



High resolution modelling of wind fields for optimization of empirical storm flood predictions

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High resolution wind fields are necessary to predict the occurrence of storm flood events and their magnitude. Deutscher Wetterdienst (DWD) creates a catalogue of wind fields of 39 historical storms at the German North Sea coast from the years 1962 to 2011. The catalogue is used by the Niedersächsisches Landesamt für Wasser-, Küsten- und Naturschutz (NLWKN) coastal research center to improve their flood alert service.

The computation of the wind fields and other meteorological parameters is based on the model chain of the DWD going from the global model GME via a COSMO model with 7 km mesh size down to COSMO runs at 2.2 km. The domain at highest resolution includes a greater part of the North Sea plus the east coast of the UK. To obtain the best possible results nudging runs are made for all historical storms. The global model GME is initialised from the ERAInterim (for storms from 1979 on) and ERA-40 (for storms till 1979) reanalysis.

The data set is presented. Results without and with nudging and from different resolutions are compared to observations. Small-scale convective structures within the storms like rolls and downdrafts are investigated. Different configurations of the tuning parameters in the turbulence parameterization of the model are tested to see the effect on the near surface wind field.