



WATER RESOURCES RESEARCH GRANT PROPOSAL

Project ID: 2003NJ47B

Title: Potential Nitrogen Saturation in Urban Wetlands

Project Type: Research

Focus Categories: Nitrate Contamination, Wetlands, Ecology

Keywords: nitrogen saturation, nitrate, wetlands, nitrification, denitrification, urban wetlands, depressional wetlands, riverine wetlands

Start Date: 03/01/2003

End Date: 03/01/2004

Federal Funds: \$1990.00

Matching Funds: \$12807.00

Congressional District: 6

Principal Investigators: Stander, Emilie; Joan G. Ehrenfeld

Abstract: It is a widely held belief that wetland systems do not experience nitrogen (N) saturation owing to their ability to remove nitrate (NO₃⁻) through denitrification. However, due to hydrological alteration resulting from urban land use, urban wetlands in northeastern New Jersey may experience lowered water tables and thus overall drier conditions and wet-dry cycles that may reduce NO₃⁻ removal capacity. This may cause New Jersey's urban wetlands to be acting as sources rather than sinks of NO₃⁻, leading to elevated NO₃⁻ concentrations in receiving water bodies and associated impacts on the integrity of aquatic ecosystems in this state. The proposed research will investigate the occurrence of N saturation symptoms in urban wetlands located in northeastern New Jersey and therefore directly addresses research priorities one, the integrity of aquatic and water-associated systems, and five, the impacts of land-use practice and change on water resources, of the RFP. The proposed research can also serve to direct restoration and management guidelines in the state. If it is demonstrated that lowered water tables, dry soils, and wet-dry cycles are responsible for degradation of wetland function, streambank and riparian buffer restoration projects can focus on restoring saturated hydrological conditions to these systems.

Objectives of the Study include:

1. To document net N mineralization, nitrification, denitrification, and N loss to shallow groundwater under wet and dry conditions in urban wetlands of contrasting soil types over the course of a one year field-based study.
2. To determine whether urban wetlands with organic and mineral soils are displaying symptoms of N saturation. For the purposes of this study, symptoms of N saturation are considered to be elevated NO₃- concentrations in soil water collected during dry and saturated conditions as well as during the initial flush after a rainstorm.

A survey will be conducted for the presence or absence of N saturation in six urban wetlands adjacent to streams in northeastern New Jersey, representing the two main wetland soil types in this part of the state. The six sites will consist of three depressional wetlands with organic soils and three riverine wetlands with mineral soils.

[U.S. Department of the Interior, U.S. Geological Survey](#)

Maintain: Schefter@usgs.gov

Last Modified: Tue June 10, 2003 12:02 PM

[Privacy Statement](#) // [Disclaimer](#) // [Accessibility](#)