H10728

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-10-2-97

Registry No.: H-10728

LOCALITY

State: NORTH CAROLINA

General Locality: NORTH ATLANTIC OCEAN

Sublocality: 5 NM ESE OF LOCKWOODS FOLLEY INLET

1997

CHIEF OF PARTY

CDR M. R. KENNY, NOAA

LIBRARY & ARCHIVES

DATE: MAY 1 1998

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NOAA FORM 77-28
(11-72)

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

REGISTRY NUMBER:

H-10728

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-10-02-97 (B)

State: North Carolina

General locality: Approaches to Cape Fear River

Locality: 5 nm ESE of Lockwoods Folley Inlet

Scale: 1: 10,000 Date of survey: 20 March - 11 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

Graphic record checked by: WHITING personnel

Protracted by: N/A Automated plot by: Zeta 936 Plotters, HP 7500C

Verification by: Hydrographic Surveys Branch personnel

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

Remarks: Basic Hydrographic and 200% Side Scan Sonar coverage of Survey H-10728

Time zone used: 0 (UTC)

Horizontal Datum: NAD83

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

AWOIS and SURF - PWD 4/98

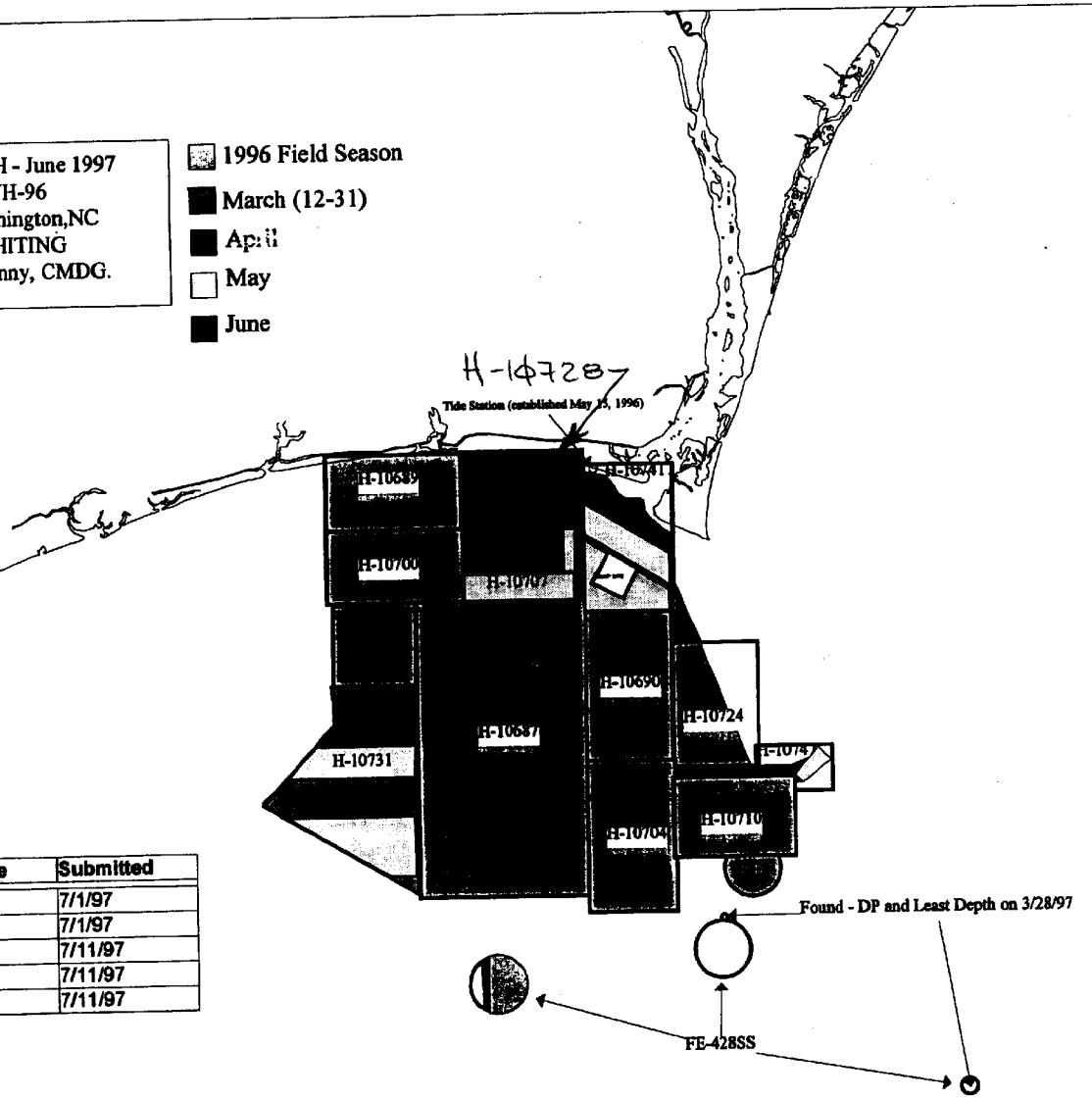
PROGRESS SKETCH - June 1997
OPR-G309-WH-96
Approaches to Wilmington,NC
NOAA Ship WHITING
CDR Maureen R. Kenny, CMDG.

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
WH-10-02-97
OPR-G309-WH
H-10728

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

A. PROJECT

Project OPR-G309-WH is being conducted to update charted hydrographic data for the approaches to Wilmington, North Carolina. This project was requested by the United States Coast Guard (USCG), Army Corps of Engineers, North Carolina State Port Authority, and the Wilmington-Cape Fear Pilot Association. Project OPR-G309-WH consists of twelve survey sheets. This survey was assigned sheet letter "B", field sheet number WH-10-2-97, and registry number H-10728. Survey operations were conducted in compliance with 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-10728 is located 5 nm ESE of Lockwoods Folley Inlet, North Carolina. The limits of hydrography are bounded by the following positions:

Position	Latitude	Longitude
1	33° 55' 06.7" N	078° 12' 00.0" W
2	33° 55' 06.7" N	078° 04' 05.3" W
3	33° 51' 00.0" N	078° 04' 05.3" W
4	33° 51' 00.0" N	078° 12' 00.0" W

Survey H-10728 is bounded to the north by the 18-foot curve east of longitude 078° 07' 00.0" W, and the 30-foot curve to the west. Survey operations commenced on March 20, 1997 (DN 079), and were completed on June 11, 1997 (DN162).

C. SURVEY VESSELS

NOAA Ship WHITING (VESNO 2930) was used to conduct mainscheme echosounder, side scan sonar, bottom samples, sound velocity casts, and echosounder splits. Dive investigations, echosounder splits, side scan sonar, holidays, sound velocity casts, crosslines, and detached

positions were conducted on launch 1014 (VESNO 2932). Echosounder, side scan sonar, holidays, and crosslines were conducted on launch 1015 (VESNO 2931). 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 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 DGPS station was checked using *MONITOR* version 1.2. The *DAILYDQA* program ensured the proper functioning of the MOD III diver least depth gauge. 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:

VESNO	Type	S/N	DN
2930	Towfish	011904	079-121
	Towfish	016697	121-135
	Recorder	016942	079-159
2931	Towfish	016697	079-089
	Towfish	020642	089-135
	Recorder	016671	079-120
	Recorder	016669	121-135
2932	Towfish	011908	079-162
	Recorder	016946	079-162

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 mounted on the stern of ship. The armored cable was connected to the side scan recorder via a slip ring assembly. On launches 1014 and 1015, the side scan sonar towfish was deployed using a Superwinch in conjunction with an adjustable davit arm on the stern of the launch. The launches' towfish was towed with 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, 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. These line spacing parameters insured the overlap required by Field Procedures Manual, section 7.3.2.2. Adequate coverage was ensured by plotting alternate mainscheme lines on the first hundred and second hundred percent swath plots.

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 and by passing aids to navigation.

Contacts were measured off the sonargram and entered into a 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 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 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. Significant features that were not selected as primary soundings were manually inserted. The following fathometers were used:

Vessel	S/N	DN
2930	B046N	079-159
2931	B054N	079-082
	A118N	082-101
	A116N	101-115
	A110N	115-159
2932	A108N	079-162

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 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 collected in this survey area:

DN	VESNO	Vel.Table #	Latitude	Longitude	Least Depth
079	2930	57	33° 50' 12"N	078° 05' 54"W	13.7 M
079	2931-32	58	33° 50' 12"N	078° 05' 54"W	13.7 M
087	2930	63	33° 39' 18"N	077° 58' 54"W	16.6 M
087	2931-32	64	33° 39' 18"N	077° 58' 54"W	16.6 M
093	2930	67	33° 48' 00"N	078° 09' 06"W	14.8 M
093	2931-32	68	33° 48' 00"N	078° 09' 06"W	14.8 M
107	2930	69	33° 49' 36"N	078° 06' 03"W	18.0 M
107	2931-32	70	33° 49' 36"N	078° 06' 03"W	18.0 M
120	2930	78	33° 49' 03"N	078° 05' 04"W	11.3 M
120	2931-32	79	33° 49' 03"N	078° 05' 04"W	11.3 M
124	2930	80	33° 47' 48"N	078° 08' 36"W	20.0 M
124	2931-32	81	33° 47' 48"N	078° 08' 36"W	20.0 M
149	2931-32	93	33° 47' 24"N	078° 07' 36"W	16.5 M
167	2932	99	33° 47' 18"N	078° 03' 12"W	16.7 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 HPS velocity table where correctors were applied to both the high and low frequency beams during 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 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. There were no variations in instrument initials.

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

*Data filed with field records.

Bar checks were performed on launch 1014 and launch 1015 on April 24, 1997 (DN 114), June 24, 1997 (DN 175), and June 25, 1997 (DN 176). No corrections to soundings were needed. Copies of the bar check data are included in the Separates, section IV. *

Leadline comparisons were performed on WHITING on April 3, 1997 (DN 093) and June 5, 1997 (DN 156). Leadlines used were calibrated on February 15, 1997 (DN 046), and the calibration confirmed that the leadline error was negligible. Weather and sea conditions were calm and proved ideal for performing the leadline comparisons. The results showed excellent agreement with DSF-6000N high frequency depths averaging 0.04 meters deeper than 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 in HPS processing for each survey platform.

Settlement and squat values for launches 1014 and 1015 were determined on March 10, 1997, and were entered into Offset Tables 2 and 1 (respectively). 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. *

Launches 1014 and 1015, and the WHITING have TSS motion sensors (s/n 2068, 2062, and 2066, respectively). For data acquired by all platforms, the HYPACK data acquisition computer logged and applied, in real time, heave data from the TSS sensors.

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 subordinate station at Yaupon Beach, North Carolina (865-9182), was installed on May 15, 1996, and 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 was received on floppy disk from N/CS33, Hydrographic Surveys Branch, and were applied to the digital data during post-processing in HPS. A request for smooth tides was submitted to Product Services Branch, Datum Section, N/OES231 on July 1, 1997 (DN182). Time and height correctors used for this survey are as follows:

Time Correction	Height Ratio
0 hr 00 min	X 0.97

Approved tides and zoning applied during office processing.
* Data filed with field records.

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 were the USCG maintained Differential GPS station at Charleston, South Carolina, and Fort Macon, North Carolina. The positions from USCG reference listing are:

Station	Latitude	Longitude
Charleston, South Carolina	34° 45.45357'N	079° 50.57225'W
Fort Macon, North Carolina	34° 41.84333'N	076° 40.98706'W

WHITING used *MONITOR* 1.2 to verify station positions and to check for multipath in the area. The digital data obtained from the *MONITOR* 1.2 program were forwarded to N/CS31 on 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. The launches and WHITING used an Ashtech Sensor GPS receiver with CSI MBX1 beacon receiver which supplied correctors for DGPS navigation. Ashtech receivers were initialized by HYPACK and the CSI MBX1's were preset to the appropriate station frequency.

DGPS positioning was accomplished in accordance with the Field Procedures Manual (FPM), section 3.4. Horizontal Dilution of Precision (HDOP) limits were computed as required in section 3.4.2 of the FPM. The HDOP limit for a 1:10,000-scale survey using the USCG Beacon 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, CSI MBX-1 receivers used are as follows:

Vesno #	Device	Serial Number
2930	Ashtech Sensor	700417B1203
	CSI MBX1	A003789
2931	Ashtech Sensor	700417B1194
	CSI MBX1	X-1088
2932	Ashtech Sensor	700417B1055
	CSI MBX1	X-1079

DGPS performance checks on WHITING were determined 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 the launches secured in WHITING davits. All platforms used correctors from the Fort Macon, North Carolina, DGPS tower. Simultaneous HYPACK positions were compared between WHITING and the launches. An offset in distance and azimuth was then calculated between the ship and launches. A summary of the DGPS performance checks are in the Separates, section III.* All DGPS performance checks confirmed that the equipment was working properly.

DGPS antenna offsets were measured in February 1997, for WHITING. Offsets and laybacks were measured using the high frequency echosounder transducer as the reference. The 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 applied by HYPACK on-line. A minimum of four satellites was used during survey H-10728 (1:10,000) providing altitude unconstrained positioning.

Offset, layback, and height correctors for each launch's SSS aft towing boom were measured in February 1997. All offset, layback, and height data were applied by HYPACK. Correctors from offset table 1 were applied to all data acquired on launch 1015. Correctors from table 2* were applied to all data acquired from launch 1014.

Offset, layback, and height for WHITING's SSS towfish A-frame were measured in February 1997, using the forward high frequency transducer as the reference. Correctors were entered into Offset table 9.*

J. SHORELINE – See also the Evaluation Report.

Shoreline features on charts 11536 (12th ed., September 4, 1993, 1:80,000), 11537 (29th ed., July 9, 1994), and 11534 (28th ed., June 11, 1994, 1:40,000) were reviewed for accuracy. All features were verified as charted except for the following pier:

Pier	Charted Position	Surveyed Position
Ocean Crest Motel Pier	33° 54' 37.0"N 078° 08' 48.1"W	33° 54' 37.9"N 078° 08' 49.0"W

The Ocean Crest Motel Pier was positioned using a hand held DGPS receiver on September 24, 1996 (DN 268). WHITING recommends relocating the pier to the surveyed position.** In addition, new tanks exist within survey limits that would be useful as aids to navigation. Photography should be planned for the future to locate these tanks. No other discrepancies were found in charted shoreline features. ** Do not concur - see the Evaluation Report.

* Filed with original field records.

K. CROSSLINES

A total of 56 nautical miles of crosslines were run on H-10728. This constitutes 14% of the total linear nautical miles of main-scheme lines run. Crossline and main-scheme agreement was adequate. In general, crossline soundings agree with mainscheme soundings to within 1 foot. The greatest difference noted was 1.3 feet.

L. JUNCTIONS – See also the Evaluation Report.

Survey H-10728 junctions with H-10707 (Sheet "D", 1:10,000) to the south, and H-10689 (Sheet "A" 1:10,000) to the west. Agreement between overlapping soundings at all junctions is satisfactory. Contour lines continue at the junction with no unusual patterns.

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

Prior survey H-9115 (1970, 1:20,000) was the most recent survey for comparison with H-10728. All comparisons were made in feet. The prior survey was referenced to NAD 27. The datum shift between NAD 27 and NAD 83 was calculated using *CORPSCON* (version 2.1) software and determined to be insignificant (1.0 mm at 1 : 20,000). Therefore, no datum shift was applied in the comparisons. In general, soundings on the prior survey agreed within 1 foot. The greatest difference found was 3 feet. On average, soundings from H-10728 were deeper than those from H-9115.

N. ITEM INVESTIGATIONS

The following items were investigated by WHITING during this survey. Least depths of features and surrounding depths are corrected to predicted MLLW. All discussed items fall within the proposed position of fish haven "AR 425" addressed below.

The North Carolina Department of Environmental, Health, and Natural Resources, Division of Marine Fisheries (NC Marine Fisheries) has established many artificial reefs. A booklet was forwarded to WHITING which describes the contents of these numerous fish havens. Yaupon Beach Reef fish haven falls within the limits of this survey. A copy of the pages pertaining to "AR425" (Yaupon Beach Reef) is included in Appendix VI of this report.

This fish haven is incorrectly charted at 33° 53' 06.0"N, 078° 07' 21.0"W. No significant contacts were found within the charted fish haven during this survey using side scan sonar (200%). However, approximately 900 meters to the east, contacts were found that agreed with the orientation of those described in the documentation for fish haven "AR 425". In addition, the fish haven debris field is marked by a buoy "AR 425" (see section Q). Mr. Steve Murphey of The NC Marine Fisheries was contacted by telephone on June 23, 1997, concerning this fish

haven. He stated that the fish haven was charted in the incorrect location because it was originally positioned using Loran and the position was inaccurate when converted to latitude and longitude. This fish haven is covered under permit number 73-10-45-289 dated September 20, 1973 [reference chart letter 833 (1974)]. For a charting recommendation concerning the fish haven, see section O.

Further information on this fish haven may be obtained by contacting:

Mr. Steve Murphy
The North Carolina Department of Environmental, Health and Natural Resources
Division of Marine Fisheries
P.O. Box 769
Morehead City, North Carolina 28557-0769

Telephone: (919) 726-7021

N.1 Obstruction

Contact No. :	5646.2
Detached Position:	10494
Least depth:	8.6 M (28 ft)
Surrounding depth:	10.2 M (33 ft)
Time of least depth:	1332 UTC
Position of least depth:	33° 53' ~~06.1~~"N 05.9"
	078° 06' ~~31.5~~"W 31.47"
Description of Investigation:	Divers investigated item on DN 142 and found a concrete pipe.
Recommendation:	Do not chart. Chart most significant feature in area. (see item N.3) - Concur

N.2 Obstruction

Contact No. :	24623.7
Detached Position:	10495
Least depth:	~~8.7~~ M 8.8m (29 ft)
Surrounding depth:	10.0 M (33 ft)
Time of least depth:	1430 UTC
Position of least depth:	33° ~~53' 00.0~~"N 52' 59.65"
	078° 06' ~~23.2~~"W 23.11"
Description of Investigation:	Divers investigated item on DN 142 and found concrete pilings.
Recommendation:	Do not chart. Chart most significant feature in area. (see item N.3) - Concur

N.3 Obstruction

Contact No. :	5647.6
Detached Position:	10496
Least depth:	~~6.6 M~~ 6.5 m (21 ft)
Surrounding depth:	10.2 M (33 ft)
Time of least depth:	1531 UTC
Position of least depth:	33° 53' ~~05.6~~"N 05.56" 078° 06' ~~34.3~~"W 34.32"
Description of Investigation:	Divers investigated item on DN 142 and found a pile of concrete blocks.
Recommendation:	Chart obstruction with least depth of 21 feet. This obstruction was reported as a danger to navigation on July 7, 1997 (see Appendix VI). - Concur - chart 21 obstr (conc blocks)

O. COMPARISON WITH THE CHART - See also the Evaluation Report

Chart 11536 (12th ed., September 4, 1993, 1:80,000) and chart 11534 (28th ed., June 11, 1994, 1:40,000) were compared with H-10728. Comparisons were made in feet. There is good agreement between survey H-10728 and all charted soundings. H-10728 soundings are generally 1 foot deeper than the charted soundings. The following observations were made:

- The charted fish haven (position centered at 33° 53' 06.0"N, 078° 07' 21.0"W) should be moved (see section N for details). WHITING investigated and disproved the charted position with 200% side scan sonar coverage. The fish haven should be moved to a position centered at 33° 53' 05.2"N, 078° 06' 29.6"W. Corner points are: 33° 53' 10.9"N, 078° 06' 47.0"W (nw), 33° 53' 15.0"N, 078° 06' 12.1"W (ne), 33° 52' 58.9"N, 078° 06' 09.0"W (se), 33° 52' 55.2"N, 078° 06' 45.1"W (sw). - Do not concur. Retain as charted per permit.
- The source of pier charted on chart 11536 at position 33° 54' 37.1"N, 078° 08' 47.8"W should be reviewed with strong consideration given to moving the pier to the surveyed position at 33° 54' 38.0"N, 078° 08' 49.7"W(see section J). - See section J. of the Evaluation Report.
- A yellow buoy labeled "AR 425" should be charted at 33° 53' ~~04.0~~ 03.66"N, 078° 06' ~~32.9~~ 32.39"W within the bounderies of the artificial reef. The Danger to Navigation letter was forwarded to the USCG discussing this uncharted buoy (see Appendix VI).

P. ADEQUACY OF SURVEY

The area surveyed is complete and adequate to supersede all prior surveys in the common area.

Q. AIDS TO NAVIGATION *SEE ALSO THE EVALUATION REPORT*

On April 16, 1997 (DN 106), one detached position on an uncharted and unlit floating aid (see appendix VI) in the survey area was recorded on launch 1014. The buoy adequately marks the mischarted fish haven discussed under section N. The USCG was notified of the following (appendix VI):

ATON	Surveyed Position
"AR425"	33° 53' ~~04.0~~"N 03.66"
"Y" Round	078° 06' ~~32.9~~"W 32.39"

No other floating aids to navigation fall within the survey area.

R. STATISTICS

Number of Soundings	23256
Main-scheme Sounding Lines (Nautical Miles)	402
Crosslines (Nautical Miles)	56
Square Nautical Miles Surveyed	17
Days of Production	22
Detached Positions	1
Bottom Samples	23
Tide Stations Installed	1
Current Stations	None
Number of CTD Casts	8
Magnetic Stations	None

S. MISCELLANEOUS *SEE ALSO THE EVALUATION REPORT*

No anomalies in either tides or currents or unusual magnetic variations were encountered in the survey area. No unusual submarine features were discovered. The Smithsonian Institution requested that bottom samples not be forwarded to them.

T. RECOMMENDATIONS

No additional hydrographic fieldwork is required. Photography should be planned for the future to locate uncharted tanks falling within survey limits.

U. REFERRAL TO OTHER REPORTS

In February 1997, a Chart User Evaluation/Inspection Report and, in December 1996, a Coast Pilot Report was submitted for OPR-G309-WH. In addition, a danger to navigation letter was sent on May 7, 1997 (see appendix VI).

Submitted by:

Maureen R. Kerry

Lieutenent (jg) Jennifer D. Garte, 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

May 7, 1997

ADVANCE INFORMATION

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

Dear Sir:

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

Feature	Latitude	Longitude	Depth
Obstruction	33° 51' 08.3" N	078° 06' 34.0" W	18.4 feet (3.0 fathoms)
Wreck	33° 32' 30.2" N	077° 56' 53.8" W	48.9 feet (8.1 fathoms)

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

Floating ATON	Latitude	Longitude	Date Located
Y, Round "AR 425"	33° 53' 03.7" N	078° 06' 32.8" W	April 16, 1997
Y, Round "AR 420"	33° 50' 24.4" N	078° 07' 14.3" W	April 21, 1997

Differential GPS was used to determine the survey positions the dangers to navigation and ATONS listed above. Positions are referenced to NAD 83. All depths are referenced to MLLW using predicted tides. Charts 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

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

ADVANCE INFORMATION

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

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

ADVANCE INFORMATION

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

SPORT FISH RESTORATION

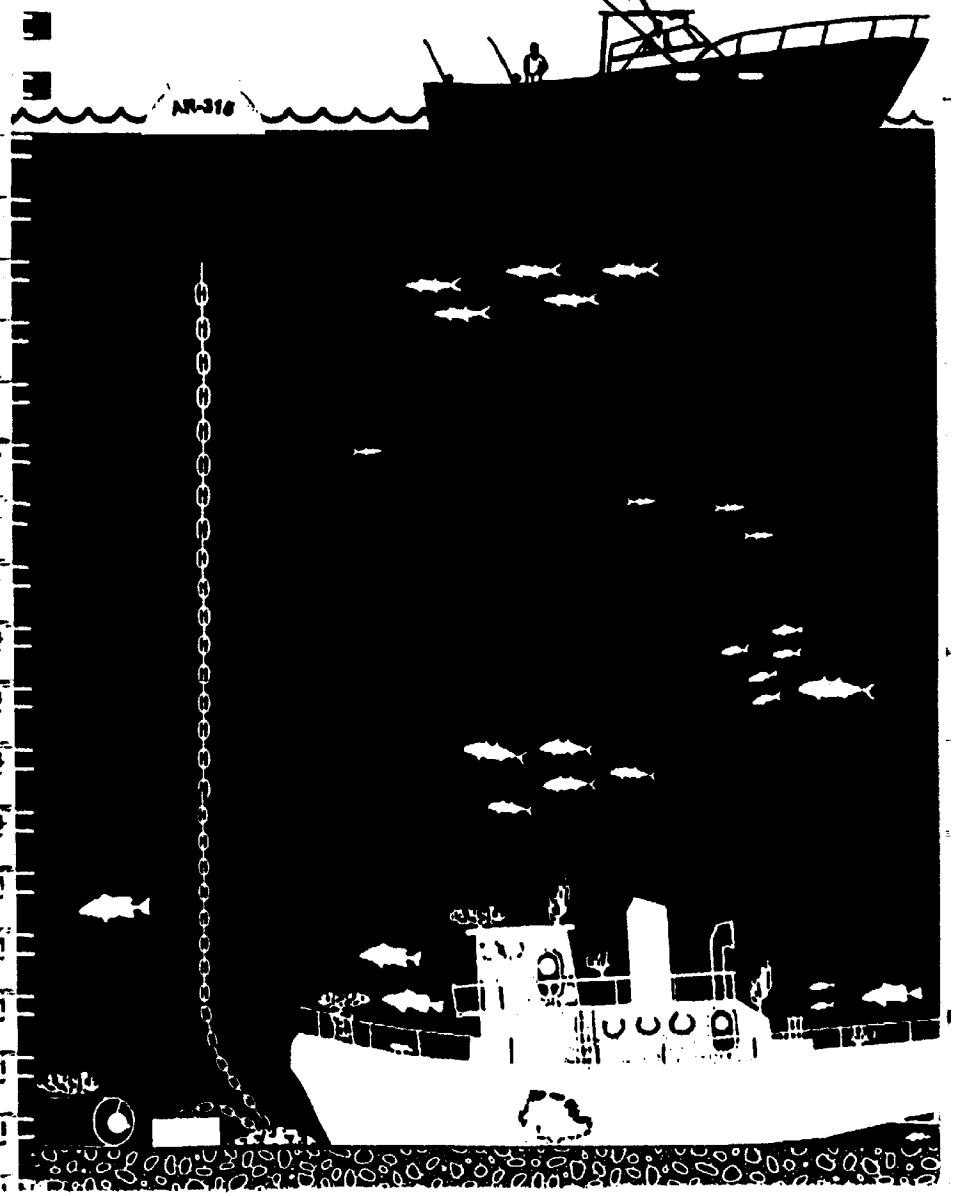
Federal Aid Project
funded by your purchase
of fishing equipment
and motor boat fuels

NORTH CAROLINA
MARINE FISHERIES

DEPARTMENT OF ENVIRONMENT,
HEALTH, AND NATURAL RESOURCES

NORTH CAROLINA

ARTIFICIAL REEF GUIDE



ARTIFICIAL REEF ADDITIONS SINCE APRIL 1995 July 30, 1996

The Division of Marine Fisheries Artificial Reef Program is continually adding material to the ocean and estuarine artificial reefs along the North Carolina coast. This construction update is provided to anglers and divers as an addendum to the North Carolina Artificial Reef Guide. Periodically construction updates will be provided to the public to keep you informed of ongoing Artificial Reef Program activities.

AR275 (55')	July 1996	150' vessel" Gulf Coast"	300 Yds ESE of buoy at 27050.8/39871.4
AR386 (82')	October 1995	320' Dredge "Markham"	100 Yds SE of buoy at 27217.7/39184.0
AR255 (84')	December 1995	10 high profile units	26996.0/39998.7 26995.9/39998.6
AR285 (65')	November 1995	10 high profile units	200 Yds SE of buoy at 27062.2/39680.8
AR330 (62')	June 1996	160 concrete pipes	75 Yds ESE of buoy at 27140.2/39569.4
AR330 (60')	June 1996	43 low profile test units	200 Yds NW of buoy at 27140.2/39569.6
AR355 (60')	June 1995	11 high profile units	50 Yds S of buoy at 27209.9/39323.8-.9 27209.9/39323.3 27210.6/39322.6
New site: AR465 "Gary Ennis Reef" 25.7 nm 187° mag. from Cape Fear inlet sea buoy (90')	June 1996	180' menhaden vessel "Mance Lassiter"	No buoy on this site. Ship is at 45262.5/59433.0

NORTH CAROLINA
ARTIFICIAL REEF GUIDE

by

Stephen W. Murphey

March 1995

North Carolina Department of Environment, Health, and Natural Resources

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

DEHNR

MARINE FISHERIES

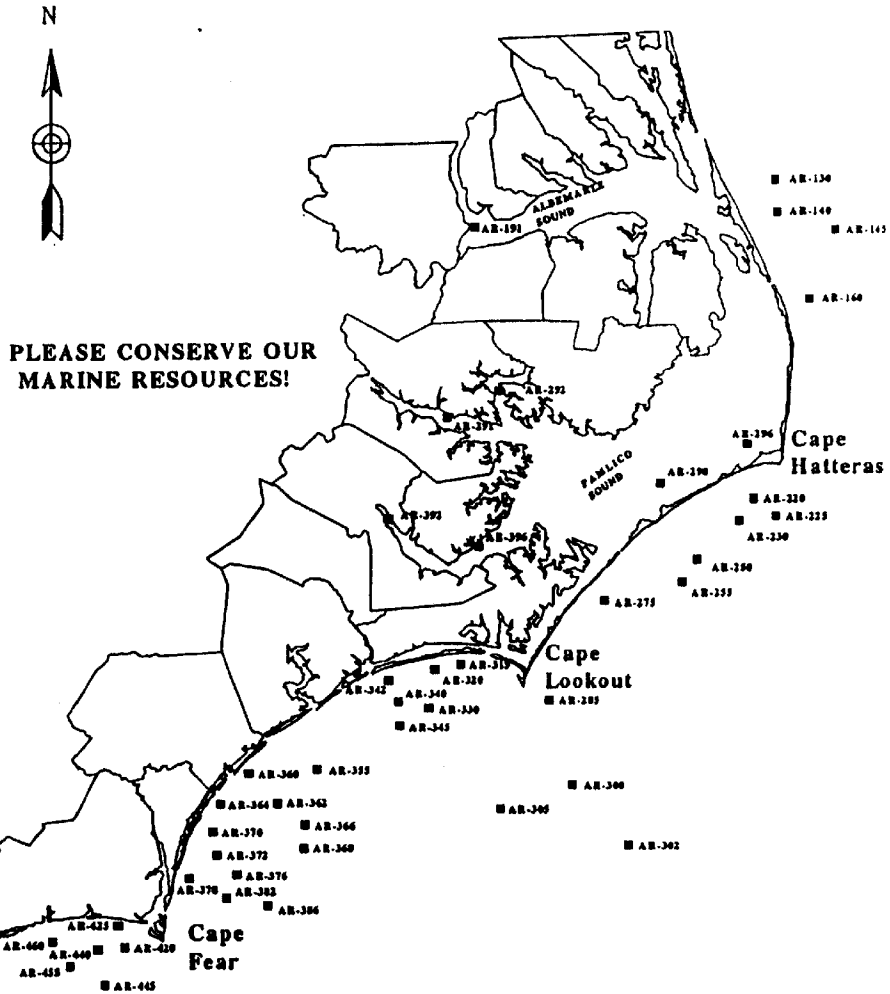
James B. Hunt, Jr., Governor Jonathan B. Howes, Secretary Bruce Freeman, Director

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

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

TABLE OF CONTENTS

NORTH CAROLINA ARTIFICIAL REEFS



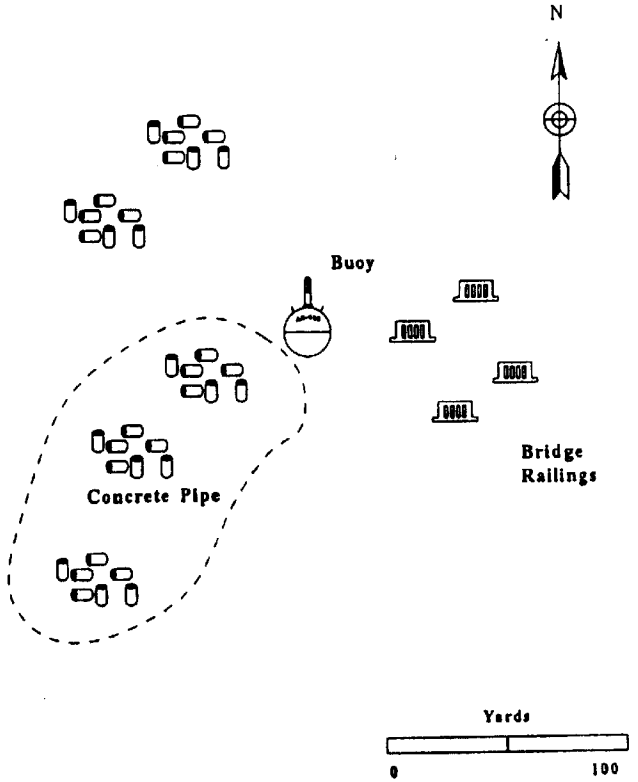
AR-425
YAUPON BEACH REEF

RANGE	336° magnetic - 4.4 nm from Cape Fear River sea buoy
BUOY	**45354.7/59169.6**
AVG. DEPTH	30 ft.

REEF MATERIAL	DEPLOYED	LOCATION
600 tons concrete rubble	1987	**100-300' SW of buoy**
100 pieces of bridge railing	1989	**45354.5/59169.1** **45354.3/59169.1** **45354.5/59168.9**
240 pieces concrete pipe and manhole sections	1992	**45354.4/59169.7**
Concrete pipe	1993	**45354.7/59169.2** **45354.7/59170.2**
Concrete pipe	1994	**45354.9/59169.7**

NOTES AND ADDITIONS:

AR-425



APPROVAL SHEET
HYDROGRAPHIC SURVEY
OPR-G309-WH
WH-10-2-97
H-10728

The data for this survey was acquired and checked under my daily supervision. Position and sounding accuracy meets 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: September 19, 1997

HYDROGRAPHIC BRANCH: Atlantic

HYDROGRAPHIC PROJECT: OPR G309-WH

HYDROGRAPHIC SHEET: H-10728

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

TIME PERIOD: March 20 - June 11, 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: SEC105, SEC109 & SEC110

Refer to attachment(s) for zoning information.

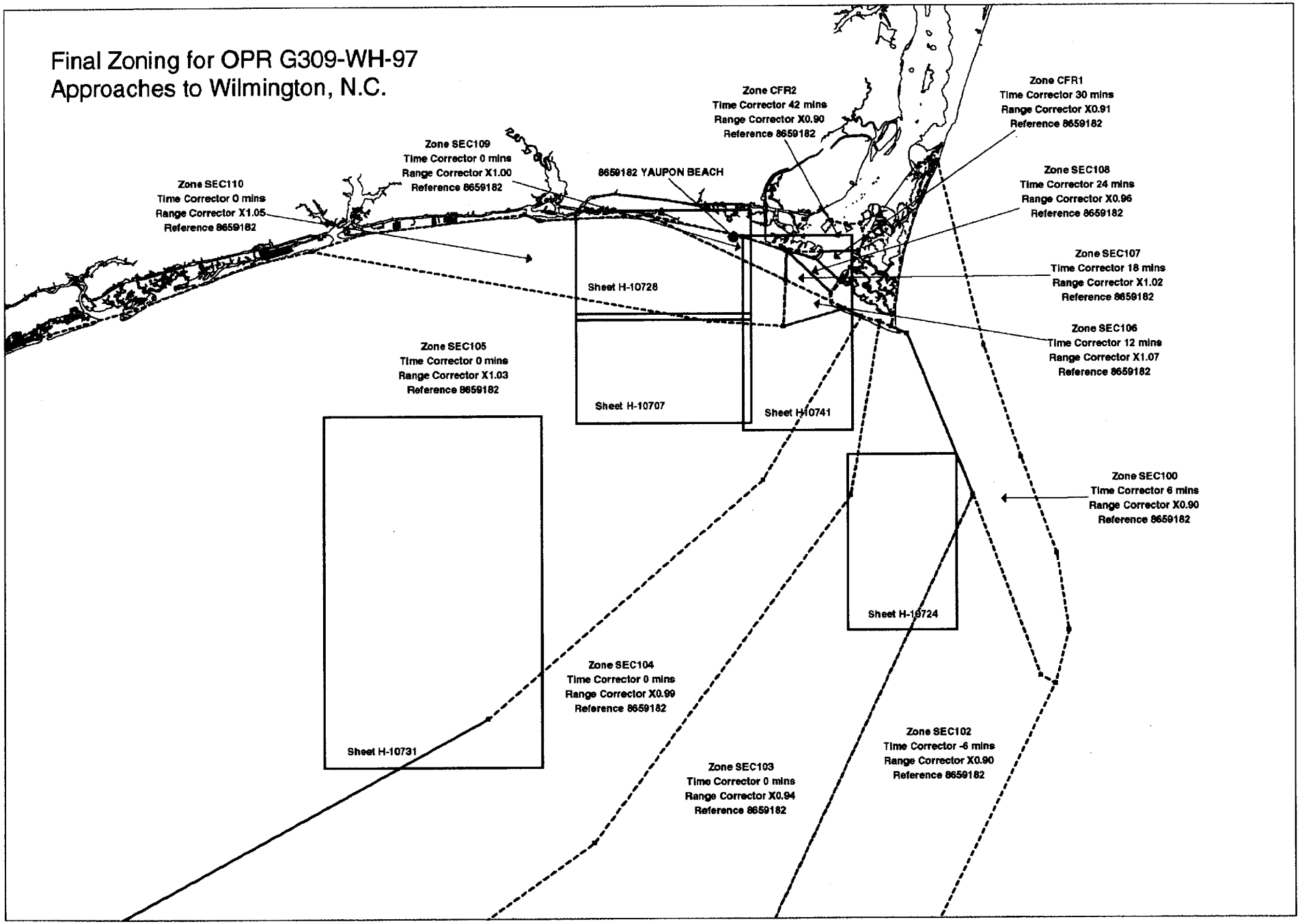
Note: Provided time series data are tabulated in metric units (meters) and on Greenwich Mean Time.

CHIEF, TIDAL ANALYSIS BRANCH

Final tide zone node point locations for OPR G309-WH-97, Sheet H-10728.

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 SEC105			
-78.266953 33.602487	865-9182	0	1.03
-78.925059 33.304092			
-78.983499 33.495024			
-78.849354 33.575122			
-78.63113 33.836158			
-78.532176 33.858868			
-78.444139 33.886271			
-78.400599 33.89418			
-78.100399 33.850126			
-78.043816 33.846645			
-77.998471 33.857593			
-77.985608 33.852782			
-78.05986 33.751023			
-78.266953 33.602487			
Zone SEC109			
-78.146383 33.916024	865-9182	0	1.00
-78.042524 33.875334			
-78.041714 33.893814			
-78.07501 33.902453			
-78.146383 33.916024			
Zone SEC110			
-78.146383 33.916024	865-9182	0	1.05
-78.227764 33.913063			
-78.238838 33.917002			
-78.360653 33.905184			
-78.400599 33.89418			
-78.100399 33.850126			
-78.043816 33.846645			
-78.042524 33.875334			
-78.146383 33.916024			


Final Zoning for OPR G309-WH-97
Approaches to Wilmington, N.C.
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 SEC109
Time Corrector 0 mins
Range Corrector X1.00
Reference 8659182
8659182 YAUPON BEACH
Zone SEC110
Time Corrector 0 mins
Range Corrector X1.05
Reference 8659182
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 SEC106
Time Corrector 12 mins
Range Corrector X1.07
Reference 8659182
Zone SEC105
Time Corrector 0 mins
Range Corrector X1.03
Reference 8659182
Sheet H-10707
Sheet H-10741
Zone SEC100
Time Corrector 6 mins
Range Corrector X0.90
Reference 8659182
Sheet H-10724
Zone SEC104
Time Corrector 0 mins
Range Corrector X0.99
Reference 8659182
Sheet H-10731
Zone SEC102
Time Corrector -6 mins
Range Corrector X0.90
Reference 8659182
Zone SEC103
Time Corrector 0 mins
Range Corrector X0.94
Reference 8659182

NOAA FORM 61-29
(12-71)

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

REFERENCE NO.

N/CS33-34-98

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

April 20, 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-10728

North Carolina, North Atl. Ocean, 5 NM ESE of Lockwoods Folly Inlet

1 Box Containing:

1 **Original Descriptive Report for H-10728**
1 Envelope with three (3) HISTORY OF CARTOGRAPHIC WORK (NOAA form 76-71) for H-10728 for charts 11534, 11537, and 11536

1 Tube Containing:

1 **Original Smooth Sheet for H-10728**
1 Paper Composite plot of survey H-10728 for chart 11534
1 Paper Composite plot of survey H-10728 for chart 11537
1 Paper Composite plot of survey H-10728 for chart 11536
1 Mylar H-Drawing of H-10728 for NOS chart 11534
1 Mylar H-Drawing of H-10728 for NOS chart 11537
1 Mylar H-Drawing of H-10728 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:1983-0-664-006/1192

04/16/98

HYDROGRAPHIC SURVEY STATISTICS
REGISTRY NUMBER: H-10728

NUMBER OF CONTROL STATIONS	2
NUMBER OF POSITIONS	23256
NUMBER OF SOUNDINGS	23256

	TIME-HOURS	DATE COMPLETED
PREPROCESSING EXAMINATION	36	08/08/97
VERIFICATION OF FIELD DATA	101	01/20/98
EVALUATION AND ANALYSIS	46	
FINAL INSPECTION	6	03/02/98
COMPILATION	71	04/13/98
TOTAL TIME	260	

ATLANTIC HYDROGRAPHIC BRANCH APPROVAL 03/18/98

NOAA FORM 76-155
(11-72)

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

GEOGRAPHIC NAMES

SURVEY NUMBER

H-10728

Name on Survey	A ON CHART NO. 1554, 1556, 1537	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	
LOCKWOODS FOLLY INLET	X		X							1
(title)										2
NORTH ATLANTIC OCEAN	X		X							3
NORTH CAROLINA (title)	X		X							4
OAK ISLAND	X		X							5
YAUPON BEACH	X		X							6
										7
										8
										9
										10
										11
										12
										13
										14
										15
										16
										17
										18
					Approved					19
										20
					Clinton A. Lobl					21
					Chief Geographer					22
					AUG 25 1997					23
										24
										25

NOAA FORM 76-155 SUPERSEDES C&GS 197

ATLANTIC HYDROGRAPHIC BRANCH
EVALUATION REPORT FOR H-10728 (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 (HPS)
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 a Hewlett Packard Design Jet 350C plotter.

H. CONTROL STATIONS

Horizontal control used for this survey during data acquisition is based upon the North American Datum of 1983 (NAD 83). Office processing of this survey is based on these values. The smooth sheet has been annotated with ticks showing the computed mean shift between the NAD 83 and the North American Datum of 1927 (NAD 27).

To place this survey on the NAD 27 datum move the projection lines 0.627 seconds (19.315 meters or 19.32 mm at the scale of the survey) north in latitude, and 1.022 seconds (26.273 meters or 26.27 mm at the scale of the survey) east in longitude.

J. SHORELINE

Brown shoreline originates with National Ocean Service (NOS) chart 11534 (29th Edition, May 17/97) and is for orientation purposes only.

The hydrographer recommends that the charted pier, "Ocean Crest Motel Pier", in the vicinity of Latitude 33°54'37.0"N, Longitude 78°08'48.1"W, be revised and charted in Latitude 33°54'37.9"N, Longitude 78°08'49.0"W. The hydrographer did not provide supporting data for the recommended change in the location of this pier. The location provided by the hydrographer is 36 meters northeast of the position scaled from the chart. It is recommended that the pier remain as charted.

L. JUNCTIONS

H-10741 (1997) 1:10,000 to the east
H-10707 (1997) 1:10,000 to the south
H-10689 (1996) 1:10,000 to the west

A standard junction was effected between the present survey and the junctional surveys.

M. COMPARISON WITH PRIOR SURVEYS

Hydrographic

H-9115 (1970) 1:20,000

Prior survey H-9115 (1970) covers the present survey in its entirety. Present survey depths are generally 1 to 2 feet (0^1 to 0^6 m) deeper than the prior survey depths.

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

O. COMPARISON WITH CHART 11534 (29th Edition, Mar 17/97)
11337 (13th Edition, Apr 15/97)
11537 (30th Edition, Apr 5/97)

The charted hydrography originates with the previously discussed prior survey and requires no further consideration. The hydrographer makes adequate chart comparisons in Section O. of the Descriptive Report. The following should be noted:

1. A wreck a with depth of 36 feet (11 m), in Latitude 33°51'15.21"N, Longitude 78°06'37.00"W, was located by the field unit. This wreck is 34 meters northeast of a wreck with a depth of 29 feet (8^8 m), in Latitude 33°51'14.58"N, Longitude 78°06'38.10"W shown on H-10707 (1997). It is the opinion of the evaluator that these are the same wreck. The wreck shown on H-10707 (1997) has been brought forward from the junctional survey to supplement the present survey. It recommended that the wreck be charted as shown on the junctional survey.

2. A submerged pile in Latitude 33°54'07.5"N, Longitude 78°05'07.0"W originating with an unknown source was neither verified nor disproved by the present survey. The submerged pile is shown on the latest editions of charts 11534SC and 11537. It is not shown on the latest edition of chart 11536. It is recommended that the submerged pile be retained on charts 11534SC and 11537. It is also recommended that the

submerged pile be charted on chart 11536.

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

P. ADEQUACY OF SURVEY

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

Q. Aids to Navigation

The hydrographer located one floating aid to navigation on the present survey. This aid appears adequate to serve its intended purpose.

S. MISCELLANEOUS

Chart compilation using the present survey was done by Atlantic Hydrographic Branch personnel in Norfolk, Virginia. Compilation data has been forwarded to Marine Chart Division, Silver Spring, Maryland.

The following NOS charts were used for compilation of the present survey: 11534 (29th Ed., May 17/97)
11536 (13th Ed., Mar 15/97)
11537 (30th Ec., Apr 05/97)

Douglas V. Mason
Cartographic Technician
Verification of Field Data
Evaluation and Analysis

APPROVAL SHEET
H-10728

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 17, 1998

Robert G. Roberson
Cartographer
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 17, 1998

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

****

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-10728

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
11534	4-2-98	[signature]	Full Part Before After Marine Center Approval Signed Via
			Drawing No.
11537	4-8-98	[signature]	Full Part Before After Marine Center Approval Signed Via
			Drawing No.
11536	4/14/98	[signature]	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
			Drawing No.
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			Drawing No.
			Full Part Before After Marine Center Approval Signed Via
			Drawing No.
			Full Part Before After Marine Center Approval Signed Via
			Drawing No.

SUPERSEDES C&GS FORM 8352 WHICH MAY BE USED.