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The impact of river restoration on the water quality of the surface water and groundwater in an Alpine catchment.

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ABSTRACT

The importance of river restoration projects can only be realized upon evaluating their success or failure in a region mainly with regards to water quality, ecological adaptations and flood mitigation.

The Thur catchment in North eastern Switzerland is chosen as the study area. The water quality along the entire river reach (with the corresponding groundwater monitoring wells) will be analyzed with regard to the existing land use and a comparison shall be made with the water quality in the restored river sections of the river. A restored river section at Niederneunforn has been heavily monitored as part of the RECORD project and this data shall be vital for the present work.

The water quality changes are to be observed by relating to some of the basic parameters like pH, electrical conductivity, dissolved oxygen, total organic carbon (TOC), total inorganic carbon (TIC) , the concentration of ions like chloride, nitrate, nitrite, ortho-phosphate, ammonium and calcium. These are to be measured in both the surface and the groundwater upstream and downstream of the restored section in the study river. Both long-term monitoring as well as localized water sampling campaigns are planned as part of the study. Use of the stable isotopes of oxygen and nitrogen is to be done to trace the possible sources of contamination in the river reach.

This study shall aim to answer the following questions:

1. What are the diurnal and seasonal water quality changes in the Thur river; upstream and downstream of the restored section?

2. Are there any links between the different water quality parameters and how does the restored section influence these links?

3. How does the water quality change from the river to the groundwater (due to the recharge) between the restored and the unrestored river sections?

4. How does the land use in the catchment affect / alter the water quality in the river?
-Is there high pollutant load from a particular waste water treatment or more agricultural runoff from a certain area?