Are two years long enough? – The effect of the length of numerical model data on wind resource assessments

Jessica Standen, Karen Walter, Clive Wilson, and Alasdair Skea
Met Office, Exeter, UK (jessica.standen@metoffice.gov.uk)

Numerical weather prediction models are increasingly being used for wind resource assessment, but often they are only run for a short period of one or two years. These are then usually used to correct a long term dataset, for example re-analysis data. However, is using a period of only one or two years long enough to be able to represent the long term climate in terms of both average wind speeds and annual variability? Ideally very long consistent data sets would always be used, but in practice this is often not possible as they are expensive to generate, both in time and computational resources and pre-satellite era can have limitations in initialisation data.

The Met Office has generated a number of hindcasts for a variety of purposes including for use in resource assessments for wind energy. One such hindcast covers most of Europe at 4.4km resolution for 35+ years (1979-present). This was produced by downscaling ERA-Interim using a nest of two limited-area configurations of the Unified Model (12km and 4.4km).

This long and consistent data set makes it possible to investigate the levels of uncertainty associated with using different length periods at a variety of types of locations across Europe. This builds on previous work looking at the effects of various sampling methods of varying complexity on the resultant average winds. This new work will go further looking at individual time series at typical hub heights and not just at the average winds but also the variability of the winds and quantify levels of uncertainty. The results of this work will assist with decisions regarding the length of future hindcasts over new areas for resource assessments, striking a balance between time and computational resources and levels of uncertainty.