

H11899

NOAA FORM 76-35A

U.S. DEPARTMENT OF COMMERCE

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION  
NATIONAL OCEAN SERVICE

## Vertical and Horizontal Control Report

Type of Survey Shallow Water Multibeam  
Hydrographic and Side Scan Sonar Survey

Field No. OPR-H324-OS-08-A

Registry No. H11899

### Locality

State Florida

General Locality Atlantic Ocean

Sub locality East of Palm Beach

**2009**

CHIEF OF PARTY

George G. Reynolds

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Date.....

REGISTER NO.  
H11899**HYDROGRAPHIC TITLE SHEET**

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

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

State *Florida*

General Locality *Atlantic Ocean*

Locality *East of Palm Beach*

Scale *N/A* Date of Survey *June 3, 2009 through July 3, 2009*

Instructions Dated *May 7, 2008* Project No. *OPR-H324-OS-08-A*

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

Chief of Party *George G. Reynolds*

Surveyed By *John G. Wetmur, Robert M. Wallace, John L. Bean*

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*

Soundings in *Meters (MLLW)*

REMARKS: *All Times Recorded in UTC**Data Recorded and Presented relative to UTM Zone 17 North**Original SOW modified by Oct 28, 2008 e-mail from COTR Mark Lathrop. (Refer to Appendix IV of the Descriptive Report.)*

*Contractor: Ocean Surveys, Inc.  
91 Sheffield St.  
Old Saybrook, CT. 06475*

THE INFORMATION PRESENTED IN THIS REPORT AND THE ACCOMPANYING BASE SURFACE REPRESENTS THE RESULTS OF A SURVEY PERFORMED BY OCEAN SURVEYS, INC. DURING THE PERIOD OF 3 JUNE 2009 TO 3 JULY 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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## **A. VERTICAL CONTROL**

### **A.1 Tide Station**

Tide/water levels for this project were provided exclusively by NOAA as verified data from NOAA Tide Station 872-3214, Virginia Key, FL. The survey site is located entirely within Zones SA220 and SA225 as indicated by preliminary tidal zoning data included in the project Statement of Work. A time corrector of -78 minutes and a range ratio of 1.41 were applied to the Zone SA220 Virginia Key (872-3214) verified tide data and a time corrector of -66 minutes and a range ratio of 1.32 were applied to the Zone SA225 Virginia Key (872-3214) verified tide data. Figure 1 depicts the survey area, tide zone delimiters and the location of the Virginia Key tide gauge.

Coordinated Universal Time (UTC) was used to annotate the tide records and all other data obtained in this project.

Preliminary tide correctors were retrieved daily from the CO-OPS website. Verified tides were retrieved on a weekly basis once they were made available by CO-OPS. Verified tides retrieved from the NOAA CO-OPS website were fully populated and smooth. Tide data were applied to processed soundings employing the CARIS “apply tides” function. The “multiple station” function was used allowing for correction of the verified tide data for zoning factors.

Based on the results of the cross line analysis presented in Separate IV, it appears that the time and range factors for Zones SSA220 and SSA225, as provided in the preliminary zoning scheme, are adequate.

## **B. HORIZONTAL CONTROL**

### **B.1 Horizontal Datum**

The horizontal datum for this project was the North American Datum of 1983 (NAD83). Horizontal coordinates are provided in Latitude/Longitude and Universal Transverse Mercator (UTM) Zone 17, in meters.

### **B.2 Horizontal Control**

All survey tasks were executed employing Differential GPS (DGPS) positioning. Miami USCG DGPS beacon correctors were input to the primary navigation system. Cape Canaveral USCG DGPS beacon correctors were input to the secondary (alarm) navigation system.

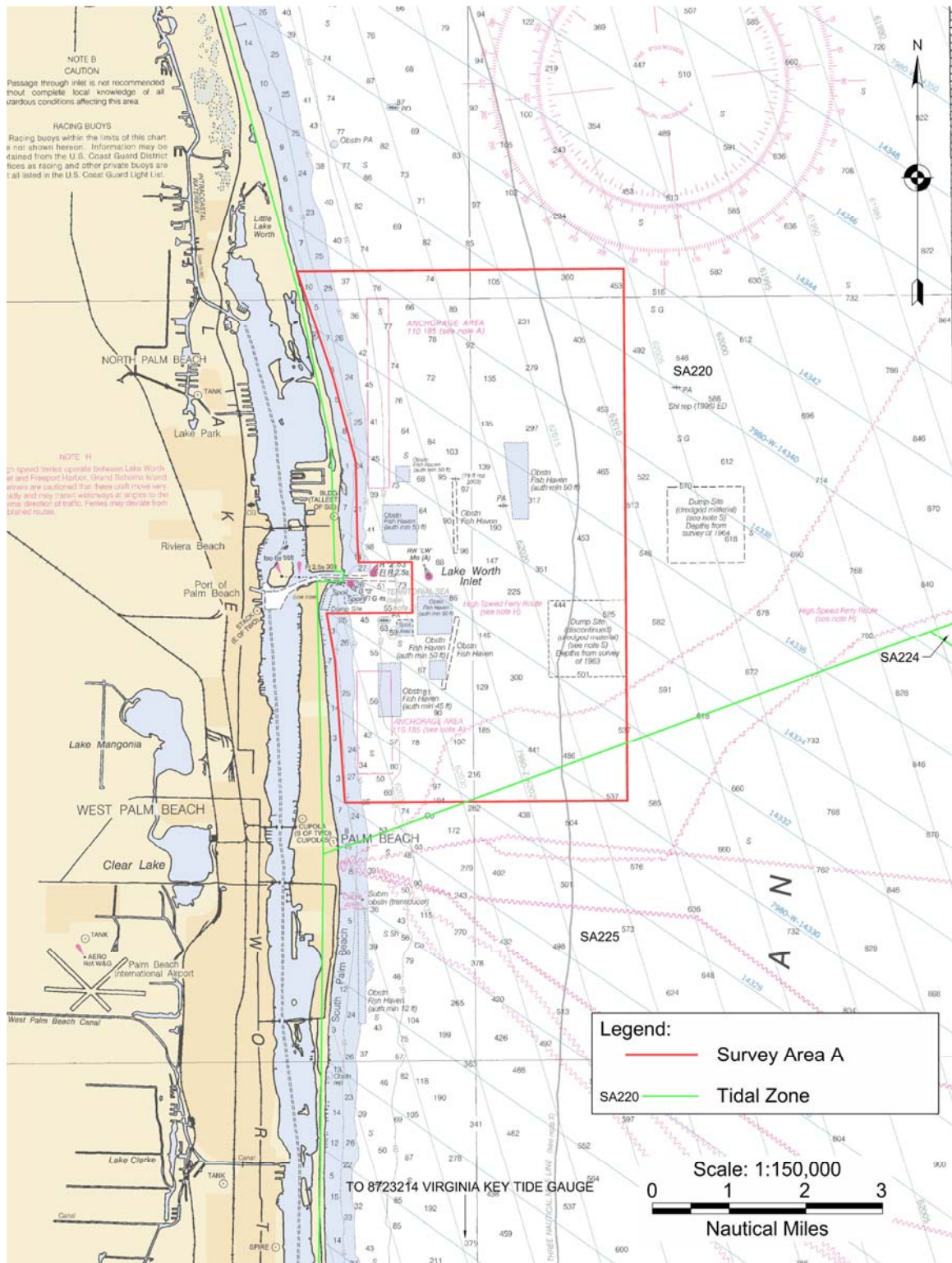


Figure 1. NOAA chart showing the Virginia Key tide station, tide zone scheme and survey area.

Prior to transiting from the Miami berth, the OSI field team verified the accuracy of the navigation system using the navigation checkpoint “CG2” previously established at this location. This reference point was established by occupying the point with a GPS capable of recording dual-frequency GPS observables. Recorded data were submitted to the National Geodetic Survey’s Online Users Positioning Service (OPUS). The OPUS-reported position solution was assigned to the point and used for subsequent navigation confidence checks. Upon arrival in Palm Beach, the field personnel established a temporary XY navigation checkpoint (“Slip 112 Side Cleat”) adjacent to the survey vessel’s berth at the Riviera Beach Marina in West Palm Beach, FL. “Slip 112 Side Cleat” was established by occupying the point with a Trimble MS750 DGPS system using U.S. Coast Guard Key West DGPS beacon correctors. The location established for this point is given in Table 1.

**Table 1**  
**Established Position of Navigation Reference Point “Slip 112 Side Cleat”**

<b>Reference ID</b>	<b>Reference Easting UTM 17N, NAD83 (meters)</b>	<b>Reference Northing UTM 17N, NAD83 (meters)</b>
Slip 112 Side Cleat	594348.4	2961560.2

This point was then used as reference for daily navigation system accuracy verification throughout the duration of the survey of H11899. Upon completion of this survey, the OSI field team returned to the Miami berth and performed an additional verification of the accuracy of the navigation system using the OPUS established reference point “CG2.”

**C. APPROVAL SHEET****LETTER OF APPROVAL  
REGISTRY NO. H11899**

This report and the accompanying data are respectfully submitted.

Field operations contributing to the accomplishment of survey H11899 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 – H11899  
September 15, 2009