Performance of regional flood simulations in Austrian Danube tributaries

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The runoff forecasting model for the Danube tributaries in Upper Austria and Lower Austria has been in operational use since 2006. The model is based on a conceptual semi distributed water balance model with catchment sizes ranging from 25 to 25.000 km^2. Input into the model are areal precipitation and temperature data based on the INCA-system developed at the Central Institute for Meteorology and Geodynamics and hourly data from 90 discharge gauging stations for the model updating procedure.

A case study on the effects of modifications in the INCA-system on the hydrological model is presented. The modifications in the meteorological input led to a recalibration of the hydrological model. Data from 6 years (2004 – 2009) were used to recalibrate and validate the model. A comparison of model results with original and modified meteorological input data is shown.

Analyses of the results of the hydrological model include the use of statistical measures as well as an evaluation of peak errors. Snow patterns were evaluated by comparing model results with MODIS data.

The analyses show that model performance strongly depends on the meteorological input and also on the hydrological attributes of the catchments.