H10731

NOAA FORM 76-35A

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

DESCRIPTIVE REPORT

Type of Survey HYDROGRAPHIC/ SIDE SCAN SONAR

Field No. WH-20-2-96

Registry No. H-10731

LOCALITY

State NORTH CAROLINA

General Locality NORTH ATLANTIC OCEAN

Sublocality 10 NM SSE OF SHALLOTTE INLET

19 96-97

CHIEF OF PARTY
CDR M. R. KENNY, NOAA

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DATE APR 20 1998

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NOAA FORM 77-28
(11-72)

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

REGISTRY NUMBER:

HYDROGRAPHIC TITLE SHEET

H - 10731

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

FIELD NUMBER: WH-20-2-96

State: North Carolina

General locality: North Atlantic Ocean

Locality: 10.5 NM SSE of Shallotte Inlet

Scale: 1: 20,000 Date of survey: Oct. 23, 1996 - June 17, 1997

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

Vessel: NOAA Ship WHITING S329

Chief of Party: CDR Maureen R. Kenny

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

dings taken by echo sounder, hand lead-line, or pole: DSF-6000N Echosounder

Graphic record scaled by: WHITING personnel

Graphic record checked by: WHITING personnel Hewlette PacKard DesignJet 350C ~~Extra Note Jet III~~ PLOTTER (OFFICE)

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

Verification by: Hydrographic Surveys Branch PERSONNEL

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 and 2932

Time zones used: UTC

Survey work began in 1996 and was completed in 1997

Horizontal Datum NAD 83

NOTES IN THE DESCRIPTIVE REPORT WERE MADE DURING OFFICE PROCESSING

AWOIS and SURF ✓ 4/98 RWD

NOAA FORM 77-28 SUPERSEDES FORM C & GS - 537 * U.S. GOVERNMENT PRINTING OFFICE: 1976-665-661/1222
REGION NO.6

DESCRIPTIVE REPORT TO ACCOMPANY
HYDROGRAPHIC SURVEY / SIDE SCAN SONAR
OPR-G309-WH
WH-20-2-96
H-10731

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

A. PROJECT

This project was envisioned to provide contemporary hydrographic survey data to update the existing nautical charts of the approaches to Cape Fear River, Wilmington, North Carolina. The survey project was conducted in response to requests from the United States Coast Guard, the United States Army Corps of Engineers, the North Carolina State Ports Authority, and the Wilmington-Cape Fear Pilots Association. There are twelve survey sheets consisting Project OPR-G309-WH. The survey sheet described in this report was earlier designated as Sheet M, field sheet WH-10-12-96, and registry number H-10731. But the designation was later amended to Sheet F, Field Sheet WH-20-2-96 and retaining its original registry number. Survey operations were conducted in compliance with the 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-10731 is located 10.5 nautical miles south southeast of Shallotte Inlet, North Carolina. The limits of hydrography are bounded by the following positions whose coordinates are:

Position	Latitude	Longitude
1	33° 47' 30.0" N	078° 14' 25.0" W
2	33° 33' 30.0" N	078° 14' 25.0" W
3	33° 38' 10.0" N	078° 23' 33.0" W
4	33° 42' 06.0" N	078° 19' 21.0" W
5	33° 47' 30.0" N	078° 19' 21.0" W

Survey operations commenced on October 23, 1996 (DN 297) and continued until November 24, 1996 (DN 329) when the ship went into scheduled winter inport repairs and drydocking. Survey fieldwork was resumed on March 16, 1997 (DN 75) and concluded on June 17, 1997 (DN 168).

C. SURVEY VESSELS

NOAA Ship WHITING, Vessel No. 2930, served as the platform for conducting and running mainscheme sounding line data acquisition, side scan sonar, crosslines, sound velocity casts, and bottom sediment sampling. Survey launch 1014 (2932) was used only for dive operations.

D. AUTOMATED DATA ACQUISITION AND PROCESSING *SEE ALSO EVALUATION REPORT*

Survey data acquisition and processing were accomplished using the HDAPS system with the standard HDAPS software dated March 28, 1996, 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	16697	297-306	1996
	Recorder	16946	297-306	
	Towfish	16900	317-329	
	Recorder	16942	317-329	
	Towfish	11904	077-143	1997
	Recorder	16942	077-143	
2932	Towfish	16946	168	1997
	Recorder	11908		

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

This survey required 200% side scan sonar coverage of sea bottom. Proper coverage was achieved by running mainscheme lines with 80-meter line spacing at the 100-meter range scale. This line spacing provided for proper overlap as required by Field Procedures Manual, section 7.3.2.2. Sufficient coverage was ensured by plotting alternate mainscheme lines on 'A' and 'B' swath plots and verifying 100% coverage on each plot.

The towfish probe was maintained at a height above the bottom of 8-20 percent of the range scale. Side scan sonar operations were limited to a speed-over-ground of 4-6 knots. Confidence checks were performed by ensuring that the clarity of SSS images of distinct bottom features was good and extended across the entire width of the sonargram or by passing alongside aids to navigation and ensuring that the anchor, chain, and buoy images were visible on the sonargram.

Contacts were measured off the sonargram and entered into an HDAPS contact table*, using the contact utility program, WHITING hydrographers determined contact heights, positions, and correlations to other profiles of the 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 obtaining detached positions on diver-placed marker buoys.

F. SOUNDING EQUIPMENT

Raytheon digital echo sounders (DSF-6000N) were used to measure water depths during the survey. The echo sounder 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 and check-scanned and any significant peaks and deeps that were not selected as primary soundings were manually recorded as inserts in the data file.

The following DSF-6000N echo sounder was used:

Vessel	S/N	DN	
2930	B046N	297 - 329	1996
2930	B046N	077 - 143	1997
2932	B050N	163, 168	1997

Electronic technicians performed accuracy checks and preventive maintenance on all DSF-6000N echo sounders 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.*

* DATA FILED WITH FIELD RECORDS.

A corrector table was generated for the ship (vessel number 2930) 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
294 1996	39	33° 32' 40" N	077° 57' 10" W	31.3 m
317	44	33° 44' 25" N	078° 16' 05" W	20.0 m
323	46	33° 44' 25" N	078° 16' 05" W	21.0 m
076 1997	55	33° 34' 12" N	078° 18' 18" W	23.2 m
126	86	33° 33' 12" N	078° 15' 36" W	27.9 m
138	88	33° 29' 54" N	078° 15' 01" W	30.9 m
163	96	33 34' 02" N	078 15' 16" W	26.8 m
168	2	33 45 30" N	078 16' 32" W	21.2 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.*

For sounding 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). All vertical correctors (offsets, sound velocity, and predicted tides) were applied during the data processing stage.* SMOOTH TIDES AND ZONES WERE APPLIED DURING OFFICE PROCESSING

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. Calibration correctors were applied to the readings taken from the hydrometer. There were no variations in hydrometer 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.

Leadline comparisons were performed on WHITING on April 22, 1996 (DN 113), November 18, 1996 (DN 323), April 3, 1997 (DN 093), and June 5, 1997 (DN 156) . Leadlines used were calibrated on December 14, 1995, November 17, 1996 (DN 322), and 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 comparison. 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.*

* DATA ON FILE WITH FIELD RECORDS

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. Settlement and squat values for WHITING were determined on March 26, 1996, and were entered into Offset Table 9. The settlement and squat correctors that were applied to the sounding Offset Tables are included in the Separates, Section II.*

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 NGWLMS (Next Generation Water Level Measurement System) was installed at Yaupon Beach, North Carolina (865-9182), as a subordinate tide station and was maintained by WHITING. Tidal data used during acquisition and onboard processing were based on Table 2 of the East Coast of North and South America Tide Tables 1996 and 1997 Editions. Digital tidal data were received on floppy disk from N/CS33, Hydrographic Surveys Branch, and were applied to the digital data.

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

Time Correction	- 00 hrs 00 mins
Height Ratio	x 0.97

H. CONTROL STATIONS See Also Evaluation Report

The horizontal datum for this project is the North American Datum of 1983 (NAD 83). The source of differential correctors used were USCG maintained Differential Global Positioning System (DGPS) station at Fort Macon, North Carolina and the station 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
Ft. Macon USCG DGPS Beacon	34° 41.84333' N	076° 40.98706' W

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

I. HYDROGRAPHIC POSITION CONTROL

DGPS was used as the navigation system for this survey. The 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.

* DATA ON FILE WITH FIELD RECORDS.

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

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

Vessel	Device	Serial Number
2930	Ashtech Sensor CSI MBX1	700417B1203
	Ashtech Sensor CSI MBX1	700417B1191
2932	Ashtect Sensor	248

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

DGPS performance checks for launch 1014 were conducted with the launch secured in the WHITING davits and with all platforms using correctors from the Charleston DGPS tower. Simultaneous HDAPS positions (1996) and HYPACK positions (1997) were compared between the WHITING and the launch. An offset in distance and azimuth was then calculated between the ship and launch.

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, 1996 and February 1997 for WHITING. Offsets and laybacks were measured using the high frequency echosounder transducer as the reference. The DGPS antenna was installed directly over the echosounder transducer on April 2, 1996, for launch 1014. A minimum of four satellites was used during the survey on Sheet F, H-10731 providing altitude unconstrained positioning.

Offset, layback, and height for WHITING's SSS towfish A-frame were measured on July 27, 1992, using the forward high frequency transducer as the reference. This measurement was checked and verified in February 1997. Correctors were entered into Offset Table 9.*

J. SHORELINE

There is no shoreline within the limits of survey H-10731.

* DATA ON FILE WITH FIELD RECORDS.

K. CROSSLINES

A total of 164 nautical miles of crosslines, or 8.8 % of the mainscheme mileage, was run on this survey. Agreement between mainscheme and crossline soundings are within the allowable limits. In general, crossline soundings agree with mainscheme soundings to within 0.2 meters. A few soundings differ by 0.6 meters. Differences were randomly either deeper or shallower with no distinct noticeable trends. The crosslines were mostly run on days when the weather conditions and state of the sea were unfavorable for side scan sonar operations.

L. JUNCTIONS SEE ALSO EVALUATION REPORT

Sheet H-10731 junctions with following surveys: H-10687 (Sheet G, scale 1:20,000) on the east and H-10700 (Sheet C, scale 1:10,000) on the north. Agreement between overlapping soundings at the junctions is satisfactory with depths agreeing to within 0.3 meter. Alignment between contour lines at the junction is satisfactory with soundings agreeing to within 0.3 meter. (ZH)

M. COMPARISONS WITH PRIOR SURVEYS SEE ALSO EVALUATION REPORT

Comparisons were made between H-10731 and the following prior surveys: H-9096 (1970-1971, 1:20,000) and H-9117 (1970, 1:20,000). All comparisons were made in feet. All prior surveys were referenced to NAD 27. The datum shift between NAD 27 and NAD 83 was calculated using *CORPSCON* (version 2.1) software and determined to be insignificant (1.0 mm at 1:20,000). No datum shift was applied in the comparisons. For both prior surveys, the majority of soundings agree to within 2 feet. In general, soundings from H-10731 are slightly deeper than the prior surveys.

N. ITEM INVESTIGATIONS

The following items were investigated. The least depths of features and surrounding depths were corrected for predicted tides and reduction to MLLW datum.

N.1 Obstructions and Wrecks in uncharted fish haven "AR 455".

The mainscheme lines run over the northwest section of the sheet confirm the existence of an uncharted dumping ground and disposal area which serves as a fish haven. This fish haven is described in the Artificial Reef Guide of the North Carolina Department of Environment, Health, and Natural Resources, Division of Marine Fisheries (NC Marine Fisheries). The fish haven is marked by a yellow buoy with identification "AR 455" at latitude 33° 47' 02.2" N and longitude 78° 17' 53.5" W. Pages 72 and 73 of the Guide describe "AR 455" and are included in Appendix VI of this report. Data filed with the original field records

Mr. Steve Murphey of the NC Marine Fisheries was contacted by telephone on June 23, 1997, concerning this fish haven. He stated this fish haven is covered under general permit number 198500194 that was issued in 1988. The fish haven originally was under permit SAWCO85-N-010-0202.

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

Mr. Steve Murphey
The North Carolina Department of Environmental, Health, and Natural Resources
Division of Marine Fisheries
P.O. Box 769
Morehead City, NC 28557-0769
Telephone: 919-726-7021

WHITING recommends charting a fish haven centered at buoy "AR 455" at latitude 33° 47' ~~02.2~~ 01.120" N and longitude 78° 17' ~~53.5~~ 54.97" W with a radius of 500 meters. The least depth found in the fish haven was 46 feet. CONCUR 46. AT REDUCED TO MLLW ✓

The uncharted fish haven "AR 455" was surveyed with 200% side scan sonar coverage. Numerous contacts were found, most of which were insignificant. All the contacts were within 500-meter radius of the yellow buoy. Listed below are descriptions of two SSS contacts in the fish haven "AR 455" that were dove on with a least depth determination.

N1.1 Wreck in Fish Haven

SSS Contact Item	7136.48
Fix No. of DP	007
Least Depth	14.35 M (47.0 feet)
Time of DP	1710 UTC 12 June 1997 (DN 163)
GP of Least Depth	Lat 33° 46' 54.3$^{"}_{12}$N Long 78° 18' 07.3$^{"}_{18}$W ✓
Description:	Divers found wreckage of a small metal boat about 28 feet long, 15 feet wide and lying about 7 feet above the sea bottom in surrounding depths of about 52 feet of water in the fish haven.
Recommendation:	Chart a wreck with a least depth of 47 feet at the above position. CONCUR CHART 47 WK ✓

N1.2 Obstruction in Fish Haven

SSS Contact Item	6672.17
Fix No. of DP	008 0 .25
Least Depth	14.12 M (46.3 feet)
Time of DP	1825 UTC 12 June 1997 (DN 163)
GP of Least Depth	Lat 33 47' 09.2$^{"}_{53}$N Long 78 17' 57.6$^{"}_{5}$W

Description: Divers found a cylindrical concrete pipe 5 feet in diameter and 10 feet long lying horizontally on its side. It has a least depth of 46.3 feet in general depths of 50 feet of water in the fish haven.

Recommendation: Chart an obstruction with a least depth of 46 feet at the above position. CONCUR
CHART '46' OBSTRS (CONC PIPE)

N 2. Wreck

SSS Contact Item	8012.34
Fix No. of DP	009
Least Depth	16.~~51~~ 52 M (~~54~~ feet)
Time of DP	1429 UTC 17 June 1997 (DN 168)
GP of Least Depth	Lat 33 45' 19.7" N Long 78 15' 00.3" W

Description: Wreckage of an old small boat about 20 feet long and 10 feet wide lying 2 feet above sea bottom and buried partially in the sand.

Recommendation: Given the wreck's deteriorated condition, depth of water, and height above bottom, this item is considered insignificant. Do not chart. ~~CONCUR~~ DO NOT CONCUR

Chart 52 WK

N 3. Wreck

SSS Contact Item	7649.29
Fix No. Of DP	011
Least Depth	16.02 M (52.5 feet)
Time of DP	1555 ~~1526~~ UTC 17 June 1997 (DN 168)
GP of Least Depth	Lat 33 45' 50.~~2~~ 5" N Long 78 16' 53.~~7~~ 6" W

Description: It is a submerged wreckage of a small boat about 30 feet long, 10 feet wide, and lying about half settled in the sea bottom. Surrounding depth is about 54 feet of water.

Recommendation: Given the depth of water and height above bottom, this item is considered insignificant.. Do not chart. DO NOT CONCUR
PLOT 52 FT - REDUCED TO MLLW (15.9 METERS)
WK

All other items investigated were also found to be insignificant. Copies of all item investigation reports are included in the Separates.

There were no AWOIS items within the survey limits of H-10731.

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

Comparison was made between survey H-10731 and Chart 11536 (13th Edition, dated March 3, 1997 scale 1:80,000). Comparison was made in feet. In general, agreement is adequate with charted depths agreeing with survey soundings within 2 feet on the average. The overall trend appears to be that the present survey depths are slightly deeper than the charted soundings within the subject survey area.

No dangers to navigation were forwarded to the US Coast Guard for this survey. They were notified of an uncharted buoy (see Section Q).

P. ADEQUACY OF SURVEY *SEE ALSO EVALUATION REPORT*

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

Q. AIDS TO NAVIGATION

One uncharted buoy was found to be in existence in the area marking the location of the fish haven. The buoy is painted yellow with the inscription "AR 455".

Floating ATON	Position from Survey	Date Located
Y, Round, "North Carolina Artificial Reef, AR 455, (919) 726-7021, Sport Fish Restoration"	Lat 33° 47' 02.2" N Long 78° 17' 53.5" W	June 12, 1997

Charting of this buoy is recommended. The US Coast Guard was notified about the buoy in a letter dated July 7, 1997.

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

R. STATISTICS

Number of Soundings	31,124
Main-scheme Sounding Lines (Nautical Miles)	1861
Crosslines (Nautical Miles)	164
Square Nautical Miles Surveyed	62
Days of Production	63
Detached Positions	11
Bottom Samples	34
Tide Stations Installed	1
Current Stations	None
Number of CTD Casts	9
Magnetic Stations	None

S. MISCELLANEOUS See Also Evaluation Report

No anomalies in either tide or current and/or unusual magnetic variations were encountered in the survey area. No unusual submarine features were discovered. The Smithsonian Institution requested that bottom samples not be submitted. A listing of the bottom sediment samples on Oceanographic Log Sheet M is included in Section II of the Separates.*

T. REMARKS AND RECOMMENDATIONS

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

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.

Submitted by:

Felix R. Cruz

FELIX R. CRUZ
Survey Technician, NOAA Ship WHITING

* DATA ON FILE WITH FIELD RECORDS

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-10731

LOCALITY: 8.5 Nautical Miles Southwest of Lockwoods Folly Inlet, North Carolina

TIME PERIOD: October 23 - November 24, 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

Final tide zone correctors and node point locations for
OPR G309-WH-96, Sheet H-1071031

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

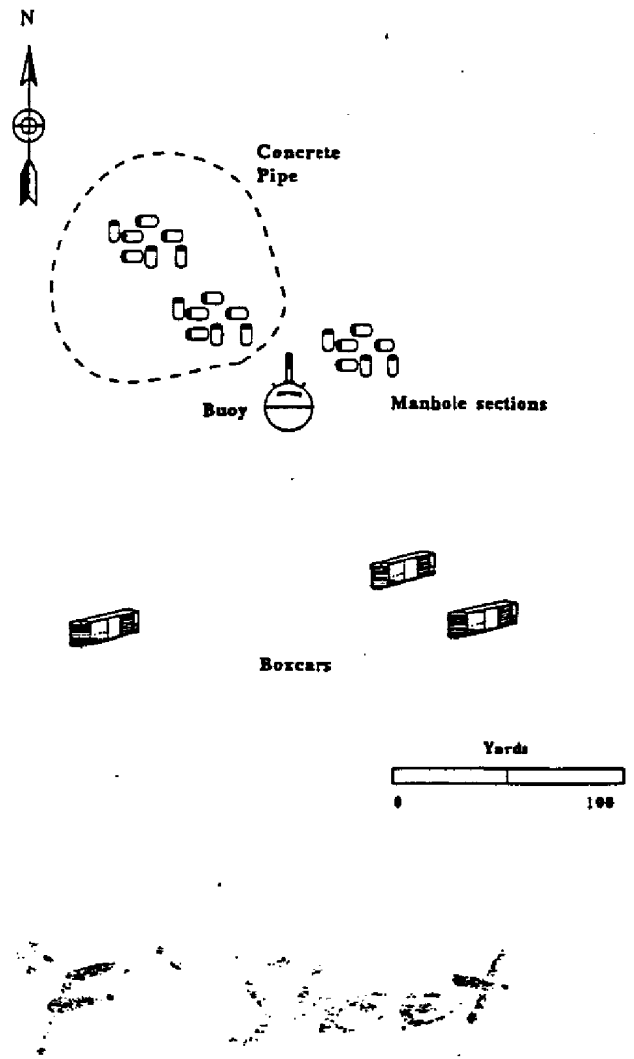
	Tide Station Order	AVG Time Correction	Range Correction
Zone EC145			
-77.511819 33.42288	8659182	Direct	Direct
-78.152544 33.331397			
-78.738129 33.794141			
-78.64431 33.828606			
-78.532176 33.858868			
-78.444139 33.886271			
-78.360653 33.905184			
-78.238838 33.917002			
-78.227764 33.913063			
-78.146383 33.916024			
-78.07501 33.902453			
-78.020236 33.888336			
-77.99893 33.876284			
-77.990338 33.858692			
-77.96456 33.849182			
-77.511819 33.42288			

AR-455

RANGE	156° magnetic - 7.0 nm from Shallotte Inlet sea buoy. 265° magnetic - 12.2 nm from Cape Fear River sea buoy.
BUOY	45373.0/59306.0
AVG. DEPTH	46 ft.

REEF MATERIAL	DEPLOYED	LOCATION
Box cars	1986	45372.6/59305.8 45372.4/59305.6 45372.6/59306.1
300 pieces concrete pipe	1992	45373.1/59305.9 45372.9/59305.8 45372.8/59306.0
150 pieces concrete manhole sections	1992	45372.7/59305.4
Concrete pipe	1993	45373.1/59305.9 45372.9/59305.8 45372.7/59305.4

NOTES AND ADDITIONS:



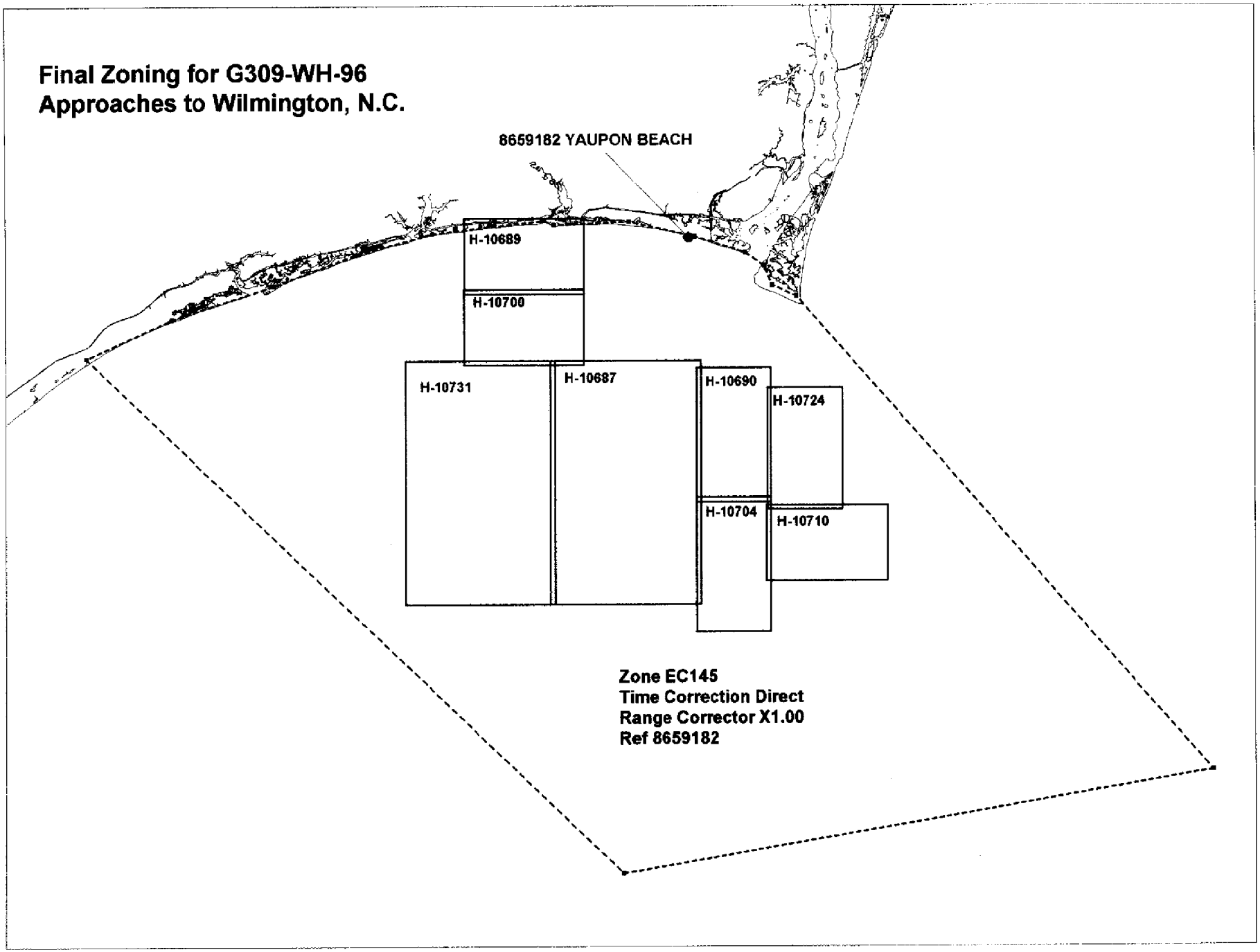
APPROVAL SHEET
HYDROGRAPHIC SURVEY
OPR-G309-WH
1996-1997
WH-20-2-96
H-10731

The data for this survey was acquired and checked under my direct daily supervision. Survey procedures, positioning and sounding accuracy meet the standards and specifications required in the Project Instructions, Hydrographic Manual, Hydrographic Survey Guideline and the Field Procedures Manual for Hydrographic Surveying. This survey is considered complete and adequate for the intended purpose of updating the nautical chart of the area with regards to delineating sea bottom topography, determining general and critical depths of submerged features, and identifying all potential dangers to navigation. No final field sheet was prepared for this survey. The survey data and accompanying records are complete for the preparation of the final smooth sheet.

Approved by:

Maureen R. Kenny

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


Final Zoning for G309-WH-96
Approaches to Wilmington, N.C.
8659182 YAUPON BEACH
H-10689
H-10700
H-10731
H-10687
H-10690
H-10724
H-10704
H-10710
Zone EC145
Time Correction Direct
Range Corrector X1.00
Ref 8659182

NOAA FORM 76-155
(11-72)

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

GEOGRAPHIC NAMES

SURVEY NUMBER

H-10731

Name on Survey	A ON CHART NO. 11536	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	
NORTH ATLANTIC OCEAN	X		X							1
NORTH CAROLINA (title)										2
SHALLOTTE INLET (title)										3
										4
										5
										6
										7
										8
										9
										10
										11
										12
										13
										14
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										22
										23
										24
										25

Approved

Chief Cartographer

NOV 17 1997

NOAA FORM 76-155 SUPERSEDES C&GS 197

04/10/98

HYDROGRAPHIC SURVEY STATISTICS
REGISTRY NUMBER: H-10731

NUMBER OF CONTROL STATIONS	2
NUMBER OF POSITIONS	31124
NUMBER OF SOUNDINGS	31124

	TIME-HOURS	DATE COMPLETED
PREPROCESSING EXAMINATION	10	10/11/97
VERIFICATION OF FIELD DATA	164	01/08/98
EVALUATION AND ANALYSIS	17	
FINAL INSPECTION	10	03/05/98
COMPILATION	32	04/10/98
TOTAL TIME	233	

ATLANTIC HYDROGRAPHIC BRANCH APPROVAL 03/12/98

NOAA FORM 61-29
(12-71)

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

REFERENCE NO.
N/CS33-31-98

LETTER TRANSMITTING DATA

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

☐ ORDINARY MAIL ☐ AIR MAIL

☐ REGISTERED MAIL ☒ EXPRESS

☐ GBL *(Give number)* _____

TO:

Chief, Data Control Group, N/CS3x1
NOAA/National Ocean Service
Station 6815, SSMC3
1315 East-West Highway
Silver Spring, Maryland 20910-3282

DATE FORWARDED
10 April 1998

NUMBER OF PACKAGES
ONE TUBE

NOTE: A separate transmittal letter is to be used for each type of data, as tidal data, seismology, geomagnetism, etc. State the number of packages and include an executed copy of the transmittal letter in each package. In addition the original and one copy of the letter should be sent under separate cover. The copy will be returned as a receipt. This form should not be used for correspondence or transmitting accounting documents.

H-10731

NORTH CAROLINA, NORTH ATLANTIC OCEAN, 10.5 NM SSE OF SHALLOTTE INLET

1 (ONE) Tube containing the following:

1 SMOOTH SHEET (H-10731)
2 Composite Drawing for chart #11536
1 H-Drawing for chart #11536
1 Descriptive Report for H-10731
1 Drawing History Form #76-71 for chart #11536

FROM: *(Signature)*
Robert R. Hill Jr. Robert R. Hill

RECEIVED THE ABOVE
(Name, Division, Date)

Return receipted copy to:

Atlantic Hydrographic Branch
N/CS33
439 West 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

This form was electronically produced by ELite Federal Forms' Forms Manager

ATLANTIC HYDROGRAPHIC BRANCH
EVALUATION REPORT FOR H-10731 (1996)

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

D. AUTOMATED DATA ACQUISITION AND PROCESSING

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

Hydrographic Processing System
NADCON, version 2.10
MicroStation 95, version 5.05
SiteWorks, version 2.01
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 0.629 seconds (19.390 meters or 1.94 mm at the scale of the survey) north in latitude, and 0.999 seconds (25.731 meters or 2.57 mm at the scale of the survey) east in longitude.

L. JUNCTIONS

H-10687 (1996) to the east
H-10700 (1996) to the north

Standard junctions were effected between the present survey and H-10687 (1996) and H-10700 (1996).

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

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 (13th Edition, Mar. 15/97)

Hydrography

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

The uncharted fish haven, marked by the yellow buoy "AR-455", in Latitude 33°47'02.02"N, Longitude 78°17'53.53"W, has no charted limits. Several features that are shown on the present survey and recommended for charting by the hydrographer would probably reside inside the limits for the fish haven. It is recommended that these features be charted as recommended in the descriptive report until the limits of the fish haven are charted.

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

Aids to Navigation

Aids to navigation shown on the present survey appear adequate to serve their intended purpose.

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.

WHITING Processing Team

Franklin L. Saunders

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

APPROVAL SHEET
H-10731

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 12, 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 12, 1998
Nicholas E. Perugini
Commander, NOAA
Chief, Atlantic Hydrographic Branch

****

Final Approval:

Approved: Andrew A. Armstrong, III Date: April 17, 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-10731

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
11536	4-1-98	Robert Hill	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.
			Full Part Before After Marine Center Approval Signed Via
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			Drawing No.
			Full Part Before After Marine Center Approval Signed Via
			Drawing No.

SUPERSEDES C&GS FORM 8352 WHICH MAY BE USED.