INTERAGENCY MONITORING OF PROTECTED VISUAL ENVIRONMENTS

IMPROVE

4th Quarter 2011 | The IMPROVE Newsletter | Volume 20 / Number 4

Monitoring update

Feature Article: Previewing the new FED Web tool, Page 4

Network operation status

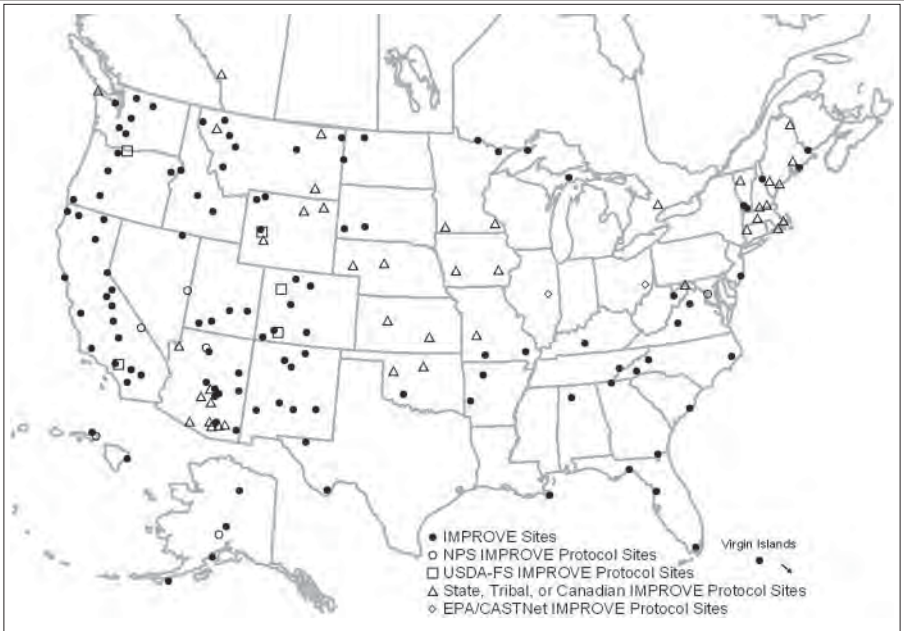
The IMPROVE (**I**nteragency **M**onitoring of **Pro**tected **V**isual **E**nvironments) Program consists of 110 aerosol visibility monitoring sites selected to provide regionally representative coverage and data for 155 Class I federally protected areas. Instrumentation that operates according to IMPROVE protocols in support of the program includes 55 additional aerosol samplers, optical instrumentation (nephelometers and transmissometers), scene instrumentation (Webcamera systems), and interpretive displays.

IMPROVE Program participants are listed on page 8. Federal land management agencies, states, tribes, regional air partnerships, and other agencies operate supporting instrumentation at monitoring sites as presented in the map below. Preliminary data collection statistics for the 4th Quarter 2011 (October, November, and December) are:

- Aerosol (channel A only) 94% collection
- Aerosol (all modules) 93% completeness
- Optical (nephelometer) 97% collection

Several aerosol monitoring sites changed operational status this quarter:

- Columbia River Gorge West, WA (COGO1) discontinued operations in November as funding for the station expired. The Gorge East site (CORI1) continues to operate.
- Ripple Creek, CO (RICR1) was relocated to another area having a more reliable power source. This new site is named Flat Tops (FLTO1). See related article on Page 6.
- Lye Brook, VT, was relocated to a nearby area due to landowner issues. The new site, installed in December 2011, is LYEB1.
- San Gabriel, CA (SAGA1), which was destroyed by wildfire two years ago, was reinstalled in late September at its previous location. San Gabriel's replacement site, Wrightwood (WRIG1), will continue to operate concurrently for several more months.



IMPROVE and IMPROVE Protocol Sites
4th Quarter 2011

Data availability status

Data and photographic spectrums are available on the IMPROVE Web site at *http://vista.cira.colostate.edu/improve/Data/data.htm* and on the VIEWS Web site at *http://vista.cira.colostate.edu/views*. They are also on the new Federal Environmental Database (FED) Web site at *http://views.cira.colostate.edu/fed/Default.aspx*).

Aerosol data are available through December 2010. Nephelometer and transmissometer data are available through September 2011 and December 2010, respectively.

Webcamera real-time images and data are available on agency-supported Web sites.

***Monitoring update** continued on page 3....*

Visibility news

IMPROVE says goodbye to one of its own

The IMPROVE group and numerous others in the field of air quality said goodbye to Scott Archer in December. He passed away following a six-month illness at the age of 57. Scott retired in 2009 from the Bureau of Land Management (BLM) where he was a Senior Air Quality Specialist and representative on the IMPROVE Steering Committee.

Scott Forrest Archer
April 22, 1954 - December 27, 2011

Scott grew up in West L.A. with his parents and older sister. He learned to love the outdoors by going on many family and Boy Scout outings; he later became a proud Eagle Scout. Scott also developed a lifelong love for the "surfer" California sound as represented by the Beach Boys. His family moved to Flagstaff, AZ, in 1973 where he attended Northern Arizona University, and where he made life-long friends of professors and fellow students. As one of the first students majoring in the environmental science program, Scott played a key role in helping to configure laboratories required for the complex analytic procedures requisite for training of young, emerging environmental scientists. In 1977 he graduated with degrees in political science, chemistry, and environmental science.

Upon graduation, Scott joined Northrop Services Inc., an environmental consulting firm under contract to the Environmental Monitoring Systems Laboratory in Las Vegas, where he played a key role in implementing the nation's first visibility monitoring program. Scott's passion for air quality then brought him to the Colorado State Office of the BLM in 1979, where he evaluated and advised how energy development impacts air quality on public lands.

On May 5, 1990, Scott married Sue Ballenski, and they enjoyed 21 years together. Scott loved his wife, family, friends, nature, travelling, and his two dogs, Jack and Strider. He is missed yet remembered by all who knew him.

Web visitors weigh in on NPS snow views

Sequoia & Kings Canyon National Parks, CA, installed a Webcamera in January 2003 to document visibility conditions. Last year over 2,000 people per day visited the park's Webcam page to view these images and air quality data. This view also contained a rain gauge, which park staff removed last October when they transitioned to another gauge outside the view.

Following this event, park staff were surprised to receive comments from virtual visitors inquiring about the missing rain gauge. Webcam watchers had grown accustomed to using the gauge to judge snow depth, and without it, were unable to estimate the amount of snow on the ground. To address this concern, park staff installed a snow stick in December 2011 so visitors could once again judge the depth of the snowpack. Some NPS staff, however, thought that the stick created a "pretty significant visual intrusion on an otherwise natural landscape view." As a result, the snow stick was moved to the edge of the view in a compromise that maintains an unobscured vista while satisfying the curiosity of snow watchers.

Now we are just waiting for the snow to fall. Real-time images of the park's Webcamera view can be seen at: *http://www.nature.nps.gov/air/WebCams/parks/sekicam/sekicam.cfm*.

For more information contact Melanie Ransmeier at the National Park Service. Telephone: 303/969-2315. E-mail: melanie_ransmeier@nps.gov.

The Webcamera at Sequoia & Kings Canyon National Parks depicts a scenic view toward the southwest. Fry's Point can be seen as the dominant peak in the center of view, 5.5 miles distant.

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IMPROVE Newsletters are also available on the IMPROVE Web site at *http://vista.cira.colostate.edu/improve/Publications/news_letters.htm.*

IMPROVE Committee meets in Frostburg

The IMPROVE Steering Committee held their annual meeting October 26-27, 2011, in Frostburg, MD. The Mid-Atlantic Regional Air Management Association (MARAMA) hosted the meeting, which included a site visit to the Frostburg Reservoir IMPROVE Protocol monitoring site. Items presented and discussed include:

- Status updates on the monitoring networks, laboratory analyses, and field and laboratory audits.
- Laboratory analytical and sample handling changes.
- XRF reanalysis and IMPROVE trends analysis reports.
- Committee recommendations for carbon artifacts.
- FTIR analysis of organic matter.
- Visibility issues and assessments in Canada.

A new Committee Chair was also selected. The USFS IMPROVE representative, Scott Copeland, was unanimously voted as the new Chair to replace Marc Pitchford, who retired from government service following the meeting.

Attendees of the IMPROVE Steering Committee meeting toured the Frostburg Reservoir (FRRE1) Big Piney monitoring site. Photograph by Dave Maxwell, BLM.

Meeting minutes and presentations from this and all past meetings can be found on the IMPROVE Web site, at *http://vista.cira.colostate.edu/improve/Activities/activities.htm*.

***Visibility news** continued on page 6....*

Monitoring update *continued from page 1 ....*

Operators of distinction

IMPROVE site operator and Physical Science Technician Liz Garcia is an integral member of the Shenandoah National Park natural resource team. As the primary operator for the air quality monitoring site, she maintains instrumentation for IMPROVE, the Clean Air Status and Trends Network, National Atmospheric Deposition Program, and Mercury Deposition Program, as well as a nephelometer and particulate monitor. She also collects water samples for the Shenandoah Watershed Study.

Since 2004, Liz has driven from her office in the valley to the air quality station an hour away. There she checks and services each piece of instrumentation. "It's an interesting job," said Liz. "It's interesting when things break down because it then becomes a puzzle and I learn a bit more trying to find the cause and solution to the problem."

Liz knew early on she would devote her career to environmental studies. She was born and raised near the Adirondacks in New York, and first arrived at Shenandoah National Park, VA, for a college internship as a student conservation associate (SCA) in 2000. She returned to Shenandoah several times to work as a biological science technician for backcountry wilderness management, fire effects monitoring, and resource management. Liz earned a B.S. degree in Environmental Studies and an M.S. in Forest Resources and Recreation Management.

It was at Shenandoah where she met her husband and they now have two children, ages 4 years and 6 months. At work, Liz gets outdoors to protect resources. At home, she gets outdoors to experience and enjoy these same resources. "It's hard to keep me indoors," said Liz. "I like to experience the outdoors through backpacking, camping, canoeing, and the like."

In addition to her air and water data collection duties, Liz is currently developing an emissions inventory for Shenandoah. The park is attempting to obtain certification as a Climate Friendly Park (*http://www.nps.gov/climatefriendlyparks*).

IMPROVE site operator Liz Garcia is an experienced operator and researcher for air and water quality, and works to protect and preserve resources of all kinds in Shenandoah National Park, VA.

***Monitoring update** continued on page 7....*

Feature article

Previewing the new FED Web tool -- The most versatile way to access up-to-date air quality data (by Scott Copeland, United States Forest Service)

The Web team at the Cooperative Institute for Research in the Atmosphere (CIRA) is developing a new tool for accessing and displaying air quality data sets, including IMPROVE data. The new site, dubbed "FED" for Federal land manager Environmental Database, is still in its early developmental stages but already has capabilities that make it well worth adding to your Internet favorites.

When you first arrive at the FED homepage (*http://views.cira.colostate.edu/fed/Default.aspx*), you're shown an early development version of the long-term goal for FED, namely a unit-oriented page where users can select a park, wilderness, or refuge, and get a summary of air quality data for that unit. The unit-specific tools are still problematic, but the homepage serves as an entry point into the Interactive Data Explorer (IDE) tool, which is the focus of this article.

From the homepage, click the "Data" tab near the top of the page just right of center. This leads to the IDE page with a map and three selection menus. Click the prominent "Get Data…" button in the middle of the screen to bring up a menu which is the heart of the IDE tool and allows a wide range of data analysis options. It should look like Figure 1.

The lefthand side of this menu includes all the steps required to complete each of the five types of reports. Start by choosing the type of report that you'd like. For purposes of introduction, select:

- "Raw Data" from the report menu.
- Next, click the button labeled "2. Datasets". All of the available data sets are displayed. For this example:
- Check the box next to "IMPROVE Aerosol, RHR (New Equation)" and deselect the default "IMPROVE Aerosol".
- Click "3. Sites" and click your favorite site.
- Click "4. Parameters" and click "Select All" near the top of the dialogue box.
- Click "5. Dates" and select "2010".
- There is no need to visit "6. Fields" and "7. Options", but you can adjust many output parameters in those menus.

Now click the "Create Report…" button in the lower-righthand corner. Move the IDE menu to the side and you should see something like Figure 2.

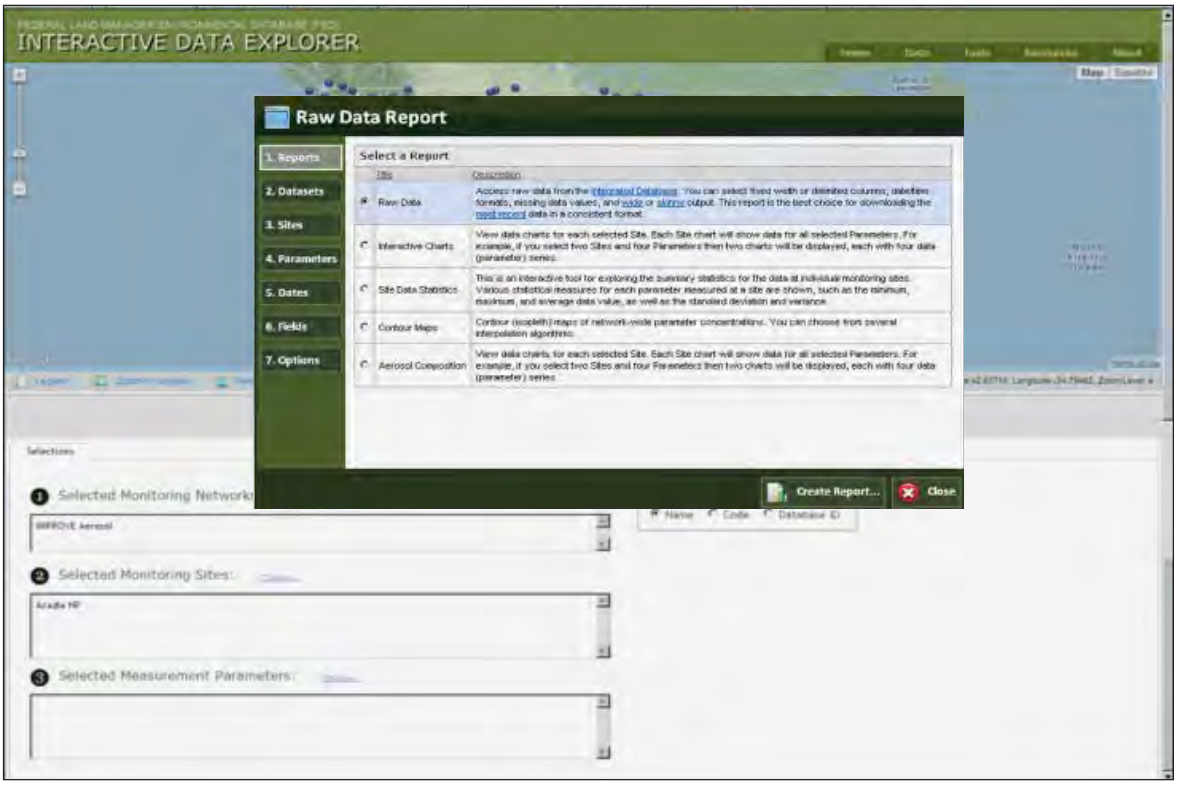


Figure 1. The Interactive Data Explorer (IDE) Web page after selecting the "Get Data" button.

Figure 2 (at left). Interactive Data Explorer screen after user parameters have been selected.

Figure 3 (below). Example contour map of selected data using the FED Interactive Data Explorer.

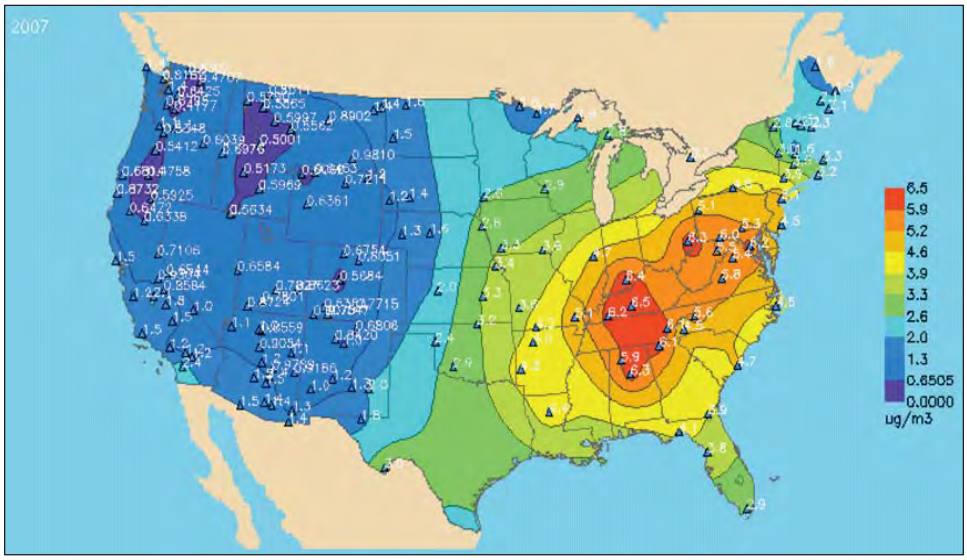
Figure 4 (far below). Example composition data plot of selected data using the FED Interactive Data Explorer.

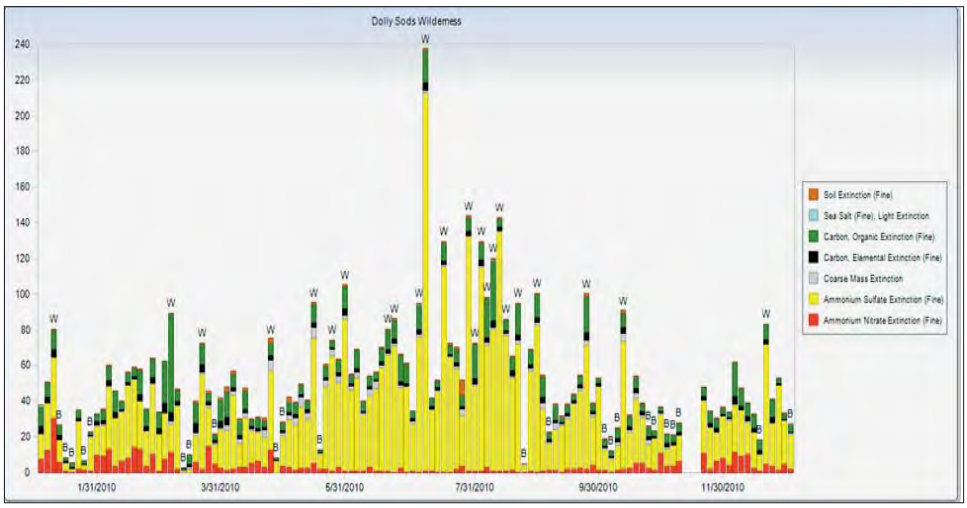
The data can be viewed or downloaded by following the instructions.

Each of the other types of report tools can be used to generate other output. Examples shown (Figures 3 and 4) are a contour map and composition data, respectively. The database behind the IDE tool currently contains IMPROVE data through 2010.

Remember that this is still an early version of the IDE tool and a very early form of the overall FED site, so enjoy the portions that are functional and anticipate the tools to come. If you have constructive comments for the development team or wish to report bugs, please contact Shawn McClure (*mcclure@cira.colostate.edu*).

This new FED Web site contains much more data than just IMPROVE network data. For that reason, IMPROVE has joined other federal land management agencies in submitting data to this comprehensive database. Once FED is fully operational, the VIEWS Web site, the current source of IMPROVE data products, will be discontinued. The IMPROVE Web site (*http://vista.cira.colostate.edu/improve/*) will continue to be operational and include a variety of IMPROVE-related information such as site specifications and photographs, raw data sets, IMPROVE Steering Committee meeting minutes and presentations, and other publications.





For more information contact Scott Copeland at the U.S. Forest Service. Telephone: 307/332-9737. E-mail: copeland@CIRA.colostate.edu.

Visibility news *continued from page 3 ....*

IMPROVE calendars are a hit again

The 2012 IMPROVE calendars made it out late last year and again are a hit. They are now in short supply, but there are extras for anyone who requests an additional calendar, or wants to provide one to an associate.

Not only are the articles informational, educational, and downright interesting, but the photography from year to year is spectacular as well. The calendars were initially designed for use by IMPROVE site operators to help them track sampling days, when cartridge changes are due, and when special cassette changes are required. The calendars have since also become popular with air quality managers and administrators.

CIRA staff, who produce each year's calendar in its entirety, is appreciative to those who contribute technical or research articles, and of course, the site operators who provide insight into their monitoring locations, responsibilities, and personal lives, making the IMPROVE Program a special, nationwide community. Please contact CIRA staff to request an additional calendar, or to have a name or address change to apply to future calendar distributions.

Want to look-up a past article? All calendars are available for download on the IMPROVE Web site at *http://vista.cira.colostate.edu/improve/Publications/publications.htm.*

To request a 2012 calendar or to contribute an idea for the 2013 calendar, contact Jeff Lemke at CIRA. Telephone: 970/491-2209. E-mail: lemke@cira.colostate.edu.

USFS-sponsored Ripple Creek monitoring relocated to Flat Tops Wilderness

The Ripple Creek Pass, CO, (RICR1) IMPROVE Protocol site was established in March 2009 and was sponsored by the United States Forest Service (USFS). The site operated until October 2011, when it was relocated and renamed Flat Tops Wilderness (FLTO1).

The Ripple Creek site had continuing power and equipment issues since its inception, due in large part to its remoteness in northwest Colorado. The aerosol sampler operated with unreliable low-power pumps as electrical line power was not available at the site.

In 2011, USFS staff worked in conjunction with UC-Davis staff to relocate the monitoring station to a more suitable area that would provide more reliable data collection and a more complete data set. This was accomplished in October as the new replacement site for the region was established. FLTO1 has available line power and should be able to operate reliably. FLTO1 is 20 miles southwest from the old RICR1 site and is about 1,500 feet lower in elevation.

The USFS-sponsored Flat Tops Wilderness aerosol monitoring site (FLTO1) was established shortly before winter arrived in the Colorado Rocky Mountains.

For more information contact Chuck McDade at the University of California-Davis. Telephone: 530/752-7119. Fax: 530/752-4107. E-mail: cemcdade@ucdavis.edu.

Monitoring update *continued from page 3 ....*

Outstanding sites

Data collection begins with those who operate, service, and maintain monitoring instrumentation. IMPROVE managers and contractors thank all site operators for their efforts in caring for IMPROVE and IMPROVE Protocol networks. Sites that achieved 100% data collection for 4th Quarter 2011 are:

Aerosol (Channel A) - 51% of all sites

Acadia	El Dorado Springs	Okefenokee
Badlands	Ellis	Olympic
Barrier Lake	Everglades	Organ Pipe
Bliss	Fort Peck	Pasayten
Bondville	Fresno	Petrified Forest
Boulder Lake	Frostburg Reservoir	Phoenix
Boundary Waters	Gates of the Arctic	Presque Isle
Breton	Glacier	Puget Sound
Bridger	Grand Canyon	Queen Valley
Bridgton	Great Basin	Redwood
Brigantine	Great River Bluffs	Rocky Mountain
Bryce Canyon	Great Sand Dunes	Saguaro West
Canyonlands	Great Smoky Mtns.	Seney
Cape Cod	Haleakala Crater	Sequoia
Cape Romain	Hawaii Volcanoes	Shamrock Mines
Cedar Bluff	Hercules-Glades	Shenandoah
Chassahowitzka	Ike's Backbone	Tall Grass
Cherokee	Indian Gardens	Theodore Roosevelt
Chiricahua	Isle Royale	Three Sisters
Crater Lake	Kaiser	Trinity
Craters of the Moon	Linville Gorge	Tuxedni
Crescent Lake	Londonderry	UL Bend
Death Valley	Lye Brook	Voyageurs
Denali	Mammoth Cave	Weminuche
Dolly Sods	Mesa Verde	White River
Dome Land	Mingo	Wichita Mountain
Douglas	Moosehorn	Yosemite
Egbert	Mount Hood	

Nephelometer - 42% of all sites

Acadia	Glacier	Shenandoah
Big Bend	Indian Gardens	Thunder Basin
Estrella	Mount Rainier	

Transmissometer - 100% of all sites

Bridger

Sites that achieved at least 95% data collection for 4th Quarter 2011 are:

Aerosol (Channel A) - 13% of all sites

Big Bend	Lostwood	Sycamore Canyon
Blue Mounds	Martha's Vineyard	Tonto
Bosque del Apache	Pack Monadnock	Upper Buffalo
Brigantine	Pinnacles	Viking Lake
Capitol Reef	San Gorgonio	Virgin Islands
Hells Canyon	Sawtooth	Wrightwood
Jarbidge	Snoqualmie Pass	Yellowstone
Kalmiopsis		

Nephelometer - 37% of all sites

Cloud Peak	Mammoth Cave	South Pass
Dysart	National Capital	Vehicle Emissions
Great Basin		

Sites that achieved at least 90% data collection for 4th Quarter 2011 are:

Aerosol (Channel A) - 21% of all sites

Bandelier	Joshua Tree	Proctor Research Cntr.
Birmingham	Lake Sugema	Quabbin Reservoir
Cabinet Mountains	Lassen Volcanic	Quaker City
Caney Creek	Medicine Lake	San Gabriel
Casco Bay	Mount Baldy	San Rafael
Cloud Peak	Mount Rainier	St. Marks
Flathead	Mount Zirkel	Starkey
Gates of the Mtns.	Nebraska	Swanquarter
Great Basin	North Absaroka	Washington DC
Guadalupe Mtns.	Northern Cheyenne	White Mountain
Hoover	Penobscot	White Pass
James River	Point Reyes	

Nephelometer - 21% of all sites

Cape Romain	Great Smoky Mtns.	Rocky Mountain
Grand Teton		

Monitoring Site Assistance:

Aerosol sites: contact University of California-Davis
telephone: 530/752-1123 (Pacific time)

Optical/Scene sites: contact Air Resource Specialists, Inc.
telephone: 970/484-7941 (Mountain time)

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First Class Mail

IMPROVE STEERING COMMITTEE

IMPROVE Steering Committee members represent their respective agencies and meet periodically to establish and evaluate program goals and actions. IMPROVE-related questions within agencies should be directed to the agency's Steering Committee representative.

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Associate Membership in the IMPROVE Steering Committee requires operation of at least one IMPROVE protocol site, openly share data, and participate in technical review and oversight of the IMPROVE Program. Associate and International Associate Member representatives are:

STATE OF ARIZONA

ENVIRONMENT CANADA

REPUBLIC OF KOREA
MINISTRY OF ENVIRONMENT