



Creating synthetic wind speed time-series in the Southern Baltic area

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The aim of the research was to identify the possibility to use the Weather Research and Forecasting Model 3.1 (WRF) for creating synthetic wind speed time series in the southern part of the Baltic Sea. The increase of interest in renewable source of energy in connection with changes in climate policy for next couple of years will initiate the study for another profitable location, especially for wind farms. The Polish offshore areas of the Baltic Sea within administrative boundaries of country are usually shallow and favorable from geotechnician point of view. However, there is a planners strong need for long term synthetic and high resolution wind data, which cannot be provided by statistical downscaling techniques due to lack of long term meteorological measurements.

Author try to present method of creating of 1-hour wind speed time series derived from NWP model forced by NCEP/NCAR reanalysis. The dataset was constructed for the period of 1991-2000 using 2-way nesting domains with the horizontal grid size of 10 kilometers. Additional vertical layers inside the boundary layer were set to estimate the wind speed on predicted wind turbines height (i.e. up to 200m above sea level).

Realism of spatial and temporal structure of dataset was validated using measurements from some of the coastal meteorological stations. Also the estimation of Weibull's distributions' parameters and simple calculations for comparable offshore and onshore wind farms were done. In conclusion it must be noticed that suggested methodology may be applied to any coastal region in the mid-latitudes, with lack of synthetic wind speed dataset for wind farm siting purposes.