

H10642

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-10-14-95
Registry No.	H-10642
LOCALITY	
State	GEORGIA
General Locality	NORTH ATLANTIC OCEAN
Sublocality	17 NM SOUTH OF GASKIN BANKS
19 95	
CHIEF OF PARTY CDR J. D. WILDER, NOAA	
LIBRARY & ARCHIVES	
DATE	JUL 1 1996

DIAGRAM 1111-1

Ⓔ

Ref Bp 158 658

Charts

CP4

11480.

1/009 NC

NOAA FORM 77-28
(11-72)

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

REGISTER NOS.

HYDROGRAPHIC TITLE SHEET

H-10642

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-10-14-95

State Georgia

General locality Atlantic Ocean

Locality 17 NM South of Gaskin Banks

Scale 1:10,000 Date of Survey Sept. 10 - Oct. 25, 1995

Instructions dated March 14, 1995 Project No. OPR-G398-WH-95

Vessel WHITING (2930) and Launch 1014 (2932)

Chief of Party Commander John D. Wilder

Surveyed by J.D. Wilder, M.R. Kenny, A.L. Beaver, J.T. Michalski, C.E. Parrish, E.J. Sipsos, J.D. Garte., U.L. Gardner Jr., M.M. Cistemelli, K.B. Shaver, F.R. Cruz, C.A. Neely

Soundings taken by echo sounder DSF-6000N

Graphic record scaled by WHITING Survey Personnel

Graphic record checked by WHITING Survey Personnel

Protracted by N/A Automated plot by HP 7959B, Bruning

Verification by [Signature]

Soundings in MLLW Meters

REMARKS: Time Zone Used, 0 (UTC)

[Handwritten notes]

AWOIS and SURF ✓ Rad 7/96

JUL 1 1996

PROGRESS SKETCH

HYDROGRAPHIC SURVEY

OPR-G115-WH

WASSAW SOUND and WILMINGTON RIVER

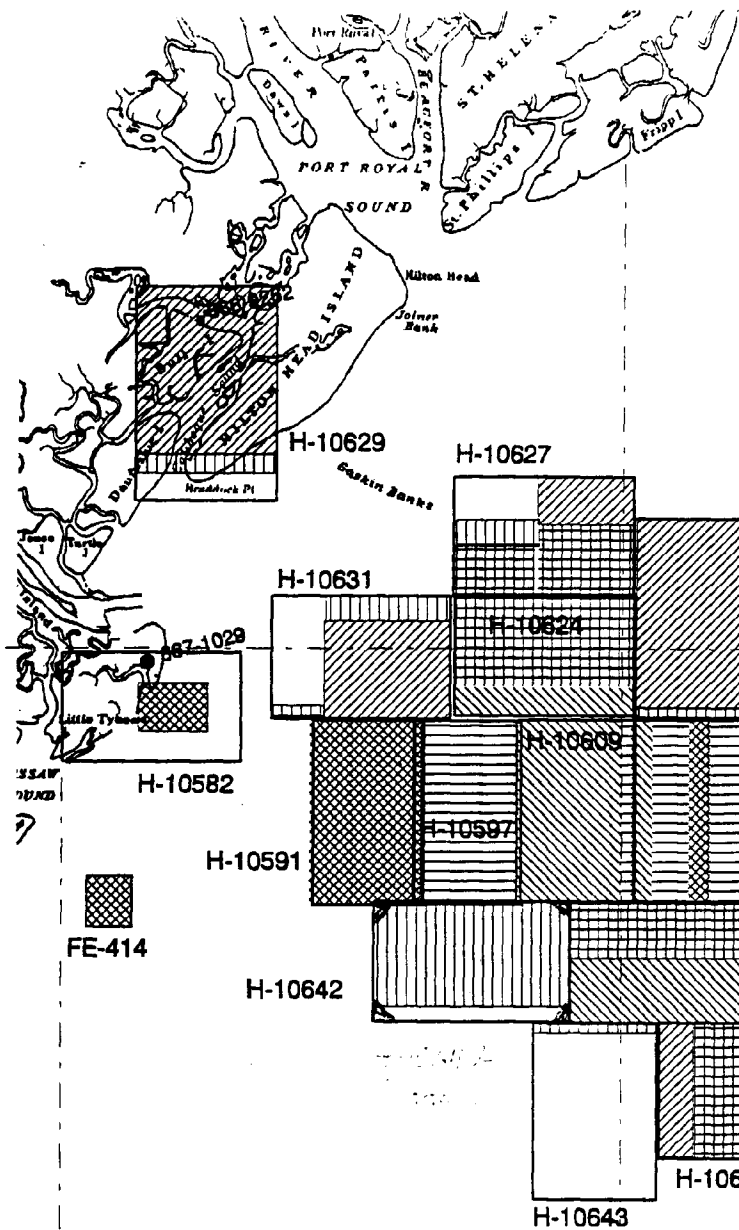
OPR-G398-WH

APPROACHES TO SAVANNAH RIVER

OPR-G352-WH

CALIBOUGUE AND PORT ROYAL SOUNDS

APRIL - NOVEMBER 1995



080-55-00

080-30-00

080-00-00

NOAA SHIP WHITING S329

CDR JOHN D. WILDER, COMMANDING

APR	MAY	JUNE	JULY	AUG	SEP	OCT	NOV
24	25	27	23	29	23		
156	83	218	0	263	224		
173	10	24	156	253	170		
904	1208	1550	1732	1336	871		
7	14	52	182	56	78		
38	49	64	74	64	37		
6	10	22	24	2	12		
	8	4	9	5	7		
5	19	15	15	8	36		
20	0	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-95
WH-10-14-95
H-10642**

**NOAA SHIP WHITING
CDR John D. Wilder, NOAA
Commanding Officer**

A. PROJECT

The purpose of project OPR-G398-WH is to provide contemporary hydrographic survey data for existing nautical charts. This project responds to requests from the Georgia Ports Authority and the Savannah Pilots Association to determine the deepest and safest approach to the 42-foot dredged shipping channel.

Project OPR-G398-WH, Approaches to Savannah, Georgia, is divided into twelve survey sheets. The survey described in this report addresses sheet "M". The survey was assigned field sheet number WH-10-14-95 and registry number H-10642.

Survey operations were conducted in accordance with Hydrographic Project Instructions OPR-G398-WH dated March 14, 1995, and Change Number One dated May 17, 1995.

B. AREA SURVEYED

Hydrographic survey H-10642 is a 4 NM by 7 NM survey positioned 17 NM South of Gaskin Banks, SC. Sheet limits are bounded by 31° 51' 35.3" N and 31° 47' 12.3" N to the north and south respectively, and by 080° 32' 21.2" W and 080° 40' 32.7" W to the east and west respectively.

Survey operations commenced on September 10, 1995 (DN 253), and were completed on October 25, 1995 (DN 298).

C. SURVEY VESSELS

WHITING (VESNO 2930) was used for main-scheme side scan sonar (SSS) and sounding data acquisition, bottom sampling, and velocity casts.

Launch 1014 (VESNO 2932) acquired SSS main-scheme holidays and conducted all dive operations.

No unusual vessel configurations were used nor were any problems encountered.

D. AUTOMATED DATA ACQUISITION AND PROCESSING

Survey data acquisition and processing were accomplished using the HDAPS system with the following software:

<u>PROGRAM NAME</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	2.11	April 17, 1995
CONTACT	2.46	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
HIPSTICK	1.01	February 27, 1995
HPRAZ	1.26	February 27, 1995
INVERSE	2.02	February 27, 1995
LISTDATA	1.02	February 27, 1995
LISTSETUP		June 26, 1995
LOADNEW	2.13	March 07, 1995
LSTAWOIS	3.07	March 27, 1995
MAINMENU	1.20	February 27, 1995
MAN_DATA	3.02	March 07, 1995
NEWPOST	6.13	February 27, 1995
PLOTALL	2.32	February 27, 1995
POINT	2.12	March 07, 1995
PREDICT	2.01	February 27, 1995
PRESURV	7.11	February 27, 1995
PRINTOUT	4.04	February 27, 1995
QUICK	2.07	February 27, 1995
RAMSAVER	1.02	February 27, 1995
REAPPLY	2.12	February 27, 1995
RECOMP	1.04	March 07, 1995
SCANNER	1.00	February 27, 1995
SELPRINT	2.05	February 27, 1995

SYMBOLS	2.00	February 27, 1995
VERSIONS	1.00	February 27, 1995
ZOOMEDIT	2.33	February 27, 1995

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 and performance checks were conducted using *SHIPDIM* version 2.1. Program *DAILYDQA* ensured the proper functioning of the MOD III diver 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. The following sonar equipment was used throughout the survey, however, it should be noted that continual replacement of inner parts occurred during the survey, thereby making the listing of serial numbers (S/N) less meaningful.

<u>Vessel</u>	<u>Instrument</u>	<u>S/N</u>	<u>DN's</u>
WHITING	Towfish	16835	253-256
		16699	256-258, 261, 262, 265, 266, 268-271
		11904	286, 287, 289
	Recorder	016942	253-258, 261, 262, 265, 266, 268-271, 286, 287, 289
Launch 1014	Towfish	10823	298
	Recorder	016671	298

On WHITING, the SSS towfish was deployed from a Reuland winch (model number 8377-XF5461A, S/N 814861A-1) using armored cabling in conjunction with an A-frame on the stern. The armored cable was connected to the SSS recorder via a slip-ring assembly.

On launch 1014 the SSS towfish was deployed using a Superwinch Model W115 in conjunction with an adjustable davit arm on the stern of the launch. The SSS towfish was towed with vinyl-coated Kevlar cable and was connected to the recorder via a slip ring assembly.

Side scan sonar data were collected utilizing the 100 meter range scale. In order to acquire the required 200% SSS coverage, main-scheme lines were run at a spacing of 75 meters. Adequate coverage was determined by producing an 'A' and 'B' swath plot and ensuring

100% coverage on each plot. Main scheme lines were split or re-run in all areas where 200% coverage was questionable.

The SSS towfish was maintained at a height off the bottom of 8 to 20 percent (8-20 meters) of the range scale in use. SSS operations were limited to a speed-over-ground of 4.0 - 6.0 knots.

Confidence checks were performed on a routine basis, primarily by noting changes in bottom texture on the outer edges of the sonagram and by comparing cross references.

All potentially significant contacts in the survey area 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 one another. Significant items were further developed by diver investigation. Refer to section N and to Separate V for more information. *Refer to section V for more information.*

F. SOUNDING EQUIPMENT

Raytheon Digital Survey Fathometers (DSF-6000N) echo sounders were used to measure water depths during this survey. The DSF-6000N produced a graphic record of the high frequency (100 kHz) and low frequency (24 kHz) depth. The high and low frequency digitized depths were recorded by the HDAPS acquisition system. The high frequency depths were selected as the primary depths as shown on all sounding plots. In addition, echograms were carefully reviewed for significant features along the track line and any significant features on the graphic record that were not selected as primary soundings were manually inserted.

The following fathometers were used during this survey, however, it should be noted that continual replacement of inner parts occurred during the survey, thereby making the listing of serial numbers (S/N) less meaningful.

<u>Vessel</u>	<u>S/N</u>	<u>DN</u>
WHITING	B050N	253-256
	B043N	256-258, 261, 262
	A106N	265, 266, 268-271
	C066	286, 287, 289
Launch 1014	A105N	298

Electronic technicians performed daily accuracy checks and preventive maintenance on the DSF-6000N.

Diver determined least depths were measured with a Diver Least Depth Gauge Module (MOD3) 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). The profiler was calibrated on February 15, 1995, during WHITING's winter inport period and Data Quality Assurance tests were performed during each CTD cast.

Data Quality Assurance (DQA) for the Seacat CTD profiler 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. Program *CAT 2.00* compared these values to the CTD surface values and determined that the velocity probe was working properly.

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 manually entered into an HDAPS velocity table. The correctors were applied to both high (100 kHz) and low (24 kHz) frequency beams during data acquisition. Velocity profile data are included in Separate IV. ↗

The casts are summarized in the following table, even Table# for the ship, odd for launches:

<u>DN</u>	<u>Vel.Table#</u>	<u>Latitude</u>	<u>Longitude</u>	<u>Depth</u>
252	2, 3	32° 03' 01"N	080° 24' 16"W	26.5 m
264	6, 7	31° 51' 25"N	080° 37' 13"W	18.7 m
287	16, 17	31° 42' 01"N	080° 31' 51"W	19.7 m

There were no variations in instrument initials.

Leadline comparisons were performed on the WHITING on May 11 and August 3, 1995 with good results. No corrections to soundings were applied based on leadline data.

The correction for static draft on WHITING (2930) is 3.2 meters and was verified on May 11, 1995 with the MOD III diver least depth gauge. The correction for the static draft for launches 1014 and 1015 is 0.55 meters, as measured on July 28, 1993. Corrections for static draft were applied via offset tables. ↗

Settlement and Squat measurements for WHITING were conducted and determined on November 10, 1993 (Offset Table 9). Settlement and squat measurements for launch 1014 (Offset Table 2) and launch 1015 (Offset Table 1) were conducted and correctors determined on March 29, 1995. The settlement and squat correctors were applied to the sounding data in real time on each survey platform. Settlement and squat corrector tables are in Separate IV. ↗

On the WHITING, heave correctors were generated and logged in real time from a heave, roll and pitch sensor (HIPPI, S/N 19109-C). For launches 1014 and 1015 heave corrections were applied during post processing by manually scanning the echograms.

Diver least depths were determined using a MOD III least depth gauge. Program *DAILYDQA* was used to monitor the daily performance of the MOD III and program *SMLGAUGE* was used to convert least depth pressure readings to depths in meters.

The tidal datum for this project is Mean Lower Low Water. The operating tide station at Fort Pulaski, Georgia (867-0870) served as the reference station for predicted tides. 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 to the digital data during acquisition by HDAPS. Digital tidal data were received on floppy disk from N/CS3, Hydrographic Surveys Division. Predicted tides were applied to data using a time correction of -0:10 for high and low tides and a 0.94 tidal height ratio.

WHITING installed a tide station at Tybee Marina (867-1029) for datum control of H-10642. Opening levels were run on March 30, 1995. On June 6, 1995 the ADR gauge was damaged in a storm. That same day the gauge was repaired and levels rerun, verifying that the tide staff had not moved. Requests for smooth tides were submitted to the Product and Services Branch, N/OES231, Datums Section, on November 10, 1995. *Approved Tides and Existing Data*

H. CONTROL STATIONS *Approved Tides and Existing Data*

The horizontal datum for this project is the North American Datum of 1983 (NAD-83). The source of differential correctors was an HF Differential GPS station erected by WHITING personnel over a surveyed mark at Skidaway Institute of Oceanography. The adjusted NAD-83 position for Skidaway Institute (SKID) was provided by the Field Photogrammetry Section on March 6, 1995. Additionally, WHITING used the forward range marker on Jones Island Range and the Charleston Coast Guard DGPS Beacon for performance checks. The positions of SKID, Jones Island Front Range and Charleston CG Beacon (scaled off the chart) follow:

	<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 CG DGPS Beacon	32° 45' 30.000" N	079° 50' 30.000" W

At Skidaway (SKID) WHITING used *MONITOR* version 3.0 to verify the station position, and to check for multipath in the area.

I. HYDROGRAPHIC POSITION CONTROL

An HF Differential Global Positioning System (DGPS) was used as the navigation system for this survey. Both ship and launches used an Ashtech Sensor GPS receiver with an LRD-1 HF receiver supplying correctors for DGPS navigation. Ashtech receivers were initialized by HDAPS; LRD-1 radios were set to the appropriate frequency.

DGPS positioning was accomplished in accordance with the FPM, section 3.4. The Horizontal Dilution of Precision (HDOP) limit was computed as required in section 3.4.2 of the FPM and found to be 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 MAXON radio-receivers used are as follows:

	<u>Device</u>	<u>Serial Number</u>
WHITING	Ashtech Sensor LRD-1	AMC# A002785 202
Launch 1014	Ashtech Sensor LRD-1	700417B1203 233
Launch 1015	Ashtech Sensor LRD-1	700417B1055 204

The serial numbers for equipment at Skidaway Island DGPS tower follows:

Station SKID	Ashtech Sensor LRD-2 Ray 152	700354A03069 605 BS29239
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DGPS performance checks were done in two stages. The first stage determined the performance of station SKID. Prior to September 25, 1995 the check was performed by using a launch to take ten DP's alongside the forward range light marking Jones Island Range. The average position from these 10 DP's was compared to the known position of the range light to verify the proper functioning of the Skidaway DGPS. After September 25, 1995 the proper functioning of WHITING's Skidaway DGPS was determined by using *SHIPDIM* version 2.1. The position from the Skidaway DGPS tower was compared to the position provided by the Coast Guard DGPS beacon in Charleston. *SHIPDIM* routinely showed the positions given by the two systems to be within 2-3 meters of each other.

Stage two was conducted with each launch securely housed in WHITING's davits. Simultaneous HDAPS positions were compared between WHITING and each launch; an offset in distance and azimuth was then applied between the ship and each launch system. All DGPS performance checks confirmed that the DGPS beacon was operating properly. DGPS performance checks were submitted under separate cover to N/CS33.

DGPS antenna offsets and laybacks were measured on July 28, 1993, for launches 1014 and 1015 and on March 19, 1993 for the WHITING. Offsets and laybacks were measured using the 100 kHz (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-10642 (1:10,000), providing altitude unconstrained positioning.

Offset, layback, and height corrections for each launch's SSS aft towing boom were measured on March 29, 1995. The same measurements were made on the WHITING on March 19, 1993.

All offset, layback, and height data were applied by HDAPS on-line via correctors from offset tables 1, 2 and 9 for 1015, 1014 and WHITING respectively. These tables are on file at N/CS33.

J. SHORELINE

There is no shoreline within the survey area of H-10642.

K. CROSSLINES

A total of 83.86 nautical miles of crosslines were run for H-10642. This amounts to 10.36% of the mainscheme miles run. Using predicted tides there was excellent agreement within 0.3 meters throughout the survey sheet with the following exception. In a small area near latitude 31° 50.5' N and between longitudes 080° 36.0' W and 080° 36.5' W the crossline soundings are consistently deeper, some by as much as 0.7 meters.

L. JUNCTIONS

Survey H-10642 junctions on the north, east and southeast sides by surveys from OPR-G398-WH-95. On the north side of H-10642 are surveys H-10591, H-10597 and H-10609. On the east edge is survey H-10613 and on the southeast corner is survey H-10643. The following table shows how each survey compares with H-10642 using predicted tides:

<u>Survey</u>	<u>Agreement (meters)</u>	<u>Remarks</u>
H-10591	0.0 to 0.4	H-10591 soundings are shallower
H-10597	0.0 to 0.5	H-10597 soundings are shallower
H-10609	0.0 to 0.5	No trends were noticed
H-10613	0.0 to 0.3	H-10631 soundings are shallower
H-10643	0.1 to 0.3	H-10643 soundings are deeper

M. COMPARISONS WITH PRIOR SURVEYS

No prior surveys were available for the area covered by H-10642.

N. ITEM INVESTIGATIONS

The following table summarizes the investigations of all side scan sonar contacts. Note that all least depths were determined using predicted tides and positions determined using Differential GPS. The contacts, listed on the next page, are arranged according to fix number and SSS contact name:

N.1	Fix 3000 (6268.28P)	Truck Tire
N.2	Fix 3001 (7937.44S)	Arches
N.3	Fix 3002 (9174.25P)	Arches
N.4	Fix 3003 (9527.41P)	Arches
N.5	Fix 3014 (8852.36P)	Arches
N.6	Fix 3016 (6067.36S)	Arches
N.7	6859.46S	False Contact
N.8	8709.02P	False Contact

N.1 Fix 3000 (6268.28P) Truck Tire

Latitude:	31° 51' 19.029" N
Longitude:	080° 32' 29.429" W
Source:	Side scan sonar contact
Least Depth:	13.6 meters (44 feet)

Divers investigated a large truck tire rising 2 feet off the bottom. The least depth was measured by diver placed MOD III least depth gauge. WHITING recommends that this insignificant item not be charted.

N.2 - N.6 Arches

Items N.2 to N.6 represent identical features. Divers investigated steel girder "arches" rising approximately 3 feet off the bottom. All least depths were measured by diver placed MOD III least depth gauge. WHITING recommends that none of these contacts be charted. The following diagram best describes the arch structures. A table on the following page lists the position and least depth for each arch.



Arches

<u>Item</u>	<u>Fix (Name)</u>	<u>Latitude</u>	<u>Longitude</u>	<u>Least Depth, m (ft)</u>
N.2	3001 (7937.44S)	31° 50' 17.893" N	080° 32' 26.715" W	15.6 (51)
N.3	3002 (9174.25P)	31° 49' 12.360" N	080° 32' 22.299" W	17.8 (58)
N.4	3003 (9527.41P)	31° 48' 53.229" N	080° 33' 31.034" W	15.7 (51)
N.5	3014 (8852.36P)	31° 49' 30.960" N	080° 37' 16.799" W	14.7 (48)
N.6	3016 (6067.36S)	31° 51' 31.858" N	080° 36' 10.290" W	17.1 (56)

N.7 6859.46S False Contact

Divers conducted a 25 meter circle search in 6-8 meters of visibility to investigate a possible SSS contact. Diver found nothing during this search.

N.8 8709.02P False Contact

This questionable contact was re-examined using SSS. Nothing was found during this investigation.

O. COMPARISON WITH THE CHART

Eight soundings from chart 11480 (32nd Ed., May 14/94 1:449,659) were compared to H-10642 soundings. Most of the H-10642 soundings were deeper than those charted with differences between 0.5 and 1.9 meters. On the NW corner of the survey sheet the H-10642 soundings did agree with a charted sounding of 7 fathoms. No H-10642 soundings were shallower.

P. ADEQUACY OF SURVEY

This survey is complete and of adequate quality to supersede all prior surveys of the area.

Q. AIDS TO NAVIGATION

There are no Aids to Navigation within the boundaries of H-10642.

R. STATISTICS

Number of Positions	5616
Main-scheme SSS Lines (Nautical Miles).....	810.07
Crosslines (Nautical Miles)	83.86
Square Nautical Miles Surveyed	27.04
Days of Production	18
Detached Positions	6
Bottom Samples	15
Tide Stations Installed	0
Current Stations	None
Number of CTD Casts	3
Magnetic Stations	None

S. MISCELLANEOUS *See also Hydrographic Report*

Bottom samples for the survey area were acquired in accordance with the Hydrographic Manual, 4th Edition. As a result of the recent 1970's surveys and the consistent bottom characteristics, bottom samples were taken at 3000 meter grid spacing. All samples confirmed the charted bottom characteristics of sand and shell. In addition, several diver investigations within the survey area observed only sand and broken shell as the bottom characteristics. Oceanographic log sheets for H-10642 are submitted with the separates for this survey. Bottom samples were submitted to the Smithsonian Institution.

No current studies were done in the area. No unusual magnetic variations were encountered in the survey area. No unusual submarine features were discovered.

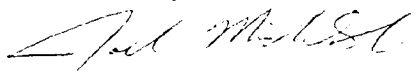
T. RECOMMENDATIONS *See also Hydrographic Report*

H-10642 is complete and without inadequacies. No additional fieldwork is required.

U. REFERRAL TO OTHER REPORTS

None.

Submitted By:



Ensign Joel T. Michalski, 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
Station:	Charleston Coast Guard Beacon (scaled off chart)
Latitude:	32° 45' 30.000" N
Longitude:	079° 50' 30.000" W

**APPROVAL SHEET
HYDROGRAPHIC SURVEY
OPR-G398-WH-95
1995
WH-10-14-95
H-10642**

The data for this survey were acquired and checked under my daily supervision. Position and sounding accuracy meet the requirements specified in the Field 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:



Commander John D. Wilder, NOAA
Commanding Officer, NOAA Ship WHITING

NOAA SHIP WHITING
ITEM INVESTIGATION REPORT
OPR-G398-WH

SURVEY H-10642

FIELD SHEET WH-10-14-95

ITEM NUMBER 6268.28P

AWOIS NUMBER -

SSS POSITION: E 52348.0

N 20959.0

DESCRIPTION OR CROSS REFERENCES:

METHOD OF INVESTIGATION (circle):

Echosounder

Diver

Other (specify) _____

INVESTIGATION NOTES:

Track line, 1-2' off bottom, 15519.

DATE/DN: 10/25/95 1298

TIME (UTC): 1240

FIX: 3000

EASTING 52350.2

LATITUDE 31° 51' 19.029"

NORTHING 20965.1

LONGITUDE 080° 32' 29.429"

LORAN C: W _____ X _____ Y _____ Z _____

45487.1 61196.0

LEAST DEPTH:

METHOD MOD3 SERIAL NUMBER 68332

MEASURED PRESSURE: 14.45 (in) 3800 (bottom) 14.62 (out)

COMPUTED DEPTH: 16.11 m

TIDE CORRECTOR: -2.5

DRAFT CORRECTOR: _____

VELOCITY CORRECTOR: _____

CORRECTED LEAST DEPTH: 13.6

RECORDER JTM

CHECKED _____

NOAA SHIP WHITING
ITEM INVESTIGATION REPORT
OPR-G398-WH

SURVEY H-10642

FIELD SHEET WH-10-14-75

ITEM NUMBER 7937445

AWOIS NUMBER -

SSS POSITION: E 52428

N 19085

DESCRIPTION OR CROSS REFERENCES:

METHOD OF INVESTIGATION (circle):

Echosounder

Diver

Other (specify) _____

INVESTIGATION NOTES:

Archives

DATE/DN: 10/15/75 1.798

TIME (UTC): 1307

FIX: 3001

EASTING 52427.5

LATITUDE 31° 50' 17.893"

NORTHING 19082.3

LONGITUDE 080° 32' 26.715

LORAN C: W _____ X 45481.6 Y 61201.1 Z _____

LEAST DEPTH:

METHOD M603 SERIAL NUMBER 68332

MEASURED PRESSURE: 14.62 (in) 41.07 (bottom) 14.63 (out)

COMPUTED DEPTH: 18.20 m

TIDE CORRECTOR: -2.65

DRAFT CORRECTOR: _____

VELOCITY CORRECTOR: _____

CORRECTED LEAST DEPTH: 15.6 7 Feet

RECORDER JTM

CHECKED _____

Investigation Report

Investigation Report

NOAA SHIP WHITING
ITEM INVESTIGATION REPORT
OPR-G398-WH

SURVEY H-10642

FIELD SHEET WH-10-14-95

ITEM NUMBER 9174.25P

AWOIS NUMBER —

SSS POSITION: E 52550

N 17066

DESCRIPTION OR CROSS REFERENCES:

Note: Positions for this contact are 40 m difference - may require large circle search.

METHOD OF INVESTIGATION (circle):

Echosounder

Diver

Other (specify) _____

INVESTIGATION NOTES:

Arches

DATE/DN: 25 Oct 95 1798

TIME (UTC): 13:40:12

FIX: 3002

EASTING 52550.0

LATITUDE 31° 49' 12.360"

NORTHING 17064.2

LONGITUDE 080° 32' 22.299"

LORAN C: W 45475.6 X 61206.4 Y _____ Z _____

LEAST DEPTH:

METHOD M₃ SERIAL NUMBER 68332

MEASURED PRESSURE: 14.63 (in) 44.05 (bottom) 14.54 (out)

COMPUTED DEPTH: 20.28m

TIDE CORRECTOR: -2.5

DRAFT CORRECTOR: _____

VELOCITY CORRECTOR: _____

CORRECTED LEAST DEPTH: 17.8m 58 feet

RECORDER AS JTM

CHECKED _____

NOAA Ship Whiting Item Investigation Report for Whiting (Gadomus aoteanus)

NOAA SHIP WHITING
ITEM INVESTIGATION REPORT
OPR-G398-WH

SURVEY H-10642

FIELD SHEET WH-10-14-75

ITEM NUMBER 9527.41P

AWOIS NUMBER -

SSS POSITION: E 50747

N 16471

DESCRIPTION OR CROSS REFERENCES:

METHOD OF INVESTIGATION (circle):

Echosounder

Diver

Other (specify) _____

INVESTIGATION NOTES:

Agass

DATE/DN: 10/25/95 1245

TIME (UTC): 1409

FIX: 3003

EASTING 50744.1

LATITUDE 31° 48' 53.229"

NORTHING 16469.4

LONGITUDE 080° 33' 31.034"

LORAN C: W _____ X _____ Y _____ Z _____

45480.6 61215.7
5 4

LEAST DEPTH:

METHOD MOD3 SERIAL NUMBER G5332

MEASURED PRESSURE: 11.52 (in) 90.90 (bottom) 14.67 (out)

COMPUTED DEPTH: 18.11 m

TIDE CORRECTOR: -2.4

DRAFT CORRECTOR: _____

VELOCITY CORRECTOR: _____

CORRECTED LEAST DEPTH: 15.7 *51 feet*

RECORDER JTM

CHECKED _____

NOAA Ship Whiting Item Investigation Report Form Whiting (see manual section)

NOAA SHIP WHITING
ITEM INVESTIGATION REPORT
OPR-G398-WH

SURVEY H-10642

FIELD SHEET ~~10~~ WH-10-14-95

ITEM NUMBER 8852.36P

AWOIS NUMBER —

SSS POSITION: E 44802

N 17618

DESCRIPTION OR CROSS REFERENCES:

METHOD OF INVESTIGATION (circle):

Echosounder

Diver.

Other (specify) _____

INVESTIGATION NOTES:

Arches

DATE/DN: 10/25/95 178299 TIME (UTC): 1527 FIX: 3014

EASTING 44803.6 LATITUDE 31°44'30.960"

NORTHING 17615.5 LONGITUDE 080°37'16.799"

LORAN C: W _____ X 45504.8 Y 61248.3 Z _____

LEAST DEPTH:

METHOD MCD 3 SERIAL NUMBER 68332

MEASURED PRESSURE: 14.53 (in) 38.21 (bottom) 14.59 (out)

COMPUTED DEPTH: 16.63m

TIDE CORRECTOR: -1.9 - 2.0

DRAFT CORRECTOR: _____

VELOCITY CORRECTOR: _____

CORRECTED LEAST DEPTH: 14.7 *14.7*

RECORDER JTM

CHECKED _____

NOAA SHIP WHITING
ITEM INVESTIGATION REPORT
OPR-G398-WH

SURVEY H-10642

FIELD SHEET WH-12-14-95

ITEM NUMBER 6067.36 S

AWOIS NUMBER —

SSS POSITION: E 46538.0

N 21346.0

DESCRIPTION OR CROSS REFERENCES:

METHOD OF INVESTIGATION (circle):

Echosounder

Diver

Other (specify) _____

INVESTIGATION NOTES:

Arches

DATE/DN: 10/25/95 1298

TIME (UTC): 1639

FIX: 3016

EASTING 46543.0

LATITUDE 31° 51' 31.858"

NORTHING 21343.6

LONGITUDE 080° 36' 10.290"

LORAN C: W _____ X _____ Y _____ Z _____

45508.3 61227.1

LEAST DEPTH:

METHOD MOD 3 SERIAL NUMBER 68332

MEASURED PRESSURE: 14.51 (in) 41.10 (bottom) 14.53 (out)

COMPUTED DEPTH: 18.30

TIDE CORRECTOR: -1.23

DRAFT CORRECTOR: _____

VELOCITY CORRECTOR: _____

CORRECTED LEAST DEPTH: 17.1 m

RECORDER JTM

CHECKED _____



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-10642

LOCALITY: Atlantic Ocean

TIME PERIOD: September 10 - October 25, 1995

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

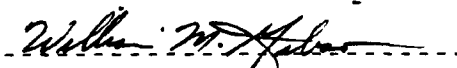
PLANE OF REFERENCE (MEAN LOWER LOW WATER): -0.08 ft.

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

REMARKS: RECOMMENDED ZONING

Apply a -12 minute correction to times, and a X0.97 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.


CHIEF, DATUMS SECTION



GEOGRAPHIC NAMES

Name on Survey	A ON CHART NO. 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											
	GASKIN BANKS (title)	X		X								
GEORGIA (title)	X		X									2
NORTH ATLANTIC OCEAN	X		X									3
												4
												5
												6
												7
												8
												9
												10
												11
												12
												13
												14
												15
												16
												17
												18
												19
												20
												21
												22
												23
												24
												25

Approved

Chris Colby

Chief Geographer

FEB 23 1996

06/27/96

HYDROGRAPHIC SURVEY STATISTICS
REGISTRY NUMBER: H-10642

NUMBER OF CONTROL STATIONS		2
NUMBER OF POSITIONS		5616
NUMBER OF SOUNDINGS		32191
	TIME-HOURS	DATE COMPLETED
PREPROCESSING EXAMINATION	10	02/08/96
VERIFICATION OF FIELD DATA	50	05/30/96
QUALITY CONTROL CHECKS	0	
EVALUATION AND ANALYSIS	1.50	
FINAL INSPECTION	5	05/21/96
COMPILATION	6	06/19/96
TOTAL TIME	73	
ATLANTIC HYDROGRAPHIC BRANCH APPROVAL		05/30/96

**ATLANTIC HYDROGRAPHIC BRANCH
EVALUATION REPORT FOR H-10642 (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 0.795 seconds (24.481 meters or 2.45 mm at the scale of the survey) north in latitude, and 0.638 seconds (16.773 meters or 1.68 mm at the scale of the survey) east in longitude.

L. JUNCTIONS

H-10591 (1995) to the northwest
H-10597 (1995) to the north
H-10609 (1995) to the northeast
H-10613 (1995) to the east
H-10643 (1995) to the southeast

Standard junctions were effected between the present survey and surveys H-10591 (1995), H-10597 (1995), H-10609 (1995), H-10613 (1995), and H-10643 (1995).

There are no junctional surveys to the west or southwest. Present survey depths are in harmony with the charted hydrography to the west and southwest.

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 CHART 11480 (32nd Edition, May 14/94)

Hydrography

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

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

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.

WRITING Processing Team

Robert Snow

Robert Snow
Cartographic Technician
Verification of Field Data
Evaluation and Analysis

APPROVAL SHEET
H-10642

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: 30 MAY 1996
Robert G. Roberson
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.

Nicholas E. Perugini Date: 30 May 1996
Nicholas E. Perugini
Commander, NOAA
Chief, Atlantic Hydrographic Branch

Final Approval:

Approved: Andrew A. Armstrong, III Date: July 3, 1996
Andrew A. Armstrong, III
Captain, NOAA
Chief, Hydrographic Surveys Division

