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Article

Methylmercury Formation in a Wetland Mesocosm Amended with Sulfate

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Abstract

This study used an experimental model to evaluate methylmercury accumulation when the soil of a constructed wetland is amended with sulfate. The model was planted with *Schoenoplectus californicus* and designed to reduce wastestream metals and metal-related toxicity. The soil was varied during construction to provide a control and two sulfate treatments which were equally efficient at overall mercury and copper removal. After an initial stabilization period, methylmercury concentrations in porewater were up to three times higher in the sulfate-treated porewater (0.5–1.6 ng/L) than in the control (<0.02–0.5 ng/L). Mean percent methylmercury was 9.0% in the control with 18.5 and 16.6% in the low-

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and high-sulfate treatments, respectively. Methylmercury concentrations measured in mesocosm surface water did not reflect the differences between the control and the sulfate treatments that were noted in porewater. The mean bulk sediment methylmercury concentration in the top 6 cm of the low-sulfate treatment (2.33 ng/g) was significantly higher than other treatment means which ranged from 0.96 to 1.57 ng/g. Total mercury in sediment ranged from 20.8 to 33.4 ng/g, with no differences between treatments. Results suggest that the non-sulfate-amended control was equally effective in removing metals while keeping mercury methylation low.

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