



WATER RESOURCES RESEARCH GRANT PROPOSAL

Project ID: 2004NJ71B

Title: Soil Moisture Regimes and Nitrate Leaching in Urban Wetlands

Project Type: Research

Focus Categories: Nitrate Contamination, Wetlands, Hydrology

Keywords: wetlands, denitrification, hydrology, stormwater, urban wetlands, lysimetry, soil moisture, nitrate leaching

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End Date: 03/01/2005

Federal Funds: \$5,000

Non-Federal Matching Funds: \$9,796

Congressional District: 6

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Abstract

This research focuses on the temporal dynamics of denitrification in urban wetlands. Soils which experience long dry periods due to hydrological disturbance will produce nitrate through the aerobic process of nitrification. Once the dry period is broken by a rain event and the soil becomes saturated, it is not known how quickly denitrification will set in. It is also unknown how much of the nitrate which has accumulated in the soil and also the nitrate which falls in precipitation will be leached to the groundwater in the initial flush before the onset of denitrification.

The study suggests that on specific temporal scales, hydrologically disturbed (i.e., flashy) forested wetlands in urban watersheds may in fact be acting as a source of nitrate to adjacent streams. Nonflashy wetlands, on the other hand, should have a greater capacity to remove nitrate following rain events.

Research will document nitrate leaching in flashy and nonflashy wetlands using lysimetry techniques. To determine the specific timing of denitrification initiation following a rain

event, stable isotope and molecular methodology will be used. Other sources will fund those aspects of the project. However, it is necessary to conduct preliminary research on soil moisture regimes in order to design future isotope and molecular experiments. This study will monitor soil moisture content in flashy and nonflashy wetlands.