

Effect of surface water-groundwater interactions on PFAS distribution

Context and objectives

The presence of PFAS in groundwater and surface water is a growing environmental concern worldwide, with potentially far-reaching implications for water supplies. Due to their high stability, PFAS can migrate long distances in groundwater, exfiltrate into surface waters, and enter the food chain via irrigation or uptake by aquatic organisms. Little is known about the processes that control the migration of different PFAS through aquatic systems. The main objective of the project is to investigate how groundwater-surface water interactions influence the distribution of PFAS in aquifers and surface waters.

Methodology

The project will be carried out downgradient of an industrial site with a known PFAS source and plume. PFAS are also present in a pond and canal downgradient of the site. A broad range of field methods will be applied. Additional piezometers will be installed around the pond. Hydrochemical, environmental tracer and artificial tracer methods will be used to investigate interactions between groundwater, the pond and the canal. Based on the results from the field campaigns, a conceptual model of how the interactions among groundwater, pond and canal influence the type, spatial distribution and concentrations of PFAS in these water bodies. Depending on the interest of the study, a numerical model could be established as well.

Supervision and collaboration

The project will be carried out in close collaboration with the cantonal environmental agency in charge of contaminated sites and the federal office of the environment that supports the project. In addition, the student might interact with the site owners, a consulting company supporting the extension of the monitoring network, the drilling company and cantonal agencies managing the surface water bodies. The project will be supervised by Daniel Hunkeler and a PhD student, Francesco Scattolini, working at the site.

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