

F00450

NOAA FORM 76-35A

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

DESCRIPTIVE REPORT

Type of Survey Hydrographic/Multibeam

Field No. RU-10-01-99

Registry No. F00450

LOCALITY

State Virginia

General Locality Southern Chesapeake Bay

Locality Vicinity of Tail Of The Horseshoe

1999

CHIEF OF PARTY
LCDR J. S. Verlaque

LIBRARY & ARCHIVES

DATE MAY 30 2000

REGISTRY NUMBER:

F00450

HYDROGRAPHIC TITLE SHEET

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 NUMBER:

RU-10-01-99

State: Virginia

General locality: Southern Chesapeake Bay

Locality: Vicinity of Tail of the Horseshoe

Scale: 1: 10,000 Date of survey: March 3, 1999 - March 31, 1999

Instructions dated: March 20, 1998 ^{26 1999} Project Number: OPR-E350-RU-99

Vessel: NOAA Ship RUDE - S-590, LAUNCH # 517

Chief of Party: LCDR J. Verlaque, NOAA

Surveyed by: LCDR J. Verlaque, LT E. Berkowitz, PS E. Owens, PS C. Parker, ST S. Rooney, AST M. Chandler, CT D. Mason, CT M. Fetterly

Soundings taken by echo sounder, hand lead-line, or pole: Reson SeaBat 9003 shallow-water sonar system, Odom-Echotrac Echosounder

Graphic record scaled by: RUDE Personnel

Graphic record checked by: RUDE Personnel

Protracted by: N/A Automated plot by: HP 2500CP

Verification by: ATLANTIC HYDROGRAPHIC ^{BRANCH} PERSONNEL

Soundings in: Feet: Fathoms: Meters: at MLW: MLLW: (*):

Remarks: Field Examination, All times recorded in UTC.

* HAND WRITTEN NOTES IN THE DESCRIPTIVE REPORT
WERE MADE DURING OFFICE PROCESSING

AW015/S4RP - 4/27/00 30V

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A. PROJECT

- A.1 This survey was conducted in accordance with Hydrographic Project Instructions OPR-E350-RU, Southern Chesapeake Bay, Virginia.
- A.2 The original instructions are dated March 2~~0~~⁶, 1999.
- A.3 There are no amendments to the original instructions.
- A.4 This survey is designated F00450.
- A.5 This survey responds to requests from the Association of Maryland Pilots and the Virginia Pilots Association in the southern Chesapeake Bay in the vicinity of Chesapeake Bay Bridge-Tunnel. The movement of commercial shipping in the southern Chesapeake Bay increasingly relies on accurate, full bottom coverage surveys in this active area. Of particular concern to the pilots is the area where the Chesapeake Channel crosses the Chesapeake Bay Bridge-Tunnel opening at buoy "13" and "14". Virtually all traffic moving up or down the Bay must pass between these buoys. Also of concern is the area where Thimble Shoal Channel crosses the Chesapeake Bay Bridge-Tunnel opening. By acquiring one hundred percent multibeam hydrographic survey data in these areas, smaller craft such as tugs, trawlers, and recreational vehicles would be encouraged to maneuver outside the main channel in order to allow the larger commercial vessels to remain in the deeper, more restricted channel.

This survey also responds to requests concerning numerous wrecks and obstructions in the southern Chesapeake Bay in the vicinity of the Chesapeake Bay Bridge-Tunnel. The movement of commercial shipping is hindered by many of these features.

B. AREA SURVEYED

- B.1 Survey F00450 covers the areas where the Chesapeake Channel and Thimble Shoal Channel cross the Chesapeake Bay Bridge-Tunnel openings. In addition, three items were surveyed within the navigable area of the lower Chesapeake Bay, two within Thimble Shoal Channel and one adjacent to the York Spit Channel. F00450 is bounded on the west by approximate longitude 076°10.0'W, and on the east by approximate longitude 076°03.0'W. The northern and southern limits are latitudes 37°09.0'N and 36°57.5'N, respectively.

B.2 Survey F00450 is comprised of three field sheets, containing five AWOIS items, with the following approximate boundaries, each starting at the southeast corner and proceeding clockwise:

SURVEY LIMITS Chesapeake Channel Bridge-Tunnel Opening		SURVEY LIMITS Thimble Shoal Bridge-Tunnel Opening & AWOIS #'s 9556, 9557		SURVEY LIMITS Barge Wreck AWOIS #'s 8875, 3190	
LATITUDE	LONGITUDE	LATITUDE	LONGITUDE	LATITUDE	LONGITUDE
37-01-42.02 N	076-03-22.87 W	36-57-46.84 N	076-05-05.62 W	37-08-46.77 N	076-09-02.58 W
37-01-42.02 N	076-05-02.04 W	36-57-46.84 N	076-07-29.99 W	37-08-46.77 N	076-09-15.57 W
37-03-14.78 N	076-05-02.04 W	36-58-55.01 N	076-07-29.99 W	37-08-58.97 N	076-09-15.57 W
37-03-14.78 N	076-03-22.87 W	36-58-55.01 N	076-05-05.62 W	37-08-58.97 N	076-09-02.58 W

B.3 Data acquisition for this survey began on March 3, 1999 (DN 062) and ended on March 31, 1999 (DN 090).

C. SURVEY VESSELS

C.1 Hydrography, side scan, and multibeam investigations were conducted from NOAA Ship RUDE, S-590, EDP# 9040. General functions include side scan sonar and multibeam sounding operations, velocity of sound determinations, and navigational aid positioning. Hydrography and side scan investigations were also conducted from Survey Launch #0517 on (DN 082).

C.2 The transducer for the multibeam sonar was deployed on a pivoting arm mounted on the port side, approximately amidships. The arm was rotated into the operating position only during times of data acquisition.

D. AUTOMATED DATA ACQUISITION AND PROCESSING

SEE ALSO EVALUATION REPORT

D.1a Coastal Oceanographics' HYPACK for Windows Version 7.1a (12/02/97) was used for data acquisition on this survey. Post processing included the use of HPTools Version 9.4.0 (04/22/99) for all Hypack data conversion data. Data processing was conducted using Hydrographic Processing System (HPS) Version 8.2 (03/02/98) supplied by Atlantic Hydrographic Branch Computer Support Group. MapInfo Version 5.0 (08/18/98) was utilized for data display during the evaluation process and completion of the field sheet. All software versions used for data processing are listed in Appendix H.*

D.1b Triton Corporation's ISIS software Version 3.28 was used to acquire SeaBat multibeam and digital side scan imagery. SeaBat data was processed on the CARIS-HIPS System Version 4.2.7 (01/17/97).

D.1c The SEABIRD SBE-19 sound velocity profiler unit was utilized with SEASOFT 3.3M (11/27/89) and SEACAT 3.1 (02/25/98) software. The program VELOCWIN Version 4.01 was used to process the acquired data and calculate velocity corrections.

D.2a Multibeam data (XTF Format) conversion in the CARIS-HIPS System utilized specific selections within the *Convert Triton Isis XTF* program in HDCS. Selections with CARIS software included "Ship Nav" from Sensor; "Ship Gyro" from Ship; "Fish Nav" from Sensor; "Fish Gyro" from Ship. Data decimation and image correction was not selected during conversion.

Side scan sonar data conversion entailed selecting "Ship Nav" from Sensor; "Ship Gyro" from Ship; "Fish Nav" from Ship; "Fish Gyro" from Ship. Data decimation and image correction was not selected during conversion.

D.2b SeaBat depth data was monitored using ISIS during acquisition and processed utilizing CARIS-HIPS multibeam data cleaning programs. Digital multibeam depth profiles were visually reviewed and fliers were identified and manually flagged as "rejected"; no SeaBat quality flags were used to automatically "reject" data. Vessel navigation data from DGPS and attitude data from heave, pitch, roll, and gyro sensors were displayed and manually cleaned (see Sections G and H).

D.2c After reviewing and cleaning the data, the depth, navigation, and attitude data were merged with sound velocity, tide, and vessel configuration data to compute the true depth and position of each sonar beam footprint. Work file processing included importing the multibeam depths (selecting "extended no key", "group by beam number", and "line by line thinning"). Processed depths were thinned by utilizing a shoal biased gridding sounding selection of fifteen meters during HIPS-Workfile Creation at a 1:10,000 survey scale. Field sheet soundings used for crossline comparisons in CARIS Workfile Processing included the full density data set (see Section J.2). Finally, the fifteen meter gridded CARIS Workfile Processing soundings were transferred into HPS (using HPTools) and MapInfo databases.

- D.2d Sounding evaluation included the use of a dat file (.dat) which was converted into HPS via HPTools, generating an HPS multibeam only data file for each day of acquisition. Final field sheet selected soundings originate from these HPS multibeam only data files.
- D.2e Final plots were created in MapInfo, a PC-based GIS package, with assistance from HPS-MI MapInfo tools supplied by Hydrographic Survey Division (HSD). These tools produced depth, track and swath plots from HPS data.
- D.2f The total number of multibeam soundings acquired and processed during field evaluation does not reflect the total number of multibeam soundings provided to N/CS33. For transfer to HPS, the sounding density was reduced by selecting a grid size of 15 meters with no sounding suppression within HIPS. Additional sounding excessing will be conducted during the verification process using HPS.

E. SIDE SCAN SONAR EQUIPMENT

- E.1 All side scan sonar data was acquired with an Edgetech (EG&G) Model 272 towfish and an Edgetech Model 260-TH image-correcting side scan sonar recorder. All side scan data was also recorded digitally using ISIS software and archived in the Extended Triton Format (*.XTF) files.
- E.2 The side scan towfish used a 50° vertical beam width tilted down 20° from horizontal.
- E.3 The 100 kHz frequency was used throughout the survey.
- E.4a The 75-meter range scale was utilized exclusively. Sixty meter line spacing was used for all item investigations to obtain 200% side scan sonar area coverage. One hundred twenty meter line spacing was used for both Chesapeake Bay Bridge Tunnel openings to obtain 100% side scan sonar area coverage in addition to the 100% multibeam coverage.
- E.4b Frequent confidence checks were obtained whenever common features such as sand waves or rocks were encountered.
- E.4c One hundred and two hundred percent side scan sonar coverage was completed for this survey. Holiday lines were run to fill in any gaps. All coverage was checked with on-screen zoomable coverage displays in MapInfo to ensure proper overlap between lines.

- E.4d Any data degraded by towfish instability, thermocline, prop wash, etc., was rejected and reacquired.
- E.4e The towfish was deployed exclusively from the stern.
- E.5 Sonar records were monitored on-line and reviewed by two persons during processing to identify contacts. Contact offsets and shadow heights were measured on sonar paper records, checked, and entered into the HPS Contact Table to compute contact heights and positions.
- E.6 All side scan contacts with computed heights greater than 10% of depth, or greater than one meter in depths shoaler than 20 meters, and all contacts which appeared man-made were deemed significant. All significant contacts were developed with multibeam sonar coverage. All coverage was checked with on-screen zoomable coverage displays in CARIS-HIPS and MapInfo, and holiday lines were run to fill in any gaps.

F. SOUNDING EQUIPMENT

F.1a All multibeam sounding data was collected with the single-frequency (455 kHz) Reson SeaBat 9003 (S/N 10496-447020) shallow-water sonar system.

Additional dual-frequency single-beam sounding data was acquired aboard the following platforms. **NOTE:** Single-beam data is not included in the final data set.

Survey Platform	Digital vertical beam Echosounder	Serial Number
NOAA Ship RUDE S-590	ODOM-Echotrac	9643
Survey Launch 0517	Innerspace	241

- F.2a High frequency (100 kHz) vertical beam ODOM and Innerspace data was recorded during data acquisition. ODOM-Echotrac and Innerspace echograms were monitored on-line. Anomalous echogram traces were immediately cross-referenced to the ISIS multibeam acquisition display online.
- F.2b Manual edits were not made to single-beam data; only missed depths (9999.9) were edited during field processing. Vertical correctors were applied to the raw single-beam digital soundings (see Section G). The archived HPS fixes of single-beam soundings do not represent the entire character of the seafloor because shoal bias inserts were not selected; graphic records were

not scanned for depths edits. **Single-beam Data should NOT be included on the final field sheet; all final field soundings originate from multibeam data.**

- F.3 There were no observed faults in sounding equipment that affected the accuracy or quality of the data.
- F.4 One diver investigation was performed for this survey. The MOD III pneumatic diver least depth gauge (S/N 68336) was used in approximately thirty-five feet of water while conducting an item investigation on AWOIS 8875/3190. Note: AWOIS listings 8875 and 3190 are the exact same item having two AWOIS reference numbers assigned due to a clerical error (See Separates IV* for data records).
- F.5a The 9003's combined transmit and receive beams yield forty (40) soundings per ping, each formed from a 3° crosstrack x 1.5° alongtrack bottom footprint. During multibeam data processing, the outermost two beams on each side of the swath (beam numbers 1, 2, 39, and 40) were not processed, reducing the effective swath width to 108°.
- F.5b SeaBat 9003 multibeam data was continuously recorded and served as the primary source for hydrographic digital soundings. Sounding depths ranged from 16 to 54 feet of water, utilizing multibeam range scales of 25 and 50 meters. Two hundred percent side scan sonar coverage was based upon 60 meter line spacing. Item investigation line spacing was based upon contact positions for nadir-beam development.
- F.6 Vessel speeds during multibeam data and side scan sonar acquisition were conducted within the standards for side scan operations. When side scan sonar acquisition was not being conducted, multibeam bathymetry data was collected at vessel speeds between 4 and 7 knots; item and contact investigation speeds were generally collected at speeds of 3 to 5 knots. Slower vessel speed increases the data density in the along track coverage over the feature. Ping rate is dependant upon multibeam range scale being utilized and determines the number of pings per unit area of the bottom.
- F.7 Multibeam sonar coverage between lines was determined in **MapInfo** by using the **HPS_MI** tool for drawing multibeam swath coverage. Multibeam swaths were based on ODOM single beam sounding data and were extrapolated to a swath width assumption of 108°, inclusive of beam numbers three through thirty-eight.

** DATA FILED WITH ORIGINAL FIELD RECORDS*

G. CORRECTIONS TO SOUNDINGS *SEE ALSO EVALUATION REPORT*

G.1a Sound velocity and refraction correctors were computed from conductivity, temperature, and depth measurements acquired with SeaBird SBE190 SEACAT Profilers (serial numbers 1251 & 1991). Data quality assurance tests using the CAT program were performed daily. The profiler is calibrated at the beginning and end of each field season. (See APPENDIX I* for data records).

The following velocity casts were used for this survey:

VELOCITY CAST #	JULIAN DAY #
1,2	062
3	068
4,5	075
6,7	076
8,9	077
10	082
11	084
12,13,14	088
15,16,17,18,19	089
20,21,22	090

Sound velocity and refraction effects were applied to the SeaBat data using CARIS-HIPS (incorporating the NOAA Nautical Charting Development Lab REFRACT algorithm). Sound velocity correctors for the vertical beam soundings were computed using VELOCITY and applied to the ODOM data using HPS.

G.1b ODOM-leadline direct comparisons were conducted on various dates during the field season. Records are provided with F00450 documentation (See Appendix E)*

G.1c Sensor offsets and transducer static drafts were measured during the December 1996 dry-dock period. Sensor offsets were stored in the CARIS-HIPS Vessel Configuration File and HPS Offset Table for use in data processing. See Separate IV* for data records.

G.1d Vessel dynamic draft was measured for NOAA Ship RUDE vessel number 9040 on March 5, 1999 using the real time kynamatic on the fly GPS method. Vessel dynamic draft for survey launch 0517 was measured and on March 4, 1999 using standard leveling procedures. Dynamic draft correctors were stored in the CARIS-HIPS Vessel Configuration File and HPS Offset Tables for use in data processing (See APPENDIX E* for data records).

* DATA FILED WITH ORIGINAL FIELD RECORDS

- G.1e Heave, pitch, and roll data were acquired with the SeaPath system. Heave, pitch, and roll data from Seatex Seapath MRU (S/N 0544) were applied to SeaBat multibeam data. Heave data were applied to ODOM vertical beam data.
- G.1f Vessel heading data was acquired with the SeaPath system. Heading data was used to compute multibeam transducer azimuth and position.
- G.1g Multibeam heave, pitch, roll, and heading sensor data was adjusted using biases as determined during a patch test conducted on March 05, 1999 (DN064). See the CARIS-HIPS Vessel Configuration File in Separate I^X for data records.
- G.2 No unusual or unique methods or instruments were used to correct sounding data.
- G.3 Tide zoning for this survey is consistent with the Project Instructions. Tide correctors were developed by applying time corrections and range correctors to the verified tides at the Chesapeake Bay Bridge Tunnel (Station 863-8863). Verified tides were computed in CARIS-HIPS and HPS and applied to SeaBat data.

CBBT TIDE GAUGE	AWOIS #'s 8875, 3190	Chesapeake Channel & Thimble Shoal Bridge-Tunnel Openings (BTO)		
Zone	SCB17	SCB12	SCB9	SCB10
Reference #	863-8863	863-8863	863-8863	863-8863
Time Corrector	+24 minutes	+6 minutes	-6 minutes	+6 minutes
Range Corrector	X 0.88	X 0.98	X 1.02	X 1.04

- G.4 The diver least depth gauge (S/N 1991) was used on March 31, 1999 (DN090) for dive operations on AWOIS item 8875,3190.
- G.5 No significant systematic errors were detected.
- G.6a The vertical reference surface for this survey is Mean Lower Low Water (MLLW).
- G.6b Tide data was acquired at the Chesapeake Bay Bridge Tunnel, Virginia (Station 863-8863) by N/OES231. A request for approved tides was mailed on May 27, 1999. This data will be compared to the verified tide data during verification by N/CS33. (see Section G.6d)
- G.6c Note that multibeam data processing was accomplished using preliminary unverified tide values during data acquisition and verified tide values during post processing (downloaded from the OPSD web-site).
X DATA FILED WITH ORIGINAL FIELD RECORDS

Zone Station time and height tidal correctors provided by N/CS31, with the project instructions, were applied to all tidal correctors relative to reference station Chesapeake Bay Bridge-Tunnel, VA (863-8863).

- G.6d **DO NOT REAPPLY ANY CORRECTORS in HPS, including verified smooth tides.** Note that verified tide values have been applied to the entire multibeam data set in CARIS-HIPS prior to conversion to HPS.

Upon receipt of Approved Tides, a comparison should be conducted by The Atlantic Hydrographic Branch (N/CS33) to determine whether tidal reference station(s), tide correction values, or zoning correctors differ from the applied OPSD verified tides. If tide station(s) and/or tidal data reducers do not differ, no reapplication of approved tides should be conducted in CARIS-HIPS. If tide station(s) and/or tidal data reducers do differ, approved tidal data will supercede these correctors and needs to be applied to the entire multibeam data set in CARIS-HIPS and only Dive Investigation data in HPS. If necessary, all vertical correctors and horizontal offsets should be reapplied to multibeam data using CARIS software only.

H. HYDROGRAPHIC POSITION CONTROL *SEE ALSO EXPLANATION REPORT*

- H.1 The horizontal reference surface for this survey is the North American Datum of 1983 (NAD 83). No horizontal control stations were established for this survey.
- H.2 Positioning for this survey was obtained from the NAVSTAR Global Positioning System (GPS) augmented with the U.S. Coast Guard Differential GPS (DGPS) service.

The Seatex Seapath 200 and Starlink systems were used throughout this survey for positioning determination. DGPS Radio Beacon reception sites were automatically selected by the strongest signal available within the survey area at a given time. The following DGPS beacons were within range of the survey area (Cape Henry, VA being nearest):

USCG DGPS Radio Beacon Broadcast Sites	Freq KHz	Rate BPS	Latitude N	Longitude W	Range N.M.	Beacon ID #
Cape Henry, VA	289	100	36°55' 34"	076°00' 27"	130	806
Cape Henlopen, VA <i>DC</i>	298	200	38°46' 34"	075°05' 16"	180	805

- H.3 Accuracy requirements were met as specified by the Hydrographic Manual, sections 1.3 and 3.1, and Field Procedures Manual, section 3.4.
- H.4 GPS and DGPS signals were acquired with the following hardware equipment:

GPS and DGPS Hardware	SERIAL #	Vessel #
SeaPath 200	0347	9040
StarLink, antenna Model MBA2	4202	9040
Magnavox DGPS Receiver MX50R	078	9040
StarLink, antenna Model MBA2	0853	0517

- H.5 The GPS Horizontal Dilution of Precision (HDOP) was recorded during data acquisition. HDOP values were checked within the raw DGPS navigational information (PreProcess.XTF data) when navigational errors were detected in HDCS navigational cleaning in CARIS-HIPS. Data where the computed maximum allowable HDOP value was exceeded was rejected in HDCS and reacquired.

Anomalous position data was either manually smoothed or flagged "rejected", depending on the extent of the affected data. Instantaneous vessel speed was automatically cleaned in CARIS with an event tolerance of 1.0 knot to aid in the manual cleaning of multibeam navigation data.

DGPS performance checks were not conducted. The necessity for control checks is eliminated when using the Seatex Seapath 200; quality positioning is supported by the continuous calibration routine inherent of Seapath.

DGPS monitor and scatter plots for USCG beacons are not required as per guidelines mentioned in (FPM 3.2.2.1).

- H.6 Calibration data is not required for differential GPS.
- H.7a There were no unusual methods used to operate the positioning equipment.
- H.7b There were no positioning equipment malfunctions.
- H.7c There were no unusual atmospheric conditions noted which might have affected data quality.
- H.7d No significant systematic errors were detected.

H.7e Offsets for the GPS antenna were applied from the CARIS-HIPS Vessel Configuration File (VCF) to compute the position of the SeaBat transducer. See Appendix E^X for data records.

Horizontal positions of the ODOM vertical beam echosounder data was corrected for GPS antenna offsets during field processing. Offsets in Hypack were acquired with multibeam transducer as the offset point ("batcentric"). See Appendix E^X for data records.

H.7f A-frame position (tow point), cable length, towfish height, and depth of water were applied to navigation data to compute the position of the towfish. This correction is applied in HPS via offset table and Reapply Sounding Corrections.

I. SHORELINE *NO SHORELINE EXISTING WITHIN SURVEY*

No shoreline exists within the boundaries of survey F00450.

J. CROSSLINES

J.1 A total of 11.35 nm of crosslines were acquired for this survey, equating to 7.03% of the multibeam and side scan sonar coverage lines.

J.2 Full density processed Seabat crossline sounding data was compared to a full density mainscheme data digital terrain model (DTM) surface in CARIS Workfile Processing. The DTM surface was built from processed SeaBat mainscheme soundings. A statistical variance representative of beam numbers 3 through 38 was computed by means of a difference file which allowed the generation of quality control reports (see Separate V)^X. The average mean difference between **SeaBat crossline and SeaBat mainscheme soundings** is -0.02456 meters and the average standard deviation is 0.096333 based on a total number of 1,273,691 3-D points compared (See Separate V)^X.

Processed multibeam soundings converted in HPS were compared to the non-edited single beam ODOM soundings in MapInfo. Sounding variance between **SeaBat mainscheme and ODOM crossline soundings** was within two feet with occasional differences of up to three feet.

J.3 No anomalous crossline comparisons were noted.

J.4 The mainscheme and crossline data was collected with the same suite of survey equipment.

K. JUNCTIONS *SEE ALSO EVALUATION REPORT*

This survey does not junction with any contemporary surveys.

L. COMPARISON WITH PRIOR SURVEYS *SEE ALSO EVALUATION REPORT*

A comparison with prior surveys will be performed by N/CS33.

M. ITEM INVESTIGATION REPORTS *SEE ALSO EVALUATION REPORT OK*

All side scan contacts with measurable shadows and all contacts which appeared manmade were deemed significant. All significant contacts were developed with one hundred percent shallow water multibeam near-nadir sonar coverage. Notable results from these developments are summarized as follows:

NOTE: AWOIS item numbers 8875 and 3190 were assigned to the same item due to a clerical error. Upon advisement from HSD/Operations Branch in Silver Spring, MD, both AWOIS numbers should be retained and maintain all additions and updates. *CORREX*

M1.1 AWOIS NO: 3190

Item Description: UNKNOWN

Source: FE415SS/95

AWOIS Position: Lat. 37°08'53.88" N Long. 076°09'08.05" W

Required Investigation: SD, S2, DI

Radius: 100m

Charts Affected: 12224, 12221

INVESTIGATION

Date(s): March 9, 1999 (DN068)

SWMB Depth Sounding Attributes: See Diver Investigation

HPS Position Number: Fix number 20101

Investigation Used: S2, SWMB, DI

Survey Position(s): Lat. 37°08'54.01" N Long. 076°09'08.12" W

Position Determined By: Differential GPS

Investigation Summary: AWOIS 3190 was covered with 200% side scan sonar. Side scan sonar contacts 1086.3s, 1092.0s and 1080.0p were determined as the sunken barge. All contacts were investigated with 100% SWMB coverage to obtain least depth soundings near nadir. On March 31, 1999 (DN090), dive operations were conducted which determined the item as a heavily encrusted sunken barge approximately seventy feet long with a deep scour to the north-northwest, which extends the length of the wreck. With the use of a MOD-III pneumatic depth gauge, divers determined the least depth, corrected with OPSD verified tides, to be 10.5 meters (34.4 Feet) at the survey position.

SAME AS AWOIS NO. 8875 POSITION NO 20101 PLOTTED

CHARTING RECOMMENDATION

Recommendation: The hydrographer recommends the removal of the charted **wreck**, least depth known to be "35 ft". Replace with **wreck** least depth known to be "34 ft" at the survey position. In addition, the AWOIS Item Description should be changed from UNKNOWN to WRECK.

CONCUR WITH CLARIFICATION

*DELETE 27 FT WIRE DRAG SOUNDING ON CHART 12224 (21ST ED, FEB 11/95)
AND CHANGE TO A DANGEROUS SUNKEN WRECK WITH A DEPTH
OF 34 FT.
CHART 34 WK*

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PAGE SIZE PLOT 1 OF 3

ALSO SEE SECTION M, OF THE EVALUATION REPORT

M1.1 AWOIS NO: 8875

Item Description: UNKNOWN

Source: FE415SS/95

AWOIS Position: Lat. 37°08'53.88" N Long. 076°09'08.05" W

Required Investigation: SD, S2, DI

Radius: 100m

Charts Affected: 12224, 12221

INVESTIGATION

Date(s): March 9, 1999 (DN068)

SWMB Depth Sounding Attributes: See Diver Investigation

HPS Position Number: Fix number 20101

Investigation Used: S2, SWMB, DI

Survey Position(s): Lat. 37°08'54.01" N Long. 076°09'08.12" W

Position Determined By: Differential GPS

Investigation Summary: AWOIS ⁸⁸⁷⁵3190 was covered with 200% side scan sonar. Side scan sonar contacts 1086.3s, 1092.0s and 1080.0p were determined as the sunken barge. All contacts were investigated with 100% SWMB coverage to obtain least depth soundings near nadir. On March 31, 1999 (DN090), dive operations were conducted which determined the item as a heavily encrusted sunken barge approximately seventy feet long with a deep scour to the north-northwest, which extends the length of the wreck. With the use of a MOD-III pneumatic depth gauge, divers determined the least depth, corrected with OPSD verified tides, to be 10.5 meters (34.4 Feet) at the survey position.

SAME AS AWOIS 3190 POSITION 20101 PLOTTED

CHARTING RECOMMENDATION

Recommendation: The hydrographer recommends the removal of the charted **wreck**, least depth known to be "35 ft". Replace with **wreck** least depth known to be "34 ft" at the survey position. In addition, the AWOIS Item Description should be changed from UNKNOWN to WRECK. *CONCUR WITH CLARIFICATION*

*DELET 27 FT WIRE DRAG SOUNDING ON CHART 12224 (21ST ED, FEB 11/95) AND CHANGE TO A DANGEROUS SUNKEN WRECK WITH A DEPTH OF 34 FT 14 CHART 34.4 FT
PAGE SIZE PLOT 10F3*

ALSO SEE SECTION M. OF THE EVALUATION REPORT

M1.2 AWOIS NO: 9556

Item Description: OBSTRUCTION

Source: FE367SS/94

AWOIS Position: Lat. 36°57'59.22" N Long. 076°05'19.07" W

Required Investigation: SD,S2,DI

Radius: 100m

Charts Affected: 12205 SC, 12221, 12222, 12254

INVESTIGATION

Date(s): March 3, 1999 (DN 062), March 9, 1999 (DN 068)

Position Number(s): Not Applicable

Investigation Used: S2, SWMB, ES

Survey Position(s): Not Applicable

Position Determined By: Differential GPS

Investigation Summary: AWOIS 9556 was covered with 200% side scan sonar. Side scan sonar contacts 1006.0s and 1057.0s were investigated with 100% SWMB coverage to obtain least depth soundings near nadir. No significant contacts were found.

CHARTING RECOMMENDATION

Recommendation: The hydrographer recommends the removal of the charted "Obstn 41 ft" symbol and text "Obstns" and replace with survey depths. *COAST*

M1.3 AWOIS NO: 9557

Item Description: OBSTRUCTION

Source: FE387SS/94

AWOIS Position: Lat. 36°57'58.48" N Long. 076°05'14.64" W

Required Investigation: SD, S4, DI **Radius:** 100m

Charts Affected: 12205 SC, 12221, 12222, 12254

INVESTIGATION

Date(s): March 3, 1999 (DN 062), March 9, 1999 (DN 068)

Position Number(s): Not Applicable

Investigation Used: S2, SWMB, ES

Survey Position(s): Not Applicable

Position Determined By: Differential GPS

Investigation Summary: AWOIS 9557 was covered with 200% side scan sonar. Side scan sonar contact 1004.3s was investigated with 100% SWMB coverage to obtain least depth soundings near nadir. No significant contacts were found.

CHARTING RECOMMENDATION

Recommendation: The hydrographer recommends the removal of the charted "Obstn 42 ft" symbol and text "Obstns" and replace with survey depths. *Obstns*

N. COMPARISON WITH THE CHART *SEE ALSO EVALUATION REPORT*

N.1 Six charts are affected by this survey:

CHART AFFECTED	EDITION	DATE	CHART SCALE
Chart 12205 SC	24 th Ed.	15 Jun 1996	1 : 40,000
Chart 12208	7 th Ed.	05 Dec 1998	1 : 50,000
Chart 12221	70 th Ed.	12 Sep 1998	1 : 80,000
Chart 12222	39 th Ed.	29 Aug 1998	1 : 40,000
Chart 12224	21 st Ed.	11 Feb 1995	1 : 40,000
Chart 12254	40 th Ed.	01 Aug 1998	1 : 20,000
Chart 12256	12 th Ed.	07 Sep 1996	1 : 20,000
Chart 12280	1 st Ed.	25 May 1996	1 : 200,000

N.2 No Danger to Navigation reports were submitted for this survey.

N.3a The overall agreement between charted soundings and survey depths is good. Most soundings compare within one foot, with occasional differences of two to three feet.

Comparisons with charted tabulations and controlling depths was made for Thimble Shoal and Chesapeake Channels. Comparisons were made using Chart 12222 39th Ed., 29 Aug 1998 (1:40,000 scale). The results are as follows:

For Thimble Shoal Channel, no soundings were found to be shoaler than tabulated controlling depths for the left and right, inside and outside quarters of both the northern and southern elements. In addition, no soundings were found to be shoaler than the controlling depths for the northern and southern auxiliary channels.

For York Spit and Chesapeake Channel, no soundings were found to be shoaler than controlling depths for the left and right inside and outside quarters of the channel.

N.3b No extensive shoaling or deepening trends were found in the survey area.

O. ADEQUACY OF SURVEY *SEE ALSO EVALUATION REPORT*

This survey is complete and fully adequate to supersede prior surveys in common areas.

P. AIDS TO NAVIGATION

P.2 A comparison was made between the side scan sonar scaled survey positions and the largest scale chart of the area. No aid was found to deviate from its charted position by more than its approximate mooring watch circle. Each aid adequately serves the apparent purpose for which it was established. *CONCUR*

NAV. AID	Light List	SURVEY POSITIONS	CHARTED POSITIONS	NAV. AID DESCRIPTION	Distance From Charted
R "8" <i>ck 257</i>	Yes 9240	36°58'25.31" N 076°06'14.62" W	36°58'24.11" N 076°06'14.22" W	Red Lighted, Fl R 2.5s Gong	~38 meters Chart 12254
G "7" <i>ck 480</i>	Yes 9235	36°58'15.29" N 076°06'18.03" W	36°58'15.23" N 076°06'18.19" W	Green Lighted Fl G 2.5s	~4 meters Chart 12254
R "14" <i>ck 257</i>	Yes 7110	37°02'30.0" N 076°04'04.86" W	37-02-30.65 N 076-04-04.99 W	Red Lighted, Fl R 4s	~21 meters Chart 12222
G "13" <i>ck 480</i>	Yes 7105	37°02'26.54" N 076°04'15.82" W	37°02'27.6" N 076°04'16.5" W	Green Lighted Fl G 4s	~37 meters Chart 12222

*Pos. No. 20102
20103
20104
20105*

Note: Used Charts 12254 40th Ed. Aug 1, 1998 (scale 1:20,000) and 12222 40th Ed. Aug 29, 1998 (scale 1:40,000) for comparison. *39*

P.3 All aids are properly identified in the Light List.

P.4 Survey F00450 is inclusive of the Chesapeake Bay Bridge Tunnel openings at Thimble Shoal and Chesapeake Channels. Except for crossing the tunnels, there were no submarine or overhead pipelines, cables, bridges, or ferry routes found in the survey area.

Q. STATISTICS

1.	a.	# of Multibeam (MB) Soundings Processed	29,392,740
	b.	Number of HPS Positions	54,723
	c.	Lineal Nautical Miles of Sounding Lines	172.74 NM
2.	a.	Square Nautical Miles of Hydrography	1.73 SQNM
	b.	Days of Production	10
	c.	Detached Positions	1
	d.	Bottom Samples	0
	e.	Tide Stations	1
	f.	Velocity Casts	22
	g.	Dive Item Investigations	1
	h.	SeaBat Item Investigations	19

R. MISCELLANEOUS

- R.1 a. No evidence of silting was found during this survey.
b. No unusual submarine features were found during this survey.
c. No evidence of anomalous tides or tidal current conditions were found during this survey.
- R.2 No bottom samples were taken for survey F00450.

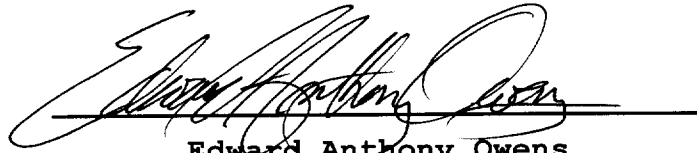
S. RECOMMENDATIONS *SEE ALSO EVALUATION REPORT*

No additional field work is required.

T. REFERRAL TO REPORTS

No reports or data are referred to in this Descriptive Report that are not included with this survey.

This report and the accompanying field sheets are respectfully submitted.

A handwritten signature in black ink, appearing to read "Edward Anthony Owens", is written over a solid horizontal line.

Edward Anthony Owens
Physical Scientist, NOAA
Atlantic Hydrographic Branch

**DGPS BROADCAST SITE STATUS & OPERATING SPECIFICATIONS
STATUS AS OF 3/2/00**

USERS SHOULD NOTIFY THE NIS WATCHSTANDER AT (703)313-5900 OF ANY OBSERVED OUTAGES, PROBLEMS, OR REQUESTS. ALL CURRENT OUTAGE INFORMATION WILL BE LISTED FOLLOWING EACH SITE.

THE COAST GUARD DGPS SERVICE IS AVAILABLE FOR POSITIONING AND NAVIGATION. USERS MAY EXPERIENCE SERVICE INTERRUPTIONS WITHOUT ADVANCE NOTICE. COAST GUARD DGPS BROADCASTS SHOULD NOT BE USED UNDER ANY CIRCUMSTANCES WHERE A SUDDEN SYSTEM FAILURE OR INACCURACY COULD CONSTITUTE A SAFETY HAZARD.

NOTE: Differential corrections are based on the NAD 83 position of the reference station (REFSTA) antenna. Positions obtained using DGPS should be referenced to NAD 83 coordinate system only. All sites are broadcasting RTCM Type 9-3 correction messages.

The Latest Status for CAPE HENLOPEN, DE

Back to the [HomePage](#)

CAPE HENLOPEN, DE

Status:	Operational
RbN Antenna Location:	38,46.6N;75, 5.3W
REFSTA Ant Location (A):	38,46.60679N;75, 5.26105W
REFSTA Ant Location (B):	38, 46.6115N;75, 5.23496W
REFSTA RTCM SC-104 ID (A):	10
REFSTA RTCM SC-104 ID (B):	11
REFSTA FIRMWARE VERSION:	RD00-1C19
Broadcast Site ID:	805
Transmission Frequency:	298 KHZ
Transmission Rate:	200 BPS
Signal Strength:	75uV at 180 NM

Outages:

No Current Outages.

CAPE HENRY, VA DGPS BROADCAST SITE IS NO LONGER IN OPERATION. THEREFORE, A CURRENT LISTING COULD NOT BE OBTAINED FOR THIS REPORT.

APPENDIX K

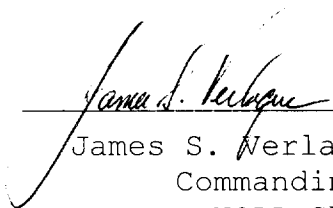
APPROVAL SHEET

LETTER OF APPROVAL

REGISTRY NO. F00450

Field operations contributing to the accomplishment of this Navigable Area survey were conducted under my direct supervision with frequent personal checks of progress and adequacy. All field sheets and reports were reviewed in their entirety and all supporting records were checked as well.

This survey is more than adequate to supersede ALL prior surveys in common areas. This survey is considered complete and adequate for nautical charting.



James S. Werlaque, LCDR, NOAA
Commanding Officer
NOAA Ship RUDE



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SERVICE
Silver Spring, Maryland 20910

TIDE NOTE FOR HYDROGRAPHIC SURVEY

DATE: August 19, 1999

HYDROGRAPHIC BRANCH: Atlantic

HYDROGRAPHIC PROJECT: OPR-E350-RU-99

HYDROGRAPHIC SHEET: F-00450

LOCALITY: Vicinity of Tail of the Horseshoe, Southern Chesapeake
Bay, VA

TIME PERIOD: March 03 - March 31, 1999

TIDE STATION USED: 863-8863 Chesapeake Bay Bridge Tunnel
Lat. 36° 58.0'N Lon. 76° 06.8'W

PLANE OF REFERENCE (MEAN LOWER LOW WATER): 0.000 meters


HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 0.829 meters

REMARKS: RECOMMENDED ZONING

Use zone(s) identified as: SCB8, SCB9, SCB10, SCB12, SCB13, SCB14
& SCB17.

Refer to attachments for zoning information.

Note 1: Provided time series data are tabulated in metric units
(Meters), relative to MLLW and on Greenwich Mean Time.



CHIEF, REQUIREMENTS AND DEVELOPMENT DIVISION



Final tide zone node point locations for OPR-E350-RU-99,
Sheet F-00450.

Format: Longitude in decimal degrees (negative value denotes
Longitude West),
Latitude in decimal degrees
Tide Station (in recommended order of use)
Average Time Correction (in minutes)
Range Correction

	Tide Station Order	AVG Time Correction	Range Correction
Zone SCB8			
-76.113244 36.912642	863-8863	-12	1.06
-76.095515 36.907555			
-76.089047 36.907765			
-76.060333 36.914695			
-76.064902 36.963231			
-76.055564 36.988553			
-76.065137 36.978093			
-76.113244 36.912642			
Zone SCB9			
-76.087381 37.026998	863-8863	-6	1.02
-76.105896 36.982638			
-76.112744 36.965329			
-76.129908 36.918213			
-76.113244 36.912642			
-76.065137 36.978093			
-76.055564 36.988553			
-76.025036 37.071459			
-76.084131 37.031167			
-76.087381 37.026998			
Zone SCB10			
-76.084131 37.031167	863-8863	+6	1.04
-76.025036 37.071459			
-76.014749 37.099271			
-75.987455 37.14165			
-76.031833 37.13234			
-76.053548 37.099149			
-76.084131 37.031167			

Zone SCB12

-76.153146 36.924084	863-8863	+6	0.98
-76.179535 36.929055			
-76.141671 37.045668			
-76.12566 37.07169			
-76.102378 37.097596			
-76.069394 37.119868			
-76.031833 37.13234			
-76.053548 37.099149			
-76.084131 37.031167			
-76.087381 37.026998			
-76.105896 36.982638			
-76.112744 36.965329			
-76.114062 36.962876			
-76.129908 36.918213			
-76.153146 36.924084			

Zone SCB13

-76.069394 37.119868	863-8863	+18	0.96
-76.102378 37.097596			
-76.12566 37.07169			
-76.141671 37.045668			
-76.179727 36.928659			
-76.196135 36.931626			
-76.212405 36.936331			
-76.203018 36.981059			
-76.179551 37.0568			
-76.162526 37.088531			
-76.132452 37.122976			
-76.091061 37.148606			
-76.051286 37.157664			
-76.011684 37.163381			
-76.031833 37.13234			
-76.069394 37.119868			

Zone SCB14

-75.996527 37.186299	863-8863	+24	0.94
-76.009476 37.204598			
-76.232754 37.099692			
-76.271244 37.086178			
-76.259439 36.958659			
-76.227084 36.940023			
-76.212405 36.936331			
-76.203018 36.981059			
-76.179551 37.0568			

-76.162526 37.088531
-76.132452 37.122976
-76.091061 37.148606
-76.051286 37.157664
-76.011684 37.163381
-75.996527 37.186299

Zone SCB17

-76.271244 37.086178	863-8863	+24	0.88
-76.251778 37.133335			
-76.230744 37.168937			
-76.21411 37.190384			
-76.185668 37.201933			
-76.13907 37.2104			
-76.081572 37.209461			
-76.009476 37.204598			
-76.232754 37.099692			
-76.271244 37.086178			

Final Tidal Zoning for OPR-E350-RU-99 Southern Chesapeake Bay, VA Sheet F-00450

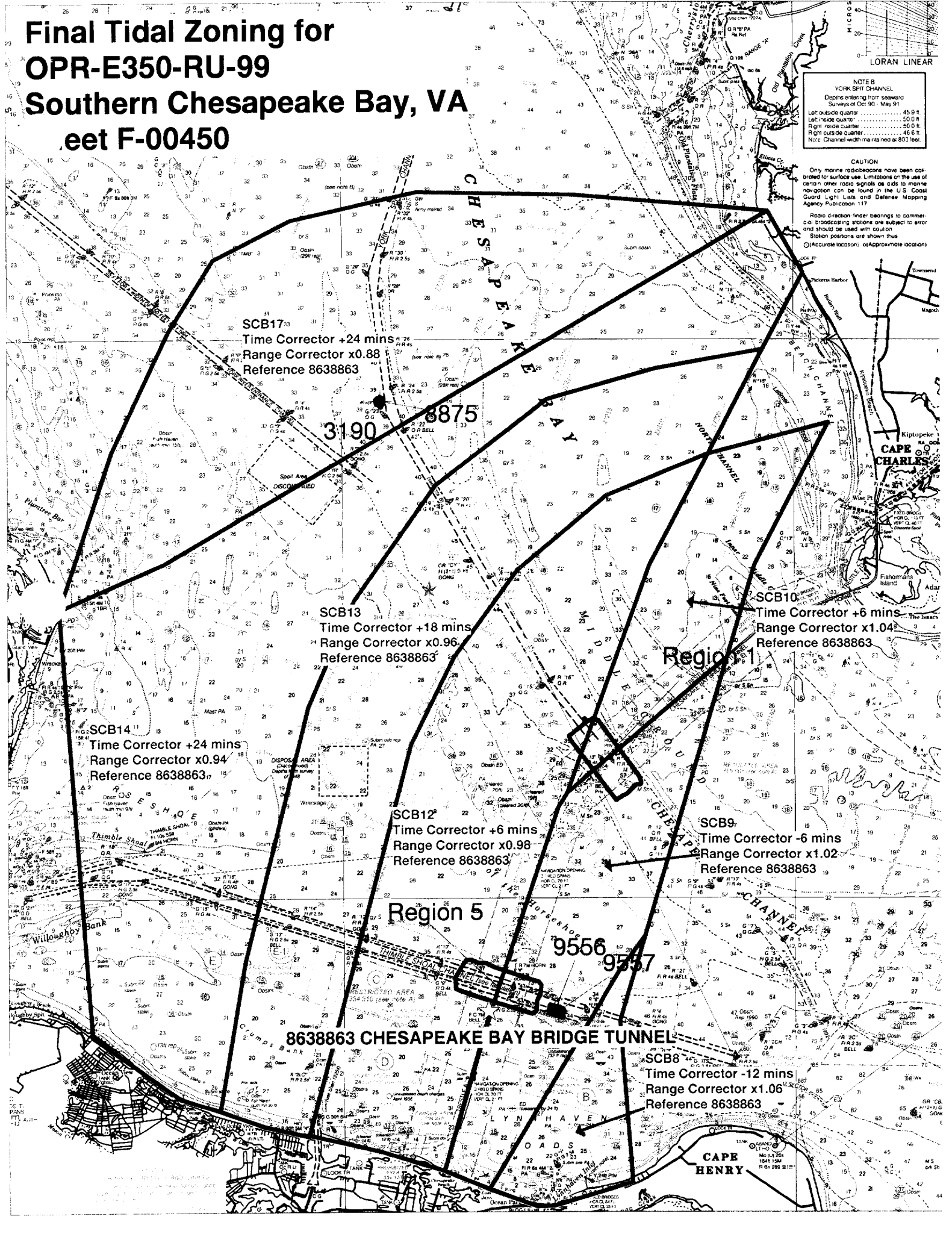
NOTE B
YORK SHOT CHANNEL
Degrees and minutes from average
Surveys of Oct 90 - May 91

Left outside quarter	45.9 ft
Left inside quarter	50.0 ft
Right inside quarter	50.0 ft
Right outside quarter	46.6 ft

Note: Channel width maintained at 800 feet.

CAUTION
Only marine radio beacons have been calibrated for surface use. Limitations on the use of certain other radio beacons as aids to marine navigation can be found in the U.S. Coast Guard Light Lists and Defense Mapping Agency Publication 117.

Radar direction finder bearings to commercial broadcasting stations are subject to error and should be used with caution.
Station positions are shown thus:
(O) Accurate location (A) Approximate location



GEOGRAPHIC NAMES

FE 00450

Name on Survey	Legend										
	A	B	C	D	E	F	G	H	K		
	ON CHART NO.	ON PREVIOUS SURVEY NO.	ON U.S. QUADRANGLE MAPS	FROM LOCAL INFORMATION	ON LOCAL MAPS	P.O. GUIDE OR MAP	GRAND MCNALLY ATLAS	U.S. LIGHT LIST			
CHESAPEAKE BAY	X		X								1
CHESAPEAKE CHANNEL	X		X								2
MIDDLE GROUND	X		X								3
TAIL OF THE HORSESHOE (title)	X		X								4
THIMBLE SHOAL CHANNEL	X		X								5
VIRGINIA (title)	X		X								6
											7
											8
											9
											10
											11
											12
											13
											14
											15
											16
											17
											18
											19
											20
											21
											22
											23
											24
											25

Approved
Dennis J. Roeschke
 Chief Hydrographer
 OCT 20 1980

LETTER TRANSMITTING DATA

N/CS33-30-00

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

ORDINARY MAIL AIR MAIL

REGISTERED MAIL EXPRESS

GBL (Give number) _____

TO:

Chief, Data Control Group, N/CS3x1
NOAA/National Ocean Service
Station 6815, SSMC3
1315 East-West Highway
Silver Spring, MD 20910-3282

DATE FORWARDED

25 April 2000

NUMBER OF PACKAGES

One Tube

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.

F00450

Virginia, Southern Chesapeake Bay, Vicinity of Tail Of The Horseshoe

(One) Tube Containing The Following:

- 1 Original Descriptive Report
- 1 Page size smooth sheet plots
- Drawing History Forms (NOAA Form #76-71) 1 each for NOS Charts 12208, 12224, and 12254
- 1 Record Of Application To Charts Form (NOAA FORM #75-96) for survey F00450
- 1 H-Drawing for NOS Chart 12208
- 1 H-Drawing for NOS Chart 12224
- 1 H-Drawing for NOS Chart 12254
- 1 Composite Drawing for NOS Chart 12208
- 1 Composite Drawing for NOS Chart 12224
- 1 Composite Drawing for NOS Chart 12254

FROM: (Signature)

Richard Blevins
Richard Blevins

RECEIVED THE ABOVE
(Name, Division, Date)

Return receipted copy to:

Richard Blevins
Atlantic Hydrographic Branc
N/CS33
439 West York Street
Norfolk, VA 23510-1114

04/25/2000

HYDROGRAPHIC SURVEY STATISTICS
REGISTRY NUMBER: F00450

NUMBER OF CONTROL STATIONS	2
NUMBER OF POSITIONS	69770
NUMBER OF SOUNDINGS	69770

	TIME-HOURS	DATE COMPLETED
PREPROCESSING EXAMINATION	31.0	09/17/1999
VERIFICATION OF FIELD DATA	92.0	04/21/2000
QUALITY CONTROL CHECKS	7.0	
EVALUATION AND ANALYSIS	44.0	
FINAL INSPECTION	30.0	02/15/2000
COMPILATION	76.0	04/20/2000
TOTAL TIME	280.0	
ATLANTIC HYDROGRAPHIC BRANCH APPROVAL		02/21/2000

**ATLANTIC HYDROGRAPHIC BRANCH
EVALUATION REPORT FOR F00450 (1999)**

This Evaluation Report has been written to supplement and/or clarify the original Descriptive Report. Sections in this report refer to the corresponding sections of the Descriptive Report.

D. AUTOMATED DATA ACQUISITION AND PROCESSING

The following software was used to process data at the Atlantic Hydrographic Branch:

Hydrographic Processing System
NADCON, version 2.10
SiteWorks, version 2.01
MicroStation 95, version 5.05
I/RAS B, version 5.01
Caris HIPS/SIPS

The smooth sheet was plotted using a Hewlett Packard DesignJet 2500CP plotter.

G. CORRECTIONS TO SOUNDINGS

A comparison between approved tides and zoning with the CO-OPS verified tides and zoning was conducted during office processing. No re-application of tides was required.

H. CONTROL STATIONS

Horizontal control used for this survey during data acquisition is based upon the North American Datum of 1983 (NAD 83). Office processing of this survey is based on these values. Three page size plots have been annotated with ticks showing the computed mean shift between NAD 83 and the North American Datum of 1927 (NAD 27).

To place sheet 1 of 3 on NAD 27 move the projection lines 0.593 seconds (18.269 meters or 1.83 mm at the scale of the survey) north in latitude, and 1.219 seconds (31.110 meters or 3.11 mm at the scale of the survey) east in longitude.

To place sheet 2 of 3 on NAD 27 move the projection lines 0.622 seconds (19.172 meters or 1.92 mm at the scale of the survey) north in latitude, and 1.251 seconds (32.089 meters or 3.21 mm at the scale of the survey) east in longitude.

To place sheet 3 of 3 on NAD 27 move the projection lines 0.600 seconds (18.481 meters or 1.85 mm at the scale of the survey) north in latitude, and 1.278 seconds (32.619 meters or 3.26 mm at the scale of the survey) east in longitude.

I. SHORELINE

The brown shoreline shown on the smooth sheet originates with NOS chart 12222, 39th Edition, Aug. 29, 1998 and is for orientation purposes only.

K. JUNCTIONS

This survey does not junction with any contemporary surveys. Present survey depths are in harmony with the charted hydrography to the north, south, east, and west.

L. COMPARISON WITH PRIOR SURVEYS

A comparison with prior surveys was not done during office processing in accordance with section 4. of the memorandum titled "Changes to Hydrographic Survey Processing", dated May 24, 1995.

M. ITEM INVESTIGATION REPORTS

1) AWOIS Item #3190, is a charted wreck with a wire drag clearance depth of 27 feet (8² m), in Latitude 37°08'53.88"N, Longitude 76°09'08.05"W, on NOS chart 12224, 21st Ed., Feb 11/95 and a charted wreck with a least depth of 35 feet (10⁷ m), in Latitude 37°08'53.88"N, Longitude 76°09'08.05"W, on NOS chart 12221, 70th Ed., Sept. 12/98. This item was investigated by the field unit and a wreck with a least depth of 34 feet (10⁵ m), in Latitude 37°08'54.01"N, Longitude 76°09'08.12"W was located. It is recommended that the charted features be deleted from their respective charts. It also recommended that the feature be charted as shown on all affected charts. See sheet 1 of 3.

N. COMPARISON WITH CHART 12205 SC (24th Edition, Jun. 15/96)

<u>12208</u>	<u>(7th Edition, Dec. 5/98)</u>
<u>12221</u>	<u>(70th Edition, Sep. 12/98)</u>
<u>12222</u>	<u>(39th Edition, Aug. 29/98)</u>
<u>12224</u>	<u>(21st Edition, Feb. 11/95)</u>
<u>12254</u>	<u>(41th Edition, Oct. 23/99)</u>

12256 (12th Edition, Sep. 7/96)
12280 (1st Edition, May. 25/96)

Hydrography

The charted hydrography originates with the prior surveys and requires no further consideration. The hydrographer makes adequate chart comparisons in sections M. and N. of the Descriptive Report. Attention is directed to the following:

1) An uncharted obstruction with a depth of 39 feet (11⁹ m), in Latitude 36°58'13.56"N, Longitude 76°06'26.76"W, was noted during office processing. It is recommended that this feature be charted as shown on sheet 2 of 3.

2) An uncharted obstruction with a depth of 39 feet (11⁹ m), in Latitude 36°58'10.74"N, Longitude 76°06'17.35"W, was noted during office processing. It is recommended that this feature be charted as shown on sheet 2 of 3.

3) An uncharted obstruction with a depth of 33 feet (10¹ m), in Latitude 37°02'05.77"N, Longitude 76°03'26.34"W, was noted during office processing. It is recommended that this feature be charted as shown on sheet 3 of 3.

*DTOW
 amended
 5/17/00
 Gxw*

The present survey is adequate to supersede the charted hydrography within the common area.

Controlling Depths

There are no conflicts between the present survey depths and the controlling depths of Thimble Shoal Channel and Chesapeake Channel.

O. ADEQUACY OF SURVEY

This is an adequate hydrographic/side scan sonar survey. No additional work is recommended.

S. MISCELLANEOUS

Chart compilation was done by Atlantic Hydrographic Branch personnel, in Norfolk, Virginia. Compilation data will be forwarded to Marine Chart Division, Silver Spring, Maryland.

The following NOS Chart were used for compilation of the present survey:

12208 (7th Ed., Dec. 5/98)
12224 (21st Ed., Feb. 11/95)
12254 (41th Ed., Oct. 23/99)

Frank Saunders

Frank Saunders

Cartographic Technician
Verification of Field Data
Evaluation and Analysis

APPROVAL SHEET
F00450

Initial Approvals:

The completed survey has been inspected with regard to survey coverage, delineation of depth curves, development of critical depths, cartographic symbolization, and verification or disproof 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 digital data for this survey. The survey records and digital data comply with NOS requirements except where noted in the Evaluation Report.

Richard W. Blevins Date: 21 MARCH 2000
Richard W. Blevins
Cartographer
Atlantic Hydrographic Branch

I have reviewed the smooth sheet, accompanying data, and reports. This survey and accompanying digital data meet or exceed NOS requirements and standards for products in support of nautical charting except where noted in the Evaluation Report.

Andrew L. Beaver Date: 21 MARCH 2000
Andrew L. Beaver
Lieutenant Commander, NOAA
Chief, Atlantic Hydrographic Branch

Final Approval:

Approved: Samuel P. De Bow, Jr. Date: May 30, 2000
Samuel P. De Bow, Jr.
Captain, NOAA
Chief, Hydrographic Surveys Division

76° 09' 30"

76° 09' 00"

76° 08' 30"

CHESAPEAKE BAY

37° 09' 00"

37° 09' 00"

39
 40 39 41 42 47
 38 38 38 39 39 40 42 51
 39 34 *Wk (barge)*
 38 39 40 41
 38 38 39 40 41
 38 38 39 40 41
 38 39
 39
 39

076° 09' 00" W

37° 08' 30"

NAD 27 37° 08' 30" N

37° 08' 30"

CHECKED BY: FLS
DATE 09/28/99

F00450
 VIRGINIA
 SOUTHERN CHESAPEAKE BAY
 TAIL OF THE HORSESHOE
 MARCH 1999
 SCALE 1:10000
 SOUNDING IN FEET AT MLLW
 HORIZONTAL DATUM : NAD 1983
 SHEET 1 OF 3
 AWOIS NUMBER 8875 & 3190

76° 09' 30"

76° 09' 00"

76° 08' 30"

76° 07' 30"

76° 07' 00"

76° 06' 30"

76° 06' 00"

76° 05' 30"

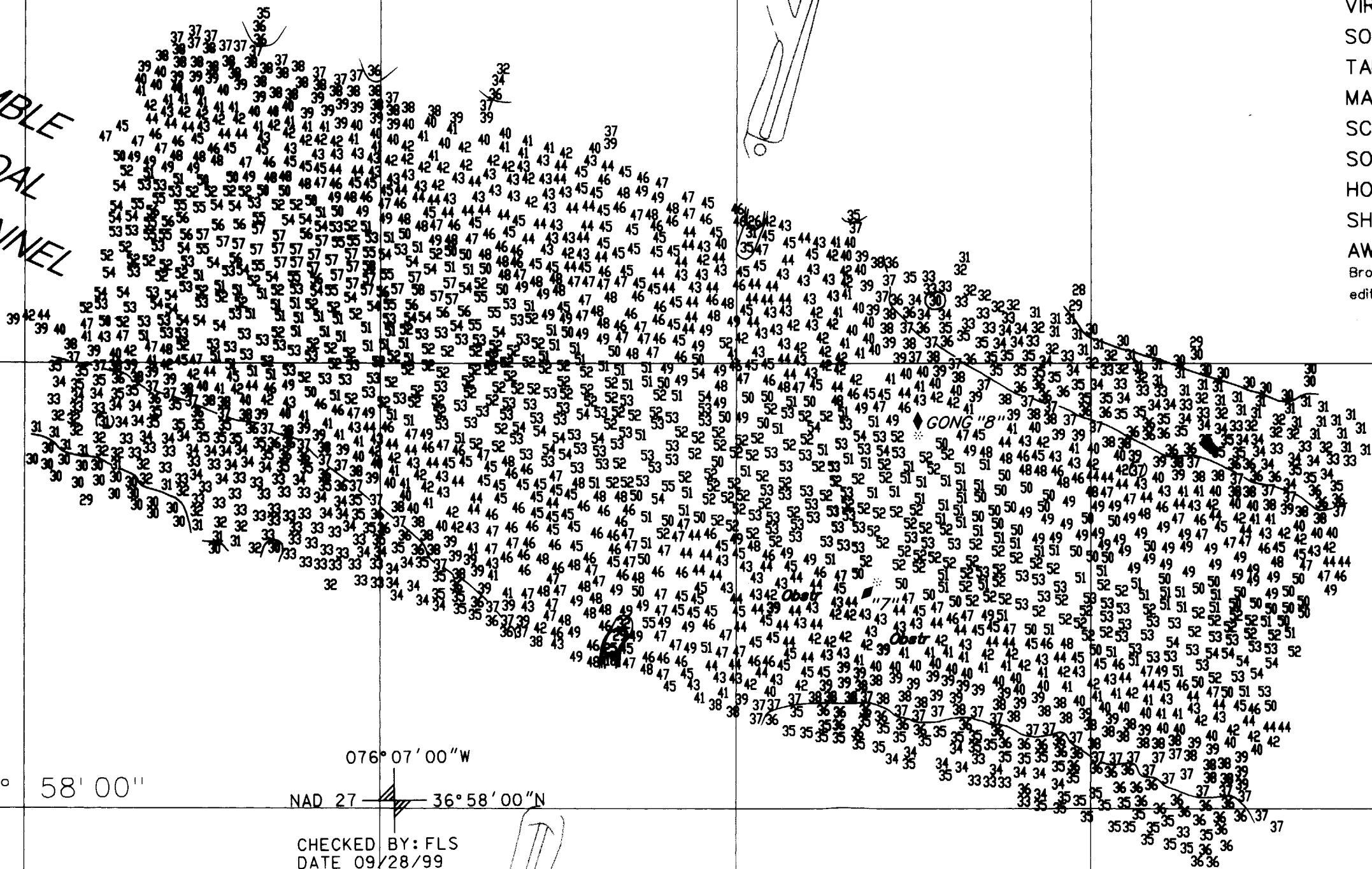
36° 59' 00"

THIMBLE SHOAL CHANNEL

F00450
VIRGINIA
SOUTHERN CHESAPEAKE BAY
TAIL OF THE HORSESHOE
MARCH 1999
SCALE 1:10000
SOUNDING IN FEET AT MLLW
HORIZONTAL DATUM: NAD 1983
SHEET 2 OF 3

AWOIS NUMBER 9556 & 9557
Brown shoreline originates with NOS chart 12222, 39th edition, Aug. 29, 1998 and is for orientation purposes only.

36° 58' 30"



076° 07' 00" W

36° 58' 00"

NAD 27 36° 58' 00" N

CHECKED BY: FLS
DATE 09/28/99

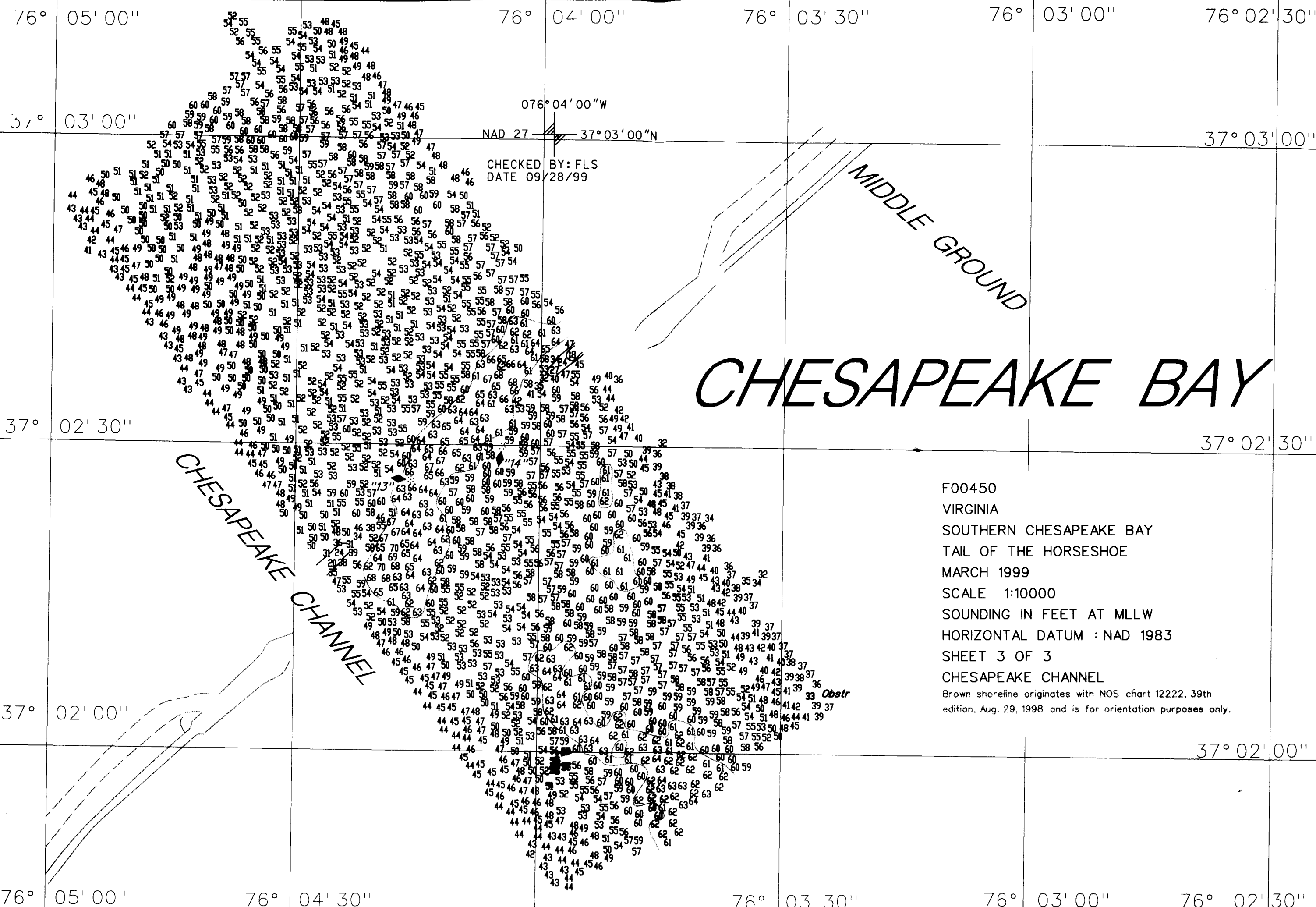
CHESAPEAKE BAY

76° 07' 30"

76° 06' 30"

76° 06' 00"

76° 05' 30"



CHECKED BY: FLS
DATE 09/28/99

CHESAPEAKE BAY

F00450
VIRGINIA
SOUTHERN CHESAPEAKE BAY
TAIL OF THE HORSESHOE
MARCH 1999
SCALE 1:10000
SOUNDING IN FEET AT MLLW
HORIZONTAL DATUM : NAD 1983
SHEET 3 OF 3
CHESAPEAKE CHANNEL
Brown shoreline originates with NOS chart 12222, 39th
edition, Aug. 29, 1998 and is for orientation purposes only.

MIDDLE GROUND

CHESAPEAKE CHANNEL

Obstr

MARINE CHART BRANCH
RECORD OF APPLICATION TO CHARTS

FILE WITH DESCRIPTIVE REPORT OF SURVEY NO. F00450

INSTRUCTIONS

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

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

CHART	DATE	CARTOGRAPHER	REMARKS
12208	4/7/2000	Richard Blewitt	Full Part Before After Marine Center Approval Signed Via Drawing No.
12224	4/7/2000	Richard Blewitt	Full Part Before After Marine Center Approval Signed Via Drawing No.
12254	4/5/2000	Richard Blewitt	Full Part Before After Marine Center Approval Signed Via Drawing No.
12254	6/8/00	Mark Hettrich PS 6-19-00	Full Part Before After Marine Center Approval Signed Via Drawing No.
12256	6/9/00	Mark Hettrich PS 6-19-00	Full Part Before After Marine Center Approval Signed Via Drawing No.
12222	6/9/00	Mark Hettrich PS 6-20-00	Full Part Before After Marine Center Approval Signed Via Drawing No.
12224	6/9/00	Mark Hettrich PS 6-20-00	Full Part Before After Marine Center Approval Signed Via Drawing No.
12208	6/12/00	Mark Hettrich PS 6-20-00	Full Part Before After Marine Center Approval Signed Via Drawing No.
12221-6			
12221	6/12/00	Mark Hettrich PS 6-20-00	Full Part Before After Marine Center Approval Signed Via Drawing No.
12205A	6/12/00	Mark Hettrich PS 6-20-00	Full Part Before After Marine Center Approval Signed Via Drawing No.
12280	6/12/00	Mark Hettrich PS 6-21-00	Full After Marine Center Approval