Geophysical Research Abstracts, Vol. 8, 10566, 2006
SRef-ID: 1607-7962/gra/EGU06-A-10566

Comparison of different approaches for calculating flood risk curves along rivers

B. Merz, H. Apel and A. Thieken

GeoForschungsZentrum Potsdam, Telegrafenberg, 14473 Potsdam, Germany,
bmerz@gfz-potsdam.de

Traditionally flood risk analysis and flood mapping are based on a static approach. For a number of return periods T, e.g. 100, 200, 500 years, water levels and associated discharges are calculated at streamflow gauge locations. Using a regionalization scheme, T-year water levels and T-year discharges are assigned to ungauged locations within the watershed. These water levels are horizontally extended across the flood plains to obtain the T-year inundation area. Combining this flooded area with flood damage estimation yields the spatial distribution of the flood damage which is attributed to the respective return period. This approach assumes that (1) flood scenarios are homogeneous throughout the river basin, and (2) the T-year damage corresponds to the T-year discharge. The presentation compares this static approach with a dynamic approach that is based on the combination of dynamic flood simulation models within a probabilistic framework. For the Lower Rhine the dynamic approach links hydrological, hydraulic, geotechnical and damage models in a Monte Carlo simulation. This leads to spatially heterogeneous flood scenarios from which flood risk curves are derived. The comparison of flood risk curves derived by the two approaches shows that the assumptions of the static approach do not hold. Consequently, the static approach may lead to overestimation of the flood risk.