



## WATER RESOURCES RESEARCH GRANT PROPOSAL

**Project ID:** 2004SD21B

**Title:** Coupled Carbon-Nitrogen Geochemistry under Reducing Conditions in a Prairie Pothole

**Project Type:** Research

**Focus Categories:** Groundwater, Water Quality, Hydrogeochemistry

**Keywords:** carbon cycle, nitrogen cycle, prairie pothole, dissolved organic carbon, dissolved organic nitrogen, NOM, organic geochemistry

**Start Date:** 03/01/2004

**End Date:** 02/28/2005

**Federal Funds:** \$7,000

**Non-Federal Matching Funds:** \$14,375

**Congressional District:** First

**Principal Investigator:**

James A. Rice

### Abstract

A study proposed to understand the coupled carbon-nitrogen cycle in a prairie pothole wetland. This site is unique because it rapidly becomes anoxic after the water surface freezes in the winter, and rapidly becomes oxic in the spring, and stays oxic, because it is well-mixed by the prevailing winds. It thus represents a convenient closed chemical reactor to study these reactions. This proposal requests funding for the first year of what will be a three-year project. The overall project has the following objectives:

1. Determine the annual variation in the redox potential of the pothole.
2. Create a nitrogen and carbon mass balance for the pothole.
3. Determine the form of nitrogen present in the dissolved organic matter.
4. Using  $^{15}\text{N}$  and  $^{13}\text{C}$  labeled compounds, trace the coupled C-N transformations in the pothole under oxic and anoxic conditions.