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Probable changes in lake chemistry in Canada's Atlantic Provinces under proposed North American emission reductions

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Abstract. Atlantic Canada, located in the extreme north-eastern portion of North America, receives acid precipitation from all major acid emission sources on the eastern part of the continent. The region was glaciated and has thin soils over a generally poorly acid buffering bedrock. Because of regional topography, large groupings of lakes occur in a number of regions. Environment Canada and the Government of New Brunswick have operated lake sampling networks in trend detection studies and have concentrated their work on these lake groupings. The MAGIC model has been applied to these lakes and their catchments to see: a) what initial water chemistry conditions existed before acidification began, b) what the chemistry was like during the worst of regional acid deposition, and c) what it would be like under deposition conditions predicted for new Canadian and US emission reduction proposals. While pH, sulphate, acid neutralisation capacity (ANC) and the sum of the base cations (SBC) of all lakes have been significantly affected by acid deposition, water chemistry conditions are now considerably better than they were in 1975, at the worst of the deposition. However, a 50% reduction in acid deposition from Year 2000 deposition amounts will not return water chemistry to original conditions in most of the region.

Keywords: Atlantic Canada, monitoring networks, acidification, predictions, MAGIC

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