



Lakes as sentinels and integrators for the effects of climate change on watersheds, airsheds, and landscapes

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Limnol. Oceanogr., 54(6_part_2), 2009, 2349-2358 | DOI: 10.4319/lo.2009.54.6_part_2.2349

ABSTRACT: Lakes provide unique sentinels and integrators of events in their catchments and airsheds and in the total landscapes in which they are embedded. A variety of physical, chemical, and biological properties of lakes are amenable to simple, precise, and inexpensive long-term monitoring. Changes to watersheds caused by climate warming can in turn affect the properties of lakes to which they drain. Examples include changes to nutrient inputs, the balance between base cations and strong acid anions, carbon cycles, and mercury, in some cases associated with insect outbreaks and forest fires caused by warmer weather. Paleolimnology also allows integration and interpretation of changes in lakes and catchments for millennia. Such studies indicate that much drier conditions occurred in the past in central and western Canada, causing the closing of lake basins, increased salinity, eutrophication, and even the disappearance of some lakes, as forested catchments were invaded by grasslands. Such historical perspectives indicate that large areas of western Canada may be adversely affected by climate warming.

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