Geophysical Research Abstracts
Vol. 16, EGU2014-15808, 2014
EGU General Assembly 2014

Modelling convective severe weather occurrence using observations, reanalysis data and decadal climate predictions

Georg Pistotnik and Pieter Groenemeijer
European Severe Storms Laboratory, Wessling, Germany (pieter.groenemeijer@essl.org)

Observations of local severe convective events can be combined with atmospheric reanalyses to compute severe weather probability as a function of parameters characterizing the local state of the atmosphere.

Using ERA-Interim reanalysis data and observations from the European Severe Weather Database, we have investigated several ways to express the probability of large hail, tornadoes, flash floods or wind gusts as a function of parameters such as convective available potential energy, vertical wind shear and precipitation.

Our attempts include fitting analytic functions, using smoothers of various kinds, and binning the data within the multidimensional parameter space according to various algorithms. We imposed that any difference between binned observations and the modelled probability function be insignificant at the 95% confidence level. Further tests of robustness of the model were conducted.

A probability function fulfilling this criterion was selected and subsequently applied to the ERA-Interim data as well as to predictions of the decadal forecasting system developed in the MiKlip programme. We investigated climatic and modelled past and future trends of severe convective weather. We will present the (preliminary) results of that effort.