

RENEWABLE ENERGY PROGRAM: Ongoing Studies

Region: Atlantic

Planning Area(s): Mid-Atlantic

Title: Virginia Ocean Geophysical Survey Phase II Analyses: Offshore Virginia Wind Energy Area

BOEM Cost: \$88,800

Period of Performance: FY 2015-2016

Conducting Organization(s): Cooperative Agreement with the Commonwealth of Virginia

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Description:

Background: In 2013, Fugro under contract to DMME and BOEM conducted a regional geophysical survey across the offshore Virginia Wind Energy Area (WEA). That survey and the resulting geologic evaluation provides key, fundamental seafloor and subsurface data and geological interpretation that will help to promote, plan and further the goals of safe, economic and responsible future commercial development of the WEA. This study is using the existing seismic reflection data collected in 2013 across the offshore Virginia Wind Energy Area (WEA) for additional purposes and interpretation. Such additional data processing will enhance the mapping and understanding of the seafloor and near surface geomorphology and geological conditions, and their implications relative to sediment mobility and scour potential around future offshore wind structures and along future cable routes.

The additional processing and data analyses will be used to evaluate different hydrophone streamer configurations and seismic data processing techniques that affect the interpretation of paleo-landforms in support of marine archeological resource assessments *and* geologic interpretation for support of site characterization and engineering studies. The initial Atlantic outer continental shelf (OCS) geophysical surveys have relied primarily upon Chirp data to support marine archaeological assessments. However, the early geophysical surveys indicate that the Chirp signal penetration is often limited to shallow depths and often does not reach the late Pleistocene unconformity or is inconclusive to due to the limited penetration. Imaging the late Pleistocene unconformity and providing high resolution data to aid interpretation of paleo-landforms is highly important for marine archaeological resource assessments. Phase II will evaluate different hydrophone configurations and processing techniques that will be able to mitigate the limitations of the Chirp signal penetration in the Atlantic OCS.

The seismic reflection data collected during the 2013 survey were acquired using a dual plate boomer seismic source and a multichannel hydrophone array (Figure 2). The advanced Geo-Eel hydrophone array included 16 channels at 1.56 meter group interval (mgi) trailed by 16 channels at 3.12 mgi. The data collected can be processed (and then interpreted) as either 16 channels at 1.56 mgi to increase the resolution and detail of the near surface geology or 24 channels at 3.12

mgi to increase the depth of subsurface imaging. After processing two survey lines at as both 16 channels at 1.56 mgi and 24 channels at 3.12 mgi data, the remainder of the data were processed as 24 channels at 3.12 mgi data so as to best meet the 2013 study objectives.

The data set will be reprocessed at 16 channels at 1.56 mgi data for the purpose of increasing the resolution of the shallow subsurface data for enhanced geological and paleogeographical (historical landforms) definition. Since this reprocessing and supplemental interpretation relies on existing data, the work can either be conducted immediately, or delayed so as to match DMME's funding opportunities.

Objectives: The objective of this study is to improve the evaluation of high-resolution seismic data for the evaluation of offshore areas for archaeological resources and geologic structure.

Importance to BOEM: The data evaluation will enable BOEM to provide accurate guidance to industry regarding data collection and ensure that the data are processed to provide the most appropriate information.

Current Status: The study was initiated in February 2015.

Final Report Due: January, 2016

Publications: None.

Affiliated Web Sites: None.

Revised Date: December 15, 2015

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