USGS

WATER RESOURCES RESEARCH GRANT PROPOSAL

1. **TITLE**: CONTROLS ON BIOMASS:NUTRIENT RATIOS IN STREAMS AND RIVERS

2. **FOCUS CATEGORIES**: a) WQL b) SW c) NU

3. **KEYWORDS**: algae, contaminant transport, ecosystems, eutrophication, fertilizers, geochemistry, land use, land-water interactions, nitrogen, nutrients, phosphorus, plant growth, pollution control, solar energy, streams, suspended sediments, urban drainage, water chemistry, water quality, water quality management.

4. **DURATION**: September, 1998 – August, 2000 (24 months)

5. **FEDERAL FUNDS REQUESTED:** $61,605

6. **NON-FEDERAL MATCHING FUNDS PLEDGED**: $59,856

7. **PRINCIPLE INVESTIGATOR**: Dr. Robert W. Sterner, Associate Professor, Department of Ecology, Evolution and Behavior, University of Minnesota, St. Paul, MN 55328. Email, stern007@tc.umn.edu.

8. **CONGRESSIONAL DISTRICT** Five.

9. **STATEMENT OF CRITICAL REGIONAL OR STATE WATER PROBLEMS**
Nutrients (N or P) create environmental degradation by their interconversion to algal biomass. However, the stoichiometry of this interconversion is poorly understood, particularly in running waters. Carbon:Phosphorus ratios in algae are known to range over approximately one order of magnitude. Predictive models of nutrient releases such as from treatment plants, agricultural activities such as feedlots, or from generally increased atmospheric deposition of nitrogen, will depend on improved understanding of the C:P stoichiometry in streams and rivers.

10. **STATEMENT OF RESULTS OR BENEFITS** This project will: 1) measure the C:N:P stoichiometry in streams and rivers in Minnesota, relating them in particular to stream order and land use practices; 2) describe the degree of nutrient limitation and how that relates to C:N:P stoichiometry; and 3) test a mechanistic model of how light and nutrients relate to the conversion of N or P into aquatic biomass.