ENVIRONMENTAL STUDIES PROGRAM: Ongoing Studies

Region: Atlantic

Planning Area(s): North, Mid, and South Atlantic

Title: Roadmap: Technologies for Cost Effective Spatial Resource Assessments for Offshore Renewable Energy (M10PC00096)

BOEM Cost: $748,035 **Period of Performance:** FY 2010-2012

Conducting Organization(s): University of Massachusetts-Dartmouth, Marine Renewable Energy Center.

BOEM Contact: Angel McCoy

Description:
Background: The Bureau of Ocean Energy Management (BOEM) is responsible for management of renewable energy development on the outer continental shelf, and effective assessment of resource availability and variability is critical to their mission. However, present assessment and monitoring practices involve on-site measurements which are manpower-intensive and costly. Consequently, there is a need for more efficient environmental assessment and monitoring tools. The use of newer technologies will yield improvements in the quality and character of the observations (for example, higher resolution profiling and mapping, or real-time measurements for control) that will feed back into improvements in the design and perhaps operating envelope of power extraction devices. This study will develop a technology roadmap for the application of advanced spatial survey technologies to the assessment and post-development monitoring of offshore wind and hydrokinetic renewable energy resources and facilities. This effort involves a consortium of five major academic institutions, four leading technology companies and the government of the Commonwealth of Massachusetts under the program management of the New England Marine Renewable Energy Center.

The study will be broadly based and will consider measurements from the sub-bottom through the top of the marine atmospheric surface boundary layer. The emphasis will be on techniques that provide spatial-temporal measurements. Although most of the evaluations will use models and existing data to analyze performance, several of the projects involve field tests intended to evaluate specific approaches.

Specific topics to be investigated are:

[1] *High resolution wind profiling from buoys and small boats.*

[2] *Statistical characterization of winds, waves and currents over a large area.*

[3] *High resolution, spatial imaging of winds, waves, currents and bathymetry.*

[4] *Mapping of currents and waves using Doppler sonar*.

[5] *Surveys of the sub-bottom, bottom sediment and benthic biotic communities from an autonomous underwater vehicle.*

[6] *Geo-referencing and data management*.

Technologies to be assessed are radar, lidar, sonar and autonomous underwater vehicles. Partners include the Woods Hole Oceanographic Institution, the School of Marine Science and Technology at the University of Massachusetts Dartmouth, the Renewable Energy Research Lab at the University of Massachusetts Amherst, the University of Washington, Applied Physics Laboratory, the University of Hawaii, Satellite and Radio Oceanography Laboratory in the School of Ocean and Earth Science and Technology, Imaging Science Research Inc., Teledyne RDI, and Battelle Memorial Institute.

Objectives: The object of this study is to develop a technology roadmap for the application of advanced spatial survey technologies for the assessment and post-construction monitoring of offshore wind and hydrokinetic renewable energy resources.

Importance to BOEM: An assessment of the best available technologies for the offshore environment is required.

Current Status: Awarded on September 14, 2010. Due to weather delays, a six month no-cost contract extension was requested in June 2012 to move the contract close date to March 29, 2013. Since this extension has been granted the contractor has requested an additional extension due to complications obtaining the correct radar components in order to complete Task 2. The new contract close date is June 30, 2013.. A new radar component contractor was secured in October 2012 and the missing component was purchased in November 2012. Work will begin on Task 2 in the spring of 2013 in North Carolina. The contractor submitted their annual report on October 28, 2012 covering the period from October 1, 2011 to September 30, 2012. Thus far, the research aspect of Tasks 1, 3, 4, and 5 have been completed. Tasks 1 and 4 have completed and submitted draft reports for review by the project manager. Draft reports for Tasks 3 and 5 are in progress. Work has not begun on Task 6 yet.

Final Report Due: June 30, 2013.

Publications: None.

Affiliated Web Sites: None.

Revised Date: December 17, 2012

ESPIS: Environmental Studies Program Information System

All *completed* ESP studies can be found here:
http://www.data.boem.gov/homepg/data_center/other/espis/espisfront.asp