



WATER RESOURCES RESEARCH GRANT PROPOSAL

Project ID: 2002MD1B

Title: Investigation of isotopic methods for identifying atmospheric deposition of nitrate to the Chesapeake Bay Watershed

Project Type: Research

Focus Categories: Non Point Pollution

Keywords: acid rain, atmospheric deposition, geochemistry, isotopes, nitrate

Start Date: 03/01/2002

End Date: 02/28/2003

Federal Funds: \$17,739

Non-Federal Matching Funds: \$36,054

Congressional District: 5th congressional district of Maryland

Principal Investigator:

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Abstract

We will focus on determining the nitrate concentrations and D17O for rain events. This will be undertaken with concurrent analyses of d18O and d15N of nitrate. Including D17O with d18O and d15N data may provide an additional dimension that is lacking in studies that only examine D17O or d18O and d15N. We will also undertake survey analyses of the isotopic composition of nitrate (D17O, d18O, and d15N) from other sources in the Chesapeake Bay watershed, including surface runoff, sewer discharge, overland flow, tributaries, agricultural and biological sources, and isotopic measurements of the compositions of the precipitation and of other species in rainwater (e.g., sulfate). The goals of the proposed research include: (1) Testing the new isotopic methods for quantifying the contribution of atmospheric nitrate to the Chesapeake Bay watershed; (2) Determining the nature and magnitude of isotopic variability of nitrate in precipitation delivered to the Chesapeake Bay watershed, including any correlation with other types of isotopic and chemical tracer data; (3) Establishing a long term program to characterize D17O, d18O, and d15N of nitrate in precipitation delivered to the Chesapeake Bay watershed. If this approach meets its expectations it will provide information that will be useful for future models of the Bay nitrogen budget and will increase our ability to target nitrogen sources and to reduce nitrogen pollution in the Chesapeake Bay ecosystem.