EMS Annual Meeting Abstracts,
Vol. 6, EMS2009-103, 2009
9th EMS / 9th ECAM

9th EMS Annual Meeting
9th European Conference on Applications of Meteorology
High resolution meteorology
- applications and services

The 2007 flood in sub-Saharan Africa: spatio-temporal characteristics, potential causes, and future perspective

H. Paeth (1), A. Fink (2), and C. Samimi (3)

(1) Universität Würzburg, Geographisches Institut, Würzburg, Germany (heiko.paeth@mail.uni-wuerzburg.de, +49 (0)931 888-5544), (2) Universität Köln, Institut für Geophysik und Meteorologie, Germany (andreas.fink@uni-koeln.de), (3) Universität Wien, Institut für Geographie und Regionalplanung, Austria (csami@geographie.uni-erlangen.de)

We analyse various observational data sets in order to assess and to compare th
spatio-temporal characteristics and intensity of the Sahel flood in 2007 and the associated rain events. The return times are estimated from daily precipitation time series at high spatial resolution and the potential causes are disclosed in a global and regional context. Finally, future changes in the occurrence of such heavy rain events are simulated by a regional climate model in order to judge the flood risk potential until the middle of the 21st century.

Satellite data reveal that the flood was not large-scale but confined to the main river basins in sub-Saharan West Africa. Nonetheless, abundant rainfall prevailed over large parts of western Africa extending north into the western Sahara, particularly during the second half of August and the beginning of September 2007. In detail, the various precipitation data sets differ considerably in terms of the monthly anomalies, demonstrating the difficulty to delineate meteorological extreme events even at a subcontinental scale and during the most recent past. Return times range between 1 and 50 years with high spatial heterogeneity. Among the potential causes we identify a La Nina event in the tropical Pacific, anomalous heating in the tropical Atlantic coming along with a greater depth of the monsoonal westerlies, and enhanced activity of African easterly waves, both evident in 2-6 day zonal wind and outgoing longwave radiation variance anomalies. The future flood risk may be slightly decreasing (increasing) in tropical West (East) Africa.