

**Project Summary**  
**Rocky Mountains Cooperative Ecosystem Studies Unit**

**Project Title:** Characterizing Reactive Nitrogen in Rocky Mountain National Park and the Rocky Mountain Region

**Discipline:** Natural  
**Type of Project:** Research  
**Funding Agency:** National Park Service  
**Other Partners/Cooperators:** Colorado State University  
**Effective Dates:** 9/1/2009 - 9/30/2010  
**Funding Amount:** \$645,582

**Investigators and Agency Representative:**

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**Project Abstract:** In order to build upon the valuable findings from the RoMANS 2006 and RoMANS II 2008/09 field studies and to continue improving our understanding of the transport and deposition of nitrogen in Rocky Mountain National Park and the spatial variability in ammonia and organic nitrogen concentrations in the Rocky Mtn. region, a series of new field experiments is planned. The primary objectives of this project are to:

- Complete the ongoing year-long RoMANS II study of reactive nitrogen concentrations and deposition begun in Nov. 2008 in order to examine seasonal trends in reactive nitrogen species concentrations and deposition and construct a full annual deposition budget for key nitrogen deposition pathways including dry deposition of ammonia and wet deposition of organic nitrogen.
- Make additional measurements of gaseous ammonia in RMNP and at a similarly situated location west of the continental divide to help determine the contribution of local ammonia emissions vs. transported ammonia to observed concentrations.
- Co-locate measurements of aerosol biomass burning markers in RMNP with ammonia measurements to examine the influence of wild and prescribed fire emissions on ammonia concentrations.
- Design, evaluate, and establish a pilot program for measurement of reduced nitrogen (gaseous ammonia + fine particle [PM<sub>2.5</sub>] ammonium) at selected IMPROVE sites in the Rocky Mountain region.
- Gather additional information about the phase distribution (particle vs. gas), composition (oxidized vs. reduced), important source regions, and suitability of different measurement methods for organic nitrogen, to include an assessment of the suitability of weekly wet deposition sampling of organic nitrogen.
- Continue analyzing observational data from the RoMANS and RoMANS II campaigns and work toward publication of key findings from these studies, in collaboration with NPS scientists.

**Outcomes with Completion Dates:** final report shall be submitted to the Key Official by September 30, 2010.

**Keywords:** Colorado State University, NPS-Air Resources Division, Rocky Mountain National Park, RoMANS, nitrogen deposition, air quality