

7/30/2004

Scope of Work

Policy Implications and Recommendations for the WRAP Planning Process: The 2002-2004 Atmospheric Particulate Exchange [Organic Aerosol] Workshops series

Introduction and Problem Statement

While much progress has been made during recent years in assessing research needs regarding airborne particulate matter (NRC, 2004), gaps exist in the ability of government agencies to implement relevant and effective policies regarding issues of visibility, health, and climate change. Although many consider monitoring, emissions, and modeling analyses of carbonaceous aerosols (PM_{2.5} organic and elemental carbon) to still be in developmental stages in comparison to other aerosols, it is increasingly vital that emerging scientific information be applied to the policy analyses and potential development of air pollution control strategies. For sometime, scientists have focused their dialogue on research, not on policy; often under the assumption that policy will follow by design. During recent years, interest beyond the research community as to what carbonaceous aerosol science research can offer to support policy analyses has grown, and demands to summarize any near-term needs or opportunities for policy development have been identified. Subsequently, a call is being made for more dialogue specific to the applications of research knowledge to policy development.

In order to address this need, since 2001, the Atmospheric Particulate Carbon Exchange (APACE), a network of researchers, sponsors and supportive organizations¹, organized three workshops in efforts to identify and discuss the needs of researchers and sponsors of atmospheric particulate carbon research. Each workshop covered an overarching theme: 1) secondary organic aerosols [February 2002, Reno, NV]; 2) organic and elemental carbon [March 2003, Durango, CO]; and, 3) organic speciation [April 2004, Las Vegas, NV] (see detailed descriptions below). The workshops, presented in a unique open-floor discussion format, were effective at focusing on the technical-scientific questions. However, while implications for how research processes can better inform policy was accounted for, the degree to which they were captured and understood was not. In light of the uncertainty of how to proceed in response to this outcome, a more comprehensive treatment of the science-policy considerations is needed.

In order to meet this demand, a white paper will be prepared that describes outcomes of the APACE workshops that are relevant to policy analyses to aid the Western Regional Air Partnership (WRAP) in expediting the needed technical analyses and analysis of potential control strategies and policies regarding atmospheric carbon issues. This paper will contribute to developing research strategies and policies that are relevant, timely, and effective at a time when carbonaceous aerosols have been shown to be important parts of regional haze and PM_{2.5} health standard nonattainment concerns.

The white paper, entitled Policy Implications and Recommendations resulting from the APACE Workshops, 2002-2004: Applications for the WRAP Regional Haze Planning Process, will

¹ National Science Foundation, U.S. Environmental Protection Agency, Western Regional Air Partnership, National Park Service

summarize and discuss outcomes of the APACE workshops as they are relevant to WRAP members' regional haze planning and air quality management concerns. It will assist the WRAP in aiding states, tribes, and federal land managers in meeting their milestones and in achieving reasonable progress toward the natural conditions goals required in the Regional Haze Rule. It will describe specific issues emerging from the APACE discussions and research activities on secondary organic aerosols, organic and elemental carbon, and organic speciation. Based on this information, the white paper will:

- 1) Identify barriers and limitations of current knowledge about the monitoring, emissions inventories, and modeling simulations of carbonaceous aerosols and precursors;
- 2) Recommend possible strategies for bridging obstacles in research that would support effective analysis and implementation of control strategies and policies;
- 3) Present information in language accessible to readers not necessarily familiar with commonly used technical terminology; and
- 4) Enrich and focus the dialogue increasingly occurring among scientists to improve the application of their research to real-world challenges.

Objectives of the Paper

To a large extent, the development of strategies and recommendations discussion has taken place among scientists and those familiar with highly technical terms specific to the disciplines involved; however, not enough communication is occurring among scientists and sponsoring agency representatives, and others, who are less familiar with the technical aspects. This paper will bring these many individuals into the conversation in ways that improve their effectiveness in utilizing what scientists are learning. Following are specifics of the white paper:

- U** Describe in non-technical terms outcomes of the APACE workshops specific to policy needs and opportunities;
- U** Provide policy makers with knowledge to inform the decision-making processes in which visibility and haze, and health-standard attainment are addressed;
- U** Identify specific knowledge gaps and ways to fill them; i.e., resources, kinds of expertise, et cetera; and
- U** Disseminate paper for publication to the WRAP organization, key journals, individuals, and institutions.

Current questions include the need to continue discussing what is known with respect to issues brought out during the workshops. For example, what can be done with the samples that have been collected through the IMPROVE network, and what more can we do with them in terms of future sampling and analysis? This summer, at a conference in Missoula, Montana, it was suggested that an extra filter channel, or two, be installed in samplers; one to improve quality control, and another for future analysis when analytical technologies and methods advance to a point of making better use of those collections.

Budget, Contractor Activities, Products/Deliverables, and Schedule

In order to assist in the development of the paper, a request is being made for \$5,000 in funding to support the collaboration of Mr. Tim Richard, coordinator of the APACE workshops. Mr. Richard would assist in all aspects of publication development. The funding would support the following activities:

- U** Coordination of draft process;
- U** Background research, as needed;
- U** Writing, including revisions, as needed;
- U** Editing, including revisions, as needed; and
- U** Publication submission, communication, and revisions with journal editors as needed.

The white paper will be developed as follows:

- Develop outline of paper with the Technical Committee [below] (August 1-20, 2004).
- Supply copies of the outline to Technical Committee members and interested reviewers for their review and comment (September 15, 2004).
- Submit final draft of approximately 3,000 words for review by the Technical Committee, including distribution for external review, as well as review by relevant WRAP Committees, Forums, and Workgroups (October 29, 2004).
- Submit final paper, with approval of appropriate WRAP committees, to peer reviewed journal(s) for publication. (December 2004). Work with journal editors as needed to publish paper.
- Disseminate the paper, or excerpts, to key individuals and institutions where applicable. (January 2005).

Technical Committee (authors and collaborators include):

Preparation of the white paper will be the responsibility of the Technical Committee. Proposed members are listed next:

- C Tim Richard, Communication Development Consultant, Durango, CO.
 - o Mr. Richard coordinates organization of the APACE workshops. Formally with Fort Lewis College Office of Community Services for 10 years, he is a private consultant who has devoted a large repertoire of journalistic expertise to foster dialogues on social, economic, and environmental well-being. He has worked closely with several federal, state and local organizations to improve civic discourse on: community-based forest restoration; national forest planning and management; sustainable tourism; public-land recreation; historical preservation and education; carbonaceous aerosols research; and other issues oriented towards community and environmental health.
- C Dr. Brooke Hemming, Physical Chemist, EPA, National Center for Environmental Assessment, Research Triangle Park, NC. Dr. Hemming.
- C Dr. John Watson², Research Professor, Div of Atmospheric Sciences, Desert

² Drs. Watson and Chow have made themselves available as reviewers during the preparation of the white paper and for advisory assistance as needed. Both have been an integral part of the APACE workshop

- Research Institute, Reno, NV.
- Dr. John Watson has over 25 years of experience in the environmental sciences, including the conduct and management of major air quality studies designed to evaluate and solve specific pollution problems. He has published more than 200 peer-reviewed articles and book chapters and is author or co-author on more than 150 technical reports.
- Dr. Judith Chow², Research Professor, Div of Atmospheric Sciences, Desert Research Institute, Reno, NV.
- Dr. Judith C. Chow has over 22 years of experience in conducting air quality studies and performing statistical data analysis. As director of DRI's Environmental Analysis Facility, she supervises filter processing and chemical operations and develops methods for aerosol sampling and analysis. Dr. Chow is a member of the National Academy of Sciences/National Research Council's Committee on Research Priorities for Airborne Particulate Matter and has been principal investigator or a major collaborator in more than 40 large air quality studies.
- Tom Moore, WRAP Technical Coordinator, Fort Collins, CO.
- Other interested reviewers from WRAP Committees, Forums, and Workgroups.

Workshop Background

Each APACE workshop covered an overarching theme: 1) secondary organic aerosols; 2) organic and elemental carbon; and, 3) organic speciation. A list of questions was provided that aimed to stimulate cross-communication of research issues among researchers, laboratories, sponsoring agency representatives, and policy makers. During the first workshop, held February 2002, discussions touched on the natural versus human sources of haze; primary and secondary aerosols; and, the compatibility of urban and non-urban networks and methods of sampling (Atmospheric Particulate Carbon Exchange, March 2004). Continuing the momentum of discussion towards identifying more specifically research needs a list of near-, mid-, and long-term recommendations for research was developed. However, the question of accounting for the gaps between science and policy proved to be difficult to bridge during that initial workshop. Still, the importance was recognized and support for building capacity for addressing the issue was expressed.

A similar list of strategies was developed for the second workshop on organic and elemental carbon fractions, held March 2003. Discussions on this rather controversial subject matter were constructive and much ground was gained as participants networked with each other and shared ideas. Especially useful was the attendance of members from EPA, WRAP, NPS, and other organizations. While discussions on the science overshadowed the policy questions, contacts were made towards developing stronger ties among researchers, sponsors and those seeking to implement policy that

series as its original organizers and bring a wealth of expertise to developing a "big picture" aspect of organic carbon issues nationally and internationally. They are strong proponents of making the links between science and policy more efficient and more widely understood.

is relevant, timely and effective regarding atmospheric carbon research.

The subject of bridging gaps between science and policy received much more direct attention during the third workshop, held April 5-7, 2004 in Las Vegas, NV. A presentation and discussion took place the afternoon of the third day, in which Tom Moore, WRAP Technical Coordinator, and Brooke Hemming, EPA, National Center for Environmental Assessment, presented their thoughts on the subject and facilitated an open floor discussion. The presentation, entitled *Bridging the Gap Between Science and Policy for Organic Aerosols: Technical Needs for Source Attribution and Air Quality Planning*, was a good start on developing a more comprehensive discussion and dissemination about the issue of bridging science and policy.

While efforts to break new ground towards addressing science and policy questions will continue, the issue clearly needs more immediate attention. In order to meet the needs of states and WRAP regarding regional haze, the proposed technical paper will provide direction for research and policy development within a more opportune timeframe.

References

Atmospheric Particulate Carbon Exchange (APACE). 2004, March [1]. Presentation Summaries and Research Recommendations from the Secondary Organic Aerosols Workshop, Feb. 5-7, 2002, Reno Nevada. (Technical Editor, Tim Richard). Durango, CO: Office of Community Services at Fort Lewis College.

Atmospheric Particulate Carbon Exchange (APACE). 2004, March [2]. Recommended Research Strategies from the International Workshop for the Development of Research Strategies for Sampling and Analysis of Organic and Elemental Carbon Fractions in Atmospheric Aerosols, March 3-5, 2003, Durango, Colorado. (Technical Editor, Tim Richard). Durango, CO: Office of Community Services at Fort Lewis College.

Committee on Research Priorities for Airborne Particulate Matter, National Research Council. (2004). Research Priorities for Airborne Particulate Matter: IV. Continuing Research Progress. Washington, DC: National Academies Press.