Geophysical Research Abstracts, Vol. 8, 02590, 2006
SRef-ID: 1607-7962/gra/EGU06-A-02590

Scenario Development for extreme Flood Events in the Mulde Catchment (Germany)

Th. Petrow (1), A.H. Thieken (1), K.-E. Lindenschmidt (1) and B. Merz (1)

(1) GeoForschungsZentrum Potsdam (GFZ), Section 5.4 Engineering Hydrology, Potsdam, Germany (thpetrow@gfz-potsdam.de/Fax. +49-331-288-1570)

Floods are very heterogeneous in their temporal and spatial extent. Large catchment-wide floods show a distinct spatial variability, which depends on the precipitation pattern, geophysical characteristics and local flood protection measures. However, often unrealistic scenarios with a uniform return period (e.g. 100 years) all over the catchment are modelled. In order to develop typical scenarios for extreme floods in the Mulde catchment in south-eastern Germany, a sound analysis of the triggering flood producing processes and subsequent consequences is needed. Therefore, analyses of annual maximum discharge series from 1929 to 2002 were performed, and historical information from chronicles and written reports were included in the analysis. Two governing flood regimes can be identified in the Mulde catchment: The majority of annual maximum discharges occur during the winter time. These are usually not extreme events, and they mostly occur during the snow-melting season in March and April. Summer floods, on the other hand, are less frequent but can reach remarkable magnitudes as experienced in August 2002. The three most extreme catchment-wide flood events (1954, 1958 and 2002), which were all triggered by weather systems with a pronounced trough over Central Europe, show a distinct spatial variability with differences in the return period. The flood events of 1958 and 2002 show a similar spatial pattern with small return periods in the south-western part of the catchment and larger ones in the north-eastern part. The 1954 flood event, however, shows a pattern that is a mirror image of 1958 and 2002, i.e. with large return periods in the south-western part and small ones in the north-eastern part. Until now, no extreme catchment-wide flood occurred, where the precipitation centre was located directly above the catchment causing large damage in the whole area. Therefore, three types of extreme scenarios will be modelled: with the precipitation centre in the western part, in the eastern

part and - as a worst case - directly in the middle of the catchment. Altogether, this methodology provides realistic flood scenarios for the Mulde catchment.