Kolloquium Boden und Wasser

13. Februar 2014, 16 ct – 18 Uhr
Hörsaal Fahnenbergplatz (Rektoratsgebäude)

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Alpine Groundwater

High spatial variability in precipitation, runoff, infiltration, and surface flow processes, as well as sparse instrumentation networks and few historical records of climate and hydrology, limit the understanding of the distribution and movement of water in alpine ecosystems. Groundwater recharge and seasonal storage in porous aquifers in alpine terrain above the timberline (2000 m) is often neglected in hydrological models due to a lack of groundwater data at higher elevations. A better understanding and conceptualization of processes and reservoirs in alpine terrain is needed to predict the impact of a melting cryosphere (glaciers, rock glaciers and permafrost) on alpine water quality and quality on a larger scale.

This critical recharge zone covers 23% of Switzerland's land surface and is the source of the country's most important resource: *clean water from a pristine environment*. New floodplains and temporary lakes will form new porous aquifers in alpine terrain. With progressive retreat of Swiss glaciers, other reservoirs, e.g. porous aquifers in alpine terrain, will provide base flow during dry spells in the near future, necessitating research of these systems. Thus we need to quantify alpine groundwater recharge and discharge processes to better conceptualize storage dynamics of high alpine porous groundwater reservoirs.

Alpine groundwater is a primary drinking water resource, which we consider to be pristine, as human impact above the timberline is limited. With air temperature increases as a consequence of climate change, alpine groundwater will increasingly become warmer, potentially intensifying weathering processes or mobilizing new pollutants and thus altering the hydro-chemical composition of alpine groundwater thus threating its purity. Over the past two decades, in remote high mountain lakes, substantial rises in solute concentrations along with increased heavy metal concentrations, e.g. for Nickel, have been observed (e.g. Thies et al. 2007). To assess the impacts on alpine groundwater systems we have to monitor and *quantify these free ecosystem services* particularly those related to water quality and quantity delivered by high alpine terrain.