

MICROPOLLUTANTS AS NEW GROUNDWATER TRACERS: TURNING A PROBLEM INTO AN OPPORTUNITY

Contexte et objectifs

With the growing use of chemicals in modern society and advances in analytical methods, micropollutants such as pharmaceuticals, consumer care products or pesticides are increasingly detected in water. While micropollutants are an important water quality challenge, they also offer new opportunities as a tracer to investigate groundwater-surface water interactions and the dynamics of groundwater flow systems.

The aim of the project is to make use of a diversity of natural tracer and micropollutants to investigate recharge processes and groundwater flow pattern at a study area in Daillens, Canton de Vaud.

Méthodologie et approches

The study will combine field approaches and numerical modeling. The field site consists of a small alluvial aquifer system that is used for drinking water supply. The aquifer is recharged by two streams and rainfall percolating through agriculture soils. The three types of recharge waters are expected to have their own micropollutant signature. Both streams are influenced by wastewater treatment plants. However, as one plant is connected to a hospital but the other not, the micropollutant signature should be different. In water percolating through agriculture land, elevated concentrations of nitrate and pesticide metabolites occur.

The students will collect surface and groundwater samples from an existing monitoring network. He/she will evaluate micropollutants and natural tracer patterns and explore which substance is best suited for characterizing the contribution of a specific recharge source. The student will then use the tracer data to calibrate a numerical model of the groundwater system and investigate the origin of groundwater that is captured by the pumping well.

Partenaires et collaborations

The field work will be supported by a PhD student (Simone Hintze), the modeling component by a postdoc (Dr. Landon Halloran).

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