

H10964

NOAA FORM 76-35A

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

DESCRIPTIVE REPORT

Hydrographic /
Type of Survey Side Scan Sonar / Multibeam

Field No. WH-5-1-00

Registry No. H10964

LOCALITY

State Florida

General Locality North Atlantic Ocean

Locality Vicinity of Port Everglades

2000

CHIEF OF PARTY
LCDR Gerd F. Glang

LIBRARY & ARCHIVES

DATE

March 25, 2002

NOAA FORM 77-28 U.S. DEPARTMENT OF COMMERCE
(11-72) NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

REGISTRY NUMBER:

HYDROGRAPHIC TITLE SHEET

H-10964

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-05-01-00

State: **Florida**

General Locality: ~~East Coast of Florida~~ **NORTH ATLANTIC OCEAN**

Sub-Locality: **Vicinity Port Everglades**

Scale: **1:5,000** Date of Survey: **4/9/00 to 6/28/00**

Instructions Dated: **3/28/00** Project Number: **S-H902-WH**

Vessel: **NOAA Ship WHITING, S-329**

Chief of Party: **Lieutenant Commander Gerd F. Glang, NOAA**

Surveyed by: **WHITING Personnel**

Soundings by: **Odom Echotrac DF3200 MK II Echosounder**

Graphic record scaled by: **WHITING Personnel**

Graphic record checked by: **WHITING Personnel**

Protracted by: **N/A** Automated Plot: **HEWLETT PACKARD HP-7500 DESIGNJET**

Verification by: **Atlantic Hydrographic Branch PERSONNEL 2600 CP**

Soundings in: **Meter at MLLW**

Remarks:

- 1) All Times are UTC.
- 2) This is a basic Hydrographic Survey with 200% SSS coverage and SWMB contact developments.
- 3) Projection is UTM Zone 17.

HAND WRITTEN NOTES IN DESCRIPTIVE REPORT WERE MADE DURING OFFICE PROCESSING

AWOIS/SURF ✓ 3/14/02 SJV

TABLE OF CONTENTS

A.	<u>PROJECT</u>	2
B.	<u>AREA SURVEYED</u>	2
C.	<u>SURVEY VESSELS</u>	4
D.	<u>AUTOMATED DATA ACQUISITION AND PROCESSING</u>	4
E.	<u>SONAR EQUIPMENT</u>	6
F.	<u>SOUNDING EQUIPMENT</u>	7
G.	<u>CORRECTIONS TO SOUNDINGS</u>	9
H.	<u>HYDROGRAPHIC POSITION CONTROL</u>	12
I.	<u>SHORELINE</u>	16
J.	<u>CROSSLINES</u>	16
K.	<u>JUNCTIONS</u>	16
L.	<u>COMPARISON WITH PRIOR SURVEYS</u>	16
M.	<u>ITEM INVESTIGATION REPORTS</u>	17
N.	<u>COMPARISON WITH THE CHART</u>	26
O.	<u>ADEQUACY OF SURVEY</u>	27
P.	<u>AIDS TO NAVIGATION</u>	27
Q.	<u>STATISTICS</u>	28
R.	<u>MISCELLANEOUS</u>	29
S.	<u>RECOMMENDATIONS</u>	29
T.	<u>REFERRAL TO REPORTS</u>	29
	* <u>APPENDICES</u>	30-73

* DATA FILED WITH ORIGINAL FIELD RECORDS

A. PROJECT

A.1. This basic hydrographic survey was conducted in accordance with Hydrographic Survey Letter Instructions OPR-S-H902-WH, for Port Everglades, Florida.

A.2. The original instructions are dated March 28, 2000.

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

A.4. This Descriptive Report applies to survey H-10964. Survey H-10964 corresponds to sheet "A" of project OPR-S-H902-WH as described by the letter instructions.

A.5. This project is in response to the Port Everglades Pilots' Association's request for a hydrographic survey within and adjacent to charted commercial anchorage areas used by vessels calling at Port Everglades, Florida. The increase in both the number and size of cruise ships and other commercial vessels entering this port requires accurate charted depth information including detection of any objects on the sea floor which may hinder the movement and anchoring of these vessels.

B. AREA SURVEYED

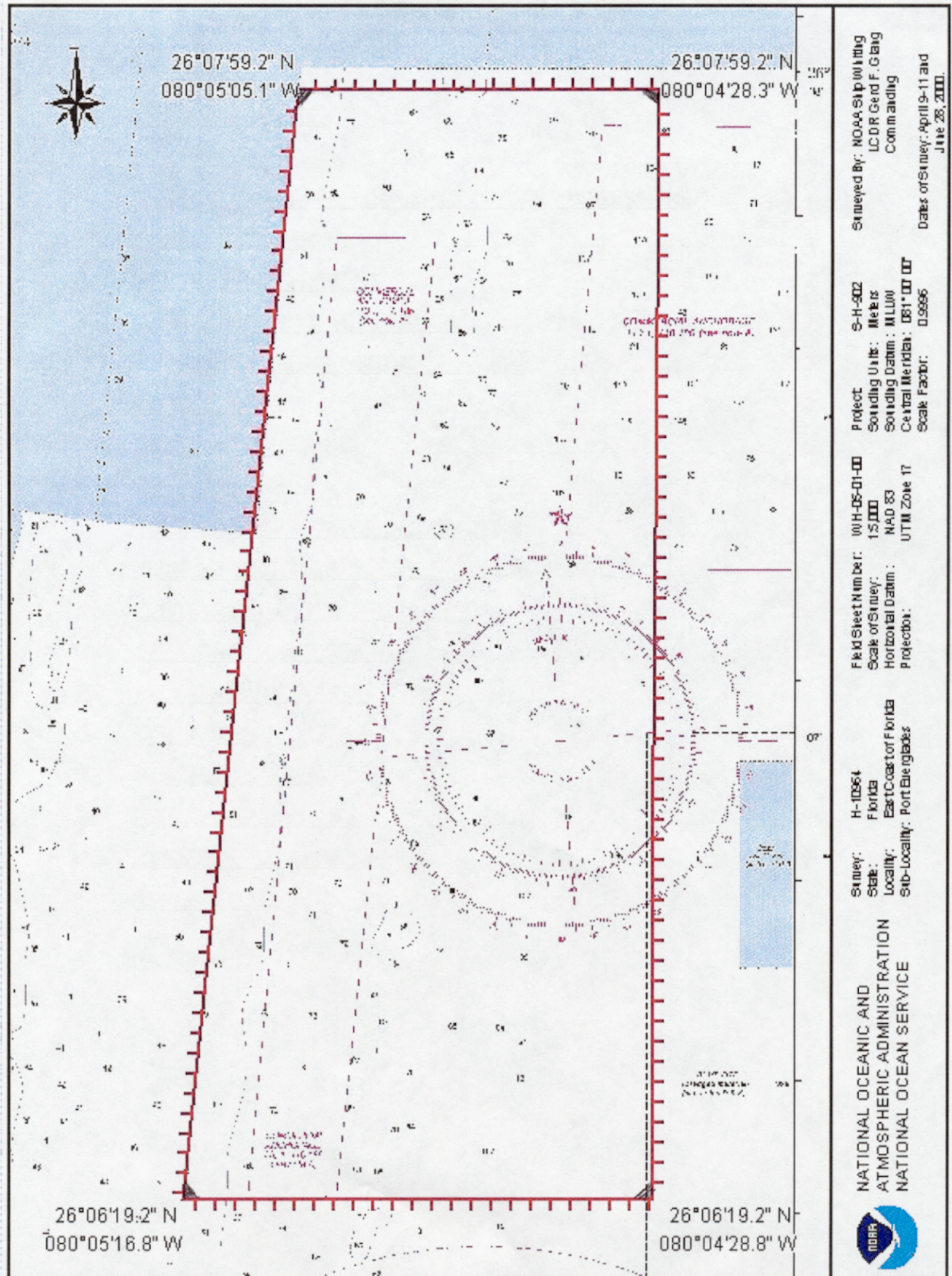
B.1. This survey extends from the northwest commercial anchorage to the west half of the adjacent anchorage area approximately 1.4 nautical miles northeast of the entrance to Port Everglades harbor. For complete survey limits, see the chartlet on the following page (Figure 1).

B.2. H-10964 has the following geographic boundaries:

<u>Latitude</u>	<u>Longitude</u>
26°07'59.2" N	080°05'05.1" W
26°07'59.4" N	080°04'28.3" W
26°06'19.2" N	080°04'28.8" W
26°06'19.2" N	080°05'16.8" W

B.3. Data acquisition for this survey occurred on April 9-11, 2000 (DN 100-103) and June 28, 2000 (DN 180).

Figure 1: Chartlet of H-10964 survey boundaries created using MAPINFO (ver 5.0).



C. SURVEY VESSELS

C.1. The following vessels were used during this survey:

Vessel	Operations
NOAA Ship WHITING	Vertical beam bathymetry, side scan sonar, bottom sample acquisition
NOAA Launch 1005	Multibeam bathymetry

C.2. The transducer for the SWMB sonar was hull mounted approximately amidships on Launch 1005. A section of the launch keel was removed, and the Reson 8101 transducer was hull-mounted along the centerline of the vessel. See Figure 2.



Figure 2 - Reson SeaBat 8101 hull-mounted in keel cut-out of Launch 1005.

D. AUTOMATED DATA ACQUISITION AND PROCESSING

SEE ALSO THE EVALUATION REPORT

D.1. A detailed list of data acquisition and processing software used for this survey can be found in Appendix H. *

Vertical beam echosounder (VBES) data acquisition was accomplished using Coastal Oceanographic's **HYPACK** (version 10.03) software. VBES data processing was accomplished using **HYDROGRAPHIC PROCESSING SYSTEM (HPS)** software and assorted utility programs contained on the **HYDROSOFT** (version 9.4 and 10.6.1) compact disk provided by the Hydrographic Systems and Technology Programs (N/CS32).

All side scan sonar (SSS) and shallow water multibeam (SWMB) data were acquired digitally using Triton Elies International (TEI) **ISIS** software. **ISIS** version 4.32 was used for [HSIRSSS] data acquisition, and **ISIS** version 4.54 was used for SWMB data acquisition. Digital SSS data and SWMB data were processed using Universal Systems Limited (USL) **CARIS/SIPS** and **HIPS** (versions 4.3.2), UNIX-based software.

The Sea-Bird Electronics SB1-19 Seacat Profilers were initialized and configured using **SEASOFT** (version 3.3M) and **SEACAT** (version 2.0) software. The program **VELOCWIN** (version 5.0) was used to process CTD data and calculate sound velocity corrections.

D.2. Reson SeaBat 8101 SWMB data were monitored using **ISIS** during acquisition and processed utilizing **CARIS/HIPS** SWMB data cleaning programs. Depth profiles were visually reviewed and cleaned. Depth fliers were identified and flagged as "rejected". Vessel navigation data from DGPS and attitude data from heave, pitch, roll, and gyro sensors were displayed and manually cleaned in a similar fashion. Soundings beyond 60° off nadir after roll compensation were filtered and flagged as rejected to minimize potential refraction errors. Outer beams were selectively "re-accepted" or not rejected during swath editing if an item of significance was noticed, the quality flags were good, and continuity was observed from beam to beam and ping to ping. Vessel navigation data from DGPS and attitude data from heave, pitch, roll, and gyro sensors were displayed and manually cleaned in a similar fashion.

After review and cleaning, SWMB depth data were merged with sound velocity, tide, system offsets and attitude data to compute the true depth and position of each sounding. Processed soundings were imported into a **CARIS** workfile using shoal-biased line-by-line thinning with a 15 meter grid. **CARIS** workfile soundings were transferred into **HPS** and **MAPINFO** using the **HIPS Converter** found in **HPTools** (version 10.6.1).

ODOM Echotrac fathograms were monitored during acquisition. Data were acquired digitally using **HYPACK** and converted in **HPTools**. The high-frequency fathogram trace was reviewed and compared to the digital data, marking changes for erroneous digitized depths and inserts for peaks observed between fixes. Fixes were flagged for rejection if the Horizontal Dilution of Precision (HDOP) in DGPS exceeded 3.0. Edits to the digital depth file were made in **HPS**. Data were smoothed or rejected if unusually high values for heave were noted. Offset and velocity tables were applied in **HPS**. Tide zoning and corrections were applied in **HPTools**. After review and editing, depths were drawn into **MAPINFO**. Due to the density of SWMB soundings, depth data were excessed with **ZOOM EDIT** in **HPTools**. Depths flagged as excess level "0" were utilized for all final plots.

F. SONAR EQUIPMENT

E.1. WHITING acquired 200% side scan sonar using a Klein T-5500 digital high speed, high-resolution side scan sonar (HSIRSSS) system (S/N 101). Launch 1005 acquired SWMB data using the Reson SeaBat 8101 SWMB system (Reson Processor S/N 13976, Reson 8101 Transducer S/N 020800JCG).

E.2. Both the Klein and SeaBat are configured with a standard 20° below-horizontal beam angle depression.

E.3. For this survey, the Klein system used a frequency of 455kHz, and the SeaBat used 240kHz.

E.4(a) Throughout side scan acquisition, WHITING used 100m range scale with line spacing of 80 meters. This range scale was used to obtain 200% area coverage and provide optimal contact detection. The line spacing is in accordance with section 6.4 of the Field Procedures Manual (FPM, dated March 1999). Side scan operations were limited to a speed-over-ground of 10 knots.

E.4(b) Daily confidence checks were conducted during data acquisition by observing bottom features such as sand waves, scours, coral heads and naturally-occurring contrast of sea floor characteristics in the side scan imagery. A good check consisted of being able to pick out contacts or even sand waves on the outer swath range.

E.4(c) Two hundred percent side scan sonar coverage was completed for this survey. Side scan sonar coverage was checked using mosaics generated in CARIS/SIPS and imported into MAPINFO for coverage assessment. Any gaps in the primary SSS coverage with a length of 200 meters or less which were sufficiently covered by the secondary coverage scheme were not scheduled for holiday coverage. This method of coverage evaluation was also applied to the second 100% of coverage. All contacts deemed to be significant by the hydrographer were investigated using SWMB.

E.4(d) There were no degraded data returns acquired with the Klein or SeaBat systems.

E.4(e) Aboard WHITING, the Klein T-5500 towfish was deployed using a SEA-MAC winch and armored coaxial cable from the stern A-frame.

E.4(f) Cable-out aboard WHITING was determined using an MD-TOTCO digital sheave meter installed on the stern A-frame block. The MD-TOTCO digitized cable-out values were acquired in real-time into HYPACK via an RS-232 serial cable. Cable-out accuracy was verified by comparison with a measured value during each deployment of the tow fish.

F.5. Contacts flagged as significant were developed with SWMB, using a nominal line spacing of three times the water depth. Final positioning and least depth determinations of significant contacts were determined from SWMB data.

F.6. HSHRSSS coverage determination is described in F.4(c) above. After ISIS data conversion, imagery was viewed in CARIS/SIPS to identify possible contacts requiring further investigation. Contact processing included determining position, measuring apparent height, and creating a .tiff image file of each item. All selected contacts and associated image files were added to the HPS contact database. Each contact was reviewed to determine its significance. Contact significance is primarily determined by the contact height to water depth ratio (i.e. contact height greater than 1 meter in water depths of 20 meters or less, or contact height greater than 10% of the water depth in deeper than 20 meters). Contacts not meeting this criteria were deemed significant if the item appeared to be manufactured (i.e. an obstruction) as opposed to a natural bottom feature.

Positions of significant contacts were exported into HYPACK target files and further investigated in the field to determine exact position and least depths using SWMB. SWMB swath coverage was monitored during data acquisition to insure 100% SWMB swath sonification of significant contacts.

Contact information was evaluated with the CORRELATOR program, which performs comparisons between contacts and AWOIS item positions, sounding data and contacts within a determined radius. CORRELATOR printouts for contacts with specific charting recommendations, are included in Separates V. This section also includes CORRELATOR printouts for all other investigated contacts are included in Separates V. ✶

F. SOUNDING EQUIPMENT

F.1. NOAA Ship WHITING used an ODOM Echotrac DF3200 MKII precision survey vertical beam echosounder to acquire bathymetric data. VBES development lines were run over the entire sheet at 80 meter line spacing. VBES splits were run at a line spacing of 40 meters over areas where contacts were numerous.

Both SWMB and VBES data were acquired by Launch 1005. SWMB data were acquired using a single-frequency (240 kHz) Reson SeaBat 8101 SWMB sonar system equipped with an extended range projector. The extended range projector increases the Reson SeaBat 8101's operational depth from a maximum slant range of 320m to a max slant range of 450m. VBES data were acquired with an ODOM Echotrac DF3200 MKII echosounder and was suppressed during processing. These data were primarily used for bottom tracking for the SWMB as well as for bottom feature cross-referencing with the SWMB system. Preliminary

** DATA FILED WITH ORIGINAL FIELD RECORDS*

smooth sheet soundings represent data acquired with both WHITING's VBES system as well as Launch 1005's SWMB system.

Vessel	Instrument	S/N
NOAA Ship WHITING	ODOM Echotrac	9656
NOAA Launch 1005	ODOM Echotrac	9644
	Reson Processor	13976
	Reson 8101	020800JCG

F.2. No other type of sounding equipment was used for this survey.

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

F.4. Both high (100kHz) and low (24kHz) frequency depths were recorded during VBES data acquisition. The high frequency digitized depths acquired by WHITING were used for sounding data throughout this survey.

Launch 1005 acquired sounding data for this survey with the 240kHz Reson SeaBat 8101. High frequency VBES depths acquired by this platform were used exclusively for bottom tracking and verification of the SWMB data.

F.5. The SWMB soundings were acquired at a 75m range scale on lines separated by 40m. For all lines the outer 15' were filtered, which ultimately generated a swath one and a half times the water depth on either side of the nadir beam. The data were processed using **CARIS/HDCS**. They were cleaned for irregular soundings, or "blowouts", and sound velocity and tide correctors were applied.

From here, the data were placed into a workfile in **CARIS/HIPS** where all of the SWMB soundings from the entire sheet could be handled on a whole. Within this workfile, a sun-illuminated digital terrain model (DTM) raster was produced to determine the actual swath width and bathymetry. In areas where contacts were developed, or obvious shoaling occurred, more SWMB lines were run so as to provide more thorough coverage.

F.6. The 8101's 101 soundings per ping were acquired at 10 pings per second at 75m range scale. The optimal speed used for this range scale was 6-8 knots.

1005 utilized SEACAT Profiler (s/n 196093-1060) during SWMB operations. SEACAT Data Quality Assurance Tests were conducted after each cast. SEACAT unit 286 was calibrated December 1, 1999, and unit 1060 was calibrated February 23, 2000. Both calibrations were completed by Sea-Bird Electronics, Inc.

All of the data were processed using **VELOCWIN** (ver. 5.0) software. Computed velocity correctors were entered into **HPS** sound velocity tables and re-applied during post-processing to both high and low frequency depths. Velocity correctors were entered into **CARIS/HIPS** for SWMB processing.

The following is a list of the casts used for this sheet, where they were taken, and the depth:

Table	DN	Vessel	Position Of Cast		DN Period	Cast Depth (M)
			Latitude	Longitude		
04	101	2930	26°06'32"N	080°04'29"W	101-103	60.3
01	180	2931	24°06'12"N	080°05'24"W	180	21.7
01	180	2931	24°07'31"N	080°04'42"W	180	41.7

G.1(b) Leadline comparisons were conducted on June 4, 2000 for WHITING and Launch 1005. The results showed that no correctors to soundings were needed. See Appendix E for results.

G.1(c) The static draft correction for WHITING (3.2 meters) was measured on May 3, 1999 and verified April 20, 2000 (**HPS** offset table 9). The static draft correction for Launch 1005 (0.53m) was measured April 14, 2000 and verified May 15, 2000 (**HPS** offset table 3). Static draft correctors were applied during data post-processing for each survey vessel. See Appendix E* for data records.

G.1(d) Settlement and squat values for WHITING were determined on April 19, 1999. The settlement and squat correctors were entered into the **CARIS/HIPS** Vessel Configuration File (VCF) for side scan processing and **HPS** (**HPS** offset table 1) for use in VBES processing.

Historical settlement and squat values for launch 1005 were utilized for this project. Offsets were measured March 15, 2000 and checked on May 1, 2000 (offset table 3). Correctors for launch 1005 were stored in the **CARIS/HIPS** VCF for SWMB processing. Since VBES data acquired with Launch 1005 were not used in the this survey, it was not necessary to apply offsets in **HPS**.

~~Corrections for settlement and squat for WHITING and Launch 1005 are located in~~ *Duplicate text from previous paragraph*

* DATA FILED WITH ORIGINAL FIELD RECORDS

~~Correctors for launch 1005 were stored in the CARIS/HIPS VCF for SWMB processing. Since VBES data acquired with Launch 1005 were not used in this survey, it was not necessary to apply effects in HIPS.~~

Corrections for settlement and squat for WHITING and Launch 1005 are located in Appendix E.*

G.1(c) WHITING is equipped with a TSS DMS-05 Dynamic Motion Sensor.

Launch 1005 is equipped with a TSS Position and Orientation System for Marine Vessels (POS/MV). The POS/MV contains an inertial measurement unit (IMU) incorporated with two differential global positioning system (DGPS) units allowing for highly-accurate vessel placement and motion determination. This is done through two complimentary methods. The first is dynamic heading alignment in which the IMU and GPS units determine the down and the north directions by sensing gravity and angular rates. This method achieves its optimal performance when the unit undergoes rapid changes in direction and acceleration. The second method is the GPS Azimuth Measurement Subsystem (GAMS). This is a system that determines the geographic vector between two GPS antennas, and compares the phase of the satellite signal arriving to each. Since the two methods have advantages and disadvantages, the POS/MV uses both, each checking one another, in order to gain accurate heading and motion data. This information is also sent to the HYPACK and ISIS units.

Performance specifications for each of these systems are tabularized below:

Motion Sensor	Heave	Pitch	Roll
DMS-05	Resolution: 1 cm Accuracy: the greater of 5 cm or 5%	Resolution: 0.01' Accuracy: ±0.05'	Resolution: 0.01' Accuracy: ±0.05'
POS/MV	Resolution: 1 cm Accuracy: the greater of 5 cm or 5% heave amplitude for periods up to 20 seconds	Resolution: 0.01' Accuracy: ±0.035' RMS	Resolution: 0.01' Accuracy: ±0.035' RMS

* DATA FILED WITH ORIGINAL FIELD RECORDS

Heave, pitch and roll correctors determined by these sensors were recorded in **HYPACK** and **ISIS** during data acquisition. Heave, pitch, and roll biases were applied to raw SSS and SWMB data during conversion in **CARIS**. Correctors for VBES data were applied to raw data in **HPTools** during conversion. Serial numbers for the specified motion sensors are as follows:

Vessel	Sensor S/N
NOAA Ship WHITING	DMS-05 S/N 2040
Launch 1005	POS M/V S/N 020

G.2. No unique methods or instruments were used for sound correcting.

G.3. There were no special correctors applied to the vessels used in this survey.

G.4. No Diver Least Depth Gauge correctors were used.

G.5. No other factors were determined to affect corrections to soundings.

G.6(a) The tidal datum for this project is Mean Lower Low Water (MLLW). The operating tide station at Port Everglades/Virginia Key, FL. (872-3214) served as control for datum determination. Upon completion of H-10964, verified water level data from station 872-3214 were applied to all sounding data.

G.6(b) Tidal zoning for this survey is consistent with the letter instructions. **HPTools** was used for creating tide tables, and importing and applying both preliminary and verified water level correctors to the hydrographic sounding data. The following zones and correctors were applied to the data:

Zone Station	Time Corrector (Minutes)	Range Ratio	Predicted Reference
Mixed (ATL885)	-60	1.22	872-3214

Approved tides for H-10964 were requested by letter to N/OPSI dated April 20, 2000 and are found in Appendix D* *DATA FILED WITH ORIGINAL FIELD RECORDS*

APPROVED TIDES AND CORRECTIONS HAVE BEEN APPLIED DURING OFFICE PROCESSING.

H. HYDROGRAPHIC POSITION CONTROL *SEE ALSO THE EVALUATION REPORT*

H.1. The horizontal datum for this survey is North American Datum of 1983 (NAD 83).

H.2. Sounding positional control was obtained using Global Positioning System (GPS) corrected by the U.S. Coast Guard differential GPS reference station.

H.3. The U.S. Coast Guard DGPS station at Miami, Florida was the primary station used throughout this survey.

H.4. No horizontal control stations were established for this survey.

H.5. The Horizontal Dilution of Precision (HDOP) and Expected Position Error (EPE) specified by the Draft NOAA Hydrographic Project Instructions were monitored during on-line data acquisition. If the positioning degraded beyond the acceptable limits while on-line, the data were either smoothed or rejected.

Performance checks for WHITING and Launch 1005 were conducted during survey operations using the program **Shipdim** (version 1.2). Port Everglades, FL and Miami, FL. USCG differential beacons were used to correct GPS signals. With Launch 1005 in the davits, simultaneous **HYPACK** positions on WHITING and Launch 1005 were acquired and an offset distance and azimuth computed between the two. The computed offset distances and azimuths were compared to measured values.

All DGPS performance checks confirmed that the equipment was working properly.

A summary of the DGPS performance checks is included in Appendix F.*

H.6. Each vessel is equipped with a Trimble DSM212L DGPS receiver. Serial numbers for each of the Trimble DSM212L receivers are included in the following table. Launch 1005 acquires non-differential, code and carrier phase position information from the POS/MV Model 320/V2 (see Section G.1(e)). The Trimble unit is configured such that it provides differential RTCM signals to the POS/MV. Trimble receivers for both launches were initialized to the appropriate station and frequency using the Trimble **TSIP TALKER** software.

* DATA FILED WITH ORIGINAL FIELD RECORDS

Serial numbers for the Trimble DSM212L receiver are as follows:

Vessel	DSM212L S/N
NOAA Ship WHITING	System 1: 0220159721 System 2: 0220159722
NOAA Launch 1005	0220168291

H.7(a) There were no unusual methods for operating the positioning equipment.

H.7(b) There were no equipment malfunctions impacting data quality.

H.7(c) There were no unusual atmospheric conditions that affected data quality.

H.7(d) Adequate satellite coverage was maintained throughout the project.

H.7(e) Aside from calibrating the clocks prior to data acquisition, there were no systematic adjustments made to the systems.

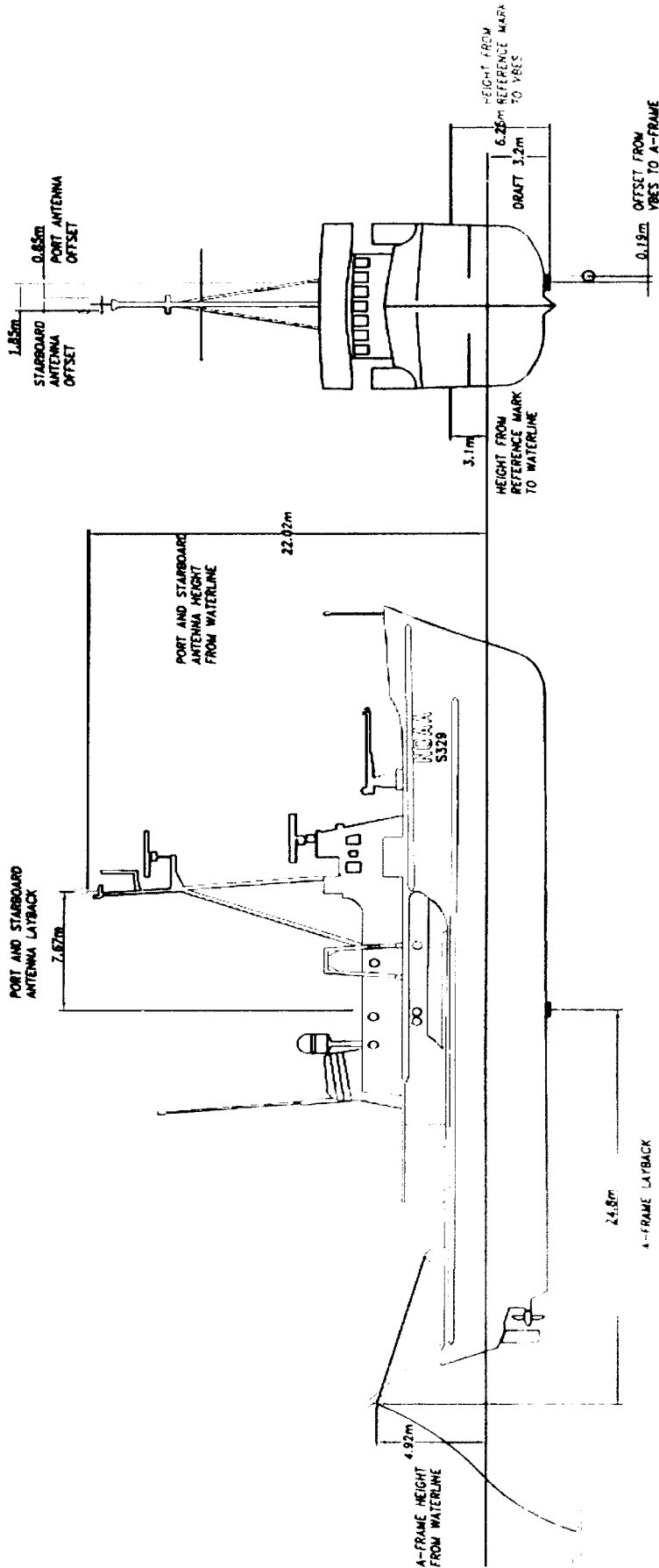
H.7(f) WHITING DGPS antenna offsets and antenna heights were measured on April 15, 1999. For VBES data, offsets and laybacks were measured using the high-frequency echosounder transducer as the reference point. Correctors were entered into HPS offset table 9. Antenna height was measured using the water line as the reference. A minimum of four satellites were used throughout this survey, providing altitude-unconstrained positioning.

H.7(g) The HSIIRSSS offset and layback distances for WHITING's A-frame were measured March 18, 1999 and verified May 3, 1999 after an antennae adjustment.

Offset and layback values were entered into the appropriate CARIS Vessel Configuration Files (VCF) and HPS (offset tables #3 and #9 for Launch 1005 and WHITING, respectively) and applied during CARIS/SIPS data processing.

For an accurate schematic of offset measurements, see the following images.

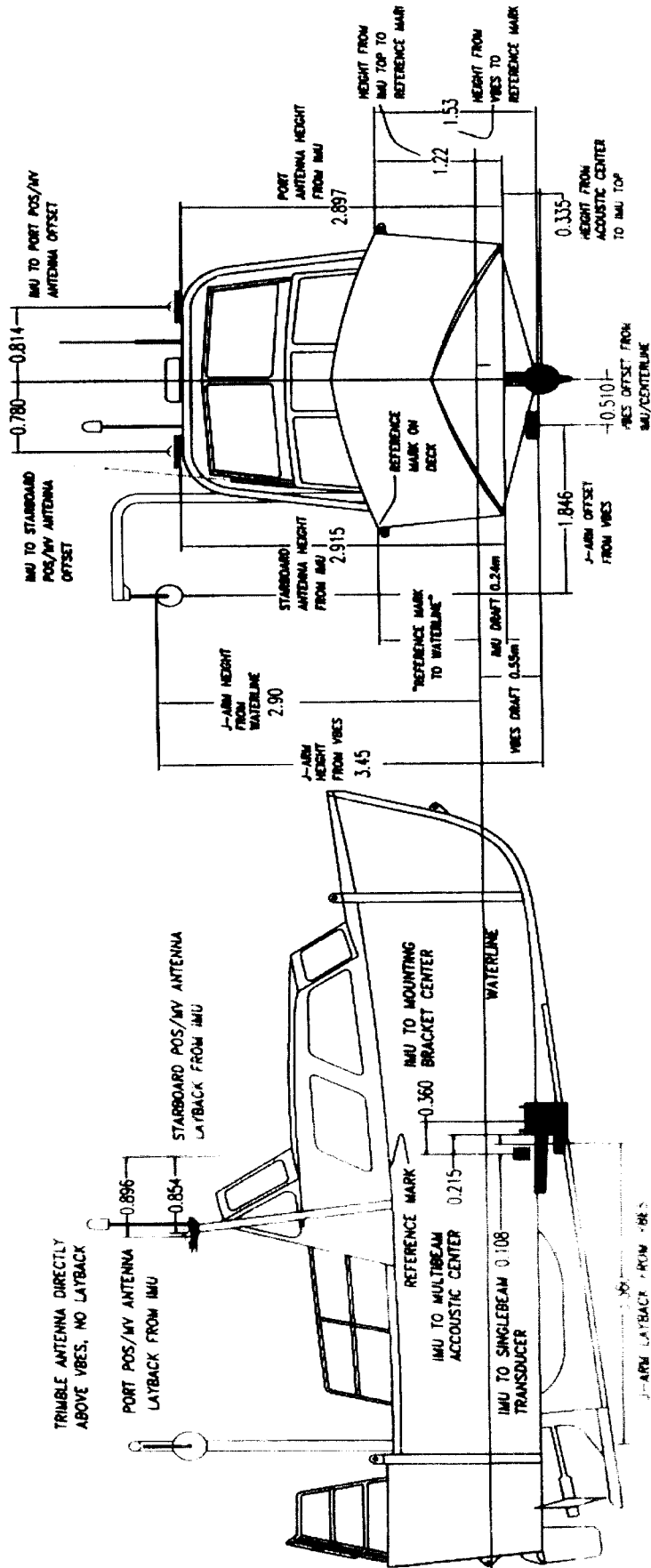
WHITING OFFSETS



1. DRAWING NOT TO SCALE, USE LABELED DIMENSIONS ONLY.
2. DISTANCE ARE IN METERS.
3. ABSOLUTE VALUES ARE SHOWN, FOR SIGNAGE, CONSULT THE CORRECT OFFSET TABLE COORDINATE SYSTEM.
4. "REFERENCE MARK TO WATERLINE" CAN BE FOUND ON A STATIC DRAFT DETERMINATION WORKSHEET, A VALUE OF 3.1m CAN BE ASSUMED.
5. THE 3.2m DRAFT IS BASED ON THE 3.1m MEASUREMENT FROM THE REFERENCE MARK TO THE WATERLINE.



LAUNCH 1005 OFFSETS



- NOTES:
1. DRAWING NOT TO SCALE, USE SHOWN VALUES ONLY.
 2. DISTANCE ARE IN METERS
 3. ABSOLUTE VALUES ARE SHOWN, FOR SIGNAGE, CONSULT THE CORRECT OFFSET TABLE COORDINATE SYSTEM.
 4. "REFERENCE MARK TO WATERLINE" CAN BE FOUND ON A "STATIC DRAFT DETERMINATION" WORKSHEET, A VALUE OF 0.98m CAN BE ASSUMED
 5. VIBS DRAFT AND IMU DRAFT ARE BASED ON THE 0.98m "REFERENCE MARK TO WATERLINE" MEASUREMENT



I. SHORELINE

I.1 No shoreline is contained within the boundaries of this survey.

J. CROSSLINES *SEE ALSO THE EVALUATION REPORT*

J.1. A total of 5.34 linear nautical miles of crossline hydrography, representing approximately 6.6% of the 80.84 lnm of mainscheme hydrography, were acquired for this survey.

J.2. Mainscheme-to-crossline soundings were compared at their common intersections. Agreement was adequate, with the majority of soundings found to be within 1 to 2 feet of each other.

K. JUNCTIONS

K.1 Survey H-10964 does not junction with any contemporary surveys.

L. COMPARISON WITH PRIOR SURVEYS *SEE ALSO THE EVALUATION REPORT*

L.1 The Atlantic Hydrographic Branch will perform a comparison with prior surveys during preliminary review.

M. ITEM INVESTIGATION REPORTS

Contact No: **101_208_1614_1**

Item Description: Obstruction

Source: N/A

AWOIS Position: N/A

Required Investigation: N/A

Radius: N/A

Charts Affected: 11470,11466

INVESTIGATION

Date: June 28, 2000

Position Numbers: 83.693

Investigation Used: SWMB

Surveyed Position: Lat. 26°07'10.⁶⁶33"N

Lon. 080°04'25.^{26.70}74"W

Position Determined By: Differential GPS

Investigation Summary: On April 10, 2000 contact 101 208 1614 1 was found during mainscheme hydrography. This contact was covered with 200% SSS and developed with SWMB. The least depth was 133ft (40.7m) It was determined from SSS imagery and local knowledge that the contact was scrapped dredge piping. The contact falls outside the charted limits of the commercial anchorages on chart 11470 (34" Ed., Jan.22/00 1:10,000).

CHARTING RECOMMENDATION

Recommendation: The hydrographer recommends charting a least depth of 133ft (40.7m) at the surveyed position.

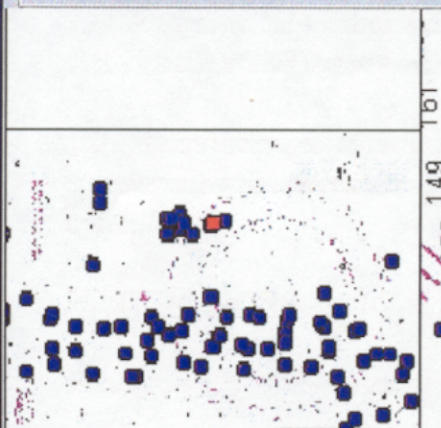
*Comment w/ Classification
 Feature is insignificant in depth of water
 chart soundings as shown on present survey*

Name **101_208_1614_1**
 Offset 32
 Shad Len 0
 Correlating Contact
 101_108A0055_1
 Correlating Dist
 15.7
 Second Hit
 Con Lat 26-07-10.33 N
 Con Lon 080-04-25.74 W

Development
 Least Depth 40.77 (133) #Selected 15
 LD Fix 83693 A WOIS#
 Day of LD 180 A WOIS Dist 0
 Contact Dist 12.7 LD Lat 26-07-10.66 N
 LD Lon 080-04-26.0 W

Control
 c:\ Program Files
 Correlator
 Print Signif
 Print Form
 Print All
 Exit

Matching Swath Info
 Line Day Fix Range



Resolution
 Height 3.9
 Apparent Height 6.62
 Average Depth 45.7
 Top Depth 41.8

Significance Criteria
 3.9 > 1 m < 20 m or 10 %
 41.8 < 25

Both Criteria must be red for Auto-Signify

Auto-Signify Significant



Name	VM
101_101_1338_1	
101_101_1338_2	
101_101_1338_3	
101_101_1339_1	
101_101_1339_2	

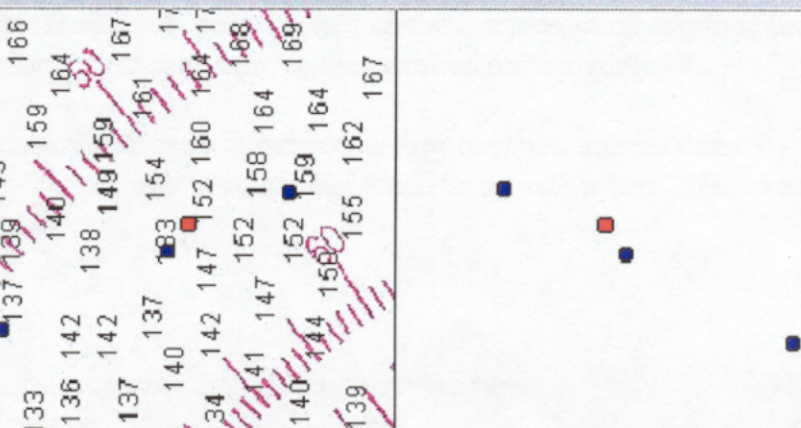
A WOIS#

Fixes <Radius

103 45821
180 83561
180 83562
180 83568
180 83571

Local Contacts

101_108A0055_1 15:
101_108A0055_1 15:



Resolution Criteria
 Relief is greater than X% of contact ht
 6.62 > 100 % 3.9

Multibeam Coverage

Number of Depths is greater than X
 15 > 7

Top Depth is greater than local depth
 41.8 > 40.6

Any green means resolved

Auto-Resolve Resolved

Resolution Notes
 SWMB developments

Contact No: 101_208_1614_2

Item Description: Obstruction

Source: N/A

AWOIS Position: N/A

Required Investigation: N/A

Radius: N/A

Charts Affected: 11470,11466

 INVESTIGATION

Date: June 28, 2000

Position Numbers: 83,494

Investigation Used: SWMB

 Surveyed Position: Lat. ^{13.91}26°07'~~14.76~~"N

 Lon. ^{24.76}080°04'~~25.90~~"W

Position Determined By: Differential GPS

Investigation Summary: On April 10, 2000 contact 101_208_1614_1 was found during mainscheme hydrography. This contact was covered with 200% SSS and developed with SWMB. The least depth was 134ft (41m). It was determined from SSS imagery and local knowledge that the contact was scrapped dredge piping. The contact falls outside the charted limits of the commercial anchorages on chart 11470 (34th Ed., Jan.22/00 1:10,000).

 CHARTING RECOMMENDATION

Recommendation: The hydrographer recommends charting a least depth of 134ft (41m) at the surveyed position.

*CENTRUM WITH GRAPPLICATION
 FEATURE IS INSIGNIFICANT IN DEPTH OF WATER
 CHART SOUNDINGS AS SHOWN IN PRESENT SUFFICE*

Correlator

Name **101_208_1614_2**

Offset 50
Shad Len 0
Correlating Contact

Development

Least Depth 41.8 (137) #Selected 15
LD Fix 83774 A WOIS#
Day of LD 180 A WOIS Dist 0
Contact Dist 19.6 LD Lat 26-07-14.72 N
LD Lon 080-04-26.61 W

Comments

Contact Remark
Investigation
Charting Rec

debris, spoil area

chart least depth in area

Matching Swath Info

Line Day Fix Range

Control

c:
C:\
Program Files
Correlator

Print Signif

Print Form

Print All

Exit

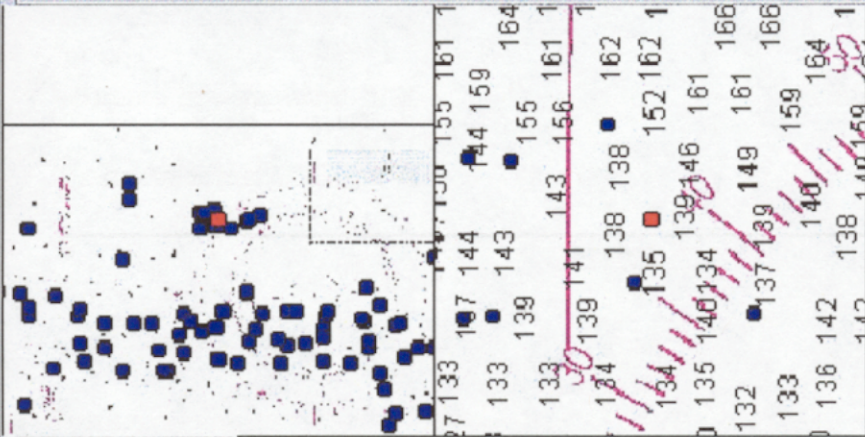
UR

Name	VM
101_101_1338_1	
101_101_1338_2	
101_101_1338_3	
101_101_1339_1	
101_101_1339_2	

A WOIS#
180 83449
180 83450
180 83451
180 83453
180 83455

Fixes <Radius
180 83449
180 83450
180 83451
180 83453
180 83455

Local Contacts



Resolution

Height 2.7
Apparent Height 4.37
Average Depth 42.2
Top Depth 39.5

Significance Criteria

2.7 > 1 m or 20 %
39.5 < 25

Both Criteria must be red for Auto-Signify

Auto-Signify Significant

Resolution Criteria

Relief is greater than X% of contact ht.
4.37 > 100 % 2.7
Multibeam Coverage
Number of Depths is greater than X
15 > 7
Top Depth is greater than local depth
39.5 > 40
Any green means resolved

Auto-Resolve Resolved

Resolution Notes

SWMB developments



M.1-2. There are no AWOIS items assigned for this project.

M.3. All significant contacts were covered on June 28, 2000 with 100% SWMB.

M.4. Original development line plans included only the significant contacts chosen. However, after creating the mosaic for Port Everglades, it was noted that two ridges of coral ran length-wise along the sheet. Since the project instructions require the detection of any objects on the sea floor, the development line plan was revised to include all of the coral found within the survey limits.

M.5. The following significant contacts were found on April 10, 2000 during mainscheme hydrography and covered with SWMB developments:

NAME	REMARK	LATITUDE	LONGITUDE
101_101_1338_1	coral	26-08-00.68 N	080-05-00.57 W
101_101_1338_2	coral	26-07-20.48 N	080-05-05.52 W
101_101_1338_3	coral	26-07-13.57 N	080-05-06.12 W
101_101_1339_1	coral	26-06-43.46 N	080-05-09.81 W
101_101_1339_2	coral	26-06-40.08 N	080-05-09.21 W
101_104_0245_2	edge of coral	26-07-34.89 N	080-04-49.51 W
101_104_0245_3	good hit	26-07-22.34 N	080-04-51.19 W
101_104_0245_4	coral	26-06-59.16 N	080-04-49.45 W
101_104_0246_1	coral	26-06-55.11 N	080-04-49.84 W
101_104_0246_2	coral	26-06-34.44 N	080-04-53.49 W
101_104_0246_3	coral	26-06-19.28 N	080-04-54.19 W
101_105_0218_1	coral	26-06-21.73 N	080-04-48.38 W
101_105_0218_2	coral	26-06-40.99 N	080-04-50.71 W
101_105_0218_3	coral	26-06-59.17 N	080-04-44.1 W
101_105_0219_1	edge of coral	26-07-44.67 N	080-04-38.41 W
101_105_0219_2	edge of coral	26-07-19.89 N	080-04-41.62 W
101_105_0219_3	coral	26-07-04.74 N	080-04-46.88 W
101_105_0220_1	coral	26-07-50.36 N	080-04-41.97 W
101_105_0220_3	coral	26-07-56.95 N	080-04-40.74 W
101_106_0146_2	edge of coral	26-07-47.9 N	080-04-37.76 W
101_106_0147_2	coral	26-06-48.4 N	080-04-43.57 W

NAME	REMARK	LATITUDE	LONGITUDE
101_106_0147_4	coral	26-07-08.43 N	080-04-41.52 W
101_106_0147_5	scattered hits/coral	26-07-04.61 N	080-04-41.11 W
101_106_0147_6	coral	26-06-58.85 N	080-04-41.9 W
101_106_0147_7	coral	26-06-53.23 N	080-04-42.88 W
101_106_0147_8	coral	26-06-32.99 N	080-04-45.93 W
101_106_0148_1	Significant coral	26-06-24.13 N	080-04-46.66 W
101_106_0148_2	coral	26-06-26.47 N	080-04-46.41 W
101_108A0055_1	debris, spoil area	26-07-10.63 N	080-04-26.19 W
101_108A0055_2	debris, spoil area	26-07-15.4 N	080-04-24.35 W
101_108A0055_3	debris, spoil area	26-07-17.13 N	080-04-27.51 W
101_201_1426_1	coral	26-07-52.27 N	080-05-02.48 W
101_201_1426_2	coral	26-07-49.52 N	080-05-02.4 W
101_201_1426_3	coral	26-07-00.2 N	080-05-08.22 W
101_201_1427_1	Object in and/or on top of coral	26-06-54.28 N	080-05-08.85 W
101_201_1452_1	coral	26-06-31.59 N	080-05-11.29 W
101_201_1452_2	coral	26-06-20.22 N	080-05-12.91 W
101_202_1548_1	Isolated coral head	26-06-34.54 N	080-05-01.7 W
101_202_1548_2	small hit	26-06-49.54 N	080-04-59.97 W
101_202_1549_1	coral	26-07-43.96 N	080-04-56.78 W
101_203_1526_1	Large hit 10m east of coral area.	26-07-22.8 N	080-04-51.21 W
101_203_1526_2	coral	26-08-01.07 N	080-04-45.8 W
101_203_1526_3	small coral	26-07-28.84 N	080-04-50.87 W
101_203_1527_1	Isolated coral 60m west of main area	26-06-44.04 N	080-04-57.78 W
101_203_1527_2	coral	26-06-50.15 N	080-04-53.87 W
101_203_1527_3	small hit	26-06-48.28 N	080-04-58.29 W
101_203_1527_4	coral	26-06-39.48 N	080-04-55.25 W
101_203_1527_5	coral	26-06-34.62 N	080-04-55.71 W
101_203_1527_6	coral	26-06-33.05 N	080-04-59.06 W
101_203_1527_7	coral	26-06-20.08 N	080-04-56.87 W
101_204_0312_1	Significant piece in heavy coral area	26-06-40.24 N	080-04-48.58 W
101_204_0312_10	coral	26-06-47.12 N	080-04-48.71 W
101_204_0312_11	coral	26-06-50.89 N	080-04-51.33 W
101_204_0312_12	coral	26-06-52.37 N	080-04-47.11 W
101_204_0312_13	coral	26-07-01.89 N	080-04-46.58 W

NAME	REMARK	LATITUDE	LONGITUDE
101_204_0312_3	coral	26-06-22.46 N	080-04-50.84 W
101_204_0312_4	coral	26-06-25.7 N	080-04-50.93 W
101_204_0312_5	coral	26-06-26.52 N	080-04-54.93 W
101_204_0312_6	coral	26-06-31.44 N	080-04-49.95 W
101_204_0312_7	coral	26-06-31.29 N	080-04-53.28 W
101_204_0312_8	coral	26-06-36.9 N	080-04-49.53 W
101_204_0312_9	coral	26-06-34.5 N	080-04-52.86 W
101_204_0313_10	coral	26-07-23.71 N	080-04-47.64 W
101_204_0313_11	coral	26-07-27.41 N	080-04-43.31 W
101_204_0313_12	coral	26-07-31.73 N	080-04-47.1 W
101_204_0313_13	coral	26-07-31.77 N	080-04-42.97 W
101_204_0313_14	coral	26-07-35.46 N	080-04-46.64 W
101_204_0313_15	coral	26-07-35.82 N	080-04-41.99 W
101_204_0313_16	coral	26-07-43.1 N	080-04-41.88 W
101_204_0313_2	coral	26-07-06.01 N	080-04-45.84 W
101_204_0313_3	coral	26-07-10.25 N	080-04-46.29 W
101_204_0313_4	coral	26-07-17.07 N	080-04-44.61 W
101_204_0313_5	coral	26-07-05.54 N	080-04-50.08 W
101_204_0313_6	coral	26-07-11.9 N	080-04-49.72 W
101_204_0313_7	coral	26-07-14.63 N	080-04-49.11 W
101_204_0313_8	coral	26-07-19.91 N	080-04-47.94 W
101_204_0313_9	coral	26-07-20.62 N	080-04-45.12 W
101_204_0314_1	coral	26-07-51.89 N	080-04-40.43 W
101_204_0314_2	coral	26-07-50.73 N	080-04-44.49 W
101_204_0314_3	coral	26-07-56.02 N	080-04-40.36 W
101_204_0314_4	coral	26-07-55.42 N	080-04-43.74 W
101_204_0314_5	coral	26-07-59.26 N	080-04-44.14 W
101_204_0314_6	coral	26-08-00.39 N	080-04-39.31 W
101_205_0337_1	coral	26-07-56.15 N	080-04-38.2 W
101_205_0337_10	coral	26-06-59.03 N	080-04-45.57 W
101_205_0337_2	coral	26-07-43.24 N	080-04-40.36 W
101_205_0337_3	coral	26-07-35.52 N	080-04-41.03 W
101_205_0337_4	coral	26-07-24.53 N	080-04-42.97 W
101_205_0337_5	coral	26-07-18.69 N	080-04-42.96 W

NAME	REMARK	LATITUDE	LONGITUDE
101_205_0337_7	coral	26-07-09.26 N	080-04-44.45 W
101_205_0337_8	coral	26-07-03.08 N	080-04-41.3 W
101_205_0337_9	coral	26-06-58.39 N	080-04-41.17 W
101_205_0338_2	coral	26-06-52.29 N	080-04-46.33 W
101_205_0338_3	coral	26-06-42.75 N	080-04-47.42 W
101_205_0338_4	coral	26-06-44.96 N	080-04-47.46 W
101_205_0338_5	coral	26-06-47.55 N	080-04-43.31 W
101_205_0338_6	coral	26-06-35.5 N	080-04-48.14 W
101_205_0338_7	coral	26-06-29.89 N	080-04-48.49 W
101_205_0338_8	coral	26-06-21.16 N	080-04-48.83 W
101_205_0338_9	coral	26-06-53.6 N	080-04-42.35 W
101_206_0401_1	small hit	26-06-50.59 N	080-04-40.26 W
101_207_0426_2	spoil area	26-07-17.59 N	080-04-27.56 W
101_207_0426_3	spoil area	26-07-14.99 N	080-04-26.97 W
101_207_0426_4	spoil area	26-07-13.23 N	080-04-27.6 W
101_208_1614_1	debris, spoil area	26-07-10.33 N	080-04-25.74 W
101_208_1614_2	debris, spoil area	26-07-14.76 N	080-04-25.9 W
101_208_1614_3	debris, spoil area	26-07-16.86 N	080-04-24.92 W
101_209_1402_1	coral	26-06-35.28 N	080-05-12.88 W
101_209_1402_2	coral	26-07-13.5 N	080-05-08.8 W
101_209_1402_3	coral	26-07-22.12 N	080-05-07.31 W
101_209_1403_1	coral	26-07-42.18 N	080-05-05.06 W

Two coral ridges are located within the limits of the present survey. The ridges run from north to south. See Figure 3.

DASHED LIMIT LINES ARE SHOWN ON SHEET SHEET
TO OUTLINE THE AREA OF SUBMERGED CORAL RIDGE

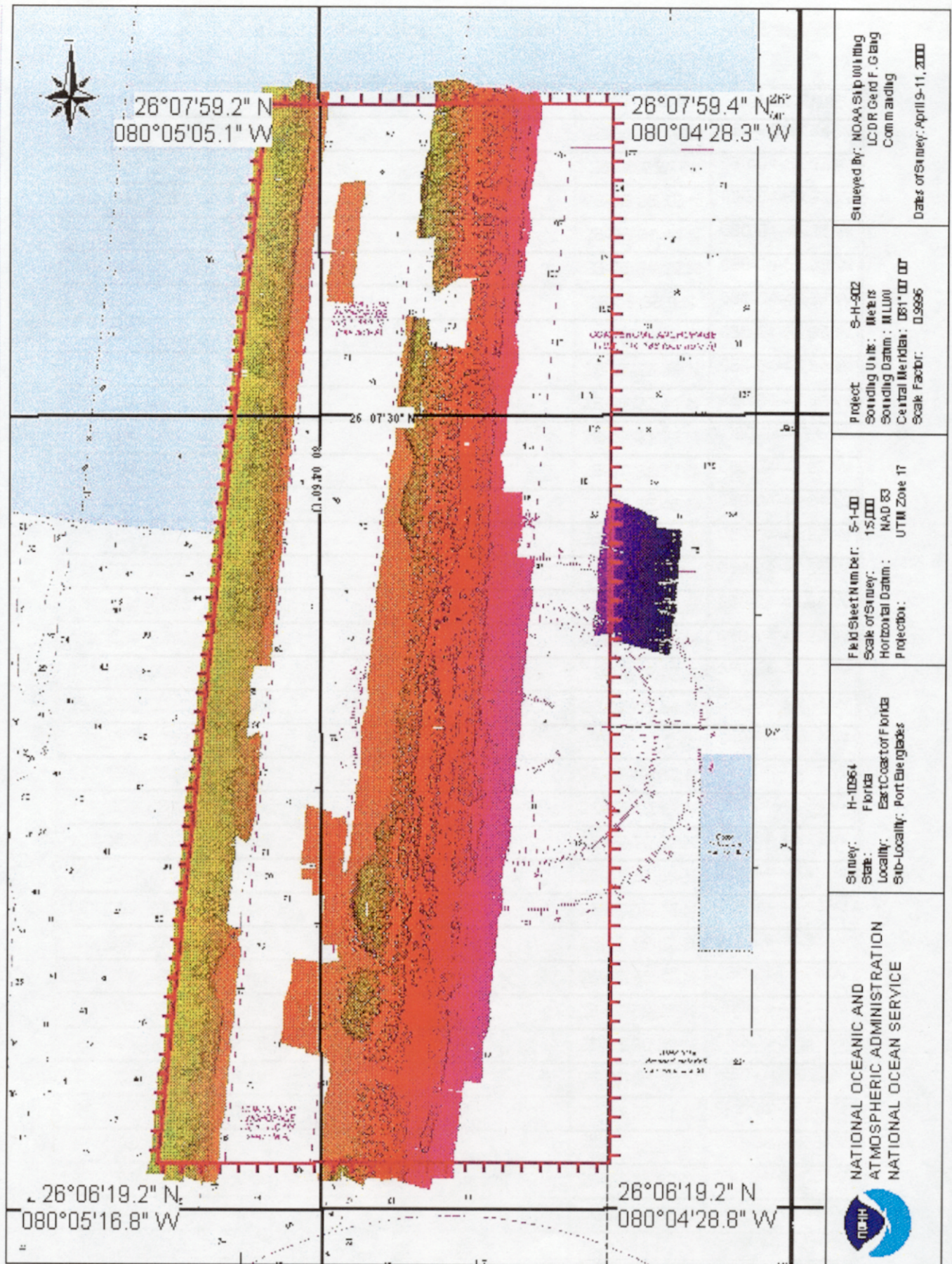


Figure 3: Chartlet of coral heads created using MAPINFO (ver 5.0).

M.6. A comparison with prior surveys is not required due to the completion of 200% side scan sonar coverage. *SEE ALSO THE EVALUATION REPORT*

M.7. Chart No. 11470 (1:10,000, 34th Ed., Jan. 22, 2000) is the largest scale chart for these coral item investigations.

None of the coral items constitute a danger to navigation. *CONCUR*

The hydrographer recommends charting the least depth in the positions of the contacts listed in section N.3. *CONCUR WITH CLARIFICATION - CHART SOUNDINGS AS SHOWN ON PRESENT SURVEY*

All developments were done on June 28, 2000. SWMB development could not be done on contact number 101_104_0245_1 due to the presence of an anchored vessel. Due to time constraints on this survey, WHITING was unable to return to the site to finish this item investigation.

N. COMPARISON WITH THE CHART

N.1. ^{FIVE} ~~Two~~ charts are affected by this survey:

Chart No. 11470
Ft. Lauderdale, Port Everglades
34th Ed., Jan. 22, 2000
1:10,000

11467 PF	July 15, 2000	36 th Ed.
11469	SEPT. 25, 1993	4 th Ed.
11460	July 29, 2000	37 th Ed.

Chart No. 11466
Jupiter Inlet to Fowey Rocks
34th Ed., February 6, 1999
1:80,000

N.2. No Danger to Navigation Reports were issued as a result of this survey.

N.3(a) Survey depths were converted from meters to feet and overlaid on the largest scale raster chart of the area using **MAPINFO** (chart 11470, 34th Ed., Jan. 22, 2000). Survey depths agreed well with charted soundings. *11470*

N.3(b) After reviewing side scan imagery, two areas on H-10964 contained numerous contacts resembling clusters of coral head. One-hundred percent SWMB development was run over these two areas. The hydrographer recommends charting bottom characteristics of Coral Head, "Co Hd" at the locations in M.5., and charting surveyed least depths (see Figure 3 for coral area) *CONCUR WITH CLARIFICATION - CHART SURVEY SOUNDINGS AS SHOWN ON PRESENT SURVEY*

N.3(c) No hydrographic findings of special note are reported.

N.3(d) No maintained channels occur within the survey area. *Correct*

N.3(e) This survey does not include any safety fairways or traffic schemes. *Correct*

N.4(a) With the exception of the items noted in N.4(b), all non-sounding features within the survey area are adequately charted. *Correct*

N.4(b) There are no charted non-sounding features for which the hydrographer has charting recommendations. *Correct*

N.4(c) No "PA", "ED", "PD", or "Rep" features occur within the survey area. *Correct*

N.4(d) Information pertaining to obstructions obtained from miscellaneous sources (i.e. local knowledge) has been incorporated into section M. Item Investigations.

N.4(e) No bridges, overhead cables or pipelines are located within the survey area. *Correct*

N.4(f) No submarine cables are located within the survey area. *Correct*

N.4(g) No pipelines are associated with the survey area. *Correct*

N.4(h) No ferry routes are located within the survey area. *Correct*

N.4(i) No ferry terminals are located within the survey area. *Correct*

N.5 The hydrographer recommends no changes be made to the scale, coverage or format of published charts of the survey area. *Correct*

N.6(a-k) No field examinations were completed in conjunction with H-10964. These sections are not applicable to this survey.

O. ADEQUACY OF SURVEY *SEE ALSO THE EVALUATION REPORT*

O.1 This survey is sufficiently complete and fully adequate to supersede prior survey data within common areas.

P. AIDS TO NAVIGATION

P.1. There were no non-floating aids to navigation included within the limits of this survey.

Q. STATISTICS

Q.1. The following table summarizes statistics for this survey by vessel:

	NOAA Ship WHITING	NOAA Launch 1005	Total
Linear nautical miles SSS	31.39	0	31.39
Linear nautical miles VBLS	99.21	0	99.21
Linear nautical miles SWMB	0	18.37	18.37
Square nautical miles SSS	1.23	0	1.23
Square nautical miles VBLS	1.06	0	1.06
Square nautical miles SWMB	0	0.41	0.41

Q.2. The following is a list of overall survey statistics:

Item	Total
Days of acquisition	4
Total number of soundings	20,646
Number of soundings depicted on final sheet	N/A
Number of detached positions	7
Number of bottom samples	7
Number of sound velocity casts	3
Number of tide gauges installed	0

R. MISCELLANEOUS *SEE ALSO THE EVALUATION REPORT*

R.1 Bottom samples sites were selected by reviewing the relative intensity of the SSS returns represented in the SSS mosaics. Samples were collected to confirm bottom characteristics that were evident on the side scan mosaics. All samples were retained and shipped to the Smithsonian Institute in Washington, D.C.

Bottom Sample Number	Position	Sample Type Collected
1	26-06-35.86 N 080-04-40.92 W	fne gy S brk Co
2	26-07-53.27 N 080-04-57.04 W	gy S brk Co
3	26-07-53.13 N 080-04-56.89W	fne gy S
4	26-06-19.33 N 080-05-18.8 W	fne gy S
5	26-07-30.42 N 080-04-58.91 W	fne gy S
6	26-07-41.74 N 080-04-29.65 W	Co Hd
7	26-06-54.01 N 080-05-02.57 W	fne gy S brk Sh

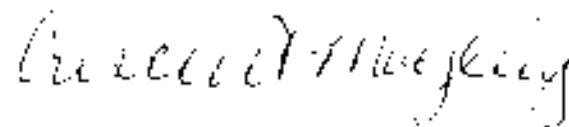
S. RECOMMENDATIONS

S.1 No further survey work is recommended. *OPPORT*

T. REFERRAL TO REPORTS

T.1 There are no referral to reports for this project.

Respectfully Submitted.



Crescent H. Moegling
Senior Survey Technician
NOAA Ship Whiting

April 9, 2001
Date

APPENDIX K

APPROVAL SHEET

OPR-S-II-902-WH-00

Port Everglades, Florida

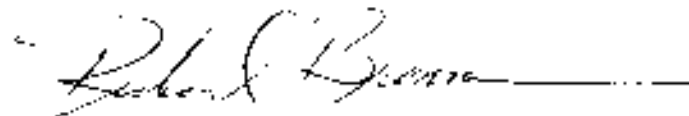
1.4 nm NW of Port Everglades Harbor

Survey Registry No. H-10964

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

This survey is adequate to supersede all prior surveys in common areas, and for application to the relevant NOS nautical charts.

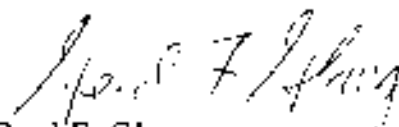
Respectfully,



Richard T. Brenman
Lieutenant, NOAA
Field Operations Officer
NOAA Ship WHITING

April 9, 2001
Date

Respectfully,



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

April 9, 2001
Date



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

TIDE NOTE FOR HYDROGRAPHIC SURVEY

DATE: August 31, 2000

HYDROGRAPHIC BRANCH: Atlantic
HYDROGRAPHIC PROJECT: S-H902 WH 2000
HYDROGRAPHIC SHEET: H-10964

LOCALITY: Port Everglades, FL
TIME PERIOD: April 10 - June 25, 2000

TIDE STATION USED: 872-3214 Virginia Key, FL
Lat. 25 43.9'N Lon. 80 9.7'W
PLANE OF REFERENCE (MEAN LOWER LOW WATER): 0.000 meters
HEIGHT OF HIGH WATER ABOVE PLANE OF REFERENCE: 0.667 meters

REMARKS: RECOMMENDED ZONING
Use zone(s) identified as: ATL885

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.

For _____
CHIEF, REQUIREMENTS AND DEVELOPMENT DIVISION



LETTER TRANSMITTING DATA

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

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

DATE FORWARDED 03/06/2002

NUMBER OF PACKAGES 1

TO:

- NOAA / National Ocean Service
- Chief, Data Control Group, N/CS 3x1
- SSMC3, Station 6815
- 1315 East-West Hwy
- Silver Spring, MD 20910-3282

NOTE: A separate transmittal letter is to be used for each type of data, as tidal data, seismology, geomagnetism, etc. State the number of packages and include an executed copy of the transmittal letter in each package. In addition the original and one copy of the letter should be sent under separate cover. The copy will be returned as a receipt. This form should not be used for correspondence or transmitting accounting documents.

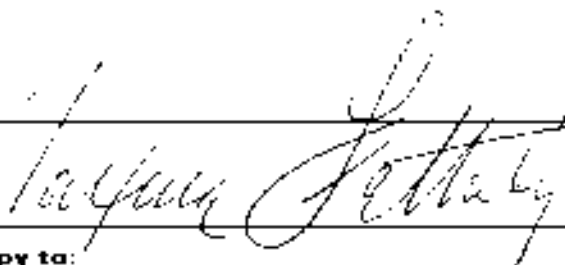
H10964

Florida
Port Everglades

- 1 Descriptive Report / Evaluation Report
- 1 Drawing History form 76-71 for NOS chart 11470
- 1 Mylar final AHB Smooth Sheet
- 1 Mylar H-Drawing for NOS chart 11470
- 1 Paper DTM plot

ATTN: George Myers 301-713-2709

FROM: (Signature)



RECEIVED THE ABOVE
(Name, Division, Date)

Return receipted copy to:

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

**ATLANTIC HYDROGRAPHIC BRANCH
EVALUATION REPORT FOR H10964 (2000)**

This Evaluation Report has been written to supplement and/or clarify the original Descriptive Report. Sections in this report refer to the corresponding sections of the Descriptive Report.

D. AUTOMATED DATA ACQUISITION AND PROCESSING

The following software was used to process data at the Atlantic Hydrographic Branch:

Hydrographic Processing System
NADCON, version 2.10
MicroStation 95, version 5.05
I/RAS B, version 5.01
CARIS HIPS/SIPS

The smooth sheet was plotted using a Hewlett Packard DesignJet 2500CP plotter.

H. CONTROL STATIONS

Horizontal control for this survey is based upon the North American Datum of 1983 (NAD 83). 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 1.310 seconds (40.323 meters or 8.06 mm at the scale of the survey) north in latitude, and 0.844 seconds (23.452 meters or 4.69 mm at the scale of the survey) east in longitude.

J. CROSSLINES

Due to the irregularity of the bottom, crossline comparisons with main-scheme soundings varied from 1 to 5 feet in the area between longitude 80°04'25"W and 80°04'45"W.

L. COMPARISON WITH PRIOR SURVEYS

A comparison with prior surveys was not done during office processing in accordance with section 4. of the memorandum titled "Changes to Hydrographic Survey Processing", dated May 24, 1995.

- N. COMPARISON WITH CHARTS 11470 (34th Edition, Jan 22/00)
11467PF (36th Edition, July 15/00)
11466 (35th Edition, June 3, 2000)
11469 (4th Edition, Sept 25/93)
11460 (37th Edition, July 29/00)

Hydrography

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

Except as noted above, the present survey is adequate to supersede the charted hydrography within the common area.

O. ADEQUACY OF SURVEY

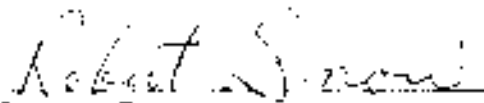
This is an adequate hydrographic/side scan sonar/multibeam survey. No additional field work is recommended.

R. MISCELLANEOUS

Chart compilation was done by Atlantic Hydrographic Branch personnel, in Norfolk, Virginia. Compilation data will be forwarded to Marine Chart Division, Silver Spring, Maryland.

The following NOS Chart was used for compilation of the present survey:

11470 (34th Edition, January 22, 2000)

A handwritten signature in cursive script that reads "Robert Snow". The signature is written in dark ink on a white background.

Robert Snow

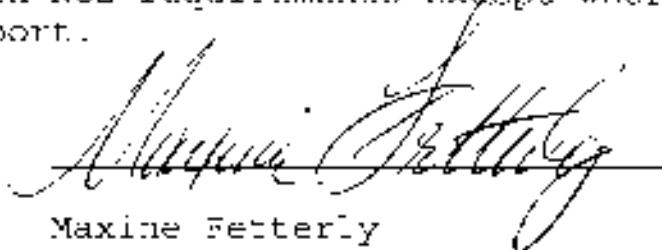
Cartographic Technician
Verification of Field Data
Evaluation and Analysis

APPROVAL SHEET

H10964

Initial Approvals:

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

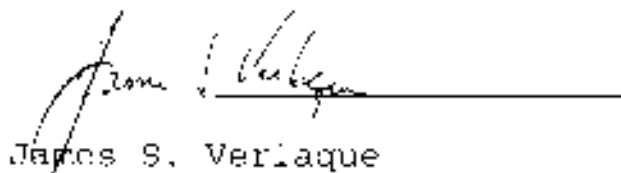


Date:

12/10/01

Maxine Fetterly
Cartographer
Atlantic Hydrographic Branch

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



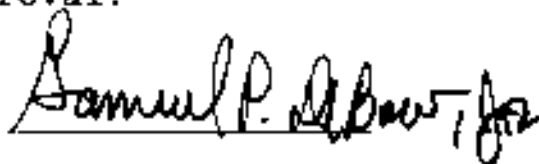
Date:

2/20/02

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

Final Approval:

Approved:



Date:

March 25, 2002

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

