H10854

NOAA FORM 76-35A

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

DESCRIPTIVE REPORT

Type of Survey Hydrographic / Side Scan Sonar

Field No. WH-10-8-99

Registry No. H10854

LOCALITY

State Delaware

General Locality North Atlantic Ocean

Locality 16.3 NM Southeast of Cape Henlopen

1999

CHIEF OF PARTY
LCDR Gerd F. Glang

LIBRARY & ARCHIVES

DATE September 8, 2000

NOAA FORM 77-28
(11-72)

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

REGISTRY NUMBER:

H10854

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:
WH-10-8-99

State: New Jersey - Delaware

General locality: North Atlantic Ocean

Locality: ~~Approaches to Delaware Bay~~ 16.3 NM SE OF CAPE HENLOPEN

Scale: 1: 10,000 Date of survey: July 17 - October 17, 1999

Instructions dated: July 1, 1999 Project Number: OPR-D392-WH-99

Vessel: NOAA Ship WHITING

Chief of Party: LCDR Gerd F. Glang

Surveyed by: LCDR G.F. Glang, LT L. Krepp, ENS G. Imahori, ENS M. Moser, M.J. Annis, C. Clemens, U.L. Gardner, C.D. Kemp, P.G. Lewit

Soundings taken by echo sounder, hand lead-line, or pole: ODOM Echotrac DF 3200 echosounder

Graphic record scaled by: WHITING Personnel

Graphic record checked by: WHITING Personnel

Protracted by: N/A Automated plot by: ~~HP 750C~~ HEWLETT PACKARD DESIGN JET 2500 CP

Verification by: Hydrographic Surveys Branch PERSONNEL

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

Remarks: **All Times UTC**

Basic Hydrographic and 200% Side Scan Sonar

UTM Grid Zone 18 Northern Hemisphere

HAND WRITTEN NOTES IN DESCRIPTIVE REPORT WERE APPLIED DURING OFFICE PROCESSING.

AWOIS/SURF ✓ 7/20/00 SJV

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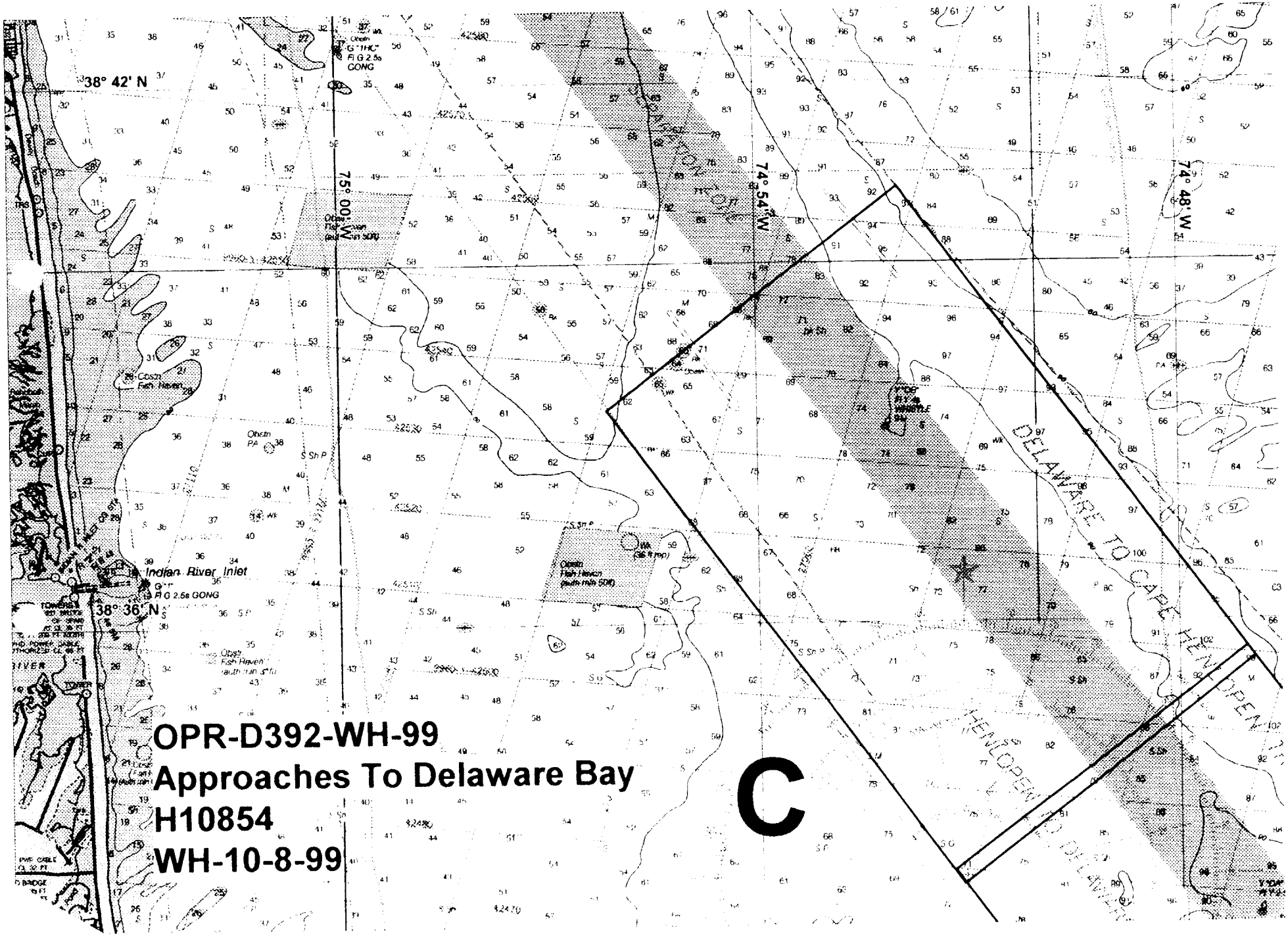
* DATA FILED WITH ORIGINAL FIELD RECORDS


38° 42' N
38° 36' N
75° 00' W
74° 54' W
74° 48' W
Indian River Inlet
DELAWARE TO CAPE HENLOPEN
OPR-D392-WH-99
Approaches To Delaware Bay
H10854
WH-10-8-99
C

A. PROJECT

A.1. This basic hydrographic survey was conducted in accordance with Hydrographic Survey Letter Instructions OPR-D392-WH-99, Delaware Bay and Approaches, New Jersey - Delaware.

A.2. The original instructions are dated July 1, 1999.

A.3. There is one change to the original project instructions. This change specifies that sheets "E" and "F" be combined into a single 1:20,000 scale survey designated as sheet "E"; sheets "G" and "H" were combined into a single 1:20,000 scale survey designated as sheet "F"; and sheets "I", "J", "K", "L", "M", and "N" were combined into a single 1:40,000 scale survey designated as sheet "G". At present, no written change has been received from N/CS31.

A.4. This Descriptive Report applies to sheet "C" of OPR-D392-WH, survey registry number H-10854. Survey H-10854 lies 16.3 nautical miles southeast of Cape Henlopen, Delaware. See section B.2 for exact survey boundaries.

A.5. Project OPR-D392-WH responds to requests from The Pilots' Association Bay and River, Delaware, and the Mariners Advisory Committee for the Bay and River, Delaware.
Both groups are concerned with routing vessel traffic in and out of Delaware Bay. The acquisition of modern hydrography and the detection or disproval of wrecks and obstructions will provide more options for vessel traffic management.

B. AREA SURVEYED

B.1. This survey covers the approximate center third portion of the navigable area of the southeast approaches to Delaware Bay, New Jersey - Delaware.

B.2. Sheet "C" has the following geographic boundaries:

Latitude	Longitude
38°40'56.0" N	074°51'58.2" W
38°35'31.3" N	074°46'49.3" W
38°32'59.7" N	074°51'04.2" W
38°38'23.4" N	074°56'17.7" W

B.3. Data collection for this survey began on July 17, 1999, (DN 198). Data collection ended on October 17, 1999 (DN 290).

C. SURVEY VESSELS

C.1. The following vessels were used during this survey:

Vessel	EDP Number	Operations
NOAA Ship WHITING	2930	Hydrography and Side Scan Operations
NOAA Launch 1014	2932	Hydrography, Dive, and Side Scan Operations
NOAA Launch 1015	2931	Hydrography and Side Scan Operations

C.2. No unusual vessel configurations were used during this survey.

D. AUTOMATED DATA ACQUISITION AND PROCESSING SEE ALSO THE EVALUATION REPORT

D.1. A detailed list of data acquisition and processing software used for this survey can be found in appendix H.*

Vertical beam echosounder (VBES) data acquisition was accomplished using Coastal Oceanographics **HYPACK** software. VBES data processing was accomplished using **HPS** (HYDROGRAPHIC PROCESSING SYSTEM) software and assorted utility programs contained on the **HYDROSOFT** version 9.4 compact disk provided by the Systems Support Branch (N/CS32).

All side scan data was acquired digitally using Triton Elics International (TEI) ISIS version 4.31 software. Digital side scan data was processed using Universal Systems Limited (USL) CARIS/SIPS version 4.3 (UNIX) software.

The Sea-Bird SBE-19 SEACAT CTD instrument was utilized with **SEASOFT 3.3M** and **SEACAT 2.0** software. The program **VELOCIWIN** (Version 4.0, March 1999) was used to process CTD data and calculate sound velocity corrections.

* DATA FILED WITH ORIGINAL FIELD RECORDS

E. SONAR EQUIPMENT

E.1. Except for the period between DN 236 and DN 251, WHITING conducted all side scan sonar operations using a 500kHz Klein T-5500 multibeam digital high speed, high resolution side scan sonar (HSHRSSS) system. Between DN 236 and DN 251, WHITING conducted side scan sonar operations using a 100kHz Edgetech Model 272-T side scan sonar (SSS) configured with an AU32 A/D converter.

Both WHITING launches used the 100kHz Edgetech Model 272-T towfish, configured with an AU32 A/D converter throughout this survey.

E.2. The Klein and Edgetech towfish are configured with a standard 20° below-horizontal beam angle depression.

E.3. The frequencies of 500kHz for the Klein and 100kHz for the Edgetech were used throughout the survey.

E.4(a) A range scale of 100 meters was used with a line spacing of 80 meters throughout the survey area. This range scale was used to obtain complete (200%) area coverage and provide optimal contact detection. The line spacing is in accordance with section 6.4 of the Field Procedures Manual (FPM, dated March 1999).

E.4(b) Periodic (usually daily) confidence checks were conducted during data acquisition by observing bottom features such as sand waves, scours, and naturally-occurring contrast of sea floor characteristics in the side scan imagery.

E.4(c) Two hundred percent side scan sonar coverage was completed for this survey. Side scan lines were assembled into mosaics using **CARIS/SIPS**. Mosaic rasters were viewed in **MapInfo** to assess sonar coverage after exporting them from **CARIS/SIPS** using the "**mosaic2tiff**" program developed by SSB. A holiday line plan was compiled over apparent gaps in the mosaic rasters using a **MapBasic** utility program; and then exported as **HYPACK** line files for acquisition. Any holidays with a length of 200 meters or less not covered with 200% side scan sonar were covered with 100% side scan sonar. All relevant and questionable contacts were investigated using a reduced side scan range scale.

E.4(d) Occasional thermocline problems were observed in the sonar imagery. Affected data was rejected and re-acquired at a later date after the thermocline dissipated.

E.4(e) Aboard WHITING, the Klein towfish was deployed using a SEA-MAC winch and armored coaxial cable from the stern A-frame. The EdgeTech SSS towfish was similarly deployed from WHITING's stern A-frame using armored cable. On launch 1014 and 1015, the EdgeTech SSS towfish was deployed on a Kevlar-jacketed cable over the vessels' sides using a Superwinch and J-arm.

E.4(f) Cable-out aboard WHITING was determined using an MD-TOTCO digital sheave meter installed on the stern A-frame block. The MD-TOTCO digitized cable-out values were acquired in real-time into **HYPACK** via an RS-232 serial cable. Cable-out aboard the launches was determined manually and entered into **HYPACK** during acquisition.

E.5. Contact investigations were conducted using VBES, reduced-range SSS, or diver methods. Line spacing for VBES or reduced-range SSS investigations was reduced to ensure 100% ensonification coverage for the particular sensor. Detailed descriptions of all investigated contacts are addressed in the Item Investigation Reports found in Section M.

E.6. Sonar coverage determination is described in E.4.c above. Sonar targets were initially evaluated during data acquisition. After ISIS data conversion, sonar targets were evaluated in CARIS/SIPS. Imagery analysis for targets during SIPS processing resulted in contact files and images for each line. These data were then exported into HPS for contact correlation and to rank contact significance using the **CORRELATOR** program. Positions of significant contacts were then exported into HYPACK target tables and further investigated using methods discussed in Section E.5.

F. SOUNDING EQUIPMENT

F.1. All hydrographic soundings were acquired using an ODOM ECHOTRAC DF3200 MKII precision survey echosounder. The following ECHOTRAC sounders were used:

Vessel	EDP Number	ECHOTRACK S/N
NOAA Ship WHITING	2930	9656
NOAA Launch 1014	2932	9644

Vessel	EDP Number	ECHOTRACK S/N
NOAA Launch 1015	2931	9655

F.2. A Diver Least Depth Gauge (DLDG Model D2000, s/n 68338) was used during dive investigations.

F.3. There were no faults in sounding equipment that affected data accuracy or quality.

F.4. Both high (100kHz) and low (24kHz) frequency depths were recorded during data acquisition. The high frequency digitized depths are used throughout this survey.

G. CORRECTIONS TO SOUNDINGS

G.1(a) Velocity of sound through water was determined using SeaBird SBE 19 SeaCat Sound Velocity Profilers (SVP s/n 196093-1060 and SVP s/n 192472-286). SeaCat Data Quality Assurance Tests were conducted IAW with the FPM after each cast. The SeaCat SVP units were calibrated January 14, 1999, by SEA-BIRD ELECTRONICS, INC.

All sound velocity data were processed using **VELOCIWIN** version 4.0. Computed velocity correctors were entered into HPS sound velocity tables and re-applied during post-processing to both high and low frequency depths.

The following is a list of sound velocity casts which apply to this survey, H-10854:

Table	DN	Vessel	Position Of Cast		DN Period	Cast Depth (M)
			Latitude	Longitude		
01	198	2930	38°40'08"N	074°52'09"W	198	34.3
02	198	2931-2932	38°40'08"N	074°52'09"W	198	34.3
03	210	2930	38°35'42"N	074°47'42"W	210-213	39.6
04	210	2931-2932	38°35'42"N	074°47'42"W	210-213	39.6
09	225	2930	38°40'12"N	074°52'12"W	225-230	38.2

Table	DN	Vessel	Position Of Cast		DN Period	Cast Depth (M)
			Latitude	Longitude		
10	225	2931-2932	38°40'12"N	074°52'12"W	225-230	38.2
15	241	2930	38°35'42"N	074°47'36"W	241-243	40.0
16	241	2931-2932	38°35'42"N	074°47'36"W	241-243	40.0
21	255	2930	38°35'42"N	074°47'36"W	251-258	36.2
22	255	2931-2932	38°35'42"N	074°47'36"W	251-258	36.2
25	262	2930	38°35'42"N	074°47'36"W	262-281	39.4
26	262	2931-2932	38°35'42"N	074°47'36"W	262-281	39.4
31	275	2931-2932	38°34'48"N	074°46'42"W	275-281	34.6
32	275	2930	38°34'48"N	074°46'42"W	275-281	34.6

G.1(b) The following dual Leadline comparisons with the ECHOTRAC DF 3200 MKII were conducted for WHITING, launch 1014, and launch 1015 for this project and apply to this survey, H-10854:

Vessel	Area	Latitude	Longitude	DN
2930	Delaware Bay	38°55'24"N	075°07'30"W	230
2931	Harbor of Refuge	38°48'37"N	075°07'51"W	223
2931	Harbor of Refuge	38°48'37"N	075°07'24"W	224
2932	Delaware Bay	38°48'48"N	075°05'30"W	224

Weather and sea conditions were calm and proved ideal for the leadline comparisons. No corrections to soundings were needed. Leadlines were calibrated on May 17, 1999; and the calibrations confirmed that leadline errors were negligible. Refer to the echogram records for the above listed day numbers.

G.1(c) Static draft corrections for launch 1014 and 1015 were measured on July 28, 1993 (HPS Offset Tables 1 and 2). The static draft correction for WHITING (3.2 meters) was measured on May 3, 1999 at Mayport Naval Station, Florida (HPS Offset Table 9). Static draft correctors were applied during data post-processing for each survey vessel.

G.1(d) Settlement and squat values for WHITING were determined on April 19, 1999 (HPS Offset Table 9). Settlement and squat values for both launches were determined March 16, 1998 (HPS Offset Tables 1 for launch 1015, and HPS Offset Table 2 for launch 1014). The settlement and squat correctors were applied during data processing. Refer to Separate I.*

G.1(e) WHITING and each launch are equipped with a TSS DMS-05 Dynamic Motion Sensor. Heave correctors determined by the DMS-05 sensors were acquired in **HYPACK** during data acquisition and applied to raw data during processing. Serial numbers for these sensors are as follows:

Vessel	EDP Number	DMS-05 S/N
NOAA Ship WHITING	2930	2066
NOAA Launch 1014	2932	2062
NOAA Launch 1015	2931	2068

G.4. No DLDG correctors were used. DLDG gauges were calibrated on February 9, 1999 by PTC Electronics Incorporated. See appendix E for calibration information.

G.5. No other factors were determined to affect corrections to soundings.

G.6(a) The tidal datum for this project is Mean Lower Low Water (MLLW). The operating tide station at Lewes, Delaware (855-7380) served as control for datum determination.

G.6(b) Zoning for this survey is consistent with the project instructions. HPTools was used for Tide table creation and was used for the application of Preliminary Water Level Data during data processing. The following tide zone was used:

* DATA FILED WITH ORIGINAL FIELD RECORDS

Zone Station	Time Corrector (Minutes)	Range Ratio	Predicted Reference
MAC302	-66	0.89	855-7380

Approved tides for H-10854 were requested by letter to N/OPS1 dated October 18, 1999. ~~See Appendix D.~~ APPROVED TIDES AND ZONING WERE APPLIED DURING OFFICE PROCESSING.

H. Hydrographic Position Control SEE ALSO THE EVALUATION REPORT

H.1 The horizontal datum for this survey is North American Datum of 1983 (NAD 83). No horizontal control stations were established for this survey.

H.2. This survey was conducted using the Global Positioning System (GPS) corrected by U.S. Coast Guard (USCG) Differential GPS reference stations.

H.3. USCG DGPS stations used were Cape Henry and Cape Henlopen.

H.4. Not applicable.

H.5. The Horizontal Dilution of Precision (HDOP) and Expected Position Error (EPE) specified by the Draft NOAA Hydrographic Project Instructions were monitored during on-line data collection. If the positioning degraded beyond the acceptable limits while on-line, the data was either smoothed or rejected.

Performance checks for WHITING and both launches were conducted with launches secured in davits using the program **Pcheck** (from the Hydrosoft 9.4 CD-ROM). Differential correctors from the Cape Henry or Cape Henlopen USCG DGPS stations were used to correct GPS signals. Simultaneous **HYPACK** positions on all three platforms were acquired and an offset distance and azimuth computed between the ship and each launch system. The computed offset distances and azimuths were compared to measured values. A summary of the DGPS performance checks is included in *Appendix G. All DGPS performance checks confirmed that the equipment was working properly.

H.6. Serial numbers for the Trimble DSM212L receivers are as follows:

* DATA FILED WITH ORIGINAL FIELD RECORDS

Vessel	EDP Number	DSM212L S/N
NOAA Ship WHITING	2930	System 1: 0220159721 System 2: 0220159722
NOAA Launch 1014	2932	0220159716
NOAA Launch 1015	2931	0220159723

Trimble receivers were initialized to the appropriate station and frequency using the **Trimble TSIP Talker** software.

H.7(a) There were no unusual methods used to operate or calibrate electronic positioning equipment.

H.7(b) No equipment malfunctions affected the quality of survey data collected.

H.7(c) No unusual atmospheric conditions affected data quality.

H.7(d) The maximum allowed HDOP value of 4.0 was never exceeded. Weak differential signals or satellite problems did not affect the survey data quality.

H.7(e) No systematic errors were detected which required adjustments.

H.7(f) DGPS antenna offsets were measured on April 15, 1999 for WHITING. For VBES data, offsets and laybacks were measured using the high-frequency echosounder transducer as the reference point. Correctors were entered into Offset Table 9. The DGPS antennae were installed on launches 1014 and 1015 on April 2, 1996, directly over the echosounder transducer. Antenna height was also measured on the same respective dates shown above, using the water line as the reference. Correctors were entered into Offset Table 1 for launch 1015 and Table 2 for launch 1014. A minimum of four satellites were used throughout this survey providing altitude-unconstrained positioning.

H.7(g) The SSS offset and layback distances for the launch J-arms were measured on July 28, 1993, and verified on April 15, 1999.

The SSS offset and layback distances for WHITING's A-frame was measured on April 15, 1999.

The offset and layback values were entered into the appropriate CARIS Vessel Configuration Files (VCF) and applied during CARIS/SIPS data processing.

I. SHORELINE

No shoreline is contained within the boundaries of this survey.

J. CROSSLINES

J.1. A total of 47.0 linear nautical miles of crossline hydrography, representing approximately 6.5% of the 718.8 lnm of mainscheme hydrography, were acquired for this survey.

J.2. Mainscheme-to-crossline soundings were compared at their common intersections. Agreement was excellent, with the majority of soundings found to be within 1 to 2 feet of each other.

J.3. No significant discrepancies between mainscheme and crossline soundings were observed.

J.4. Vessels acquiring crossline data did not necessarily acquire the mainscheme data.

K. JUNCTIONS SEE ALSO THE EVALUATION REPORT

K.1. Survey H-10854 junctions along the southeast with contemporary survey H-10931. Survey H-10931 is sheet "D" of OPR-D392-WH (1:10000 scale).

K.2. A comparisons of junction soundings between H-10854 and H-10931 showed no significant differences. Agreement was generally excellent, with occasional differences of up to three feet.

K.3. These minor junction discrepancies are likely due to positioning and beam-footprint uncertainties inherent in the VBES systems.

K.4. No recommendations are made.

L. COMPARISON WITH PRIOR SURVEYS SEE ALSO THE EVALUATION REPORT

A comparison with prior surveys is not required due to the completion of 200% side scan sonar coverage.

M. ITEM INVESTIGATION REPORTS SEE ALSO THE EVALUATION REPORT

Contact No: 252_042_0939_2

Item Description: Wreck

Source: N/A

AWOIS Position: N/A

Required Investigation: N/A **Radius:** N/A

Charts Affected: 12214

INVESTIGATION

Date(s): 15 October 1999 (DOY 288)

Position Numbers: 25780.0

Investigation Used: DI

Surveyed Position: Lat. 38°35'14.67"N Lon. 074°49'39.21"W

Position Determined By: Differential GPS

Investigation Summary: On DOY 288 divers investigated contact #252_042_0939_2 and found the remains of a wooden wreck. Least depth was taken atop the wreck's A-frame.

CHARTING RECOMMENDATION

Recommendation: The Hydrographer recommends charting a "Non-dangerous wreck, least depth known by diver of 23.~~05~~10m (~~76.6~~ ~~75.8~~ ft)", (corrected with ~~predicted~~ tides) at the surveyed position.

APPROVED CONCUR

CHART 76 WK

The following SSS contacts were developed using the VBES with 10m line spacing, and subsequently determined to be insignificant:

DO NOT CONCUR
SEE ALSO THE EVALUATION REPORT

Contact Number	Position	Dev. Day #	
226_082_1951_1	38°35'08.97" N 074°52'17.60" W	288 (M.1)	chart 75 obstn
212_057_1340_1	38°35'17.42" N 074°50'43.94" W	288	
226_080_2061_1	38°38'42.41" N 074°55'31.10" W	288 (M.2)	RETAIN GS: RK
211_021_2058_1	38°37'55.60" N 074°50'44.89" W	288 (M.3)	RETAIN 69 WK

N. COMPARISON WITH THE CHART

N.1. Three charts are affected by this survey:

Chart No. 12214
Cape May to Fenwick Island
42nd Ed., September 25, 1999
1:80,000

Chart No. 12200
Cape May to Cape Hatteras
45th Ed., December 12, 1998
1:419,706

Chart No. 13003
Cape Sable to Cape Hatteras
44th Ed., October 9, 1999
1:1,200,000

N.2. No Danger to Navigation Reports were issued as a result of this survey.

N.3(a) Survey depths were converted from meters to feet and overlaid on the largest scale raster chart of the area using MapInfo. In general, survey depths agreed well with charted soundings. Any survey depths found to be more than three feet deeper than the charted soundings were investigated with single beam echosounder at 40-meter line spacing.

N.3(b) No significant shoaling or deepening trends were observed within the limits of this survey.

N.3(c) No hydrographic findings of special note are reported.

N.3(d) No maintained channels occur within the limits of this survey.

N.3(e) This survey is inclusive of and approximately bounded by a portion of the southern traffic separation scheme (the Cape Henlopen to Delaware and Delaware to Cape Henlopen traffic lanes) in the approaches to Delaware Bay. During the course of this survey, the hydrographer observed inbound deep-draft vessels, typically laden tankers, with drafts of up to 55 feet. The shoalest depths observed on this survey of 60 feet or deeper were confined to the extreme western corner of the survey. The soundings on this survey confirm the traffic separation scheme boundaries are adequately charted.

N.4(a) With the exception of the item noted in N.4.b., all non-sounding features within the survey area are adequately charted.
DO NOT CONCUR SEE SECTION M.2 OF THE EVALUATION REPORT

N.4(b) The hydrographer recommends removing the charted obstruction with danger circle at position 38°38'53"N 074°55'09.8"W. No significant contacts were found within the area during the course of mainscheme hydrography. DO NOT CONCUR SEE SECTION N.1 OF EVALUATION REPORT

N.4(c) thru N.6(k) These sections not applicable to this survey.

O. ADEQUACY OF SURVEY SEE ALSO THE EVALUATION REPORT

This survey is sufficiently complete and fully adequate to supersede prior survey data within common areas. DO NOT CONCUR

P. AIDS TO NAVIGATION

P.1. Not applicable to this survey.

P.2. One floating aid to navigation lies within the limits of H-10854. The charted position of the yellow separation zone buoy "DB", (Y "DB" Fl Y 4s WHISTLE), which is not listed in the Light List, was compared with a position scaled from side scan sonar imagery. The charted and scaled positions agreed within eighty meters of each other. The color and light characteristics of this floating aid were visually confirmed during the survey operations.

P.3. The position of the Y "DB" Fl Y 4s WHISTLE buoy is included in the survey records as contact # 229_037_1237_1.

P.5. Not applicable to this survey.

P.6. There were no non-floating aids to navigation included within the limits of this survey.

Q. STATISTICS

	Total number of Non-Rejected Positions	262743
Q.1.a.	Linear Nautical Miles of SSS	718.8
Q.1.b	Linear Nautical Miles of VBES-only	50.8
Q.1.c.	Square Nautical Miles of VBES	23.6
Q.1.d.	Square Nautical Miles of SSS	23.6
Q.2.a.	Days of Data Acquisition	23
Q.2.b.	Total Number of Soundings	30035
Q.2.c.	Number of Soundings on Final Field Sheet	NA
Q.2.d.	Number of Detached Positions	1
Q.2.d.	Number of Bottom Samples	40
Q.2.e.	Number of Velocity Casts	8
Q.2.f.	Number of Tide Stations Installed	1

R. MISCELLANEOUS

Bottom samples were sent to the Smithsonian Institution as per project letter.

S. RECOMMENDATIONS

No further survey work is recommended.

T. REFERRAL TO REPORTS

A Coast Pilot Report will be submitted to N/CS26 at the conclusion of project OPR-D392-WH.

A Tide Station Report for station 855-4399 (Mahon River Entrance) will be submitted to N/OPS1 at the conclusion of project OPR-D392-WH.

This is a multi-year project for WHITING and is expected to be complete in September 2000.

This is a multi-year project for WHITING and is expected to be complete in September 2000.

Respectfully Submitted,

Lawrence T. Krepp
Lieutenant, NOAA
Operations Officer
NOAA Ship Whiting

Date

APPENDIX K

APPROVAL SHEET

OPR-D392-WH-99
Delaware Bay and Approaches
New Jersey - Delaware

16.3 nm SE of Cape Henlopen, Delaware
Survey Registry No. H-10854

Field operations for this basic hydrographic survey were conducted under my daily supervision with frequent checks of progress and adequacy. All field sheets, this Descriptive Report, and all accompanying records and data are approved.

This survey is adequate to supersede all prior surveys in common areas, and for application to the relevant NOS nautical charts.

Respectfully,

Gerd F. Glang
Lieutenant Commander, NOAA
Commanding Officer
NOAA Ship WHITING

March 2, 2000
Date

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

TIDE NOTE FOR HYDROGRAPHIC SURVEY

DATE: March 8, 2000

HYDROGRAPHIC BRANCH: Atlantic
HYDROGRAPHIC PROJECT: OPR-D392-WH-99
HYDROGRAPHIC SHEET: H-10854

LOCALITY: Approaches to Delaware Bay, NJ/DE
Atlantic Ocean

TIME PERIOD: July 17 - October 17, 1999

TIDE STATION USED: 855-7380 Lewes, DE
Lat. 38° 46.9'N Lon. 75° 07.2'W
PLANE OF REFERENCE (MEAN LOWER LOW WATER): 0.000 meters
HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 1.314 meters

REMARKS: RECOMMENDED ZONING
Use zone(s) identified as: ATL526 & ATL527.

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.

For ----------

CHIEF, REQUIREMENTS AND DEVELOPMENT DIVISION

NOAA FORM 76-155
(11-72)

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

GEOGRAPHIC NAMES

SURVEY NUMBER

H-10854

Name on Survey	A ON CHART NO. 12214	B ON PREVIOUS SURVEY NO.	C ON U.S. QUADRANGLE MAPS	D FROM LOCAL INFORMATION	E ON LOCAL MAPS	F P.O. GUIDE OR MAP	G RAND MCNALLY ATLAS	H U.S. LIGHT LIST	K	
CAPE HENLOPEN (title)	X		X							1
DELAWARE (title)	X		X							2
NORTH ATLANTIC OCEAN	X		X							3
				[redacted]						4
										5
				[redacted]						6
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NOAA FORM 76-155 SUPERSEDES C&GS 197

NOAA FORM 61-29
(12-71)

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

REFERENCE NO

N/CS33-48-00

LETTER TRANSMITTING DATA

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

	ORDINARY MAIL		AIR MAIL
	REGISTERED MAIL	☒	EXPRESS
	GBL *(Give number)*		

TO:

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

DATE FORWARDED

7-14-0

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.

H10854 OPR-D392-WH-99

DELAWARE

Descriptive Report / Evaluation Report
Drawing History forms 76-71 for NOS Chart 12214

1 Smooth Sheet

1 Mylar H-Drawing
2 Paper Composite Plots

FROM: *(Signature)* Maxine Fetterly

RECEIVED THE ABOVE
(Name, Division, Date)

Return receipted copy to:

Maxine Fetterly
Atlantic Hydrographic Branch
439 W. York St.
Norfolk, VA 23510

NOAA FORM 61-29 SUPERSEDES FORM C & GS 413 WHICH MAY BE USED

07/14/2000

HYDROGRAPHIC SURVEY STATISTICS
REGISTRY NUMBER: H10854

NUMBER OF CONTROL STATIONS	2
NUMBER OF POSITIONS	30120
NUMBER OF SOUNDINGS	30120

	TIME-HOURS	DATE COMPLETED
PREPROCESSING EXAMINATION	8.0	05/08/2000
VERIFICATION OF FIELD DATA	45.0	06/23/2000
QUALITY CONTROL CHECKS	20.5	
EVALUATION AND ANALYSIS	15.5	
FINAL INSPECTION	4.5	06/07/2000
COMPILATION	53.5	06/29/2000
TOTAL TIME	147.0	

ATLANTIC HYDROGRAPHIC BRANCH APPROVAL 07/13/2000

ATLANTIC HYDROGRAPHIC BRANCH
EVALUATION REPORT FOR H10854 (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
MicroStation 95, version 5.05
I/RAS B, version 5.01

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

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. The smooth sheet has been annotated with ticks showing the computed mean shift between the NAD 83 and the North American Datum of 1927 (NAD 27).

To place this survey on the NAD 27, move the projection lines 0.405 seconds (12.477 meters or 1.25 mm at the scale of the survey) north in latitude, and 1.385 seconds (33.504 meters or 3.35 mm at the scale of the survey) east in longitude.

K. JUNCTIONS

H10931 (1999) to the southeast

A standard junction was effected between the present survey and survey H10931 (1999). There are no junctional surveys to the northeast, south, or west. Present survey depths are in harmony with the charted hydrography to the northeast, south, 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

1. An uncharted obstruction with a depth of 75 feet (22^9 m), in Latitude 38°35'08.89"N, Longitude 74°52'17.56"W, was located by the field unit. It is recommended that the obstruction be charted as shown on the present survey.

2. A charted wreck, with a depth of 65 feet (20 m), in Latitude 38°38'42"N, Longitude 74°55'24"W, originates with prior survey H10476 (1993) as a rock with a depth of 65 feet (20 m). This feature was neither verified nor disproved by the hydrographer and has been brought forward from the prior survey to supplement the present survey. It is recommended that the notation be revised from wreck to rock and remain charted in its present position. Additional investigation using multibeam is recommended at an opportune time.

3. A charted wreck, with a depth of 69 feet (21 m), in Latitude 38°37'56"N, Longitude 74°50'48"W, originates with Notice to Mariners 24 in 1971 (NM24/71). A wire drag clearance depth of 69 feet (21 m) was found by H09295WD (1971-72) in Latitude 38°38'00"N, Longitude 74°50'36"W. The wreck was further investigated by prior survey H09727 (1977) with negative results. During present survey operations, an echosounder depth of 72 feet (21^9 m) was noted in Latitude 38°37'55.69"N, Longitude 74°50'45.41"W. Surrounding depths range from 74 to 75 feet (22^6-22^9 m). This feature is charted in error and should be revised to a wire drag clearance depth of 69 feet as noted above by H09295WD (1971-72), in Latitude 38°38'00"N, Longitude 74°50'36"W. The feature has been brought forward from the prior survey to supplement the present survey. Additional investigation using multibeam is recommended at an opportune time.

N. COMPARISON WITH CHARTS 12200 (45th Edition, Dec 12/98)
12214 (42nd Edition, Sep 25/99)
13003 (44th Edition, Oct 9/99)

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. Automated Wreck and Obstruction Information System (AWOIS) Item #9283, a charted obstruction with a depth of 64 feet (19[7] m), in Latitude 38°38'52.72"N, Longitude 74°55'09.64"W, originates with prior survey H10476 (1993). This feature was not adequately disproved by the hydrographer and has been brought forward from the prior survey to supplement the present survey. No change in charting status is recommended.

2. AWOIS Item #1104, a charted sunken wreck, in Latitude 38°37'57"N, Longitude 74°55'34"W, originates with Notice to Mariners 3939 of 1924 (NM 3939/24). This feature was neither verified nor disproved by the hydrographer. No change in charting status is recommended.

3. AWOIS Item #9284, a charted rock with a depth of 66 feet (20[1] m), in Latitude 38°39'01.11"N, Longitude 74°55'02.49"W, originates with prior survey H10476 (1993). This feature was neither verified nor disproved by the hydrographer and has been brought forward from the prior survey to supplement the present survey. No change in charting status is recommended.

4. AWOIS Item #9286, a charted rock with a depth of 68 feet (20[9] m) in Latitude 38°39'27.56"N, Longitude 74°54'14.87"W, originates with prior survey H10476 (1993). This feature was neither verified nor disproved by the hydrographer and has been brought forward from the prior survey to supplement the present survey. No change in charting status is recommended.

Depths have been brought forward from prior surveys H10476 (1993) and H09295WD (1971-72) and supplement the present hydrography. With these additions the present survey is adequate to supercede the prior survey in the common area. Additional investigation using multibeam is recommended at an opportune time for the above charted items.

O. ADEQUACY OF SURVEY

This is an adequate hydrographic/side scan sonar survey. Additional work is recommended.

R. 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 was compiled using the present survey data:

12214 (42nd Edition, Sept. 25/99)

Robert Snow

Robert Snow
Cartographic Technician
Verification of Field Data
Evaluation and Analysis

APPROVAL SHEET
H10854

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 disapproval 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.

Date: 6/7/00

Maxine Fetterly
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.

Date: 6/15/00

Andrew L. Beaver
Lieutenant Commander, NOAA
Chief, Atlantic Hydrographic Branch

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Final Approval:

Approved: Samuel P. DeBow Date: September 8, 2000

Samuel P. DeBow, Jr.
Captain, NOAA
Chief, Hydrographic Surveys Division

NOAA FORM 75-96
(10-83)

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

MARINE CHART BRANCH

RECORD OF APPLICATION TO CHARTS

FILE WITH DESCRIPTIVE REPORT OF SURVEY NO. H10854

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
12214	6/27/2000	[signature]	Full Part Before After Marine Center Approval Signed Via
			Drawing No.
			Full Part Before After Marine Center Approval Signed Via
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			Full Part Before After Marine Center Approval Signed Via
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