



## WATER RESOURCES RESEARCH GRANT PROPOSAL

**Project ID:** 2003IA59B

**Title:** Spatial and temporal patterns in precipitation and dry-fall deposition of Nitrogen and Phosphorus in Iowa: implications for nutrient transport and water quality

**Project Type:** Research

**Focus Categories:** Nutrients, Geochemical Processes, Water Quality

**Keywords:** atmospheric deposition, phosphorus, nitrogen, wet-deposition, dry-deposition, spatial variation, temporal variation

**Start Date:** 03/01/2003

**End Date:** 02/29/2004

**Federal Funds:** \$500.00

**Matching Funds:** \$0.00

**Congressional District:** IA 4

**Principal Investigators:** Downing, John

**Abstract:** Atmospheric nutrient (nitrogen and phosphorus; N and P) loading and transport through precipitation and dry deposition is one of the least understood and may be one of the most important pathways of nutrient transport in agricultural landscapes. Atmospheric P deposition through precipitation on a lake's surface has recently been found to contribute >30% of the annual P load, single handedly preventing eventual remediation to attain projected federal nutrient standards. The purpose of this project is to fill three essential information gaps: (I) to characterize both nitrogen and phosphorus deposition, (II) through both wet- and dry-deposition to dry- and wet-surfaces, and (III) to characterize the spatial and temporal variation of this deposition across the state of Iowa. We will measure nutrient deposition from April 1st, 2003-March 31st, 2005 at seven sites representing a range of landscape characteristics common in Iowa. Upon collection, samples will be returned to the Limnology Lab at Iowa State University for analysis. Comparisons among types of deposition measures will be made using non-parametric equivalents of ANOVA. Temporal analyses will be made graphically as well as using multivariate methods to relate deposition to storm type, source and intensity. Spatial patterns will be characterized using kriging within geostatistical (GIS) packages. This project will allow a broader understanding of the

process of atmospheric nutrient transport in agricultural landscapes and a means of evaluating the role of atmospheric deposition in water quality impairment and remediation.

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