Geophysical Research Abstracts,
Vol. 11, EGU2009-5046, 2009
EGU General Assembly 2009

Early Flood Warning System based on a "Catalogue Concept"

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In this paper we present an early flood warning system on the basis of a “Catalogue Concept”. The hydrological modelling system combines a continuous soil moisture accounting scheme and an event based rainfall runoff model. The continuous model provides information on the a-priori evaluation of the initial conditions and the incorporation of snowmelt, while the event based model is a simple tool for the simulation of catalogue scenarios. The basis for the flood estimation catalogue are predefined flood categories. The classification arises from combining time distribution of precipitation (constant, beginning-accented, end-accented and double-accented), precipitation amount (50mm, 100mm, 125mm, 150mm, 175mm, 200mm, 250mm and 300mm) precipitation duration (12h, 24h, 48h and 72h) and initial moisture state (dry, moderate, wet). Based on precipitation forecasts the catalogue is used to estimate flood magnitudes and their exceeding of recurrence intervals for early warning (1 – 4 days) and pre-alarm warning (up to 24 hours). For proper flood warning, precipitation and water level observations are incorporated.
The straightforward hydrological model and the rough scenario classification provide the original idea of the “Catalogue Concept” of a manageable and significant tool to support the operators of a flood warning system. Though due to this simple structure a certain level of inaccuracy has to be accepted.
Further analysis on the performance of the catalogue based warning system are required for improvements in building categories and modifications of the catalogue system concerning the realistic range. The aim is to strike the balance between the reduction of inaccuracy and the preservation of a simple tool for early warning systems.