NSERC Canadian Network for Aquatic Ecosystem Services

Theme 1, Project 1.2

Hydrogeomorphic Classification Approach for the Hudson Bay Lowlands in the Attawapiskat Watershed

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Abstract

The Hudson Bay Lowland (HBL) in Ontario's far north contains one of the world's largest peatland complexes. Northern peatlands are wetland ecosystems that act as shallow freshwater aquifers and are important in sequestering terrestrial carbon. Current emphasis on peat as a major carbon sink that is susceptible to changes in climate, has triggered the need for further understanding of the hydrologic processes governing peatlands in order to develop better carbon storage and climate change monitoring and modeling systems. A regional hydrogeomorphic classification of the Attawapiskat watershed in the HBL is the proposed direction of this study, to characterize hydrologic landscape regions and evaluate them based on their hydrologic similarities within the watershed, specifically between the distinct Lowland and headwater Shield divide.

Keywords: Hydrogeomorphic, classification, watershed scale, peat systems

Geographic Location:

- Attawapiskat River watershed, Hudson Bay Lowlands, Ontario, Canada
- De Beers Victor Mine, Attawapiskat River watershed, Hudson Bay Lowlands, Ontario, Canada

How does your project link to Canadian aquatic ecosystem services?

Given the limited information on watershed hydrology in Ontario's Far North, the development and testing of catchment classification approaches will harness existing data to improve understanding of the hydrological and biogeochemical processes that are occurring within northern aquatic ecosystems (e.g. processes of delivery of carbon and contaminants such as Hg to surface waters) and the distribution of those contaminants in northern aquatic ecosystems. Our improved understanding of hydrologic and biogeochemical processes is foundational for making sound policy decisions concerning land use and climate change impacts in the north. Watershed classification across the HBL will be essential to both source water protection planning for communities and industry-based development planning, as they assess use of local water resources against environmental regulations such as meeting minimum baseflow requirements. This approach will also provide a basis for hydrologic modeling in both private and public sectors.