



Application of MODIS snow cover images to hydrological modeling in Austria

J. Parajka (1,2), G. Blöschl (1) and R. Kirnbauer (1)

(1) Institute for Hydraulic and Water Resources Engineering, Vienna University of Technology, Austria (parajka@hydro.tuwien.ac.at, www.hydro.tuwien.ac.at), (2) Institute of Hydrology, Slovak Academy of Sciences, Bratislava, Slovakia (www.ih.savba.sk)

This contribution presents results of two case studies that use MODIS snow cover images for hydrological modeling in Austria. The main goal of the first study was the assimilation of MODIS snow cover images into a conceptual semi-distributed hydrologic model. The space-time patterns of MODIS snow cover images were used jointly with runoff data to calibrate the hydrologic model for 150 gauged catchments, based on a multi-objective approach. An assessment of runoff and snow model performances in an independent validation period demonstrates that the use of MODIS images improves the simulation of snow cover, but slightly decreases the performance in terms of simulating runoff.

The second case study demonstrates the application of MODIS images in constraining and validating a distributed energy based snow model. The main goal here was to develop a tool for an operational simulation of snow water equivalent in one of Vienna's water supply regions. The results show that spatial patterns of MODIS snow cover images allowed more robust model calibration than was possible by using limited in situ observations alone. The same results were found for the validation of hydrologic simulations using different snow course campaigns.

Both case studies show the potential of MODIS snow cover images, which resulted in robust model calibration and improvements in hydrologic simulations. These results indicate that, in alpine regions with sparse observational data, the remotely sensed images provide a very valuable source of information which has strong potential for operational applications.