



Low flow forecasting for the Austrian Danube

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Cargo traffic on the Danube depends on the water level of the Danube. If the water level is too low, heavy loaded push convoys could strand. Therefore, in the case of low flow periods, push convoys either need to unload parts of their cargo or wait for a higher water level. Both these options are not economic for the shippers. To give the shippers a better possibility to plan their cargo, via donau has commissioned a forecasting system to forecast low flows with a lead time of up to 168 hours.

This paper gives a general overview of the low flow forecasting model for the Danube and its tributaries. Runoff is estimated for all tributaries to the Austrian Danube and the Danube (with a total size of more than 100.000 km²).

The model is based on a conceptual water balance model. The catchments are divided into sub-basins with sizes ranging from 69 km² to 15.000 km² according to on-line available gauging stations. Hourly data from 91 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 168 hours. A real time updating procedure based on ensemble Kalman filtering is implemented to have the best initial conditions.