

## **Developing an Integrated Water Management Tool for Winnipeg River's Hydropower System**

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Hydropower is a renewable, economic, and low-emission source of energy and has the flexibility to accommodate different electricity demands. The Province of Manitoba's current electricity supply is about 97% generated by hydropower, making it potentially vulnerable to climate change. The increase in the annual mean temperature in the Canadian Prairies is twice the rise in the global mean temperature, influencing precipitation patterns which ultimately highlights the importance of understanding the impacts of climate change in Manitoba. A MODSIM-DSS model has been developed for the operation of water control structures and hydropower facilities along the Winnipeg River, including the Rainy and English Rivers, which contains 11% of the hydropower capacity in Manitoba. This simulation model is equipped with parametric rule curves representing the operation of control points in the system. These rule curves are calibrated and evaluated against historically measured and observed data. To better understand potential adaptation responses, the simulation model will be used to project the response of this hydropower system to future climate conditions.