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REMOVAL OF METALS BY WETLAND MESOCOSMS SUBJECTED  
TO DIFFERENT HYDROPERIODS

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by  
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## ABSTRACT

*Scirpus californicus* (giant bulrush) wetland mesocosms were subjected to four hydroperiods. The most frequently pulsed treatment (twice per day) was the most efficient at removing metals from synthetic wastewater. This was attributed to the formation of iron oxyhydroxides which complex with the metals. The continuously flooded treatment had slightly lower removal rates probably due to insufficient formation of sulfides caused by a high flow rate.

After a year of metal additions, means of 75% to 78% of the cadmium, chromium, and zinc, 84% of the lead, and 55% of the nickel were removed by the systems. Most of the metals were retained in the soil. The fine roots accumulated roughly 35% of the added cadmium, 6% of the copper, and 13% of the zinc. The shoots, rhizomes, and coarse roots each accumulated about 1% or less of the added metals. Metal accumulation in the fine roots should be considered when evaluating the effects these systems may have on the environment.

Indications are that wetland treatment, especially with hydroperiod manipulation, can reduce metal concentrations in wastewater and, therefore, in adjacent estuaries. Wastewater wetland systems offer an alternative form of water treatment that is beneficial to the environment.