U.S. Environmental Protection Agency (EPA) Board of Scientific Counselors (BOSC)

Safe and Sustainable Water Resources (SSWR) Subcommittee

Meeting Summary

April 23–24, 2019

Dates and Times: April 23, 2019, 9:00 a.m. to 5:00 p.m.; April 24, 2019, 9:00 a.m. to 2:45 p.m. Eastern Time

Location: EPA Headquarters, William Jefferson Clinton East 1153, 1300 Pennsylvania Ave, NW Washington, DC 20460

Executive Summary

On April 23–24, 2019, EPA's BOSC SSWR subcommittee convened in Washington, DC. The goals of the two-day meeting were to review the SSWR Research Program's draft Strategic Research Action Plan (StRAP)[1] and the SSWR Research Program's presentations and posters, and propose research strategies therein, and provide overall direction to the SSWR program by responding to several charge questions. SSWR program staff members were available during the meeting to address StRAP content and specific areas of input from the BOSC. The meeting format allowed for presentations, open dialogue, program feedback, subcommittee questions, and EPA responses to questions.

Day 1 consisted of presentations and demonstrations outlining the SSWR program's three topic areas and associated research and outputs, in addition to review and discussion of the five Agency-provided charge questions. The subcommittee then formed 3–4 person BOSC workgroups to develop strengths, suggestions, and recommendations for each charge question. Day 2 consisted of continued discussion between the subcommittee and SSWR program staff, followed by each workgroup's report-out on each charge question.

Dr. Bruce Rodan, Associate Director for Science, Office of Research and Development (ORD), welcomed the SSWR subcommittee members and noted their role of providing independent peer review of ORD planning and implementation of research. He explained that EPA will make every effort to implement the subcommittee's recommendations. Mr. Tom Tracy served as the Designated Federal Officer from ORD.

SSWR Research Topic Overviews, Demonstrations, and Group Discussion

Dr. Suzanne van Drunick, National Program Director, SSWR Research Program, outlined the program's integration of three organizing topic areas, 11 research areas, and 31 strategic outputs. She described the SSWR program's long-term vision, including providing information needed to support innovative scientific and technological solutions to ensure adequate supplies of clean water to protect the public's health and livelihood; to protect and restore watersheds and aquatic ecosystems; and to strengthen the economy. She provided an overview of the SSWR program's partners and stakeholders and emphasized how the program focuses on partner needs and solutions, specifically surrounding partner-driven research, engagement, and outreach.

[1] https://www.epa.gov/research/safe-and-sustainable-water-resources-strategic-research-action-plan-2016-2019

Mr. Rick Greene, SSWR Research Program, presented the first research topic overview on watersheds. There are three research areas within this topic, including assessment, monitoring, and management of aquatic resources; improved aquatic resource mapping; and human health and aquatic life criteria. Examples of specific outputs included science to support the National Aquatic Resource survey (NARS) and applications of NARS data; development of tools, models, and methods to assess potential health effects from exposure to micro and nanoplastics, and microbial and chemical contaminants in water; improved accuracy and application of geospatially explicit aquatic resource data; and science to advance derivation of water quality criteria.

Dr. Scot Hagerthey, Deputy Division Director, ORD, and Mr. Hale Thurston, Assistant Laboratory Director, ORD, presented the second research topic overview on nutrients and harmful algal blooms (HABs). There are three research areas within the topic, including assessment and management of HABs; science to support nutrient-related water quality goals; and nutrient reduction strategies and assessment. They discussed specific outputs, including research for characterizing nutrient-related impacts across multiple spatial scales; trajectories of aquatic ecosystem responses to and recovery from nutrient pollution; providing tools, technologies, and best practices to predict, monitor, and reduce nutrients; and best practices for integrated nutrient management programs.

Dr. Chris Impellitteri, Associate National Program Director, SSWR Research Program, presented the third research topic overview on water treatment and infrastructure. There are five research areas within the topic, including drinking water and distribution systems; per- and poly-fluorinated alkyl substances (PFAS); wastewater and water reuse; integrated stormwater management; and technical support. Examples of specific outputs included provision of resources and tools for characterizing and mitigating lead and copper release in drinking water distribution systems and premise plumbing; validated analytical methods for PFAS in environmental samples; assessment of treatment strategies and technologies for wastewater and fit-for-purpose water reuse; integrated guidance for planning, implementing, and monitoring stormwater management practices; and technical support for water treatment, analytical methods, and risk assessments.

Ms. Michelle Latham, Technical Communications Lead, SSWR Research Program, discussed the program's communication and outreach efforts. She presented highlights from the program.

SSWR subcommittee members and EPA staff members engaged in discussion on various subjects surrounding each research topic, including research methods used in outputs, the incorporation of translational science into research methods, providing data to stakeholders, challenges associated with stakeholder engagement, and potential research gaps.

Public Comment

Mr. Steve Vies presented comments from the American Water Works Association (AWWA). AWWA supports several recommendations: bringing greater focus to ORD; being transparent as to what can be achieved with available funds; engaging the water sector and water research funding community; improving coordination across EPA; and taking steps now to improve the next StRAP cycle.

SSWR subcommittee members and EPA staff engaged in discussion on these recommendations and suggested that AWWA's perceived lack of focus in the StRAP might be because the StRAP is a high-level document that had specific details removed. ORD staff provided examples of recent stakeholder engagement and outreach efforts. However, increasing stakeholder engagement and outreach should continue to be considered. The participants agreed that Mr. Vies' attendance and AWWA's comments were a positive step towards improving stakeholder engagement.

Subcommittee Discussion of Charge Questions and EPA Response to Questions

The SSWR subcommittee discussed each of the five charge questions for the SSWR program. The subcommittee formed 3–4 member workgroups to address each charge question, with the goal to produce a draft response on day 2 of the meeting.

Subcommittee Report-Out and Summary of Preliminary Recommendations

Each workgroup identified strengths, suggestions, and preliminary recommendations pertaining to the draft SSWR StRAP and their specific charge questions. The SSWR subcommittee discussed the recommendations of each workgroup and presented an initial summary for SSWR program staff on day 2. These recommendations and supporting suggestions will be reviewed and refined by the subcommittee over the next few months and finalized in a draft report to be reviewed at the BOSC Executive Committee (EC) meeting.

Charge Question 1a: Does the research outlined for the 2019–2022 timeframe support the relevant Agency priorities as described in the EPA and ORD Strategic Plans?

- The StRAP includes three EPA strategic goals (core mission, cooperative federalism, and rule of law and process) and three ORD goals (advancing environmental science and technology, cooperative federalism, and enhancing the ORD workforce and workplace).
- None of the proposed research topics, research areas, and associated outputs are outside of the strategic goals identified by EPA and ORD and, by extension, the StRAP supports these goals.
- Stakeholder engagement, as described in the StRAP, supports the goal of cooperative federalism.
- The subcommittee needs additional detail on measures of success with respect to meeting strategic resesarch goals.
- The subcommittee needs a more transparent explanation of how the three SSWR research topics and their underlying research areas match to the four broader research objectives identified in the StRAP.
- The program should consider overlap between EPA and other federal research programs. Other federal research programs might also focus on research topic areas included in the StRAP.
- Formal recommendations were not presented at this time.

Charge Question 1b: Each ORD research program undertook a rigorous engagement process to provide additional detail on specific EPA program and region, state, and tribal needs, the results of which are summarized in the StRAP objectives and explanations of research topics

and areas. How well does the proposed research program respond to these partner-identified needs?

- ORD should increase collaboration with stakeholders (e.g., AWWA and other international research water groups) and identify research needs as part of this collaboration.
- The program should rank items in the StRAP that will be addressed during this 4-year period.
- The program should specify ongoing research activities not completed during the previous period that will continue during the 2019–2022 timeframe. They should explain why research topics that were included during the previous period are not included in this iteration of the StRAP. Examples of these research topics include groundwater remediation; nutrient impact on wastewater reservoirs from water reuse; a hydraulic fracturing water reuse study for evaluating ecological impacts; and human health and ecological effect studies for large vessel ships.
- The StRAP should provide more transparency on how outputs were aligned with stakeholders' needs. Some of the outputs in the StRAP were not identified as stakeholders' (state) needs while other needs identified in these surveys are not included in the StRAP as research outputs.
- The recommendation was made that ORD continue distributing surveys to states, but the existing survey is not adequate. An updated survey should consist of fewer leading questions and be broader with distribution to more partners. ORD should conduct more stakeholder outreach to better understand their priorities. ORD must listen to the needs of states and adapt to address their needs.

Charge Question 1c: Does the StRAP, including the topics, research areas, and proposed outputs, clearly describe the strategic vision of the program? Given the environmental problems and research objectives articulated, please comment on the extent to which the StRAP provides a coherent structure toward making progress on these objectives in the 2019–2022 time frame.

- ORD should provide a vision for research prioritization. This vision should allow the SSWR program to react and adjust their research priorities as conditions change. As other workgroups suggested, SSWR should consider identifying metrics for program success in the context of achieving the SSWR program vision.
- The program might need to restructure and reorganize the StRAP, including research areas included as part of the "watersheds" research topic. Program staff should describe outputs more consistently and articulate them in a different manner within the StRAP.
- The program should consider the communication of risk to public health and the environment and how it requires special tools and methods.
- Strengths include that the SSWR program is strong, has a clear vision, is representative of stakeholders' needs, and broadly considers analytical methods.

Charge Question 1d: Recognizing ORD's focus on addressing identified partner research needs, in the presence of reduced scientific staff and resources, are there any other critical

emerging environmental needs or fields of expertise and/or new research methods where this program should consider investing resources?

- Strengths include extensive surveys and communications with regions, states, and tribes; the integration and leveraging existing and innovative technologies; inclusion of comprehensive PFAS approaches and outputs; research to provide new and advanced tools, methods, and information in support of guidelines for the development of recommended safe drinking and recreational cyanotoxin levels; addressing microplastics; and the focus on lower food web dynamics.
- The StRAP is too focused on short-term needs. ORD needs to maintain the capacity to anticipate and innovate.
- The StRAP should incorporate strategies for identifying future and emerging issues.
- The program should define the link between technical support and research.
- The StRAP needs a strategy for contaminants of emerging concern.
- Although some pressing environmental issues are included in the StRAP, other issues (e.g., stormwater, diminished water availability, and wetlands) are not further addressed.
- Although the section of the StRAP on integration mentions "resiliency," that topic is not considered elsewhere.
- The StRAP does not adequately address integration of research efforts across federal agencies (e.g., the United States Geological Survey, or USGS, mapping and water quality programs) and ORD research programs. As resources become scarce, it is important to maximize and leverage across programs.
- The StRAP needs more specificity about algal bloom types (i.e., benthic and pelagic algal blooms) within the nutrients and HABs research topic.
- Translation and communication are limited to traditional methods. The program should incorporate the use of social media along with approaches for integrating messages through existing ORD tools, such as EnviroAtlas.
- Recommendations were that ORD should develop a deliberate process for identifying emerging stressors and problems; explore the ramifications of changing climate (i.e., extreme events and warming) and consider stressor interactions, changing hydrologic regimes and patterns of biota, groundwater and surface water interactions, and ecological effects of diminished water availability; and include in the StRAP more work in the next generation environmental monitoring and assessment area (e.g., genomics; technologies for detecting and analyzing chemical of emerging concern; automated monitoring technology development; leveraging opportunities to ensure interoperability and connectivity across data and tools; and empower community-engaged science).

Charge Question 1e: What are some specific ideas for innovation (including prizes/challenges) and market-based approaches that the program could use to advance solutions to existing and emerging environmental problems?

- Creation of successful incentives is reliant on consideration of implementation. ORD and industry associations must work together to better understand the priorities and concerns of practitioners.

- ORD should identify new markets or incentives for water conservation and consider drivers for the public to continue water conservation activities after droughts or mandatory conservation ends.
- If ORD wants to encourage academic competitions, incentive programs must be supportive of and give recognition to the faculty and teachers behind the student teams.
- ORD should engage corporations to act as sponsors and provide donations for incentive programs.
- The StRAP needs metrics for gauging the success of incentives or challenges. EPA could compile information on previous competitions or incentives and their long-term impacts.
- Recommendations were that ORD should shift from enforcement to an incentive-based approach and focus on water quality treatment approaches that do not generate residuals.

Conclusion

The combined responses from each workgroup's recommendations will be compiled into the draft SSWR StRAP review report. The subcommittee will convene via teleconference to discuss the final revisions as a group before the BOSC EC meeting, which will convene in June 2019. The EC will consider the subcommittees' recommendations and finalize the overall BOSC report, which will include reviews of each of ORD's research programs.

Meeting Agenda and Charge Questions

The agenda[2] and the draft charge[3] can be accessed at https://www.epa.gov/bosc/safe-and-sustainable-water-resources-subcommittee-meeting-documents-april-23-24-2019.

Meeting Participants

BOSC Safe and Sustainable Water Resources Subcommittee Members:

Joseph Rodricks, *Chair*
Robert Blanz, *Vice Chair*
Scott Ahlstrom
Jerad Bales
Elizabeth Boyer*
Steve Carr
Shahid Chaudhry
David Cole
Timothy Davis
Joel Ducoste
Elizabeth Fassman-Beck
Fred Hitzhusen
Lucinda Johnson
Kate Lajtha
Michelle Lorah
John Lowenthal
Tim Verslycke
Stephen Weisberg
John White

**participated via phone on Day 1 of the meeting, present on Day 2*

EPA Designated Federal Officer (DFO): Tom Tracy, *Office of Research and Development*

EPA Presenters:

Benita Best-Wong, *Principal Deputy Assistant Administrator, Office of Water*
Carole Braverman, *Regional Science Liaison, Region 5*
Sandra Connors, *Deputy Director, Office of Wetlands, Oceans, and Watersheds*
Rick Greene, *Safe and Sustainable Water Resources Research Program*
Scot Hagerthey, *Deputy Division Director and Science Advisor, Office of Research and Development*
Chris Impellitteri, *Associate National Program Director, Safe and Sustainable Water Resources Research Program*
Michelle Latham, *Technical Communications Lead, Safe and Sustainable Water Resources Research Program*
Jennifer McLain, *Acting Director, Office of Ground Water and Drinking Water*

[2] https://www.epa.gov/sites/production/files/2019-04/documents/bosc_agenda_april_f2f_final.pdf
[3] https://www.epa.gov/sites/production/files/2019-04/documents/strap_charge_to_bosc.pdf

Deborah Nagle, *Director, Office of Science and Technology*
Bruce Rodan, *Associate Director for Science, Office of Research and Development*
Andrew Sawyers, *Director, Office of Wastewater Management*
Hale Thurston, *Assistant Laboratory Director, Safe and Sustainable Water Resources Research Program*
Suzanne van Drunick, *National Program Director, Safe and Sustainable Water Resources Research Program*
Joe Williams, *Deputy National Program Director, Safe and Sustainable Water Resources Research Program*

Other EPA Attendees:

Ryan Albert	Gail Harris	Matt Richards
Steven Bakovic	Shannon Kenny	Crystal Rodgers-Jenkins
Catherine Brady	Mike Loughran	Nicole Shao
Kacee Deener	Ben Packard	Tim Torma
Megan Fleming	Amber Penaina*	Deirdre Turner
Jeff Frithsen	Brenda Rashleigh	Phil Zaheddine
Ann Grimm	Mary Reiley	

**Attendee did not register for meeting. Name was transcribed from sign-in sheet and may not be accurate.*

Other Participants:

Wen Chen
Steve Davies
Chris Moody
David Schultz
Steve Vies

Contractor Support (ICF):

Kaedra Jones
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