

**U.S. Environmental Protection Agency Board of Scientific Counselors**  
**Homeland Security Subcommittee**  
**Virtual Meeting Summary**

**August 20–21, September 9, and September 24, 2020**

**Dates and Times:** August 20, 2020, 12:00 to 5:00 p.m.; August 21, 2020, 12:00 to 5:00 p.m.; September 9, 2020, 2:00 to 5:00 p.m.; September 24, 2020, 2:00 to 5:00 p.m. Eastern Time

**Location:** Virtual

**Executive Summary**

On August 20–21, September 9, and September 24, 2020, the Environmental Protection Agency’s (EPA’s) Board of Scientific Counselors (BOSC) Homeland Security (HS) Subcommittee (further referred to here as Subcommittee) convened in a virtual meeting. The goals of the two-day meeting and following teleconferences were to discuss the Office of Research and Development’s (ORD) Homeland Security Research Program (HSRP) oil spill response research and water research. The meeting format allowed for presentations, open dialogue, program feedback, Subcommittee deliberations and questions, and EPA responses to questions.

The meeting consisted of presentations and discussions providing an HSRP overview, various EPA Center capabilities, and details on HSRP’s oil spill response research (Day 1) and water research (Day 2). The teleconferences on September 9 and 24, 2020 allowed the Subcommittee to further discuss their draft strengths, suggestions, and recommendations and complete their Subcommittee report.

Dr. Bruce Rodan, the Office of Research and Development’s (ORD’s) Associate Director for Science, thanked everyone for their flexibility to meet virtually due to Coronavirus Disease 2019 (COVID-19) gathering restrictions. He emphasized that the Subcommittee’s input is the foundation of the scientific effort and emphasized the importance of the BOSC program.

**Center for Environmental Solutions and Emergency Response Welcome**

Dr. Greg Sayles, Director, Center for Environmental Solutions and Emergency Response (CESER), described CESER’s mission, vision, organization, and collaboration techniques between centers. Dr. Sayles outlined CESER’s COVID-19 capabilities and responses. He shared EPA’s COVID-19 research website, <https://www.epa.gov/coronavirus>.

Following the presentation, Subcommittee members and EPA staff engaged in discussion. Topics discussed included COVID-19 findings and electrostatic spray disinfectants.

**Homeland Security Research Program Overview**

Dr. Shawn Ryan, National Program Director, HSRP, outlined HSRP’s vision, program objectives, and partnerships with other EPA programs and regional offices. He emphasized HSRP’s goal to find preparation gaps and develop solutions before disseminating solutions for others to use.

Dr. Sang Don Lee, Principal Associate National Program Director, HSRP, reviewed videos of HSRP's work and emphasized that waste handling and spread can be a difficult problem to logistically and chemically mitigate; therefore, HSRP is often the first called for technical assistance. Dr. Ryan discussed the HSRP Strategic Research Action Plan (StRAP) purpose and future directions of the program.

### **Overview of Oil Spill Response Research**

Dr. Robyn Conmy, Research Scientist, CESER, provided an overview of CESER's oil spill response research. She explained the Research Area Coordination Team structure, goals, and collaboration across program and regional offices. Dr. Conmy discussed CESER's interest in developing new tools and approaches for oil research and highlighted the strong collaborations with outside partners, including the Interagency Coordinating Committee on Oil Pollution Research to establish research programs and identify community needs.

Dr. Conmy detailed the three-pronged approach to address oil spill response gaps and the high priority need of Output 1: National Contingency Plan (NCP) Regulatory Support. She also discussed Output 2: Behavior, Fate, and Effects of Oil and Spill Treating Agents and outlined the three projects. Lastly, Dr. Conmy highlighted the Agency's emergency response support efforts and spill preparedness efforts and collaborations with EPA's Region 10.

Following the presentation, Subcommittee members and EPA staff engaged in discussion. Topics discussed included desired oil spill partners, sorbents, and the difficulty of obtaining domestic crude oil samples.

### **National Contingency Plan Protocol Schedule Development**

Dr. Conmy detailed CESER's evaluation of seven new reference oils for density, dispersant effectiveness, droplet size distribution, chemical and physical properties, and toxicity.

Dr. Mace Barron, Toxicologist, CESER, presented on the treating agent toxicity test and the focus on advancing toxicity testing from 1994 science, standardizing protocols for test laboratory and responsible party use, increasing relevance of reference oils to spill response, allowing comparison to global oil and agent toxicity knowledgebase, and using ecotoxicity benchmarks in oil spill monitoring.

Dr. Conmy described the use and efficacy of surface washing agents or shoreline cleaners and how the dispersed surfactants are difficult to recover. She also explained the types of tests to evaluate surface washing agents, efficacy, and results.

Following the presentations, Subcommittee members and EPA staff engaged in discussion. Topics discussed included biodegradation tests and the possibility of standardized test methods.

### **Behavior, Fate, and Effects**

Dr. Kiara Lech, Research Scientist, CESER, outlined the factors that affect oil biodegradation and noted that the conventional ways to clean up oil involve the mechanical removal of oil. She heightened CESER's partnership with the Canadian government to help the Center understand the fate of oil on treating agents.

Dr. Barron discussed CESER's collaboration with the Office of Land and Emergency Management to increase knowledge about oil spill response agents, species diversity, and sublethal or chronic toxicity. He outlined CESER's strategy to adapt existing EPA protocols and the results on the oil and agent toxicity research, which included new toxicity data on three potential reference oils.

Dr. Brian Gullett, Senior Research Engineer, Center for Environmental Measurement and Modeling (CEMM), discussed the characterization of in situ oil burns emissions and the resulting collaboration efforts across many agencies.

Dr. Conmy discussed oil's fate processes in natural waters and how dispersal affects the biodegradation. She described two laboratory-scale dispersion studies and the tank-scale dispersion studies conducted at the University of New Hampshire, Fisheries and Oceans Canada, and in Ohmsett, New Jersey.

Following the presentations, Subcommittee members and EPA staff engaged in discussion. Topics discussed included test agents, the large-scale applicability to real world events, and event variability.

### **Spilled Oil Detection Tools**

Mr. Alex Hall, Title, CESER, outlined the purpose for detection of deep-water plumes. He described the collection and sampling process and explained the results, emphasizing the goal was to answer the question of how much oil was present.

Dr. Blake Schaeffer, Research Scientist, CEMM, described the emergency response operations to detect and estimate the size of oil slicks. He described the use of grid cells to allow aerial sensors to determine a thickness measurement and EPA's Airborne Spectral Photometric Environmental Collection Technology plane to quantitatively measure oil thickness.

Dr. Conmy explained the use of the devices and platforms of the autonomous underwater vehicles, remotely operated vehicles, and existing sensor suite. She described the timeline and the process to ensure the appropriate tools and platform are deployed based on the event occurrence and location.

Following the presentations, Subcommittee members engaged in discussion on the topics presented and the applicability to the respective charge questions. Topics discussed included protocol development and the process of dissemination of products to partners and stakeholders.

### **Overview of Water Research**

Dr. Jeff Szabo, Environmental Engineer, CESER, introduced water resource decontamination and detailed the impacts of storm and source water on drinking water distribution. He discussed the Office of Water (OW) and their partners' needs and outlined specific needs and outputs of each research area. He emphasized EPA support to local municipalities in both preparatory exercises and disaster recovery. Dr. Szabo added that the next HS StRAP would include water cybersecurity section.

Following the presentation, Subcommittee members and EPA staff engaged in conversation. Topics discussed included the emerging needs and priorities based on the COVID-19 pandemic, the identification of partners, and methods to capture partner input.

### **Full Scale Research at the Water Security Test Bed**

Dr. Szabo described the water security test bed (WSTB) process, its remote location, and system upkeep. He discussed some of the potential contamination events studied at these remote sites and how the contamination events are simulated.

Dr. Szabo discussed decontamination methodologies, specifically distribution system and premise plumbing, and stressed the need for pipe testing and a hierarchical pipeline decontamination approach. He elaborated on some of the specifics of the piping used.

Dr. John Hall, title, CESER, outlined the sensors and automatic hydrant flushing systems to test if fire hydrants are effective at keeping the flow of contaminants from reaching downstream hydrants.

Dr. Jim Goodrich, Senior Science Advisor, CESER, discussed cyber security research objectives, how to identify and close security gaps. He demonstrated hydrant flushing, radiological detection, and cure-in-place re-lining with videos.

Dr. Goodrich then presented the WSTB videos and virtual tours. He described the research approach and technical description for the “Water-on-Wheels” (WOW) cart and summarized the study results. Dr. Goodrich discussed specific research applications in portable wash water technologies.

### **Premise Plumbing Research**

Dr. Helen Buse, Microbiologist, CESER, discussed the premise plumbing pathogen research, emphasizing collaboration with Region 6. She described the equipment and scenarios to mimic varying factors that change pathogen growth.

Dr. Matthew Magnuson, TITLE, CESER, described the fate and transport of contaminants in damaged premise plumbing and systems.

Following the presentations, Subcommittee members and EPA staff engaged in conversation. Topics discussed included how CESER prioritizes research and if the premise plumbing research was new to the Center.

### **Wash-water Treatment Methodologies**

Dr. Goodrich and Dr. Magnuson discussed wash-water treatment methodologies and onsite decontamination including future directions and outcomes. He explained that HSRP’s focus on per- and polyfluoroalkyl substances (PFAS) is narrowed to emergency response effects of firefighting foam.

### **Wastewater Research**

Dr. Magnuson discussed that the focus of wastewater research was high consequence pathogens, specifically concern with the Ebola virus.

## **Sensor Research**

Dr. Hall provided an overview of the sensor research facility in Cincinnati, Ohio, including the typical research processes and lessons learned. He discussed future directions of sensor research and emphasized the low risk tolerance of the industry.

Following the presentation, Subcommittee members and EPA staff engaged in conversation. Topics discussed included viral sensors and selectivity, speed of analysis, and sensitivity in sensors.

## **Source Water and Stormwater Research**

Dr. Anne Mikelonis, Environmental Engineer, CESER, summarized past stormwater research, and emphasized the speed difficulty with the process and the need to forecast data. She also reviewed the differences in field studies and pilot studies. Dr. Goodrich discussed specific examples of decontamination research to emphasize and elucidate considerations of the decontamination process.

## **Water System Modeling Tools**

Dr. Katherine Ratliff, Physical Scientist, CESER, discussed the stormwater modeling tools, ongoing projects, and future research directions. She also presented a case study adapting the Greater Detroit Regional Sewer System Stormwater Management Model.

Dr. Terra Haxton, Environmental Engineer, CESER, presented the background and motivations of the distribution system modeling program, and highlighted the Water Network Tool for Resilience to help utilities identify risks and model input scenarios. She also presented several case studies to exemplify the tool and reviewed the future directions regarding tool use.

## **Water Sampling Strategies, Collection, and Analysis Methods**

Dr. Sarah Taft, Associate Division Director, CESER, reviewed contaminants, sample types, and distribution models to inform the ideal sampling locations and schedules.

Following the presentations, Subcommittee members and EPA staff engaged in a question and answer session. Topics discussed included access to reference oils, WSTB research, partner-identified needs, and the interface of cyber and water systems. Subcommittee members inquired about collaboration efforts with OW and the SSWR program's long-term research demands.

## **Wednesday, September 9, 2020: BOSC Subcommittee Discussion and Deliberation**

The Subcommittee divided into five workgroups to discuss and draft responses to the charge questions. Following deliberations, Subcommittee members reported on the workgroup's responses. EPA staff were available to answer questions.

Dr. Michael Wichman reviewed the Charge Question 1a draft strengths, suggestions, and recommendations. Dr. Paula Olsiewski shared strengths within HSRP's research planning, including working with health agencies to monitor for natural or terrorism related pathogens, pivoting from all-hazards to specific pathogens, and researching premise plumbing and management of pathogens and related issues. Subcommittee members discussed HSRP's process to collaborate with partners. Dr. Ryan explained that partner needs are broad and HSRP

would benefit from a more formal process for needs assessment to develop research coordination.

Dr. Monica Schoch-Spana reviewed the Charge Question 1b draft strengths, suggestions, and recommendation. She stated the WSTB is a complex and growing facility expected to support ORD in multiple areas. She mentioned the suggestions focused on WSTB improvements. Mr. Ed Hackney recognized the progress made with cybersecurity and possible cyberattacks on water distribution systems. Dr. Schoch-Spana explained their recommendation for HSRP create a formal process to have partners queued to develop future research plans. She stated the possible benefit of input from a broader range of stakeholders.

Dr. Shawn Gibbs reviewed the Charge Question 1c draft strengths, suggestions, and recommendations. Subcommittee members discussed and prioritized the list by changing two recommendations to suggestions.

Dr. Bob Scudder reviewed the Charge Question 2a draft strengths, suggestions, and recommendations. He stated HSRP has demonstrated consistent ability to leverage partner collaboration to enhance knowledge and testing capabilities. The workgroup would appreciate stronger collaborative efforts toward engagement. Dr. Scudder suggested that HSRP remove the protocol development process. If there is success in doing so, EPA could make it a trend across the Agency.

Dr. Debra Reinhart reviewed the Charge Question 2b draft strengths, suggestions, and recommendations. The workgroup made recommendations including establishing a task force with members from private entities to examine means to acquire oil in small amounts for testing purposes, integration of the latest science into real-time response, and considering research and response needs for managing in-land water oil spills.

#### **Thursday, September 24, 2020: BOSC Subcommittee Report Finalization**

Subcommittee members reconvened to discuss the finalization of their subcommittee report. The Subcommittee reviewed the workgroup's recommendations and responses to each of the charge questions. EPA staff were available to address questions.

Dr. Olsiewski reviewed the workgroup's recommendations to Charge Question 2a and inquired if the Subcommittee needed both recommendations pertaining to reference oils. Subcommittee members and Dr. Conmy discussed the nuances of Charge Question 2a and 2b. The Subcommittee decided to merge the topics into one recommendation because Charge Question 2a relates to procurement used in product testing and Charge Question 2b's recommendation is for procurement for research purposes.

Dr. Olsiewski read Charge Question 2b and the workgroup's recommendation. The Subcommittee discussed HSRP's approach to provide feedback from lessons learned to the research community. Dr. Justin Teegarden emphasized the importance of connecting field studies to HSRP's research to drive translational science elements and strengthen dissemination.

Dr. Teegarden read the updated recommendation from Charge Question 2b. He asked for HSRP's input on the recommendation, specifically if it was aimed at a research gap that should

be filled. Dr. Ryan stated that HSRP addresses means to obtain feedback from stakeholders and across EPA on products.

Dr. Olsiewski provided the workgroup's recommendation for Charge Question 1a and a detailed overview of the recommendation aimed at cybersecurity. The Subcommittee discussed the need for detection mechanisms, emphasized drinking water protection, and suggested a consequence analysis.

Dr. Teeguarden read the revised recommendation for Charge Question 1b and emphasized the long-term vision to interact with stakeholders.

Dr. Olsiewski provided the workgroup's recommendation for Charge Question 1c.

Dr. Teeguarden asked for opinions from Subcommittee members on the revisions to the charge question's recommendation. The Subcommittee discussed topics including perceived limitations, stormwater overflow, and priority pathogens.

The Subcommittee agreed and approved the revisions to the charge question recommendations.

## Meeting Agenda and Other Meeting Materials

The [agenda](#)<sup>1</sup>, [charge questions](#)<sup>2</sup>, and other meeting materials can be accessed at <https://www.epa.gov/bosc/homeland-security-subcommittee-meeting-august-september-2020>.

## Meeting Participants

### BOSC Homeland Security Subcommittee Members:

Paula Olsiewski, *Chair*  
Justin Teeguarden, *Vice Chair*  
Charles Barton\*\*  
Murray Cohen  
Kari Cutting  
Andrew DeGraca  
Shawn Gibbs  
Edward Hackney  
Lucinda Johnson, *BOSC Executive Committee Vice Chair\*\**  
David Klein\*  
Debra Reinhart  
Edwin Roehl  
Monica Schoch-Spana  
Robert Scudder  
Dana Tulis\*\*\*  
Michael Wichman

\**did not attend August 20*

\*\**did not attend September 9 and 24*

\*\*\**did not attend September 24 only*

**EPA Designated Federal Officer (DFO):** *Tom Tracy, Office of Science Advisor, Policy, and Engagement*

### Presenters:

Mace Barron, *Toxicologist, Center for Environmental Solutions and Emergency Response*  
Helen Buse, *Microbiologist, Center for Environmental Solutions and Emergency Response*  
Robyn Conmy, *Research Scientist, Center for Environmental Solutions and Emergency Response*  
Jim Goodrich, *Senior Science Advisor, Center for Environmental Solutions and Emergency Response*  
Brian Gullett, *Senior Research Engineer, Center for Environmental Measurement and Modeling*  
Alex Hall, **Title**, *Center for Environmental Solutions and Emergency Response*

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<sup>1</sup>[https://www.epa.gov/sites/production/files/2020-08/documents/bosc\\_hs\\_agenda\\_august\\_20\\_21\\_2020\\_1.pdf](https://www.epa.gov/sites/production/files/2020-08/documents/bosc_hs_agenda_august_20_21_2020_1.pdf)

<sup>2</sup>[https://www.epa.gov/sites/production/files/2020-08/documents/hsrp\\_bosc\\_charge\\_questions\\_august\\_20\\_21\\_2020\\_2\\_0.pdf](https://www.epa.gov/sites/production/files/2020-08/documents/hsrp_bosc_charge_questions_august_20_21_2020_2_0.pdf)



John Hall, **Title**, *Center for Environmental Solutions and Emergency Response*  
 Terra Haxton, *Environmental Engineer, Center for Environmental Solutions and Emergency Response*  
 Kiara Lech, *Research Scientist, Center for Environmental Solutions and Emergency Response*  
 Sang Don Lee, *Principal Associate National Program Director, Homeland Security Research Program*  
 Matthew Magnuson, **Title**, *Center for Environmental Solutions and Emergency Response*  
 Anne Mikelonis, *Environmental Engineer, Center for Environmental Solutions and Emergency Response*  
 Katherine Ratliff, *Physical Scientist, Center for Environmental Solutions and Emergency Response*  
 Bruce Rodan, *Associate Director for Science, Office of Research and Development*  
 Shawn Ryan, *National Program Director, Homeland Security Research Program*  
 Greg Sayles, *Director, Center for Environmental Solutions and Emergency Response*  
 Blake Schaeffer, *Research Scientist, Center for Environmental Measurement and Modeling*  
 Jeff Szabo, *Environmental Engineer, Center for Environmental Solutions and Emergency Response*  
 Sarah Taft, *Associate Division Director, Center for Environmental Solutions and Emergency Response*

**Other EPA Attendees:**

Franklin Alvarez	Vasudevan Namboodiri	Mike Slimak
Savannah Bertrand	Kathy Nickel	Darcie Smith
Lance Brooks	Sharon Oxendine	Emily Snyder
Jamie Falik	Viktoriya Plotkin	Joshua Steenbock
Megan Fleming	Mary Ross	Peter Whitman
Ken Labbe	Sanjiv Shah	Stuart Willison
Paul Lemieux	Ramona Sherman	
Demond Matthews	Erin Silvestri	

**Other Attendees:**

David Graybill	Patricia Lamb	Craig Updyke
Chelsea Hintz	Sophie Manaster	Suzanne Yohannan
M Karimi		

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