

From: Rebecca Rooney
Subject: PhD Opportunity: Linking Land and Water - Modeling causes and consequences of nutrient loadings to Lake Erie with incomplete information.

Exciting opportunity for a Ph.D. student to join the Lake Futures:
Enhancing Adaptive Capacity and Resilience of Lakes and their Watersheds
project, funded under the Global Water Futures.

The successful applicant will work in the laboratory of Rebecca Rooney (University of Waterloo) co-advised by Jan Ciborowski (University of Windsor) and will enroll in the Doctor of Philosophy (PhD) in Biology-Water graduate program under the Collaborative Water Program, supported by the Water Institute at the University of Waterloo.

Starting date: April 1, 2018
Stipend: 3 years at \$25,000 CDN/yr

Our ability to effectively manage aquatic ecosystems is limited by our ability to monitor system inputs or to predict the complex environmental responses. Both conceptual and mechanistic models are important tools in helping to understand ecological relationships in aquatic ecosystems and to create hypotheses about causal pathways that can improve natural resource management. Fuzzy Cognitive Maps (FCMs) offer an approach that summarizes qualitative and semi-quantitative information.

The student will have the opportunity to evaluate, refine and develop FCM models to improve our understanding of the associations between land-based drivers of eutrophication (agriculture, rural and urban development) and biological manifestations of concern in Lake Erie (harmful algal blooms, hypoxia, Cladophora fouling, botulism).

The model pathways showing the strongest associations between drivers and biological response variables will identify candidate indicator variables whose association with drivers will be subsequently calibrated using machine learning algorithms. Identification of appropriate indicators is a major knowledge gap constraining management of eutrophication-related issues in Lake Erie. This project offers a substantial opportunity for the student to work collaboratively the Lake Erie Management community to plan and undertake co-operative monitoring in Lake Erie and its watersheds.

To be eligible, applicants must have successfully defended and submitted their MSc thesis prior to the proposed start date. Applicants should have strong interests in quantitative ecology and a background in food webs or nutrient dynamics of aquatic ecosystems. They should be highly motivated, with the ability to work independently and collaboratively, and possess strong verbal and written communication skills.

Applications must include a cover letter, C.V., unofficial transcripts, and the contact information of three references. All documentation submitted must be assembled in a single PDF file and sent to: Dr. Rebecca Rooney, c/o Tatjana Milojevic at GWF-UW@uwaterloo.ca with PhD-LFWP3-YourName in the subject line.