

Characterization and control of microplastics across remote, rural and urbanized environments

University of Windsor, School of the Environment

About the project:

A fully funded PhD studentship in the area of microplastics pollution control, catchment hydrology, sediment dynamics and process-based modelling is available under the supervision of Dr Jill Crossman, at the University of Windsor. The student will use both emerging and established analytical and modelling techniques in characterizing sources and transport pathways of microplastics across a remote, rural and urban gradient, and quantifying the effectiveness of select microplastic control strategies.

International concern is mounting regarding risks of microplastics (MP) accumulation, associated with long residence times, ubiquity, and propensity for ingestion. In response the Canadian government has developed strategies to reduce plastic waste, such as the addition of specific plastic products to a list of toxic substances controlled under the Canadian Environmental Protection Act. The government's intent to control plastic pollution highlights knowledge gaps in MP research, including a need for improved understanding of major sources in order to perform targeted MP reductions. And to obtain benchmark data on levels of MPs in the environment before evaluating control measures. This project takes a systems analysis approach to addressing these gaps. Using new source identification and tracking methods, we will quantify MP sources, transport pathways and fate in Canadian watersheds. An existing process-based model will be refined to incorporate this new knowledge, and applied to evaluate pollution reduction strategies across Ontario.



The research program adopts a networked approach to sampling and analysis, in a synergy between Windsor, Toronto, Western and Trent University, with additional support from the Swedish University of Agricultural Sciences, to enable higher resolution quantification of microplastics distribution than any single establishment could achieve. Knowledge and data collected across the Ontario network will be collated in the modelling framework in Windsor.

By operating a cross-institutional training and graduate exchange program between the institutes, students will be provided with opportunities to train at every facility, offering access to a unique and world class range of analytical instrumentation, and supported by researchers with expertise in different analytical and modelling approaches.

Entry Requirements:

To join our provincial microplastics surveillance and modelling network, the University of Windsor is looking for candidates who have completed an honors degree in Environmental or Earth Science, Biochemistry, or Bioinformatics (or closely related field) with a GPA of 77% or above; and hold a Masters degree in a related field.

To be eligible for a full scholarship, a complete application must be received before May 1st 2021, with a view to officially starting the PhD in September 2021. Summer studentships to participate in field work from June to August are however also available. To apply, please proceed to [Graduate Application Steps | Faculty of Graduate Studies \(uwindsor.ca\)](#) and complete the four steps. Be sure to select “Earth Sciences” under the ‘search for program’ bar. Please notify Dr Jill Crossman (jill.crossman@uwindsor.ca) that you have applied; and if you have any questions about the application process, please don’t hesitate to contact her.

Equal opportunities

All qualified candidates are encouraged to apply, however Canadian citizens and permanent residents will be given priority. Members of minority groups are encouraged to self-identify. The University of Windsor is a comprehensive research and teaching institution with more than 15,500 students. We are a welcoming community committed to equity and diversity in our teaching, learning, and work environments. In pursuit of the University's Employment Equity Plan, members from the federally designated and other minority groups including women, Aboriginal peoples, visible minorities, persons with disabilities and sexual minorities are encouraged to apply and to self-identify.

