

## **Atlantic -European winter wind storms in the ECMWF Ensemble Prediction System**

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Winter wind storms are the most costly natural hazards in Europe. An estimation of their recurrence period includes large uncertainties, which are related to the small sample that can be obtained from historical records or reanalysis data sets. The archived ECMWF EPS forecasts provide the opportunity to increase the sample size significantly and the ensemble spread represents feasible alternative storm realizations. This includes EPS storm modifications of historical events with a higher damage potential than their historical counterparts. These additional events can be used for an improved risk assessment of winter storms.

Storms are identified and tracked over their lifetime using an algorithm, based on the local exceedance of the 98th percentile of instantaneous 10 m wind speed. A storm severity measure is calculated and used as input for the extreme value theory. To be able to use the data set for estimations of recurrence periods, inhomogeneities arising from major modifications of the operational system have to be taken into account, as well as dependencies between member showing slightly different representations of the same event.

The overall principal properties of storms in the EPS are in good agreement with storms from the ERA-Interim dataset, making it suitable for climatological investigations of these extreme events.

Osinski, R., Lorenz, P., Kruschke, T., Voigt, M., Ulbrich, U., Leckebusch, G. C., Faust, E., Hofherr, T., and Majewski, D.: An approach to build an event set of European wind storms based on ECMWF EPS, Nat. Hazards Earth Syst. Sci. Discuss., 3, 1231-1268, doi:10.5194/nhessd-3-1231-2015, 2015.