

F00462

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-10-1-00

Registry No. F00462

LOCALITY

State North Carolina

General Locality North Atlantic Ocean

Locality Monitor Marine Sanctuary

2000

CHIEF OF PARTY
LCDR Gerd F. Glang

LIBRARY & ARCHIVES

DATE

August 28, 2001

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-10-01-00

State: North Carolina

General locality: NORTH ATLANTIC OCEAN
Cape Hatteras, North Carolina

Locality: MONITOR Marine Sanctuary

Scale: 1: 10,000 Date of survey: April 2, 3, and June 10, 2000

Instructions dated: March 28, 2000 Project Number: S-F904-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

Graphic record scaled by: WHITING Personnel

Graphic record checked by: WHITING Personnel

Hewlette Packard Design Jet 2500 00 (office)

Protracted by: N/A Automated plot by: HP750C (FIELD)

Verification by: Atlantic Hydrographic Branch Personnel

Soundings in: Feet: Fathoms: Meters: at MLW: MLLW: (°):

* HAND WRITTEN NOTES IN DESCRIPTIVE REPORT WERE MADE DURING OFFICE PROCESSING.

Remarks: Item Investigation by HSHRSSS (For Imagery Only)

ALWOIS/SURF ✓ 7/30/01 SJV

This chartlet may not be up to date with the latest
Local Notice to Mariners information.
NOT FOR NAVIGATION



Meters



Chartlet 1 of 1



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Chart 11555, 36th Edition, January 11 1997, Scale 1:80,000, Wimble Shoals to Ocracoke Inlet. Data from NOAA Hydrographic Survey F00462.
Depths Plotted in Feet

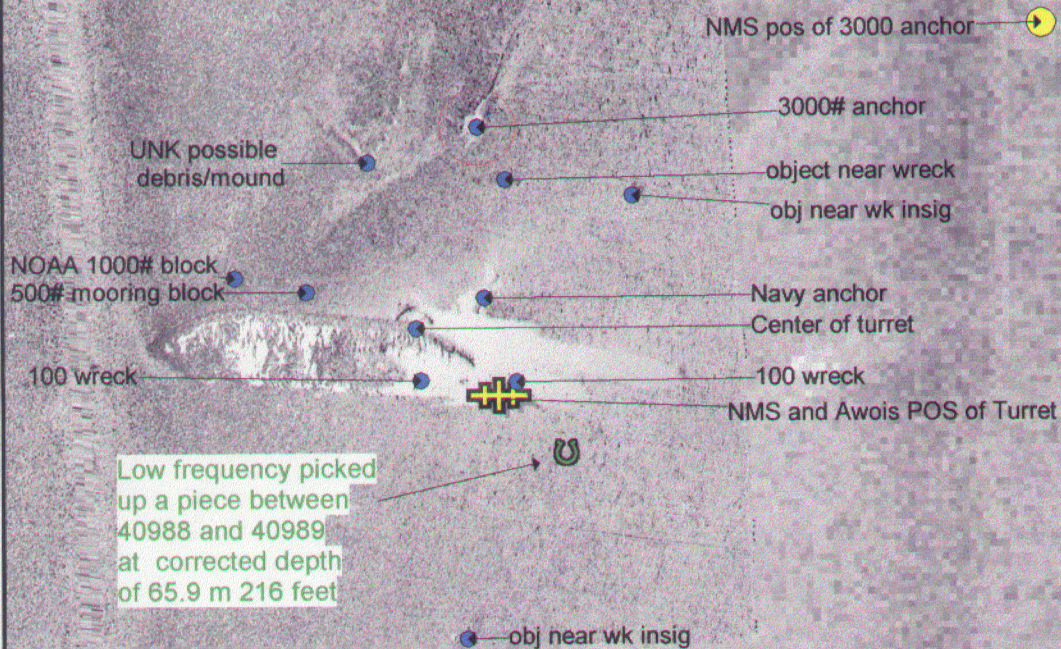
Project: S-F904-WH
Survey: F00462
State: North Carolina
Locality: Atlantic Ocean
Sub-locality: USS Monitor Marine Sanctuary
Survey Scale: 1:10,000

Sounding Units: Meters
Sounding Datum: MLLW
Horizontal Datum: NAD 83
Projection: UTM 18
Central Meridian: 075° 00 00
Scale Factor: 0.9996

NOAA Ship WHITING
LCDR Gerd F. Glang
Commanding
April 2 to April 8, 2000
June 10, 2000

100% Contacts = BLUE
 200% Contacts = RED
 DEV Contacts = PURPLE
 NMS & Awois Pos=YELLOW

0 10 20
 meters



This chartlet may not be up to date with the latest Local Notice to Mariners information.
NOT FOR NAVIGATION.

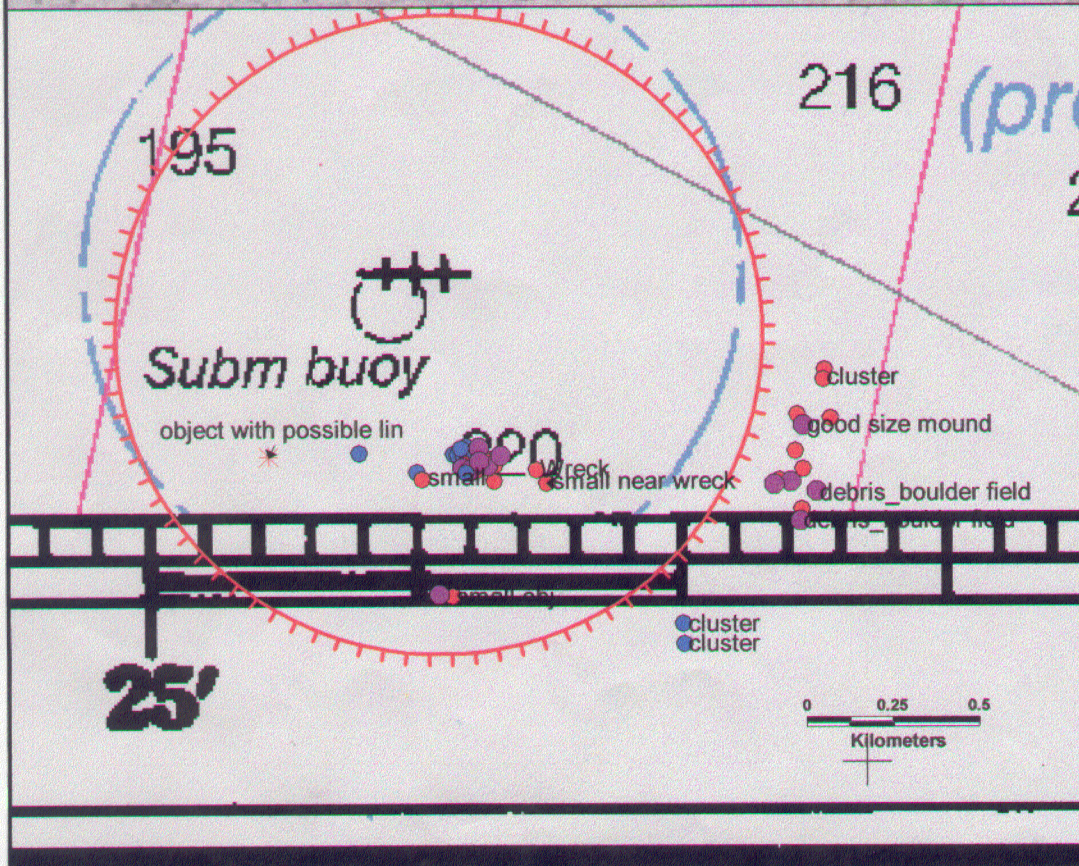


Chart 11555, 36th Edition, January 11, 1997, Scale 1:80,000, Wimble Shoals to Ocracoke Inlet. Data from NOAA Hydrographic Survey F00462

Chartlet 1 of 1
 Depths Plotted in Feet

NOAA Ship WHITING
LCDR Gerd F. Glang
 Commanding
 April 2 to April 3, 2000
 June 10, 2000

Sounding Units: Meters
 Sounding Datum: MLLW
 Horizontal Datum: NAD 83
 Projection: UTM 18
 Central Meridian: 075° 00 00
 Scale Factor: 0.9996

Project: S-F904-WH
 Survey: F00462
 State: North Carolina
 Locality: Cape Hatteras
 Sub-locality: MONITOR, Marine Sanctuary
 Survey Scale: 1:10,000

NATIONAL OCEANIC AND
 ATMOSPHERIC ADMINISTRATION
 NATIONAL OCEAN SERVICE



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* DATA FILED WITH FIELD RECORDS.

A. PROJECT

A.1. This special hydrographic survey was conducted in accordance with Hydrographic Survey Letter Instructions S-F904-WH, Item Investigations, Monitor Marine Sanctuary, North Carolina.

A.2. The original instructions are dated March 28, 2000. This survey was originally assigned a registry number D00132.

A.3. Change No.1 is dated May 24, 2000. This survey's registry number was changed from D00132 to F00462.

A.4. This survey is designated F00462. See section B.2 for exact survey boundaries.

A.5. This special project responds to a request from the Manager, MONITOR Marine Sanctuary for a survey of the entire sanctuary and a high resolution image of the wreck and its immediate surroundings. This survey will support plans to remove MONITOR's engine. The primary purpose of this survey is to provide side scan sonar imagery of the Monitor and surrounding area.

B. AREA SURVEYED

B.1. Survey F00462 covers AWOIS Item 10586, located approximately fourteen nautical miles southeast of Hatteras Bight, NC.

B.2. Survey F00462 item investigations comprise an area with a 926 meter radius around the position 35°00'18.59" N 075°24'26.7" W.

B.3. Data acquisition for this survey began on April 2¹, 2000, (DN 92) and ended on April 3¹, 2000 (DN 93).

C. SURVEY VESSELS

C.1. NOAA Ship WHITING was used for VBES and Side Scan Sonar Operations.

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

D. AUTOMATED DATA ACQUISITION AND PROCESSING *See Also Evaluation Report.*

D.1. A detailed list of data acquisition and processing software used for this survey can be found in appendix H. ** DATA Filed with Field Records.*

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 (HPS)** 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) 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. Data were processed using Universal Systems Limited (USL) **CARIS/SIPS** (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 **VELOCWIN** (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 an ODOM ECHOTRAC DF3200 MKII precision survey echosounder. Depth profiles were visually reviewed and cleaned. Depth fliers were identified and flagged as "rejected". Biological interference due to large schools of fish often found in the vicinity of wrecks was frequently observed in the VBES data. Sonar returns typical of the presence of aquatic life, e.g. unusually shoal soundings on one VBES pass, with no correlating SSS data, were reviewed and also flagged as "rejected" at the discretion of the hydrographer.

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. Edits and inserted depths were entered into **HPS**. Fixes were flagged for rejection if HDOP exceeded 4.0. Edits to the digital depth file were made in **HPS**. Data were smoothed or rejected if "stuck heave" (unusually high values for heave) were noted. Offset and velocity tables were applied in **HPS**. Tide zoning and corrections were applied in **HPTools**. After review and editing, depths were drawn into **MAPINFO**. Depth data were excessed with the **HPTools** utility **ZOOMEDIT**. 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 (HSHRSSS) tow fish and the T5100 Transceiver Processing Unit (TPU).

E.2 The 5250 HSHRSSS was configured with a vertical beam angle of 40°.

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

E.4(a) The 100-meter range scale was used with 160 meter line spacing. 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) Two-hundred percent side scan sonar coverage was completed for this survey. Side scan sonar coverage was checked using mosaics generated in **CARIS SIPS** and imported into **MapInfo** using the "**mosaic2tiffab**" program. Any deficiencies in the side scan sonar data were found, and a holiday line file was created from the mosaics.

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

E.4(e) The 5250 HSHRSSS 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. 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 may also be deemed significant if the item appears to be manufactured (i.e. an obstruction) as opposed to a natural feature.

E.6(a) All information concerning a contact was displayed in the **CORRELATOR** program, including comparisons between contacts and AWOIS item positions, surrounding depths, and contact cross references.

F. SOUNDING EQUIPMENT

F.1 Bathymetric data was acquired using the ODOM ECHOTRAC DF3200 MKII (S/N 9656).

F.2 No Diver Least Depth Gage was used.

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

F.4(a) ECHOTRAC high-frequency (100 kHz) and low frequency (24 kHz) data were recorded during data acquisition. The high frequency returns served as the primary sounding source for VBES.

F.5(a) All sounding data acquired by WHITING were manually edited and entered into HPS. Vertical correctors were applied to the raw single-beam digital soundings.(see Section G).

F.5(a-c) Shallow water multibeam data were not acquired during this survey.

F.6. Klein System 5250 towed operations were typically limited to 8 knots speed-over-ground aboard WHITING. When surveying at the 75 meter range scale, speed was periodically reduced to 4 knots to decrease fish altitude for optimal contact detection.

F.7. Shallow water multibeam coverage do not apply to this survey.

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) during survey 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.

All sound velocity data were processed using VELOCWIN (version 5.0) software. Computed velocity correctors were entered into HPS sound velocity tables and re-applied during post-processing to both high and low frequency depths.

Complete data sets for each cast have been submitted on CD-ROM with the digital data package.

The following velocity cast was used for this survey:

SVP Table	DN	Vessel	Latitude	Longitude	Cast Depth(M)
1	92	2930	35° 00' 37"N	75° 24' 18"W	66.3

Sound velocity correctors were computed using VELOCITY and applied to VBES data in HPS .

G.1(b) The following dual leadline comparisons with the ECHOTRAC DF 3200 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. The sensor offsets were stored in the **CARIS** Vessel Configuration File (VCF WH29) and **HPS** Offset table 9 and were applied during data processing for each survey vessel. See Separate IV* for data records

G.1(d) Settlement and squat values for WHITING were determined on April 19, 1999 and were applied during data processing (**HPS** Offset Table 9)

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. The serial number is as follows:

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

G.3 Tide zoning for this survey was specified in Change No.1 to the letter instructions. Verified tides for Duck, NC (Station 865-1370) were applied to these data using a time corrector of -12 minutes and a range ratio of .93.

* DATA filed with Field Records.

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 Duck, NC (865-1370) served as the primary control station for datum determination.

G.6(b) There were no subordinate tide gauges installed for this project. Data for this project was acquired at the primary control station at Duck, NC (865-1370). A request for approved tides was sent to N/OPS1, dated February 27, 2001 (see APPENDIX D).*

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 differ, approved tidal data will supercede these correctors and must be applied to sounding data in HPS. * APPROVED TIDES AND ZONES WERE COMPARED TO FIELD APPLIED CO-OPS TIDES AND ZONES, NO CHANGES WERE NEEDED.

H. HYDROGRAPHIC POSITION CONTROL See Also Evaluation Report.

H.1 The horizontal datum used 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	Freq	Rate	Latitude	Longitude	Range	Beacon
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.

* DATA FILED WITH FIELD RECORDS.

H.4 The WHITING is equipped with Trimble DSM212L DGPS receivers. Trimble receivers were initialized to the appropriate station and frequency using the Trimble TSIPTalker (ver.2)

Vessel	HPS/DGPS Hardware	Serial Number
NOAA Ship WHITING S-329	Trimble DSM212L	SYS 1: 0220159721 SYS 2: 0220159722

H.5. Horizontal Dilution of Precision (HDOP) and Expected Position Error (EPE) specified by the letter 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 were conducted using the program **PCheck** (from the Hydrosoft 9.4 CD-ROM) in the Shipdim software. Differential correctors from the USCG differential beacon stations were used to correct GPS signals. A summary of the DGPS performance check is included in Appendix F. All DGPS performance checks confirmed that the equipment was working properly. DGPS monitor and scatter plots for USCG differential beacon stations are not required as per guidelines mentioned in (FPM 3.2.2.1).

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) Adequate satellite coverage was maintained throughout the project.

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.

* DATA Filed with Field Records.

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.

I. SHORELINE

No shoreline is contained within the boundaries of this survey.

J. CROSSLINES

No crossline comparisons were required for this survey.

K. JUNCTIONS

This survey does not junction with any contemporary surveys.

L. COMPARISON WITH PRIOR SURVEYS

A comparison with prior surveys is not required.

M. ITEM INVESTIGATION REPORTS

All side scan contacts with measurable shadows and all contacts which appeared man made were deemed significant. No echosounder development was done on items. Depths and heights are approximate based on the best information provided by the HSHRSSS system and VBES data. The following item(s) are discussed.

F00462

NOAA Ship WHITING

June 6, 2001

AWOIS No: 10586

Item Description: Uss Monitor

Source: N/A

AWOIS Position: Lat 35°-00'-06.84" N Lon 075°-24'-23.64" W

Required Investigation: WD, SSS Radius: 1000m

Largest Scale Chart Item Resides: 11555 36thed. Jan 11, 1997 at 1:80,000 Soundings in Feet

INVESTIGATION

Date(s): April 02, 200(DN 092.)

Time: N/A

Position Determined By: GPS

Position No: N/A

Profile #N/A Beam: N/A

Investigation Used: SSS

Surveyed Position(s): Wreck

Lat. 35° 00' 07.17" N Lot. 075° 24' 24.13" W

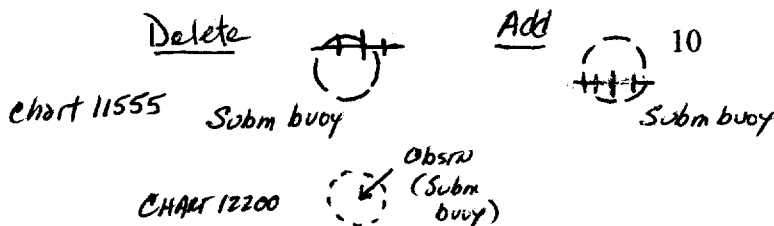
Subsurface Buoy

Lat. 35° 00' 08.14" N Lot. 075° 24' 23.79" W

Investigation Summary:

The wreck known as the USS MONITOR was located and imaged multiple times using the WHITING's KLEIN 5500 HSHRSSS. The wreck was not developed with shallow water multibeam (SMB) or vertical beam echosounder (VBES) and the ship did not survey directly on top of the item due to a subsurface mooring buoy. Lines were run orthogonally to north-south lines at a spacing of 160 meters for 200 percent coverage. Side scan development lines were also run at the 75 meter range scale for increased imagery resolution. Variations to the Monitor's position between the 100 and 200 percent side scan is due in part to the long cable length, wind and current direction. Analysis revealed that lines run east-west were more susceptible to position change due to currents. North-south lines offer the best possible position and are consistent with MONITOR NMS position. Contact 092_106_0107_5 positions the wreck at the shoalest point near the turret. Contact 092_106_0107_4 positions the 3000 lb subsurface buoy anchor. NMS documentation and historical records reveal the vessel to be upside down resting on the turret. The hull is beginning to give way. The height from keel to gun turret is approximately 18-20 feet. This corresponds to a side scan contact height of 2 - 4.5 meters but may be exaggerated due to its position on a slope. The charted depth is 220 feet, with surveyed depths in the 225 foot range. A side lobe hit was at 216 feet. The wreckage is approximately 195 feet long and 41 feet wide. The wreck is 590 meters southeast of the charted position. Archeological work and salvage operations are in progress by Monitor National Marine Sanctuary. None of the items pose a danger to navigation.

Charting Recommendation: The hydrographer recommends removing the charted sunken wreck, NOT DANGEROUS submerged buoy danger circle and marine sanctuary circle. Chart ~~SUBMERGED WRECK~~ ^{correct} SUNKEN WRECK MONITOR at the surveyed position. Chart a submerged buoy danger circle on the north side of the wreck at the surveyed position. Chart the sanctuary circle around the new wreck symbol at a 950m radius. The charted depth of 220 feet is adequate and should be retained. (See Appendix J. Supplemental Correspondence.) ^{correct} CONCERN w/ CHAIRFACTIONS - chart survey SOUNDINGS



Note: The AWOIS Position is 16 meters northwest of surveyed position. And the surveyed position is 590 meters southeast of the charted position.

N. COMPARISON WITH THE CHART

N.1 Five charts are affected by this survey:

CHART AFFECTED	EDITION	DATE	CHART SCALE
Chart 11555	36 th Ed.	11 Jan 1997	1 : 80,000
Chart 12200	46 th Ed.	4 Nov. 2000	1: 419,706
Chart 11520	39 th Ed.	36623	1 : 432,720
Chart 11009	35 th Ed.	07 Aug 1999	1 : 1,200,000
Chart 13003	45 th Ed.	28 Oct. 2000	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 11555. Agreement between charted and surveyed soundings was adequate. (See section M.1).

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

N.3(c) The subsurface buoy is 460 meters southeast of the charted position.

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

N.3(e) The survey did not reside in any fairway or traffic schemes.

N.4(a) The wreck is not accurately depicted by the chart and is 560 meters southeast of the charted position.

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

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

P. AIDS TO NAVIGATION

P.1 There was no correspondence to the Coast Guard on aids to navigation.

P.2 There are no aids to navigation to compare with the light list.

P.3 There are no aids to navigation descriptions for this survey.

P.4 There were no aids to navigation located during this service that were not found in the light list.

P.5 There were no aids to navigation listed in the light list that were not found during this survey.

Q. STATISTICS

Lineal Nautical Miles of Sounding Lines	29.87nm
Square Nautical Miles of Hydrography	1.2sqnm
Days of Production	1
Detached Positions	0
Bottom Samples	0
Tide Stations	1
Velocity Casts	1
Dive Item Investigations	0
SeaBat Item Investigations	0

R. MISCELLANEOUS

Bottom samples were not required as per letter instructions.

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

OPR-S-F904-WH-00
Monitor Marine Sanctuary
North Carolina
14nm SE of Hatteras Bight, NC.

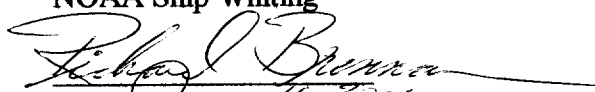
Survey Registry No. F00462

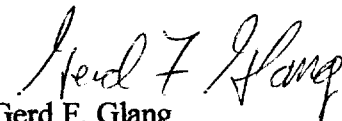
Field operations for this basic hydrographic survey were conducted under my daily supervision with frequent checks of progress and adequacy. All field sheets, this Descriptive Report, and all accompanying records and data are approved.

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
Field Operations Officer
NOAA Ship Whiting


Date June 16, 2001


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

JUNE 20, 2001
Date



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

TIDE NOTE FOR HYDROGRAPHIC SURVEY

DATE: June 6, 2001

HYDROGRAPHIC BRANCH: Atlantic
HYDROGRAPHIC PROJECT: S-F904-WH-2000
HYDROGRAPHIC SHEET: F00462

LOCALITY: USS MONITOR NMS, NC
TIME PERIOD: April 1-2, 2000

TIDE STATION USED: 865-1370 Duck, NC
Lat. $36^{\circ} 11.0'N$ Lon. $75^{\circ} 44.8'W$
PLANE OF REFERENCE (MEAN LOWER LOW WATER): 0.000 meters
HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 1.046 meters

REMARKS: RECOMMENDED ZONING
Use zone(s) identified as: ATL730

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. Mero 6/11/01

CHIEF, REQUIREMENTS AND DEVELOPMENT DIVISION



GEOGRAPHIC NAMES

F00462

Name on Survey	A ON CHART NO 11555 B ON PREVIOUS SURVEY 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										
	A	B	C	D	E	F	G	H	K		
MONITOR MARINE											1
SANCTUARY	X										2
NORTH ATLANTIC											3
OCEAN	X		X								4
NORTH CAROLINA (title)	X		X								5
											6
											7
											8
											9
											10
											11
											12
											13
											14
											15
											16
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											18
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											21
											22
											23
											24
											25

Approved: *Chris Clay*

Chief Geographer JUL 18 2001

LETTER TRANSMITTING DATA

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

- ORDINARY MAIL
- REGISTERED MAIL
- GBL (Give number) _____
- AIR MAIL
- EXPRESS

DATE FORWARDED 07/27/2001

NUMBER OF PACKAGES 1

TO:

[NOAA / National Ocean Service
Chief, Data Control Group, N/CS 3x1
SSMC3, Station 6826
1315 East-West Hwy.
Silver Spring, MD 20910-3282]

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.

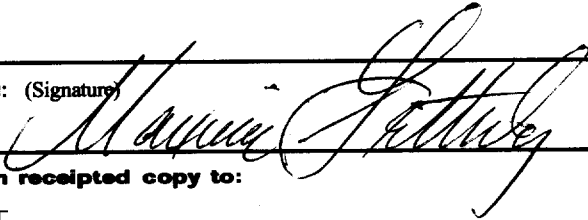
F00462

North Carolina
North Atlantic Ocean
Monitor Marine Sanctuary

- 1 Descriptive Report / Evaluation Report w/ Smooth Sheet
- 1 Paper Composite plot for Nos chart 11555
- 1 Mylar H-Drawing for NOS chart 11555
- 1 Paper Composite plot for Nos chart 12200
- 1 Mylar H-Drawing for NOS chart 12200

ATTN: George Myers 301-713-2709

FROM: (Signature)



RECEIVED THE ABOVE
(Name, Division, Date)

Return receipted copy to:

[Maxine Fetterly
Atlantic Hydrographic Branch
439 W. York St.
Norfolk, VA 23510]

07/27/2001

HYDROGRAPHIC SURVEY STATISTICS
REGISTRY NUMBER: F00462

NUMBER OF CONTROL STATIONS		2
NUMBER OF POSITIONS		1149
NUMBER OF SOUNDINGS		1149
	TIME-HOURS	DATE COMPLETED
PREPROCESSING EXAMINATION	4.0	07/06/2001
VERIFICATION OF FIELD DATA	12.0	07/16/2001
QUALITY CONTROL CHECKS	6.0	
EVALUATION AND ANALYSIS	1.0	
FINAL INSPECTION	2.0	07/13/2001
COMPILATION	10.0	07/26/2001
TOTAL TIME	35.0	
ATLANTIC HYDROGRAPHIC BRANCH APPROVAL		07/13/2001

**ATLANTIC HYDROGRAPHIC BRANCH
EVALUATION REPORT FOR F00462 (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

The smooth sheet was plotted using a Hewlett Packard DesignJet 2500CP 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 0.661 seconds (20.368 meters or 2.04 mm at the scale of the survey) north in latitude, and 1.489 seconds (38.027 meters or 3.80 mm at the scale of the survey) east in longitude.

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 11555 (36th Edition, JAN 11/97)
12200 (46th Edition, NOV 4/00)**

Hydrography

The charted hydrography originates with prior surveys and requires no further consideration. The hydrographer makes

adequate chart comparisons in section M. and section N. of the Descriptive Report.

Except as noted above, 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 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:

11555 (36th Edition, JAN 11/97)
12200 (46th Edition, NOV 4/00)

Robert Snow

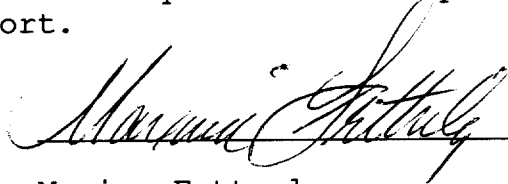
Robert Snow
Cartographic Technician
Verification of Field Data
Evaluation and Analysis

APPROVAL SHEET

F00462

Initial Approvals:

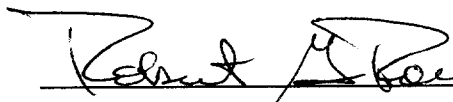
The completed survey has been inspected with regard to survey coverage, delineation of depth curves, development of critical depths, cartographic symbolization, and verification or disapproval of charted data. The digital data have been completed and all revisions and additions made to the smooth sheet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




Date: 7/13/01

Maxine Fetterly
Cartographer
Atlantic Hydrographic Branch

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



Date: 13 July 2001

 James S. Verlaque
Lieutenant Commander, NOAA
Chief, Atlantic Hydrographic Branch

Final Approval:

Approved: 

Date: August 28, 2001

Samuel P. DeBow, Jr.
Captain, NOAA
Chief, Hydrographic Surveys Division

75° 25'00"

75° 24'30"

75° 24'00"

75° 23'30"

75° 23'00"



75° 23' 30" W
 NAD 27 — 35° 00' 30" N

CHECKED BY: RS
 7/9/01

F00462
 NORTH CAROLINA
 NORTH ATLANTIC OCEAN
 MONITOR MARINE SANCTUARY
 SCALE: 1:10,000
 APRIL 1-2, 2000
 NORTH AMERICAN DATUM OF 1983
 SOUNDINGS IN FEET AT MLLW
 SHEET 1 OF 1
 AWOIS ITEM *10586

35° 00'00"

NORTH ATLANTIC OCEAN

75° 25'00"

75° 24'30"

75° 24'00"

75° 23'30"

75° 23'00"

MARINE CHART BRANCH
RECORD OF APPLICATION TO CHARTS

FILE WITH DESCRIPTIVE REPORT OF SURVEY NO. F00462

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
11555	7/24/01	<i>Manning</i>	Full Part Before After Marine Center Approval Signed Via Drawing No.
12200	7/24/01	<i>Manning</i>	Full Part Before After Marine Center Approval Signed Via Drawing No.
11555	10/4/01	Tangdi Yang	Full Part Before After Marine Center Approval Signed Via Drawing No.
11520	10/4/01	Tangdi Yang	Full Part Before After Marine Center Approval Signed Via Drawing No.
12200			
12200	10/4/01	Tangdi Yang	Full Part Before After Marine Center Approval Signed Via Drawing No.
13003	10/4/01	Tangdi Yang	Full Part Before After Marine Center Approval Signed Via Drawing No.
11009	10/4/01	Tangdi Yang	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.