**Fully funded M.Sc. positions at the University of Guelph**

**Hydrometeorological risk indicators IN THE LAKE ERIE BASIN**

**Short project description**: Hydrological processes, including flooding and hydrologic connectivity, are strong drivers of nutrient transport between crop fields and the major rivers that ultimately flow into Lake Erie. Current and future weather extremes are expected to significantly affect those hydrological processes and, subsequently, water-mediated nutrient export. However, typical climate change impact assessments do not explicitly consider hydrologic connectivity from individual crop fields to aquatic systems. The goal of this project is therefore to establish statistical relationships between risk indicators pertaining to extreme weather, flooding and hydrologic connectivity in the Lake Erie Basin, under historical conditions as well as future climate change scenarios. The research conducted under this project will combine methods and models from hydrology, remote sensing, geomatics, and graph and network theory. **This project is co-led by Dr. Genevieve Ali (**[**gali@uoguelph.ca**](mailto:gali@uoguelph.ca)**), Dr. Ben DeVries (**[**bdv@uoguelph.ca**](mailto:bdv@uoguelph.ca)**) and Dr. Wanhong Yang (**[**wayang@uoguelph.ca**](mailto:wayang@uoguelph.ca)**)**

**Number of positions available**: 3 M.Sc. positions based at School of Environmental Sciences (SES) and the Department of Geography, Environment and Geomatics (GEG) at the University of Guelph. The three students to be recruited will focus on the Lake Erie Basin and work on: 1) the estimation of extreme weather risk indicators using gridded climate data from the past 30 years; 2) flood mapping and the characterization of hydrologic connectivity under historical conditions using optical and radar satellite data and graph theory metrics; and 3) the prediction of extreme weather, flooding and connectivity risk indicators under various climate change scenarios.

**Desired background**: This project is computer-based and requires strong quantitative data analysis (including GIS and remote sensing) and programming (e.g., R, MATLAB, Python or C++) skills. Students with undergraduate degrees in geography, mathematics and statistics, computer science, environmental science, ecology, biology/bioinformatics or engineering are especially invited to apply.

**Start date**: September 2020 or January 2021

**APPLICATION PROCEDURE**

To apply for a position associated to a particular project, please ensure to:

* Indicate, in the subject header of your email: “Application – Hydrometeorological risk indicators project”
* Briefly describe, in the body of your email, your interest in the project you selected
* Attach to your email a single pdf file that includes: a) your curriculum vitae, b) copies of your undergraduate (and, if applicable, graduate) transcript(s), and c) contact information for up to 3 references.
* Send your application package to all project leaders (email addresses are listed above)

**Closing date**

Applications will be reviewed as they are received, and all positions will remain open until filled. While all applicants are thanked for their interest, please note that only those selected for an interview will be contacted.