

Project Summary

Rocky Mountains Cooperative Ecosystem Studies Unit

Project Title: Evidence for Shifts in Plant Species Diversity Along N Deposition Gradients: A First Synthesis for the United States

Discipline: Natural
Type of Project: Research
Funding Agency: USGS
Other Partners/Cooperators: University of Colorado Boulder
Effective Dates: 1/15/2014 - 1/14/2015
Funding Amount: \$68,000

Investigators and Agency Representative:

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Project Abstract: The goal of this research is to use available plant diversity (richness plus abundance) data sets along known N deposition gradients, to test the relationships between species diversity and richness N deposition.

Objectives are:

- 1) To use available plant diversity data sets along known N deposition gradients, statistically test the relationships between species diversity and richness with modeled (CMAQ) and measured (NADP, CASTNET) N deposition.
- 2) To determine critical loads based on rates of N deposition that cause decreases in richness and diversity using several approaches (e.g. nonlinear regression, confidence interval exceedances).
- 3) To test hypotheses related to species environments and species traits as follows:
 - Hypothesis related to covarying environmental drivers of species richness: Declines in species richness under N deposition are also related to soil pH, climate, other limiting soil nutrients (especially P), and ecosystem productivity.
 - Hypothesis related to species traits and abundance as drivers of species loss: Mechanisms of loss or decline of individual species along N deposition gradients are related to commonness vs. rarity, native vs. exotic species, lifeform, mycorrhizal relationships, plant traits such as tissue N concentration, growth rate, leaf longevity, and others.

Outcomes with completions dates: January 14, 2015

Keywords: species diversity, plants, N deposition, USGS, University of Colorado Boulder