



WATER RESOURCES RESEARCH GRANT PROPOSAL

Project ID: GA4141

Title: Investigation in the role of oxidized iron in the surface water phosphorus dynamics in the Georgia Piedmont

Focus Categories: Nutrients, Non Point Pollution, Water Quantity

Keywords: surface water, iron, nutrient dynamics, phosphorus

Start Date: 03/01/2001

End Date: 02/28/2002

Federal Funds: \$18,000

Non-Federal Matching Funds: \$36,000

Congressional District: 11

Principal Investigator:

Bruce M Beck

Professor, University of Georgia

Abstract

The complex interactions iron and phosphorus play a primary role in the availability of phosphorus in surface waters of the Georgia Piedmont. Iron hydroxides are known to sorb phosphorus through ligand exchange. Multiple biogeochemical processes can effect the sorption of phosphorus to iron hydroxides, influence the biological availability of phosphorus, and may control its cycling. The study we propose will explore the geochemical and biological relationships involved in phosphorus cycling in Georgia Piedmont lakes. The proposed laboratory experiments will be conducted in multiple phases; the first phase will involve investigation of iron and phosphorus chemistry using Standard Methods (APHA 1995). We then propose to further investigate iron-phosphorus dynamics by adding organic material and measuring changes in sorption of phosphorus to iron. The final phase of the laboratory work will involve measuring algal response to additions of iron complexed phosphorus. The third component of our proposed work will include depth measurements of metals, nutrients, and basic water chemistry parameters taken four times in the annual cycle on Lake Lanier. We propose to use these measurements to test our hypothesis that phosphorus cycling in Georgia Piedmont lakes differs significantly from the northeast temperate lake paradigm.