Geophysical Research Abstracts, Vol. 7, 02237, 2005
SRef-ID: 1607-7962/gra/EGU05-A-02237

Potential future change in extreme wet and dry spells in Europe simulated by the HIRHAM regional climate model

W. May and O. B. Christensen
Danish Meteorological Institute (wm@dmi.dk, +45 3915 7460)

In this study the characteristics of wet and dry spells, i.e., extended episodes with and without precipitation, respectively, in Europe are investigated. This is done on the basis of a small ensemble of simulations with the HIRHAM regional climate model at a horizontal resolution of 50 km. 3 simulations for the period 1961-1990 represent the recent climate and 3 simulations for the period 2071-2100 the future climate, that is after a doubling of the atmospheric CO2 concentration compared to recent conditions. The individual ensemble members are driven by lateral boundary conditions from en ensemble of transient simulations with a particular coupled climate model for the respective period. Moreover, observational daily precipitation data from the European Climate Assessment and Dataset project for the period 1961-1990 are considered. In addition to some basic properties such as the frequency and duration of wet and dry spells, the amounts of precipitation associated with extreme wet spells are investigated by means of the Generalized Pareto distribution.

The main focus of this study is to assess potential future changes in the characteristics of extreme wet and dry spells in Europe as a consequence of the anticipated greenhouse warming. This, however, also requires an assessment of the performance of the HIRHAM model regarding this particular aspect of weather and climate by comparing the simulation for recent times with the observational data. Furthermore, the significance of the ensemble technique for the level of uncertainty of the simulated future changes is assessed.