

H-10631

NOAA FORM 76-36A

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-10-13-95**
Registry No. **H-10631**

LOCALITY

State **GEORGIA**
General Locality **NORTH ATLANTIC OCEAN**
Sublocality **6 NM SE OF GASKIN
BANKS**

19 95

CHIEF OF PARTY
CDR M. R. Kenny, NOAA

LIBRARY & ARCHIVES

DATE **SEP 10 1996**

DIAGRAM 1240-3

(5)

Ref Bp 159335-36

Charts

CP4

AC 11512 Appd 9/21/96 TLW

11513 Appd 3/6/97 TLW

11509

11480 Appd 3/6/97 TLW

11009 NC

HYDROGRAPHIC TITLE SHEET

H-10631

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

FIELD NO.

WH-10-13-95

State Georgia

General locality NORTH Atlantic Ocean

Locality 6 nm South of Gaskin Banks, S.C.

Scale 1 : 10,000 Date of Survey 16 Aug 95 - 16 Nov 95

Instructions dated 3/8/95 (Change No.1: 4/17/95) Project No. OPR-G398-WH

Vessel NOAA Ship WHITING (2930), S-329

Chief of Party COMMANDER Maureen R. Kenny

Surveyed by J.D. Wilder, M.R. Kenny, A.L. Beaver, P.A. Gruccio, E.J. Sipos, C.E. Paarrish, J.T. Michaleki, J.G. Gaarte, U.L. Gardner, M.M. Cisternelli, K.B. Shaver, F.R. Cruz

Soundings taken by echo sounder DSF-6000

Graphic record scaled by WHITING Survey Personnel

Graphic record checked by WHITING Survey Personnel

Protracted by N/A Automated plot by ENCAD NOVAJET III PLOTTER (AHO) HP 7959B, Bruning (FIELD)

Verification by ATLANTIC HYDROGRAPHIC BRANCH PERSONNEL

Soundings in MLLW Meters FEET

REMARKS: Time Zone Used: 0 (UTC)

200 % Side Scan Coverage

Horizontal Datum Used: NAD 83

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

RWD Anois and SURF ✓ 9/96

6/29/96

PROGRESS SKETCH

HYDROGRAPHIC SURVEY

OPR-G115-WH

WASSAW SOUND and WILMINGTON RIVER

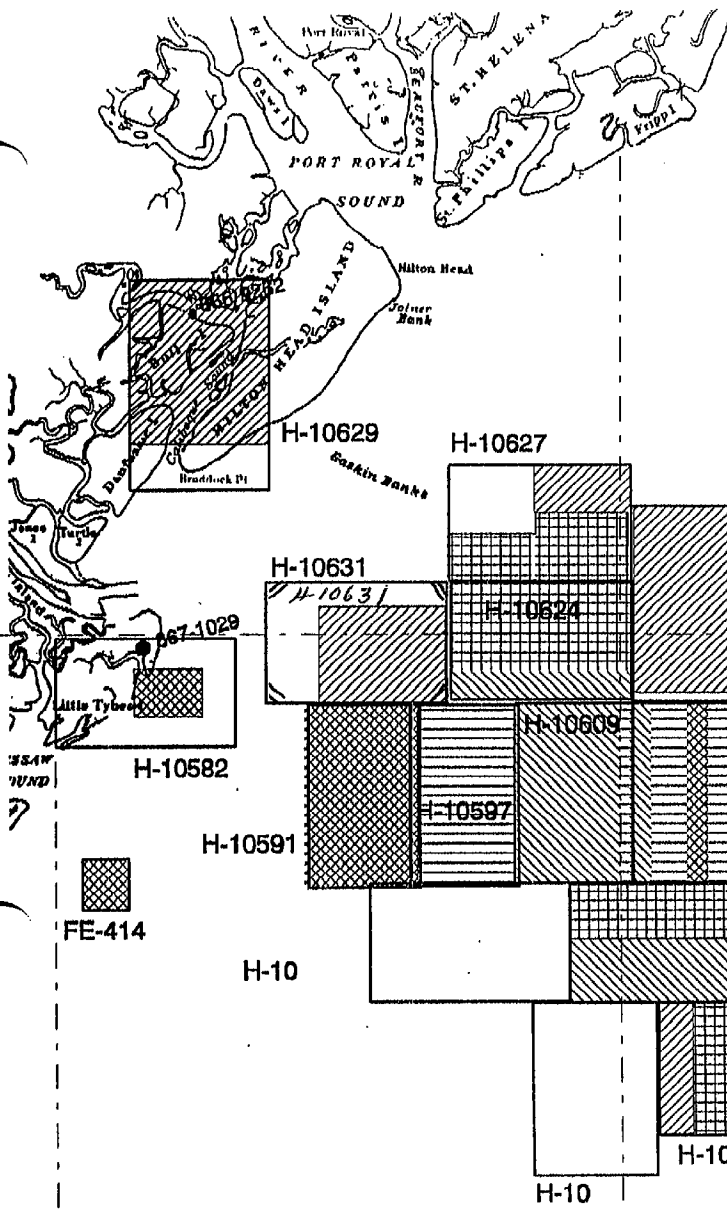
OPR-G398-WH

APPROACHES TO SAVANNAH RIVER

OPR-G352-WH

CALIBOUGUE AND PORT ROYAL SOUNDS

APRIL - NOVEMBER 1995



NOAA SHIP WHITING S329

CDR JOHN D. WILDER, COMMANDING

APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV
24	25	27	23	29			
156	83	218	0	263			
173	10	24	156	253			
904	1208	1550	1732	1336			
7	14	52	182	56			
38	49	64	74	64			
6	10	22	24	2			
7	8	4	9	5			
45	19	15	15	8			
20	0	0	0	0			

DAYS AT SEA

LNM SOUNDINGS (SHIP)

LNM SOUNDINGS (LAUNCHES)

LNM SIDE SCAN (SHIP)

LNM SIDE SCAN (LAUNCHES)

SQ NM SURVEYED

ITEMS INV/DIVES

VELOCITY CASTS

BOTTOM SAMPLES

WATER CLARITY OBS

HYDROGRAPHY

**DESCRIPTIVE REPORT TO ACCOMPANY
HYDROGRAPHIC SURVEY
OPR-G398-WH
H-10631**

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

A. PROJECT

Project OPR-G398-WH is being conducted to provide contemporary hydrographic survey data with 200% side scan sonar coverage for the approaches to Savannah, Georgia. This project was requested by the Savannah Pilots Association, U.S. Coast Guard, and Georgia Port Authority to locate obstructions and determine the deepest and safest approach to the 42-ft dredged channel.

Survey Operations were conducted in compliance with Hydrographic Project Instructions OPR-G398-WH, dated March 08, 1995 and change No. 1 dated May 17, 1995.

Project OPR-G398-WH consists of twelve survey sheets. This survey was assigned sheet letter "B", field sheet number WH-10-13-95, and registry number H-10631.

B. AREA SURVEYED

Hydrographic survey H-10631 is 1.5 nm north of Savannah Light and 6 nm south of Gaskin Banks, South Carolina. This survey is registered as a 1:10,000 scale survey. All data acquired meet the accuracy requirements for a 1:10,000 scale survey. The area surveyed is bounded by the following positions:

<u>Position</u>	<u>Latitude</u>	<u>Longitude</u>
1	31° 58' 30" N	080° 45' 30" W
2	31° 58' 30" N	080° 37' 18" W 09
3	32° 02' 45" N 51.5	080° 37' 18" W 09
4	32° 02' 45" N 51.5	080° 43' 00" W
5	32° 00' 30" N 27.0	080° 43' 00" W
6	32° 00' 30" N 27.0	080° 45' 30" W

Survey operations commenced on August 16, 1995 (DN 228), and were completed on November 16, 1995 (DN 320).

C. SURVEY VESSELS

NOAA Ship WHITING (VESNO 2930) was used to conduct mainscheme echosounder, side scan sonar, holidays, and crosslines. Dive investigations, bottom samples, crosslines, mainscheme echosounder, and side scan sonar lines were conducted on launch 1014 (VESNO 2932). Bottom samples, mainscheme echosounder, and side scan sonar lines were performed by launch 1015 (VESNO 2931). 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 following software:

<u>Program</u>	<u>Version</u>	<u>Date Installed</u>
BACKUP	2.00	February 27, 1995
BASELINE	1.14	February 27, 1995
BIGABST	2.07	February 27, 1995
BIGAUTOST	3.01	February 27, 1995
BLKEDIT	2.02	February 27, 1995
CARTO	2.17	February 27, 1995
CLASSIFY	2.12	April 17, 1995
CONTACT	2.48	April 17, 1995
CONVERT	3.65	February 27, 1995
DAS_SURV	6.80	April 17, 1995
DIAGNOSE	3.05	February 27, 1995
DISC_UTIL	1.00	February 27, 1995
DP	2.18	February 27, 1995
DPCONVERT	1.03	March 07, 1995
DSNEDITS	1.04	March 07, 1995
EXCESS	4.32	February 27, 1995
FILESYS	3.31	March 07, 1995
GRAFEDIT	1.06	February 27, 1995
HIPSTIC	1.01	February 27, 1995
HPRAZ	1.26	February 27, 1995
INVERSE	2.02	February 27, 1995
LISTDATA	1.02	February 27, 1995
LOADNEW	2.13	March 07, 1995
LSTAWOIS	3.07	March 07, 1995
MAINMENU	1.20	February 27, 1995
MAN_DATA	3.02	March 07, 1995
NEWPOST	6.13	February 27, 1995

<i>PLOTALL</i>	2.32	<i>February 27, 1995</i>
<i>POINT</i>	2.12	<i>March 07, 1995</i>
<i>PREDICT</i>	2.01	<i>February 27, 1995</i>
<i>PRESURV</i>	7.11	<i>February 27, 1995</i>
<i>PRINTOUT</i>	4.04	<i>February 27, 1995</i>
<i>QUICK</i>	2.07	<i>February 27, 1995</i>
<i>RAMSAVER</i>	1.02	<i>February 27, 1995</i>
<i>REAPPLY</i>	2.11	<i>February 27, 1995</i>
<i>RECOMP</i>	1.04	<i>March 07, 1995</i>
<i>SCANNER</i>	1.00	<i>February 27, 1995</i>
<i>SELPRINT</i>	2.05	<i>February 27, 1995</i>
<i>SYMBOLS</i>	2.00	<i>February 27, 1995</i>
<i>VERSIONS</i>	1.00	<i>February 27, 1995</i>
<i>ZOOMEDIT</i>	2.33	<i>February 27, 1995</i>

Sound velocity corrections were determined using *CAT* version 2.00 and *VELOCITY* version 2.11. The DGPS station was checked using *MONITOR* version 3.0. The *DAILYDQA* program ensured the proper functioning of the MOD 3 diver least depth gauge. 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. Data was collected using the 100 meter range scale. The following sonar equipment was used throughout the survey:

<u>VESNO</u>	<u>Type</u>	<u>S/N</u>
2930	Towfish	A001343
2930	Recorder	016942
2931	Towfish	016835
2931	Recorder	016671
2932	Towfish	0011902
2932	Recorder	016673

On *WHITING*, the SSS towfish was deployed from a Reuland winch (Model 814861A-1), S/N 814861A-1) using one of two armored cables in conjunction with an A-frame mounted on the stern of ship. The armored cable was attached to the side scan recorder via a slip ring assembly. On both launches, the side scan sonar towfish was deployed using a Superwinch Model W115 in conjunction with an adjustable davit arm on the side of the

launch. The launches towfish was towed with vinyl-coated Kevlar cable and was connected to the recorder via a slip ring assembly.

The SSS towfish was maintained at a height off the bottom of 8 to 20 percent of the range scale in use. SSS operations were limited to a speed-over-ground between four and six knots. Adequate coverage was determined by generating two 100% coverage swath plots (A and B) and determining whether any holidays existed.

Confidence checks were obtained by observing changes in bottom texture on the outer limits of the sonargram.

All potentially significant targets were measured off the sonargram and entered into the a HDAPS contact table. Contacts appearing significant were entered into the contact utility table and were developed, as needed, by side scan sonar or diver investigation. Least depths were determined by divers utilizing the MOD 3 diver least depth gauge. All detached positions were taken during diving operations by launch 1014 (VESNO 2932).

F. SOUNDING EQUIPMENT

Raytheon Digital Survey Fathometer (DSF) 6000N echo sounders were used to measure bottom depths during the survey. The DSF-6000N produced a graphic record of the high frequency (100 kHz) and low frequency (24 kHz) bottom depths. Digital depths from the high frequency and low frequency beams were recorded by the HDAPS acquisition system. High frequency depths were selected as the primary depths and are shown on the sounding plots. Echograms were carefully reviewed for significant features along the track line. Any features on the graphic record that were not selected as primary soundings were manually inserted. The following echosounders were used during this survey:

<u>Vessel</u>	<u>S/N</u>
2930	A109N
2931	B050N
2932	A105N

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). The profiler was calibrated on February 15, 1995, during WHITING's winter inport period. A copy of the calibration report is included in Separate IV.*

After the CTD cast, programs CAT 2.00 and VELOCITY 2.11 were used to process the data, select significant data points, and create a corrector table. The velocity correctors were

** DATA FILED WITH ORIGINAL SURVEY RECORDS.*

manually entered into an HDAPS velocity table. The correctors were applied to both high and low frequency beams during acquisition. Velocity profile data are in the H-10631 separates submitted for this survey. *

Data Quality Assurance (DQA) for the Seacat CTD profiler was performed by using a hydrometer and a thermometer to measure the density and temperature of a surface water sample taken during the CTD cast. The program *CAT* compared these values to the CTD surface values and confirmed that the velocity probe was working properly throughout project.

The velocity cast was performed at locations described below for mainscheme data acquisition:

<u>DN</u>	<u>VESNO</u>	<u>Vel.Table#</u>	<u>Latitude</u>	<u>Longitude</u>	<u>Least Depth</u>
232	2930	46	31° 59' 12"N	080° 38' 00"W	21.2
232	2931-32	47	31° 59' 12"N	080° 38' 00"W	21.2
251	2930	01	31° 59' 03"N	080° 37' 58"W	26.5
251	2931-32	50	31° 59' 03"N	080° 37' 58"W	26.5
286	2930	15	32° 04' 56"N	080° 35' 21"W	20.9
299	2930	22	31° 58' 17"N	080° 44' 05"W	24.4
299	2931-32	23	31° 58' 17"N	080° 44' 05"W	24.4
306	2931-32	29	32° 06' 17"N	080° 31' 24"W	23.8

There were no variations in instrument initials.

Throughout survey operations bar checks were performed on launches 1014 and 1015 to detect the need for corrections to digitized readings from the DSF-6000N. No corrections were needed.

New leadlines were made and calibrated on February 23, 1995. Calibration confirmed the leadline error was negligible. Leadline comparisons were made on May 11, 1995. Due to uneven bottom and current conditions, leadline comparisons though within tolerance, were somewhat high. Another leadline comparison was conducted on August 3, 1995. The second comparison indicated accuracy to within 0.08 meters agreement between the high frequency depth and the leadline. Leadline comparisons are included in Separate IV. *

The correction for the static draft for launches 1014 and 1015 is 0.55 meters, measured July 28, 1993. The correction for the static draft 3.2 meters (Offset Table 9) for WHITING was checked by divers on May 11, 1995. This value was taken with the MOD 3 Diver Least Depth Gauge. The measured draft of the transducer was determined to be within 0.04 meters of the historical value used during this survey.

WHITING settlement and squat measurements were conducted on November 10, 1993. Settlement and squat measurements were taken on launches 1014 and 1015 on March 29,

* FILED with original data.

1995. The correctors for WHITING, and both 1014 and 1015 were entered in offset tables 9, 2, and 1, respectively, then applied on line throughout the survey. Offset tables are included in separate II.

The DAILYDQA program, in conjunction with the ship's barometer, was performed daily to assure that the MOD 3 least depth gauge was working properly. Velocity casts were also performed during diving operations for use in the SMLGAUGE program when calculating least depths on contacts.

For data collected on WHITING, heave correctors were applied using a Heave, Roll and Pitch Sensor (S/N 19109-C). On launch platforms (1014 and 1015) heave correctors were applied during post processing by manually scanning the echograms and making the appropriate corrections.

All soundings and least depths for this project were reduced to Mean Lower Low Water using predicted tides. The operating tide station at Fort Pulaski, Georgia (867-0870) served as the reference station for predicted tides. No tidal zoning was done for this survey. Time and height correctors used for this survey are as follows:

<u>Time Correction</u>	<u>Height Ratio</u>
+ 0 hr 0 min	x 0.99

Tidal data used during data acquisition were taken from Table 2 of the East Coast of North and South America Tide Tables and were applied on-line to the digital data using HDAPS software. The tidal data, in digital form, was received on floppy disk from N/CS3, Hydrographic Surveys Division.

On March 29, 1995, WHITING installed a tide station at Tybee Marina (867-1029) for datum control of OPR-G398. Opening levels were run on March 30, 1995. Closing levels were run on November 16, 1995. A request for smooth tides was submitted to Product and Services Branch, Datum Section, N/OES231 on November 21, 1995. *APPROVED TIDES AND ZONING WERE APPLIED DURING OFFICE PROCESSING*

H. CONTROL STATIONS *SEE ALSO EVALUATION REPORT.*

The horizontal datum for this project is the North American Datum of 1983 (NAD-83). The source of differential correctors was a high frequency Differential GPS station set on a tower over a control mark "SKID" on Skidaway Island, GA. Additionally, WHITING used the forward range marker on Jones Island Range, as well as differential correctors from the Charleston USCG Beacon, for performance checks. The adjusted NAD-83 positions for "SKID" (2nd Order Class I) and Jones Island Forward Range (4th Order) were provided by the Field Photogrammetry Section on August 16, 1994. The position of USCG Beacon was scaled from the chart. The positions are as follows:

** Filed with original field records.*

<u>Station</u>	<u>Latitude</u>	<u>Longitude</u>
SKID	31° 59' 19.22599" N	081° 01' 12.26294" W
Jones Island Range, Front	32° 02' 31.71243" N	080° 51' 10.09256" W
Charleston USCG Beacon	32° 45' 30" N	079° 50' 30" W

WHITING used *MONITOR* version 3.0 to verify the station position and to check for multipath in the area. The *OUTLIER.SUM* files and associated scatterplots are in Separate III.*

I. HYDROGRAPHIC POSITION CONTROL

A Differential Global Positioning System (DGPS) was used as the navigation system for this survey. WHITING and both launches used an Ashtech Sensor GPS receiver with a LRD-1 HF receiver which supplied correctors for DGPS navigation. Ashtech receivers were initialized by HDAPS; LRD-1 receivers were set to the appropriate frequency. The shore station consisted of an Ashtech MKXII receiver (S\N 700354A03069), an LRD-2 modulator (S\N 605), and a Ray 152 HF transceiver (S\N B529239).

DGPS positioning was accomplished in accordance with the Field Procedures Manual (FPM), section 3.4. Horizontal Dilution of Precision (HDOP) limits were computed as required in section 3.4.2 of the FPM. The HDOP limit for a 1:10,000 scale survey using the Skidaway Island 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, LRD-1 receivers used are as follows:

<u>VESNO #</u>	<u>Device</u>	<u>Serial Number</u>
2930	Ashtech Sensor	700417B1203
	LRD-1	248
2931	Ashtech Sensor	700417B1193 and 700417B01055
	LRD-1	233 and 204
2932	Ashtech Sensor	700417B1194
	LRD-1	206

DGPS performance checks were done in two stages. Prior to September 25, 1995, the first stage determined the performance for one launch using station "SKID". The launch would take ten detached positions, correct for range and bearing to center of the range light marking Jones I. range, and compare these positions to the known position. After September 25, 1995, the first stage determined the performance of WHITING using station "SKID". The check was performed by simultaneously receiving positions from station "SKID" and from the USCG Beacon in Charleston, S.C. Stage two was conducted with each launch securely housed in WHITING's davits. Simultaneous HDAPS positions were compared

** filed with original field records.*

between WHITING and each launch; and offset in distance and azimuth was then applied between the ship and each launch system. All DGPS performance checks confirmed that the DGPS equipment was working properly.

SHIPDIM version 1.2 was used to compare the WHITING's position. SHIPDIM routinely showed the positions given by the two systems to be within 2-3 meters of each other.

DGPS antenna offsets and laybacks were measured on July 28, 1993 for launches 1014 and 1015, and on March 19, 1993 for WHITING. Offsets and laybacks were measured using the 100kHz (high frequency) echosounder transducer as the reference. Antenna heights were also measured on the same date using the water line as the reference. A minimum of four satellites were used during survey H-10631 (1:10,000), providing altitude unconstrained positioning.

Offset and layback for WHITING's SSS towfish A-frame were measured on July 27, 1992 using the forward 100 kHz (high frequency) transducer as a reference. The A-frame height was measured from the waterline on the same date. Offset, layback, and height corrections for launch 1014's and 1015's SSS aft towing booms were measured on July 28, 1993, and verified on April 5, 1994.

All Offset, layback, and height data has been applied by HDAPS on-line. Correctors from offset table 1* and 2* were applied to all data acquired for launch 1015 and 1014 respectively. Correctors from offset table 9 were applied to all data acquired aboard WHITING. This data is on file at N/CS33.

J. SHORELINE

There is no shoreline within the limits of survey H-10631.

K. CROSSLINES

A total of 84.45 nautical miles of crosslines were run on H-10631. This constitutes 8% of the total linear nautical miles of main-scheme lines run. Crossline and main-scheme agreement was adequate. Over 90% of the soundings agreed to within 0.5 meters. In the western portion of the sheet differences of up to 1.0 meter were observed. This section was completed over a month's time with data acquired under numerous different weather conditions. Smooth tides should resolve these differences.

L. JUNCTIONS *SEE ALSO EVALUATION Report*

Comparisons were made with sheet C (H-10597), sheet D (H-10624), and sheet A
** filed with original field records.*

(H-10591). Overlap agreement with all three sheets is adequate. Over 90% of the soundings agree to within 0.4 meters at all junctions. All soundings agree to 0.5 meters. Depth contours were continuous at all junctions.

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

Prior surveys were not available for comparison with H-10631.

N. ITEM INVESTIGATIONS

Sheet B has no AWOIS investigations. All items that were investigated within survey area H-10631 were found to be insignificant. Item investigation reports are included in separate VI. DATA FILED WITH FIELD RECORDS.

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

Depths from chart 11480 (32nd ed., 14 May 94, 1:449,659) were compared to H-10631 soundings. There is good agreement between survey H-10631 and the charted soundings and features. Comparisons generally agreed within 1.0 meter, with the current survey soundings being deeper than the charted soundings.

P. ADEQUACY OF SURVEY *SEE ALSO EVALUATION REPORT*

The northwest quadrant of sheet B was not completed due to time constraints and lack of commercial traffic in the area. The area surveyed is adequate to supersede all prior surveys in the common area. All items found during this survey have been resolved.

Q. AIDS TO NAVIGATION

There were two floating aids to navigation within H-10631 survey limits. These buoys (G "1" and R "2") were positioned by WHITING personnel during the collection of data for H-10591 (WH-10-01-95, Sheet A). The H-10591 positions are listed below:

G "1" Structure Buoy, State of Georgia	Latitude: 031°58'16.8"N Longitude: 080°44'12.5"W	<i>NOT IN SURVEY AREA</i>
R "2" Structure Buoy, State of Georgia	Latitude: 031°58'24.3"N Longitude: 080°44'07.6"W	<i>NOT IN SURVEY AREA</i>

The Savannah River entrance buoys (G "1", and R "2") positions agree with the charted positions as updated by Notice to Mariners.

R. STATISTICS

Number of Positions	4894
Main-scheme Sounding Lines (Nautical Miles)	665.53
Crosslines (Nautical Miles)	84.45
Square Nautical Miles Surveyed	30.34
Days of Production	20
Detached Positions	1
Bottom Samples	15
Tide Stations Installed	1
Current Stations	None
Number of CTD Casts	5
Magnetic Stations	None

S. MISCELLANEOUS *SEE ALSO EVALUATION REPORT*

No anomalies in either tides or currents and/or unusual magnetic variations were encountered in the survey area. No unusual submarine features were discovered. Bottom samples were submitted to the Smithsonian Institution.

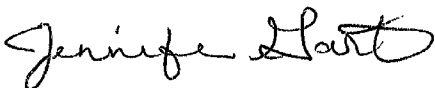
T. RECOMMENDATIONS *SEE ALSO EVALUATION REPORT.*

H-10631 is complete and without inadequacies. No additional fieldwork is required.

U. REFERRAL TO OTHER REPORTS

A Coast Pilot Report for this project will be submitted in March 1996.

Submitted by:



Ensign Jennifer D. Garte, NOAA
Junior Officer, NOAA Ship WHITING

HORIZONTAL CONTROL STATIONS

WHITING personnel erected a HF Differential GPS receiver/transmitter on the grounds of Skidaway Institute of Oceanography (station SKID). The position of the Skidaway mark was faxed from Field Photogrammetry Section to the WHITING on March 6, 1995. WHITING launches conducted DGPS performance checks using the Jones Island Range, Front Light as a known position. The positions are as follows:

Station:	SKID
Latitude:	31° 59' 19.22599" N
Longitude:	081° 01' 12.26294" W
Ellipsoid Ht:	-29.858 meters
Station:	Jones Island Range, Front Light
Latitude:	32° 02' 31.71243" N
Longitude	080° 51' 10.09256" W

APPROVAL SHEET
HYDROGRAPHIC SURVEY
OPR-G398-WH
1995
WH-10-13-95
H-10631

The data for this survey was acquired and checked under the Commanding Officer's 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
Rockville, Maryland 20852

TIDE NOTE FOR HYDROGRAPHIC SURVEY

DATE: May 8, 1996

HYDROGRAPHIC BRANCH: Atlantic

HYDROGRAPHIC PROJECT: OPR-G398-WH

HYDROGRAPHIC SHEET: H-10631

LOCALITY: 6 Nautical Miles South of Gaskin Banks, S.C.

TIME PERIOD: August 16 - November 16, 1995

TIDE STATION USED: 867-1029 Tybee Island, Ga.
Lat. $31^{\circ} 59.8' N$ Lon. $80^{\circ} 51.3' W$

PLANE OF REFERENCE (MEAN LOWER LOW WATER): -0.08 ft.

HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 6.9 ft.

REMARKS: RECOMMENDED ZONING

Times are direct, and apply a X1.02 range ratio to heights using Tybee Marina, Ga. (867-1029).

Notes: 1. Times are tabulated in Greenwich Mean Time.
2. Data for Tybee Marina, Ga. (867-1029) are temporarily stored in file #667-1029.

William M. Gibson
CHIEF, DATUMS SECTION



GEOGRAPHIC NAMES

Name on Survey

A ON CHART NO. 11512, 11513, 11509
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

Name on Survey	A	B	C	D	E	F	G	H	K
GASKIN BANKS (title)	X		X						1
GEORGIA (title)	X		X						2
NORTH ATLANTIC OCEAN	X		X						3
									4
									5
									6
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Approved:

Chris Clay

Chief Geographer

APR 29 1996

09/09/96

HYDROGRAPHIC SURVEY STATISTICS
REGISTRY NUMBER: H-10631

NUMBER OF CONTROL STATIONS	2
NUMBER OF POSITIONS	4894
NUMBER OF SOUNDINGS	27583

	TIME-HOURS	DATE COMPLETED
PREPROCESSING EXAMINATION	3	01/19/96
VERIFICATION OF FIELD DATA	68	05/31/96
QUALITY CONTROL CHECKS	0	
EVALUATION AND ANALYSIS	4	
FINAL INSPECTION	6	05/22/96
COMPILATION	45	08/24/96
TOTAL TIME	126	
ATLANTIC HYDROGRAPHIC BRANCH APPROVAL		05/31/96

**ATLANTIC HYDROGRAPHIC BRANCH
EVALUATION REPORT FOR H-10631 (1995)**

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 0.775 seconds (23.255 meters or 2.32 mm at the scale of the survey) north in latitude, and 0.625 seconds (16.411 meters or 1.64 mm at the scale of the survey) east in longitude.

L. JUNCTIONS

H-10577 (1994) to the west
H-10591 (1995) to the south
H-10597 (1995) to the southeast
H-10624 (1995) to the east

Standard junctions were effected between the present survey and surveys H-10577 (1994), H-10591 (1995), H-10597 1995) and H-10624 (1995).

There are no junctional surveys to the west, north of Latitude 32°00'30"N, or to the north. Charted hydrography is in harmony with present survey depths in the common area.

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 11480 (32nd Edition, May 14/94)
11512 (53rd Edition, Oct 21/95)
11513 (21st Edition, June 4/94)**

Hydrography

The charted hydrography originates with prior surveys and requires no further consideration. The hydrographer makes adequate chart comparison with chart 11480 in section O. of the Descriptive Report. On chart 11512 the present survey depths range from 1 to 4 feet (0³ to 1² m) shoaler than the charted depths. On chart 11513 present survey depths are in good agreement west of Longitude 80°29'W, with differences of plus or minus (±) 1 to 2 feet (±0³ to 0⁶ m). East of Longitude 80°29'W present survey depths are as much as 7 feet (2¹ m) deeper than charted depths. These differences are attributed to natural change and improved surveying technology. The following should be noted:

An uncharted obstruction (pipe), in Latitude 31°58'41.11"N, Longitude 80°44'27.60"W, was located by the field unit. The obstruction was described as a pipe with a diver depth gauge depth of 39 feet (12 m). Surrounding depths range from 40 to 42 feet (12¹ to 12⁸ m). ~~The obstruction is considered insignificant.~~ It is recommended that the obstruction be charted as shown on the present survey.

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.

WHITING Processing Team

Franklin L. Saunders

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

APPROVAL SHEET
H-10631

Initial Approvals:

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

Robert G. Roberson Date: 31 MAY 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: 31 May 1996
Nicholas E. Perugini
Commander, NOAA
Chief, Atlantic Hydrographic Branch

Final Approval:

Approved: Andrew A. Armstrong, III Date: Sept 19, 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-10631

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
11512	8/20/96	<i>Onul</i>	Full Part Before After Marine Center Approval Signed Via <u>FULL APPLICATION</u> Drawing No. <u>OF SOUNDINGS FROM SMOOTH SHEET</u>
11513	8/22/96	<i>Onul</i>	Full Part Before After Marine Center Approval Signed Via <u>FULL APPLICATION</u> Drawing No. <u>OF SOUNDINGS THRU 11512</u>
11480	3/6/97	<i>Travis Newman</i>	Full Part Before After Marine Center Approval Signed Via Drawing No. <u>42 Appl thru 11513</u>
			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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