

Offshore wind flow variability from ship-borne lidar measurements. Yelena Pichugina, CIRES/NOAA (USA); Robert Banta, Alan Brewer and Mike Hardesty, NOAA (USA).

ABSTRACT

In this paper we analyze an existing data-set of wind-speed and wind-direction profiles from the water surface up to several kilometers obtained during a research experiment off the New England coast in July-August 2004, a region planned for development of wind farms in the near future.

The measurement system is NOAA/ESRL's scanning, pulsed, coherent Doppler lidar system equipped with a sophisticated motion compensation system that allows the winds to be measured to high accuracy.

Analysis of wind flow over a wide range of heights, spatial variability along the shore line and at distances from coastal area and examples of error in the actual and predicted wind resources will be given. These results will illustrate of the kind of information available from remote sensing instruments for wind energy research and show the value of the existing data sets to gain greater insight into the characteristics of offshore flows at turbine heights for better understanding of the range of marine atmospheric conditions.