

# **IMPROVE Website**

## **Status and Great Things to Come**

Presented to the IMPROVE Steering Committee Durango, CO  
September 2007  
B.A. Schichtel

# IMPROVE's Evolution

**IMPROVE** *Interagency Monitoring of Protected Visual Environments* Home Search Contents Contact

Overview Data Tools Publications Studies Education/Reg Forum Activities Links

## Interagency Monitoring of Protected Visual Environments

Our national Parks and Wilderness Areas possess many stunning vistas and scenery. Unfortunately, these scenes are diminished by uniform [haze](#) causing discoloration and loss of texture and visual range. [Layered hazes](#) and [plume blight](#) also detract from the scene. Recognizing the importance of visual air quality, congress included [legislation in the 1977 Clean Air Act](#) to prevent future and remedy existing visibility impairment in [Class I areas](#). To aid the implementation of this legislation, the [IMPROVE program](#) was initiated in 1985. This program implemented an extensive long term monitoring program to establish the current visibility conditions, track changes in visibility and determine causal mechanism for the visibility impairment in the National Parks and Wilderness Areas.

The [purpose](#) of this website is to provide access to the IMPROVE monitoring data resources and educational material on the science of visibility and regulations. First time visitors should visit the [Overview](#) section which summarizes the IMPROVE network and visibility science and regulations.

**IMPROVE and Visibility Overview**

- Data Resources
- Tools
- Publications
- Special Studies
- Visibility & Regulation Education

**IMPROVE Resources**

- Database
- Metadata
- Graphics
- Photos
- Web Cams
- IMPROVE Reports
- Grey Literature

**Bulletins**

**Diminishing View**  
Diminishing View  
Diminishing View

West Elk Mountains, Colorado

B <sub>ext</sub> (Mm <sup>-2</sup> )	20	30	40	60	100	200	300	500		
DeclViews	4	7	11	14	18	23	30	34	37	39
V.R. (km)	200	130	100	65	40	20	13	10	8	

< Stop Loop >

- Data
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- Special Studies
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### Website Categories

- Data Resources
- Tools
- Publications
- Special Studies
- Visibility & Regulation Education
- IMPROVE & Visibility Overview

### IMPROVE Resources

- Database
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- Graphics
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# IMPROVE Website Purpose

- The primary purpose of the IMPROVE website is to provide federal, state, and local air quality regulatory agencies as well as the general public access to:
  - IMPROVE monitoring data
    - aerosol, optical and soot
  - Processed data graphs and derived data values, reports to satisfy some of State's needs for regional haze rule
  - Provide access to data analysis tools and algorithms
- Secondary objectives of the website are:
  - **Provide access to educational material and documents on visibility issues, science and regulations**
  - **Inform users of data QA/QC activities and issues**
  - **Document IMPROVE activities - maintain transparency**

IEWS and now TSS  
Handles this

# VIEWS' Vicissitude Vision

- VIEWS to be a source of the most *relevant, up to date and quality assured air quality data* for visibility and other applications
- The VIEWS data management system and web tools have application beyond regional haze
  - potential to link air quality monitoring data, emissions data, modeling results to support environmental science, planning and regulations
  - simplify and coordinate SIP development activities for States and Tribes
- The development of the **WRAP TSS** is realizing this potential
  - VIEWS infrastructure is being leveraged to facilitate the development of the WRAP TSS
  - Applicable WRAP TSS developments are being incorporated back into views

# IMPROVE/VIEWS Growing International User Community

- Average unique visitors a month
  - IMPROVE - 2300 ; VIEWS - 1600
- 1117 registered users (increase from 870)
- Visitors from 164 different countries have accessed the websites include visitors from Iran and Iraq
  - No one from Afghanistan yet
- Over 50 other websites Link to IMPROVE and VIEWS
- About 400 - 1200 queries to the database a month (650 on average)
  - Previously about 450 queries / month
- 1000s dynamic images generated a month

# Major Change to the VIEWS/TSS Team

- Rodger Ames left (and had a baby boy)
- In process of hiring his replacement
- For the mean time
  - Slowed development of wiz bang features and tools
  - Reevaluating the system and better integrating and organizing the various products
- Lindsey Debell (NPS-CIRA) has moved on
  - UC Davis has taken over most of her QA/QC activities

# Additions - Data

- IMPROVE aerosol data update ~~QUARTER MONTH~~  
**QUARTER**
  - Final data is available through July 2006
  - Complete preliminary data: Aug - Sep 2007
  - **Incomplete preliminary data (mass, ions, C): Nov – Feb '07**
- Optical data updates
  - Nephelometer scattering data (quarterly)
    - 1993 through March 2007 data available from online database.
  - Transmissometer extinction data (annually)
    - ASCII files: 1987 – 2006
    - This is the end, my only friend the end .... (J. M.)

# Additions – Data Continued

- Regional Haze Rule Metrics: best and worst 20% haze days
  - RHR1 (old algorithm) data available through 2004
  - RHR2 (new algorithm) data available through 2005
  - Added “substitute” data for 19 sites not meeting the RHR completeness criteria or needing a complete 2002
    - These data have been added to the RHR2 network
    - Calculating RHR haze metric with and with out substituted data
- New New (thanks Scott) natural condition estimates for best and worst 20% haze days for 181 IMPROVE sites
  - Addressed several deficiencies in the first implementation of the new algorithm
  - Incorporated state “substituted data”

# Additions – Data Continued

- IMPROVE Data Archive
  - Historical data can be revised once a year in January.
  - Prior to making these changes, the entire IMPROVE data set is archived and differences between each years archive is noted.
    - The first archive will be for the 1988 – 04 data which includes the Oct 2005 resubmission of 2000-04 data
  - RHR Data in the baseline period (2000 – 2004) is frozen
  - RHR Data from 2005 onward will continue to be revised
- Adding an index describing IMPROVE and other data sets
  - IMPROVE has 7 different datasets:
    - Raw, Preliminary, RHR1, RHR2, Substituted, Nephelometer, transmissometer

# Additions - Documents

- 2006 IMPROVE Report
- 2006 IMPROVE Steering Committee Meeting Presentations
- Latest IMPROVE newsletters and meeting minutes
- 2007 IMPROVE Calendars
- SOPs
  - UCD - SOP 101 Procurement and Acceptance Testing
  - ARS – Collection of scene monitoring photographic film, .....
- QA/QC
  - 6 data advisories by W. White
  - UCD QA/QC quarterly reports Q1 2005 through Q1 2006
  - NPS/CIRA QA/QC procedures and reports for data through 2004
    - Lindsey Debell has moved on and UCD has taken over these QA/QC procedures

# Additions - Gray Literature

- Eight articles added to the Gray literature page
  - Proposed FLAG Level II AND III Visibility Assessment – Schichtel
  - Natural Haze Levels II: Application of the New IMPROVE Algorithm to Natural Species Concentrations Estimates – Natural haze level committee
  - Behavior of Fine-Particle Elemental Data Near the Detection Limit – W. White
  - Using In-Network Precision Data as a Basis for Cross-Network Comparisons – W. White
  - A SAS Macro for Theil Regression – A. Hess
  - Summary of IMPROVE Nitrate Measurements – C. McDade
  - Artifact Corrections in IMPROVE – C. McDade
  - Evaluation of the Equation for Soil Composite – B. Eldred

# New Tools

- Upgrade VIEWS tools for data analysis, display and delivery tools
  - Query wizard 3 – coming soon
  - Enhanced tools to deliver and explore graphical and tabular Summaries of IMPROVE data relevant to RPO's
  - Enhanced tools to access and visualize data from other networks – still in draft mode
  - Added capabilities to dynamically make contour maps – currently only available from TSS

# Coming year activities

- Upgrade integrated database, incorporating emission and modeling data and aggregated data
  - Unify all databases in VIEWS/TSS
- Create a Data Set Index page to unify and organize data descriptions and access to all VIEWS datasets
  - Query wizard content, ASCII files, Substituted data, archived data, data repository, natural conditions.....
- Upgraded tools based on developments from TSS
- Continued maintenance and addition of routine products
- Enhancements to the visibility and air quality educational tools (Winchester, Malm, Lemke)

**end**