

**GEO SUBSEA** LLC  
Marine Geoscience Consulting

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## Offshore Wind, Representative Project Career Experience:

### **Cape Wind Energy Project (Nantucket Sound, MA)**

The first permitted large scale offshore wind farm in the US, currently on hold. Seafloor and subsurface mapping conducted for nearly all phases of the project from 2001-2014. Over 5,000 km of trackline data collected since project inception. Wind farm planned with up to 130 WTGs each with 3.6 MW generating capability.

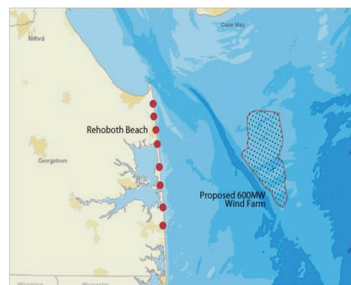


### **Deepwater Wind Block Island Wind Farm (RI Sound, Atlantic Ocean)**

The first operational offshore wind farm in the US. Five 6 MW turbines built in state waters south of the island. Marine geophysical, remote sensing, and geotechnical investigations performed from the start of the project in 2009 up to construction in 2015. Surveys covered the wind farm and cable routes to the island and mainland.

### **Aqua Ventus 1 Project (Gulf of Maine, Monhegan Island, ME)**

Phase 1 hydrographic and geophysical surveys for reconnaissance of the seafloor and shallow subsurface, for WTG siting as well as potential transmission routes to shore (2011-2013). The successful 1/8th scale Voltorn US demo (right) has paved the way for two proposed full scale 6 MW floating turbines off Monhegan Island in over 300 ft of water. The first floating WTG design in the US.

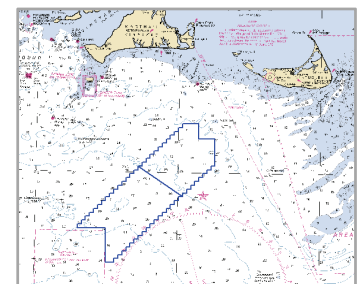


### **Bluewater Wind Project (Atlantic Ocean, DE)**

Proposed plans called for up to 150 WTGs offshore Delaware producing 450-600 MW of energy. Project since taken over by Deepwater Wind. Reconnaissance level geophysical and geotechnical investigations completed for WTG siting and cable corridors to shore, with wind farm sites both offshore and in Delaware Bay (2006-2007).

### **Vineyard Wind Project (Atlantic Ocean, offshore Cape Cod, MA)**

Phase 1 geophysical and geotechnical surveys (2016) in support of WTG layout and siting completed. Deep seismic surveys to develop a geology ground model for foundation design was an important task completed to-date. Potential transmission cable routes to shore to be investigated in 2017 will focus on the seafloor and shallow subsurface, and avoidance of adverse conditions.





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## Wind Project Experience Details:

Planning and execution of offshore wind investigations have been evolving processes in the U.S. due to continuously changing government guidelines. Mr. Gardner is familiar with the regulatory landscape having worked in the industry nearly since its inception. As a result, Geo SubSea has experience working with state and federal agencies to apply best practices and a common sense approach to acquiring information that is representative of the project site conditions. Over the years, Mr. Gardner has dealt with a wide range of issues and has gained significant experience with the following tasks:

- ◇ Pre-survey planning, logistics, mobilization; includes federal and state agency coordination and meetings to satisfy government requirements; communication intensive
- ◇ Organization and scheduling all members of the project team, including field and office groups
- ◇ Planning, supervising, and execution of acoustic noise verification (vessel and equipment)
- ◇ Health and Safety plan implementation and proactive work environment
- ◇ Planning and implementing protected species observers as part of the field program
- ◇ Familiarity of working together with tribal communities and supervising archaeological tasks
- ◇ Supervision of complex field programs involving multiple vessels and variable survey requirements
- ◇ Operation of geophysical systems with onsite evaluation and interpretation
- ◇ Responsible for quality control; ensure high survey data quality for the best scientific information
- ◇ Planning geotechnical data acquisition based on subbottom profiling results
- ◇ Handling, organization, and archival of significant volumes of data
- ◇ Supervision of data processing and product development
- ◇ Perform analysis and interpretation of geophysical data; correlation with geotechnical results
- ◇ Map surface and subsurface geology and geomorphology based on interpretation
- ◇ Identify subsurface paleo-features associated with past coastal environments
- ◇ Produce technical reports to support government submittals; SAP, COP, others
- ◇ Synthesize data and interpreted results into coherent, readable site reports
- ◇ Document and deliver all data (digital and hard copy) required for agency submittal
- ◇ Presentation and effective communication of results to the client and agencies

Geo SubSea is very familiar with the marine aspects of developing an offshore wind farm in the US, and has been involved in most overwater program tasks that require some form of surveying. This knowledge and experience is brought to each project the company is involved with to streamline and enhance the process, working hard to ensure marine scientific data can be used by all project team members to satisfy multiple objectives. Successfully meeting project deadlines, receiving government approval, and moving the development forward has been achieved in all cases.

