

6B.5 WRF 2-km wind resource dataset over North Sea area

Hartmann, Hugo, Daniel van Dijke, Sally Webb, Laura Gunn, and Clare Allen,
Meteogroup, Netherlands

New wind farms, oil/gas rigs or onshore intake terminals, are usually screened on the basis of the wind atlas on site. However, meteorological wind data of global weather prediction models is usually not sufficient for siting purposes. Site observations are often not available for a long time period and they are not (always) representative for facilities occupying a large footprint.

A solution to the problem outlined above is to downscale global numerical reanalysis data to a spatial resolution of the order of a kilometer. The advantage of reanalysis data is that it is available over a long time period and observations have been assimilated into the dataset. The challenge is to generate a high resolution wind map by using a high resolution meso-scale model.

We have selected WRF, fed by ERA-interim reanalysis data, to model the North Sea and surrounding countries (i.e. United Kingdom, Southern Norway, Netherlands, Belgium and parts of Denmark, Germany and France comprising a total area of ~2,200,000 km²) at a spatial resolution of 2 km over a period of 10 years.

We have carried out a thorough verification analysis comprising basic point verification scores (bias, mean-absolute error), comparison of wind roses and annual wind distributions, and quantile-quantile plots. Based on this analysis, we concluded to have obtained a high quality wind climatology dataset on a high resolution over the North Sea area.

This presentation highlights all aspects that have contributed to this dataset, from running the massive simulations on HPCC's, through post-processing and extracting time series at all WRF grid points, to the final verification studies. In addition, a brief summary will be presented on a similar study for an onshore terminal close to Hammerfest, Norway.