Validation of the snow component of a runoff forecasting model

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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.

For alpine catchments the time period of snow accumulation and snow melt is very important regarding flood simulations and flood forecasts. The snow routine of the model used is based on a simple degree day factor concept. To verify the results of the snow model a combination of MODIS Terra and Aqua images were used.

Analyses include the spatial distribution of the snow cover within the catchments of the Danube tributaries model. It shows that the spatial comparison of the two data sets (simulated depletion patterns and satellite images) gives good results, depending on the cloud coverage, especially in the Alpine parts of the model area. In the prealpine foothills differences between the MODIS data and the model results can be observed. The results of the analyses of the temporal process of snow depletion show similar results: In alpine catchments the melting process of the snow cover can be simulated quite accurate, whereas there are some differences in the flatter prealpine areas.

Potential future plans of using MODIS data in the forecasting model include the use of the data not only in validation of the model but also in calibration in order to achieve more accurate results for the prealpine catchments.