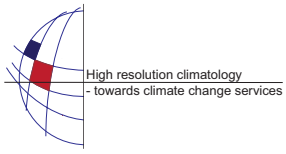
EMS Annual Meeting Abstracts
Vol. 7, EMS2010-635, 2010
10th EMS / 8th ECAC



Projections of extreme indices over Europe from a pattern scaling approach

A. Lustenberger (1) and R. Knutti (2)

(1) Institute for Atmospheric and Climate Science (IAC), ETH, Zurich, Switzerland (andreas.lustenberger@env.ethz.ch), (2) Institute for Atmospheric and Climate Science (IAC), ETH, Zurich, Switzerland (reto.knutti@env.ethz.ch)

Extreme events have a large impact on the society and ecosystems. Therefore, the scientific community and different end-users are interested in future changes of extreme events, i.e. in changes of the frequency, intensity or duration. Unfortunately, the rareness of extremes makes it difficult to apply statistical methods or to model them. For this purpose, the extreme indices suggested by the CCI/CLIVAR/JCOMM Expert Team on Climate Change Detection and Indices (ETCCDI) are used here due to their more moderate character. These indices are based on daily temperature and precipitation data which are the output of spatially high-resolution transient runs computed by different regional climate models in the ENSEMBLES framework and made available by the ENSEMBLES data centre. A further issue is that there are in general only a limited number of simulations available leading to less reliable uncertainty estimations. In this context, the idea of pattern scaling is to create scenarios for time periods or emission scenarios for which no simulations are available. However, there are only a few studies available about the applicability of patterns scaling on extreme indices. Therefore, this project investigates the applicability of pattern scaling over Europe and the associated limitations. For the pattern scaling approach, significant changes in simple statistical quantities, such as for example the mean or the variance, of extreme indices and potential predictor variables are used. Thus, the first step is the detection of statistically significant trends in the extreme indices and predictor variables and the characterization of the significant trends, i.e. if they are linear or nonlinear and additionally characterize their temporal and spatial evolution. In conjunction with the pattern scaling approach, it is important to understand and quantify the temporal and spatial characteristics of different sources of uncertainty adding up to the total uncertainty in the computed scenarios. Further, the influence of model biases and potential nonlinearities in the extreme indices and predictor variables on the pattern scaling is investigated.