



Validating a spatially distributed snow model using MODIS snow data and spring discharge in a karstic aquifer

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This paper presents a framework of combining physically based modelling of snow accumulation and snow melt with hydrological modelling of spring discharge in a karstic system.

The study focuses on the validation of both the spatial patterns and the magnitude and temporal dynamics of the simulated snow water equivalent in the area. MODIS snow cover data is used to spatially validate the model results and the timing of snow melt in spring/summer. Additionally the simulated melt rates are validated by the use of a spatially distributed hydrological model including a karst model to compare the simulated discharge with observations at the outlet of the karstic system. The parameters of the hydrological model are identified by a combination of hydrogeological mapping methods with calibration against observed runoff data, available in a sub catchment at the karst massif, and discharge at the main spring during periods without snow influence. The results show that the use of these different data sources for model calibration and validation leads to a more robust and realistic representation of the snow accumulation and snow melt processes. While snow melt plays an important role, this is vivid to accurately model spring discharge dynamics in a high Alpine catchment.