

Impact of climate change on the nutrient load of the Pike River watershed

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Using future climate change scenarios and water quality projections, experts found that sediment and the blue-green algae producing nutrients phosphorus and nitrogen are likely to increase in the Missisquoi Bay despite active efforts to reduce nutrient loads.

A team made up of researchers from the Faculty of Agricultural and Environmental Sciences at McGill University, the Institut de recherche et de développement en agroenvironnement and the Consortium on Regional Climatology and Adaptation to Climate Change have been studying the effects of land, water, and [climate change](#) on the amount of nitrogen and phosphorus in the Missisquoi Bay for 15 years. Using [climate models](#) designed to test a large range of different conditions in temperature and precipitation, the team has found that the presence of these hazardous nutrients is likely to increase in the Bay over the next 50 years.

The study estimates that mean annual sediment will increase from 1% to 7%, phosphorus will increase from 13% to 20% and nitrogen will increase from 24% to 43% due to higher air temperatures, early snowmelt and more drainage into the Bay resulting from climate change.

"If these projected results become a reality, it will be very difficult to achieve the proposed water quality standards set by the governments of Vermont and Quebec, which share jurisdiction of the Bay," says lead researcher Dr. Chandra Madramootoo of McGill University. "It will be equally as difficult to prevent the degradation of water and habitat

quality as a result of human activity and to control the growth of cyanobacterial blooms (toxic blue-green algae)" continues Dr. Madramootoo. "This research is of particular interest to policy-makers, those involved in watershed management and all those involved with cyanobacteria outbreaks in lakes."

The Missisquoi Bay, located on the northernmost section of Lake Champlain, is the source of drinking water for several towns and supports water sports, fisheries, resorts and other economic and recreational activities. The Bay and its watershed is an exceptional aquatic ecosystem as it provides habitat and spawning grounds for several flora and fauna, amongst which are 25 endangered or threatened species.

The results of this study could enable stakeholders to develop strategies to better adapt to climate change impacts.

More information: "Impacts of climate change on nutrient losses from the Pike River watershed of southern Québec" by C. Gombault, C.A. Madramootoo, A.R. Michaud, I. Beaudin, M.F. Sottile, M. Chikhaoui, and F.F. Ngwa was published today in the *Canadian Journal of Social Science*.

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