

## Postdoctoral research project

# DOCUMENTING HOW NATURE-BASED SOLUTIONS REDUCE HYDRO-GEO-LOGICAL HAZARDS AND CONTRIBUTE TO CLIMATE CHANGE ADAPTATION

Rural watersheds are experiencing water quantity and quality stresses. These stresses will be magnified by climate change due to more frequent droughts and extreme storm events that will influence how water is stored and flows, further impacting water availability and nutrient transport. Nature-based solutions (NBS), including wetlands, river corridors, and forests, are increasingly considered to mitigate the impacts of hydrometeorological hazards and increase watershed resilience to climate. However, NBS are not well understood and are seldom implemented in agricultural watersheds.

The aim of this postdoc project is **to better understand how NBS can reduce hydrological hazards and contribute to climate change adaptation in agricultural areas from hydrological and hydrogeological perspectives**. The project will include 1) documenting the role of NBS in agricultural areas in climates comparable to that of southern Canada, 2) reconstructing past and current NBS in agricultural watersheds of southern Ontario, and 3) develop a range of plausible NBS options for this region and for others in similar environments to increase watershed resilience under changing climatic conditions. The project is part of a larger research initiative led by a team of researchers from University of Guelph and UQAM, with funding from NSERC-Alliance, in partnership with the Ontario ministry of Environment and the Grand River Conservation Authority. A MSc project (starting summer 2025, UQAM) will focus on quantifying the hydrological impacts of NBS in the study area. Outcomes of the postdoc project will be used as inputs in the Master project, thus offering supervision opportunities.

Inspirational article in newspapers in [English](#) and in [French](#).

**PREREQUISITE** PhD in Hydrological sciences, Agricultural sciences, or a related field; Strong background in hydrogeology and water resource management; demonstrated abilities to publish original work in international journals; and interest in supervision. Proficiency in French is an asset but not required.

**OUTCOMES** The project aims for the publication of at least two peer-reviewed papers, participation in conferences, collaboration with a dynamic and high-profile research team, and the development of a professional network across academia, industry, and stakeholder communities.

**SALARY** 70 000\$/year

**DURATION** 18 months, full time, starting as soon as possible in 2025

**SUPERVISORS** **Marie Larocque**, groundwater specialist and professor at the Department of Earth and atmospheric sciences UQAM (Montreal, Canada) ([larocque.marie@uqam.ca](mailto:larocque.marie@uqam.ca)), **Emmanuel Dubois**, groundwater specialist and grant-funded researcher at the Department of Earth and atmospheric sciences UQAM (Montreal, Canada) ([dubois.emmanuel@uqam.ca](mailto:dubois.emmanuel@uqam.ca)), and **Jana Levison**, groundwater specialist and professor at the Civil Engineering department University of Guelph (Guelph, Ontario, Canada) ([jlevison@uoguelph.ca](mailto:jlevison@uoguelph.ca)).

**APPLICATION BY EMAIL INCLUDING :** 1) Motivation letter, 2) Full CV, 3) BSc, MSc, and PhD transcripts, 4) Contact details for two references, 5) Selection of max. 3 authored papers with short presentation of the scientific contribution and role in the writing process.

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