

Project Completion Report

Rocky Mountains Cooperative Ecosystem Studies Unit (RM-CESU)

Project Title: Plant Community and Soil Nitrogen Responses to Nitrogen Deposition in Two Northern Great Plains National Parks

Project Code: WASO agreement, P08AC00257

Type of Project: Research

Funding Agency: National Park Service

Partner University: Colorado State University

NPS Agreement Technical Representative: Ellen Porter, Air Resources Division, National Park Service, Denver, Colorado 80225; ellen_porter@nps.gov; 303-969-2617

Principal Investigators

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Start Date of Project: September 1, 2008

End Date of Project: August 1, 2013

Funding Amount: \$109,000.00

Project Summary:

Grassland plots in two Northern Great Plains Network parks, Wind Cave NP and Badlands NP, were fertilized with nitrogen (N) for two years to simulate effects from atmospheric deposition of nitrogen (N). N addition at the sites resulted primarily in an increase in leaf and soil nitrogen, with greater increases occurring at sites with lower initial productivity.

Products:

- Final Report: Master's Thesis by Anine Smith

- Data from the first two years of the study (2010 & 2011) have been provided in hard copy and Excel form to WICA and BADL natural resources programs
- Annual Accomplishment Reports for 2010 and 2011
- There will be a final report of the project in 2014, following another year of N applications.
- Also the researchers will write a NPS Natural Resource (Technical) Report, and publications in peer-reviewed journal(s) for widespread dissemination

Number of students participating in this project: one graduate student; earned MS degree

Lessons Learned from this project: Two years of N fertilization do not appear to be sufficient to induce changes in species composition or diversity; longer-term studies are preferable to assess plant community changes at ambient/near-ambient levels of N deposition.