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Development of a storm hazard map for Germany

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In Germany, winter storms represent one of the greatest catastrophic potential compared to other natural disasters. The winter gales Anatol and Lothar in December 1999 continued a series of windstorms which caused high losses and fatalities.

The purpose of the project is to develop a highly resolved hazard map for winter storms based on calculations of maximum wind speeds for different statistical return periods. Using meteorological observations of the years 1971-2000, the strongest past storms are detected in the region under investigation. In order to achieve a high spatial resolution of 1 km x 1 km for the map, a mesoscale numerical model (KAMM) is used to simulate the strongest historical storms. Therefore, the corresponding ERA-40 data by the ECMWF of these strongest storm events are used as initialization fields for the model. Then, hazard curves are calculated from the results of the simulations at each grid point of the area investigated using the classical extreme value theory. Finally, ground based weather stations are used to quantify the uncertainties of the modelled hazard curves.

The assessing and mapping of the storm damage risk is done in the corresponding subproject storm risk map Germany, which is part of the risk map project of the Centre for Disaster Management and Risk Reduction Technology (CEDIM) initiated by the University of Karlsruhe and the Geoforschungszentrum Potsdam.