



## **Hydrogeological controls on dynamic groundwater storage in Alpine catchments**

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Recent studies suggest a shift of snow-influenced discharges towards earlier periods of the year and a concentration in time of the snow melt discharge. For water resources management, this seasonal pattern is particularly relevant, as shifts to lower flows in summer combined with increased water needs could lead to water shortage. The magnitude of change in discharge dynamics will most probably be influenced by the dynamic groundwater storage (DGS; part of groundwater contributing to streamflow) dynamics in alpine areas and buffer capacity of groundwater. However, the groundwater storage of these areas remains poorly understood.

The main objective of this study is therefore to investigate groundwater storage dynamics in alpine catchments. DGS is firstly quantified for a selection of 14 small alpine catchments across the Swiss Alps using conceptual hydrological modelling and water balances. Results allow an evaluation on how groundwater storage influences the discharge regime under different hydrogeological conditions. Parameters controlling DGS are then identified and the dominant role of geology is highlighted. Finally, we discuss the hypothesis that catchments with higher DGS will show smaller changes in their discharge regime under future conditions due to the buffering effect of groundwater.