

## **ANNUAL ACCOMPLISHMENT REPORT PMIS # 104675**

**Title:** Assessment of nitrogen deposition and its possible effects on alpine vegetation in Grand Teton National Park

PMIS # 104675

**Contact:** Helga Van Miegroet, Utah State University

The objective of this two-year project is to assess the impact of atmospheric N deposition on the structure and function of alpine ecosystems in Grand Teton National Park (GRTE), based on field measurements and experimental manipulation of N loadings in alpine sites with contrasting (wet/dry) edaphic conditions and assumed N input regimes. Specific goals for year 1 were to establish a series of vegetation plots along a modeled N deposition gradient, determine winter and summer N loadings, and determine plant and soil characteristics relevant to N status. Based on modeled N deposition estimates for GRTE and access via existing trail system, three candidate sites were identified: Moose Basin (High), Paintbrush Canyon (Low) and Rendez-Vous Mountain (Medium/Low). In early spring 2006 (at peak snow accumulation) students from Utah State University (USU) were trained in snow survey techniques by for George Ingersoll from USGS, and snow cores were taken at the three sites (by USGS or USU personnel) and sent to USGS for chemical analysis. As soon as field sites were accessible, 36 plots were delineated and instrumented with temperature dataloggers, soil moisture probes, and N deposition resin collectors. Field crews finished floristic surveys (composition and cover), and collected samples for above- and belowground plant biomass and N content, total soil N, extractable soil inorganic N, and microbial biomass and nitrification potential (the latter with funds from the University of Wyoming and USU). Ion exchange membranes were installed in the soil to measure flow of inorganic N through the soil (surrogate for N leaching). At the end of field season, summer N deposition collectors and exchange resins were removed for extraction in the lab. All samples are currently being processed at USU for chemical analysis.

Initial positive outcomes: First measured (rather than modeled) N deposition loading data to the alpine sites at GRTE; background information on plant composition and plant and soil nitrogen status

Total project cost: \$100,002

Funds expended in FY 06: \$27,522

**Note** - Award/Budget Period for USU different from FY: 1 January 2006 – 31 March 2008 (Cooperative Agreement H1200040001, Task Agreement J1460050008)

During period 1 March – 31 September, \$27,522 of the first-year allocation of \$50,094 was expended mostly on purchase of equipment, travel to the site, and stipends and wages for graduate and undergraduate students; the remainder will be spent during the rest of the first contract period on sample analysis and student stipends.

Funds expected for FY07 \$49,908

PHOTOS:

TETONS\_PMIS # 104675-PlotSetup.bmp

Caption: View of plot layout in the field

TETONS\_PMIS # 104675-Installation of Collectors.bmp

Caption: Installation of N deposition collectors

TETONS\_PMIS # 104675-Plots\_at Paintbrush Mountain.bmp

Caption: Field installation with interpretative sign