



## Modelling glacier mass balance and runoff in the Austrian Alps

Bernhard Hynek (1), Wolfgang Schöner (1), Marc Olefs (1), Gernot Weyss (1), Ulrich Strasser (2), Florian Hanzer (2), Michael Warscher (3), and Thomas Marke (2)

(1) Zentralanstalt für Meteorologie und Geodynamik, Vienna, Austria (b.hynek@zamg.ac.at), (2) Department of Geography and Regional Science, University of Graz, Austria, (3) Institute for Meteorology and Climate Research (IMK-IFU), Karlsruhe Institute of Technology, Garmisch-Partenkirchen, Germany

The distributed glacio-hydrological model AMUNDSEN has been applied to simulate glacier mass balance of Goldbergkees ( $1.4 \text{ km}^2$ ) and Kleinfleißkees ( $0.9 \text{ km}^2$ ) and glacial runoff in the corresponding catchment areas ( $2.7 \text{ km}^2$ ,  $2.1 \text{ km}^2$  respectively) in the Austrian Alps. Glacier mass balance and runoff have been modeled for the last six mass balance seasons in a spatial resolution of 10m. The model has been driven with hourly meteorological data from the observatory at Hoher Sonnblick (3105m asl.), situated at the highest point of the catchment areas. The model includes simulation of wind-induced snow transport, gravitational redistribution of snow along couloir courses to calculate accumulation and an energy balance approach to calculate melt and ablation. To model runoff the concept of linear reservoirs has been employed. A multi-validation approach using hourly discharge hydrographs, measured snow water equivalent data at various timesteps, snow cover patterns derived from satellite data and glacier mass balance point data has been used to validate the model results.