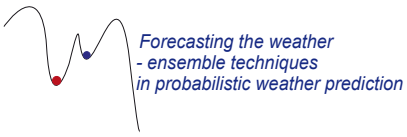
EMS Annual Meeting Abstracts
Vol. 8, EMS2011-578, 2011
11th EMS / 10th ECAM



Non stationary extreme value analysis of wind storms over Europe - An ensemble study

T. Pardowitz (1), M.G. Donat (2), D. Renggli (3), G.C. Leckebusch (1,4), and U. Ulbrich (1)

(1) Freie Universität Berlin, Germany (tobias.pardowitz@met.fu-berlin.de), (2) Climate Change Research Centre, University of New South Wales, Sydney, Australia, (3) SwissRe, Zurich, Switzerland, (4) School of Geography, Earth and Environmental Sciences, University of Birmingham, United Kingdom

Studying the recent storm history of Europe it can be found that most of the losses due to winter storms can be related to very few extreme synoptic systems. This fact expresses the high risk which severe storms pose to European economy and society. Due to their rarity it is naturally difficult to predict changes in the winter storm risk for future climate conditions. In this study we present a framework for the robust assessment of changes in the intensity and frequency of extreme storm events in a future climate. The analysis is based on 8 transient scenario simulations with General Circulation Models (GCM) from the ENSEMBLES project. Each model is analyzed using a wind based tracking algorithm to identify severe storm systems. For each system a Storm Severity Index (SSI) is calculated, which contributes to the sample investigated in this study. The statistical analysis is done using non stationary extreme value analysis, which enables us to derive robust trends in e.g. the return periods of severe storms. As a result for model simulations with greenhouse gas concentrations following the A1B scenario, significant positive trends in the intensity of rare storms are identified for the Scandinavian region. For central and western Europe, positive non significant trends are calculated, while for southern Europe negative trends are detected. The study thus affirms previous studies which analyzed an increased storm activity over central and northern Europe under changed climate conditions.