INTERAGENCY MONITORING OF PROTECTED VISUAL ENVIRONMENTS

IMPROVE

Volume 8, No. 1 **Winter 1999** **April 1999**

IMPROVE MONITORING UPDATE

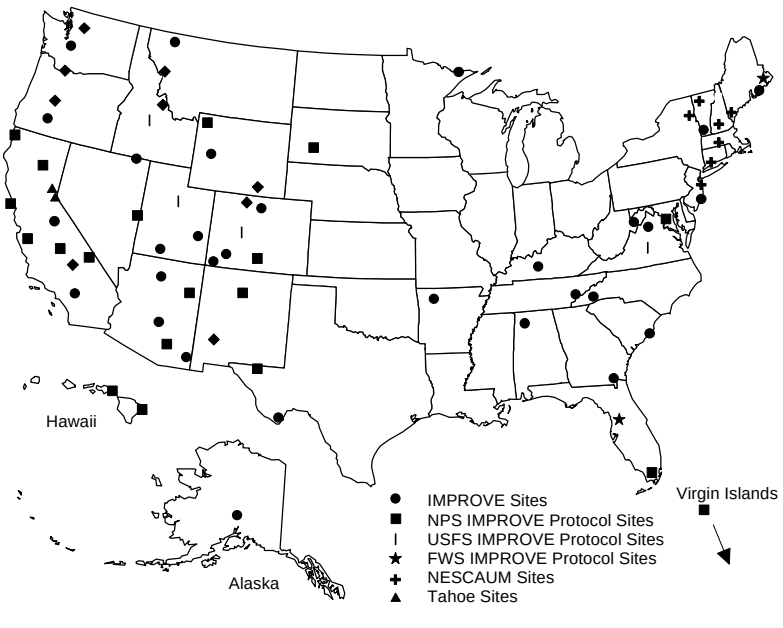
Preliminary data collection statistics for the Winter 1999 season (December, January, and February) are:

Data Type	Collection Percentage
Aerosol Data	95%
Optical (transmissometer) Data	89%
Optical (nephelometer) Data	98%
Scene (photographic) Data	89%

Particulate data have been submitted through November 1998 for all measurements including carbon. The data are available on the UC-Davis FTP site, and as hard copy seasonal summaries.

Optical data have been submitted through August 1998. The data are available on the CIRA FTP site, at ftp://alta_vista.cira.colostate.edu. Scene data are archived but are no longer routinely reported.

Two nephelometer sites will begin monitoring in May. Optical monitoring at the U.S. Forest Service Lye Brook Wilderness, VT (IMPROVE) and Great Gulf Wilderness, NH (USFS IMPROVE Protocol) only occurs during the summer months.



IMPROVE and IMPROVE Protocol Sites
Winter 1999

VISIBILITY NEWS....

EPA submits final rule on regional haze

In early February, the Environmental Protection Agency (EPA) delivered a draft final version of the regional haze regulations to the Office of Management and Budget for review. When finalized, the regulations will describe the requirements for states to submit implementation plans to EPA for making "reasonable progress" toward the national goal of "remedying any existing and preventing any future" manmade impairment in the 156 Class I national parks and wilderness areas across the country. EPA is encouraging states to work together in regional groups to evaluate the problem and develop coordinated strategies to improve air quality in Class I areas and in $PM_{2.5}$ nonattainment areas. Over the past several months, the IMPROVE Steering Committee has been developing a network design plan that will provide for monitoring that is representative of all Class I areas.

What is MARAMA?

Charles Pietarinen recently joined the IMPROVE Steering Committee as a representative from the Mid-Atlantic Regional Air Management Association (MARAMA). The association, organized in February 1990 by Mid-Atlantic governors, mayors, and county commissioners, promotes cooperation and coordination among air quality agencies. MARAMA's mission is to strengthen the skills and capabilities of member agencies and help them work together to prevent and reduce air pollution in the Mid-Atlantic Region. MARAMA's members are: Delaware; the District of Columbia; Maryland; New Jersey; North Carolina; Pennsylvania; Virginia; Philadelphia; and Allegheny County, PA.

MARAMA is active in training, regional projects, and promoting cooperation. It holds numerous workshops and meetings during the year, including an annual air monitoring workshop. MARAMA is working with regional organizations to develop a process for regional visibility planning. For more information see MARAMA's web site at:

http://www.marama.org

***VISIBILITY NEWS** continued on page 3....*

Feature Article

Arizona combines IMPROVE monitoring with its own Class I area monitoring program

by Tom Moore and Mike George, Arizona Department of Environmental Quality

In the spring of 1996, the Arizona Department of Environmental Quality (ADEQ) invited a number of national and local federal land managers, EPA staff, and local government representatives to a workshop to explore the creation of a visibility monitoring network in Arizona. The goal of the network would be to document visibility conditions in each of Arizona's 12 Class I areas. As a result of that workshop, a monitoring plan was developed and distributed to the group for approval. The plan was further distributed to a broader group of stakeholders including industry and environmental groups.

That plan recommended adopting IMPROVE protocol monitoring and deploying monitoring equipment in or near all 12 Class I areas, if at all possible. The network design and site locations in the ADEQ monitoring plan are intended to supplement the IMPROVE program's existing sites by tripling the total number of Class I area monitoring sites in Arizona.

Because of resource and infrastructure constraints, two configurations of equipment have been adopted. One is comprised of aerosol sampling, optical measurements, and meteorological monitoring. The alternative consists of only optical and meteorological monitoring. Aerosol sampling has used IMPROVE A and B modules, which will be expanded to include all four modules by the end of 1999. Optical measurements are made with Optec NGN-2 nephelometers. Meteorological measurements include temperature at two heights, relative humidity, wind speed, and wind direction. The Arizona network sites consist of various combinations of optical, aerosol, and meteorological instrumentation. Data are processed through ADEQ contracts using protocols that generally parallel IMPROVE.

Initially, a total of nine new sites were proposed; five with a full array of instruments and four with the alternative set of instruments. Between December 1996 and June 1998, a total of seven sites were installed around Arizona. These are shown in Figure 1. For the two sites included in the plan that have not yet been installed, ADEQ will augment the IMPROVE program's aerosol sampler near the Mount Baldy Wilderness with optical and meteorological instrumentation once local U.S. Forest Service staff, IMPROVE contractors, and ADEQ agree on a site location this year. For the second site, a full array near the Superstition Wilderness will be installed by ADEQ during the summer of 1999; this location will serve the dual purposes of measuring $PM_{2.5}$ background and transport, and determining Class I area impacts immediately east of the Phoenix metropolitan area.

On a related note, ADEQ has crafted the statewide EPA-required $PM_{2.5}$ monitoring network to integrate visibility and fine particulate monitoring as much as possible. The Superstition Wilderness site is illustrative of that approach. In addition, ADEQ has conducted aerosol and optical urban haze monitoring in the Phoenix and Tucson metropolitan areas since 1993, using IMPROVE optical data processing protocols. These data have provided valuable information used in deploying the $PM_{2.5}$ and Class I monitoring networks.

In the summer of 1998, the group that attended the original organizational workshop was invited to review the program's progress and recommend any mid-course corrections. From that review, the most significant influence on the continuing form of the program was determined to be the IMPROVE network expansion, and changes to the plan were made based on what was known at that time. As before, the plan was distributed for review and approval. Further changes to the IMPROVE program's operations in Arizona, along with the need to respond to recent communications from the IMPROVE Steering Committee and EPA, has resulted in the need to reconvene the group again. Mid-April 1999 has been targeted for the next meeting.

Tom Moore and Mike George of ADEQ coordinate the visibility program at ADEQ. They can be contacted at:

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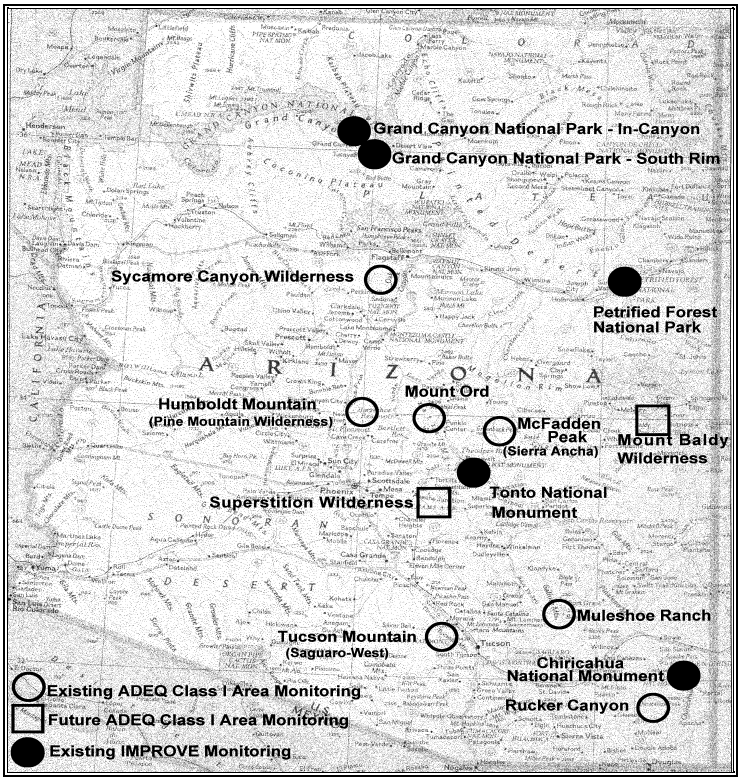

Figure 1. Arizona Class I Visibility Monitoring Network April 1999

VISIBILITY NEWS continued from page 1....

IMPROVE data useful to virtual workgroup

IMPROVE aerosol data are currently being employed extensively in a number of multi-network data sets, data analysis reports, and proposed studies by "The Virtual Workgroup for the $PM_{2.5}$ Analysis Workbook" - a collaborative effort to explore relevant analyses of the $PM_{2.5}$ data to be collected by the new national and state monitoring networks. The goals of this collaboration are to foster an environment for the sharing of ideas and develop a workbook detailing useful analyses of the $PM_{2.5}$ mass and speciated data. The workgroup is supported by an interactive Internet web site at *http://capita.wustl.edu/PMFine/.* There are currently about a dozen on-line reports, proposed studies, and data sets available on this web site which make use of the extensive IMPROVE aerosol data. Examples include:

- Several merged North American Data Sets which combine IMPROVE and other fine particle data from the U.S. and Canada
- Maps of estimated regional fine particle concentrations
- Meteorological interpretation of IMPROVE aerosol data
- Trends analysis
- Episode analysis
- Exploration of relationships between fine particles, ozone, and meteorology.

These IMPROVE-related projects can be accessed directly at: *http://capita.wustl.edu/PMFine/Activities/improve/improved.htm.*

Folks with knowledge of or interest in IMPROVE are encouraged to register (on the "People" page) on the interactive PMFine web site; review and comment on the web site content; ask questions; submit data, analysis reports, analysis tools, or literature references; and to participate in various workgroup discussions. For additional information, contact:

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WRAP introduces new web site

The Western Regional Air Partnership (WRAP) introduced a new web site to disseminate information about its strategies to reduce haze in national parks and wilderness areas in the West. Internet visitors can also comment on preliminary reports and working documents, and contact committees and forums. The new web site's address is:

http://www.wrapair.org

IMPROVE aerosol site clusters selected

In December 1998 the IMPROVE Steering Committee approved a strategy to implement aerosol monitoring in all 156 mandatory Class I areas during 1999. These areas have been combined into 108 clusters; one IMPROVE site will be located in each cluster. To date, 93 of the 108 clusters have been approved, the remaining 15 are allocated for the California Class I areas and are shown below with tentative cluster names:

	Cluster Name	Agency		Cluster Name	Agency
1.	Acadia, ME	NPS	55.	Weminuche, CO	FS
2.	Moosehorn, ME	FWS	56.	Maroon Bells, CO	FS
3.	Lye Brook VT	FS	57.	Rocky Mtn., CO	NPS
4.	Great Gulf, NH	FS	58.	Mount Zirkel, CO	FS
5.	Brigantine, NJ	FWS	59.	Badlands, SD	NPS
6.	Shenandoah, VA	NPS	60.	Wind Cave, SD	NPS
7.	James River Face, VA	FS	61.	Theodore Roosevelt, ND	NPS
8.	Dolly Sods, WV	FS	62.	Lostwood, ND	FWS
9.	Mammoth Cave, KY	NPS	63.	Medicine Lake, MT	FWS
10.	Great Smoky Mtns., TN	NPS	64.	UL Bend, MT	FWS
11.	Shining Rock, NC	FS	65.	Bridger, WY	FS
12.	Cohutta, GA	FS	66.	Yellowstone, WY	NPS
13.	Linville Gorge, NC	FS	67.	North Absoraka, WY	FS
14.	Swanquarter, NC	FWS	68.	Jarbidge, NV	FS
15.	Cape Romain, SC	FWS	69.	Craters of the Moon, ID	NPS
16.	Okefenokee, GA	FWS	70.	Sawtooth, ID	FS
17.	St. Marks, FL	FWS	71.	Anaconda-Pintler, MT	FS
18.	Chassahowitzka, FL	FWS	72.	Glacier, MT	NPS
19.	Everglades, FL	NPS	73.	Bob Marshall, MT	FS
20.	Breton Island, LA	FWS	74.	Scapegoat, MT	FS
21.	Sipsey, AL	FS	75.	Cabinet Mountains, MT	FS
22.	Seney, MI	FWS	76.	Eagle Cap, OR	FS
23.	Boundary Waters, MN	FS	77.	Hells Canyon, ID	FS
24.	Voyageurs, MN	NPS	78.	Mount Rainier, WA	NPS
25.	Isle Royale, MI	NPS	79.	Goat Rocks, WA	FS
26.	Mingo, MO	FWS	80.	Alpine Lakes, WA	FS
27.	Upper Buffalo, AR	FS	81.	North Cascades, WA	NPS
28.	Hercules-Glades, MO	FS	82.	Pasayten, WA	FS
29.	Caney Creek, AR	FS	83.	Olympic, WA	NPS
30.	Wichita Mountain, OR	FWS	84.	Three Sisters, OR	FS
31.	Big Bend, TX	NPS	85.	Mount Hood, OR	FS
32.	Guadalupe Mtns., TX	NPS	86.	Crater Lake, OR	NPS
33.	Bandelier, NM	NPS	87.	Lava Beds, CA	NPS
34.	San Pedro Parks, NM	FS	88.	Redwood, CA	NPS
35.	Wheeler Peak, NM	FS	89.	Kalmiopsis, OR	FS
36.	Salt Creek, NM	FWS	90.	Lassen Volcanic, CA	NPS
37.	White Mountain, NM	FS	91.	Point Reyes, CA	NPS
38.	Bosque del Apache, NM	FWS	92.	Pinnacles, CA	NPS
39.	Chiricahua, AZ	NPS	93.	Marble Mountain, CA	FS
40.	Saguaro - East, AZ	NPS	94.	San Rafael, CA	FS
41.	Petrified Forest, AZ	NPS	95.	Desolation, CA	FS
42.	Gila, NM	FS	96.	Yosemite, CA	NPS
43.	Mount Baldy, AZ	FS	97.	Hoover, CA	FS
44.	Superstition, AZ	FS	98.	Sequoia, CA	NPS
45.	Sierra Ancha, AZ	FS	99.	San Gorgonio, CA	FS
46.	Pine Mountain, AZ	FS	100.	Agua Tibia, CA	FS
47.	Sycamore Canyon, AZ	FS	101.	Joshua Tree, CA	NPS
48.	Grand Canyon, AZ	NPS	102.	Denali, AK	NPS
49.	Bryce Canyon, UT	NPS	103.	Tuxedni, AK	FWS
50.	Canyonlands, UT	NPS	104.	Bering Sea, AK	FWS
51.	Arches, UT	NPS	105.	Simeonof, AK	FWS
52.	Capitol Reef, UT	NPS	106.	Virgin Islands, VI	NPS
53.	Great Sand Dunes, CO	NPS	107.	Hawaii Volcanoes, HI	NPS
54.	Mesa Verde, CO	NPS	108.	Haleakala, HI	NPS

A map of the clusters and associated Class I areas is available on the National Park Service's web site, at:

http://www.nature.nps.gov/ard/vis/canmap.htm

For more information regarding site selection, contact:

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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. Steering Committee representatives are:

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