

Paper No. 13-16**Presentation Time:** 1:00 PM-5:00 PM***DYNAMICS OF NUTRIENT RETENTION BY SMALL PONDS***

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Surface impoundments, particularly large reservoirs, have been shown to retain nutrients. In South Carolina alone there are over 1,200 small surface impoundments. The goal of this study was to determine if small surface impoundments have the same effect on the transport of nutrients as large reservoirs. To investigate this idea, three small ponds in the Greenville, SC area, ranging in size from 1 to 5 hectares, were sampled. For each pond an upstream sample, a sample within the pond, and a downstream sample were collected. Samples were collected during the summer of 2001 and 2002 as well as limited seasonal data. The land cover in the watersheds ranged from forested to urbanized. The samples were analyzed for major cations, anions, pH, and alkalinity. Planktonic diatom counts were also made to determine their relationship to dissolved Si (DSi) concentration. Biogenic Si (BSi) concentrations were measured to determine its relationship to DSi concentrations.

In all cases nitrate and DSi concentrations decreased within the ponds. DSi concentrations decreased by as much as 75% in an urban watershed, and by as little as 1% in a forested watershed. Upstream DSi concentrations averaged 7.14 mg/L, and concentrations within the ponds averaged 5.02 mg/L. Nitrate concentrations paralleled DSi concentrations in all ponds. Average total dissolved nitrogen (TDN) concentrations decreased within each pond, with the greater decreases found in the urban ponds. Within the ponds organic nitrogen became a greater percentage of TDN than in the upstream sites. Chloride concentrations remained relatively constant through each system and DOC concentrations increased within the ponds. The lowest concentrations of all cations and anions were found in a forested watershed. Preliminary results from BSi measurements show an increase in BSi concentrations in the ponds compared to upstream sites.

The results from this study suggest that small ponds can serve as sinks for nutrients much like large reservoirs. Planktonic diatom counts and BSi concentrations indicate that uptake by diatoms is the major cause of the decrease in DSi concentrations found within the ponds. Nitrogen data suggests that nutrient loading in urban areas causes ponds in these areas to retain more nutrients than ponds in forested watersheds.

[South-Central Section \(37th\) and Southeastern Section \(52nd\), GSA Joint Annual Meeting \(March 12–14, 2003\)](#)

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Session No. 13--Booth# 16

[Undergraduate Research Session \(Posters\)](#)

University of Memphis Conference Center: Holiday Inn, Ballroom 2/3
1:00 PM-5:00 PM, Thursday, March 13, 2003

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