



## Factors controlling the extent of eutrophication and toxicity in sulfate-polluted freshwater wetlands

Lamers, Leon P. M., Sarah-J. Falla, Edyta M. Samborska, Ivo A. R. van Dulken, Gijs van Hengstum, Jan G. M. Roelofs

Limnol. Oceanogr., 47(2), 2002, 585-593 | DOI: 10.4319/lo.2002.47.2.0585

**ABSTRACT:** Increased sulfur loads originating from polluted surface water and groundwater, and from enhanced atmospheric input, are a major threat to the biogeochemical functioning and biodiversity of freshwater wetlands. Sulfate reduction, normally playing a modest role in these systems, becomes the most important biogeochemical process, inducing severe eutrophication and sulfide toxicity. In field enclosure experiments we observed striking differences between the responses of two freshwater marshes to sulfate. On one location sulfate addition resulted in strong phosphorus mobilization without sulfide accumulation, whereas high sediment sulfide concentrations, known to be toxic to wetland macrophytes, were reached in the other marsh without eutrophication occurring. The results could be explained by differences in groundwater iron discharge and nutrient contents of the peat sediments. Sulfate reduction rates appeared to be limited by either electron donor availability (first marsh) or electron acceptor availability (second marsh). The implications of these findings are explained in relation to freshwater wetland management.

### Article Links

[Download Full-text PDF](#)

[Return to Table of Contents](#)

### Please Note

Articles in L&O appear in PDF format. Open access articles may be freely downloaded by anyone. Other articles are available for download to subscribers only, or may be purchased for \$10 per article. All L&O articles are moved into Open Access after three years.