



Synchrony in relationships between the North Atlantic Oscillation and water chemistry among Sweden's largest lakes

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ABSTRACT: The North Atlantic Oscillation (NAO) is commonly presented as an easy and reliable index that can be used to study climatic effects on aquatic ecosystems. Here, the NAO winter index (NAOW) was applied to determine effects of winter climate changes on 13 water chemical variables measured monthly at 16 sites in Sweden's three largest lakes (Vänern, Vättern, and Mälaren). The NAOW strongly affected meteorological, physical, and consequently also chemical conditions. Significant relationships were numerous in Sweden's three largest lakes, but they exhibited little agreement among lakes and even across a lake. Synchronous relationships between the NAOW and water chemistry among lake sites were restricted to variables closely linked to surface-water temperature (i.e., reactive silica and pH in May). The weaker the association of a lake variable with water temperature, the weaker the mean NAOW signal on the variable over the 16 lake sites. The results of this study might facilitate the prediction of lake ecosystem responses to future changes in the weather over a large region.

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