

ECOHYDROLOGY OF HIGHLY AQUALYZED MINEROTROPHIC PEAT BOGS IN THE LA GRANDE RIVER WATERSHED:

MONITORING THE WATER CYCLE AND CH₄ AND CO₂ DYNAMICS.



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CONTEXT

Despite increased precipitation levels in recent decades, the level of the La Grande hydroelectric reservoirs, which generate approximately 40% of the electricity produced in Quebec's Middle North, has remained relatively low. One of the possible proximal causes of this paradox is the little-understood hydrological influence of peat bogs, which cover up to 20% of the land environment. Because of their particular nature, peat bogs form systems that filter, retain and slow the supply of water in downstream rivers and reservoirs.

OBJECTIVES

- The main objective is to provide tools for modelling the hydrological behaviour of minerotrophic peat bogs (MPBs) for managers of hydroelectric facilities.
- The project is also intended to refine ecological indicators for quantitatively evaluating the degree of spatial evolution of hydrological processes, develop remote monitoring procedures for certain components in the hydrological budget and produce a greenhouse gas budget for MPBs.

EXPECTED RESULTS

- In response to the expectations of many hydroelectric companies, the hydrological analyses resulting from this project will make it possible to develop conceptual MPB models and also improve and consolidate models for forecasting water supply in Nordic regions, which will eventually be integrated into an operational model (the HYDROTEL model).
- The project is also intended to develop original remote monitoring procedures for certain terms in the hydrological budget. These procedures will allow managers of hydroelectric complexes and government water resource managers to monitor conditions in Nordic regions, by making effective use of Canadian RADARSAT-2 satellite images, among other tools.
- The in-depth study of the components of the hydrological budget will help to fill in the gaps in our knowledge of the hydrology of aqualyzed MPBs and their influence on greenhouse gas production and emissions.

PROJECT START DATE AND LENGTH

October 2008 • 3 years

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FUNDING

- Natural Sciences and Engineering Research Council of Canada (NSERC)
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PROJECT OVERVIEW

A highly aqualyzed MPB in a sub-watershed will be equipped for spatio-temporal monitoring, to make it possible to analyze terms in the hydrological budget and GG fluxes, in order to evaluate the direct influence of hydrological conditions on the carbon budget. The characterization of ecological indices and image analysis procedures will make it possible to generalize the local-scale hydrological attributes studied to the regional scale.