

## Traditional water meadows as a method of groundwater recharge in the context of climate change

### Context and objectives

Groundwater recharge from precipitation is expected to decrease due to climate change, potentially limiting the availability of groundwater for water supply and ecosystems. Artificial recharge is increasingly considered to counteract this trend. Controlled flooding of meadows with river water is a century-old approach to increase the productivity of meadows. It may also be beneficial for groundwater recharge, which has not been systematically studied.

The aim of the project is to investigate whether flooding of meadows leads to increased groundwater recharge, how long the additional water is stored in the aquifer, and how the additional recharge affects discharge to springs and ecosystems. It will also be investigated how the flooding influences groundwater quality. The project will be carried out in the region of Oberaargau, Switzerland, where century-old water meadows have recently been declared a UNESCO World Heritage Practice.

### Methodology

A wide range of field and computational methods will be used. The field investigation will be planned around meadow flooding events. Hydraulic properties of the soils will be determined. Groundwater levels and discharge to springs and streams will be recorded continuously. Environmental and artificial tracer methods will be used to follow the infiltrated water through the aquifer. Water quality analyses, including micropollutant analysis, will be used to investigate potential substance inputs into the aquifer from the river and from soil flushing. A recently developed numerical groundwater model can be used for quantitative interpretation of the results.

### Supervision and collaboration

The project will be supervised by Daniel Hunkeler and Philip Brunner. The project will be carried out in collaboration with cantonal agencies, the local association managing the water meadows, and the water works in the region.

Contact : Daniel Hunkeler, [daniel.hunkeler@unine.ch](mailto:daniel.hunkeler@unine.ch)



Figure 1: Water meadows in Oberaargau.