



Downscaling of drought for Southwest Germany by using circulation types based on NCAR-SLP data and transient RCM-A1B scenario runs

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In June and August 2003 Europe suffered a drought with extreme low flows and an extreme heat wave which caused about 35 000 fatalities and economic losses totalling 13 billion US-\$. Droughts and extreme low flows for Southwest Germany in summer and the vegetation period are mostly linked to a few special circulation types (CP). The methodology of a fuzzy rule based objective CP classification using NCAR-SLP data and time series of daily areal precipitation for several river basins of Southwest Germany will be described. "Critical" drought-CPs, which are causing droughts and low flows in the study area are detected by using a wetness index. Spatial distribution of drought conditions will be illustrated by using maps of wetness index of specific CPs for the State of Baden-Württemberg. Time series of the frequencies and maximum persistence of the "critical" CPs will be analyzed for the observation period (1900-2007) and transient RCM-A1B-Scenario runs (2001- 2100) for three different RCMs. The KNMI RACMO2 model and the MPI REMO model, both driven by the A1B emission scenario of ECHAM5 and 3 ensemble runs of HadRM3 (2001-2099) of the UK Hadley Centre. The results of the statistical analysis of the "critical" CPs will be demonstrated for summer (JJA) and the vegetation period (April-Sept.). A comparison of the results obtained for the observation period (1900-2007) and the transient A1B-scenario runs of 2001-2100 will indicate how the risk of extreme low flows and droughts in summer will change for Southwest Germany in the future for the different RCM runs.