



Relict rock glaciers as groundwater storage in alpine catchments – the example of the Seckauer Tauern Range

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Debris accumulations like relict rock glaciers (RRG) might act as groundwater storages in alpine catchments influencing the discharge dynamics of mountain streams. The degree of influence is related to the hydrometeorological conditions and changes seasonally. Especially during drought and flood events, the storage/buffer abilities of RRGs have an impact on the downstream river network. Stream flow could be assured during low flow periods and peak flows might be dampened during storm events. The assessment of the impact is investigated in the Seckauer Tauern Range, the easternmost subunit of the Niedere Tauern Range. In more detail, the discharge of a spring (Schöneben spring) emerging at the front of a RRG draining a catchment of 0.67 km² and discharges at gauging stations Finsterliesing and Unterwald further downstream with areal extents of 7.26 and 44.10 km² respectively are used as input for a lumped-parameter rainfall-runoff model, a modified version of the GR4J (Perrin et al., 2003).

The Schöneben spring is 100% influenced by the RRG groundwater storage, as the whole catchment drains through the RRG. The flow dynamics of the other catchments are influenced only partially by RRGs with 15 and 12% as only headwater sections of it are drained by RRGs. The areal extend of the RRG (sub-) catchments, vegetation, debris in general and bare rock are compared to the storage parameters (routing and production store) of the rainfall-runoff model. As such, the influence of RRGs can be identified even in the overall catchment.

It can be concluded that RRGs, due to their storage and buffer capabilities and abundance in the Seckauer Tauern Range are important for stream basin management and as a water resource for the sensitive ecosystem in alpine catchments.

References:

Perrin, C., Michel, C., Andréassian, V. (2003): Improvement of a parsimonious model for streamflow simulation. *Journal of Hydrology* 279, 275-289.