Collaborative Postdoctoral, PhD and MSc Positions in

Adaptive Management of Green Stormwater Infrastructure to Reduce Greenhouse Gas Emissions from Urban Watersheds

We invite applications for two postdoctoral fellow (PDF), five PhD and two MSc positions to participate in a collaborative research project to assemble and propose solution options for urban green stormwater management (SWM) infrastructure that optimize the reduction of greenhouse gases (GHGs; CO_2, CH_4, and N_2O). The project aims to quantify the landscape-scale drivers and processes within stormwater ponds (SWPs) and bioretention systems (BRSs) that control GHG exchanges. The resulting knowledge will be integrated into robust representations of SWPs and BRSs in coupled hydrology-biogeochemistry models to analyze the responses of urban GHG emissions and nutrients export to the implementation and management of green SWM infrastructure.

The main supervisor for each position is listed in parentheses; however, each position will have an interdisciplinary supervisory team consisting of multiple project team members.

Instructions for applying can be found below.

PDF-1 will use statistical predictors including land use/land cover, climate variables, event characteristics, and system design to identify drivers of GHG emissions from green SWM infrastructure. (Elodie Passeport, University of Toronto)

PDF-2 will use biogeochemical modeling to predict GHG emissions from green SWM systems and propose solution options for municipal and regional climate action. (Philippe Van Cappellen, University of Waterloo)

PhD-1 will quantify GHG emissions from green SWM infrastructure using existing GHG emission data plus field monitoring of GHG fluxes at SWP and BRS sites with fixed and floating chambers. (Fereidoun Rezanezhad, University of Waterloo)

PhD-2 will focus on processes controlling the organic and inorganic carbon cycles in SWM systems to identify external and internal sources and sequestration pathways for GHG emission reduction. (Scott Smith, Wilfrid Laurier University)

PhD-3 will generate mass balances of carbon, nitrogen and phosphorus in SWM infrastructure to assess trade-offs between GHG reduction and water quality protection. (Philippe Van Cappellen, University of Waterloo)

PhD-4 will simulate and analyze management scenarios with variable SWM configurations

and hydroclimatic conditions in urban watersheds to optimize the reduction of GHG emissions at the watershed scale. (Andrea Brookfield, University of Waterloo)

PhD-5 will test the full-scale feasibility of geochemical interventions in SWPs and BRSs that increase carbon sequestration in green SWM infrastructure. (Bahram Gharabaghi, University of Guelph)

MSc-1 will determine the rates of carbon sequestration in green SWM systems with the focus on CO_2 saturation and carbonate mineral sequestration potential. (Fereidoun Rezanezhad, University of Waterloo)

MSc-2 will simulate and analyze the vulnerability of GHG emissions from SWM infrastructure to changes in urban watershed hydrology including more extreme flooding and drought events. (Andrea Brookfield, University of Waterloo)

The PDFs and students will work closely together within a highly interdisciplinary team of researchers from University of Waterloo, Wilfrid Laurier University, University of Toronto and University of Guelph. The research team will regularly interact with scientists, practitioners, decision-makers, and public participants from stakeholder organizations, including Environment and Climate Change Canada (ECCC), Toronto and Region Conservation Authority (TRCA), City of Kitchener, Ontario Clean Water Agency (OCWA), Muslim Families, and Crozier & Associates Consulting Engineers.

Applicants must have (or expect to soon complete) a degree relevant to the position applied for. Preference will be given to candidates with strong quantitative skills and demonstrated experience in one or more of the following or closely related areas: biogeochemistry, aquatic chemistry, hydrology, soil science, and environmental modeling and risk assessment. There will be flexibility in locations of the positions. Exceptional candidates who prefer to undertake a Master's degree in one of the PhD topics above will be considered.

Please submit your application package electronically as a single pdf file to Anita Ghosh (a9ghosh@uwaterloo.ca). In your email, include "Missions_yourname" in the subject line. Your applications should contain:

- Which PDF, PhD-# or MSc-# position(s) you wish to be considered for
- A letter explaining your motivation to apply
- Curriculum vitae
- Copy of transcripts (unofficial transcripts will be accepted at the application stage)

Closing date: Applications will be reviewed as they are received. Preference will be given to applications submitted before June 1, 2023.

We thank all applicants for their interest, however, only those individuals selected for an interview will be contacted.

The partnering universities in this project are committed to implementing the Calls to Action framed by the Truth and Reconciliation Commission. We regard equity, diversity, and

inclusion (EDI) as an integral part of academic excellence. We are committed to removing barriers that have been historically encountered by some people in our society. We strive to recruit individuals who will further enhance our diversity and will support their academic and professional success while they are here. In particular, we encourage members of the designated groups (women, Indigenous peoples, persons with disabilities, members of visible/racialized minorities, and diverse sexual orientation and gender identities) to apply. To ensure a fair and equitable assessment, we offer accommodation at any stage during the recruitment process to applicants with disabilities.

If you have any questions regarding the application process, eligibility, or a request for accommodation during the selection process, please contact a9ghosh@uwaterloo.ca.