

F00436

NOAA FORM 76-35A

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

DESCRIPTIVE REPORT

Type of Survey . Field Examination

Field No. WH-10-6-97

Registry No. F00436

LOCALITY

State Georgia

General Locality .. Atlantic Ocean

Sublocality Approaches to Brunswick

19 97

CHIEF OF PARTY

..... LCDR. J. W. Humphrey

LIBRARY & ARCHIVES

DATE OCT 2 1998

REGISTRY NUMBER:

F00436

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-10-06-97

State: Georgia

General locality: Atlantic Ocean

Locality: Approaches to Brunswick

Scale: 1: 20,000 10,000 Date of survey: Aug 26
September 5, 1997 - November 17, 1997

Instructions dated: May 21, 1997 Project Number: OPR-G311-WH

Vessel: NOAA Ship WHITING

Chief of Party: LCDR John W. Humphrey

Surveyed by: LCDR J.W. Humphrey, LT H. Orlinsky, M.J. Annis, R. Corson, F.R. Cruz, U.L. Gardner, P.G. Lewit, E.A. Owens, D.B. Pattison, K.B. Shaver

Soundings taken by echo sounder, hand lead-line, or pole: DSF 6000N fathometer

Graphic record scaled by: WHITING Personnel

Graphic record checked by: WHITING Personnel

Protracted by: N/A Automated plot by: HP 750C

Verification by: Atlantic Hydrographic Surveys Branch Personnel

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

Remarks: Time Zone Used, 0 (UTC)

Field Examination

Notes in red were made in the Descriptive Report during office processing

Sheet 3 of 3 Filed in tube

Awois and Surf 9/98 RWD

Field Sheet 1

OPR-G311-WH
FOO436 Sheet Layout
AWOIS Items: 9868, 9869
9870 & 9879
Approaches To
Brunswick, Georgia

9879

9870

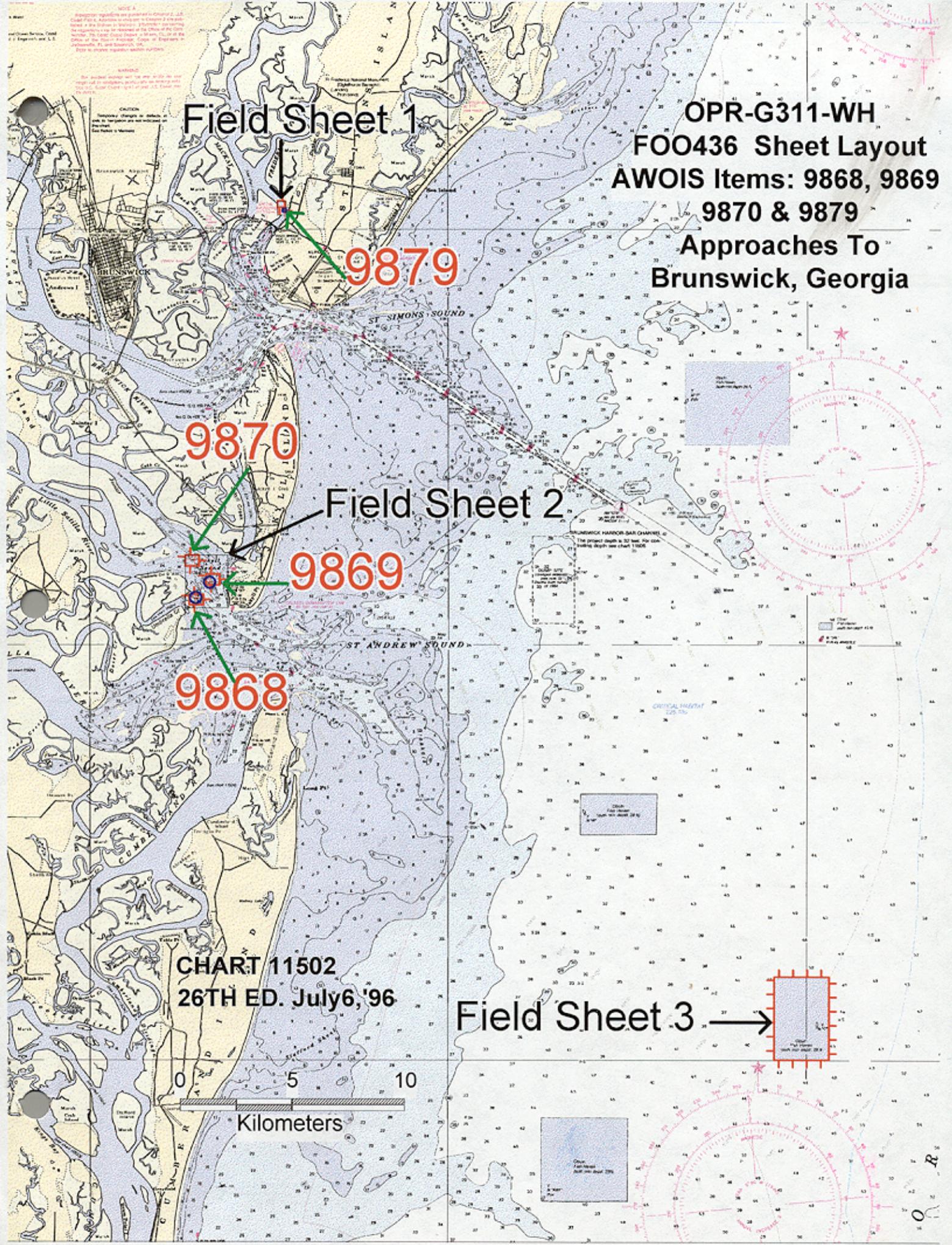
Field Sheet 2

9869

9868

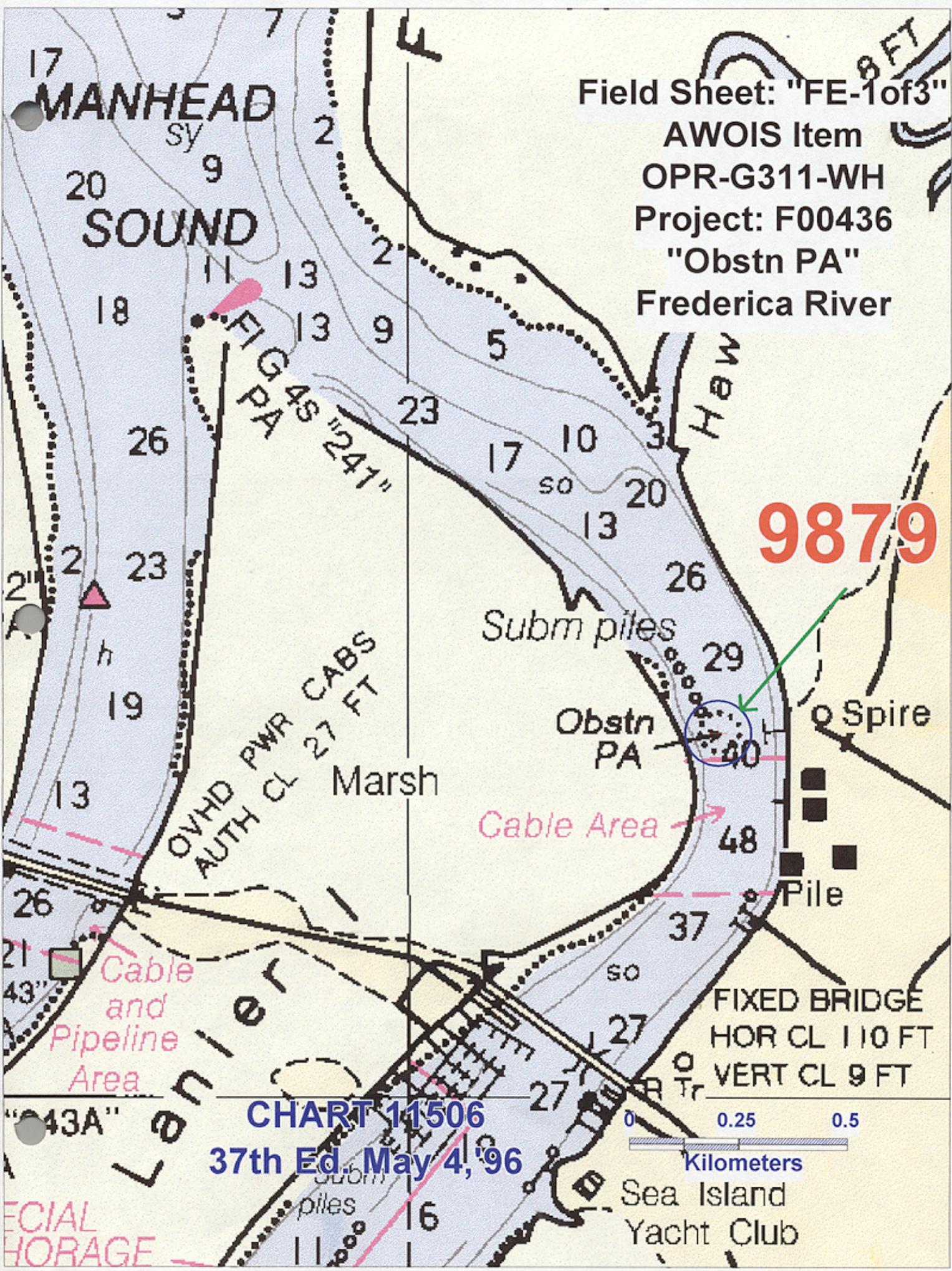
CHART 11502
26TH ED. July 6, '96

Field Sheet 3



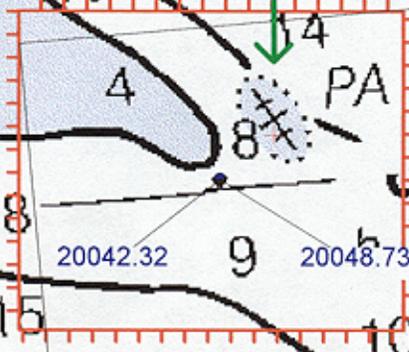
Field Sheet: "FE-1 of 3"
AWOIS Item
OPR-G311-WH
Project: F00436
"Obstn PA"
Frederica River

9879

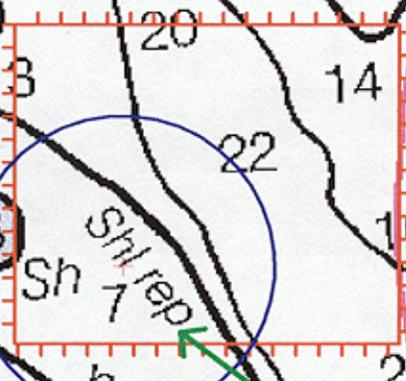


SPECIAL STORAGE

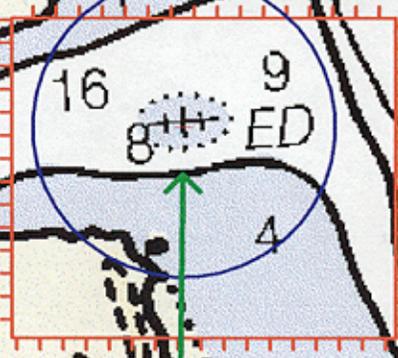
9870



J E K Y L L
S O U N D



9869



9868

Field Sheet: "FE-2of3"

'AWOIS Items:

9868,9869,9870

OPR-G311-WH

Project: F00436

'Jekyll Sound

CHART 11489 PF
31st Ed. September 13, '97

0.0 0.25 0.5

Kilometers

1/2

24

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* Data filed with original field records.

DESCRIPTIVE REPORT TO ACCOMPANY
HYDROGRAPHIC SURVEY
OPR-G311-WH
WH-10-06-97
F00436

NOAA SHIP WHITING
LCDR JOHN W. HUMPHREY
Commanding Officer

A. PROJECT

A.1 These surveys were conducted in accordance with Hydrographic Project Instructions OPR-G311-WH, basic hydrographic survey, Atlantic Ocean, Approaches to Brunswick, Georgia.

A.2 The original instructions are dated May 21, 1997.

A.3 There have been no changes to the original instructions.

A.4 This Descriptive Report covers three field sheets contained within F00436. Sheet "FE-1of3" is comprised of AWOIS item 9879. Sheet "FE-2of3" is comprised of AWOIS items 9868, 9869 and 9870. Sheet "FE-3of3" located on the eastern edge of H-10769 encompasses a fish haven with a authorized minimum depth of 28 feet. See section B.2 for exact survey boundaries. AWOIS # 476

A.5 Project OPR-G311-WH responds to requests from Brunswick Bar Pilots Association. The entrance to Brunswick is currently transited daily by Panamax car carriers and bulk cargo vessels drawing maximum draft, some of which use the tidal cycle for entry on high tide.

B. AREA SURVEYED

B.1 Survey F00436 covers various items within the navigable area of the Approaches to Brunswick, Georgia. It is bounded on the west by approximate longitude 81°46'W, and on the east by approximate longitude 81°15'W. The northern and southern limits are latitudes 31°18'N and 30°83'N, respectively.

B.2 Survey F00436 is comprised of three field sheets with the following boundaries, each starting at the SE corner and proceeding clockwise:

| SURVEY LIMITS "FE-1of3" (AWOIS 9879) | |
|-----------------------------------------|--------------|
| LATITUDE | LONGTITUDE |
| 31°10'19" N | 081°24'32" W |
| 31°10'19" N | 081°24'43" W |
| 31°10'41" N | 081°24'43" W |
| 31°10'41" N | 081°24'32" W |

| SURVEY LIMITS "FE-2of3" (AWOIS 9868, 9869, 9870) | |
|-----------------------------------------------------|--------------|
| LATITUDE | LONGTITUDE |
| 31°00'54" N | 081°26'10" W |
| 31°00'54" N | 081°27'18" W |
| 31°02'10" N | 081°27'18" W |
| 31°02'10" N | 081°26'10" W |

| SURVEY LIMITS "FE-3of3" (Fish Haven) | |
|-----------------------------------------|--------------|
| LATITUDE | LONGTITUDE |
| 30°49'59" N | 081°09'25" W |
| 30°49'59" N | 081°10'55" W |
| 30°52'01" N | 081°10'55" W |
| 30°52'01" N | 081°09'25" W |

B.3 Data collection for survey F00436 began on August 26, 1997 (DN 238). Data collection for F00436 ended on November 17, 1997 (DN 321).

C. SURVEY VESSELS

C.1 The following vessels were used during these surveys:

| Vessel | EDP Number | Primary Function |
|-------------------|-------------|--------------------------------------------|
| NOAA Ship Whiting | 2930 (WTEW) | Hydrography and Side Scan Sonar Operations |
| NOAA Launch WH-2 | 2932 (1014) | Hydrography and Side Scan Sonar Operations |
| NOAA Launch WH-1 | 2931 (1015) | Hydrography and Side Scan Sonar Operations |

C.2 No unusual vessel configurations were used during these surveys.

D. AUTOMATED DATA ACQUISITION AND PROCESSING

See also Evaluation Report

D.1 All software used for data acquisition and processing are contained on the **HYDROSOFT 7.3 (plus updates as of 10/20/97)** compact disc provided by Hydrographic Surveys Division (N/CS32). The following is a list of software used from this disc:

HYPACK for Windows version 6.4
HSD Utilities
Hydrographic Processing System

D.2 The SEABIRD SBE-19 sound velocity profile unit was utilized with **SEASOFT 3.3M** and **SEACAT 2.0** software. The program **VELOCITY** (Version 2.11, September 21, 1994) was used to process the collected data and calculate velocity corrections.

E. SONAR EQUIPMENT

E.1 The WHITING and its launches conducted all side scan sonar operations using an EG&G Model 260 image-corrected side scan sonar recorder and a 100 kHz Model 272-T towfish.

E.2 The towfish was configured with a 20° beam depression, which is the normal setting and yields the optimum beam correction.

E.3 The 100 kHz frequency was used throughout the survey.

E.4 a. During survey preparation, it was determined that the depth of water in each survey area would require various range scales and line spacing. Field sheet surveys were conducted as table below.

| Field Sheet | AWOIS Item | Range Scales (meters) | Line Spacing (meters) | % SSS Coverage |
|-------------|------------|-----------------------|-----------------------|----------------|
| "FE-1of3" | 9879 | 50m & 75m | Random | 100% |
| "FE-2of3" | 9868 | 25m & 50m | 40m & Splits | 200% |
| | 9869 | HYDRO | 50m & Random | ---- |
| | 9870 | 25m | 20m & Splits | 100% |
| "FE-3of3" | Fish Haven | 50m, 75m, 100m | 80m & Splits | 200% |

The line spacing is in accordance with the value specified in section 7.3.2.1 of the Field Procedures Manual (FPM). Data collected with an EPE of 30 or greater was rejected or smoothed during post-processing, so the maximum line spacing was never exceeded.

E.4 b. Confidence checks were obtained during frequent passes by various aids to navigation and bottom features such as sand waves or anchor scours. These features were annotated on the sonargram.

E.4 c. Two hundred percent side scan coverage was completed for field sheet "FE-3of3" and AWOIS item 9868 of field sheet "FE-2of3" in areas where depths would allow. One hundred percent side scan coverage was completed for AWOIS item 9879 of field sheet "FE-1of3" and AWOIS item 9870 of field sheet "FE-2of3" in areas where depths would allow. All side scan coverage was checked with swath plots to ensure proper overlap between adjoining lines. All relevant and questionable contacts were investigated using a reduced side scan range scale (either 25, 50 or 75-meter range scale, dependent on depth) followed by an echo sounder investigation.

E.4 d. No degraded data returns were collected during this survey.

E.4 e. 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. A slip-ring assembly connected the armored cable to the SSS recorder. On launches 1014 and 1015 the SSS towfish was deployed using a Superwinch in conjunction with an adjustable davit arm on the stern. The SSS towfish was towed with a vinyl-coated kevlar cable and was connected to the recorder by a slip-ring assembly.

E.5 Significant side scan sonar contacts were investigated using side scan sonar at a reduced range scale. Development survey lines were routinely run with side scan sonar at 25, 50 and 75-meter range scale. Detailed descriptions of all AWOIS items and investigated contacts falling within the Navigable Area are addressed in the ITEM INVESTIGATION REPORTS found in section N.

E.6 All overlap was checked and holidays identified during post processing using **HPS_MI**, a MapBasic program provided by Hydrographic Surveys Division (N/CS32) to accompany **MapInfo** software **version 4.1**.

F. SOUNDING EQUIPMENT

F.1 All hydrographic soundings were acquired using a Raytheon Model 6000N Digital Survey Echosounder.

F.2 No other sounding equipment was used.

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

F.4 Both high (100 kHz) and low (24 kHz) frequency sounding data were recorded during data acquisition. Only high frequency soundings were plotted.

G. CORRECTIONS TO SOUNDINGS *See also Evaluation Report*

G.1 a. Sound Velocity Correctors

The velocity of sound through water was measured using a Sea-Bird SBE 19 Seacat Profiler (s/n 196093-1060). Seacat Data Quality Assurance Tests were conducted after each respective velocity cast to ensure that the unit was operating within tolerance.

All sound velocity data were processed using program **VELOCITY**. Computed velocity correctors were entered into the HPS sound velocity table and re-applied during post-processing to both high and low frequency soundings.

The following is a list of sound velocity casts used for F00436:

| Cast Number | Day No. | Vessel Covered | Position of Cast | | Days Covered |
|-------------|---------|----------------|------------------|-------------|--------------|
| | | | Latitude | Longitude | |
| 10 | 232 | Launches | 30°59'36"N | 081°06'48"W | 238 |
| 16 | 251 | Launches | 30°59'24"N | 081°13'42"W | 249 |
| 17 | 267 | Ship | 30°48'52"N | 081°16'07"W | 268-296 |
| 28 | 305 | Ship | 30°53'24"N | 081°11'36"W | 308-320 |
| 33 | 315 | Ship | 30°53'18"N | 081°11'36"W | 315 |
| 34 | | Launches | | | 319 |
| 36 | 316 | Launches | 31°06'12"N | 081°04'30"W | 321 |

d. Leadline/Barcheck Comparison

Dual leadline comparisons with the DSF-6000N were conducted for WHITING during OPR-G311-WH and applied to F00436 on:

| Day Number | Latitude | Longitude | Depths |
|------------|------------|-------------|---------|
| 274 | 31°07'26"N | 081°11'14"W | 27 feet |
| 324 | 31°18'35"N | 081°08'22"W | 28 feet |

Weather and sea conditions were calm and proved ideal for performing the leadline comparison. No corrections to soundings were needed. Leadlines used were calibrated on February 11, 1997, and the calibration confirmed that the leadline error was negligible.

Barcheck comparisons were performed for the launches and applied to F00436 on:

| Day Number | Latitude | Longitude | Launch Number |
|------------|------------|-------------|---------------|
| 273 | 31°08'04"N | 081°12'07"W | 1014 |
| 275 | 31°08'04"N | 081°29'48"W | 1015 |

Leadline comparisons were performed for the launches and applied to F00436 on:

| Day Number | Latitude | Longitude | Depth | Launch |
|------------|------------|-------------|-------|--------|
| 324 | 31°10'23"N | 081°17'28"W | 21 | 1014 |
| 324 | | | feet | 1015 |

Weather and sea conditions were fair and proved satisfactory for performing the barcheck and leadline comparisons. No corrections to soundings were needed. Barcheck lines used were calibrated on February 12, 1997, and the calibration confirmed that the barcheck line error was negligible. *Copies of the bar and lead-line check data are included in the Separates, section IV.

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.

f. Static Draft

The static draft correction for launches 1014 and 1015 is 0.55 meters, and was measured on July 28, 1993. The corrector was entered into HPS Offset Tables 2 and 1, respectively. The correction for static draft for WHITING is 3.2 meters, a historical value which WHITING divers confirmed with a MOD III Diver Least Depth Gauge on May 11, 1995. The corrector was entered into Offset Table 9. Static draft correctors were applied during data processing for each survey platform.

g. Dynamic Draft (Settlement and Squat Correctors)

Settlement and squat values for launch 1014 were determined on March 7, 1997, and were entered into HPS Offset Table 2. Settlement and squat values for launch 1015 were determined on March 10, 1997, and were entered into HPS Offset Table 1. Settlement and squat values for WHITING were determined on March 26, 1996, and were entered into HPS Offset Table 9. The settlement and squat correctors were applied to the sounding data in real time for each survey platform. *Refer to Separate IV for data records.

h. Heave, Roll, and Pitch Correctors

Heave correctors for data acquired by WHITING, launch 1014, and launch 1015 were determined by a TSS Dynamic Motion Sensor DMS-05. Heave correctors were collected during data acquisition and applied to raw data during the **HSD Utilities** conversion process. Serial numbers for these sensors were as follows:

| Vessel | Serial Number |
|--------|---------------|
| 2930 | 2066 |
| 2931 | 2062 |
| 2932 | 2068 |

*G.6 Tide Correctors

a. The tidal datums for this project are Mean Lower Low Water (MLLW) and Mean High Water (MHW). Soundings are referenced to MLLW. Heights of bridges and cables are referenced to MHW. The operating tide station at Fernandina Beach, Florida (872-0030) served as control for datum determination.

b. Tidal zones are controlled by one primary gauge, Fernandina Beach, Florida (872-0030). Due to the limitations of HPS and for ease of data processing, the following zone correctors were applied to all F00436 data using the predicted tides utility in HPS. All proper zones will be applied through HPS upon receipt of approved tides from N/CS41. See following page for location of zones GA16, GA15 and SEC181.

| Field Sheet | "FE-1of3" | "FE-2of3" | "FE-3of3" |
|-----------------|-----------|------------|-------------|
| Zone | GA16 | GA15 | SEC181 |
| Reference # | 872-0030 | 872-0030 | 872-0030 |
| Time Corrector | 0 minutes | 18 minutes | -24 minutes |
| Range Corrector | X0.91 | X1.12 | X0.96 |

Approved tides for F00436 were requested from N/CS41 in a letter mailed and dated December 4, 1997. *Approved tides and zones have been partially applied during office processing.*

The WHITING and its launches employed no unusual or unique methods or instruments to correct echo soundings.

All sounding correctors were applied to both the narrow (100 kHz) and wide (24 kHz) DSF-6000N beams. Zoning for this project is consistent with the Project Instructions.

H. CONTROL STATIONS.

- See also Evaluation Report.

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

I. HYDROGRAPHIC POSITION CONTROL.

I.1 This survey was conducted using the Global Positioning System (GPS) corrected by the U.S. Coast Guard (USCG) Differential GPS reference station network. The launches and the ship used an Ashtech Sensor GPS receiver with a CSI MBX1 beacon receiver supplying USCG correctors for DGPS navigation. Ashtech receivers were automatically initialized by HSDutils and the CSI MBX1 units were preset to the appropriate station and frequency.

I.2 Accuracy requirements were met as specified by the Hydrographic Manual and Field Procedures Manual (FPM). The Horizontal Dilution of Precision (HDOP) and Expected Position Error (EPE) specified by the FPM were monitored during on-line data collection. If the positioning degraded beyond the acceptable limits while on-line, the data were either smoothed or rejected.

I.3 Differential GPS Equipment:

The serial numbers of the Ashtech Sensor and CSI MBX1 receivers on the data acquisition platforms are as follows:

| Vessel | Device | Serial Number |
|-------------|-----------------|------------------------|
| 2930 (WTEW) | Ashtech Sensors | 700417B1203 (system A) |
| | | 700417B1191 (system B) |
| | CSI MBX1 | X-1318 (system A) |
| | | X-1081 (system B) |
| 2931 (1015) | Ashtech Sensor | 700417B1194 |
| | CSI MBX1 | X-1088 |
| 2932 (1014) | Ashtech Sensor | 700417B1055 |
| | CSI MBX1 | X-1079 |

I.4 Correctors were received from the Charleston, SC, and Cape Canaveral, FL radiobeacons.

I.5 a. DGPS performance checks on NOAA Ship WHITING were determined by using Shipboard Data Integrity Monitor program ("**SHIPDIM**", Version 2.1), according to section 3.4.5 of the FPM. The position determined using correctors from the Charleston, SC DGPS tower was compared to the position determined using correctors from the Cape Canaveral, FL 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. *See SHIPDIM PERFORMANCE CHECKS in Separate III for system checks.

¹⁰
*Data filed with original field data.

I.5 b. DGPS performance checks for launch 1014 and launch 1015 were conducted while secured in the WHITING davits using correctors from the Charleston, SC DGPS tower. Simultaneous HYPACK positions were compared with WHITING. An offset in distance and azimuth was then calculated between the ship and launch system. All DGPS performance checks confirmed that the equipment was working properly.

I.7 a. There were no unusual methods used to operate or calibrate electronic positioning equipment.

I.7 b. There were no equipment malfunctions.

I.7 c. No unusual atmospheric conditions affected data quality.

I.7 d. No systematic errors were detected which required adjustments.

I.7 e. The maximum allowed HDOP value of 5.70 was never exceeded.

I.8 f. DGPS antenna offsets were measured on March 19, 1993, for WHITING. Offsets and laybacks were measured using the high frequency echosounder transducer as the reference. Correctors were entered into Offset Table 9. The DGPS antennae were installed on launches 1014 and 1015 on April 2, 1996, directly over the echosounder transducer. Antenna height was also measured on the same respective dates shown above, using the water line as the reference. The offsets and laybacks were applied by HYPACK on-line. Correctors were entered into Offset Table 1 for launch 1015 and Table 2 for launch 1014. A minimum of four satellites were used during survey F00436 providing altitude unconstrained positioning.

I.9.g. Offset, layback and height corrections for the launches aft towing boom were measured on July 28, 1993, verified on April 5, 1994, and applied by HYPACK on-line. Correctors were entered into Offset Table 1 for launch 1015 and Table 2 for launch 1014. Offset, layback and height for WHITING's A-frame was measured on July 27, 1992, using the forward high frequency transducer as the reference. The offset and layback correctors were adjusted slightly on March 11, 1997, due to a small shift of the A-frame. Correctors were entered into Offset Table 9.

These offsets, along with the cable length, towfish height, and depth of water, were used by the HPS system to compute the position of the towfish. *Copies of HPS Offset Tables 1, 2 and 9 are contained in Separate III.

J. SHORELINE

No shoreline is contained within the boundaries of this survey.

K. CROSSLINES.

There were no crosslines run within the limits of survey F00436.

L. JUNCTIONS *See also Evaluation Report*

L.1 Junctions occur on field sheet "FE-3of3" of survey F00436. "FE-3of3" (scale 1:20,000) junctions the eastern edge of H-10769 (scale 1:20,000).

L.2 A comparison of data collected at junction on field sheet "FE-3of3", of survey F00436, to that on H-10769 proved no significant differences between soundings exist. Generally agreement was excellent, with an occasional difference of 1 to 3 feet.

M. COMPARISON WITH PRIOR SURVEYS *See also Evaluation Report*

A comparison with prior surveys is not required for this survey, as stated in the Hydrographic Project Instructions for OPR-G311-WH.

N. ITEM INVESTIGATION REPORTS *See also Evaluation Report*

AWOIS investigations were conducted for AWOIS items 9868, 476, 9869, 9870 and 9879. No dives were conducted for F00436.

N1.1

Investigation Summary: On September 6, 1997 a detached position was obtained on an uncharted visible wreck at latitude $31^{\circ}00'38.40''$ and longitude $81^{\circ}25'57.49''$. The detached position (echosounder position number 20390) was taken approximately 20 meters due ~~east~~^{west} of target at a depth of ~~79~~⁷⁹ feet (corrected with predicted tides). According to local information the wreck had occurred approximately six weeks prior to investigation.

Recommendation: Based on the results of this survey, the hydrographer recommends charting visible wreck with a 20 meter offset due east from surveyed position and charting a depth of ~~79~~⁷⁹ feet (corrected with predicted tides) at surveyed position. *Concur with conditions. See Evaluation Report Section N.1.1*

N1.2 AWOIS NO: 9868

Item Description: 50 ft. Shrimp Boat

Source: LNM2/72

AWOIS Position: Lat. 31°01'07.84"N Lon. 081°27'02.34"W

Required Investigation: VS,ES Radius: 250

Charts Affected: 11502, 11504, 11489 P.F.

INVESTIGATION

Date(s): August 26, 1997 (DN 238)

Position Number(s): Not Applicable

Investigation Used: S2,ES

Position Determined By: Differential GPS

Investigation Summary: AWOIS 9868 was covered with 200% side scan sonar, where depths would allow. No significant contacts were found.

CHARTING RECOMMENDATION

Recommendation: Based on the results of this survey, the hydrographer recommends removal of the charted submerged dangerous wreck symbol. *Concur*

See also Evaluation Report Section N.1.2.

N1.3 AWOIS NO: 9869

Item Description: Shoal

Source: Unknown

AWOIS Position: Lat. 31°01'30.00"N Lon. 081°26'39.00"W

Required Investigation: VS,ES

Radius: 250

Charts Affected: 11502, 11504, 11489 P.F.

INVESTIGATION

Date(s): 08-26-97 (DN238), 11-15-97 (DN319), 11-17-97 (DN321)

Position Number(s): Not Applicable

Investigation Used: ES

Position Determined By: Differential GPS

Investigation Summary: AWOIS 9869 was investigated with single beam echosounder. Survey data showed expansion and movement of the reported shoal as seen in figure N.1.

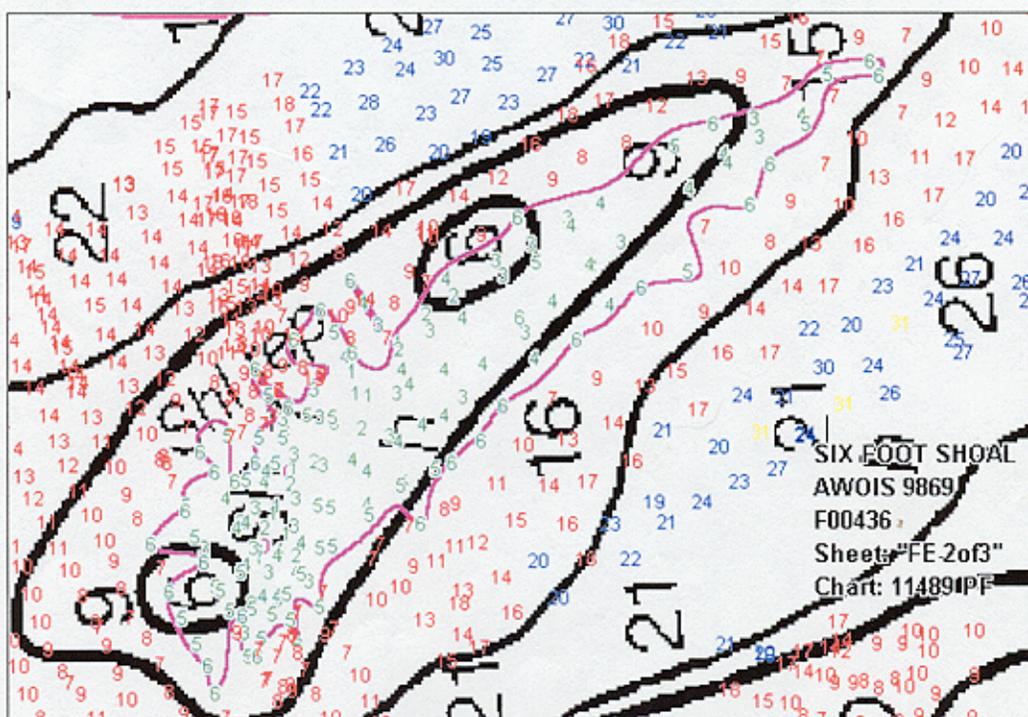


figure N.1

CHARTING RECOMMENDATION

Recommendation: Based on the results of this survey, the hydrographer recommends the removal of the "Shl rep" charted text on charts 11489-PF and 11504. In addition, the hydrographer recommends the charting of survey depths and text "Shoal" on charts 11502, 11504 and 11489-PF. *Do not concur. See also Evaluation Report Section N.1.3.*

N1.4 AWOIS NO: 9870

Item Description: Submerged Wreck (PA)

Source: Unknown

AWOIS Position: Lat. 31°02'02.83"N Lon. 081°27'04.34"W

Required Investigation: VS, ES, BD, DI, SD## **Radius:** none 100
Charts Affected: 11502, 11504, 11489 P.F.

INVESTIGATION

Date(s): August 26, 1997 (DN238)

Position Number(s): 20048.87

Investigation Used: VS, ES, S1

Surveyed Position: Lat. 31°02'00.882"N Lon. 081°27'07.848"W

Position Determined By: Differential GPS

Investigation Summary: AWOIS 9870 was covered with 100% side scan sonar at 25 meter range scale with 20 meter line spacing and splits. Several contacts were found within 120 meters of the AWOIS position. Contact 20042.32 was determined to be AWOIS 9870. A least depth of ~~1.1~~^{0.7} meters (corrected with predicted tides) was determined from echosounder position number 20048.87. The associated charted pile (PA) was not found after echosounder, side scan sonar and visual searches were conducted.

CHARTING RECOMMENDATION

Recommendation: Based on the results of this survey, the hydrographer recommends the charted submerged dangerous wreck be moved to the surveyed position, removal of charted "PA" and chart a depth (corrected with predicted tides) of ~~3.6~~^{2.5} feet. In addition, associated charted pile should be removed from chart 11504 (13th Ed. 01/26/91). *Concur with conditions. See E & A Report Section N1.4.*

N1.5 AWOIS NO: 9879

Item Description: Obstruction

Source: CL947/81

AWOIS Position: Lat. 31°10'26.83"N Long. 081°24'33.35"W

Required Investigation: VS, ES, BD, DI **Radius:** 75

Charts Affected: 11502, 11506, 11507 S.C.

INVESTIGATION

Date(s): August 26, 1997 (DN238), October 23, 1997 (DN296)

Position Number(s): Not Applicable

Investigation Used: ES, S1

Position Determined By: Differential GPS

Investigation Summary: : AWOIS 9879 was investigated with 100% side scan sonar using 50 and 75 meter range scales with random line spacing. Side scan sonar and echosounder coverage was not completely obtained within the 75 meter search radius. Reported obstruction "PA" may exist within the 75 meter radius of the reported position.

CHARTING RECOMMENDATION

Recommendation: Item not resolved. Retain as charted. *Concur*
See also Evaluation Report Section N.1.5,

O. COMPARISON WITH THE CHART

- See also Evaluation Report

O.1 Seven charts are affected by this survey (F00436):

Chart 11009
"Cape Hatteras to Straits of Florida"
34th Ed. 23 January 1993
Scale: 1:1,200,000

Chart 11480
"Charleston Light to Cape Canaveral"
33rd Ed. 6 April 1996
Scale: 1:449,659

Chart 11489 P.F.
"St. Simons Sound to Tolomato River"
31st Ed. 13 September 1997
Scale: 1:40,000

Chart 11502
"Doboy Sound to Fernandina"
26th Ed. 6 July 1996
Scale: 1:80,000

Chart 11504
"St. Andrew Sound and Satilla River"
13th Ed. 26 January 1991
Scale: 1:40,000

Chart 11506
"St. Simons Sound, Brunswick Harbor and Turtle
River"
37th Ed. 4 May 1996
Scale: 1:40,000

Chart 11507 S.C.
"Beaufort River to St. Simons Sound"
28th Ed. 3 August 1996
Scale: 1:40,000

0.2 No Danger to Navigation reports were submitted for this survey.

0.3 a. Survey depths were converted from meters to feet and overlaid on the largest scale chart of the area using MapInfo software. Overall, the soundings collected for AWOIS item investigations 9868, 9870, 9879 and survey "FE-~~3of3~~" correlated well with charted depths. Survey depths showed minor shoaling and deepening when compared to charted soundings. In addition, the investigation of AWOIS item 9869 showed significant shoaling and migration of charted shoal.

For AWOIS # 476

0.3 b. In general, survey depths for AWOIS item investigations 9868, 9870, 9879 and survey "FE-~~3of3~~" were deeper than charted depths. Differences of 1 to 3 feet were common, with an occasional difference of 4 feet. Survey depths for the investigation of AWOIS item 9869 showed differences up to 10 feet shoaler when compared to charted depths.

For AWOIS # 476

P. ADEQUACY OF SURVEY

See also Evaluation Report Sections Nando. and P.

Survey "FE-1of3" is an incomplete and inadequate investigation of AWOIS item 9879. Survey "FE-2of3" is a complete and fully adequate investigation of AWOIS items 9868, 9869 and 9870. Survey "FE-3of3" is a complete and fully adequate investigation of this fish haven.

Q. AIDS TO NAVIGATION

See also Evaluation Report

Field Sheet "FE-3of3" contained one aid to navigation. The fish haven buoy charted as (Y N "C") was determined to be located at latitude $30^{\circ}50'43.34''$ ⁶¹N longitude $081^{\circ}50'50.84''$ ^{09, 50, 39}W from side scan sonar position number 40060 on September 25, 1997 (DN 268). Survey position was located approximately 260 meters southwest from charted position, chart 11502 (26th Ed. 6 July 1996).

R. STATISTICS

| | | |
|-----|-----------------------------------------------|------------|
| 1.a | Number of Fixes | 2492 |
| .b | Lineal Nautical Miles (NM) of Sounding Lines | 93.68 NM |
| | Lineal Nautical Miles Using Side Scan Sonar | 79.24 NM |
| | Lineal Nautical Miles Without Side Scan Sonar | 14.44 NM |
| 2.a | Square NM of Hydrography | 3.06 SQ NM |
| .b | Days of Production | 10 |
| .c | Detached Positions | 1 |
| .d | Bottom Samples | 0 |
| .e | Tide Stations | 1 |
| .g | Velocity Casts | 7 |

S. MISCELLANEOUS

See also Evaluation Report

- S.1 a. No evidence of silting was found during this survey.
b. No unusual submarine features were found during this survey.
c. No evidence of anomalous tides or tidal current conditions were found during this survey.

S.2 No bottom samples were taken for survey F00436.

T. RECOMMENDATIONS

See Sections N, O, and P. of the Evaluation Report

T.1 AWOIS 9879 ("FE-1of3") is a low priority item and is not of navigational concern to local marine traffic. Although the item is not resolved WHITING does not recommend expenditure of resources to resolve this unless a field party is in the area for additional survey work anyway.

T.2 No present or planned construction or dredging should affect the results of these surveys.

T.3 Aside from the item mentioned in T.1. No further survey work is recommended for surveys "FE-2of3" and "FE-3of3". *Do not concur - See Sections N and O. of the Evaluation Report*

U. REFERRAL TO REPORTS

No reports or data are referred to in this Descriptive Report that are not included with this survey.

This report and the accompanying field sheets are respectfully submitted.

A handwritten signature in cursive script, reading "Edward A. Owens", written over a horizontal line.

Edward A. Owens
Physical Scientist
Atlantic Hydrographic Branch

APPENDIX III

LIST OF HORIZONTAL CONTROL STATIONS

No horizontal control stations were needed for this survey since differential GPS employed exclusively for all positioning control. The geographic positions for the two differential GPS radio beacons used during this survey are as follows:

| Radio Beacon Positions | Latitude | Longitude |
|----------------------------|------------|-------------|
| Charleston, SC 298 KHz | 32° 45.5 N | 079° 50.6 W |
| Cape Canaveral, FL 289 KHz | 28° 27.6 N | 080° 32.6 W |

APPENDIX VII

APPROVAL SHEET

LETTER OF APPROVAL

REGISTRY NUMBER: F00436

Field operations contributing to the accomplishment of this basic hydrographic survey were conducted under my direct supervision with frequent personal checks of progress and adequacy. All field sheets and reports were reviewed in their entirety and all supporting records were checked as well.

This survey is more than adequate to supersede ALL prior surveys in common areas. This survey is considered complete and adequate for nautical charting.


John W. Humphrey, LCDR, 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: April 10, 1998

HYDROGRAPHIC BRANCH: Atlantic

HYDROGRAPHIC PROJECT: OPR-G311-WH

HYDROGRAPHIC SHEET: F00436

LOCALITY: Georgia, Atlantic Ocean, Approaches to Brunswick

TIME PERIOD: August 26 - November 20, 1997

"FE-1" AWOIS 9879

TIDE STATION USED: 872-0030 Fernandina, FL

Lat. 30° 40.5'N Lon. 81° 27.9'W

PLANE OF REFERENCE (MEAN LOWER LOW WATER): 0.000 meters

HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 1.908 meters

REMARKS: RECOMMENDED ZONING

Use zone(s) identified as: GA6.

Refer to attachments for zoning information.

NOTE: A water level gauge was required for the Frederica River area, however was not installed. The zoning is based on historical information from Frederica River Bridge (867-7045) and is referenced to Fernandina. The area of hydrography is in a river system. Therefore, correctors based on historical zoning to Fernandina may not reflect the conditions during the time of hydrography. Without actual tide gauge measurements in the river, the uncertainty cannot be quantified.

"FE-2" AWOIS 9868, 9869, 9870

TIDE STATION USED: 867-7832 Jekyll Island Marina, GA

Lat. 31° 03.4'N Lon. 81° 25.4'W

PLANE OF REFERENCE (MEAN LOWER LOW WATER): 0.000 meters

HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 2.14 meters

REMARKS: RECOMMENDED ZONING

Use zone(s) identified as: GA16.

Refer to attachments for zoning information.

NOTE: This zone is referenced to the tide staff data from Jekyll Island Marina (867-7832). A water level gauge was required for



hydrography in the Jekyll Creek area. Instead, a staff was installed and connected to the historical bench marks. Therefore, datum references are based on historical information and their accuracy for modern conditions cannot be verified.

NOTE: Staff values are provided in feet and on Eastern Standard Time. Conversion to meters and GMT is required. Use the column of staff readings which are relative to mean lower low water.

"FE-3" 18' Curve

TIDE STATION USED: 872-0030 Fernandina, FL
Lat. 30° 40.5'N Lon. 81° 27.9'W
PLANE OF REFERENCE (MEAN LOWER LOW WATER): 0.000 meters
HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 1.908 meters

REMARKS: RECOMMENDED ZONING

Use zone(s) identified as: SEC179, SEC180 & SEC181.
Refer to attachments for zoning information.

"FE-4" Fish Haven

TIDE STATION USED: 872-0030 Fernandina, FL
Lat. 30° 40.5'N Lon. 81° 27.9'W
PLANE OF REFERENCE (MEAN LOWER LOW WATER): 0.000 meters
HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 1.908 meters

REMARKS: RECOMMENDED ZONING

Use zone(s) identified as: SEC169 & SEC170.
Refer to attachments for zoning information.

Note 1: Provided time series data are tabulated in metric units (Meters), relative to MLLW and on Greenwich Mean Time, except data from the staff at Jekyll Creek. See note for "FE-2".



CHIEF, OPERATIONAL ANALYSIS BRANCH

Final tide zone node point locations for OPR G311-WH-97,
F00436.

Format: Longitude in decimal degrees (negative value denotes
Longitude West),
Latitude in decimal degrees
Tide Station (in recommended order of use)
Average Time Correction (in minutes)
Range Correction

| | | Tide Station Order | AVG Time Correction | Range Correction |
|--------------------------------|-----------|-----------------------|------------------------|---------------------|
| "FE-1" AWOIS 9879 | | | | |
| Zone GA6 | | | | |
| -81.415397 | 31.156746 | 872-0030 | +6 | 1.14 |
| -81.398235 | 31.174076 | | | |
| -81.399795 | 31.198071 | | | |
| -81.410716 | 31.201182 | | | |
| -81.415397 | 31.189628 | | | |
| -81.422072 | 31.193829 | | | |
| -81.435499 | 31.194863 | | | |
| -81.427036 | 31.180418 | | | |
| -81.439575 | 31.15829 | | | |
| -81.434051 | 31.156627 | | | |
| -81.424758 | 31.160745 | | | |
| -81.415397 | 31.156746 | | | |
| "FE-2" AWOIS 9868, 9869 & 9870 | | | | |
| Zone GA16 | | | | |
| -81.463022 | 31.053069 | 867-7832 | -12 | 0.99 |
| -81.436331 | 31.038782 | | | |
| -81.430345 | 31.031007 | | | |
| -81.426838 | 31.017422 | | | |
| -81.426374 | 31.014427 | | | |
| -81.456481 | 31.012507 | | | |
| -81.462608 | 31.028109 | | | |
| -81.467575 | 31.043687 | | | |
| -81.463022 | 31.053069 | | | |
| "FE-3" 18' Curve | | | | |
| Zone SEC179 | | | | |
| -81.405516 | 30.924481 | 872-0030 | -12 | 1.01 |
| -81.402283 | 30.957877 | | | |
| -81.405775 | 30.957178 | | | |
| -81.28994 | 31.069948 | | | |
| -81.331984 | 30.945514 | | | |
| -81.423387 | 30.86377 | | | |
| -81.405516 | 30.924481 | | | |

Zone SEC180

| | | | |
|----------------------|----------|-----|------|
| -81.349531 30.8764 | 872-0030 | -12 | 0.97 |
| -81.369244 30.795385 | | | |
| -81.44972 30.717596 | | | |
| -81.465646 30.753367 | | | |
| -81.458561 30.800707 | | | |
| -81.43241 30.835358 | | | |
| -81.423387 30.86377 | | | |
| -81.331984 30.945514 | | | |
| -81.349531 30.8764 | | | |

Zone SEC181

| | | | |
|----------------------|----------|-----|------|
| -81.185329 31.076448 | 872-0030 | -24 | 0.97 |
| -81.218542 30.940138 | | | |
| -81.369246 30.795385 | | | |
| -81.331984 30.945514 | | | |
| -81.185329 31.076448 | | | |

"Fe-4" Fish Haven

Zone SEC169

| | | | |
|----------------------|----------|-----|------|
| -80.995859 31.155667 | 872-0030 | -42 | 0.94 |
| -81.218542 30.940138 | | | |
| -81.272904 30.721046 | | | |
| -80.943948 31.072817 | | | |
| -80.843639 31.198624 | | | |
| -80.8199 31.365616 | | | |
| -80.995859 31.155667 | | | |

Zone SEC170

| | | | |
|----------------------|----------|-----|------|
| -81.307354 30.527636 | 872-0030 | -42 | 0.91 |
| -81.272817 30.720991 | | | |
| -80.943948 31.072817 | | | |
| -80.943948 31.072817 | | | |
| -80.843639 31.198624 | | | |
| -80.868145 31.019904 | | | |
| -81.307354 30.527636 | | | |

GEOGRAPHIC NAMES

FE-436

| Name on Survey | A ON CHART NO. 11502-11506 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 | | | | | | | | | | | |
|------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|--|--|--|--|--|--|--|--|--|----|
| | GEORGIA (title) | X | | | | | | | | | | |
| NORTH ATLANTIC OCEAN (title) | | | | | | | | | | | | 2 |
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Approved

Dennis P. ...
Chief Cartographer

APR 8 1998

08/12/98

HYDROGRAPHIC SURVEY STATISTICS
REGISTRY NUMBER: F00436

| | |
|----------------------------|------|
| NUMBER OF CONTROL STATIONS | 2 |
| NUMBER OF POSITIONS | 2492 |
| NUMBER OF SOUNDINGS | 2492 |

| | TIME-HOURS | DATE COMPLETED |
|---------------------------------------|------------|----------------|
| PREPROCESSING EXAMINATION | 48 | 02/06/98 |
| VERIFICATION OF FIELD DATA | 142.50 | 04/30/98 |
| EVALUATION AND ANALYSIS | 25 | |
| FINAL INSPECTION | 10 | 07/28/98 |
| COMPILATION | 17 | 08/07/98 |
| TOTAL TIME | 242 | |
| ATLANTIC HYDROGRAPHIC BRANCH APPROVAL | | 07/31/98 |

**ATLANTIC HYDROGRAPHIC BRANCH
EVALUATION REPORT FOR F00436 (1997)**

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 (HPS)
NADCON, version 2.10
SiteWorks 2.01
MicroStation 95, version 5.05
I/RAS B, version 5.01
Tides & Currents 2.1

The smooth sheet was plotted using a CALCOMP TechJet Color plotter.

G. CORRECTIONS TO SOUNDINGS

Tide Correctors

The field unit did not install tide gauges in the Frederica River for AWOIS Item #9879, or in the Jekyll Island Marina for AWOIS Items #9868, #9869, and #9870, as required in section 5.8.2. of the Project Instructions. A tide staff was installed in the Jekyll Island Marina. The tide staff data provided by the field unit was not considered adequate by headquarters. Tide correctors for these items is not considered adequate for reduction of the hydrographic data; therefore, the hydrographic data is not suitable for application to the nautical chart and is not being shown on the smooth plots.

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 sheet 1 of 1, on the NAD 27 datum move the projection lines 0.841 seconds (25.892 meters or 2.59 mm at the scale of the survey) north in latitude, and 0.652 seconds (17.291 meters or 1.73 mm at the scale of the survey) east in

longitude.

To place sheet 1 of 3, on the NAD 27 datum move the projection lines 0.832 seconds (25.612 meters or 2.56 mm at the scale of the survey) north in latitude, and 0.648 seconds (17.156 meters or 1.72 mm at the scale of the survey) east in longitude.

To place sheet 2 of 3, on the NAD 27 datum move the projection lines 0.841 seconds (25.892 meters or 2.59 mm at the scale of the survey) north in latitude, and 0.652 seconds (17.291 meters or 1.73 mm at the scale of the survey) east in longitude.

To place sheet 3 of 3, on the NAD 27 datum move the projection lines 0.856 seconds (26.371 meters or 2.64 mm at the scale of the survey) north in latitude, and 0.691 seconds (18.356 meters or 1.84 mm at the scale of the survey) east in longitude.

Sheet 3 of 3 "Approach to Brunswick" contains investigations on a large plot separate from this report.

*GKM
7/18/03*

All geographic positions listed in this report are on NAD 83 datum unless otherwise specified.

L. JUNCTIONS

H10769 (1997) 1:20,000 to the west

A standard junction was effected between the present survey and H10769 (1997).

M. COMPARISON WITH PRIOR SURVEYS

A comparison with prior surveys was not conducted in areas of 200% side scan sonar coverage. This is in accordance with section 4. Of the memorandum titled "Changes to Hydrographic Survey Processing", dated May 24, 1995. Where the side scan coverage was not adequate for sheet 2 of 3, prior survey soundings were not compared because no changes in charting will be recommended in this area. See sections N.1.2, N.1.3, and N.1.4.

N. ITEM INVESTIGATION REPORTS

N.1.1 An uncharted visible wreck, in Latitude 31°00'38.39"N, Longitude 81°25'56.80"W, was located by the field unit and is shown on sheet 1 of 1. The field unit determined an elevation of 24 feet for this item. A tide gage was not installed in the vicinity and approved tides were not available for reduction of the elevation to the proper plane

of reference. It is recommended that a visible wreck symbol be charted in the present survey location. See sheet 1 of 1. It is further recommended that a 9 ft (2⁷m) reconnaissance depth found 20m due west of the wreck be charted as a reported depth.

N.1.2 AWOIS Item #9868, a charted sunken wreck, ED, in Latitude 31°01'07.84"N, Longitude 81°27'02.34"W, originates with Local Notice to Mariners 2 of 1972 (LNM2/72). The field unit was unable to investigate the entire required area with side scan sonar because of shallow water in portions of the search area. Considering the investigation conducted by the field unit, it is evident that the item is not in its charted position; it is further believed that this wreck no longer exists. It is recommended that the wreck, PA be deleted from the chart. The hydrography associated with this item is not shown on the smooth sheet because it is considered reconnaissance in nature.

N.1.3 AWOIS Item #9869, the charted note, Shl rep, in the vicinity of Latitude 31°01'30"N, Longitude 81°26'39"W, originates with an unknown source. The field unit investigated the shoal and determined that the shoal exists and is larger than currently charted. The field unit did not install a tide gage in the survey area as required by section 5.8.2. of the Project Instructions; therefore, approved tides were not available from headquarters for application to the hydrographic data. The data for the shoal investigation is sufficient to determine that the shoal does exist and to a greater extent than charted. The least depth on the shoal was 0⁵ feet (0² m), based on predicted tides. It is recommended that the charted shoal note be revised to depths rep 1997. Additional work is recommended to ascertain the extent and depths of the shoal found by the field unit. The hydrography associated with this item is not shown on a smooth sheet because it is considered reconnaissance in nature, however it is recommended that these depths be charted as reported depths.

N.1.4 AWOIS Item #9870, a charted sunken wreck, PA, in Latitude 31°02'02.83"N, Longitude 81°27'04.34"W, originates with an unknown source. The adjacent charted pile, PA was also assigned to be investigated with the wreck. A full 100 meter search was not performed. A wreck determined to be the AWOIS Item was located in Latitude 31°02'00.85"N, Longitude 81°27'07.86"W. This wreck is 111 meters southwest of the charted wreck. It is recommended that the charted features be deleted from the chart. It is also recommended that a sunken wreck symbol be charted as shown on the present survey.

N.1.5 AWOIS Item #9879, a charted obstruction PA, in Latitude 31°10'26.83"N, Longitude 81°24'33.35"W, originates with Chart Letter 947 of 1981 (CL947/81). An obstruction with a depth of 10 feet (3 m), based on predicted tides, was located in Latitude 31°10'33.44"N, Longitude 81°24'37.53"W. This obstruction is 232 meters north northwest of the AWOIS item and 16 meters northwest of charted submerged piles. Side scan sonar records show indications of additional debris in this area. The hydrographer states that this item has not been adequately investigated. Additional work is recommended to adequately investigate the AWOIS item and to ascertain the least depth and extent of the uninvestigated debris seen on the side scan sonargrams. No changes in charting status are recommended. The hydrography associated with this item is not shown on a smooth sheet because it is considered reconnaissance in nature. See Sheet 1 of 3.

- O. COMPARISON WITH CHART 11009 (34th Edition, Jan 23/93)**
11480 (33rd Edition, Apr 6/96)
11489 (31st Edition, Sep 13/97)
11502 (26th Edition, Jul 6/96)
11504 (13th Edition, Jan 26/91)
11506 (37th Edition, May 4/96)
11507 (28th Edition, Aug 3/96)

Hydrography

The charted hydrography originates with prior surveys and requires no further consideration. The following should be noted:

1) AWOIS Item #476, an uncharted sunken wreck, in Latitude 31°50'45.85"N, Longitude 81°09'57.30"W, originates with Notice to Mariners 20 of 1942 (NM20/42). The AWOIS item is within the limits of a charted fish haven which originates with Chart Letter 907 of 1986 (CL907/86). Several obstructions were located by the field unit within the limits of the fish haven, none were positively identified as the AWOIS item. These obstructions are deeper than the authorized minimum depth. No change in charting status is recommended. See Sheet 3 of 3.

P. ADEQUACY OF SURVEY

Sheets 3 of 3 and 1 of 1 are adequate field

investigations. Sheets 1 and 2 of 3 are of reconnaissance value. See notes in the previous sections of this report for recommended additional work.

Q. Aids to Navigation

Three floating aids to navigation were located and are considered adequate for their intended purpose.

S. MISCELLANEOUS

Chart compilation using the present survey was done by Atlantic Hydrographic Branch personnel in Norfolk, Virginia. Compilation data has been forwarded to Marine Chart Division, Silver Spring, Maryland.

The following NOS charts were used for compilation of the present survey:

| | |
|--------------------------------------------------|----------------|
| 11502 (26 th Edition, July 6/96) | Scale 1:80,000 |
| 11504 (14 th Edition, December 13/97) | Scale 1:40,000 |
| 11507 (28 th Edition, August 3/96) | Scale 1:40,000 |

Douglas V. Mason

Douglas V. Mason

Cartographic Technician

Verification of Field Data

APPROVAL SHEET
F00436

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.

Deborah A. Bland

Deborah A. Bland
Cartographer,
Atlantic Hydrographic Branch

Date: 29 July 98

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.

Andrew L. Beaver

Andrew L. Beaver
Lieutenant Commander, NOAA
Chief, Atlantic Hydrographic Branch

Date: 29 JULY 98

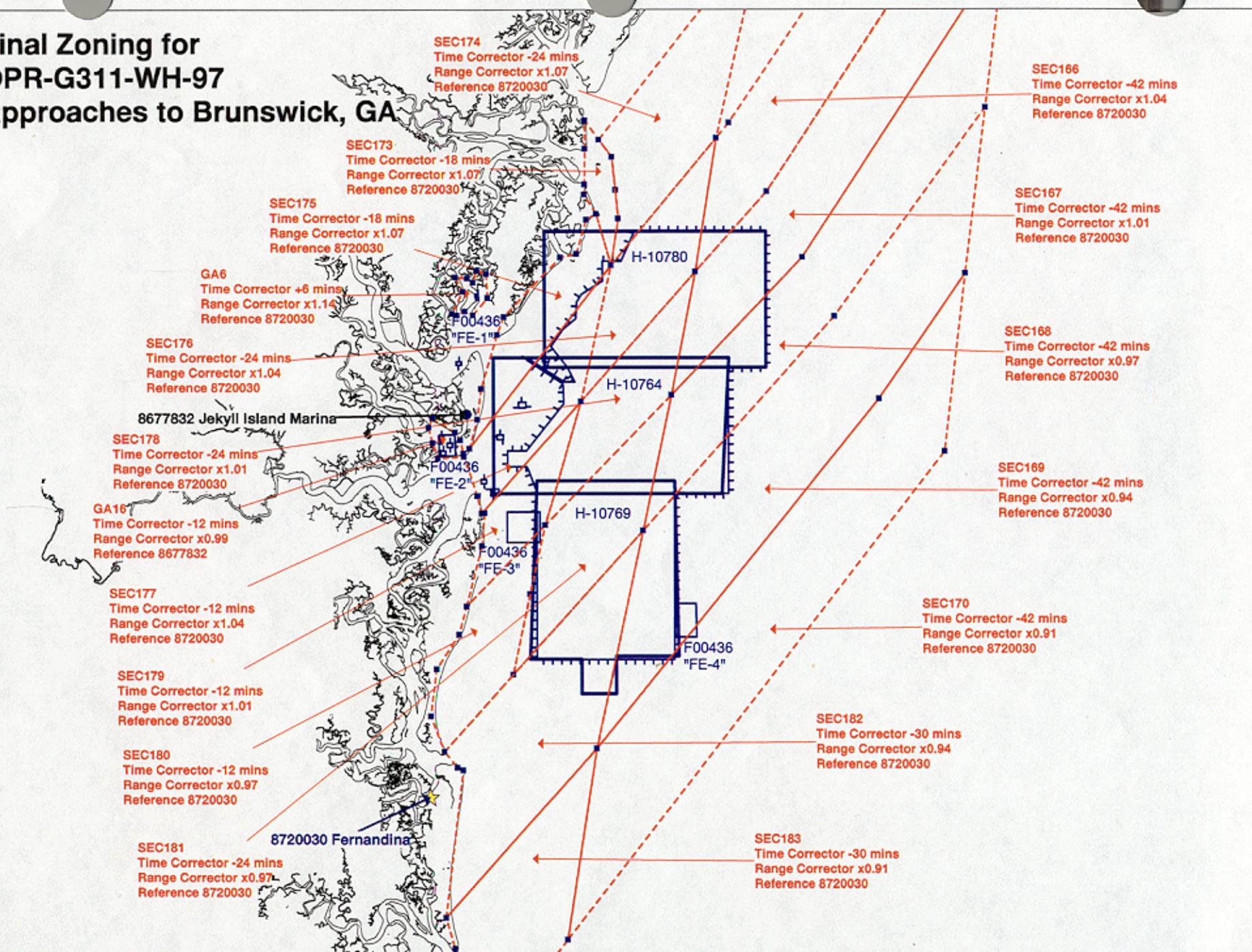
Final Approval:

Approved: Andrew A. Armstrong

Date: Oct 1, 1998

Andrew A. Armstrong, III
Captain, NOAA
Chief, Hydrographic Surveys Division

Final Zoning for OPR-G311-WH-97 Approaches to Brunswick, GA



81° 26' 00"

81° 25' 30"

31° 01' 00"

~~Wk~~

31° 00' 30"

F00436
GEORGIA
ATLANTIC OCEAN
APPROACHES TO BRUNSWICK
26 AUG 1997 TO 17 NOV 1997
1:10,000
VERTICAL DATUM: SOUNDINGS IN FEET AT MLLW
HORIZONTAL DATUM: NAD 83
SHEET 1 OF 1
NEW ITEM

81° 26' 00" W

NAD 27  31° 00' 00" N

CHECKED BY: DVM
03/19/98

31° 00' 00"

11504

81° 25' 00"

81° 24' 30"

31° 11' 00"

F00436
 GEORGIA
 ATLANTIC OCEAN
 APPROACHES TO BRUNSWICK
 26 AUG 1997 TO 24 OCT 1997
 1:10,000
 VERTICAL DATUM: SOUNDINGS IN FEET AT MLLW
 HORIZONTAL DATUM: NAD 83
 SHEET 1 OF 3
 AWOIS ITEM NUMBER 9879

o *Obstr*

31° 10' 30"

81° 25' 00"W

NAD 27 31° 10' 00"N

31° 10' 00"

CHECKED BY: DVM
1/30/98

11506

81° 27' 00"

81° 26' 30"

31° 02' 30"

Wk
+++

31° 02' 00"

F00436
GEORGIA
ATLANTIC OCEAN
APPROACHES TO BRUNSWICK
26 AUG 1997 TO 17 NOV 1997
1:10,000
VERTICAL DATUM: SOUNDINGS IN FEET AT MLLW
HORIZONTAL DATUM: NAD 83
SHEET 2 OF 3
AWOIS ITEM NUMBER 9870

81° 27' 00" W
NAD 27 — 31° 01' 30" N

CHECKED BY: DVM
03/19/98

31° 01' 30"

