
										12
										13
					Approved:					14
										15
					Chas. E. Harris					16
					Chief Geographer - C3x5					17
					27 March 1979					18
										19
										20
										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 STATISTICS

HYDROGRAPHIC SURVEY NUMBER: H-9739

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

RECORD DESCRIPTION	AMOUNT	RECORD DESCRIPTION	AMOUNT
SMOOTH SHEET	1	BOAT SHEETS & PRELIMINARY OVERLAYS	24
DESCRIPTIVE REPORT	1	SMOOTH OVERLAYS: POS. ARC, EXCESS	2

DESCRIPTION	DEPTH RECORDS	HORIZ. CONT. RECORDS	PRINTOUTS	TAPE ROLLS	PUNCHED CARDS	ABSTRACTS/ SOURCE DOCUMENTS
ENVELOPES	PDR 1 Fatho.					1-misc. data
CAHIERS	1 w/ printouts		1			
VOLUMES	1					
BOXES			1 - Smooth & Sawtooth rec.			

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			800
POSITIONS CHECKED	27	115	
POSITIONS REVISED		3	
SOUNDINGS REVISED		15	
SOUNDINGS ERRONEOUSLY SPACED		2	
SIGNALS (CONTROL) ERRONEOUSLY PLOTTED		0	
	TIME – HOURS		
CRITIQUE OF FIELD DATA PACKAGE (PRE-VERIFICATION)	2		
VERIFICATION OF CONTROL		2	
VERIFICATION OF POSITIONS		4	
VERIFICATION OF SOUNDINGS		41	
COMPILATION OF SMOOTH SHEET		5	
APPLICATION OF TOPOGRAPHY		0	
APPLICATION OF PHOTOBATHYMETRY		0	
JUNCTIONS		3	
COMPARISON WITH PRIOR SURVEYS & CHARTS		7	
VERIFIER'S REPORT		3	
OTHER		1	
TOTALS	2	65	

	Beginning Date	Ending Date
Pre-Verification by		
Verification by: S. Kelly, P. Niland, S. Bradford	05/15/78	12/15/78
Verification Check by: R. Roberson	Time (Hours): 2	Date: 01/11/79
Marine Center Inspection by: Hydrographic Inspection Team (AMC)	Time (Hours): 5	Date: 01/18/79
Quality Control Inspection by: R. W. Wellman	Time (Hours): 31	Date: 3-23-79
Requirements Evaluation by: L. O'Keefe	Time (Hours): 1	Date: 4/6/79

Carolens 6 hr 4/3/79

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-9739

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-9739 FIELD NO.: MI-80-2-78

~~Atlantic Ocean, Virginia~~/North Carolina, ~~Cape Henry to~~ Offshore-Atlantic Ocean
Currituck Beach to Oregon Inlet

SURVEYED: February 27 through March 25, 1978

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

SOUNDINGS: Ross Automated Hydrographic Survey System Raytheon Universal Graphic Recorder

CONTROL: Odom Offshore Hydrotrac System (Range/Range)

Chief of Party ..... Melvin J. Umbach
Survey by ..... G. Mills
..... D. Waltz
..... M. Henderson
..... P. Daugherty
..... T. Rulon
..... W. Pringle
..... J. Wilder
..... M. Murphy
..... T. Bainbridge
Automated Plot by ..... CALCOMP-618 Plotter (AMC)
Verified and Inked by ..... J. S. Bradford
January 10, 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.

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 is considered adequate with the following exception, a reduction of line spacing to 200 meters over submerged wreck, charted latitude 36°15.0', longitude 74°53.0', would have been preferred.

4. Condition of Survey

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

5. Junctions

An adequate junction was effected with the following contemporary surveys:

H-9738	(1978)	1:80,000	to the north
H-9231	(1971)	1:80,000	to the southwest (See Q.C. Report-item 2)
H-9243	(1971)	1:80,000	to the south and west

No contemporary survey junctions with the present survey to the east; however; present depths are in general harmony with charted depths.

6. Comparison With Prior Survey

	H-1500a	(1881)	1:600,000
a.	H-1726	(1886)	1:200,000
	H-2920a	(1882)	1:1,200,000

None of the soundings from H-1726 fall within the common area. (See Q.C. Report-item 3)

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

b.	FE 3	1945	USC & GS "Gentian"
	FE 17	1957	USC & GS "Bowen & Stirni"

(See Q.C. Report-item 4)

Submerged wreck "Norfolk" (~~5152~~ 6210 gross tonnage) was located April 16, 1942 at latitude 36°16.0', longitude 74°53.5' by sonar and five underwater pictures taken to verify the status of the wreck. No attempt was made to investigate this wreck by field. It is recommended that this feature be retained as charted. The wreck is presently charted in latitude 36°15.60', longitude 74°51.10'. (Reference U.S. Navy Wreck List of 1957 - Wreck identified as "EQUIPOISE)

The area of submerged wreck "Barque" ~~located at~~ charted in latitude 36°16.1', longitude 74°51.1'* was investigated with negative results. It is recommended that this feature remain charted. ~~until a more thorough investigation can be made.~~ Charted as cleared by 17 fathoms on the authority of FE. No. 17 (1957) W.D. (Originally reported in latitude 36° 16.10', longitude 74° 51.10' - Reference FE No 3)

*Present charted position based on the U.S. Navy Wreck list of 1957 - Source attributed to H.O. Notice to Mariners.

7. Comparison With Chart #12200 (29th Edition, April 3, 1976)

a. Hydrography

There is a fair agreement between the present survey and Chart 12200. The greatest difference, 180 fathoms, was noted at latitude 36°16.2', longitude 74°10.7'. The charted depth of 1480 is believed to be taken from an unidentified U.S. Navy survey. The validity of these charted soundings is unknown, and it is recommended that the present survey supersede all charted depths within the common area.

b. Aid to Navigation

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

8. Compliance With Instruction

This survey adequately complies with Project Instruction.

9. Additional Field Work

This is considered a good basic survey and no additional field work is recommended at this time.

APPROVAL SHEET
FOR
SURVEY H-9739

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: 1-23-79

Signed: [illegible]

Title: Chief, Verification Branch

Inspection Report
H-9739

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 19, 1979

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

(Absent)
Charles H. Nixon, CAPT, NOAA
Chief, Operations Division

(Absent)
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 23, 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-9739 (1978), North Carolina, Offshore--Atlantic Ocean, Currituck Beach to Oregon Inlet

A quality control inspection of H-9739 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. 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.)

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

Present depths are generally 6 to 9 fathoms shoaler than depths within the common area on H-9231 (1971). General depths within the common area exceed 1,000 fathoms and are probably affected by the Gulf Stream. An exhaustive examination of the records to reconcile the differences is not considered necessary. A butt junction was effected with H-9231 during quality control inspection.

Section 5 of the Verifier's Report is supplemented by the following:

Present survey depths are generally 6 to 9 fathoms shoaler than depths within the common area on H-9231. The depth differences probably result

from varying effects of Gulf Stream waters. A butt junction has been effected with H-9231 (1971) on the southwest. Depths within the common area on H-9231 are superseded by the present survey.

3. Reference section 6-a of the Verifier's Report:

Prior survey H-1721 was misidentified as H-1726 during verification. Further, two additional prior surveys were not considered during verification. The referenced section of the Verifier's Report was appropriately annotated during the quality control inspection.

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

The sparsely developed prior surveys offer a limited basis for meaningful comparisons. Comparisons between the present survey and the few prior survey soundings within the common area, however, reveal some areas of good agreement intermingled with differences of as much as ± 100 fathoms. The noted depth differences are attributed to the less detailed and less accurate methods employed on the prior surveys. The present survey is adequate . . . .

4. Reference section 6-b of the Verifier's Report:

The comments pertaining to the charted wrecks are confusing since the indicated positions do not correspond to the respective positions presently charted. Further, the referenced section is lacking any comments pertaining to a comparison between present survey depths and cleared wire-drag depths within the common area.

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

There are no conflicts between present depths and cleared wire-drag depths within the common area.

5. 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--Fourth Edition.) The 29th edition of chart 12200 (April 9, 1977) should have been used by the hydrographer rather than the 28th edition of the chart. 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.

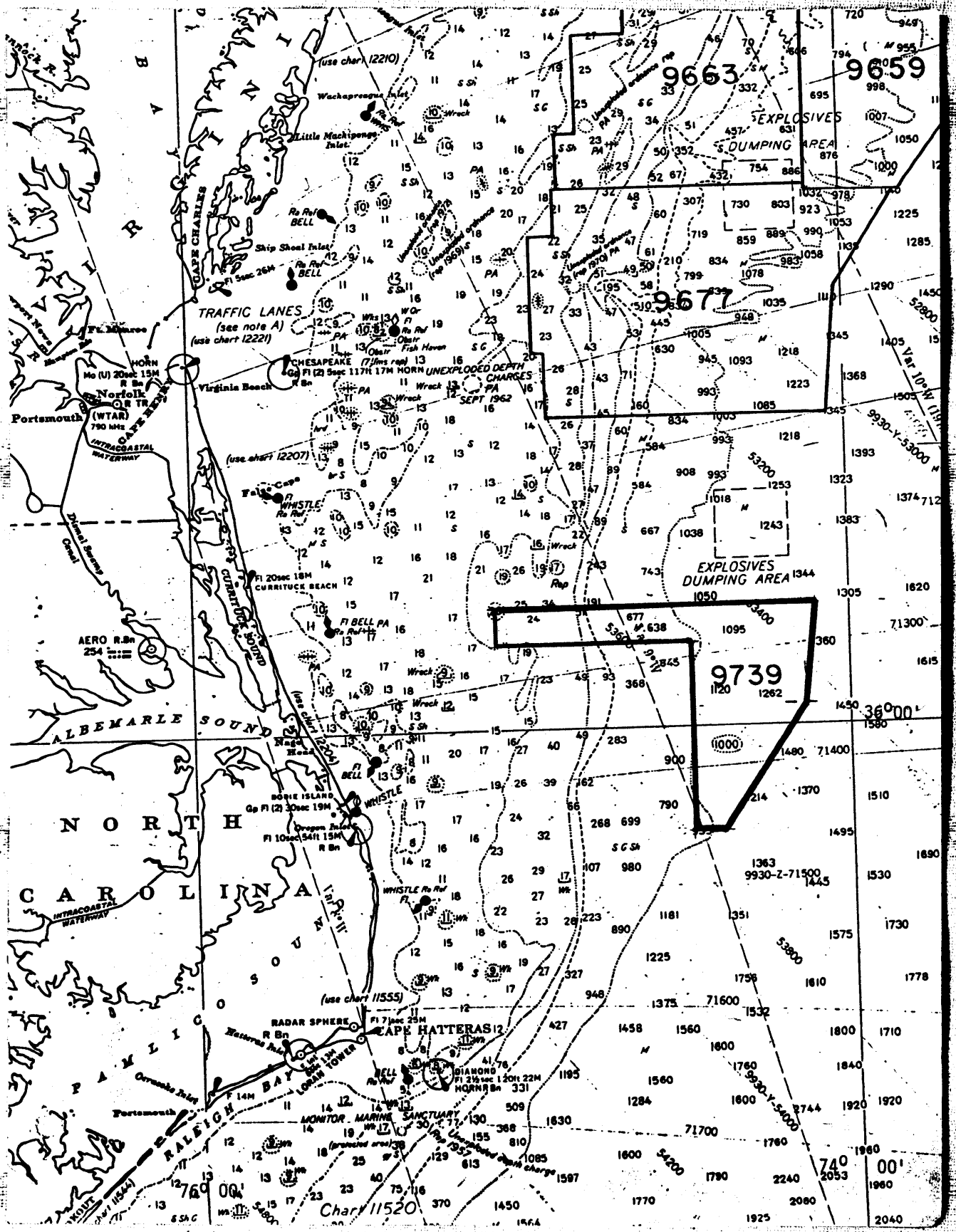
6. The title of the survey, as shown on the title page of the Verifier's Report, is inappropriate and inaccurate. The present survey area is not appropriately referenced to Virginia or to Cape Henry as implied in the Verifier's Report. The title of the survey, shown in the Verifier's Report, should correspond to that shown on the Hydrographic Title Sheet in the Descriptive Report. The title page of the Verifier's Report was appropriately revised to provide a more realistic identification of the survey area.

7. During verification, the reference station shown in block number 42 on the smooth sheet was erroneously designated as an adjusted station. There is no record of this station on file with the National Geodetic Survey. Further, it is not indicated in section F of the Descriptive Report (Control Stations) that station Cerc #46 was established in accordance with acceptable triangulation procedures and accuracy standards. During quality control inspection, block number 42 on the smooth sheet was appropriately revised to indicate the most likely status of the station; i.e., unadjusted.

Section 2 of the Verifier's Report is supplemented by the following:

Station Cerc #46 (1978) is designated as the reference station for the present survey. Formal documentation of acceptance of this station by the National Geodetic Survey is not presently available to the verifier. Accordingly, the status of the station was designated as unadjusted. It is assumed, however, that the necessary records and computations will eventually be submitted to the National Geodetic Survey. Ultimately, therefore, it is expected that the triangulation station status of the station will be validated and that the station position will be formally adjusted.

cc:
OA/C35
OA/C351


9663
9659
9677
9739
EXPLOSIVES DUMPING AREA
EXPLOSIVES DUMPING AREA
TRAFFIC LANES
(see note A)
(use chart 12221)
UNEXPLODED DEPTH CHARGES
SEPT 1962
(use chart 12210)
(use chart 12207)
(use chart 12204)
(use chart 11555)
Chart 11520
CAPE CHARLES
Virginia Beach
Norfolk
Portsmouth
CHESAPEAKE
CURRITUCK BEACH
BODIE ISLAND
CAPE HATTERAS
RADAR SPHERE
ALBEMARLE SOUND
NORTH CAROLINA
PAMLICO SOUND
RALEIGH BAY
MONITOR MARINE SANCTUARY
INTRACOASTAL WATERWAY
Dismal Swamp Canal
Var 10°W (1971)
Var 11°W (1971)
9930-Y-53000
9930-Z-71500
9930-Y-54000
36° 00'
74° 00'

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

NAUTICAL CHART DIVISION

RECORD OF APPLICATION TO CHARTS

FILE WITH DESCRIPTIVE REPORT OF SURVEY NO. 9739

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.

RH

CHART	DATE	CARTOGRAPHER	REMARKS
12200	5/31/79	Bill Wanless	Full ~~Part Before~~ After Verification Review Inspection Signed Via
(1109)			Drawing No. 45
13003	7/23/80	Barbara Lortz	Full ~~Part Before~~ After Verification Review Inspection Signed Via
(1000)			Drawing No. #57 Applied thru reduction
			of cht. 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
			Drawing No.
			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
			Drawing No.
			Full Part Before After Verification Review Inspection Signed Via
			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.