Pooled Monitoring Forum

Restoration Research: Connecting Science and Regulatory Practice

June 18, 2026 | 9:00 AM – 5:00 PM
Maryland Department of the Environment, 1800 Washington Boulevard, Baltimore, MD
In-person and virtual participation available

Directions and parking information are available **here**. Park in the Blue Lot and follow signs to the Auditorium.

Forum Overview

The Maryland Department of Natural Resources, Anne Arundel County, Baltimore City, Charles County, Frederick County, Harford County, Montgomery County, Prince George's County, the Maryland Department of Transportation State Highway Administration, the Environmental Protection Agency, the Chesapeake Bay Trust, and other Pooled Monitoring partners such as Maryland Department of the Environment welcome you to the 11th Annual Pooled Monitoring Forum. This forum brings together regulatory staff, program managers, practitioners, and researchers to share and discuss the latest findings from the Pooled Monitoring Initiative's Restoration Research Award Program.Topics include efficacy of research practices for water quality and biological resources, potential chemical/physical impacts, climate change impacts, pollutants of emerging concern, and "trade-offs." The speakers and audience will be charged with discussing how this science is used or could be used, discussing how the existing scientific knowledge could be translated to be useful for regulators and others, and identifying what questions remain unanswered.

Background

The Restoration Research Award Program grew out of conversations held in 2012 to 2015, when regulators and practitioners identified priority research questions for the scientific community. This forum continues the commitment to bring research back to those who asked the questions and can use the findings. Now in its 11th year, Restoration Research awardees will present their work to the regulatory audience and a few practitioners, receive feedback on current projects, and identify future research needed. The Pooled Monitoring Program was included as an option under Maryland's MS4 permit (BMP Effectiveness Monitoring and Watershed Assessment Monitoring – Assessment of Controls

section), expanding the program's ability to support research and serving as an innovative strategy to ensure that the latest science informs implementation.

Learn more about the Pooled Monitoring Initiative and its Restoration Research Award Program including the research projects completed, past forums, and more at: https://cbtrust.org/grants/restoration-research/.

Charge to Participants

Regulators
Use the information from this forum to help inform the permit process and other regulatory processes. Ask the researchers questions that can help you and your teams to answer lingering questions, ensure the research answers your questions, and design future research projects.

Practitioners
Use the information from this forum to design and build the most effective projects possible from a water quality, quantity control, and stream ecology standpoint. Ask questions that can help design future research projects that will help determine the types of projects that are most effective, as well as where and how they should be built.

Researchers
Present your findings that addressed the key restoration question(s) posed in the Restoration Research Request for Proposals. Be specific about the research question(s) identified for the study, previous work done on the subject, the experimental design, the results, the level of uncertainty/confidence in the findings, and most importantly how the audience can use the information you present.

Listen carefully to feedback from the audience about remaining knowledge gaps and management needs, and consider how future research can address those questions.

Pooled Monitoring Forum Agenda

Time	Session
9:15 – 9:30 AM	**Welcome and Charge for the Day** Speaker: Sadie Drescher, Chesapeake Bay Trust Review of the agenda and kickoff of the meeting, centering on the forum's goal of strengthening connections between restoration science and regulatory implementation.
Presentations from recent Pooled Monitoring Initiative Restoration Research projects addressing key restoration questions in watershed restoration across Maryland and throughout the Chesapeake Bay. These studies are designed to inform regulatory decisions and practitioner implementation.	
9:30 – 10:00 AM	**"Evaluating whether BMP and restoration investments improve stream condition at the watershed scale"** Speakers: Peter Groffman and Brittany Washington, Research Foundation of CUNY – Advanced Science Research Center Translation: Ari Engelberg, Maryland Department of Natural Resources (MD DNR)
10:00 – 10:30 AM	**"The Long-Term Effects of BMP Implementation on Stream Channel Stability in Urban Watersheds"** Speakers: Lisa Fraley-McNeal, Deb Caraco and Sami Khan, Center for Watershed Protection Translation: Deborah J. Cappuccitti, Maryland Department of the Environment
10:30 – 10:50 AM	**Break**

10:50 – 11:20 AM	**“Impacts of Urban Soil Compaction on Stormwater Runoff Volumes and BMP Sizing”** Speakers: Shirley Clark and Bishwodeep Adhikari, Pennsylvania State University Translation: Kim Grove, Baltimore City Department of Public Works
11:20 – 11:50 AM	**“Stormwater Thermal Reduction Through Bioretention Media Layers”** Speaker: Allen Davis, University of Maryland Translation: Don Dorsey, Frederick County, MD
11:50 AM – 12:20 PM	**Questions for the Researchers**
12:20 – 1:30 PM	**Lunch Break** Lunch provided by the Chesapeake Bay Trust
1:30 – 2:00 PM	**“Development of a Simplified Approach of PCB Loading Estimation Using a Combination of Passive Sampling and Sediment Trapping”** Speaker: Nathalie Lombard, University of Maryland Baltimore County Translation: Chris Clark, Prince George’s County
2:00 – 2:30 PM	**“Combining Incubations, Sensors, and Molecular Approaches to Understand E. coli Sources and Wastewater Contamination Across the Anacostia River Watershed”** Speaker: Rebecca Hale, Smithsonian Institution Translation: Morgan Corey, MD DNR
2:30 – 3:00 PM	**Break**

3:00 – 3:30 PM	**“Synthesizing Restoration Research to Inform Chesapeake Bay Decision-Making”** Speaker: Seth Theuerkauf, Thriving Coasts Consulting, LLC Translation: Erik Michelsen, Anne Arundel County
3:30 – 3:45 PM	**Questions for the Researchers**
3:45 - 4:00 PM	**Congresswoman Sarah Elfreth,** Congresswoman for Maryland’s Third District - Leading with science and research to support Chesapeake Bay watershed health.
4:00 – 4:45 PM	**Help shape research questions for the next Request for Proposals – What would help you in your work? What debate do you want to see settled with research?** **Open format – discussion with the audience**
4:45 – 4:50 PM	**Closing Remarks and Next Steps**
4:50 PM – ?	**Continue the Conversation** **Checkerspot located at 1421 Ridgely Street, Baltimore, MD** **Light appetizers and refreshments provided by the Chesapeake Bay Trust**

About the Forum Speakers

Jana Davis, Ph.D
President, Chesapeake Bay Trust

Dr. Jana Davis is the President of the Chesapeake Bay Trust, overseeing our work on watershed restoration, education, outreach, and innovation. Jana has been at the Trust since 2005, first as Assistant Director for Programs and then as Associate Executive Director before assuming the role of President. Jana is trained as a marine ecologist, with a B.S. in biology from Yale University and a Ph.D. in oceanography from the Scripps Institution of Oceanography. Jana shifted from academia to resource management via the American Association for the Advancement of Science Congressional Science Fellowship program, during which she served in a United States Senate personal office and was sponsored by the American Geophysical Union.

Sadie Drescher (your emcee)
Vice President of Programs for Restoration, Chesapeake Bay Trust

Sadie and her team lead restoration programs that use innovative partnerships to work with and engage watershed organizations and community members in our work. The Trust's mission is to engage and empower diverse groups to take actions that enrich natural resources and local communities of the Chesapeake Bay region. She has a M.S. in Environmental Studies from the College of Charleston and a B.S. in Environmental Biology from Tennessee Technological University. Sadie using the latest science and best practices, to benefit the water and people in the Chesapeake Bay. Connect with me at: www.linkedin.com/in/sadiedrescher.

Peter Groffman, Ph.D.
Professor, Earth and Environmental Sciences and Biology, The Graduate Center, CUNY

Dr. Peter Groffman is a Professor of Earth and Environmental Sciences and Biology at The Graduate Center, CUNY, and a professor in Brooklyn College's Department of Earth and Environmental Sciences. His research focuses on ecosystem ecology and biogeochemistry, with particular emphasis on how climate change affects carbon and nitrogen cycling in forest, urban, and wetland ecosystems. His work spans scales from microbial and molecular processes to landscape- and regional-scale analyses using remote sensing, geographic information systems, and simulation models.

Dr. Groffman has authored more than 300 scientific publications and has contributed to national and international climate assessments, including serving as a Convening Lead Author for the U.S. National Climate Assessment and a Lead Author for assessment reports of the Intergovernmental Panel on Climate Change (IPCC). He holds a B.A. from the University of Virginia and a Ph.D. in Ecology from the University of Georgia.

Brittany Washington
Doctoral Student, Groffman Lab, Environmental Sciences Initiative

Brittany Washington is a PhD candidate in Earth and Environmental Sciences at the CUNY Graduate Center and the Advanced Science Research Center, where she is advised by Professor Peter Groffman. Her research examines how hydrologic connectivity governs the movement, transformation, and retention of nutrients in urban watersheds. Her dissertation investigates how urbanization alters connections among soils, groundwater, and stream networks, with attention to nitrogen and phosphorus dynamics across multiple spatial scales. Her work integrates field measurements, laboratory analysis, stream chemistry, geomorphic data, and spatial analysis to understand how hydrologic flow paths shape

ecosystem function. Her research aims to improve understanding of nutrient transport and retention in urban systems and inform water quality management under increasing climatic and urban pressures.

Lisa Fraley-McNeal
Senior Watershed and Stormwater Research Specialist, Center for Watershed Protection, Inc.

Lisa has over 15 years of experience in watershed and stormwater management. Her expertise is in stream and watershed assessment, fluvial geomorphology, GIS, and technical writing. Prior to joining the Center, Lisa conducted graduate research at the University of Maryland Baltimore County, where she led an extensive monitoring effort to quantify sediment storage and transport for a stream in an urbanizing watershed. She has assisted several communities with stream geomorphic assessments to quantify bank erosion for the purposes of applying the Bay Program's stream crediting protocols and is currently leading a research study for the Chesapeake Bay Program on maintaining forests during stream corridor restoration. Lisa has a B.S. degree in Geography and Environmental Systems from the University of Maryland, Baltimore County and an M.S. degree from the University of Maryland, Baltimore County in Marine and Estuarine Environmental Science.

Deb Caraco
Senior Water Resources Engineer, Center for Watershed Protection, Inc.

Deb has over 22 years of experience in watershed management. With a background in stormwater management design and water quality, Deb's areas of expertise include: watershed modeling, stormwater design, watershed planning and statistics. Her areas of focus include IDDE, pollutant modeling, stormwater design, and data analysis. She has a Master of Engineering in Biological and Environmental Engineering from Cornell University, and a Master of Applied Statistics from Penn State University.

Sami Khan, PhD
Water Resources Engineer, Center for Watershed Protection, Inc.

Sami Towsif Khan is a Water Resources Engineer at the Center for Watershed Protection. Sami holds a Ph.D. in Biological Systems Engineering. He has 5+ years of research experience in watershed management, sediment transport analysis, green infrastructure (GI) / best management practice (BMP) / sediment control structure and stormwater conveyance system sizing, and development of hydrologic, hydraulic, and water quality models. His skills include big data analysis, computer programming, machine learning, technical writing and presentation, and model calibration & optimization. Sami has presented findings of graduate and undergraduate research at seven conferences in USA, Bangladesh, and Australia and published two peer-reviewed journal articles.

Shirley E. Clark, Ph.D., P.E., D.WRE, ENV SP, F.EWRI
Director, School of Science, Engineering, and Technology and Distinguished Professor of Environmental Engineering, Penn State Harrisburg

Dr. Shirley Clark is the Director of the School of Science, Engineering, and Technology and a Distinguished Professor of Environmental Engineering at Penn State Harrisburg. Her research and teaching focus on the intersection of water, climate, and public health, with particular expertise in stormwater management, urban flooding, and water quality. Her work examines the impacts of urbanization, aging infrastructure, and climate change on communities and water resources.

Dr. Clark leads multidisciplinary research teams addressing challenges related to stormwater treatment, pluvial flooding, and wastewater-based epidemiology. She is actively involved in professional leadership and currently serves in leadership roles within the American Society of Civil Engineers' Environment and Water Resources Institute (EWRI). She also serves on several state and national advisory committees related to water resources and environmental protection.

Bishwodeep Adhikari, Ph.D.
Assistant Professor of Civil Engineering, Penn State Harrisburg

Dr. Bishwodeep Adhikari is an Assistant Professor of Civil Engineering at Penn State Harrisburg. His research focuses on hydrology, water quality, and sustainable stormwater management in the context of a changing climate. His work examines how land use, climate variability, and infrastructure design influence runoff, pollutants, and nutrient dynamics across natural and built environments.

Dr. Adhikari integrates field observations, laboratory analyses, and computational methods, including machine learning and hydrologic modeling, to better understand and improve the performance of water systems. He earned his Ph.D. in Civil Engineering from The Pennsylvania State University and a master's degree in Geology from Indiana University–Purdue University Indianapolis. Prior to joining Penn State Harrisburg, he served as a Postdoctoral Scholar at Kent State University and worked as a hydrologist in the private sector.

Allen P. Davis, Ph.D., P.E., D.WRE, F.EWRI
Professor and Charles A. Irish Sr. Chair in Civil Engineering, University of Maryland

Dr. Allen Davis is Professor and Charles A. Irish Sr. Chair in Civil Engineering in the Department of Civil and Environmental Engineering at the University of Maryland, with affiliate appointments in Plant Science and Landscape Architecture. For more than three decades, his research has focused on urban stormwater quality and treatment, with particular emphasis on nature-based practices and bioretention systems.

Dr. Davis is the author or co-author of more than 160 peer-reviewed publications and two leading texts on stormwater management and green stormwater infrastructure. His research has been supported by numerous federal, state, and local agencies, including the National Science Foundation, NOAA-supported programs, the U.S. Department of Agriculture, and the Chesapeake Bay Trust. He is a Fellow of the American Society of Civil Engineers and the ASCE Environmental and Water Resources Institute and was the recipient of the 2025 ASCE EWRI Urban Water Resources Research Council Founder's Award and the 2026 ASCE Simon W. Freese Environmental Engineering Award.

Nathalie Lombard, Ph.D.
Research Assistant Professor, University of Maryland, Baltimore County

Research assistant professor with a PhD in Microbial Ecology and multidisciplinary skills in plant biology and analytical chemistry. More than 10 years' experience in developing innovative (bio)technological tools. Research geared towards environmental health and cleanup. Publications and presentations covering subjects on metagenomics, bioremediation, persistent organic pollutant (POP) monitoring and bioaccumulation in freshwater organisms. More online at: Researchgate and Linkedin

Rebecca Hale, Ph.D.
Principal Investigator and Senior Scientist, Smithsonian Environmental Research Center

Dr. Rebecca Hale is a Principal Investigator and Senior Scientist at the Smithsonian Environmental Research Center. An ecosystem ecologist, her research focuses on the intersection of biogeochemistry, hydrology, and society. She studies how human activities influence aquatic and terrestrial ecosystems, with expertise in watersheds, water quality, carbon cycling, and landscape ecology.

Dr. Hale works across urban and rural environments, integrating concepts and methods from ecology, geography, sociology, and history to better understand ecosystem processes and environmental change at local to regional scales.

Seth Theuerkauf, Ph.D.
Founder and Lead Consultant, Thriving Coasts Consulting

Dr. Seth Theuerkauf is the Founder and Lead Consultant of Thriving Coasts Consulting, where he helps coastal communities and organizations address environmental challenges through science-based and collaborative solutions. A marine conservation biologist with more than 18 years of experience, his work focuses on coastal resilience, habitat restoration, aquaculture, ecosystem services, and science-informed decision-making.

Prior to founding Thriving Coasts Consulting, Dr. Theuerkauf held leadership roles with the U.S. Department of the Interior's Bureau of Ocean Energy Management, NOAA Fisheries, NOAA's National Centers for Coastal Ocean Science, and The Nature Conservancy. He has authored more than 25 peer-reviewed scientific publications and has extensive experience translating scientific research into practical guidance for policymakers, resource managers, and stakeholders.

Congresswoman Sarah Elfreth

Congresswoman for Maryland's Third District

Sarah Elfreth proudly represents Maryland's Anne Arundel, Howard, and Carroll Counties in Congress, where she serves on the powerful House Armed Services Committee and House Natural Resources Committee. Sarah is the youngest woman elected to Congress from Maryland and has built a reputation as one of the state's most effective legislators during her six years serving in the Maryland Senate and now in Washington. Known for her collaborative approach, Sarah is focused on bringing people together to solve problems and deliver policies that improve the lives of all Marylanders. On the House Armed Services Committee and Naval Academy Board of Visitors, Sarah works with her colleagues to support our military families, care for our veterans, and protect our country's national security. As Vice-Ranking

Member of the House Natural Resources Committee, Sarah has continued her decades-long advocacy for the Chesapeake Bay and our environment. Raised by two civil servants in a union household, Sarah has dedicated much of her first term advocating on behalf of the 44,000 federal workers she represents.

Before coming to Congress, Sarah broke barriers in 2018, becoming the youngest woman ever elected to the Maryland State Senate. In Annapolis, she passed 91 bipartisan bills into law – more than any other legislator – and was recognized as "Legislator of the Year" by numerous organizations.

Sarah began her career of public service on the University System of Maryland Board of Regents and then went on to advocate for the National Aquarium in Baltimore. A proud graduate of Towson University and the Johns Hopkins University, Sarah lives in Annapolis with her fiancé, Eric, and her dog, Ollie, where she enjoys hiking, being on the water, and collecting oyster plates. More online at: https://elfreth.house.gov/.