H10724

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-10-11-96

Registry No. H-10724

LOCALITY

State North Carolina

General Locality North Atlantic Ocean

Sublocality Frying Pan Shoals

19 96

CHIEF OF PARTY
CDR M. R. KENNY

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DATE APR 30 1998

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NOAA FORM 77-28
(11-72)

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

REGISTRY NUMBER:

H-10724

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-10-11-96 (J)

State: North Carolina

General locality: North Atlantic Ocean

Locality: Frying Pan Shoals

Scale: 1: 10,000 Date of survey: September 28, 1996 to May 5, 1997

Instructions dated: May 03, 1996 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, Emily Christman, Harold Orlinsky, Eric Sipos, C.E. Parrish, R.C. Jones, J.D. Garte, U.L. Gardner, P.G. Lewit, K.B. Shaver, F.R. Cruz, Brad Armbruster, Danielle Pattison and Parran Keane

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

Graphic record scaled by: WHITING personnel

ic record checked by: WHITING personnel

Protracted by: N/A Automated plot by: Zeta 936 Plotters & HP PLT 750C Plotter

Verification by: Hydrographic Surveys Branch PERSONNEL (AMC)

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

Remarks: Basic Hydrographic and 200% Side Scan Sonar.

Electonic Data Processing (EDP) vessels numbers involved in data acquisition: 2930, 2931 and 2932

Time zones used: UTC

Survey work began in 1996 and was completed in 1997

Horizontal Datum NAD 83

NOTES IN RED WERE MADE DURING OFFICE PROCESSING

AWOIS and SURF RWD 4/98

NOAA FORM 77-28 SUPERSEDES FORM C & GS - 537

* U.S. GOVERNMENT PRINTING OFFICE: 1976-665-661/1222 REGION NO.6

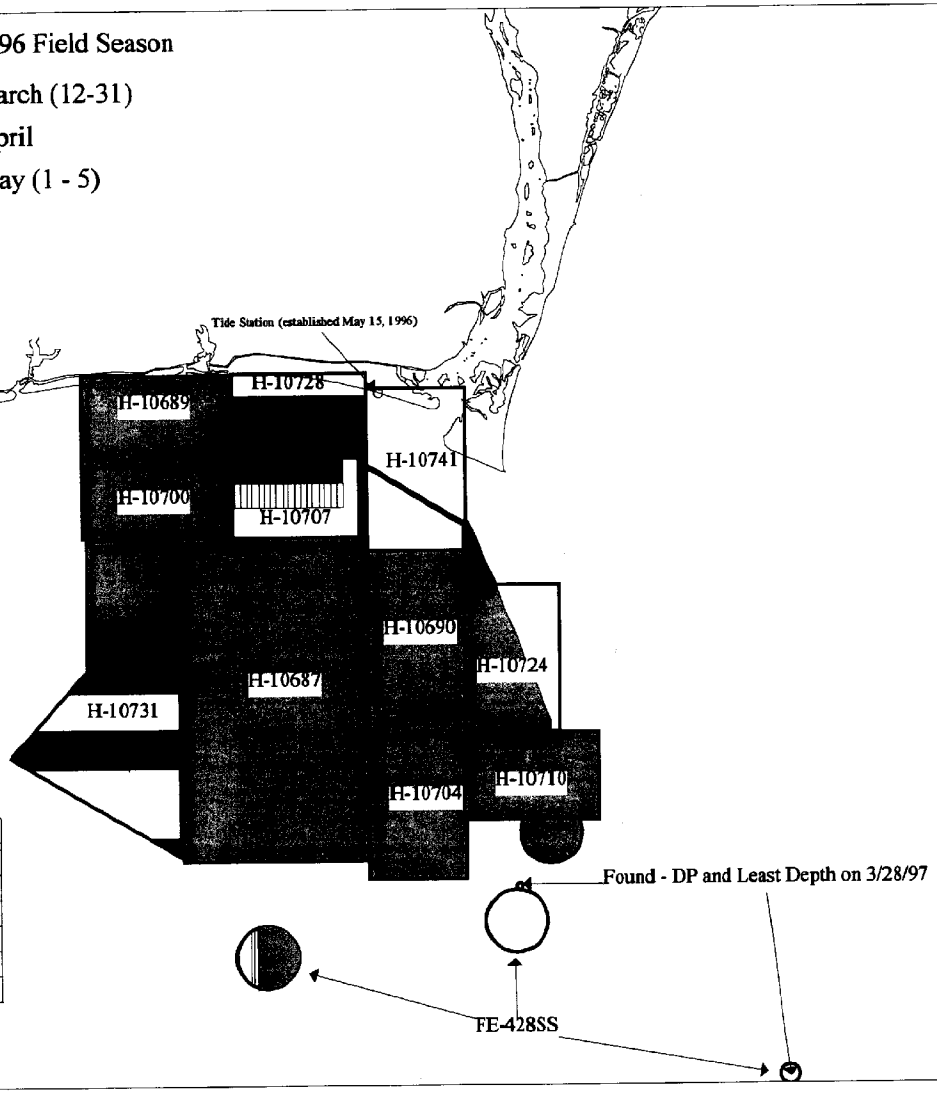
PROGRESS SKETCH - March 1997
OPR-G309-WH-96
Approaches to Wilmington,NC
NOAA Ship WHITING
CDR Maureen R. Kenny, CMDG.

1996 Field Season
March (12-31)
April
May (1 - 5)

Accomplished	Mar	April	May	June	July
LNM Hydro	151	89			
LNM SSS	655	952			
Sq NM Surveyed	28.3	39.3			
AWOIS Items	2	0			
Dives	2	8			
Bottom Samples	19	26			

Downtime_Hrs	Mar	April	May	June	July
Weather	137	280			
Electronics	6	15			
Mechanical	24	9			
Other	0	10			

Reg_No	Started	Est_Complete	Complete	Submitted
H-10724	9/28/96	5/8/97	100%	5/9/1997
FE-428	8/02/96	5/15/97	80%	
H-10731	10/23/96	6/1/97	65%	
H-10707	3/18/97	6/1/97	60%	
H-10728	3/20/97	5/15/97	90%	
H-10741	4/20/97	6/25/97	5%	



DESCRIPTIVE REPORT TO ACCOMPANY
HYDROGRAPHIC SURVEY
OPR-G309-WH
WH-10-11-96
H-10724

NOAA SHIP WHITING
CDR Maureen Kenny, NOAA
Commanding Officer

A. PROJECT

The purpose of this project is to update charted hydrography in 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-G309-WH consists of twelve survey sheets. The survey described in this report was designated "J" sheet, field sheet number WH-10-11-96, and registry number H-10724. Survey operations were conducted in compliance with the Hydrographic Project Instructions OPR-G309-WH dated May 3, 1996.

B. AREA SURVEYED

Hydrographic survey H-10724 is located in the vicinity of Frying Pan Shoals, North Carolina. The limits of hydrography are bounded by the following positions:

Position	Latitude	Longitude
1	33° 39' 5" N	077° 59' 8" W
2	33° 39' 5" N	077° 54' 9" W
3	33° 46' 0" N	077° 54' 9" W
4	33° 46' 0" N	077° 59' 8" W

Project OPR-G309 is bounded by the 30-foot curve. Hydrography was run up to and included the 30-foot curve in all areas of the sheet. Survey operations commenced on September 28, 1996 (DN 272), and concluded on May 5, 1997 (DN 125).

C. SURVEY VESSELS

NOAA Ship WHITING (vessel number 2930), launch 1015 (vessel number 2931) and launch 1014 (vessel number 2932) were used to conduct mainscheme sounding data acquisition, side scan sonar, cross lines, sound velocity casts, main scheme echosounder splits, bottom samples, AWOIS investigations, and dive operations. No unusual problems or equipment configurations

were encountered.

D. AUTOMATED DATA ACQUISITION AND PROCESSING

SEE ALSO THE EVALUATION REPORT.

Survey data acquisition and processing were accomplished using the HDAPS system with the standard HDAPS software dated March 28, 1996, HYPACK version 6.4 for Windows, Hydrographic Processing System (HPS) and MAPINFO version 4.1. Sound velocity corrections were determined using *CAT* version 2.00 and *VELOCITY* version 2.11. The Differential GPS 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-TH 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	DN
2930	Towfish	0011904, 16697	272, 290-292, 296
		016700	329-330
	Recorder	016946	
2931	Towfish	016673, 0011902	291-292, 294-296
		20642	
	Recorder	16699, 16671	306, 324-326
			329-330,077, 099
2932	Towfish	11591, 20642, 11908	291, 294-296, 306
	Recorder	016669,16946	324-326, 329,077,
			099, 125

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 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 either 80-meter line spacing at the 100-meter range scale, 55-meter line spacing at the 75-meter range scale or 40 meter line spacing at the 50-meter range scale,

depending on the depth of water. 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 and HPS 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 and 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 by taking detached positions 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 and HYPACK 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:

Vessel	S/N	DN
2930	B046N	272, 290, 292-296, 329-330, 125
2931	C076N A118N	291-292, 294-296, 306, 324-326, 329-330,075-082,101, 125
2932	A018N	291, 294-296, 306, 324-326 329,075,101, 125

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 and January 10, 1997. 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 acquired in this survey area:

DN	Velocity Table #	Latitude	Longitude	Depth
270	35 (ship)	33° 32' 42" N	078° 02' 36" W	26.8 m
270	36 (launches)	33° 32' 42" N	078° 02' 36" W	26.8 m
294	39 (ship)	33° 32' 40" N	077° 57' 10" W	31.3 m
294	40 (launches)	33° 32' 40" N	077° 57' 10" W	31.3 m
309	41 (ship)	33° 30' 54" N	078° 00' 48" W	31.0 m
309	42 (launches)	33° 30' 54" N	078° 00' 48" W	31.0 m
324	47 (launches)	33° 39' 54" N	077° 57' 36" W	16.8 m
324	48 (ship)	33° 39' 54" N	077° 57' 36" W	16.8 m
087	63 (ship)	33° 39' 18" N	077° 58' 54" W	16.6 m
087	64 (launches)	33° 39' 18" N	077° 58' 54" W	16.6 m
107	69 (ship)	33° 49' 36" N	078° 06' 03" W	18.0 m
107	70 (launches)	33° 49' 36" N	078° 06' 03" W	18.0 m
125	84 (ship)	33° 40' 56" N	077° 58' 30" W	15.3 m
125	85 (launches)	33° 40' 56" N	077° 58' 30" W	15.3 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 and HPS 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 and March 3, 1997. Correctors were applied to the readings taken from the hydrometer. There were no variations in instrument initials.

* FILED WITH THE ORIGINAL FIELD RECORDS.

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 and launch 1015 on November 16, 1996 (DN 321) and April 24, 1997 (DN 114). No corrections to soundings were needed. Copies of the bar check data are included in the Separates, section IV. *

A leadline comparison was performed on WHITING while in the project area on November 18, 1996 (DN 323) and April 3, 1997 (DN 093). Leadlines used were calibrated on November 17, 1996 (DN 322) and February 15, 1997 (DN 046), and the calibrations confirmed that the leadline error was negligible. Weather and sea conditions were calm and proved ideal for performing the leadline comparison. The results showed excellent agreement with DSF-6000N high frequency depths averaging 0.04 meters deeper that leadline depths. Copies of the leadline comparison data are included in the Separates, section IV. *

The correction for the static draft for launches 1014 and 1015 is 0.55 meters and was measured on July 28, 1993. The corrector was entered into 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. 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 March 10, 1997, and were entered into Offset Table 2. Settlement and squat values for launch 1015 were determined on March 18, 1996 and March 10, 1997, and were entered into Offset Table 1. 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 launches 1014 and 1015 were applied during post processing by manually scanning the echograms and making the appropriate corrections (DN 272-330). For the data acquired by launches 1014 and 1015 using HYPACK (DN 077-101), the data acquisition computer logged and applied in real time, heave data from a TSS Heave Compensator (S/N 002068 and 002062, respectively). For data acquired by WHITING, the HDAPS and HYPACK data acquisition computer logged and applied, in real time, heave data from a heave, roll and pitch sensor (HIPPY, S/N 19109-C) and a TSS Heave Compensator (S/N 002066).

The tidal datum for this project was Mean Lower Low Water (MLLW). The operating tide station at Springmaid Pier, South Carolina (866-1070), served as the reference station for predicted tides. 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. APPROVED TIDES AND ZONING WERE APPLIED DURING OFFICE PROCESSING

* FILED WITH THE ORIGINAL FIELD RECORDS

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

Time Correction	00 hrs 00 mins
Height Ratio	x 0.97

A subordinate tide station for the project was installed at Yaupon Beach, North Carolina (865-9182). The station was installed on May 15, 1996, and leveled on September 7, 1996, November 18, 1996, March 6, 1997 and April 5, 1997. A request for smooth tides was submitted to Product and Services Branch, Datum Section, N/OES231, on May 12, 1997.

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 GPS station at Charleston, South Carolina. In addition, WHITING used a USCG maintained Differential GPS station at Fort Macon, North Carolina, for performance checks. 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. The digital data obtained from the *MONITOR* 1.2 program was forwarded to N/CS31 in July 1996 and March 11, 1997. Printouts from the *MONITOR* program are included in the Separates, section III.

I. HYDROGRAPHIC POSITION CONTROL

A Differential Global Positioning System (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 HYPACK 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 station is 3.75. 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
	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 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 launches 1014 and 1015 were conducted with each launch secured in the WHITING davits and with all platforms using correctors from the Charleston DGPS tower. Simultaneous HDAPS positions (1996) and HYPACK positions (1997) were compared between WHITING and each launch. An offset in distance and azimuth was then calculated between the ship and each 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. *FILED WITH THE ORIGINAL FIELD RECORDS

The DGPS antenna offset was measured on March 19, 1996, and February 1997, for WHITING. Offsets and laybacks were measured using the high-frequency echosounder transducer as the reference. DGPS antenna were reinstalled directly over the echosounders transducers on April 2, 1996, for launches 1014 and 1015. Antenna heights were also measured on the same respective dates shown above, using the water line as the reference. The offsets and laybacks were applied by the HDAPS and HYPACK on-line. A minimum of four satellites was used during survey H-10724 providing altitude unconstrained positioning.

Offset, layback, and height corrections for each launch's SSS aft towing boom were measured on February 1997. All offset, layback, and height data were applied by HDAPS and HYPACK on-line. Correctors from Offset Table 1 were applied to all data acquired from launch 1015. 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, and February 1997, using the forward high frequency transducer as the reference. Correctors were entered into Offset Table 9.

J. SHORELINE

No shoreline exists within the limits of survey H-10724.

K. CROSSLINES

A total of 45 nautical miles of crosslines, or 9 % of the mainscheme mileage, was run on H-10724. Agreement between mainscheme and crossline soundings is adequate with most cross line soundings agreeing with main scheme soundings to within 0.3 meters. The greatest difference noted was 0.5 meters.

L. JUNCTIONS SEE ALSO THE EVALUATION REPORT

H-10724 junctions with surveys H-10704 (1:10,000), H-10710 (1:10,000) and H-10690 (1:10,000) . Alignment between contour lines at the junction of H-10724 and all the surveys listed above is satisfactory.

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

Comparisons were made between H-10724 and the following prior surveys: H-9116 (1970) and H-9323 (1973). 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. Therefore, no datum shift was applied in the comparisons. Results of the comparisons are as follows:

H-9116

Agreement between H-10724 and H-9116 is good, with most soundings agreeing to within 2 feet. In general, soundings from H-10724 are slightly deeper than soundings from H-9116. No point features exist on the portion of survey H-9116 which is covered on survey H-10724.

H-9323

Agreement between H-10724 and H-9323 is good, with most soundings agreeing to within 2 feet. In general, along the western edge of the survey area, soundings from H-10724 are slightly deeper than soundings from H-9323. Also in a few places, the 30-foot curve appears to have shifted irregularly approximately 50 meters to the east. No point features exist on the portion of H-9323 which is covered on survey H-10724.

N. ITEM INVESTIGATIONS

Divers found two items during contact investigations. The following is a list of the contacts, their positons, least depths and descriptions. Depths of these features are corrected to ~~predicted~~ APPROVED TIDES MLLW.

Item #	Latitude	Longitude	Least Depth	Description
3987.51	33° 43' 04.998" N	077° 58' 48.149" W	12.2 m (40 FT)	Sunken Buoy
6030.12	33° 43' 21.243" N	077° 59' 34.369" W	11.8 m (38 FT)	Metal Box (3'x3'x3')

WHITING recommends the sunken buoy located at latitude 33° 43' 04.998" N, longitude 077° 58' 48.149" W be charted as an obstruction with a least depth of 12.2 meters. WHITING also recommends, that the metal box located at latitude 33° 43' 21.243" N, longitude 077° 59' 34.369" W be charted as an obstruction with a least depth of 11.8 meters. ~~40 ft Obstn and 38' Obstn respectively~~ CONCUR. CHART AS DO NOT CONCUR. SHOALER DEPTHS OF 30 TO 35 FEET ARE IN THE IMMEDIATE CHARTED VICINITY

O. COMPARISON WITH THE CHART SEE ALSO THE EVALUATION REPORT

Comparisons were made between survey H-10724 and chart 11536 (12th ed., Sept. 4/93, 1:80,000). Comparisons were made in feet. In general, agreement is adequate with charted depths agreeing with survey soundings within 2 feet. The overall trend appears to be a slight deepening in the survey area, outside of Frying Pan Shoals.

No Danger to Navigation Reports were required for this survey.

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

There are no aids to navigation within the survey limits. CONCUR

R. STATISTICS

Number of Positions	10,803
Main-scheme Sounding Lines (Nautical Miles)	577 nm
Cross lines (Nautical Miles)	45 nm
Square Nautical Miles Surveyed	30.9 nm
Days of Production	19
Detached Positions	0
Bottom Samples	9
Tide Stations Installed	1
Current Stations	0
Number of CTD Casts	7
Magnetic Stations	0

S. MISCELLANEOUS SEE ALSO THE 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 was submitted in February 1997 as part of OPR-G309-WH.
A Coast Pilot Report was submitted in December 1996.

Submitted by:

Lieutenant (jg) RC Jones, NOAA
NOAA Ship WHITING

APPROVAL SHEET
HYDROGRAPHIC SURVEY
OPR-G309-WH
WH-10-5-96
H-10724

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

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-10724

LOCALITY: 7.5 Nautical Miles South of Cape Fear, North Carolina

TIME PERIOD: September 28 - November 25, 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

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

NOAA FORM 76-155
(11-72)

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

SURVEY NUMBER

H-10724

GEOGRAPHIC NAMES

Name on Survey	A ON CHART NO. 11536, 11537	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
NORTH ATLANTIC OCEAN	X		X							2
NORTH CAROLINA (title)										3
										4
										5
										6
										7
										8
										9
										10
										11
										12
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										25

Approved

Chief Cartographer

DEC 23 1997

NOAA FORM 76-155 SUPERSEDES C&GS 197

NOAA FORM 61-29
(12-71)

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

LETTER TRANSMITTING DATA

REFERENCE NO.

N/CS33-29-98

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

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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 6, 1998

NUMBER OF PACKAGES

1 Box, 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-10724

North Carolina, North Atl. Ocean, Frying Pan Shoals

1 Box Containing:

1 Original Descriptive Report for H-10724
1 Envelope with two (2) HISTORY OF CARTOGRAPHIC WORK (NOAA form 76-71) for H-10724 for charts 11537, and 11536

1 Tube Containing:

1 Original Smooth Sheet for H-10724
1 Paper Composite plot of survey H-10724 for chart 11537
1 Paper Composite plot of survey H-10724 for chart 11536
1 Mylar H-Drawing of H-10724 for NOS chart 11537
1 Mylar H-Drawing of H-10724 for NOS chart 11536

FROM: *(Signature)* R H Whitfield

Richard H. Whitfield

RECEIVED THE ABOVE
(Name, Division, Date)

Return receipted copy to:

Atlantic Hydrographic Branch N/CS331
439 W. York Street
Norfolk, VA 23510-1114

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

☆U.S.GPO:1993-0-864-006/1192

04/06/98

HYDROGRAPHIC SURVEY STATISTICS
REGISTRY NUMBER: H-10724

NUMBER OF CONTROL STATIONS	2
NUMBER OF POSITIONS	10803
NUMBER OF SOUNDINGS	10803

	TIME-HOURS	DATE COMPLETED
PREPROCESSING EXAMINATION	26	05/30/97
VERIFICATION OF FIELD DATA	282.50	03/20/98
EVALUATION AND ANALYSIS	41.50	
FINAL INSPECTION	28	03/17/98
COMPILATION	47	03/31/98
TOTAL TIME	425	

ATLANTIC HYDROGRAPHIC BRANCH APPROVAL 03/17/98

ATLANTIC HYDROGRAPHIC BRANCH
EVALUATION REPORT FOR H-10724 (1996-97)

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 (HPS)
SiteWorks, version 2.1
MicroStation 95, version 5.05
NADCON, version 2.10
I/RAS B, version 5.01

The smooth sheet was plotted using an ENCAD NovaJet III plotter.

H. CONTROL

Horizontal control used for this survey during data acquisition is based upon the North American Datum of 1983 (NAD 83). 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 .636 seconds (19.61 meters or 1.96 mm at the scale of the survey) north in latitude, and 1.048 seconds (26.98 meters or 2.70 mm at the scale of the survey) east in longitude.

L. JUNCTIONS

H-10690 (1996) to the west
H-10704 (1996) to the southwest
H-10710 (1996) to the south southwest
H-10747 (1996) to the south southeast

A standard junction has been effected between the present survey and surveys H-10690 (1996), H-10704 (1996), H-10710 (1996), and H-10747 (1996).

There are no contemporary surveys to the north and east of the present survey. Present survey depths are in harmony with the charted hydrography to the north and east.

M. COMPARISON WITH PRIOR SURVEYS

A comparison of prior survey was not done during office processing in accordance with section 4.f. the memorandum

titled *Changes to Hydrographic Survey Processing*, dated May 24,1995. An adequate comparison can be found in section M. of the Descriptive Report.

O. COMPARISON WITH CHARTS 11536 (13th Edition Mar 15/97) 11537 (30th Edition Apr 05/97)

Hydrography

The charted hydrography originates with the prior surveys discussed in section M. of the Descriptive Report. The hydrographer makes an adequate chart comparison in section O. of the Descriptive Report. The following should be noted:

An uncharted obstruction with a depth of 39 feet was located by the hydrographer in Latitude 33°45'24.124"N, Longitude 77°58'46.347"W and is shown on the present survey. The obstruction was found to be tires tied together in three groups. Surrounding depths in the immediate vicinity are 39 to 41 feet. This item is not considered significant and charting the obstruction is not recommended.

The present survey is adequate to supersede the chart in the common area.

P. ADEQUACY OF SURVEY

This is an adequate hydrographic survey. No additional work is recommended.

S. MISCELLANEOUS

Chart compilation using the present survey 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 (13th Ed., Mar 15/97)
11537 (30th Ec., Apr 05/97)

Reginald L. Keene Sr.

Reginald L. Keene Sr.
Cartographic Technician
Verification and Evaluation and Analysis

APPROVAL SHEET
H-10724

Initial Approvals:

The completed survey has been inspected with regard to survey coverage, delineation of depth curves, development of critical depths, cartographic symbolization, and verification or disapproval of charted data. The digital data have been completed and all revisions and additions made to the smooth sheet during survey processing have been entered in the digital data for this survey. The survey records and digital data comply with NOS requirements except where noted in the Evaluation Report.

Richard H. Whitfield Date: March 17, 1998

Richard H. Whitfield
Cartographer
Atlantic Hydrographic Branch

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

Nicholas E. Perugini Date: March 17, 1998

Nicholas E. Perugini, CDR, NOAA
Chief, Atlantic Hydrographic Branch

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Final Approval:

Approved: Andrew A. Armstrong, III Date: April 30, 1998

Andrew A. Armstrong, III
Captain, NOAA
Chief, Hydrographic Surveys Division

NOAA FORM 75-96
(10-83)

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

MARINE CHART BRANCH

RECORD OF APPLICATION TO CHARTS

FILE WITH DESCRIPTIVE REPORT OF SURVEY NO. H-10724

INSTRUCTIONS

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

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

CHART	DATE	CARTOGRAPHER	REMARKS
11537	3/19/98	[illegible]	Full ~~Part Before~~ After Marine Center Approval Signed Via
			Drawing No.
11536	3/30/98	[illegible]	Full ~~Part Before~~ After Marine Center Approval Signed Via
			Drawing No.
			Full Part Before After Marine Center Approval Signed Via
			Drawing No.
			Full Part Before After Marine Center Approval Signed Via
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			Full Part Before After Marine Center Approval Signed Via
			Drawing No.

SUPERSEDES C&GS FORM 8352 WHICH MAY BE USED.