EUROPEAN-AMERICAN
COLLABORATION IN WIND ENERGY

MONTHLY WEBINAR SERIES

Observations and Multi-scale Modeling off the U.S. West Coast

Dr. Raghu Krishnamurthy
PACIFIC NORTHWEST NATIONAL LABORATORY

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Please join us via zoom

ABSTRACT To accurately assess the hub-height wind resource and model uncertainty, the U.S. DOE in collaboration with the Bureau of Ocean Energy Management deployed two lidar-equipped buoys off the coast of Morro Bay and Humboldt within regions designated for wind energy deployments. These buoys were deployed for an entire annual cycle and provided measurements of winds and turbulence, surface meteorology, sea surface temperature, solar radiation, 2-dimensional wave spectra, and ocean current profiles of speed and direction. These measurements are valuable for studying basic science with regards to offshore wind profiles, validating or calibrating atmospheric and oceanographic models and developing new parameterization schemes. In this presentation, we will provide a summary of the wind resource off the U.S. West Coast, reanalysis model errors, an assessment on the advantages/disadvantages of coupled wind-wave modeling during conditions with large reanalysis model errors, and finally novel multi-day high-resolution large-eddy simulations of a frontal passage followed by post- frontal clouds over the U.S. West Coast wind energy lease areas will be presented. These observations and simulations provide information to address some of the challenges for floating offshore wind along the U.S. West Coast and highlight areas of further improvement for reducing uncertainty of offshore wind resource assessment.

BIO At Pacific Northwest National Laboratory, Dr. Krishnamurthy is leading a multidisciplinary team of atmospheric and oceanographers to better understand the offshore environment for wind energy applications, which is critical to energy and national security needs. Within the wind energy portfolio, he is currently the principal investigator for DOE's Lidar Buoy Program, Wind Forecasting Improvement Project Phase 3 (WFIP3) focused on U.S East Coast resource assessment and forecasting challenges, and Observationally Driven Resource Assessment with Coupled Models (ORACLE) focused on U.S. West Coast resource assessment challenges. He is also an instrument mentor for the Doppler lidars within DOE's Atmospheric Radiation Measurement (ARM) Program.