

Effect of river revitalization on groundwater quantity and quality

Context and objectives

In Switzerland, it is planned to revitalize about 4000km of rivers. Revitalization projects often influence groundwater-surface water interactions and can modify groundwater quality. However, effects on groundwater are often not investigated systematically or too late. The CHYN is currently developing a toolbox to consider groundwater systematically in river revitalization projects. An important step of the analysis is the characterization of initial surface groundwater – interactions as basis to predict project effects. The main objective of the thesis is to test the initial characterization approach at a site where river revitalization measures are planned in the vicinity of a water work.

Methodology

The effect of surface water – groundwater interactions on groundwater quantity and quality will be investigated. The existing monitoring network will be completed with additional boreholes. A broad range of field methods will be employed, covering hydrological, hydrochemical, isotopic and microbial parameters. In particular, the dynamics of surface water infiltration will be evaluated using continuous ^{222}Rn measurements and the effect on the microbial water quality using online flow cytometry. Depending on the interest of the student, it is possible to include some numerical modeling.

Supervision and collaboration

The project will be carried out in close collaboration with the cantonal environmental agency supervising the revitalization project and the water work. The project will be supervised by Daniel Hunkeler and Philip Brunner.

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