



## MSc Candidate Position

### Impacts of Forest Disturbances on Long-term Water Quality and Carbon Cycling in Boreal Lakes

**Context:** Canada's boreal forest has one of the highest densities of pristine wetlands, streams, rivers, and lakes in the world. However, this landscape is under increasing pressure from the extraction of resources (e.g., forestry, mining). Lakes are intimately connected with their surrounding landscape, and natural and anthropogenic forest disturbances (e.g., forest fires or logging) alter the export of nutrients and organic matter from forest soils to aquatic systems. These changes in element cycling can have broad implications for lakes as they can affect water quality, aquatic productivity, and the transfer of carbon from the landscape to the atmosphere. Monitoring studies have shown short-term effects of these human disturbances on aquatic environments. However, the lack of monitoring data over longer time periods (beyond a few years) severely limits our understanding of the long-term effects of these disturbances on boreal lakes and the forecasting of future environmental changes.



**Project Description:** This project will study forest-lake interactions and the effects of forest disturbance on lakes over the past 200 years using lake sediments. Lake sediments are natural archives of environmental change because they preserve physical, chemical, and biological information that allow us to reconstruct the history of a lake and of its surrounding landscape over time. The objectives of the study are: i) Assess how forest fires over the past 200 years and recent forest management activities have affected lake-water quality and lake productivity; and ii) Identify the implications of these changes for the role of lakes in the terrestrial-aquatic carbon cycle. The project will include fieldwork (recovery of sediments from study lakes) and the analysis of several geochemical and biological proxies (charcoal).

**Start Date:** Winter or Summer 2024

**Location:** The student will be based at the research station located at the Lake Duparquet Research and Teaching Forest ([FERLD](#)) and the Forest Research Institute ([IRF](#), Rouyn-Noranda) of the Université du Québec en Abitibi-Témiscamingue.

**Financial Support:** Scholarship of 18,000\$ per year for 2 years

#### Requirements:

- Bachelor degree or equivalent in Biology, Earth or Environmental Sciences, or related fields, with a strong interest in aquatic research, forest dynamics, biogeochemistry, and paleolimnology
- Field work experience (or interest)
- Motivation to learn and passion for understanding environmental change and solving environmental issues
- Ability to work independently and in teams



**Application:** For enquiries or to apply, please send an email with the subject line "MSc Project: Forest Disturbance Impacts on Boreal Lakes" to [carsten.meyer-jacob@uqat.ca](mailto:carsten.meyer-jacob@uqat.ca). Applications should include a statement of interest, a CV, a copy of transcripts (unofficial transcripts are acceptable), and the contact information of two referees.



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