

## **Geophysical Investigations for Offshore Wind Farm Development**

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**Abstract:** The burgeoning offshore wind energy sector demands thorough and precise site characterization to reduce risk, reduce costs and ensure the safe and efficient development and operation of wind farms. Geophysical surveys play a critical role in this process, providing essential information about the seabed and subsurface conditions.

The information provided by the Geophysical surveys is critical to the design of the Windfarm platforms, the safe and rapid installation of the turbines and the reliability of the windfarm fields.

The large area required to install a modern windfarm and the necessity for very high resolution in the first 30 m of the seabed has driven new developments in the equipment, deployment and acquisition of seismic reflection methods to obtain the required resolution in an efficient manner. In addition the presence of munitions in many areas where windfarm development is occurring has also resulted in significant improvements in the deployment of magnetometers to ensure that those risks are mitigated.

As Windfarm development has moved from its beginning in Europe to areas around the Pacific and the East coast of the U.S. – additional development has been required to characterize the shallow seabed for engineering properties to ensure the ability to continue operation when dealing with seismic events and storm events.

This talk will cover the current state of the art of geophysical surveys for near-surface seabed hazard characterization as well as Unexploded Ordnance mapping and the measurement of seabed engineering properties.



Bart Hoekstra received a B.S. in Geophysical Engineering from the Colorado School of Mines in 1984 and a Master of Electrical Engineering from Rice University in 1987. He spent the first 17 years of his career as a consulting geophysicist working for several different companies performing surveys for a variety of objectives including Hydrocarbon,

Mineral and Groundwater exploration as well environmental hazards and Unexploded Ordnance detection. In 2006 he began work for Geometrics – a geophysical equipment manufacturer as a Product Manager and has since worked in business development roles and is now currently President of Geometrics. He has presented several papers at Geophysical conferences and has served as President of the Environmental and Engineering Geophysical Society (EEGS)

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