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Real time flood forecasting system for the Danube tributaries in Austria

T. Nester, U. Drabek, R. Kirnbauer, and D. Gutknecht
Institute for Hydraulic and Water Resources Engineering, Vienna University of Technology (nester@hydro.tuwien.ac.at)

The 100 year flood at the Austrian Danube and some of its tributaries has produced significant damage in 2002. As part of the future flood management strategy flood forecasting systems have been developed for several Danube tributaries in Upper Austria and Lower Austria. The forecasting model shown here is in operation since 2006.

This paper gives a general overview of the flood forecasting model for the Danube tributaries. Runoff is estimated for all tributaries to the Austrian Danube with a total size of more than 90.000 km^2. The model is based on a conceptual water balance model. The catchments are divided into subbasins with sizes ranging from 25 km^2 to 42.000 km^2 according to on-line available gauging stations. Hourly data from 90 discharge gauges as well as precipitation and temperature data from more than 170 stations were used to calibrate the runoff formation in the catchments. Results from different calibration periods are shown.

Meteorological forecasts are used as input for the hydrologic forecasts. Both deterministic and ensemble forecasts cover a time span of 48 hours. A real time updating procedure based on ensemble Kalman filtering is implemented to have the best initial conditions. The results of the hydrologic forecasting model provide the basis for a hydraulic 1D-model of the Danube river.