

PREFACE

Technical Conference Co-Chair

The Air & Waste Management Association and the American Geophysical Union are once again cooperating to hold their third jointly sponsored International Specialty Conference on the effects of atmospheric aerosols on regional haze and the global radiation balance, titled "Regional Haze and Global Radiation Balance - Aerosol Measurements and Models: Closure, Reconciliation and Evaluation."

For the first time, A&WMA and AGU are pre-publishing the Proceedings on CD-ROM for distribution to attendees at the Conference. This eliminates the delay in distributing timely information to participants which has occurred in previous years, but precludes editorial and peer review of the Proceedings. It also required authors to prepare their manuscripts well in advance of the Conference. In some cases, authors requested to publish "extended abstracts" in the Proceedings, so that they could submit their full manuscripts for Journal publication after the Conference.

The conference is preceded by two half-day short courses that address topics related to the main themes of the meeting. An "Aerosols, Clouds and Climate Change" course will be taught by Dr. Kevin J. Noone, Professor of Atmospheric Physics, Department of Meteorology, Stockholm University, Sweden. In addition, an "Introduction to Visibility Concepts" course will be conducted by Dr. William C. Malm, Research Physicist with the USDI - National Park Service located at Colorado State University in Fort Collins, Colorado.

This CD-ROM is the formal record of the presentations to be made at the Conference. Two Keynote presentations ("Aerosol-induced Modulation of Climate" by Dr. V. Ramaswamy, Senior Scientist with NOAA's Geophysical Fluid Dynamics Laboratory at Princeton University, New Jersey; and "Our Hopes and Expectations for the New Space-borne Aerosol Measurement Techniques" by Dr. Ralph A. Kahn, Research Scientist with NASA's Jet Propulsion Laboratory at the California Institute of Technology in Pasadena, California) will precede the 95 papers scheduled to be presented at the conference. After the joint Plenary Session, topics include: Legal and Policy Issues; Instrumentation (Aerosol and Optical); Posters Exhibition Viewing; Data Analysis, Modeling and Interpretation Techniques; Field Studies in California, British Columbia and Asia; Field Studies in the Pacific Northwest, Midwest, and Southern United States; the Big Bend Regional Aerosol and Visibility Field Studies Observational (BRAVO) Field Study; the Southern African Regional Science Initiative (SAFARI) 2000 Field Study; Field Studies in the Western United States; and Vegetative Burning. Conference participants are also able to view company exhibits, and experience the clean, clear mountain vistas in and around the conference site at the Inn of the Seventh Mountain resort near Bend, Oregon.

It is appropriate that at a Conference addressing topics of global concern, manuscript authors represent Asia (Japan and Korea), Europe (Germany and Portugal), and Africa (Botswana, Mozambique, and South Africa), in addition to North America (Canada, Mexico and the United States). It is anticipated that Conference attendees will represent many more nations as well.

The International A&WMA (then the Air Pollution Control Association) began its series of visibility-related Specialty Conferences at the “View on Visibility - Regulatory and Scientific” meeting held in Denver, Colorado, November 26-27, 1979. As demonstrated in a separate file on this CD-ROM (viscon79.pdf), there were 19 papers presented, focusing primarily on the anticipated U.S. Environmental Protection Agency’s first visibility protection regulations, and providing a foundation of prior research in the areas of human perception, field studies, modeling, monitoring, instrument inter-comparisons, and social/economic impacts.

On September 8-10, 1986, the “Visibility Protection: Research and Policy Aspects” Conference (viscon86.pdf) was held at Grand Teton National Park, Wyoming. The program had expanded to nine sessions with nearly seventy papers. Several presentations addressed the U.S. Environmental Protection Agency’s Phase I (plume impact) visibility protection regulations. In addition to providing up-dates to the topics covered previously, the agenda was expanded to include radiative transfer, aerosols and optical properties, meteorology and long-range transport, source attribution, and urban visibility.

The next International Speciality Conference, “Visibility and Fine Particles” (viscon89.pdf), was held in Estes Park, Colorado, on October 16-19, 1989. This time the program had grown to 17 sessions and nearly 120 presentations, providing even more information on the topics addressed in previous conferences. At that point, the U.S. Environmental Protection Agency’s visibility protection regulations has been in effect for nearly a decade, and the first actions to reduce “plume” impacts from industrial sources had just begun.

In 1994, the American Geophysical Union joined A&WMA in cosponsoring the “Aerosols and Atmospheric Optics: Radiative Balance and Visual Air Quality” conference, held September 26-30, in Snowbird, Utah (viscon94.pdf). Given the common research interests of aerosols and radiative balance on visibility and global climate change, this inter-organizational cooperation was very successful, with nearly 125 presentations in five primary topic areas and multiple sessions. Not only was the nature of the scientific papers expanded, so was the participation of international attendees from eleven different nations.

The last A&WMA/AGU meeting prior to the current Conference was titled “Visual Air Quality: Aerosols and Global Radiation Balance” (viscon97). It was held September 9-12, 1997, in Bartlett, New Hampshire. Again, there were nearly 125 individual presentations in 11 sessions, with significant international participation. Held twenty years after the United States Congress had established their national visibility goal, much of the scientific uncertainty regarding visibility protection had been addressed. The technical information developed and presented at this and previous conferences provided a foundation for the U.S. Environmental Protection Agency to develop and eventually implement their Phase II (regional haze) visibility protection regulations.

As the A&WMA International Technical Program Co-Chair, I was privileged to work with a dedicated team of individuals in the long process of organizing the technical portion of this conference. I sincerely appreciate everyone’s devotion to build yet another successful A&WMA/AGU Visibility and Global Radiation Conference. I would also like to recognize the professional organizational skills of Amy Butler, Denise Stotler, and Andy Knopes of A&WMA’s Headquarters Office in organizing the conference and this CD-ROM of the proceedings. Thank you all for your efforts, including the authors of the many presentations which are the basis of this Conference.

Scott F. Archer
A&WMA International Technical Program Co-Chair

FINAL PROGRAM

Air & Waste Management Association

Regional Haze and Global Radiation Balance - Aerosol Measurements and Models: Closure, Reconciliation and Evaluation

October 2-5, 2001 - Bend, Oregon

Conference Co-Sponsoring Organizations



GENERAL INFORMATION

Conference Overview

The Air & Waste Management Association and the American Geophysical Union are holding their third jointly sponsored conference on the effects of atmospheric aerosols on Regional Haze and the Global Radiation Balance. Atmospheric aerosols interact both with incident solar radiation (influencing the global climate-related radiation balance) and with the transmission of light from scenic vistas (influencing “visibility,” or how far and how well objects can be seen through the atmosphere). This International specialty conference will focus on aerosol measurements and prediction techniques (modeling), particularly related to: aerosol and optical instrumentation; data analysis, modeling and interpretation techniques; and the planning, implementation and analysis from actual field monitoring studies (including studies in Africa, Asia and North America). In particular, intensive field studies of aerosols and their effects measured throughout the Big Bend, Texas, area (BRAVO) and southern Africa (SAFARI 2000) will be reported. Descriptions of the legal and policy issues concerning visibility protection (especially relating to the U.S. Environmental Protection Agency’s recently promulgated Regional Haze regulations), and the relations between vegetative burning, aerosol generation, and visibility effects, will also be discussed. There will be nearly 100 formal presentations during the four-day conference, with authors representing over 25 states and 11 nations. Presentations will be made both in auditorium and evening poster formats (including refreshments). There will also be opportunities to view company exhibits, and experience the clean, clear mountain vistas in and around the conference site at the Inn of the Seventh Mountain resort near Bend, Oregon.

GENERAL INFORMATION

General Conference Chair

Kirk Stopenhagen

CH2M Hill, Bellevue, WA

General Conference Committee

Delbert J. Eatough

Brigham Young University, Provo, UT

Rob Farber

Southern California Edison Company, Rosemead, CA

Mark Green

Desert Research Institute, Las Vegas, NV

Jim Price

Texas Natural Resource Conservation Commission, Austin, TX

Ken Stubbs

Greater Vancouver Regional District, Burnaby, BC

Ivar Tombach

Environmental Consulting, Camarillo, CA

Technical Program Co-chairs

Scott F. Archer

USDI - Bureau of Land Management, Denver, CO

Joseph M. Prospero

University of Miami, Miami, FL

John Core

Core Environmental Consulting, Portland, OR

GENERAL INFORMATION

About The Association

The Air & Waste Management Association is the world's leading membership organization for environmental professionals. The association enhances the knowledge and competency of environmental professionals by providing a neutral forum for technology exchange, professional development, networking opportunities, public education and outreach events. A&WMA also promotes global environmental responsibility and increases the effectiveness of organizations to make critical decisions that benefit society. The views expressed by the individual presenters do not imply endorsement and are not necessarily reflective of the views of the Association.

Speaker Ready Room

The Forest Board Room has been reserved as a speaker ready room and will be available for authors to prepare for their presentations.

Speakers' Breakfast

Presenters of papers, posters and session chairs will meet for a complimentary continental breakfast on the day of their session to review program details. The breakfasts will be held in the Forest Room beginning at 7:00am each day.

GENERAL INFORMATION

Information Center

Incoming messages for conference attendees will be posted on a bulletin board at the conference registration desk. Callers to the Inn of the 7th Mountain's main number, (541) 382-8711 should ask that their messages be delivered to the A&WMA Conference registration desk. Faxes may be sent to (541) 382-3517.

The Air & Waste Management Association is not responsible for lost or stolen items. Please secure all valuables.

Attendance List

A final post-conference list of attendees will be provided upon request.

Exhibition

Exhibitors will spend three days interfacing with attendees interested in learning more about any of the topics discussed at this conference. Mid-morning and afternoon breaks from the technical sessions will be held in the exhibit area in the Cascade Room. There will also be a reception and poster viewing on Tuesday and Thursday evenings in the exhibition hall and Galleria Foyer.

At the time of publication, the Exhibitors included:

Air Resource Specialists, Inc.

ARS provides professional consulting and support services in air quality monitoring, modeling, permitting, analysis, and research. (www.air-resource.com)

Met One Instruments, Inc.

Met One Instruments is a world leader in the design and manufacture of meteorological and particulate monitoring instruments. (www.metone.com)

GENERAL INFORMATION

Exhibition (*cont.*)

Rupprecht & Patashnick Co., Inc.

Rupprecht & Patashnick manufactures and supports world-class instrumentation for air quality measurements in ambient (indoor/outdoor/personal), diesel and stack applications, as well as for catalyst research. (www.rpco.com/index.htm)

Thermo MIE, Inc.

MIE, Inc., a subsidiary of Thermo Instrument Systems Inc., is the largest manufacturer of real-time aerosol monitoring nephelometers in the U.S. (www.mieinc.com/mie_company.htm)

URG Corp

Since 1986, URG has been actively involved in the research and development of sampling instrumentation for indoor and outdoor air pollution. (www.urgcorp.com)

PLENARY SESSION

The following schedule is final at the time of publication, but subject to change in the event of unforeseen circumstances.

7:00 am

Registration Opens

8:00 am

Welcome, Introduction and Technical Program Overview

Kirk Stopenhagen, General Program Chair

Scott F. Archer, A&WMA International Technical Program Co-chair

Joseph Prospero, AGU Technical Program Co-chair

John Core, A&WMA PNWIS Technical Program Co-chair

Denise Stotler A&WMA Technical Programs Manager

PLENARY SESSION

Keynote Address

8:45 am

“Aerosol-induced Modulation of Climate”

Dr. V. Ramaswamy, Senior Scientist

NOAA - Geophysical Fluid Dynamics Laboratory

Princeton University Princeton, New Jersey, USA

Dr. Ramaswamy’s research at GFDL has involved estimating the natural and human factors that cause climate change, including: radiative transfer; climate perturbations by trace species; and cloud-climate interactions. He has been involved in several national and international scientific assessments, including WMO/ UNEP reports on the stratospheric ozone layer, and as the Coordinating Lead Author for the recent IPCC Assessment Chapter “Radiative Forcing of Climate Change.”

9:30 am Keynote Address

*“Our Hopes and Expectations for the New Space-borne
Aerosol Measurement Techniques”*

Dr. Ralph A. Kahn, Research Scientist

NASA - Jet Propulsion Laboratory

California Institute of Technology

Pasadena, California, USA

PLENARY SESSION

Dr. Kahn has been located at JPL since 1988, where he works primarily on Earth observations, specializing in tropospheric aerosol research. He has lectured on global change and atmospheric physics at several universities, and is editor and founder of PUMAS, the on-line journal of science and math examples for pre-college education (<http://pumas.jpl.nasa.gov>).

10:15 am

Break and Exhibition Viewing

11:00 am

A Ten-year Spatial and Temporal Trend of Sulfate Across the United States

W.C. Malm, J.F. Sisler L.L. Ashbaugh, R. Eldred, and M.L. Pitchford

11:20 am

Temporal and Spatial Characteristics of Atmospheric Aerosols in Texas During the Big Bend Regional Aerosol and Visibility Study (BRAVO)

L.L. Ashbaugh, R. Eldred, and M.C. Green

PLENARY SESSION

11:40 am

Aerosol Sources and Atmospheric Distributions over Southern Africa

S.J. Piketh, H.J. Annegarn, D. Terblanche, G. Kirkman, and G. Helas

12:00 pm *Adjourn Plenary Session*

12:00 - 2:00 Luncheon Speaker

Dr. Keith W. Harless, M.D. (Pulmonary Disease)
Bend Memorial Clinic

Dr. Harless is a founding member of the Bend/Deschutes Clean Air Committee (an advisory body for both the Bend City Council and the Deschutes County Commission). Created in 1989, the CAC was formed in response to worsening air quality conditions in Bend. Specifically, the area had violated the Clean Air Act particulate matter NAAQS. The CAC has also responded to draft recommendations of Oregon's Visibility Protection Advisory Committee.

1 SESSION

Legal and Policy Issues
Concurrent with Session 2

Session Chair:

Richard Damberg, U.S. Environmental Protection Agency,
Research Triangle Park, NC

2:00 pm

*Reasonably Attributable BART and Reasonably Attributable
BART-like Case Studies*

B. Lebens, J. Anderson, M. Sundblom, D. Ely,
A. Newman, B. Polkowsky, and B. Rolofson

2:20 pm

*Recommendations for Natural Condition Deciview Variability:
An Examination of IMPROVE Data Frequency Distributions*

R.B. Ames and W.C. Malm

2:40 pm

*Characterizing Best, Median, and Worst Visibility Conditions
at Federally Protected Class I Areas: A Comparison
Between EPA Proposed Guidance and Historic
IMPROVE Methods*

J.F. Sisler and W.C. Malm

3:00 pm

*Regional Haze State Implementation Plan
Template Development*

B. Lebens, T. Pella, S. Arnold, A. Edwards,
L. Van Ommering, D. Riley, J. Smitherman,
R. Trujillo, D. Mount, B. Finneran, T. Rogers,
D. McNeill, D. Schneider and D.J. Potter

2 SESSION

Instrumentation (Aerosol and Optical)
Concurrent with Session 1

Session Chairs:

William C. Malm, USDI-National Park Service, Fort Collins, CO
Ivar Tombach, Environmental Consulting, Camarillo, CA

2:00 pm

*Photoacoustic and Filter-based Ambient Aerosol Light
Absorption Measurements: Instrument Comparisons and the
Role of Relative Humidity*

W.P. Arnott, H. Moosmuller P.J. Sheridan,
J.A. Ogren, R. Raspert, and W.V. Slayton

2:20 pm

*The Vertical Distribution of Aerosol Properties in the
Maritime and Continental Planetary Boundary Layer and its
Influence on Shortwave Radiation*

W. Junkermann

2:40 pm

*Sea Salt Aerosols: Time-resolved Field Study of the Nitrate
Replacement of Chlorine Using Single Particle Analysis*

A. Laskin, M.J. Iedema, and J.P. Cowin

3:00 pm

*Towards Establishing an Aerosol Extinction-to-Backscatter
Ratio Climatology*

J.A. Reagan, K.J. Thome, and D.M. Powell

1 SESSION

Legal and Policy Issues
Concurrent with Session 2

3:20 pm

Break and Exhibition Viewing

4:00 pm

*Crop Inventory and Data Development Assessing
Non-Burning Management Alternatives on Agricultural Lands*
P.G. Fields, K. Black, and B. Jenkins

4:20 pm

*Factual Issues under the Regional Haze Rule: The
Perspective of an Attorney to Electric Utilities*
M.L. Teague

4:40 pm

*An Assessment of Visibility Responses in the Southern
Appalachian Mountains to Selected SAMI
Emissions Strategies*
J.P. Adlhoch, P. Brewer, J. Boylan, and R. Imhoff

5:00 pm

Adjourn Session 1

2 SESSION

Instrumentation (Aerosol and Optical)
Concurrent with Session 1

3:20 pm

Break and Exhibition Viewing

4:00 pm

*Spectroscopic Measurements of Atmospheric Ammonia
Emissions for a Dairy*
B.P. Rumburg, G. Mount, B.K. Lamb,
H.H. Westberg, J.R. Havig, K.A. Johnson, and
R.L. Kincaid

4:20 pm

*Real-Time Observations of Fine Particulate NO_3^- and NH_4^+
at a Rural and Urban Pair of Sites in the SEARCH Network*
B.E. Hartsell and E.S. Edgerton

4:40 pm

*Ammonium Sulfates in Houston: Automated Time-tagged
Archiving of Field Collected Aerosols for Laboratory Single
Particle Analysis*
A. Laskin, M.J. Iedema, and J.P. Cowin

5:00 pm

*Comparative Evaluation of Calculations of Light Extinction
Based on Measurements by Two Speciated Particulate
Matter Samplers*
I. Tombach

5:20 pm

Adjourn Session 2

3A SESSION

Poster Session and Exhibition Viewing

Session Chair:

Lowell L. Ashbaugh, University of California, Davis, CA

6:00 - 7:30 pm Hors d'oeuvre Reception

Application of Multiangle Imaging SpectroRadiometer (MISR) to Study of Regional Haze Problems in Conjunction with California Regional PM10/PM2.5 Air Quality Study (CRPAQS) and SAFARI-2000 Dry Season Campaign

J.E. Conel, M.C. Hemlinger, S.H. Pilorz,
W.A. Abdou, D.J. Diner, J.V. Martonchik,
R.A. Kahn, M. Kleeman, A. Eldering,
and K. Magliano

Black Carbon and Elemental Composition of the Airborne Particles in Mexico City

M. Zepeda, T. Castro, G. Raga,
D. Baumgardner, A. Oliver and
L. Rodriguez-Fernandez

Changes in Aerosol Chemical, Physical and Optical Properties in Southern New Hampshire and their Relationship to Variations in Air Mass Airmass Transport
J.E. Slater and J.E. Dibb

A Climatology of Aerosol Optical Depth over the Mid-Columbia River Basin and its Relationship to Long Range Transport

N. Laulainen, N. Larson, L. Barrie, and S.J. Ghan

3A SESSION

Poster Session and Exhibition Viewing

Development and Application of the Remote Digital Camera System in the USDA - Forest Service Visibility Monitoring Network

K. Savig, R. Fisher, and D.S. Cismoski

Measurements of Aerosol Hygroscopicity at Big Bend National Park

D.E. Day and W.C. Malm

PARSL Radiometer Instrumentation and Preliminary Results of Direct Aerosol Forcing Analysis from IMPROVE Phase One Pacific Beach Surface Radiation Measurements

D.M. Powell, C.N. Long, and T.R. Ackerman

Portable Scanning Eye-Safe Dual-Wavelength Polarization-Diverse Micropulse Lidar for Cloud and Aerosol Research

C.J. Flynn and A. Mendoza

Relationship Between Haze Characteristic and Scenic Image Color in the Urban Atmosphere of Kwangju, Korea

K.W. Kim and Y.J. Kim

Retrieval of the Atmospheric Aerosol Extinction-to-Backscatter Ratio Using Lidar Multiple-Angle Sensing

D.M. Powell and J.A. Reagan

4 SESSION

Data Analysis, Modeling and
Interpretation Techniques

Concurrent with Session 5A

7:00 am

Registration Opens

Session Chair:

David Maxwell, USDI-National Park Service, Denver, CO

8:00 am

*Spatial Trends From the Expanded
IMPROVE Network*

R. Eldred

8:20 am

Outlier Analysis of Visibility Data

K. Walsh, G. Serad, R. Damberg, and T. Rosendahl

8:40 am

*A Comparison of Data Imputation Methods for
Estimating Annual Visibility Indices*

A. Hess, H. Iyer and W.C. Malm

9:00 am

Global and Local Dust Over North America

R.B. Husar and J.D. Husar

5A SESSION

Field Studies

(California, British Columbia and Asia)

Concurrent with Session 4

Session Chair:

Charles McDade, ENSR Consulting & Engineering Int'l,
Camarillo, CA

8:00 am

*The California Regional PM₁₀/PM_{2.5} Air Quality Study
(CRPAQS): Field Study Description and Initial Findings*

K. Magliano and C. McDade

8:20 am

*Light Scattering Measurements During
the California Regional PM₁₀/PM_{2.5} Air Quality Study*

L.W Richards, D.E. Lehrman, R.E. Weiss, D. Bush,

J.G. Watson, C. McDade, and K. Magliano

8:40 am

*Comparison of Nephelometer Light Scattering
Measurements in Central California as a Function of
Meteorological Variables, Particle Size, and Particle
Composition*

J.G. Watson, J.C. Chow, L.W. Richards, R. Ouchida, and

S. Scheller

SESSION 4

Data Analysis, Modeling and
Interpretation Techniques

Concurrent with Session 5A

9:20 am

*A Comparative Study of Atmospheric Aerosols Between
Sihwa Residential and Industrial Sites, Korea*

S.S. Park, K.Y. Joon, and B.M. Suk

9:40 am

Break and Exhibition Viewing

10:20 am

*Response of Atmospheric Particulate Nitrate to Precursor
Emissions*

B.K. Pun and C. Seigneur

10:40 am

*Regional Haze in the Midwest: Composition,
Seasonality, and Source Region Identification*

D.M. Kenski and M. Koorber

SESSION 5A

Field Studies
(California, British Columbia and Asia)

Concurrent with Session 4

9:00 am

*Particle Size Relationships at the
Fresno Supersite*

D.H. Lowenthal, J.C. Chow, J.G. Watson, S.V. Hering, and
M.R. Stolzenburg

9:20 am

*Particle Nitrate Measurements at the
Fresno Supersite*

J.C. Chow, J.G. Watson, and S.V. Hering

9:40 am

Break and Exhibition Viewing

10:20 am

*Managing Data from the California Regional
 $PM_{10}/PM_{2.5}$ Air Quality Study*

H. Main, C. Green, and R. Roberts

10:40 am

*Visibility and Aerosol Trends in Southern California from
1986 - 2000*

R. Farber and J.F. Sisler

4 SESSION

Data Analysis, Modeling and
Interpretation Techniques

Concurrent with Session 5A

11:00 am

*Development and Initial Application of the Model for Aerosol
Dynamics, Reaction, Ionization and Dissolution (MADRID)*

B.K. Pun, Y. Zhang, K. Vijayaraghavan, S-Y. Wu,
C. Seigneur, and J.H. Seinfeld

11:20 am

*Inter-annual Variability in the Composition of
North American Haze*

W.H. White

11:40 am

*Assessment of the Source Receptor Relationship at Big
Bend, TX Using Forward Airmass Histories - Methodology
and Evaluation*

B.A. Schichtel, E.S. Edgerton

12:00 noon

Adjourn Session 4

5A SESSION

Field Studies

(California, British Columbia and Asia)

Concurrent with Session 4

11:00 am

Pacific 2001 Air Quality Study

R.B. Thomson and S-M. Li

11:20 am

Regional Character of Highly Absorbing Aerosols in Japan

R. Hoeller, M. Kasahara, S. Tohno, T. Cahill, S. Cliff, and K. Perry

11:40 am

*Organization of Asian Dust Network and Asian
Lidar Observation Network*

T. Murayama, A. Shimizu, N. Sugimoto, and I. Uno

12:00 noon

Adjourn Session 5A

12:00 - 2:00 Luncheon Speaker to be Announced

"Geologic Features of the High Desert Region of Oregon"

Bob Jensen and Larry Chitwood, Geologists

USDA - Forest Service

Deschutes National Forest

The Deschutes National Forest is a geologically young and complex volcanic region on the east flank of the Cascade Range and on the large shield shaped volcano, Newberry. Large volcanoes, many deeply eroded by glaciers, line the crest of the Cascades, and hundreds of cinder cones dot the landscape.

2:00 - 11:00 pm

Field Tours and Observatory Trip (See page 39)

5B
SESSION

Field Studies (Pacific Northwest ,
Midwest, and Southern United States)

7:00 am

Registration Opens

**Session 5B - Field Studies (Pacific Northwest ,
Midwest, and Southern United States)**

Session Chair:

Mitchell Baer, U.S Department of Energy, Washington, DC

8:00 am

*Assessment of Ambient Air Quality During Spring Dust
Events at Lake Chelan National Recreation Area*

J.P Adlhoch, M. Tigges, B. Freet, and G. Yow

8:20 am

*Gas and Aerosol Observations at Background Sites on the
West Coast of the U.S.: Trends, Vertical Distributions, and
Seasonal Patterns*

D. Jaffe, H. Price, P. Weiss, and A. McClintick

8:40 am

Particle Growth in Power Plant Plumes

C. Brock, R. Washenfelder, J.C. Wilson,
J.M. Reeves, M. Trainer, T.B. Ryerson, J. Holloway,
G.F. Hubler, and D.D. Parrish

5B
SESSION

Field Studies (Pacific Northwest ,
Midwest, and Southern United States)

9:00 am

*Evaluating Contributions to Fine Mass and
Visibility Impairment near the Great Smoky
Mountains Using Continuous Measurements of Particles and
Their Gaseous Precursors*

R.L. Tanner and W.J. Parkhurst

9:20 am

*Conceptual Model for Regional Haze in the
Upper Midwest*

B.K. Pun, M. Leidner and C. Seigneur

9:40 am

*Adjourn Session 5B
Break and Exhibition Viewing*

6A
SESSION

Field Studies (BRAVO)
Concurrent with Session 7A

Session Chair:

Mark Green, Desert Research Institute, Las Vegas, NV

10:20 am

*Big Bend Regional Aerosol and Visibility
Observational (BRAVO) Study Emissions Inventory*
H.D. Kuhns

10:40 am

*Physical, Chemical, and Optical Properties of
Fine and Coarse Particles in West Texas (Big
Bend National Park)*
W.C. Malm, D.E. Day, J.L. Hand, S.M. Kreidenweis, T. Lee,
and J.L. Collett, Jr.

7A
SESSION

Field Studies (SAFARI)
Concurrent with Session 6A

Session Chair:

Scott Archer, USDI - Bureau of Land Management, Denver, CO

10:20 am

*Multi-Platform Characterization of Haze Layers Along the
Eastern Coastal Region of Southern Africa during SAFARI
2000*
D.C. Stein, R.J. Swap, B. Doddridge, A.J. Queface,
S.J. Piketh, T. Elias, and S.A. Macko

10:40 am

*In-situ Airborne Observations of Aerosol Properties over
Southern Africa During SAFARI 2000*
S.J. Piketh, R.J. Swap, R.T. Bruintjes,
H.J. Annegarn, and K.E. Ross

11:00 am

*Regional Aerosol Optical Properties Measured
During the Intensive (Year 2000) Southern
African Biomass Burning Season*
B.N. Holben, D.E. Ward, T.E. Eck, R. Susott,
R. Babbitt, and M.M. Mukelabai

6A
SESSION

Field Studies (BRAVO)
Concurrent with Session 7A

11:00 am

Estimating Contribution of Power Plant Emissions to Sulfate Levels in the Big Bend National Park
N. Kumar and M. Gupta

11:20 am

Real-Time PM_{2.5} Sulfate Measurements at Big Bend National Park
S.V. Hering, M. Stolzenburg, D. Dietrich, M. Tigges, J. Wagner, and D. Dutcher

11:40 am

The Composition of Aerosol Sampled at Big Bend National Park During the 1999 Big Bend Regional Aerosol and Visibility Observational Study (BRAVO)
J.L. Collett, Jr, T. Lee, D.E. Sherman, J.E. Reilly, S.G. Brown, and S.M. Kreidenweis

12:00 noon

Adjourn Session 6A

7A
SESSION

Field Studies (SAFARI)
Concurrent with Session 6A

11:20 am

Aerosol Optical Thickness and Size Distribution from Southern Africa Sites
A.J. Queface, S.J. Piketh, H.J. Annegarn, B.N. Holben, R.J. Swap, and R. Uthui

11:40 am

Emissions of Trace Gases and Aerosols from Biomass Burning in Southern Africa
P. Sinha and P.V. Hobbs

12:00 noon

Adjourn Session 7A

12:00 - 2.00 Luncheon

[Speaker to be announced]

SESSION

Field Studies (BRAVO)
Concurrent with Session 7B

Session Chairs:

Stuart Dattner, Texas Natural Resource Conservation Commission,
Austin, TX
Marc Pitchford, NOAA/Desert Research Institute, Las Vegas, NV

2:00 pm

Molecular Composition of Organic Aerosol Sampled at Big Bend National Park, Texas, During the 1999 Big Bend Regional Aerosol and Visibility Observational (BRAVO) Study
P. Herckes, S.G. Brown, T. Lee, M.P. Hannigan,
S.M. Kreidenweis, and J.L. Collett, Jr.

2:20 pm

Aerosol Physical and Optical Properties During the Big Bend Regional Aerosol and Visibility Observational Study
J.L. Hand, D.E. Sherman, S.M. Kreidenweis,
J.L. Collett, Jr, T. Lee, D.E. Day, and W.C. Malm

2:40 pm

Estimating the Hygroscopicity of Aerosol Species at Big Bend National Park
W.C. Malm, D.E. Day, S.M. Kreidenweis,
and J.L. Hand

3:00 pm

Empirical Orthogonal Function (EOF) Analysis of BRAVO Particulate Data
K. Gebhart, B.A. Schichtel, W.C. Malm,
and L.L. Ashbaugh

3:20 pm

Break and Exhibition Viewing

SESSION

Field Studies (SAFARI)
Concurrent with Session 6B

Session Chair:

Rob Farber, Southern California Edison Company, Rosemead, CA

2:00 pm

Characterization of the Excess Atmospheric Carbon from Biomass Burning for Savanna Ecosystems of Southern Africa
D.E. Ward, B.N. Holben, T.F. Eck, R. Susott,
R. Babbitt, and M.M. Mukelabai

2:20 pm

Semi-Volatile Particulate Organic Material in Southern Africa During SAFARI-2000: A Preliminary Report
D.J. Eatough, N.L. Eatough, Y. Pang, S. Sizemore,
J. Pratt, T. Kirchstetler, T. Novakov, and P.V. Hobbs

2:40 pm

Stable Isotope Geochemical Characterization of Southern African Aerosols and Analysis of Large-Scale Regional Atmospheric Properties
K.A. Bilimark, R.J. Swap, and S.A. Macko

3:00 pm

Aerosols Transport and Haze Layers Within the Southern African Troposphere
M.T. Freiman, S.J. Piketh, R.J. Swap,
and H.J. Annegarn

3:20 pm

Break and Exhibition Viewing

6B SESSION

Field Studies (BRAVO)
Concurrent with Session 7B

4:00 pm

Transport Patterns Associated With High and Low Sulfur Concentration at Big Bend, Texas, During BRAVO

B.A. Schichtel and K. Gebhart

4:20 pm

Modeling Regional Haze in Big Bend National Park with Models-3/CMAQ

C. Seigneur, P. Karamchandani, and N. Kumar

4:40 pm

Preliminary Analysis of Several Back-Trajectory Methods for Potential Use in Source Apportionment Studies for the BRAVO Project

K. Gebhart and B.A. Schichtel

5:00 pm

Perfluorocarbon Tracers Used to Study Transport and Dispersion During the BRAVO Study

M.L. Pitchford, M.C. Green, H.D. Kuhns, V. Etyemezian, R. Dietz, and T. Watson

5:20 pm

Preliminary Analysis of Perfluorocarbon Tracer Measurements in the Big Bend Regional Aerosol and Visibility Study (BRAVO)

W.H. White

5:40 pm

Adjourn Session 6B

7B SESSION

Field Studies (SAFARI)
Concurrent with Session 6B

4:00 pm

Interactions Between Aerosols and Clouds During SAFARI 2000

R.T. Bruintjes, S.J. Piketh, K.E. Ross, V. Salazar, R.P. Burger, and R.J. Swap

4:20 pm

Effects of Humidity on Light Scattering by Aerosols in Southern Africa During the Biomass Burning Season

B.I. Magi and P.V. Hobbs

4:40 pm

The Impact of Anthropogenic Activities on the Aerosol Concentration in Gaborone, Botswana

T.S. Verma and T. Thomas

5:00 pm

Ground, Airborne and Satellite Observations of the "River of Smoke" Biomass Burning Plume over Southern Africa During SAFARI 2000

H.J. Annegarn, R.J. Swap, J.T. Suttles, J.L. Privette, M.D. King, S.J. Piketh, P.V. Hobbs, S. Platnick, A.J. Queface, M.T. Freiman, B.N. Holben, S.C. Tsay, J.D. Spinhirne, S.L. Nasiri, P.B. Russell, R.A. Kahn, Y.J. Kaufman, and L.A. Remer

7B
SESSION

Field Studies (SAFARI)
Concurrent with Session 6B

5:20 pm

Combination of Ground-based and In-situ Optical Measurements During SAFARI 2000 for Retrieval of the Aerosol Single Scattering Albedo

T. Elias, A.M. Silva, S.J. Piketh, and L. Bagalho

5:40

Adjourn Session 7B

3B
SESSION

Poster Session and Exhibition

Session Chair:

Kirk Stopenhagen, CH2M Hill, Bellevue, WA

6:00 - 7:30 pm *Hors d'oeuvre Reception*

Advancements in Digital Camera, Computer, and Internet Technology Combine to Allow Acquisition and Dissemination of High Quality Digital Images and Associated Air Quality Data
D.S. Cismoski and R.M. Tree

Aircraft Aerosol Chemical and Physical Observations in Northwestern Washington State During Pacific Northwest 2001
L. Barrie, W. Barchet, N. Laulainen, T. Cahill,
D. Covert, J.P. Cowin, R. Disselkamp, A. Laskin,
and V. Shutthanandan

Impact of Aerosol Size Representation on Modeling Aerosol-Cloud Interactions
Y. Zhang, R.C. Easter, S.J. Ghan,
and H. Abdul-Razzak

The IMPROVE Web Site

B.A. Schichtel, J. Winchester, R.B. Ames,
M. Engle, D.G. Fox, and W.C. Malm

3B
SESSION

Poster Session and Exhibition

*Optical Properties of Tropospheric Aerosols
During LACE 98 Derived from Single Particle Analysis*
M. Ebert, S. Weinbruch, A. Rausch, G. Gorzawski,
G. Helas, and R. Hoffmann

*Particle Mixing and Optical Properties of Aerosol During
LACE 98*
A. Rausch, G. Gorzawski, M. Ebert, S. Weinbruch,
P. Hoffmann, and G. Helas

Radiance Research Model 903 Integrating Nephelometer
L.W. Richards, R.E. Weiss, and A.P. Waggoner

5C
SESSION

Field Studies (Western United States)

8:00 am
Registration Opens

Session Chair:
Delbert J. Eatough, Brigham Young University, Provo, UT

8:40 am
*Visual Air Quality in Northeast Wyoming: Visibility Study
Objectives and Design*
D.J. Potter, L. Sherman, and G.S. Mercer

9:00 am
*Spatial and Temporal Patterns of Light Scattering and Light
Absorption in Las Vegas, Nevada*
A. Hecobian, M.C. Green, V Etyemezian,
H.D. Kuhns, J.C. Chow, J.G. Watson, W. Cates,
D. Ransel, and F. Durosinmi

9:20 am
Chemical Composition of Haze in the Las Vegas Valley
M.C. Green, V. Etyemezian, H.D. Kuhns, J.C. Chow, J.G. Watson,
A. Hecobian, W. Cates, D. Ransel, and F. Durosinmi

9:40 am
Adjourn Session 5C
Break



SESSION
Vegetative Burning

Session Chair:

Judith Chow, Desert Research Institute, Reno, NV

10:20 am

Carbonaceous Aerosol Over North America

R.B. Husar and J.D. Husar

10:40 am

*Source Apportionment of PM_{2.5} and Carbon in Seattle
Using Chemical Mass Balance and
Positive Matrix Factorization*

N. Maykut, J. Lewtas, and T. Larson

11:00 am

*Apportionment of Particle Carbon to
Wildland Fires*

R.B. Ames, W.C. Malm, B.A. Schichtel,
and D.G. Fox

11:20 am

*Observations of Gas and Particulate Emissions from
Biomass Burning in the Southeastern U.S.*

E.S. Edgerton and B.E. Hartsell

11:40 am

Adjourn Symposium

Trip to Pine Mountain Observatory (PMO)

(6:00 - 11:00 pm)

PMO is a University of Oregon facility for astronomy education and research. The observatory consists of three Cassegrain reflecting telescopes, with mirrors of 15", 24", and 32" diameters, each in its own domed building. At sunset, a tour-guide gives a presentation about astronomy. After dark, tour-guides show visitors through the various telescopes, CCD Cameras, and a pair of giant binoculars, and point out various objects of the night sky visible with naked eye. As you view objects, tour-guides explain in detail about what you see.

Wednesday evening depart the Inn of the 7th Mountain approximately 6:00 pm. We could return as late as 11:00 pm. Note: since there is a full moon on Tuesday night, viewing will be limited. Bus transportation provided (approximately a 1-hour drive from the Inn). Be sure to bring warm clothing; PMO is located at 6200 feet in elevation. The trip is limited to 50 persons. Take a virtual tour: <http://pmo-sun.uoregon.edu>.

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