Abstract

Storms cause severe damages and cost lives. In order to assess the severity of storms, historical data sets such as reanalysis data can be employed. This kind of data is based on numerical weather prediction models. The realism of model data is limited by the spatial resolution of the model. A numerical weather prediction model is only as precise as its grid distance, meaning that a model cannot detect phenomena occurring on scales smaller than the grid distance of the model. In this study it was investigated whether a data set using a tighter grid distance detects more weather information than one with a wider grid distance. The investigation focused on wind speeds. In order to see how well data sets using different grid distances performed for near surface wind speed, data was extracted from a few days before to a few days after three Swedish storms. The storms were Gudrun (January 2005), Per (January 2007) and Carola (December 1999). The data sets compared were ERA-Interim (80 km grid distance) and the two data sets of the EURO4M project; HIRLAM (22 km grid) and DYNAD (5 km grid). The results showed that the theoretical assumption – that the data set using the tightest grid distance detects the largest values for wind speed – only holds for events of particularly strong winds. During events of lower wind speeds the wind- and kinetic energy representations of the data sets are not ordered as expected according to the theoretical assumption. Observations from one station (Falsterbo) were compared with the kinetic energy representations of the data sets. The results showed that the data sets often overestimated the kinetic energies with respect to the observations. The station chosen was Falsterbo and it turned out to be a poor selection because the models parameterise Falsterbo to be located in the ocean when in fact it lies on a slim peninsula. Lastly, a significance test showed that, with a 95 % confidence level, the average difference in mean kinetic energy between two data sets is not zero, meaning that there is a difference between the data sets. In conclusion, it might still be that the hypothesis is correct, but then it could not be proven with this study.