

# Organic carbon suggests Swedish lakes were less acidified

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During the 1970s and 1980s, researchers and policymakers became increasingly worried about multiple consequences of acidic emissions of sulfur dioxide and nitrogen oxides from the stacks of power stations, and eventually they were controlled. In Europe, there was much concern about the effects on Sweden's many lakes, which were found to be in some cases strikingly acidic. The Swedish government instituted a program of countering the acidification by adding thousands of tonnes of lime to the lakes.

The link between emissions and acidification of lakes was never universally accepted, however. A new study of the role of dissolved organic carbon, which comes from [living organisms](#) and can also make lakes acidic, suggests that power station emissions may have played less of a role than previously thought. Martin Erlandsson of the University of Reading, United Kingdom, and his colleagues wondered whether it was possible to distinguish the historical effects of [organic acids](#) and power station emissions by assessing findings during the 20 years since lake acidification started to decrease in Sweden. They describe their results in the August issue of [BioScience](#).

Although there are few measurements of the amount of dissolved organic carbon in Swedish lakes before the 1980s, the amount of dissolved organic carbon in them has continued to increase despite the stabilization of power station emissions around 1990. The reason is unknown, but the increase supports the idea that as power station emissions increased during the 20th century they may have partly

suppressed organic acidity in lakes that was present in pre-industrial times—at higher levels than when it was assessed in 1990. Erlandsson and colleagues estimated the pre-industrial acidity of 66 lakes under different assumptions about the amount of dissolved organic carbon in them, and found that the assumptions had a large effect on estimates of how much the lakes had been affected by power station emissions. Studies of sediments in some of the lakes seem to bear out the idea that preindustrial organic carbon levels were at least as high as they are today—and considerably higher than they were in 1990. That in turn means the power station emissions did not contribute as much to lake acidification as was thought when liming programs were instigated.

Erlandsson and his coauthors say their work does not call into question the value of reducing power station emissions generally, since this has had many other benefits besides improving the condition of lakes. But they comment that their work does emphasize the importance of getting a better understanding of the amounts of dissolved [organic carbon](#) in lakes in pre-industrial times, because they have a large influence on the degree of acidification that can be blamed on power station emissions.

**More information:** [www.aibs.org/bioscience/index.html](http://www.aibs.org/bioscience/index.html)

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