RECHARGE DYNAMICS IN THE SEELAND AQUIFER-2 MASTER PROJECTS

Context and objectives

The Seeland is one of the most important agricultural areas in Switzerland. Irrigation demands are increasing, with a large amount of irrigation water originating from the aquifer. Understanding recharge dynamics in this context is essential to elaborate the potential for irrigation, as well to provide guidance on a sustainable management of the water and soil resources. In this context, the CHYN is involved in several projects with the FOEN (BAFU) and Agroscope. For the canton of Berne, the CHYN currently develops a numerical FeFlow model. Two master thesis are available focusing on the Seeland aquifer: One with the focus on recharge dynamics through the soil under consideration of soil compaction and drainage, and one on the relative contribution to recharge through the Aare river and precipitation. Both projects focus on the southern part of the Seeland aquifer system.

Research approach and methodology

Recharge dynamics are poorly understood in the Seeland. Several factors complicate recharge assessment: aquifer recharge through rainfall and irrigation is influenced by varying degrees of soil compaction, the lateral inflows of the aquifer are unknown, the role played by the drainage network in the aquifer dynamics is poorly known and the river-aquifer interactions remain largely unexplored. These aspects are investigated in the context of two master thesis projects. Depending on the interest of the student, a wide range of activities and investigations can be carried out including the following: (a) Use of isotopic signatures to identify the relative contribution of river infiltration vs recharge through precipitation (b) Develop a better understanding of surface water groundwater interactions (rivers and drainage channels) (c) Characterize the spatial variability of recharge based on infiltration measurements (d) Evaluate recharge dynamics under different crop- and groundwater conditions. Both projects have a modelling and a field component.

Partners and collaboration

The project will be supervised by Prof. P. Brunner, Prof. D. Hunkeler and F. Cochand. **Contact for further information:** philip.brunner@unine.ch