BOEM ENVIRONMENTAL STUDIES PROGRAM: Ongoing Studies

Region: Pacific OCS Region

Planning Area: Oregon-Washington, Northern and Southern California

Title: Renewable Energy Visual Evaluations

BOEM Information Need(s) to be Addressed: The final product will be incorporated into BOEM environmental reviews of proposed offshore renewable energy facilities under the National Environmental Policy Act and the National Historic Preservation Act.

Total BOEM Cost: $497,768 **Period of Performance:** FY 2010-2012

Conducting Organizations: Center for Advanced Spatial Technologies, University of Arkansas; Argonne National Laboratories;

Principal Investigators: Jackson Cothren, University of Arkansas
Bob Sullivan, Argonne National Laboratories

BOEM Contact: Dave Ball

Description:
Background: With the support of the National Oceanographic Partnership Program, this study project (Topic 6) was solicited through a competitive joint funding process known as a Broad Agency Announcement. This innovative partnership between Bureau of Ocean Energy Management, Regulation and Enforcement (BOEM), the Department of Energy (DOE), and the National Oceanic and Atmospheric Administration created a common research portfolio that meets key management needs. This significantly magnifies the impact of all three agencies' research funding by eliminating redundancies, supporting complementary work, and sharing the results of research findings.

The BOEM, an agency of the U.S. Department of the Interior, is charged with the responsibility of considering the effects of its actions on significant cultural resources. This program arose out of a variety of legislation enacted to ensure proper management and protection of the nation's cultural heritage. The most pertinent of these laws are the National Historic Preservation Act (NHPA), the National Environmental Policy Act (NEPA), and the Outer Continental Shelf Lands Act (OCSLA).

Under the Energy Policy Act of 2005, BOEM is responsible for permitting renewable energy activities on the Outer Continental Shelf (OCS). There are a number of different renewable energy projects and offshore technologies that can capture energy from wind, wave, tidal flow, and/or ocean current. One of the concerns with the development of these facilities is the visual impacts these installations will have on-shore, both from the structures and the lighting, on archaeological resources and historic properties listed on,

or potentially eligible for listing on, the National Register of Historic Places. These properties include historic structures, historic archaeological sites, prehistoric archaeological sites, and traditional cultural properties. Our coastlines are lined with many historic properties that potentially could be impacted visually. The determination of whether a property may be adversely impacted is a requirement of Section 106 of the NHPA.

Objectives: The objective of the study is to develop a GIS-based computer tool designed expressly to support the assessment of potential visual impacts associated with offshore renewable energy technologies, including wave, wind, tidal flow, and ocean current facilities.

Methods: The proposed offshore renewable energy facility visual impact evaluation system will consist of a landscape visualization system controlled by and integrated with a Toolbox for ArcGIS Desktop. The project will include a literature review, technology and needs assessments, and development of a computer-based system that incorporates 3D computer models of energy facilities, among other parameters, to identify potential visual impacts from construction of offshore facilities. The project is broken into 7 discrete tasks and numerous sub-tasks.

Current Status: The contract was awarded on October 1st, 2010. A design workshop was held for BOEM staff was held in Herndon, VA, in February 2011, to develop a technical assessment and needs assessment, which resulted in a product design brief.

A contract modification request was approved in July 2011 to allow for ten days of fieldwork assessment in the United Kingdom of existing offshore wind turbine arrays. The fieldwork was carried out at the end of August 2011 and successfully completed 48 daytime and 6 nighttime observations of ten offshore wind arrays from 29 onshore locations. A kmz file, which includes data and photos from this fieldwork, was developed by the contractor.

Systems (hardware/software) testing was completed in the BOEM GOMR office in October 2011. Several issues were identified that will prevent the system from operating within the BOEM Citrix environment. The contractor prepared a list of hardware requirements that BOEM regions will need to acquire for the final system to function properly.

Final Report Due: The Draft of the fully integrated GIS visualization system is due March 31, 2012. The Final is due September 2012.

Publications Completed: The contractors have submitted abstracts for the following conferences based on preliminary assessments of the UK fieldwork: AWEA Regional Wind Energy Summit in Chicago, IL, March 6-7, 2012; MidAmerica GIS Consortium (MAGIC) Symposium in Kansas City, MO, April 22-26, 2012; and the NAEP conference in Portland, Or, May 21-24, 2012. They have also submitted a draft manuscript for publication in the June 2012 issue of Environmental Practice.

Affiliated WWW Sites: None at this time.

Revised date: April 18, 2012