

## **Climate Driven Changes in Snowpack: Simulations (1970s to 2020) for the Bay of Quinte, Ontario, Canada**

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### **ABSTRACT**

SNOWPACK simulations that capture climate driven changes in snow water equivalent (SWE) and snow cover will be presented from the 1970s to 2020 for the entire Bay of Quinte watershed located in Ontario, Canada. This is an Area of Concern, listed under the Great Lakes Water Quality Agreement due to consistent harmful algal blooms resulting from excessive phosphorus runoff from the watershed. Future management actions should consider the effects of climate change, such as increased frequency and intensity of storm events. These events will amplify erosion and leaching of phosphorus from soils, while ruptured vegetation from freeze-thaw will also contribute to further leaching. Our simulations focus on the changes in snow parameters, specifically SWE, which drive snow melt. Other parameters such as snow density will also be discussed. Preliminary simulations show a substantial change in SWE, especially after 2000. The implications of changes in SNOWPACK on runoff and nutrient loadings will be discussed.

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