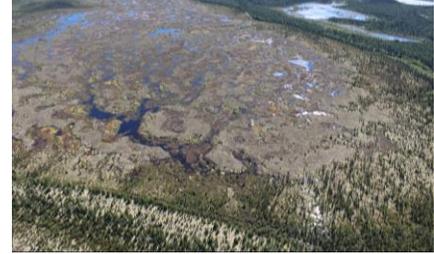


PhD Research Opportunities: Polar Bear Provincial Park, Ontario

As the third largest wetland in the world, the Hudson Bay Lowlands (HBL) provides many ecological values such as climate regulation through carbon stored as peat and water quantity and quality to sustain the well-being and cultural values of the region's Indigenous people. Understanding and projecting future contributions of permafrost to ecological and cultural values has become a high science priority in Ontario. Unfortunately, lack of adequate data on current and future permafrost conditions impedes land use planning in the permafrost dominated regions of the HBL.



The HBL landscape is being exposed to rapidly warming temperatures and permafrost responses are expected to alter the region's hydrology, carbon cycles, and heavy metal mobilization dynamics. By 2100, permafrost losses of 16 to 67% are predicted, a range that needs to be narrowed to reduce uncertainty. Active layer thickness in the HBL also varies (from <50 to >150 cm) and is expected to change. Much of the water flow, carbon cycling, and heavy metal mobilization occurs in the active layer, and thus may intensify as the permafrost thaws.



The PhD student will be based at the Cold Regions Research Centre at Wilfrid Laurier University in collaboration with the Ontario Ministry of Natural Resources and Forestry. The student will develop a research project to increase understanding of active layer freeze/thaw cycles in Polar Bear Provincial Park, Ontario, using a combination of field and laboratory methods, and will use the resulting information to explain these cycles at watershed scale. The individual will also gain experience in research site establishment by participating with science teams composed of government, academic, and First Nations representatives who will install boreholes, carbon flux towers, stream gauges, and other infrastructure at the site. These interactions will provide the student with excellent networking opportunities across several institutions.

This PhD research project fills a critical knowledge gap impeding the overall goal of sustaining future hydrology, carbon stores, and water quantity and quality as climate change and land use pressures intensify in the HBL. It will also establish a necessary foundation for developing data sets, modeling applications, and mapping products that can be used to inform policy and provide advice and guidance to natural resource practitioners, First Nation communities, and policymakers as climate science is incorporated into planning and decision making.

Contact: Dr. Jim McLaughlin, Ontario Ministry of Natural Resources and Forestry at jim.mclaughlin@ontario.ca for further details.