Geophysical Research Abstracts, Vol. 9, 08420, 2007
SRef-ID: 1607-7962/gra/EGU2007-A-08420


# Modelling morphological changes during floods utilised as impact on flood risk assessment.

**C. Neuhold**, Ph. Stanzel, H.-P. Nachtnebel

University of Natural Resources and Applied Life Sciences, Vienna, Austria

(clemens.neuhold@boku.ac.at / Fax: +43 1 36006 5549 / Phone: +43-1-36006-5507)

Alluvial river beds are subjected to severe morphological changes during floods. This effect has to be considered in the delineation of flood endangered riparian zones. The objective of this study was to combine hydrological catchment models with a hydraulic and sediment transport model for the main river stem. On the basis of design storms the hydrological model delivered design floods for each sub-catchment which provided hydrographs as an input for the hydraulic model. The concept was tested in an alpine catchment which suffered from three major floods during the last six years. Along sixty kilometres of the river Ill and its tributaries in the western Austrian Alps bed load samples were taken and data of gauges were collected. Based on hourly and daily records a semi-distributed continuous hydrological model was calibrated and validated for a few gauged sub-basins and for the whole river basin having an area of 1300 $km^2$. The parameters for the ungauged catchments were estimated by utilising information from neighbouring sub-basins and by comparing the simulated runoff with the observed discharge at the outlet of the whole river basin. The hydraulic model (GSTAR-1D) was calibrated on the basis of river bed changes measured in the last thirty years. Especially modifications of the river morphology as well as potential sediment inputs from tributaries were analysed for extreme runoff situations. Large uncertainty was in the estimation of the sediment deliveries from the sub-basins. Therefore, the bed load supply was characterised by a probability distribution from which a random input was selected which may vary within a range dependent on the magnitude of flood peak. The respective water tables were calculated by numerous simulation runs and provided thus a probability for inundation along the river. This approach offers the possibility to consider uncertainties in hydrological and morphological data for risk zonation maps.