H11896

NOAA FORM 76-35A

U.S. DEPARTMENT OF COMMERCE

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL OCEAN SERVICE

Descriptive Report

Type of Survey *Shallow Water Multibeam Hydrographic and Side Scan Sonar Survey*
Field No. *OPR-H328-OS-08-A*
Registry No. *H11896*

Locality

State *Florida*
General Locality *Atlantic Ocean*
Sub locality *East of Port Everglades*

2009

CHIEF OF PARTY

George G. Reynolds

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Date……..

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

HYDROGRAPHIC TITLE SHEET

REGISTER NO. *H11896*

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 NO. *OPR-H328-OS-08-A*

State *Florida*

General Locality *Atlantic Ocean*

Locality *East of Port Everglades*

Scale *N/A* Date of Survey *March 12, 2009*

Instructions Dated *May 7, 2008* Project No. *OPR-H328-OS-08-A*

Vessel *R.V. Able II - Registration Number CT4788BB*

Chief of Party *George G. Reynolds*

Surveyed By *John G. Wetmur, David A. Sinson*

Soundings taken by (*Echo Sounder*) *Reson Seabat 8101*

Graphic Record Scaled by *N/A*

Graphic Record Checked by *N/A*

Protracted by *N/A* Automated Plot by *Angela M. Rizzo*

Verification by ~~*Michael J. Engels*~~ ***Atlantic Hydrographic Branch Personnel***

REMARKS: *- All Times Recorded in UTC*
-Data Recorded and Presented relative to NAD83 UTM Zone 17 North
-Original SOW modified by Oct 28, 2008 e-mail from COTR Mark Lathrop. (Refer to Appendix V of the Descriptive Report.)
-Contractor: Ocean Surveys, Inc.
91 Sheffield St.
Old Saybrook, CT. 06475

Notes in red, bold, italic were made during office processing.

THE INFORMATION PRESENTED IN THIS REPORT AND THE ACCOMPANYING DATA REPRESENT THE RESULTS OF A SURVEY PERFORMED BY OCEAN SURVEYS, INC. BETWEEN 12 FEBRUARY AND 12 MARCH 2009 AND CAN ONLY BE CONSIDERED AS INDICATING THE CONDITIONS EXISTING AT THAT TIME. REUSE OF THIS INFORMATION BY CLIENT OR OTHERS BEYOND THE SPECIFIC SCOPE OF WORK FOR WHICH IT WAS ACQUIRED SHALL BE AT THE SOLE RISK OF THE USER AND WITHOUT LIABILITY TO OSI.

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SEPARATES ***File with original field records.***

DESCRIPTIVE REPORT
TO ACCOMPANY
HYDROGRAPHIC SURVEY H11896

Field Number OPR-H328-OS-08-A
March 12, 2009
Ocean Surveys, Inc. – R.V. Able II
Chief of Party: George G. Reynolds

INTRODUCTION

The purpose of this survey is to provide NOAA with modern, accurate hydrographic survey data to update the nautical charts of the Atlantic Ocean east of Port Everglades, Florida.

A. AREA SURVEYED

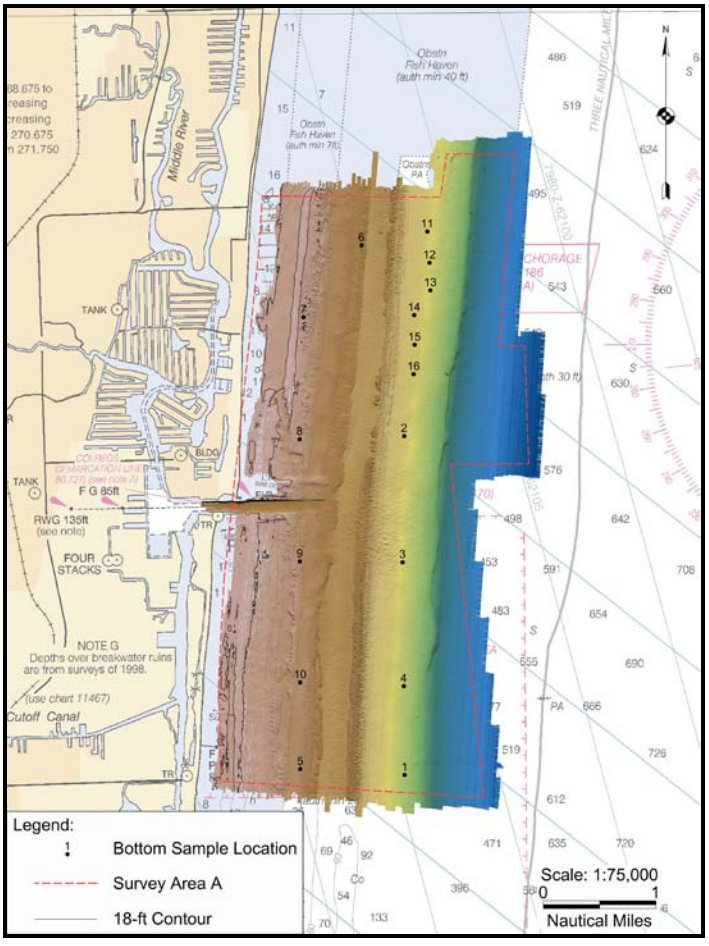

Figure 1. H11896 multibeam coverage area developed from a 2m surface colored by depth overlain on Chart 11466. The NOAA project limits are shown in red.

This survey provides hydrographic data for the Atlantic Ocean waters east of Port Everglades, Florida. The project limits (Table 1) define the inshore 18-foot contour and extend offshore approximately 2 nautical miles. The survey area includes the Outer Bar Cut of the entrance channel, the primary offshore commercial anchorage for the Port, and several offshore fish havens. Survey data were acquired to meet requirements specified in the contract Statement of Work (SOW, May 7, 2008; amended Oct. 28, 2008), and NOS Hydrographic Surveys Specifications and Deliverables, April 2007 (HSSD 2007). Two hundred percent (200%) coverage with side scan sonar (SSS) data, with concurrent shallow water multibeam echo sounder (SWMB) data, were acquired with set line spacing to water depths of approximately 65 feet. One hundred percent (100%) SWMB coverage was acquired for the survey area in the entrance channel and in deep water (i.e. greater than approximately 65 feet) where 200% SSS imagery was not obtained. Although not required by the SOW, nearly full SWMB coverage was acquired for the survey area in depths greater than 30 feet. Additional SWMB coverage was obtained as necessary to provide a least depth for all significant SSS contacts. The final survey area covers 13.2 square nautical miles (Figure 1). ***Concur.***

Table 1
General Location of Survey H11896

Northern Limit	Southern Limit	Western Limit	Eastern Limit
26° 09’ 02” N	26° 02’ 50” N	80° 06’ 40” W	80° 03’ 14” W

The main scheme SSS/SWMB tracklines were oriented nominally parallel to charted depth contours (Figure 2). Trackline offset and accompanying SSS range scale settings are presented in Table 2. SSS tracklines were separated by one-half the distance required for 100% coverage. The tracklines used to generate 100% and 200% coverages were separated by an odd/even numbering convention. Deeper water, 100% SWMB data were acquired at 75 meter line spacing. ***Concur.***

On-location system integration began on January 9, 2009. Due to weather and operational delays, system calibration (patch test) data for the H11896 survey were not acquired until February 13, ~~2006~~ ***2009***. Calibration data, main scheme data, cross line data, significant target development, and bottom samples were acquired on the following dates: February 12-16, 19-23, 27-28, 2009; March 1-3, 9-12, 2009 (calendar day numbers 043-047, 050-054, 058-062, 068-071). Sixteen (16) bottom samples were acquired. Survey trackline statistics are indicated in Table 3.

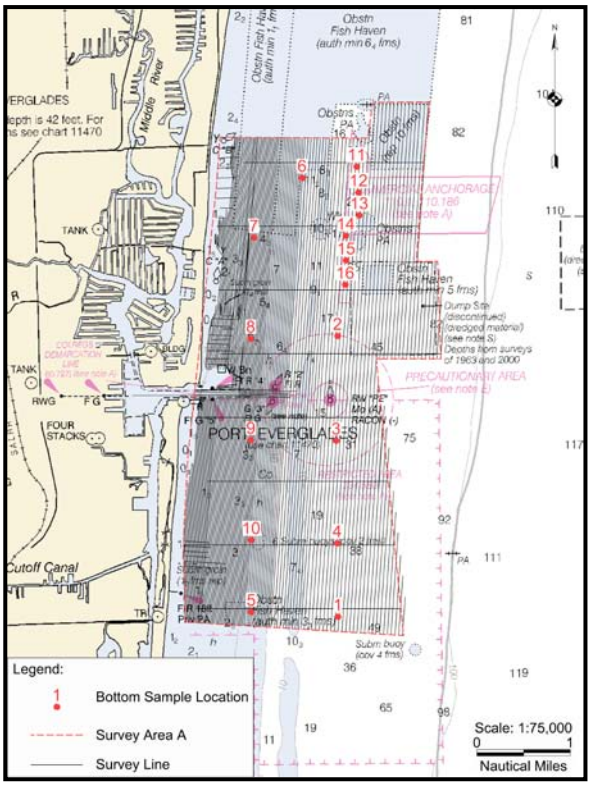

Figure 2. H11896 survey area with planned SSS/SWMB tracklines and bottom sample locations.

Table 2
H11896 Survey Line Spacing

Water Depths (meters)	Trackline Offset (meters)	SSS Range Scale (meters)
1-10	30	37.5
10-20	40	50
20-30	65	75
> ≈30	75	SWMB only

Table 3
H11896 Survey Trackline Statistics

Concurrent MB/SSS Lineal NM	SSS Only (Fill-in) Lineal NM	Multibeam Only Lineal NM	Additional Developments Lineal NM	Cross Lines Lineal NM	Square Nautical Miles Covered	Bottom Samples Acquired
381.6	10.6	123.3	31.0	35.6	13.2	16

B. DATA ACQUISITION AND PROCESSING *See also the H-Cell Report.*

Refer to OPR-H328-OS-08 Data Acquisition and Processing Report (DAPR)* for a complete description of data acquisition and processing systems, survey vessels, quality control procedures, and data processing methods. Additional information to supplement survey data, and any deviations from the DAPR* is included in this descriptive report.

B.1 Equipment

All survey operations were conducted from OSI's R/V "Able II," a 7.6 meter fiberglass vessel, with a 3 meter beam and 0.8 meter draft. The vessel is powered by twin 150 HP outboard engines. Table 3 summarizes the primary equipment used to acquire SWMB and SSS data. All equipment was installed, calibrated and operated in accordance with the DAPR.* *Concur.*

Table 3
H11896 Primary Survey Equipment

System	Manufacturer	Model/Version No.
Multibeam Echo sounder	Reson	8101
Side Scan Sonar	Klein	3000
Sound Speed Profiler	Sea-Bird	SeaCAT SBE 19+
Sound Speed Profiler	Sea-Bird	SeaCAT SBE 19
Sound Speed Sensor (Real-Time Surface Water Sound Speed)	Sea-Bird	MicroCAT SBE37
Primary Navigation DGPS	Applanix/Trimble	POS MV 320 V.4
Secondary Navigation DGPS (Position Integrity Alarm)	Trimble	MS750
Motion Compensation	Applanix/Trimble	POS MV 320 V.4
Heading Compensation	Applanix/Trimble	POS MV 320 V.4
Multibeam acquisition, trackline control, position fixing	HYPACK, Inc.	2008
SSS acquisition	Chesapeake Technology, Inc.	SonarWiz Map
U.S.C.G. Differential Beacon Receivers (2)	Trimble	Probeacon
Bar Check	OSI	Lead Disk
SSS Cable Payout Indicator	Hydrographic Consultants	SCC16"

H11896 DAPR is on file at AHB and submitted to OCS Hydrographic Surveys Division with H11896 deliverables.

B.2 Quality Control (QC)

B.2.1 System Calibration

A SSS calibration survey was performed within the survey area on February 12 (DN 043) to verify object detection and towfish positioning accuracy of the SSS system. Calibration results are presented in the DAPR.* ***Concur.***

A SWMB system calibration survey (patch test) was performed within the survey area on February 13 (DN 044) to measure sensor alignments and to verify offsets. A SWMB system calibration report is included in the DAPR.* The CARIS vessel configuration file (HVF) was updated with all appropriate time stamps, offset values, and error estimates. ***Concur.***

B.2.2 SWMB Crosslines

A total of 35.6 nautical miles of cross line data were acquired. These data were obtained on February 14 and March 11 (DN 045 and DN 071) and comprised 7.05% of the 504.9 nautical miles of the recorded main scheme SWMB data. ***Concur.***

Statistical quality control information was generated by comparing each of the 12 major crosslines to a 2m x 2m CARIS BASE (Bathymetry Associated with Statistical Error) surface. A statistical analysis was performed using the inner 5-degree, near nadir beams. Crossline comparisons generated with the CARIS QC Report utility are presented in Separate IV. In general, crossline comparisons showed excellent agreement with main scheme SWMB data and 99% of crossline soundings considered in the analysis meet IHO Order 1 uncertainty standards. There was good agreement between overlapping lines and day-to-day sounding coverage as observed during the CARIS subset editor review. ***Concur.***

B.2.3 Data Quality Review

B.2.3.1 CARIS BASE Surface Standard Deviation and Uncertainty

The standard deviation and uncertainty BASE surfaces were reviewed in order to identify areas with excessive noise, systematic artifacts, and bathymetric features that warranted additional investigation. In general, the final combined uncertainty BASE surfaces generated from the higher of the standard deviation or uncertainty values were appropriate for the bathymetric relief observed in the survey area. The CARIS QC BASE surface report utility was used to evaluate IHO uncertainty for the final combined surface (Table 5). QC BASE surface reports are included for all final surfaces in Separate IV. Higher standard deviation was observed along steep slopes of the channel and reefs, on fish haven features, and in the deepest water of the survey area. ***Concur.***

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Table 5
H11896 Combined Final BASE Surface Uncertainty

IHO Order	Special (0-20m)	I (0-100m)	II (> 100m)	III (> 100m)
H11896 Combined Final 2m Surface Nodes Within Specifications	99.80%	99.98%	100%	100%

B.2.3.2 SSS Imagery and Contacts

Contacts with approximately 1-meter heights were identified in 2 x 100% coverage SSS imagery and attributed with feature classifications and descriptive remarks if applicable. Contacts with greater than 0.5-meter heights were identified in 200% SSS imagery within the channel. A custom CARIS ContactFeatures.hcf was created for feature classification when positioning contacts and is submitted with the session data. Contacts were classified according to SSS shadow height and surrounding depths as specified in the SOW and HSSD (Table 6). All contacts were correlated and evaluated in the CARIS HIPS/SIPS map window with respect to BASE surfaces, contours and charted information. Each significant contact was examined in the CARIS subset editor and a sounding was designated for the representative least depth of each contact (or Primary/Secondary contact pair). All significant contacts that were not developed with mainscheme SWMB coverage were investigated with additional coverage. A list of all side scan sonar contacts is contained in Separate V. Isolated shoal features that were outstanding or navigationally significant with respect to the surrounding depths are represented and attributed in the S-57 feature file (i.e. OBSTRN, WRECKS). ***Concur***

Table 6
Significant Contact Selection Criteria

Surrounding Depth or Area (meters)	Significant Contact Height (meters)
Channel	0.5
0-5	0.5 - 1
5-20	1
>20	10% of surrounding depth

B.2.4 Survey Junctions

There were no junctions assigned for this survey.
Concur.

B.2.5 Unusual Conditions/Factors Affecting Soundings/Imagery

Survey data for H11896 revealed many small contacts (> 1600) and extensive reef areas. Few of the side scan sonar contacts merit navigational significance beyond BASE surface representation. Many are coral rocks with heights approximately 1 meter or less above surrounding depths. Additional contacts observed include numerous fish haven features with insignificant heights. ***Concur.***

There was a steady longshore current observed in offshore areas during the survey. The current velocity was generally observed to be approximately one knot heading in a north-to-south direction. Although vessel speed through the water, and therefore dynamic draft, may have been slightly affected by the current, no significant water level offsets were observed in the sounding data or BASE surfaces. ***Concur.***

In general, there was very little variation in sound speed observed in the shallow water column throughout the survey. However, in depths greater than 60 meters, there were significant changes of sound speed with depth (Figure 3). Sound speed profiles were acquired in appropriate areas and at regular intervals to correct soundings for observed water column differences. There was no indication of high sound speed uncertainty in crossline evaluations or BASE surfaces. ***Concur.***

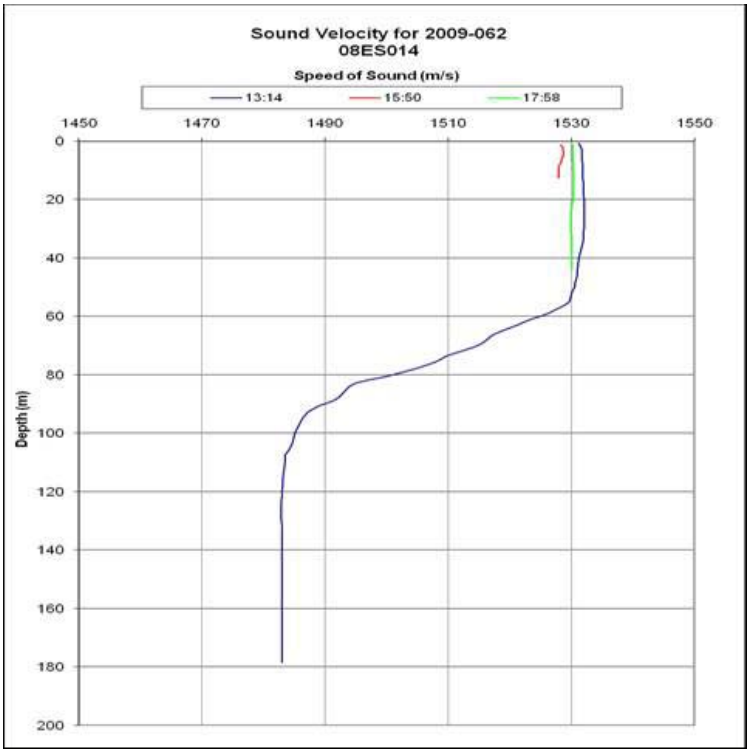

Figure 3. Typical deep water sound speed cast.

B.3 Corrections to Echo Soundings

Corrections to echo soundings were performed in accordance with the DAPR.* No changes to the sensor or vessel configuration, other than minimal static draft changes, occurred during the survey and no systematic errors were observed in the data to warrant additional echo sounder calibration. ***Concur.***

B.3.1 Static Draft Corrections

Static draft measurements were measured daily (Table 7), prior to survey operations and recorded in the acquisition log. The static draft value was also measured daily or after each fueling. The CARIS vessel configuration file was updated with daily time tags and static draft values. Static draft corrections were applied during the merge process.

Table 7
H11896 Daily Static Draft Corrections

Date/Julian Day	Time (UTC)	Reference Measurement (meters)	Calculated Static Draft (meters)
Feb 13, 2009 (44)	14:38	0.74	0.002
Feb 14, 2009 (45)	12:32	0.75	0.007
Feb 15, 2009 (46)	13:25	0.75	0.012
Feb 16, 2009 (47)	12:19	0.75	0.012
Feb 19, 2009 (50)	12:13	0.75	0.012
Feb 20, 2009 (51)	12:46	0.74	0.002
Feb 21, 2009 (52)	12:12	0.75	0.012
Feb 22, 2009 (53)	11:44	0.74	0.002
Feb 23, 2009 (54)	11:47	0.74	0.002
Feb 27, 2009 (58)	11:51	0.74	0.002
Feb 28, 2009 (59)	17:29	0.74	0.002
March 1, 2009 (60)	12:37	0.74	0.002
March 2, 2009 (61)	12:15	0.75	0.012
March 3, 2009 (62)	12:26	0.75	0.012
March 4, 2009 (63)	12:32	0.74	0.002
March 8, 2009 (67)	12:38	0.74	0.002
March 9, 2009 (68)	12:05	0.75	0.012
March 10, 2009 (69)	12:31	0.75	0.012
March 11, 2009 (70)	12:01	0.76	0.022
March 12, 2009 (71)	12:43	0.74	0.002

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B.4 Data Processing

B 4.1 Survey Coverage

This survey was conducted to develop 200% SSS coverage of the survey area along with set line spacing SWMB bathymetry. High-resolution multibeam developments were acquired over significant features. SSS coverage was verified with 100% and 200% 1-meter resolution mosaics. ***Concur.***

B 4.2 Coverage BASE Surfaces and Mosaics

Survey H 11896 was divided into several field sheets (Table 8 and Figure 4) based upon depth ranges and final BASE surface resolutions. BASE surface resolutions were created to meet corresponding IHO Order I object detection standards. For example, in 0-20 meter depths, a 1-meter resolution BASE surface was created to resolve 2-meter objects. Half-meter (0.5) resolution surfaces were created for the channel and a rocky area to resolve 1-meter objects. One-meter (1) resolution coverage mosaic field sheet was created for each 100% SSS coverage. ***Concur.***

Table 8
H11896 Field Sheets

Field Sheet Name	Resolution (meters)	Depth Range	Type
H11896_channel	0.5	0-15	SWMB coverage
H11896_N_RockyArea	0.5	0-10	SWMB coverage
H11896_N_Inshore	1	0-20	SWMB coverage
H11896_S_Inshore	1	0-20	SWMB coverage
H11896_Offshore	2	> 20	SWMB coverage
H11896_full*	2	all	Combined SWMB coverage
H11896_SSS_100	1	all	100% SSS mosaic
H11896_SSS_200	1	all	100% SSS mosaic

Not considered a source grid.

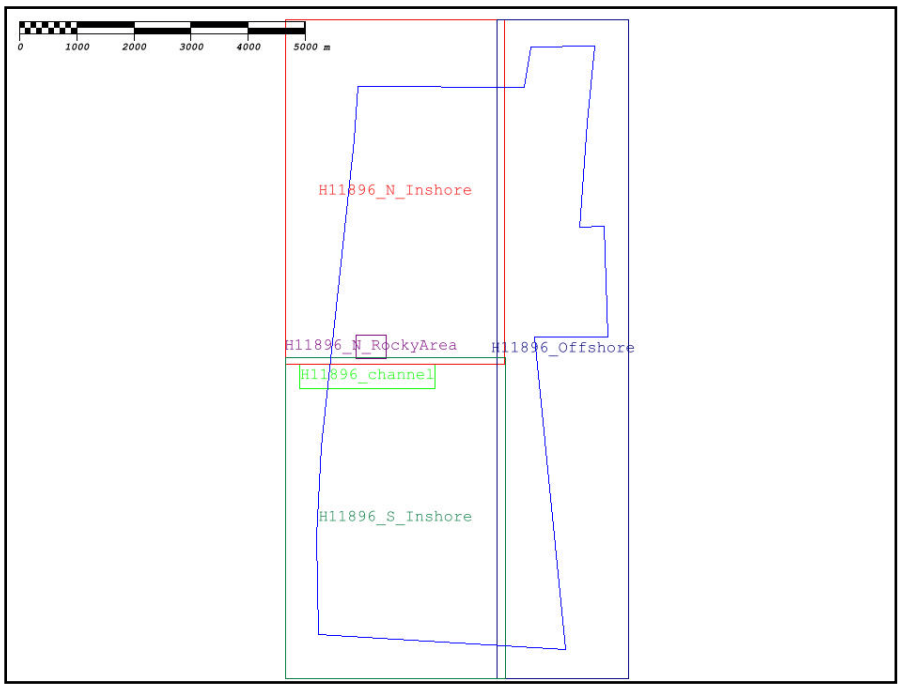


Figure 4. H11896 final HIPS field sheet layout with survey limits shown in blue.

C. VERTICAL AND HORIZONTAL CONTROL *See also the H-Cell Report.*

C.1 Vertical Control

The vertical datum for this project is Mean Lower-Low Water (MLLW). The operating National Water Level Observation Network (NWLON) station at Virginia Key, FL (872-3214) serves as datum control for Survey H11896. ***Concur.***

OSI observed data gaps and vertical offsets in the preliminary water level data for the Virginia Key tide gauge and notified the COTR on January 17, 2009. OSI was informed that there was no reason to suspend survey operations. All data gaps and offsets were smoothed by CO-OPS and final verified tides were provided on the CO-OPS internet (WWW) site. A record of correspondence between OSI and the COTR is included in Appendix V. ***Concur.***

The survey area is located entirely within Zone SA229 preliminary tidal zoning data included with the SOW. A time corrector of -60 minutes and a range ratio of 1.22 were applied to all Virginia Key (872-3214) verified water level data.

Verified tides with final tide zoning were applied by OSI. There were no significant water level errors or uncertainty observed in crossline data or final BASE surfaces. ***Concur.***

C.2 Horizontal Control

The horizontal datum for this project is the North American Datum of 1983 (NAD83). All data products are referenced to Latitude/Longitude or Universal Transverse Mercator (UTM) Zone 17, meters. ***Concur.***

All position data were acquired using a POS MV inertial motion unit (IMU) Differential GPS (DGPS) positioning system. Differential beacon correctors from the U.S. Coast Guard station in Miami were used for the primary position system. Differential beacon correctors from the U.S. Coast Guard station in Cape Canaveral were used by a secondary navigation system as a horizontal control confidence check.

OSI established a horizontal control point, "CG1," adjacent to the survey vessel's berth at the U.S. Coast Guard Station, Ft. Lauderdale, FL, using the National Geodetic Survey's Online Positioning Users Service (OPUS) technology. The OPUS position was used as a reference for daily navigation system confidence checks. Refer to the DAPR and Vertical and Horizontal Control Report (VHCR) for additional details. ***Concur.***

D. RESULTS AND RECOMMENDATIONS

See also the H-Cell Report.

D.1 Chart Comparison

Chart comparisons were performed in CARIS HIPS/SIPS, Notebook and Easy View using surface models, contours and soundings generated from the combined final BASE surface. The latest editions of the NOAA NOS Raster Nautical Charts (RNC) and Electronic Nautical Charts (ENC) were downloaded from the NOAA Coast Survey WWW site (http://www.nauticalcharts.noaa.gov/) weekly during survey operations, and when the survey was completed for final comparisons.

The Local Notice to Mariners (LNM) and Notice to Mariners (NM) (Table 9) issued between May 7, 2008 to March 12, 2009 were reviewed for significant updates. LNM/NM changes affecting aids to navigation (ATON) are discussed in Section D.2.3.

Table 9
H11896 Affected Charts

Chart Number	Scale	Edition	Latest LNM	Latest NM	ENC
11013	1:1,200,000	47th, Feb./08	Feb.	Feb.	US2EC01M
11460	1:466,940	41st, Jul./08	Jul.	Jul.	US3FL30M
11466	1:80,000	38th, Jun./08	Jun.	Jun.	US4FL31M
11467	1:40,000	41st, Jun./08	Jun.	Jun.	US5FL33M
11469	1:100,000	8th, Dec./07	Dec.	Dec.	US4FL23M
11470	1:10,000	38th, Aug./08	Aug.	Aug.	US5FL32M

D.1.1 General Chart Comparison

In general, charted depths and depth areas agreed with survey depths and contours with less than 5-foot differences on the large scale chart of the area, 11470 (US5FL32). High-resolution data from this survey provide more detailed delineations of depth areas, reefs, and individual features. Many scale-dependent discrepancies exist between the RNC, ENC, and survey data; these differences are discussed in the detailed chart comparisons. ***Concur.***

D.1.2 Detailed Chart Comparison and Charted Features

Chart 11013 (US2EC01M)

Chart 11013 is a small scale RNC coastal approach chart with very little detail of the survey area. The ENC US2EC01M does not cover the survey area.

- H11896-1: An RNC charted Dump Site (discontinued, dredged material) is not fully covered by the survey limits; however, most of the area is covered with SWMB data. This feature is fully addressed in the large scale chart comparisons. ***See H-Cell Report for final charting recommendation.***
- H11896-2: An Obstruction (6 1/2 fathoms) is incorrectly charted in the northern part of the survey area because it includes the boundary of an inshore Obstruction Fish Haven (auth min 7 ft). These features are fully addressed in the large scale chart comparisons. ***Do not concur – Item is outside of survey limits. No change in charting is recommended.***

Chart 11460 (US3FL30M)

- H11896-3: A Fish Haven (auth min 1 fm) was surveyed to the 18-foot contour and the northern survey limit with 200 % SSS. All contacts were developed with SWMB data. A least depth of 1.25 fathoms (2.3 meters) was observed at 26-08-06.40N, 80-05-37.70W and is represented in the final combined surface. ***Concur***
- H11896-4: A Fish Haven (auth min 6.5 fm) was surveyed to the northern survey limit. A least depth of 5.64 fathoms (10.3 meters) was observed in the southwest corner on the reef at 26-07-32.65N, 80-05-25.71W and is represented in the final combined surface. ***Concur***
- H11896-5: The 60 foot depth curve is charted inshore of a shoal reef in the southern part of the survey area between approximate coordinates of 26-05-16N, 080-05-05W and 26-03-38N, 80-05-07.5W. The reef is accurately represented in survey data and on large scale Chart 11470. ***Concur***
- H11896-6: A dangerous submerged wreck charted at 26-08-40N, 80-04-15W was observed in SSS and SWMB data outside the northern survey limits. A least depth of 21.3 fathoms (38.9 meters) was developed on the wreck with SWMB at, 26-08-43.6N, 80-04-17.81W. The least depth is represented in the final BASE surface and a WRECKS object was submitted with the S-57 feature file. ***Concur with clarification- Chart a non dangerous sunken wreck with a depth of 127 ft. Add 127 Wk.***

- H11896-7: An Obstruction (reported 10 fms) centered at approximately 26-08-24N, 80-03-55W was covered with 100% SWMB data. The approximate least depth observed 27 fathoms (50 meters) was greater than the reported least depth. ***Concur with clarification - It is recommended that the area obstruction and text Obstn (rep 10 fms) be deleted from chart. Chart present survey depths.***
- H11896-8: A charted (USFL30M) Obstruction PA (position approximate) at 26-07-24N, 80-04-32W was not observed in 100% SWMB coverage. ***Delete charted Obstn PA.***
- Debris on the seafloor was observed in approximate position 26-07-13N, 080-04-26W. An OBSTRN object was created in the S-57 feature file to designate the debris area as foul. ***Concur with clarification - *These area was charted as Obstns PA. The debris was determined insignificant during office processing. Delete charted Obstns PA.***
- H11896-9: A charted wreck (10 ¼ fathom) was verified with SSS and 100% SWMB data and submitted with the S-57 feature file. A designated sounding on the wreck has a least depth of 10.0 fathoms (18.4 meters) at position 26-07-22.74N, 80-04-51.18W. ***Concur with clarification - Chart a wreck with a depth of 60 feet in Latitude 26-07-22.74"N, Longitude 80-04-51.18"W. Delete charted 10 ¼ Wk and danger curve. Add 10 fms Wk and danger curve.***
- H11896-10: A charted Obstruction (5 fathoms) centered at approximately 26-06-48N, 80-04-10W was covered with 100% SWMB data. The approximate least depth observed 27 fathoms (50 meters) was greater than the charted minimum depth.

  See H-Cell Report for final charting recommendation.
- H11896-11: A dangerous submerged wreck PA charted at 26-06-00N, 80-04-51W was not observed in 100% SWMB coverage. ***Concur - Delete the dangerous sunken wreck.***
- H11896-12: A Dump Site (discontd, dredged material) centered at approximately 26-06-28N, 80-03-50W was covered with 100% SWMB data. The approximate least depth observed was ~~37~~*24* fathoms (~~70~~ *45* meters *149 ft*). ***See H-Cell Report for final charting recommendation.***
- H11896-13: A charted Obstruction (3 ¼ fathoms) centered at approximately 26-03-15N, 80-05-54W was covered with 200% SSS data and all contacts were developed with SWMB data. The least depth observed was 2.9 fathoms (5.3 meters) positioned at 26-03-8.20N, 80-05-57.04W. This depth is represented in the final combined surface and updated with the obstruction area in the S-57 feature file. ***See H-Cell Report for final charting recommendation.***

Charts 11466 (US4FL31M), 11467 (US5FL33M Small craft chart #5), Chart 11469 (US4FL23M) and Chart 11470 (US5FL32M)

- H11896-14: A Fish Haven (auth min 6.4 fathoms/40 feet) was surveyed to the northern survey limit. A least depth of ~~37.4~~ *37.33* feet (11.4 meters) was observed on a reef at 26-07-37.00N, 80-05-18.95W and is represented in the final combined surface. ***Concur - Add 37 depth.***

- H11896-15: An Obstructions (Obstns) PA area centered at approximately 26-8-25N, 80-04-19W was outside the survey limit and not completely resolved by this survey. There were many low-relief features (debris) observed on the seafloor in this area and a least depth of 116.5 feet (35.5 meters) is represented in the final combined surface. An OBSTRN object was created in the S-57 feature file to designate the debris area as foul. ***Do not concur – Items determined insignificant during office processing. See H-Cell Report for final charting recommendation.***
- H11896-16: A dangerous submerged wreck PA charted at 26-08-43N, 80-04-17W was observed in SSS and SWMB data outside the northern survey limits. A least depth of ~~127.7~~ ***127.62*** feet (38.9 meters) was developed on the wreck with SWMB at 26-08-43.6N, 80-04-17.81W was represented in the final surface. A WRECKS object was submitted with the S-57 feature file. ***Concur with clarification- Chart a n on dangerous sunken wreck with a depth of 127 ft. Add 127 Wk.***
- H11896-17: An Obstruction (reported 10 fathoms/60 feet) centered at approximately 26-08-24N, 80-03-55W was covered with 100% SWMB data. The approximate least depth observed, ~~160.0~~ ***159.95*** feet (48.8 meters) at 26-08-43.~~35~~ ***41***N, 80-04-09.75~~6~~***6***W, was greater than the reported least depth. ***Concur***

- H11896-18: Debris was observed on the seafloor at 2 Obstructions PA locations charted in approximate positions 26-07-26N, 80-04-19W* and 26-07-15N, 80-04-25W.* The depths on the debris were not significantly shoaler than surrounding depths; however, the area may be foul for anchorage. ***Concur with clarification - *These areas were charted as Obstns PA. The debris was determined insignificant during office processing. Delete both charted Obstns PA.***
- H11896-19: A charted Fish Haven (auth min depth 5 fm/30 ft) centered at approximately 26-06-48N, 80-04-10W was covered with 100% SWMB data. The approximate least depth observed 174 feet (50 meters) was greater than the authorized minimum. ***Concur***

- H11896-20: A Dump Site (discontinued, dredged material; Depths from surveys of 1963 and 2000) centered at approximately 26-06-28N, 80-03-50W was covered with 100% SWMB data. The approximate least depth observed in the northwest corner was 140.0 feet (42.7 meters). ***See H-Cell Report for final charting recommendation.***

- H11896-21: A charted wreck (62 feet) was verified with SSS and 100% SWMB data and submitted with the S-57 feature file. A designated sounding on the wreck has a least depth of 60.2 feet (18.356 meters) at position 26-07-22.74N, 80-04-51.18W. ***Concur with clarification - Chart a wreck with a depth of 60 feet in Latitude 26-07-22.74"N, Longitude 80-04-51.18"W. Delete charted 62 Wk and danger curve. Add 60 Wk and danger curve.***

- H11896-22: A charted Submerged groin (reported 1.4 f athoms/10 f eet) at approximate position 26-06-37N, 80-05-50W was developed with 200% SWMB data. A least depth of ~~11.1~~ ***10.03*** feet (~~3.4~~ ***3.05*** meters) was observed at 26-06-37.2~~2~~***5"***N, 80-05-57.~~26~~***04"***W on the inshore end of the groin. ***Concur with clarification - The Subm groin (10 ft rep) is shown on ENC US5FL32M. The Subm groin (10 ft rep) was brought forward from the ENC US5FL32M to supplement the present survey H-Cell. The depth was verified by the present survey.***

  Revise legend Subm groin (10 ft rep) to Subm groin (10 ft).
- H11896-23: A charted obstruction Submerged buoys (6) (cov 15 feet) at 26-04-03N, 80-05-37W were not observed in 200% SSS and 100% SWMB coverage. A least depth of 29.5 feet (9.0 meters) was observed on the reef in this area at 26-04-04.69N, 80-05-36.97W. Many new private buoys were positioned along the reef during this survey. Refer to Section 2.3 Aids to Navigation. ***Concur with clarification - It is recommended that the six Subm buoy (cov 15 ft) and associated danger curves be deleted from the chart. Chart present survey depths.***
- H11896-24: A charted Submerged groin (8 feet reported) at approximate position 26-03-46N, 80-06-25W was developed with 200% SWMB data. A least depth of ~~9.2~~ ***9.3*** feet (2.8 meters) was observed at 26-03-46.0~~1~~***6***N, 80-06-24.4~~6~~***8***W and represented in the final surface. ***Concur with clarification - The Subm groin (8 ft rep) is shown on ENC US5FL32M. The Subm groin (8 ft rep) was brought forward from the ENC US5FL32M to supplement the present survey H-Cell.***
- H11896-25: A charted Obstruction Fish Haven (auth m in 32.fathoms/20feet) centered at approximately 26-03-15N, 80-05-54W was covered with 200% SSS data and all contacts were developed with SWMB data. The least depth observed was ~~17.4~~ ***18.3*** *feet* (5.~~3~~***6***meters) positioned at 26-03-8.20N, 80-05-57.04W. This depth is represented in the final combined surface and updated with the obstruction area in the S-57 feature file. ***See H-Cell Report for final charting recommendation.***
- H11896-26: Two (2) yacht club racing buoys charted inshore of the 18-foot contour at 26-08-22N, 80-06-00W (Y C "B") and 26-06-50N, 80-06-06W (Y C "A") were not observed at the surface during survey operations. ***Concur - Delete charted buoys.***
- H11896-1: Two (2) charted Submerged breakwaters north and south of the entrance channel (Bar Cut/Outer Bar Cut) were surveyed with 200% SSS and SWMB data to the inshore 18-foot contour. All significant contacts were developed with SWMB data and designated shoal soundings were represented in the final BASE surfaces. ***Concur - See H-Cell Report for additional information.***
- H11896-28: A charted (11467) Sign PA was not observed at the surface or in 200% SWMB at approximate position 26-05-34.3N, 80-06-19.5W.

  Concur - Delete charted Sign PA.

D.1.3 Controlling and Tabulated Depths (Table 10) Chart 11470 (US5FL32M)

Table 10
Port Everglade Channel Controlling Depths, Chart 11470

Channel Depths feet(meters)	Left Outside Quarter	Left Inside Quarter	Right Inside Quarter	Right Outside Quarter	Date of Survey
Outer Bar Cut	46.5(14.2)	47.5(14.5)	48.1(14.7)	37.2(11.3)	8-07
Bar Cut	41.9(12.8)	45.2(13.8)	43.9(13.4)	38.7(11.8)	8-07

Contours of controlling depths were created from the final combined surface and evaluated with respect to the largest scale ENC and RNC.

- H11896-29: A shoal on the northern side of the Outer Bar Cut Right Outside Quarter is encroaching on the channel in the vicinity of the east end of the north jetty. A shoal sounding of 29.9 feet (9.1 meters) was observed at 26-05-39.43N, 80-06-16.46W at the very northern limit of the Outer Bar Cut limits, south of the charted North Jetty. The 37.2 foot (11.3 meters) contour extends approximately 20 meters south into the channel on a steep slope. A DTON report was submitted for this feature. ***See Appendix I for final charting recommendation.***
- H11896-30: A rectangular obstruction with a least depth of 36.8 feet (11.2 meters) was observed within the Bar Cut Left Outer Quarter at 26-05-34.89N, 80-06-27.49W. The obstruction has the following approximate dimensions of 24x 12x6 (LxWxH feet). A DTON report was submitted for this feature. ***See Appendix I for final charting recommendation.***
- H11896-31: A shoal sounding of 43.3 feet (13.2 meters) was observed at 26-05-37.90N, 80-06-24.33W within the Bar Cut Right Inside Quarter. ***Concur***
- H11896-32: A shoal sounding of 46.6 feet (14.2 meters) was observed at 26-05-36.51N, 80-06-10.06W within the Outer Bar Cut Left Inside Quarter. ***Concur***
- H11896-33: A shoal sounding of 46.3 feet (14.1 meters) was observed at 26-05-38.02N, 80-06-13.82W within the Outer Bar Cut Right Inside Quarter. ***Concur***

D.1.4 AWOIS Items

No AWOIS item investigations were assigned within the survey area. ***Concur.***

D.1.5 Danger to Navigation Reports

A Danger to Navigation Report was generated for 2 shoal features in the channel. A copy of the report is included in Appendix I. ***Concur***

H11896 Dangers to Navigation are shown in Table 11.

Table 11
Dangers to Navigation

	Feature	Depth Feet	Depth Meters	Latitude	Longitude	Description
1	Shoal	29.9	9.1	26-05-39.43	080-06-16.46	Shoal in Outer Bar Cut Outer Right Quarter *
2	Obstruction	36.8	11.2	26-05-34.89	080-06-27.49	Obstruction in Bar Cut Outer Left Quarter *

**** See Appendix I. for final charting recommendations.***

D.2 Additional Results

D.2.1 Shoreline Verification

Shoreline verification was not required for this survey. ***Concur.***

D.2.2 Comparison with Prior Surveys

A comparison with prior surveys was not required for this survey. ***Concur.***

D.2.3 Aids to Navigation (ATON)

D.2.3.1 United States Coast Guard (USCG) ATON

The positions and condition of all charted ATON were verified by visual inspection and detached positions. The surveyed positions and descriptions were compared to the most recent version of the USCG Light List, downloaded from the USCG WWW site (http://www.navcen.uscg.gov/pubs/LightLists/LightLists.htm). Charted ATON were verified for the largest scale and the most recent release of RNC and ENC during chart comparisons.

- A charted light at approximate location 080-06-08.50W, 26-05-40.90N has been temporarily replaced by a lighted buoy R "4". The buoy is on station and serving

intended purposes; however, the light is incorrectly displayed as a fixed aid on Chart 11470 and ENC US5FL32M. The temporary buoy status is published in the LNM. Replacement status of the permanent fixed aid is unknown. ***Concur***

D.2.3.2 Private Aids to Navigation

A number of uncharted recreational mooring buoys were observed within the survey area. The steel buoys are white with a horizontal blue stripe, having a diameter of approximately 2.5 feet (Figure 5). There are nine (9) buoys located north of the inlet and 23 buoys located south of the inlet. Table 12 summarizes the location of each recreational buoy as recorded by a detached position employing the vessel's DGPS positioning system. The buoys are included in the S-57 feature file submitted with the survey data deliverables. ***Concur.***

Table 12
Private ATON - Recreational Buoys

OSI Buoy Designation	Latitude (NAD83)	Longitude (NAD83)	OSI Buoy Designation	Latitude (NAD83)	Longitude (NAD83)
1	26-07-28.73 N	080-05-30.89 W	17	26-04-43.50 N	080-05-44.88 W
2	26-07-30.85 N	080-05-30.60 W	18	26-04-40.02 N	080-05-45.83 W
3	26-07-32.42 N	080-05-31.27 W	19	26-04-38.72 N	080-05-46.18 W
4	26-07-33.78 N	080-05-30.04 W	20	26-04-37.78 N	080-05-44.88 W
5	26-07-35.89 N	080-05-30.04 W	21	26-04-34.79 N	080-05-45.03 W
6	26-07-39.80 N	080-05-29.81 W	22	26-04-32.77 N	080-05-44.84 W
7	26-07-41.46 N	080-05-29.17 W	23	26-04-30.89 N	080-05-46.00 W
8	26-07-43.38 N	080-05-29.22 W	24	26-04-28.88 N	080-05-46.39 W
9	26-07-45.12 N	080-05-27.74 W	25	26-04-27.80 N	080-05-46.11 W
10	26-04-56.14 N	080-05-43.76 W	26	26-04-26.01 N	080-05-45.73 W
11	26-04-54.06 N	080-05-44.24 W	27	26-04-24.10 N	080-05-45.34 W
12	26-04-52.66 N	080-05-44.55 W	28	26-04-22.57 N	080-05-45.71 W
13	26-04-51.54 N	080-05-45.28 W	29	26-04-19.03 N	080-05-45.92W
14	26-04-49.35 N	080-05-45.01 W	30	26-04-17.16 N	080-05-46.55 W
15	26-04-47.34 N	080-05-44.99 W	31	26-04-15.14 N	080-05-46.61 W
16	26-04-45.27 N	080-05-44.98 W	32	26-04-13.16 N	080-05-46.79 W

It is recommenced that these buoys not be charted.

Figure 5. Recreational mooring buoy.

D.2.4 Restricted Data

The survey area south of the Port Everglades Channel is bounded by a charted restricted area and may be subject to limited application. Inquiries about data within the restricted area should be directed to the Chief, Hydrographic Surveys Division.

D.2.5 Other Data

D.2.5.1 Bottom Characteristics

Sixteen (16) bottom samples were acquired to determine bottom characteristics. Bottom samples were spaced at about 2000-meter intervals in accordance with the SOW. Additional bottom samples were acquired at approximately 500-meter intervals within the Port Everglades Commercial Anchorage. A table listing the positions and descriptions along with photographs of the bottom samples obtained are included in Appendix V. A position and description of each sample is provided as attributed SBDARE objects in the S-57 feature file. Digital images with identification reference numbers are submitted with the survey data. ***Concur***

D.2.6 S-57 Feature File

D.2.6.1 S-57 Chart Features File

Several uncharted obstructions, wrecks and foul areas were identified and delineated in the SSS data, SWMB data, and BASE surfaces. An S-57 feature file (H11899_S57_Features.000/.hob) was created to emphasize navigationally significant objects discovered during the survey, update charted objects and to provide information for these objects that could not be portrayed in the BASE surfaces. All S-57 features were attributed in accordance with guidance provided in the SOW and HSSD. Table 13 describes the attribute mapping for the S-57 feature file. ***Concur.***

Table 13
S-57 Chart Features Attribute Mapping

S-57 Attribute	Value
VALSOU	Corrected least depth
TECSOU	Technique used to develop VALSOU
INFORM	Remarks
SORDAT	Survey date
SORIND	Survey reference – registry ID

D.2.6.2 S-57 Contact File

All contacts are submitted in an attributed S-57 feature file of $CSYMB objects. Table 14 describes the attribute mapping for the S-57 contact file.

Table 14
S-57 Contact File Attribute Mapping

S-57 Attribute	Value
INFORM	Corrected least depth
SORDAT	Survey Date
SORIND	Survey reference – registry ID
PICREP	Contact image file name
TXTDSC	Unique Critical Sounding ID (Line-beam-ping)
userid*	Unique Contact ID (Line-ping-offset)
remrks*	Acquisition or processing remarks
recomd*	Charting recommendations

*These attributes are available in the CARIS HOB file format.

D.2.6.3 S-57 Critical Sounding File

All critical soundings are submitted in an attributed S-57 feature file of $CSYMB objects. Table 15 describes the attribute mapping for the S-57 critical soundings file.

Table 15
S-57 Critical Sounding File Attribute Mapping

S-57 Attribute	Value
INFORM	Corrected least depth
SORDAT	Survey Date
SORIND	Survey reference – registry ID

userid*	Unique Critical Sounding ID (Line-beam-ping)
remrks*	Acquisition or processing remarks
recomd*	Charting recommendations

*These attributes are available in the CARIS HOB file format.

E. APPROVAL SHEET

LETTER OF APPROVAL

REGISTRY NO. H11896

This report and the accompanying data are respectfully submitted.

Field operations contributing to the accomplishment of survey H11896 were conducted under my direct supervision with frequent personal checks of progress and adequacy. This report and associated data have been closely reviewed and are considered complete and adequate as per the Statement of Work.

George G. Reynolds
Ocean Surveys, Inc.
Chief of Party – H11896
September 15, 2009

Appendix I

Danger to Navigation Report

Report of Dangers to Navigation

Hydrographic Survey Registry Number: H11896
State: Florida
General Locality: Atlantic Ocean
Sub Locality: East of Port Everglades
Project Number: OPR-H328-OS-08
Survey Dates: February 12 – March 12, 2009
Feature depths are corrected to Mean Lower Low Water datum using verified zoned tides.
Horizontal positions are referenced to the North American Datum of 1983 (NAD83).
Charts Affected:

Chart Number	Scale	Edition	ENC
11467	1:40,000	41st, Jun./08	US5FL33M
11470	1:10,000	38th, Aug./08	US5FL32M

Dangers to Navigation

	Feature	Depth Feet	Depth Meters	Latitude	Longitude	Description
1	Shoal	29.9	9.1	26-05-39.43	080-06-16.46	Shoal in Outer Bar Cut Outer Right Quarter
2	Obstruction	36.8	11.2	26-05-34.89	080-06-27.49	Obstruction in Bar Cut Outer Left Quarter

Controlling and Tabulated Depths Chart 11470 (US5FL32M)

Controlling Channel Depths feet(meters)	Left Outside Quarter	Left Inside Quarter	Right Inside Quarter	Right Outside Quarter	Date of Survey
Outer Bar Cut	46.5(14.2)	47.5(14.5)	48.1(14.7)	37.2(11.3)	8-07
Bar Cut	41.9(12.8)	45.2(13.8)	43.9(13.4)	38.7(11.8)	8-07

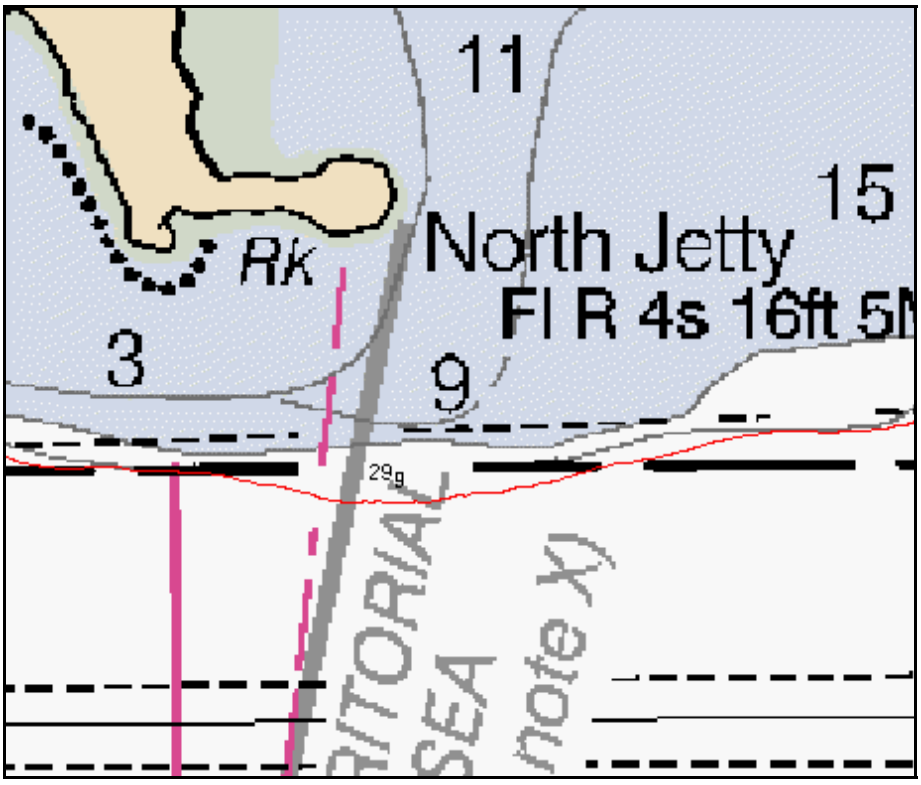


Figure 1. Shoal encroaching on Outer Bar Cut Outer Right Quarter (37.2 foot contour in red)

Feature 1 : A shoal on the norhern side of th e Outer Bar Cut Right Outside Quarter is encroaching on the ch annel in the vicinity of the east end of the north jetty. A shoal sounding of 29.9 feet (9.1 meters) was observed at 80-06-16.46, 26-05-3 9.43 at the northern limit of the Outer Bar Cut, south of the charted North Jetty. The 37.2 foot (11.3 meter) contour extends approximately 20 meters south into the channel on a steep slope.
Concur -- Add 30 ft depth.

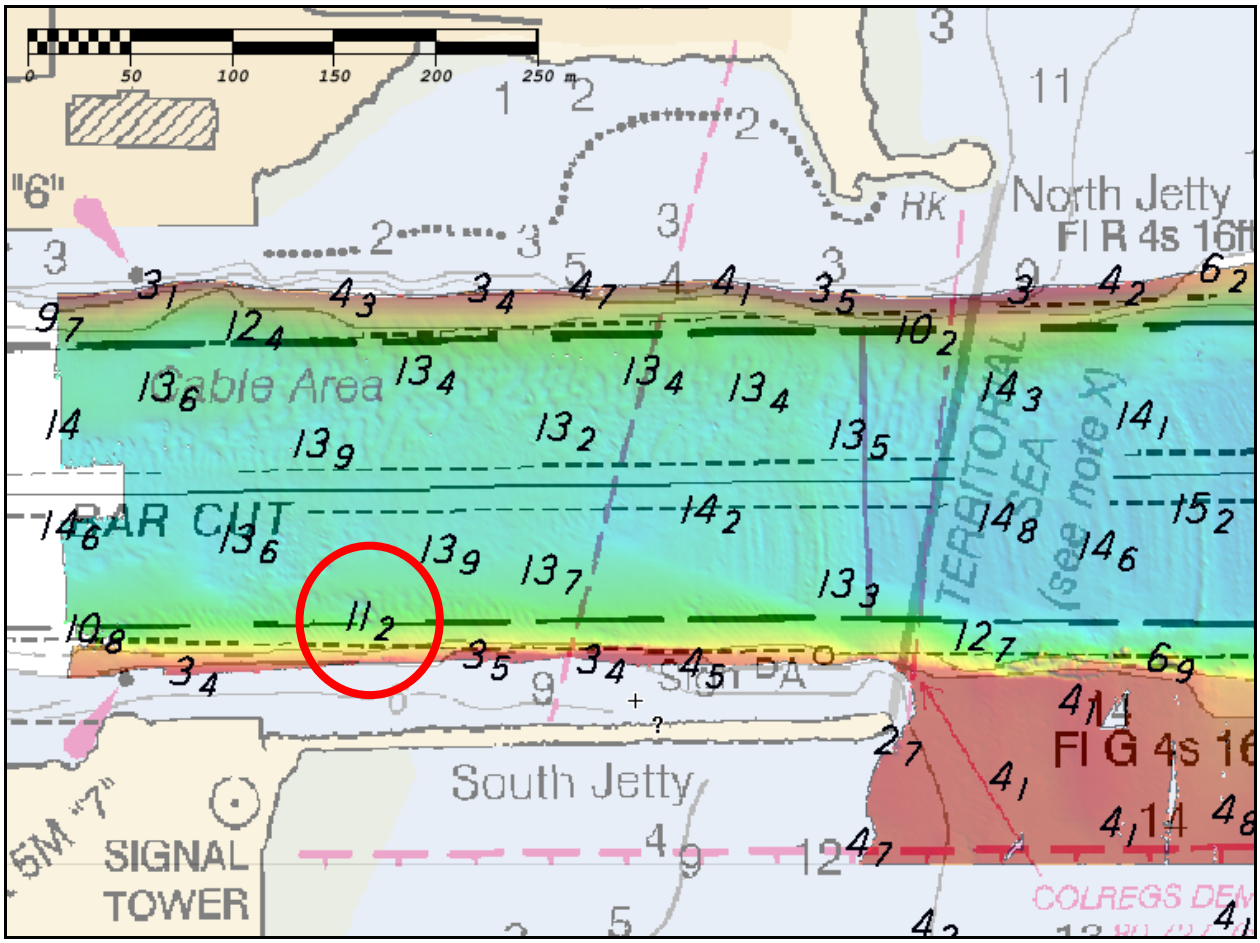


Figure 2. Obstruction with 11.2 meters depth within the Bar Cut Outer Left Quarter.

Feature 2: A rectangular obstruction with a least depth of 36.8 feet (11.2 m eters) was observed within the Bar Cut Left Outer Quarter at 080-06-27.49, 26-05-34.89. The obstruction has the following approximate dimensions of 24x12x6 (LxWxH feet).
See the H-Cell Report for final charting recommendation.

Registry Number: H11896

State: Florida

Locality: Atlantic Ocean

Sub-locality: East of Port Everglades

Project Number: OPR-H328-OS-08-A

Survey Dates: February 13, 2009 - March 12, 2009

Charts Affected

Number	Edition	Date	Scale (RNC)	RNC Correction(s)*
11470	38th	08/01/2008	1:10,000 (11470_1)	USCG LNM: 08/04/2009 (09/29/2009) NGA NTM: 10/23/1999 (10/10/2009)
11467	41st	06/01/2008	1:40,000 (11467_5)	[L]NTM: ?
11466	38th	06/01/2008	1:80,000 (11466_1)	[L]NTM: ?
11469	8th	12/01/2007	1:100,000 (11469_1)	[L]NTM: ?
11460	41st	07/01/2008	1:466,940 (11460_1)	[L]NTM: ?
11451	33rd	09/01/2007	1:495,362 (11451_17) 1:495,362 (11451_16)	[L]NTM: ?
11013	47th	02/01/2008	1:1,200,000 (11013_1)	[L]NTM: ?
411	52nd	09/01/2007	1:2,160,000 (411_1)	[L]NTM: ?

* Correction(s) - *source: last correction applied (last correction reviewed--"cleared date")*

Features

No.	Feature Type	Survey Depth	Survey Latitude	Survey Longitude	AWOIS Item
1.1	Shoal	5.59 m	26° 03' 08.9" N	080° 05' 56.9" W	---

1 - Danger To Navigation

1.1) Profile/Beam - 62374/1 from h11896_port_everglades / able_ii_8101_pps / 2009-051 / 2009ab0511805_34

DANGER TO NAVIGATION

Survey Summary

Survey Position:	26° 03' 08.9" N, 080° 05' 56.9" W
Least Depth:	5.59 m (= 18.33 ft = 3.056 fm = 3 fm 0.33 ft)
TPU (±1.96σ):	**THU (TPEh)** ±1.965 m ; **TVU (TPEv)** ±0.135 m
Timestamp:	2009-051.18:51:48.268 (02/20/2009)
Survey Line:	h11896_port_everglades / able_ii_8101_pps / 2009-051 / 2009ab0511805_34
Profile/Beam:	62374/1
Charts Affected:	11470_1, 11467_5, 11466_1, 11469_1, 11460_1, 11451_16, 11451_17, 11013_1, 411_1

Remarks:

Coral invading charted Obstn Fish Haven (auth min 20 ft). Least depth corrected with verified tides is 18.33 ft.

Hydrographer Recommendations

Chart 18 ft sounding as an obstruction at the surveyed position.

Cartographically-Rounded Depth (Affected Charts):

18ft (11470_1, 11467_5, 11466_1, 11451_16, 11451_17)

3fm (11460_1, 11013_1, 411_1)

3fm 0ft (11469_1)

S-57 Data

Geo object 1:	Sounding (SOUNDG)
Attributes:	EXPSOU - 2:shoaler than range of depth of the surrounding depth area
	QUASOU - 6:least depth known
	SORDAT - 20090312
	SORIND - US,US,nsurf,H11896
	STATUS - 1:permanent
	TECSOU - 3:found by multi-beam

Office Notes

Concur with clarification - The coral fall within a charted Obstn Fish Haven (auth min 20 ft). Do not chart 18 Obstn. Chart 18 ft depth in present survey location.

Feature Images

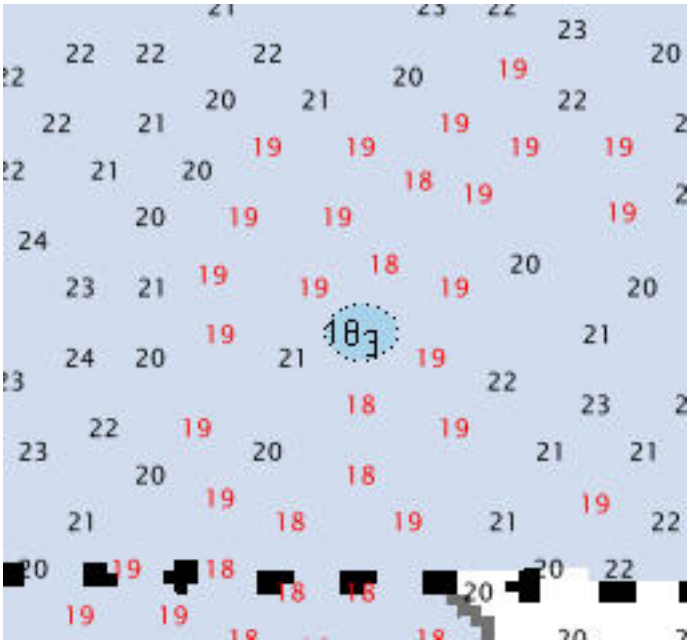


Figure 1.1.1

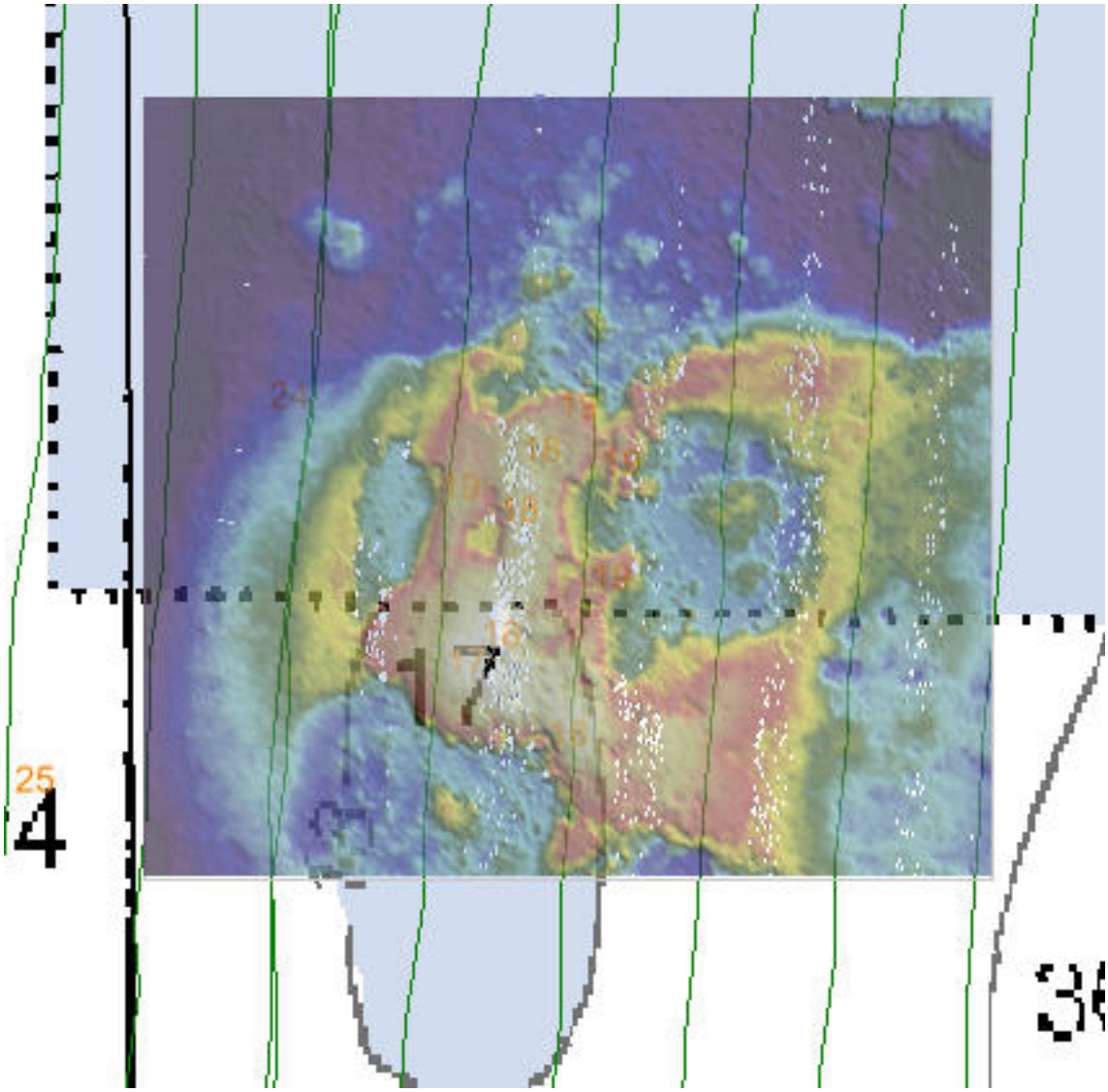


Figure 1.1.2

Appendix II

Survey Feature Report

Survey Feature Report

Several uncharted obstructions, wrecks and foul ground areas were identified and delineated in the SSS data, SW MB data, and BASE surfa ces. An S-57 feature file (H11896_S57_Features.000) was created to empha size navigationally si gnificant objects discovered during the survey and to provide infor mation for thes e objects that could not be portrayed in the BASE surfaces. All S-57 feat ures were attributed in accordan ce with guidance provided in the SOW and HSSD.

All S-57 features were attribu ted in accord ance with gu idance prov ided in the S OW and HSSD using the following conventions:

- INFORM was used for survey des criptive in formation to aid in ch art applica tion. SBDARE bottom sam ple objec t I NFORM attribu tes con tain th e original f ield descriptions of the sediment samples.
- SORDAT was attributed with the final date of the survey.
- SORIND was attributed with the country codes and survey registry (e.g. US, US, survey, H11896).

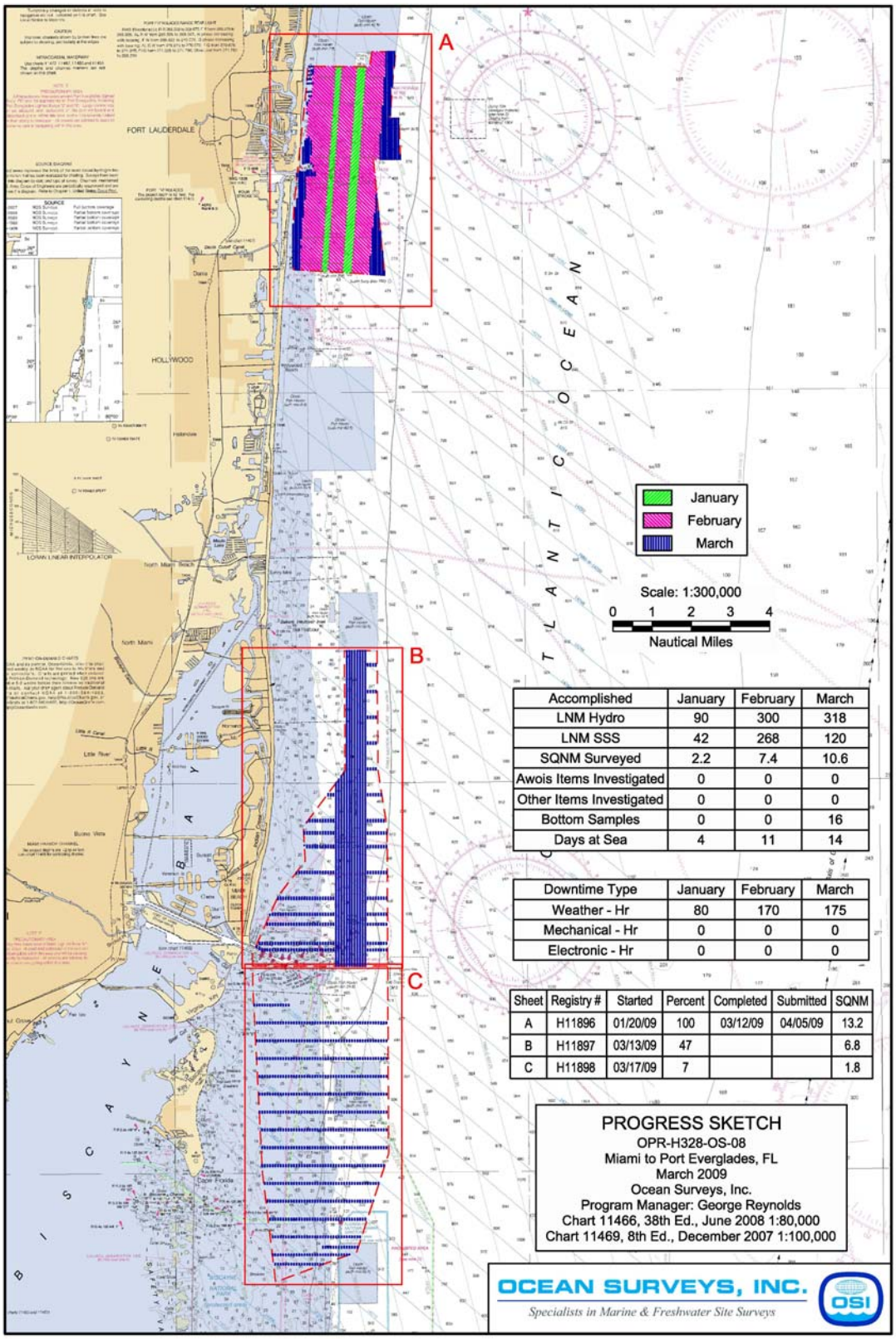
No AWOIS item investigations were assigned for this survey. AWOIS items were located within the survey area. Items discussed in H-Cell Report.

Appendix III

Final Progress Sketch

And

Survey Outline



Accomplished	January	February	March
LNM Hydro	90	300	318
LNM SSS	42	268	120
SQNM Surveyed	2.2	7.4	10.6
Awois Items Investigated	0	0	0
Other Items Investigated	0	0	0
Bottom Samples	0	0	16
Days at Sea	4	11	14

Downtime Type	January	February	March
Weather - Hr	80	170	175
Mechanical - Hr	0	0	0
Electronic - Hr	0	0	0

Sheet	Registry #	Started	Percent	Completed	Submitted	SQNM
A	H11896	01/20/09	100	03/12/09	04/05/09	13.2
B	H11897	03/13/09	47			6.8
C	H11898	03/17/09	7			1.8

Figure 1. March 2009 Progress Sketch Inclusive of Survey H11896.

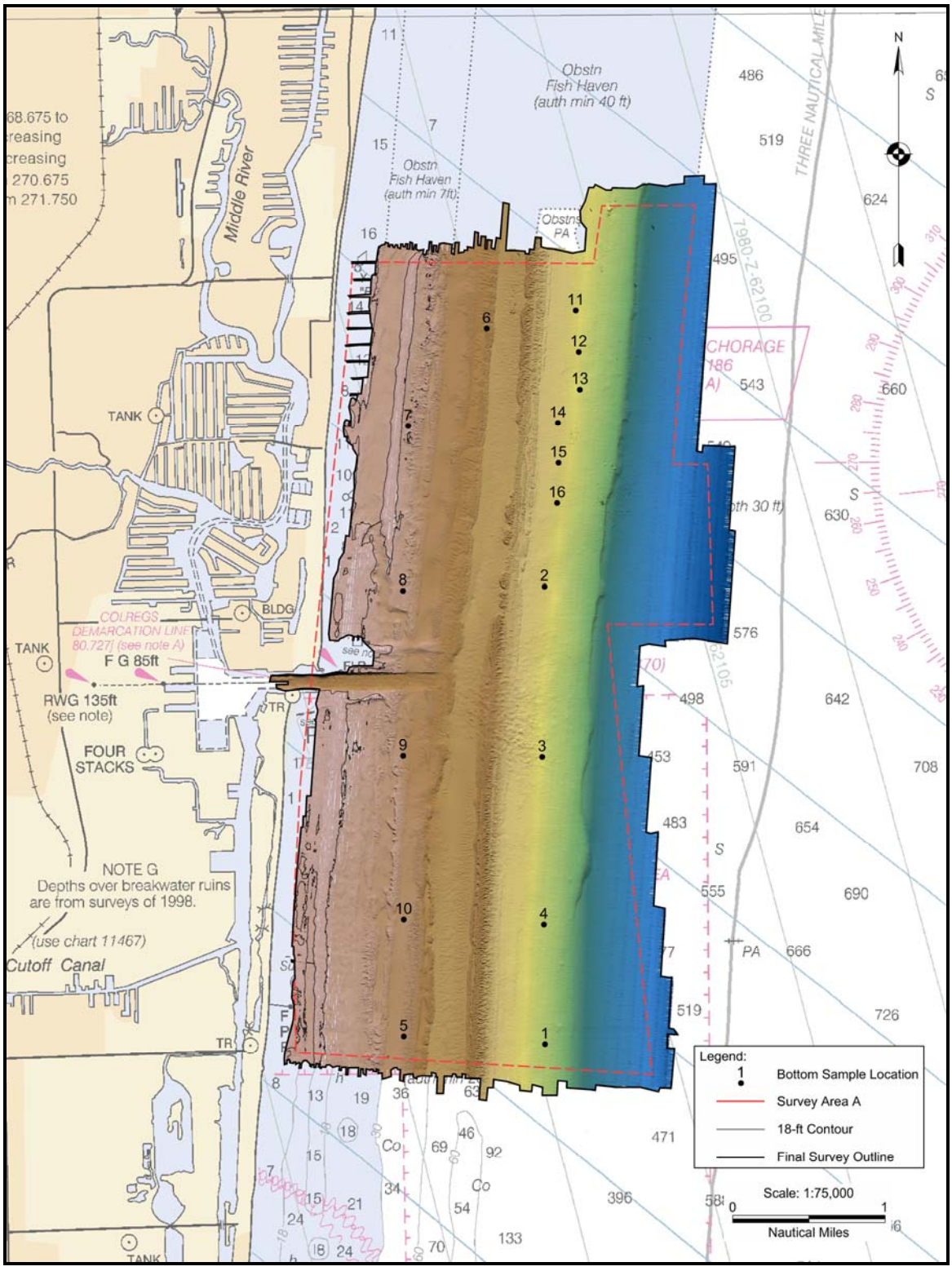


Figure 2. Final Survey Outline.

Appendix IV

Tides and Water Levels

Abstract of Times of Hydrography

The following table, "Abstract of Times of Hydrography," summarizes the days in which data were collected that contribute to the final accepted data set.

Date/Julian Day	Start (UTC)	End (UTC)
Feb 13, 2009 (44)	16:38	23:27
Feb 14, 2009 (45)	14:03	23:24
Feb 15, 2009 (46)	15:10	23:20
Feb 16, 2009 (47)	13:06	21:31
Feb 19, 2009 (50)	12:49	23:43
Feb 20, 2009 (51)	13:40	20:38
Feb 21, 2009 (52)	12:40	14:22
Feb 22, 2009 (53)	16:14	23:06
Feb 23, 2009 (54)	12:35	20:52
Feb 27, 2009 (58)	13:10	20:13
Feb 28, 2009 (59)	12:59	22:16
March 1, 2009 (60)	13:20	22:35
March 2, 2009 (61)	13:06	20:35
March 3, 2009 (62)	13:44	18:33
March 9, 2009 (68)	13:55	0:06
March 10, 2009 (69)	13:06	20:30
March 11, 2009 (70)	12:28	17:53
March 12, 2009 (71)	13:21	14:04

The COTR was notified via e-mail and telephone communications that the OSI field team was ready to commence survey operations. The COTR subsequently instructed CO-OPS to begin providing OSI with verified tides.

Appendix V

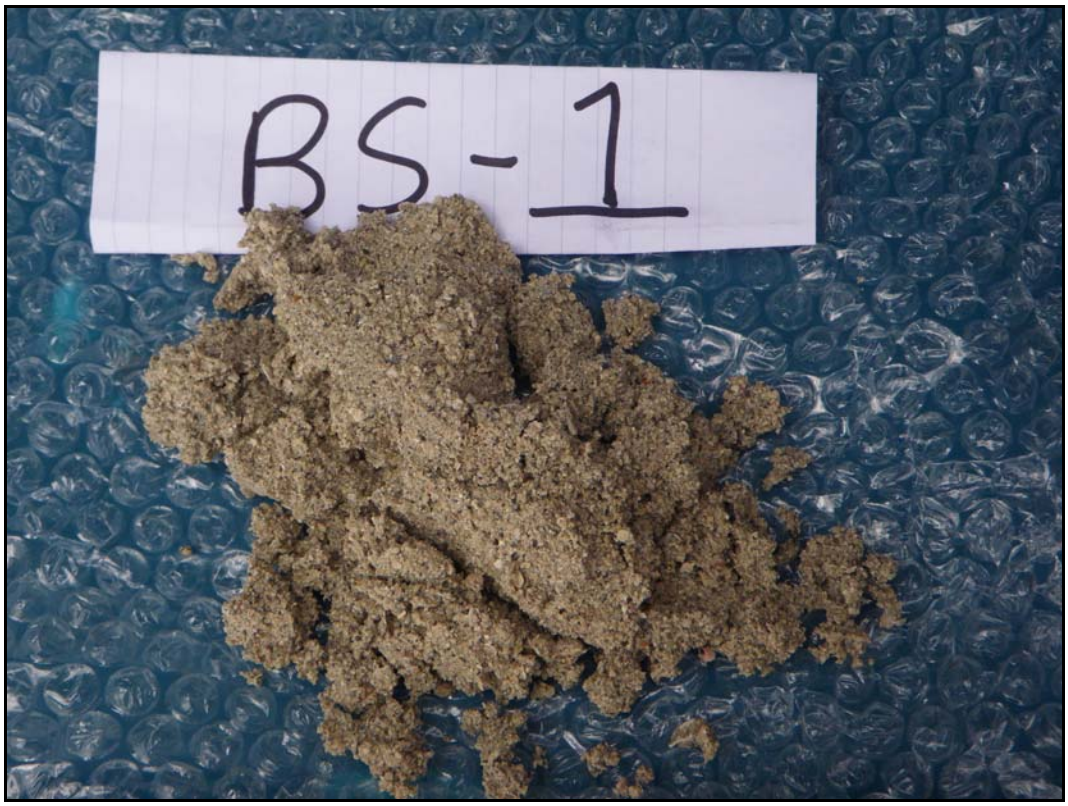
Supplemental Survey Records and Correspondence

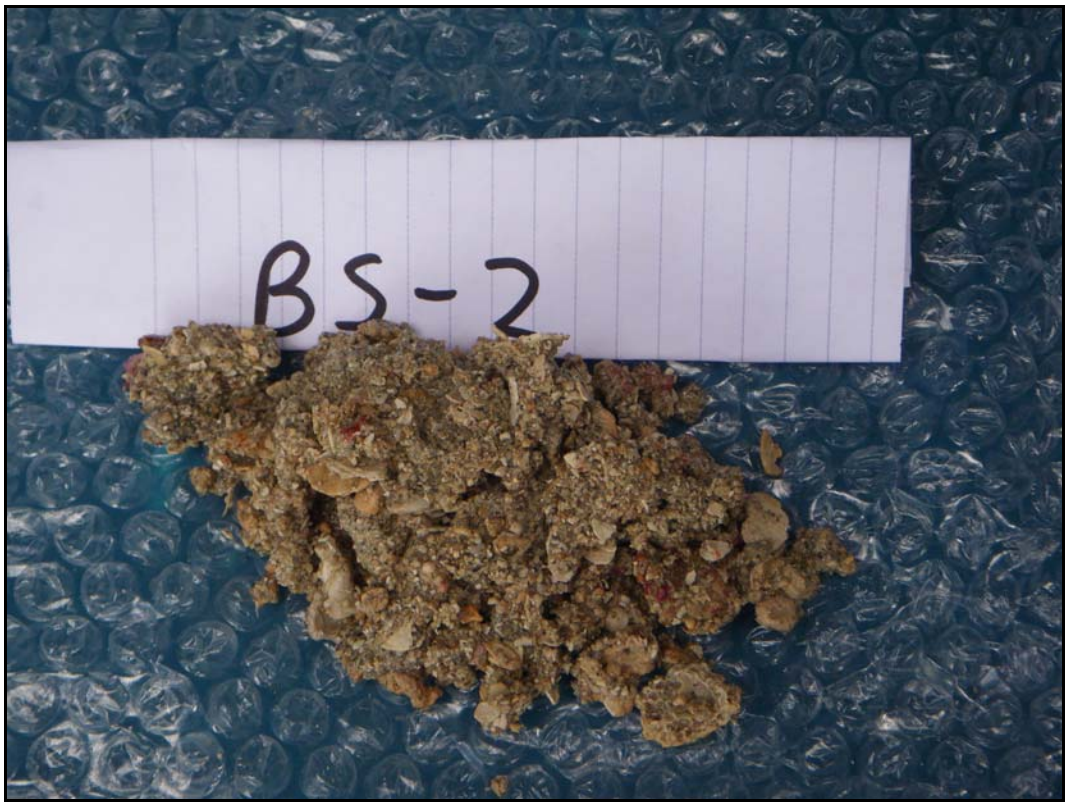
Bottom Samples

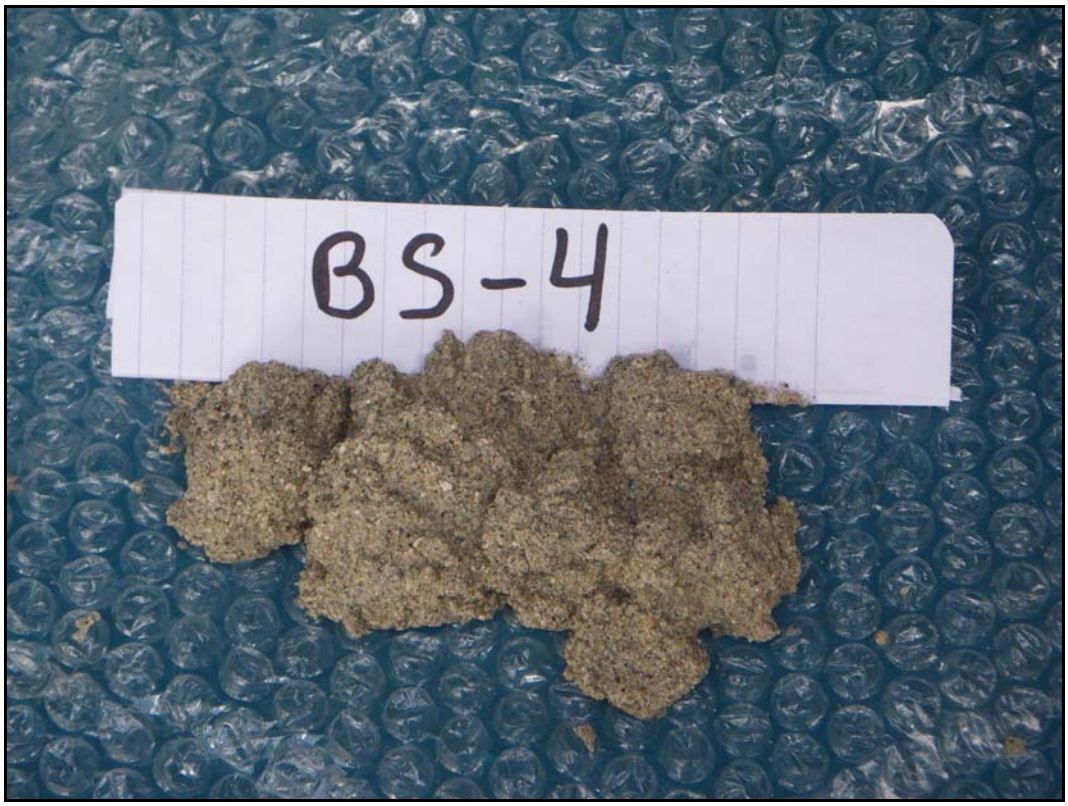
Bottom samples were obtained at required grid node locations (i.e. 2000 meters across site and 1200 meters in anchorages) in water depth less than 100 meters per an e-mail modification to the SOW on October 28, 2008. The field team elected to collect a number of supplemental samples. The table below summarizes the sediment grabs collected during Survey H11896. Sediment grab locations are depicted in the final survey outline (Appendix III of the Descriptive Report).

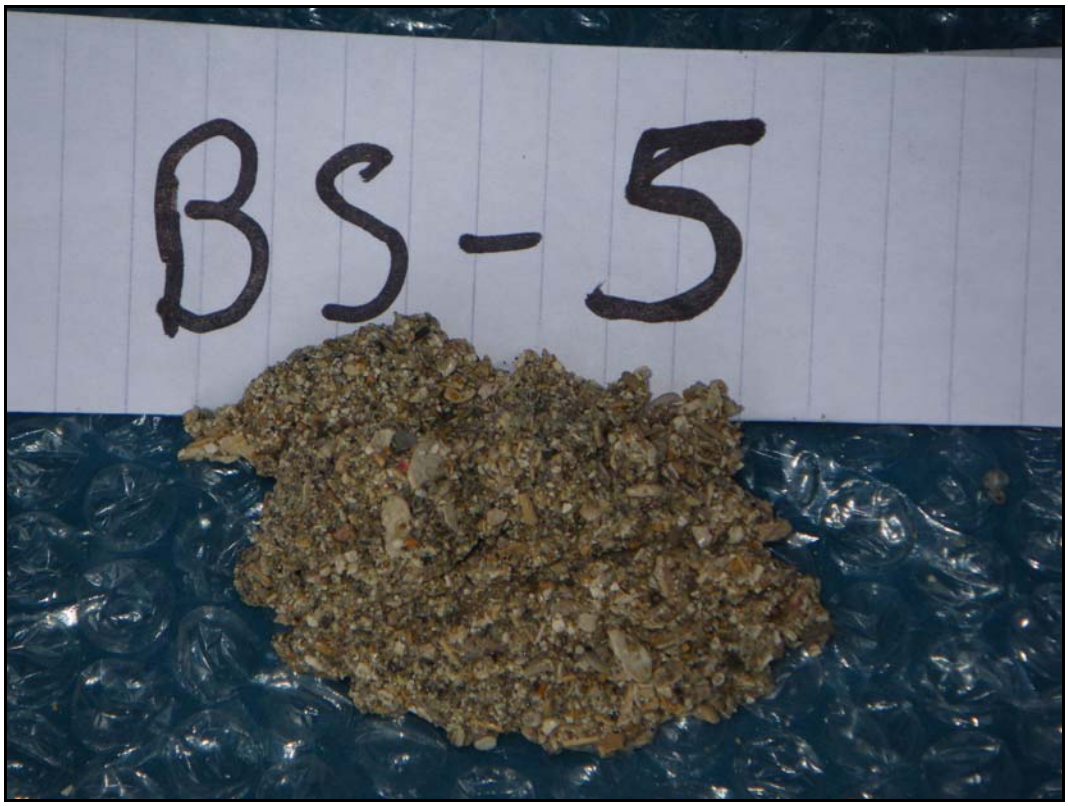
A photo of each sample follows the tabulation. After several attempts, no samples were recovered at the location of bottom sample designation BS-3. The location is presumed to be coral. A suitable description is "hard." At hard bottom or coral locations, multiple attempts were made.

OSI Bottom Sample Designation	Latitude (NAD83)	Longitude (NAD83)	Depth (meters)	Description
BS-1	26.0536514	80.07783911	57.3	Fine sand, light grey
BS-2	26.1039581	80.07750328	39.0	Medium sand with shells, light grey
BS-3	26.0846174	80.07772144	48.9	Hard bottom, no recovery
BS-4	26.0668290	80.07786222	54.5	Fine sand, light grey
BS-5	26.0546256	80.09499128	11.1	Fine sand with shells, grey
BS-6	26.1323387	80.08432072	15.5	Fine sand, grey
BS-7	26.1217548	80.09398533	7.9	Hard bottom, recovered only plants
BS-8	26.1035528	80.09473522	7.8	Coral
BS-9	26.0854438	80.09483728	10.1	Fine sand, grey
BS-10	26.0674868	80.09490225	11.1	Fine sand with shells, grey
BS-11	26.1342971	80.07347997	41.9	Fine sand with shells, grey, some red coral
BS-12	26.1296385	80.07305514	46.2	Fine/medium sand, light grey, shells, some red coral
BS-13	26.1255660	80.07304564	48.4	Fine/medium sand, light grey, some red coral
BS-14	26.1219029	80.07573853	35.9	Fine/medium sand, light grey, shells, some red coral
BS-15	26.1175068	80.07570739	37.9	Medium sand, shells, light grey, some red coral
BS-16	26.1131268	80.07590614	40.8	Fine/medium sand, light grey, shells, some red coral


BS-1


BS-2


BS-4


BS-5


BS-6

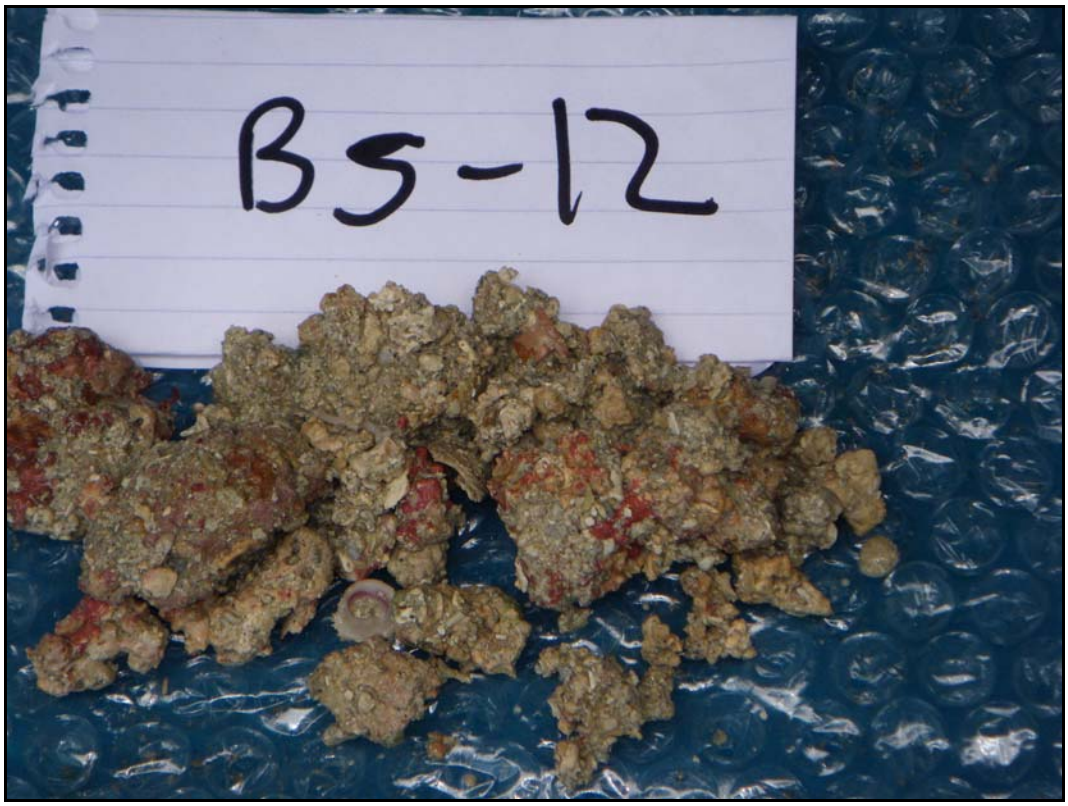

BS-7


BS-8


BS-9


BS-10


BS-11


BS-12


BS-13


BS-14


BS-15


BS-16

Survey H11896 Correspondence

The following pages contain e-mail correspondence between OSI and the COTR.

****
From: Mark.T.Lathrop [Mark.T.Lathrop@noaa.gov]
Sent: Tuesday, October 28, 2008 1:40 PM
To: George Reynolds
Subject: Re: OSI Task Order # 1

George,

I confirm that these exceptions and clarifications will apply for the Statement of Work for OPR-H324-OS-08 and OPR-H328-OS-08.

Mark

George Reynolds wrote:
Mark,

Per our discussion we understand the Statement of Work for OPR – H 324 – OS -08 and OPR – H328 – OS -08 dated May 7, 2008 is modified to reflect the following exceptions and clarifications as discussed in our proposal.

Please confirm your acceptance of these exceptions and clarifications.

Please give me a call if you have any questions or need additional information.

Thanks,
George

SOW Reference 2.4.1.2 (IT Security requirements – attachment 14) are not applicable given that OSI computers will not be interfaced to the NOAA network and that OSI personnel will not be using NOAA computers or systems during the course of this project.

SOW Reference 3.1 – Attachment 6
*Side scan sonar data will be acquired in shallow water areas starting at the 18-ft contour and continuing out to about 65 to 100 ft of water within the areas depicted on OSI's Proposal Figures 3-6.

*Multibeam data will be collected on set line spacing in shallow areas where 200% side scan coverage is obtained. In deeper waters where side scan coverage is not developed, full bottom multibeam coverage will be achieved. Multibeam data will also be acquired along a set of cross lines equal to at least 5 percent of the lineal nautical miles of all the main scheme sounding lines.

*Additional shallow water multibeam coverage will be obtained to achieve full bottom coverage within Fish Haven or Dump Site areas containing

multiple contacts. This methodology will be employed in cases where it is more efficient to obtain full bottom coverage than to determine least depths over multiple individual contacts.

*Additional shallow water (66 feet or less) multibeam coverage will be obtained, such that all significant SSS contacts have a least depth that meets the accuracy requirements. It is our understanding that significant contacts in water depths of 66 feet or greater do not require further development.

*With the exception of AWOIS items, it is assumed that individual target identification in Fish Haven areas will not be necessary.

SOW Reference 5.1 – Attachment 6
Bottom samples will be collected within each survey area on a nominal 2000-meter grid in water up to 100 feet deep. Samples within charted anchorage areas will be obtained on a 1200-meter grid. The sample locations are depicted on OSI's Proposal Figures 3-6.

SOW Reference - Attachment 9
There are a total of 9 Automated Wreck and Obstruction Information System (AWOIS) items assigned for investigation under this Task Order.

George Reynolds
Ocean Surveys, Inc.
91 Sheffield St.
Old Saybrook, CT 06475
Phone 860 388 4631
Fax 860 388 5879
http://www.oceansurveys.com

****

From: Mark.T.Lathrop [Mark.T.Lathrop@noaa.gov]
Sent: Friday, December 19, 2008 6:24 PM
To: George Reynolds
Cc: kathleen jamison; 'Russell S. Watson'
Subject: Re: FW: NOAA Survey - Ft. Lauderdale coast

George,

We don't have a problem with these requests, except for Item 3. We don't normally allow third parties access to our raw data files. After the survey is processed by the branch, any metadata can be be made

available to them for further analysis. You may have them give me a call for further discussion.

Mark

George Reynolds wrote:
> Hi Mark,
>
> In preparation for the Ft Lauderdale survey we contacted the Site
> Director for the Navy South Florida Ocean Measurement Facility. As you know the Facility operates within a restricted area encompassed by the limits of the Ft Lauderdale survey area.
>
> We have obtained permission from the Navy to survey within the
> restricted area based on adhering to the requests detailed in
> following email. OSI has no problem complying with any of these requests however; we would need your approval before committing to Items 2, 3 and 5.
>
> Please look this information over and let me know how you would like
> us to respond.
>
> Regards
> George
>
> -----Original Message-----
> From: Garbini, Douglas J CIV NSWCCD Ft. Lauderdale, 7540
> [mailto:douglas.garbini@navy.mil]
> Sent: Wednesday, December 17, 2008 2:31 PM
> To: Russell S. Watson
> Cc: George G Reynolds; Venezia, William A CIV NSWCCD Ft Lauderdale,
> 7540; Rodgers, Max D CIV NSWCCD DANIA BEACH, 7540; Chapman, Frank D
> CIV NSWCCD
Ft
> Lauderdale, 7540
> Subject: RE: NOAA Survey - Ft. Lauderdale coast
>
> Russ,
>
> Thanks for your time this morning in the survey telecom meeting. The
> following items address my action items.
>
> 1) Your office is authorized to set up and maintain for the duration
> of your survey effort, the tracking antenna. If required, my site will provide the unit with 120v electrical power. Please coordinate with me as to the desired location of this equipment before installation. It is understood that the US Navy and my facility assumes no responsibilities for the care and operation of this equipment.
>
> 2) We shall continue to identify to you and NOAA, all undersea and
> bottom mounted systems of value and/or concern to the U.S. Navy.
> Identification is provide to you such that protection and avoidance of Navy systems from damage by your side scan sonar system is maintained at all costs.
>

> 3) As a courtesy to our site, I would respectfully request access to
> both the raw and processed survey data. I understand this request
> needs to be forwarded and approved by NOAA and anxiously await that
approval.
> Please note, any provided data shall be utilized solely by my site as
> we seek to further characterize and understand the bottom areas where
> we conduct our operations.
>
> 4) To provide a redundant tracking system in the protection of our
> assets, I would like to request the installation of an AIS transmitter
on your vessel. This system allows us to track and identify your vessel
while it is on the range. Once approval is obtained, my site electronics
technician will install and ensure the operation of the system on your
vessel. This installation shall be conducted under the direction and
assistance of your ship's crew. Once the operation is
> completed, the AIS system shall be removed by our technician.
>
> 5) Lastly, I would like to request a NOAA point of contact for this
> project. I would like to talk directly with the government's technical
official responsible for this effort to ensure the Navy's assets are
addressed accordingly in this effort as well as the follow on chart
updates.
>
> Thank you for addressing these concerns and I look forward to
> continuing cooperative efforts.
>
> VR,
>
> Douglas J. Garbini
> Site Director,
> South Florida Ocean Measurement Facility.
****

****
From: Mark.T.Lathrop [Mark.T.Lathrop@noaa.gov]
Sent: Tuesday, December 02, 2008 6:57 PM
To: George Reynolds
Cc: 'Kathleen Jamison'
Subject: Re: A few items

George,

I have the Lidar CD now. Do you have an address that I can send it to?

Mark

George Reynolds wrote:
Thanks Mark…

From: Mark.T.Lathrop [mailto:Mark.T.Lathrop@noaa.gov]
Sent: Tuesday, December 02, 2008 11:23 AM
To: George Reynolds

Cc: Kathleen Jamison
Subject: Re: A few items

George,

- I was positive I had sent you the tide files. If not I apologize. They are attached.
- The inshore limit is the 18-foot curve. If you have a detached shoal make every effort to survey it. We can discuss specific examples as they arise. We'll have Lidar for Miami only. I'll get back to you on the delivery date and make sure you get it soon.
- Stick to the 2007 Specs as per the SOW.

Give me a call if you have further questions.

Mark

George Reynolds wrote:
Mark,

Just a few loose ends…

- We have not received a copy of the tidal zoning information for our Florida projects. When you have a chance please forward the files.
- Attached are copies of our proposed line plans that were included in our technical proposal. The charts indicate that there are shoal areas bounded by the 18-foot contour within the survey areas. As such, we have not planned to survey these areas. Just to confirm, the LIDAR data will cover these areas and we are not responsible for developing SSS or multibeam data within these or similar locations.

- Do you have an ETA for the delivery of the LIDAR data?
- If NOAA prefers to have products delivered under the most modern criteria, we can conduct these surveys and develop products in accordance with the 2008 Specs and Deliverables. Just let me know if we should continue with the 2007 Specs or switch to the 2008 version.

Thanks
George

George Reynolds
Ocean Surveys, Inc.
91 Sheffield St.
Old Saybrook, CT 06475
Phone 860 388 4631
Fax 860 388 5879
http://www.oceansurveys.com
****

****
From: Craig Martin [Craig.Martin@noaa.gov]
Sent: Wednesday, January 21, 2009 6:15 PM
To: Mark.T.Lathrop@noaa.gov
Cc: ggr@oceansurveys.com; Crescent Moegling
Subject: Re: Virginia Key tide gauge problem

Mark,

The data has been cleaned & QC'ed and is ready for the contractor to download
through the 18th of January. We are going to be fixing the Virginia Key gauge
at the end of the month / beginning of February which will remove these low
water abnormalities. Until this time we will be processing each
monday/tuesday for the week previous - so you should see this week's data
cleaned and fixed at the beginning of next week. As a side note, it looks
like weather fronts / meteorological patterns have caused the water level to
divert from predictions; the contractor should not be alarmed by this.

Thanks,
Craig

Mark.T.Lathrop@noaa.gov wrote:
> George,
>
> Continue with the survey.
>
> Craig, can you give a quick answer to the Virginia Key gage issue? I'll talk to you on Wednesday as well.
>
> Mark
>
> ----- Original Message -----
> From: ggr@oceansurveys.com
> Date: Saturday, January 17, 2009 4:22 pm
> Subject: Re: Virginia Key tide gauge problem
> To: Mark.T.Lathrop@noaa.gov, ggr@oceansurveys.com
>
>
>
>> Thanks Mark
>>
>> On further review of the last couple of days of data the system may
>> have a more serious issue. The separation between verified and
>> predicted values appears to increasing.
>>
>> We visited the gauge today to look for an obvious problem. There
>> was no apparent physical damage.
>>
>> The question is, should we suspend survey operations until gauge
>> issue is resolved or carry on with the survey and assume CO OPS can
>> generate verified tides? Since the main focus of the project is SSS,

>> if verified tides can not be generated will NOAA accept predicted tide
>> corrected multibeam data, (could be considered reconnaissance data)?
>> If so, this scenario will allow survey ops to continue.
>>
>> Please give me call to discuss if you need more information. 860 395
>> 9521
>>
>> Thanks
>> George
>> ------Original Message------
>> From: Mark.T.Lathrop@noaa.gov
>> Sender:
>> To: George Reynolds
>> Subject: Re: Virginia Key tide gauge problem
>> Sent: Jan 17, 2009 3:31 PM
>>
>> Hi George,
>>
>> I'll pass the information to CO-OPS, but it won't be until Jan. 21
>> due to MLK Day and the Inauguration.
>>
>> Mark
>>
>> ----- Original Message -----
>> From: George Reynolds <ggr@oceansurveys.com>
>> Date: Saturday, January 17, 2009 7:52 am
>> Subject: Virginia Key tide gauge problem
>> To: "'Mark.T.Lathrop'" <Mark.T.Lathrop@noaa.gov>
>>
>>
>> > Hi Mark,
>> >
>> > It appears that the Virginia Key tide gauge has a problem
>> recording tide
>> > values when water levels are a few tenths of a foot below MLLW.
>>
>> >
>> > The hydro hotlist link to the gauge monitoring site is:
>> >
>> >
>> > ,+FL&type=Tide+Data
>> >
>> >
>> > Please pass this info onto CO-OPS.
>> >
>> > Thanks
>> > George
>>
>> Sent from my Verizon Wireless BlackBerry
>>
****

****

From: Gerald.Hovis@noaa.gov
Sent: Friday, March 06, 2009 2:45 PM
To: Mark.T.Lathrop <Mark.T.Lathrop@noaa.gov>
Cc: NOS.COOPS.HPT@noaa.gov; Larry Neeson; Richard Bourgerie
Subject: Virginia Key

Mark,

As I mentioned the other day. Our Virginia Key station has been relocated due
to flat low waters. The data stream has been temporarily switched from A1 DCP1 to A1 DCP3. Once the work is final it will be switched back to A1 DCP1. NO data has been lost, and any seemingly missing will be backfilled. Let me know if you or the contractors have questions.

Jerry
****

****
From: George Reynolds [ggr@oceansurveys.com]
Sent: Friday, March 06, 2009 4:17 PM
To: 'Mark.T.Lathrop'
Subject: RE: [Fwd: Virginia Key]

Mark,

As a follow up on the gauge status, FYI the preliminary Virginia Key data posted for yesterday is offset about +10 feet or so.

Regards
George

-----Original Message-----
From: Mark.T.Lathrop [mailto:Mark.T.Lathrop@noaa.gov]
Sent: Friday, March 06, 2009 9:58 AM
To: George Reynolds
Subject: [Fwd: Virginia Key]

George,

The Virginia Key Tide Station has been relocated and the data stream has been switched. CO-OPS says that no data has been lost. Let me know if you have any issues with this.

Thanks,

Mark
****

****
From: "Mark.T.Lathrop"
Date: Wed, 18 Mar 2009 11:42:17 -0400
To: George Reynolds<ggr@oceansurveys.com>
Subject: Re: FW: Final tide zoning Ft. Lauderdale?
George,

The zoning you have is correct. Preliminary, in this case, refers to preliminary tides (as opposed to final smooth tides), not preliminary zoning.

Mark

George Reynolds wrote:
Mark,

We are finalizing our Ft Lauderdale MB data products and have a question regarding tidal zoning. As you know, the SOW included a Preliminary zoning scheme. Could you check with Co-Ops to see if there will be any changes to the Preliminary scheme and if so when will the final scheme be available?

Thanks
George

**********From: Gerald Hovis [mailto:Gerald.Hovis@noaa.gov]
Sent: Thursday, March 19, 2009 6:58 AM
To: George Reynolds
Cc: Mark T Lathrop; _NOS.CO-OPS.HTP; Kate Bosley
Subject: Re: [Fwd: 8723214 Virginia Key, FL Update - New C2]

George,

Thanks. I was informed yesterday that our engineering group will be evaluating the switch from DCP1 (old site) to DCP3 (Temp site) back to DCP1 (New location) later today. I will update you when I know more.

regards
Jerry

Reynolds wrote:
Jerry,

We will be using data from this gauge on a daily basis for the next 2 to 3 months.

George

From: Gerald Hovis [mailto:Gerald.Hovis@noaa.gov]
Sent: Wednesday, March 18, 2009 2:32 PM
To: George Reynolds
Cc: Mark T Lathrop; _NOS.CO-OPS.HTP
Subject: Re: [Fwd: 8723214 Virginia Key, FL Update - New C2]

George,

What is your survey status utilizing Virginia Key at present. Our operations team will be discussing this gauge tomorrow. We have switched back to DCP 1 but the data is still looking strange.

Jerry

Gerald Hovis wrote:
George,

An update on Virginia key. No action is required on your part. Just an update.

Jerry

Subject:
8723214 Virginia Key, FL Update - New C2
From:
Thomas Landon <Thomas.Landon@noaa.gov>
Date:
Wed, 11 Mar 2009 10:36:26 -0400
To: NOS CO-OPS Hydro <nos.coops.hydro@noaa.gov>

To: NOS CO-OPS Hydro <nos.coops.hydro@noaa.gov>

OET has received the latest set of levels confirming the sensor stability of the temporary gage. Levels indicated a sensor elevation of 6.754m vs the accepted C2 of 6.755m.

The elevated platform station has been reinstalled with a new C2 of 7.220m. The arbitrary C2 of 10.000m has been being used since the start of data collection on 3/4. The met data
began on 3/8.

Please apply a corrector of -2.780m to data from 3/4 to 3/11 1257 (since start of the A1 data on an offset of 10.000m).

Continue to use DCP3 data for TOL until notified.

Thanks...Tom

--
Jerry Hovis
Tidal Datums & Hydrographic Planning Team
Center for Operational Oceanographic Products & Services

Products and Services Division
National Ocean Service
National Oceanographic Atmospheric Administration
http://www.tidesandcurrents.noaa.gov/

gerald.hovis@noaa.gov
SSMC4, Sta. 7200
1305 East-West Highway
Silver Spring, MD 20910 USA
Work: (301) 713-2890 x109
cell: (240)-997-2651
Fax: (301) 713-4437

****

****
Date: Tue, 17 Mar 2009 11:21:07
To: <Mark.T.Lathrop@noaa.gov>
Cc: George Reynolds<ggr@oceansurveys.com>; Russell S. Watson<rsw@oceansurveys.com>; Corregan, Kameron S CIV NSWCCD Ft Lauderdale, 7540<kameron.corregan@navy.mil>; Chapman, Frank D CIV NSWCCD Ft Lauderdale, 7540<frank.d.chapman@navy.mil>
Subject: RE: FW: NOAA Survey - Ft. Lauderdale coast

Mark,
Great talking with you again. As we discussed, I'm going to ask my GIS expert, Kam Corregan to contact George to discuss the transfer of the data when it's ready. Thanks greatly for the courtesy of sharing the data with us. Before you go to print on the updated chart I would like to have a discussion with the appropriate group there at NOAA to discuss how our underwater are to be shown.

Thanks again for the courtesy. It was a pleasure working with you and your contractors.

VR,
Douglas Garbini
Site Director
South Florida Ocean Measurement Facility

From: Mark.T.Lathrop@noaa.gov
Sent: Friday, March 13, 2009 10:58 PM
To: douglas.garbini@navy.mil
Cc: George Reynolds; 'Russell S. Watson'
Subject: Re: FW: NOAA Survey - Ft. Lauderdale coast

Doug,

Give me a call on Monday and we can discuss this.

Mark

----- Original Message -----
From: George Reynolds <ggr@oceansurveys.com>
Date: Friday, March 13, 2009 4:34 pm
Subject: FW: NOAA Survey - Ft. Lauderdale coast
To: "'Mark.T.Lathrop'" <Mark.T.Lathrop@noaa.gov>
Cc: douglas.garbini@navy.mil, "'Russell S. Watson'" <rsw@oceansurveys.com>

> Mark,
>
> Please see Doug's email below. Per our conversation in early January we understand that NOAA will handle this request directly.
>
> Please let me know if we can assist in anyway.
>
> Regards
> George
>
> George Reynolds
> Ocean Surveys, Inc.
> 91 Sheffield St.
> Old Saybrook, CT 06475
> Phone 860 388 4631
> Fax 860 388 5879
>
>
> -----Original Message-----
> From: Garbini, Douglas J CIV NSWCCD Ft. Lauderdale, 7540 [
> Sent: Thursday, March 12, 2009 1:26 PM
> To: Russell S. Watson
> Subject: RE: NOAA Survey - Ft. Lauderdale coast
>
> Russ,
> I heard you guys are done. Did everything go well? I did talk with
> Mark regarding the data and wanted to know how we can go about it?
> D
>
> -----Original Message-----
> From: Russell S. Watson [
> Sent: Thursday, January 08, 2009 20:08
> To: Garbini, Douglas J CIV NSWCCD Ft. Lauderdale, 7540
> Subject: RE: NOAA Survey - Ft. Lauderdale coast
>
> Doug,
> My understanding is that Mark is available to discuss these matters anytime. I'm not sure what happened with the e-mails but he is awaiting your call.
> Regards,
> Russ
>
> -----Original Message-----
> From: Garbini, Douglas J CIV NSWCCD Ft. Lauderdale, 7540 [

> Sent: Tuesday, December 23, 2008 9:53 AM
> To: mark.t.lathrop@noaa.gov
> Cc: Russell S. Watson
> Subject: RE: NOAA Survey - Ft. Lauderdale coast
>
> Mark,
>
> Greetings. By way of an introduction, I am the Site Director of the
> South Florida Ocean Measurement Facility. We are a small US Navy
> facility located on the south side of Port Everglades inlet. Our mission
is to provide the Navy with a unique ocean environment test site. As part
of this facility, we have numerous underwater items, from structures, to
electronics and associated cables to items buoyed from the bottom. We
also maintain a formalized restricted zone where mooring, anchoring and
digging is restricted.
>
> Over the last few weeks it has been a pleasure working and
> coordinating your upcoming underwater survey with Mr. Watson of Ocean
Surveys. Before the survey begins I wanted the opportunity to discuss
with you, my facility, its function and the importance of the items we
have in the area of the pending survey. Mr. Watson has assured us that the
survey can be conducted in such a way as to accommodate our concerns and
for that I'm most appreciative.
>
> At you convenience next week I would like to call you and discuss my
> facility and the survey.
>
> Regards,
>
> Douglas Garbini
> Site Director
> South Florida Ocean Measurement Facility
>
> (954) 926-4005
****

Subject:
[Fwd: Fwd: FW: PEV obstr revisited]
From:
"Castle.E.Parker" <Castle.E.Parker@noaa.gov>
Date:
Tue, 08 Jun 2010 14:11:38 -0400
To:
Richard T Brennan <Richard.T.Brennan@noaa.gov>, Norris A Wike <Norris.A.Wike@noaa.gov>, Edward Owens <Edward.Owens@noaa.gov>

FYI... as per our discussion in regards to the 37-ft Obstn, south side USACE Channel in Port Everglades, FL. Please review attached email and associated attached files.

Please bear in mind the DtoN location of the obstruction, based upon the OSI survey H11896, that the feature is no longer located where it was noted with H11896 survey data. Unfortunately, the contract diver does not document a location where the feature currently resides that we could use for charting. It is clear by all parties involved, that the feature no longer resides at the H11896 DtoN location.

If any questions arise please respond.
Gene

Subject:
Fwd: FW: PEV obstr revisited
From:
David.Elliott@noaa.gov
Date:
Tue, 08 Jun 2010 13:55:55 -0400
To:
Castle E Parker <Castle.E.Parker@noaa.gov>
CC:
"LCDR Rick Brennan, NOAA" <Richard.T.Brennan@noaa.gov>, Michael Henderson <Michael.Henderson@noaa.gov>

Gene,

As per our conversation a few minutes ago here is the original message from ACOE in Jacksonville. After all the leg work I have done trying to assist them removing this they have decided to leave it. Rocco Galetta the owner of Industrial Divers Corp. has told me first hand after diving there that the dredge pontoon is now resting on the floor of the channel in about 48 feet of water. The controlling depth is 47.1ft on the left inside quarter and 46.8 on the right inside quarter. So there should be clearance and I guess that is what is guiding the ACOE. That and the lack of money for removal. Anyway, I have asked them to keep me informed of new least depth, position etc. and if they should remove it to please submit some documentation. Just wanted to keep you guys in the loop on this long overdue obstruction. At least for now it is down on the bottom and not presenting any problems. If I hear more you will be the first to know.

All the best, D.

Subject:
FW: PEV obstr revisited
From:
"Morris, Allan D SAJ" <Allan.D.Morris@usace.army.mil>
Date:
Tue, 18 May 2010 11:22:48 -0400
To:
David.Elliott@noaa.gov
CC:
"Brodehl, Brian K SAJ" <Brian.K.Brodehl@usace.army.mil>, "Holland, Lisa A SAJ" <Lisa.A.Holland@usace.army.mil>

Final verdict is not to remove at this time. We will be obtaining a survey
later this summer and continue to monitor.

Allan D. Morris, P.E.
Operations Division,
Navigation Branch
Jacksonville District
U.S. Army Corps of Engineers
904-232-2258/allan.d.morris@usace.army.mil

-----Original Message-----
From: Morris, Allan D SAJ
Sent: Tuesday, May 18, 2010 9:25 AM
To: Brodehl, Brian K SAJ
Cc: Holland, Lisa A SAJ
Subject: FW: PEV obstr revisited

Brian,
I would like to move ahead on removing this but need some money to do so. I
originally thought we could do this for about $2500 but I am getting an estimate now of between 7K & 8K because the feature appears to be more difficult to remove than originally thought. I need to respond to NOAA as to
whether they should go ahead and mark this on charts or whether we are going
to remove.

TX

Allan D. Morris, P.E.
Operations Division,
Navigation Branch
Jacksonville District

U.S. Army Corps of Engineers
904-232-2258/allan.d.morris@usace.army.mil

-----Original Message-----
From: David.Elliott@noaa.gov [mailto:David.Elliott@noaa.gov]
Sent: Thursday, May 13, 2010 11:06 AM
To: Holland, Lisa A SAJ; Morris, Allan D SAJ; Tappmeyer, Bruce A SAJ
Cc: Michael Henderson; Ed Martin; IDC@Bellsouth.net
Subject: PEV obstr revisited

Morning Lisa,

Just got off the phone with Rocco Galetta the owner of Industrial Divers Corp. in Ft. Lauderdale. (See original message) I have asked him to give you a call about this feature that has been in question for a long time. The message I had received from Mike Henderson (NOAA) yesterday was of the conjecture that this feature was not in the channel. Well according to the divers at IDC it is residing in 45-47 feet of water and has slid down into the floor of the channel from it's original target position provided by contract surveyors which was on the edge of the channel. It sounds like to me it does require removal, if it has moved once it could move again. I can not say it is an immediate "Danger to Navigation" but it is in the channel.
Mr. Galetta is prepared to send a ACOE Dive Plan to Mr. Tappmeyer if there is going to be a contact issued for removal. Not trying to beat a dead horse but just wanted you to know that this feature is inside of the channel limits according to IDC. There are folks in Norfolk that still think this feature should be charted and I am trying to hold them off on that. This is not our jurisdiction and please understand I am only the messenger. If the feature is removed any salvage documentation, photographs etc. would be greatly appreciated so I can send them to the Marine Chart Division and put this item to rest. If I can be of any assistance please don't hesitate to call or write, You have the divers video that I provided so just let me know what the final verdict will be to remove or not remove that is the question. Thanks!

Best regards, D.

David B. Elliott
NOAA- SE Nav.Mgr.
2234 S. Hobson Ave.
Charleston, SC
29405

843-740-1178 office
904-229-9359 cell

"The problems we create cannot be resolved at the rate we create them."

Jacques
Cousteau

Castle Eugene Parker <castle.e.parker@noaa.gov>
Physical Scientist - Hydrographic Team Lead
Atlantic Hydrographic Branch
NOAA Office of Coast Survey
Fwd: FW: PEV obstr revisited.eml

Content-Type:
message/rfc822
Content-Encoding:
7bit

FW: PEV obstr revisited.eml

Content-Type:
message/rfc822
Content-Encoding:
7bit

IDC Divers.doc

Content-Description:
IDC Divers.doc
Content-Type:
application/msword
Content-Encoding:
base64

H11896 COMPILATION LOG

General Survey Information	
REGISTRY No.	*H11896*
PROJECT No.	*OPR-H328-OS-08-A*
FIELD UNIT	*OCEAN SURVEYS, INC.*
DATE OF SURVEY	*February 12 to March 12, 2009*
LARGEST SCALE CHART	*11470, 38th Ed., 20080801*
ADDITIONAL CHARTS	*11466, 38th Ed., 20080601*
ADDITIONAL CHARTS	*11467, 41st Ed., 20080601*
SOUNDING UNITS	*Feet*
COMPILER	*Norris Wike*

Source Grids	File Name
	H11896_channel_0p5m_Cube_Final.hns
	H11896_S_Innshore_1m_Cube_final.hns
	H11896_N_Innshore_1m_Cube_final.hns
	H11896_FishHaven_Extraction.hns
	H11896_SW_FishHaven_50cm_Cube.hns
	H11896_Rocky_0p5m_Cube_final.hns
	H11896_Offshore_2m_Cube_final.hns
Surfaces	**File Name**
Combined	*H11896_Combined_2M.hns*
Interpolated TIN	*H11896_InterpTIN.hns*
Shifted Interpolated TIN	*H11896_InterpTIN_shifted.hns*
Product Surface	*N/A*
Final HOBs	**File Name**
Survey Scale Soundings	*H11896_SS_1M.hob,*
Chart Scale Soundings	*H12008_CS_1M.hob*
Contour Layer	*H11896_Contours.hob*
Feature Layer	*H11896_Features.hob*
Meta-Objects Layer	*H11896_META_Layers.hob*
Blue Notes	*H11896_BlueNotes.hob*
ENC Retain Soundings	*H12008_ENC-Retained.hob*

Meta-Objects Attribution	
Acronym	**Value**
M_COVR	
CATCOV	*1*
SORDAT	*20090312*
SORIND	*US,US,graph,H11896*
M_QUAL	
CATZOC	*6*
INFORM	*R. V. Able II*
POSACC	*10*
SORDAT	*20090312*
SORIND	*US,US,graph,H11896*
SUREND	*20090312*

SURSTA	***20090120***
DEPARE	
DRVALV 1	***5.0 ft***
DRVALV2	***550.0 ft***
SORDAT	***20090312***
SORIND	***US,US,graph,H11896***
M_CSCL	
CSCALE	***40000***
SORDAT	***20090312***
SORIND	***US,US,graph,H11896***
CSCALE	***80000***
SORDAT	***20090312***
SORIND	***US,US,graph,H11896***

SPECIFICATIONS:

I. COMBINED SURFACE:
   a. Number of ESAR Final Grids: ***7***
   b. Resolution of Combined (m): ***2M***

II. SURVEY SCALE SOUNDINGS (SS):
   a. Radius
   b. Shoal biased
   c. Use Single-Defined Radius (mm at Map Scale) ; Radius Value = ***1.00***
   d. Queried Depth of All Soundings
      i. Minimum: ***2.276M***
      ii. Maximum: ***166.978M***

III. INTERPOLATED TIN SURFACE:
   a. Resolution (m): ***2M***
   b. Linear
   c. Shifted value: *[-0.229m (feet), (≤ 10 fathoms)]*
      [-1.372m (fathoms), (> 10 fathoms)]

IV. CONTOURS:
   a. Use a Depth List: ***H11896_NOAA_depth_curves_list.txt***
   b. Line Object: DEPCNT
   c. Value Attribute: VALDCO

V. FEATURES:
   a. Total Number of Features***:*** ***13***
   b. Number of Insignificant Features:

VI. CHART SURVEY SOUNDINGS (CS):
   a. Number of ENC CS Soundings: ***1674***
   b. Radius
   c. Shoal biased
   d. Use Single-Defined Radius: m on the ground
      i. Radius Value (m):
      ii. Or use a Sounding Space Range Table (if applicable): ***N/A***
   e. Filter: Interpolated != 1
   f. Number Survey CS Soundings: ***1517***

VII. Notes:

ATLANTIC HYDROGRAPHIC BRANCH
H-CELL REPORT to ACCOMPANY
SURVEY H11896 (2009)

This H-Cell 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.

B. DATA ACQUISITION AND PROCESSING

B.1 DATA PROCESSING

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

CARIS HIPS/SIPS version 6.1 SP2, HF 1-8
CARIS Bathy DataBASE version 2.1 SP1, HF 1-10
CARIS S-57 Composer version 2.1 HF 4
DKART INSPECTOR, version 5.0 Build 732 SP1
CARIS HOM ENC 3.3 SP3 HF 8

B.2. QUALITY CONTROL

B.2.1. H-Cell

The AHB source depth grid for the survey's nautical chart update product entailed the field's original 50cm, 1m, 2m and shoal-extracted grids combined at 2 meter resolution. The survey scale soundings were created from the combined surface at 2mm radius at 1:10,000, 40,000 and 1:80.000 for the respective chart scale areas. A TIN was created from the survey scale soundings from which an interpolated surface was generated. The chart scale soundings were selected from the filtered interpolated surface using a single defined radius at the 10,000 chart scale. The chart scale selected soundings are a subset of the survey scale selected soundings. The surface model was referenced when selecting the chart scale soundings, to ensure that the selected soundings portrayed the bathymetry within the common area.

Depth contours were created from a shifted interpolated TIN surface of 2m resolution and the contours were then derived from the interpolated and non-interpolated nodes. Therefore, using this method the contour are in harmony with the SS and CS soundings while maintaining the chart equivalent contour values as whole integers. The depth contours are being forwarded to MCD for reference only. The contours were utilized during

chart scale sounding selection and quality assurance efforts at AHB. The depth contours are incorporated into the SS H-Cell product as per 2009 H-Cell Specifications.

The compilation components (Stand Alone HOB files (SAHOB)) are detailed in the Compile Log attached to the Descriptive Report. The SAHOB files included depth areas (DEPARE), depth contours (DEPCNT), sounding selections (SOUNDG), features (SBDARE, OBSTN, SLCONS, WRECKS), Meta objects (M_COVR, M_QUAL, M_CSCL), and cartographic Blue Notes ($CSYMB).

All of the components with the exception of the survey scale sounding selection and depth contours were inserted into one feature layer (including the Bluenotes, as dictated by Hydrographic Technical Directive 2008-8), and this layer was exported into S-57 format in order to create the H-Cell deliverable. Similarly, the survey scale sounding selection and depth contours were exported into S-57 format separately, and then both S-57 files were processed in CARIS HOM to convert the metric units to feet. The final products are two S-57 files, in Lat/Lon NAD-83, one that contains the chart soundings, all the features, Meta objects, and Bluenotes (H11896_CS.000), and one that contains the survey scale sounding selection and depth contours (H11896_SS.000). Finally, quality assurance checks were made utilizing CARIS S-57 Composer version 2.1 validation checks and DKART INSPECTOR version 5.

H11896 CARIS H-Cell final deliverables include the following products:

H11896_CS.000	1:10,000 Scale 1:40,000 Scale 1:80,000 Scale	H11896 H-Cell with Chart Scale Selected Soundings H11896 H-Cell with Chart Scale Selected Soundings H11896 H-Cell with Chart Scale Selected Soundings
H11896_SS.000	1:10,000 Scale	H11896 Selected Soundings (Survey Scale)

C. VERTICAL AND HORIZONTAL CONTROL

The Hydrographer makes adequate mention of tidal correction horizontal control in the Descriptive Report and the Horizontal and Vertical Control Report included as part of the H11896 H-Cell deliverables.

Horizontal control used for this survey during data acquisition is based upon the North American Datum of 1983 (NAD83), UTM projection zone 17.

D. RESULTS AND RECOMMENDATIONS

D.1 CHART COMPARISON

11466 (38th Edition, Jun. /08)
Corrected through NM 5/01/2010
Corrected through LNM 4/20/2010
Scale 1:80,000

11467 (41st Edition, Jun. /08)
Corrected through NM 5/01/2010
Corrected through LNM 4/20/2010
Scale 1:40,000

11470 (38th Edition, Aug. /08)
Corrected through NM 5/01/2010
Corrected through LNM 4/20/2010
Scale 1:10,000

ENC Comparison

US4FL31M
Intracoastal Waterway Miami to
Edition 24
Application Date 2010-03-17
Issue Date 2010-03-17
Chart 11466

US5FL33M
Intracoastal Waterway Miami to
Edition 17
Application Date 2010-05-04
Issue Date 2010-05-04
Chart 11467

US5FL32M
Intracoastal Waterway Miami
Edition 23
Application Date 2010-03-16
Issue Date 2010-03-16
Chart 11470

D.1.1 Hydrography

The charted hydrography originates with prior surveys and requires no further consideration. The hydrographer makes adequate chart comparisons in section "D" and Appendix 1 & 2 of the Descriptive Report. The following exceptions are noted:

A charted ***Dump Site discontinued, dredged material, Depths from surveys of 1963 and 2007*** in Latitude 26°06'30"N, Longitude 080°04'22"W was completely surveyed by 100% multibeam. It is r*ecommended that the* charted ***Dump Site, discontinued, dredged material, Depths from surveys of 1963 and 2007*** be deleted. Chart present survey depths.

A charted ***Obstn Fish Haven (auth min 20ft)*** in Latitude 26°03'15"N, Longitude 080°05'54"W was surveyed by the present survey. A depth of 18 feet was located in Latitude 26°03'09.32"N, Longitude 080°05'56.73"W. An 18 depth was added to the H-Cell. Retain the ***Obstn Fish Haven (auth min 20ft)***.

A charted ***Obstn Fish Haven (auth min 7ft)*** in Latitude 26°07'56"N, Longitude 080°05'36"W was surveyed by the present survey. Retain the ***Obstn Fish Haven (auth min 7ft)***.

A charted ***Obstn Fish Haven (auth min 40ft)*** in Latitude 26°08'05"N, Longitude 080°05'07"W was surveyed by the present survey. Retain the ***Obstn Fish Haven (auth min 40ft)***.

A charted ***Obstn Fish Haven (auth min 30ft)*** in Latitude 26°06'50"N, Longitude 080°04'10"W was surveyed by the present survey. Retain the ***Obstn Fish Haven (auth min 30ft)***.

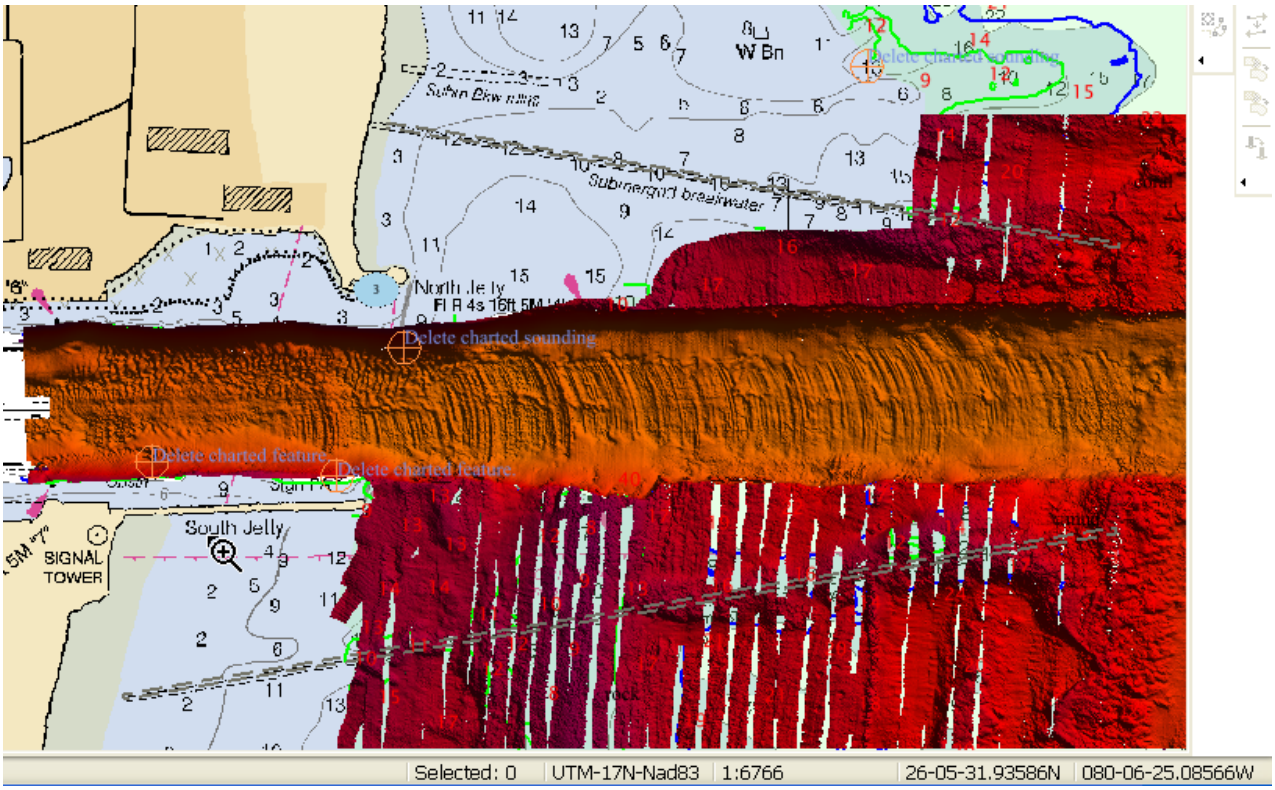
A charted ***Obstns PA, area*** in Latitude 26°08'25"N, Longitude 080°04'19"W was partially disproved by the present survey. Present survey depths are 124 to 162 feet. Depths are in harmony with the chart. The Obstns, PA limits have been revised. The revised limit was brought forward from ENC US5FL33M, 20100316. It is recommended that the ***Obstns PA, area*** be revised as shown on H-Cell.

A charted ***Obstns (Anchor) PA*** in Latitude 26°07'50.52"N, Longitude 080°04'26.5"W was neither verified nor disproved by the present survey. Object detection criteria was not met. It is recommended that the ***Obstns (Anchor) PA*** be retained.

An ***obstruction*** with a depth of ***37 feet*** in Latitude 26°05'34.89"N, Longitude 080°06'27.49"W was located by the present survey. It is recommended that an ***obstruction*** with a depth of ***37 feet*** be charted. Add ***37Obstn*** and danger curve.

AWOIS item #9908, is a charted ***Submerged breakwater*** in the vicinity of Latitude 26-05-43”N, Longitude 80-05-51”W. The item’s existence was not supported by the data from the present survey. It is recommended that the ***Submerged breakwater*** be deferred to MCD Source Data Branch for final charting. See area view below.

AWOIS item #9907, is a charted ***Submerged breakwater*** in the vicinity of Latitude 26-05-31”N, Longitude 80-05-50”W. The item’s existence was not supported by the data from the present survey. It is recommended that the ***Submerged breakwater*** be deferred to MCD Source Data Branch for final charting. See area view below.



D.3. 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. See Section D.1. of this report for a list of the Raster Charts and Electronic Navigation Charts (ENC) used for compiling the present survey.

D.4. ADEQUACY OF SURVEY

The present survey is adequate to supersede the charted bathymetry within the common area. Any features not specifically addressed either in the H-Cell BASE Cell File or the Blue Notes should be retained as charted. Refer to the Descriptive Report for further recommendations by the hydrographer.

APPROVAL SHEET
H11896

Initial Approvals:

The completed survey has been inspected with regard to survey coverage, delineation of depth contours, disposition of critical depths, cartographic symbolization, and verification or disproval of charted data. All revisions and additions made to the H-Cell files during survey processing have been entered in the digital data for this survey. The survey records and digital data comply with National Ocean Service and Office of Coast Survey requirements except where noted in the Descriptive Report and the Evaluation Report.

All final products have undergone a comprehensive reviews per the Hydrographic surveys Division Office Processing Manual and are verified to be accurate and complete except where noted.

Norris Wike

Digitally signed by Norris Wike
DN: cn=Norris Wike, o=NOAA, ou=AHB, email=norris.a.wike@noaa.gov, c=US
Date: 2010.06.30 11:06:59 -04'00'

Norris A. Wike
Cartographer
Atlantic Hydrographic Branch

I have reviewed the H-Cell files, accompanying data, and reports. This survey and accompanying Marine Chart Division deliverables meet National Ocean Service requirements and standards for products in support of nautical charting except where noted.

Richard T. Brennan
I am approving this document
2010.06.30 17:12:58 -04'00'

Approved:

Richard T. Brennan
Lieutenant Commander, NOAA
Chief, Atlantic Hydrographic Branch

Digitally signed by Kathleen Jamison
Reason: AWOIS/SURF check
Date: 2010.07.08 13:51:21 -04'00'