

H-10669

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-10-1-96**
Registry No. **H-10669**

LOCALITY

State **SOUTH CAROLINA**
General Locality **NORTH ATLANTIC OCEAN**
Sublocality **8 NM ESE OF RATTLESNAKE
SHOAL**

19 96

CHIEF OF PARTY

..... **CDR. M. R. Kenny, NOAA**

LIBRARY & ARCHIVES

DATE **DEC 21 1996**

H-10669

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-10-1-96

State: South Carolina

General locality: NORTH Atlantic Ocean

Locality: 8.0 NM ESE of Rattlesnake Shoal, SC

Scale: 1: 10,000 Date of survey: April 4 - May 2, 1996

Instructions dated: March 5, 1996 and CH No. 1 dated March 13, 1996 Project Number: OPR-G342-WH

Vessel: NOAA Ship WHITING (S-329)

Chief of Party: CDR Maureen R. Kenny, NOAA

Surveyed by: M.R. Kenny, A.L. Beaver, P.A. Gruccio, J. Pikulsky, C.E. Parrish, E.J. Spos, G. Garte, U.L. Gardner, M.M. Cisternelli, K. Shaver, F.R. Cruz

Soundings taken by echo sounder: DSF 6000N fathometer

Graphic record scaled by: WHITING Survey Personnel

Graphic record checked by: WHITING Survey Personnel

Projected by: N/A Automated plot by: ENCAD NOAA SET III PLOTTER (AMC) HP 7959, Bruning (FIELD)

Verification by: ATLANTIC HYDROGRAPHIC BRANCH PERSONNEL

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

Remarks:

Time zones used: 0 (UTC)

Horizontal Datum Used: NAD 83

NOTES IN THE DESCRIPTIVE REPORT WERE
MADE IN RED DURING OFFICE PROCESSING

AWDIS ✓ & SURF ✓ by MBH 12/17/96

PROGRESS SKETCH - MAY 1996

OPR-G342-WH-96

Approaches to Charleston, SC

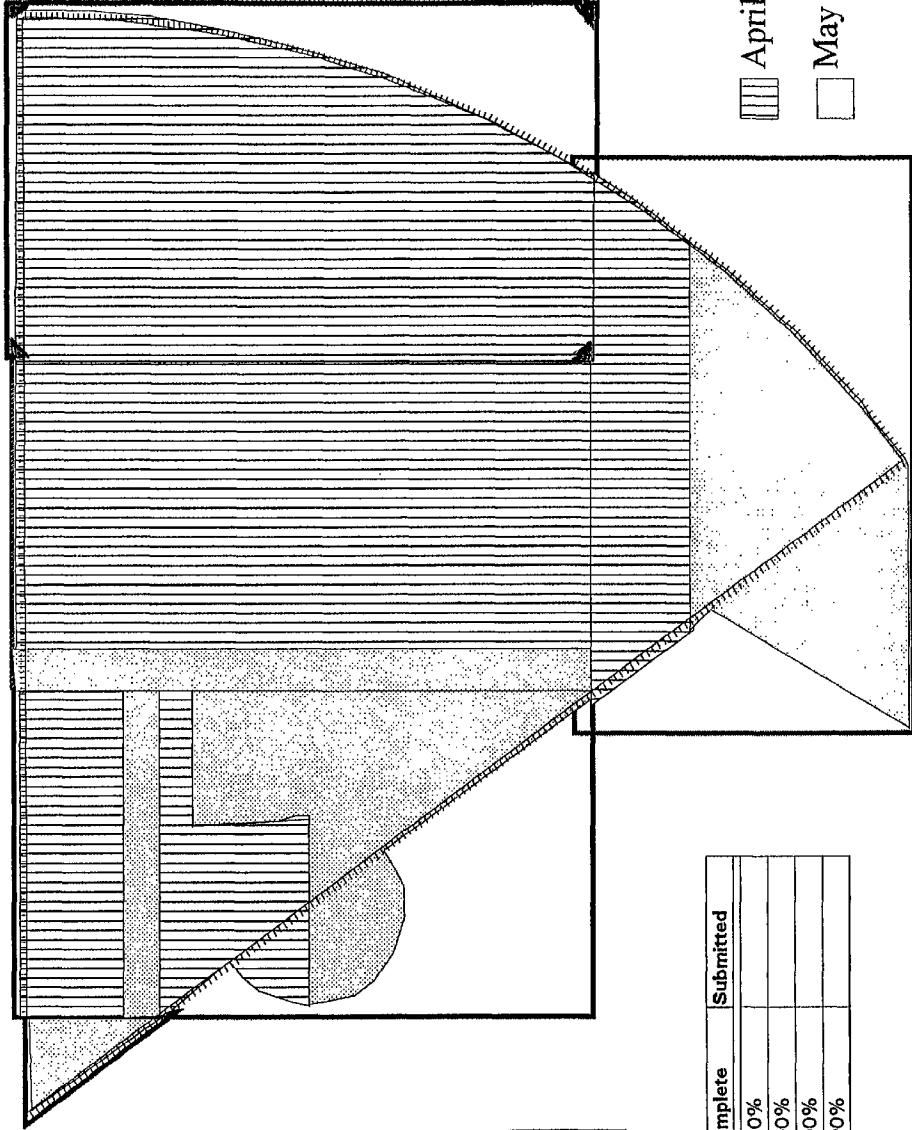
NOAA Ship WHITING

CDR Maureen R. Kenny, CMDG.

H-10669 (1996)

H-10671

H-10670



H-10674

▨ April (2-30)

□ May (1-19,23)

Accomplished	April	May
LNM Hydro	132	271
LNM SSS	1789	694
Sq NM Surveyed	69	26
AWOIS Items	0	8
Dives	11	40
Bottom Samples	15	58

DownTime Hrs	April	May
Weather	67	62
Electronics	22	3
Mechanical	0	0

Reg_No	Started	Completed	Complete	Submitted
H-10669	4/4/96	5/09/96	100%	
H-10670	4/5/96	5/23/96	100%	
H-10671	4/5/96	5/19/96	100%	
H-10674	4/10/96	5/19/96	100%	

**DESCRIPTIVE REPORT TO ACCOMPANY
HYDROGRAPHIC SURVEY
OPR-G342-WH
WH-10-1-96
H-10669**

**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 Charleston, South Carolina. The project is being conducted in response to requests from the Charleston Branch Pilots Association. Project OPR-G342-WH consists of five survey sheets. The survey described in this report was designated "C" sheet, field sheet number WH-10-1-96, and registry number H-10669. Survey Operations were conducted in compliance with the Hydrographic Project Instructions OPR-G342-WH dated March 5, 1996 and Change Number 1 dated March 13, 1996.

B. AREA SURVEYED

Hydrographic survey H-10669 is located eight nautical miles east-southeast of Rattlesnake Shoal, South Carolina. The limits of hydrography are bounded by the following six positions:

<u>Position</u>	<u>Latitude</u>	<u>Longitude</u>
1	32° 43' ⁴² 24 " N	079° 37' ⁵⁴ 52 " W
2	32° 43' ⁴² 24 " N	079° 33' ¹⁴ 14 " W
3	32° 40' 45" N	079° 33' ³⁵ 35 " W
4	32° 38' ⁴² 35 " N	079° 34' ¹⁶ 12 " W
5	32° 36' ⁴² 44 " N	079° 35' ²⁵ 25 " W
6	32° 36' ⁴² 44 " N	079° 37' ⁵² 52 " W

Survey operations commenced on April 4, 1996 (DN 095) and concluded on May 9, 1996 (DN 130).

C. SURVEY VESSELS

NOAA Ship WHITING (vessel number 2930) was used to conduct mainscheme sounding data acquisition, side scan sonar, crosslines, sound velocity casts, mainscheme echosounder splits, bottom samples, and AWOIS investigations. Launch 1014 (vessel number 2932) was used to conduct item investigations and dive operations.

No unusual problems or equipment configurations were encountered.

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

Survey data acquisition and processing were accomplished using the HDAPS system with the standard HDAPS software dated March 28, 1996.

Sound Velocity corrections were determined using *CAT* version 2.00 and *VELOCITY* version 2.11. The DGPS station was checked using *MONITOR* version 1.2. The MOD III diver least depth gauge was checked using the *DAILYDQA* program.

There were no nonstandard automated acquisition or processing methods used.

E. SIDE SCAN SONAR EQUIPMENT

Side scan sonar (SSS) operations were conducted using an EG&G model 260 slant-range corrected SSS recorder and an EG&G 272-TH dual-channel, dual-frequency towfish. The towfish was operated on the 100 kHz frequency and configured with a 20° beam depression. The following SSS equipment was used throughout the survey:

<u>VESNO</u>	<u>Type</u>	<u>S/N</u>
2930	Towfish Recorder	016700 016942
2932	Towfish Recorder	011904 016673

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 launch 1014, the SSS towfish was deployed using a Superwinch in conjunction with an adjustable davit arm on the stern. The 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 north-south mainscheme lines with 80-meter line spacing at the 100-meter range scale. This line spacing provided for proper overlap as required by Field Procedures Manual, section 7.3.2.2, as well as giving an additional 10-meter safety factor to compensate for bad weather and currents. Additionally, 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. 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 sonagram, and by passing aids to navigation. Confidence checks were also performed by noting objects at a fish haven marked by buoy R"8" (Fl R 2.5 s), located approximately one nautical mile north of the survey limits.

Contacts were measured off the sonagram 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 divers. Contacts of questionable significance were further investigated by SSS development and then by divers if deemed necessary. Least depths were determined by diver least-depth gauge (MOD III - SN 68332) and final positioning of significant items was determined with detached positions taken on diver-placed buoys.

A review of mainscheme SSS records showed patches of thermocline noise (seen as dark blotches at the outer 50 meters of the SSS trace) clustered in two areas bounded by the following positions:

<u>Position</u>	<u>Area 1</u>	
	<u>Latitude</u>	<u>Longitude</u>
1	32° 41' 20.8" N	079° 35' 18.2" W
2	32° 40' 43.8" N	079° 35' 18.2" W
3	32° 40' 43.8" N	079° 33' 33.1" W
4	32° 41' 20.8" N	079° 33' 28.8" W

<u>Position</u>	<u>Area 2</u>	
	<u>Latitude</u>	<u>Longitude</u>
1	32° 40' 06.2" N	079° 35' 18.4" W
2	32° 39' 29.2" N	079° 35' 18.4" W
3	32° 39' 29.2" N	079° 33' 59.4" W
4	32° 40' 06.2" N	079° 33' 46.2" W

In order to ensure that the thermocline did not prevent the detection of significant contacts, these

areas were covered with an additional 100% SSS coverage using the 100-meter range scale running east-west lines with 160-meter line spacing. The thermocline was not present when this third 100% SSS coverage (fixes 9982 -10148) was run and no contacts were detected.

F. SOUNDING EQUIPMENT

Raytheon Digital Survey Fathometer (DSF-6000N) echo sounders 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:

<u>VESSEL</u>	<u>S/N</u>
2930	C076N
2932	A105N

Electronic Technicians performed accuracy checks and preventative 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 launch 1014 (vessel number 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:

** DATA FILED WITH ORIGINAL SURVEY RECORDS*

<u>DN</u>	<u>Vel. Table #</u>	<u>Latitude</u>	<u>Longitude</u>	<u>Depth</u>
095	1 (ship)	32° 36' 32" N	079° 34' 55" W	23.6 m
108	2 (ship)	32° 36' 56" N	079° 38' 33" W	18.9 m
112	4 (ship)	32° 39' 06" N	079° 34' 33" W	24.3 m
112	5 (launch 1014)	32° 39' 06" N	079° 34' 33" W	24.3 m
130	14 (ship)	32° 33' 19" N	079° 40' 02" W	25.4 m
130	15 (launch 1014)	32° 33' 19" N	079° 40' 02" W	25.4 m

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 the 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 were performed by using a hydrometer and a thermometer to measure the density and temperature of a surface water sample taken during the CTD cast. The *CAT* program compared these values to the Seacat's surface values and confirmed that the Seacat was working properly. WHITING hydrometers were calibrated on March 25, 1996. 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.

A bar check was performed on April 22, 1996 (DN 113), on launch 1014 to detect the need for corrections to digitized readings from the DSF-6000N. No corrections were needed. Copies of the bar check data are included in the Separates, section IV. ✕

A leadline comparison was performed on WHITING while in the project area on April 22, 1996 (DN 113). Leadlines used were calibrated on December 14, 1995, and the calibration confirmed that the leadline error was negligible. Weather and sea conditions were calm and proved ideal for performing the leadline comparison. The results showed excellent agreement with DSF-6000N high frequency depths averaging 0.04 meters deeper than leadline depths. Copies of the leadline comparison data are included in the Separates, section IV. ✕

The correction for the static draft for launch 1014 is 0.55 meters and was measured on July 28, 1993. The corrector was entered into Offset Table 2. ✕ The correction for static draft for WHITING is 3.2 meters, a historical value which WHITING divers confirmed with a MOD III

✕ DATA FILED WITH ORIGINAL SURVEY RECORDS

depth gauge on May 11, 1995. The corrector was entered in 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 measurements for WHITING were determined on March 26, 1996, and were entered in 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.*

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 (HIPPI, s/n 19101-C). For data acquired by launch 1014, heave correctors were applied during post processing by manually scanning the echograms and making the appropriate corrections.

The tidal datum for this project was Mean Lower Low Water (MLLW). The operating tide station at Charleston, South Carolina (866-5530), served as the reference station for predicted tides. Smooth tides will be reapplied during verification by N\CS33. 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.

As listed in the Project Instructions, the survey limits of H-10669 are covered by Tide Zone # 2. Time and height correctors used for this survey are as follows:

<u>Time Correction</u>	<u>Height Ratio</u>
- 00 hrs 24 min	x 0.95

No subordinate tide stations were required for this survey.

The Charleston tide station (866-5530) is maintained by the Atlantic Operation Section (N/OES213). A request for smooth for tides was submitted to Product Services Branch, Datum Section, N/OES231 on May 16, 1996. *APPROVED TIDES & 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 as follows:

** DATA FILED WITH ORIGINAL SURVEY RECORDS*

<u>Station</u>	<u>Latitude</u>	<u>Longitude</u>
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 will be forwarded to N/CS31 in July, 1996.

I. HYDROGRAPHIC POSITION CONTROL

A Differential Global Positioning System (DGPS) was used as the navigation system for this survey. Both the ship and the launches 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 the Charleston station is 3.75. No position flyers were encountered. All suspect positions (high HDOP, DR'ed positions, high EPE) were examined for reliability. Questionable positions were either smoothed or rejected.

The serial numbers of the Ashtech Sensor and CSI MXB1 receivers on the data acquisitions platforms are as follows:

<u>VESNO #</u>	<u>Device</u>	<u>Serial Number</u>
2930	Ashtech Sensor	700417B1203
	CSI MBX1	A003789
2932	Ashtech Sensor	700417B1055
	CSI MBX1	A003790

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

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

summary of the DGPS performance checks are in the Separates, section III.* All DGPS performance checks confirmed that the equipment was working properly.

DGPS antenna offset was measured on April 2, 1996, for launch 1014 and on March 19, 1993, for WHITING. Offsets and laybacks were measured using the high frequency echosounder transducer as the reference. 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 were used during survey H-10629 (1:10,000) providing altitude unconstrained positioning.

Offset, layback, and height for WHITING's SSS towfish A-frame were measured on July 27, 1992, using the forward high frequency transducer as the reference. Correctors were entered into Offset Table 9. Offset, layback, and height corrections for launch 1014's SSS aft towing boom were measured on April 2, 1996, and verified on April 5, 1996. Correctors were entered into Offset Table 2. All offset, layback, and height data were applied by HDAPS on-line.

J. SHORELINE

There is no shoreline within the limits of H-10669.

K. CROSSLINES

A total of 52.7 nautical miles of crosslines, or 9.6 % of the mainscheme mileage, was run on H-10669. Agreement between mainscheme and crossline soundings is excellent. Ninety-nine percent (99 %) of the crossline soundings agree with mainscheme soundings to within 0.2 meters. Differences were randomly shoal and deep with no noticeable trends. The largest difference noted was 0.5 meters.

L. JUNCTIONS *SEE ALSO EVALUATION REPORT*

Survey H-10669 junctions with H-1067¹~~2~~ (B sheet) to the west and H-10674 (D sheet) to the south. Agreement with H-1067¹~~2~~ was excellent with 90% of compared soundings agreeing to within 0.4 meters. Differences were randomly shoal and deep with no noticeable trends. The largest difference noted was 0.5 meters.

Agreement with H-10674 was good with 90% of compared soundings agreeing to within 0.4 meters. On average, soundings from this survey were 0.2 meters shoaler than soundings from H-10674. It is suspected that this discrepancy will be resolved upon the application of smooth tides. The largest difference noted was 0.6 meters.

* DATA FILED WITH FIELD RECORDS.

M. COMPARISONS WITH PRIOR SURVEYS *SEE ALSO EVALUATION REPORT*

Comparisons were made between H-10669 and prior survey H-7172 (1965, 1:40,000). H-7172 was referenced to NAD 27. The datum shift between NAD 27 and NAD 83 was calculated by using CORPSCON (ver. 2.1) software and determined to be insignificant (0.5 mm @ 1:40,000). No datum shift was applied in the comparisons. Results of the comparison show that the smaller shoals in the survey have migrated an average of 400 meters in a SSW direction. Generally, the soundings are in good agreement with differences of 0 - 3 feet. On average, soundings from this survey were deeper than those from H-7172.

Comparisons were also made between H-10669 and prior survey H-9174-WD (1963, 1:40,000). Soundings from this survey were consistent with the results from the wire drag survey.

N. ITEM INVESTIGATIONS

AWOIS 9664 is within the survey area of H-10643 but was not assigned. It should be noted that AWOIS 9664 did receive 200% SSS coverage as a result of normal mainscheme SSS coverage and is included in this report for informational purposes only.

AWOIS 9664

Reported Latitude: 32° 41' 54" N
Reported Longitude: 079° 34' 25" W
Reported Depth: 30 feet
Feature: Obstruction

AWOIS 9664 is described as a reported permanent drill minefield of moored and ground mines with a minimum depth of 30 feet that was established in 1967. Two-hundred percent SSS coverage using 100-meter range scale was performed over the drill minefield area bounded by:

<u>Position</u>	<u>Latitude</u>	<u>Longitude</u>
1	32° 41' 24"N	079° 34' 48"W.
2	32° 41' 24"N	079° 33' 48"W
3	32° 42' 24"N	079° 33' 48"W
4	32° 42' 24"N	079° 34' 48"W.

No contacts or items of interest were found. *CONCUR*
NO CHANGE IN CHARTING IS RECOMMENDED.

All other items that were investigated within the survey area of H-10669 were found to be insignificant. Item investigation reports are included in the Separates, section VI. *DATA*

FILED WITH FIELD RECORDS

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

Soundings from chart 11521 (21st ed., Feb. 05/94, 1:^{80,000}~~40,000~~) were compared to H-10669 soundings. On average, soundings from H-10669 are approximately 2 feet deeper than charted depths.

P. ADEQUACY OF SURVEY *SEE ALSO EVALUATION REPORT*

All items found during this survey have been resolved. This survey is complete and adequate to supersede all prior surveys in their common area.

Q. AIDS TO NAVIGATION

There are no aids to navigation within the survey area.

R. STATISTICS

Number of Positions.....	4028
Main-scheme Sounding Lines (Nautical Miles).....	551
Crosslines (Nautical Miles).....	53
Square Nautical Miles Surveyed.....	28.0
Days of Production.....	12
Detached Positions.....	18
Bottom Samples.....	15
Tide Stations Installed.....	None
Current Stations.....	None
Number of CTD Casts.....	4
Magnetic Stations.....	None

S. MISCELLANEOUS *SEE ALSO EVALUATION REPORT*

No anomalies in either tide or current and/or unusual magnetic variations were encountered in the survey area. No unusual submarine features were discovered. There are no current plans for construction or dredging in the survey area. Bottom samples were submitted to the Smithsonian Institution.

T. RECOMMENDATIONS SECTION P. OF THE
SEE ALSO EVALUATION REPORT

H-10669 is complete and without inadequacies. No additional fieldwork is needed.

U. REFERRAL TO OTHER REPORTS

There are no other relevant reports.

Submitted by:



Lieutenant (jg) Eric J. Sipos, NOAA
NOAA Ship WHITING

**APPROVAL SHEET
HYDROGRAPHIC SURVEY
OPR-G342-WH
1996
WH-10-1-96
H-10669**

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: June 14, 1996

HYDROGRAPHIC SECTION: Atlantic

HYDROGRAPHIC PROJECT: OPR-G342-WH

HYDROGRAPHIC SHEET: H-10669

LOCALITY: Approaches to Charleston, S.C.

TIME PERIOD: April 4 - May 9, 1996

TIDE STATION USED: 866-5530 Charleston, S.C.
Lat. $32^{\circ} 46.9'N$ Lon. $79^{\circ} 55.5'W$

PLANE OF REFERENCE (MEAN LOWER LOW WATER): 2.49 ft.

HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 5.5 ft.

REMARKS: RECOMMENDED ZONING

Apply a -24 minute correction to times and a X0.95 range ratio to heights using Charleston, S.C. (866-5530).

Note: Times are tabulated in Greenwich Mean Time.

William M. Hobson

CHIEF, DATUMS SECTION



H-10669

GEOGRAPHIC NAMES

Name on Survey	A ON CHART NO. 11521, 11520, 11480 B ON PREVIOUS SURVEY NO. C ON U.S. QUADRANGLE MAPS D FROM LOCAL INFORMATION E ON LOCAL MAPS F P.O. GUIDE OR MAP G RAND McNALLY ATLAS H U.S. LIGHT LIST K											
	NORTH ATLANTIC OCEAN	X		X								
RATTLESNAKE SHOAL (title)	X											2
SOUTH CAROLINA (title)	X		X									3
												4
												5
												6
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Approved

Christie C. Long

Chief Geographer

OCT 1 1996

10/30/96

HYDROGRAPHIC SURVEY STATISTICS
REGISTRY NUMBER: H-10669

NUMBER OF CONTROL STATIONS	2
NUMBER OF POSITIONS	4028
NUMBER OF SOUNDINGS	22726

	TIME-HOURS	DATE COMPLETED
PREPROCESSING EXAMINATION	21	06/21/96
VERIFICATION OF FIELD DATA	26	08/16/96
QUALITY CONTROL CHECKS	0	
EVALUATION AND ANALYSIS	2	
FINAL INSPECTION	4	08/29/96
COMPILATION	19	10/18/96
TOTAL TIME	72	
ATLANTIC HYDROGRAPHIC BRANCH APPROVAL		09/09/96

**ATLANTIC HYDROGRAPHIC BRANCH
EVALUATION REPORT FOR H-10669 (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, version 5.0
I/RAS B, version 5.01

The smooth sheet was plotted using an ENCAD NovaJet III 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 0.642 seconds (19.797 meters or 1.98 mm at the scale of the survey) north in latitude, and 1.738 seconds (19.226 meters or 1.92 mm at the scale of the survey) east in longitude.

L. JUNCTIONS

H-10671 (1996) to the west
H-10674 (1996) to the south

Standard junctions were effected between the present survey and surveys H-10671 (1996), H-10674 (1996).

There are no junctional surveys to the north and east. Charted depths are in general harmony with present survey depths to the north and east.

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 11521 (21st Edition, Feb 5/94)

Hydrography

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

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

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.

H-10669

WHITING Processing Team

Franklin L. Saunders

Franklin L. Saunders
Cartographic Technician

Norris A. Wike

Norris A. Wike
Cartographer

APPROVAL SHEET
H-10669

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 disproof 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: 9 SEPTEMBER 1996
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: September 9, 1996
Nicholas E. Perugini
Commander, NOAA
Chief, Atlantic Hydrographic Branch

Final Approval:

Approved: Andrew A. Armstrong, III Date: Dec 20, 1996
Andrew A. Armstrong, III
Captain, NOAA
Chief, Hydrographic Surveys Division

MARINE CHART BRANCH
RECORD OF APPLICATION TO CHARTS

FILE WITH DESCRIPTIVE REPORT OF SURVEY NO. H-14669

INSTRUCTIONS

1. A basic hydrographic or topographic survey supersedes all information of like nature on the uncorrected chart.
2. Letter all information.
3. In "Remarks" column cross out words that do not apply.
4. Give reasons for deviations, if any, from recommendations made under "Comparison with Charts" in the Review.

CHART	DATE	CARTOGRAPHER	REMARKS
1521	10/11/96	<i>[Signature]</i>	Full Part Before After Marine Center Approval Signed Via <i>FULL APPLICATIONS</i> Drawing No. <i>OF SOUNDINGS FROM SMOOTH SHEET</i>
			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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