



Adaptation of design flood calculation standards to Climate Change in southern Germany using downscaling from ECHAM4

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After the severe winter floods of Feb. 1990 and Dec. 1993 the analysis of series of annual peak discharges of several river basins in southwestern Germany indicated an increased risk of river flooding due to a changed winter climate which was caused by increased frequency and persistence of zonal circulations. Caspary and Bárdossy (1995) argued that the assumption of stationarity of the annual peak discharges is no longer valid for these basins. After a controversial discussion the water resources management administration (WRMA) of the States of Baden-Württemberg, Bavaria and the German Weather Service (DWD) agreed in 1999 on a joint long term cooperation. The project is entitled "KLIWA" (Impact of Climate Change on Water Resources Management) and is described in detail in www.KLIWA.de. Within KLIWA a detailed analysis was carried out to detect changes in series of observed hydro-meteorological and hydrological data of southern Germany.

Since July 2005 a "Climate Change Factor" (CCF) has to be introduced to the design flood calculation standard in Southern Germany. The presentation will describe the methodology of the CCF calculation and the results obtained for Southern Germany. CCF is derived from downscaled ECHAM4 circulation data for a scenario run (2021-2050) based on IPCC emission scenario B2. Validation period was 1971-2000. The daily runoff data were simulated with the hydrological model LARSIM. The extreme value statistics for a large number of gauges in the State of Baden-Württemberg revealed different CCFs for different recurrence intervals and 5 different regions. CCF has to be used for planning new flood protection measures. CCF introduces the impact of Climate Change to an official engineering standard

of water resources management in Germany for the first time. Detailed information about methodology and results of the KLIWA-project are available as pdfs from www.kliwa.de/de/ergebnisse/index.html.