

Investigating the connectivity between groundwater and surface water within agricultural fields and catchments

The fluxes of nitrogen that originate from anthropogenic activities including farming are entering water bodies and posing serious threats to freshwater sources worldwide. So far, numerous best management practices (BMPs) have been developed and implemented to reduce the risk of water quality deterioration locally. However, the focus has often been on improving surface water quality, while the impact of agriculture and effectiveness of BMPs on improving groundwater quality have mostly been ignored.



Streamflow measurement

In this thesis project, the objective is to understand the interaction between surface and groundwater, in selected fields and catchments under non-structural BMPs in Sweden. The project will use long-term water quality data that has been collected from streams leaving agricultural farms and agriculturally dominated catchments, and from ground water wells within same locations. The data covers more than 20 years and analyses can advance the knowledge on the long term impact of BMPs on water bodies in subsurface and underground, and to eventually develop customized management practices that corresponds to unique characteristics of each area (slope, soil texture/type, etc).

This specific study is part of the work “Analysis of soil and water monitoring data and effects of agricultural management practices by “Agricultural Water Management Group” at the Department of Soil and Environment. The thesis findings will contribute insight into understanding the link between ground water quality and surface water quality leaving agricultural farms and associated agricultural catchments in Catchment Monitoring Programme in Sweden. It would also shed lights on possible retention/propagation of impacts in field-streams and field-catchments and therefore defines the future work needed.

The ideal candidate should have good knowledge of scientific computing environments (statistical and modelling techniques with R, Matlab, etc), some expertise in the use of GIS, feels comfortable to work with big data, and ideally have basic knowledge and interest in hydrology. Field trips to observe the water sampling methods in place and observing the catchments/fields might be expected.

This project is planned to start in January 2020 for a 30-credit MSc thesis in Environmental Science.

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