

U.S. Environmental Protection Agency Board of Scientific Counselors
Executive Committee
Teleconference Minutes
April 11, 2017

Meeting Minutes

Provided below is a list of the presentations and discussions that took place during the teleconference meeting with hyperlinked page numbers. The minutes follow. The agenda is provided in Appendix A, the participants are listed in Appendix B, and the charge questions are provided in Appendix C.

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Convene Meeting

Thomas Tracy, Designated Federal Officer

Mr. Thomas Tracy, the U.S. Environmental Protection Agency (EPA) Designated Federal Officer (DFO) for the Board of Scientific Counselors (BOSC) Executive Committee (EC), formally opened the meeting and welcomed the committee members. He briefly reviewed the Federal Advisory Committee Act (FACA) stipulations governing the meeting, which require that the meeting is open to the public and that there must be time reserved for public comments. Mr. Tracy conducted roll call.

Welcome

Robert Kavlock, Acting Assistant Administrator

Bruce Rodan, Associate Director for Science

Dr. Robert Kavlock, Acting Science Advisor and Acting Assistant Administrator for the Office of Research and Development (ORD), thanked the BOSC EC members for their efforts in reviewing the Agency's programs. Dr. Kavlock briefly discussed the budget uncertainties, noting that the Agency is operating under continuing resolution through the end of April 2017.

Dr. Kavlock summarized the Administrator's priorities, which include ensuring measurable changes in Superfund communities, increasing attainment of National Ambient Air Quality Standards (NAAQS) across the country, focusing on water infrastructure, fulfilling the new Toxic Substance Control Act (TSCA) requirements, ensuring sound science and research, detecting non-compliance, and building a stronger and more responsive EPA.

Introduction of Members and Review of Agenda

Deborah Swackhamer, Chair

Dr. Deborah Swackhamer welcomed the EC members and reviewed the agenda. She provided an overview of the process for reviewing and submitting the final draft reports, which entails the EC members reaching consensus and sending a cover letter that outlines the BOSC's process along with the final reports to Dr. Kavlock. She asked if any EC members were opposed to this approach. No one was opposed to the approach.

Public Comments

Dr. Swackhamer asked for registered public comments, and there were none.

Homeland Security Subcommittee Draft Report

Tammy Taylor, Vice Chair

Dr. Tammy Taylor presented the Homeland Security (HS) subcommittee draft report on behalf of the EC HS subcommittee. She began by reviewing the subcommittee's three charge questions (Appendix C).

Dr. Taylor summarized the subcommittee's three recommendations for overarching and crosscutting research, which include engaging in future interagency large-scale demonstrations, identifying research gaps during laboratory and large-scale field-testing, and continuing to build social and behavioral science capability with Agency support.

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Dr. Taylor continued the presentation by presenting the recommendations specific to the charge questions. Charge Question 1 is separated into five EPA responsibility areas. First, under fate and transport, the HS subcommittee recommends that HSRP fully integrate the fate and transport research within a comprehensive view of the program's research agenda, particularly with the decontamination research team. Consistency in articulating research challenges, approaches, and materials should be a priority.

Second, related to contamination and exposure assessment, the HS Subcommittee recommends that given the uncertainty of a large-scale, wide-area biological remediation demonstration, HSRP should develop a step-by-step demonstration plan and field test that they could implement over time.

Third, within the area of decontamination, the HS Subcommittee recommends that HSRP should review any existing comprehensive plans for wide-area incidents that include quickly and efficiently decontaminating outdoor areas and massive amounts of waste. The review should include a research gap and scalability analysis. HSRP should also include any newly developed solutions in the plan as well.

Fourth and related to waste management, the subcommittee recommends that HSRP provide OLEM with their research findings on the low potential for exposure to hazardous contaminants to reduce concerns of large-scale waste management entities and to support the development of waste acceptance criteria. In addition, the subcommittee recommends that HSRP should develop methods for informing and pre-qualifying waste disposal service providers to dispose of contaminated materials.

Finally, in the area of decision support, the HS subcommittee made several recommendations. First, all applications developed during 2017 and later should conform to the application development standards promoted by the EPA Developers' Guide. Second, HSRP should allocate funding to regularly evaluate, document, and convert (as appropriate) legacy tools to make them available using and web- and mobile-focused to support end-user partners. Third, HSRP should adopt a secure Microsoft Cloud strategy and use cloud-hosted MS SQL for databases, as allowed by Agency policy. Finally, HSRP should manage application programming interfaces between applications via Mulesoft to provide better reusability and auditing.

Dr. Taylor presented the HS subcommittee's two recommendations addressing Charge Question 2. First, HSRP should develop white papers to support the development of guidance manuals to help program offices develop a formal train-the-trainer curriculum along with associated training methods for reaching stakeholders required for conducting a wide-area remediation. Second, HSRP should transition research products not only to the Office of Emergency Management (OEM) but to other offices in EPA and to local, state, and federal agencies, trade associations, utilities, and transit systems.

Dr. Swackhamer commented that she thought the report was exceptional. She asked the EC members for clarifying questions, and there were none.

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Homeland Security Program Comments

Gregory Sayles, National Program Director

Dr. Gregory Sayles thanked Dr. Taylor and Dr. Paula Olsiewski for their leadership of the subcommittee and praised the draft report.

Dr. Sayles highlighted positive comments presented in the HS subcommittee draft report, and expressed his appreciation for this feedback. Dr. Sayles highlighted three recommendations which would likely have the greatest impact on improving the program:

- HSRP should continue to build its social and behavioral science capability.
- HSRP should more fully integrate fate and transport research with the activities of other HS research teams.
- HSRP should review any comprehensive plans for wide-area incidents.

Dr. Sayles asked for clarification regarding the “pre-qualifying waste disposal service providers” recommendation. He explained that the Agency does not pre-qualify waste disposal service providers. He noted that it would be helpful to clarify this wording to suggest that the program should work with waste disposal service providers to ensure they are comfortable accepting such waste.

Dr. Sayles also suggested clarifying the language of the first general recommendation, which states: “The HSRP should do what it can to actively promote the ability to participate in interagency large-scale demonstrations.” Dr. Taylor agreed this statement could be modified to better convey that the recommendation is for HSRP to promote interagency collaborations.

Dr. Sayles presented three recommendations that the subcommittee could remove because either HSRP is already actively implementing the changes or the program does not have the ability to make the suggested changes. He explained that the following two recommendations are already underway: (1) HSRP should provide OLEM with research findings on the low potential for exposure to hazardous contaminants to reduce concerns of large-scale waste management entities and to support development of waste acceptance criteria, and (2) HSRP should transition research products not only to OEM but to other offices in EPA and to local, state, and federal agencies, trade associations, utilities, and transit systems. Regarding the recommendations focused on software development, Dr. Sayles explained that some of these are already underway, but the recommendation to adopt a Microsoft Cloud strategy is prohibited by Agency policy at this time.

Dr. Sayles thanked the BOSC HS subcommittee for their participation in an engaging meeting and appreciated the insights raised during the process.

Discussion of Homeland Security Subcommittee Report

Deborah Swackhamer, Chair

Dr. Swackhamer thanked Dr. Taylor and Dr. Sayles, and asked the EC members for clarifying questions or comments.

Dr. Viney Aneja asked for clarification on the definition of “large-scale” as presented in Dr. Sayles’ presentation on slide 6: “Future interagency large-scale demonstrations are vitally

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important to national security.” Dr. Taylor responded that “large-scale” describes when the Agency comes together to organize a decontamination event, and added that this definition can be clarified.

Dr. Sayles added that “large-scale” work is important to the program, as HSRP research needs to be tested at a reasonably large scale to involve both researchers and the response communities to show operational aspects and to identify the pros and cons of the tested research. Dr. Aneja responded that the purpose of this research should be clarified in the report. Dr. Taylor commented that the report can be updated with more explanatory text or visuals to provide greater context on why large-scale demonstrations are important.

Dr. Swackhamer thought the report was exceptional, and she appreciated the subcommittee’s effort. She suggested reducing the number of acronyms used throughout the report, referencing the use of “SBS” which is used in the report to signify different phrases. Dr. Taylor instructed the subcommittee to use “social and behavioral sciences” consistently without the use of the acronym.

Dr. Swackhamer recommended various other minor editorial comments, including the consistent use of passive versus active and first versus third person.

Dr. Swackhamer drew attention to the use of “guild” on page 15 of the report. Dr. Taylor asked whether the phrase should be changed to “EPA Developers’ Guide,” and Dr. Swackhamer agreed that “guild” should be changed to “guide.”

Ms. Sandra Smith commented that the report was excellent and well written. She added that a list of acronyms would be helpful. Ms. Smith also asked for clarification on the meaning of “fence” on page 5; it appeared to suggest EPA should reduce funding. Dr. Taylor responded that the sentence was meant to suggest that EPA cordon off funding for that effort and offered to change the word “fence” to clarify this.

Dr. Swackhamer commented that the EC members raised no major issues. Dr. Swackhamer asked that Dr. Taylor and Dr. Olsiewski make the suggested changes to the report and stated that the report will be considered final when the edits are completed.

Report on Environmental Justice Annual Report

Courtney Flint

Dr. Courtney Flint summarized the changes to the Environmental Justice Annual Report on behalf of the EC Environmental Justice workgroup. Dr. Flint noted that the main updates focused on restructuring the report to make it more logical, clarifying text based on comments from EC members at the January 2017 meeting, and moving non-actionable recommendations about “continuing” current activities to the text. Dr. Flint explained that the workgroup streamlined the original list of 11 recommendations to a smaller set of 8 recommendations. Dr. Flint stated that the recommendations are separated into two types: science (5 total recommendations) and technical (3 total recommendations). She added that the technical recommendations focused on recommendations for future reporting.

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Discussion of Report on Environmental Justice Annual Report

Deborah Swackhamer, Chair

Dr. Swackhamer asked for clarification regarding the difference between the “science” and “technical” recommendations located on page 3 of the report. Dr. Flint suggested adding a sentence to clarify the difference between the recommendation types. Mr. Tracy will send the Word version of the report to the subcommittee chair to make this edit.

Dr. Swackhamer asked if the terms “recognitional” and “intersectionality” are commonly used in the social sciences field. Dr. Flint explained that these terms are commonly accepted words in the environmental justice and social science communities and throughout EPA. Dr. Flint clarified that “recognitional” refers to recognizing the interests and positions of various stakeholders, and “intersectionality” addresses the interaction effects between factors. Dr. Flint added that the definitions can be added to the report.

Dr. Swackhamer commented that the Environmental Justice workgroup responded well to the suggested changes, and thanked the EC for their contributions.

Dr. Swackhamer asked for further comments from the EC members, and there were none.

Report on Children’s Environmental Health Annual Report

Gina Solomon

Dr. Gina Solomon presented the updates to the EC Children’s Environmental Health (CEH) workgroup’s report on the Children’s Environmental Health Annual Report. Dr. Solomon explained that the workgroup reduced the total number of recommendations by eliminating non-actionable recommendations. Other changes were minor and focused on clarifying the text to address questions from the EC members during the January 2017 meeting.

Dr. Solomon summarized the workgroup’s recommendations, which include focusing on cumulative environmental insults including non-chemical stressors, strengthening collaborative relationships with other agencies to explore crosscutting issues, and developing publications and presentations targeted at non-technical audiences to expand the reach of the children’s agenda. She explained that the last recommendation suggests that the next Annual Report includes a summary of how EPA is incorporating social science across CEH with accompanying examples.

Dr. Solomon thanked the members of the EC CEH workgroup for their significant contributions to the report. She asked for further comments, and there were none.

Discussion of Report on Children’s Environmental Health Annual Report

Deborah Swackhamer, Chair

Dr. Swackhamer thanked Dr. Solomon and the EC CEH workgroup for their work on this report.

Dr. Swackhamer asked whether the summary list of recommendations could be excluded from the report because there are only four total recommendations. Dr. Solomon clarified that the summary list of recommendations had been removed from the latest version of the report, and this issue is no longer relevant.

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Dr. Swackhamer asked the EC members for further comments, and there were none. Dr. Swackhamer expressed that the report is very concise and clear, and the current draft version can be considered final.

Report on Climate Change Annual Report

Robert Richardson

Dr. Robert Richardson presented the changes to the EC Climate Change workgroup's report on the Climate Change Annual Report. Dr. Richardson explained that most of the changes were minor, including moving two non-actionable recommendations into the text. He noted that the updated report contains only one recommendation "Pursue opportunities to coordinate climate-related research activities across all ORD roadmaps."

Dr. Richardson pointed out that there is a missing bullet point in front of the fourth name listed on page 1 of the workgroup's report, which needs to be added.

Discussion of Report on Climate Change Annual Report

Deborah Swackhamer, Chair

Dr. Swackhamer thanked the group for being responsive to the comments at the January 2017 meeting. She asked the EC members for further comments, and there were none. Dr. Swackhamer noted that after the missing bullet is added, she will consider the report final.

Report on Nitrogen and Co-pollutant Annual Report

James Galloway

Dr. James Galloway summarized the changes to the draft Nitrogen and Co-pollutant Annual Report on behalf of the EC Nitrogen and Co-pollutant workgroup. Dr. Galloway commended the excellent discussion during the January 2017 meeting that resulted in various changes to the annual report. He noted that the subcommittee clarified the term "co-pollutant" in the "Areas of Innovation" section to focus on nutrients. He added that there were some further changes focused on social science.

Discussion of Report on Nitrogen and Co-pollutant Annual Report

Deborah Swackhamer, Chair

Dr. Swackhamer inquired whether the workgroup should separate Recommendation 1 into two recommendations because the second sentence specifically highlights nitrous oxide. Dr. Galloway responded that he has no issue with splitting Recommendation 1 into two separate recommendations.

Dr. John Tharakan noted that the actionable aspect of Recommendation 1 is unclear. Dr. Galloway responded that the actionable portion is the suggestion that EPA focus on nitrogen and phosphorus, as the Agency has previously considered other pollutants (e.g., sulfur, sediment, trace metals).

Dr. Bruce Rodan commented that he does not agree that the second sentence of Recommendation 1 could become a stand-alone recommendation. He noted that the consequence would be that nitrous oxide becomes a third primary focus, which contradicts the first recommendation to focus on nitrogen and phosphorus. Dr. Rodan suggested that, if the

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workgroup's intent is to highlight the importance of nitrous oxide as a major issue related to nitrogen, the workgroup rephrase the first sentence of the recommendation to reflect that instead.

Dr. Swackhamer commented that the purpose of narrowing EPA's to focus to nitrogen and phosphorus is to address the cause of environmental issues in the troposphere but not issues in the stratosphere, including ozone loss and greenhouse gases. She added that the concern about nitrous oxide relates to its ability to function as a greenhouse gas. Dr. Swackhamer asked whether it was the workgroup's intent to separate the issue of nitrogen and phosphorus cycling from the issue of nitrogen as a greenhouse gas. Dr. Galloway replied that it is reasonable to separate nitrous oxide as a separate recommendation, as the recommendation focuses on the need for an international partnership focused on mitigation.

Dr. Rodan agreed with the previous comments, but he explained that the new recommendation focused on the nitrous oxide as a greenhouse gas would constitute a major recommendation.

Dr. Anne Rea stated that EPA's research is focused more on nitrous oxide as it relates to the nitrogen cycle and less on how it is emitted as a greenhouse gas. Dr. Rea added that it is important to include sulfur when examining co-pollutants, because the Office of Air and Radiation (OAR) uses that for the secondary NAAQS for nitrogen and sulfur oxides.

Dr. Swackhamer presented two suggestions. First, she suggested clarifying the recommendation that EPA focus on nitrogen and phosphorus so that it indicates the various forms of the elements are relevant. The workgroup could specify the forms in a list or summarize them in the text. As a second option, Dr. Swackhamer suggested the workgroup underscore the importance of nitrous oxide as a greenhouse gas in the text and remove it from the recommendation. Dr. Swackhamer stated that EPA may continue to investigate sulfur, but the specific recommendation from the subcommittee is to focus on nitrogen and phosphorus. Dr. Galloway responded that Dr. Robert Kavlock encouraged the focus on nitrogen and phosphorus. Dr. Galloway also acknowledged the relevance of sulfur to OAR and suggested that this could be specified in the text.

Dr. Aneja disagreed with the characterization that the main concern related to nitrous oxide is its ability to act as a greenhouse gas. He clarified that the Agency also considers nitrous oxide as part of the family of reactive nitrogen compounds and stated that he does not have a problem with separating Recommendation 1 into two separate recommendations.

Dr. Anne Rea clarified that in the roadmap, reactive nitrogen was specified as all forms of nitrogen (including nitrous oxide) except for nitrogen (N₂) gas.

Dr. Flint commented that she is unclear why this recommendation is within the section on "Communication and Outreach," as she believes this recommendation is more science-focused. She suggested that more explanatory text would be helpful to bridge the gap between the topic of communication and outreach and this specific recommendation on nutrients. Dr. Swackhamer added that the communication issue relates to the fact that there are numerous definitions of co-pollutants, and the recommendation is for EPA to clarify this definition and focus on nitrogen and phosphorus. Dr. Swackhamer suggested that this could be clarified in the text.

Dr. Tharakan suggested that the recommendation may be for EPA to "enhance" focus on nitrogen and phosphorus, as EPA is focused on them already.

Dr. Kavlock commented that the workgroup could recommend EPA's "principal" focus to be on

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nitrogen and phosphorus, which would accommodate the consideration of sulfur in the context of air issues. Dr. Galloway responded that he agreed with the suggestion to recommend that EPA “principally” focus on nitrogen and phosphorus without explicitly highlighting sulfur. Dr. Rea and Dr. Swackhamer also agreed with this proposed change.

Dr. Courtney Flint asked for clarification regarding the use of “we” on page 3. Dr. Flint explained that it is unclear whether the term “we” refers to the subcommittee or ORD. Dr. Galloway clarified that “we” refers to the subcommittee. Dr. Swackhamer stated that all reports should use third person and suggested the global replacement of “we” with “the subcommittee.”

Dr. Swackhamer stated that additional text in the section on “Opportunities for Implementation and Integration” would be useful. In particular, Dr. Swackhamer noted that the use of “sustainability related issues” on page 4 is broad and could be expanded.

Dr. Swackhamer asked for further comments from the EC members, and there were none. Dr. Swackhamer asked that Dr. Galloway complete the edits and send to herself and Mr. Tracy by April 24, 2017.

Safe and Sustainable Water Resources Subcommittee Report

Joseph Rodricks, Chair

Shahid Chaudhry, Vice Chair

Dr. Joseph Rodricks and Mr. Shahid Chaudhry presented the updates to the Safe and Sustainable Water Resources (SSWR) subcommittee report. Dr. Rodricks explained that since the EC meeting in January 2017, he and Mr. Chaudhry have carefully reviewed the recommendations and moved non-actionable recommendations to the text, clarified phrasing and reduced the total number of recommendations. There are now three technical recommendations for the first project concerning current systems and regulatory support, one recommendation on timing of project completion for the second project regarding technology advances, and three technical recommendations for the third project which concerns advanced technologies.

Dr. Rodricks noted that he and Mr. Chaudhry clarified or removed the language regarding overlapping funding and resource allocation across federal agencies, as appropriate, and clarified the descriptions of the analytical techniques.

Discussion of Safe and Sustainable Water Resources Subcommittee Report

Deborah Swackhamer, Chair

Mr. Chaudhry suggested removing Recommendation 1.3, because it is also mentioned in the text. Dr. Rodricks responded that “continue” may not be the best word to use in this recommendation. He clarified that the recommendation is focused on the Agency’s management of the quality of the water system, rather than designing water systems. Dr. Rodricks asked for clarification from EPA on whether this topic is still relevant. Dr. Suzanne Van Drunick responded that Recommendation 1.3 is acceptable as currently written. She was not concerned with the word “continue,” as it references ongoing SSWR work in the area of post-treatment water quality and also new research in the area of premise plumbing. She clarified that this is not part of the distribution system the Agency has jurisdiction to regulate; however, it is an important part of the water distribution system for which EPA expertise is needed, as evidenced during the response to

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lead contamination in Flint, Michigan. Dr. Rodricks concluded that Recommendation 1.3 should be clarified.

Mr. Chaudhry drew attention to a minor edit to Recommendation 3.1, in which the extra word “the” should be removed.

Dr. Swackhamer suggested an edit for Recommendation 3.3 to change “i.e., PCR” to “e.g., PCR.”

Dr. Swackhamer thanked the SSWR subcommittee for their work addressing the suggested changes. She asked the EC members for further comments, and there were none.

Sustainable and Healthy Communities Subcommittee Report

Robert Richardson, Chair

Courtney G. Flint, Vice Chair

Dr. Richardson summarized the updates to the Sustainable and Healthy Communities (SHC) subcommittee report. He noted that based on the feedback from the EC members during the January 2017 meeting, he and Dr. Flint removed the non-actionable recommendations. Dr. Flint added that they left the organization of the report structured around the three projects.

Dr. Richardson added that he and Dr. Flint shared the updated draft report with the members of the SHC subcommittee.

Discussion of Sustainable and Healthy Communities Subcommittee Report

Deborah Swackhamer, Chair

Dr. Swackhamer asked the EC members if there were any questions or comments related to the changes to the report. She expressed her gratitude for the subcommittee’s work on a complex set of changes.

Dr. Swackhamer asked for opinions regarding the clarity of the current structure and numbering of the recommendations, and Dr. Bruce Rodan responded that the current numbering is unclear. Dr. Richardson explained that the purpose of the current numbering system was to relate the recommendation number to the project number. Dr. Flint, Dr. Swackhamer and Dr. Richardson agreed to change the numbering of the projects to “project 3.61,” “project 3.62,” and “project 3.63.”

Dr. Tharakan asked whether the system of linking the numbering of the recommendations to the charge questions is explained in the text. Dr. Richardson clarified that this is not explicitly stated, but follows the charge question numbering.

Dr. Tharakan also wondered if it was necessary to repeat the phrase “general recommendation” before each recommendation. Dr. Swackhamer agreed that there is redundancy in repeating “general recommendation,” but pointed out that this phrase links the recommendations to the boxes and distinguishes them from the charge question recommendations.

Dr. Richardson suggested removing the project numbering before each recommendation listed in the summary list (e.g., “Project 3.2 Recommendation 2.2” would be simplified to “Recommendation 2.2”) to ensure consistency with how the recommendations are stated elsewhere in the report. He noted that it should be sufficient to state the project number in the

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heading. Dr. Tharakan agreed with this suggestion.

Dr. Flint asked if it would be helpful to include a sentence to clarify the difference between project-specific and general recommendations. Dr. Swackhamer responded that it would be helpful to explain this difference at the beginning of the report.

Dr. Swackhamer asked for any further comments from EC members, and there were none. She added that she will consider the report final once the suggested corrections have been made.

Chemical Safety for Sustainability Subcommittee Report

Ponisseril Somasundaran, Chair

Gina Solomon, Vice Chair

Dr. Ponisseril Somasundaran summarized the Chemical Safety for Sustainability (CSS) subcommittee report. He reviewed the four research topic areas of the report—chemical evaluation, life cycle analytics, complex systems science and solutions-based translation and knowledge delivery.

Dr. Somasundaran highlighted that one of the main concerns raised during the discussion was that CSS currently uses several assays that measure the same target. He explained that these assays could potentially be streamlined because they are not for distinct modes of action.

Dr. Somasundaran discussed the rapid exposure and dosimetry section, in which the subcommittee noted the Agency has made remarkable advancements. On the topic of chemical mixtures, he noted that CSS is addressing this difficult and complex problem well. He noted that the subcommittee recommends fostering collaborations with other agencies to address these issues during a time of decreasing resources.

Dr. Somasundaran drew attention to Recommendation 1.4, which recommends that the Agency “consider creating a pipeline of scientifically sound and accepted adverse outcome pathways (AOPs) awaiting Organization for Economic Cooperation and Development (OECD) endorsement.” He explained that the OECD approval process can be slow, which raises the question of whether EPA should wait for approval. He clarified that the subcommittee is suggesting EPA and OECD work in parallel.

Dr. Somasundaran also emphasized Recommendation 1.8: “periodic updates of underlying databases and checking against real-world exposure measurements will be essential for keeping this strong work relevant and useful for risk-based decision making.” He explained that “real-world” situations are cited throughout the report, and these vary across different areas of the world.

Dr. Solomon explained that in response to suggestions to organize the report around the charge questions, the subcommittee restructured the report to clarify the connection between recommendations and charge questions and added some explanatory text, as well. Dr. Swackhamer responded that the new structure reads well and does not need to be further restructured.

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Discussion of Chemical Safety for Sustainability Subcommittee Report

Deborah Swackhamer, Chair

Dr. Swackhamer asked whether the word “consider” should be removed from Recommendation 1.4, which states: “consider creating a pipeline of scientifically sound and accepted AOPs awaiting OECD endorsement.” She added that removing “continue” could make the recommendation sound too demanding. Dr. Solomon responded that the subcommittee purposefully included “continue” to soften the wording of the recommendation. She clarified that the subcommittee is suggesting that the Agency should not wait for OECD endorsement, as it is slowing down the AOP program. However, the subcommittee also acknowledges that EPA still needs to work with OECD for numerous reasons and therefore did not want to suggest that EPA should bypass OECD entirely. Dr. Solomon added that they would like EPA to be able to publish AOPs that are not OECD-endorsed. Dr. Swackhamer agreed with this explanation and noted that the subcommittee does not need to change the language.

Dr. Swackhamer asked for further questions from the EC members, and there were none. Dr. Swackhamer expressed appreciation for the subcommittee’s work on this report and stated that she considers the report final.

Air, Climate, and Energy Subcommittee Report

Viney Aneja, Chair

Sandra Smith, Vice Chair

Dr. Aneja summarized the changes made to the Air, Climate, and Energy (ACE) Subcommittee Report. Dr. Aneja and Ms. Smith edited the subcommittee process details to include the suggestions provided during the January 2017 meeting, removed non-actionable recommendations and revised others to be less restrictive, reformatted the document so it is consistent with the other subcommittee reports.

Ms. Smith added that she and Dr. Aneja also moved a small number of in-text recommendations into proper recommendations based on EC member feedback.

Discussion of Air, Climate, and Energy Subcommittee Report

Deborah Swackhamer, Chair

Dr. Swackhamer asked whether the subcommittee intends to use the word “consider” in Recommendation 1.1. Ms. Smith noted that the subcommittee used “consider” to make the recommendation less prescriptive.

Dr. Flint pointed out that in other instances of subcommittees using “consider,” the decision was to move these recommendations to the text. Ms. Smith stated that this was not originally a recommendation, but the subcommittee moved it from the text to a recommendation based on the EC discussion during the January 2017 meeting. Dr. Flint proposed an actionable alternative: “Work toward identification and development...” versus “Consider identifying and developing...” Dr. Swackhamer agreed with this suggestion.

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Presentation on Program Evaluation and Metrics

Elizabeth Corley

Dr. Elizabeth Corley presented on the topic of program evaluation and metrics. She discussed a general program evaluation logic model and applied it in the context of the National Research Program Strategic Research Action Plan (StRAPs).

Dr. Corley introduced the components of the logic model, which include inputs (e.g., budget, full-time equivalents, advice), activities (e.g., number of ongoing projects, disciplinary mix of personnel), outputs (i.e., direct products, such as publications, reports), outcomes/impacts (i.e., short-, intermediate-, and long-term changes or benefits as a result of activities and outputs, both intended and unintended), and context (i.e., the way the program functions within the economic, social, and political environment).

Dr. Corley discussed the workgroup's thoughts on how to gather data on each component of the logic model. She suggested that EPA staff may routinely collect certain information that could be distributed to the BOSC subcommittees with fairly little effort. Examples include high-level budget and staff information, a record of ongoing projects, and previously published reports. Other aspects of the logic model will require more effort to discern and will likely be the responsibility of the subcommittees. The subcommittees could consistently revisit the StRAPs to determine outcomes and impacts. Dr. Corley highlighted the usefulness of case studies in this context, as both qualitative and quantitative assessments are important.

Discussion of Program Evaluation and Metrics

Deborah Swackhamer, Chair

Dr. Tharakan asked if this workgroup effort is part of a larger effort to streamline evaluation metrics. Dr. Kavlock confirmed that the goal is for ORD to have a set of evaluation principles that are similar across research programs. Dr. Corley confirmed that the goal is to achieve consistency across subcommittees.

Dr. Flint commented that the logic model focuses on positive impacts, as "negative" is included parenthetically. Dr. Corley responded that the logic model does not apply a normative view and should capture all outputs and impacts, both positive and negative. She did acknowledge that the StRAPs focus on positive outputs.

Dr. Swackhamer noted the importance of program evaluation and asked Dr. Corley what she would advise in the short- and long-term. Dr. Corley replied that an important next step would be to find out how much of the information she outlined in her presentation ORD could make available to the subcommittees. The second step would be for the subcommittees to review the StRAPs for positive and negative anticipated outcomes and impacts.

Dr. Kavlock stated that ORD is familiar with logic models and much of the necessary information to determine inputs and outputs is available (e.g., Agency reports to the Office of Management and Budget, National Program Director webinars) include the percent of completed products). He added that the difficult aspect of program evaluation is determining impacts.

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Dr. Rodan pointed out that there is an opportunity to incorporate better intermediate- and long-term metrics during the StRAP revision process. Dr. Corley added the workgroup discussed that as an ideal time to consider which evaluation metrics best fit each program.

Dr. Flint suggested that ORD add charge questions that specifically ask for subcommittee input on the best outcome and impact metrics.

Dr. Swackhamer asked Dr. Kavlock for clarification on the BOSC's next steps related to program evaluation and metrics. Dr. Kavlock suggested meeting virtually to conduct a retrospective analysis of a single research program's metrics as a case study. Dr. Swackhamer and Dr. Corley agreed that this was a good path forward.

Summary and Next Steps

Deborah Swackhamer, Chair

Dr. Swackhamer thanked the EC members for their participation and edits to the reports. She expressed satisfaction with the updated reports and explained that she will prepare a cover letter to submit with the final versions to EPA.

Dr. Swackhamer thanked Dr. John Tharakan and Dr. Suzanne Cozzens whose membership terms as EC members will expire before the next meeting.

Dr. Kavlock thanked Dr. Swackhamer for her great work leading the meeting.

Adjourn

Thomas Tracy, Designated Federal Officer

Mr. Tracy thanked the presenters and EC members for their participation and adjourned the meeting.

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Appendix A: Agenda

**U.S. Environmental Protection Agency
Board of Scientific Counselors Executive Committee
Public Meeting
April 11, 2017**

1:00 p.m.	Convene Meeting	Thomas Tracy Designated Federal Officer
1:05 p.m.	Welcome	Robert Kavlock Acting Assistant Administrator Bruce Rodan Associate Director for Science
1:15 p.m.	Introduction of Members	Deborah Swackhamer, Chair
1:20 p.m.	Review Agenda, Meeting Charge, and Process	Deborah Swackhamer, Chair
1:25 p.m.	Public Comments	Registered Speakers

Deliberation on Draft Homeland Security Report

1:30 p.m.	Homeland Security Subcommittee Draft Report	Paula Olsiewski, Chair Tammy Taylor, Vice Chair
1:50 p.m.	HS Program comments	Gregory Sayles National Program Director
2:10 p.m.	Discussion: HS Subcommittee	Deborah Swackhamer, Chair

Research Roadmap Annual Reports

2:45 p.m.	Report on Environmental Justice Annual Report	Courtney Flint
2:50 p.m.	Discuss Report on Environmental Justice Annual Report	Deborah Swackhamer, Chair

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2:55 p.m.	Report on Children's Environmental Health Annual Report	Gina Solomon
3:00 p.m.	Discuss Report on Children's Environmental Health Annual Report	Deborah Swackhamer, Chair
3:05 p.m.	Report on Climate Change Annual Report	Robert Richardson
3:10 p.m.	Discuss Report on Climate Change Annual Report	Deborah Swackhamer, Chair
3:15 p.m.	Break	
3:20 p.m.	Report on Nitrogen & Co-pollutant Annual Report	James Galloway
3:25 p.m.	Discuss Report on Nitrogen & Co-pollutant Annual Report	Deborah Swackhamer, Chair
BOSC Subcommittee Reports		
3:30 p.m.	Safe and Sustainable Water Resources Subcommittee Report	Joseph Rodricks, Chair Shahid Chaudhry, Vice Chair
3:35 p.m.	Discussion: SSWR Subcommittee Report	Deborah Swackhamer, Chair
3:40 p.m.	Sustainable and Healthy Communities Subcommittee Report	Robert Richardson, Chair Courtney G. Flint, Vice Chair
3:45 p.m.	Discussion: SHC Subcommittee Report	Deborah Swackhamer, Chair
3:50 p.m.	Chemical Safety for Sustainability Subcommittee Report	Ponisseril Somasundaran, Chair Gina Solomon, Vice Chair

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3:55 p.m.	Discussion: CSS Subcommittee	Deborah Swackhamer, Chair
4:00 p.m.	Air, Climate and Energy Subcommittee Report	Viney Aneja, Chair Sandra Smith, Vice Chair
4:05 p.m.	Discussion: ACE Subcommittee Report	Deborah Swackhamer, Chair

Discussion on Program Evaluation and Metrics

4:10 p.m.	Presentation on Program Evaluation and Metrics	Elizabeth Corley
4:25 p.m.	Discussion on Program Evaluation and Metrics	Deborah Swackhamer, Chair

Wrap-up

4:50 p.m.	Summary and Next Steps	Deborah Swackhamer, Chair
5:00 p.m.	Adjourn Public Meeting	Thomas Tracy Designated Federal Officer

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Appendix B: List of Participants

BOSC Executive Committee Members:

Deborah L. Swackhamer, *Chair*
Viney Aneja
Shahid Chaudhry
Elizabeth Corley
Susan Cozzens
Courtney Flint
James Galloway
Paula Olsiewski
Robert Richardson
Joseph Rodricks
Sandra Smith
Gina Solomon
Ponisseril Somasundaran
Tammy Taylor
John Tharakan

EPA Designated Federal Officer (DFO):

Tom Tracy, *Office of Research and Development*

EPA Presenters:

Robert Kavlock, *Office of Research and Development*
Bruce Rodan, *Office of Research and Development*
Gregory Sayles, *Office of Research and Development*

Other EPA Attendees:

Dan Costa
Jeffrey Frithsen
Michael Slimak
Tami Thomas-Burton
Suzanne Van Drunick

Other Registered Participants:

Suzanne Hafey
Maria Hegstad
Wendy Heiger-Bernays

Contractor Support (ICF):

Ali Goldstone
Devon Morgan

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Appendix C: Charge Questions

Charge for the Environmental Justice Roadmap

Charge Question 1: Comment on areas of successful integration and implementation as articulated in the related Roadmap. This may include, but is not limited to, the following:

- Levels of commitment to Roadmap recommendations as incorporated into the ORD StRAPs;
- Coordination across ORD's six National Research Programs;
- Communication and outreach to partners and stakeholders; and
- Areas of innovation

Charge Question 2: Provide suggestions for improving implementation of the roadmaps and research integration across the National Research Programs.

- Are there additional opportunities for implementation or integration not highlighted in the annual report?
- Does "The Year Ahead section" adequately describe the next steps and short-term research areas and commitment?

Charge for the Children's Environmental Health Roadmap

Charge Question 1: Comment on areas of successful integration and implementation as articulated in the related Roadmap. This may include, but is not limited to, the following:

- Levels of commitment to Roadmap recommendations as incorporated into the ORD StRAPs;
- Coordination across ORD's six National Research Programs;
- Communication and outreach to partners and stakeholders; and
- Areas of innovation

Charge Question 2: Provide suggestions for improving implementation of the roadmaps and research integration across the National Research Programs.

- Are there additional opportunities for implementation or integration not highlighted in the annual report?
- Does "The Year Ahead section" adequately describe the next steps and short-term research areas and commitment?

Charge for the Climate Change Roadmap

Charge Question 1: Comment on areas of successful integration and implementation as articulated in the related Roadmap. This may include, but is not limited to, the following:

- Levels of commitment to Roadmap recommendations as incorporated into the ORD StRAPs;

- Coordination across ORD’s six National Research Programs;
- Communication and outreach to partners and stakeholders; and
- Areas of innovation

Charge Question 2: Provide suggestions for improving implementation of the roadmaps and research integration across the National Research Programs.

- Are there additional opportunities for implementation or integration not highlighted in the annual report?
- Does “The Year Ahead section” adequately describe the next steps and short-term research areas and commitment?

Charge for the Nitrogen and Co-pollutant Roadmap

Charge Question 1: Comment on areas of successful integration and implementation as articulated in the related Roadmap. This may include, but is not limited to, the following:

- Levels of commitment to Roadmap recommendations as incorporated into the ORD StRAPs;
- Coordination across ORD’s six National Research Programs;
- Communication and outreach to partners and stakeholders; and
- Areas of innovation

Charge Question 2: Provide suggestions for improving implementation of the roadmaps and research integration across the National Research Programs.

- Are there additional opportunities for implementation or integration not highlighted in the annual report?
- Does “The Year Ahead section” adequately describe the next steps and short-term research areas and commitment?

Charge for the BOSC ACE Subcommittee

Charge Question 1: The ACE program has developed a conceptual model for interdisciplinary research that brings together social and environmental sciences to address significant environmental challenges within the ACE research program. What are the strengths and weaknesses of this model in guiding ACE toward a more integrated social-environmental research program?

Charge Question 2: The ACE program is piloting several applications of the conceptual model, including an interdisciplinary problem formulation workshop on wildfire smoke risk communication and management that took place in September 2016. How can the ACE program make this approach more widely applicable to other aspects of the program such as 1) the Climate Roadmap and 2) distributed data collection, e.g., social and economic impacts of air quality sensors?

Charge Question 3: What are other viable, near-term opportunities for integrating social sciences, either within the ACE program or jointly with other ORD research programs, that warrant discussion?

Charge for the BOSC CSS Subcommittee

Charge Question 1: Science: Are we doing the right research? Taking resource limitations into considerations, are there any significant scientific gaps?

Charge Question 2: Integration: Based on prior feedback from this Subcommittee, over the past year, CSS has focused on further integrating the program within and between projects. Please comment on the progress. Is the integration approach right? Are there other areas that should be enriched?

Charge for the BOSC HS Subcommittee

Charge Question 1: Are we doing the right research? In other words, how well does the HSRP's current research portfolio address high-priority Agency needs in this area? Taking resource limitations into consideration, should the HSRP increase or decrease the emphasis of certain areas of research?

Charge Question 2: Assess the current approaches that the HSRP uses to transition research to end-users. How might these approaches be improved?

Charge Question 3: To what extent will the program's work provide multiple benefits to our nation by addressing critical needs beyond those directly related to terrorist attacks? In other words, will the research, while designed primarily to improve our partners' capabilities to respond to acts of terrorism, result in science that is useful in addressing other environmental problems?

Charge for the BOSC SHC Subcommittee

Charge Question 1: How well do SHC's R&D accomplishments and proposed research address high priority Agency, state, and community needs in this area?

Charge Question 2: How well does SHC's planned research anticipate future problems in this area and address longer-term community sustainability and environmental justice goals?

Charge Question 3: How are SHC Sustainable Approaches for Contaminated Sites and Materials projects, and associated research from other parts of SHC, helping communities achieve sustainability?

Charge for the BOSC SSWR Subcommittee

Charge Question 1: Are we doing the right research: Taking resource limitations into consideration, is there any additional research that warrants new investment or current research that merits expansion, and are there areas of research that SSWR may consider divesting in?

Charge Question 2: Are we doing the right research at the right time? Comment on the balance of near, current and long-term research objectives.