

F00461

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-10-2-00

Registry No. F00461

LOCALITY

State North Carolina

General Locality North Atlantic Ocean

Locality Onslow Bay

2000

CHIEF OF PARTY
LCDR Gerd F. Glang

LIBRARY & ARCHIVES

DATE

October 18, 2001

NOAA FORM 77-28
OF COMMERCE
(11-72)
ATMOSPHERIC ADMINISTRATION

U.S. DEPARTMENT
NATIONAL OCEANIC AND

REGISTRY NUMBER:

F00461

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-10-02-00

State: North Carolina

General locality: ~~Offshore North Carolina Coast~~

NORTH ATLANTIC OCEAN

Locality: Onslow Bay, North Carolina

Scale: 1: 10,000

Date of survey: April 3, 2000 and June 30, 2000

Instructions dated: March 28, 2000

Project Number: S-F908-WH

Vessel: NOAA Ship Whiting

Chief of Party: LCDR Gerd F. Glang

Surveyed by: WHITING Personnel

Soundings taken by echo sounder, hand lead-line, or pole: ODOM Echotrac DF3200 echosounder and Reson 8101 Shallow Water Multibeam

Graphic record scaled by: WHITING Personnel

Graphic record checked by: WHITING Personnel

Protracted by: N/A

Automated plot by: HP750C

(FIELD)

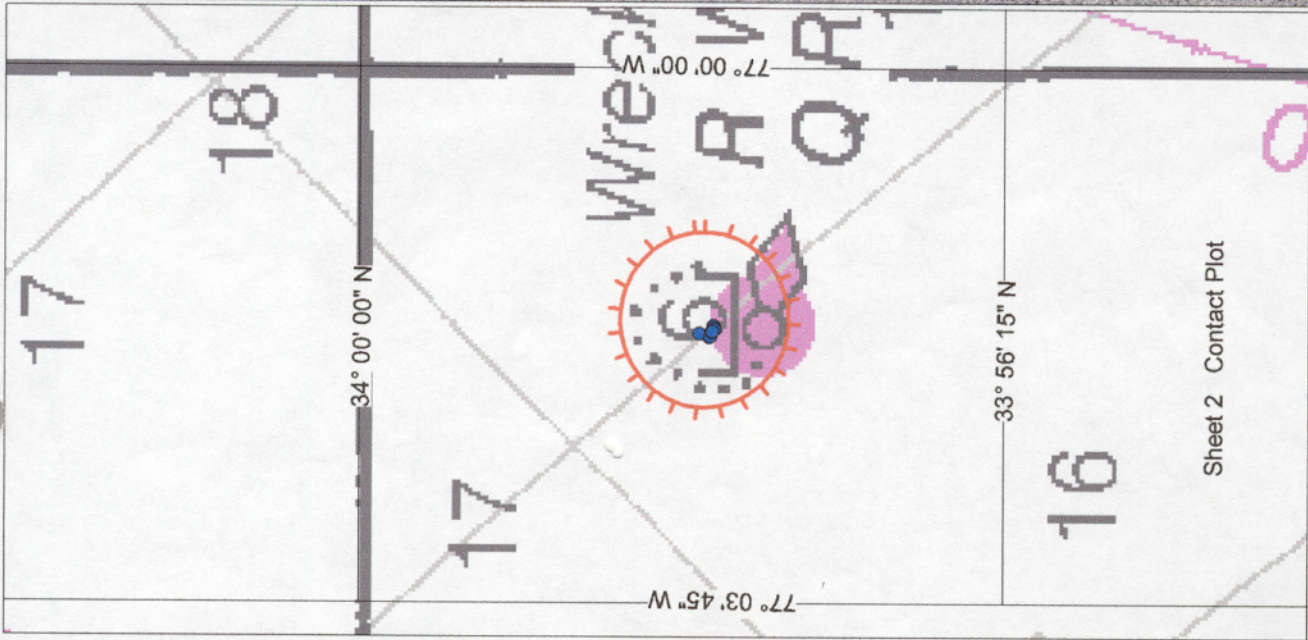
Verification by: Atlantic Hydrographic Branch

PERSONNEL

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

HANDWRITTEN NOTES IN THE DESCRIPTIVE REPORT WERE MADE DURING OFFICE PROCESSING.

AWOIS/SURF ✓ 9/21/01, SSJ



Sheet 2 Contact Plot



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ATMOSPHERIC ADMINISTRATION
NATIONAL OCEAN SERVICE

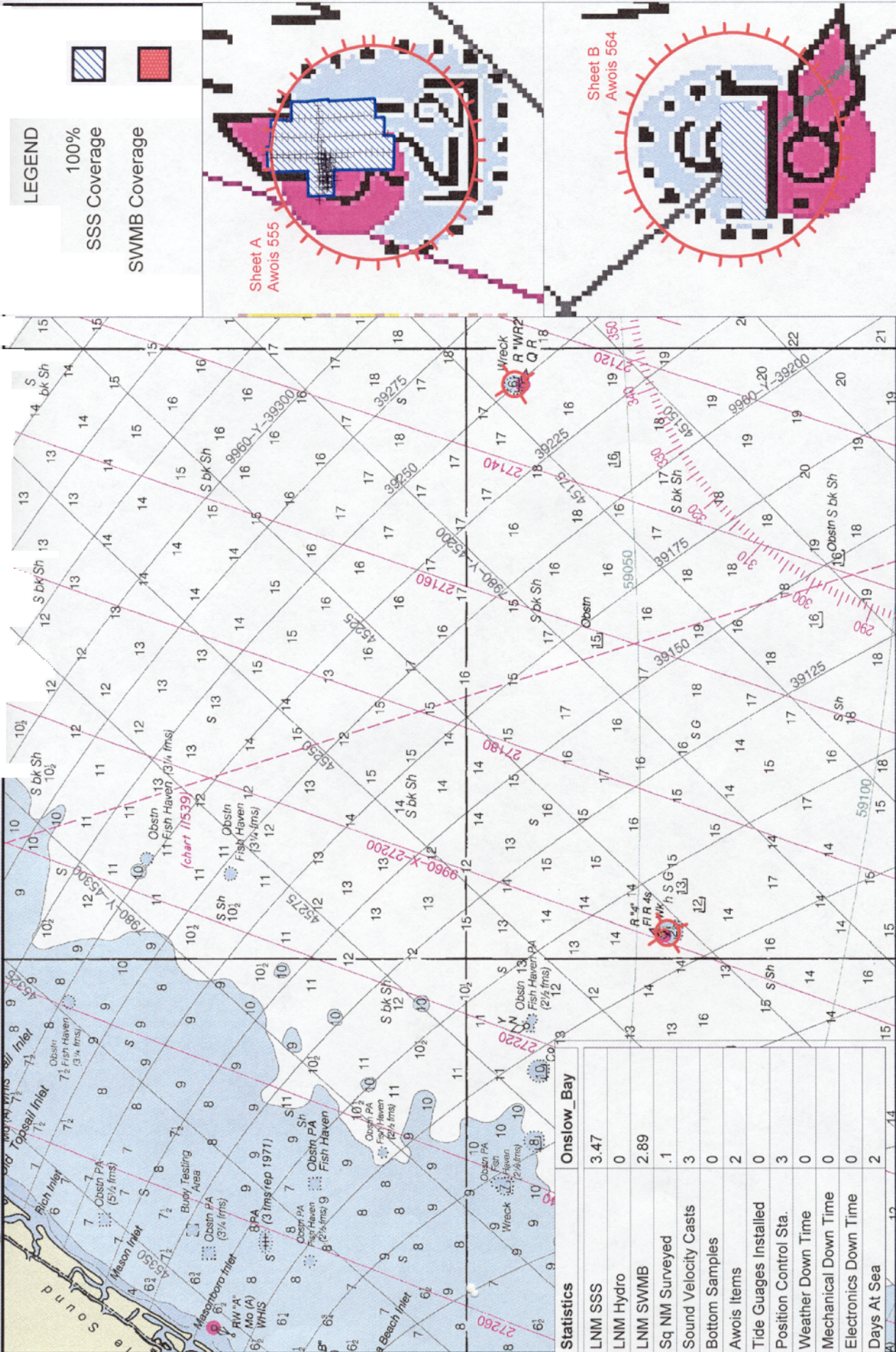
Survey: F00461
State: North Carolina
Locality: Onslow Bay
Sub-Locality: Awois 564

Field Sheet Number: 10-02-00
Scale of Survey: 1:10,000
Horizontal Datum: NAD 83
Projection: UTM Zone 18

Project: OPR-S-F908-00
Sounding Units: Meters
Sounding Datum: MLLW
Central Meridian: 075° 00' 00W
Scale Factor: 0.9996

Surveyed By: NOAA Ship Whiting
LCDR Gerd F. Glang
Commanding

Date of Survey: 4/3, 6/30 2000



LEGEND
 100% SSS Coverage
 SWMB Coverage

Sheet A
Awois 555

Sheet B
Awois 564

Surveyed By:
 NOAA Ship WHITING
 LCDR Gerd F. Glang
 Commanding Officer

Type of survey..... Basic
 Sounding Units..... METERS
 Sounding Datum... MLLW
 Central Meridian.. 075° 00' 00"
 Scale Factor..... 0.9996
 Dates of survey... 4/3,6/30 2000

Onslow Bay
 Progress Sketch
 OPR-S-F908-WH F00461
 Onslow Bay, North Carolina

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Onslow_Bay	
LNM SSS	3.47
LNM Hydro	0
LNM SWMB	2.89
Sq NM Surveyed	.1
Sound Velocity Casts	3
Bottom Samples	0
Awois Items	2
Tide Guages Installed	0
Position Control Sta.	3
Weather Down Time	0
Mechanical Down Time	0
Electronics Down Time	0
Days At Sea	2

0 0.04 0.08



Kilometers

33-51-58.33 N 077-28-55.2 W

West End of Wreck

Fix 61253

Depth 21.7m

094_009_0518_6

094_014_0532_7

094_009_0518_7

094_014_0532_4

182_014_1442_2

094_014_0532_1

094_009_0518_9

094_009_0518_5

094_009_0518_8

094_004_0444_1

182_014_1457_2

094_009_0518_3

094_014_0532_2

182_014_1457_1

094_009_0518_1

094_009_0518_2

182_014_1457_2

182_014_1457_1

094_014_0532_8

094_014_0532_9

182_014_1442_1

094_013_0504_1

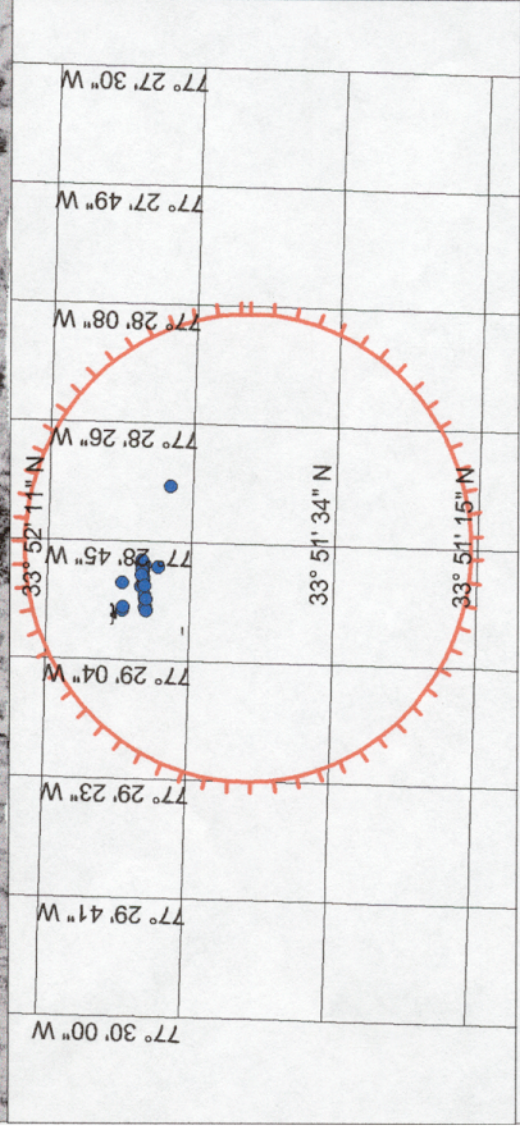
182_014_1442_4

182_014_1442_3

094_009_0518_4

094_014_0532_9

094_013_0504_2



33-51-58.75 N 077-28-48.74 W

Shoal part of Wreck East

John D. Gill Fix 61,013

Depth 18.6m

AW555

Contact P/Lot



NATIONAL OCEANIC AND
ATMOSPHERIC ADMINISTRATION
NATIONAL OCEAN SERVICE

Survey: F00461
State: North Carolina
Locality: Onslow Bay
Sub-Locality: Awotis 555

Field Sheet Number: 10-02-00 Project: OPR-S-F908-00
Scale of Survey: 1:10,000 Sounding Units: Meters
Horizontal Datum: NAD 83 Sounding Datum: MLLW
Projection: UTM Zone 18 Central Meridian: 075° 00' 00\"/>

Surveyed By: NOAA Ship Whiting
LCDR Gerd F. Glang
Commanding

Date of Survey: 4/3,6/30 2000

A. PROJECT

A.1. This special hydrographic survey was conducted in accordance with Hydrographic Survey Letter Instructions S-F908-WH, Item Investigations, Onslow Bay, North Carolina.

A.2. The original instructions are dated March 28, 2000.

A.3. There are no amendments to the original instructions.

A.4. This survey is designated F00461. See section B.2 for exact survey boundaries.

A.5. Project S-F908-WH responds to requests from the Fifth Coast Guard District to investigate two charted wrecks in Onslow Bay, North Carolina. These two wrecks, AWOIS item numbers 555 and 564, are presently marked by buoys. The Coast Guard will relocate the buoys if found; or remove them if the wrecks are disproved from the results of the investigation.

B. AREA SURVEYED

B.1. Survey F00461 covers AWOIS Items 555 and 564, located approximately 24 and 47 nautical miles east of Cape Fear, NC respectively.

B.2. Survey F00461 item investigations comprise two areas, each with a 500 meter radius around the following positions.

AWOIS Item 555 Sheet 1/A	AWOIS Item 564 Sheet 2/B
33°51'57.03" N 077°28'48.6" W	34°57'57.62" N 077°01'49.79" W

B.3. There were two days of acquisition for this project. The first was on April 3, 2000, (DN 94) during WHITING's transit to Key West. Due to heavy seas on that day, only side scan sonar data acquisition was completed. On June 6, 2000 (DN 182) acquisition was resumed and least depths were determined using shallow water multibeam (SWMB).

C. SURVEY VESSELS

C.1. The following vessels were used for this survey:

Vessel	Operations
NOAA Ship WHITING	VBES and Side Scan Operations
NOAA Launch 1005	VBES and SWMB Operations

C.2. No unusual vessel configurations were used during this survey.

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

D.1. A detailed list of data acquisition and processing software used for this survey can be found in appendix H.

Vertical beam echosounder (VBES) data acquisition was accomplished using Coastal Oceanographics **HYPACK** (version 10.03) software. VBES data processing was accomplished using **HYDROGRAPHIC PROCESSING SYSTEM (HIPS)** software and assorted utility programs contained on the **HYDROSOFT** (version 10.6.1) compact disk provided by the Hydrographic Systems and Technology Programs (HSTP N/CS32).

All side scan sonar (SSS) and SWMB data were acquired digitally using Triton Elics International (TEI) **ISIS** software. **ISIS** (version 4.32) was used for High Speed High Resolution Side Scan Sonar (HSHRSSS) data acquisition, and **ISIS** (version 4.54) was used for SWMB data acquisition. Digital SSS data and SWMB data were processed using Universal Systems Limited (USL) **CARIS/SIPS** and **HIPS** (versions 4.3.2), UNIX-based software.

The Sea-Bird Electronics SBE-19 Seacat Profilers were initialized and configured using **SEASOFT** (version 3.3M) and **SEACAT** (version 2.0) software. The program **VELOCIWIN** (version 5.0) was used to process CTD data and calculate sound velocity corrections.

D.2 All soundings portrayed on the final field sheet for this survey are based upon data acquired with the Reson Seabat 8101 System. Reson SeaBat 8101 SWMB data were monitored using **ISIS** during acquisition and processed utilizing **CARIS/HIPS** multibeam data cleaning programs.

Following acquisition, shallow water multibeam data were converted from **XTF** to **HDCS** using the **CARIS xtfToHDCS** program, and initially reviewed with the **HDCS** program **SwathEdit**. All soundings were reviewed, ping-by-ping, and obvious depth fliers were identified and manually flagged as "rejected". Vessel positioning and attitude data from each system were similarly displayed and manually cleaned. All data greater than 60° to either side of nadir were not processed, reducing the effective swath width to 120°. This is in accordance with the Draft Standing Project Instructions to reduce the noise and refraction errors possible in these outer beams.

After review and cleaning in **SwathEdit**, the **CARIS** program **HDCSLineMerge** was used to merge depth, position and attitude data with sound velocity, tide, vessel offset, and dynamic draft correctors to compute the corrected depth and position of each sounding. All soundings were reviewed again in **HDCS Subset Mode**. Depth fliers and noisy data that were either missed or not apparent in **SwathEdit** were rejected in **Subset Mode**. Outer beams were selectively re-accepted during subset cleaning if an item of significance was noticed, and if continuity was observed from ping to ping.

Biological interference due to large schools of fish often found in the vicinity of wrecks was frequently observed in the SWMB data. Sonar returns typical of the presence of aquatic life, e.g. unusually shoal soundings on one SWMB pass, with no correlating soundings on additional SWMB passes or on SSS, were reviewed and also flagged as "rejected" at the discretion of the hydrographer.

Processed soundings were imported into a **CARIS** workfile using shoal-biased, line-by-line thinning with a 15 meter bin. **CARIS** workfile soundings were exported into **HIPS** and **MAPINFO** using the **HIPS Converter** found in **HPTools** (version 10.6.1).

ODOM ECHOTRAC echograms were monitored during acquisition. Data were acquired digitally using **HYPACK** and converted in **HPTools**. Analog paper records of vertical beam echo soundings were manually compared with digitized selected soundings and scanned for missed depths. Additional selected soundings were inserted where necessary to define peaks and abrupt changes in slope. Fixes were flagged for rejection if HDOP exceeded 3.0. Edits to the digital depth file were made in **HIPS**. Data were smoothed or rejected if unusually high values for heave were noted. Offset and velocity tables were applied in **HIPS**. Tide zoning and corrections were applied in **HPTools**. After review and editing, depths were drawn into **MAPINFO**. Due to the density of SWMB soundings, depth data were excessed with the **HPTools** utility **ZOOM EDIT**. Depths flagged as excess level "0" were utilized for all final plots.

E. SONAR EQUIPMENT

E.1 WHITING conducted all side scan sonar operations using the KLEIN system 5500 (S/N 101). This system includes the Model 5250 High Speed High resolution Side Scan sonar (HSHRSSH) tow fish and the T5100 Transceiver Processing Unit (TPU).

E.2 The KLEIN towfish was configured with a 40° vertical beam angle.

E.3 The 5250 HSHRSSH operates at a frequency of 455 kHz.

E.4(a) The 100-meter range scale was used with 160 meter line spacing to locate AWOIS items 555 and 564. This range scale was used to provide optimal contact detection. The line spacing is in accordance with section 6.4 of the Field Procedures Manual (FPM, dated March 1999). Data acquired with an HDOP greater than 4.0 were rejected or smoothed during post-processing.

E.4(b) Daily confidence checks were conducted during data acquisition by observing bottom features such as sand waves, scours, and naturally occurring contrast of sea floor characteristics in the side scan imagery.

E.4(c) 200% percent side scan sonar coverage over the entire AWOIS search radius was not required. Items 555 and 564 were both located with the HSHRSSH. Mosaics were created in **CARIS SIPS** and imported into **MapInfo** using the "mosaic2tiftab" program.

E.4(d) Degraded data-returns were not acquired during this survey.

E.4(e) The 5250 HSHRSSH is deployed using a SeaMac electric-hydraulic winch spooled with approximately 200 meters of armored tow cable. The tow cable is lead from the winch through the stern A-frame over a snatch block with a metered sheave. The tow cable at the winch is connected to a deck cable through a slip ring assembly mounted coaxially on the winch.

E.4(f) Cable-out aboard WHITING was determined using an MD-TOTCO digital sheave meter installed on the stern A-frame block. This sensor computes cable out by the number of revolutions of the block's sheave. The MD-TOTCO cable counter provides a serial message to the HYPACK and ISIS acquisition computers.

E.5 Contact investigations were conducted using the RESON 8101 Shallow Water Multibeam System (SWMB) aboard WHITING Launch 1005. For discrete item developments, line spacing was reduced to 2 times water depth to ensure least-depth determination by SWMB near-nadir beams. Detailed descriptions of all investigated contacts are addressed in the Item Investigation Reports found in Section M.

E.6 All side scan contacts were digitized in CARIS SIPS. Digitizing a contact included measuring apparent height, and creating a "snapshot" of each image. All contacts were added to the HPS data structure as a contact file. "Snapshots" for each contact were also integrated into the HPS data structure. Contact significance is primarily determined by the contact height to water depth ratio (i.e. contact height greater than 1 meter in water depths of 20 meters or less, or contact height greater than 10% of the water depth in deeper water). Contacts not meeting this criteria were also deemed significant if the item appeared to be manufactured (i.e. an obstruction) as opposed to a natural feature.

All significant contacts were developed with SWMB sonar coverage. All coverage was checked with onscreen coverage displays in CARIS/HIPS and MAPINFO. No holidays were encountered.

F. SOUNDING EQUIPMENT

F.1 Soundings were acquired using the RESON 8101 shallow water multibeam system (SWMB) and an ODOM ECHOTRAC DF3200 MKII

The following depth sounders were used:

VESSEL	SOUNDING SYSTEM S/N
NOAA Ship WHITING	ODOM ECHOTRAC - 9656
Launch 1005	ODOM ECHOTRAC - 9644 Reson Processor - 13976 Reson 8101 Transducer - 020800JCG

F.2 No Diver Least Depth Gauge was used.

F.3 There were no faults in sounding equipment that affected data accuracy or quality.

F.4 ECHOTRAC high-frequency (100 kHz), low frequency(24 kHz) and RESON (240 kHz) data were recorded during data acquisition. Vertical beam echosounder data (VBES) acquired concurrently with multibeam data were not processed. **This data should not be used for smooth sheet compilation.**

F.4(a) All sounding data acquired by WHITING were manually edited and entered into **HPS**. All SWMB data acquired by launch 1005 were edited digitally in **CARIS/HIPS**. Vertical correctors were applied to the raw single beam digital soundings (see Section G).

F.5(a) The SeaBat 8101 is a 240 kHz SWMB system which measures relative water depths across a 150° swath; each swath consisting of 101 individually formed 1.5° x 1.5° beams. During SWMB data processing, all beams greater than 60 degrees to port and 60 degrees starboard from nadir were not processed after roll-compensation, reducing the effective swath width to 120°.

F.5(b) RESON 8101 SWMB data were continuously recorded and served as the primary source for hydrographic digital soundings. Sounding depths ranged from 59 to 116 feet of water. SWMB was set to a range scale of 75 meters. The entire wreckage field of each item was covered with line spacing based on 2 times water depth.

F.6 Vessel speeds during SWMB data and HSHRSSH acquisition were conducted within the standards for survey operations (FPM.6.3.2 and 6.4, Specs and Deliverables 6.2.2.). HSHRSSH data were acquired at speeds between 5.8 and 7.0 knots. SWMB data were acquired at vessel speeds between 3.6 and 5.0 knots. Slower vessel speed increases the data density in the along track coverage over the feature.

F.7 Sun-illuminated Digital Terrain Models (DTMs) were created in **CarisNT Spatial Editor** to demonstrate SWMB coverage and to further check for systematic errors such as tide, sound velocity, or attitude and timing errors. The Spatial Editor grids full density multibeam bathymetry. It generates mean seabed surfaces by applying weighting schemes according to sonar footprint dimensions and grazing angles. Sun-illumination is used to highlight the seabed features.

Spatial Editor DTMs were created as specified in the NOS Hydrographic Surveys Specifications and Deliverables. The WorldReg MapBasic application was used to register Spatial Editor DTM's for analysis in MapInfo..

G. CORRECTIONS TO SOUNDINGS

G.1(a) Velocity of sound through water in areas surveyed by WHITING were determined using a Sea-Bird Electronics SBE-19 Seacat Profiler (S/N 192472-286). Launch 1005 utilized Sea-Bird Electronics SBE-19 Seacat Profiler (S/N 196093-1060) during SWMB operations. Seacat Data Quality Assurance Tests (DQA) were conducted in accordance with the Field Procedures Manual (FPM) after each cast. Seacat Profiler unit 286 was calibrated December 1, 1999, and unit 1060 was calibrated February,23, 2000. Both calibrations were completed by Sea-Bird Electronics.

All sound velocity data were processed using **VELOCIWIN** (version 5.0) software. Computed velocity correctors were entered into **HPS** sound velocity tables and re-applied during processing to both high and low frequency VBES depths. Velocity correctors were entered into **CARIS/HIPS** for SWMB processing. Complete data sets for each cast have been submitted on CD-ROM with the digital data package.

The following velocity casts apply to SWMB data. For supporting data acquired by WHITING refer to Appendix I : *

Sounds table SVP Table	DN	Vessel	Latitude	Longitude	Cast Depth(M)
00218185.wlq 182_1005.svp	182	2931	38° 35' 54"N	74 40 55"W	23.5
00218201.wlq 182A_1005.svp	182	2931	38° 56' 38"N	74 36 50"W	31.6

G.1(b) The following dual Leadline comparisons with the ECHOTRAC DF3200 MKII were conducted for WHITING and apply to this survey:

Vessel	Area	Latitude	Longitude	DN
2930	Truman Annex Basin, Fl	24° 33' 12" N	081° 48' 36" W	156
2931	Truman Annex Basin, Fl	24° 33' 06" N	081° 48' 31" W	136

Leadline calibration was checked on March 13, 2000 and the calibrations confirmed that leadline errors were negligible. Refer to the echogram records for the above listed day numbers.

G.1(c) Static draft corrections for WHITING were measured on April 19, 1999 at Atlantic Marine Center (3.23m), August 14, 1999 Delaware Bay (3.22m), and April 20, 2000 (DN 111) at Key West, Florida (3.17m) The historical value of 3.2 meters was maintained for draft in the offset tables. Static draft corrections for launches 1005 and 1014 were measured on April 14, 2000. The Reson Seabat 8101 sensor offsets were stored in the **CARIS** Vessel Configuration File (WH05) and were applied to SWMB data acquired with Launch 1005. The HSHRSSS offsets were stored in the **CARIS** Vessel Configuration Files (WH29) and were applied to side scan data during the Recompute SSS Navigation Program in SIPS. HPS Offset Tables 3 (1005) and 9(WHITING) were applied during data processing only for VBES data acquired with all survey vessels. See Separate IV for data records. *

G.1(d) Settlement and squat values for WHITING were determined on April 19, 1999 (**HPS** Offset Table 9). The settlement and squat correctors were applied during data processing. Settlement and squat values for Launch 1005 were measured July 26, 2000 using OTF ("On-the-Fly") GPS techniques (**CARIS** Vessel Configuration File WH05).

G.1(e) WHITING is equipped with a **TSS DMS-05** Dynamic Motion Sensor (S/N 2066). Heave correctors determined by the DMS-05 sensor were acquired in **HYPACK** during data acquisition and applied to VBES data during processing.

Launch 1005 is equipped with a **TSS** Position and Orientation System for Marine Vessel (POS/MV S/N 020). Heave, pitch, and roll data from the **TSS** POS/MV were applied to SWMB data during

** FILED WITH THE ORIGINAL FIELD RECORDS*

processing.

G.1(f) Heave, pitch, roll, and navigation latency biases for Launch 1005 were determined during patch test conducted on April 13, 2000 (DN 104). SWMB vessel offsets, dynamic draft correctors, and system bias values are contained in **CARIS** Vessel Configuration Files (VCFs) and were created using the program “**VCFEDIT**” in **CARIS**. These offsets and biases are applied to the sounding data during processing in **CARIS**. The VCFs and Patch Test data are included with the digital HDCS data.

G.2 No unusual or unique methods or instruments were used to correct sounding data.

G.3 Verified tides for Springmaid Pier, SC (Station 866-1070) were applied to these data using the following correctors:

SPRINGMAID, SC TIDE GAUGE Reference Number 866-1070	
Zone ATL740	Zone ATL741
Time Corrector -18 minutes	Time Corrector -12 minutes
Range Ratio 0.73	Range Ratio 0.77

G.4 No diver least depth gauge was used for this survey. (See Section M and Separates IV)

G.5 No significant systematic errors were detected.

G.6(a) The vertical datum for this survey is Mean Lower Low Water (MLLW). The operating tide station at Beaufort, Duke Marine Lab, NC (865-6483) served as the Primary control station for datum determination.

G.6(b) Reference or subordinate data for this project were acquired at the secondary station at Springmaid Pier, SC (866-1070) and the tertiary station at Atlantic Beach Triple S Pier, NC (865-6590) by N/OES231. A request for approved tides was sent to N/OPS1, dated December 12, 2000 (see APPENDIX D). (See Section G.6d) *FILED WITH THE ORIGINAL FIELD RECORDS*

G.6(c) SWMB data processing were accomplished using preliminary water level data during field processing. Verified water level data was applied prior to data submission to N/CS33 (downloaded from the CO-OPS web-site)

G.6(d) Final tide zoning and verified tide values should be applied to the entire SWMB data set in **CARIS** and **HPS**. Note that **CARIS/HIPS** applies zoning to all beams using only the zone in which the nadir beam resides. **HPS** will apply zoning to all soundings independently based on which zone they lie in.

Upon receipt of Approved Tides, a comparison should be conducted by The Atlantic Hydrographic Branch (N/CS33) to determine whether tidal reference station(s), tide correction, or zoning

correctors differ from the applied CO-OPS verified tides. If tide station(s) and/or tidal data reducers do not differ, no additional application of approved tides should be conducted in

CARIS/HIPS. If tide station(s) and/or tidal data reducers do differ, approved tidal data will supercede these correctors and must be applied to sounding data in **HPS**. *APPROVED TIDES AND ZONES WERE APPLIED COMPARED AND NOT APPLIED DURING OFFICE PROCESSING*

H. HYDROGRAPHIC POSITION CONTROL *SEE ALSO THE EVALUATION REPORT.*

H.1 The horizontal reference surface for this survey is the North American Datum of 1983 (NAD 83). No horizontal control stations were established for this survey.

H.2 Positioning for this survey was obtained from the Global Positioning System (GPS) corrected by the U.S. Coast Guard differential beacon stations. The following USCG differential beacon stations were used:

USCG DGPS Beacon	Freq KHz	Rate BPS	Latitude	Longitude	Range N.M.	Beacon ID #
Charleston, SC	298	100	32°45'27.2142"N	079°50'34.3350"W	150	808
Fort Macon, NC	298	100	34°41'50.5998"N	076°40'59.2236"W	130	807

H.3 Accuracy requirements were met as specified by the Hydrographic Manual, sections 1.3 and 3.1, and Field Procedures Manual, section 3.4.

H.4 GPS and DGPS signals were acquired with the following hardware equipment:

Vessel	GPS/DGPS Hardware	Serial Number
NOAA Ship WHITING S-329	Trimble DSM212L	Sys 1: 0220159721 Sys 2: 0220159722
Launch 1005	Trimble DSM212L (RTCM) TSS POS/MV320 ver 2 (GPS)	0220168291 020

Trimble receivers were initialized to the appropriate station and frequency using the Trimble TSIPTalker (ver.2)

H.5. The GPS Horizontal Dilution of Precision (HDOP) and Expected Position Error (EPE) specified by the Draft NOAA Hydrographic Project Instructions were monitored during on-line data acquisition. HDOP was also manually checked via the Detailed Data Abstract in **HPS**. The calculated maximum allowable HDOP value was rarely exceeded. Anomalous position data were either smoothed or flagged "rejected," depending on the extent of the affected data.

Performance checks for WHITING and both launches were conducted with both launches secured in davits or a side by side comparison using the program **Pcheck** (from the Hydrosoft 9.4 CD-ROM) in the **Shipdim** software. Differential correctors from the USCG DGPS stations were used to

correct GPS signals. Simultaneous **HYPACK** positions on both platforms were acquired and an offset distance and azimuth computed between the ship and each launch system. The computed offset distances and azimuths were compared to measured values. A summary of the DGPS performance check is included in Appendix F. All DGPS performance checks confirmed that the equipment was working properly.

H.6. Calibration data is not required for differential GPS.

H.7(a) There were no unusual methods used to operate the positioning equipment.

H.7(b) There were no positioning equipment malfunctions.

H.7(c) There were no unusual atmospheric conditions noted which might have affected data quality.

H.7(d) The maximum allowed HDOP value of 4.0 was never exceeded. Weak differential signals or satellite problems did not affect the survey data quality. A minimum of four satellites were used throughout this survey providing altitude-unconstrained positioning

H.7(e) There were no systematic errors noted which might have affected data quality.

H.7(f) WHITING utilizes the *Recompute SSS Navigation* program to recalculate the towfish position based on the course made good of the vessel as opposed to the instantaneous heading of the vessel. During *Recompute SSS Navigation*, tow point measurements (A-frame and cable out), fish height, and depth are used to calculate horizontal layback. The SSS offset and layback distances for WHITING's A-frame was measured on March 18, 1999.

H.7(g) WHITING'S echosounder transducer positions were measured on April 15, 1999 using the high frequency echosounder transducer as the reference point. On June 10, 1999 the layback and offsets for WHITING's GPS antennae were measured with respect to the echosounder transducer. These offsets were entered into HPS Offset Table 9.

For Launch 1005, the reference point is the IMU (Inertial Motion Unit), which is located amidships and along the centerline of the vessel. Offsets were applied from the **CARIS** Vessel Configuration File (VCF WH05) to correct for biases and navigation latencies from data acquired with the Reson 8101. (See Appendix E for data records)

I. SHORELINE

No shoreline is contained within the boundaries of this survey.

J. CROSSLINES

No crossline comparisons were required for this survey, however development lines were run orthogonally. There was excellent correlation.

K. JUNCTIONS

This survey does not junction with any contemporary surveys.

L. COMPARISON WITH PRIOR SURVEYS *SEE ALSO THE EVALUATION REPORT*

A comparison with prior surveys is not required.

M. ITEM INVESTIGATION REPORTS

All side scan contacts with measurable shadows and all contacts which appeared manmade were deemed significant. All significant contacts were developed with SWMB. Results from these developments are summarized as follows:

AWOIS No: 555

Item Description: UNKNOWN

Source: NM44/55

AWOIS Position: Lat. 33° 51'57.03" N Lon. 077° 28'48.6" W

Required Investigation: SD, S2, DI Radius: 500m

Largest Scale Chart Item Resides: 11539 17thed. June 5 1993 at 1:80,000 Soundings in Feet

INVESTIGATION *SHEET 1 OF 2*

Date(s): June 30, 2000(DN 182)

Time: 13:03:12.00 UTC

Position No: Fix 61013 *LD EAST END*

Investigation Used: S2, SWMB, DI

Survey Position(s): Lat. 33° 51'58.75" N Lon. 077° 28'48.73" W

Position Determined By: Differential GPS

Investigation Summary: This item was located and imaged multiple times using the WHITING's KLEIN 5250 HSHRSSS during the ship's transit south. Due to inclement weather, development of this wreck was not possible until the ship's transit north in June. Side scan contact 94_014_0532_4 was used to locate AWOIS 555 and conduct a SWMB development. Development lines were run orthogonally to each other in a north-south and east-west direction at a spacing of 40 meters. Position number 61013 is the shoalest point at the wreck's eastern end. The SWMB least depth corrected with verified tides was 18.6 meters (61.0 Ft/10.1 fm) at the survey position. The danger circle is not properly charted. Partial wreckage lies outside the western edge of a danger circle. Position 62203 and 61253 define the middle and western portion of the wreck. Research of historical data revealed a wreck known to be the JOHN D.GILL torpedoed in WWII. Local dive reports indicate relief at 60-70 fsw. The wreckage is approximately 662 feet long, 148 feet wide, and is frequented by recreational divers.

(See Appendix J. Supplemental Correspondence.) *FILED WITH ORIGINAL FIELD DATA*

Charting Recommendation: The hydrographer recommends removing the charted wreck, 16 feet cleared by wire drag and its associated danger circle. Chart a submerged wreck at 33° 51'58.75" N 077° 28'48.73" W with least depth by SWMB of "61.0 feet" and add a danger circle to encompass the extremities of the wreck. In addition, the AWOIS Item Description should be changed from UNKNOWN to WRECK JOHN D. GILL. *CONCUR CHART A (63) WK (FEET)*

(10) WK (FATHOMS)

Name 094_014_053

Offset 40
Shad Len 0
Correlating Contact

Correlating Dist 0

Second Hit

Con Lat 33.8663033
Con Lon 77.4807323

Development

Least Depth 0 (0) #Selected 0
LD Fix 0 AWOIS# 0
Day of LD 0 AWOIS Dist 0
Contact Dist 0 LD Lat
LD Lon

Comments

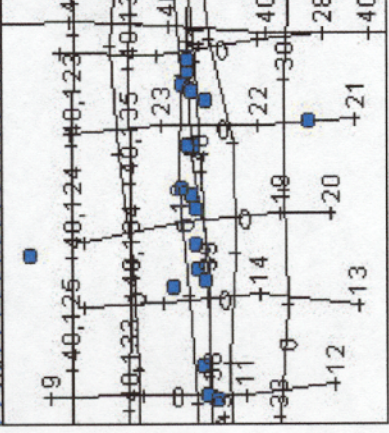
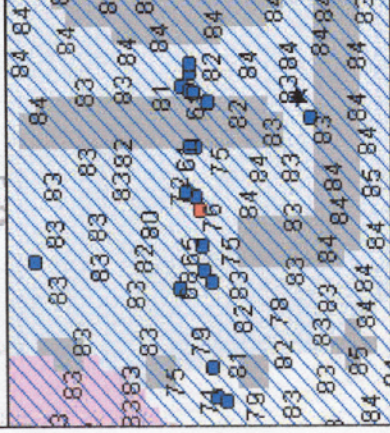
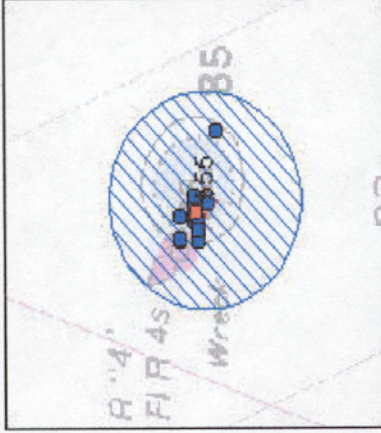
Contact Remark
Investigation
Charting Rec

Matching Swath Info
Line Day Fix Range

0, top_half 555

Fixes < Radius VM

Local Contacts



Resolution
Height
Apparent Height 0
Average Depth 0
Top Depth 0

Significance Criteria

4.3 > 1 m < 20 m or 10 %
-4.3 < 25

Both Criteria must be red for

Auto-Signify Significant

Resolution Criteria

Relief is greater than X% of contact ht.
0 > 100 % 4.3
Multibeam Coverage
Number of Depths is greater than X
0 > 7
Top Depth is greater than local depth
-4.3 > 0
Any green means resolved

Auto-Resolve Resolved

Resolution Notes

Resolution Notes input field

AWOIS NO: 564

Item Description: UNKNOWN

Source: NM44/55

Position: Lat. 33° 57'57.62" N

Long. 077° 01'49.79" W

Required Investigation: SD, S2, DI

Radius: 500m

Largest Scale Chart for Item: 11520 38th ed. July 10, 1999

1: 432,720 Soundings in Fathoms

INVESTIGATION *SHEET 2 OF 2*

Date(s): June 30, 2000 (DN 182)

Time 19:00:15.00

HIPS Position Number: Fix number 64684

Investigation Used: S2, SWMB, DI

Survey Position(s): Lat. 3³7°57'56.07" N Lon. 077°01'49.09" W

Position Determined By: Differential GPS

Investigation Summary: This item was located and imaged multiple times using the WHITING's KLEIN 5500 High Speed High Resolution Side Scan Sonar during the ship's transit south. Due to inclement weather, development of this wreck was not possible until the ship's transit north in June. Side scan contact 94_009_0105_4 was used to locate the item. A SWMB development was accomplished over the entire wreck. Development lines were run orthogonally to each other in a north easterly and north westerly direction at a spacing of 40 meters. Position number 64684 defines the Southeast portion of the wreck. It is the bow and is detached from the hull. The SWMB least depth corrected with verified tides was 25.7 meters, (84.3ft/14.0fm). Position numbers 66565 and 63327 define the mid and northwest portions of the wreck. Research of historical data revealed this wreck to be the CASSIMER sunk in a collision. The wreckage is approximately 420 feet long and 100 feet wide and is also frequented by recreational divers.

(See Appendix J. Supplemental Correspondence.) *FILED WITH ORIGINAL FIELD RECORDS*

Charting Recommendation: The hydrographer recommends the removal of the charted wreck, least depth known to be "6 fathoms" by wire drag. Replace with wreck least depth by SWMB of "14.0 fathoms" with a danger circle encompassing the wreck at 37°57'56.07" N, 077°01'49.09" W. In addition, the AWOIS Item Description should be changed from UNKNOWN to WRECK CASSIMER. *CONCUR CHART A (14) WK (FA)*

Name 094_010_01
 Offset -75
 Shad Len 0
 Correlating Contact

Correlating Dist 0
 Second Hit
 Con Lat 33.9657922
 Con Lon 77.0307952

Development

Least Depth	0	(0)	#Selected	0	●
LD Fix	0		AWOIS#	0	
Day of LD	0		AWOIS Dist	0	
Contact Dist	0		LD Lat		
			LD Lon		

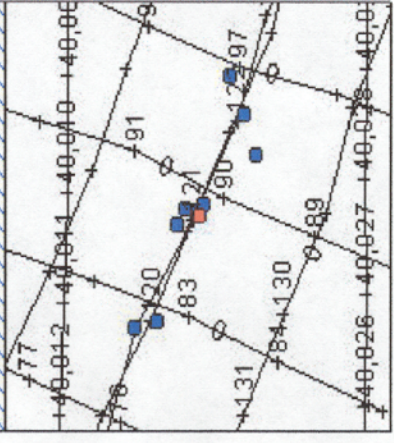
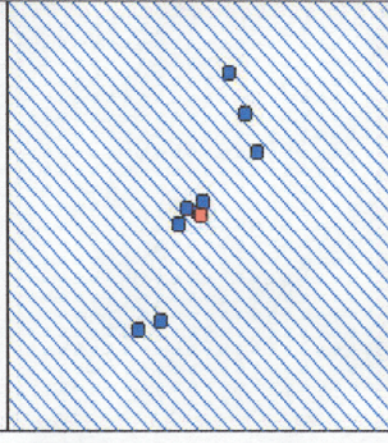
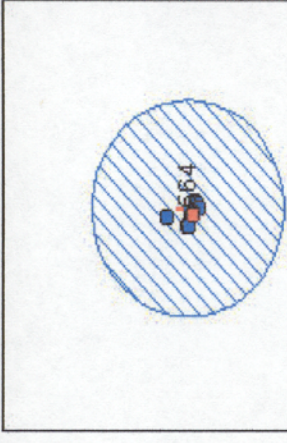
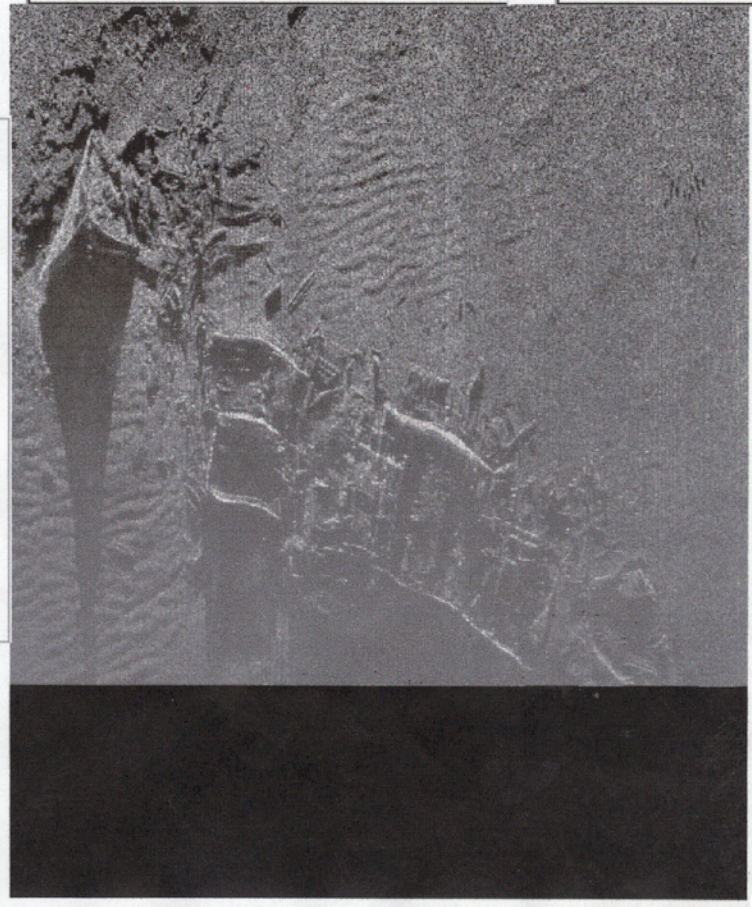
Comments
 Contact Remark
 Investigation
 Charting Rec

0, whole view aw 564

Matching Swath Info
 Line Day Fix Range

Fixes < Radius VM

Local Contacts



Resolution
 Height
 Apparent Height
 Average Depth
 Top Depth

Significance Criteria
 0 > 1 m < 20 m or 10 %
 0 < 25

Both Criteria must be red for

Auto-Signify Significant

Resolution Criteria

Relief is greater than X% of contact ht.

0 > 100 % 0

Multibeam Coverage

Number of Depths is greater than X

0 > 7

Top Depth is greater than local depth

0 > 0

Any green means resolved

Auto-Resolve

Resolved

Resolution Notes

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

N.1 Three charts are affected by this survey:

CHART AFFECTED	EDITION	DATE	CHART SCALE
Chart 11539	17 th Ed.	05 June 1993	1 : 80,000
Chart 11520	38 ³⁹ th Ed.	10 July 1999 08 APR 2000	1 : 432,720
Chart 11009	35 th Ed.	07 Aug 1999	1 : 1,200,000

N.2 No Danger to Navigation Reports were issued as a result of this survey.

N.3(a) A comparison of surveyed soundings was made to NOS chart 11539. Soundings are deeper than charted(See section M.1. and M.2). *DO NOT CONCUR. SOUNDINGS ARE IN GOOD AGREEMENT WITH THE CHART.*

N.3(b) No significant shoal or deepening trends were observed within the limits of this survey.

N.3(c) Some soundings of AWOIS 555 lie outside the danger circle (See M.1).

N.3(d) No maintained channels occur within the limits of this survey.

N.3(e) No fairways or traffic schemes occur within the survey limits.

N.4(a) The wrecks are accurately depicted by the buoys.

N.4(b) The charted items were found in the survey.

N.4(c) No other feature definitions needed to be discussed.

N.4 (d) Recommendations for features are discussed in Section M.

N.4.(e) There are no bridges, or overhead cables in this survey area.

N.4(f,g) There is no submarine cable or pipeline in this survey.

N.4(h) There are no ferry routes in this survey.

N.5 There are no recommendations to scale, coverage and format of the chart.

O. ADEQUACY OF SURVEY *SEE ALSO THE EVALUATION REPORT*

This survey is sufficiently complete and fully adequate to supersede prior survey data within common areas.

P. AIDS TO NAVIGATION

P.1 N/CS31 provided preliminary results of this survey to Coast Guard Fifth District.

P.2 A comparison was made between the detached positions of the buoys and the largest scale chart of the area. No aid was found to deviate from its charted position by more than its approximate mooring watch circle. Each aid adequately serves the apparent purpose for which it was established.

P.3 The following aids appear in this survey and are adequately charted.

R "4" Fl R 4s	33 51 54.83N 77 28 52.46 W
R "WR2" QR	33 57 41.66N 77 01 47.87 W

P.4 There were no aids found that did not appear in the light list.

P.5 There were no aids in the light list that were not found.

Q. STATISTICS

Lineal Nautical Miles of Sounding Lines	5.1 nm
Square Nautical Miles of Hydrography	0.1 sqnm
Days of Production	2
Detached Positions	8
Bottom Samples	0
Tide Stations	3
Velocity Casts	3
Dive Item Investigations	0
SeaBat Item Investigations	2

R. MISCELLANEOUS *SEE ALSO THE EVALUATION REPORT*

R.1. Bottom samples were not required as per project instructions.

R.2. The following files are Not for Smooth Plot and should not be used in the final smooth sheet.

Sheet01	D3009410	D3118200
Sheet02	D3009400	D3118210

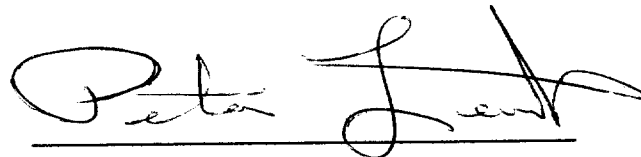
S. RECOMMENDATIONS

No further survey work is recommended.

T. REFERRAL TO REPORTS

A copy of the Coast Pilot Report will be included in the Separates. No reports or data are referred to in this Descriptive Report that are not included with this survey.

This report and the accompanying field sheets are respectfully submitted.



Peter G. Lewit
Senior Survey Technician
NOAA Ship WHITING S329

APPENDIX K

APPROVAL SHEET

S-F908-WH-00
Onslow Bay
North Carolina
37nm SSE and 40nm SSW of New River Inlet


Survey Registry No. F00461

Field operations for this basic hydrographic survey were conducted under my daily supervision with frequent checks of progress and adequacy. All field sheets, this Descriptive Report, and all accompanying records and data are approved.

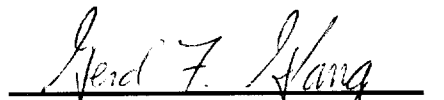
This survey is adequate to supersede all prior surveys in common areas, and for application to the relevant NOS nautical charts.

Respectfully,

Richard T. Brennen
Lieutenant, NOAA
Operations Officer
NOAA Ship WHITING


Date June 16, 2001

Gerd F. Glang
Lieutenant Commander, NOAA
Commanding Officer
NOAA Ship WHITING


Date JUNE 20, 2001

F00461

GEOGRAPHIC NAMES

Name on Survey	A ON CHART NO. 11539 B ON PREVIOUS SURVEY NO. 11520 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									2
NORTH CAROLINA (title)	X		X									3
ON SLOW BAY	X		X									4
												5
												6
												7
												8
												9
												10
												11
												12
												13
												14
												15
												16
												17
												18
Approved: <i>Chris Clay</i>											19	
Chief Geographer											20	
JUL 23 2001											21	
												22
												23
												24
												25



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SERVICE
Silver Spring, Maryland 20910

TIDE NOTE FOR HYDROGRAPHIC SURVEY

DATE: June 5, 2001

HYDROGRAPHIC BRANCH: Atlantic
HYDROGRAPHIC PROJECT: S-F908-WH-2000
HYDROGRAPHIC SHEET: F00461

LOCALITY: Onslow Bay, NC
TIME PERIOD: April 3, 2000 & June 30, 2000

TIDE STATION USED: 866-1070 Springmaid Pier, SC
Lat. 33° 39.3'N Lon. 78° 55.1'W
PLANE OF REFERENCE (MEAN LOWER LOW WATER): 0.000 meters
HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 1.601 meters

REMARKS: RECOMMENDED ZONING
Use zone(s) identified as: ATL740 & ATL741.

Refer to attachments for zoning information.

Note 1: Provided time series data are tabulated in metric units (meters), relative to MLLW and on Greenwich Mean Time.

Thomas V. New 6/6/01

CHIEF, REQUIREMENTS AND DEVELOPMENT DIVISION

09/07/2001

HYDROGRAPHIC SURVEY STATISTICS
REGISTRY NUMBER: F00461

NUMBER OF CONTROL STATIONS		2
NUMBER OF POSITIONS		7024
NUMBER OF SOUNDINGS		7024
	TIME-HOURS	DATE COMPLETED
PREPROCESSING EXAMINATION	4.0	07/11/2001
VERIFICATION OF FIELD DATA	15.0	07/16/2001
QUALITY CONTROL CHECKS	0.0	
EVALUATION AND ANALYSIS	1.0	
FINAL INSPECTION	7.0	09/05/2001
COMPILATION	17.0	09/07/2001
TOTAL TIME	44.0	
ATLANTIC HYDROGRAPHIC BRANCH APPROVAL		09/06/2001

LETTER TRANSMITTING DATA

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

ORDINARY MAIL AIR MAIL

REGISTERED MAIL EXPRESS

GBL (Give number) _____

DATE FORWARDED 09/10/2001

NUMBER OF PACKAGES 2

TO:

[NOAA/National Ocean Service
Chief, Data Control Group, N/CS 3x1
SSMC3, Station 6826
1315 East-West Highway
Silver Spring, MD 20910-3832]

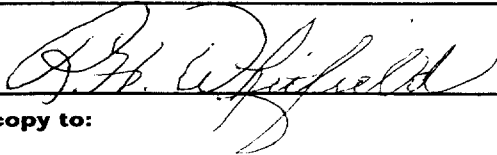
NOTE: A separate transmittal letter is to be used for each type of data, as tidal data, seismology, geomagnetism, etc. State the number of packages and include an executed copy of the transmittal letter in each package. In addition the original and one copy of the letter should be sent under separate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

F00461
North Carolina, Onslow Bay

1 Box Containing:
1 Original Descriptive Report with 2 page size smooth sheets appended

1 Tube Containing:
1 paper composit plot of F00461 for chart 11539
1 paper composit plot of F00461 (1 of 2) for chart 11520
1 paper composit plot of F00461 (2 of 2) for chart 11520
1 mylar H-Drawing of F00461 for chart 11539
1 mylar H-Drawing of F00461 for chart 11520

FROM: (Signature)



RECEIVED THE ABOVE
(Name, Division, Date)

Return receipted copy to:

[Richard H. Whitfield
NOAA, NOS, Atlantic Hydrographic Branch, N/CS33
439 West York St.
Norfolk, VA 23510]

**ATLANTIC HYDROGRAPHIC BRANCH
EVALUATION REPORT FOR F00461 (2000)**

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
I/RAS B, version 5.01
CARIS HIPS/SIPS

The smooth sheet was plotted using a Hewlett Packard DesignJet 2500CP plotter.

H. HYDROGRAPHIC POSITION CONTROL

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. Two page size plots have been annotated with ticks showing the computed mean shift between the NAD 83 and the North American Datum of 1927 (NAD 27).

(1) To place plot 1 of 2 on NAD 27, move the projection lines 0.631 seconds (19.443 meters or 1.94 mm at the scale of the survey) north in latitude, and 1.124 seconds (28.894 meters or 2.89 mm at the scale of the survey) east in longitude.

(2) To place plot 2 of 2 on NAD 27, move the projection lines 0.625 seconds (19.254 meters or 1.93 mm at the scale of the survey) north in latitude, and 1.207 seconds (30.979 meters or 3.10 mm at the scale of the survey) east in longitude.

K. JUNCTIONS

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

L. 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.

**N. COMPARISON WITH CHART 11009 (35th Edition, AUG 07/99)
11520 (39th Edition, APR 08/00)
11539 (17th Edition, JUN 05/93)**

The charted hydrography originates with the prior surveys and requires no further consideration. An adequate chart comparison is discussed in section N. of the Descriptive Report.

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

O. ADEQUACY OF SURVEY

This is an adequate hydrographic/side scan sonar/multibeam survey. No additional field work is recommended.

R. 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. The following NOS Charts were used for compilation of the present survey: 11520 (39th Edition, APR 08/00)
11539 (18th Edition, JUL 14/01)

Robert Snow


Robert Snow

Cartographic Technician
Verification of Field Data
Evaluation and Analysis

**APPROVAL SHEET
F00461 (2000)**

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.


Richard H. Whitfield
Cartographer
Atlantic Hydrographic Branch


Date: 6 SEPT. 2001

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.


James S. Verlaque, LCDR, NOAA
Chief, Atlantic Hydrographic Branch

Date: 6 SEPTEMBER 2001

Final Approval:

Approved: 
Samuel P. De Bow, Jr.
Captain, NOAA
Chief, Hydrographic Surveys Division

Date: October 18, 2001

ONSLOW BAY

NORTH ATLANTIC OCEAN

33° 52' 00"

84 84 83 83 83 83 84 85
83 83 83 83 83 83 83 83 85
83 84 82 78 83 80 83 84 85
83 84 77 80 65 66 77 84
83 83 80 78 84 82 84 84
83 83 83 83 83 83 84 84
83 83 83 84 84 84 83

"JOHN D GILL"

F00461
NORTH CAROLINA
NORTH ATLANTIC OCEAN
ONSLOW BAY
SCALE: 1:10,000
JUN 30, 2000
NORTH AMERICAN DATUM OF 1983
SOUNDINGS IN FEET AT MLLW
SHEET 1 OF 2
AWOIS ITEM 555

77° 29' 00" W

NAD 27 33° 51' 30" N

33° 51' 30"

CHECKED BY: RS
7/12/01

77° 29' 00"

77° 28' 30"

ONSLOW BAY

NORTH ATLANTIC OCEAN



33° 58' 00"

F00461

NORTH CAROLINA
NORTH ATLANTIC OCEAN

ONSLOW BAY

SCALE: 1:10,000

JUN 30, 2000

NORTH AMERICAN DATUM OF 1983

SOUNDINGS IN FEET AT MLLW

SHEET 2 OF 2

AWOIS ITEM 564

77° 02' 00" W

NAD 27  33° 57' 30" N

CHECKED BY: RS
7/12/01

33° 57' 30"

77° 02' 00"

77° 01' 30"

MARINE CHART BRANCH
RECORD OF APPLICATION TO CHARTS

FILE WITH DESCRIPTIVE REPORT OF SURVEY NO. F00461

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
11539	9/7/01	<i>[Signature]</i>	Full Part Before After Marine Center Approval Signed Via Drawing No.
11520	9/7/01	<i>[Signature]</i>	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.
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