

Losing and disconnected stream-groundwater interactions in a pre-alpine alluvial system

Context and objectives

Under certain conditions, losing streams in pre-alpine contexts may be disconnected from the groundwater table. Where this occurs, surface water – groundwater interactions will occur via an unsaturated zone of varying thickness. For disconnected streams to maintain perennial flow, the flux of water from higher elevations and the hydraulic properties of the sediments play the deciding roles. Understanding the dynamics of losing and disconnected streams is vital for sustainable water management and the preservation of fragile mountain environments.

The Röthenbach stream is a pre-alpine tributary of the Emme. In its lower section, it is known to be a losing, connected stream, while in its upper section, it is believed to be disconnected from the groundwater table. The goals of this project are to: *a)* localise the point(s) where the Röthenbach stream becomes disconnected and *b)* determine the range of conditions that allow the stream to maintain constant flow under losing, disconnected conditions.

The project

Several MSc projects are possible within the context of the SNSF-funded [RADMOGG](#) project.

This project will make use of extensive groundwater and surface water monitoring installations in the Röthenbach stream. We will use hydraulic measurements as well as geophysical techniques (GPR, ERT) to determine the location(s) above which the stream becomes disconnected from groundwater. We will also employ modelling techniques to investigate combinations of aquifer properties and water fluxes that enable perennial, disconnected conditions in the stream.

Supervision and collaboration

The project will be supervised by Dr. Landon Halloran in collaboration with the RADMOGG team. The student will benefit from synergies with other relevant MSc and PhD projects. Given satisfactory results, eventual publication of a journal article, co-authored by the student, is possible.

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