

SCCWRP #678

Sediment contaminant chemistry and toxicity of freshwater in urban wetlands in southern California

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ABSTRACT

Wetlands provide many critical functions in urban ecosystems, including habitat for wetland-dependent fauna and enhancement of water quality. Interest in restoring or creating wetlands to enhance these functions is increasing due to the scale and extent of wetland loss and water quality problems associated with urbanization. One of the most pressing questions associated with urban wetland restoration is the extent to which urban wetlands tend to concentrate contaminants, and if so, whether an associated risk to wildlife exists. The goal of this study was to better understand these potential risks, and the associated tradeoffs with using wetlands to treat urban runoff. Sediment toxicity, contaminant chemistry, and macroinvertebrate (MI) community metrics were measured in 21 southern California wetlands that receive urban runoff as their primary water source. MI organisms in 18 of the 21 urban wetlands examined were considered to be at risk due to sediment contaminant concentrations and toxicity. Most of the sites were either toxic to the amphipod *Hyaella azteca*, exceeded a sediment quality guideline, or both. Sediment chemistry and toxicity identification evaluation studies suggest that pyrethroid pesticides may have been responsible for much of the toxicity documented in this study. The mean Probable Effects Concentration quotient (an index of degree of sediment contamination) was found to negatively correlate with MI diversity in these wetlands suggesting that toxicity was affecting organisms at the base of the food chain in these wetlands.

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