

10193

Diagram No. 77-3

NOAA FORM 76-35A

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

DESCRIPTIVE REPORT

Type of Survey .. Hydrographic

Field No. HFP-10-4-85

Registry No. H-10193

LOCALITY

State Maryland

General Locality .. Chesapeake Bay

Sublocality Cedar Point

19 85-86

CHIEF OF PARTY
LCDR K.W. Perrin

LIBRARY & ARCHIVES

DATE November 5, 1987

10193

☆U.S. GOV. PRINTING OFFICE: 1985-566-054

Area 1
CHTS

12264
12230
12260
12284
13003-nc

TO SIGN OFF SEE:
"RECORD OF APPLICATION TO CHARTS"
off limits of Chart 2-11-85 HR

HYDROGRAPHIC TITLE SHEET

H-10193

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.

HFP 10-4-85

State Maryland

General locality Chesapeake Bay

Locality CEGAR POINT ~~Approaches to Patuxent River~~

Scale 1:10,000 Date of survey July 29¹⁹⁸⁵ to February 7, 1986

Instructions dated June 27, 1985 Project No. OPR S-E211-HFP-85

Vessel NOAA Launch 1020 *Hydrographic Field Party No. 4*

Chief of party LCDR Kenneth W. Perrin

Surveyed by LT(jg) J.^{H.} Maddox, E.^{L.} Martin, D.^{M.} Bryant, R.^{W.} Adams, C.^{A.} Dowty,

Soundings taken by echo sounder, hand lead, pole *Raytheon DSF 6000N echo sounder*
R.L. KEENE, F.L. Saunders

Graphic record scaled by J.M., E.M., D.B., R.A., C.D., F.S., R.K.

Graphic record checked by J.M., E.M., D.B., R.A., C.D., F.S., R.K.

Protracted by N/A Automated plot by AMC-EDP (AMC)
XINTELIS 1201 PLOTTER

Verification by AMC, Hydrographic Surveys Branch *D.V. MASON*

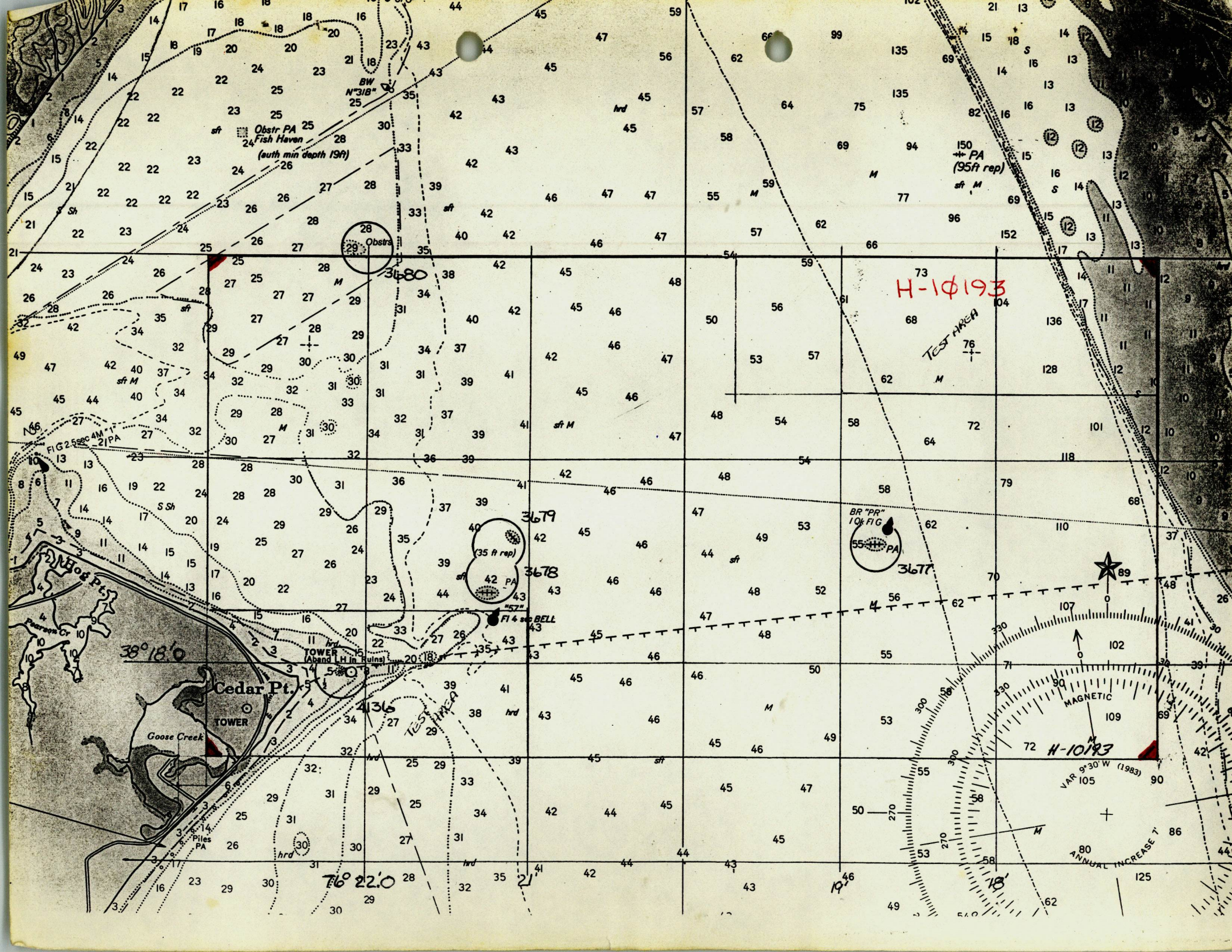
Soundings in fathoms (feet) at MLW (MLLW) *MLLW*

REMARKS: Amendment to Instructions: Change no. 1 July 10, 1985,
change no. 2 July 24, 1985

*NOTES IN DESCRIPTIVE REPORT WERE MADE IN RED DURING OFFICE
PROCESSING.*

AWOIS/Surf M&M 1/7/88

Notes in Descriptive Report in blue ink made during examination.
84-15-97



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* DATA REMOVED FROM ORIGINAL DESCRIPTIVE REPORT AND FILED WITH
FIELD DATA.

DESCRIPTIVE REPORT
TO ACCOMPANY
HYDROGRAPHIC SURVEY H-10193
HFP-10-4-85

Scale 1:10,000

Chief of Party: Lt. Cdr. Kenneth W. Perrin
Officer-in-Charge: Lt. (jg) Jason H. Maddox
Hydrographic Field Parties Section
Hydrographic Field Party 4
Launch 1020

A. PROJECT

This survey was conducted under Project Instructions S-E211-HFP-85, Solomons Island, Maryland, dated June 27, 1985 and amended by Change No. 1, dated July 10, 1985 and Change No. 2, dated July 24, 1985

B. AREA SURVEYED

The area surveyed was the Chesapeake Bay extending from Cedar Point and the mouth of Patuxent River eastward toward Hooper Islands at a scale of 1:10,000.

The actual boundaries of the survey are as follows:

LAT. 38°20'00"N
LONG. 76°23'00"W

LAT. 38°20'00"N
LONG. 76°17'00"W

LAT. 38°17'30"N
LONG. 76°23'00"W

LAT. 38°17'30"N
LONG. 76°17'00"W

This survey was conducted from July 29, 1985 (DN 210) to February 7, 1986 (DN 38).

C. SOUNDING VESSEL

All soundings were obtained from Launch 1020, a 29 ft. Jensen Type I survey launch borrowed from the NOAA Ship MT. MITCHELL for this project. All survey records are annotated with the vessel number.

D. SOUNDING EQUIPMENT AND CORRECTIONS TO ECHO SOUNDINGS

A Raytheon DSF 6000N, S/N B041N, was used to obtain soundings on July 29, 1985 (DN 210). On July 31, 1985 (DN 212) this unit burned a resistor and was exchanged with another Raytheon DSF 6000N, S/N B036N, by the the NOAA Ship PEIRCE.

On August 1, 1985 (DN 213) the Raytheon DSF 6000N, S/N B036N, experienced problems in the scale of the fathogram. The scale lines began to waiver. Also, an exaggeration of distance between foot marks were observed at different depths. This unit was taken back to the NOAA Ship PEIRCE and exchanged for the original DSF 6000N, S/N B041N. This unit was used for the remainder of the survey. The data collected by the DSF 6000N, S/N B036N, obtained from the NOAA Ship PEIRCE was rejected.

Bar checks were taken every day and a Martek, Mark IV. No. 222, cast taken once each week. All bar check data agreed very well with one another and were compared to the average of the Martek casts. The average of the Martek casts was used to generate two velocity tables. Velocity Table I is data obtained from July 29, 1985 to August 14, 1985 (DN 210 - DN 226 respectfully). On these dates the Raytheon DSF 6000N was operating in automatic high frequency gain and it is believed that all inherited instrument errors are consistent. Velocity Table II is data obtained from August 15, 1984 to December 4, 1985 (DN 227 - DN 338 respectfully). On these dates the Raytheon DSF 6000N was operating in manual high frequency gain number six on the dial. This reduced the high frequency noise on the fathogram observed when the unit was running in auto mode. With the consistent setting of gain, all inherited errors should remain the same. It was observed that an instrument error of -0.2 ft. was seen on both Tables I and II. Correctors for instrument error are applied via TC/TI tapes. *SEE ALSO SECTION 4.d. OF THE EVALUATION REPORT.*

Velocity corrections from Tables I & II were derived from "VELTAB", a program written for the IBM-PC. Graphs were constructed for these tables to show trends, and are included in the Appendix. *SEE PAGES 20 THROUGH 23 FOR TABLES I AND 2. FILED WITH FIELD RECORDS*

Fathometer corrections from Table III were also obtained using an IBM-PC program "BARTAB". A curve for this table was drawn and included in the Appendix. *SEE PAGES 24 AND 25 FOR TABLE 3. FILED WITH FIELD RECORDS.*

Velocity Table III is derived from bar checks taken on DN 35 and 37. *SEE PAGE 26 FOR BAR CHECK ABSTRACT FILED WITH FIELD RECORDS.*

A static transducer depth of 1.6 ft. was applied to all DSF 6000N soundings via the corrector tape. Settlement and squat tests were run on 19 July, 1985 (DN 200) and 29 September, 1985 (DN 272) at the south eastern entrance of Third Cove, on the property of N.A.S. Solomons Island Annex. Correctors for settlement and squat are applied via the TC/TI tape. All data pertaining to the fore mentioned corrections to soundings are appended at the end of this report. *SEE PAGES 27 THROUGH 33 FOR SETTLEMENT AND SQUAT DATA FILED WITH FIELD RECORDS.*

No Nansen casts were taken to check the Martek because necessary equipment was not available. A Pre-Deployment Calibration sheet is included in the accordion file containing survey data.

Bar check lines were measured at the beginning of the project and will be measured at the end. No corrections are to be applied to the bar check lines.

E. SURVEY SHEETS (FIELD)

All field sheets were prepared by HFP-4 personnel using Digital PDP8/e computer and a Houston DP-3 Complot Plotter. Boatsheets, rough plots, overlays, and final field sheets are included with this survey.

All mainscheme hydrography, aids to navigation, labels, and bottom samples are plotted on the final field sheet. All crosslines, developments, and pick-up work are plotted on the overlay sheet. All shoal soundings have been brought through the final field sheet and any soundings removed are marked in pencil with an arrow near sounding's position.

F. CONTROL STATIONS

All horizontal control stations were historic Third-order, Class I horizontal control stations or new stations established by N/MOA2x1. All are referred to the North American 1927 datum and are listed in the appendix of this report. *SEE PAGE 41 FOR A LIST OF STATIONS.*

G. HYDROGRAPHIC POSITION CONTROL

The positioning control system used for this survey was the Motorola Mini-Ranger Falcon 484 positioning system.

The electronic equipment used for this survey follows:

Launch 1020

S/N

Range Processing Unit	E0141
Control Display Unit	E0002
Master R/T unit	E2919

Shore Stations

Remote unit Code 1	E2890
Remote unit Code 2	E2909
Remote unit Code 4	E2924
Remote unit Code 5	E2889
Remote unit Code 6	E2922

On DN 244, September 1, 1985, Code 4, S/N E2924, was taken from a shore station and was replaced by Code 1, S/N E2890. A final baseline of Code 4 was achieved prior to the unit being removed.

On DN 266, September 23, 1985, Code 5, S/N E2889, failed and was replaced by Code 2, S/N E2909. A final baseline of Code 5 was achieved prior to the unit failing.

All daily system checks were done once every day and a critical system check once each week. No other problems were encountered during the operation of this survey. The daily system checks were done on a floating aid (Chesapeake Bay Channel Buoy "57") and the system checks showed shaky results. But these days when daily system checks were made, winds were observed to be the main cause of the disagreement. However, all critical system checks show the positioning of the Mini-Ranger to be accurate despite the anomalous results of the daily system checks. All records were retained.

Additional control and a secondary three-station ARGO DM-54 positioning net was used during the survey to provide test input data for SDS III. All data was recorded by SDS III equipment and is in their possession. This system was critically calibrated twice daily on a fixed point and all calibration data submitted to N/CG211. The arrangement of this system could not be recorded by the conventional data acquisition of the HYDROPLOT. The Mini-Ranger Falcon is the only position system used for controlling the survey data submitted to AMC.

H. SHORELINE SEE ALSO SECTION 2.D. OF THE EVALUATION REPORT.

There are no recent photogrammetric source data for this project. Shoreline for field sheets are from the maps listed below.

Registry No.	Scale	Year
=====	=====	=====
T-854 ² 1	1:10,000	1942-43

All shoreline features were verified within the project limits of this survey that could be reached by a Type I survey launch. No gross discrepancies were observed and all minor discrepancies are shown in red on the final field sheet.

No shoreline shown in red ink on field sheet.

There are two control stations seaward of the HWL-012 Drum Pt. Lt. 2 and 019 Hooper's Island Lighthouse. Neither station is within the sheet limits.

I. CROSSLINES SEE ALSO SECTION 3.2. OF THE EVALUATION REPORT.

Crosslines comprise 25.6 miles or 10.03% of the mainscheme hydrography. All crosslines agree to within one foot or less except in the southern area of the sheet located on long. 76° 17.07' 30"W. where depths disagree 2-3 ft. The discrepancy is due to the slope of the bottom and high winds bringing up more water in the bay.

J. JUNCTIONS SEE ALSO SECTION 5. OF THE EVALUATION REPORT.

This survey junctions with H-9826, a 1:5,000 scale survey, dated 1979. All soundings agree very well with this survey falling within 0-2 feet. The 30-ft. contour line and all 30-ft. soundings which are observed outside this 30-ft. contour have been found and agree very well with this current survey.

K. COMPARISON WITH PRIOR SURVEYS SEE ALSO SECTION 6. OF THE EVALUATION REPORT.

Comparisons were made with the following prior surveys:

Registry Number	Scale	Year Surveyed
FE-27533	1:20,000	1985
H-9826	1:5,000	1979
H-7092	1:10,000	1946
H-7094	1:20,000	1945-1946
H-6876	1:10,000	1944

~~Tidal datum correctors for this survey were extracted from the 1985 volume of tide tables for the East Coast and South American areas. Predicted tides were abstracted from reference station in Baltimore, Md. on a diurnal basis. These tides were then referred to the area of our working grounds off of Solomons, Md. in the Chesapeake Bay. Unfortunately, the predicted tides from Baltimore should have been picked on a semidiurnal basis in order to have a correct predicted tape generated for tides during times of actual hydrography. The month's involved in the diurnal predictions are from July - December 1985. Pick-up work done in February 1986 have predictions based on semidiurnal ranges. Therefore, any discrepancy of soundings and contours shown on field plots should be accounted for by reasons implied in this context.~~

Prior survey H-9826, which is also a junction survey, shows very good agreement of all soundings. Refer also to Section J.

Prior survey H-7092 shows very good agreement with this survey. All depths outside the six-foot contour agree within 0-2 ft. of each other. Disagreement of up to four feet. does occur inside the six-foot contour. This area, located behind the

Abandoned Light House off of Cedar Point has undergone considerable change since the prior survey. The prior shows a ½ ft. shoal located at lat. 38°17'50"N, long. 76°22'20"W. Hydrography was conducted with a Type I launch throughout this area recording depths of 4-5 ft. This area is also influenced by heavy currents and at the time of this survey this area was considerably deeper than what it had been in 1946. CONSIDER ½ FT SOUNDING DISPROVED BY PRESENT HYDROGRAPHY. CONCUR

An 18 ft. sounding located at lat. 38°18'02"N, long. 76°21'40"W was searched for and found. Hydrography was conducted four (4) times over this area and a star pattern development was made during slack current. A 19 ft. least depth was recorded on the launch's DSF 6000N Fathometer. This sounding was recorded during a time of very high tidal influences and it is believed that with real tidal information this sounding would be reduced to 18 ft. 19 FT SOUNDING FOUND IN LATITUDE 38°18'02.04"N LONGITUDE 76°21'38.43"W. 19 IT IS RECOMMENDED THE 18 FT SOUNDING BE DELETED, AND REPLACED BY A 19 FT SOUNDING FROM PRESENT SURVEY. CONCUR

Prior survey H-7094 shows very good agreement with this survey. All depths agree within 0-2 ft. of each other except for depths greater than 100 ft. on the eastern portion of the survey area and in the Chesapeake channel. The prior shows deeper depths of up to nine feet. It is possible that a "filling - in" of the channel has occurred since the prior survey. The channel is bordered by a very steep slope rising on the east side and the depths agree very well on the top of this submarine embankment.

Both prior surveys H-7092 and H-7094 represent the soundings on Chart 12264, 22nd Edition, 1983. It is evident by this survey that a long term change is occurring. Erosion of 0-2 ft. has occurred on the western portion of the Bay and deposition on the eastern portion filling the channel with sediment.

Prior survey H-6876 shows very good agreement with this survey. All depths otherwise agree within 0-2 feet of each other.

L. COMPARISON WITH THE CHART SEE ALSO SECTION 7.a. OF THE EVALUATION REPORT.

This survey was compared with Chart 12264, 1:40,000 scale, 22nd Edition, 1983.

All presurvey review items were investigated. SEE ALSO SECTION 4.b. OF THE EVALUATION REPORT.

AWIS PSR 3677 was a 30-ft. work boat reported sunk at lat. 38°18'35.5"N, long. 76°18'47.2"W. This item was investigated by Fathometer search and not found. Additional investigation was conducted by NOAA Ships RUDE & HECK during the same time of operations on this survey. Recommend wreck be deleted from chart. SEE ALSO SECTION 6.b. OF THE EVALUATION REPORT. CONCUR

^{Item}
 ANOIS PSR 3678 was a 30-ft. cabin cruiser sunk at lat. 38°18'21"N, long. 76°21'14"W. This item was investigated by Fathometer search and not found. Additional investigation was conducted by NOAA Ships RUDE & HECK during the same time of operations on this survey. ~~Recommend wreck be deleted from chart.~~ *NO WORK ACCOMPLISHED BY RUDE/HECK IN 1985. SEE ALSO SECTION 7.a.1) OF THE EVALUATION REPORT.*

ANOIS PSR item 3679 was a sunken barge located at lat. 38°18'37"N, long. 76°21'05"W. This item was investigated by Fathometer search and not found. Additional investigation was conducted by

NOAA Ships RUDE & HECK during the same time of operations on this survey. ~~Recommend wreck be deleted from chart.~~ *NO WORK ACCOMPLISHED BY*

RUDE/HECK IN 1985. SEE ALSO SECTION 6.a. OF THE EVALUATION REPORT.

ANOIS PSR item 3680 was two obstructions located at lat. 38°20'03"N, long. 76°22'05.5"W. This item was investigated by fathometer search and not found. No other investigation was attempted.

~~Recommend obstructions be retained on chart.~~ *CONCUR SEE ALSO SECTION 6.a. OF THE EVALUATION REPORT.*

ANOIS PSR item 4136 is a rock awash located at lat. 38°17'57"N, long. 76°22'09.4"W. This item was searched for and found.

~~Recommend rock awash be retained at presently charted position.~~ *DO NOT CONCUR. SEE ALSO SECTION 7.a.2) OF THE EVALUATION REPORT.*

Soundings taken during this survey agree very well with the chart, except in the areas of the six-foot contour, as described in Section K. of this report, a 24-ft. shoal, and numerous 30-ft. soundings in the northwestern portion of the survey. *CONCUR*

Tidal datum correctors for this survey were extracted from the 1985 volume of tide tables for the East Coast and South American areas. Predicted tides were abstracted from reference station in Baltimore, Md. on a diurnal basis. These tides were then referred to the area of our working grounds off of Solomons, Md. in the Chesapeake Bay. Unfortunately, the predicted tides from Baltimore should have been picked on a semidiurnal basis in order to have a correct predicted tape generated for tides during times of actual hydrography. The month's involved in the diurnal predictions are from July - December 1985. Pick-up work done in February 1986 have predictions based on semidiurnal ranges. Therefore, any discrepancy of soundings and contours shown on field plots should be accounted for by reasons implied in this context.

The six-foot contour which bounds Cedar Point and the Abandoned Light House has shifted towards shore giving way to deeper depths in the area. The ½-ft. shoal doesn't exist as described in Section K. of this report. *CONCUR*

On the northwestern portion of the survey, many 30-ft. shoals were discovered. Each shoal was developed by star pattern fatho-search for a least depth and shoal extension. *SEE ALSO SECTION 3.c. OF THE EVALUATION REPORT.*

All least depths were brought through on the final field sheet overlay and contoured. It is recommended that all of the following soundings be charted at these locations: *CONCUR*

SOUNDINGG.P.

29-28	Lat. 38°19' ²⁴ 23"N, Long. 76°22' ⁰⁷ 09"W
32-31	Lat. 38°19'13"N, Long. 76°21'13"W ^{46.5"}
30-29	Lat. 38°19'13"N, Long. 76°22'15"W
29	Lat. 38°19'30"N, Long. 76°22'16"W
29	Lat. 38°19'09"N, Long. 76°22'14"W
29-28	Lat. 38°19'34"N, Long. 76°22'15"W
28-27	Lat. 38°19'15"N, Long. 76°22'33"W
31-28	Lat. 38°19'27"N, Long. 76°21'52"W
31-30	Lat. 38°19'32"N, Long. 76°21'43"W
29-30	Lat. 38°19'23"N, Long. 76°22'18"W
30'S	Lat. 38°19'23"N, Long. 76°22'11"W
26	Lat. 38°19'27"N, Long. 76°22'16"W - Isolated shoal sdg. in surrounding 30-ft depths

All soundings were plotted using corrected predicted tides.

(includes 23-foot depths)
 * ~~ALL~~ 24-foot shoal has been found at lat. 38°18'30"N, Long. 76°22'00"W extending to lat. 38°18'08"N, long. 76°21'31"W. Two developments were conducted over this area using corrected predicted tides. Again, the contours and least depths have been brought through on the final field sheet overlay.

SEE ALSO SECTIONS 3.C. AND 4.A. OF THE EVALUATION REPORT.

The following shoals have been found and developed:

SOUNDINGG.P.

35-33-36	Lat. 38°18'51"N, Long. 76°21'45"W - depicts gradual bottom slope
29	Lat. 38°18'08"N, Long. 76°21'22"W
30'S	Lat. 38°18'11"N, Long. 76°21'17"W
14	Lat. 38°18'01"N, Long. 76°21'44"W
14'S	Lat. 38°18'00"N, Long. 76°21'46"W
13-4	Lat. 38°18'00"N, Long. 76°21'50"W
22	Lat. 38°18'17"N, Long. 76°21'57"W * Falls about 100 meters south of 24-ft shoal.
24	Lat. 38°18'22"N, Long. 76°21'56"W
24	Lat. 38°18'27"N, Long. 76°21'59"W
19	Lat. 38°18'02"N, Long. 76°21'39"W
23	Lat. 38°18'02"N, Long. 76°21'30"W

Most of the

All above soundings fall outside their respected contours and have been brought through to the final field sheet overlay.

Recommend that all acquired soundings listed be charted. CONCUR

significant differences

No other ~~discrepancies~~ were found in the comparison with the chart.

There were no newly found dangers to navigation. CONCUR

M. ADEQUACY OF SURVEY

This survey is complete and adequate to supersede the presently charted soundings and prior surveys. CONCUR. SEE ALSO SECTIONS 6.9 AND 9.1 OF THE EVALUATION REPORT.

6.9 AND 9.1 OF THE EVALUATION REPORT.

N. AIDS TO NAVIGATION *SEE ALSO SECTION 7.b. OF THE EVALUATION REPORT.*

The following landmarks, which are visible from the survey area; are also triangulation stations, and have been verified by theodolite cuts:

- (1) COVE PT. LIGHTHOUSE (1848) 10 sec. 45 Ft. 14M RBN HORN
- (2) CEDAR POINT LIGHTHOUSE now revised to TOWER (Abandoned L.H. in Ruins)
- (3) HOOPERS ISLAND LIGHTHOUSE (1902) FL 6 sec. 63 ft. 10M HORN (Sept 15- June 1)
- (4) DRUM POINT LIGHT "2" FL 2.5 sec. 22 ft. 10M "2" HORN
- (5) PATUXENT RIVER LIGHT "4" FL R 2.5 sec. 3M "4"

The characteristics of the following landmarks and fixed aids visible from the sheet area were verified visually. Positions were not determined. *SEE ALSO SECTION 4.c. OF THE EVALUATION REPORT.*

	<u>LATITUDE N.</u>	<u>LONGITUDE W.</u>
DOME	38°15'52.7"	76°24'00.8"
NAS BASIN ENT LT 1 F G	38°16'01.0"	76°23'39.0"
NAS BASIN ENT LT 2 F R	38°16'06.0"	76°23'37.9"
TANK	38°15'53.1"	76°24'52.6"
TANK	38°16'10.5"	76°24'12.1"
TANK	38°16'16.0"	76°27'02.3"
AREO LIGHT ROT W & G	38°16'56.3"	76°26'00.8"
TOWER	38°17'21.8"	76°25'23.6"
DOME	38°17'22.0"	76°25'26.0"
PATUXENT RIVER LIGHT "3" FL G	38°18'33.5"	76°25'06.0"
CEDAR POINT TOWER	38°17'46.5"	76°22'43.8"
SPIRE	38°18'58.4"	76°13'40.2"
PATUXENT RIVER LIGHT "1" FL G	38°19'01.0"	76°24'04.0"
TOWER	38°19'55.7"	76°13'50.6"
TAR BAY CH LT 3 FL	38°21'03.5"	76°15'41.1"
TAR BAY CH LT 2 FL R	38°21'04.1"	76°15'56.9"
TAR BAY CH LT 1 FL G	38°21'06.4"	76°16'21.0"
LITTLE COVE PT. TANK	38°21'33.8"	76°23'33.4"
COVE PT S. MOR DOL LT C F1 R	38°23'59.9"	76°22'55.9"
COVE PT PLAT FORM LT B QK FL	38°24'07.5"	76°23'08.5"
COVE PT PLAT FORM LT A QK FL	38°24'08.4"	76°23'09.4"
COVE PT MID MOR DOL LT D QK FL	38°24'10.0"	76°23'04.7"
COVE PT N. MOR DOL OT E QK FL	38°24'20.4"	76°23'13.5"

Information obtained from DIPFILE listing of Chart 12264. All floating aids were located by conventional hydrographic methods and are found adequate for the purpose in which they serve.

O. STATISTICS

	<u>TOTAL</u>
VESNO 1020	
Total number of positions	1852
Nautical miles of sounding lines	316.9
Square miles of hydrography	22
Bottom samples	13
Tide gage stations	2
Martek casts	5

P. MISCELLANEOUS

Thirteen bottom samples are taken to verify bottom characteristics, a copy of the Oceanographic Log Sheet-M is included in Appendix "H" of this report.

There were no anomalous or dangerous currents observed in the project area.

Q. RECOMMENDATIONS

Specific recommendations can be found in Sections K. and L. of this report.

R. AUTOMATED DATA PROCESSING

Programs used during the field processing of this survey are as follows:

PROGRAMS	DESCRIPTION	VERSION
RK 112	Range-Range Real Time Plot	04/23/84
RK 201	Grid, Signal, Lattice Plot	04/18/75
RK 211	Range-Range Non-Real Time Plot	02/13/84
RK 300	Utility Computations	02/05/76
RK 330	Reformat and Data Check	05/04/76
RA 362	RK 330 & AM 602 Combined	08/20/84
RK 407	Geodetic Inverse/Direct Computations	09/25/81
AM 500	Predicted Tide Generator	11/10/72
RK 530	Velocity Correction Computations	05/10/76
AM 602	Elinore	12/08/82

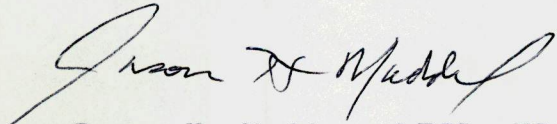
S. REFERRAL TO REPORTS

The following reports for Project S-E211-HFP-85 have been submitted.

Reports	Submitted
Horizontal Control	N/MOA2x1, AMC
Mini-Ranger Electronic Calibration	Verification, AMC

Reports	Submitted
=====	=====
Coast Pilot	N/CG243
Chart Inspection	N/CG243
DIPFILE	N/CG243
Currents	N/CG243

Respectfully Submitted,



Jason H. Maddox, LTJG, NOAA
OIC, HFP-4

SIGNAL TAPE LISTING

OPR-S-E211-HFP-85

HFP 10-4-85

H-10193

001	5	38	08	27323	076	19	21824	250	0000	164670	PT NO PT AZ, 1985
002	4	38	19	09645	076	25	18101	250	0000	164670	DRUM PT, 1985
003	1	38	23	07943	076	22	57633	250	0000	164670	COVE ARGO, 1985
004	6	38	19	34054	076	27	56959	250	0000	000000	TELL, 1943
005	6	38	18	58744	076	27	21050	250	0000	000000	SOLOMONS IS., 1985
007	6	38	18	44891	076	28	35202	250	0000	000000	LEWIS, 1985
008	6	38	19	20355	076	29	28908	250	0000	000000	KINGSTON CREEK, 1985
009	6	38	19	23299	076	29	40653	250	0000	000000	LITTLE KINGSTON, 1985
010	6	38	19	46548	076	29	02495	250	0000	000000	PT PATIENCE, 1985
011	6	38	19	55284	076	29	25147	250	0000	000000	CUCKOLD, 1985
012	6	38	19	07805	076	25	16691	139	0000	000000	DRUM PT LT. "2", 1985
013	6	38	18	55632	076	26	27640	139	0000	000000	PAX RIVER LT. "4", 1985
014	6	38	18	44242	076	27	17829	139	0000	000000	PAX RIVER LT. "6", 1985
015	6	38	19	41011	076	29	04287	139	0000	000000	PAX RIVER LT. "8", 1985
016	6	38	20	13073	076	29	22538	139	0000	000000	CUCKOLD CREEK LT. "9", 1985
017	6	38	18	54510	076	28	45753	250	0000	000000	TOWN CREEK LT. "2", 1985
018	6	38	23	10009	076	22	55543	250	0000	000000	COVE PT LH, 1848
019	6	38	15	22143	076	15	00418	250	0000	000000	HOOPER'S IS. LH, 1902

Above control located or verified by N/MOA2x1 - data on file at that office.

APPROVAL SHEET
SURVEY H-10193 (HFP-10-4-85)

The hydrographic records transmitted with this report are complete and adequate.

No direct supervision was given by me during the field work.

This survey is complete and adequate with no additional field work recommended. *SEE ALSO SECTION 9. OF THE EVALUATION REPORT.*

Kenneth W. Perrin
Kenneth W. Perrin
Lt. Cdr., NOAA
Chief, Hydrographic Field Parties Section

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

TIDE NOTE FOR HYDROGRAPHIC SHEET

DATE: 09/09/86

Marine Center: Atlantic

OPR: *S*-E211

Hydrographic Sheet: H-10193

Locality: *Cedar Point*
~~Approaches to Patuxent River~~, Chesapeake Bay

Time Period: July 29, 1985 - February 7, 1986

Tide Station Used: 857-7330 Solomons Island, MD

Plane of Reference (Mean Lower Low Water): 3.47 ft.

Height of Mean High Water Above Plane of Reference: 1.4 ft.

Remarks: Recommended Zoning:

Zone Direct

James R. Hubbard

Chief, Tidal Datum Quality
Assurance Section

GEOGRAPHIC NAMES

Name on Survey	A ON CHART NO. 12264 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										
	A	B	C	D	E	F	G	H	K		
CEDAR POINT	X									1	
CHESAPEAKE BAY	X									2	
MARYLAND (title)	X									3	
PATUXENT RIVER	X									4	
										5	
										6	
										7	
										8	
										9	
										10	
										11	
										12	
										13	
										14	
										15	
										16	
										17	
										18	
										19	
										20	
										21	
										22	
										23	
										24	
										25	

Approved:

Charles E. Harrington
Chief Geographer - N/CG2x5

DEC 16 1986

HYDROGRAPHIC SURVEY STATISTICS
 REGISTRY NO.: H-10193

Number of positions	3123
Number of soundings	10378
Number of control stations	54

	<u>TIME-HOURS</u>	<u>DATE COMPLETED</u>
Preprocessing Examination	32	1 Apr 86
Verification of Field Data	173	3 Dec 86
Quality Control Checks	70	
Evaluation and Analysis	61	24 Mar 87
Final Inspection	15	23 Mar 87
TOTAL TIME	351	
Marine Center Approval		24 Mar 87

Transmittal letter of survey and survey records will be included in the Descriptive Report to identify the records accompanying the survey.

MOA23-66-87

LETTER TRANSMITTING DATA

DATA AS LISTED BELOW WERE FORWARDED TO YOU BY (Check):

- ORDINARY MAIL AIR MAIL
 REGISTERED MAIL EXPRESS
 GBL (Give number) _____

TO:

Chief, Data Control Branch, N/CG243
 Room 151, WSC-1
 National Ocean Service - NOAA
 Rockville, MD 20852

DATE FORWARDED

20 Oct 1987

NUMBER OF PACKAGES
 THREE (3)

NOTE: A separate transmittal letter is to be used for each type of data, as tidal data, seismology, geomagnetism, etc. State the number of packages and include an executed copy of the transmittal letter in each package. In addition the original and one copy of the letter should be sent under separate cover. The copy will be returned as a receipt. This form should not be used for correspondence or transmitting accounting documents.

H-10193 (HFP-10-4-85)
OPR-S-E211, Maryland, Chesapeake Bay,
Approaches to Patuxent River

PKG. 1 (TUBE)

- 1 SMOOTH SHEET
- 1 FINAL SMOOTH POSITION OVERLAY
- 3 FINAL EXCESS OVERLAY
- 2 FINAL FIELD SMOOTH SHEET
- 1 ORIGINAL DESCRIPTIVE REPORT

PKG. 2 (BOX)

- 2 NOAA FORM 77-44 (SOUNDING VOLUMES)
- 1 ENVELOPE containing FIELD VELOCITY DATA
- 1 ENVELOPE containing DATA REMOVED FROM ORIGINAL DESCRIPTIVE REPORT
- 1 ENVELOPE containing FIELD POSITION CALIBRATION DATA

FROM: (Signature)

NORRIS A. WIKE

Norris A. Wike

RECEIVED THE ABOVE
 (Name, Division, Date)

Return receipted copy to:

Chief, Hydrographic Surveys Branch,
 N/MOA23
 Atlantic Marine Center
 439 W. York Street
 Norfolk, VA 23510-1114

Dwayne S. Clark
November 5, 1987
N/CG243

MOA23-66-87

LETTER TRANSMITTING DATA

DATA AS LISTED BELOW WERE FORWARDED TO YOU
BY (Check): ORDINARY MAIL AIR MAIL REGISTERED MAIL EXPRESS GBL (Give number) _____

TO:

Chief, Data Control Branch, N/CG243
Room 151, WSC-1
National Ocean Service - NOAA
Rockville, MD 20852

DATE FORWARDED

20 OCT 1987

NUMBER OF PACKAGES

THREE (3)

NOTE: A separate transmittal letter is to be used for each type of data, as tidal data, seismology, geomagnetism, etc. State the number of packages and include an executed copy of the transmittal letter in each package. In addition the original and one copy of the letter should be sent under separate cover. The copy will be returned as a receipt. This form should not be used for correspondence or transmitting accounting documents.

H-10193 (HFP-10-4-85)
OPR-S-E211, Maryland, Chesapeake Bay,
Approaches to Patuxent River

PKG. 2 (BOX) cont:

- 1 CAHIER containing FINAL POSITION PRINTOUT
- 1 CAHIER containing FINAL SOUNDING PRINTOUT and L-FILE
- 1 ENVELOPE containing SUPPLEMENTAL DATA from PRINTOUT

PKG. 3 (BOX)

- 1 ACCORDION FILE containing MASTER TAPE PRINTOUTS,
CORRECTOR TAPE PRINTOUTS, and FATHOGRAMS for
following JD,s:

VESNO 1020: 1985--210, 213, 217, 219-220, 224,
226-227, 274-277, 280, 284,
288-289, 296, 298, 319, 323,
338

1986--35, 37-38

one slot containing tide tape printouts data

FROM: (Signature)

NORRIS A. WIKE

*Norris A. Wike*RECEIVED THE ABOVE
(Name, Division, Date)

Return receipted copy to:

Chief, Hydrographic Surveys Branch,
N/MOA23
Atlantic Marine Center
439 W. York Street
Norfolk, VA 23510-1114

ATLANTIC MARINE CENTER
EVALUATION REPORT

SURVEY NO.: H-10193

FIELD NO.: HFP-10-4-85

Maryland, Chesapeake Bay, Cedar Point

SURVEYED: 29 July 1985 through 7 February 1986

SCALE: 1:10,000

PROJECT NO.: S-E-211-HFP-85

SOUNDINGS: RAYTHEON DSF-6000N
Fathometer, leadline

CONTROL: MOTOROLA Falcon 484
Mini-Ranger
(Range/Range)

Chief of Party.....K. W. Perrin

Surveyed by.....J. H. Maddox
.....E. L. Martin
.....R. W. Adams
.....D. M. Bryant
.....C. A. Dowty
.....R. L. Keene
.....F. L. Saunders

Automated Plot by.....XYNETICS 1201 Plotter (AMC)

1. INTRODUCTION

a. No unusual problems were encountered during office processing.

b. A page size plot of Automated Wreck and Obstruction Information System (AWOIS) item #4007, investigated during this survey, has been inserted into the Descriptive Report.

c. Notes in the Descriptive Report were made in red during office processing.

2. CONTROL AND SHORELINE

a. Control is adequately discussed in sections F., G., and S. of the Descriptive Report.

b. Brown shoreline applied to the smooth sheet originates with a Bromide copy of T-8542 of 1942-43 and is for orientation purposes only.

3. HYDROGRAPHY

a. Soundings at crossings are in excellent agreement and comply with the criteria found in sections 4.6.1 and 6.3.4.3. of the HYDROGRAPHIC MANUAL.

b. The standard depth curves could be drawn in their entirety. The zero (0) curve was not delineated because of vessel safety. The supplemental twenty-four (24) and thirty-six (36) foot curves were drawn to show additional bottom relief. Additionally, some brown and dashed curves were also drawn to delineate bottom relief.

c. The development of the bottom configuration and determination of least depths is considered adequate with the exception of several shoal depths.

The shoal depths are as follows:

<u>Depth</u>	<u>Latitude</u>	<u>Longitude</u>	<u>Surrounding Depths</u>
22	38°18'16.85"N	76°21'56.81"W	25-28
19	38°18'02.04"N	76°21'38.43"W	24-26
23	38°18'02.84"N	76°21'30.06"W	25-40
30	38°18'07.47"N	76°21'29.33"W	33-37
29	38°18'08.43"N	76°21'21.68"W	35-39
30	38°18'13.97"N	76°21'20.05"W	32-40

The field unit did not sufficiently develop to assure a least depth on a twenty-three (23) foot shoal feature in the vicinity of Latitude 38°18'23"N, Longitude 76°21'58"W as required by section 1.4.3. of the HYDROGRAPHIC MANUAL.

Additional lines of hydrography in the vicinity of the soundings discussed above would have provided a better delineation of the bottom configuration. The lack of development of items discussed above does not substantially degrade the overall quality of the survey.

4. CONDITION OF SURVEY

The smooth sheet and accompanying overlays, hydrographic records and reports are adequate and conform to the requirements of the HYDROGRAPHIC MANUAL with the following exceptions:

a) The field unit did not run axis lines, or obtain a bottom sample on a twenty-three (23) foot shoal feature, in the vicinity of Latitude 38°18'23"N, Longitude 76°21'58"W as required by sections 1.4.3. and 4.5.9.2. of the HYDROGRAPHIC MANUAL.

b) AWOIS items #3678, #3679, #3680, and #4007 were all listed as having full survey requirements, an echosounder investigation for a least depth and/or chain drag for disproval. The areas insonified by the echo sounder are not sufficient for verification or disproval. Chain drag was not attempted by the field unit. It should be noted that a chain drag of 500 meters or greater in the depths where these AWOIS items are located is not practical. A more suitable method of verification or disproval would be constant tension wire drag

Concur

This IS NOT an English word

or side scan sonar investigation. See also sections 6.a. and 7.a. of this report.

c) The field unit did not adequately examine, locate, or describe landmarks as required by section 4.2.2. of the Project Instructions and sections 1.6.5., 4.5.13., and 5.5.1. of the HYDROGRAPHIC MANUAL.

d) The field unit did not take twice daily bar checks. Twenty-four (24) out of a possible forty-eight (48) bar checks were taken. Four (4) Martek (TDC) casts were also taken to support the bar check data. All bar checks and Martek casts were taken outside the survey area. Sections 1.5.2 and 4.9.5.1.1. of the HYDROGRAPHIC MANUAL outline the necessary requirements for collecting data for velocity corrections. This does not degrade the overall quality of the present survey.

5. JUNCTIONS

H-9826 (1979) 1:5,000 to the northwest

A standard junction could not be effected with H-9826 (1979) to the northwest. A butt junction was effected between present survey and H-9826 (1979) during office processing. A xerographic copy of the area superseded by the present survey is included in the Descriptive Report. H-9826 (1979) is archived at National Ocean Service (NOS) Headquarters, Rockville, Maryland. Any adjustments to the depth curves in the junctional areas will have to be made at headquarters during chart compilation. *See sec. 6a.*

There are no contemporary junctional surveys to the north south or east of the present survey. Charted hydrography in these areas is in harmony with the present survey.

6. COMPARISON WITH PRIOR SURVEYS

a. Hydrographic

H-6876 (1944) 1:10,000

H-7092 (1946) 1:10,000

H-7094 (1945-46) 1:20,000

H-9826 (1979) 1:5,000 - *Adjoins present Survey*

The four (4) prior surveys listed above cover the present survey with the exception of the extreme northeast corner.

H-6876 (1944) compares favorably with present survey and shows a general trend of being one (1) to two (2) feet shoaler than the present survey. Scattered prior survey soundings are four (4) to six (6) feet deeper than present survey depths in general depths of thirty (30) to thirty-two (32) feet. The following item should be noted:

AWOIS item #4007, a charted dangerous sunken wreck with a known depth of 27 feet in Latitude $38^{\circ}18'45.47''N$, Longitude $76^{\circ}25'01.57''W$, originates with prior survey H-6876 (1944). A 27 foot depth recorder sounding was obtained on the wreck by prior survey H-6876 (1944). A leadline least depth from the prior survey recorded a 32 foot depth. The wreck was located by the present survey in Latitude $38^{\circ}18'44.91''N$, Longitude $76^{\circ}25'00.60''W$ with an echo sounder least depth of 34 feet. While this may be the shoalest depth determined for this item it should not be considered the least depth. The present survey position is 29.2 meters southeast of the position on prior survey H-6876 (1944). No change in charting status is recommended. It is recommended that additional work be performed at an opportune time to determine a least depth on the wreck and the extent of the wreck and/or wreckage.

H-7092 (1946) compares favorably with present survey and shows a general trend of being one (1) foot shoaler than the present survey. Scattered prior survey soundings are four (4) to six (6) feet deeper than present survey depths in general depths of ~~thirty~~^{twenty}-three (33) to thirty-five (35) feet. *Three* Several soundings have been brought forward from the prior survey to supplement the present survey in the vicinity of Latitude $38^{\circ}17'59.0''N$, Longitude $76^{\circ}21'53.8''W$.

H-7094 (1945-46) compares favorably with present survey and shows a general trend of being one (1) foot shoaler than the present survey. Scattered prior survey soundings are four (4) to nine (9) feet deeper than present survey depths in general depths of ~~108 to 147 feet~~. The following should be noted: *greater than 100 feet.*

AWOIS item #3679, a charted dangerous sunken wreck, (35 ft rep), in Latitude $38^{\circ}18'37''N$, Longitude $76^{\circ}21'14''W$, originates with Notice to Mariners 28 of 1945 (NM 28/45). The field unit conducted a fathometer search for the item. The area investigated by the field unit is not centered at the charted location of the item. No indication of the item was found during the investigation. The Descriptive Report for H-7094 (1945-46) recommended the wreck be removed from the chart based on an echo sounder search and local knowledge; the review for the prior survey also recommended deleting the wreck from the chart. It is recommended the charted dangerous sunken wreck be removed from the chart. This item should have been included in AWOIS as an information item based on information found in H-7094 (1945-46). *Do not concur. Retain wreck on chart. AWOIS requires side scan search, wire sweep, or salvage documentation to disprove.*

H-9826 (1979) compares favorably with present survey and shows a general trend of being one (1) to two (2) feet deeper than the present survey. The following should be noted:

AWOIS item #3680, charted Obstrs, with a known depth of 29 feet, and a danger curve, in Latitude $38^{\circ}20'01.90''N$,

Longitude 76°22'05.50"W, originates with a U.S. Navy survey of 1973, (BP 96500/73), and prior survey H-9826 (1979). The prior survey locations of the obstructions are as follows:

Obstrs fall on edge of present survey limits.

	<u>Depth</u>	<u>Latitude</u>	<u>Longitude</u>
29 foot obstruction		38°20'01.9"N	76°22'05.5"W
30 foot obstruction		38°20'01.2"N	76°22'03.0"W

The positions of the obstructions were scaled from a copy of prior survey H-9826 (1979). The obstructions have been brought forward from prior survey H-9826 (1979) to supplement the present survey. No change in charting status is recommended; additional work should be conducted on this item at an opportune time to determine the continued applicability of the obstructions to the chart. *Concur*

Differences between the above prior surveys and the present survey depths can be attributed to improved hydrographic surveying methods and equipment.

b. Side Scan Sonar

SS
FE-275~~88~~^S (1985) 1:20,000

Present survey supplemented by FE 275SS.

S
~~Prior~~ survey FE 275SS (~~1985~~) covers the search area of AWOIS item #3677. AWOIS item #3677, a charted dangerous sunken wreck, PA, in Latitude 38°18'35.50"N, Longitude 76°18'47.20"W, originates with Notice to Mariners 25 of 1963 (NM 25/63). ~~Prior~~ *S* survey FE-275SS (~~1985~~) performed 400% side scan sonar coverage on the item. *any* No indication of the wreck was observed. Divers did not find ~~any~~ wreckage in the vicinity of the charted position during dive operations conducted on 21 November 1985. The present survey performed a fathometer investigation with negative results. A recommendation of deletion from the chart for this item is found on page 118 of the Descriptive Report for ~~prior~~ survey FE-275SS. (~~1985~~). *Concur*

Except as noted above the present survey is adequate to supersede the above prior surveys within the common area.

7. COMPARISON WITH CHART

Chart 12264, 22nd Ed., dated May 28, 1983

a. Hydrography

Most

~~Ninety nine percent, (99%),~~ *A* of the charted hydrography originates with the previously discussed prior surveys and is adequately discussed under those comparisons. The remaining hydrography is from a not readily ascertainable source. The following should be noted:

1) AWOIS item #3678, a charted dangerous sunken wreck, PA, in Latitude 38°18'21"N, Longitude 76°21'14"W, originates with Local Notice to Mariners 26 of 1982 (LNM 26/82). The field unit conducted a fathometer search for the item. No

indication of the item was found during the investigation. It is recommended that the charted dangerous sunken wreck, PA be retained as charted. *concur*

2) AWOIS item #4136, a charted rock awash, in Latitude 38°17'57.00"N, Longitude 76°22'09.40"W was located by the field unit in Latitude 38°17'56.10"N, Longitude 76°22'08.51"W. The AWOIS item is 35.2 meters northwest of the rock found on the present survey. The rock bares one (1) foot above the sounding datum. It is recommended that the charted rock awash be deleted, and the rock found by the present survey be charted as shown on present survey. *concur*

Rock at off shore end of foul area extending from shore.
Except as noted above the present survey is adequate to supersede the charted hydrography in the common area.

b. Aids to Navigation

The hydrographer located two (2) ^{*charted*} floating aids to navigation in the survey area. These aids appear adequate to serve their intended purpose. *concur*

8. COMPLIANCE WITH INSTRUCTIONS

This survey complies with the Project Instructions except as noted in sections 3.c. and 4. of this report.

9. ADDITIONAL FIELD WORK

This is an adequate basic survey. Additional work is recommended to verify or disprove AWOIS items 3678, ^{*3680,*} and 4007. ^{*3679,*}

Douglas V. Mason

Douglas V. Mason
Cartographic Technician
Verification of Field Data

Norris A. Wike

Norris A. Wike
Cartographer
Evaluation and Analysis

Robert R. Hill

Robert R. Hill
Senior Cartographic Technician
Verification Check

ADDENDUM TO ACCOMPANY SURVEY H-10193

The average values for shifting surveyed NAD 1927 positions to NAD 1983 positions for this survey are as follows:

Position shifts (NAD 1983 minus NAD 1927):

Average latitude shift = 0.442 seconds = 13.6 meters

Average longitude shift = -1.180 seconds = -28.7 meters

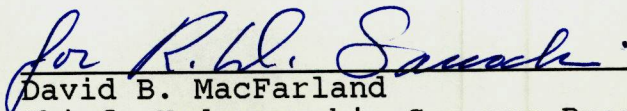
Inspection Report
H-10193

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
Chief, Evaluation and Analysis Group
Hydrographic Surveys Branch



David B. MacFarland
Chief, Hydrographic Surveys Branch

Approved: 24 March 1987



Ray E. Moses, RADM, NOAA
Director, Atlantic Marine Center



**UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration**

NATIONAL OCEAN SERVICE
OFFICE OF CHARTING AND GEODETIC SERVICES
ROCKVILLE, MARYLAND 20852

October 5, 1988

TO: N/CG24 - Russell C. Arnold
FROM: N/CG24 - *George K. Myers, Jr.*
George K. Myers, Jr.

SUBJECT: Examination of Hydrographic Survey H-10193 (1985-1986), Maryland,
Chesapeake Bay, Cedar Point

Chief of Party	K. W. Perrin
Officer in Charge	J. H. Maddox
Field Unit	Hydrographic Field Party No. 4
Processed by	Atlantic Marine Center
Examined by	G. K. Myers

An examination of hydrographic survey H-10193 (1985-1986) was accomplished to monitor the survey for adequacy with respect to data acquisition, conformance with applicable project instructions, delineation of the bottom, determination of least depths, navigational hazards, junctions, sounding line crossings, smooth plotting, shoreline transfer, decisions made and actions taken by the evaluator, and the cartographic presentation of data.

Cartographic deficiencies and constructive comments are noted on a 1/2-scale copy of the survey smooth sheet which will be forwarded to the marine center.

In general, the survey was found to conform to National Ocean Service standards and requirements except as stated in the Evaluation Report.



38° 19' 30" 76°

25' 30"

76° 25' 00"

76° 24' 30"
38° 19' 30"

AWOIS ITEM 4007
Scale 1:10,000
Position Overlay
To Accompany H-10193

38° 19' 00"

38° 19' 00"

2164

38° 18' 50"

38° 18' 30"

76° 25' 30"

76° 25' 00"

76° 24' 30"

38° 19' 30" 76° 25' 30"

76° 25' 00"

76° 24' 30"
38° 19' 30"

AWOIS ITEM 4007
Scale 1:10,000
Sounding Overlay
To Accompany H-10193

38° 19' 00"

38° 19' 00"

34 wt

38° 18' 30"

38° 18' 30"

76° 25' 30"

76° 25' 00"

76° 24' 30"

DEPARTMENT OF COMMERCE
 National Oceanic and Atmospheric Administration
 National Ocean Survey
 Rockville, Maryland

Hydrographic Index No. 68 J

INDEX
 HYDROGRAPHIC SURVEYS
 Complete through August 1978
 1972-1977
 CHESAPEAKE BAY
 NORTHERN PART
 MARYLAND-VIRGINIA

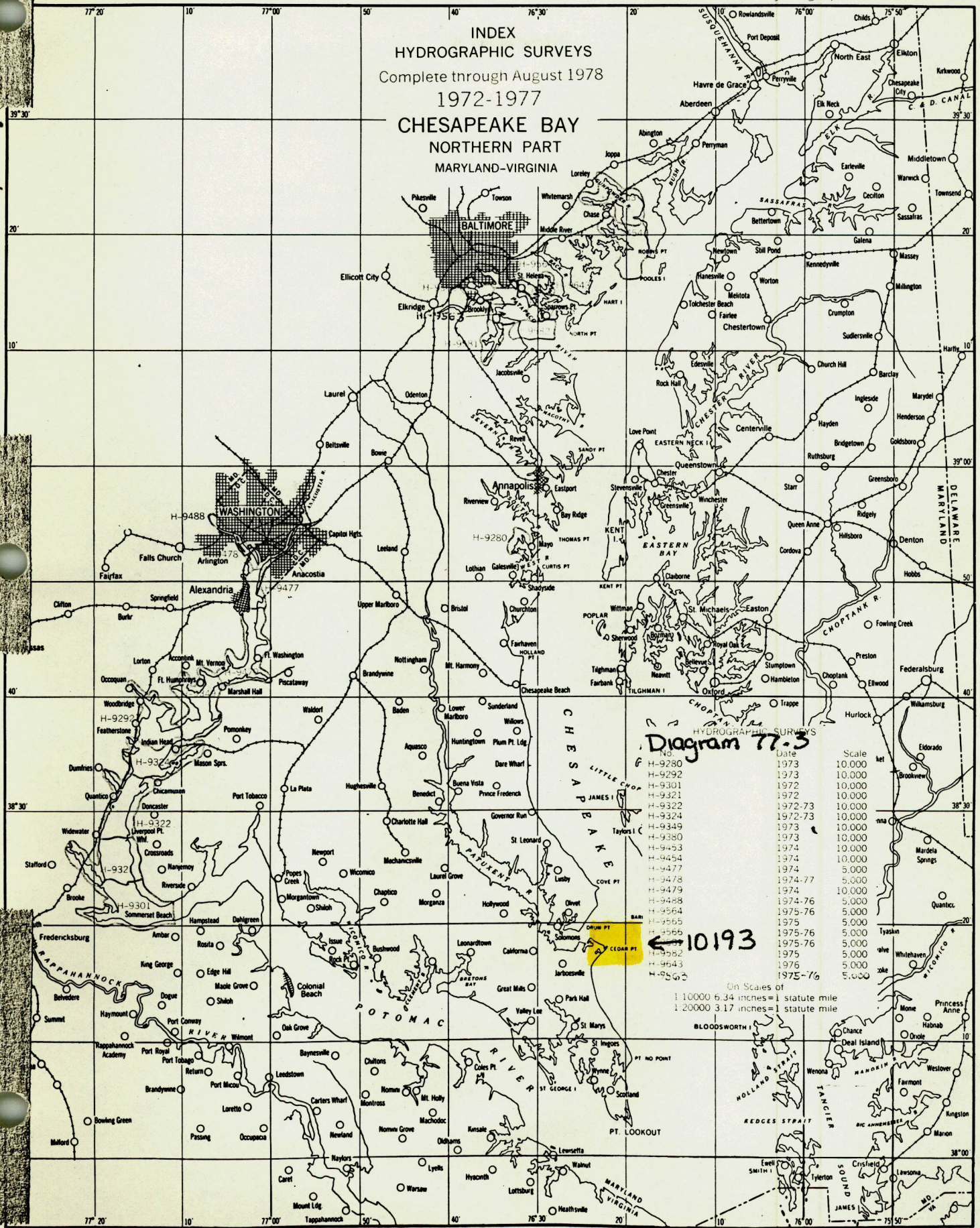


Diagram 77-3
 HYDROGRAPHIC SURVEYS

No.	Date	Scale
H-9280	1973	10,000
H-9292	1973	10,000
H-9301	1972	10,000
H-9321	1972	10,000
H-9322	1972-73	10,000
H-9324	1972-73	10,000
H-9349	1973	10,000
H-9380	1973	10,000
H-9453	1974	10,000
H-9454	1974	10,000
H-9477	1974	5,000
H-9478	1974-77	5,000
H-9479	1974	10,000
H-9488	1974-76	5,000
H-9564	1975-76	5,000
H-9565	1975	5,000
H-9566	1975-76	5,000
H-9567	1975-76	5,000
H-9568	1975	5,000
H-9569	1976	5,000
H-9570	1975-76	5,000

On Scales of
 1:10000 6.34 inches = 1 statute mile
 1:20000 3.17 inches = 1 statute mile

