

**U.S. Environmental Protection Agency
Science Advisory Board
Advisory Panel on EPA's Report on the Environment 2014**

J.W. Marriott, 1331 Pennsylvania Ave., NW
Washington, DC 20004

July 30-31, 2014

Minutes of the Meeting

Attendees:

Members of Advisory Panel on EPA's Report on the Environment (ROE) 2014: James Sanders (Chair), Joe Arvai, Sharan Campleman, Terry Daniel, Chris Frey, Lucinda Johnson, Rob Johnston, Allan Legge, James Mihelcic, Keith Moo-Young, Eileen Murphy, Jim Opaluch, Rebecca Parkin, Amanda Rodewald, Sujoy Roy, Tom Theis, Stephen Weisberg (for full details, see Attachment A: Panel Roster)

SAB Staff Office: Stephanie Sanzone (Designated Federal Officer), Chris Zarba, Tom Brennan

Other Attendees (see Attachment B)

Purpose:

The purpose of the meeting was to review EPA's draft *Report on the Environment 2014*, a web-based product that presents indicators on the status and trends for environmental and human health conditions related to the mission of the agency

Meeting Materials:

All materials discussed at the meeting are available on the SAB website, at www.epa.gov/sab on the July 30-31, 2014 meeting page:

<http://yosemite.epa.gov/sab/sabproduct.nsf/a84bfee16cc358ad85256ccd006b0b4b/3a4fa7289c8d17bd85257cd90049ba64!OpenDocument&Date=2014-07-30>

Summary of Discussions:

Wednesday, July 30, 2014

The meeting was announced in the Federal Register¹ and proceeded according to the meeting agenda,² as revised. **Stephanie Sanzone**, Designated Federal Officer for the Panel, convened the meeting and noted that the Science Advisory Board Advisory Panel on the Report on the Environment (ROE) 2014 (the ROE Panel) operates under the auspices of the chartered SAB. The SAB and its panels operate in accordance with the Federal Advisory Committee Act. This means that meetings are announced and open to the public, deliberations are done in public, meeting minutes are prepared, and all materials prepared for or by the Panel are available to the public. She noted that panel members serve as Special Government Employees who are subject to Executive Branch ethics rules and regulations. The SAB Staff Office has determined that the matter before the panel is a general matter that would not affect the financial interests of the panel members. She thanked all members for taking the mandatory ethics training. Ms. Sanzone announced that Dr. Crittenden had been unable to attend the meeting and so other members, as indicated on the agenda, would cover his lead discussant duties. Ms. Sanzone noted that one written public comment³ had been submitted for the panel's consideration and that there had been

no requests to provide oral comments at the meeting. She added that all pre-meeting comments⁴ prepared by panel members had been posted on the meeting page and shared with panel members. She indicated that a teleconference line was available for interested persons who could not attend the meeting in person and she asked those on the telephone to please mute their lines and to send her an email so she could include them on the list of participants in the meeting minutes.

Christopher Zarba, Director of the SAB Staff Office, welcomed the members and thanked them for taking time to participate on the panel. **Dr. James Sanders**, Chair of the ROE Panel, welcomed the panel and acknowledged the importance of the ROE effort. He gave an overview of the goals for the meeting, noting that the agenda provides an opportunity to complete a majority of the panel's work before departing the meeting. He noted that lead discussants were assigned to start the discussion on particular charge questions, but that all panel members would have an opportunity to provide comment on all questions. He requested members to briefly introduce themselves. He then turned to the EPA presenters for their overview remarks on the ROE.

Overview of the ROE and Focus for the SAB Review

Dr. Jeffrey Frithsen, Senior Scientist and Special Projects Coordinator with EPA's Office of Research and Development (ORD) National Center for Environmental Assessment, introduced his colleague **Dr. Patricia Murphy**, Principal Investigator leading the development of the draft ROE 2014. In his presentation,⁵ he provided a brief overview on the history of the ROE, and emphasized ORD's role within the agency as providing scientific information but not making policy recommendations. He noted that ROE is an activity within the ORD research program on Sustainable and Healthy Communities (SHC). The ROE is designed to provide a set of national-level indicators organized to answer a series of questions that inform EPA priorities. Dr. Frithsen noted the dual role of the ROE to inform EPA decisions as well as to communicate with the public, but that the ROE is not intended to be a resource for expert specialists or researchers. He acknowledged the SAB panel pre-meeting comments on the ambiguity on intended audience for the ROE and welcomed suggestions from the SAB on that and other topics in response to the charge questions. Dr. Frithsen also clarified that the ROE uses indicators to report on status and trends, but does not attempt to analyze or diagnose the reasons for the trends. He noted that EPA hopes to finalize the ROE 2014 by the end of the calendar year.

Dr. Frithsen summarized the current structure for the ROE and indicated that the agency was seeking input from the SAB on whether the organization works well to communicate about sustainability and on how well the ROE questions are answered by the current indicators. He noted that all indicators in the ROE had been peer-reviewed prior to inclusion and the question before the SAB was how well the indicators were serving the purpose of provided an integrated picture on the environment.

Dr. Murphy provided a summary of the enhancements that had been made to the draft ROE since its beginning in 2001. She noted that drivers for these changes included the SAB review and consultation in 2008 and 2009, as well as interagency reviews, input from internal and external users, and aligning with EPA priorities (e.g., the emerging EPA focus on sustainability, and desire to incorporate sustainability indicators). The current draft ROE exists in an online environment, with graphics that are interactive, and individual indicators are being updated with new data prior to the final release. Statistical information was added where available from the original data owners, and the sustainability framework and a new sustainability theme were added as a first step to incorporate sustainability into the ROE.

Dr. Frithsen reiterated the agency's plan to finalize the ROE website by the end of 2014 based on SAB and public comments. He indicated that EPA would continue to add indicators, including sustainability indicators, in the future and would explore ways that ROE could support the goals of EPA and the SHC program with respect to community-based (rather than national) indicators.

Following the EPA overview presentation, several panel members asked clarifying questions. One member asked about the anticipated level of effort that the agency could devote to enhancements to the ROE. Dr. Frithsen replied that there are currently several ORD staff devoted to the ROE and, although resources are finite, some additional effort might be available to respond to SAB recommendations on both short and long-term efforts. Another member asked whether the agency felt life-cycle issues or international trade implications for sustainability were within the scope of the ROE. Dr. Frithsen replied that he welcomed the deliberations of the panel on that issue, but noted that the ROE focuses on environmental sustainability consistent with the agency's legislative mandates. A member asked about other agencies that EPA worked with to develop the ROE, and Dr. Frithsen replied that the presentation slides list the agencies that provided data for the ROE indicators.

With respect to the online format, a member asked whether the agency was collecting information on who is using the site, and what they are using it for. Another member added that this sort of information could be useful in defining metrics of success for the ROE. Dr. Frithsen replied that EPA has not done detailed demographic analysis of ROE users and which pages they are using. A member asked whether the focus on sustainability was likely to continue into future administrations, and another commented that sustainability felt "tacked on" to the previous ROE structure. Dr. Frithsen replied that sustainability concepts have been important at the agency for some time and, for example, EPA does have sustainability goals as part of the Governmental Performance and Results Act (GPRS) reporting. He noted that EPA welcomes the panel's input on how to use the sustainability theme within the ROE.

Another member asked why the environmental values from Tribes and First Nations (traditional environmental knowledge) were not represented in the ROE. Dr. Frithsen replied that he welcomes thoughts on how to bring these perspectives into an ROE environment of quantitative metrics.

Public Comments

No members of the public had requested time to make oral statements to the panel.

Discussion of the EPA Charge

Dr. Sanders reviewed the EPA charge questions and asked if panel members had any questions about the charge. He noted that he had preliminary input on the questions via the SAB Staff Office and was comfortable with the questions. One member asked whether a question was needed to address the overall usability of the ROE website. Dr. Sanders replied that the panel could provide advice on that topic under Charge Question 4. There were no other panel comments on the charge questions.

Discussion of Responses to Charge Questions

Charge Question 1. After a short break, the panel proceeded to discuss responses to Charge Question 1 regarding sustainability as the ROE 2014 conceptual framework. The lead discussants were Drs. Lucinda Johnson, Chris Frey, Jim Mihelcic, and Eileen Murphy.

Dr. Johnson summarized the panel members' pre-meeting comments, noting that there was general agreement that the conceptual framework was valuable but that several members thought the framework

might be too general. Some members felt that the term “sustainability” should be further defined to include “sustainable for what and for whom.” The diagrams do not capture important relationships and feedbacks between society, economy and well-being and there is no sense of how trade-offs to sustainability would be considered. The framework does not seem to have impacted how indicators and data are presented across the ROE website; it was not clear how the issue areas were identified and how they inter-relate. Members like the use of questions to organize the information but noted that different audiences may have different questions and some of the questions are never answered in the ROE. Some members noted that the spatial scale of the indicators may not match the regional nature of some important trends and that trends are not placed within the context of resource limitations.

Dr. Frey noted that sustainability is a goal, and therefore a normative concept that requires a value or policy judgment on what is, or is not, sustainable. He recommended that the ROE make this clear. If the ROE is intended to be “just the facts” without interpretation of the indicators, site users may not be able to assess what indicator trends are sustainable. Without this interpretation, the ROE may lose much of its potential value. He recommended that the framework diagram be based on some formalism, so that the meaning of boxes versus arrows are defined; i.e., are the boxes depicting stocks of resources and the arrows meant to represent flows of energy or material? It is not clear how the trends in consumptions indicators relate to sustainability; economic and social indicators are not represented; and the international aspects of sustainability (e.g., movement of trade goods and long-range transport of pollutants) are not acknowledged. Dr. Frey further noted that the indicators do not give a balanced perspective on some issues, such as acid deposition and tropospheric ozone.

Dr. Mihelcic supported adoption of the framework as a way to show relationships among indicators and linkages between environment, economy and society. He noted that he had participated in a recent SAB review of the ORD Strategic Research Action Plans (StRAPs), including for SHC, and asked whether those research plans could be better linked to the ROE. He noted that the ROE focuses only on the environmental pillar of sustainability and the framework does not incorporate principles of Smart Growth. He recommended that the ROE developers look internally at what EPA does well in social indicators and try to develop measures of societal well-being for the ROE. He also noted that the focus on resource use could include carbon use as an example of resource consumption. Dr. Mihelcic noted that he did not support normalizing resource use to GDP as a measure of sustainability.

Dr. Murphy noted that, while she understood the desire for more interpretation of the ROE indicator data, the ROE is presenting information for a broad array of audiences and it may be up to academic researchers and other audiences to interpret the indicator trends. She viewed the framework as being at an appropriate level of complexity, but noted that some of the data are old and sustainability should be integrated within the other themes.

Following the summary comments from the lead discussants, the panel discussed the response to the charge question, including the following points:

- There is a mismatch between the technical framing of the ROE indicators and the ability of the ROE website to communicate information to the public. As science advances, so does our understanding of what is sustainable. In the meantime, the ROE could provide basic information on trends and interpretation of the findings for the public.
- The ROE could benefit from the research literature, much of it in Europe, on “sustainability transitions” that focuses on human adoption and uptake of sustainability behaviors. The ROE also could address sustainability trade-offs as discussed in the NAS “Green Book.” A focus on trade-offs is needed to inform decision-making.

- Sustainability should be a core concept in each of the ROE themes. The ROE approach of using questions is a good one, but each of the questions could have a sustainability twist. The ROE might have different sets of questions for different audiences, and site users could be directed to the appropriate place.
- Many people are concerned about climate change, but most do not make the connection between that and individual behaviors. ROE could be a vehicle for making that connection for the public.
- The “What you can do” box could be embedded into indicator descriptions to highlight how the public can enhance sustainability (e.g., possible changes in human behavior)
- Although the general public is one of the audiences for the ROE, there are important audiences within the EPA and ROE also has potential as an educational tool.
- The ROE is supposed to be evidence-based, but it does not address expected future trends (e.g., implications of hydraulic fracturing for water use)—structural shifts that are important to decision-making are scoped out of the ROE.
- The ROE asks questions about trends in air and water quality, for example, but does not take a systems approach to considering trade-offs and cross-media issues.
- The six examples are a good early attempt to integrate along reasonable themes people care about, but the examples should be easily accessible from the front page of the ROE.

Dr. Sanders reminded the lead discussants that they were to work together to prepare a consensus draft response to the charge questions. The panel then recessed for lunch.

Charge Question 2. After lunch, the panel began discussing responses to Charge Question 2 regarding the incorporation of sustainability indicators into the ROE. The lead discussants were Drs. Robert Johnston, Keith Moo-Young and Thomas Theis.

Dr. Johnston noted that there was some overlap between Charge Questions 1 and 2 and that he would not repeat points discussed in the morning session. He noted that the ROE sustainability framework diagram could be misleading because it depicts economy (markets, production, etc.) as separate from the environment and the broader definition of individual behaviors. The three pillars of sustainability overlap rather than being separate aspects of sustainability. Sustainability is being treated as something that is considered separately from air, water, and the other parts of the ROE. He noted also that the sustainability indicators in the draft ROE do not provide direct insight into sustainability, a fact that is acknowledged in the fine print for each of the indicators. For example, to interpret sustainability implications of trends in water withdrawals would require information on stocks and flows available from natural systems (e.g., reservoir levels, aquifer levels, stream flows). It also is misleading to think of sustainable freshwater use on a national level because the resource is very region-specific. He suggested that ROE could go beyond EPA’s regulatory mission to provide indicators such as population levels of indicator species/taxa, fishery stocks/harvests, land use/land cover and other areas consistent with the sustainability theme. There might also be regional indicators, such as spatial changes in certain fisheries harvests that would provide information on human use of resources.

Dr. Moo-Young agreed that sustainability seems like an add-on, not well integrated with the rest of the ROE. Although the site lists the criteria for what is a good indicator, he questioned whether many of the resource use indicators are good indicators, and indicators of what? The ROE does not discuss the implications and why a trend goes up or down. For example, trends in solid waste should be evaluated in light of changes in combustion for energy, recycling and other sustainable practices that impact solid waste management. The hazardous waste indicators did not have enough data to provide trend analysis. Data on material recovery and reuse might explain why with population growth there is less going into the waste stream per capita. Resource consumption intensity is not really covered by the 4 indicators

included. The ROE indicator criteria require that indicators be national-scale, reproducible, and based on reliable data sets. However, many of the practices are local or regional, especially for water withdrawal. He suggested that the ROE could take the current data and link them to sustainable practices, as well as look for additional indicators and surrogates.

Dr. Theis summarized what he felt was the consensus that the four sustainability indicators were too narrowly chosen and do not represent the breadth of sustainability, nor do they illustrate the links between the pillars of sustainability. He recommended that the SAB encourage the agency to adopt a broader approach, rather than just renaming the theme as “environmental sustainability.” He noted that there were existing sustainability metrics that the ROE is not including, e.g., eco footprint as a life-cycle concept that can be regionalized, and the concept of embodied energy. He suggested that EPA could pick a suite of consumer products and report over time on the embodied energy, and hopefully see it go down over time. He echoed earlier comments that GDP not a good basis for normalizing and suggested that a better approach might be GDP less loss of human and natural capital, or other existing metrics that others are using. He also recommended that the agency consider including economic and social-based metrics that matter, such as green employment/green jobs, measures of disparity (e.g., of health and welfare), and other environmental justice metrics (regional or city metrics).

Following the summary comments from the lead discussants, the panel discussed the response to the charge question, including the following points:

- The new sustainability tab could be renamed to “resource use” to more accurately reflect the content and a broader list of resources could be added.
- EPA could look at each of the 86 indicators to see what information they provide on sustainability and what sustainability questions they help to answer.
- More information could be added on sustainability actions (e.g., extent of renewable energy use, water recycling, choices to purchase energy-efficient vehicles, movement toward sustainable agriculture) to capture progress toward sustainability.
- It would be helpful to quantify relationships between ROE indicators—look at correlation or covariation among indicators using fairly simple techniques. Are they varying together, or in opposite trends?
- The information provided under “what the data shows” is often too brief, and somewhat hidden. To integrate sustainability, ROE could have a tab about “what do the data show about sustainability” as a lower-cost way rather than totally redesigning the site.
- Agriculture is an example of the difficulty of considering sustainability—agriculture now produces more food on less land than ever in the past, yet it is generating lots of nutrients that are running off, etc. This is an example of the need to discuss sustainability trade-offs.
- Given ORD’s budget realities and where EPA can take leadership role, should EPA be developing indicators, or should EPA be compiling existing indicators developed elsewhere? Rather than focusing on adding lots more indicators, a higher priority might be to focus on a few indicators that could leverage the information provided from the existing indicators.
- ROE could link to an existing eco footprint calculator and explain to site users how to use ROE information to tailor their own footprint analysis.

Charge Question 3. Next the Panel turned to discussion of Charge Question 3 regarding incorporating statistical information in the ROE. Lead discussants were Drs. Jim Opaluch, Allan Legge and Amanda Rodewald.

Dr. Legge noted that there was very little statistical information in the previous version of the ROE and that some additional statistical information had been added to the current draft ROE. While acknowledging that statistical analysis might not be appropriate when indicators are supported by heterogeneous data sets, he urged the agency to consider adding additional statistical information when data are robust and trends are obvious, e.g., with SO₂/air quality monitoring data. There are some good news stories in the air quality area, but ROE leaves it up to the user to piece these together.

Dr. Rodewald noted that she had only found 12 indicators that had statistical analysis and although the issue of trends was highlighted in all of the ROE questions, statistical analysis of trends was rarely done. Thus, it is left to the user to determine whether a trend shown is significant. She also recognized the challenge of communicating uncertainty to the public. She concluded that there had been a good effort to include more detail on data limitations for the ROE indicators, but that the information was pretty dense and probably not useful to the general public.

Dr. Opaluch agreed that EPA had made an attempt to add some statistical information to the ROE, but that it was a limited start. He concluded that this is not so much an issue of the ROE, but really a function of the fact that the studies underlying the indicators need to do better job of uncertainty analysis. He pointed to the International Panel on Climate Change (IPCC) approach as a good model for analysis based on data from many sources and for thinking about groups of indicators that are linked to tell a story.

Following the summary comments from the lead discussants, the panel discussed the response to the charge question, including the following points:

- The agency should try to characterize the relationships among multiple indicators.
- Developing statistical information on a few of the existing indicators, or looking for associations among key existing indicators, might be a better use of resources than developing lots of new indicators.
- Some indicators are related using complicated models, so it is not easy to simply relate them in the ROE. The ROE could provide more spatial disaggregation and that might allow users to interpret the data in a more nuanced manner; some of the highly aggregated information (e.g., national stream flow) is not useful.
- The current approach seems to be to add statistical information where it is available. Another way to prioritize would be to focus on cases where statistical information is important for telling a story about the science, for communicating about sustainability, and in the context of what information the user audience needs.
- Regarding uncertainty, the agency could use ROE to help the public understand scientific uncertainty and that fact that the presence of uncertainty doesn't mean the information cannot be useful.

Charge Question 4. The panel discussions were running ahead of schedule, so Dr. Sanders indicated that he wanted to proceed to the next charge question if there were no objections. The panel began its discussion of responses to Charge Question 4 regarding the scientific rigor, clarity and utility of the web-based ROE. Dr. Sanders noted that in the 2009 consultation with a previous SAB panel, the members had strongly urged that ROE be an online product rather than a printed book. He then asked the lead discussants, Drs. Stephen Weisberg, Sharan Campleman and Sujoy Roy, to give their summary remarks.

Dr. Weisberg provided a summary of the panel members' pre-meeting comments on the question, using a simplified rephrasing of the questions. Regarding user friendliness, he concluded that most members

gave a resounding “yes” with the only downside being that there was not an offline version. He described the ROE as having good tools, links to more information, mouse-overs and other features. Some panel members had provided suggestions for further enhancements and some had wanted to be able to drill down further for more detailed information. Regarding clarity, the writing was clear and well-done, although the ROE should avoid jargon on graphics, etc. The strongest critique from the panelists was with regard to the clarity of the conclusions; while scientists would be able to connect indicators with important resource values, the public is not as likely to make that leap and there could be better connections between the questions many users will have and the answers provided by the ROE. Regarding clarity of purpose for the ROE, Dr. Weisberg noted that it was unclear what the agency wanted to achieve with the ROE. For example, who is the primary audience? Is the aim of the ROE to give indicators for which we have the best information or is it to try and answer the questions with the best data we have? What are the metrics of success for the ROE? Without knowing what will be success, it is hard to say how to best refine the ROE.

On the question of scientific rigor, Dr. Weisberg concluded that the panel members had a mixed response. Issues had been raised with a few of the indicators, but again is the goal to do the best we can with the available data or to answer the questions for which we have the data? The “where you live” is a great idea, but was poorly executed; sub-setting the national data set results in a small sample size compared to richer local/regional datasets. Also, many of the data are 10 years old whereas the title, ROE 2014, implies that it is recent data.

Dr. Campleman noted that the 24 ROE questions are helpful, but hard to find on the site. When users get to the individual indicators, it is hard to connect back to why the indicator is important to sustainability (although users can see the questions if they start from the top level, at the themes). She noted that the use of maps is a good idea but the ROE maps are not interactive as most people expect web-based maps to be. She also commented that the conceptual framework diagram and example issue diagrams might be confusing in their complexity for the general public and perhaps a general explanation of the figures could be added. She agreed with other panelists that the “where you live” feature could be enhanced.

Dr. Roy commented that the former ROE document was intimidating for many users and so the web format is more accessible. In the future, the agency could include more detailed spatially resolved data and the ROE could be a tool of interest to professionals that are trying to relate metrics spatially, etc. The agency could consider using ROE as a front end for integrating more of the information that is available so that it is a tool for researchers, students and others who want to do more with the data.

Panel members discussed additional points, including the following:

- ROE could benefit from some sort of focus group testing. The site has a lot of information but it was often difficult to find everything of interest.
- The front page could be redesigned to help the casual visitor more easily use the site.
- The ROE needs a consistent definition of sustainability, and the text describing statistical analysis should be consistent across the indicators.
- There would be value in bundling indicators in additional ways, e.g., to provide information on special populations (children, elderly), agriculture, or other issues. Children’s health is an EPA priority, so could the ROE find a way to tell that story?
- A downloadable version of the ROE would be available to all segments of society, and not just those with unlimited access to the Internet.

- Putting ROE on the web implies that it will have broad appeal and use, which raises the bar for ease of communication. ROE presents a tremendous opportunity to communicate with a broad array of clients and audiences.

Opportunity for Brief Clarifying Remarks. Prior to recessing for the day, Dr. Sanders asked the EPA representatives if they had any brief remarks to make about the panel's discussions on the first four charge questions. In particular, he asked Dr. Frithsen if he wanted to clarify the agency's goals for the ROE. **Dr. Frithsen** agreed that EPA will need to better define the audiences and said that the panel had made many suggestions on that topic. Regarding resources available for enhancing the ROE, he noted that the current level of effort is approximately \$750K and 5 FTE. He noted that not all enhancements will happen at once, so it would be very helpful if the SAB could prioritize its recommendations (e.g., high, medium and low) and indicate which need to be done to be able to roll out the website initially versus other updates and enhancements that could be accomplished over time. Dr. Frithsen commented that one constraint is that the ROE is a national tool and the indicators will have a national flavor. Regarding suggestions for new indicators, Dr. Frithsen commented that the ROE team does not have resources to collect or assemble new data for indicators but would partner with others who had the data and work with them to develop the indicator. Regarding the issue of whether sustainability is best as its own theme or as a highlight within the other themes, he noted that sustainability is a federal government-wide goal and that is one reason for making the sustainability framework a visible part of the ROE.

In response to questions from panelists, Dr. Frithsen said that he welcomed SAB thoughts on whether the indicators were answering questions about whether the environment is improving and, if the current set of indicators needs to be expanded, what additional indicators could be added to round out the ROE and make it more robust. He confirmed that EPA views ROE as being for internal audiences (e.g., for setting EPA priorities) as well as for the public.

Summary of Assignments and Administrative Reminders. Dr. Sanders reminded lead writers that their small group write-ups were to be provided to the Ms. Sanzone prior to leaving tomorrow. He asked panelists to think about priorities for the various recommendations that had been discussed.

At 4:30 p.m., the DFO recessed the meeting for the day.

Thursday, July 31, 2014

Ms. Sanzone reconvened the meeting at 8:30 a.m. **Dr. Sanders** indicated his plan to discuss responses to Charge Questions 5 and 6 before the break, then at about 10:30 a.m. to provide EPA representatives an opportunity to make brief clarifying remarks if they wished. At about 11:00 a.m., he planned to switch to discussion of key points and overarching thoughts. He indicated that he had a draft list to start the discussion, and this would set the stage for the writing groups as they develop the detailed recommendations. After the scheduled writing time, the panel would reconvene for brief report-outs from each group so that the full panel could discuss key recommendations and concerns.

Charge Question 5. The panel discussed responses to Charge Question 5 regarding the ability of the ROE to communicate to a range of technical and non-technical audiences. Lead discussants were Drs. Terry Daniel, Joe Arvai and Rebecca Parkin.

Dr. Daniel stated that to answer the charge question, it is necessary to know the purpose of the ROE. He noted that the ROE clearly is intended to communicate EPA's accomplishments and challenges in protecting the environment and human health, and that ROE aspires to address and engage diverse audiences and inform them about EPA's work. He summarized the panelists' feedback on the approaches used to communicate and the effectiveness of ROE for technical and non-technical audiences. The most consistent comment was reiterating the recommendation of the previous SAB reviews that an overarching framework is critical to guide users through the 24 questions and the 86 indicators. He agreed that the sustainability framework could serve this purpose, but its potential is not realized in the current draft. He recommended that the framework be an entry point of the ROE, with the questions and indicators integrated under that. While noting that the ROE 2014 probably could not fully implement a sustainability framework, even "sustainability light" would be a great improvement for site users. Regarding future versions of the ROE, Dr. Daniel noted that it should be based on consistent testing and interactions with intended user audiences. Once the EPA has decided more clearly what audiences it wishes to reach, the site could be revised to highlight linkages across themes and among indicators and highlight issues and questions that users are most likely to have. He concluded that the ROE 2014 is an important opportunity to bring audiences along as EPA continues its journey to consider its mission in a more sustainable, holistic manner.

Dr. Arvai said that the name, Report on the Environment, implies that it will describe the state of affairs or provide a report card, but the ROE really is not an integrated report in that sense. He said that EPA might reconsider whether ROE is a clearinghouse of information rather than a report. He noted that the home page of the ROE is not very informative at setting up what the ROE is and is not. He recommended that the agency have more clarity about the audiences and who the ROE is intended to inform. He also noted that the ROE could discuss sustainability trade-offs and the fact that sustainability is an outcome of decision making rather than a goal for decision making. ROE could be restructured so that areas of concern are better explained, followed by the indicators under each, and discussion of trends and their causes and relationship to other indicators and trends, and why they are important. The ROE currently is a one-size-fits-all report, but public, policy makers, educators, students, etc. all come to ROE with different levels of sophistication. Thus, it may be necessary to build a layered ROE where users can select a "track" for using ROE. Dr. Arvai noted that it may not be realistic for ROE to both inform the public and serve as a decision-support for EPA managers, but EPA has many other resources for informing internal decision making.

Dr. Parkin agreed with Drs. Daniel and Arvai that the EPA needs to better define the audience(s) for the ROE. She noted that EPA could think in terms of primary and secondary audiences, without treating all objectives as equally important. She recommended getting input from the primary audience about what is needed from the ROE, using one or more methodologies with even a small test group. The purpose of the ROE site is confused and the home page may raise expectations that are not met by the rest of the ROE. The panel has some suggestions for "buttons" that could lead to a cluster of issues, but the SAB cannot recommend many specific revisions until the audience testing and input has been done. For example, the ROE does not seem to meet the needs of subgroups, e.g., Tribes, caregivers for children, and if these groups are elements of the primary audience more work should be done to synthesize the indicators that are relevant to them. In addition, she noted some functional problems with the site (e.g., the absence of a keyword search function).

During the subsequent panel discussions, points made included the following:

- The ROE needs a succinct summary, e.g., highlights for users who just want the bottom line on national trends in the environment.

- Is ROE part of ORD’s mission or is it more within the role of the Office of Environmental Information and getting information out to the public?
- Most of the ROE questions focus on trends, rather than on sustainability. If sustainability is the overarching concept, need to work that into questions not just have them implied.
- Although the questions include trends, very few of the indicators provide trend information and the significance of the trends is not discussed.
- The ROE is not structured to allow easy consideration of trends across multiple indicators.
- Some panelists wanted to see more interpretation in the ROE, but others noted that over its 12-year history the ROE has been a compilation of data facts (indicators) rather than an interpretive report.
- The previous ROE document included a “highlights” section and that is what is missing with the current format. Perhaps a brief highlights PDF could be added up front for download or there could be a “highlights” box with links.

Charge Question 6. Dr. Sanders led the panel’s discussion of responses to Charge Question 6 regarding recommendations for any additional indicators. He referred to the EPA presentation slides that show the criteria that EPA uses for identifying and reviewing candidate indicators, and for deciding which indicators to update or discard. He noted that he had looked through the pre-meeting comments to look for examples of possible indicators (beyond those suggested for sustainability). Categories included economic and social science indicators addressing human dimensions (e.g., status of recreational fisheries, bans on water use, beach water quality). If EPA decides to integrate sustainability within the other ROE themes, that may affect the sort of indicators that would be needed.

The panel discussed possible additional indicators and agreed on the following points:

- It is more important to have indicators that are useful rather than just adding lots of new indicators; add indicators that make the existing indicators more useful.
- Indicators of drinking water infrastructure and wastewater infrastructure condition and trends would be useful.
- Resilience of ecosystems is critical, and several of the indicators could be couched in that way.
- EPA should consider indicators based on data collected or catalogues by other federal agencies, including some that would provide insights on sustainability.
- Ecological foot printing: there are calculators elsewhere on the EPA website (e.g., household carbon footprint) and ones developed by other agencies and organizations that might be useful to include in the ROE.

Brief Clarifying Remarks: After a break, Dr. Sanders asked if the EPA representatives wanted to make any remarks. **Dr. Frithsen** thanked the panel for its comments. He clarified that the ROE is truly a “report on the environment” as seen through the EPA lens, not just a report on sustainability. He added that ROE is not intended to be an interpretive report that discusses causation, but noted that EPA welcomes feedback on how to do that interpretation in other venues. He agreed that the public includes a broad range of audiences, but added that the ROE still needs to meet the needs of internal EPA users. He noted that the Administrator views the ROE as a tool to communicate with the public on the environment and to be accountable for progress, as well as a tool for helping EPA set priorities. He commented that the Office of the Administrator has set a theme of sustainability across the agency so that focus is reflected in the ROE. He welcomed the panel’s thoughts on how to more fully meet the potential of the ROE in the future, especially a sense of priorities for any SAB recommendations. He encouraged the panel not to let budget concerns unduly restrict their suggestions.

Discussion of Summary Points. Dr. Sanders presented a list of summary points⁶ to make in the executive summary and letter to the Administrator. Panelists discussed the summary points, including whether or not to recommend that the ROE retain the Sustainability tab, whether to rename it to more closely match the content, and how ROE could take best advantage of the sustainability framework as an organizing framework through which the rest of the ROE is understood. Members also discussed the trade-off between the concept of ROE as a report card with a given time frame, or a totally living web document. Several panelists urged that the agency think of the ROE as reporting on progress toward sustainability. Regarding additional points to include in the SAB report, several panelists requested a recommendation for a succinct summary that could be printed and used by the public and to make the point that the ROE is relevant to EJ communities. A unique aspect of the ROE is that it is a synthesis, which is not found in other parts of the EPA website, because it can look across media if the integration across the indicators can be enhanced. One member recommended that an additional point should be made in the letter to the Administrator regarding the importance of including the perspectives of First Nations in the ROE.

Plan for Report Preparation: Dr. Sanders instructed the lead writers to prepare approximately 4 to 5 pages in response to their charge question, and to provide any references cited. Initial drafts were to be provided before departing from the meeting, and members would have until August 8, 2014 to make any final edits. In response to questions about areas where the charge questions seemed to overlap, Dr. Sanders indicated that he would work with the DFO to place all draft text in the appropriate sections as the integrated draft report was prepared.

Dr. Sanders then announced that the panel would take a break for lunch and writing time, which was scheduled to continue until 3:00 p.m., although he noted that he might reconvene the panel earlier than that if the groups were ready to report out. At approximately 2:30 p.m., the various groups provided summary bullets in response to their assigned charge questions and agreed to provide their written materials to the DFO. Ms. Sanzone noted that an integrated draft report would be sent to the panel for their review and a teleconference would be scheduled to discuss the draft report at the end of September or early October. She reminded the panelists that following concurrence from the panel, the chartered SAB would conduct a quality review of the draft, perhaps as early as November, so that the SAB's final advice could be provided to the agency as quickly as possible.

There being no further discussions, the DFO adjourned the meeting at 3:00 p.m.

Respectfully Submitted:

/s/

Stephanie Sanzone
Designated Federal Officer

Certified as Accurate:

/s/

Dr. James Sanders, Chair
SAB Advisory Panel on the Report on the
Environment 2014

NOTE AND DISCLAIMER: The minutes of this public meeting reflect diverse ideas and suggestions offered by Panel members during the course of deliberations within the meeting. Such ideas, suggestions and deliberations do not necessarily reflect consensus advice from Panel members. The reader is cautioned to not rely on the minutes to represent final, approved, consensus advice and

recommendations offered to the Agency. Such advice and recommendations may be found in the final advisories, commentaries, letters or reports prepared and transmitted to the EPA Administrator following the public meetings.

Attachment A. SAB Advisory Panel on the Report on the Environment (ROE) 2014

CHAIR

Dr. James Sanders, Executive Director, Skidaway Institute of Oceanography, University of Georgia, Savannah, GA

SAB MEMBERS

Dr. Joseph Arvai, Svare Chair in Applied Decision Research, Department of Geography, University of Calgary, Calgary, Alberta, Canada

Dr. Terry Daniel, Professor of Psychology and Natural Resources, Department of Psychology, University of Arizona, Tucson, AZ

Dr. H. Christopher Frey, Distinguished University Professor, Department of Civil, Construction and Environmental Engineering, College of Engineering, North Carolina State University, Raleigh, NC

Dr. Lucinda Johnson, Center Director, Center for Water and the Environment, Natural Resources Research Institute, University of Minnesota Duluth, Duluth, MN

Dr. Robert J. Johnston, Director of the George Perkins Marsh Institute and Professor, Department of Economics, Clark University, Worcester, MA

Dr. James R. Mihelcic, Professor, Civil and Environmental Engineering, University of South Florida, Tampa, FL

Dr. H. Keith Moo-Young, Chancellor, Office of Chancellor, Washington State University, Tri-Cities, Richland, WA

Dr. Eileen Murphy, Director of Research and Grants, Ernest Mario School of Pharmacy, Rutgers University, Piscataway, NJ

Dr. James Opaluch, Professor and Chair, Department of Environmental and Natural Resource Economics, College of the Environment and Life Sciences, University of Rhode Island, Kingston, RI

Dr. Amanda Rodewald, Director of Conservation Science, Cornell Lab of Ornithology and Associate Professor, Department of Natural Resources, Department of Natural Resources, Cornell University, Ithaca, NY

Dr. Sujoy Roy, Director, Research and Development, Tetra Tech Inc., Lafayette, CA

CONSULTANTS

Dr. Sharan Campleman, Independent Consultant, Campbell, CA

Dr. John C. Crittenden,* Professor, Department of Civil and Environmental Engineering, School of Civil and Environmental Engineering, Georgia Institute of Technology, Atlanta, GA

Dr. Allan Legge, President, Biosphere Solutions, Calgary, Alberta, CANADA

Dr. Rebecca Parkin, Professorial Lecturer in Environmental and Occupational Health and in Epidemiology and Biostatistics, Environmental and Occupational Health, School of Public Health and Health Services, The George Washington University Medical Center, Washington, DC

Dr. Thomas L. Theis, Director, Institute for Environmental Science and Policy, University of Illinois at Chicago, Chicago, IL

Dr. Stephen Weisberg, Executive Director, Southern California Water Research Project Authority, Costa Mesa, CA

SCIENCE ADVISORY BOARD STAFF

Ms. Stephanie Sanzone, Designated Federal Officer, U.S. Environmental Protection Agency, Science Advisory Board (1400R), 1200 Pennsylvania Avenue, NW, Washington, DC

*Dr. Crittenden was unable to attend the meeting and resigned from the panel.

Attachment B. Other Attendees

Other persons who attended the July 30-31, 2014 meeting of the SAB Advisory Panel on the ROE 2014 or who requested the call-in number to participate by teleconference:

| Name | Affiliation |
|-------------------|---|
| David Bottimore | Versar |
| Tom Brennan | SAB Staff Office |
| Caitlin Bruce | US EPA |
| Tom Carpenter | SAB Staff Office |
| Jeff Frithsen | US EPA ORD |
| Odelia Funke | US EPA OEI |
| Maria Hagstad | Risk Policy Report |
| Michael Heintz | Association of Public Health Laboratories |
| David Hrdy | US EPA OCSPP |
| Kara Koehn | US EPA OEI |
| Chris Larrie | ERG |
| Jessica M. Latham | US EPA ORD |
| Maricruz Magowan | US EPA |
| David Miller | US EPA |
| Kitty Miller | US EPA OW |
| Anand Mudambi | US EPA OSA |
| Patricia Murphy | US EPA ORD |
| Martha Otto | US EPA OSA |
| Sharon Pang | US EPA |
| Marian Rutigliano | US EPA |
| Seema Schappelle | US EPA |

| | |
|------------------|------------------|
| Michael Slimak | US EPA ORD |
| Sue Shallal | SAB Staff Office |
| Holly Stallworth | SAB Staff Office |
| Debra Walsh | US EPA |
| Ed Washburn | US EPA |
| Chris Zarba | SAB Staff Office |

Material Cited

All materials discussed at the meeting are available on the SAB website, at www.epa.gov/sab on the July 30-31, 2014 meeting page:

<http://yosemite.epa.gov/sab/sabproduct.nsf/a84bfee16cc358ad85256ccd006b0b4b/3a4fa7289c8d17bd85257cd90049ba64!OpenDocument&Date=2014-07-30>

¹ Federal Register Notice announcing the meeting, 79 FR 40101-40103.

² Agenda for the Meeting, July 30-31, 2014

³ Comments from T. Bently Wigley on behalf of the National Council for Air and Stream Improvement, Inc

⁴ Pre-Meeting Comments from Members of the Advisory Panel on EPA's ROE 2014

- Advisory Panel on EPA's Report on the Environment 2014 Pre-Meeting Comments (as of 7/25/14)
- Pre-Meeting Comments from Allan Legge on ROE 2014 (received 7/29/14).
- Pre-Meeting Comments from Keith Moo-Young.
- Pre-Meeting Comments on ROE 2014 from Christopher Frey (received 7-29-14).

⁵ EPA's draft Report on the Environment 2014 (ROE) -- Presentation by Drs. Jeffrey Frithsen and Patricia Murphy.

⁶ Possible Summary Points from Dr. Sanders, July 31, 2014