

DISCHARGE BEHAVIOR OF ALPINE WATERSHEDS INFLUENCED BY RELICT ROCK GLACIERS: EXAMPLES OF THE NIEDERE TAUERN RANGE, AUSTRIA

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Relict rock glaciers are apparent sediment accumulations in crystalline mountain regions influencing the runoff in alpine watersheds as a result of their discharge behavior. However, little is known about their impact on the streamflow further downstream. More than 560 mostly relict rock glacier-related landforms have been identified in the Styrian part of the Niedere Tauern Range (Austria). Large parts of the area are drained through these landforms (27% above 2000 m a.s.l.). The catchment of a single relict rock glacier (Schöneben Rock Glacier, SRG), and two catchments with relict rock glaciers in their headwaters were investigated with a simple lumped-parameter rainfall-runoff model to shed light on this issue. The model parameters of the SRG catchment are in agreement with the existing conceptual understanding of the discharge dynamics, indicating considerable storage and buffer capabilities. Moreover, the parameter configuration of the SRG catchment is used to simulate the runoff of ungauged relict rock glacier catchments in the area. This allows the application of a semi-distributed approach to quantify the impact of relict rock glacier-influenced headwaters on the downstream runoff. The results suggest that the contribution ranges from about a quarter to more than four times its areal share. The highest impact is observed during the late snow melt period and in the late summer. The findings highlight the relevance of these sediment accumulations in relation to water management issues, in particular concerning altering meteorological conditions due to climate change.