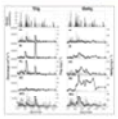

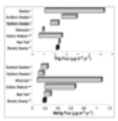

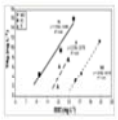

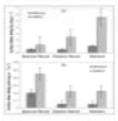

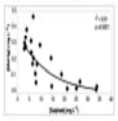

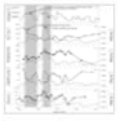

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Mercury dynamics of a temperate forested wetland

M.E Galloway[1], B.A Branfireun

Department of Geography, University of Toronto at Mississauga, 3359 Mississauga Rd., N., Mississauga, Ontario, Canada L5L 1C6

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Abstract

Wetlands have been identified as important sites of mercury methylation in catchments, but the range of wetland types and their geographic distribution for which methylmercury fluxes are reported in the literature are limited. Linkages among wetland hydrology, total mercury and methylmercury concentrations and fluxes, and other water quality parameters were assessed in a temperate forested swamp in Southern Ontario, Canada. Two hydrogeomorphically distinct stream reaches within the wetland exhibited differences in wetland-stream hydrologic connectivity, which strongly influenced mercury dynamics. Total mercury flux from both reaches to the downstream was highest during flow conditions in which the wetland and stream were hydrologically connected. The wetland as a whole was a net sink for total mercury and a net source for methylmercury to the downstream system. Both total mercury and methylmercury concentrations were related to dissolved and particulate organic carbon in stream waters, but these relationships were dependent upon the sampling location and flow conditions. Throughout the wetland, methylmercury concentrations exhibited temporal relationships with sulfate concentrations. Further, despite short surface water residence times, periods of wetland and stream disconnect and high pH (approx. 8) in surface water, methylmercury fluxes from this wetland to the downstream were similar to those from more stagnant and acidic wetlands.

Keywords

Mercury; Methylmercury; Organic carbon; Sulfate; Wetland; Hydrology

Figures and tables from this article:

Fig. 1. Location of study site in Canada and the province of Ontario (top). Map of Beverly Swamp, near Hamilton, Ontario, Canada (bottom).