

CLEAN AIR SUBCOMMITTEE

Conference Call Summary
Friday, May 29, 2009
12:00 – 2:00 p.m. Eastern Time

Welcome

Dr. Kenneth Demerjian, Atmospheric Sciences Research Center, State University of New York, Subcommittee Chair

Dr. Demerjian, Chair of the Board of Scientific Counselors (BOSC) Clean Air Subcommittee, welcomed the Subcommittee members to the teleconference and asked the participants to identify themselves (a list of the participants is attached). He noted that members had received materials regarding the presentations that would be given on today's call. After the presentations, there will be time for public comment, and the final matter of business for the call involves the face-to-face meeting; in particular, assignments of the members to the workgroups, the purpose of the workgroups, and draft writing assignments. Dr. Demerjian stated that, during this call, the members can discuss these assignments and make any necessary changes.

BOSC DFO Remarks

Ms. Lori Kowalski, U.S. Environmental Protection Agency (EPA)/Office of Research and Development (ORD), Designated Federal Officer (DFO)

Ms. Kowalski thanked the Subcommittee members for their attendance and reviewed the Federal Advisory Committee Act (FACA) procedures that are required for all BOSC Subcommittee meetings. All meetings and teleconferences involving substantive issues, whether in person, by phone, or by e-mail, that include one-half or more of the Subcommittee members must be open to the public and there must be an opportunity for public comment. As the DFO, Ms. Kowalski ensures that all FACA requirements are met and that records of board deliberations are made public. The minutes are being recorded by a contractor, Jen Hurlburt from The Scientific Consulting Group, who will prepare a summary of the meeting. Following review by the Subcommittee members and certification by the Chair, the summary will be made available to the public on the BOSC Web Site. In accordance with FACA requirements, a notice of this conference call was posted in the *Federal Register* and an electronic docket was established. The docket is available on the Web at <http://www.regulations.gov>; the docket number is EPA-HQ-ORD-2009-0225. The meeting materials can be accessed at that site, as well as at the BOSC Web Site. Ms. Kowalski asked that Subcommittee members inform her if they discover a potential conflict of interest with respect to any of the topics under discussion during this call.

This conference call was convened to provide an overview of the Clean Air Research Program's Long-Term Goals (LTGs), and was preceded by the first public call of the Subcommittee on May 21, 2009. Although there were no advance requests for comment from the public, time for public comment is scheduled for 1:40 p.m. Comments must be limited to 3 minutes each. Ms. Kowalski asked the Subcommittee members to identify themselves when speaking so that the minutes may accurately reflect the discussion. Poster books and additional materials will be sent via Federal Express to Subcommittee members.

Regarding the face-to-face meeting in June, all members should have received an e-mail regarding their travel arrangements; if not, they should contact Ms. Kowalski after the call. The agenda for the upcoming meeting has been updated, and will be sent to members soon.

Charge to the ORD Air BOSC: Highlights From the Charge Roadmap

Dr. Dan Costa, National Program Director (NPD), Clean Air Research Program

Dr. Costa explained that the Roadmap was developed to assist the Subcommittee in linking the materials members had received (notebook and CD) with some of the charge elements.

The Clean Air Research Program has made significant progress during the past 4 years (2005-2009) by meeting multi-dimensional challenges. The Program's scope now encompasses all air pollutants instead of only particulate matter (PM) and ozone. The research integrates many scientific disciplines, and management of the Program, which serves numerous clients, requires extensive coordination with other EPA programs and various public and private funders. The Roadmap that was sent to members was meant to be illustrative rather than comprehensive, but a few examples of the Program's progress include explanations of the priorities reflecting shareholder needs; integration of research; science quality, management, and leveraging; and relevance and outcomes of the Program work.

Program priorities are established with input from EPA's clients through meetings between the National Program Director (NPD) and the Office of Air and Radiation (OAR) management, regional representatives, and other stakeholders, including specially convened client groups and technical committees. The Research Coordination Team (RCT), responsible for program development, also holds weekly conference calls and has workgroups on various levels of planning at which members interact with individual ORD laboratories on specific aspects of Multi-Year Plan (MYP) implementation. The Program also receives input from public comments, state and regional air pollution agencies (through OAR), Congress, and the scientific community. The Program is integrated across intramural and extramural laboratories.

As noted in the BOSC Mid-Cycle Review Report, the quality of the research in the Clean Air Research Program is very high, with work conducted by internationally renowned air pollution researchers with more than 1,200 reports and other publications published between 2005 and 2009, including many highly cited papers. The science is leveraged across other ORD programs such as Human Health, Global Change, and Nanotechnology. The Program is cooperating with other EPA offices and federal agencies on a number of projects including the National Health and Environmental Effects Research Laboratory's (NHEERL) exposure-effects studies and the Federal Highway Administration's Near Road Program. Additionally, the Program is collaborating with University of Michigan scientists on several near roadway studies, and is investigating the role of long-term exposure to fine particles in the Multi-Ethnic Study of Atherosclerosis-(MESA) Air Pollution Study. Dr. Costa noted that the PM Research Centers have been awarded more than \$50 million in grant funds beyond the funding provided by EPA.

The Program's relevance is evident in the use of its data for National Ambient Air Quality Standards (NAAQS) setting and implementation and in assessments of the impact of PM standards. The Program's research also is used for endangerment findings and in air toxics determinations (by the Office of Transportation and Air Quality). The Clean Air Research Program has identified systemic impacts of air pollution; in addition, air pollution now is cited as a top-six risk factor for cardiovascular disease. Other impacts of the Program are evidenced by the work of the PM Research Centers and in the U.S. Office of Management and Budget's (OMB) finding that air pollution research is an important element of federal regulations protecting human health and the environment.

LTG 1: Health and Exposure Overview

Dr. Robert Devlin, NHEERL

Dr. Devlin noted key achievements since the last BOSC review, including the development of a more robust epidemiology database and a better understanding of: mechanisms by which PM can cause acute mortality and morbidity, PM physical and chemical attributes and effects, and susceptibility based on clinical and toxicology studies. He explained that the first session at the face-to-face meeting will be organized around three questions: What are the physical/chemical attributes of PM that are associated with adverse health effects? How and to what extent does PM cause adverse health effects? Who is susceptible to PM?

In 1999, EPA was beginning work on PM because there was very little information available about PM attributes. Although more than 50 epidemiology studies reported associations between ambient PM and cardiac mortality and morbidity, the mechanism of action was not understood. During the past 10 years, much progress has been made in understanding how PM causes adverse health effects, and how these effects are associated with PM size and components.

The posters that will be presented at the face-to-face meeting cover research on: PM size and the comparative potency of different size PM fractions, coarse and ultrafine PM health effects, PM components, and the health effects of long-term PM exposures.

The impact of this research will be demonstrated by client offices, which will be presenting posters describing how they use the data from the Clean Air Program's research, including how it is used in standard setting. For example, the Air Quality Index was a collaboration between ORD and OAR. Additionally, the Program worked with OAR to develop continuing medical education (CME) courses for physicians so that they could better understand the health effects of air pollutants and communicate these to their patients; other public outreach efforts are being conducted as well. Air pollution health and exposure research has significant benefits and impacts. The Program's research indicates that the current standards are necessary to protect public health and provides information to educate at-risk populations about minimizing exposure to air pollutants.

Discussion

Dr. Praveen Amar asked, regarding Slide 26, whether the Integrated Science Assessment (ISA) process was changing. He referred to a memorandum from EPA Administrator Lisa Jackson. Dr. Devlin responded that, in the past, OAR prepared a staff paper in addition to the ISA, which used the science to support recommendations to the Administrator. There was a question as to whether this staff paper was going to continue to be produced, but the memorandum from Dr. Jackson clearly states that the Agency will continue to produce the staff paper. Dr. Rogene Henderson confirmed that this was correct. EPA is going back to what was done previously, where the staff paper integrated the science and included proposed alternative approaches to setting the standards, which she believes is a positive development. Dr. Devlin added that most EPA staff members agreed with Dr. Henderson. He will ensure that Slide 26 is updated to reflect this memorandum if it is not currently up to date. Dr. Costa noted that the critical change was removing the Advance Notice of Proposed Rulemaking (ANPR).

Dr. Jonathan Levy commented that the theme of the session was health and exposure, but the preponderance of posters seem to be on the health side of the equation, such as epidemiology or toxicology studies, with less work on exposure. Is that reflective of the distribution of the research in the Program? Dr. Devlin responded that some of the posters with "health" in the title have an exposure component to them as well, but much of the exposure research will be presented in the third session on multi-pollutants.

LTG 1: Air Quality Overview

Mr. Tim Watkins, National Exposure Research Laboratory (NERL)

Air quality research supports LTG 1 through NAAQS development and implementation, and LTG 2 through the tools being developed to connect sources to health and to characterize multi-pollutant concentrations. The research is driven by science gaps associated with NAAQS implementation and insights and recommendations from National Research Council (NRC) reports. Session themes include: source emissions (estimation and evaluation), ambient measurements (air quality characterization and process insights), air quality modeling (applications driving development and evaluation), and extending applications of methods and models (linking to ecosystem effects, human exposure, and climate assessments).

The Clean Air Research Program's source emissions work aims to improve both the understanding of the sources contributing to air quality problems and the emissions inputs needed for air quality models, such as the CMAQ model. Research accomplishments include: characterization of emissions from wildland and prescribed fires, advancements in measuring and modeling biogenic emissions, an improved understanding of ammonia emissions, advancements in anthropogenic source sampling, and the integration of inverse, source-based, and receptor models.

The Program's ambient measurements research is focused on developing, applying, and evaluating sampling and analytical methods in the hopes of providing insights into source contributions, atmospheric processes, and ambient concentration variability. Research accomplishments include: development of methods to support NAAQS compliance and improved understanding of secondary organic aerosol (SOA), coarse PM, and mercury fate and transport.

Air quality modeling research within the Clean Air Research Program aims to develop, apply, evaluate, and refine air quality modeling systems to improve their reliability and credibility for research and policy assessments. This work will provide insights into model sensitivities to data and processes to guide related physical, chemical, and meteorological research. To date, this research has improved understanding of the PM process, the extension of chemical kinetic mechanisms, and air quality-meteorology interactions. A framework for model evaluation has been developed.

Extended applications research aims to link air quality methods, measurements, and models to assessments for ecosystem health, human exposures, and climate change impacts.

Models developed by the Clean Air Research Program are used to inform policy decisions, ecosystem assessments, and global change assessments. Measurement studies have been used for determining nonattainment areas and mercury deposition. These models and measurements are continually improved through the Program's research.

The Program will continue to work to enhance emissions source characterization, improve ambient measurements and models, and increase its focus on multi-pollutant modeling and applications.

Discussion

Dr. Greg Yarwood noted that the first bullet on emissions, Slide 15, Future Directions, mentions some mobile source categories, and asked if work also would be conducted on stationary sources. An EPA representative replied that some work on oil and gas storage, but not exploration, is underway. ORD's National Risk Management Research Laboratory (NRMRL) is conducting remote sensing work to determine the emissions factors from certain facilities. Ms. Sherri Hunt added that a Request for Applications (RFA) on emissions projects just closed, so new work in this area will be supported in the next year.

Dr. Yarwood asked if the Program was interested in optical remote sensing techniques. Dr. Watkins responded that it was, and that a poster would highlight that topic at the face-to-face meeting. Dr. Yarwood questioned whether the Program had plans for further development of mercury models, especially mercury chemistry models. Mr. Ken Schere responded that the Clean Air Program was continuing a lower level of development with mercury models; there has been intense development during the past few years. The science is changing rapidly, and new reactions and kinetics are being published often. The focus has shifted to expanding the domains of application to hemispheric domains because of the large global influence on modeling over North America. After the hemispheric to continental systems are running to satisfaction, the Program will revisit the mercury chemistry issue. Dr. Yarwood added that he was specifically thinking of the role of halogens in mercury chemistry. Dr. Costa added that Dr. Joel Scheraga, NPD for the Global Change and Mercury Program, will speak at the face-to-face meeting and he can address why mercury is not part of the Clean Air Research Program. There is a small mercury effort that is heavily leveraged across air, air toxics, and mercury. Ms. Hunt added that approximately four projects on mercury are being supported by the Global Change budget; some of these projects are studying the chemical mechanism.

Dr. Amar asked Mr. Schere if he would be providing a summary of the posters to be presented at the face-to-face meeting. Dr. Demerjian explained that there was not time for the Program to prepare this summary, but the posters are listed in the binder that was sent to the Subcommittee members. Mr. Watkins added that each bullet in the "Accomplishments" slide in his presentation corresponds to a poster.

LTG 2: Source-to-Health Outcomes/Multi-Pollutant Overview

Dr. Alan Vette, NERL

The NRC's 2004 Report on Air Quality Management recommended moving to an integrated, multi-pollutant air quality management strategy based on reducing risk and oriented toward achieving results. The Clean Air Research Program is working to develop an integrated multi-pollutant research strategy that will meet OAR's needs. OAR initiated a multi-pollutant risk reduction strategy focused on Detroit, Michigan, and Clean Air Program researchers are working with OAR to further develop ORD's multi-pollutant research strategy. The Program welcomes the BOSC's input on this multi-pollutant approach.

There are many ways to define multi-pollutant including: sources of emissions, controls, atmospheric processes, receptors, or effects. Additionally, multi-pollutant management can be defined as the achievement of single pollutant goals recognizing multi-pollutant sources, atmosphere, and/or co-benefits for other pollutants; combining strategies to address multiple air quality goals; or implementing strategies to address multi-pollutant risks, recognizing synergies and tradeoffs in controls, air quality, and effects.

In terms of multi-pollutant standards, EPA is exploring a multi-pollutant secondary standard for NO_x and SO_x, accounting for the joint atmospheric processes and ecological effects associated with these pollutants.

To achieve LTG 2, the Program will develop a multi-pollutant approach to research; identify specific source-to-health linkages, using near roadway studies as the prototype; and assess health and environmental improvements attributed to past regulatory actions. While not specifically identified as a focus in the multi-year plan, the multi-pollutant approach will be developed with consideration of the research on air quality-climate interactions being performed concurrently in the Global Change Research program.

This session will include posters on four themes: linking multi-pollutant sources and health effects, atmospheric transport and transformation, the influence of airsheds on multi-pollutant air quality and health effects, and assessing and managing multi-pollutant exposures and health effects.

OAR representatives will be presenting posters to show how they have used the Program's research. Specifically, the research is used to develop tools and inform policy decisions. For example, ORD's research has contributed to the development of tools that could help mitigate air pollution from roads from the beginning of the roadway design process.

Future plans include disseminating a Clean Air Research Centers Request for Applications (RFA) that aims to build on the success of the PM Centers by addressing key uncertainties and processes to help improve understanding of health effects from multi-pollutant atmospheres. Research also will be conducted to learn more about climate-air quality interactions.

Discussion

Dr. Tina Bahadori noted that some work had been conducted previously that examined molecular markers as a method of source characterization, and asked if any such work was currently underway. Dr. Vette responded that there was an extensive effort underway. Slide 14, under the "Near Road" topic, contains a plot that shows a variety of organic molecular markers that have been examined to understand the impacts of motor vehicles near roads. This same type of approach is underway in the Detroit study, and much work has been conducted in the PM Centers to identify specific molecular markers, primarily organic, to aid in source apportionment analyses. Dr. Bahadori added that this tied into some of the work on stationary sources as well.

Dr. Bahadori asked whether she had understood correctly that volatile organic compound (VOC) reactivity was a measure being considered as a multi-pollutant approach to examine reactivity. Dr. Vette responded that this area has not been explored fully, but it would be considered. Dr. Tager commented that the multi-city studies had not considered the large population differences, especially with migration patterns changing rapidly, and this must be taken into account to determine how much of the observed differences occur because of sources versus changes in population demographics due to migration. Dr. Costa responded that much of the epidemiology work in the Program is conducted by extramural grantees, and those working out of the PM Centers. Population demographics and other important attributes (e.g. susceptibility) is playing into the research they are conducting more and more frequently. He suggested discussing this further at the face-to-face meeting because some grantees with expertise in this topic will be present as well as some of the intramural epidemiological researchers.

Dr. Amar noted, referring to the slides on multi-pollutant research, that the emphasis seems to be on ozone and PM and their precursors. Dr. Vette responded that those were selected as examples because they are largely understood, but they are not the only precursors being considered. Air toxics are an important consideration that have not been explored fully. Dr. Costa noted that he had mentioned in a previous call that integration was taking place with ozone and PM and in the future, hazardous air pollutants, but the rationale behind combining these programs is the limited support for the air toxics program. By collapsing these programs together, the Clean Air Program has been able to examine the air toxics most relevant to the studies being conducted. EPA does not have an all-encompassing air toxics program, but is attempting to do more in this area.

Public Comment

Ms. Lori Kowalski, EPA/ORD, DFO

Ms. Kowalski called for public comment at 1:40 p.m. No comments were offered.

Preparation for Face-to-Face Meeting

Dr. Kenneth Demerjian, Atmospheric Sciences Research Center, Subcommittee Chair

Dr. Demerjian noted that he had sent out a list of proposed members for three workgroups—the health and exposure, air quality, and source-to-health outcomes workgroups—similar to the LTGs discussed today. The purpose in sending this information out was to focus the members' review for the meeting. He asked if the Subcommittee members found their group assignments acceptable, and noted that there were approximately 18 posters per topic; each workgroup can decide how it wants to conduct the review of their assigned posters. The Subcommittee members agreed to the group assignments.

Prior to the call, Dr. Demerjian also sent members a list of writing assignments associated with the charge questions, highlighting in bold type the Subcommittee member in each area who has been asked to take the lead in compiling the response for that area. Dr. Mittleman has been assigned to the area of program design and demonstrated leadership; Dr. Henderson is the leader for the area of science and quality; Dr. Bahadori has been assigned to lead the topic of relevance; and Dr. Amar will take the lead in the area of demonstrated outcomes. Dr. Demerjian included a matrix showing overlap across the areas to ensure that each item is covered. He noted that input is welcomed from any member on any area, but these workgroup assignments will allow the Subcommittee members to prioritize the time they spend reviewing the materials to ensure that all are covered adequately.

Dr. Bahadori asked if Dr. Demerjian would like the workgroups to develop a draft document before the face-to-face meeting. He responded that it would be useful for members to have their thoughts and comments organized prior to the meeting, and a draft would be helpful, but not necessary. His goal is to have a draft response prepared within 2 weeks after the meeting.

Dr. Bahadori asked about the length of the report. Dr. Demerjian explained that the report will include a preamble and background on the Program, but most of it will address the responses to the charge questions. He suggested that members look at the report for the 2005 BOSC program review, which was approximately 40 pages, half of which was devoted to the charge questions.

Dr. Demerjian asked the workgroup members to decide on how the poster review would be handled. Members will receive these posters on Monday, June 1, 2009. He suggested that the members review them, and that the person at the top of the list in each group act as the coordinator (i.e., Dr. Mittleman for health and exposure, Dr. Amar for air quality, and Dr. Tager for source-to-health outcomes). These leaders should ask their workgroup members to choose 10 posters that they are interested in reviewing; overlap is fine, but all posters must be covered. The Subcommittee members agreed to this plan.

Discussion

Ms. Kowalski told the Subcommittee members she would be e-mailing further information on the logistics for the face-to-face meeting to them within the next few days.

A Subcommittee member asked Dr. Demerjian to provide some guidance on how to review the posters and Program. For example, stating that the Program has met its goals is not the same as agreeing that the Program has achieved its desired outcomes. Should the Subcommittee note any problems with the direction of certain research efforts? Dr. Demerjian responded that the members should keep the charge questions in mind when reviewing the Program. Does the research being conducted address the LTGs? Is the Program achieving its goals? Points about the direction of the research definitely should be included; the Subcommittee is not only reviewing the Program as it stands, but offering recommendations to help improve the Program in the future.

Dr. Branch asked that another poster book sent to him because he will not be back at his office before the meeting. Ms. Kowalski said she will ensure that one is mailed to him.

Dr. Demerjian thanked the Subcommittee members and the EPA staff, and stated that he looked forward to a very productive face-to-face meeting in June. He then adjourned the meeting at 2:13 p.m.

Action Items

- ✧ The workgroups will determine how they would like to handle the poster reviews.
- ✧ Ms. Kowalski will send a revised face-to-face meeting agenda and logistical information to the Subcommittee members.
- ✧ Ms. Kowalski will send a poster book to Dr. Branch's current address.

PARTICIPANTS LIST

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BOARD OF SCIENTIFIC COUNSELORS

**CLEAN AIR SUBCOMMITTEE
AGENDA**

May 29, 2009

12:00 PM – 2:00 PM EDT

CONFERENCE CALL

Participation by Teleconference Only

866-299-3188

code: 2025648239#

12:00 – 12:10 pm	Welcome <ul style="list-style-type: none">- Overview of Agenda- Summary of Ongoing Activities	Dr. Ken Demerjian, Subcommittee Chair
12:10 – 12:15 pm	BOSC DFO Remarks	Ms. Lori Kowalski, Office of Research and Development (ORD)
12:15 – 12:30 pm	Highlights to the Charge Roadmap Program	Dr. Dan Costa, Clean Air National Director, ORD
12:30 – 12:55 pm	LTG 1 Health & Exposure Overview <ul style="list-style-type: none">- <i>Overview(20 min)</i>- <i>Q & A (5 min)</i>	Dr. Robert Devlin, ORD
12:55 – 1:15 pm	LTG 1 Air Quality Overview <ul style="list-style-type: none">- <i>Overview (15 min)</i>- <i>Q & A (5 min)</i>	Mr. Tim Watkins, ORD
1:15 – 1:40 pm	LTG 2 Overview <ul style="list-style-type: none">- <i>Overview (20 min)</i>- <i>Q & A (5 min)</i>	Dr. Alan Vette, ORD
1:40 – 1:45 pm	Public Comment	
1:45 – 2:00 pm	Preparation for Face-to-Face Meeting <ul style="list-style-type: none">- Workgroups Subcommittee Chair- Subcommittee Discussion	Dr. Ken Demerjian,
2:00 pm	Adjourn	