

TITLE: CHRONIC AND EPISODIC ACIDIFICATION OF ADIRONDACK STREAMS FROM ACID RAIN IN 2003-2005

Authors: LAWRENCE GREGORY B.; ROY KAREN M.; BALDIGO BARRY P.; ET AL.

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Abstract: Limited information is available on streams in the Adirondack region of New York, although streams are more prone to acidification than the more studied Adirondack lakes. A stream assessment was therefore undertaken in the Oswegatchie and Black River drainages; an area of 4585 km² in the western part of the Adirondack region. Acidification was evaluated with the newly developed base-cation surplus (BCS) and the conventional acid-neutralizing capacity by Gran titration (ANC(G)). During the survey when stream water was most acidic (March 2004), 105 of 188 streams (56%) were acidified based on the criterion of BCS < 0 $\mu\text{eq L}^{-1}$, whereas 29% were acidified based on an ANC(G) value < 0 $\mu\text{eq L}^{-1}$. During the survey when stream water was least acidic (August 2003), 15 of 129 streams (12%) were acidified based on the criterion of BCS < 0 $\mu\text{eq L}^{-1}$, whereas 5% were acidified based on ANC(G) value < 0 $\mu\text{eq L}^{-1}$. The contribution of acidic deposition to stream acidification was greater than that of strongly acidic organic acids in each of the surveys by factors ranging from approximately 2 to 5, but was greatest during spring snowmelt and least during elevated base flow in August. During snowmelt, the percentage attributable to acidic deposition was 81%, whereas during the October 2003 survey, when dissolved organic carbon (DOC) concentrations were highest, this percentage was 66%. The total length of stream reaches estimated to be prone to acidification was 718 km out of a total of 1237 km of stream reaches that were assessed.

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