H10747

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-10-04-97

Registry No. H-10747

LOCALITY

State NORTH CAROLINA

General Locality NORTH ATLANTIC OCEAN

Sublocality 14 NM SOUTHEAST OF CAPE FEAR RIVER ENTRANCE

1997

CHIEF OF PARTY

CDR M. R. KENNY, NOAA

LIBRARY & ARCHIVES

DATE MAY 14 1998

☆U.S. GOV. PRINTING OFFICE: 1987—756-980

NOAA FORM 77-28
(11-72)

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

REGISTRY NUMBER:

H-10747

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-10-04-97 (M)

State: North Carolina

General locality: ~~Approaches to Cape Fear River~~ North Atlantic Ocean

Locality: 14 nm southeast of Cape Fear River entrance

Scale: 1: 10,000 Date of survey: 5 May -24 June 1997

Instructions dated: 03 May 1996 Project Number: OPR-G309-WH-96

Vessel: NOAA Ship Whiting S-329

Chief of Party: CDR Maureen R Kenny

Surveyed by: M.R. Kenny, E.B. Christman, H.E. Orlinsky, R.C. Jones, J.D. Garte, U.L. Gardner, K.B. Shaver, F.R. Cruz, P.G. Lewit, D.B. Pattison, B.C. Armbruster

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

Graphic record scaled by: WHITING personnel

raphic record checked by: WHITING personnel

Protracted by: N/A Automated plot by: Zeta 936 Plotters, HP 7500C (field) Hewlett Packard DesignJet 350C (AHB)

Verification by: Hydrographic Surveys Branch personnel

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

Remarks: Basic Hydrographic and 200% Side Scan Sonar coverage of Survey H-10747

Time zone used: 0 (UTC)

Horizontal Datum: NAD83

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

AWOIS and SURF ✓ RWD 4/98

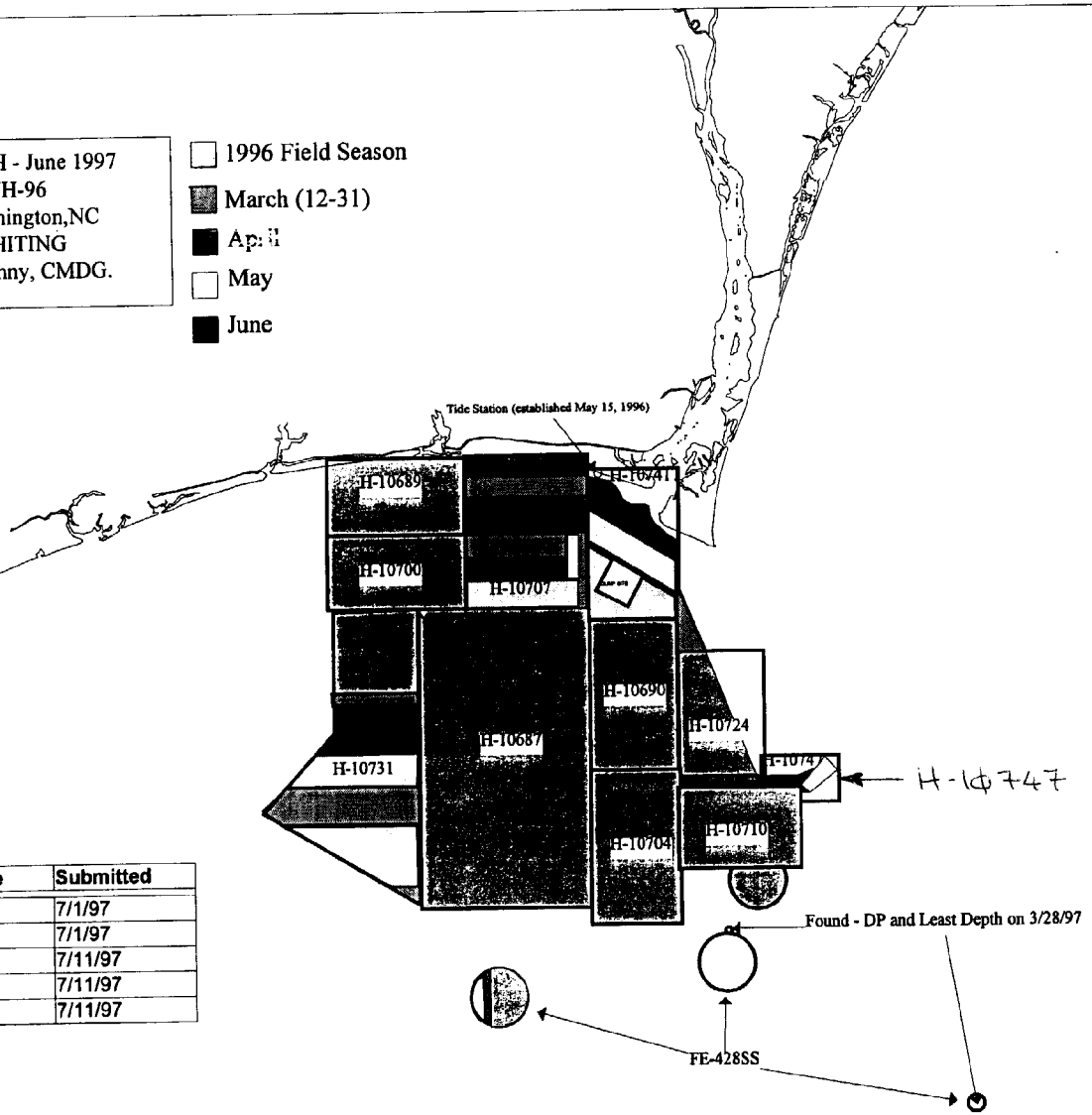
PROGRESS SKETCH - June 1997
OPR-G309-WH-96
Approaches to Wilmington,NC
NOAA Ship WHITING
CDR Maureen R. Kenny, CMDG.

- 1996 Field Season
- March (12-31)
- April
- May
- June

Accomplished	Mar	April	May	June
LNM Hydro	151	89	113	239
LNM SSS	655	952	1283	447
Sq NM Surveyed	28.3	39.3	51.7	13.3
AWOIS Items	2	0	0	8
Dives	2	8	7	44
Bottom Samples	19	26	7	35

Downtime_Hrs	Mar	April	May	June
Weather	137	280	72	60
Electronics	6	15	17	18
Mechanical	24	9	2	1
Other	0	10	0	0

Reg_No	Started	Est_Complete	Complete	Submitted
H-10731	10/23/96	6/18/97	100%	7/1/97
H-10707	3/18/97	6/12/97	100%	7/1/97
H-10728	3/20/97	6/10/97	100%	7/11/97
H-10741	4/20/97	6/18/97	100%	7/11/97
H-10747	5/5/97	6/18/97	100%	7/11/97



DESCRIPTIVE REPORT TO ACCOMPANY
HYDROGRAPHIC SURVEY
OPR-G309-WH
WH-10-04-97
H-10747

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 "M" sheet, field sheet number WH-10-04-97, and registry number H-10747. Survey operations were conducted in compliance with the Hydrographic Project Instructions OPR-G309-WH dated May 3, 1996; Change No. 1 dated February 25, 1997; and Change No. 2 dated April 11, 1997.

B. AREA SURVEYED

Hydrographic survey H-10747 is located 14 nautical miles southeast of Cape Fear River entrance in North Carolina at Frying Pan Shoals Slue. The limits of hydrography are bounded by the following positions:

Position	Latitude	Longitude
1	33° 38' 23" N	077° 55' 57" W
2	33° 41' 13" N	077° 55' 57" W
3	33° 41' 13" N	077° 51' 34" W
4	33° 38' 23" N	077° 51' 34" W

Survey operations commenced on May 5, 1997 (DN 125) and concluded on June 24, 1997 (DN 175).

C. SURVEY VESSELS

NOAA Ship WHITING (vessel number 2930) was used to conduct velocity casts. Launch 1015 (vessel number 2931), and launch 1014 (vessel number 2932) were used to conduct mainscheme

sounding data, side scan sonar and crosslines. Launch 1014 was used to conduct bottom samples. No unusual problems or equipment configurations were encountered.

D. AUTOMATED DATA ACQUISITION AND PROCESSING – See also the Evaluation Report.

Survey data acquisition was performed with Coastal Oceanographics' HYPACK software, version 6.4. Pre-survey and data processing was accomplished by using a combination of HPS software and MAPINFO software version 4.1. Sound velocity corrections were determined using *CAT* version 3.00 and *VELOCITY* version 3.00. The DGPS stations were checked using *MONITOR* version 1.2. 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 SSS equipment was used:

Vessel	Type	S/N
2931	Towfish	20642
	Recorder	16669
2932	Towfish	20642
	Recorder	16946

On launches 1014 and 1015 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 on the 100-meter range scale and 57 meter spacing on the 75 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 4-5 knots. Confidence checks were performed by noting changes in linear bottom features extending to the outer edges of the sonargram, by passing aids to navigation, or by towing the sonar by a known contact.

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 HYPACK acquisition system. The high frequency depths were selected as the primary depths and were used for plotting. All echograms were scanned and check-scanned for significant features. Significant features that were not automatically selected as primary soundings were manually inserted.

The following fathometers were used:

Vessel	S/N	DN
2931	A110N	125-175
2932	A108N	125-168
	B050N	169-125

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

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 2, 1997. The Seacat calibration records are included in the Separates, section IV.*

A corrector table was generated for WHITING and both launches for each velocity cast taken. 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:

DN	Velocity Table #	Latitude	Longitude	Depth
125	85	33° 40' 56" N	077° 58' 30" W	15.3 m
168	01	33° 38' 34" N	077° 56' 14" W	18.0 m

Each cast was processed and corrector tables generated using *CAT* version 3.00 and *VELOCITY* version 3.00. The velocity correctors were manually entered into an HPS velocity table where correctors were applied to both the high and low frequency beams during data processing. 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

Data filed with field records

values and confirmed that the Seacat was working properly. WHITING hydrometers were calibrated on March 3, 1997. Correctors were applied to the readings taken from the hydrometer.

Bar checks were performed on launch 1014 and 1015 on April 24, 1997 (DN 114) and June 25, 1997 (DN 176). No corrections to soundings were needed. Copies of the bar and lead-line check data are included in the Separates, section IV. *

The static draft correction for launches 1014 and 1015 is 0.55 meters, and was measured on July 28, 1993. The corrector was entered into HPS Offset Tables 2* and 1* respectively. Static draft correctors were applied during data processing for each survey platform.

Settlement and squat values for launch 1014 were determined on March 07, 1997, and were entered into HPS Offset Table 2. Settlement and squat values for launch 1015 were determined on March 10, 1997, and were entered into HPS Offset Table 1.* 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 data acquired by launch 1014, and launch 1015 were determined by a TSS Dynamic Motion Sensor DMS-05. The HYPACK data acquisition computer logged and applied these calculations in real-time. Serial numbers for these sensors were as follows:

VESSEL	SN
2931	2062
2932	2068

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, a Sutron 8200 with an aquatrak head, 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 applied in HPS to the digital data during data processing. A request for smooth tide data was submitted to Product Services Branch, Datum Section, on July 11, 1997.
Approved tides and 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

H. CONTROL STATIONS – See also the Evaluation Report.

The horizontal datum for this project is the North American Datum of 1983 (NAD 83). The source of differential correctors used was a USCG maintained Differential Global Positioning

* Filed with field records

System (DGPS) station at Fort Macon, North Carolina, and at Charleston, South Carolina. Positions obtained from USCG reference listings are:

Station	Latitude	Longitude
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. 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 automatically initialized by HSDutils 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 1:10,000 scale survey using the Charleston and Fort Macon stations is 3.2. No position flyers were encountered. All suspect positions (high HDOP, DR'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:

Vessel	Device	Serial Number
2930	Ashtech Sensors	700417B1203 (system A)
		700417B1191 (system B)
	CSI MBX1	X-1318 (system A)
		X-1081 (system B)

Vessel	Device	Serial Number
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 Fort Macon DGPS tower was compared to the position determined using correctors from the Charleston 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.

* Data filed with field records

DGPS performance checks for launch 1014 and launch 1015 were conducted while secured in the WHITING davits using correctors from the Fort Macon DGPS tower. Simultaneous HYPACK 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 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 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. The offsets and laybacks were applied by HYPACK on-line. A minimum of four satellites were used during survey H-10747 providing altitude unconstrained positioning.

Offset, layback and height corrections for the launches' SSS aft towing boom were measured on July 28, 1993, verified on April 5, 1994, and applied by HYPACK on-line. Correctors were entered into Offset Table 9.

J. SHORELINE

There is no shoreline within the limits of survey H-10747.

K. CROSSLINES

A total of 7.9 nautical miles of crosslines, or 7.5% of the mainscheme mileage, was run on H-10747. Agreement between mainscheme and crossline soundings is adequate. In general, crossline soundings agree with mainscheme soundings within 0.3 meters and were randomly shoal and deep with no noticeable trends.

L. JUNCTIONS - See also the Evaluation Report

H-10747 junctions with the following two surveys: H-10724 to the north and H-10710 to the west and south. Agreement between the surveys was excellent, with most soundings within 1 foot. The greatest difference noted was 3 feet on the northern edge of H-10747.

M. COMPARISONS WITH PRIOR SURVEYS - See also the Evaluation Report

To be completed by the Atlantic Hydrographic Branch

N. ITEM INVESTIGATIONS

None.

O. COMPARISON WITH CHART - See also the Evaluation Report

The survey was compared to chart 11536, 12th edition. In general there seemed to be a migration of the shoal area to the south, with depths of 5 to 8 feet shoaler than the charted depth to the north, and depths of up to 10 feet deeper on the southern section. One significant area in the north contained a 17 foot sounding at 33° 39' 12.1" N and 077° 53' 26.5" W falling within the charted 30 foot curve. This depth was reported to the U.S. Coast Guard as a danger to navigation (see appendix I).

P. ADEQUACY OF SURVEY - See also the Evaluation Report

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

Q. AIDS TO NAVIGATION ~~- See also the Evaluation Report~~

There are two charted floating aids to navigation (ATONS) in the survey area:

Floating ATON	Position from Survey	Date Located
Buoy G "1" (unlit)	Lat: 33°39' 40.~~87~~" 96" N Lon: 077°52' 32.~~90~~" 88" W	June 17, 1997
Buoy R "2" (unlit)	Lat: 33°39' 47.74" Lon: 077°52' 47.27"	June 17, 1997

The positions of these ATON's were checked against their charted positions (chart 11537, 30th edition, dated 4/97, 1:40,000), and the Buoy G "1" was found approximately 600 meters to the northeast of its charted position. The USCG was notified of this discrepancy..

R. STATISTICS

Number of Soundings	5698
Main-scheme Sounding Lines (Nautical Miles)	104
Crosslines (Nautical Miles)	7.9
Square Nautical Miles Surveyed	3.7
Days of Production	7
Detached Positions	2
Bottom Samples	6
Tide Stations Installed	1
Current Stations	None
Number of CTD Casts	2
Magnetic Stations	None

S. MISCELLANEOUS - See also the Evaluation Report.

No anomalies in either tides or current were observed and no unusual magnetic variations were encountered in the survey area. No unusual submarine features were discovered. Bottom samples were not required to be submitted to the Smithsonian Institution.

T. RECOMMENDATIONS

No additional field work is required. The shoaling of the slue on the north side of the cut may pose a danger to navigation for larger craft vessels. It is recommended that the USCG be supplied a copy of this survey to be used to determine adequate placement of the buoys marking the channel.

U. REFERRAL TO OTHER REPORTS

A Chart User Evaluation Report was submitted in February 1997 and a Coast Pilot Report was submitted in December 1996. A Danger to Navigation letter was sent to the Coast Guard on July 8, 1997.

Submitted by:

Harold Orlinsky

Lieutenant Harold Orlinsky, NOAA
NOAA Ship WHITING

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

July 7, 1997

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

ADVANCE INFORMATION

Dear Sir:

The NOAA Ship WHITING, while conducting hydrographic survey operations in the approaches to Wilmington, North Carolina, located four features which are dangers to navigation. Our findings are summarized below.

Feature	Latitude	Longitude	Depth
1. Shoal Depth	33° 39' 12.1" N	077° 53' 26.5" W	17 feet (2.8 fathoms)
2. Obstruction	33° 53' 05.6" N	078° 06' 34.3" W	21 feet (3.5 fathoms)
3. Obstruction	33° 48' 17.8" N	078° 00' 57.7" W	32 feet (5.4 fathoms)

4. A submerged artificial reef composed of rock that is approximately 120 meters in width was found 4 miles south of the entrance to the Cape Fear River. It extends northeast from 33°47' 11.8" N, 078° 02' 03.9" W, to 33° 47' 48.1" N, 078° 01' 19.9" W, and extends southeast from 33° 47' 49.7" N, 078° 01' 50.9" W to 33° 47' 34.7" N, 078° 01' 32.2" W. Least depths of 25 feet were found along the ridges in areas.

In addition, NOAA Ship WHITING located the following uncharted floating aid to navigation:

	Latitude	Longitude	Date Located
Yellow, Round Labeled "AR 455"	33° 47' 02.2" N	078° 17' 53.5" W	June 12, 1997

WHITING also found buoy "1", green can, in Frying Pan Shoals Slue, presently charted at 33° 39' 24" N, 077° 52' 41" W, to be in a different position than charted. The position is as follows:

	Latitude	Longitude	Date Located
Green, can, "1"	33° 39' 40.9" N	077° 52' 32.9" W	June 17, 1997

Differential GPS was used to determine the survey positions of the dangers to navigation and buoys listed above. Positions are referenced to NAD 83. All depths are referenced to MLLW using predicted tides. Charts 11534 (28th edition), 11536 (12th edition), and 11537 (29th edition) are affected by this report.

A copy of this letter has 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

Maureen R. Kenny
Commander, NOAA
Commanding Officer

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

APPROVAL SHEET
HYDROGRAPHIC SURVEY
OPR-G309-WH
1996
WH-10-8-96
H-10704

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:

Maureen R. Kenny

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

NOAA FORM 76-155
(11-72)

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

SURVEY NUMBER

H-10747

GEOGRAPHIC NAMES

Name on Survey	A ON 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	
FRYING PAN SHOALS	X		X							1
FRYING PAN SHOALS SLUE	X									2
NORTH ATLANTIC OCEAN	X		X							3
NORTH CAROLINA (title)	X									4
										5
										6
										7
										8
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APPROVED

Chief, Geography Section

OCT 21 1997

NOAA FORM 76-155 SUPERSEDES C&GS 197

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SERVICE

TIDE NOTE FOR HYDROGRAPHIC SURVEY

DATE: November 5, 1997

HYDROGRAPHIC BRANCH: Atlantic

HYDROGRAPHIC PROJECT: OPR G309-WH

HYDROGRAPHIC SHEET: H-10747

LOCALITY: Approaches to Cape Fear River, Wilmington, N.C.

TIME PERIOD: May 5, - June 24, 1997

TIDE STATION USED: 865-9182 Yaupon Beach, N.C..
Lat. 33° 54.1'N Lon. 78° 4.9'W

PLANE OF REFERENCE (MEAN LOWER LOW WATER): 0.000 m
HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 1.512 m

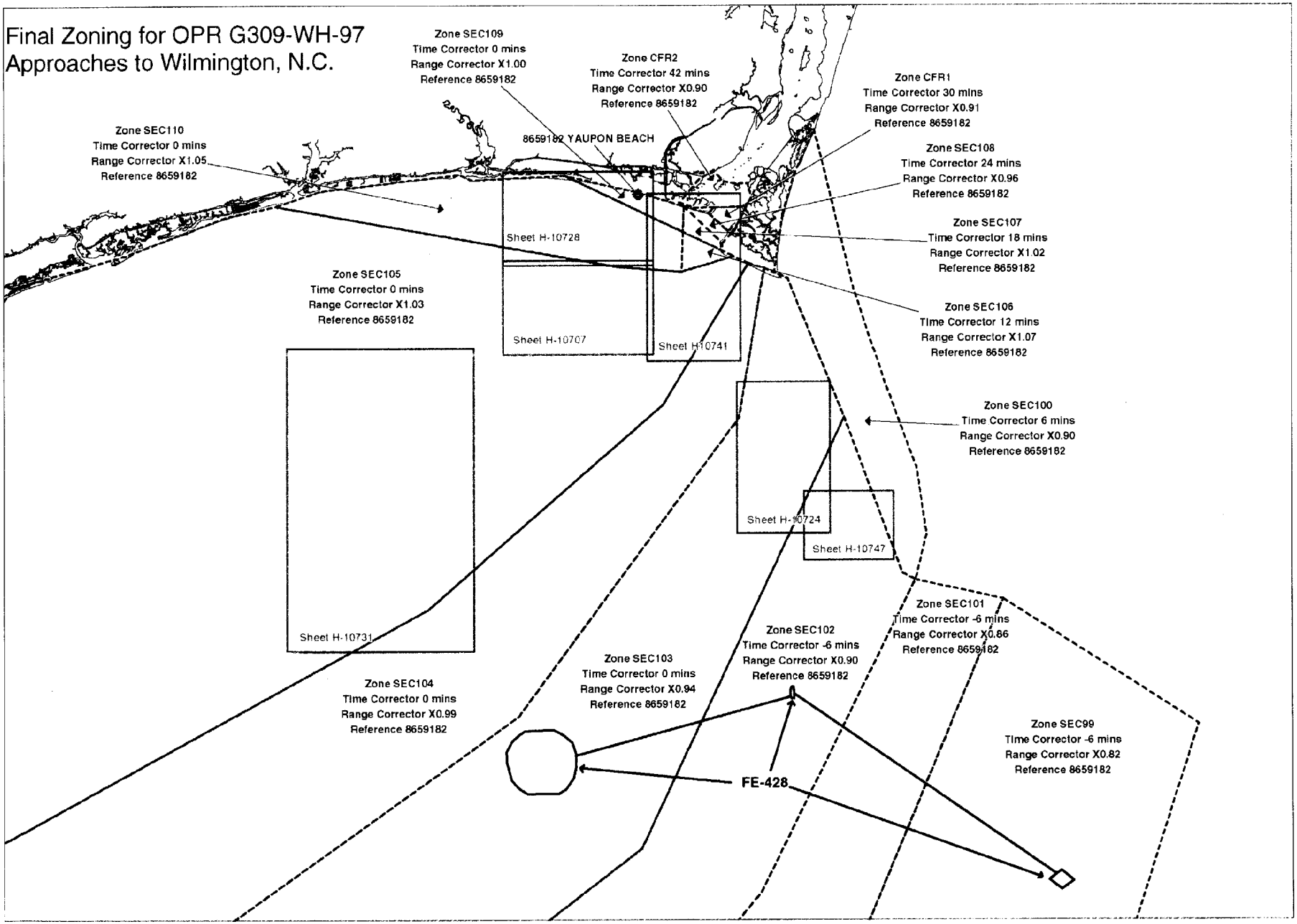
REMARKS: RECOMMENDED ZONING

Use zone(s) identified as: SEC100, SEC102 & SEC103

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


Final Zoning for OPR G309-WH-97
Approaches to Wilmington, N.C.
Zone SEC109
Time Corrector 0 mins
Range Corrector X1.00
Reference 8659182
Zone CFR2
Time Corrector 42 mins
Range Corrector X0.90
Reference 8659182
Zone CFR1
Time Corrector 30 mins
Range Corrector X0.91
Reference 8659182
Zone SEC110
Time Corrector 0 mins
Range Corrector X1.05
Reference 8659182
8659182 YAUPON BEACH
Zone SEC108
Time Corrector 24 mins
Range Corrector X0.96
Reference 8659182
Zone SEC107
Time Corrector 18 mins
Range Corrector X1.02
Reference 8659182
Sheet H-10728
Zone SEC105
Time Corrector 0 mins
Range Corrector X1.03
Reference 8659182
Zone SEC106
Time Corrector 12 mins
Range Corrector X1.07
Reference 8659182
Sheet H-10707
Sheet H-10741
Zone SEC100
Time Corrector 6 mins
Range Corrector X0.90
Reference 8659182
Sheet H-10724
Sheet H-10747
Zone SEC101
Time Corrector -6 mins
Range Corrector X0.86
Reference 8659182
Zone SEC102
Time Corrector -6 mins
Range Corrector X0.90
Reference 8659182
Zone SEC103
Time Corrector 0 mins
Range Corrector X0.94
Reference 8659182
Sheet H-10731
Zone SEC104
Time Corrector 0 mins
Range Corrector X0.99
Reference 8659182
Zone SEC99
Time Corrector -6 mins
Range Corrector X0.82
Reference 8659182
FE-428

Final tide zone node point locations for OPR G309-WH-97, Sheet H-10747.

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

	Tide Station Order	AVG Time Correction	Range Correction
Zone SEC100			
-77.955747 33.88791	865-9182	6	0.90
-77.96318 33.846179			
-77.951585 33.841933			
-77.901931 33.7414			
-77.850802 33.628711			
-77.839882 33.623779			
-77.829646 33.656927			
-77.838593 33.705045			
-77.865445 33.764924			
-77.893575 33.834427			
-77.927957 33.949443			
-77.941657 33.923586			
-77.945767 33.915731			
-77.955747 33.88791			
Zone SEC102			
-77.901931 33.7414	865-9182	-6	0.90
-77.850802 33.628711			
-77.839882 33.623779			
-77.975489 33.397092			
-78.494495 32.884319			
-78.698374 33.033043			
-78.079757 33.429171			
-77.901931 33.7414			
Zone SEC103			
-77.971956 33.84933	865-9182	0	0.94
-77.96318 33.846179			
-77.951585 33.841933			
-77.901931 33.7414			
-78.079757 33.429171			
-78.698374 33.033043			
-78.803317 33.16091			
-78.187457 33.524942			
-77.993895 33.741116			
-77.971956 33.84933			

04/21/98

HYDROGRAPHIC SURVEY STATISTICS
REGISTRY NUMBER: H-10747

NUMBER OF CONTROL STATIONS	2
NUMBER OF POSITIONS	5698
NUMBER OF SOUNDINGS	5698

	TIME-HOURS	DATE COMPLETED
PREPROCESSING EXAMINATION	8	10/09/97
VERIFICATION OF FIELD DATA	38	03/27/98
EVALUATION AND ANALYSIS	8	
FINAL INSPECTION	10	03/26/98
COMPILATION	11	04/08/98
TOTAL TIME	75	

ATLANTIC HYDROGRAPHIC BRANCH APPROVAL 03/27/98

ATLANTIC HYDROGRAPHIC BRANCH
EVALUATION REPORT FOR H-10747 (1997)

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

D. AUTOMATED DATA ACQUISITION AND PROCESSING

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

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

The smooth sheet was plotted using an Hewlett Packard DesignJet 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 0.640 seconds (19.719 meters or 1.97 mm at the scale of the survey) north in latitude, and 1.058 seconds (27.259 meters or 2.72 mm at the scale of the survey) east in longitude.

L. JUNCTIONS

H-10710 (1996) to the south
H-10724 (1996) to the northwest

Standard junctions were effected between the present survey and H-10710 (1996) and H-10724 (1996). There are no junctional surveys to the northeast, east, or southeast. Present survey depths are in harmony with the charted hydrography to the northeast, east and southeast.

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, Sep 4/93)

Hydrography

The charted hydrography originates with the prior surveys and requires no further consideration. The hydrographer makes adequate chart comparisons in sections N. and O. of the Descriptive Report. The area surveyed is near the southern edge of Frying Pan Shoals and appears to be an extremely changeable area. Present survey depths are generally deeper than the charted depths. The changes can be attributed to natural causes and improved surveying technology.

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

Aids to Navigation

Two floating aids to navigation were located by the field unit and appear adequate for their intended purpose.

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. A copy of this 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. Chart compilation was performed on Chart 11536 13th Edition., Mar. 15,1997.

WHITING Processing Team

Robert Snow

Robert Snow
Cartographic Technician
Verification of Field Data
Evaluation and Analysis

APPROVAL SHEET
H-10747

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 disproval of charted data. The digital data have been completed and all revisions and additions made to the smooth sheet during survey processing have been entered in the 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 27, 1998
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 27, 1998
Nicholas E. Perugini
Commander, NOAA
Chief, Atlantic Hydrographic Branch

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Final Approval:

Approved: Andrew A. Armstrong III Date: May 14, 1998
Andrew A. Armstrong, III
Captain, NOAA
Chief, Hydrographic Surveys Division