EMS Annual Meeting Abstracts
Vol. 8, EMS2011-766-1, 2011
11th EMS / 10th ECAM

Forecasting the weather
- ensemble techniques
in probabilistic weather prediction

Representativeness of the climate change impact analysis based on a subset of available GCMs

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The number of GCM simulations available for climate change impact studies continually increases, which allows for a better representation of GCM related uncertainties. On the other hand, involvement of climate change scenarios based on all available GCMs could imply an unacceptable demands on computer and human resources, so that many impact modellers require only a limited number of climate change scenarios for their studies.
In the first part, we present an algorithm for creating the "representative" subset of GCMs based on two criteria: (i) performance of GCMs to reproduce the present climate, (ii) ability of the subset to represent the variability of scenarios across the whole set of GCMs. This algorithm is applied to the output from IPCC-AR4 GCMs regridded into common 0.5 degree mesh – the mesh of CRU gridded climatological data, which are used here to validate the GCMs quality. The maps showing the subsets for each single gridbox in a whole Europe will be shown.
In the second part, we test the representativeness of the subsets: we show results of the example climate change impact study, in which we compare impacts of the climate change on selected climatic indices based on all available GCMs with those based on the GCM subsets.
The choice of the representative GCM subset may be relatively easy when it is made for a single site (grid box). However, the impact modellers often demand a unique subset for a larger area, e.g. the territory of the Czech Republic, which could rather require different subsets for its individual sub regions. To address this conflict, we will also compare results of the above impact analysis made with grid specific subsets with those made with a unique subset representating a whole territory.

Acknowledgements: The present study was supported by (i) project KONTAKT 10128, (ii) 7FP EU project CLIMSAVE (Contract Number: 244031), and (iii) GAAV Grant Agency (project IAA300420806).