



## Two Postdoctoral Positions focusing on Watershed Biogeochemical Data Synthesis and Modelling

The Basu Lab at the University of Waterloo is seeking two postdoctoral associates to quantify the impacts of past and current land use and land management activities on stream and lake water quality.

### **Postdoctoral Fellow 1: Quantifying Past Legacies and its Impact on Current Water Quality**

This position is funded by a Canada-Europe Collaborative Project titled “Legacies of Agricultural Pollutants (LEAP): Integrated Assessment of Biophysical and Socioeconomic Controls on Water Quality in Agroecosystems” funded by the Water Joint Programming Initiative. The goal of the LEAP project is to develop a unified framework that incorporates agricultural legacies and time lags into adaptive management strategies to protect water resources under changing climate and land use. This project involves collaborators in the social and natural sciences across Canada and Europe (Sweden, Denmark and Portugal) and builds on our work on Nutrient Legacies. Some recent successes in this project include our paper in *Science* (<http://science.sciencemag.org/content/early/2018/03/21/science.aar4462>) that was covered extensively in *New York Times*, *Washington Post*, *Chicago Tribune* and *Boston Globe*. The **primary responsibility of PDF 1** will be to further develop the ELEMNT (Exploration of Long Term Nutrient Trajectories) model, which was fundamental to the work reported in the *Science* paper. ELEMNT is a unique model, created by the Waterloo team, that has the ability to predict time lags in watershed response to various best management practices as a function of the accumulated legacies in the landscape. The two primary responsibilities of the PDF will be: a) Develop and implement the Element Model for Phosphorus in Watersheds in the Great Lakes Basin (b) Create an agroecosystem typology that links the biophysical and socioeconomic drivers of non-point source pollution to water quality impacts.

### **Postdoctoral Fellow 2: Integrated Watershed-Lake Modelling**

This position is funded by the Global Water Futures funded project “Lake Futures: Enhancing Adaptive Capacity and Resilience of Lakes and their Watersheds.” The Lake Futures project is a collaboration between natural and social scientists, and aims to deliver adaptive watershed and lake management solutions that minimize trade-offs between lake ecosystems, water uses, and economic growth. The **primary responsibility of PDF2** will be to create and apply basin-scale, coupled lake-watershed models to predict nutrient dynamics from headwaters to offshore waters. Specifically, PDF 2 will (a) develop basin scale water quality models for watersheds draining into lakes Erie and Ontario using the HYPE modeling framework, (b) integrate the impacts of watershed and reservoir management on downstream water quality, (c) collaborate with PDF 1 to integrate the effect of past land use, (d) collaborate with lake modeler Dr. Bocanov at UW to develop coupled watershed-lake models that can be used to predict the effect of current and future land use and climate on lake water quality.

Both these positions will allow autonomy in aligning the project's broad goals with the interests of the successful applicant. Desirable qualifications include a PhD in hydrology, engineering, earth science, biogeochemistry, agriculture, or geography; and experience with GIS. Additional, preferred qualifications include proficiency in handling large datasets (eg NETCDF files), computer modelling, biogeochemistry and familiarity with the HYPE model. The initial appointment is for one year; second year is contingent upon funding and performance. For further information regarding these positions or to submit an application, please contact Nandita Basu (nandita.basu@uwaterloo.ca)

In your application email to nandita.basu@uwaterloo.ca, please include:

- Your motivation for the position (note which of the positions you are applying for) and research interests
- Curriculum vitae
- Copy of transcript(s)
- Contact information for 3 references

**Closing date:** Applications will be reviewed as they are received. The positions will remain open until filled. **We thank all applicants for their interest; however, only those individuals selected for an interview will be contacted.** The University of Waterloo encourages applications from all qualified individuals, members of visible minorities, native peoples, and people with disabilities.