
Supervisor's Name	Jennifer Korosi
Supervisor Email Address*	jkorosi@yorku.ca
Supervisor's Department	Geography
Project Title	A paleoenvironmental approach for assessing present-day ecosystem sensitivity to thawing permafrost

Description of Research Project (1500 characters maximum)

The prevalence of ice-rich permafrost soils in the western Canadian Arctic precondition the landscape to be highly susceptible to dramatic landscape disturbances under a warming climate. This is evident in the intensification of permafrost thaw slumping that has been observed in recent decades, which has compromised the structural integrity of northern infrastructure, and had extensive impacts on lakes and streams through enhanced inorganic sediment transport.

Our research will provide a window into the past that can be used to better inform projections of future landscape sensitivity to thawing permafrost. Specifically, we will collect sediment cores from several lakes along the Inuvik-Tuktoyaktuk Highway (Northwest Territories) in order to examine linkages between climate/landscape history, permafrost thaw, and ecosystem change over millennial timescales.

Our objectives are to: (1) Provide a comprehensive post-glacial environmental history of the Mackenzie Delta uplands for use in the interpretation of present-day terrain sensitivity to thawing permafrost; (2) Reconstruct past permafrost dynamics in relation to Holocene climate variation, in order to contribute to developing models of terrain sensitivity; (3) Investigate aquatic ecological responses to both climate variation and permafrost dynamics throughout the Holocene, to better predict the trajectories and drivers of future lake ecosystem changes.

Undergraduate Student Responsibilities (1500 characters maximum)

The student will provide integral support to the project, working as part of a collaborative research team that also includes scientists at Brock University, Queen's University, the Government of the Northwest Territories, and the Geological Survey of Canada. Specific responsibilities fall under 3 categories:

1. Lab technician - The student will process sediment samples collected from a recent field sampling trip, including identifying macrofossils from the sediment cores that can be sent away for radiocarbon dating.
2. Data analyst - The student will compile and analyze long-term water chemistry data from the region, dating back to 2005.
3. Community outreach - The student will prepare communication materials (posters, reports, outreach videos) on the project and its preliminary findings, to distribute to the Aurora Research Institute and the Inuvialuit Hunters and Trappers Committee

Qualifications Required (750 characters maximum)

- Have completed GEOG 4200 (Water Quality and Stream Ecosystems) or other senior-level undergraduate course in aquatic ecology/limnology
 - Have previous experience working in a lab (undergraduate coursework is acceptable).
 - WHMIS training must be completed prior to the start of the employment term.
 - Demonstrated skills in data management and statistics, including competency in using Excel. Familiarity with R Statistical Software is desirable, but not a requirement. Supplemental training in advanced statistics will be provided during the employment term.
 - Microscopy skills are an asset
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