

H10687

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-20-1-96
Registry No.	H-10687
LOCALITY	
State	NORTH CAROLINA
General Locality	NORTH ATLANTIC OCEAN
Sublocality	14 NM SSW OF CAPE FEAR RIVER
	19 96
	CHIEF OF PARTY CDR M. R. KENNY, NOAA
LIBRARY & ARCHIVES	
DATE	MAY 12 1998

REGISTRY NUMBER:

H-10687

**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-20-1-96

State: North Carolina

General locality: North Atlantic Ocean

Locality: 14 NM SSW of Cape Fear River

Scale: 1: 20,000 Date of survey: May 20 - October 22, 1996

Instructions dated: May 3, 1996 Project Number: OPR-G309-WH

Vessel: NOAA Ship WHITING (2930), Launch 1014 (2932)

Chief of Party: CDR Maureen R. Kenny, NOAA

Surveyed by: M.R. Kenny, A.L. Beaver, P.A. Gruccio, J. Pikulsky, E.J. Sinos, C.E. Parrish, J. Garte, U. Gardner Jr., P. Lewit, K.B. Shaver, F.R. Cruz

Soundings taken by echo sounder, hand lead-line, or pole: DSF 6000N fathometer

Graphic record scaled by: WHITING survey personnel

Graphic record checked by: WHITING survey personnel

Protracted by: N/A Automated plot by: HP 7959B, Bruning ~~ET AL~~  
*ENCAL DASH 411 Plotter (after)*

Verification by: Hydrographic Surveys Branch Personnel  
*HERRICK PHILLIP DESILVER 350C. (NSB)*

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

Remarks: Time Zone Used, 0 (UTC)

*Notes in Descriptive Report were made in Red during  
Office Processing*

*AWOIS and SURF ✓ PWD 5/98*

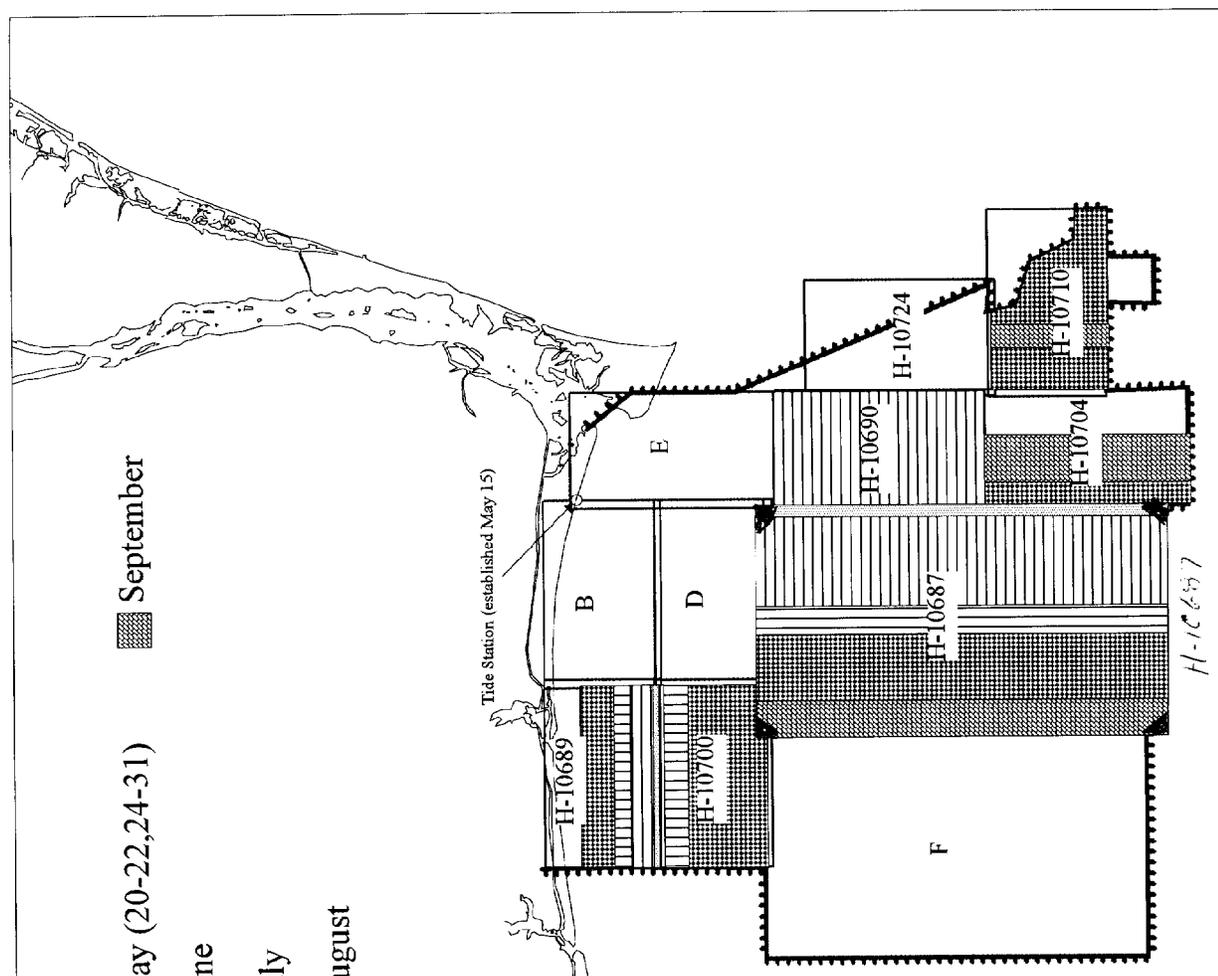
PROGRESS SKETCH - SEPT 1996  
 OPR-G309-WH-96  
 Approaches to Wilmington, NC  
 NOAA Ship WHITING  
 CDR Maureen R. Kenny, CMDG.



Accomplished	May	June	July	Aug	Sept	Oct	Nov
LNM Hydro	222	276	120	32	141		
LNM SSS	200	1985	659	2205	1041		
Sq NM Surveyed	8.5	86	26.8	92.6	37.2		
AWOIS Items	0	0	0	0	4		
Dives	0	7	4	12	6		
Bottom Samples	44	36	26	0	28		

Downtime Hrs	May	June	July	Aug	Sept	Oct	Nov
Weather	4	73	218	68	188		
Electronics	1	114	13	22	16		
Mechanical	0	7	0	0	0		
Other	0	7	0	2	4		

Reg No	Started	Est_Complete	Complete	Submitted
H-10687	5/20/96	10/25/96	95%	
H-10689	5/30/96	Completed	9/27/96	
H-10690	5/31/96	10/11/96	99%	
H-10700	6/25/96	10/11/96	98%	
H-10704	7/23/96	11/25/96	50%	
H-10710	8/25/96	11/08/96	80%	
H-10724	9/28/96	11/25/96	2%	
FE-428	8/02/96	11/25/96	10%	



**DESCRIPTIVE REPORT TO ACCOMPANY  
HYDROGRAPHIC SURVEY  
OPR-G309-WH  
WH-20-1-96  
H-10687**

**NOAA SHIP WHITING  
CDR Maureen Kenny, NOAA  
Commanding Officer**

**A. PROJECT**

The purpose of this project is to provide contemporary hydrographic survey data to update existing nautical charts of the approaches to Wilmington, North Carolina. The project is being conducted in response to requests from the United States Coast Guard (USCG), the United States Army Corps of Engineers, the North Carolina State Ports Authority, and the Wilmington-Cape Fear Pilots Association. Project OPR-G309-WH consists of twelve survey sheets. The survey described in this report was designated "G" sheet, field sheet number WH-20-1-96, and registry number H-10687. Survey operations were conducted in compliance with the Hydrographic Project Instructions OPR-G309-WH dated May 3, 1996.

**B. AREA SURVEYED**

Hydrographic survey H-10687 is located 14 nautical miles south southwest of Cape Fear River, North Carolina. The limits of hydrography are bounded by the following positions:

<u>Position</u>	<u>Latitude</u>	<u>Longitude</u>
1	33° 47' 43.485" N	078° 04' 35.462" W
2	33° 47' 43.284" N	078° 14' 26.366" W
3	33° 33' 39.392" N	078° 14' 25.156" W
4	33° 33' 39.591" N	078° 04' 35.853" W

Survey operations commenced on May 20, 1996 (DN 141) and concluded on October 22, 1996 (DN 296).

**C. SURVEY VESSELS**

NOAA Ship WHITING (vessel number 2930) and launch 1014 (vessel number 2932) were used to conduct mainscheme sounding data acquisition, side scan sonar, crosslines, sound velocity

casts, mainscheme echosounder splits, bottom samples, and dive operations. Launch 1015 (vessel number 2931) was not used for data acquisition but was used for performance checks. No unusual problems or equipment configurations were encountered.

**D. AUTOMATED DATA ACQUISITION AND PROCESSING** *See also Evaluation Report.*

Survey data acquisition and processing were accomplished using the HDAPS system with the standard HDAPS software dated March 28, 1996. Sound velocity corrections were determined using *CAT* version 2.00 and *VELOCITY* version 2.11. The DGPS station was checked using *MONITOR* version 1.2. The MOD III Diver Least Depth Gauge was checked using the *DAILYDQA* program. There were no nonstandard automated acquisition or processing methods used.

**E. SIDE SCAN SONAR EQUIPMENT**

Side scan sonar (SSS) operations were conducted using an EG&G model 260 slant-range corrected SSS recorder and an EG&G 272-T dual-channel towfish. The towfish was operated on the 100 kHz frequency and configured with a 20° beam depression. The following sonar equipment was used throughout the survey:

<u>VESNO</u>	<u>Type</u>	<u>S/N</u>	<u>DN</u>
2930	Towfish	016630	141-206
	Recorder	016942	141-206
	Towfish	016697	206-296
	Recorder	016946	206-296
2932	Towfish	016697	141-176
	Recorder	016673	141-296
	Towfish	011591	222-296

On NOAA Ship WHITING, the SSS towfish was deployed from a Reuland winch using one of two armored cables in conjunction with an A-frame on the stern. The armored cable was connected to the SSS recorder by a slip-ring assembly. On launch 1014, the SSS towfish was deployed using a Superwinch in conjunction with an adjustable davit arm on the stern. The SSS towfish was towed with a vinyl-coated Kevlar cable and was connected to the recorder by a slip-ring assembly.

This survey required 200% side scan sonar coverage. Proper coverage was achieved by running mainscheme lines with 80-meter line spacing at the 100-meter range scale. This line spacing provided for proper overlap as required by Field Procedures Manual, section 7.3.2.2. Adequate

coverage was ensured by plotting alternate mainscheme lines on 'A' and 'B' swath plots and verifying 100% coverage on each plot.

The towfish was maintained at a height off the bottom of 8-20 percent of the range scale. Side scan operations were limited to a speed-over-ground of 4-6 knots. Confidence checks were performed by noting changes in linear bottom features extending to the outer edges of the sonargram and by passing aids to navigation.

Contacts were measured off the sonargram and entered into an HDAPS contact table. Using the contact utility program, WHITING hydrographers determined contact heights, positions, and correlations to other contacts. Contacts appearing significant were further investigated by SSS development then by divers if deemed necessary. Least depths were determined by a MOD III Diver Least Depth Gauge (S/N 68332) and final positioning of significant items was determined with detached positions taken on diver-placed buoys.

## F. SOUNDING EQUIPMENT

Raytheon Digital Survey Fathometer (DSF-6000N) echosounders were used to measure water depths during the survey. The DSF-6000N produced a graphic record of the high frequency (100 kHz) and low frequency (24 kHz) depths. The high and low frequency digital depths were recorded by the HDAPS acquisition system. The high frequency depths were selected as the primary depths and were used for plotting. All echograms were scanned for significant features and any significant features that were not selected as primary soundings were manually inserted.

The following fathometers were used:

<u>Vessel</u>	<u>S/N</u>	<u>DN</u>
2930	047N	141-176
	C076N	200-206
	A01244	206-223
	B046N	223-296
2932	B051N	141-296

Electronic technicians performed accuracy checks and preventive maintenance on all of the DSF-6000N echosounders used.

Least depths on diver investigations in the survey area were acquired using the MOD III Diver Least Depth Gauge (S/N 68332).

## G. CORRECTIONS TO SOUNDINGS

Sound velocity profiles of the water column were determined using a Seacat Conductivity, Temperature and Depth (CTD) profiler (model SBE-19, S/N 286 and S/N 1060). The CTD profilers were calibrated on January 10, 1996. The Seacat calibration records are included in the Separates, section IV. ✕

A corrector table was generated for the ship (vessel number 2930) for each velocity cast taken. Additionally, a corrector table was generated for the launch (vessel number 2932). The following table shows the dates, locations and the table depths of each velocity cast that was applied to the data collected in this survey area:

<u>DN</u>	<u>Velocity Table #</u>	<u>Latitude</u>	<u>Longitude</u>	<u>Depth</u>
141	1 (ship)	33° 34' 42" N	078° 10' 30" W	24.0 m
152	2, 3 (ship, launch)	33° 34' 00" N	078° 10' 00" W	29.2 m
165	6, 7 (ship, launch)	33° 34' 53" N	078° 10' 26" W	25.0 m
178	10, 11 (ship, launch)	33° 34' 26" N	078° 11' 01" W	24.0 m
192	12, 13 (ship, launch)	33° 33' 16" N	078° 08' 16" W	25.7 m
200	16, 17 (ship, launch)	33° 34' 26" N	078° 11' 01" W	26.7 m
210	18 (dive use only)	33° 40' 50" N	078° 04' 05" W	19.2 m
214	19, 20 (ship, launch)	33° 34' 48" N	078° 10' 28" W	25.2 m
221	23, 24 (ship, launch)	33° 35' 00" N	078° 10' 40" W	22.7 m
234	25, 26 (ship, launch)	33° 34' 52" N	078° 10' 32" W	26.7 m
256	29, 30 (ship, launch)	33° 33' 00" N	078° 00' 54" W	30.6 m
269	33 (dive use only)	33° 44' 54" N	078° 14' 02" W	20.8 m
270	35, 36 (ship, launch)	33° 32' 42" N	078° 02' 36" W	26.8 m
294	39, 40 (ship, launch)	33° 32' 40" N	077° 57' 10" W	31.3 m
309	41, 42 (ship, launch)	33° 30' 54" N	078° 00' 48" W	31.0 m

Additional sound velocity casts were taken to ensure a uniform water column over the project area. When the shallow water casts were similar to deeper casts, only the deeper casts were used. Each cast was processed and corrector tables generated using *CAT* version 2.00 and *VELOCITY* version 2.11. The velocity correctors were manually entered into an HDAPS velocity table where correctors were applied to both the high and low frequency beams during data acquisition. Velocity profile data are included in the Separates, section IV. ✕

Data Quality Assurance (DQA) for the Seacat CTD profilers was performed by using a hydrometer and a thermometer to measure the density and temperature of a surface water sample taken during the CTD cast. The *CAT* program compared these values to the Seacat's surface values and confirmed that the Seacat was working properly. WHITING hydrometers were calibrated on March 25, 1996. Correctors were applied to the readings taken from the hydrometer.

✕ Data Filed with Field Records.

There were no variations in instrument initials.

The *DAILYDQA* program used in conjunction with the ship's barometer was used to assure that the MOD III Diver Least Depth Gauge was working properly. Daily results fell within specified operating ranges. CTD casts were used in the *SMLGAUGE* program to calculate least depth measurements.

Bar checks were performed on launch 1014 on April 22, 1996 (DN 113) and on August 8, 1996 (DN 221). Leadline and bar checks were performed on launch 1014 on November 17, 1996 (DN322). In all cases, results showed satisfactory agreement with DSF-6000N high frequency depths and no corrections to soundings were needed.

A leadline comparison was performed on WHITING on April 22, 1996 (DN 113) and on November 18, 1996 (DN 323). In both cases, results showed excellent agreement with DSF-6000N high frequency depths and no corrections to soundings were needed. Copies of all bar check and leadline comparison data are included in the Separates, section IV.\*

The correction for the static draft for launch 1014 is 0.55 meters and was measured on July 28, 1993. The corrector was entered into Offset Tables 2.\* The correction for static draft for WHITING is 3.2 meters, a historical value which WHITING divers confirmed with a MOD III Diver Least Depth Gauge on May 11, 1995. The corrector was entered into Offset Table 9.\* Static draft correctors were applied to the sounding data in real time for each survey platform.

Settlement and squat values for launch 1014 were determined on March 25, 1996, and were entered into Offset Table 2.\* Settlement and squat values for WHITING were determined on March 26, 1996, and were entered into Offset Table 9.\* The settlement and squat correctors were applied to the sounding data in real time for each survey platform. Offset tables are included in the Separates, section II.

Heave correctors for launch 1014 were applied during post processing by manually scanning the echograms and making the appropriate corrections. For data acquired by WHITING, the HDAPS data acquisition computer logged and applied, in real time, heave data from a heave, roll and pitch sensor (HIPPY, S/N 19109-C).

The tidal datum for this project was Mean Lower Low Water (MLLW). The operating tide station at Springmaid Pier, North Carolina (866-1070) served as the reference station for predicted tides. The water level sensor was located at Yaupon Beach, North Carolina (865-9182) and was maintained by WHITING. Tidal data used during data acquisition were based on Table 2 of the East Coast of North and South America Tide Tables. Digital tidal data were received on floppy disk from N/CS33, Hydrographic Surveys Branch, and were applied to the digital data during acquisition by HDAPS. A request for smooth tide data was submitted to Product Services Branch, Datum Section on October 25, 1996 (DN 299). *Smooth Tides & Zoning were Applied During Ocean Processing*

Time and height correctors used for this survey are as follows:

Time Correction	00 hrs 00 mins
Height Ratio	x 0.97

**H. CONTROL STATIONS** *see also Evaluation Report.*

The horizontal datum for this project is the North American Datum of 1983 (NAD 83). The source of differential correctors used were USCG maintained Differential Global Positioning System (DGPS) stations at Fort Macon, North Carolina and at Charleston, South Carolina. Positions obtained from USCG reference listings are:

<u>Station</u>	<u>Latitude</u>	<u>Longitude</u>
Charleston USCG DGPS Beacon	32° 45.45357' N	079° 50.57225' W
Fort Macon USCG DGPS Beacon	34° 41.84333' N	076° 40.98706' W

WHITING used *MONITOR* 1.2 to verify station positions and to check for multipath in the area. The digital data obtained from the *MONITOR* 1.2 program were forwarded to N/CS31 in September 1996. Printouts from the *MONITOR* program are included in the Separates, ✕ section III.

**I. HYDROGRAPHIC POSITION CONTROL**

DGPS was used as the navigation system for this survey. The launch and the ship used an Ashtech Sensor GPS receiver with a CSI MBX1 beacon receiver supplying correctors for DGPS navigation. Ashtech receivers were initialized by HDAPS and the CSI MBX1's were preset to the appropriate station and frequency.

DGPS positioning was accomplished in accordance with the Field Procedures Manual, section 3.4. The HDOP limit for a 1:20,000 scale survey using the Charleston and Fort Macon stations is 6.4. No position flyers were encountered. All suspect positions (high HDOP, DR'ed positions, high EPE) were examined for reliability. Questionable positions were either smoothed or rejected.

The serial numbers of the Ashtech Sensor and CSI MBX1 receivers on the data acquisition platforms are as follows:

<u>Vessel</u>	<u>Device</u>	<u>Serial Number</u>
2930	Ashtech Sensors	700417B1203
	CSI MBX1	A003789

*✕ DATA Filed with Field Records.*

DGPS performance checks on NOAA Ship WHITING were determined by using *SHIPDIM* version 2.1. The position determined using correctors from the Charleston DGPS tower was compared to the position determined using correctors from the Fort Macon DGPS beacon using two independent DGPS systems. *SHIPDIM* routinely showed the positions given by the two systems to be within 2-3 meters of each other.

DGPS performance checks for launch 1014 were conducted with the launch secured in the WHITING davits and with all platforms using correctors from the Charleston DGPS tower. Simultaneous HDAPS positions were compared between WHITING and the launch. An offset in distance and azimuth was then calculated between the ship and the launch system. A summary of the DGPS performance checks is included in the Separates, section III. All DGPS performance checks confirmed that the equipment was working properly.

DGPS antenna offsets were measured on March 19, 1993, for WHITING. Offsets and laybacks were measured using the high frequency echosounder transducer as the reference. The DGPS antennae was reinstalled on launch 1014 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. The offsets and laybacks were applied by HDAPS on-line. A minimum of four satellites was used during survey H-10687 (1:20,000) providing altitude unconstrained positioning.

Offset, layback, and height corrections for the launch's SSS aft towing boom were measured on July 28, 1993, and verified on April 5, 1994. All offset, layback, and height data were applied by HDAPS on-line. Correctors from Offset Table 2 were applied to all data acquired from launch 1014. Offset, layback, and height for WHITING's SSS towfish A-frame were measured on July 27, 1992, using the forward high frequency transducer as the reference. Correctors were entered into Offset Table 9.

## J. SHORELINE

There is no shoreline within the limits of survey H-10687.

## K. CROSSLINES

A total of 196 nautical miles of crosslines, or 6.7% of the mainscheme mileage, was run on H-10687. Agreement between mainscheme and crossline soundings is satisfactory. In general, crossline soundings agree with mainscheme soundings to within 0.2 meters. A few soundings differ by 0.5 meters. Differences were randomly shoal and deep with no noticeable trends.

Survey operations were interrupted by Hurricane Bertha on July 13, 1996 (DN 195) and again by Hurricane Fran on September 6, 1996 (DN 250). Both of these class III hurricanes passed directly through the Cape Fear region. Additional crosslines, running diagonally across mainscheme lines, were run after each hurricane. In both cases, the diagonal crossline soundings agreed with mainscheme soundings to within 0.2 meters. Differences were randomly shoal and deep with no noticeable trends. It can be concluded that depths within the survey area of H-10687 were not altered by either hurricane.

**L. JUNCTIONS** *see also Evaluation Report*

H-10687 junctions with three completed surveys: H-10690 (Sheet "H", 1:10,000), H-10700 (Sheet "C", 1:10,000), and H-10704 (Sheet "K", 1:10,000). Agreement between overlapping soundings at the junctions is satisfactory with soundings generally agreeing to within 0.2 meters. The greatest difference noted was 0.5 meters. Differences were randomly shoal and deep with no noticeable trends.

**M. COMPARISONS WITH PRIOR SURVEYS** *see also Evaluation Report*

Comparisons were made between H-10687 and the following prior surveys: H-9117 (1970, 1:40,000) and H-9115 (1970, 1:20,000). All comparisons were made in feet. All prior surveys were referenced to NAD 27. The datum shift between NAD 27 and NAD 83 was calculated using *CORPSCON* (version 2.1) software and determined to be insignificant (1.0 mm at 1:20,000). No datum shift was applied in the comparisons. In general, the soundings agree to within 2 feet with both prior surveys, with deeper soundings on H-10687. The greatest difference noted was 3 feet.

**N. ITEM INVESTIGATIONS**

The following items were investigated by WHITING during this survey. Depths of features and surrounding depths are corrected to ~~predicted~~ MLLW.

*APPROVED Smooth Tides*

**N1. Obstructions and a wreck in uncharted fish haven "AR 445".**

*AWOIS # 9864*

The uncharted fish haven is marked by an uncharted and unlit yellow mooring bouy labeled "North Carolina Artificial Reef, AR 445, (919) 726-7021, Sport Fish Restoration" with a position of latitude 33° 44' 47.524" N, longitude 078° 14' 06.119" W. The fish haven has a surrounding depth of approximately 17 meters (56 feet). The number on the bouy was determined to be the telephone number for:

The North Carolina Department of Environmental, Health, and Natural Resources  
 Division of Marine Fisheries  
 PO Box 769  
 Morehead City, NC 28557-0769

The Division of Marine Fisheries was contacted and they sent WHITING a copy of "North Carolina Artificial Reef Guide", a detailed booklet which describes the contents of the numerous fish havens of their fish restoration programs. Pages 70 and 71 describe "AR 445" and are included in Appendix VI of this report. ✕

The uncharted fish haven "AR 445" was surveyed with 200% side scan coverage. Numerous contacts were found, most of which were insignificant. All contacts found were located within 400 meters of yellow buoy "AR 445". Most notably, the wreck of the 174-ft vessel JELL II was investigated by divers using the MODIII and was found to have a least depths of 11.04 meters (36 feet). This item was sent in as a danger to navigation (see Appendix I).  
 35

Listed below are descriptions of the five SSS contacts in fish haven "AR 445" that were considered significant enough to warrant diver investigation and a MOD III least depth determination.

**N1.1. Boat Mold**

**(Investigation No. 13)**

SSS Item: 14676.22  
 Fix Number of DP: 3132  
 Least Depth: 16.38 m 15.5 m (51 FT.)  
 Time of Least Depth: 1334 UTC  
 Position of Least Depth: Lat 33° 44' 54.711" N  
 Long 078° 14' 14.230" W  
 Description: Divers investigated on September 25, 1996 (DN 269) and located a boat mold approximately 25 ft in length, rising approximately 3 ft off the bottom.

*Do Not Chart 51 Obstr (boat mold)*

**N1.2. Wreck of JELL II**

**(Investigation No. 15)**

SSS Item: 14764.48  
 Fix Number of DP: 3136  
 Least Depth: 11.04 m 10.9 m (35 FT.)  
 Time of Least Depth: 1551 UTC  
 Position of Least Depth: Lat 33° 44' 50.300" N  
 Long 078° 14' 04.226" W

*Chart 35 Wk "Jell II"*

Description: Divers investigated on September 25 ,1996 (DN 269) and located the wreck of the 174-ft vessel JELL II, rising approximately 20 ft off the bottom.

**N1.3. Cement Pipes (Investigation No. 19)**

SSS Item: 14765.07  
Fix Number of DP: 3147  
Least Depth: ~~16.29~~ m *16.2 m (53 FT.) Do Not Chart*  
Time of Least Depth: 1540 UTC  
Position of Least Depth: Lat 33° 44' 43.746" N  
Long 078° 14' 01.894" W  
Description: Divers investigated on October 18 ,1996 (DN 292) and located numerous cement pipes, approximately 6 ft in length and 3 ft in diameter, scattered close together in a deep scour.

**N1.4. Metal Debris (Investigation No. 20)**

SSS Item: 17044.31  
Fix Number of DP: 3148  
Least Depth: ~~16.48~~ m *16.6 m (54 FT.) Do Not Chart*  
Time of Least Depth: 1650 UTC  
Position of Least Depth: Lat 33° 44' 48.704" N  
Long 078° 14' 27.442" W  
Description: Divers investigated on October 18 ,1996 (DN 292) and located scattered metal debris rising approximately 3 feet off the bottom.

**N1.5. Cement Pipes (Investigation No. 21)**

SSS Item: 14746.57  
Fix Number of DP: 3151 *Do Not Chart*  
Least Depth: ~~16.43~~ m *14.9 m (49 FT.) Chart 49 Obstr (A.205)*  
Time of Least Depth: 1805 UTC  
Position of Least Depth: Lat 33° 44' 49.479" N  
Long 078° 14' 07.555" W  
Description: Divers investigated on October 18 ,1996 (DN 292) and located several cement pipes standing straight up, approximately 8 ft in length and ranging from 3 to 8 ft in diameter, each in a deep scour.

WHITING recommends charting a fish haven centered by buoy "AR 445" at latitude 33° 44' 47.524" N and longitude 078° 14' 06.119" W with a radius of 400 meters. The least depth found in the fish haven was ~~36~~<sup>35</sup> feet. WHITING also recommends charting a wreck at a latitude 33° 44' 50.300" N and longitude 078° 14' 04.226" W with a least depth of ~~36~~<sup>35</sup> feet. ~~CONCERN~~ *CONCERN*

**N2. Metal Obstruction (Investigation No. 2)**

SSS Item: 8986.23  
 Fix Number of DP: 3003  
 Least Depth: 12.72 m (41 FT.) *CHART 41 Ebbin (metal Debris)*  
 Time of Least Depth: 1437 UTC  
 Position of Least Depth: Lat 33° 47' 10.863" N  
 Long 078° 07' 04.903" W  
 Description: Divers investigated on June 12, 1996 (DN 164) and located a flat metal object, approximately 30 ft x 15 ft, with one end stuck in the sand and the other end inclined and rising 5 feet off the bottom.

WHITING recommends charting an obstruction with a depth of ~~42~~<sup>41</sup> feet at the above position. *CONCERN*

**N3. Coral Head (Investigation No. 4)**

SSS Item: 7171.04  
 Fix Number of DP: 3011  
 Least Depth: 12.62 m (41 FT.) *CHART 41 Co Hd*  
 Time of Least Depth: 1624 UTC  
 Position of Least Depth: Lat 33° 46' 22.981" N  
 Long 078° 05' 54.232" W  
 Description: Divers investigated on June 12, 1996 (DN 164) and located a coral head rising 5 feet off the bottom.

WHITING recommends charting a depth of 41 feet at the above position with a coral symbol "Co". *CONCERN IN PART CHART AS 41: COHD*

**N4. Coral Head (Investigation No. 7)**

SSS Item: 11302.55  
 Fix Number of DP: 3053  
 Least Depth: 16.56 m 16.7 m (55 FT.) *DE NOT CHART*  
 Time of Least Depth: 1330 UTC

Position of Least Depth: Lat 33° 43' 25.851" N  
 Long 078° 07' 22.350" W  
 Description: Divers investigated on July 28, 1996 (DN 210) and located two coral heads roughly 10 meters apart. The larger coral head rose 5 feet off the bottom. The smaller coral head rose less than 3 feet off the bottom and is insignificant.

WHITING recommends charting a depth of <sup>1/2</sup>54 feet at the above position with a coral symbol "Co". *Do NOT CONCERN, SHALLOW DEPTHS IN THE IMMEDIATE VICINITY*

All other items that were investigated within the survey area of H-10687 were found to be insignificant. Copies of all item investigation reports are included in Separate VI. \*

There were no AWOIS items within the survey area of H-10687.

**O. COMPARISON WITH THE CHART** *see also Evaluation Report.*

Comparisons were made between survey H-10687 and chart 11536 (12th edition, dated Sept 4/93, 1:80,000). Comparisons were made in feet at the 1:20,000 scale. In general, agreement is satisfactory with charted depths agreeing with survey soundings to within 2 feet. The overall trend is a slight deepening throughout the survey area.

**P. ADEQUACY OF SURVEY** *see also Evaluation Report.*

This survey is complete and adequate to supersede all prior surveys in their common area.

**Q. AIDS TO NAVIGATION**

An uncharted and unlit floating aid to navigation, marking an uncharted fish haven in the survey area, was located and positioned using DGPS. The U.S. Coast Guard was notified of the following:

<u>Floating ATON</u>	<u>Position from Survey</u>	<u>Date Located</u>
Y, Round, "North Carolina Artificial Reef, AR 445, (919) 726-7021, Sport Fish Restoration"	Lat 33° 44' 47.524" N Long 078° 14' 06.119" W	Sept 16, 1996

\* Data filed with Field Records.

There are no other aids to navigation in the survey area.

## R. STATISTICS

Number of Positions .....	10459
Number of Selected Soundings.....	58236
Main-scheme Sounding Lines (Nautical Miles) .....	2927
Crosslines (Nautical Miles) .....	196
Square Nautical Miles Surveyed .....	115
Days of Production .....	65
Detached Positions .....	10
Bottom Samples .....	28
Tide Stations Installed .....	1
Current Stations .....	None
Number of CTD Casts .....	15
Magnetic Stations .....	None

## S. MISCELLANEOUS *see also Evaluation Report.*

No anomalies in either tide or current and/or unusual magnetic variations were encountered in the survey area. No unusual submarine features were discovered. Bottom samples were submitted to the Smithsonian Institution.

## T. RECOMMENDATIONS

No additional field work is required. There are no current plans for construction or dredging in the survey area.

## U. REFERRAL TO OTHER REPORTS

A Chart User Evaluation Report will be submitted in December 1996 as part of OPR-G309-WH. A Coast Pilot Report will be submitted in December 1996.

Submitted by:



Lieutenant (jg) Eric J. Sipos, NOAA  
NOAA Ship WHITING

## HORIZONTAL CONTROL STATIONS

**Station:** **Charleston Coast Guard Beacon**

Latitude: 32° 45.45357' N  
Longitude: 079° 50.57225' W  
Frequency: 298 MHZ  
Station ID (Antennae A): 016  
Transmission Rate: 100 BPS

**Station:** **Fort Macon Coast Guard Beacon**

Latitude: 34° 41.84333' N  
Longitude: 076° 40.98706' W  
Frequency: 294 MHZ  
Station ID (Antennae A): 014  
Transmission Rate: 100 BPS



**U.S. DEPARTMENT OF COMMERCE**  
**National Oceanic and Atmospheric Administration**  
**Office of NOAA Corps Operations**  
**NOAA Ship WHITING S-329**  
**439 W. York Street**  
**Norfolk, VA 23510-1114**

September 26, 1996

Commander, Fifth Coast Guard District  
Federal Building  
431 Crawford Street  
Portsmouth, VA 23704-5004

Dear Sir:

The NOAA Ship WHITING, while conducting hydrographic survey operations in the approaches to Wilmington, North Carolina, located two features which constitute dangers to navigation. Enclosed are reports concerning these features which should be placed in the next Notice to Mariners. Our findings are summarized below:

<u>Feature</u>	<u>Latitude</u>	<u>Longitude</u>	<u>Depth</u>
Wreck	33° 49' 48.7" N	078° 13' 07.7" W	24 ft
Wreck	33° 44' 50.3" N	078° 14' 04.2" W	36 ft

In addition, NOAA Ship WHITING located the following uncharted aids to navigation (ATONS):

<u>Floating ATON</u>	<u>Latitude</u>	<u>Longitude</u>	<u>Date Located</u>
Y, Round, "AR" Priv	33° 49' 47.3" N	078° 13' 05.0" W	Aug 24, 1996
Y, Round, "AR 445" Priv	33° 44' 47.5" N	078° 14' 06.1" W	Sept 16, 1996

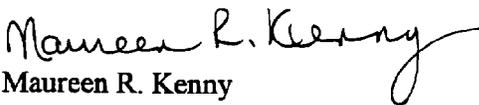
Differential GPS was used to determine the survey positions of both the ATONS and the dangers to navigation listed above. Positions are referenced to NAD 83. All depths are referenced to MLLW using predicted tides. Chart 11536 is affected by this report.

A copy of this letter and enclosures have been forwarded to the following offices:

Chief, Marine Charting Division, NOAA  
Chief, AMC Operations Division, NOAA  
Chief, Atlantic Hydrographic Branch, NOAA  
Director, Defense Mapping Agency  
Hydrographic/Topographic Agency  
President, Wilmington Cape Fear Pilots Association



Sincerely,

  
Maureen R. Kenny  
Commander, NOAA  
Commanding Officer

Enclosures

cc: AMC1  
N/CS2  
N/CS33  
DMAHTC

## REPORT OF DANGER TO NAVIGATION

Hydrographic Survey Registry Number: H-10687  
State: North Carolina  
Locality: Atlantic Ocean  
Sub Locality: 14 NM SSW of Cape Fear River  
Project Number: OPR-G309-WH, NOAA Ship WHITING

The following item was discovered during hydrographic survey operations:

A sunken wreck was located using side scan sonar and investigated by divers. The item is covered 36 feet corrected to MLLW using predicted tides and is located within a presently uncharted fish haven marked by a presently uncharted, unlit, yellow mooring buoy labeled "North Carolina Artificial Reef, (919) 726-7021, AR 445, Sport Fish Restoration." Positions are as follows:

<u>Item</u>	<u>Affected Chart</u>	<u>Latitude</u>	<u>Longitude</u>	<u>Depth</u>	<u>Datum</u>
Wreck	11536, 12th ed. Sept 4/93	33°44' 50.3" N	078° 14' 04.2" W	36 ft	NAD 83
Buoy	11536, 12th ed. Sept 4/93	33° 44' 47.5" N	078° 14' 06.1" W	NA	NAD 83

Questions concerning this report should be directed to the NOAA Atlantic Hydrographic Branch in Norfolk, Virginia, at telephone number (757) 441-6746.

## REPORT OF DANGER TO NAVIGATION

Hydrographic Survey Registry Number: H-10700  
State: North Carolina  
Locality: Atlantic Ocean  
Sub Locality: 5.5 NM SSW of Lockwoods Folley Inlet  
Project Number: OPR-G309-WH, NOAA Ship WHITING

The following item was discovered during hydrographic survey operations:

A sunken wreck was located using side scan sonar and investigated by divers. The item is covered 24 feet corrected to MLLW using predicted tides and is located within a charted fish haven marked by a presently uncharted, unlit, yellow mooring buoy labeled "AR". Positions are as follows:

<u>Item</u>	<u>Affected Chart</u>	<u>Latitude</u>	<u>Longitude</u>	<u>Depth</u>	<u>Datum</u>
Wreck	11536, 12th ed. Sept 4/93	33°49' 48.7" N	078° 13' 07.7" W	24 ft	NAD 83
Buoy	11536, 12th ed. Sept 4/93	33° 49' 47.3" N	078° 13' 05.0" W	NA	NAD 83

Questions concerning this report should be directed to the NOAA Atlantic Hydrographic Branch in Norfolk, Virginia, at telephone number (757) 441-6746.

# NORTH CAROLINA ARTIFICIAL REEF GUIDE

by

Stephen W. Murphey

March 1995

North Carolina Department of Environment,  
Health, and Natural Resources

Division of Marine Fisheries  
PO Box 769  
Morehead City, NC 28557-0769



James B. Hunt, Jr., Governor

Jonathan B. Howes, Secretary

Bruce Freeman, Director

This project was funded, in part, by the U.S. Fish and Wildlife Service through the Federal Aid in Sportfish Restoration Program, Project F-25.

5,000 copies of this public document were printed at a cost of \$20,000 or \$4.00 per copy. 5/95

# AR-445

## AR-445

**RANGE** 185° magnetic - 9.3 nm from Lockwood's Folly Inlet

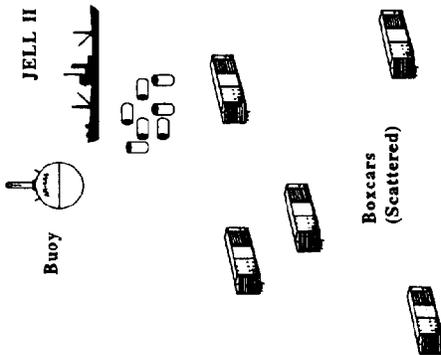
**BUOY** 45352.0/59289.0

**AVG. DEPTH** 53 ft.

**REEF MATERIAL DEPLOYED LOCATION**

Box cars	1986	100 to 800' SE to SW of buoy
174 ft vessel <b>JELL II</b>	1991	45351.7/59289.0
100 fiberglass and steel boat molds	1991	45352.4-.3/59291.4 45352.5/59291.2 45352.4/59291.1 45352.6/59291.4 45351.8/59287.3-.4
Concrete sections	1993	45351.9/59289.7
250 pieces of concrete pipe	1994	45351.3/59289.5 45351.2/59290.3 45351.5/59289.5 45351.4/59290.0

**NOTES AND ADDITIONS:**



**APPROVAL SHEET  
HYDROGRAPHIC SURVEY  
OPR-G309-WH  
1996  
WH-20-1-96  
H-10687**

The data for this survey were acquired and checked under my daily supervision. Position and sounding accuracy meet the requirements specified in the Project Instructions, Hydrographic Manual, Hydrographic Survey Guidelines and the Field Procedures Manual for Hydrographic Surveying. This survey is complete and adequate for the intended purpose of delineating bottom topography, determining depths, and identifying all potential dangers to navigation. No final field sheets were prepared for this survey. The survey data and accompanying records are complete for the preparation of the smooth sheet.

Approved by:

  
Commander Maureen R. Kenny, NOAA  
Commanding Officer, NOAA Ship WHITING



UNITED STATES DEPARTMENT OF COMMERCE  
National Oceanic and Atmospheric Administration  
NATIONAL OCEAN SERVICE  
Office of Ocean and Earth Sciences  
Silver Spring, Maryland 20910

TIDE NOTE FOR HYDROGRAPHIC SURVEY

DATE: February 5, 1997

HYDROGRAPHIC BRANCH: Atlantic

HYDROGRAPHIC PROJECT: OPR-G309-WH

HYDROGRAPHIC SHEET: H-10687

LOCALITY: North Atlantic Ocean

TIME PERIOD: May 20 - September 20, 1996

TIDE STATION USED: 865-9182 Yaupon Beach, N.C.  
Lat. 33° 54.1'N Lon. 78° 04.9'W

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

HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 1.512 meters

REMARKS: RECOMMENDED ZONING

Use zone(s) identified as: EC145

Refer to attachment(s) for zoning information.

Note: Provided time series data are tabulated in metric units (meters) and on Greenwich Mean Time.

  
-----  
CHIEF, TIDAL ANALYSIS BRANCH

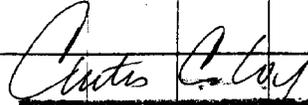


GEOGRAPHIC NAMES

Name on Survey

ON CHART NO. 11536, 11537, 11520  
 B ON PREVIOUS SURVEY  
 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

Name on Survey	A	B	C	D	E	F	G	H	K
CAPE FEAR RIVER (title)	X		X						1
NORTH ATLANTIC OCEAN	X		X						2
NORTH CAROLINA (title)	X		X						3
									4
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Approved  
  
 Chief Geographer

LETTER TRANSMITTING DATA

N/CS33-40-98

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 Highway  
Silver Spring, MD 20910-3282

DATE FORWARDED

April 30, 1998

NUMBER OF PACKAGES

1 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.

H-10687

North Carolina, North Atlantic Ocean  
14 NM SSW of Cape Fear River

Tube containing:

- 1 Mylar Smooth Sheet
- 1 Mylar H-Drawing for NOS Chart 11536
- 1 Mylar H-Drawing for NOS Chart 11537
- 1 Paper Composite plot for NOS Chart 11537
- 2 Paper Composite plots for NOS Chart 11536
- 1 Descriptive Report
- 2 Drawing History Forms #76-71 for NOS Charts 11536, 11537

FROM: (Signature)

Maxine Fetterly

RECEIVED THE ABOVE

(Name, Division, Date)

Return receipted copy to:

Atlantic Hydrographic Branch  
439 W. York Street  
Norfolk, VA 23510-1114

04/30/98

HYDROGRAPHIC SURVEY STATISTICS  
REGISTRY NUMBER: H-10687

NUMBER OF CONTROL STATIONS		2
NUMBER OF POSITIONS		10459
NUMBER OF SOUNDINGS		58419
	TIME-HOURS	DATE COMPLETED
PREPROCESSING EXAMINATION	97	12/20/96
VERIFICATION OF FIELD DATA	46	03/06/96
EVALUATION AND ANALYSIS	33	
FINAL INSPECTION	3	03/05/97
COMPILATION	156.50	04/29/98
TOTAL TIME	336	
ATLANTIC HYDROGRAPHIC BRANCH APPROVAL		03/06/96

**ATLANTIC HYDROGRAPHIC BRANCH  
EVALUATION REPORT FOR H-10687 (1996)**

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  
AutoCAD, Release 12  
QUICKSURF, version 5.1  
MicroStation 95, version 5.05  
I/RAS B, version 5.01

The smooth sheet was plotted using an Hewlett Packard Design Jet 350C 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 0.431 seconds (6.646 meters or .665 mm at the scale of the survey) north in latitude, and 1.001 seconds (12.10 meters or 1.21 mm at the scale of the survey) east in longitude.

**L. JUNCTIONS**

H-10690 (1996) to the northeast  
H-10700 (1996) to the northwest  
H-10704 (1996) to the southeast  
H-10707 (1996) to the north  
H-10731 (1996) to the west  
H-10741 (1996) to the north northeast

Standard junctions were effected between the present survey and the junctional surveys.

There are no junctional surveys to the south. Present survey depths are in harmony with the charted hydrography to the south.

**M. 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.

**O. COMPARISON WITH CHARTS 11536 (12<sup>th</sup> Edition, Sept 4/93)  
11537 (30<sup>th</sup> Edition, April 5/97)**  
**Hydrography**

The charted hydrography originates with prior surveys and requires no further consideration. The hydrographer makes adequate chart comparisons in section O. of the Descriptive Report.

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

**Dangers to Navigation**

One Danger to Navigation report was submitted to Commander(oan), Fifth Coast Guard District, Portsmouth, Virginia for inclusion in the Local Notice to Mariners, and to the Marine Chart Division, N/CS3x1, Silver Spring, Maryland. Attention should be directed to the following:

A danger to navigation report was submitted by the hydrographer on an uncharted wreck with a depth of 36 foot in Latitude 33°44'50.3"N and Longitude 78°14'04.2"W. The wreck is shown on the present survey with a depth of 35 feet after application of approved tides during office processing. Charting recommendations are found in section N1.2. of the Descriptive Report.

A copy of the report is appended to the Descriptive Report.

**P. 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 charts were used for compilation of the present survey: 11536 (13<sup>th</sup> Edition, March 15/97)  
11537 (30<sup>th</sup> Edition, April 5/97)

**WHITING Processing Team**

*Robert Snow*

**Robert Snow**

Cartographic Technician  
Verification of Field Data  
Evaluation and Analysis

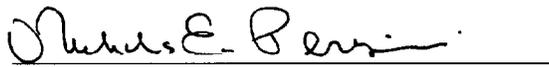
APPROVAL SHEET  
H-10687

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.

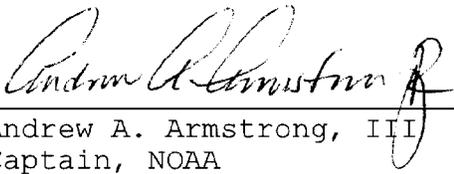
 Date: MARCH 6, 1997  
Robert G. Roberson  
Chief, Cartographic Section

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: March 6, 1997  
Nicholas E. Perugini  
Commander, NOAA  
Chief, Atlantic Hydrographic Branch

\*\*\*\*\*

Final Approval:

Approved:  Date: May 11, 1998  
Andrew A. Armstrong, III  
Captain, NOAA  
Chief, Hydrographic Surveys Division

