

9978

Diagrams 1222-4 & 1227-2

NOAA FORM 76-35A

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

DESCRIPTIVE REPORT

Type of Survey .. Hydrographic.....
Field No. PE-20-4-81.....
Office No..... H-9978.....

LOCALITY

State Virginia.....
General Locality Atlantic Ocean.....
Locality 20 Miles east of Cape Henry.....

1981

CHIEF OF PARTY
CDR D.E. Nortrup

LIBRARY & ARCHIVES

DATE August 4, 1983.....

AREA 2 + 1

CHARTS

12200

12221

12207

13003

8266
9978

HYDROGRAPHIC TITLE SHEET

H-9978

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.

PE 20-4-81

State Virginia

General locality Chesapeake Bay Entrance ~~Approach~~ Atlantic Ocean

Locality Offshore Cape Henry 20 Miles East of Cape Henry

Scale 1:20,000 Date of survey 20 October 1981 - 6 Nov 1981

Instructions dated 31 March 1981 Project No. OPR-D103-MI/PE-81

Vessel NOAA Ship PEIRCE (S-328) VESNO 2830

Chief of party CDR Donald E. Nortrup, Commanding

Surveyed by T.W. Ruzala, G.E. Leigh, L.F. Simoneaux, M. Mozgala, J.W. Bailey, R.B. Harris

Soundings taken by echo sounder, ~~hand lead, pole~~ Ross #5000

Graphic record scaled by G.E.L., L.F.S., M.M., J.W.B., R.B.H.

Graphic record checked by G.E.L., L.F.S., J.W.B.

Protracted by _____ Automated plot by _____

Verification by _____

Soundings in fathoms feet at MLW MLLW

REMARKS: All times recorded in GMT

Notes in red were made during verification.

AWOIS - 10/4/83 mjt

RWW 8/21/92

OPR-D103, DELMARVANC

~~OFFSHORE CHESAPEAKE BAY ENTRANCE~~
20 MILES EAST OF CAPE HENRY

NOAA Ship PEIRCE

DONALD E. NORTRUP, CDR, NOAA

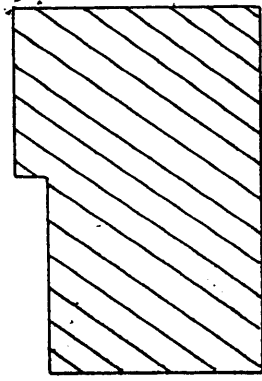
From Chart 12200

Registry Number H-9978

Field Number PE 20-4-81

76°W
—
37°N

75°W
—
37°N



75°W.
—
36°40'N.

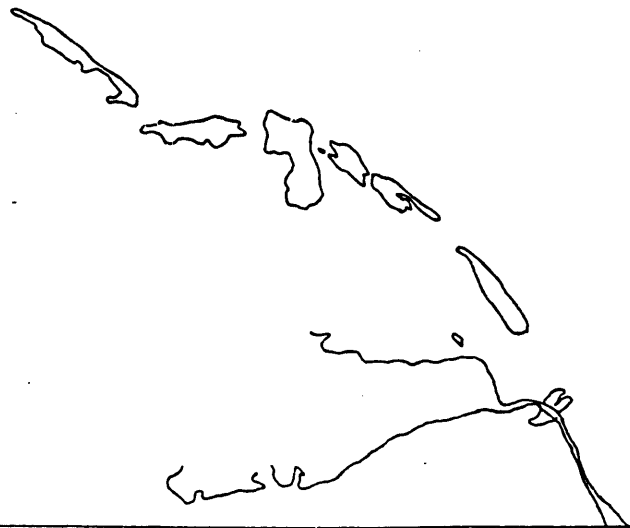


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Descriptive Report
 To Accompany
 Hydrographic Survey H-9978
 (Field Number PE-20-4-81) ✓
 CDR D. E. Nortrup, NOAA

A. PROJECT

This survey is part of OPR-D103-MI/PE81, Atlantic Seaboard Area Project (ASAP), DELMARVANC phase. It was conducted in accordance with project instructions dated 31 March 1981, from Associate Director, Marine Surveys and Maps, forwarded via Director, Atlantic Marine Center. ✓

There were three changes to the project instructions issued during the 1981 field season. The changes affecting this survey were change numbers 2 and 3 dated 6 May 1981 and 21 July 1981, respectively. ✓

B. AREA SURVEYED

20 miles east of Cape Henry.

This survey was conducted in the vicinity of ~~Chesapeake Bay entrance, off shore Cape Henry.~~ ^{Approach} ✓

To Junction with MT MITCHELL'S sheet "U", H9955
 at 36° 54' 22" N continuing east to 75° 26' 12" W
 then north to 36° 55' 30" N and east to the
 eastern sheet limit.

Northern Sheet Limit

36° 47' 30" North	Southern Sheet Limit ✓
075° 20' 00" West	Eastern Sheet Limit ✓
075° 34' 00" West	Western Sheet Limit ✓

This survey was conducted between the dates of 20 October 1981 (J.D. 293), and 6 November 1981 (J.D. 310). ✓

C. SOUNDING VESSEL

The hydrography was conducted by the NOAA Ship PEIRCE, Vesno 2830, which was equipped with the hydroplot system. ✓

D. SOUNDING EQUIPMENT AND CORRECTIONS TO ECHO SOUNDINGS

This survey was conducted utilizing the Ross digital ^{echosounder} fathometer model #5000. The individual sounding equipment and serial numbers are as follows: ✓

<u>NOAA Ship PEIRCE</u>	<u>Echosounder Fathometer s/n</u>	<u>J.D</u>
Vesno 2830	1087	293-302
		306-308
	1079	308-310 ✓

Complete phase checks were performed on both units at the conclusion of each hydrographic line. Partial checks at the fifty foot interval were made while running on line. All discrepancies and recalibrations were considered and noted in the sounding volume. During this survey the ship encountered actual depths of ~~49-109~~ feet. ✓

The corrections for the velocity of sound in water were computed for the ship via TDC casts #9 and #10, on the dates of 28 October 1981, and 6 November 1981, respectively. On 6 November 1981, simultaneous Nansen and TDC (#10) casts were performed and the results were compared to validate TDC accuracy. Salinities agreed within 1.7 parts per thousand and temperatures within .14° centigrade. The two TDC casts were graphed and the resulting velocity tables scaled at 0.2 of a foot intervals. The T.D.C. casts were performed by the Martek Mark VII water quality instrument and sensor unit. (There were no calibrations performed on this unit.) ✓

A vertical cast 5 was taken on 22 July 1981, to a depth of 67 feet, indicating a static draft of 10.35 feet. The draft correction of 10.4 feet was entered on all correction tapes with a corrector value of -.05 of a foot being applied to the transducer correction on the sounding correction abstract. The vertical cast data is included in the supplemental data files. The following is a list of stations observed. ✓

<u>Type of Station</u>	<u>S/N</u>	<u>Vesno</u>	<u>J.D.</u>	<u>Latitude</u>	<u>Longitude</u>
Nansen	-	2830	310	36°53'.0"N	75°21'.6"W ✓
TDC #9	Martek Mark VII (#167-10) Martek VII Sensor (#167-20)	2830	302	36°52'.8"N	75°22'.0"W ✓
TDC #10	Martek VII	2830	310	36°53'.0"W	75°21'.6"W ✓
Vertical Cast	PE-100-1-78 (leadline)	2830	203	36°54'.6"W	75°43'.6"W ✓

Settlement and squat corrections for the ship were determined on 21 September 1981, from the U.S. Corps. of Engineer's pier on the Elizabeth River, (depth of water 40 ft.). Corrections were obtained using a Zeiss level instrument, s/n 18946, positioned at the end of the pier, and a tide staff positioned on the starboard side of PEIRCE, in line with ship's transducer. Readings were recorded at throttle speeds of 0,2,4,6,8's. The results were graphed and are included within the supplemented data files, "Settlement and Squat NOAA Ship PEIRCE". ✓

Speed changes, during the survey were noted daily in the sounding volume and the settlement and squat correctors were entered in the sounding correction abstract. ✓

E. HYDROGRAPHIC SHEETS

The field sheets were constructed and drawn up aboard PEIRCE by the ship's PDP8/E computer and complot roll bed plotter. The data is presented on 4 plotter sheets (2 north, 2 south) at the scale of 1:20,000 with a skew of 0,19.5, 48. Two of the plotter sheets contain the mainscheme and mainscheme splits while the overlay sheets contain crosslines, bottom samples, and developments. ✓

The final smooth sheet ^{was} will be plotted by the Atlantic Marine Center. All field records and appropriate data ^{were} will be forward ^{ed} to A.M.C. for final verification. ~~All sheet parameters are appended to this report.~~

F. CONTROL STATIONS

All hydrography was controlled by electronic positioning with reference stations located at horizontal control stations COROLLA and BATTERY CRAMER (signals 002 and 018, respectively). All positioning system calibrations were relative to station CHESAPEAKE LIGHT, 1966 (station 023). ✓

Station COROLLA was established in May, 1981 by the Atlantic Marine Center, Operations Division personnel by Third Order, Class I traverse methods. ✓

Station BATTERY CRAMER, 1980 is a third order station and was established ✓ by AMC Operations Division personnel.

Station CHESAPEAKE LIGHT, 1966 is a published Third Order Intersection Station, Quad 360754, station #1047. ✓

None of the horizontal control stations are located within the limits of this survey. A complete list of the signals is included in section "F" of the appendix. ✓

G. HYDROGRAPHIC POSITION CONTROL

Position of the ship was by range/range method using ARGO (Automated Range/Grid Overlay) a medium range, phase comparison system. ✓

The electronic equipment and serial numbers used for this survey are as follows: ✓

<u>Equipment</u>	<u>Vesno 2830 s/n</u>	<u>J.D.</u>	
RPU	R0379116	293-302-306-310	
CDU	C037948	293-302,306-310	
ALU	A047847	293-302,306-310	✓
Strip Chart Recorder	S097948	293-302,306-310	
Thermal Printer	A04127	293-302,306-310	✓
<u>Shore Stations</u>			
COROLLA (002)			
RPU	R0379121	293-295	
	R0379115	296-302,306-310	
ALU	A047853	293-302,306-310	✓
Power Supply	V0478108	293-295	
	V0478105	296-302,306-310	
BATTERY CRAMER (018)			
RPU	R047855	293-295	
	R047844	296-302,306-310	
ALU	A047851	293-302, 306-310	✓
Power Supply	VO38167	293-302, 306-310	

Throughout the survey ARGO was maintained at a smoothing code of 02 with time slots 01-05-00-00, and at a frequency of 1646.7 KHZ. Fixed shore station AGC values and antenna range tune values were monitored every hour while on line on a daily basis. Individual values can be found in the supplemental data file for electronic positioning control. ✓

The ARGO positioning system was calibrated via fixed point circle calibration at station CHESAPEAKE LIGHT, (023); Latitude $36^{\circ}54'16.158\text{N}$, $075^{\circ}42'47.123\text{W}$. (See Hydrographic Manual, Fourth Edition, Section 4.4.3.3 for description of method). Line of position azimuths were determined by adding 90 and 270 degrees to the computed azimuth from CHESAPEAKE LIGHT to each shore station. Two complete circles were observed at the beginning and end of each day of sounding. On line partial electronic rate corrections were based on each day's beginning calibration and entered via the nav-cal feature of program RK112. Final rate correctors are based on the mean of each day's beginning and ending calibrations and applied via the off line corrector tape. ~~Since calendar days overlapped Julian days, there are usually two sets of correctors for each day of hydrography.~~

H. SHORELINE

There was no shoreline contained within the survey limits. ✓

I. CROSSLINE

During this survey, a total of 61.3 nautical miles of crosslines were run. This ✓ constitutes 6% of the total mainscheme hydrography.

The crossline/mainscheme agreement is very good; ~~the largest notable discrepancy is 3 feet with all other~~ sounding agreement within ± 2 feet.

J. JUNCTIONS

This survey junctions with survey H-9955, sheet "U", MI-20-1-81, to the north; H-9959, PE-20-2-81, sheet "W" to the west; and H-9972, PE-20-3-81, sheet "Z" to the southwest. Contemporary surveys to the east and southeast were not accomplished during this survey. See Sec. 5 of the Evaluation Report. ✓

(1981) 1:20,000
Comparison with ~~unverified~~ H-9955, MI-20-1-81 indicates very favorable agreement. General agreement is within ± 2 with occasional larger discrepancies of ± 3 feet. The larger differences occur in areas of frequent sand waves which were developed at reduced line spacing during this survey. The 60 foot curves, common to both sheets, ✓ indicate excellent agreement with no systematic curve displacement through the junctioning area.

(1981) 1:20,000
Comparisons with ~~unverified~~ H-9959, PE-20-2-81 indicate very good agreement. General agreement is within ± 2 feet, ~~with occasional ± 3 foot discrepancies.~~ The depth curves are continuous and show no systematic curve displacement through the junctioning area.

(1981) 1:20,000
Comparisons with ~~unverified~~ H-9972, PE-20-3-81, indicate very good agreement. ~~General agreement is favorable but due to the displacement of sounding lines, a sounding by sounding comparison is difficult.~~ No large anomalies are evident with good continuity in the junctioning depth curves.

K. COMPARISON WITH PRIOR SURVEYS See Sec.6 of the Evaluation Report.

The DELMARVANC Presurvey Review was issued 21 April 1980, extended Source CL 1404/74 8 August 1980, and updated 10 September, 1980 and again 21 April 1981. One presurvey review item (#110), lies within the survey area. Item #110 is reported as 76 foot steel hulled F/V Gulf Hustler at latitude 36°51'48" north and 075°30'30" west. This item required a limited investigation reducing line spacing to 100 meters for a 1000 meter radius from the reported position. The investigation revealed a least depth 68' with no anomalies on the fathogram trace. It is recommended that the item be charted with the annotation "Existence Doubtful". Retain as charted.

Pos. 1396⁺⁸ (part of sandwave)

Comparisons were made with prior survey H-5992, scale 1:40,000, surveyed in 1935. This prior survey covers the eastern portion of hydrography and constitutes approximately one half of the area surveyed. Comparisons indicate fair agreement. Depths agree within +4⁵ feet with occasional larger 8-14 foot discrepancies. Charted Prior soundings are consistently deeper than the acquired soundings for this survey as are 90% of the other comparable soundings.

The significant discrepancies are as follows:

<u>Latitude/Longitude</u>	<u>Prior Charted Sounding</u>	<u>Survey Soundings</u>
36°47.5' N ✓ 77°26.0' W ✓	85 ✓	77 ✓
36°47.9' N ✓ 75°20.3' W ✓	88 ✓	80 ¹
36°47.9' N ✓ 75°21.1' W ✓	89 ✓	80 ²
36°48.8' N ✓ 75°20.6' W ✓	90 ✓	81 ²
36°50.5' N ✓ 75°25.2' W ✓	80 ✓	88 ⁶
36°50.5' N ✓ 75°24.4' W ✓	102 ✓	87 ✓
36°51.5' N ✓ 75°24.0' W ✓	90 ✓	98 ¹⁰¹
36°54.9' N ✓ 75°24.7' W ✓	105 ✓	91 ⁴
36°55.3' N ✓ 75°21.8' W ✓	95 ✓	88 ⁹
36°55.3' N ✓ 75°23.9' W ✓	101 ✓	94 ⁵

Comparisons made with prior survey H-5990, scale 1:40,000, surveyed in 1935 indicates very good agreement while general agreement is within ± 3 feet. The 60 foot curve indicates excellent agreement with very little displacement or alteration. This prior survey covers the western portion of hydrography which constitutes one half of the area surveyed.

Three developments were run during this survey. Two of the developments are contained on the north overlay sheet while the third is contained on the south overlay sheet. The two developments on the north sheet were conducted to further delineate depth curves at $36^{\circ}54.0'$ north and $075^{\circ}23.0'$ west. Due to the depth curves running parallel to mainscheme lines, line spacing was run 100 and 200 meters at 70° and 90° angles to the mainscheme lines. The third development on the south sheet was conducted to investigate a $72'$ foot on line mainscheme sounding in the area of $36^{\circ}50.0'$ north and $075^{\circ}22.0'$ west. The investigation revealed an actual sounding of $72'$ feet. Recommend this sounding supersede the chart. Concur

Several mainscheme splits were run on both north and south sheets to insure proper coverage and delineation of these areas.

L. COMPARISON WITH THE CHART See Sec. 7 of the Evaluation Report.

Comparisons were made with Chart 12207, 14th edition, 5 May 1979, at scale of 1:80,000 and chart 12200, 33rd edition, 25 October 1980, at scale of 1:416,944.

Comparisons made with chart 12207, which covers the western half of the survey, indicate good agreement with depths comparing within ± 3 feet. Several larger disagreements were noticed and those of significance are listed below.

<u>Latitude</u>	<u>Longitude</u>	<u>Charted Soundings</u>	<u>Survey Sounding</u>
$36^{\circ}54.2'$ north ✓	$075^{\circ}32.8'$ west ✓	51 ✓	70 63-73
$36^{\circ}51.9'$ north ✓	$075^{\circ}32.7'$ west	63 ✓	77 ✓
$36^{\circ}51.1'$ north ✓	$075^{\circ}32.6'$ west ✓	60 ✓	71 67
$36^{\circ}54.3'$ north ✓	$075^{\circ}34.0'$ west ✓	45 ✓	53 54
$36^{\circ}53.1'$ north ✓	$075^{\circ}32.8'$ west ✓	59 ✓	64

33rd edition, October 25, 1980,
 Comparisons made with chart 12200, which covers the eastern half of the survey, indicate very good agreement with differences generally less than ± 4 feet. Two larger differences of ± 6 feet are located in the areas of $36^{\circ}48.5'N$, $075^{\circ}20.0'W$ and $36^{\circ}52.4'N$, $075^{\circ}20.4'W$.

M. ADEQUACY OF SURVEY See Sec. 7a of the Evaluation Report.

This survey is complete and adequate to supersede the presently charted soundings and prior surveys of this area.

N. AIDS TO NAVIGATION

There are no aids to navigation located within this survey area. ✓

O. STATISTICS

<u>Category</u>	<u>Vesno 2830</u>
Nautical Miles of Sounding lines	986.20
Square Miles of Hydrography	82.6
Total #of Positions	2676
Nansen Casts	1 ✓
T.D.C Casts	2
Bottom Samples	51
Tide Stations	1
Vertical Casts	1

P. MISCELLANEOUS

~~Forty-nine~~
~~Fifty-one~~ bottom samples were taken during this survey, a copy of Oceanographic Log Sheet "M" is included within the appendix. ✓

Supplemental reports will be submitted with other data at the conclusion of the field season. ✓

Q. RECOMMENDATIONS

It is recommended that data compiled for this survey supersede all existing charts and information. Specific recommendations regarding charted features and general bottom topography were made in sections K and L of this report. ✓

R. AUTOMATED DATA PROCESSING

The following programs were used in requiring and processing data for this survey. ✓

<u>Program</u>	<u>Program Name:</u>	<u>Version</u>
RK 112	Hyperbolic R/R Hydroplot	08/04/81
RK 201	Grid, Signal Lattice Plot	04/18/75
RK 211	Range/Range Non-Real Time Plot	02/02/81
RK 300	Utility Computations	10/21/80
RK 330	Reformat and Data Check	05/04/76 ✓
RK 360	Electronic Corrector Abstract	02/02/76
RK 530	Layer Corrections for Velocity	05/10/76
AM 500	Predicted Tide Generator	11/10/72
AM 602	Extended Line Oriented Editor	05/20/75
AM 612	Line Printer Test	03/22/78

S. REFERENCE TO REPORTS

The ship's personnel installed two tide gages during this survey. See field tide note appended. This report, leveling records, and monthly tide records have been submitted to the Tides and Water Levels Branch, Rockville, Maryland. Horizontal Control Reports are available at the Operations Division of the Atlantic Marine Center. The yearly report on Corrections to Echo Soundings will be submitted at the conclusion of the field season. ✓

Respectfully submitted,

Jonathan W. Bailey for
LTJG/NOAA

Jonathan W. Bailey
LTJG, NOAA

APPENDIX B

FIELD TIDE NOTE

FIELD TIDE NOTE ✓

Field tide reduction of soundings were based on predicted tides from Hampton Roads, Virginia which were corrected in accordance with the rezoning scheme provided with the 1980 Project Instructions and was interpolated by the PDP 8/E computer utilizing program AM 500. All times of both predicted and recorded tides are Greenwich Mean Time.

Two tide stations were in operation during hydrography performed by PEIRCE. Station Sandbridge, Virginia (863-9428) was installed and maintained by personnel from PEIRCE. Station Duck, North Carolina (#865-1370) was operational and under the jurisdiction of Atlantic Marine Center, Tides and Water Levels Branch throughout the survey. The location and period of operation of both stations are as follows:

<u>Site</u>	<u>Location</u>	<u>Period of Operation</u>
Sandbridge Pumping Pier Sandbridge, VA	36°41'30" N 075°55'12" W	11 Jun 1981 - 10 Nov 1981
Army Corps of Engineers Pier Duck, NC	36°10'54" N 075°45'00" W	Permanent Station (Primary)

Sandbridge Pumping Pier - Metercraft Model 7602, S/N 705-108 gage was installed on 11 June 1981 and began operation on 12 June 1981. The staff was installed during the 1980 field season and was leveled on 12 June 1981. Fisher-Porter ADR, Model 1551, S/N 6511A5632M2, gage was installed on 11 June 1981 and began operations on 12 June 1981. The same staff, leveled 12 June 1981, was used for both gages.

On 25 June 1981, the ADR gage failed. The paper jammed in the punch block assembly and as a result the punch pins were bent. The gage was removed and returned to A.M.C. for repairs on 28 June 1981. The ADR gage was reinstalled at Sandbridge, VA and commenced operating on 29 June 1981.

On 1 August 1981, the recording paper jammed in the punch block assembly and bent the pins in the gage. On 4 August the problem was corrected by replacing the punch block and a modified strip plate in the field. Total down time for the gage was 63.5 hours. During the down time of the ADR gage, the Metercraft bubbler gage was operational.

On 7 August 1981, the punch block assembly jammed in the ADR gage. The gage was removed and returned to A.M.C. for inspection. On 10 June, a new Fisher-Porter gage was installed at the site (S/N 7601A1469M23). During the replacement time of the new ADR gage, the bubbler gage was operational. Annotations on the bubbler gage marigrams are questionable for this period of time. A copy of a letter regarding the bubbler gage annotations sent to the Chief, Tide Requirements & Acquisitions Branch, Rockville, Maryland accompanies this tide note.

On 7 September 1981, the bubbler gage failed during hydrographic operations. During the down time of the bubbler gage, the ADR gage was operational. Upon inspection of

the gage on 12 September 1981, it was discovered that the orifice was buried below 6" of sand. The problem was rectified by remounting the orifice 2.5 feet above the ocean bottom. The gage was restored to operations on 12 September 1981.

On 16 September 1981 during inspection of the ADR gage, it was found that the gage was punching 12 minutes fast. The conclusion was that the problem resulted from excessive vibration of the pier and partially by the take-up spring on the gage. The spring was readjusted and the gage commenced operating on 17 September 1981.

On 30 October 1981, the punch block jammed on the ADR gage. The gage was removed and returned to AMC for repair. The punch block assembly was replaced and the gage reinstalled at Sandbridge that same day.

All tidal records were removed from the tide station at Sandbridge, VA on 11 November 1981. The tide station operation was discontinued due to completion of the hydrographic field season by PEIRCE.

Levels: Four spirit level runs were made at the Sandbridge station: (1) on 12 June 1981, to establish tide station prior to hydrographic operations; (2) on 19 August 1981, station releveled by personnel from Tides and Water Levels Branch at AMC; (3) on 1 October 1981, to check the elevation of the tide staff after the passage of Hurricane Dennis; and (4) on 16 November 1981, to level at the removal of the tide station. All information and data was forwarded to Tides and Water Levels Branch, Rockville, Maryland.

Zoning: Zoning is based on the pre-zoning scheme noted in the Project Instructions with correctors of -2 hours 30 minutes applied to times of high and low tides and a tide value multiplier of 1.30 applied to heights of the tides.

Duck, North Carolina - A check level was performed on this station on the 5 June 1981 prior to commencement of hydrographic operations. The gage was again leveled on 19 November 1981 at the end of the field season. All data was forwarded to Tide and Water Levels Branch, Rockville, Maryland.

Hampton Roads, Virginia - Reference station number 863-8610.

APPENDIX C

GEOGRAPHIC NAMES LIST

APPENDIX F

LIST OF STATIONS

PE-20-4-81



H-9978

Signal Names / Source Listing

002 COROLLA, 1981

AMC.OPS.

018 BATTERY CRAMER, 198⁰~~1~~

AMC.OPS.

023 CHESAPEAKE LIGHT, 1966

Published Station

002 3 36 22 35633 075 49 49342 250 0000 164670

018 3 36 55 04200 075 59 444⁹¹~~89~~ 250 0006 164670

023 3 36 54 16158 075 42 47123 139 0000 000000

APPENDIX I

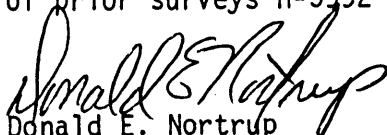
LANDMARKS FOR CHARTS

APPENDIX L

APPROVAL SHEET

APPROVAL SHEET ✓
H-9978

Field operations contributing to the accomplishment of this survey were conducted under my supervision with frequent personal checks of progress and adequacy. This report and the final field sheet have been closely reviewed and found to represent a complete survey adequate to supersede the common coverage portions of prior surveys H-5992 and H-5990 for charting purposes.


Donald E. Nortrup
Commander, NOAA
Commanding Officer
NOAA Ship PEIRCE S-328

NOAA FORM 76-40
(8-74)

Replaces C&GS Form 567.

- TO BE CHARTED
- TO BE REVISED
- TO BE DELETED

REPORTING UNIT
(Field Party, Ship or Office)
NOAA SHIP PEIRCE

STATE
VA.

LOCALITY

~~CHESAPEAKE BAY ENTRANCE~~
20 MILES EAST OF CAPE HENRY

DATE

APPROACH

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

NONFLOATING AIDS OR LANDMARKS FOR CHARTS

The following objects HAVE HAVE NOT been inspected from seaward to determine their value as landmarks.

DATUM

SURVEY NUMBER

OPR PROJECT NO.
D-103-MI/PE81

JOB NUMBER
H-9978

SURVEY NUMBER
PE-20-4-81

CHARTING NAME

DESCRIPTION
(Record reason for deletion of landmark or aid to navigation.
Show triangulation station names, where applicable, in parentheses)
N/A

METHOD AND DATE OF LOCATION
(See instructions on reverse side)

OFFICE

FIELD

CHARTS AFFECTED

ORIGINATING ACTIVITY

- HYDROGRAPHIC PARTY
 - GEODETIC PARTY
 - PHOTO FIELD PARTY
 - COMPILATION ACTIVITY
 - FINAL REVIEWER
 - QUALITY CONTROL & REVIEW GRP.
 - COAST PILOT BRANCH
- (See reverse for responsible personnel)



U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SURVEY
NOAA Ship PEIRCE S-328
439 West York Street
Norfolk, Virginia 23510

September 11, 1981

TO: Chief, Tidal Requirements & Acquisitions Branch
FROM: *Donald E. Taylor*
Commanding Officer
NOAA Ship PEIRCE S-328

SUBJECT: Bubbler Marigrams for August 1981

During the months of June and July, we successfully gathered data from the two tide gages mounted on the Sandbridge Pumping Pier. During the month of August, the ADR gage, with good annotations, remained in operation for most of the month. The Bubbler gage also operated most of the month. However, the Bubbler's time annotations were extremely inconsistent.

The ADR record contains one gap in excess of three days. This gap extends from J.D. 218, 2300Z - J.D. 222, 1712Z. The Bubbler gage was in operation during this period, except for one hour, but its time annotations are questionable.

In an attempt to resolve this problem, overlapping ADR and Bubbler readings were compared at both ends of the ADR "down" period. The ADR readings were hand plotted and mylar overlays were made of the Bubbler readings. The end of gap comparisons indicated that the Bubbler gage time was one hour fast. Green colored annotations to this effect have been made on the Bubbler marigram covering this 3 3/4 day period. It should be emphasized that this is our "best estimate" and a more thorough analysis of the entire month's Bubbler marigram is necessary. The remainder of the month has similar time annotation problems. Apparently many different observers from several sources annotated the marigram during this period. Our tides officer and our contract observer have, again, thoroughly discussed annotations and the first nine days of September have excellent annotations.

Hourly heights normally supplied with this report have not been included because of the ambiguity of the marigram annotation.

The three day, eighteen hour gap exceeds normal hydrographic requirements. If it is impossible to interpolate tidal correctors for the period during which the ADR gage was inoperative resulting in the loss of survey data, we request you advise us as soon as possible.



10TH ANNIVERSARY 1970-1980

National Oceanic and Atmospheric Administration

A young agency with a historic
tradition of service to the Nation

DATE: February 16, 1982

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): 863-9428 Sandbridge, Virginia

Period: June 13-November 9, 1981

HYDROGRAPHIC SHEET: H-9978

OPR: D103

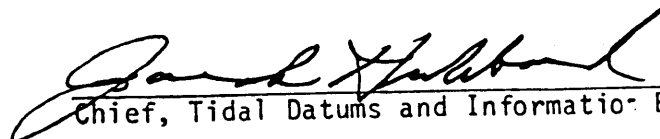
Locality: Delmarvance

Plane of reference (mean lower low water): 2.59 ft.

Height of Mean High Water above Plane of Reference is 3.60 ft.

REMARKS: Recommended zoning:

Apply - 10 minute time correction and x 1.06 range ratio.


Chief, Tidal Datums and Information Branch

ATLANTIC MARINE CENTER
EVALUATION REPORT

REGISTRY NO: H-9978

FIELD NO: PE-20-4-81

Virginia, Atlantic Ocean, 20 Miles East of Cape Henry

SURVEYED: October 20 through November 6, 1981

SCALE: 1:20,000

PROJECT NO: OPR-D103-MI/PE-81

SOUNDINGS: Ross 5000 Digital
Echo Sounder

CONTROL: ARGO

Chief of Party D. E. Nortrup
Surveyed by T. W. Ruszala
..... G. E. Leigh
..... L. F. Simoneaux
..... M. Mozgala
..... J. W. Bailey
..... R. B. Harris
Automated Plot by Xynetics 1201 Plotter (AMC)
Verified and Inked by D. V. Mason

1. INTRODUCTION

- a. No unusual problems were encountered during verification.
- b. Notes in the Descriptive Report were made in red during verification.

2. CONTROL AND SHORELINE

- a. The control is adequately described in sections F and G of the Descriptive Report.
- b. This is an offshore survey and no shoreline is shown on the present survey.

3. HYDROGRAPHY

- a. Crosslines on this survey agree with the main scheme sounding lines within the limits prescribed by the Hydrographic Manual.
- b. The standard depth curves could be drawn in their entirety. Dashed curves and brown curves were used to better delineate the bottom.
- c. This survey adequately delineates the basic bottom and the least depths.

4. CONDITION OF SURVEY

The smooth sheet and accompanying overlays, hydrographic records and reports comply with the requirements of the Hydrographic Manual except as follows:

- a. No comparison was made with prior surveys F.E. 78 WD (1949) and F.E. 225 WD (1975).
- b. No comparison was made with a small section along the eastern edge of Chart 12221, 49th Ed., November 8, 1980, which falls between the area coverage of Charts 12207 and 12200.

5. JUNCTIONS

H-9955 (1981) to the northwest
H-9959 (1981) to the west
H-9972 (1981) to the southwest

On H-9955, the junctional soundings are 1-3 feet shoaler than those on the present survey. The records for H-9955 had already been forwarded to Rockville and could not be checked. A look at the records for H-9978 indicated that the averaging of the sea state on the fathogram trace, coupled with the rounding procedures for changing soundings and tenths to whole soundings could account for the discrepancies in the junctional soundings. The bottom topography is not extremely rugged and does not seem to be the cause of the sounding differences. No displacement of standard depth curves has occurred, although a displacement of the 90 foot supplemental curve in the vicinity of Latitude $36^{\circ}55.6'$, Longitude $75^{\circ}26.0'$, was caused by a 1 foot difference in soundings. The locations of shoals and deeps are in excellent agreement and the discrepancy in soundings is not considered serious enough to make a butt junction. However, in the common junctional area, the shoaler soundings from H-9955 should be charted.

A good junction, with differences of $\pm 1-2$ feet, was made with H-9955 and the junctional curves are complete and require no further consideration.

The junction with H-9972 is discussed in its Evaluation Report.

There are no contemporary junctional surveys to the northeast, east or southeast of the present survey.

6. COMPARISON WITH PRIOR SURVEYS

- A. H-5990 (1:40,000) 1935
H-5992 (1:40,000) 1935

These two prior surveys together cover the entire area of the present survey.

In general, these prior surveys agree with the present survey within 1-5 feet, with the present survey deeper by these amounts most of the time. Scattered soundings are up to 14 feet deeper on the prior surveys. The largest differences in depths occur in the deeps between sand waves. On H-5990, deeper areas may have naturally filled in or they may represent errors in reading the old style flashing light echo sounder. On H-5992, the more extreme differences in depths are probably due not so much to natural changes as to the inherent inaccuracies in the Radio Acoustic Ranging (R.A.R.) method of positioning. Where R.A.R. positions were apparently wrong, dead reckoning and "logical" shifting of soundings were used to determine positions. The Descriptive Report for this survey has a 5-page discussion of the problems encountered and the solutions used when plotting positions.

The shoal areas bounded by the 60 foot depth curve still exist along the western edge of the present survey although they have been reduced somewhat in size and are 2-4 feet deeper than in the past.

The locations of the highs and lows on the prior and present surveys indicate a relatively stable bottom that has experienced some deepening during the intervening 46 years.

The present survey is adequate to supercede these prior surveys in the common area.

- B. F.E. 78 WD (1949)
F.E. 225 WD (1975)

There are no conflicts between the present survey depths and the effective wire-drag depths.

The wreck of the FRANCIS E. POWELL located in Latitude $36^{\circ}49.03'$, Longitude $75^{\circ}23.93'$, on F.E. 78 WD, and the wreck of the CAPTAIN RICK located in Latitude $36^{\circ}47.87'$, Longitude $75^{\circ}29.58'$, on F.E. 225 WD should both be retained as charted.

OK

7. COMPARISON WITH CHARTS

- No. 12200 (33rd Edition, October 25, 1980)
No. 12207 (14th Edition, May 5, 1979)
No. 12221 (49th Edition, November 8, 1980)

A. Hydrography

Eighty-eight percent of the charted hydrography originates with the previously discussed prior surveys and is adequately discussed under that comparison. The remaining 12% of charted hydrography comes from not readily ascertainable sources. Of those soundings charted from these sources, most can be disregarded because the present survey shows natural deepening in the areas where they were charted. Only the six soundings discussed below need further consideration because they tend to be shallower than present survey depths by amounts greater than the 1-5 feet trend discussed in Section 6 of this report, and they were not investigated by the field unit. The sources of these soundings should be researched and thoroughly evaluated by the chart compiler to determine whether these soundings should be retained on the chart.

1) A 51-foot charted depth is in Latitude $36^{\circ}54.15'$, Longitude $75^{\circ}32.83'$. The depth range in this area on the present survey is 63-73 feet.

2) A 45-foot charted depth is in Latitude $36^{\circ}54.3'$, Longitude $75^{\circ}34.05'$. This depth falls between sounding lines showing 54 feet soundings on the present survey. Prior survey H-5990 also shows a 54-foot depth here. *45 Sounding restored at Prod Sta 9 Chart 12221 5/3/84 JWC*

3) A 65-foot charted depth is in Latitude $36^{\circ}53.55'$, Longitude $75^{\circ}32.75'$. This depth falls between present survey sounding lines which show no indication of sand waves. Present survey depths are 71 feet in the area. *9959*

4) A 63-foot charted depth is in Latitude $36^{\circ}51.88'$, Longitude $75^{\circ}32.7'$. This depth falls between present survey sounding lines which show no indication of sand waves. Present survey depths are 77-78 feet in the area. *53"*

5) A 60-foot charted depth is in Latitude $36^{\circ}51.13'$, Longitude $75^{\circ}32.58'$. Present survey depths are 71 feet and there are no sand waves in the area. *35*

6) A 63-foot charted depth is in Latitude $36^{\circ}48.6'$, Longitude $75^{\circ}32.43'$. Present survey depths are 72 feet and there are no sand waves in the area. *26*

Attention is directed to the following:

1) One Presurvey Review Item (number 110) was investigated by the field. The Descriptive Report (Section K) addresses this item.

2) On chart 12207, a 55 foot sounding charted in Latitude $36^{\circ}53.6'$, Longitude $75^{\circ}34.3'$, is actually a 58 foot sounding from H-5990.

Except where noted above or discussed elsewhere in this report, the present survey is adequate to supersede the charted hydrography in the common area.

B. Aids to Navigation

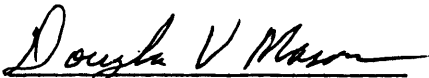
There are no fixed or floating aids to navigation within the area covered by the present survey.

8. COMPLIANCE WITH INSTRUCTIONS

Except as listed elsewhere in this report, this survey adequately complies with the Project Instructions.

9. ADDITIONAL FIELD WORK

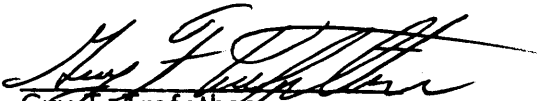
This is an excellent basic survey. Future wire drag work should be considered to verify or disprove Presurvey Review Item No. 110.



Douglas V. Mason
Cartographic Technician
Verification of Data



Charles D. Meador
Cartographer
Evaluation and Analysis



Guy T. Trefethen
Senior Cartographic Technician
Verification Check

INSPECTION REPORT
H-9978

The completed survey has been inspected with regard to survey coverage, delineation of depth curves, development of critical depths, cartographic symbolization, and verification or disproval of charted data. The digital data have been completed and all revisions and additions made to the smooth sheet during survey processing have been entered in the magnetic tape record for this survey. Final control, position, and sounding printouts of the survey have been made. The survey complies with National Ocean Service requirements except as noted in the Evaluation Report. The survey records comply with NOS requirements except where noted in the Evaluation Report.

Inspected



Robert G. Roberson
Acting Chief, Verification Section



Karl Wm. Kieninger, CDR, NOAA
Chief, Hydrographic Surveys Branch

Approved 27 June 1983



Richard H. Houlder, RADM, NOAA
Director, Atlantic Marine Center

GEOGRAPHIC NAMES

H-9978

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

ATLANTIC OCEAN (TITLE)

CAPE HENRY (TITLE)

~~CHESAPEAKE BAY (TITLE)~~

VIRGINIA (TITLE)

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Approved:

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Chris E. Harrington

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Chief Geographer - N/C62x5

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5 APRIL 1983

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HYDROGRAPHIC SURVEY STATISTICS

H-9978

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

RECORD DESCRIPTION		AMOUNT	RECORD DESCRIPTION		AMOUNT
SMOOTH SHEET		one	SMOOTH OVERLAYS: POS. ARC, EXCESS		2
DESCRIPTIVE REPORT		ONE	FIELD SHEETS AND OTHER OVERLAYS		8 ⁴ - Smooth 1 - raw
DESCRIPTION	DEPTH/POS RECORDS	HORIZ. CONT. RECORDS	SONAR-GRAMS	PRINTOUTS	ABSTRACTS/SOURCE DOCUMENTS
ACCORDIAN FILES				1 raw Plo bathograms	Misc. data strip charts
ENVELOPES					1 Sounding Volume
VOLUMES					
CAHIERS					
BOXES				2 smooth Plo	Misc. data strip charts

SHORELINE DATA

SHORELINE MAPS(List):

PHOTOBATHYMETRIC MAPS(List):

NOTES TO THE HYDROGRAPHER(List):

SPECIAL REPORTS(List):

NAUTICAL CHARTS(List):

OFFICE PROCESSING ACTIVITIES

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

PROCESSING ACTIVITY	AMOUNTS		
	VERIFICATION	EVALUATION	TOTALS
POSITIONS ON SHEET			2675
POSITIONS REVISED	1	0	1
SOUNDINGS REVISED	307	3	310
CONTROL STATIONS REVISED	0	0	0
	TIME - HOURS		
	VERIFICATION	EVALUATION	TOTALS
PRE-PROCESSING EXAMINATION	25	0	25
VERIFICATION OF CONTROL	3	0	3
VERIFICATION OF POSITIONS	54	0	54
VERIFICATION OF SOUNDINGS	101	20	121
VERIFICATION OF JUNCTIONS	7	6	13
APPLICATION OF PHOTOBATHYMETRY	0	0	0
SHORELINE APPLICATION/VERIFICATION	0	0	0
COMPILATION OF SMOOTH SHEET	21	0	21
COMPARISON WITH PRIOR SURVEYS AND CHARTS	0	10	10
EVALUATION OF SIDESCAN SONAR RECORDS	0	0	0
EVALUATION OF WIRE DRAGS AND SWEEPS	0	5	5
EVALUATION REPORT	0	25	25
OTHER Digitizing & Misc. E&A	13	8	21
TOTALS	224	74	298

Pre-processing Examination by G.F. Trefethen & R.H. Whitfield	Beginning Date Jan. 6, 1982	Ending Date Jan. 8, 1982
Verification of Field Data by D.V. Mason, M.W. Holloway & Whitfield	Time(Hours) 186	Ending Date Nov. 10, 1982
Verification Check by G.F. Trefethen & C.D. Meador	Time(Hours) 44	Ending Date Nov. 18, 1982
Evaluation and Analysis by C.D. Meador	Time(Hours) 74	Ending Date Dec. 29, 1982
Inspection by CDR. K.W. Kieninger & R.G. Roberson	Time(Hours) 3	Ending Date June 24, 1983

