Geophysical Research Abstracts
Vol. 18, EGU2016-7361, 2016
EGU General Assembly 2016

Future changes in atmospheric circulation types and related precipitation extremes in Central Europe

Markus Homann, Jucundus Jacobeit, Christoph Beck, and Andreas Philipp
University of Augsburg, Institute of Geography, Augsburg, Germany (markus.homann@geo.uni-augsburg.de)

The statistical evaluation of the relationships between atmospheric circulation types and areal precipitation events took place in the context of an international project called WETRAX (Weather patterns, storm tracks and related precipitation extremes). The aim of the project was to estimate the regional flooding potential in Central Europe under enhanced climate change conditions.

For parts of southern Central Europe, a gridded daily precipitation set with 6km horizontal resolution has been generated for the period 1951-2006 by the Austrian Zentralanstalt für Meteorologie und Geodynamik (ZAMG). To determine regions with similar precipitation variability, a S-mode principal component analysis has been applied.

Extreme precipitation events are defined by the 95% percentile, based on regional arithmetic means of daily precipitation. Large-scale atmospheric circulation types have been derived by different statistical methods and variables using the COST733 classification software and gridded daily NCEP1 reanalysis data.

To evaluate the performance of a particular circulation type classification with respect to regional precipitation extremes, multiple regression models have been derived between the circulation type frequencies as predictor variables and monthly frequencies of extreme precipitation as well as monthly rainfall amounts from these events.

To estimate the regional flooding potential in Central Europe under enhanced climate change conditions, multiple regression models are applied to different projected GCM predictor data. Thus, future changes in circulation type occurrence frequencies are transferred into assessments of future changes in precipitation extremes on a regional scale.