U.S. Environmental Protection Agency
Office of Research and Development

BOARD OF SCIENTIFIC COUNSELORS EXECUTIVE COMMITTEE MEETING

Arlington, VA
January 27-28, 2005

Thursday, January 27, 2005

Welcome, Introductions, and Overview

Dr. James H. Johnson, Jr. (Howard University), Chair of the Board of Scientific Counselors (BOSC), called the meeting to order at 9:30 a.m. He reviewed the agenda, which included updates on the program and Multi-Year Plan (MYP) reviews, review and approval of the report from the Endocrine Disrupting Chemicals (EDC) Subcommittee, lessons learned from the EDC program review, update on the National Homeland Security Research Center (NHSRC), overview of Science Advisory Board (SAB) activities, and review and approval of the September meeting minutes. Dr. Johnson said that he would like to review the Office of Research and Development's (ORD) response to the BOSC's Biotechnology Research Program letter report at 9:15 a.m. on Friday morning. He thanked Lorelei Kowalski (ORD/OSP), Designated Federal Officer (DFO) for the BOSC, and the other DFOs for their outstanding work on behalf of the subcommittees. He also thanked Beverly Campbell (SCG) and her staff for their support of the BOSC and its subcommittees.

Dr. Johnson asked each of the attendees to introduce themselves, following which he announced that Dr. Elaine Dorward-King (Rio Tinto) had declined her invitation to extend her term as a member of the BOSC. He asked the Board members to review the EDC Subcommittee report that evening and be prepared to discuss it during the afternoon session on Friday.

Dr. Johnson listed the following six topics in which the BOSC members had expressed interest: nanotechnology, biomonitoring, risk assessment, regional vulnerability assessment, public health outcomes, and grid computing. He noted that the BOSC's workload has been and will continue to be dominated by the program reviews for the next 5 months; however, these topics will be addressed as the workload permits.

Review and Approval of the September 2004 Meeting Minutes

Dr. Johnson asked if there were any comments on the draft meeting minutes. He noted that the word "for" should be deleted in the second sentence of the second full paragraph on page 3. Dr. Rogene Henderson (Lovelace Respiratory Research Institute) stated that she had unintentionally omitted Dr. John Giesy's (Michigan State University) name from the list of the members involved in planning the Risk Assessment Workshop. She asked that his name be inserted in the first paragraph under the Risk Assessment Workshop Proposal heading so that the minutes accurately reflect those individuals who have helped plan the workshop. Dr. Johnson commented that the table on pages 11 and 12 of the minutes has been updated and will be distributed to the members before the close of the meeting. He asked the members to update their biosketches for the BOSC Web Site. Seeing that there were no additional comments on the minutes, Dr. Johnson asked for a motion to approve the minutes with the noted corrections/additions. Dr. Herb Windom (Skidaway Institute of Oceanography) made a motion to

approve the minutes, which was seconded by Dr. Juarine Stewart (Morgan State University). The minutes were unanimously approved by the BOSC with the noted corrections/additions.

Remarks from the BOSC DFO

Ms. Kowalski reminded the BOSC members that the Board is a federal advisory committee subject to the rules of the Federal Advisory Committee Act. As the DFO, she is present to ensure compliance with all FACA rules. She commented that BOSC meetings are advertised in the *Federal Register* and open to the public, and members of the public will be afforded an opportunity to comment on Friday from 9:45 to 10:00 a.m. Ms. Kowalski stated that a contractor is present to take notes of the presentations and discussions. The contractor will prepare meeting minutes, which will be posted on the BOSC Web Site once they are approved by the Executive Committee. She asked that the members submit their travel vouchers by the close of the meeting, particularly those members who are involved with subcommittees. The expenses for the Executive Committee should be kept separate (i.e., submitted on separate forms) from those incurred in support of a subcommittee. Ms. Kowalski identified the DFOs for the various subcommittees:

- Heather Drumm—DFO for Mercury Subcommittee and Backup DFO for Executive Committee
- Neil Stiber—DFO for EDC Subcommittee
- Greg Susanke—DFO for Ecological Subcommittee
- Lawrence Martin—DFO for Particulate Matter/Ozone Subcommittee
- Virginia Houk—DFO for Human Health Subcommittee
- Edie Coates—DFO for Drinking Water Subcommittee
- Janet Gamble—DFO for Global Change Subcommittee.

Ms. Kowalski indicated that she has developed organization charts for the BOSC and its subcommittees to assist the DFOs in identifying the subcommittee members. These charts are available to the BOSC members on request. Susan Peterson (ORD/OSP) is developing a database for internal use to track information on past and current Executive Committee members, subcommittee members, candidates considered for membership, and other information. The database will be searchable by specific expertise, which should improve the efficiency of forming BOSC subcommittees.

Remarks from the AA/ORD

Dr. Johnson introduced Mr. Tim Oppelt (ORD/NHSRC) who presented the remarks from the Assistant Administrator (AA). Mr. Oppelt said he was glad to see the new members who have been added to the BOSC since he last made a presentation to the Board. He explained that he is an engineer who has done many different jobs in the Agency during his career, the most recent of which was to direct the NHSRC. He noted that many of the senior management positions within ORD are filled temporarily with individuals who are acting in those positions; with Dr. Paul Gilman's resignation in fall 2004, this includes the AA/ORD position.

Mr. Oppelt thanked Dr. Johnson for accepting the responsibility of chairing the BOSC and he praised the Board's aggressive agenda and the work it is doing on behalf of ORD. If he is asked to act as the AA/ORD, he has some ideas on what needs to be accomplished to keep ORD on track to fulfill its ongoing commitments. He mentioned that acting AAs often are viewed as caretakers, but he would like to improve ORD's efficiency and address a number of issues that cannot be postponed until the appointment of a new AA. Mr. Oppelt said that one of his priorities would be to fill many of the vacant senior positions in the laboratories and centers. He noted that the recruitment process is long and arduous, and the limit on government salaries makes it difficult to attract the best scientists and engineers

to the Agency. In addition, the restrictions on the number of full-time equivalents (FTEs) makes hiring difficult. Many of these positions have not been filled so that the new EPA Administrator will have an opportunity to weigh in on these hiring decisions. The Agency soon will have a new Administrator so it is hoped that many of these positions can be filled in the near future. Mr. Oppelt said that he would work aggressively to fill these positions and improve the stability of ORD.

One of the major challenges to be faced in the coming year is the reduction in resources. ORD's budget has been slowly declining but costs have been steadily increasing. Although ORD has not faced a crisis in any one year, it is clear that managers may have to re-examine priorities and improve efficiency as budgets continue to shrink. He noted that the BOSC's program reviews will be very helpful to ORD managers in re-prioritizing their programs. Mr. Oppelt stressed the importance of preserving ORD's core competencies. ORD will have to explore creative ways of sharing human resources in different geographic locations to ensure that core competencies are preserved. He suggested that the BOSC may want to review ORD's Management MYP at the May meeting. ORD will need insights from the BOSC on its strategic choices and priorities, as well as input with regard to how ORD is managed. He noted that ORD faces a number of scientific challenges, including mercury and perchlorate. Mr. Oppelt mentioned the creation of the new Center for Computational Toxicology, stating that there is no shortage of work for this new center. Another challenge for ORD will be the transition to the National Program Directors (NPDs). These new positions will require ORD to develop a different way to manage its research planning process, but Mr. Oppelt is confident that ORD will work through the process and become a more effective organization.

Mr. Oppelt concluded his remarks by stating that he has great respect for the BOSC and the advice the Board has provided to ORD has been timely and beneficial. He asked if any of the members had any questions.

Dr. Anna Harding (Oregon State University) asked about the authority of the NPDs. Will they have the authority of a Laboratory or Center Director? Dr. Farland responded that none of the candidates for the NPDs had officially been offered a position yet. The candidates have been invited to Science Policy Council (SPC) and senior management meetings, but he does not know when the positions will be filled. The level of authority for the NPDs is an issue that is being discussed by ORD management.

Dr. Gary Sayler (University of Tennessee) asked if there were any issues on the agenda of the European Union that may drive ORD's agenda. Mr. Oppelt responded that global monitoring is one international area in which ORD will play a role, and there are a number of others.

Dr. Jim Clark (Exxon Mobil) asked if ORD had learned any lessons in managing the recovery from the devastation of the laboratory at Gulf Breeze. Dr. Farland replied that they learned a great deal about managing a geographically dispersed workforce operating in alternative work space. The staff did a tremendous amount of work outside the laboratory, but the current priority is to get the laboratory operational again. Mr. Oppelt added that the Management Council could examine the incident to identify and document lessons learned. He mentioned that the regional office in San Francisco experienced similar challenges when it was damaged in an earthquake.

Using stem cell research as an example of how states are willing to fund research, Dr. George Lambert (University of Medicine and Dentistry of New Jersey) asked if there is some way that ORD can leverage state resources to do more for less. Could ORD enter into agreements with states to equally share the cost of research? Mr. Oppelt said that this issue was discussed at the SPC meeting and it bears further investigation. EPA needs to be more aggressive in seeking opportunities to leverage resources from the states. With regard to homeland security, EPA is working with numerous agencies to leverage resources.

He noted, however, that the projects become more difficult to manage because the various "players" have different priorities and timeframes. Dr. Farland mentioned coastal conditions as a good example of where EPA has done that type of leveraging. Dr. Windom added that mercury is another example where EPA has successfully leveraged state resources. Dr. Farland commented that EPA has been less successful in leveraging state resources with respect to health issues. Dr. Lambert replied that the public interest in health issues should make it easier to leverage state resources.

Risk Assessment Workshop Update

Dr. Henderson, Chair of the Risk Assessment Work Group, said that the September minutes provided a good overview of the planned workshop. The focus of the workshop will be Chapter 4 of the Risk Assessment Principles and Practices Staff Paper. She noted that Chapter 4 focuses on the use of default and extrapolation assumptions. The goal of the workshop is to review the methods used by EPA and suggest alternative methods that could improve current practices. The workshop will include three sessions. Each session will begin with a presentation by EPA, followed by three speakers who will suggest ways to improve the current process. There will be time for questions and discussion following each speaker and again at the panel discussion at the end of each session. The speakers have been asked to submit extended abstracts, which will be published in the journal *Environmental Science and Pollution Research – International*. The authors will have the opportunity to revise their papers before publication and a summary of the workshop discussions will be included in the journal publication. Dr. Henderson pointed out that the agenda for the workshop, which identifies the invited speakers, was provided in the meeting notebook. She added that the National Academy of Sciences (NAS) offered its auditorium for the workshop so that the members of an NAS work group could attend to become better informed about the issues surrounding risk assessment.

Dr. Lambert asked about the number of registrants, and Ms. Kowalski replied that 110 individuals had registered and she expected an attendance of approximately 150. She indicated that it may be possible for individuals to participate by telephone. Dr. Lambert asked if there were plans to videotape the workshop, and Ms. Kowalski replied that it would only be audiotaped. Dr. Johnson asked if the presentations could be posted on the BOSC Web Site prior to the meeting. Dr. Farland said that the presentations probably would not be posted until after the meeting because most of the speakers had not submitted their presentations. Dr. Windom asked if the workshop would address the differences between the extrapolation of risk between species for metals versus organics. Dr. Henderson replied that Dr. Mel Anderson may touch on that topic. Dr. Windom asked if the workshop abstracts could be distributed to the BOSC and Ms. Kowalski responded that she probably would not have them all until after the meeting. She agreed to distribute the abstracts she had received to the BOSC members along with information about participating in the workshop via telephone several days prior to the meeting. Ms. Kowalski said that she will update the workshop agenda on Tuesday, February 1 and distribute that to the BOSC.

Dr. Johnson commented that this is the BOSC's second workshop; the first focused on communication of research results. He asked Dr. Henderson and the other work group members to participate in a post-workshop review that will provide advice for the members responsible for organizing the next BOSC workshop.

Coastal Condition Report

Dr. Clark, Chair of the Coastal Conditions Work Group, distributed a draft position paper on the review of the Second National Coastal Condition Report (NCCR). At its September meeting, the BOSC agreed to review the report in the context of other recent, related reports. The resulting letter report will be written in the style of the BOSC's letter report on the biotechnology research program. Dr. Clark

explained that it is not meant to be a consultation; it simply identifies a number of issues. He noted that the draft paper reflects the BOSC's focus and addresses communication, outputs/outcomes, and integration and utilization of other data. He asked the BOSC members to review the draft paper overnight so that they could provide specific comments during a session on Friday morning. Dr. Johnson suggested setting aside some time for comments after 9:15 a.m. He noted that the charge to EPA in preparing the NCCR is very different from the purpose of the other reports to which it is compared. Therefore, it may not be a fair comparison. Dr. Clark commented that the other reports did a good job of suggesting what to do next, but the NCCR does not. He also noted that the NCCR includes good generalizations and great summaries of data. The writing style and level of detail in the report raise questions regarding the intended audience. Some sections that may be too technical to hold the interest of decision makers are combined with simple graphics and simplified language about conditions that are not appropriate for the technical audience. This could be the result of trying to create one report for different audiences.

EPA could have pointed the readers to resources that might help them act on the information included in the NCCR. The NCCR did not address how the use of different methods among the organizations collecting the data affects interpretation and outcomes. The data quality analysis and data quality objectives in the NCCR are excellent. The NCCR could be improved by including explicit recommendations for strengthening the 305(b) program.

Because this is the second NCCR, the Agency can start to identify trends. It was difficult, however, to do the trends analysis on the 10 years of data because both the methods and interpretations have changed over time. Some of these differences were explained in the NCCR and it did include some trends analysis. The NCCR also explained the problems associated with that analysis. The NCCR could benefit from the inclusion of an explanation of the cost or logistical constraints that limited the use of other more sophisticated, intensive, or emerging sampling or analytical approaches. The chapters summarizing regional data and ongoing activities are very informative. Chapters 3 through 9 provide useful summaries of the data, ongoing monitoring and environmental assessment programs in these regions, and EPA's ability to work within these geographic areas to make more detailed assessments of environmental conditions and key stresses. The consolidation of turbidity into a more general water quality criterion is a great improvement over the first NCCR.

Dr. Windom asked how often EPA planned to update the NCCR. Dr. Farland responded that it will be updated every 5 years. Dr. Clifford Duke (Ecological Society of America) commented that the scientific quality of the NCCR is good, the work group is just trying to point out some ways future reports could be improved. Dr. Johnson asked that the position paper be edited and vetted by two BOSC members before it is signed and transmitted to ORD. He asked that Dr. Clark serve as one of the two vettors. Dr. Sayler suggested that the BOSC letter report include a more expanded explanation of the 305(b) requirements. Dr. Johnson stated that this could be added in the text or as a footnote. Dr. Windom asked if this format was acceptable to the BOSC, and if it would be appropriate for the letter report on the Mercury MYP. Dr. Johnson said this format would be appropriate for the Mercury MYP review report. Ms. Kowalski asked that the recommendations be clearly identified in the BOSC report so that ORD can respond to them. Dr. Farland stated that the second NCCR has been published so the BOSC's review and recommendations will be used to improve the next NCCR. Dr. Windom said that the second report is better than the first, which indicates that EPA listened to previous suggestions for improvement. Dr. Clark agreed to reword some of the recommendations so that they focus on what EPA can do to improve the next NCCR. Dr. Johnson said that the BOSC will vote to approve the position paper tomorrow with the understanding that the vettors will ensure that the members' comments have been addressed.

Dr. Johnson reminded the members to include communication and interagency cooperation/collaboration in every program review. He also asked the BOSC members to review Dr. Farland's comments in the minutes regarding the purpose of the program reviews.

Computational Toxicology Subcommittee Update

Because Dr. George Daston (Proctor & Gamble) was unable to attend the meeting until Friday, Dr. Michael Clegg (University of California) was asked to update the BOSC on the Computational Toxicology Subcommittee's activities. Dr. Clegg reported that the subcommittee members may be meeting with EPA staff at the facility in Research Triangle Park (RTP), North Carolina, in April 2005, to learn more about the program. Dr. Daston wants to discuss with the staff how the subcommittee could benefit the program. Ms. Kowalski said that she had informed Dr. Daston that not all the subcommittee members were available to meet in April; therefore, the date of the meeting has not been determined. The subcommittee plans to conduct the site visit and prepare a letter report. It is anticipated that the subcommittee will continue to assist and advise the center after this initial review.

Dr. Henderson asked about the distinction between the MYP review and a program review. Dr. Johnson replied that an MYP review is simply a review of the document; a program review is a retrospective and prospective review of the entire program. A program review is more extensive and it includes the MYP and research plan.

Mercury MYP Subcommittee Update

Dr. Windom reported that the subcommittee had been formed. It is chaired by Dr. Windom and its members include Rui Afonso, Cynthia Gilmour, Rogene Henderson, Jim Johnson, George Lambert, and Michael Waalkes. Dr. Windom stated that the charge questions for the review were developed more than 18 months ago and were revised about 12 months ago. There was a productive public conference call on January 19, 2005, and a public face-to-face meeting has been scheduled for February 23-24, 2005, in Washington, DC. Each subcommittee member has been assigned two of the charge questions and asked to develop responses for each one prior to the February meeting. Dr. Windom will use the draft responses to develop a PowerPoint presentation for the meeting. He noted that the agenda for that meeting was provided in the notebook. On the morning of the first day, EPA will present an overview of the MYP and Dr. Windom will review the charge questions. Then the subcommittee members will go through the draft responses as a group. Each member will be responsible for modifying his/her two responses to incorporate the comments of the other members. The revised responses will be presented to the subcommittee and discussed on the morning of the second day. Dr. Windom hopes that the BOSC subcommittee letter report will be near to final by the close of the meeting around noon on the second day. He will finalize the letter report, which will be distributed to the subcommittee members and discussed on a public conference call on March 29, 2005. Dr. Windom hopes that the report can be approved by the BOSC at the May 2005 Executive Committee meeting. Because he may not be able to attend the May meeting, the subcommittee report may be circulated to the BOSC Executive Committee and discussed via conference call prior to the May meeting so that the Executive Committee members' comments can be incorporated before the vote in May.

Dr. Johnson expressed his approval of the process; however, Ms. Kowalski cautioned that the BOSC could not discuss the report unless it is in a public forum. Dr. Johnson voiced his concern about the number of members who will be unable to attend the May meeting. He asked the members to check their calendars for May and June so that an alternative meeting date could be selected.

Nomination Subcommittee Update

Dr. Johnson reported that Dr. John Giesy (Michigan State University) has agreed to co-chair the Nomination Subcommittee. This is a good role for him given that he has a number of conflicts that prevent him from participating on several of the other subcommittees. Dr. Giesy will work with Dr. Johnson to identify candidates to fill the vacant positions on the Board. Dr. Johnson suggested that some younger scientists/engineers be targeted for BOSC membership. This might be helpful in avoiding some of the conflicts of interest experienced by the more senior members. Dr. Windom pointed out that it will be very difficult to recruit young scientists because many are conducting field research and working toward tenure. Dr. Duke suggested looking toward retirees as a good source for members; they have the required expertise and they are more available than younger researchers. Dr. Henderson suggested a balance of younger and older scientists/engineers. She expressed some concern that younger scientists/engineers usually are interested in a specific area and focus on the technical details; older scientists/engineers focus more on the bigger picture, which is important for the work of the BOSC. Perhaps some of the subcommittee members may be good candidates for the Board.

Dr. Farland noted that many of the BOSC members serve on other committees and could identify individuals who have the right perspective and appropriate expertise, and are not involved in EPA programs. He asked them to make such recommendations to the Nomination Subcommittee.

Dr. Johnson said that he would like to identify several young professors who might be appropriate for the BOSC as well as some individuals from outside academia.

Activities of the National Research Council (NRC) Committee on Models in the Regulatory Decision Process

Dr. Johnson introduced Dr. K. John Holmes who has been with NRC's Board on Environmental Studies and Toxicology (BEST) since 1999. He works primarily on studies related to air quality and mobile source emissions. Prior to his position with BEST, Dr. Holmes worked on carbon emissions trading at the H. John Heinz Center for Science, Economics, and the Environment. As a researcher, he worked with a variety of models, including groundwater, contaminant transport, water resources, energy/economic, emissions, and global change models. Dr. Holmes received a B.S. degree in Geology from Indiana University and an M.S.E. in Water Resources Management from the University of Washington. He received his Ph.D. from The Johns Hopkins University.

Dr. Holmes provided some background for this NRC study and described the task statement for the Committee on Models in the Regulatory Decision Process. His presentation also covered the committee's work plan, the focus of the workshops, and some future activities. He explained that the study was initiated because of the regulatory and judicial challenges to models used in regulatory activities. In addition, the reliance on models has been expanding, model innovations are increasing, and regulatory requirements are increasing (Data Quality Act and others). Dr. Paul Gilman, former AA/ORD, revitalized the Council for Regulatory Environmental Modeling (CREM) and moved CREM's focus to model users. CREM was tasked to develop a guidance document and a Web-based knowledge base, conduct regional workshops, and perform stakeholder outreach. CREM also was asked to engage the NAS for this study.

The NRC committee was asked to provide advice concerning the development of guidelines and a vision for the selection and use of models at EPA. The committee will consider cross-discipline issues related to model use, performance evaluation, peer review, uncertainty, and quality assurance/quality control. The committee's objective will be to provide a report that will serve as a fundamental guide for the selection and use of models in the regulatory process. As part of its work, the committee will need to carefully

consider the realities of EPA's regulatory mission so as to avoid an overly prescriptive and stringent set of guidelines. In particular, the committee will not attempt to define a numerical standard for accuracy that all models must attain.

Dr. Holmes identified a number of questions to be addressed by the committee. What factors should be considered in developing model acceptability and application criteria that address the needs of the EPA and others? How can cross-discipline issues related to peer review, uncertainty, and other factors be addressed? How can users of proprietary models meet acceptability criteria while maintaining the proprietary nature? Are there unique evaluation issues associated with different categories of models? How can uncertainties and limitations of models be communicated effectively? What are the emerging scientific and technologic advances that may affect the selection and use of models?

The chair of the committee is Chris G. Whipple (Environ, Inc.), and the members include: M. Bruce Beck (University of Georgia), Clayton Clark (University of Florida), Robert T. Clemen (Duke University), Judith A. Graham (American Chemistry Council), Louis J. Gross (University of Tennessee), Winston Harrington (Resources for the Future), Philip Howard (Syracuse Research Corporation), Kimberly L. Jones (Howard University), Thomas E. McKone (University of California), Spyros N. Pandis (Carnegie Mellon University), Louise M. Ryan (Harvard School of Public Health), Michael L. Stein (The University of Chicago), and Wendy E. Wagner (University of Texas School of Law).

The committee initiated its activities with a major public workshop attended by staff from EPA offices, regions, and laboratories/centers; and representatives from the regulated communities and other interested parties. The committee organized a second public workshop and continues to hold small-scale meetings with EPA modelers. The committee also communicates frequently with the CREM on current policies, activities, and CREM-sponsored events.

The initial public workshop was held March 18-19, 2004, at the NAS. Its objective was to develop insights into the breadth of environmental regulatory modeling at EPA and the issues associated with these activities. The workshop covered a variety of models including air quality, water quality, groundwater contaminant transport, environmental economic, exposure, chemical screening, and emissions models. A number of overarching issues were addressed at the workshop, including the role of the EPA regional offices; the roles of EPA, state agencies, and consultants in total maximum daily load (TMDL) modeling, as an example; and model scale variability and groundwater contaminant transport modeling. The second public workshop was held December 3, 2004, and its topics included the use of proprietary models, peer review of models, and uncertainty analysis. With regard to proprietary models, the discussion centered on motivations for using proprietary models, the different types of proprietary models, and ways to mitigate issues with these models. On the topic of peer review, the discussions focused on different types of peer review (regulatory, science and trans-science, and iterative/extended), and elements of regulatory peer review (conceptualization, model structure, inputs, corroboration with observations, reproducibility, and transparency). With regard to uncertainty analysis, the workshop discussions covered the methods of uncertainty and sensitivity analysis and the use of uncertainty analysis in decision making.

The committee may hold a third workshop on emerging issues, depending on the availability of funds. The topics addressed at this workshop might include modeling frameworks, new sources of information (e.g., toxicogenomics, geographical information systems, Earth Observing Satellites), and increasing amounts of environmental monitoring and human health data. The committee hopes to continue its small-scale meetings with EPA modelers.

In concluding his presentation, Dr. Holmes provided some final thoughts. He stated that the United States has a long history of computational modeling that precedes the development of digital computers. Modeling has been used in the management of environmental and natural resources for more than a century. In the past, many quantitative modeling fields and approaches have been devoted to improving environmental regulatory applications (e.g., risk analysis, systems analysis, decision analysis, program evaluation, integrated assessment), but the question remains: How does one develop a generalized approach for environmental regulatory modeling that recognizes the consistent elements of the problem while incorporating advances in modeling and decision making?

Dr. Johnson asked Dr. Farland if he had any comments on the NAS study. Dr. Farland replied that Dr. Holmes' presentation provided a good overview of the study and the progress of the committee. Dr. Farland asked Pasky Pascual (ORD/OSP) if he had anything to add to Dr. Holmes' presentation. Mr. Pascual agreed that Dr. Holmes did an excellent job of describing the mission and the progress of the committee. Dr. Farland stated that this is an important issue for EPA because computing capabilities are improving and models are becoming more complicated. The NAS study is designed to assess if the models are providing what we need and if they are resulting in the desired outputs. He noted that there is increased focus on dealing with uncertainty. In the absence of a mathematical approach, the Agency relies on the advice of experts. Dr. Holmes said that, based on comments that were made at the second workshop, the Office of Management and Budget (OMB) considered the use of expert elicitation in the recently issued non-road rule to be more of a demonstration of possibilities as opposed to the approach they would endorse for future rulemakings. Dr. Farland said this continues to be a point of discussion with OMB and that OMB's concern focuses on calculating the value of benefits.

Dr. Henderson asked if the committee is discussing when it is appropriate to use data and when to use a model. Dr. Holmes replied that he could not discuss the committee's deliberations. Dr. Windom stated that everyone uses models, but they are just a tool. There are many different models and each one has its own weaknesses. Many modelers model data, but few are looking in great detail at the models. Some models are stand alone, but others are dependent on input data. Dr. Clegg asked what is being done to ensure that model users are informed about the assumptions used in the models. He added that assumptions tend to be lost over time as model use increases. Dr. Holmes said that the goal would be a "one-stop shop" for models that retains the assumptions with the models. Dr. Clegg asked if the committee could suggest ways to train users about the limitations and assumptions of models. Dr. Johnson suggested that the committee may want to develop a redbook for models. Dr. Clark asked if the committee had compared EPA's models to those used by other agencies such as the National Oceanic and Atmospheric Administration (NOAA) and Federal Aviation Administration (FAA). Dr. Holmes responded that the committee wanted to focus on regulatory models rather than research models; he did not know how EPA's regulatory models compared with research models used by NOAA and FAA.

EDC Program Review Lessons Learned

Dr. Harding said that the EDC Subcommittee was formed by September 2004, and followed the process that was suggested by EPA—premeeting conference calls, receipt and review of program materials, face-to-face meeting, and follow-up conference call. She noted that it is extremely important for the subcommittee members to cover the different areas of expertise required to review the program. It also is important that the members work together as a team to complete their assignments.

Dr. Harding stated that the EPA staff was very helpful. Both Neil Stiber (the Subcommittee DFO) and James Avery (the DFO for the meeting) were great. They knew the FACA rules and timelines for posting call and meeting agendas in the *Federal Register* and they kept the subcommittee focused and on

schedule. She stressed the importance of cooperating with the DFO and responding promptly to his/her requests and questions.

The face-to-face meeting was held in December 2004, at the EPA facility in RTP. There were two conference calls prior to the meeting—one in early November and the other in early December, about 2 weeks before the meeting. During the first conference call, the subcommittee reviewed the charge questions and discussed the format of the report. Dr. Harding worked with the DFO to prepare the agenda for the call. The subcommittee members asked questions about the charge and discussed whether any of the questions should be revised or expanded. She pointed out that the format of the report became an immediate concern during the first call. Because there was no previous BOSC program review upon which to base the report format, Dr. Harding suggested using the format used by the National Health and Environmental Effects Research Laboratory (NHEERL) in its Division review reports. The subcommittee members also were provided some background information on the program, the research strategy, and the MYP prior to the first call. Also during the first call, the members discussed their areas of expertise and Dr. Harding asked them to identify the questions most suited to their interests and expertise. She then made writing assignments and the members discussed how to implement the writing responsibilities. The subcommittee members decided the best approach was to focus the review on the three long-term goals (LTGs) in the MYP so the subcommittee was divided into three teams. Each team was assigned one LTG and was responsible for addressing the charge questions for that LTG. The overarching issues of leadership and resources were each assigned to a subcommittee member. Dr. Harding reported that this approach worked well for the EDC Subcommittee, but the approach taken by other subcommittees may have to be different to accommodate their programs.

The focus of the December conference call was the status of the writing assignments. Additional information was distributed in early December, so there was little progress on the writing assignments prior to the meeting. For subsequent reviews, the materials should be distributed 3 to 4 weeks before the meeting to allow the members adequate time to prepare drafts prior to the meeting.

The face-to-face meeting was held in December and the final conference call was held in January 2005. This final conference call focused on review of the drafts prepared by the teams, the identification of gaps, and areas that still needed to be addressed. Dr. Stewart stated that the teams had prepared preliminary drafts by the end of the meeting, but these drafts were expanded by the teams following the meeting. Dr. Harding said that a huge amount of materials was sent to the subcommittee members; however, the materials were well organized in a tabbed notebook, which made it easier for the subcommittee members to review. The materials were distributed 2 weeks before the meeting. It would have been better to have received the materials a week or so earlier, but it is more important that the materials be organized in a manner that facilitates review by the subcommittee.

Dr. Johnson asked if there were other materials requested by the members after they began the review or were additional materials suggested by the NPD. Dr. Harding replied that the subcommittee members asked to receive some of the references cited in the materials. Dr. Stewart pointed out that because the NPD participated in the conference calls, Dr. Francis had a good idea what the members needed for the review and did an excellent job of supplying the materials. All of the members were overwhelmed with the volume of material, but as they began writing, they realized it was just what they needed to complete their writing assignments.

Dr. Clark asked why little writing was done prior to the meeting and Dr. Harding responded that the 2 week timeframe made it difficult for the subcommittee members to prepare their drafts. Dr. Sayler asked if the drafts were refined using e-mail. Dr. Harding confirmed that the teams had used e-mail to refine their drafts; she cautioned, however, that drafts were not distributed to the entire subcommittee for

refinement because this would have required a public forum. That is the advantage of dividing the subcommittee into teams or work groups. The membership of each team has to be less than half of the members of the subcommittee. Dr. Johnson said that an alternative approach would be to send comments to the chair, who then would incorporate them into the draft report. Ms. Kowalski noted that the subcommittees do not have to use all the materials distributed by EPA for the reviews. She reminded the members that EPA does not direct the subcommittee's review; the members decide what they want to use for the review. Referring to Dr. Johnson's alternative approach, Dr. Clegg asked if someone other than the chair could receive the comments. Ms. Kowalski replied that the comments could be sent to another individual designated by the subcommittee. She noted that the subcommittee cannot discuss the technical or substantive aspects of the report outside of a public forum; however, administrative activities can be discussed by the entire subcommittee without the public present.

Dr. Henderson asked how to balance the time devoted to getting input from EPA at the meeting and the time devoted to drafting the report. Dr. Harding replied that it is important to have EPA present an overview of the program. The EPA presentations on the three LTGs solidified the information distributed before the meeting, and helped the subcommittee members synthesize the information and focus on progress and relevance. The presentations were very good and the subcommittee members were provided copies of the slides. One hour was allotted to each presentation—about 40 minutes for the presentation and 20 minutes for questions and answers. Dr. Harding said that a total of 1 hour was appropriate for each presentation. Following the presentations, there were poster sessions. The posters were prepared by both intramural and extramural investigators and copies of the posters were provided to the members. Ms. Kowalski mentioned that abstracts of the posters were distributed to the members prior to the meeting. The poster sessions were very helpful. They allowed the subcommittee members to interact one-on-one with the investigators and to ask specific questions. In response to a question about covering all the posters, Dr. Harding said that members were assigned specific posters so that at least one member would have viewed every poster. The posters were organized by LTGs so the members selected those corresponding to their expertise. Dr. Harding stated that there were approximately 15 to 20 posters per LTG; one LTG had 25 posters. Each poster session was about 90 to 120 minutes so it was important to make poster assignments. She noted that the members decided to add more time to the poster sessions after they arrived at the meeting. Dr. Harding said that the subcommittee reconvened after each poster session for an hour discussion of the posters. She noted that this should have been reduced to 30 minutes.

Dr. Harding said that she would not recommend scheduling writing time on the first day of the meeting. It is more efficient to have the presentations on the first day. At the conclusion of the meeting, the subcommittee provided EPA an oral report of the review. Dr. Johnson said that an oral debriefing is appropriate; no written comments should be provided to EPA at that time. Dr. Harding said that each team drafted some notes for the oral debriefing and the entire subcommittee reviewed the notes to ensure that all were comfortable with what was to be reported on behalf of the subcommittee. Dr. Johnson advised the subcommittees to share only comments on which the subcommittee members are in agreement. He asked the members to be conservative with regard to these oral reports. In response to a question concerning the time allotted for the oral report, Dr. Harding said that it took about an hour to present the oral report. Dr. Johnson asked the subcommittees to prepare notes for the oral presentations so that the comments are restricted to those on which the subcommittee members have agreed.

Dr. Stewart indicated that there was little information on resources provided to the subcommittee and it was difficult to coax that information from EPA staff during the meeting. She advised the other subcommittees to be prepared to ask specific questions about resources at the meeting. Dr. Farland said that EPA can and should provide information about program resources to the subcommittee; however, he noted that it is difficult for EPA staff to respond to a question about whether they have enough resources to do the work because EPA staff must agree with the President's budget. Dr. Stewart said that she could

not get information regarding how the program's resources were distributed across the laboratories and centers. Dr. Lambert pointed out that how the priorities are established may be more informative than the actual budget numbers. Dr. Johnson pointed out that there are assumptions about the budget in the strategic plans and MYPs. Perhaps the subcommittees should focus their resource review on the relative distribution of the programs' resources. Dr. Farland suggested that the subcommittees look at the research program in light of the resources available. Is EPA making good use of the resources it allocates to this program? Is the Agency careful not to duplicate the efforts of other agencies/organizations? Does EPA leverage resources for the program? Dr. Henderson asked how the subcommittees obtain information on the activities of other agencies. Dr. Johnson replied that the subcommittee should request that information from the DFO.

With regard to the report format, Dr. Harding said that the NHEERL report upon which the EDC program review report was based had some redundancy. Nevertheless, it worked well for the EDC Subcommittee. She suggested that the subcommittee chairs send a sample format to the members very early in the process so that it can be discussed and a format can be selected. She mentioned that the subcommittee members also had discussed the use of self assessment, similar to that used by the BOSC for the laboratory and center reviews. Dr. Harding thought a self assessment may have been helpful, but Dr. Johnson did not believe that review of a self assessment would meet the requirements for a program review. Dr. Harding said the chair has to be prepared to set reasonable deadlines, send out reminders of deadlines to the members, and pull all the pieces of the report together after the sections are drafted. Dr. Lambert noted that the report indicates that the subcommittee did not receive adequate information in certain areas. Were there opportunities to request more information from EPA? Dr. Harding said that the subcommittee members did not request additional information after the meeting and very little was presented on certain issues at the meeting; however, she acknowledged that more information could have been requested by the subcommittee.

Human Health Subcommittee Update

Dr. Johnson introduced Dr. James Klaunig (Indiana University School of Medicine), who joined the meeting via telephone, as the Chair of the Human Health Subcommittee. Dr. Klaunig's areas of expertise include chemical carcinogenesis and hepatic toxicity, and he teaches both graduate and undergraduate students. He has provided toxicological expertise for the State of Indiana, served as a member of EPA's SAB and the National Toxicology Program's Board of Scientific Advisors, chaired the review of the ORD carcinogenesis program, and served as the treasurer of the Society of Toxicology.

Dr. Clark, Vice-Chair of the Human Health Subcommittee, stated that the DFO for the subcommittee, Virginia Houk, has done an excellent job of keeping the review on track. The subcommittee will have nine members when they are approved on February 11. A number of the members have served on the SAB or its subcommittees in the past. Dr. Clark said that his role will be to ensure that the subcommittee focuses on the issues of importance to the BOSC. The first conference call has been scheduled for February 15, and the second for February 24. The face-to-face meeting will be held February 28-March 2, 2005, in RTP, North Carolina. Dr. Clark said that he will be working with the DFO to develop the agendas for the calls and the meeting—these must be completed by February 1. Dr. Johnson thanked Dr. Klaunig for accepting the leadership role for the human health program review.

Dr. Clark had some questions about the poster session so Dr. Farland agreed to distribute copies of the poster booklet that was prepared for the EDC Subcommittee meeting. Dr. Farland explained that the posters are not in the traditional format. Through the posters, ORD is trying to identify where this research fits within the Agency's mission, who else is doing this type of work, and the significance of the work in terms of outcomes. Dr. Harding commented that each poster was linked to an LTG. Dr. Johnson

suggested that the subcommittees request a similar format for the future poster sessions. Ms. Kowalski stressed the importance of presenting a summary of the poster session discussions for all participants following the poster session so that the exchanges can be captured in the meeting summary in compliance with FACA requirements. The summary of the poster session does not have to be detailed but the highlights should be captured as part of the official record. Dr. Harding said that the members were responsible for describing the exchanges for the posters they had been assigned to review.

Global Change Subcommittee Update

Dr. Duke, Vice-Chair of the Global Change Subcommittee, reported that with Dr. Dorward-King's departure from the BOSC, this subcommittee is seeking a chair, preferably an individual with expertise in climate science. Janet Gamble, the DFO for this subcommittee, has been working to identify a chair and there is an interested candidate. Five individuals have agreed to serve on the subcommittee and the face-to-face meeting probably will be held in May or June 2005. Dr. Johnson stated that, like the Human Health Subcommittee, the chair of the Global Change Subcommittee, will not be a member of the BOSC.

Particulate Matter (PM) Subcommittee Update

Dr. Henderson said that she has been working with Lawrence Martin, the DFO for the PM Subcommittee, to form the subcommittee. Dr. Henderson is the chair of the subcommittee and Dr. Stewart also serves on the PM Subcommittee. The other members should be approved soon. Two conference calls will be held in March, and the face-to-face meeting will be held March 30-31, 2005, in RTP. An extra day may be added to the meeting to allow for a tour of the facility and more writing time for the report. Dr. Henderson has been discussing the format of the report with Mr. Martin, and she noted that Dr. Harding's comments on the lessons learned have been very helpful. Dr. Henderson liked the approach of focusing the report on the LTGs, but there are only two LTGs in the PM MYP. FACA requirements may make it difficult to have only two work groups, so another approach may be required.

Drinking Water Subcommittee Update

Dr. Sayler, Chair of the Drinking Water Subcommittee, reported that the subcommittee will have seven members but five members have not been approved yet. Dr. Johnson has agreed to serve as the co-chair of the subcommittee. The face-to-face meeting probably will be held in Cincinnati, Ohio, in late March 2005, so the first conference call will be held in early March. Drs. Sayler and Johnson have begun to review the charge questions and the materials compiled by EPA. Dr. Sayler hopes to complete the subcommittee report by April 2005.

Ecological Subcommittee Update

Dr. Clegg, Chair of the Ecological Subcommittee, reported that two additional members of the BOSC are serving on this subcommittee—Drs. Giesy and Windom. Five additional members have been identified, one has been approved and the other four have yet to be approved. Dr. Clegg said that he hopes to complete the report by April 2005, before the Performance Assessment Rating Tool (PART) review of the Ecological Research Program. The remaining subcommittee members should be approved by February 14, and an administrative conference call to discuss the review process has been scheduled for February 2, 2005. The first public conference call will be held on February 17, and the second call on March 3. The face-to-face meeting will be held March 7-9, 2005, in RTP. Dr. Clegg hopes to develop the first draft of the report at the meeting; the third day of the meeting will be devoted to writing time so that a draft can be completed by the close of the meeting. For the subcommittee's report to be used in the PART review, the report will have to be reviewed and approved by the BOSC before the next Executive Committee

meeting. This can be accomplished by conference call, but a notice of the call must be posted in the *Federal Register* at the required time. Dr. Clegg is working with the DFO for the subcommittee, Greg Susanke, to determine what materials should be distributed to the subcommittee members prior to the meeting.

Dr. Clark asked if the human health program was scheduled for a PART review, and Dr. Farland replied that four of the programs being reviewed by the BOSC are scheduled for PART reviews. Therefore, it may be necessary for the BOSC to review several of the subcommittee reports via teleconference. Dr. Sayler indicated that the PART review for the drinking water program is schedule for April 30, 2005. Dr. Farland said that EPA will submit materials to OMB for the drinking water review on April 30, but additional materials probably can be submitted through May 31. EPA will be responsible for determining the timing of the submissions for the PART reviews.

Table of BOSC Projects

During the afternoon break, Dr. Johnson distributed the updated table of the BOSC's projects (see Table 1). He reviewed the status column and stated that there may be three subcommittee reports to review before the next BOSC meeting.

Dr. Clark asked about the Environmental Monitoring and Assessment Program (EMAP), which was the subject of a presentation at the September BOSC meeting. Should EMAP be covered in the Coastal Condition letter report? Dr. Johnson replied that the Ecological Research Subcommittee will include EMAP in its review. Dr. Johnson reminded the BOSC of Mr. Oppelt's suggestion that the BOSC review the Management MYP. Should we request a briefing from EPA on this MYP at the next BOSC meeting? Dr. Farland agreed to distribute copies of the Management MYP to the BOSC members prior to the next meeting. Dr. Johnson said that he would prefer to receive the report approximately 2 weeks before the meeting. Dr. Farland said that he will provide the URL for the report as soon as possible and distribute hardcopies of the report 2 weeks before the next meeting. Dr. Johnson asked the members to give some thought to other items and issues that should be included on the agenda for the next BOSC meeting. Dr. Sayler suggested a briefing on international activities that might impact ORD activities. Dr. Farland responded that ORD is involved in many international activities. He asked if the BOSC would like a briefing from the Office of International Activities. Dr. Sayler said that the specific areas of interest include pollution prevention, sustainability, global change, biotechnology, and nanotechnology.

Dr. Farland suggested that the BOSC consider the addition of a foreign scientist to the Board. Dr. Clegg may be able to assist in identifying potential candidates, given his position as Foreign Secretary for NAS. A European or Mexican scientist might be beneficial to the Board. Dr. Clegg asked if there would be any problems appointing a foreign scientist as a Special Government Employee (SGE). Ms. Kowalski said that no individual who receives compensation from a foreign government could be appointed as an SGE. Dr. Lambert pointed out that the BOSC could invite someone from a foreign government to come to make a presentation to the Board. Dr. Farland did not think that would be a problem; however, compensating the individual may be an issue. He noted that China's use of coal is rapidly increasing. If the PM standards in the Clean Air Act are implemented, the majority of the PM emitted would come from Asia and not the United States within the next 10 years. Dr. Harding mentioned that there are several areas of expertise needed on the Board; the minutes or previous meetings provide the specifics. She suggested that the required areas of expertise be added to the table of BOSC projects under the Nomination Subcommittee.

Dr. Clegg thought it would be a good idea to include one or two foreign scientists on the BOSC. He has been working to encourage other countries to adopt rational, science-based approaches that have worked

Table 1. FY 2004-2005 Projects of the EPA Board of Scientific Counselors

Subcommittee/ Work Group	Project Title	Types of Advice	Status	Project Completion Date
Mercury MYP Subcommittee Chair: H. Windom DFO: H. Drumm	Mercury MYP Review	Letter Report	Subcommittee formed. First conference call held January 19; face-to-face meeting scheduled for February 23-24, 2005, in Washington, DC; final conference call scheduled for March 29, 2005. Anticipate Executive Committee review of report in May.	May 2005
Computational Toxicology Subcommittee Chair: G. Daston DFO: L. Kowalski	Computational Toxicology Research Program Review	Review	Subcommittee formed. Anticipate site visit to RTP, NC, in mid- to late-April 2005. Considering letter report to provide ORD feedback on creating the Computational Toxicology Research Center.	Continuous
Endocrine Disrupting Chemicals (EDC) Subcommittee Chair: A. Harding DFO: N. Stiber	EDC Research Program Review	Program Review	Subcommittee formed. Conference calls held November 2 and December 1, 2004, and January 6, 2005; face-to-face meeting held December 13-15, 2004 in RTP, NC. Draft report submitted for Executive Committee review at January BOSC meeting.	January 2005
Global Change (GC) Subcommittee Vice Chair: C. Duke DFO: J. Gamble	GC Research Program Review	Program Review	Subcommittee almost formed (still need to identify a chair). Anticipate conference calls in April/May, a face-to-face meeting will be held in May/June 2005, and Executive Committee review of report at September meeting.	September 2005

Table 1. FY 2004-2005 Projects of the EPA Board of Scientific Counselors (Continued)

Subcommittee/ Work Group	Project Title	Types of Advice	Status	Project Completion Date
Risk Assessment Work Group Chair: R. Henderson DFO: L. Kowalski	Risk Assessment Workshop	Workshop and Proceedings	Workshop to be held February 2-3, 2005 in Washington, DC. Anticipate Executive Committee review of proceedings at June 2005 meeting.	June 2005
Biotechnology Subcommittee	Biotechnology Research Program Review	Letter Report	Completed	September 2004
Coastal Health Work Group Chair: J. Clark DFO: L. Kowalski	National Coastal Condition Report Review	Letter Report	Work group formed and draft position paper submitted for Executive Committee review at January 2005 meeting.	January 2005
Homeland Security Subcommittee	National Homeland Security Research Center (NHSRC) Review	Undetermined	Project was placed on hold pending EPA decision to continue the NHSRC. BOSC was briefed on NHSRC activities at January 2005 meeting.	Continuous
Ecological Research Subcommittee Chair: M. Clegg DFO: G. Susanke	Ecological Research Program Review	Program Review	Subcommittee almost formed (DA letters of invitation to subcommittee members sent out January 19). Anticipate conference calls on February 17 and March 3; a face-to-face meeting will be held March 7-9, 2005, in RTP, NC; and Executive Committee review of draft report expected in May 2005.	May 2005

Table 1. FY 2004-2005 Projects of the EPA Board of Scientific Counselors (Continued)

Subcommittee/ Work Group	Project Title	Types of Advice	Status	Project Completion Date
Human Health Subcommittee Chair: J. Klaunig DFO: V. Houk	Human Health Research Program Review	Program Review	Subcommittee almost formed (DA letters of invitation to subcommittee members sent out January 19). Anticipate conference calls on February 15 and 24; a face-to-face meeting will be held February 28-March 2, 2005, in RTP, NC; and Executive Committee review of draft report is expected in May 2005.	May 2005
Drinking Water Subcommittee Chair: G. Sayler DFO: E. Coates	Drinking Water Research Program Review	Program Review	Subcommittee Chair identified and subcommittee is being formed. Anticipate 1-2 conference calls in March; face-to-face meeting will be held March 29-31, 2005, in Cincinnati, OH; and Executive Committee review of draft report is expected in May 2005.	May 2005
Particulate Matter Subcommittee Chair: R. Henderson DFO: L. Martin	Particulate Matter Research Program Review	Program Review	Subcommittee almost formed (nomination package delivered to Administrator's office for signature on January 14). Anticipate 1-2 conference calls in March; a face-to-face meeting will be held March 30-31, 2005, in RTP, NC; and Executive Committee review of draft report is expected in May 2005.	May 2005
Nomination Subcommittee Chair: J. Johnson Vice-Chair: J. Giesy	Nomination of BOSC Candidates	List of Candidates	List of air pollution/atmospheric sciences candidates being compiled and list will be presented to BOSC for consideration at January meeting. Two new members should be appointed by May 2005 meeting and third vacancy filled by September 2005 meeting.	Continuous

well in the United States. Involvement of other countries in the BOSC could reinforce this message. Dr. Johnson agreed that it would be beneficial to EPA to include a foreign scientist on the BOSC. It is important for the Board members and EPA to hear other perspectives. International input could be linked to items already on the BOSC's radar screen, namely pollution prevention, nanotechnology, and global change. Dr. Windom suggested adding mercury to that list. Dr. Johnson responded that he did not add it because the mercury report will be completed by the time this input could be obtained. Dr. Lambert suggested a session on international issues. He noted that the university representatives may be able to assist foreign scientists with travel expenses. Dr. Johnson said that it may not be feasible to do this at the May meeting; it may be better to include an international issues session at the September meeting. Dr. Farland suggested that the BOSC could sponsor a workshop. International scientists could be brought to the meeting to present different perspectives on the issues of interest to the BOSC. Dr. Johnson asked Drs. Lambert, Clegg, and Duke to develop a concept for a BOSC workshop on international issues. Dr. Windom stated that the United Nations roster through the World Bank (Global Environmental Fund) may be a good source for identifying potential speakers. Dr. Lambert agreed to chair the work group to develop the workshop concept. Dr. Farland mentioned two upcoming activities that may be of interest to the Board. The first was a United Nations Environmental Programme (UNEP) meeting on mercury in mid-February. There may be some speakers at that meeting who would be appropriate for a BOSC workshop. The second activity is EPA's international meeting on sustainability, which will be held March 18-19, 2005. This meeting will include a number of international participants who may be able to help identify potential speakers for the workshop.

Dr. Johnson asked the members to check their calendars for possible dates for the September meeting.

BOSC Communications Report

Dr. Donna Roa, ORD's Public Affairs and Science Communication Director, said that she joined the Agency on July 12, 2004, not long before the BOSC's communications report was submitted to the Agency in September 2004.

Dr. Roa said that both Michael Brown and Paul Gilman had done a great deal to sensitize ORD to the importance of communications. She conducted more than 200 staff interviews to collect information about ORD's communications. She evaluated the ORD Strategic Plan and business goals to guide the development of a strategy that helps achieve them.

Dr. Roa's evaluation covered the processes, systems, structures, products, audiences, and organizational culture. She identified achievements, opportunities, needs, and issues. In addition, management and staff ideas on how an Office of Science Communication (OSC) could add value were identified. Dr. Roa used the research to help define ORD's relationship with EPA's Office of Public Affairs (OPA).

Dr. Roa discussed preliminary findings of her research with senior communicators and then presented a strategy to the ORD Tri-Council (managers, executives, and scientists). She conducted a prioritization exercise on eight project focus areas and administered an initial brand questionnaire. Dr. Roa also evaluated and prioritized the BOSC's recommendations for ORD communications.

With regard to ORD Science Communication, the plans were to: (1) hire a science communication director, (2) finalize the proposed reorganization in RTP, (3) develop a multi-year strategic plan for communication, (4) present research findings and the proposed strategic plan to management, (5) obtain a budget and prioritize activities, (6) finalize the reorganization and establish the OSC, (7) initiate/ consolidate business planning, and (8) complete staffing and begin strategy implementation. As part of

her efforts, Dr. Roa examined the titles and levels of the communication positions as part of an effort to improve consistency across ORD.

Existing communication services (e.g., Web sites, fact sheets, research publications) were identified along with expected services (e.g., Web-based newsroom, science writer's circle, communication inputs at the beginning of research project lifecycle) and differentiating products/services (e.g., radio, focused public affairs campaign, communication strategies for MYPs, improving EPA's image).

The issues identified during her research included internal communication and information management, writing capability/service, getting the science out in new/different channels, and knowing and delivering what is needed by program offices. Dr. Roa found that there is a lack of visual identity and face for ORD (i.e., ORD has "too many faces"). The platform for the Web-based newsroom allows the Agency to track how quickly users open the press releases after they are sent. This capability will help ORD to establish metrics across the news organization.

Dr. Roa mentioned that EPA plans to examine the news releases of the National Aeronautics and Space Administration (NASA) because NASA ranks in the top 5 of 100 government workplaces. What is NASA doing right? Dr. Roa noted that NASA is conducting a series of internal workshops on trust. EPA also plans to review Federal Express to learn more about that company's best communication practices. There are plans to review two government agencies and two companies by the end of the year. Dr. Johnson commented that it may not be appropriate for EPA to model NASA's trust effort because NASA's motivation for doing these workshops may be very different from EPA's reasons for building trust. Dr. Roa agreed, but said that EPA does have a trust problem and could learn something from NASA's approach.

The science writer's circle will review ORD's 40,000 Web pages to identify possible stories. The science writers will develop the "slant" for the story emphasizing the importance of the science for the economy and growth. The writers will develop the same story, but change it slightly for different venues (e.g., newspaper, Parade Magazine).

Dr. Roa said the writers must be careful not to focus on "hot" or politically sensitive topics. They will work with OPA to ensure that such topics are avoided. The writers also will target venues to reach young people. Ideas for science articles are submitted every day; the current focus includes successes, new developments, STAR grantees, and best practices. Dr. Roa stated that the media is beginning to look to EPA for these types of stories. She noted that EPA will be doing a 90-second spot on nanotechnology on the Earth and Sky Radio Network. The communications staff are working to increase media interest in EPA's stories.

The overall goal of ORD Science Communication is to align communication structure, operations, and activities to show results and to serve employees, internal and external clients, and the general public. OSC's vision is to leverage ORD research results to reinforce EPA's reputation for sound science and its position as a public health and environmental protection agency. Its mission is to get the word out and position ORD as a leader in the environmental and science communities. The group seeks to meet the following objectives: (1) create outputs that support ORD's strategic goals, (2) ensure that ORD's research and results are communicated widely, (3) create a customer-first culture, and (4) support the EPA research and development brand.

By September 2007, the team will initiate improvements in ORD's internal and external science communication processes and create activities to increase awareness and visibility of ORD research among clients and stakeholders and to reinforce EPA's reputation for sound science. Thirteen project

performance measures have been developed for the 3-year strategy. In addition to the project performance indicators, the team is developing seven additional key indicators covering either impact, effect, or effectiveness to track over the life of the 3-year strategy.

The communication priorities include external communication, internal communication, ORD Web communication, communication research, ORD visual identity, "Science for You" campaign, media relations, and project communication. Dr. Roa noted that external communication was the highest priority among managers and internal communication was the highest priority among staff.

In the recent past, the ORD intranet has been improved to facilitate internal communications and there has been a significant increase in story inputs. Greater emphasis will be placed on the ORD intranet for use as an internal communication tool. There are plans in place to position ORD's internal and extermal Web sites as key communication tools, to incorporate user needs and preferences, to attract more and targeted traffic, to improve visitor engagement, and to facilitate two-way communication. This effort already has had some early successes—when the News from the AA Web Site was redesigned to be more appealing, the number of hits increased by 40 percent in 8 weeks.

The communications staff also is working to enhance the buy-in of managers and scientists throughout ORD and to provide tools that can help them to do their work. Dr. Roa stated that ORD plans to launch a new Web-based tool that will help scientists prepare fact sheets.

Dr. Johnson asked if there would be a specific response to the BOSC's communications report. Dr. Roa replied that ORD is preparing a response to the report. Each of the laboratories, centers, and offices has provided an update on the BOSC recommendations. Those responses have been summarized and will be provided to the BOSC.

She noted the importance of making the case for effective communications across EPA. Communication of research is necessary to drive decisions, both within the Agency and among the congressional oversight committees. ORD needs to explore further its target audiences and determine how its products are being used and what additional products are needed.

Dr. Roa stated there is a need to build skills in communication across ORD and strengthen the writing capacity. The communications staff will be working with managers on developing messages designed to change behavior and identifying research areas that deserve more visibility. If these messages are effective, the science information will bring about desired outcomes.

Dr. Henderson asked if the staff had begun focusing on the challenges of communicating risk. Dr. Roa replied that the technology transfer group in Cincinnati has been working on risk communication. There are plans to do more in this area on an Agency-wide basis but this will take time. Dr. Farland added that the Agency has initiated risk communication training and there is a Fellow doing work on risk communication.

Dr. Roa said that there are many facets to communication and many specialties within the field. Project communication is one of those specialties and it requires understanding what it would take to get the message to the target audience. Dr. Farland mentioned that Dr. Roa will be helping ORD get the message out to engineers, consumers, investors, politicians, and others about the successful arsenic treatment technologies for small systems that were tested by EPA.

Dr. Harding asked about ORD's efforts to engage Hill staffers to ensure they are receiving good scientific information. How does ORD affect decisions regarding the President's budget? Dr. Roa responded that

communication programs affect the bottom line, but to affect ORD's budget, the communication has to be couched in terms of what ORD has done to protect human health and the environment. She stated that many staffers on Capitol Hill do not know that EPA has laboratories and conducts research.

Dr. Johnson thanked Dr. Roa for her presentation and before adjourning the meeting for the day, he reminded the members of their homework assignments—review the Coastal Condition report, review ORD's response to the BOSC's biotechnology research letter report, and determine availability in May, June, and September to schedule the next two BOSC meetings.

Friday, January 28, 2005

Dr. Johnson reconvened the meeting at 8:30 a.m., and reviewed the day's agenda, reminding the BOSC members that several items were added to the agenda, including comments on the Coastal Condition letter report, review of ORD's response to the BOSC's biotechnology research letter report, and a report from Dr. Sayler concerning the nanotechnology workshop he attended.

BOSC Issues

Dr. Farland thanked the BOSC members for their excellent work. He realizes that the members will be very busy during the next several months and ORD is grateful for the time and energy expended by the members. He noted that ORD looks at the BOSC as a partnership and is trying to promote a good working relationship with the Board members. It will be very beneficial to have continuous advice from the BOSC as the new Computational Toxicology Center develops. Since the last BOSC meeting, Michael Leavitt, the EPA Administrator, was confirmed as the new Secretary of the Department of Health and Human Services (DHHS). When announcing his departure to EPA staff, Mr. Leavitt said he informed the President that the science he worked on at EPA was going to help him in assuming his responsibilities at DHHS. Dr. Farland plans to work with Mr. Leavitt to strengthen the relationship between EPA and DHHS, particularly with regard to the Children's Health Study, public health tracking and environmental monitoring with the Centers for Disease Control and Prevention (CDC), and collaborative activities with the National Institute of Environmental Health Sciences (NIEHS) and National Toxicology Program.

Dr. Farland reported the Dr. Gilman would have liked to personally thank the BOSC members for their work on behalf of ORD before his departure, but he did not want to announce his resignation until after the election. Dr. Gilman now is working on energy and environmental science for a consortium of universities at the Oak Ridge National Laboratory in Knoxville, Tennessee. Dr. Farland mentioned that Henry Longest, the ORD Deputy Assistant Administrator for Management, retired in January. These departures leave two top management positions open in ORD, but provide an opportunity for ORD to bring in some new managers

Dr. Farland expressed his commitment to be more responsive to the BOSC's reports. He mentioned the response to the biotechnology letter report and stated that the response to the communication report is forthcoming.

The President's 2006 budget will not be released until February 7, 2005, but it appears that EPA's R&D budget will be reduced. ORD is striving to maintain its internal workforce, its extramural workforce, and the infrastructure that supports its workforce. If such budget cuts continue, ORD will no longer be able to absorb the reductions in the extramural research program. Last year, the extramural grants budget was reduced by 35 percent (from $100 million to $65 million). ORD does not want to see this trend continue, but some difficult funding decisions will have to be made. This also means that ORD must examine how it conducts its research and the organization of its programs. That is why the program reviews being

conducted by the BOSC are so important. Dr. Duke asked if the subcommittees should emphasize the budget in their reviews. Dr. Farland responded that the subcommittees should determine whether EPA is positioned well given the resources available. He mentioned that the MYPs identify activities on which additional resources could be spent should the budget increase. It is more difficult, however, to determine where to cut when the budget declines. Dr. Windom suggested that EPA look for more opportunities to leverage its resources with the states. Dr. Farland responded that the nature of ORD's programs requires such leveraging activities. He stated that the SAB will review the 2006 science budget February 17-18, 2005, and the Chair of the SAB will testify about the budget. Dr. Farland mentioned that those meetings are open to the public and members of the BOSC are welcome to attend. Dr. Johnson agreed to distribute information on the meeting to the members. He asked if it would be possible for the BOSC and SAB to work on developing a better model for EPA to assist the Agency in doing more for less. Dr. Farland hopes that the new NPDs will help with that type of decision making. They will be looking at the science programs and not be concerned with managing the laboratories.

The annual EPA Science Forum will be held May 16-18, and its focus will be collaborations and partnerships. The Forum will be followed by the international meeting on sustainability. Dr. Farland mentioned the P3 awards developed by the National Academy of Engineering. The 61 finalists will be displaying their approaches May 16-17, 2005, on the National Mall. Six of these finalists will be selected to receive grants to continue to develop their technologies.

Dr. Farland referred to the NAS review of the perchlorate report. NAS recommended a reference dose that was different from that proposed by EPA, but the Agency has decided to accept NAS' recommendation and move forward with it. He noted that NAS used a clinician's view of the data, which may be appropriate for setting public health goals. Dr. Farland wanted to make it clear that NAS' recommendation was not a condemnation of the quality of EPA's science. He distributed copies of an article entitled "What is Sound Science?", a series of four editorials published in *The Environmental Forum*. Dr. Farland was one of the four authors of the article. Dr. Harding asked how the authors were selected, and Dr. Farland responded that the authors were selected to provide a range of opinions.

In his closing remarks, Dr. Farland thanked Dr. Harding and the members of the EDC Subcommittee for their outstanding efforts to complete the first program review. They have set a high standard to be met by the other subcommittees. He stated that ORD will work to communicate the results of the review and get the message out about the program.

Dr. Clark asked why so many ORD positions have not been filled permanently. Dr. Farland replied that five of the eight NPD positions will be filled with permanent positions and three will be acting for a period of 1 year. ORD will be recruiting to permanently fill these three positions in 2005. Perhaps the BOSC can provide advice regarding these three positions. ORD will begin the process in February and keep the search open until June 2005. Advertisements will be placed in journals and in publications of professional societies. The BOSC members should identify potential candidates. The three NPDs to be recruited are those for human health, ecology, and drinking water. Dr. Windom asked if the morale of the ORD staff is suffering because of the delays in filling positions. Dr. Farland commented that it has an effect on morale, but some progress was made in filling vacancies at the laboratories and centers. Dr. Harding asked if those acting in the NPD positions are serious candidates for the permanent positions. Dr. Farland replied that these individuals were chosen because they were capable of moving the programs forward, and they are eligible to apply for the positions.

Dr. Duke asked what EPA is doing to refute allegations that the Agency's science regarding perchlorate is bad. Dr. Farland said this is a difficult situation. If EPA states that NAS is incorrect, then it challenges the opinions of the NAS reviewers, which could work against EPA. There are many individuals within

EPA trying to figure out how best to respond to this situation. EPA has had very positive interactions with NAS and it is one of the best places for the Agency to go to seek this type of advice. He acknowledged that some NAS reports are better than others and EPA's proposed standard for perchlorate had withstood two external peer reviews. He noted that there is a great deal of uncertainty with regard to establishing a reference dose. Dr. Lambert served on the NAS committee that conducted the perchlorate review. He reported that the committee decided to go with the human data and ignore the animal studies, even though the human data are limited. He added that the committee included some well-respected clinicians who did not believe the risk was significant. He added that one committee member was removed because of an undisclosed conflict of interest.

Dr. Duke expressed his support for the P3 program, stating that he had served on the review panel. He was very encouraged at the quality of the applications and he asked the BOSC members to mentor their students to apply to the program. Dr. Farland agreed to distribute materials on the 61 finalists to the BOSC.

Comments on the National Coastal Condition Report (NCCR)

Dr. Clark agreed to add more information about the constraints of Section 305(b) of the Clean Water Act. He also will rephrase the recommendations to focus on improving the next NCCR. The BOSC's letter report will be formatted and subjected to an editorial review before it is finalized and submitted to ORD.

Dr. Sayler asked about the example included in the seventh line of the paragraph under the section entitled Report as a Communication Tool. Is it the responsibility of the Agency to identify and prioritize research needs to improve poor conditions and prevent good conditions from deteriorating? Dr. Clark replied that the work group would like future NCCRs to include such information. The 305(b) reports provide information on the conditions and the impact of ameliorating those conditions as well as the progress being made. The 305(b) reports are data sources.

Dr. Johnson referred to an apparent discrepancy in the draft position paper prepared by the work group. The seventh line on page 4 states that ORD understands its audience and their expectations; in the last paragraph on page 1; however, the paper indicates that there is some question about the intended audience. Dr. Clark responded that in the case mentioned on page 4, ORD understood its audience. Dr. Johnson asked that the statement on page 4 be clarified so that it does not appear to be contradictory to the statement on page 1. Dr. Sayler asked about the comment on page 3 (last paragraph, line 5), which recommends including references to sources of information on actions that could change the trends or improve the condition of coastal areas. Does this go beyond what is expected of EPA in the NCCR? Dr. Clark replied that the NCCR would be much more useful if such references were included. Dr. Sayler asked if there were monitoring needs that are not being met or if there is anything missing from the NCCR. Dr. Clark responded that the network of stakeholders that helped design the program was appropriate, so he did not think anything was missing from the NCCR. Dr. Duke noted that the NCCR identifies some additional needs and acknowledges that there are gaps. Dr. Sayler asked if there were new variables or parameters coming forward, and if there should be some mention of this in the BOSC's letter report. Dr. Clark agreed to add something about this in the section on quality. Dr. Johnson suggested moving the last paragraph on the first page to the communication section.

Dr. Farland informed the BOSC that the NCCR is a joint report of ORD and the Office of Water (OW). He noted that from page 3 through the end of the position paper, it refers only to ORD. He asked the work group to take a look at these references. There also is an issue about how data from EMAP have been used. The application of EMAP tools by the states is improving the data and these tools offer states the

advantage of getting better data for less money. If the work group members agree, it might be helpful if the letter report includes such a statement.

Drs. Clark and Harding will be responsible for vetting the letter report. Dr. Clark will prepare the letter report in response to the BOSC's comments and send it to Drs. Johnson and Harding, as well as Ms. Kowalski. The Board members agreed to approve the letter report subject to final vetting.

Dr. Harding asked if there is any intersection between the NCCR and the Oceans and Human Health Initiative. Dr. Duke thought drawing such a connection goes beyond the work group's scope in reviewing the NCCR.

National Homeland Security Research Center

Oba Vincent (ORD/NHSRC) provided an update on the activities of the NHSRC. The Center was established on February 24, 2003, and became a permanent part of ORD's organization in 2004. Andy Avel will be serving as the Acting Director in Mr. Oppelt's absence. The Center was initially funded with approximately $100 million for a period of 3 years. It was designed to act quickly and aggressively to get results within 3 years. Its design was guided by threat assessment and stakeholder needs.

Since becoming a permanent center, the number of core staff has been increased from 20 to 50, and the reliance on part-time staff is being phased out. The staff now are located in four cities rather than six cities and staff will be organized by divisions rather than teams.

Mr. Vincent presented a slide of the NHSRC Program Design/Evaluation Logic Model. He noted that all ORD organizations use this model. It identifies the Center's activities, outputs, customers reached, and how these outputs lead to short-term outcomes, intermediate outcomes, and long-term outcomes. Center staff are looking hard at how to measure outcomes and obtain feedback from stakeholders. Dr. Clark asked about the regulatory offices supported by the Center, and Mr. Vincent replied that it supports the regions, OW, Office of Solid Waste and Emergency Response (OSWER), and Office of Air and Radiation (OAR). The NHSRC is responsible for preparing these offices and the regions for responding to threats/attacks. He noted that EPA has been assigned specific responsibilities in a number of Presidential Directives regarding homeland security.

Microsoft Project, a project management system, is used to track the projects conducted/supported by the NHSRC. For each project, a baseline is developed with project descriptions, budget, deliverables, and schedule. Gantt charts are issued on a monthly basis and deliverables are tracked each month. A formal baseline change control system has been implemented.

The two research strategies generated by NHSRC were reviewed by NAS. EPA has received classification authority and the Center developed EPA's first classification procedure manual. Projects are reviewed for classification at initiation, at critical points, and at completion. Dr. Sayler asked if EPA's classification authority extended beyond the work of the NHSRC. Mr. Vincent replied that it did extend beyond NHSRC and that one of the documents classified was an OW document. Dr. Sayler asked if individuals with a Department of Defense (DOD) or Department of Energy (DOE) clearance could access EPA's classified documents. Mr. Vincent responded in the affirmative, stating that agencies are trying to do more with regard to sharing classified information relevant to homeland security. Dr. Henderson asked how classified documents could be peer reviewed. Mr. Vincent stated that the documents can be reviewed only by individuals with appropriate clearances. This is an issue that has been faced by the intelligence community for many years. Peter Jutro (ORD/NHSRC) indicated that there is a parallel universe of classified peer reviewed journals and documents that has existed for DOD

and DOE, but is new for EPA. If the Agency cannot locate reviewers with the appropriate clearances, temporary clearances for scientists can be granted to ensure the quality of the review. Mr. Vincent noted that EPA does not want its products to be classified unless absolutely necessary because first responders usually do not have clearances.

Mr. Vincent noted that quality assurance and peer review are integral to the program. In FY 2004, the Center had 191 projects, 90 of which were active, 85 pending, and 16 completed. The Center has committed about $65 million of the $82 million available for projects. Detailed reports are generated each month and deliverables are identified for each project. Mr. Vincent stated that 412 deliverables are being tracked. Deliverables are assigned one of three levels of priority. Priority 1 deliverables include formal documents and are generally of interest beyond the Agency with national implications. Fifteen Priority 1 deliverables have been completed. Priority 2 deliverables include research products that may or may not be a formal document and are generally of interest only to EPA and ORD. Ten Priority 2 deliverables have been completed. Priority 3 deliverables include research products that support the interim and/or final phase of development and are generally of interest internal to ORD. The deliverable tracking system and file system are updated each month and Center staff continue to perfect the process.

Mr. Vincent identified some Priority 1 deliverables that have been completed, including the Standardized Analytical Methods (SAM) Protocol for Homeland Security, Acute Exposure Guidance Limits (AEGLs) for 26 Chemicals, Compendium of Current Microbial Risk Assessment Methods to Support Biological Incident-Based Risk Assessment, and Short-Term Exposure Limits Guidance for Group I (11) Chemicals.

NHSRC staff are developing a communication plan. They are identifying the audience for each project and determining the best way to communicate and disseminate the product(s). Dr. Johnson asked if outputs are targeted to the audience so that the information is presented differently for different audiences. Mr. Vincent replied that the outputs are targeted to the audience. For example, laboratory procedure documents are targeted to laboratories and guidance for sample collection is directed at first responders. The communication procedures are to identify products/information requiring communication tool(s), define the target audience, define the communication needs, develop the communication tool schedule, involve researchers in tool development, determine delivery method, generate communication tool, communicate via tool(s), and conduct follow-up evaluation.

Mr. Vincent identified several follow-on activities for the Center, including: revision of the program design and management system to reflect the new NHSRC organization, development and implementation of an outcome measurement plan, completion of the communication plan, and implementation of the communication program.

Dr. Lambert asked about the interaction between the Center and other agencies. Mr. Vincent replied that there has been tremendous interaction, particularly with the Department of Homeland Security. Dr. Windom asked if the Center interacted directly with ports. Mr. Vincent responded that the NHSRC interacts with the regions and regional staff interacts with ports, states, and others.

Dr. Johnson commented that the BOSC should consider the next steps for assisting the NHSRC at the May meeting. If the September meeting is held in Cincinnati, the Board members may have the opportunity to learn more about the NHSRC at that meeting.

Public Comment

Dr. Johnson asked if anyone would like to make a public comment. No public comments were offered.

Computational Toxicology Subcommittee Update

Dr. Daston, Chair of the Computational Toxicology Subcommittee, asked Dr. Bob Kavlock (ORD/NHEERL), Acting Director for the new Computational Toxicology Research Center, who joined the meeting by telephone, to update the Board on the activities of the new Center. Dr. Kavlock said that the staff has been working diligently to get the new Center up and running. A framework for the program was developed and the Computational Toxicology Implementation Steering Committee (CTISC) was formed. This committee was tasked with using the framework document to create a program. The program has been operational for the past 12 months, with a budget of $3.5 million. The funding was divided into three categories: pre-decisions, augmentation requests, and new starts. The majority of the budget was devoted to the new starts. From the augmentation requests, 10 projects were funded in the areas of genomics, proteomics, metabolomics, and information technology. From the new starts requests, 42 research groups applied for funding and ORD requested full proposals from 14 of the applicants. Dr. Kavlock said that ORD had hoped to involve the BOSC subcommittee in reviewing those proposals but the review could not be conducted in a public forum. Seven of the 14 proposals were ultimately funded by ORD and abstracts of these projects are available from Dr. Kavlock as well as being posted on http://www.epa.gov/comptox. Most of the projects have a performance period of 3 years and the average funding is $300K/year. A Request for Applications (RFA) is being issued to establish a STAR-funded Center for Environmental Bioinformatics. A cooperative agreement will be awarded to the selected applicant and it will be funded at $1 million/year for 5 years.

The Center has 19 positions, including systems modelers (9 positions), computational chemists (5 positions), bioinformaticians (2 positions), and management/administration. Eleven of the 19 positions have been filled—10 of these staff are located in RTP, and one is located in Athens, Georgia. The Center is recruiting to fill the remaining eight positions.

The staff developed an activities report (20-30 pages) that highlights the activities and progress of the program during FY2004. Dr. Kavlock agreed to provide copies of the report to the BOSC. The Center plans to focus on high priority areas of the Agency, including information technology, prioritization and screening approaches (to determine which chemicals to monitor), quantitative risk assessment, data management/interpretation, and education.

Dr. Daston thanked Dr. Kavlock for explaining how the computational toxicology program had progressed from a concept to a center that is responding to Agency needs. The subcommittee will review the program in spring 2005. Dr. Daston anticipates a 1 ½ day meeting in RTP—a half day will be devoted to an overview and update of the program and the remaining time will be focused on developing a plan for providing subcommittee advice and input. Dr. Farland thanked Dr. Kavlock for his work in implementing this program and getting it off to a terrific start.

Response to the Biotechnology Research Letter Report

Dr. Daston said that ORD's response to the report makes it clear that the Agency is taking the BOSC's comments seriously. ORD acknowledges the need to provide greater context to the BOSC for such reviews and to better explain how its work fits into the bigger picture of activities for which ORD has no control. Dr. Daston commented that this response will be helpful to the BOSC in calibrating how much information is needed for future reviews. The response from ORD is thorough and very helpful. It provides EPA and the BOSC a better understanding of what information needs to be exchanged for such reviews. Dr. Johnson asked Dr. Daston to draft a letter to ORD that acknowledges receipt of the response.

Dr. Sayler pointed out that the response from ORD skirts the question raised by the BOSC that too many resources are being spent on developing resistance to Bt. Dr. Daston thought this comment was addressed by ORD in the last few sentences on page 10 of the response. There was general agreement that the response was appropriate and thorough.

SAB Activities Update

Dr. Lambert distributed a table of the FY 2005 Advisory Projects for the SAB and its committees. He noted that the SAB's new Chair is Granger Morgan from Carnegie Mellon University. The report on the Drinking Water MYP was reviewed by the SAB 2 days ago. The SAB plans to internally harmonize the document and make it more consistent. Dr. Johnson noted that the SAB also reviewed the MYP for RCRA and Contaminated Sites. There was discussion about the PART process and how the MYP was responsive to PART. Also discussed was the difficulty of striking a balance among basic, applied, and future research in the research portfolio for any topic. There is increased emphasis on applied research and less on future issues as the budgets decrease. Dr. Daston mentioned the NAS review on this balance conducted in the 1990s. Dr. Johnson commented that NAS recommended a 50-50 distribution between basic and applied research, but most programs were not even close to that distribution even when there were fewer budget constraints. Dr. Farland stated that there is more applied than basic research in most MYPs; however, the Human Health MYP includes considerable basic research related to air and water issues. He noted the need to consider related MYPs when looking at the portfolio balance. The program-focused MYPs are dominated by applied research, but the Human Health and Ecological MYPs include more basic research.

Dr. Johnson asked the BOSC members to let him know if they are interested in any of the SAB activities. He suggested that perhaps some of the activities should be joint efforts of the SAB and BOSC. Dr. Henderson, who is the Chair of SAB's Clean Air Scientific Advisory Committee (CASAC), noted that there are a number of CASAC members on the BOSC PM Subcommittee.

Nanotechnology Workshop Report

Dr. Sayler attended the SAB's workshop entitled Nanotechnology, Biotechnology, and Information Technology: Implications for Future Science at EPA. Participants included members of the SAB, CASAC, and Advisory Council on Clean Air Compliance and their committees; EPA staff; and representatives from other federal agencies and panels. The workshop focused on six discussion topics: (1) nanotechnology, (2) bioproduction, (3) genomics, (4) sensor networks, (5) large-scale computing, and (6) converging technologies. The goal of the workshop was to assist the SAB in helping EPA successfully meet opportunities and challenges posed by these new and developing technologies. To accomplish this goal, breakout groups for each of the six topic areas addressed the following questions:

Opportunities

- ✧ Which technologies, within the scope of the breakout session, are likely to offer the greatest application potential for protecting the environment?

- ✧ What opportunities may offer the greatest potential in the near term (3-5 years)?

- ✧ What science and research issues need to be addressed to take effective advantage of those opportunities?

Challenges

- ✧ What are likely to be the most significant challenges for environmental protection presented by these new technologies?

- ✧ Which challenges would be most urgent to address in the near term (3-5 years)?

- ✧ What science and research and environmental policy issues need to be addressed to confront these challenges effectively?

Summary presentations at the closing plenary session for these questions were attempted, but a penultimate summary of responses was not available at the close of the workshop.

The plenary session on nanotechnology was initiated with a presentation by Dr. Roland Clift, Center for Environmental Strategy, University of Surry, United Kingdom (UK). Dr. Clift was engaged in the UK commissioned effort resulting in the July 2004 report, "Nanoscience and Nanotechnologies: Opportunities and Uncertainties" by the Royal Society and the Royal Academy of Engineering. The report was used as the basis for discussion of the nature of the science and engineering, breadth and current status of the applications and products, and the unknowns, uncertainties, and risk management concerns. The Royal Academy report presentation produced a number of questions regarding the environmental issues of nanomaterials, including:

- ✧ Given the surface properties of nanomaterials, should surface area be a greater regulatory driver than total bulk production?

- ✧ To what extent do anticipated vast numbers of products, with very low production volumes, concern the risk analysis process?

- ✧ What new use issues affect regulations? For example, TiO_2 is regulated as a bulk chemical but is used in nanoblends, such as in sunscreen, that are not regulated.

- ✧ Should nanoproducts be regulated as drugs rather than cosmetics in some cases?

- ✧ Should nanolabeling be required?

- ✧ Should there be a moratorium on large environmental applications such as nanoscale iron particles for remediation?

- ✧ Should there be a required demonstration that the hazards are limited?

There was some discussion about the limited funding allocated to environmental and health effects and risk management. The discussion focused on uncertainties, environmental and health unknowns, risk management, and prospects for regulation under the Toxic Substances Control Act (TSCA) and Significant New Use Rules. Some of the questions that arose during the discussion session included: What risk assessment approach really makes sense for nanotechnology? What are the aquatic fate and transport issues relating to exposure to nanomaterials? Has production technology reached a point where a large scale, low cost efficiency can be achieved for bulk production? What safety precautions are needed at the production site to control release to the environment? Are standards and standard materials available for characterization, measurement, and experimentation? Are effects at the cellular and molecular levels sufficiently well understood to aid in predicting toxicity or developing appropriate

assays? Are the issues being effectively communicated to the public (more so than what occurred with biotechnology)?

In the closing session, there was an attempt to summarize the issues within the context of the charge questions. Some of questions included: Can the benefits and efficiencies of nanomaterials be documented by life cycle assessment? What are the requirements for standards and measurement capability and are new National Institute of Standards and Technology and National Cancer Institute (NCI) efforts in these areas sufficient? Should there be a greater emphasis on partnering with industry including standardization and effect assessment? What will be the ultimate manufacturing foot print of nanotechnology? For toxicity evaluation, will screening approaches as well as mechanistic evaluations include structure activity relationships? Some of issues included: the inclusion of physical/chemical properties, the environmental consequences, and the *in vivo* consequences of nanomaterials in mechanistic evaluation; the use of environmental health and safety issues to encourage multiagency, interdisciplinary cooperation in support of ORD needs; and the convergence of social implications of nanotechnology.

Dr. Lambert commented that there was some discussion of environmental applications of nanotechnology, such as for monitoring oceans. Nanotechnology could significantly lower the cost of this monitoring. Dr. Sayler reported that Catherine Alexander (NSTC) and Steve Lingle (ORD/NCER) talked about how the STAR Program is funding grants to investigate the effects of nanotechnology. Dr. Farland reminded the BOSC of Mr. Lingle's presentation at the last meeting, which noted that EPA's research efforts are focused on implications of nanotechnology rather than applications. Dr. Farland agreed to distribute copies of Kevin Dreher's paper on nanotechnology to the BOSC members. He also mentioned that a panel discussion co-chaired by EPA and the International Life Sciences Institute will be held at the Society of Toxicology meeting. The discussion will focus on how nanotechnology will impact data collection approaches for toxicology testing.

Dr. Farland stated that EPA recognizes the importance of nanotechnology; therefore, a program was initiated in a manner similar to that for genomics. A number of committees and work groups are dealing with issues surrounding nanotechnology so the Agency has a good handle on the science and policy issues. Dr. Johnson said that the BOSC would like to be kept informed on these nanotechnology efforts and may request a briefing from EPA staff at a future meeting.

EDC Program Review Draft Report

Dr. Harding stated that it was a privilege to chair the EDC Subcommittee because the members were outstanding. She then presented the names and affiliations of the eight subcommittee members. The objective of the program review was to prospectively and retrospectively evaluate the EDC research program. The review was intended to provide guidance to ORD for: assessing the progress and direction of the program; planning, implementing, and strengthening the program; making research investment decisions over the next 5 years; comparing the program with programs designed to achieve similar outcomes in other parts of EPA and in other federal agencies; and preparing EPA's performance and accountability reports to Congress under the Government Performance and Results Act (GPRA) of 1993.

The subcommittee approved and responded to five broad charge questions that focused on program design, relevance, program progress in addressing key scientific questions and impacting environmental decision making, leadership, and resources.

In 1996, ORD identified EDCs as one of its top six research priorities, and the Food Quality Protection Act and the Safe Drinking Water Act Amendments required screening for contaminants with estrogenic activity. The EDC Research Plan (EDRP) was published in 1998, followed by the MYP for EDCs. The MYP identifies the elements of the Research Plan to be addressed in the next 5-10 years. The intramural program is integrated across all laboratories and centers with the exception of NHSRC, and it includes an extramural grants program. The MYP provides a framework, integrates the research, supports the Agency's mission, and produces scientifically credible research to meet GPRA goals. The MYP also presents Annual Performance Goals (APGs) and Annual Performance Measures (APMs) for a planning window of 5-10 years. The following three Long-Term Goals (LTGs) are identified in the MYP: (1) address key areas of uncertainty, (2) develop scientific underpinnings to interpret data from the Endocrine Disruptors Screening Program (EDSP), and (3) incorporate the data into risk assessment and Agency decision making. The MYP is intended to be a living document and it is now in its third iteration covering research activities from 2000 to 2012. The MYP identifies research directions for all ORD laboratories and centers, and several have developed their own implementation plans.

The subcommittee found that the goals and science questions in the EDRP and MYP are appropriate and represent a solid framework for setting research priorities for EDC. The EDC program is nationally and internationally recognized as a unique multidisciplinary program that cuts across the risk assessment/risk management paradigm. The key research areas are closely aligned to the LTGs and to the APGs, and there is a combination of "problem-driven" (LTG 3) and core (LTGs 1 and 2) research. The subcommittee was favorably impressed with the quality and relevance of the work and progress made to date. There was some confusion with regard to defining the scope of activities considered to be EDCs. EPA should establish a procedure for determining which chemicals and/or exposure circumstances are of high priority to study as EDCs.

The APGs are highly ambitious and progress may continue past the initial timeline. EPA's future success in meeting specified goals will depend on several factors: continued funding, support from EPA management, extramural grants and interagency collaborations, and multidisciplinary intramural research spanning ORD and other EPA entities.

The subcommittee developed specific conclusions and recommendations for each LTG. LTG 1 is to provide a better understanding of the science underlying the effects, exposure, assessment, and management of endocrine disruptors. The LTG 1 research is well designed and it will strengthen the foundation of EPA's risk assessment and risk management decisions for EDCs. The program and scientists provide strong leadership in design and execution of research. The subcommittee recommended that the program focus its efforts on development of risk assessment paradigms for EDCs and application of research findings. The subcommittee noted that the complexity of endocrine systems makes evaluation of combined effects a daunting task, and that more expertise in wildlife toxicology is needed to attain the program's goals. The subcommittee recommended that the program have full-time personnel to evaluate EDCs on wildlife within the risk assessment paradigm, and that ORD continue to collaborate with other partners to better characterize variability in species. Another challenge articulated by the subcommittee is how to define an adverse effect and the biological indicator for risk assessment purposes. The progress of the risk management program may be hindered because the development of analytical methods is not identified as an APG or APM in LTG 1. The subcommittee noted that related research conducted outside the program on water and wastewater treatment technologies is not integrated into the program, and there is not current ongoing research or a specific plan regarding natural processes in sediments.

LTG 2 is to determine the extent of the impact of endocrine disruptors on humans, wildlife, and the environment. The research for this goal is consistent with the EDRP, and it has been productive, of high quality, and relevant to EPA's mission, and the resources have been used efficiently. There has been greater progress on ecological effects compared to human effects. The intramural and extramural investigators are enthusiastic and they have made good decisions about the use of genomics in EDC studies. The interactions between ORD and the regional offices are strong and effective—a good model to use for other programs. The subcommittee recommended that EPA take a leadership role in application of "omics" technologies requiring strong commitment to systems biology and computational toxicology. EPA also should continue to investigate common ground between ecological and human health because no other agency is in a position to do this. Subsequent reviews should include more of the interagency research regarding epidemiology and human health studies. EPA also should improve interactions with other agencies to identify new sources of environmental and human exposure, including investigation of the role of pharmaceuticals as sources of EDCs.

LTG 3 is to support EPA's screening and testing program. The mechanistic focus to research provides a sound scientific foundation for test methods and the progress on LTG has been excellent. There are clear goals for development of screening and testing methods and the work is on track—mammalian tests will be available soon for use by the EDSP. The research objectives are clearly relevant to the program offices. A challenge identified by the subcommittee is that validation and implementation of the screening and testing occurs outside the Agency, which may delay their use by the program offices. Research accomplishments in NHEERL related to improved methods are not centralized and may not be captured in an APG. The subcommittee recommended that this research be identified as important for LTG 3. Because genomics and quantitative structure activity relationship (QSAR) methods hold promise for EDC identification, it is important for ORD to hire experts in bioinformatics to work with the life scientists on staff. Dr. Elaine Francis, the Program Director, and Dr. Larry Reiter, the Executive Lead, have provided outstanding leadership for the program. The Program Director, however, has no budgetary authority for the program. The program scientists provide exemplary scientific leadership in the field as evidenced by their: (1) enthusiastic dedication to the research and the program; (2) publication of research in top-tier journals; (3) being on the forefront of research in EDC screening and testing methodologies, source identification, effects on wildlife, and ecological health; and (4) service as consultants, providing technical advice to EPA program offices, federal agencies, and the broader scientific community.

The EDC program is projected to have a $12 million annual budget, but this budget has not been actualized. The FY 2005 budget is projected to be $8 million, which includes the extramural grants. The ORD laboratories and centers contribute resources, both dollars and FTEs. The Program Director negotiates with the Division Directors of the laboratories and centers to secure the required resources for the program, and a number of scientists spend only a fraction of their time on the EDC program. The subcommittee found that the STAR Program adds significant value to the research portfolio so there needs to be adequate and dependable funding for the extramural component of the program. The EDC program leverages resources by collaborating with other federal agencies (e.g., National Institute for Occupational Safety and Health [NIOSH], NIEHS, NCI), and although the indirect funding does not hinder the quality of the program, it does not allow for forward planning. The subcommittee recommended that the FTE ceiling/hiring freeze be lifted so that additional personnel can be hired to share the workload of the affected laboratories/centers. The Program Director position should be elevated to the level of the Laboratory/Center Directors, and the Program Director should be given budget authority.

Dr. Johnson thanked Dr. Harding and her subcommittee for their excellent work and asked if the BOSC members had any comments on the draft report. Dr. Clark mentioned that there is a great deal of similarity between the charge questions for the EDC program review and the charge questions for the human health program review. He added the element of how resources are applied into the human health program review charge. Is there a process in place for setting priorities? Are the available resources allocated to the priority areas? Dr. Johnson commented that the MYPs should help answer those questions. Dr. Clark said that the EDC report made it appear that priorities are established in negotiations between the Program Director and Laboratory/Center Directors. He noted that such negotiation is fine if the priorities are already identified. Dr. Harding stated that there was no indication of reluctance to conduct the EDC research among the scientists. Dr. Johnson pointed out that the strategy identifies what is important and the MYP identifies what needs to be done and when. He added that the subcommittees should determine if there is a process for setting priorities. Are the available resources being used in the most effective way to achieve the stated goals and objectives? Dr. Stewart explained that the EDC Subcommittee recommended an increase in FTEs because the time scientists are devoting to EDC research is time they cannot dedicate to their original assignments. The EDC research was added to their existing workload. Dr. Farland responded that this practice is typical when building new programs in the Agency. He acknowledged that the scientists are trying to serve two "masters"—the Program Director and their Laboratory/Center Directors, but this is how EPA plans and conducts its research. Dr. Stewart said that ORD needs to better communicate expectations to the scientists and explain how they will be rewarded for supporting the program. Dr. Johnson commented that there is no hiring freeze so Dr. Harding may want to revise that recommendation.

Dr. Duke asked if the BOSC needs a better understanding of how resources are allocated to programs. Dr. Farland replied that ORD staff have made presentations to the BOSC to explain the research planning process, how priorities are established, and budget planning. The BOSC also was briefed on the laboratory implementation plans during the laboratory and center reviews. Dr. Farland recommended that the subcommittee members ask the Program Director about resources during a conference call prior to the meeting. Dr. Stewart commented that it was very difficult to get information on resources from the Program Director and the staff. Dr. Farland pointed out that the timing made it difficult. The staff could not talk about the FY 2005 budget at the time of the review. They will have the same problem discussing the FY 2006 budget.

Dr. Lambert asked how the process will work when the new NPDs are hired. Will the Laboratory Director request funding from the NPD to support the program? Dr. Farland replied that the NPDs will be able to request an increase in effort for certain areas within a laboratory or center. This will impact the work for other NPDs so there will have to be some negotiation.

Dr. Johnson pointed out that there is no mention of PART or the EDC Research Plan in the Executive Summary section of the EDC program review report. He asked that the report include brief biosketches of the subcommittee members. He also noted that the report fails to discuss one of the five items identified by the subcommittee; specifically, it does not discuss interspecies extrapolation. He noted that the Executive Summary is long and there is some repetition. He asked Dr. Harding to try to shorten it. Dr. Johnson also stated that there was no recommendation associated with the challenge regarding external validation and implementation of screening and testing. He said that the report would benefit from an edit to harmonize the different sections. Dr. Johnson provided his comments to Dr. Harding so that she could discuss them with the subcommittee and revise the report as needed.

Dr. Lambert noted that on page 14 of the report it states that the program is well funded; in other areas of the report, however, it indicates that additional resources are needed. He also pointed out that the third sentence in the second full paragraph on page 24 of the report does not make sense. Whether something was presented at an October meeting at Tulane University has no bearing on this review. In fact, it should have been easier for them to include the posters if they had already been prepared for that October meeting. Dr. Lambert also expressed some concern about the statement in the third sentence in the first full paragraph on page 25. It reads as though the subcommittee is endorsing heavier emphasis of ecological studies over human health studies. Dr. Harding agreed to reword that sentence. She asked that Dr. Lambert provide a copy of his comments to her. Dr. Johnson suggested that the subcommittee review the revisions via a conference call if there are any substantive changes. If the changes are only editorial in nature, it will not be necessary for the subcommittee members to review the revisions.

Dr. Lambert was impressed by the report and asked if it will be published. Dr. Johnson replied that the final report will be transmitted to the AA/ORD along with a letter with his signature. The report then will be posted on the BOSC Web Site. Ms. Kowalski commented that drafts of the report have been made available to the public for the conference calls and at this meeting. Dr. Farland added that it may be beneficial if EPA is more proactive in disseminating the report. Dr. Johnson asked the members to submit their editorial comments to Dr. Harding, who will be responsible for revising the report. SCG will do a final edit of the report and then Drs. Harding, Stewart, Johnson, and Henderson will vet it before transmission of the report to the AA/ORD. He asked that the revised report be submitted to Ms. Kowalski by February 7, 2005, and sent to SCG for editing. The edited document should be submitted to the vettors by February 14, 2005 and the final document should be ready for transmission by March 7, 2005.

Future Business

Dr. Johnson stated that the next BOSC meeting will be held June 2-3, 2005, in Washington, DC. The first choice for the September meeting is September 12-13, 2005, but it could be held September 22-23, 2005. The September meeting probably will be held in Cincinnati, Ohio. Dr. Johnson indicated that it may be necessary to schedule two 2-hour conference calls before the June meeting to discuss and approve four additional program review reports. The subcommittee chair will be responsible for presenting a summary of his/her subcommittee's report. There will be 20 minutes allotted for these presentations, followed by 20 to 30 minutes for comments and questions and answers. Prior to the calls, Dr. Johnson will identify lead discussants for the reports. He asked members to identify the reports for which they would like to lead the discussion. The following assignments were made:

Report	Lead Discussants
Mercury MYP Review Report	Jim Clark, Gary Sayler
Human Health Program Review Report	Rogene Henderson, George Daston
Particulate Matter Program Review Report	John Giesy, Jim Johnson
Drinking Water Program Review Report	Herb Windom, Anna Harding
Ecological Program Review Report	Clifford Duke, George Lambert

Dr. Johnson asked that all drafts reports include line numbering and page numbering to facilitate their discussion by the BOSC. Ms. Kowalski agreed to post the PowerPoint files of the presentations on the

BOSC Web Site prior to the Ecological Subcommittee conference call. Dr. Johnson suggested that the PowerPoint files be posted on the BOSC Web Site prior to future calls/meetings of other subcommittees.

Dr. Johnson said that the discussion of the Ad Hoc Communication Subcommittee will be postponed until the June meeting. He asked that the subcommittee chairs ensure that communications is considered in the program review and other reports.

Dr. Clark volunteered to contact NHSRC and follow-up on today's presentation. Dr. Sayler agreed to serve as the lead for following up on nanotechnology. Dr. Johnson asked Drs. Clark and Sayler to notify Ms. Kowalski if there are relevant meetings they would like to attend.

Dr. Farland mentioned that Steve Johnson was named Acting Administrator of EPA. He also noted that an article on the perchlorate review was just published in *Science*. The first draft of the ozone criteria document will be released on February 1, 2005. The CASAC will review the ozone document in May or June.

In response to the call for a motion to adjourn the meeting, Dr. Windom moved to adjourn and Dr. Stewart seconded the motion. The meeting was adjourned at 1:10 p.m.

Action Items

- ✧ Dr. Farland asked the BOSC members to identify individuals who have the right perspective and appropriate expertise, and are not involved in EPA programs. He requested that they provide such recommendations to the Nomination Subcommittee.

- ✧ Dr. Farland will provide the URL for the Management MYP to the BOSC members as soon as possible and distribute hardcopies of the report approximately 2 weeks before the next BOSC meeting.

- ✧ Dr. Harding suggested that the required areas of expertise be added to the table of BOSC projects under the Nomination Subcommittee.

- ✧ Dr. Johnson asked Drs. Lambert, Clegg, and Duke to develop a concept for a BOSC workshop on international issues. Dr. Lambert agreed to chair the work group to develop the workshop concept.

- ✧ Dr. Johnson agreed to distribute information to the members on the February 17-18, 2005, SAB meeting to review the 2006 science budget. In addition, he will distribute information regarding the Chair of the SAB testifying about the budget.

- ✧ Dr. Farland agreed to distribute materials on the 61 finalists of the P3 program to the BOSC.

- ✧ Dr. Clark agreed to add more information about the constraints of Section 305(b) of the Clean Water Act to the report on the NCCR. He also will rephrase the recommendations to focus on improving the next report. The report will be formatted and subjected to an editorial review before it is finalized and submitted to ORD.

- ✧ Dr. Clark agreed to add something about new variables or parameters coming forward in the section of the NCCR letter report on quality. Dr. Johnson suggested moving the last paragraph on the first page to the communication section.

- ✧ Dr. Farland suggested adding a statement in the NCCR letter report about the fact that the application of EMAP tools by the states is improving the data and these tools offer states the advantage of getting better data for less money.

- ✧ Dr. Kavlock agreed to provide copies of the computational toxicology accomplishments report to the BOSC members.

- ✧ Dr. Johnson asked Dr. Daston to draft a letter to ORD that acknowledges receipt of the response to the biotechnology research letter report.

- ✧ Dr. Farland agreed to distribute copies of Kevin Dreher's paper on nanotechnology to the BOSC members.

- ✧ Dr. Johnson commented that there is no hiring freeze so Dr. Harding may want to revise that recommendation in the EDC program review report.

- ✧ Dr. Johnson asked Dr. Harding to shorten the Executive Summary and eliminate the repetition. Dr. Harding will review and incorporate the additional comments provided by Dr. Johnson.

- ✧ Dr. Harding agreed to reword the statement in the third sentence in the first full paragraph on page 25 so that it does not read as if the subcommittee is endorsing heavier emphasis of ecological studies over human health studies. Dr. Lambert agreed to provide a copy of his comments to Dr. Harding.

- ✧ Dr. Johnson asked the members to submit their editorial comments to Dr. Harding, who will be responsible for revising the report. SCG will do a final edit of the report and then Drs. Harding, Stewart, Johnson, and Henderson will vet it before transmission of the report to the AA/ORD. He asked that the revised report be submitted to Ms. Kowalski by February 7, 2005, and sent to SCG for editing. The edited document should be submitted to the vettors by February 14, 2005 and the final document should be ready for transmission by March 7, 2005.

- ✧ Dr. Johnson asked that all drafts reports include line numbering and page numbering to facilitate their discussion by the BOSC.

- ✧ Ms. Kowalski agreed to post the PowerPoint files of the presentations for the Ecological Research Program Review on the BOSC Web Site prior to the conference calls. She also will post the presentations for other program reviews prior to the calls/meetings.

- ✧ Dr. Clark volunteered to contact NHSRC and follow-up on today's presentation.

- ✧ Dr. Sayler agreed to serve as the lead for following up on nanotechnology.

- ✧ Dr. Johnson asked Drs. Clark and Sayler to notify Ms. Kowalski if there are relevant meetings they would like to attend.

- ✧ Dr. Johnson postponed the discussion of the Ad Hoc Communication Subcommittee until the June meeting. He asked that the subcommittee chairs ensure that communications is considered in the program review and other reports.

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January 27-28, 2005

Agenda

Thursday, January 27, 2005

8:30 a.m. – 9:30 a.m.	Subcommittee Meetings	Subcommittee Chairs
9:00 a.m. – 9:30 a.m.	Registration	
9:30 a.m. – 9:45 a.m.	Welcome and Introductions - Review of Sept Mtg Minutes - Overview of Agenda	Dr. Jim Johnson, Chair, Executive Committee
9:45 a.m. – 9:55 a.m.	BOSC DFO Remarks	Lorelei Kowalski, ORD
9:55 a.m. – 10:15 a.m.	AA/ORD Remarks	TBD
10:15 a.m. – 10:45 a.m.	Risk Assessment Workshop Update	Dr. Rogene Henderson, Workshop Chair
10:45 a.m. – 11:00 a.m.	Break	
11:00 a.m. – 11:30 a.m.	Coastal Condition Report	Dr. James Clark, Lead
11:30 a.m. – 12:00 noon	Subcommittee Reports - Computational Toxicology - Mercury	Subcommittee Chairs Dr. George Daston Dr. Herb Windom
12:00 noon – 1:00 p.m.	Lunch	
1:00 p.m. – 2:00 p.m.	Activities of the National Research Council Committee on Models in the Regulatory Decision Process	Dr. K. John Holmes, NAS

2:00 p.m. – 3:00 p.m.	Program Reviews - EDCs – Lessons Learned - Global Change - Human Health	Subcommittee Chairs Dr. Anna Harding Dr. Clifford Duke, Vice-Chair Dr. James Clark, Vice-Chair
3:00 p.m. – 3:30 p.m.	Break	
3:30 p.m. – 4:30 p.m.	Program Reviews (Continued) - Particulate Matter - Drinking Water - Ecological	Subcommittee Chairs Dr. Rogene Henderson Dr. Gary Sayler Dr. Michael Clegg
4:30 p.m. – 5:00 p.m.	BOSC Communications Report - ORD Update	Dr. Donna Roa, ORD Public Affairs and Science Communication Director
5:00 p.m.	Adjourn	

Friday, January 28, 2005

8:30 a.m. – 9:15 a.m.	BOSC Issues	Dr. William Farland, Acting Deputy for Science for Research and Development
9:15 a.m. – 9:45 a.m.	National Homeland Security Research Center - Management Plan - Communications Plan	Mr. Oba Vincent, National Homeland Security Research Center
9:45 a.m. – 10:00 a.m.	Public Comment	
10:00 a.m. – 10:30 a.m.	Break	
10:30 a.m. – 11:00 a.m.	SAB Activities	Dr. George Lambert, SAB Liaison to the BOSC; Dr. Gary Sayler
11:00a.m. – 12:00 noon	Program Reviews (Continued) EDCs: - Presentation of findings - General comments from meeting participants	Dr. Anna Harding, EDC Subcommittee Chair
12:00 noon – 1:00 p.m.	Lunch	
1:00 p.m. – 1:30 p.m.	Future Discussion/Future Business - Meetings in 2005 - Nomination Subcommittee Update - Ad Hoc Communication Subcommittee	Dr. Jim Johnson Chair, Executive Committee
1:30 p.m.	Adjourn	