

H10710

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-10-10-96
Registry No.	H-10710
LOCALITY	
State	NORTH CAROLINA
General Locality	NORTH ATLANTIC OCEAN
Sublocality	20 NM SOUTH OF CAPE FEAR
19 96	
CHIEF OF PARTY	
CDR M. R. Kenny, NOAA	
LIBRARY & ARCHIVES	
DATE	MAY 1 1998

H-10710

HYDROGRAPHIC TITLE SHEET

WH-10-10-96

INSTRUCTIONS: The Hydrographic Sheet should be accompanied by this form, filled in as completely as possible, when the sheet is forwarded to the Office.

State: North Carolina

General locality: North Atlantic Ocean

Locality: 20 nm south of Cape Fear

Scale: 1: 10,000 Date of survey: 25 August -24 November 1996

Instructions dated: 03 May 1995 Project Number: OPR-G309-WH

Vessel: NOAA Ship Whiting S-329

Chief of Party: CDR Maureen R Kenny

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

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

Electronic record scaled by: WHITING personnel

Electronic record checked by: WHITING personnel

Protracted by: N/A Automated plot by: Zeta 936 Plotters *HEWLETT PACKARD DESIGN JET 350 C*

Verification by: Hydrographic Surveys Branch ATLANTIC HYDROGRAPHIC BRANCH PERSONNEL

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

Remarks: Basic Hydrographic and 200% Side Scan Sonar coverage of Survey H-10710 with inset covering Awois 9681

Time zone used: 0 (UTC)

Horizontal Datum: NAD 83

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

Awois and SURF ✓ 4/98 RWD

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

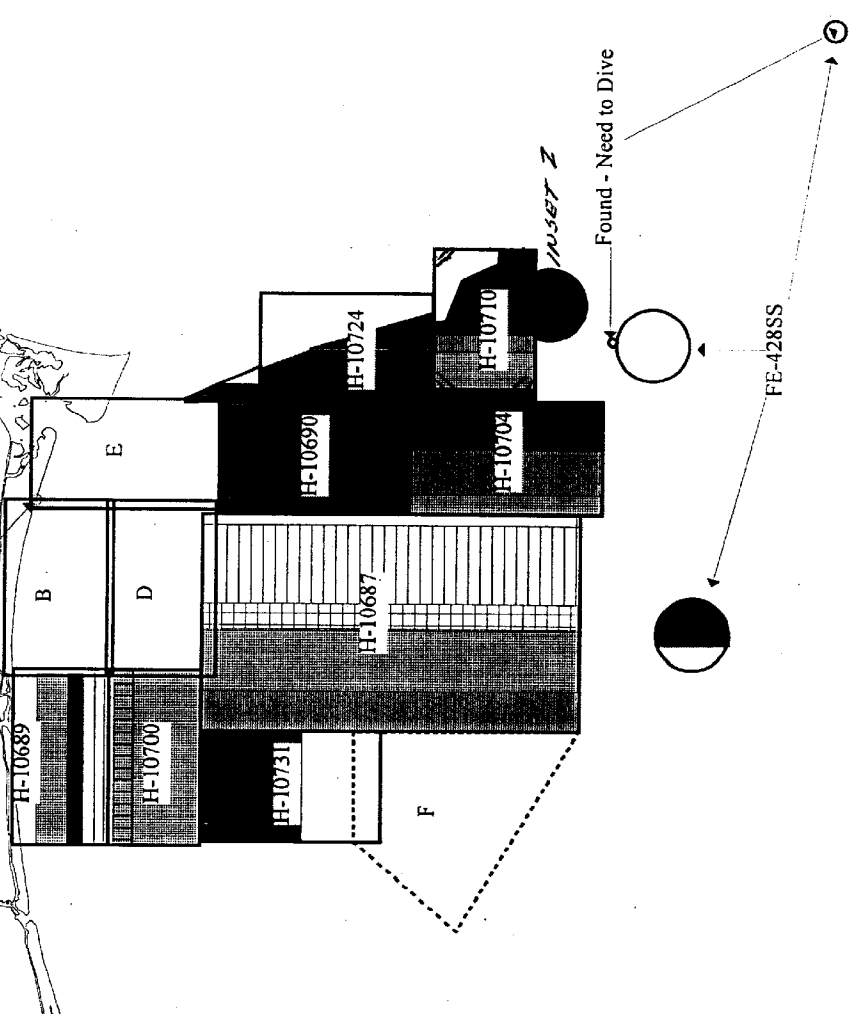
- May (20-22,24-31)
- ▨ June
- ▧ July
- ▩ August
- ▨ September
- October
- November

Tide Station (established May 15)

Accomplished	May	June	July	Aug	Sept	Oct	Nov
LNM Hydro	222	276	120	32	141	121	132
LNM SSS	200	1985	659	2205	1041	884	751
Sq NM Surveyed	8.5	86	26.8	92.6	37.2	34.3	28.2
AWOIS Items	0	0	0	0	4	2	1
Dives	0	7	4	12	6	8	3
Bottom Samples	44	36	26	0	28	24	0

Downtime_Hrs	May	June	July	Aug	Sept	Oct	Nov
Weather	4	73	218	68	188	237	198
Electronics	1	114	13	22	16	8	18
Mechanical	0	7	0	0	0	40	0
Other	0	7	0	2	4	3	0

Reg_No	Started	Est Complete	Complete	Submitted
H-10687	5/20/96	Completed	10/22/96	12/5/96
H-10689	5/30/96	Completed	9/27/96	11/27/96
H-10690	5/31/96	Completed	10/16/96	12/16/96 est
H-10700	6/25/96	Completed	10/18/96	11/8/96
H-10704	7/23/96	Completed	11/23/96	12/96 est
H-10710	8/25/96	Completed	11/23/96	12/96 est
H-10724	9/28/96	11/25/96	90%	
FE-428	8/02/96	11/25/96	50%	
H-10731	10/23/96	11/25/96	50%	



Found - Need to Dive

FE-428SS

**DESCRIPTIVE REPORT TO ACCOMPANY
HYDROGRAPHIC SURVEY
OPR-G309-WH
WH-10-10-96
H-10710**

**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 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 (USACE), the North Carolina State Ports Authority, and the Wilmington-Cape Fear Pilots Association. Project OPR-309-WH consists of 12 sheets.

The survey described in this report is designated as "L" sheet, field sheet number WH-10-10-96, and registry number H-10710. It includes an inset for AWOIS item 9681. Survey operations were conducted according to the Hydrographic Project Instructions OPR-G309-WH dated May 3, 1996.

B. AREA SURVEYED

Hydrographic survey H-10710 is located 20 nm south of Cape Fear, North Carolina, and overlaps the west edge of Frying Pan Shoals.

L sheet coordinates:

SW corner ① $33^{\circ} 35' 24''$ N $77^{\circ} 59' 36''$ W
 NW corner ② $33^{\circ} 39' 12''$ N $77^{\circ} 59' 36''$ W
 NE corner ③ $33^{\circ} 39' 12''$ N $77^{\circ} 52' 36''$ W
 SE corner ④ $33^{\circ} 38' 39''$ N $77^{\circ} 52' 36''$ W
 ⑤ $33^{\circ} 37' 30''$ N $77^{\circ} 53' 15''$ W

L-inset:

SW corner $33^{\circ} 33' 30''$ N $77^{\circ} 57' 00''$ W
 NW corner $33^{\circ} 35' 24''$ N $77^{\circ} 57' 00''$ W
 NE corner $33^{\circ} 35' 24''$ N $77^{\circ} 53' 30''$ W
 SE corner $33^{\circ} 33' 30''$ N $77^{\circ} 53' 30''$ W

Survey operations began 25 August 1996 and concluded on 24 November 1996. The inshore limits of survey operations are limited to the 9-meter (30-ft) curve in the NE section of the sheet.

⑦ $33^{\circ} 36' 54''$ N $77^{\circ} 53' 00''$ W
 ⑧ $33^{\circ} 36' 48''$ N $77^{\circ} 52' 36''$ W
 ⑨ $33^{\circ} 35' 18''$ N $77^{\circ} 52' 36''$ W

C. SURVEY VESSELS

NOAA Ship Whiting S-293, launch 1015 and 1014 are designated as vessel numbers 2930, 2931 and 2932, respectively. These vessels were used for mainscheme echosounder and side scan sonar data collection, mainscheme echosounder splits, developments, sound velocity casts, AWOIS investigations, crosslines, bottom samples, detached positions and dive operations. 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 2.10. The DGPS stations were 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-TH 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 equipment was used:

<u>Vessel</u>	<u>DN</u>	<u>Recorder</u>	<u>Towfish</u>
2930	238-241	016942	0011904
	255-272	016946	0011904
	277-306	016946	016697
	319-328	016946	016700
2931	238-239	016669	016630
	240-270	016669	011902
	270	016673	011902
	324	016673	016699
2932	238-259	016673	11591
	290	016669	11591
	318	016669	16699

On NOAA Ship WHITING, the SSS towfish was deployed from a Reuland winch using one of two armored cables on an A-frame on the stern. The armored cable was connected to the SSS recorder by a slip-ring assembly. On launches 1014 and 1015, the SSS towfish was deployed using a Superwinch

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 except as noted below. Side scan operations were limited to a speed-over-ground of 4-6 knots. Confidence checks were accomplished by noting changes in linear bottom features extending to the outer edges of the sonagram, by passing aids to navigation, or by towing the fish near a known contact.

Near the shallow-water limits of the survey (the 9-meter curve) a fish height above the bottom of 8% of range scale could not always be maintained. However, any objects rising above the general level of the bottom would have been detected out to the full width of range scale.

Contacts were measured off the sonagram and entered in the HDAPS contact table. Using the contact utility program, WHITING hydrographers determined contact heights, positions, and correlations to other contacts. Analysis was done on overlapping SSS records to correlate contacts or find items not previously entered. 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>DN</u>	<u>Serial Number</u>
2930	238-328	B046N
2931	238-240 259-324	A118N C076N
2932	238-318	A108N

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

Least depths on diver investigations in the survey area were acquired by 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 launches (vessel numbers 2931 and 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 Meters</u>
234	25,26	33° 34' 52"N	078° 10' 32"W	26.7
256	29,30	33° 33' 00"N	078° 00' 54"W	30.6
270	35,36	33° 32' 42"N	078° 02' 36"W	26.8
294	39,40	33° 32' 40"N	077° 57' 10"W	31.3
309	41,42	33° 30' 54"N	078° 00' 48"W	31.0
324	49,50	33° 33' 00"N	077° 59' 18"W	26.1
330	1,2	33° 33' 07"N	077° 59' 09"W	30.1

Tables 1 and 2 are from the closing cast and verified the cast accomplished on DN 324; they were not used for corrections, only for comparison. Only fifty tables can be entered. The last day of data collection was DN 328.

* DATA ON FILE WITH FIELD RECORDS

Data Quality Assurance (DQA) for the Seacat CTD profilers was checked 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 then applied to the hydrometer readings.

There were no variations in instrument initials.

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 2.10. The velocity correctors were entered manually in the 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. *

The *DAILYDQA* program, with data from 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 a least depth.

The correction for the static draft for launches 1014 and 1015 are 0.55 meters and was measured on July 28, 1993. The corrector was recorded in Offset Tables 2* and 1*, respectively. 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. This corrector was recorded 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 determined on March 25, 1996, and were recorded into Offset Table 2.* Settlement and squat values for launch 1015 were determined on March 18, 1996, and were recorded into Offset Table 1.* Settlement and squat values for WHITING were determined on March 26, 1996, and were recorded 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 and 1015 were applied during post processing by manually scanning the echograms and making the appropriate corrections. For data acquired by WHITING, the HDAPS data acquisition computers logged and applied, in real time, heave data from a heave, roll and pitch sensor (HIPPI, S/N 19109-C).

The tidal datum for this project is 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 November 27, 1996. *APPROVED TIDES & ZONING WERE APPLIED DURING OFFICE PROCESSING*

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

Time Correction	00 hrs 00 mins
Height Ratio	x 0.97

WHITING did a lead line comparison on April 22, 1996 (DN 113) and November 18, 1996 (DN 323). The lead line calibration was checked on November 17, 1996, and the calibration confirmed that the lead line error was negligible. Weather and sea conditions were calm and proved ideal for accomplishing the lead line comparison. The results showed excellent agreement with DSF-6000N high frequency depths and no corrections were needed. Copies of the lead line comparison data are included in the Separates, section IV. ★

Bar checks were done on launches 1014 and 1015 on October 11, 1996 (DN 285). A bar check and lead line comparison was done on launch 1015 on November 16, 1996 (DN 321). A bar check and lead line comparison was done on launch 1014 on November 17, 1996 (DN 322). No corrections to soundings were needed. Copies of the bar/lead line data are included in the Separates, section IV.

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 a USCG maintained Differential Global Positioning System (DGPS) stations at Fort Macon, North Carolina and at Charleston, South Carolina, for performance checks. Positions obtained from USCG reference listings are:

<u>Station</u>	<u>Latitude</u>	<u>Longitude</u>
Charleston USCG DGPS Beacon	32° 45' 27.214" N	079° 50' 34.335" W
Fort Macon USCG DGPS Beacon	34° 41' 50.600" N	076° 40' 59.224" 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 *SEE ALSO EVALUATION REPORT*

DGPS was used as the navigation system for this survey. Both launches 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 according to the Field Procedures Manual, section 3.4. The HDOP limit for a 1:10,000 scale survey using the Charleston and Fort Macon stations is 3.2. No position flyers were encountered. All suspect positions (high HDOP, DR'd positions, high EPE) were examined for reliability. Questionable positions were either smoothed or rejected and annotated on the on-line printout.

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
2931	Ashtech Sensor	700417B1194
	CSI MBX1	X-1088
2932	Ashtech Sensor	700417B1055
	CSI MBX1	X-1079

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 with 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 and 1015 were conducted with the launches secured in the WHITING davits using correctors from the Charleston DGPS tower. Simultaneous HDAPS positions were compared with WHITING. An offset in distance and azimuth was then calculated between the ship and launch system. A summary of the DGPS performance check 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. DGPS antennae were reinstalled on launches 1014 and 1015 on April 2, 1996, directly over the echosounder transducers. Antenna heights were also measured on the same respective dates shown above, using the water line as the reference. The offsets and laybacks were recorded in tables 2* and 1* and applied by HDAPS on-line. A minimum of four satellites was used during survey H-10710 (1:10,000) providing altitude unconstrained positioning.

Offset, layback, and height corrections for launch 1014 and 1015's SSS aft towing booms were measured on July 28, 1993, and verified on April 5, 1994. These were recorded in tables 2* and 1*. All offset, layback, and height data were applied by HDAPS on-line. Offset, layback, and height for

WHITING's SSS towfish A-frame was measured on July 27, 1992, using the forward high frequency transducer as the reference. Correctors were recorded in Offset Table 9^{*} and applied by HDAPS on-line.

J. SHORELINE

No shoreline is present within the limits of survey H-10710.

K. CROSSLINES

A total of 53 nautical miles of crosslines, or 10% of the mainscheme mileage, was run on H-10710. Agreement between mainscheme and crossline soundings is adequate. Overall, crossline soundings agree with mainscheme soundings to within 0.2 meters. A few soundings differ by 0.6 meters. Differences were randomly shoal and deep with no noticeable trends.

Survey operations were interrupted by Hurricane Fran on September 6, 1996 (DN 250). This class III hurricane passed directly through the Cape Fear region. The crosslines were run after the hurricane. Since the crosslines agreed with the mainscheme line soundings, it can be concluded that depths within the survey area of H-10710 were not altered by the hurricane.

L. JUNCTIONS *SEE ALSO EVALUATION REPORT*

H-10710 junctions with the following two surveys: H-10704 (Sheet "K" 1:10,000) to the west and H-10724 (Sheet "J" 1:10,000) to the north. No overlapping sounding lines are required with adjacent sheets since they are a part of the same project, same year, same method, and same vessel number as stated in the Hydrographic Manual, Sec. 1.4.4. Agreement between overlapping soundings at the junction of H-10710, H-10704 and H-10724 is satisfactory with soundings agreeing to within 0.3 meters.

M. COMPARISONS WITH PRIOR SURVEYS *SEE ALSO EVALUATION REPORT*

Comparisons were made between H-10710 and four prior surveys. All comparisons were made in feet. All prior surveys were referenced to NAD 27. The datums 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. Results of the comparisons are as follows:

H-9389 (1974, 1:20,000)

Survey H-9389 overlaps the northeast portion of survey H-10710 in the vicinity of Frying Pan Shoals. In the area of Frying Pan Shoals most of the soundings were 2-5 feet shoaler than H-9389. Areas

outside the 30-foot curve agreed within 3 feet. The 30-foot curve appears to have shifted south approximately 150 meters.

H-9323 (1973-1974, 1:20,000)

Survey H-9323 overlaps a small portion of survey H-10710 in the vicinity of Frying Pan Shoals at the northern limit of the sheet. Overall, the H-10710 soundings averaged 2 feet shoaler than H-9323.

H-9116 (1970, 1:20,000)

Survey H-9116 overlaps the majority of survey H-10710 outside of Frying Pan Shoals. Overall, H-10710 soundings agree within 1 foot with prior survey H-9116. The soundings were randomly shoaler or deeper with no discernable trends.

H-6540 (1939, 1:40,000)

Survey H-6540 overlaps the southeastern portion of survey H-10710 including the inset. Overall, H-10710 soundings agree within 1 foot outside of Frying Pan Shoals. In the vicinity of Frying Pan Shoals, survey H-6540 has been superseded by survey H-9389 and was already discussed above.

N. ITEM INVESTIGATIONS

The following items were investigated by WHITING during this survey. Depths are corrected to ~~predicted~~ MLLW. (*SMOOTH TIDES APPLIED*)

N1. AWOIS 2841

AWOIS 2841 is the "Marie Palmer" reported to be a schooner of 1904 tons lost December 1, 1909. It is charted at 33°37' 48.64"N, 077° 54' 10.94"W. Only 60% of the 3000m search radius falls within the survey limits of H-10710. The AWOIS item was not found within the area (the southwest portion of the circle) and should remain as charted. ~~CONCUR~~ *DO NOT CONCUR*

*PER CONVERSATION WITH RWD 4/11/98
DO NOT CHART - NOT CURRENTLY CHARTED*

N2. AWOIS 9681 *INSET 3*

AWOIS item 9681 is the "Inispree" reported to be a 54 foot ketch sunk in 70 feet of water. It is charted at 33° 34' 48.64"N, 077° 55' 10.94"W and is on the inset. The 2500m search radius was completely covered during the survey. The AWOIS item was not found after 200% side scan coverage and should be removed from the chart. WHITING recommends that representative soundings from this survey be charted. *CONCUR*

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

Comparisons were made between survey H-10710 and chart 11536 (12th edition, dated Sept 4/93, 1:80,000). Overall, agreement is adequate with charted depths agreeing with survey soundings to within 2 feet. The trend is a slight deepening throughout the survey area except as noted below.

The 30ft curve (9m) has shifted randomly from 90 -200 meters, in the vicinity of Frying Pan Shoals. At 33° 38' 33"N, 077° 58' 15"W, a shoal extending from the northeast was found with surveyed soundings of 42 feet in the vicinity of a charted sounding of 49 feet.

REDUCED TO MLLW

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

One buoy R "4FP" is in the area. A detached position was taken placing it at 33° 36' 30.652"N, 077° 54' 59.318"W. It is 53 meters northeast of its charted position. It should remain as charted.

Pos Number 4022

R. STATISTICS

Number of Positions	4057
Mainscheme Sounding Lines (Nautical Miles)	482
Crosslines (Nautical Miles)	53
Square Nautical Miles Surveyed	20.8
Days of Production	27
Detached Positions	2
Bottom Samples	19
Tide Stations Installed	1
Current Stations	None
Number of CTD Casts	7
Magnetic Stations	None

S. MISCELLANEOUS *SEE ALSO EVALUATION REPORT*

No other anomalies in either tide or currents 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 other field work is required. No current plans for construction or dredging in the survey area are reported.

U. REFERRAL TO OTHER REPORTS

A Coast Pilot Report was submitted in December 1996 and a Chart User Evaluation Report was submitted in February 1997 as part of OPR-G309-WH.

Submitted by:

A handwritten signature in black ink, appearing to read "Peter Lewit". The signature is written in a cursive style with a large initial "P" and "L".

**Senior Survey Technician Peter Lewit
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-10710

LOCALITY: Approaches to Wilmington, North Carolina

TIME PERIOD: August 25 - November 23, 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.



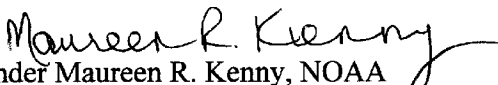
CHIEF, TIDAL ANALYSIS BRANCH



**APPROVAL SHEET
HYDROGRAPHIC SURVEY
OPR-G309-WH
1996
WH-10-10-96
H-10710**

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

GEOGRAPHIC NAMES

Name on Survey	A P.C. CHART NO. 11536, 11520 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 FEAR (title)	X		X								
FRYING PAN SHOALS	X		X									2
NORTH ATLANTIC OCEAN	X		X									3
NORTH CAROLINA (title)	X		X									4
												5
												6
												7
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Approved

Charles C. Loy
Chief Geographer

APR 10 1997

N/CS33-33-98

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 Highway
 Silver Spring, MD 20910-3282

DATE FORWARDED

4-17-98

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.

H10710

North Carolina, North Atlantic Ocean, 20 NM South of Cape Fear

1 (one) Tube containing the following:

- 1 H-drawing for chart#11536
- 3 Composite drawings for chart#11536
- 1 Smooth Sheet for Survey H10710

FROM: (Signature)

Richard Blevins
 Richard Blevins

RECEIVED THE ABOVE
(Name, Division, Date)

Return receipted copy to:

Atlantic Hydrographic Branch
 N/CS33
 439 West York Street
 Norfolk, VA 23510-1114

N/CS33-36-98

LETTER TRANSMITTING DATA

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

- ORDINARY MAIL
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- 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

4-20-98

NUMBER OF PACKAGES

One FedEx-Pak

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.

H10710

North Carolina, North Atlantic Ocean, 20 NM South of Cape Fear

1 (one) FedEx-Pak containing:

Original Descriptive Report For H10710

FROM: (Signature)

Richard Blevins
 Richard Blevins

RECEIVED THE ABOVE
(Name, Division, Date)

Return receipted copy to:

Atlantic Hydrographic Branch
 N/CS33
 439 West York Street
 Norfolk, VA 23510-1114

04/16/98

HYDROGRAPHIC SURVEY STATISTICS
REGISTRY NUMBER: H-10710

NUMBER OF CONTROL STATIONS	2
NUMBER OF POSITIONS	4057
NUMBER OF SOUNDINGS	26913

	TIME-HOURS	DATE COMPLETED
PREPROCESSING EXAMINATION	26	02/12/97
VERIFICATION OF FIELD DATA	59	03/17/97
EVALUATION AND ANALYSIS	6	
FINAL INSPECTION	4	03/17/97
COMPILATION	92	04/16/98
TOTAL TIME	187	
ATLANTIC HYDROGRAPHIC BRANCH APPROVAL		03/24/97

**ATLANTIC HYDROGRAPHIC BRANCH
EVALUATION REPORT FOR H-10710 (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 ENCAD NovaJet III 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 0.642 seconds (19.793 meters or 1.98 mm at the scale of the survey) north in latitude, and 1.057 seconds (27.248 meters or 2.72 mm at the scale of the survey) east in longitude.

L. JUNCTIONS

H-10704 (1996) to the west
H-10724 (1996) to the north

A Standard junction was effected between the present survey and H-10704 (1996). A standard junction could not be

effected with H-10724 (1996). H-10724 (1996) has not been completed by the field unit. The note "JOINS" is shown on the smooth sheet in the junctional area. Adjustments to the depth curves will have to be made during chart compilation.

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

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 CHART 11536 (12th Edition, Sept 4/93)

Hydrography

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

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

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.

H-10710

The following NOS chart was used for compilation of the present survey: 11536 (13th Edition, March 15/97)

WHITING Processing Team

Franklin L. Saunders

Franklin L. Saunders
Cartographic Technician
Verification of Field Data
Evaluation and Analysis

APPROVAL SHEET
H-10710

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.

Robert G. Roberson Date: MARCH 24, 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.

Nicholas E. Perugini Date: March 24, 1997
Nicholas E. Perugini
Commander, NOAA
Chief, Atlantic Hydrographic Branch

Final Approval:

Approved: Andrew A. Armstrong Date: April 30, 1998
Andrew A. Armstrong, III
Captain, NOAA
Chief, Hydrographic Surveys Division

