

Two Graduate Student Positions at Queen's University

We seek two keen and dedicated graduate students for the following projects:

Project 1. Effect of Snow Melt from the Athabasca Oil Sands on Amphibian Health

The Canadian oil sands industry is a major emitter of air pollutants such as sulfur and nitrogen oxides, as well as toxic pollutants such as mercury and polycyclic aromatic compounds. While there is a growing body of evidence that mining and upgrading of bitumen in the Athabasca oil sands region has increased contaminant loadings to surrounding ecosystems, the ecological consequences of this pollution are poorly understood. Some species of amphibians are particularly vulnerable to atmospheric contaminants scavenged by snow, as their reproduction and early life development coincides with the timing of snow melt. In this project, we will explore potential impacts of exposure to contaminants in snow adjacent to oil sands operations on the health of amphibians during their early stages of development.



Project location: Queen's University Biological Station (<https://qubs.ca/>). *Key collaborators:* Dr. Christina Davy, Ontario Ministry of Natural Resources and Forestry; Dr. Jane Kirk, Environment and Climate Change Canada.

Project 2. Response of Freshwater Phytoplankton to Diluted Bitumen Spills



Diluted bitumen ('dilbit') is a type of crude oil derived from the Canadian oil sands. It is a combination of bitumen, the heavy oil extracted from the oil sands, and a diluent such as a natural gas condensate. Transportation of dilbit through pipelines raises concerns about potential environmental impacts should a breach occur. Little toxicological data on the effects of dilbit on freshwater ecosystems and their associated food webs exists. In this project, we will simulate a dilbit spill in large mesocosms installed in a boreal lake to better understand the fate and toxicity of dilbit in freshwater ecosystems. This student will be responsible for assessing how a dilbit spill impacts the structure and function of phytoplankton communities.

Project location: IISD Experimental Lakes Area (<https://www.iisd.org/ela/>). *Key collaborators:* Dr. Jules Blais, University of Ottawa; Dr. Scott Higgins, IISD-Experimental Lakes Area

Students may enroll in a Master's program at Queen's University in the **School of Environmental Studies** (<http://www.queensu.ca/ensc/>) or the **Department of Biology** (<http://biology.queensu.ca>), under the supervision of Dr. Diane Orihel (<http://biology.queensu.ca/people/department/professors/diane-orihel>). Students will officially start their graduate programs in September 2017, but summer employment may also be possible. Interested candidates should send an application package consisting of: (i) cover letter (please explain: why do you want to do graduate work? what are your research interests? which of the above projects interests you and why? are you interested in the MES (Environmental Studies) or MSc (Biology) program?); (ii) curriculum vitae; (iii) transcripts; (iv) names and contact information of three references. Please email your complete application package to Dr. Diane Orihel (diane.orihel@queensu.ca) by January 25, 2017. Short-listed candidates will be contacted for an interview.