



Estimating the combined risk due to hail, convective gusts and tornadoes

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In Europe, severe convective storms produce losses of hundreds of millions of euros per year due to hail, convective gusts and tornadoes. Individual events can cause losses of more than a billion euros, for example the 2013 loss in Germany due to storm Andreas.

Generalized linear models (GLMs) are often used to link the synoptic situation with the probability of severe weather for individual perils. We present GLM results giving the potential for each peril (hail, tornado and straight-line wind) over Europe in terms of the underlying meteorological conditions. The models are constructed independently using parameters calculated from output of the Climate Forecast System Reanalysis (CFSR) and observations from the European Severe Weather Database (ESWD) to indicate the occurrence of an event.

The results take the form of daily probability maps, from which individual realisations of severe weather events can be sampled. This allows modelling the spatial pattern of individual perils together with the cross-peril correlation in one modelling framework.

The model is used to create a multi-year three-peril event set of European severe convective storms for use in quantifying risk and the potential for loss.