INTERAGENCY MONITORING OF PROTECTED VISUAL ENVIRONMENTS

IMPROVE

Volume 6, No. 3 **Summer 1997** **October 1997**

IMPROVE MONITORING UPDATE

Preliminary data collection statistics for the Summer 1997 season (June, July, and August) are:

Data Type	Collection Percentage
Aerosol Data	94%
Optical (transmissometer) Data	89%
Optical (nephelometer) Data	94%
Scene (photographic) Data	72%

Particulate data have been submitted through February 1997 for all measurements except carbon. Seasonal summaries including carbon have been distributed through November 1996.

Figure 1 shows the IMPROVE and IMPROVE Protocol monitoring sites.

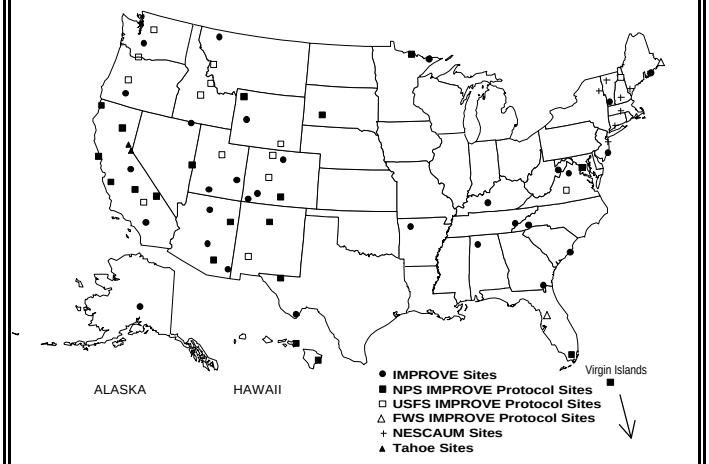

Figure 1. IMPROVE and IMPROVE Protocol Sites July 1997

VISIBILITY NEWS....

Rocky Mountain relocates transmissometer

Personnel at Rocky Mountain National Park are involved in a project to remove overhead electrical lines throughout the park, for aesthetic and utility company maintenance reasons. Because of the project, optical monitoring with a transmissometer was interrupted in July; the instrument and the electrical line that serviced it were disconnected. Monitoring is expected to resume later this fall, after the instrument's receiver component is moved and after electrical service is provided at a different location in the park.

$PM_{2.5}$ standard conference coming in January

The Air & Waste Management Association is sponsoring an international specialty conference, titled *$PM_{2.5}$: A Fine Particulate Standard*, in Long Beach, California, January 28-30, 1998. Scientists, regulatory and industrial personnel, and environmentalists are invited to share information regarding the new standard, which includes differences in size fractions measured, averaging methods over space and time, and types of monitoring methods and network designs that will be applied to determine compliance. For more information contact:

Judy Chow
Desert Research Institute
Telephone: 702/677-3173

Cahill steps down as principal investigator

Dr. Thomas Cahill, longtime principal investigator of the UC-Davis IMPROVE aerosol program, has stepped down on October 1 to pursue other interests in size-compositional analysis and international programs at UC-Davis. The IMPROVE program at UC-Davis was established 10 years ago under Tom's direction, after earlier research on a smaller scale. For example, Tom studied air quality in Grand Teton National Park 25 years ago, and helped establish the first three-site monitoring network 20 years ago. Tom says now is a good time to hand off the IMPROVE program to others.

Dr. Lowell Ashbaugh has taken the lead as the new principal investigator. Dr. Robert Eldred will remain co-principal investigator and will assist in the transition to the new leadership. Lowell is familiar with IMPROVE and its predecessor networks, having done his doctoral research on transport of sulfur particles into western national parks. He has also worked with Dr. William Malm in Fort Collins during the early 1980s, and has spent 10 years in the Research Division of the California Air Resources Board. For the last three years he has been the project leader of a large USDA-funded study of PM_{10} in the San Joaquin Valley.

Tom remains available to advise Lowell and Bob, but will concentrate on improvements in size-resolved sampling and compositional analysis, and on the international trans-Pacific ACE-Asia research study scheduled for 2000. Lowell can be contacted at UC-Davis at:

Telephone: 916/752-2848
e-mail: ashbaugh@crocker.ucdavis.edu

Tom can be contacted at:

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e-mail: tacahill@ucdavis.edu

VISIBILITY NEWS continued on page 3....

Feature Article
Regional haze regulations proposed for visibility protection in parks and wilderness areas

The Environmental Protection Agency (EPA) in July, proposed regulations to improve visibility in all 156 Class I areas across the country. The proposed regulations address visibility impairment in the form of regional haze. Haze is caused by various pollutants in the atmosphere, which reduce the color, clarity, and texture of scenes we see. These pollutants are emitted into the atmosphere through electric power generation, various industrial and manufacturing processes, automobile emissions, forestry and agricultural burning, roadway dust, and construction activities. These emissions can be transported significant distances, hence the need for regional regulations.

The proposed regulations are an important part of EPA's approach to protect public welfare from visibility impairment effects associated with particulate matter. They will enable the EPA to develop a comprehensive visibility protection program under the Clean Air Act, and respond to recommendations formed by the Grand Canyon Visibility Transport Commission, which is required under the Clean Air Act.

Visibility impairment occurs as particles and gases in the air scatter and absorb light. Even without manmade pollution, average visual range would be limited to about 140 miles in the western United States and 90 miles in the eastern United States. Currently, visual range is about 33 to 90 miles in the West and 14 to 24 miles in the East. Figures 1 and 2 show these visual ranges in split images of Shenandoah National Park, Virginia, and Chiricahua National Monument, Arizona, respectively. The proposed regulations call for states to improve visibility in their Class I areas by about 10% every 10 to 15 years.

The regulations will apply to all states, even if they have no Class I areas. States will be required to propose "presumptive reasonable progress targets" for improving visibility in each Class I area, which will be reviewed by the states every three years.

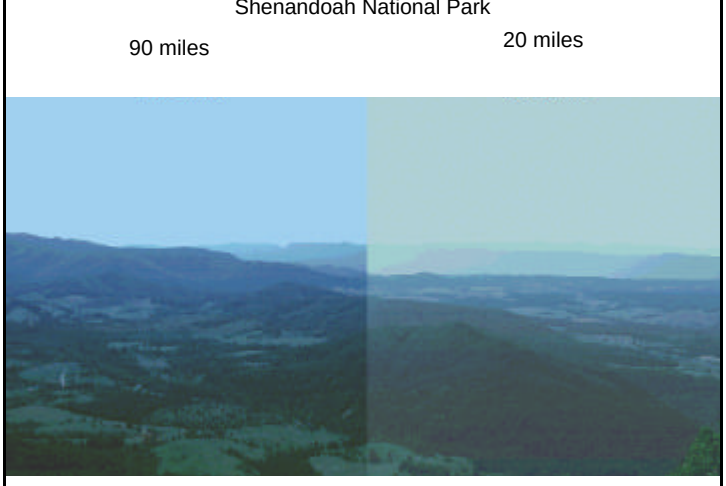

Figure 1. Shenandoah National Park, Virginia. Computer-Modeled Image With Visual Ranges of 90 Miles and 20 Miles.

Figure 2. Chiricahua National Monument, Arizona. Computer-Modeled Image With Visual Ranges of 140 Miles and 61 Miles.

States will also be required to revise their state implementation plans (SIPS) for visibility within 12 months of announcement of the ruling. This initial SIP will include timing requirements for future SIP revisions, progress demonstrations, emission reduction strategies, plans for expanding the current visibility monitoring network in conjunction with the new monitoring network established for the $PM_{2.5}$ standard, plans for enhancing particulate matter emission inventories and modeling capabilities, and plans for assessing sources subject to Best Available Retrofit Technology requirements.

The EPA also encourages states to develop multi-state regional strategies for attaining needed emission reductions. Both the proposed regional haze program and the Clean Air Act require consultation between the states and federal land managers responsible for managing Class I areas.

The proposed rule may be downloaded from the Clean Air Act Amendments bulletin board (under "Recently Signed Rules") on EPA's Technology Transfer Network, by dialing 919/541-5742. For further information about how to access the bulletin board, call 919/541-5384. The Technology Transfer Network may also be accessed directly through the WWW at:

http://www.epa.gov/ttn

Or, for more information about the proposal, contact the EPA's Office of Air Quality Planning and Standards:

Bruce Polkowsky
Telephone: 919/541-5532
or
Richard Damberg
Telephone: 919/541-5592

VISIBILITY NEWS continued from page 1....

AWMA/AGU conference proceedings

The Air and Waste Management Association and the American Geophysical Union sponsored the *Visual Air Quality, Aerosols and Global Radiation Balance* conference in Bartlett, New Hampshire, September 9-12, 1997. Papers presented at the conference, which either used IMPROVE data or were a direct result of the IMPROVE program, are listed below. Full conference proceedings will be available in the near future. For more information, contact:

Air and Waste Management Association
Telephone: 412/232-3444

Interpretation of Trends of $PM_{2.5}$ and Reconstructed Visibility from the IMPROVE Network
J.F. Sisler, R. Damberg

Update of Spatial and Seasonal Trends of Sulfur and $PM_{2.5}$ as Measured by the IMPROVE Aerosol Monitoring Network *J.F. Sisler, W.C. Malm*

An Analysis of the Yearly Changes in Sulfur Concentrations at Various National Parks in the United States for the Period 1980-1996
P.Patterson, H. Iyer, J. Sisler, W.C. Malm

Trend Analysis of Fine Particle Data in the Grand Canyon Region *S. Mahadev, K. Ahossane, R.C. Henry*

Exploring Spatial Patterns of Sulfate from the Project MOHAVE Summer Intensive Using Analysis of Variance Techniques and Meteorological Parameters as Sort Parameters *R.J. Farber, L.C. Murray, W. Moran*

Use of Project MOHAVE Perfluorocarbon Tracer Data for Source Attribution Analysis *M.C. Green, I. Tombach*

A Preliminary Look at the Source-Receptor Relationships in the Texas-Mexico Border Area
K.A. Gebhart, W.C. Malm, M. Flores

Providing Real-Time Air Quality Data to Decision Makers and the Public *D.S. Cismoski, R.M. Tree*

Air Quality Issues at Great Smoky Mountains National Park *J.I. Winchester, J.A. Lemke*

Visual Air Quality Image Processing System and Simulation Techniques
Y. Golestani, J.V. Molenar, W.C. Malm

Analysis of the Real World Performance of the OPTEC NGN-2 Ambient Nephelometer *J.V. Molenar*

Aerosol Light Scattering Measurements as a Function of Relative Humidity *D.E. Day, W.C. Malm, S.M. Kreidenweis*

Measurement of the Aerosol Absorption Coefficient for the IMPROVE Network *D. Campbell, B. Perley, R. Eldred*

Effects of Aggregation and Mixing on Extinction by Carbonaceous Particles
K.A. Fuller, W.C. Malm, S.M. Kreidenweis

MIE Scattering and Sulfate Speciation
J.F. Sisler, R. Ames, W.C. Malm

Comparison of Measured Scattering as a Function of Relative Humidity to Aerosol Scattering Models
W.C. Malm, D. Day, S.M. Kreidenweis

Comparison of Measured and Modeled High Spectral Resolution Sky Radiance Data
J. Molenar, R. Henry, S. Mahadev

The Size-resolved Chemical Composition of Natural and Anthropogenic Aerosols at Mace Head, Ireland
C.F. Cahill, D.D. Dutcher, P.M. Wakabayashi, M. Geever, S.G. Jennings

Concentration and Composition of Atmospheric Aerosols in the Southeastern United States: Results from a 1995 Experiment -- (SEAVS) in the Smoky Mountains
P. Saxena, S. Musarra, D. Day, L. Hildemann, P. Koutrakis, W.C. Malm, P.H. McMurray, I. Olmez

Estimates of Particle Hygroscopicity During Southeastern Aerosol and Visibility Study (SEAVS)
J.L. Hand, R.B. Ames, S.M. Kreidenweis, D. Day, W.C. Malm

Trends in the Extremes of Aerosol Concentration Distributions *H. Iyer, P. Patterson, W.C. Malm, J. Delgado*

Fine Particulate Matter in the Cascade, Sierra Nevada, and San Bernardino Mountains
T.A. Cahill, R.A. Eldred, L.L. Ashbaugh, K. Bowers

Visibility Impairment in the San Bernardino Mountains: A Detailed Look at IMPROVE Data 1988-1996 *S. Copeland*

Fine Particulate Chemical Composition and Light Extinction at Meadview, Arizona During the Project MOHAVE 1992 Summer Intensive Study
D.J. Eatough, W. Cui, J. Hull

Estimating the Contribution of the MOHAVE Coal-fired Power Plant Emissions to Atmospheric Extinction at Grand Canyon National Park *R.B. Ames, W.C. Malm*

Relating Summer Particulate Sulfur and Sulfur Dioxide to Gaseous Tracer Emissions at the Mohave Power Project
V.A. Mirabella

Aerosol Light Scattering Measurements: A Comparison of Differently Configured Optec Nephelometers
D.E. Day, W.C. Malm, S.M. Kreidenweis, R.M. Tree

Sampling Duration Calculations
H. Iyer, W.C. Malm, P. Patterson

Water and Volatile Organic Compound Contributions to Fine Aerosol Gravimetric Mass
D.D. Dutcher, K.D. Perry, T.A. Cahill

Optical Measurements of Aerosol Size Distributions in Great Smoky Mountains National Park: Dry Aerosol Characterization
R.B. Ames, J.L. Hand, S.M. Kreidenweis, D. Day, W.C. Malm

Size/Compositional Profiles of Aerosols at Great Smoky Mountains National Park During SEAVS *T.A. Cahill, K. Perry, D.D. Dutcher, R.A. Eldred, D.E. Day*

Organic Aerosols at Great Smoky Mountains National Park During SEAVS *T.A. Cahill, D.D. Dutcher, K.D. Perry, R.A. Eldred, C.P. Castaneda, R.M. Higashi*

Regional Patterns of Fine Carbonaceous Particle Concentrations at Remote Sites Throughout the United States *R.A. Eldred*

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The next IMPROVE Newsletter will be published in January 1998.

Please Contact Us: If you know someone who would like to receive the newsletter or if you are no longer interested in receiving a copy, please call us at 970/484-7941. Your ideas and comments are always welcome. We continue to look for ways to improve the newsletter and to provide you with interesting and pertinent information.

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