H10689

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-10-5-96

*Registry No.* H-10689

## LOCALITY

*State* North Carolina

*General Locality* North Atlantic Ocean

*Sublocality* Offshore Lockwoods Folly Inlet

19 96

CHIEF OF PARTY
CDR M. R. Kenny, NOAA

## LIBRARY & ARCHIVES

DATE MAY 14 1998

*U.S. GOV. PRINTING OFFICE: 1967—756-980

NOAA FORM 77-28
(11-72)

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

REGISTRY NUMBER:

H-10689 ✓

# 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-10-5-96 ✓

State: North Carolina ✓

General locality: North Atlantic Ocean ✓

Locality: Offshore--Lockwoods Folly Inlet ✓

Scale: 1: 10,000 ✓ Date of survey: May 30 - September 28, 1996

Instructions dated: May 3, 1996 Project Number: OPR-G309-WH

Vessel: NOAA Ship WHITING (2930), Launch 1014 (2932), Launch 1015 (2931)

Chief of Party: CDR Maureen R. Kenny

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

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

Graphic record scaled by: WHITING survey personnel

Graphic record checked by: WHITING survey personnel

Protracted by: N/A Automated plot by: HP ~~7959B, Bruning~~ ~~[illegible]~~ DesignJet 350C

Verification by: ~~Hydrographic Surveys Branch~~ Atlantic Hydrographic Branch personnel

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

**Remarks:** **Time Zone Used, 0 (UTC)**

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

AWOIS + SURF ~ RWD 4/98

**DESCRIPTIVE REPORT TO ACCOMPANY**
**HYDROGRAPHIC SURVEY**
**OPR-G309-WH**
**WH-10-5-96**
**H-10689**

**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 "A" sheet, field sheet number WH-10-5-96, and registry number H-10689. Survey Operations were conducted in compliance with the Hydrographic Project Instructions OPR-G309-WH dated May 3, 1996.

## B. AREA SURVEYED

Hydrographic survey H-10689 is located offshore of Lockwoods Folly Inlet, North Carolina. The limits of hydrography are bounded by the following positions:

| Position | Latitude | Longitude |
|---|---|---|
| 1 | 33° 51' 11.9" N | 078° 19' 33.6" W |
| 2 | 33° 54' 46.0" N | 078° 19' 33.6" W |
| 3 | 33° 54' 46.0" N | 078° 11' 38.8" W |
| 4 | 33° 51' 11.9" N | 078° 11' 38.8" W |

Project OPR-G309 is bounded to the north by the 30-foot curve. Hydrography was run up to and including the 30-foot curve in all areas of the sheet, except for AWOIS circles, where hydrography was run inside the 30-foot curve and as close to shore as safety precautions would permit.

Survey operations commenced on May 30, 1996 (DN 151), and concluded on September 28, 1996 (DN 272).

## 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, crosslines, sound velocity casts, mainscheme echosounder splits, bottom samples, AWOIS investigations, and dive operations. WHITING's Sea Arc (vessel number 2933) was used for shoreline verification and near-shore item investigations. No unusual problems or equipment configurations were encountered.

## D. AUTOMATED DATA ACQUISITION AND PROCESSING

Survey data acquisition and processing were accomplished using the HDAPS system with the standard HDAPS software dated March 28, 1996. Sound Velocity corrections were determined using *CAT* version 2.00 and *VELOCITY* version 2.10. The DGPS 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-T dual-channel towfish. The towfish was operated on the 100 kHz frequency and configured with a 20° beam depression. The following SSS equipment was used:

| Vessel | Type | S/N | DN |
|---|---|---|---|
| 2930 | Towfish | 0011901 | 151-208 |
| | Recorder | 016942 | 151-208 |
| 2931 | Towfish | 011591 | 155-178 |
| | Towfish | 0011902 | 199-221 |
| | Recorder | 016669 | 155-221 |
| 2932 | Towfish | 0011904 | 155-220 |
| | Towfish | 0011901 | 221-237 |
| | Towfish | 011591 | 242-268 |
| | Recorder | 016673 | 155-268 |

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, 35-meter line spacing at the 50-meter range scale, or 5-meter line spacing at the 25-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, except when in depths of less than ten feet. In all cases, line spacing was adjusted to obtain the required 200% coverage. 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 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 HDAPS acquisition system. The high frequency depths were selected as the primary depths and were used for plotting. All echograms were scanned for significant features and any significant features that were not selected as primary soundings were manually inserted.

The following fathometers were used:

| Vessel | S/N | DN |
|---|---|---|
| 2930 | C076 | 151-208 |
| | B046N | 272 |
| 2931 | C066 | 155-178 |
| | A116N | 199-221 |
| 2932 | B051N | 155-220 |
| | A118N | 221 |
| | A108N | 223-268 |

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. 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 | Velocity Table # | Latitude | Longitude | Depth |
|---|---|---|---|---|
| 155 | 4 (ship) | 33° 51' 27" N | 078° 15' 21" W | 15.1 m |
| 155 | 5 (launches) | 33° 51' 27" N | 078° 15' 21" W | 15.1 m |
| 177 | 8 (ship) | 33° 47' 17" N | 078° 14' 51" W | 18.7 m |
| 177 | 9 (launches) | 33° 47' 17" N | 078° 14' 51" W | 18.7 m |
| 199 | 14 (ship) | 33° 47' 20" N | 078° 12' 26" W | 18.4 m |
| 199 | 15 (launches) | 33° 47' 20" N | 078° 12' 26" W | 18.4 m |
| 220 | 21 (ship) | 33° 46' 54" N | 078° 12' 24" W | 20.8 m |
| 220 | 22 (launches) | 33° 46' 54" N | 078° 12' 24" W | 20.8 m |
| 234 | 27 (ship) | 33° 47' 31" N | 078° 13' 12" W | 21.1 m |
| 234 | 28 (launches) | 33° 47' 31" N | 078° 13' 12" W | 21.1 m |
| 237 | 29 (launches) | 33° 49' 49" N | 078° 13' 03" W | 17.7 m |
| 257 | 31 (ship) | 33° 46' 42" N | 078° 14' 00" W | 19.8 m |
| 257 | 32 (launches) | 33° 46' 42" N | 078° 14' 00" W | 19.8 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 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

* Filed with original field records.

taken during the CTD cast. The *CAT* program compared these values to the Seacat's surface values and confirmed that the Seacat was working properly. WHITING hydrometers were calibrated on March 25, 1996. Correctors were 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.

Bar checks were performed on launch 1014 on April 22, 1996 (DN 113), August 8, 1996 (DN 221), and November 17, 1996 (322). Bar checks were performed on launch 1015 on April 22, 1996 (DN 113), and November 16, 1996 (DN 321). 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 22, 1996 (DN 113), and November 18, 1996 (DN 323). Leadlines used were calibrated on December 14, 1995, and the calibrations 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 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 were entered into Offset Table 2.* Settlement and squat values for launch 1015 were determined on March 18, 1996, 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 launch 1014 and 1015 were applied during post processing by manually scanning the echograms and making the appropriate corrections. For data acquired by WHITING, the HDAPS data acquisition computer logged and applied, in real time, heave data from a heave, roll and pitch sensor (HIPPY, S/N 19109-C).

Filed with original Field records.

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.

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 May 16, 1996, July 14, 1996 and September 7, 1996. A request for smooth tides was submitted to Product and Services Branch, Datum Section, N/OES231, on October 1, 1996.

Approved tides and zoning were applied during office processing

**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 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 on September 7, 1996. 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 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 either the Charleston or Fort Macon station is 3.2. No position flyers were encountered. All suspect positions (high HDOP, DR'ed positions, high EPE) were examined for reliability. Questionable positions were either smoothed or rejected.

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

| Vessel | Device | Serial Number |
|---|---|---|
| 2930 | Ashtech Sensors | 700417B1203 |
| | CSI MBX1 | A003789 |
| 2931 | Ashtech Sensor | 700417B1194 |
| | CSI MBX1 | X-1088 |
| 2932 | Ashtech Sensor | 700417B1055 |
| | CSI MBX1 | X-1079 |
| Hand held | Magellan NAV 5000 | 1C000158 |
| | CSI MBX1 | 520AJE0249 |

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 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.* A performance check for the hand-held DGPS unit was conducted by comparing positions given by the hand-held unit with positions given by WHITING's DGPS system. All DGPS performance checks confirmed that the equipment was working properly.

The DGPS antenna offset was measured on March 19, 1993, for WHITING. Offsets and laybacks were measured using the high-frequency echosounder transducer as the reference. DGPS antennae were reinstalled directly over the echosounder 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 HDAPS on-line. A minimum of four satellites was used during survey H-10689 (1:10,000) providing altitude unconstrained positioning.

Offset, layback, and height corrections for each launch's SSS aft towing boom were measured on

* Filed with original field records.

July 28, 1993, and verified on April 5, 1994. All offset, layback, and height data were applied by HDAPS 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, using the forward high frequency transducer as the reference. Correctors were entered into Offset Table 9.*

**J. SHORELINE** – See also Evaluation Report.

Shoreline verification on survey H-10689 was performed from launch 1014 on DN 224, from WHITING's Sea Arc on DN 268 and from shore on DN 268. Survey H-10689 shoreline was compared to charts 11536 (12th ed., Sept. 4/93, 1:80,000), and 11534 (28th ed., June 11/94, 1:40,000).

Two piers are located in the survey area and were positioned using a hand-held DGPS receiver on DN 268. Their charted locations were verified with the following positions acquired:

| Pier | Latitude | Longitude |
|---|---|---|
| Holden Beach Fishing Pier | 33° 54' 33.18" N | 078° 17' 50.22" W |
| Long Beach Pier | 33° 54' 41.10" N | 078° 11' 23.88" W |

Two additional piers are charted on chart 11536 at the following approximate positions: 1) 33° 54.75' N, 078° 11.62' W; and 2) 33° 54.72' N, 078° 12.42' W. These piers are not charted on chart 11534 which has a later release date than chart 11536. In addition, the piers were not found during survey H-10689. The charted areas were visually observed at low water from approximately fifteen meters offshore, and from Long Beach Pier. Water visibility was approximately 1.5 meters. No indication of pier ruins was seen in the area. WHITING recommends the source of these piers be reviewed with strong consideration given to removing the piers from chart 11536. ~~Concur w/clarification~~

~~Piers not shown on chart 11536. No change to charting.~~

No other discrepancies were found in charted shoreline features.

Do not concur - Two charted 1-ft sdgs were mistakenly identified by the field as piers. No changes in charting are recommended.
GTM
5-14-98

**K. CROSSLINES**

A total of 56 nautical miles of crosslines, or 11% of the mainscheme mileage, was run on H-10689. Agreement between mainscheme and crossline soundings is adequate with most crossline soundings agreeing with mainscheme soundings to within 0.3 meters. The greatest difference noted was 0.8 meters. The application of smooth tides should correct any discrepancy.

Filed with original field records.

## L. JUNCTIONS - See also Evaluation Report

H-10689 junctions with survey H-10700 (Sheet "C", 1:10,000). Alignment between contour lines at the junction of H-10689 and H-10700 is satisfactory. Overlap between the two surveys was not required because hydrography on the northern portion of H-10700 and the southern portion of H-10689 was collected by the same platform (VESNO 2930).

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

Comparisons were made between H-10689 and the following prior surveys: H-9115 (1970, 1:20,000), and H-9096 (1970-71, 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. No datum shift was applied in the comparisons. Results of the comparisons are as follows:

### H-9115

Agreement between H-10689 and H-9115 is good, with most soundings agreeing to within 2 feet. In general, soundings from H-10689 are slightly deeper than soundings from H-9115. No point features exist on the portion of survey H-9115 which is covered on survey H-10689.

### H-9096

Agreement between H-10689 and H-9096 is good, with most soundings agreeing to within 2 feet. In general, soundings from H-10689 are slightly deeper than soundings from H-9096. The 30-foot curve appears to have shifted irregularly. In some areas, the 30-foot curve now extends further offshore, while in other areas it is closer to shore. WHITING recommends that the wreck on survey H-9096 at approximate position 33° 54' 43.49" N, 078° 15' 30.71" W be moved to the position specified in section N6 for AWOIS 9691. There were no other point features on the portion of H-9096 which is covered on survey H-10689.

## N. ITEM INVESTIGATIONS

The following items were investigated by WHITING during this survey. Depths of features and surrounding depths are corrected to predicted MLLW.

### N1. AWOIS 9686

AWOIS 9686 is a dangerous submerged wreck at position 33° 54' 44.12" N, 078° 12' 39.23" W. 200% side scan sonar coverage was obtained throughout the 50-meter search radius of AWOIS 9686. The item was also searched for visually from launch 1014 at low water. No features were

observed; WHITING recommends that the dangerous submerged wreck be removed from the chart. - concur.

**N2.** AWOIS 9687

AWOIS 9687 is a dangerous submerged wreck at position 33° 54' 34.70" N, 078° 14' 13.60" W. This item could not be investigated by WHITING launches due to dangerous breakers and sandbars in the area. The item was searched for visually from shore and from launch 1014 at low water. The item was not observed; WHITING recommends that the charted position be carried forward. - concur.

**N3.** AWOIS 9688

AWOIS 9688 is a dangerous submerged wreck at position 33° 54' 36.12" N, 078° 14' 12.29" W. This item could not be investigated by WHITING launches due to dangerous breakers and sandbars in the area. The item was searched for visually from shore and from launch 1014 at low water. The item was not observed; WHITING recommends that the charted position be carried forward. - concur. w/Clarification No change in charting

**N4.** AWOIS 9689

AWOIS 9689 is a dangerous submerged wreck at position 33° 54' 41.63" N, 078° 14' 18.94" W. This wreck was visually observed and positioned by a wader using a hand-held DGPS receiver on DN 268. It is located on the edge of the 50-meter search radius. The wreck is uncovered 0.6 7 meters at MLLW (fix number 9000). WHITING recommends that the wreck charted at 33° 54' 41.63" N, 078° 14' 18.94" W be removed from the chart, and that a dangerous wreck be charted at:

Latitude: 33° 54' 43.20" N
Longitude: 078° 14' 19.80" W
Least Depth: ~~-0.6~~ -0.7 meters (uncovers ~~0.6~~ -0.7 meters) (2 ft)
Concur.

**N5.** AWOIS 9690

AWOIS 9690 is a wreck reported visible at low tide at position 33° 54' 43" N, 78° 15' 02" W. 200% side scan sonar coverage was obtained throughout the portion of the 300-meter search radius of AWOIS 9690 which was deemed to be navigable by the launches. Launches were not run closer to shore than the 1-meter curve. The portion of the AWOIS 9690 search radius which was not navigable by the launches was investigated visually from a launch at low water on DN 224. No features were found; WHITING recommends that this item be removed from the chart.

Concur

**N6.** AWOIS 9691

AWOIS 9691 is dangerous submerged wreck at position 33° 54' 44.11" N, 078° 15' 29.70" W. This item was investigated on DN 224. A wreck which uncovers 0.5 meters at MLLW was observed visually and positioned by launch 1014 (fix number 4428). It is located within the 100-meter search radius. WHITING recommends that the wreck charted at 33° 54' 44.11" N, 078° 15' 29.70" W be removed from the chart, and that a dangerous wreck be charted at:

Latitude: 33° 54' 43.466" N
Longitude: 078° 15' 30.138" W
Least Depth: -0.5 meters (uncovers 0.5 meters) (1 Ft)
Concur

**N7.** AWOIS 9694

AWOIS 9694 is the submerged wreck of a fishing vessel at position 33° 54' 40.62" N, 078° 14' 10.99" W. This item could not be investigated by WHITING launches due to dangerous breakers and sandbars in the area. The item was searched for visually from shore and from launch 1014 at low water. The item was not observed; WHITING recommends that the charted position be carried forward. - Concur

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

Comparisons were made between survey H-10689 and the following two charts: 11536 (12th ed., Sept. 4/93, 1:80,000), and 11534 (28th ed., June 11/94, 1:40,000). All charted depths are from prior surveys. The comparison was consistent with prior survey comparisons (see section M).

The following were also noted:

1. The dangerous submerged wreck charted at approximate position 33° 54' 44.12" N, 078° 12' 39.23" W should be removed from the charts (see section N1). - concur

2. The dangerous submerged wreck charted at approximate position 33° 54' 41.63" N, 078° 14' 18.94" W should be removed from the charts. A dangerous wreck should be charted at position 33° 54' 43.20" N, 078° 14' 19.80" W (see section N4). - concur

3. The dangerous submerged wreck charted at approximate position 33° 54' 43" N, 78° 15' 02" W should be removed from the charts (see section N5). - concur

4. The dangerous submerged wreck charted at approximate position 33° 54' 44.11" N, 78° 15' 29.70" W should be removed from the charts. A dangerous wreck should be charted at position 33° 54' 43.466" N, 078° 15' 30.138" W (see section N6). concur

5. The source of the pier charted at approximate position 33° 54.75' N, 078° 11.62' W should

be reviewed with strong consideration given to removing the pier from chart 11536 (see section J). - CONCUR

6. The source of the pier charted at approximate position 33° 54.72' N, 078° 12.42' W should be reviewed with strong consideration given to removing the pier from chart 11536 (see section J). - CONCUR

## P. ADEQUACY OF SURVEY

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

## Q. AIDS TO NAVIGATION

All aids to navigation were visually verified during the survey. All aids appear adequate to serve their intended purpose. The US Coast Guard was notified of the following discrepancy (see Appendix VI):

| Floating ATON | Position Charted | Position from Survey | Date Located |
|---|---|---|---|
| RW Mo(A) "LW" | 33° 54' 00.0" N<br>078° 13' 25.8" W | 33° 53' 59.4" N<br>078° 13' 12.4" W | August 11, 1996 |

## R. STATISTICS

| | |
|---|---|
| Number of Positions | 3740 |
| Main-scheme Sounding Lines (Nautical Miles) | 497 |
| Crosslines (Nautical Miles) | 56 |
| Square Nautical Miles Surveyed | 19 |
| Days of Production | 21 |
| Detached Positions | 7 |
| Bottom Samples | 17 |
| Tide Stations Installed | 1 |
| Current Stations | None |
| Number of CTD Casts | 7 |
| Magnetic Stations | None |

## S. MISCELLANEOUS

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 and Coast Pilot Report will be submitted in December 1996 as part of OPR-G309-WH.

Submitted by:

Lieutenant (junior grade) Christopher Parrish, 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**

November 16, 1996

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

**ADVANCE INFORMATION**

Dear Sir:

The NOAA Ship WHITING, while conducting hydrographic survey operations in the approaches to Wilmington, North Carolina, located the following aid to navigation (ATON) at a position which differs from its charted position:

| Floating ATON | Position Charted | Position from Survey | Date Located |
|---|---|---|---|
| RW Mo(A) "LW" | 33° 54' 00.0" N<br>078° 13' 25.8" W | 33° 53' 59.4" N<br>078° 13' 12.4" W | August 11, 1996 |

Differential GPS was used to determine the survey position of the ATON listed above. The position is referenced to NAD 83. Chart 11536 is affected by this report.

A copy of this letter and enclosures have 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

cc: AMC1
N/CS2
N/CS33
DMAHTC

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 |

# TIDE STATION NOTE

## Yaupon Beach # 865-9182

The tide station at Yaupon Beach was set up on May 16, 1996 and continues to be operational. Five bench marks were tied and leveled forward and backward. Opening levels were run on May 16, 1996. Levels tying five bench marks were run after hurricanes Bertha and Fran on July 14, 1996 and September 7, 1996.

The station referenced with the tide station at Springmaid Pier, South Carolina (866-1070) will serve as control for datum determination for hydrography run during project OPR-G309-WH. The Yaupon Beach station is located at position 33° 54.1' N, 078° 04.9' W.

The station was installed on the seaward end of the northeast face of the Yaupon Beach Fishing Pier. The station consists of : 1) A protective cabinet mounted to the pier railing, 2) a 36 foot long 4" PVC protective well secured with 4 stainless steel long-arm piling clamps, 3) a GOES antenna and solar panel mounted on a 8'x4"x4" wood mast, and 4) a Next Generation Sutron 8200 tide gauge secured inside the protective cabinet. The water level sensor is connected to the 8200 DCP using standard connections and cables.

An opening tide station package was submitted for this station on June 6, 1996. Post-hurricane levels were submitted to N/OES212 on July 19, 1996 and September 14, 1996.

NOAA FORM 61-29
(12-71)

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

REFERENCE NO.
WH-OPS-56-96

## LETTER TRANSMITTING DATA

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

_X_ ORDINARY MAIL ___ AIR MAIL

___ REGISTERED MAIL ___ FED-XPRESS

____ GBL *(Give number):*_____

*{Hand carried}*

**TO:**

NOAA, National Ocean Service
Product and Services Branch
Datum Section
SSMC4 Station 7601, N/OES231
1305 East West Highway
Silver Spring, Maryland 20910

DATE FORWARDED
October 1, 1996

NUMBER OF PACKAGES
1 Envelope

**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.

OPR-G309-WH-96
WH-10-5-96
SHEET "A"
H-10689

Request for smooth tides for Survey Sheet listed above.

Enclosures: Abstract of Times of Hydrography
Project Sketch of Survey Area
Request for approved Tides

**FROM:** *(Signature)*
Maureen R. Kenny
CDR Maureen R. Kenny, NOAA

Return receipted copy to:

Commanding Officer
NOAA Ship WHITING
439 West York Street
Norfolk, Virginia 23510-1114

**RECEIVED THE ABOVE**
*(Name, Division, Date)*

W. M. Hudson
10/4/96

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

**APPROVAL SHEET**
**HYDROGRAPHIC SURVEY**
**OPR-G309-WH**
**1996**
**WH-10-5-96**
**H-10689**

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-10689

**LOCALITY:** Atlantic Ocean, N.C.

**TIME PERIOD:** May 30 - September 28, 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 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-10689

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 | | | |

NOAA FORM 76-155
(11-72)

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

SURVEY NUMBER

H-10689

# GEOGRAPHIC NAMES

| Name on Survey | A ON CHART NO. 11536, 11520, 11534 | 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 | |
|---|---|---|---|---|---|---|---|---|---|---|
| HOLDEN BEACH | X | | X | | | | | | | 1 |
| LOCKWOODS FOLLY INLET | X | | X | | | | | | | 2 |
| LONG BAY | X | | X | | | | | | | 3 |
| LONG BEACH | X | | X | | | | | | | 4 |
| NORTH ATLANTIC OCEAN | X | | X | | | | | | | 5 |
| NORTH CAROLINA (title) | X | | X | | | | | | | 6 |
| | | | | | | | | | | 7 |
| | | | | | | | | | | 8 |
| | | | | | | | | | | 9 |
| | | | | | | | | | | 10 |
| | | | | | | | | | | 11 |
| | | | | | | | | | | 12 |
| | | | | | | | | | | 13 |
| | | | | | | | | | | 14 |
| | | | | | | | | | | 15 |
| | | | | | | | | | | 16 |
| | | | | | | | | | | 17 |
| | | | | | | | | | | 18 |
| | | | | | | | | | | 19 |
| | | | | | Approved | | | | | 20 |
| | | | | | | | | | | 21 |
| | | | | | | | | | | 22 |
| | | | | | Chief Geographer | | | | | 23 |
| | | | | | NOV 22 1996 | | | | | 24 |
| | | | | | | | | | | 25 |

NOAA FORM 76-155 SUPERSEDES C&GS 197

04/28/98

HYDROGRAPHIC SURVEY STATISTICS
REGISTRY NUMBER: H-10689

| | |
|---|---|
| NUMBER OF CONTROL STATIONS | 2 |
| NUMBER OF POSITIONS | 3470 |
| NUMBER OF SOUNDINGS | 18357 |

| | TIME-HOURS | DATE COMPLETED |
|---|---|---|
| PREPROCESSING EXAMINATION | 22 | 10/08/96 |
| VERIFICATION OF FIELD DATA | 136 | 03/10/97 |
| EVALUATION AND ANALYSIS | 32 | |
| FINAL INSPECTION | 18 | 03/19/98 |
| COMPILATION | 34 | 04/27/98 |
| TOTAL TIME | 242 | |

ATLANTIC HYDROGRAPHIC BRANCH APPROVAL 03/20/98

NOAA FORM 61-29
(12-71)

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

REFERENCE NO.

N/CS33-42-98

## 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

29 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-10689

NORTH CAROLINA, NORTH ATLANTIC OCEAN, OFFSHORE -- LOCKWOODS FOLLY INLET

1 (ONE) Tube containing the following:

1 SMOOTH SHEET (H-10689)
2 Composite Drawings for chart #11536
2 Composite Drawings for chart #11534
1 H-Drawing for chart #11536
2 H-Drawings for chart #11534
1 Descriptive Report for H-10689
1 Drawing History Form #76-71 for chart #11536
1 Drawing History Form #76-71 for chart #11534

**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

**ATLANTIC HYDROGRAPHIC BRANCH**
**EVALUATION REPORT FOR H-10689 (1996)**

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

## D. AUTOMATED DATA ACQUISITION AND PROCESSING

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

Hydrographic Processing System
NADCON, version 2.10
AUTOCAD, Release 12
QUICKSURF, version 5.1
MicroStation 95, version 5.05
I/RAS B, version 5.01

The smooth sheet was plotted using a 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 0.624 seconds (19.231 meters or 1.92 mm at the scale of the survey) north in latitude, and 1.005 seconds (25.831 meters or 2.58 mm at the scale of the survey) east in longitude.

## J. SHORELINE

Brown shoreline on the survey smooth sheet originates with National Ocean Survey chart 11536 (12th Edition, Sept. 4/93) and is for orientation purposes only.

## L. JUNCTIONS

H-10728 (1996) to the east
H-10700 (1996) to the south

Standard junctions were effected between the present survey and the junctional survey.

There are no junctional surveys to the north or west. Present survey depths are in harmony with the charted hydrography to the north 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 CHARTS 11534 (28th Edition, Jun. 11/94) 11536 (12th Edition, Sep. 4/93)

### Hydrography

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

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

### Dangers to Navigation

No Danger to Navigation reports were submitted.

## 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.

Robert Snow

**Robert Snow**
Verification and
Evaluation and Analysis
Cartographic Technician

**APPROVAL SHEET**
**H-10689**

**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 26, 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.

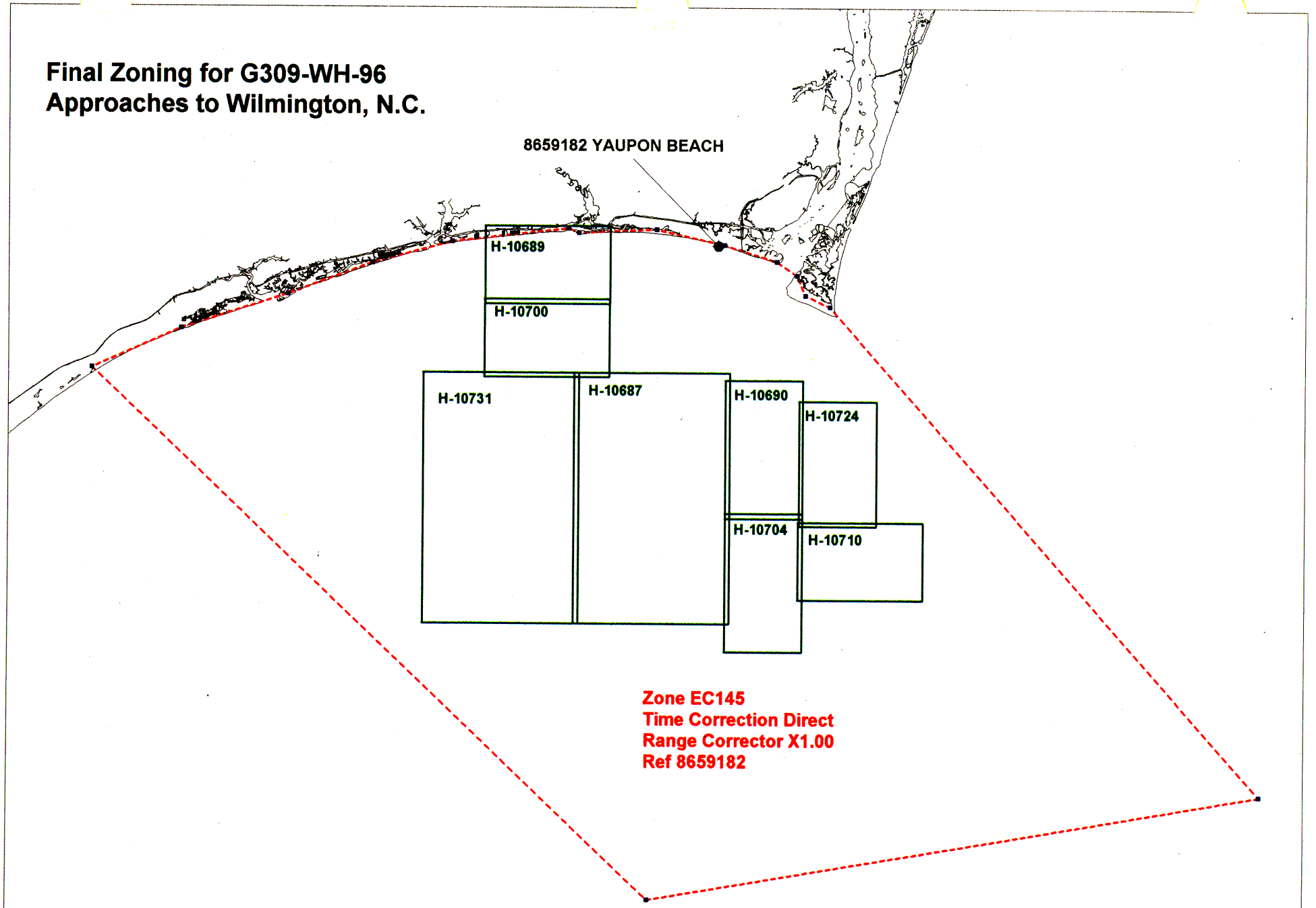
Nicholas E. Perugini Date: 3-20-98
Nicholas E. Perugini
Commander, NOAA
Chief, Atlantic Hydrographic Branch

**********

**Final Approval:**

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

# Final Zoning for G309-WH-96
# Approaches to Wilmington, N.C.



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-10689

**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 | 4/13/98 | Robert Hill | Full ~~Part Before~~ After Marine Center Approval Signed Via |
| | | | Drawing No. |
| | | | |
| 11536 | 4/14/98 | Robert Hill | Full ~~Part Before~~ After Marine Center Approval Signed Via |
| | | | Drawing No. |
| | | | |
| 11536 | 5/27/98 | Kevin Jutt PB | Full Part Before After Marine Center Approval Signed Via |
| | | | Drawing No. 24 |
| | | | |
| 11534 | 5/27/98 | Kevin Jutt PB | Full Part Before After Marine Center Approval Signed Via |
| | | | Drawing No. ~~52~~ 30 |
| | | | |
| 11520 | 5/28/98 | Kevin Jutt PB | Full Part Before After Marine Center Approval Signed Via |
| | | | Drawing No. 52 |
| | | | |
| | | | 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 |
| | | | Drawing No. |
| | | | |
| | | | Full Part Before After Marine Center Approval Signed Via |
| | | | Drawing No. |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

SUPERSEDES C&GS FORM 8352 WHICH MAY BE USED.