B·O·S·C
BOARD OF SCIENTIFIC COUNSELORS

34th BOSC EXECUTIVE COMMITTEE MEETING SUMMARY

Arlington, VA
January 23, 2007

Tuesday, January 23, 2007

Welcome and Introductions

Dr. James Clark (Exxon Mobil Research & Engineering Co.), Chair of the Board of Scientific Counselors (BOSC), called the 34th face-to-face meeting of the Executive Committee to order at 8:40 a.m. He welcomed the members, particularly the new members—Drs. Deborah Swackhamer (University of Minnesota), Henry Falk (Centers for Disease Control and Prevention), and Charles Haas (Drexel University)—as well as guests to the meeting and asked the Board members to introduce themselves. Biosketches of the new BOSC members were distributed at the meeting. Following the introductions, Dr. Clark reviewed the meeting agenda topics, which included review of the October meeting minutes, an update on the reports transmitted to the Office of Research and Development (ORD), remarks of the BOSC Designated Federal Officer (DFO), remarks of the Assistant Administrator for Research and Development (AA/ORD), the program review tool workgroup proposal, the ORD responses to recent BOSC reports (Computational Toxicology), updates from the Subcommittees (Computational Toxicology, Human Health Mid-Cycle Review, Safe Pesticides/Safe Products, Technology for Sustainability, Human Health Risk Assessment, and Homeland Security), update on the National Center for Environmental Research (NCER) and National Exposure Research Laboratory (NERL) Standing Subcommittees, the ORD update, presentations on ORD communications and the Ecological Benefits Assessment Plan, an update on Science Advisory Board (SAB) activities, and a discussion of future BOSC business. Dr. Clark asked if there was anything that should be added to the agenda. No changes or additions were suggested.

Approval of the October 19-20, 2006 Meeting Minutes

Because he was not present for the entire October 2006 meeting, Dr. Clark asked Dr. Rogene Henderson (Lovelace Respiratory Research Institute), Vice-Chair of the BOSC, to lead the discussion of the minutes. Dr. Henderson asked if there were any comments on the draft summary of the October 19-20, 2006 BOSC Executive Committee meeting. She noted that the minutes were very thorough and accurate; she had reviewed them and had no comments. When no comments were provided, Dr. Henderson made a motion to approve the minutes and Dr. Clifford Duke (Ecological Society of America) seconded the motion. The October meeting summary was approved unanimously by the BOSC.

Reports Transmitted to ORD

Dr. Clark stated that the Computational Toxicology Program Review Letter Report was submitted to ORD after the October BOSC meeting. He suggested that the members look at this report as an example of the length and breadth of a letter report. There will be a response from ORD on this report later in the meeting.

BOSC DFO Remarks

Ms. Kowalski, DFO for the BOSC Executive Committee, welcomed Drs. Swackhamer, Falk, and Haas to their first face-to-face meeting of the BOSC Executive Committee. She mentioned that Drs. Anna Harding (Oregon State University) and John Giesy (University of Saskatchewan) were unable to attend this meeting.

Ms. Kowalski stated that the BOSC is chartered as a Federal Advisory Committee and subject to the rules and regulations of the Federal Advisory Committee Act (FACA). Therefore, this meeting was open to the public, and time was designated for public comment. A contractor, Beverly Campbell from SCG, was present to take notes to capture the presentations and discussions, and the meeting minutes will be made available to the public on the BOSC Web Site after approval by the Executive Committee and certification by the BOSC Chair. The Chair must certify the minutes within 90 days following the meeting. Notice of this meeting was published in the *Federal Register*. Ms. Kowalski established an electronic public docket for the meeting on the Federal Docket Management System (FDMS), which can be accessed at http://www.regulations.gov. The number to search for this docket is EPA-HQ-ORD-2006-0977. The *Federal Register* notice and the agenda were available to the public on the docket in advance of the meeting. Ms. Kowalski mentioned that she had not received any requests for public comment prior to the meeting, but there is time set aside at 2:30 p.m. today for public comment. As DFO, she worked with EPA's ethics officials to ensure that all appropriate ethics requirements were satisfied for the Executive Committee. Nevertheless, she asked the members to notify her during the meeting if they have any potential conflicts of interest. Because some members have grants with EPA, potential conflicts of interest arise from time to time.

Each BOSC member should have received a notebook of materials by mail prior to the meeting as well as some supplemental materials that were sent by e-mail last Friday. Ms. Kowalski apologized for not sending the materials earlier, but the rating tool document was revised just 2 weeks ago and those revisions affected several of the items in the package. Therefore, the notebooks were sent without these materials. She mentioned that there will be a telephone line open for parts of the meeting. Dr. Robert Kavlock, Director of the National Center for Computational Toxicology (NCCT), will be making his presentation on the ORD response to the BOSC's letter report via telephone. Also, Dr. Wayne Munns from the ORD laboratory in Narragansett, will be joining the meeting later by telephone to make his presentation on the Ecological Benefits Assessment Plan.

Ms. Kowalski noted that at the October meeting, Dr. Jim Johnson, then the Chair of the BOSC, asked the new members to comment on their experience as new members. A number of the new members indicated that it would be helpful to have some orientation materials. In response, Ms. Kowalski assembled some materials, which included the EPA organization chart, the ORD organization chart, the handbook for subcommittee chairs, the ORD 101 presentation, and a list of acronyms. These materials were provided to the new members and she spent an hour with each new member going through the materials. Ms. Kowalski received positive feedback from some new members, but she asked the members to notify her if they have any ideas for revising the materials. She will continue to revise the orientation materials to keep them up to date.

Ms. Kowalski commented that the BOSC was very active last year and it looks like the activity level may increase in the coming year. There will be 12 active subcommittees in 2007, including 4 program reviews (Safe Pesticides/Safe Products, Technology for Sustainability, Human Health Risk Assessment, and Homeland Security). In addition, five mid-cycle reviews are planned for the following research programs: Human Health, Ecological, Drinking Water, Endocrine Disrupting Chemicals (EDCs), and Particulate Matter/Ozone (PM/Ozone). The Board also has three standing subcommittees—the Computational Toxicology, NCER, and NERL Subcommittees. Ms. Kowalski noted that the BOSC needs to appoint chairs for the EDCs and PM/Ozone Mid-Cycle Review Subcommittees.

Ms. Kowalski asked the members if they have been able to access the MyPay system. BOSC members must use the system to electronically download their W-2 forms. She asked the members to let her know before March if they are having problems accessing the system. Ms. Kowalski also requested that the BOSC members submit their timesheets as soon as possible, and reminded the members and other attendees to sign in at the registration desk if they had not done so already. She then introduced Susie Warner (SCG) who would be available during the meeting to assist the members with any logistical needs.

Dr. Clark thanked Ms. Kowalski for her comments and then welcomed Dr. George Gray, Assistant Administrator for Research and Development, who provided his report.

AA/ORD Remarks

Dr. Gray extended his welcome to the new BOSC members, thanking them for their willingness to serve and letting them know how important the work of the Board is to ORD. He apologized for missing the October meeting, and he extended a welcome to Drs. Martin Philbert (University of Michigan) and Carol Weiss (Harvard University), who attended their first BOSC meeting in October.

Dr. Gray thanked the BOSC for its review of the Computational Toxicology Research Program. He attended the review meeting in June, and has read the report and discussed it with Dr. Kavlock. He also thanked the members who served on the Rating Tool Workgroup—Drs. Carol Weiss, Clifford Duke, and George Daston (Proctor & Gamble). It is important that ORD does a good job of managing its science. It is very helpful to have the Board take a look at how ORD is managing its science, doing its science, and prioritizing its science. ORD is looking forward to the upcoming program and mid-cycle reviews and the implementation of the new rating tool.

Dr. Gray and others from EPA met earlier this week with high-level managers from the Office of Management and Budget (OMB) to discuss efficiency measures. He explained that the Program Assessment Rating Tool (PART) review conducted by OMB requires both performance measures and efficiency measures. Dr. Gray commented that the Agency is considering asking the National Academy of Sciences (NAS) to help EPA identify efficiency measures that indicate the cost-effectiveness of its programs. He thinks that because ORD has made such a good faith effort to work with OMB and the BOSC to develop the new rating tool, it was much easier to negotiate efficiency measures with OMB. Because OMB has respect for the BOSC, it made a difference in the attitudes of the OMB managers. Dr. Gray related this information to the BOSC so that the Board members understand that OMB recognizes the value and rigor of the BOSC reviews. The efforts of the BOSC are really making a difference in ORD.

Dr. Gray reported that Dr. Hugh Tilson has been appointed the National Program Director (NPD) for Human Health after acting in this position since 2005. Prior to acting as the NPD for Human Health, Dr. Tilson served as the Assistant Laboratory Director of Human Health at the National Health and Environmental Effects Research Laboratory (NHEERL). On December 24, 2006, Dr. Audrey Levine joined ORD as the NPD for Drinking Water. Prior to joining EPA, she was a faculty member in the Department of Civil and Environmental Engineering at the University of South Florida in Tampa. She is an environmental engineer with extensive research experience in water quality, water treatment and distribution systems, treatment technologies, and water reuse. Dr. Hal Zenick has been officially selected as the Director of NHEERL, which is ORD's largest laboratory in terms of number of staff. Prior to acting in this position for the past 18 months, Dr. Zenick served as the Deputy Director of NHEERL; he also served as the Acting Deputy Assistant Administrator for Science for about 1 year. Dr. Greg Sayles, who was acting as the NPD for Drinking Water, has been selected as the Associate Director of the

National Homeland Security Research Center (NHSRC). Dr. Sayles will be involved with the BOSC review of that program.

Dr. Gray was pleased to announce that the BOSC won two of EPA's recently implemented FACA awards; ORD won 3 of the 7 awards that were issued by the Agency. One of the BOSC awards was for the responsiveness to FACA committee recommendations. Dr. Gray commented that the BOSC members should be pleased with that award because it demonstrates the great interactions between ORD and the Board and the relevance of its recommendations. The second award, the Federal Advisory Committee Impact Award, was given to Ms. Kowalski for her work as the DFO for the BOSC.

Dr. Gray stated that he was in China during the October BOSC meeting. He was part of a group that met with China's environmental protection technology representatives. A Memorandum of Understanding (MOU) was signed with the Chinese Ministry of Science and Technology to allow the two groups to share information and look for opportunities to collaborate and learn from one another. Subsequent to this visit, the EPA Administrator went to China with a large group of cabinet officials in December 2006, which was led by the Secretary of the Treasury. There was considerable discussion of environmental opportunities during the December meeting. Dr. Gray stated that just weeks before he arrived in China, the Chinese government had released its 11th 5-year plan, which has a strong emphasis on the environment. The plan talks about a harmonious society, which includes harmony between people and between people and nature. He believes that there will be a number of opportunities for ORD to work with China.

Dr. Gray said that this concluded his remarks but he would be happy to answer any questions. Dr. Henderson asked about the role EPA will play with OMB and its revision of the risk assessment bulletin. She noted that the bulletin was soundly rejected by the National Research Council (NRC). Dr. Gray explained that OMB oversees the regulatory process, keeping an eye on how regulatory agencies implement their regulations. In summer 2006, OMB issued a risk assessment bulletin with the goal of providing a floor for the standards expected from government agencies with respect to quality, procedures, and characterization. OMB decided to submit the bulletin to NRC for review. The NRC report was issued a few weeks ago and it urged OMB to rescind the bulletin. The NRC review found that the bulletin was too "one size fits all," and was not specific enough for the different assessments performed by government agencies. Although the executive summary of the NRC report was very critical of the bulletin, Dr. Gray found a disconnect between the executive summary and the report. In his opinion, the fatal flaw mentioned in the executive summary was not evident in the report.

OMB will not issue the bulletin in its current form but Dr. Gray did not know if OMB plans to modify it or eliminate it completely. EPA will be provided a chance to comment on the bulletin if it is revised. He noted that EPA representatives also spoke to the NRC panel to provide the Agency's views during the review. Dr. Gray mentioned that a number of EPA staff members think that the Agency already fulfills most of the requirements identified in the OMB bulletin.

Dr. George Lambert (University of Medicine and Dentistry of New Jersey), SAB liaison to the BOSC, commented that EPA funds a number of extramural researchers who have developed good relationships with foreign governments and populations in various countries. EPA could get a good return on its investment by becoming involved in these international studies. Dr. Lambert also mentioned that the National Institute of Environmental Health Sciences (NIEHS) is reassessing its research approach to children and EPA is an important partner in research on susceptible populations. Does EPA plan to reassess its research approach? Dr. Gray replied that a review of the research of the children's centers was being conducted that day. EPA works hard to set priorities based on science needs and the Agency strives to characterize and understand potential susceptible subpopulations. In response to Dr. Lambert's suggestion concerning involvement with international research, Dr. Gray commented that EPA funds a

number of researchers who work internationally. A number of EPA scientists have personal connections with scientists in China and the Agency is trying to build on those connections.

Dr. Swackhamer asked Dr. Gray to elaborate on the discussions of efficiency measures with OMB. Dr. Gray responded that when the Agency was asked to develop efficiency measures, EPA looked at those being used by other agencies. Most research agencies were using something like publications per full-time equivalent (FTE). This measure may not be as appropriate for ORD, however, because ORD is a research organization within a regulatory agency; there are real issues and questions from the program and regional offices that must be addressed by ORD. At the same time, ORD must prepare the Agency to cope with future problems, making it necessary for ORD to conduct core research. A number of the measures used by other agencies were not acceptable for EPA. The Agency worked with OMB to identify measures that were more appropriate for the Agency. The measures on which the Agency and OMB agreed are at a lower level than the research program level. The earned value measure looks at the resources EPA invested in the program and its outputs (e.g., publications, impacts of Agency use of research results). ORD is working on plans for a consultative workshop with the American Association for the Advancement of Science (AAAS) Committee on Science, Engineering, and Public Policy (COSEPP) to brainstorm about efficiency measures for ORD. Dr. Gray mentioned that ORD staff members also visited IBM's facility in New York to learn what IBM uses to measure research efficiency. Although IBM has a bottom line and EPA does not, some of the ideas from that site visit have been helpful in deciding how ORD assigns its resources.

Dr. Clark said that the BOSC subcommittees will talk to the NPDs about efficiency measures during the program reviews. Dr. Lambert suggested looking at the number of patents awarded to researchers. He noted that researchers now are patenting biomarkers. Is EPA receiving patents and getting a return on its research investments? Dr. Gray said he did not think patents had come up in the discussions with OMB. He noted that the Agency has received some patents and the researchers share in the royalties paid to EPA. Only one or two EPA patents have reached this point, however, and those are associated with the research of the Ann Arbor laboratory on automobiles. Dr. Kevin Teichman (EPA/ORD), Acting Deputy Assistant Administrator for Science, stated that the Agency does track patents. There are about 10-15 patents that have resulted from Cooperative Research and Development Agreements (CRADAs) with EPA. ORD has not used this as a measure. Dr. Ken Demerjian (State University of New York) mentioned that there would be a number of patents resulting from EPA's Small Business Innovation Research (SBIR) Program as well. Dr. Gray pointed out that OMB does not regard a patent as an outcome; to OMB, an outcome is something like a reduction in the number of asthma cases. Dr. Gray mentioned that ORD is trying to measure environmental progress and impact for the *Report on the Environment*.

Dr. Philbert commented that Americans think of return on investment (ROI) in a short time frame. Is EPA looking at ROI over decades? Dr. Gray replied that EPA has been talking to OMB about this issue. The benefits of today's research could come 10-20 years from now. He stated that the time frame for the return is an issue; ORD has, however, identified a number of short-term efficiency measures.

Dr. Daston said that he was uncomfortable with this discussion of efficiency measures. Such discussions take place at Proctor & Gamble (P&G) as well, but there is one major difference between ORD and P&G—one aspect of ORD's function and value is maintenance of core competence. He cautioned ORD to be steadfast in its discussions with OMB that ORD must preserve core expertise and competence to ensure that the Agency can address future problems. He commented that this always creates problems for "bean counters" who are looking for efficiency and short-term returns. Dr. Gray stated that because the Agency must make year-to-year budget decisions, this information could help ORD identify the programs that are making a difference. This is a difficult issue and no one has any clear answers yet. He agreed that ORD needs to remind OMB of the value of core research and new knowledge. Dr. Teichman cautioned against confusing efficiency and performance measures. He commented that OMB wants ORD

to identify the outcomes from the investment each year, not 3 to 5 years in the future. In addition, OMB is not taking into account the current returns that are being reaped from ORD's past investments. In response to Dr. Swackhamer's earlier question about efficiency measures, Dr. Teichman stated that one example would be to increase the number of grants that are awarded and processed in less time without compromising the quality of the review. That is an efficiency measure rather than a performance measure, which would be something like reducing the number of asthma attacks.

Dr. Falk commented that the Centers for Disease Control and Prevention (CDC) is in a similar situation, but ORD's situation may be more complex because the impacts probably are the result of the actions of the program offices, such as the Office of Water (OW) or Office of Air and Radiation (OAR). It is a real challenge to define such measures for ORD.

Dr. Demerjian stated that ORD began conducting core research years ago in response to a recommendation by NAS, and it still is reasonable for ORD to conduct such research. He asked if there are efficiencies in a multi-pollutant approach. Process research is needed to answer this question and ORD certainly has a role to play in that research. Dr. Gray responded that the air program is considering a move in that direction.

Dr. Clark thanked Dr. Gray for his remarks and for answering the questions of the BOSC members. He then introduced the next item on the agenda.

Program Review Tool Workgroup Proposal

Dr. Clark asked Dr. Daston, who serves on the workgroup, to describe the tool to the BOSC. Dr. Daston stated that the purpose of the tool is to help ORD get more value from the BOSC program reviews. ORD asked the BOSC to help develop a tool that would be consistent with the BOSC's goals in reviewing the programs and would provide some means for OMB to compare the review results with those of other EPA programs and with programs of other agencies. The workgroup spent a great deal of time trying to accommodate this request. He explained that the BOSC has resisted using a numerical scoring system, which is preferred by OMB, so the proposed tool uses four defined rating terms (i.e., exceptional, exceeds expectations, satisfactory, and unsatisfactory) to rate the progress in achieving the long-term goals (LTGs) of the program. Dr. Daston speculated that most programs will fall into the two middle categories, which provides EPA an opportunity for improvement. He noted that because it is impossible to do a "one size fits all" rating, these "scores" will be accompanied by a narrative statement that explains the judgment of the subcommittee. The workgroup has met four or five times to work on this tool and it has taken a tremendous amount of negotiation to get to this point. Dr. Daston asked the members to consider this when reviewing the draft tool.

Dr. Demerjian asked what the Subcommittee should do if the members decide that an LTG is flawed. Dr. Daston responded that the unsatisfactory description deals with that event. Dr. Teichman commented that although the LTGs were negotiated with OMB, the Subcommittee should comment if the members think the LTG should be changed.

Dr. Weiss, who served on the workgroup, stated that the proposed tool is an amalgam of two processes—the BOSC review and OMB's interest in an overall rating. The BOSC will not provide a numerical rating, but will assign one of the defined categories and provide a narrative statement that explains the rating. It is a compromise, but one that can meet the needs of all groups involved. Dr. Duke, another member of the workgroup, mentioned that the BOSC members on the workgroup were concerned about the difficulty of getting the Subcommittee members to reach consensus on a rating for each LTG.

Dr. Clark pointed out that the last draft reviewed by the BOSC had only three rating categories and this latest draft has four. This fourth category (i.e., exceeds expectations) was added to convey that a program

is more than satisfactory but less than exceptional. He asked the Board members if they were comfortable with the terms and their definitions, reminding them that they will be explaining to the Subcommittees how to apply the tool.

Dr. Barry Ryan (Emory University) said that the tool will be used in February during the Safe Pesticides/Safe Products (SP2) program review; he will probably have some comments to share on the tool after that review. Dr. Philbert asked if anyone could provide some advice on how to convey the nonlinearity of the rating categories. For example, satisfactory may be very good for a program that has very few resources. Dr. Daston replied that this is the reason the workgroup members thought it was absolutely essential to include a narrative statement that explains the rationale for the rating. The Executive Committee should examine the summary statements and make sure that the members understand the basis of the subcommittee's decisions. He acknowledged that the definitions of the terms are rather broad, but they serve ORD's purpose. EPA needs to know what is working well and what needs improvement.

Dr. Swackhamer commented that the PART review focuses on short-term outcomes, which makes it very difficult for some programs to obtain a respectable score. Does this tool bridge that gap, allowing programs to score a higher rating by assessing long-term progress? Dr. Daston responded that the tool is being used to assess long-term progress. Dr. Swackhamer noted that the only time outcomes are mentioned is in the middle of page 2 of the rating tool document. Given OMB's focus on outcomes, perhaps the subcommittee should discuss the program's performance in terms of outcomes. Dr. Daston said such a discussion should be included in the report as part of the review process. Dr. Swackhamer was concerned that some programs would perform well relative to these questions, but would not score well on a PART review. Dr. Henderson commented that the review report on the PM/Ozone Research Program emphasized outcomes and the Subcommittee tried to identify measures ORD could use to assess outcomes. The Board needs to be aware of outcome measures but it is up to EPA to figure out how to collect data on the measures.

Dr. Lambert noted that outcome is one of the most important parameters, but some outcomes are difficult to measure; for example, the ability to respond to a national emergency such as Hurricane Katrina. Dr. Falk agreed that outcomes measures are tricky. The performance in achieving LTGs and the public benefits of the program could be outcome measures. Dr. Clark commented that this tool focuses on the LTGs, applying all 20 questions across each LTG. The last questions focus on LTGs, not the whole program. This is a good strategy because research for one LTG feeds the others, and some LTGs are leveraged more than others. He noted that it will probably be easier to apply the tool in reviews of smaller, less complex programs.

Dr. Weiss commented that the workgroup is ready to revise the tool as the BOSC conducts more reviews so that it can be improved and brought into alignment with the BOSC's needs. Dr. Duke stated that the Board has learned from each program review conducted and the process now used has evolved over time; those who are the first to use the tool will help those who come behind.

Dr. Henderson made a motion to approve the rating tool and its use for BOSC reviews. Dr. Philbert seconded the motion. Dr. Clark asked if there were any more comments and when none were offered, he called for a vote. The rating tool was approved unanimously by the BOSC.

ORD Response to Computational Toxicology Letter Report

Dr. Robert Kavlock, Director of NCCT, explained that the mission statement of the Computational Toxicology Research Program is "to integrate modern computing and information technology with molecular biology to improve Agency prioritization of data requirements and risk assessment of chemicals." He presented a diagram that describes computational toxicology. The graphic included high

throughput screens (determining which of the 10,000 chemicals with which a biological entity prefers to associate), high content screens (allowing ORD to get much more information out of a sample), systems biology, toxicology, and informatics (processing approaches for bringing information together to integrate it and make sense of it).

The framework document for computational toxicology research was issued in 2003. That document was reviewed by the SAB and the BOSC. An implementation plan was developed in response to the BOSC review that was conducted in April 2005, and that plan was reviewed by the BOSC during the 2006 program review. Dr. Kavlock stated that the program expects to have outcomes in 2008. The vision statement of the program is "an Agency that efficiently characterizes exposure, hazard, and risk through the pervasive use of modern biological tools, information technologies, and computational models.

In FY2002, a congressional redirection called for EDC proof of concepts. In FY2003, ORD began building the foundation of the program—forming a design team, developing the framework document (reviewed by SAB and BOSC), conducting the Research Triangle Park (RTP) workshop, and issuing the Science To Achieve Results (STAR) High Throughput Screening solicitation. In FY2004, implementation of the program began. The Computational Toxicology Implementation Steering Committee was formed, the EDC proof of concepts was expanded, and the STAR Systems Biology solicitation was issued. In FY2005, The NCCT was established, the first BOSC review was conducted, the initiatives were prioritized, and the ToxCast concept was developed. In FY2006, the STAR Informatics Centers were funded, the implementation plan was developed, the second BOSC review was conducted, and hiring authority under Title 42 was granted to offer competitive salaries to individuals with expertise to fill critical data gaps. Dr. Kavlock reported that a systems biologist has been hired under Title 42. In FY2007 and beyond, the program will focus on making an impact with ToxCast, chemoinformatics, the Virtual Liver, and cumulative risk.

The first BOSC Subcommittee review was held in April 2005 and the second in June 2006. The second review addressed nine charge questions that focused on evaluation of progress, the STAR Informatics Centers, impacts and use of outputs, the implementation plan, depth and breadth of the program, responsiveness, communications, and outcomes.

The major comments from the BOSC report and the ORD responses to those comments follow:

BOSC Comment: Responsiveness to program office and regional needs.
ORD Response: Implementation plan, Communities of Practice (CoPs), and outreach to collaborators.

BOSC Comment: Consider establishing additional CoPs.
ORD Response: ORD proposed to develop a Cumulative Risk CoP and asked the BOSC for input. There is concern about how many CoPs can be supported by program staff. The program is seeking partners whose goals would be served by the new CoPs to possibly lead the new CoPs.

BOSC Comment: Extend outreach to other parts of EPA.
ORD Response: The program is conducting outreach to other parts of EPA through the Science Policy Council (SPC), Regional Risk Assessors, and the Office of Prevention, Pesticides, and Toxic Substances (OPPTS).

BOSC Comment: Coordinate with STAR Informatic Centers.
ORD Response: The program is conducting frequent site visits to the Centers and coordinating a monthly seminar series. The program has hired a Title 42 Bioinformatician (Richard Judson) and is holding one junior level position.

BOSC Comment: Develop a comprehensive strategic plan for data collection, management, and integration.
ORD Response: This is a top priority for the NCCT and it was supported in the recent meeting of the ORD management. The plan will be facilitated by hiring of the Title 42 Bioinformatician and Computational Systems Biologist. The program proposes to brief the BOSC on the plan in 2007.

BOSC Comment: Consider adding a training component (such as the National Institutes of Health K program).
ORD Response: The program has formed an internal team to develop educational materials (courses and Web content). There are plans to consult the Office of Human Resources Management on career training. There has been recent notable success in recruiting post docs.

BOSC Comment: Pursue additional opportunities outside the mechanistic models (especially in biomarkers that indicate exposure but that are not immediately or directly linked to toxicological response).
ORD Response: The program is accelerating development of the Virtual Liver as a prototype for approach. In addition, the program is beginning to explore a coordinated effort with NHEERL on an arsenic dose-response model.

BOSC Comment: Consider the importance of validating models based on genomic methodologies given the inherent constraints in sample sizes and other challenges with these approaches.
ORD Response: ORD agrees and discussions are underway to develop joint projects related to this topic with NHEERL and NERL. The Virtual Liver and ToxCast programs will be contributing to this important goal.

BOSC Comment: Develop a more detailed work plan for the Virtual Liver model, and have the plan reviewed more extensively by the Computational Toxicology Subcommittee during its next annual review.
ORD Response: With the hiring of a senior level Computational Systems Biologist (Imran Shah), this effort is evolving rapidly. There are plans to brief the BOSC in the FY2007 review cycle.

BOSC Comment: The areas of cumulative risk assessment and cross-species extrapolation are still under-represented, but given the state-of-the-science, it is appropriate to place limited emphasis on these areas for the next 3 to 5 years.
ORD Response: ORD concurs with this assessment and will be looking for ways to close these gaps as the program matures.

BOSC Comment: Given that the NCCT plans to develop tools and methods that will be used by ORD and other EPA staff, the Center should establish a regularly scheduled plan for communication and updates.
ORD Response: The NCCT is working with senior communication staff within ORD to develop a communication plan, including enhancing its Web site, defining the meaning of being a "Center," and wider programmatic briefings (potentially including Congress). The program has provided recent briefings to the SPC and the Regional Risk Assessors, will hold a half-day briefing for OPPTS, will host the International Science Forum in May 2007, and will attend the Organisation for Economic Co-operation and Development **(**OECD)/International Programme on Chemical Safety (IPCS) Molecular Screening Project Satellite Meeting.

The future focus of the program will include the ToxRef Database (collaboration with the Office of Pesticide Programs [OPP] to develop a relational database that can be used as a reference for interpreting activity profiles), Virtual Liver, Array Track (evaluating software developed by the Food and Drug Administration's National Center for Toxicological Research laboratory in Arkansas to determine its

applicability for making data available to the program offices), ToxCast (interpreting bioactivity profiles of chemicals), and ToxMiner.

In closing, Dr. Kavlock expressed his appreciation for the guidance and support of the BOSC as ORD develops the Computational Toxicology Research Program. The new Title 42 hires in Bioinformatics and Computational Systems Biology have filled critical expertise gaps and they have had a tremendous impact on the program that continues to accelerate. The program is holding one junior level informatic support position that will be filled as needs are better defined. He expects to hire a senior level scientist (potentially a Title 42 position) who has expertise in genomics in the very near future. The NCCT is continuing to refine its educational and communication activities, and will be placing increasing emphasis on them in the coming year. The program is prepared to provide detailed briefings to the BOSC on the ToxCast and Virtual Liver projects, as well as an information management strategy and potentially on communication plans. Dr. Kavlock asked how the BOSC would like to be briefed on these topics (ToxCast, Virtual Liver, etc.). After the Science Forum to be held May 21-23, 2007, the program could do a 1½-day briefing on several topics; alternatively, a series of teleconferences could be scheduled during which the BOSC could be briefed on a single topic per teleconference. He asked the BOSC Chair to indicate the Board's preference.

Dr. Clark thanked Dr. Kavlock for presenting ORD's response and asked if the BOSC members had any questions. He expressed interest in the tone and nature of the discussions with the science policy and regulatory staff members because that is where the research is used to solve real-world problems. Dr. Kavlock responded that both briefings were done by teleconference so it was difficult to judge the reaction of the audience. What was presented was quite new to them. Following the briefings, Dr. Kavlock received several e-mails requesting the presentation and expressing interest in future discussions. The OPP briefing will be several hours and provide more detail. He noted that cumulative risk is a real issue with OPP and the office needs help in that area. The ToxCast approach is where the program will have an impact on cumulative risk—building a systems understanding of cell biology will help determine the pathways with which the chemicals interact. The ability to find these pathways will open doors for looking at cumulative risk in a way that has never been done before.

With regard to the BOSC's preference for briefings, the Computational Toxicology Subcommittee will discuss this and get back to Dr. Kavlock. Dr. Clark asked the Executive Committee members to let him know if they would like to be briefed on the program's projects.

Dr. Henderson asked for clarification with respect to the ToxRef Database. Are you developing a large relational database on various chemicals? She mentioned that there has been some discussion about doing this for National Ambient Air Quality Standards (NAAQS) pollutants to accelerate the review for the Clean Air Science Advisory Committee (CASAC). Has there been any progress on that? Dr. Kavlock replied that although he had not been involved with any discussions on NAAQS pollutants, he has talked to George Woodall about an inhalation toxicology database. Dr. Henderson thought it would be helpful to integrate these database efforts. Dr. Kavlock agreed, stating that ORD should ensure that they are not redundant. He noted that researchers in The Netherlands are extracting data on high volume production chemicals; perhaps ORD can work with those involved with that effort to avoid having to repeat the work. The goal is to get the maximum use of the data.

Dr. Lambert asked if the program is looking at the genetics of asthma or autism. Have you started integrating the genetics of selective disease states? Dr. Kavlock responded that the current work is directed more at rodent toxicology and the better targeting of the use of animals in toxicology studies. Genetics has not been a major focus, but Dr. Jane Gallagher of NHEERL is involved in a project in the Detroit area that is looking at the exposure of school children to organics and metals and the relationship to asthma. A large component of this study focuses on genetics. Dr. Richard Judson, one of the Title 42 hires, came from a company that has been trying to design personalized medicines so the program

probably will move in that direction. Dr. Kavlock noted that there is a need to understand the pathways first.

Dr. Clark will refer Dr. Kavlock's request concerning briefing the BOSC to the Computational Toxicology Subcommittee. Perhaps the Executive Committee members can sit in with the Subcommittee members on those teleconferences if that is the preferred approach for briefing the BOSC.

Dr. Daston thought the ORD response was appropriate. He was glad to see the program doing some international outreach, noting that the European Commission may have a greater need for ToxCast now that the REACH regulation was formally adopted in December. Dr. Daston recommended keeping REACH informed of program activities. Dr. Kavlock agreed but added that, unfortunately, the key REACH members cannot attend the Science Forum in May because of scheduling conflicts; however, some REACH representatives will be attending the Forum.

Subcommittee Updates

Computational Toxicology Subcommittee

Dr. Daston, Chair of the Computational Toxicology Subcommittee, reported that the Computational Toxicology Research Program is new but it is making great progress. He had not seen the ORD response before this meeting and he liked the idea of the briefing on the ToxCast and Virtual Liver projects. Perhaps the annual Subcommittee meetings should take a more targeted focus on one or two of the projects. The program has made some excellent additions to the staff and the Subcommittee has been very supportive of those actions. He agrees that there needs to be some mechanism for the program to share information on its progress with the BOSC. The CoPs are a great success story, but he acknowledged that NCCT cannot lead all of the CoPs, suggesting that it may be appropriate for the program office that needs the support to lead the cumulative risk CoP. The program is developing a wide variety of educational tools and programs. The challenge is to get the program offices and regions to understand the value of what the program is producing. This understanding will increase the chances that the program's tools will have an impact within the Agency. The Subcommittee should meet again in the fall of 2007; the meeting should include updates on the ToxCast and Virtual Liver projects.

Human Health Mid-Cycle Review Subcommittee

Dr. Clark, Chair of the Human Health Mid-Cycle Review Subcommittee, explained that the BOSC Human Health Subcommittee conducted a program review of the Human Health Research Program (HHRP) in February-March 2005. The HHRP is a very large, complex program and it was a challenge to conduct the program review. For the 2005 program review, the Subcommittee members participated in three conference calls prior to the meeting and reviewed the Multi-Year Plan (MYP), the strategic plan, and project descriptions. The members attended a 2 ½-day meeting that was held in RTP, which included researchers from various laboratories and centers involved in the program. The Subcommittee then prepared a report, which was approved by the BOSC Executive Committee and submitted to ORD.

In the 2005 program review, the BOSC looked at measures of performance for the success of the research, the publications resulting from the program, and the impact of the program on Agency decisions. The BOSC made suggestions on how to better quantify performance. The most controversial LTG was risk management/risk decision making. In 2005, the BOSC indicated that this LTG needed more work and the program needed to explain how it planned to achieve this goal. The BOSC also recommended that the MYP for the program be better organized. Dr. Clark stated that Dr. Hugh Tilson, the NPD for the HHRP, leads the effort to develop and update the program MYP and then draws on the resources in the ORD laboratories and centers to conduct the research. He noted that one of the keys to

understanding the program is the MYP—these plans are an important component of the BOSC's program reviews.

Because it had been about 2 years since the program review, the mid-cycle review was scheduled, a charge was developed for the review, and the Human Health Mid-Cycle Review Subcommittee was formed from a subset of the original Human Health Subcommittee. All four of the Mid-Cycle Review Subcommittee members participated in the 2005 program review, which provides them with considerable knowledge of the review process and the program. Since the review, ORD has rewritten the MYP and responded to a number of other recommendations made by the BOSC, so the BOSC agreed it was time to conduct a mid-cycle review. Dr. Clark explained that a mid-cycle review is more focused and has a smaller charge than a program review. The draft charge for the mid-cycle review, which includes objectives and draft charge questions, was provided in the meeting notebook. Also included in the notebook was the table of contents for the notebook of materials that was distributed to the Subcommittee.

Since the 2005 review, the program has reworked the risk management/risk decision making LTG and made it more relevant to Agency decisions. The last question of the charge is to rate the progress using the rating tool that the BOSC just adopted. This will be the first application of this tool in a BOSC review.

For the mid-cycle review, the Subcommittee members have participated in two pre-meeting conference calls—one on December 12, 2006, that involved administrative issues and the requirements of FACA, and one on January 9, 2007, during which Dr. Tilson presented ORD's response to the 2005 program review and several future directions being considered by the program.

The face-to-face meeting for the mid-cycle review will be held tomorrow, January 24. Dr. Clark invited any interested BOSC members to attend the review meeting. He noted that the Subcommittee members were asked to draft responses to the charge questions and bring them to the meeting. Dr. Clark hoped that a first draft of the report would be developed by the end of the day. The report will be finalized by the Subcommittee during a follow-up conference call and presented to the BOSC Executive Committee for review and approval at the BOSC's next meeting in May.

Dr. Falk asked Dr. Clark to explain the relationship between programs and laboratories and centers. Dr. Clark responded that the HHRP is a program that is coordinated by the NPD. The research required to achieve the program's goals and outputs is conducted by the ORD laboratories and centers. Dr. Falk then asked if the laboratory/center personnel report to the NPDs. Dr. Teichman agreed to provide the "ORD 101" presentation to Dr. Falk, which explains this relationship. (Dr. Falk was the only new member who was unable to attend the orientation briefing conducted by Ms. Kowalski.) The Laboratory/Center Directors supervise the researchers; the NPDs plan the strategic direction for the program. If the NPD thinks there needs to be a shift in the strategic direction, the NPD can recommend that change to ORD senior management. The Laboratory/Center Directors can express their thoughts regarding the shift, but the final decision is made at the top. NPDs work with the program and regional offices to develop the strategic direction of a program, then the Laboratory/Center Directors provide or hire the expertise needed to achieve the results. This process differs slightly for the HHRP and Ecological Research Program because these programs are core and may not be applied directly by the program and regional offices as much as other programs. For example, the HHRP may use pesticides in a research project, but the purpose of the project is not to support OPP. Dr. Falk commented that CDC is moving in this direction—having one group setting goals and other groups implementing the work to achieve them.

Dr. Demerjian asked why all of the original Human Health Subcommittee members were not on the Mid-Cycle Review Subcommittee. Dr. Clark responded that two of the members of the original Subcommittee had received EPA funding so they could not participate in the review. Ms. Kowalski mentioned that the

intention is to have one person for each program LTG on each mid-cycle review subcommittee, so if there are four LTGs, there would be four subcommittee members.

Dr. Haas said that it appears that the programs overlap. Dr. Teichman replied that they do not overlap in terms of budget but the programs' efforts complement each other.

Safe Pesticides/Safe Products Subcommittee

Dr. Ryan, Vice Chair of the SP2 Subcommittee, provided the update on behalf of the Chair, Dr. Harding, who was unable to attend the meeting. Dr. Ryan stated that during fall 2006, there were a number of telephone calls and e-mail communications with the Subcommittee DFO, Heather Drumm. Drs. Harding and Ryan evaluated a list of potential Subcommittee members and prioritized the list with the DFO. Ms. Drumm then contacted the individuals according to the priority developed. The following individuals have agreed to serve on the Subcommittee:

- ✧ Craig Adams, Department of Civil, Architectural, and Environmental Engineering, University of Missouri–Rolla
  Expertise: Drinking Water and Metals in the Environment and Environmental Engineering

- ✧ Jerald Ault, Rosenstiel School of Marine and Atmospheric Sciences, University of Miami
  Expertise: Theoretical and Applied Tropical Marine Biology

- ✧ Elly Best, Environmental Processes and Engineering Division, U.S. Army Engineering Research and Development Center
  Expertise: Aquatic Plant Ecology

- ✧ Joel Coats, Department of Entomology, Iowa State University
  Expertise: Pesticide Toxicology and Entomology

- ✧ Judy Graham, American Chemistry Council (also 32 years at EPA)
  Expertise: Toxicology, Risk Assessment, and Exposure Analysis

There also are two Subcommittee consultants:

- ✧ Carlos Blanco, U.S. Department of Agriculture
  Expertise: Biotechnology and Insect Resistance, Genetically Engineered Crops

- ✧ Richard Di Guilio, Nicholas School of the Environment and Earth Sciences, Duke University
  Expertise: Computational Toxicology

There have been two conference calls to date. The first one was held on December 15, 2006, and it was an administrative call focusing on procedures and timelines for reports. The second was a public conference call that was held on January 17, 2007, a few days after the Subcommittee members received a large binder of materials that included the Subcommittee's charge, a list of the program LTGs, and other materials needed for the review.

All of the Subcommittee members were present for at least the majority of the January 17 teleconference. Ms. Drumm reviewed the rules and requirements of the FACA process. She also defined the role of the Subcommittee Chair and addressed other administrative matters. Ms. Drumm indicated that an additional FACA conference call was scheduled for January 29, 2007, and the face-to-face meeting was scheduled for February 7-9, 2007 in RTP, North Carolina. Ms. Drumm also mentioned that the Subcommittee would divide into small workgroups to begin writing assignments.

Jeff Morris, Acting Director of the Office of Science Policy (OSP), gave the group an overview of ORD, and Phillip Juengst (EPA/ORD) addressed the rating charge questions to the Subcommittee. One new component he described was the use of the four category qualitative assessment rating scheme required for each LTG. Although the terminology was still in flux last week, the BOSC now knows that the four categories are "exceptional," "exceeds expectations," "satisfactory," and "unsatisfactory" with each term having a specific meaning with respect to goals met and the timeliness of actions.

Mr. Juengst's presentation was followed by one from Dr. Elaine Francis, the NPD for the SP2 Program, in which she outlined the SP2 research program for the Subcommittee. She also described the review process that would occur at the face-to-face meeting.

Upon completion of the formal presentations, Dr. Harding initiated a discussion regarding the framework for evaluation. It was agreed that workgroups of two or three Subcommittee members would be formed to work on each LTG. Each workgroup was to have a draft written prior to the face-to-face meeting. Each charge question will be addressed separately for each LTG.

Dr. Ryan explained that he and Dr. Harding were not designated as a lead for an LTG because they will be responsible for integrating the drafts of the workgroups into a cohesive report. The target date for completion of a draft report is April 1, 2007.

An additional public conference call may be required after the face-to-face meeting to complete and approve the report. There certainly will be the need for communication among workgroup members, but the workgroup communications will not invoke FACA rules because less than half of the Subcommittee will be in attendance at any workgroup meeting or call.

For the benefit of the new BOSC members, Dr. Clark explained that the Chairs and sometimes Vice Chairs of the Subcommittees are usually members of the BOSC Executive Committee. As new subcommittees are formed, there will be opportunities for new members to serve in this capacity. He also noted that two vettors from the Executive Committee are assigned to each Subcommittee report to ensure that the Subcommittee addresses the BOSC's comments. Dr. Clark asked members to notify him if they would like to serve as a vettor for any of the reports that will be coming to the Board in May.

Ms. Kowalski drew attention to Section B of the SP2 Subcommittee charge, which involves assessing performance by LTG. When the charge was originally drafted, the Subcommittee was to rate three questions per LTG and then provide an overall LTG rating. Now, the Subcommittee will take into account the responses to those three questions in assigning an overall rating for the LTG. Ms. Kowalski requested feedback on this approach. Dr. Ryan asked if the feedback was needed before the May meeting and Ms. Kowalski responded that it would be better to get the feedback sooner. She asked the members to e-mail their comments to Dr. Clark and copy her so ORD can assess how well the tool is working and determine if it is necessary to reconvene the rating tool workgroup to revise the tool before the May BOSC meeting so that any revisions could be approved by the Executive Committee at that meeting.

Technology for Sustainability Subcommittee

Dr. John Giesy, Subcommittee Chair, was not present to give the BOSC an update. Dr. Teichman provided a brief history on the ORD program. He explained that this program has its origins in the Pollution Prevention (P2) and New Technology program. Although the research of the predecessor program was related to sustainability, it did not include the entire picture. EPA needed a strategy that would move the entire Agency toward sustainability to ensure that we leave the world behind us in a condition that is at least as good as when we came. ORD developed a Technology for Sustainability

MYP that describes the planned research activities. Dr. Teichman noted that the strategic thinking for all MYPs will include sustainability.

The program review will include elements of the P2 program that related to the three LTGs of the Technology for Sustainability Research Program. The P2 program did not include any research that would address LTG 1, develop sustainable metrics. Therefore, the Subcommittee will not examine past performance for LTG 1. The Subcommittee will, however, assess past performance for LTGs 2 and 3. Dr. Teichman commented that this makes the Technology for Sustainability Research Program review somewhat different from the others done by the BOSC.

Ms. Kowalski emphasized that only two LTGs will be rated using the new rating tool. She stated that, in addition to Dr. Giesy, the Subcommittee includes:

- ✧ Wayne Landis, Western Washington University
- ✧ Concepción Jiménez-González, GlaxoSmithKline
- ✧ Earl Beaver, Institute for Sustainability
- ✧ Martin Abraham, University of Toledo
- ✧ Ted Tomasi, ENTRIX, Inc.
- ✧ Peter Blaze Corcoran, Florida Gulf Coast University

The first Subcommittee conference call was held on January 23, and the second call is scheduled for late February. The face-to-face meeting will be held in late March in Cincinnati, Ohio. The report is expected to be presented to the BOSC Executive Committee for review at the May meeting.

Dr. Henderson commented that the SAB just completed a review of the sustainability program. Ms. Kowalski responded that the SAB just reviewed the Agency-wide sustainability strategy and the MYP. It was a review of a strategic plan and the MYP, not a retrospective and prospective review of ORD's research program.

Dr. Lambert commented that the SAB could benefit from BOSC involvement in such reviews. He thought there should be more communication between the two boards, noting that the reviews of both groups probably would be enhanced from such communication. He suggested that some thought be given to how to better integrate the efforts of the two boards.

Ms. Kowalski responded that her intention was to include a member from the SAB group that worked on the sustainability review on the BOSC Technology for Sustainability Subcommittee. She contacted several engineers and economists who worked on the SAB review but none of them were available to serve on the Subcommittee. Dr. Lambert suggested that the communication between the two boards be increased and Ms. Kowalski agreed to include this as an action item.

Human Health Risk Assessment Subcommittee

Dr. Daston, Chair of the Human Health Risk Assessment Subcommittee, commented that because there is no PART review scheduled for this program, the deadline for the program review is not pressing. He is working with the DFO, Joanna Foellmer, to assemble the Subcommittee, with the goal of establishing a balance among risk assessment, toxicology, and human disease expertise. He wants to ensure that the Subcommittee includes individuals who have practical risk assessment experience, such as those working in state agencies, academia, or industry. The draft charge will be provided to the Subcommittee in the next week or so. The face-to-face meeting probably will be held in September 2007.

Dr. Haas asked if these are chemical risk assessments, and Dr. Daston confirmed that they are chemical risk assessments rather than microbial risk assessments.

Homeland Security Subcommittee

Dr. Gary Sayler (University of Tennessee), Chair of the Homeland Security Subcommittee, reported that this is the first BOSC review of the Homeland Security Research Program. He explained that after 9/11, a virtual homeland security research center was created in Cincinnati. That center, called the National Homeland Security Research Center (NHSRC), was made a permanent ORD center in September 2002.

Greg Susanke (EPA/ORD) is the DFO for the Subcommittee and he is working with Dr. Sayler to form the Subcommittee. A diverse range of expertise is needed to review the program. Seven of the eight members have been identified and have agreed to serve on the Subcommittee. Dr. Sayler noted that the members will need some level of security clearance. Two conference calls will be scheduled prior to the face-to-face meeting, which probably will be held in late October 2007. The report will be finalized on a conference call in November, and it will be presented to the BOSC Executive Committee at the January 2008 meeting. The charge is being developed by ORD and will be provided to the Subcommittee soon.

Dr. Philbert asked how it will be possible for the Subcommittee to present its findings to the Executive Committee if the Subcommittee members must have security clearances to conduct the review. Dr. Sayler said the members will have to exercise some judgment regarding what can be included in the report. Ms. Kowalski stated that all BOSC reports are public reports; therefore, whatever is presented to the Executive Committee will be available to the public. She assumed that parts of the program review meeting will be closed to the public because the Subcommittee members will be reviewing materials that are secret. The report, however, must be presented to the Executive Committee and made available to the public. She reminded the BOSC that the Executive Committee has received briefings on the NHSRC in the past that did not require the members to have security clearances. Dr. Daston was concerned that it may be necessary to discuss classified information in the Subcommittee report to provide the level of advice needed by ORD to improve the program. He asked if it would be possible to have both a public and private report. Dr. Haas said that he served on a review panel for NAS that required security clearances and the panel had no difficulty preparing the report that could be released to the public. In response to Dr. Sayler's inquiry regarding how many Executive Committee members had security clearances, Drs. Haas, Falk, and Daston indicated that they have secret clearances.

Standing Subcommittees

Common Process Outline

Susan Peterson (EPA/ORD) reported that ORD requested that the BOSC form standing subcommittees to provide ongoing advice to the Laboratory and Center Directors. These subcommittees will become familiar with the workings of their respective laboratories/centers and provide advice on management and administrative issues, strategic plans, career development, training and outreach, etc. She referred to the proposal for implementing the standing laboratory/center subcommittees, which was included in the meeting notebook.

The BOSC has agreed to establish two pilot standing laboratory/center subcommittees—the NCER Subcommittee and the NERL Subcommittee. The NCER Subcommittee is chaired by Dr. Philbert and the NERL Subcommittee is chaired by Dr. Demerjian. The initial conference call for each of these Subcommittees probably will be held in May 2007. The first meeting likely will be a 3-day meeting at the laboratory/center. It is anticipated that there will be one annual face-to-face meeting and as many conference calls as needed to provide advice to the Laboratory/Center Director. The nature of the meeting/call(s) will be dependent on the needs of the Laboratory/Center. The Subcommittee may help identify ways that the laboratory/center could conduct its research more efficiently or emerging issues that need to be addressed. Ms. Peterson stated that the Subcommittee will prepare a letter report that provides

the requested advice. The letter report will be submitted to the BOSC Executive Committee for review; the Executive Committee will revise the report if necessary and approve it for submission to ORD.

Dr. Falk asked if subcommittees will be established for the other laboratories/centers. Ms. Kowalski replied that additional subcommittees may be formed; however, ORD and the BOSC would like to try it as a pilot first.

NERL and NCER Subcommittees

Dr. Demerjian has begun to look at the areas of expertise needed for the NERL Subcommittee. He suggested that it may make sense to match the expertise distribution to the distribution of funds in the laboratory. He was not sure if that would be the best approach, but he was certain that the Laboratory Director should review the areas and balance of expertise on the Subcommittee to ensure that the mix reflects the emphasis of the Director. Dr. Philbert agreed, stating that he was having difficulty evaluating which potential reviewers should serve on the NCER Subcommittee.

Ms. Kowalski acknowledged that this will be a difficult task for the two pilot standing subcommittees because they do not have charges yet and it is not clear what the subcommittees will be doing. Dr. Demerjian asked if it would be possible to wait to identify the subcommittee members until after the charge is available. Ms. Kowalski responded that the NCER Director has identified some items for the Subcommittee to review. She mentioned that the idea of having a standing subcommittee for the laboratory/center is so that the members gain familiarity with the laboratory/center and can provide better, more relevant advice. She noted, however, that expertise can be added as needed from year to year. She suggested 1-year terms for the subcommittee members, which would allow some members to rotate off the subcommittee and new ones to join. Ms. Kowalski agreed to arrange for conference calls with the NERL and NCER Directors with the respective Subcommittee Chairs so that the Directors can provide input with respect to the types of expertise they expect will be needed for the Subcommittees.

Dr. Falk asked if other parts of EPA have advisory committees similar to the BOSC. Ms. Kowalski replied that there are about 25 federal advisory committees at EPA. Every FACA committee has a charter and each year the Agency determines if the committee should be continued. A number of FACA committees are sponsored by the Assistant Administrators. The Administrator's office has several as well. Each FACA committee has a mission that identifies its focus. She explained that the SAB provides advice across the Agency, including ORD. There is a limit on the number of FACA committees that can be sponsored by EPA as well as a limit for the entire federal government.

Dr. Henderson asked if a letter report will be prepared following each advisory call and meeting. Who is responsible for writing the report? Ms. Kowalski replied that the Subcommittee would write the report and the members would determine what to include in the report.

Ms. Kowalski reminded the Executive Committee members that the previous draft of the common process included an option for information exchange that would not be covered by FACA (and was an approved approach per EPA's FACA attorney). After getting negative feedback from the BOSC at the October meeting about this option, ORD decided not to pursue this approach. All deliberations of the laboratory/center subcommittees will be in a public forum and the advice to the Directors will be transmitted in a letter report through the Executive Committee. She noted that the Laboratory/Center Directors can contact the Subcommittee Chair or other members individually to ask for feedback on a topic. Dr. Demerjian asked if the Chair must notify the DFO of these contacts, and Ms. Kowalski replied that such notification is not required. Dr. Lambert expressed some concern about discussing certain issues in an open forum; it limits ORD's ability to share confidential data and other information that EPA may not want released to the public. Ms. Kowalski understood Dr. Lambert's concerns but responded that the BOSC subcommittees must operate under these rules.

Dr. Philbert asked about the direction of the information flow. Ms. Kowalski responded that the subcommittee would prepare a letter report and submit it to the Executive Committee. The Executive Committee would review, change if necessary, and approve the letter report, which then would be transmitted to the AA/ORD. The report also may be submitted to the appropriate Laboratory/Center Director at the same time it goes to the AA/ORD. Dr. Swackhamer asked if there would be only one letter report each year following the annual meeting. Ms. Kowalski answered that teleconferences also could result in letter reports, but there must be a quorum of members to make decisions. Ms. Kowalski reminded the BOSC members that the subcommittees cannot provide advice directly to EPA. The advice must come from the Executive Committee. There will be a charge developed for each public meeting/call. The product from the meeting/call will depend on that charge.

Dr. Henderson advised the Subcommittee Chairs to consult their DFOs if they have any questions about what the Subcommittee can and cannot do. Dr. Swackhamer asked if the charge questions for the laboratory/center subcommittees will be developed by the Laboratory/Center Directors. Ms. Kowalski responded that the Directors and the DFOs will work with the Subcommittee Chairs to develop the charge questions.

Dr. Demerjian thought it might be helpful to discuss with the Directors their priorities for the first year. Dr. Philbert thought it might be useful for him, Dr. Demerjian, and Ms. Peterson to meet after the NERL and NCER Subcommittees have been operating for 1 year to write down procedures that will help streamline the process. Ms. Kowalski agreed that as these two Subcommittees work through the process, they will make recommendations on how to change the common procedures. Feedback on the process will be very helpful and this is why ORD decided to begin with two pilot subcommittees.

Dr. Weiss asked if the impetus for forming these standing subcommittees originated with the Laboratory/Center Directors. Ms. Kowalski replied that this idea arose before she became the DFO; however, she understood that there was interest on both sides. Dr. Clark explained that the reviews originally conducted by the BOSC were reviews of the laboratories and centers. When ORD started writing MYPs, the BOSC began reviewing those, and then began reviewing the research programs. The Laboratory/Center Directors and the BOSC thought the early laboratory/center reviews were helpful, so it was agreed that two pilot standing subcommittees would be formed. Dr. Henderson mentioned that there was some initial concern about the BOSC taking on this extra task; the compromise was to start small with only two laboratories/centers.

Dr. Demerjian said his next step will be a discussion of needed expertise with the NERL Director. Dr. Philbert agreed, adding that he will look to Ms. Peterson for guidance on how to proceed.

Dr. Clark stated that the BOSC will evaluate the effectiveness of the NERL and NCER Subcommittees before creating additional laboratory/center subcommittees.

Because there was some time before Dr. Munns joined the meeting by telephone to make his presentation on the Ecological Benefits Assessment Plan, Dr. Clark asked Dr. Lambert if he would be willing to make his presentation on SAB activities.

SAB Activities

Referring to the table provided in the meeting notebook, Dr. Lambert stated that this is the SAB's game plan for 2007. The table includes all of the requests from the various EPA offices. It identifies the requesting office, the topic, the type of advice (e.g., peer review, consultation, advisory), and the responsible committee/panel. Dr. Lambert pointed out that, unlike the previous tables presented to the BOSC, this one did not identify the status of the projects. He noted that the projects in the shaded area are

those for which the SAB has received a request from EPA but the SAB has not yet scheduled these reviews. He indicated that Dr. Vanessa Vu, Director of the SAB Staff Office, and Dr. Granger Morgan, Chair of the SAB, are interested in exchanging information with the BOSC. Dr. Lambert asked the BOSC members to notify Ms. Kowalski if there are any SAB activities with which they want to be involved. Ms. Kowalski will notify Dr. Vu of the BOSC's interest. Dr. Lambert stated that he was not sure that the SAB would be able to accommodate many of the requests that are shaded in the table.

Dr. Lambert noted a few of the projects that might be of interest to the BOSC, such as the Arsenic Health Effects Assessment and the Sustainability Research Strategy. He indicated that the Science Programs Investment Advisory, which is a review of the EPA budget, is scheduled for February 22-23, 2007. The SAB has discussed how the budget review should be conducted this year and the impact that the SAB reviews have had in the past on the EPA budget. Dr. Lambert mentioned that the SAB's input on the STAR Program helped emphasize the importance of that program within the Agency.

The review of the *Report on the Environment* should be underway, but the SAB has not yet received the report. He asked if the BOSC has any plans with respect to reviewing the *Report on the Environment*. Dr. Clark replied that the BOSC currently has no role in reviewing that report. Dr. Swackhamer said that she is chairing the SAB panel that will be reviewing the report. Nominees for the panel are being considered now so there is an opportunity for BOSC members to be involved with that review.

Dr. Falk asked if there is a clear distinction between the topics/products referred to the SAB and those that are submitted to the BOSC. Dr. Clark responded that the two Boards have two different charters but there is no clear statement about what topics or products are reviewed by these Boards. Dr. Lambert pointed out that the SAB does not review process or policy—only science and products. Ms. Kowalski suggested that Dr. Falk pose that question to Dr. Teichman when he rejoins the meeting. She noted that these decisions are made at the Assistant Administrator level within the Agency.

Dr. Clark asked if any members would be interested in participating in the SAB budget review meeting to be held in February. Dr. Jim Johnson participated in the review of the 2007 budget and because he had participated in the review of the Drinking Water Research Program, he was able to provide some insightful comments during the SAB review. Dr. Clark asked if the review will be program by program. Dr. Lambert responded that the review has been slightly different each year. The SAB Chair is trying to determine how to conduct it this year. The focus may be cross-cutting issues, but there has to be some review of individual programs to be responsive to EPA's request. Drs. Gray and Teichman are working with Dr. Morgan on how to conduct the review. It is anticipated that there will be a presentation from EPA and a breakout session that will involve an interchange between EPA and the SAB.

Dr. Swackhamer commented that she thinks Dr. Morgan will devote less than one-half of the meeting to the 2008 budget; the major focus will be influencing budget development within EPA. Therefore, the meeting will focus less on the existing budget and more on influencing EPA's 2008 to 2012 budgets.

Dr. Clark said that he will ask again for volunteers to attend the SAB budget review following Dr. Teichman's presentation later this afternoon. He also asked BOSC members who are interested in participating in the SAB review of the *Report on the Environment* to notify him or Ms. Kowalski. Dr. Swackhamer stated that Dr. Tom Armitage is the DFO for the *Report on the Environment* review.

Public Comment

At 2:30 p.m., the discussion was paused so that Ms. Kowalski could call for public comments. No comments were offered and the discussion resumed.

SAB Activities (Continued)

Dr. Lambert reiterated that the BOSC has a standing invitation to become involved in any of the SAB activities. Members who are interested in a particular review should notify Ms. Kowalski. Dr. Sayler noted that there were some homeland security topics in the shaded area of the table. Dr. Lambert responded that the SAB has not yet agreed to do those reviews so they may not take place in 2007. Dr. Sayler then asked if the HSAC is the Homeland Security Advisory Committee and Dr. Haas replied in the affirmative.

Dr. Clark thanked Dr. Lambert for the update on SAB activities and he asked the BOSC members to consider participating in some of the SAB projects.

ORD Update

Dr. Teichman announced that Dr. Bill Farland, recently retired from his position as Deputy Assistant Administrator for Science, and Dr. Peter Preuss, Director of the National Center for Environmental Assessment (NCEA), were recipients of the 2006 Presidential Rank Awards for Meritorious Senior Professional. This is the highest level of award for EPA staff members and it requires Presidential review.

ORD was a large contributor to the new EPA Climate Change Web Site, which includes issues of science, climate policy, and what individuals can do to help address this problem. The third edition of the Peer Review Handbook was distributed to the BOSC members. Dr. Teichman commented that EPA has one of the best federal models for peer review and the Agency is proud of its handbook. He mentioned that Drs. Daston and Haas will be presenters/facilitators at an upcoming ORD workshop. In response to Dr. Daston's interest in hearing about biodiesel fuels, Dr. Teichman stated that Donna Perla (EPA/ORD) is working on that topic.

EPA awards approximately $4-5 million of fellowships to students through the STAR and Greater Research Opportunities (GRO) Programs. Dr. Teichman also mentioned that ORD is looking forward to the BOSC's first mid-cycle review, which will be conducted tomorrow. There are four additional mid-cycle reviews to follow later this year. He stated that Dr. Donna Roa, ORD Public Affairs Director, will provide an update on ORD's communications efforts and Dr. Wayne Munns will present the Ecological Benefits Assessment Plan.

Dr. Teichman then made a brief presentation on the strategic directions for ORD, which was a summary of what he presented to the SAB in December. ORD is trying to move away from the annual year-by-year planning and take a more strategic longer term approach to budget development. He identified the key needs for SAB advice: (1) where ORD should be in 2012 (areas of increased emphasis and areas of decreased emphasis), and (2) the scientific considerations in getting there (strategic workforce planning, efficiency opportunities). In the past, the SAB has reviewed the annual budget in February and testified on the Hill in March. The SAB usually finds that the budget is insufficient in some areas. This year, ORD wants the SAB to provide advice on which areas should be emphasized and which areas should be de-emphasized. The SAB was reluctant to provide advice on what areas to decrease, but Dr. Teichman argued that ORD needs this advice. ORD also wants advice on the type of expertise that will be needed in the future.

Dr. Teichman noted a number of important considerations for the budget review: (1) the FY2008 President's budget request will be EPA's basis for guidance out to 2012; (2) the assumption that fixed costs will continue to increase at their historic rates; (3) ORD will maintain high-quality support for its scientists; (4) ORD is committed to maintaining the STAR Program at least at its current level; and (5)

the above implies a more-focused program by 2012. The SAB was told to assume that the budget will be flat from 2008 to 2012.

ORD will hold strategic directions discussions in December and January. These discussions—together with advice from the SAB, ORD clients, and others—will lead to 2008 to 2012 strategic guidance. This guidance will begin to be implemented immediately and incorporated into ORD's FY2009 planning decisions. The NPDs already have identified the strategic directions for their programs through 2012 and this was done with the assumption that the programs would receive no additional resources. The strategic directions developed by the NPDs had to be presented to the ORD Executive Council in no more than three pages and two slides at a 1 ½ day meeting. Everyone involved with that meeting thought this was a good approach because it did not allow the budget to drive the science. Following these presentations, the Executive Council met to discuss ORD's strategic directions and some changes were made to the NPD's plans. Last week, the Laboratory/Center Directors proposed to the NPDs where the laboratories and centers can engage to meet the programs' needs. The Directors also identified where they were lacking the required expertise. This approach focused the discussion on the science rather than the budget. Dr. Teichman hopes that the NPDs will be able to present their proposed strategic directions for their programs to the SAB and obtain feedback. This approach to the budget review is quite different from those taken in the past. Dr. Teichman believes that this approach will be better because it focuses on where to go and not just on the budget for the year. He commented that Dr. Morgan agrees with taking this longer term perspective. Some topics for discussion at the SAB review meeting may be climate change, sensitive populations, urban sprawl, and environmental disasters (natural and terrorist).

Dr. Teichman stated that the budget review is a longstanding SAB task but the SAB has reached out to the BOSC to provide assistance. The SAB would welcome BOSC input, particularly from those members who have served on program reviews or mid-cycle reviews.

Dr. Falk asked why the SAB selected the four topics mentioned earlier. Dr. Teichman could not explain how they were identified but there was more information provided in the memorandum. He thought the SAB wanted to focus on these topics to find out what is being done across the Agency to address them. For example, EPA has a modest research program in climate change so the SAB wanted to take a more cross-cutting view of what the other programs are doing that might address climate change. Dr. Swackhamer commented that these four topics resulted from a discussion at the last SAB meeting; the review will focus on these cross-cutting topics.

Dr. Clark complimented Dr. Teichman on the proposed strategic approach for the budget review. It appears to be a sound approach. How does this relate to the MYPs? Does this process increase ORD's faith in the MYP development process? Dr. Teichman responded that he is somewhat biased because he helped to implement the MYP process; however, he believes that the MYPs have served ORD well. He asked that the BOSC members keep in mind that some of the MYPs were developed 5 years ago and the program managers never met together to discuss all of the plans and to figure out how they impact one another. He noted that the ecological program will shift more toward ecosystem services and away from the Environmental Monitoring and Assessment Program (EMAP). EPA needs to quantify the benefits of ecological research to support rulemaking.

Dr. Henderson asked how OMB influences the budget. Dr. Teichman replied that before February each year, EPA considers advice on the budget from the Office of Science and Technology Policy (OSTP), OMB, the SAB, and others. This advice usually is rather broad. EPA then does its planning inside ORD and the other offices and prepares an Agency budget request. This request is submitted to OMB and when EPA and OMB come to agreement on the budget, it is released in February of the subsequent year. Dr. Teichman explained that EPA staff members cannot discuss the budget while it is in process. Congress reviews the budget request and may call on the SAB to testify concerning the budget. Congress

prepares a bill, approves it, and then the Agency has a budget. When Congress cannot come to an agreement on the budget, the government operates under a continuing resolution.

Dr. Falk commented that CDC is facing a similar situation with respect to flat or shrinking budgets, and CDC is spending considerable effort developing criteria to make decisions on what programs to de-emphasize. Dr. Teichman responded that, for EPA, the criteria should include high risk—the problem should be a high risk issue on which the Agency could work to reduce that risk. The problem also should be something to which EPA can contribute.

Dr. Clark thanked Dr. Teichman for his ORD update and welcomed Dr. Roa, who presented an update on ORD's communications efforts.

ORD Communications Update

Dr. Roa presented ORD's strategic plan for communications to the BOSC about 2 years ago and she wanted to return and report on the progress that has been made since then. On June 25, 2006, the science communication proposal and science communication staff were approved. The NPDs seemed a logical focal point for implementing the communications efforts so a communications staff member was assigned to work with Dr. Hugh Tilson to develop a process and various communication products for the HHRP. Much work has been done on the protocol and process of communications in the past 2 years and significant outputs are expected in the next few months.

The staff began working to develop appropriate channels and mechanisms for ORD to communicate both internally and externally. The external communication channels identified by Dr. Roa included: Science@EPA, Science Features, NPD Communication: Human Health Research Pilot, 2007 Science Forum, Spanish Access to Science, epa.gov/ord Redesign, and Spanish Science and Technology Portal. The internal communication channels included: What's Happening InORD; ORD@Work Redesign, Research, and Communication; Science Communication Handbook; Executive Media Training; and RTP Exhibit.

On January 17, 2007, the HHRP pilot Web site was launched (http://www.epa.gov/hhrp). The science communication staff also developed various print products to communicate the research of the HHRP, including a suite of "Science in ACTION" factsheets to describe the research that is being conducted by the program and its applications to EPA guidance and decision-making in regional and program offices. A matching accomplishments brochure was developed to describe the purpose of the HHRP, provide highlights of research progress, and outline significant contributions to EPA's decisions, outcomes, and strategic goals. In addition, a Research Contributions Report was developed to provide a comprehensive description of the HHRP and to summarize and highlight EPA's scientific advances in human health research.

Dr. Roa said that the ultimate goal is to establish ORD-wide channels for sharing and communicating information. Science NEWS is an online newsroom that focuses on the national programs and how important questions are being answered using ORD data. For Science FEATURES, the stories on the Web are put into print publications so that they can be provided to target audiences. Dr. Roa explained that Science in ACTION fact sheets focused on results and outcomes and something comparable was needed to communicate research that is in progress. The Science BRIEF was created to fill this need. A PowerPoint presentation for the HHRP also was created to allow Dr. Tilson to explain the program to the program and regional offices, the Research Coordination Team, and others.

Dr. Roa pointed out that a specific color scheme was selected for the HHRP using the ORD color palette. Each program will select a color scheme that will be used on its products to give the program's products a consistent "look."

The next ORD communication product will be an internal electronic newsletter, the first issue of which will be published tomorrow. Science@EPA is another electronic newsletter that covers a wide variety of topics of interest to EPA.

Dr. Roa commented that, with respect to communications, ORD wants to be strategists, not firefighters. She commented that working closely with Dr. Tilson yielded high output very quickly and this approach will be used for the other programs. She noted that ORD would like to assess the effectiveness and the impact of these communication products in late 2007.

Dr. Henderson asked if the science communication staff has given any thought to how to communicate risk. This is one of the Agency's greatest challenges. Dr. Roa responded that her team has not been tasked to do that, but one member of her team has some risk communication experience. Dr. Teichman commented that the Agency's risk communication efforts are more robust than in the past. It is critical that there is a clear understanding of risk so that the best decisions are made.

Dr. Philbert said that he liked this proactive style of communication. He noted that the amount of information is not the problem; rather, it is the configuration of that information into a useful format. Who decides what gets posted on the Web and how it is marketed? Dr. Roa responded that previously there were only links to ORD publications from the EPA Web page. The scientists wanted to tell their stories, but they were too busy writing journal articles and doing the research to prepare the stories for posting on the Web. Therefore, the science communication staff designed a process to create science features for the Web site. Dr. Roa said that ORD has been tracking Web trends and has found that the number of hits has increased because of these new science features.

Ann Brown, the National Program Communications Director, said that she worked with Dr. Tilson and the research team to identify research information needs and the Web site design was based on this input. The primary audience is stakeholders within and outside the Agency. The Web site also can be understood by the general public.

Dr. Weiss asked about the evaluation to be conducted in late 2007. What measures will be used to evaluate effectiveness and impact? Dr. Roa replied that a contractor will be used to evaluate the communication efforts. There are some measures in place for that evaluation (the 345 interviews that she conducted when she began this effort at EPA, pulse surveys, etc.). Questions could be added to the client survey (to be conducted in May 2007) that is mentioned in Dr. Tilson's HHRP presentation.

Dr. Sayler asked if these new communication products actually reach the public. Dr. Roa answered that her focus has been to raise awareness within EPA and to develop the channels for communication. She noted that the public can access the products on the Web site. Dr. Sayler asked if it was possible to determine how many of the hits on the Web site are from members of the public, policy makers, etc. Dr. Roa replied that such information currently is not available.

Dr. Clark thanked Dr. Roa for her presentation and introduced Dr. Wayne Munns who joined the meeting by telephone.

Ecological Benefits Assessment Strategic Plan

Dr. Munns said that his presentation will cover the motivation, vision, and goal of the plan; the scope and audience; development of the plan; priority actions; implementing actions; recognizing success; and accessing the plan.

The motivation for the plan is the: (1) increasing need to understand impacts (both positive and negative) of Agency actions; (2) increasing need to communicate impacts and tradeoffs to the public; and (3) Agency's limited ability to comprehensively quantify impacts and tradeoffs because of current states of science and practice.

Dr. Munns presented a schematic of the challenge, commenting that current Agency benefits assessments often are incomplete with respect to identifying, quantifying, and valuing changes in ecological goods and services. During the early stages of an assessment, some benefits may go unrecognized because complex ecosystems and their interactions with economic systems are not understood completely. As the assessment proceeds, recognized benefits may remain unquantified because of methodological and data limitations. The goal of the plan is to improve Agency decision-making by enhancing EPA's ability to identify, quantify, and estimate the value of the ecological benefits of existing and proposed policies. Dr. Munns described the vision of the plan as follows: (1) natural and social sciences provide models, methods, and information needed to support economic valuation and benefits assessment; (2) ecological benefits assessments are multidisciplinary and based on good science; and (3) Agency decisions are transparent and sound.

The plan was developed with broad Agency participation involving the Office of Policy, Economics, and Innovation (OPEI); ORD; OW; OPPTS; OAR; and Office of Solid Waste and Emergency Response (OSWER). The Agency held information gathering meetings attended by EPA and other federal agency ecologists and economists, and an information electronic questionnaire was distributed to Agency staff to obtain input for the plan. Broad issues were analyzed and actions were identified. A workshop focusing on OW programs was conducted and a Society of Environmental Toxicology and Chemistry (SETAC) workshop on valuation and decision-making was co-sponsored by EPA. The plan was subjected to broad Agency review and was the subject of a consultation with the SAB's Committee on Valuing the Protection of Ecological Systems and Services (C-VPRESS).

The plan focuses on institutional and technical considerations arising most often in national-level ecological benefits assessments where statutory requirements for conducting benefit-cost analyses exist. The primary audiences of the plan are the EPA program offices, EPA's natural and social scientists, other federal agencies, and external partners of EPA's research. The plan is applicable to regional, state, and local issues and in many contexts.

The strategic plan presents a collaborative approach for ecological benefits assessment that builds on the conceptual foundations of the Agency's ecological risk assessment framework. The assessment approach emphasizes collaborative interaction among Agency decision-makers, social scientists, natural scientists, and analysts throughout the process. Such collaboration should begin at the earliest stages of the process, with the identification of the need to evaluate alternative policy options for a decision. The steps include: (1) problem formulation and the identification of management alternatives, (2) estimation of changes in stressors for each alternative, (3) estimation of changes in ecosystem services (monetize the changes when feasible); and (4) synthesis and communication of results to decision-makers.

Dr. Munns identified the following priority actions to improve benefits assessments:

- ✧ Institutional arrangements
  - Promoting interdisciplinary assessments
  - Promoting rigorous and comprehensive assessments

- ✧ Interdisciplinary research—organized around framework
  - Addressing overarching issues
  - Understanding policy impacts on stressors
  - Understanding stressor effects on ecological endpoints

- Understanding linkages among ecological endpoints and social welfare

✧ Fostering partnerships
- Supporting studies relevant to Agency policies
- Communicating Agency research needs
- Coordinating data collection and research
- Expediting collection of information about public values.

It is envisioned that an oversight committee will be responsible for the implementation of the plan, identifying cross-Agency priorities, leveraging resources to support priorities, and developing performance measures and tracking the success. The oversight committee would include technical and management representation from across the Agency. An Ecological Benefits Assessment Forum, modeled after the Agency's Risk Assessment Froum and Economics Forum, would be responsible for promoting good practices across the Agency, providing expert advice and assistance, facilitating information exchange, and developing guidelines and special projects. It would be an open staff-level forum.

The plan communicates the goal and the desired state, an improved approach, and actions (broadly). It also identifies mechanisms to enhance success. The plan informs various planning processes, including development of program office action plans, OPEI research plans, ORD MYPs, and STAR solicitations and other collaborations. With respect to the Government Performance Results Act (GPRA), success will be recognized by development and implementation of Office-specific Action Plans, and incorporation and attainment of relevant performance measures in OPEI's research plans and ORD's MYPs. In an operational sense, success will be recognized when the Agency's benefits assessments become increasingly quantitative and comprehensive of valued ecological services, and EPA's decisions become more transparent and supportable.

In closing his presentation, Dr. Munns stated that the strategic plan was posted on the National Center for Environmental Economics (NCEE) Web Site (http://www.epa.gov/economics) in December 2006.

Dr. Clark thanked Dr. Munns for his presentation and asked if the BOSC members had any questions. Dr. Sayler asked if ORD has strong competency in emergy analysis. Does the alternative valuation include energy-based biophysical approaches? Is there support for this from the STAR Program? Dr. Munns responded that he did not know if there would be a STAR solicitation for biophysical valuation approaches. Dr. Weiss asked if the schematic in slide 9 was in the plan. Dr. Munns replied that it is in section 2.3 of the plan (page 9), along with a description of the paradigm.

Future Discussion/Future Business

Dr. Clark stated that the next BOSC Executive Committee meeting will be held May 24-25, 2007, in Narragansett, Rhode Island. The agenda will include a tour of the EPA laboratory at Narragansett.

Two mid-cycle reviews will be held on May 23, 2007. Dr. Sayler, Chair of the Drinking Water Mid-Cycle Review Subcommittee, has been working with Edie Coates, the DFO, to establish the Subcommittee. Dr. Clark will Chair the Ecological Mid-Cycle Review Subcommittee because the Chair of the Subcommittee that conducted the program review is no longer available.

Dr. Clark asked for volunteers to vet the Human Health Mid-Cycle Review Report. Dr. Henderson agreed to serve as a vettor for this report. He then called for volunteers to vet the SP2 Program Review Report. Dr. Falk said he would gladly serve as a vettor for the report but he would not be able to attend the May meeting. He offered to provide his comments to the other vettor who could share them at the meeting. Dr. Philbert agreed to serve as the second vettor for the SP2 Program Review Report.

Drs. Duke and Demerjian agreed to serve as vettors for the Technology for Sustainability Program Review Report.

Dr. Clark asked if there were any members who wanted to be involved in the SAB review of the *Report on the Environment*. Drs. Clark, Ryan, Haas, Falk, Duke, and Demerjian agreed to participate in a workgroup that would review the *Report on the Environment* and provide comments to the SAB.

Dr. Clark then asked if anyone would like to participate in the SAB budget review in February. Dr. Henderson agreed to participate in the budget review.

The mid-cycle reviews of the EDCs and PM/Ozone Research Programs will be conducted in conjunction with the September Executive Committee meeting. Drs. Henderson and Demerjian were on the Subcommittee that conducted the program review of the PM/Ozone Program. Dr. Henderson will Chair the PM/Ozone Mid-Cycle Review Subcommittee and Dr. Demerjian will serve on that Subcommittee.

Dr. Harding chaired the Subcommittee that reviewed the EDCs Program; however, her term on the Board ends in October 2007. Dr. Clark said that he will contact Dr. Harding and ask her if she would be willing to chair the EDCs Mid-Cycle Review Subcommittee.

Dr. Clark asked if there were any issues or topics that the Board would like ORD to address at future meetings. Dr. Henderson stated that she would like to hear more about the "one atmosphere" approach that EPA is taking, their progress, and future plans. Dr. Clark promised to mention this request to ORD.

Dr. Clark asked the members to submit nominations for replacing himself and Dr. Harding when their terms on the BOSC end in October.

The reports to be reviewed at the May meeting will be distributed with the premeeting materials. Members who have serious concerns about the reports should share them with the appropriate vettors prior to the meeting.

Dr. Clark thanked everyone for their participation and for staying to the close of the meeting. He reminded the members that the Human Health Mid-Cycle Review would take place tomorrow. The meeting was adjourned at 4:40 p.m.

Action Items

- ✧ BOSC members will attempt to access the MyPay system before March and inform Ms. Kowalski if they are having problems accessing the system. Members must use the system to electronically download their W-2 forms.

- ✧ BOSC members should submit their timesheets to Ms. Kowalski as soon as possible.

- ✧ Dr. Ryan will provide comments on the rating tool after the Safe Pesticides/Safe Products (SP2) Subcommittee has used it in the program review in February. He will e-mail comments to Dr. Clark and copy Ms. Kowalski.

- ✧ ORD will review the feedback on the rating tool and assess how well it is working. ORD will determine if it is necessary to reconvene the rating tool workgroup to revise the tool before the May BOSC meeting so that any revisions could be approved by the Executive Committee at that meeting.

- ✧ The Computational Toxicology Subcommittee will discuss the proposed approaches (1 ½-day briefing or series of teleconferences) for briefings on the ToxCast, Virtual Liver, and other topics. The Subcommittee Chair will inform the DFO of the Subcommittee's preferences.

- ✧ The BOSC Executive Committee members will let Dr. Clark know if they would like to be briefed on the ToxCast, Virtual Liver, and other topics.

- ✧ The Computational Toxicology Subcommittee will meet again in the fall of 2007, and the meeting should include updates on the ToxCast and Virtual Liver projects.

- ✧ Ms. Kowalski will work with Dr. Clark and Dr. Vanessa Vu to identify ways to better integrate the efforts of the SAB and the BOSC, and enhance communication between the two boards.

- ✧ Ms. Kowalski asked the BOSC to provide feedback on the value of the laboratory/center subcommittee pilots. ORD also will seek feedback on these pilots from the Laboratory/Center Directors.

- ✧ Ms. Kowalski will make arrangements for conference calls between the NERL and NCER Directors and the respective Subcommittee Chair so that the Directors can provide input with respect to the types of expertise required for the Subcommittees.

- ✧ The DFO for the NCER and NERL Subcommittees will work with the Laboratory/Center Directors and Subcommittee Chairs to develop the charge questions for the NCER and NERL Subcommittees.

- ✧ Drs. Philbert and Demerjian will meet with Ms. Peterson after the NERL and NCER Subcommittees have been operating for 1 year to write down procedures that will help streamline the process and make recommendations on how to change the common procedures.

- ✧ The BOSC members will notify Ms. Kowalski if there are any SAB activities with which they want to be involved. Ms. Kowalski then will notify Dr. Vanessa Vu of the BOSC's interest.

- ✧ Dr. Henderson volunteered to serve as a vettor for the Human Health Mid-Cycle Review Report.

- ✧ Drs. Falk and Philbert agreed to serve as vettors for the SP2 Program Review Report. Because Dr. Falk will be unable to attend the May meeting, he will provide his comments to Dr. Philbert who will share them at the meeting.

- ✧ Drs. Duke and Demerjian agreed to serve as vettors for the Technology for Sustainability Program Review Report.

- ✧ Drs. Clark, Ryan, Haas, Falk, Duke, and Demerjian agreed to participate in a workgroup that would review the *Report on the Environment* and provide comments to the SAB.

- ✧ Dr. Henderson agreed to participate in the SAB budget review meeting to be held in February.

- ✧ Dr. Henderson will serve as the Chair the PM/Ozone Mid-Cycle Review Subcommittee and Dr. Demerjian will serve on that Subcommittee.

- ✧ Dr. Clark will contact Dr. Harding to ask her if she would be willing to chair the EDCs Mid-Cycle Review Subcommittee even though her term on the BOSC ends in October 2007.

- ✧ Dr. Clark will submit Dr. Henderson's request for ORD to provide more information about the "one atmosphere" approach that EPA is taking, their progress, and future plans at an upcoming BOSC meeting.

- ✧ The BOSC members will submit nominations for replacing Drs. Clark and Harding when their terms on the BOSC end in October.

- ✧ Ms. Kowalski will distribute the reports to be reviewed at the May meeting with the premeeting materials. Members who have serious concerns about the reports should share them with the appropriate vettors prior to the meeting.

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B·O·S·C
BOARD OF SCIENTIFIC COUNSELORS

34th EXECUTIVE COMMITTEE FACE-TO-FACE MEETING
AGENDA
January 23, 2007

Crowne Plaza Washington National Airport
1480 Crystal Drive
Arlington, Virginia 22202
Tel: (703) 416-1600

Tuesday, January 23, 2007

8:00 a.m. – 8:30 a.m.	Registration	
8:30 a.m. – 9:00 a.m.	Welcome and Introductions - New Member Welcome - Review of October Meeting Minutes - Reports Transmitted to Office of Research and Development (ORD) - Overview of Agenda	Dr. James R. Clark, Chair, Executive Committee
9:00 a.m. – 9:15 a.m.	BOSC DFO Remarks - Administrative Issues	Ms. Lori Kowalski, Office of Research and Development
9:15 a.m. – 9:45 a.m.	AA/ORD Remarks	Dr. George Gray, Assistant Administrator for Research and Development
9:45 a.m. – 10:15 a.m.	Program Review Tool Workgroup - Revised Draft Proposal	Dr. James R. Clark, Chair, Executive Committee
10:15 a.m. – 10:30 a.m.	Break	
10:30 a.m. – 11:30 a.m.	ORD Response to Recent BOSC Reports	ORD Technical Leads
11:30 a.m. – 12:00 Noon	Subcommittee Updates - Computational Toxicology - Human Health Mid-Cycle Review	 Dr. George Daston, Subcommittee Chair Dr. James R. Clark, Subcommittee Chair
12:00 noon – 1:00 p.m.	Lunch	

1:00 p.m. – 2:00 p.m.	Subcommittee Updates (Continued)	
	<u>Program Review Subcommittees:</u>	
	- Safe Pesticides/Safe Products Program Review	Dr. P. Barry Ryan, Subcommittee Vice-Chair
	- Technology for Sustainability Program Review	Dr. John Giesy, Subcommittee Chair
	- Human Health Risk Assessment Program Review	Dr. George Daston, Subcommittee Chair
	- Homeland Security	Dr. Gary Sayler, Subcommittee Chair
2:00 p.m. – 2:30 p.m.	Subcommittee Updates (Continued)	
	<u>Standing Subcommittees:</u>	
	- Common Process Outline	Ms. Susan Peterson, Office of Research and Development
	- National Center for Environmental Research (NCER)	Dr. Martin Philbert, Subcommittee Chair
	- National Exposure Research Lab (NERL)	Dr. Ken Demerjian, Subcommittee Chair
2:30 p.m. – 2:45 p.m.	Public Comment	
2:45 p.m. – 3:00 p.m.	Break	
3:00 p.m. – 3:30 p.m.	ORD Update	Dr. Kevin Teichman, Acting Deputy Assistant Administrator for Office of Research and Development
3:30 p.m. – 4:00 p.m.	ORD Communications Update	Dr. Donna Roa, Office of Research and Development
4:00 p.m. – 4:30 p.m.	Ecological Benefits Assessment Plan	Dr. Wayne Munns, Office of Research and Development
4:30 p.m. – 5:00 p.m.	SAB Activities	Dr. George Lambert, SAB Liaison to the BOSC
5:00 p.m. – 5:30 p.m.	Future Discussion/Future Business - Meetings in May, September 2007 - Mid-Cycle Reviews - Future Work	Dr. James R. Clark, Chair, Executive Committee
5:30 p.m.	Adjourn	