



Evaluating the snow component of a runoff forecasting model

Thomas Nester and Robert Kirnbauer

Vienna University of Technology, Vienna, Austria (nester@hydro.tuwien.ac.at)

For alpine catchments the time period of snow accumulation and snow melt is very important regarding flood simulations and flood forecasts. The objective of this study is to evaluate the snow routine based on a simple degree day factor concept of a semi-distributed conceptual water balance model calibrated to runoff alone. The model is used for operational flood forecasting in 57 catchments in Austria and Southern Germany and has been in operational use since 2006. Elevation ranges from 200 m a.s.l. to 3800 m a.s.l.

For the evaluation of the snow routine, we have compared snow water equivalents simulated by the hydro-logic model and observed MODIS snow cover data for the years 2003-2009. The snow model performance is evaluated using a combined product of MODIS (version 5) Terra and Aqua images on the temporal and spatial scale as well as with statistical error measures. Results indicate that the model performance is dependent on the choice of the threshold for snow covered area used for estimating snow errors as well as on the cloud cover threshold used for the decision whether a MODIS image can be used for model analysis. The overall model performance is good with 88% of the model area modelled correctly on more than 80% of the days. Analyses of snow patterns for the model region show that the model performs better in alpine catchments and open land and has a tendency to underestimate snow cover in prealpine areas and forested areas.