

NASSAU COUNTY - SAISSA  
Task Order Memorandum  
Contract CM1852

To: Olsen Associates, Inc.  
2618 Herschel St.  
Jacksonville, FL 32204

Date: 25 February 2015  
Contract: Coastal Engineering  
Request Made By: SAISSA  
Request Received By: Albert E. Browder, Ph.D., P.E.  
Task Order No: CM 1852-TO #13

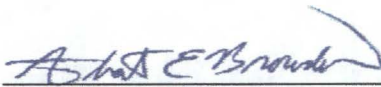
**Task Order: Phase I Field Geotechnical Investigation for Offshore Geologic Model Verification  
South Amelia Island Shore Stabilization Project**

The Consultant, aided by qualified subcontractors, shall collect supplemental bathymetric and sub-bottom sonar data to describe limited areas of the seabed in both State and Federal waters off Amelia Island, Nassau County, FL. These areas are proposed for investigation to advance prior research by the Florida Geologic Survey, Scientific Environmental Applications, Inc., and OAI to improve the understanding of the marine geological model for the area. These data are needed to evaluate the potential of these areas to contain beach-compatible sand for upcoming SAISSA nourishment projects. Consultant tasks include the development of the field test plan, submittal of a Notice of Scientific Research to the Bureau of Ocean Energy Management (BOEM), management of subcontractor activities, and final synthesis and reporting of results. Specific subcontractor efforts include an expansion of the hydrographic surveying component authorized under Task Order CM 1852-TO #12, collection of sub-bottom sonar data across these same offshore areas, and the synthesis of these collected data, including the formulation of a larger-scale Phase II Field Geotechnical Investigation. These Services are potentially eligible for State cost-sharing, pending FDEP approval.

|           |  |                     |
|-----------|--|---------------------|
| Subtask A | Project Management, BOEM Coordination, Final Reporting | \$ 11,300.00        |
| Subtask B | Bathymetric Data Collection                            | \$ 7,800.00         |
| Subtask C | Sub-bottom Sonar Data Collection and Analysis          | \$ 30,900.00        |
|           | <b>TOTAL</b>   | <b>\$ 50,000.00</b> |

Olsen Associates, Inc.

SAISSA

  
Albert E. Browder, Ph.D., P.E.

  
Mr. Drew Wallace, SAISSA President

Date: 5 August 2014

Date: 3/5/2015

Nassau County, Board of County  
Commissioners



Pat Edwards  
Its: Chair

Date: 3-23-15

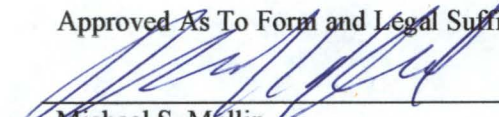
Attest to Chair  
Signature



John A. Crawford  
Its: Ex-Officio Clerk

Date: 3-25-15

Approved As To Form and Legal Sufficiency:

  
Michael S. Mullin

Date: 3-23-15

MES  
03-25-15

## **SCOPE OF WORK**

### **Phase I Field Marine Geotechnical Investigation for Offshore Geologic Model Verification South Amelia Island Shore Stabilization Project**

**FDEP Grant 14NA1 – Task 2.2**

**25 February 2015**

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#### **Overview**

The South Amelia Island Shore Stabilization Association (SAISSA) manages 3.0 miles of the Atlantic Ocean shoreline on the south end of Amelia Island, FL, on behalf of Nassau County, FL, through the SAIS-Municipal Services Benefit Unit (SAIS-MSBU). SAISSA partners with the Florida Park Service on behalf of Amelia Island State Park for the adjacent 0.5 miles of Atlantic Ocean shoreline at the tip of the island to coordinate the care of both shoreline segments. The management of the overall South Amelia Island Shore Stabilization Project (FDEP R-59 to R-79) is predicated on a program of comprehensive beach nourishment, supplemented with strategic structural stabilization at the southern tip of the island (Figure 1). The project was initially restored via beach nourishment in 1994, and was subsequently renourished in 2002. A stabilizing 1,600-ft terminal groin and 285-ft detached rock breakwater were constructed to stabilize the south end of the project limits in 2005. The project was last renourished in 2011. Plans are ongoing for the next renourishment, presently scheduled for 2019 or 2020. In that regard, the proposed Task relates to the identification of the nearshore geology off Nassau County, FL, with the ultimate purpose of supporting the development of borrow areas containing beach compatible sands.

The purpose of the proposed task is to collect supplemental bathymetric and sub-bottom sonar data to describe limited areas of the seabed in both State and Federal waters off Amelia Island, Nassau County, FL. These areas are proposed for investigation to advance prior research by the Florida Geologic Survey, Scientific Environmental Applications, Inc., and OAI to improve the understanding of the marine geological model for the area. These data are needed to evaluate the potential of these areas to contain beach-compatible sand for upcoming SAISSA nourishment projects. Consultant tasks include the development of the field test plan, submittal of a Notice of Scientific Research to the Bureau of Ocean Energy Management (BOEM), management of subcontractor activities, and final synthesis and reporting of results. Specific subcontractor efforts include an expansion of the hydrographic surveying component authorized under Task Order CM 1852-TO #12, collection of sub-bottom sonar data across these same offshore areas, and the synthesis of these collected data, including the formulation of a larger-scale Phase II Field Geotechnical Investigation.

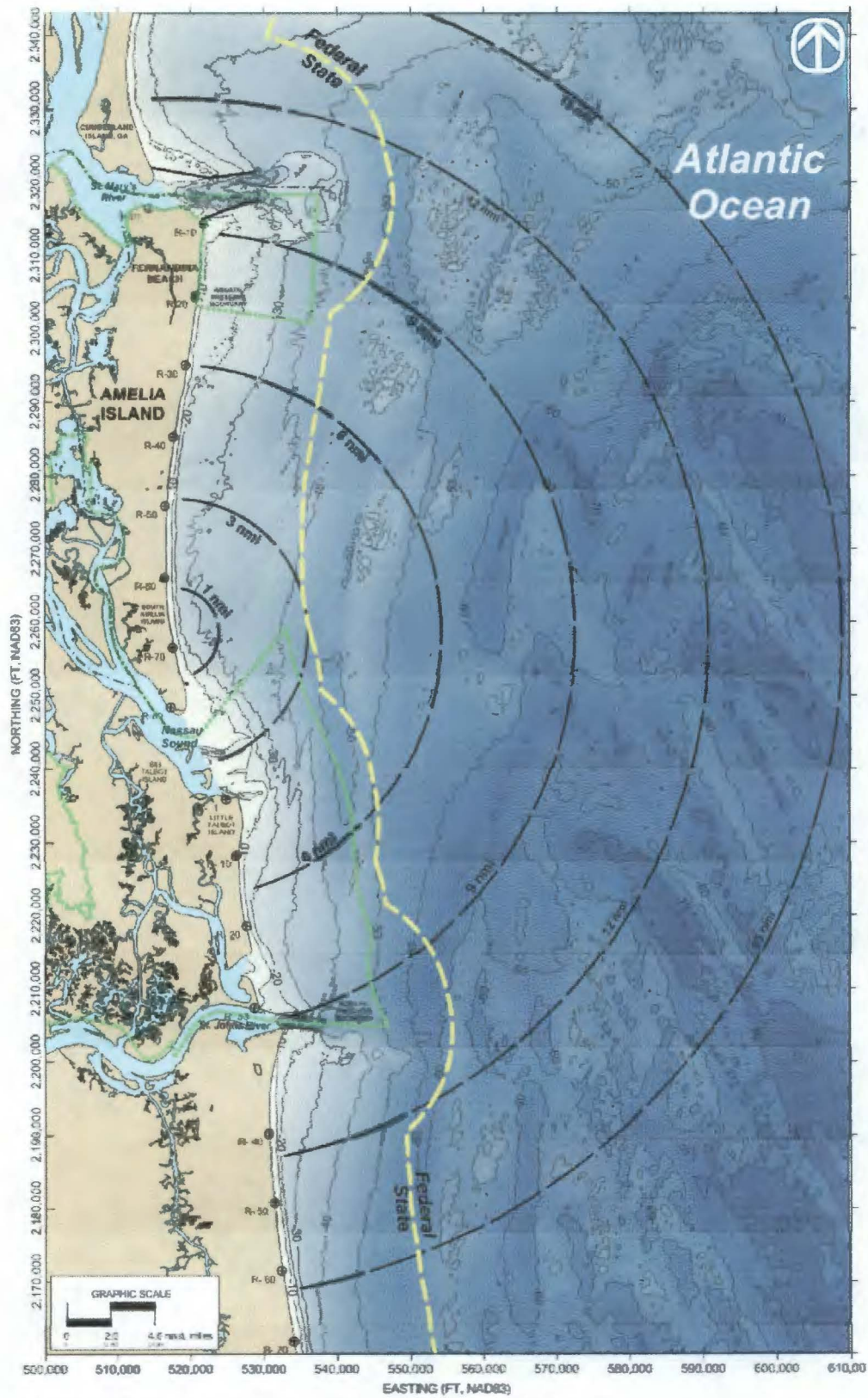


Figure 1 – Location map – South Amelia Island and adjacent bathymetry.

**Task 2.2 - Phase I Field Marine Geological Investigation****Description**

Numerous investigators have studied the State and Federal waters off Nassau County, FL, dating back to the 1960's and 1970's ICONS studies. Most recently, the Florida Geological Survey (Dan Phelps, principal investigator) took several Vibracores and conducted sonar sub-bottom profiling to develop a geologic model of the seabed in Federal waters off Amelia Island (Figure 2). That geologic model describes a prediction of the morphology of the river channel system that existed in the area during lower stands of sea level. Based upon the sub-bottom records and the available Vibracores, Phelps identified predicted channel locations, now-infilled or buried with the higher current level of the ocean. These in-filled channels are typically characterized by finer sediments (i.e. siltier, muddier, etc.) which would not be suitable for beach nourishment.

In a followup discussion of the FGS/Phelps geologic model, Dr. Gary Zarillo opined that the shoal and ridge features adjacent to these infilled channels would be more likely sources of coarser, reworked beach sediments, similar to ebb shoal sediments or reworked nearshore beach sediments. The initial ICONS study identified several areas matching this potential description, labeled as "B" shoals in those early reports. Referring to Figure 2, these "B" shoal features close to the present-day shoreline have never been directly sampled. Previous investigators have taken cores either in the bathymetric lows adjacent to the "B" shoals (e.g. the ICONS cores), or in areas of suspected in-filled channels (the FGS/Phelps cores closer to shore).

The objective of the current task is to fill out the geologic model proposed by FGS/Phelps to evaluate the sediments along some of the ICONS "B" shoals and the nearshore ridge features AWAY FROM the infilled channels, testing the theory of Zarillo that such areas may contain coarser, re-worked beach sediments. These features lie in Federal waters just outside the 3-mile State/Federal boundary. As such, correspondence with the Bureau of Ocean Energy Management (BOEM) is required to conduct scientific research in those areas.

Future work to be conducted from the results of this scientific research task will include limited probing of the selected shoal areas by Vibracore (under separate Task Order) to verify sediment characteristics, and if found to be warranted, the future development of borrow areas for beach nourishment.

**Subtask A: Project Management, BOEM coordination, final reporting**

Consultant shall coordinate all activities of subconsultants associated with Subtasks B and C and shall establish the overall field test plan. Consultant shall prepare and submit a Notice of Scientific Research to BOEM and shall respond to any Requests for Additional Information

(RAIs) that may be generated by BOEM. A BOEM requirement to qualify for the simpler Notice of Scientific Research permission is the submittal of the collected data to the public, including BOEM, the FDEP (via the ROSS database), and SAISSA. Consultant shall prepare a brief report of findings and shall coordinate the submittal of the collected data and report to these agencies (in the appropriate electronic formats).

Deliverable A: Final report of findings, electronic data submittal to Client and agencies.  
Total Cost: \$11,300.00

#### **Subtask B: Updated hydrographic data collection**

Consultant shall coordinate the collection of updated controlled hydrographic survey data for selected areas associated with the ICONS “B” shoals and nearshore ridge features of interest. These data shall be used to update or calibrate the bathymetry shown in Figures 1 and 2, which were collected by NOAA in the 1970s. The new data will provide increased detail in the vicinity of the areas of interest. Task includes three days of data acquisition, up to approximately 60 line miles of single-beam survey data. Data shall be collected by a Certified Hydrographic Surveyor (subconsultant), and shall be referenced to the local horizontal and vertical datums (NAD83, State Plane Coordinates, FL East Zone, and NAVD88, all units in feet).

Deliverable B: Map product of results, electronic data submittal  
Total Cost: \$7,800.00

#### **Subtask C: Supplemental sub-bottom sonar profiling**

Consultant shall coordinate the collection of high-resolution sub-bottom sonar profile data across the selected areas associated with the “B” shoals and nearshore ridge features of interest. The focus shall be on the upper 20 to 30 ft of sediment in these selected areas. Up to three days of field data collection are planned. These data will be used to compare the sonar records of the sediments in these target shoal features to those in the bathymetric lows and in the infilled channel areas (**Figure 2**), with the objective of identifying areas of potentially coarse reworked clean sands. A geological subconsultant, Dr. Gary Zarillo, will lead the field data collection and will interpret the sonar results. Field work consists of conducting survey transects with an EdgeTech SB-512i X-Star Sub-bottom Profiler System.

Deliverable C: Interpretive report from subconsultant, electronic submittal of sonar sub-bottom profile imagery (additional discussion included in report associated with sub-task A).  
Total Cost: \$30,900.00

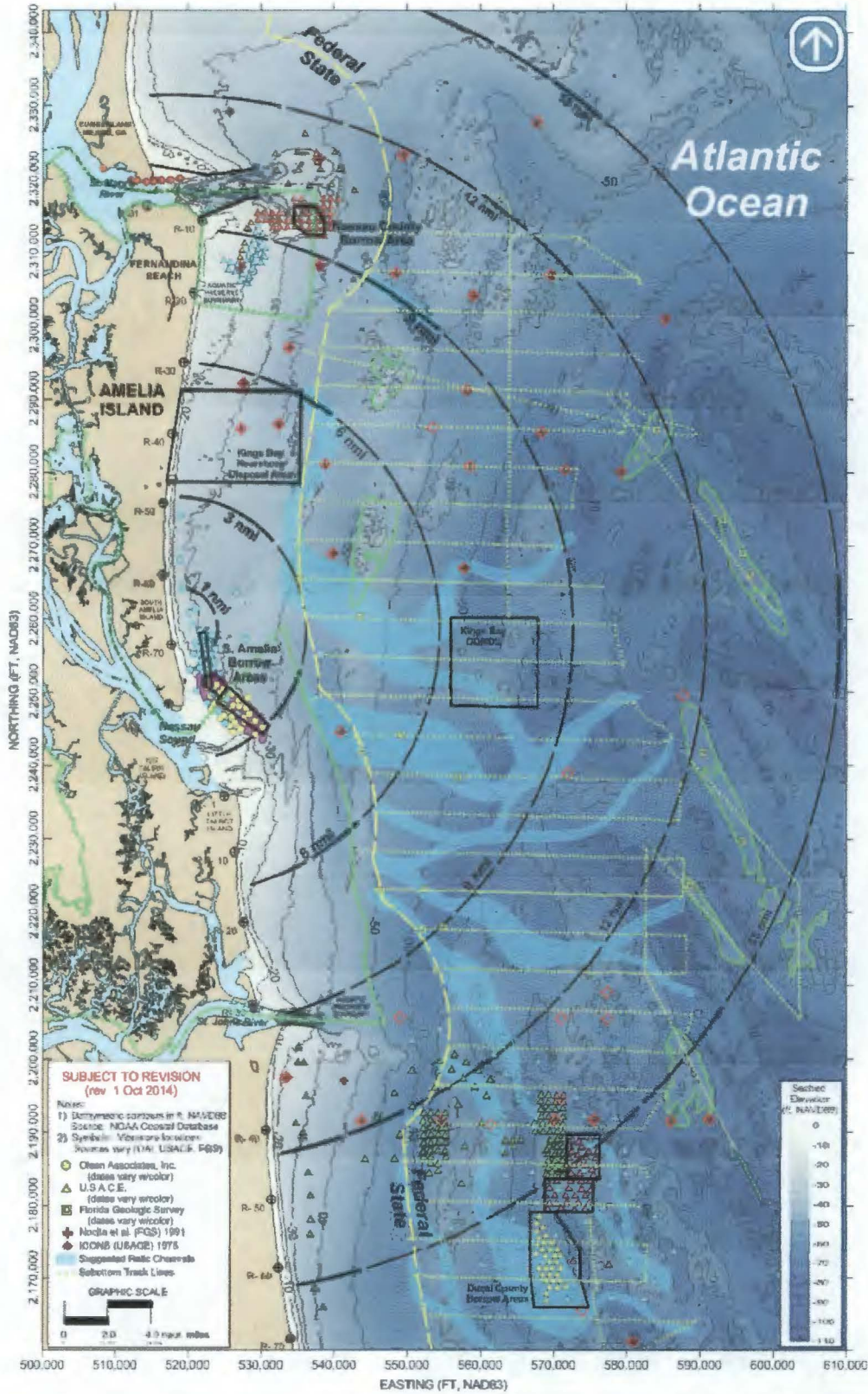


Figure 2 Compilation of available geotechnical data, and predicted buried channel locations from the geologic model of FGS/Phelps. Areas in green represent “A&B” shoals identified in the ICONS study.