

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

**Project Title:** Assistance for Visibility Data Analysis and Image Display Techniques

**Discipline:** Natural

**Type of Project:** Technical Assistance

**Funding Agency:** National Park Service

**Other Partners/Cooperators:** Colorado State University

**Effective Dates:** 9/1/2007-8/31/2008

**Funding Amount:** \$930,297

**Investigators and Agency Representative:**

NPS Contact: Bill Malm, Air Resources Division, National Park Service, CIRA Foothills Campus, Colorado State University, 1375 Campus Delivery, Fort Collins, CO 80523, (970) 491-8598;  
[malm@cira.colostate.edu](mailto:malm@cira.colostate.edu)

Investigator: Kenneth Eis, Colorado State University, Cooperative Institute for Research in the Atmosphere (CIRA), 1375 Campus Delivery, Fort Collins, CO 80523; e-mail: [eis@cira.colostate.edu](mailto:eis@cira.colostate.edu)  
Tel: (970) 491-8397

**Project Abstract:** The NPS-Air Resources Division will work with Colorado State to advance the air quality and visibility protection programs of the National Park Service, and the USDA-Forest Service, with an emphasis on monitoring, measurements and data analysis in Class 1 parks and wilderness areas. The specific tasks to be carried out under this agreement include:

1. Continue supporting the Interagency Monitoring of Protected Visual Environments (IMPROVE) Steering Committee, Environmental Protection Agency (EPA), and associated Federal and State Land Managers in matters pertaining to ambient aerosol and visibility reporting.
2. Continue development and evaluation of regional air quality modeling using state-of-the-science tools to assist Regional Planning Organizations (RPO's).
3. Develop and use receptor models to determine transport pathways and estimate the proportion of a measured pollutant that can be attributed to each of several sources.
4. Investigate trends in air pollution at federal Class I visibility areas going as far back as 1979.
5. Continue research on organic carbon aerosols, including their measurement, characterization, and source attribution.
6. Continue implementation of the IMPROVE website including developing an interactive database allowing users to download data and selected analyses of these data from the Web.
7. Continue development of photographic imaging techniques that will accurately depict slight changes in visibility due to layered and regional haze.
8. Continue to produce videos and CDs showing the impact of air pollution on various national parks.
9. Continue research addressing the issue of smoke impact on regional haze and visibility in national parks.
10. Conduct analyses of data collected during special air quality monitoring studies in Yosemite National Park, CA and at the USDA Forest Service Missoula, MT Fire Laboratory designed to monitor smoke from forest wildfire.
11. Continue development of the Visibility Information Exchange Web System (VIEWS) web service being developed for the Regional Planning Organization's Air Monitoring and Data Analysis Committee.
12. Continue to work on assignments from the NPS in the conduct of a major study: "Fate and Origin of Nitrogen and Sulfur along the Colorado Front Range and Rocky Mountain National Park."

**Outcomes with Completion Dates:**

DELIVERABLES	DATES OF DELIVERY
Presentations at and participation in the AAAR annual meeting,	September 30, 2007
Complete new set of smoke measurements	November 30, 2007
Complete preparations for new IMPROVE calendar.	November 30, 2007
Presentations at and participation in the AGU fall meeting,	December 31, 2007
Ingest latest IMPROVE data submissions from UC Davis	February 29, 2008
Presentations at and participation in the AWMA annual meeting,	June 30, 2008
Draft publications submitted for review	February 29, 2008

Draft report from Aerosol Research Task 1	April 30, 2008
Manuscripts submitted for publication	August 31, 2008
Continuous operation of IMPROVE web site	August 31, 2008

**Keywords:** Colorado State University, NPS-Air Resources Division, visibility, air quality, class 1 areas, data analysis, IMPROVE, web site, modeling

**For Administrative Use Only:**

Date Annual Report Received:

Date Final Report Received:

Publications, etc. on file: