Pooled Monitoring Forum: Restoration Research to make Science and Regulatory Connections

Wednesday, June 12, 2019, from 9 AM to 5 PM
Maryland Department of the Environment - 1800 Washington Boulevard, Baltimore, MD 21230

The Maryland Department of Natural Resources, the Maryland Department of the Environment, the Maryland Department of Transportation's State Highway Administration, the National Fish and Wildlife Foundation through the Environmental Protection Agency's Chesapeake Bay Program Office, Montgomery County Department of Environmental Protection, the Chesapeake Bay Trust, and other Pooled Monitoring partners are excited to invite you to a forum in which the most recent restoration research will be presented and discussed. At this forum, regulatory staff and practitioners will have an opportunity to ask new questions and clarify the current state of scientific knowledge. Topics include efficacy of research practices for water quality and biological resources, potential chemical impacts, tree "trade-offs" for stream restoration, and effectiveness of stream restoration practices. Topics also include the latest science for the water quality value of trees. The speakers and audience will be charged with discussing how this science is used or could be used by regulators, discussing how the existing scientific knowledge could be translated to be useful for regulators and others, and identifying what questions remain unanswered.

This Pooled Monitoring Initiative/Restoration Research award program is a follow up item from a series of similar conversations held in 2012, 2013, 2014, and 2015, when the needs of both regulators and practitioners were articulated, and important questions asked and prioritized. The questions were posed to the research community to garner their help through the program that is now known as the Pooled Monitoring effort that asks questions through the Restoration Research award program. This forum keeps the promise made following those prior meetings to work towards answering the priority questions. This forum is the 4th annual event where the Restoration Research awardees present their work to the regulatory audience and practitioners for their use and receive feedback for future research needed to support their work.

Charge to participants

- Permitters- Use the information from this Forum to help inform the permit process. Ask the restoration researchers questions that can help with the permit process and help design future research projects to answer lingering questions.
- Practitioners – Use the information from this forum to design and build the most effective projects possible from a water quality 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 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 presented. Listen to what the audience still needs to know to make management decisions in their respective fields and how you might address their questions in future research.

Agenda

- 9 am to 9:30 am –
    - Pooled Monitoring Initiative – Restoration Research background, current state, and future of the program/science (Sadie Drescher, Director of Restoration Programs, Chesapeake Bay Trust)
    - Key restoration research needs from the federal and state agencies, the state of the science now, and how science can support permit reviews
        - Suzanne Dorsey, Ph.D., Assistant Secretary, Maryland Department of the Environment

- "Maryland stream ecology" to provide context for the Restoration Research being conducted – Scott Stranko, MANTA Director, Resource Assessment Service, Maryland Department of Natural Resources

Presentations from the most recent Restoration Research (and related) projects to answer the key restoration questions in watershed restoration in Maryland and in the Chesapeake Bay. This work is tailored to be useful to the regulatory and practitioner efforts.

- 9:30 am to 10:00 am – Sujay Kaushal and Kelsey Wood (University of Maryland), "Tree trade-offs in stream restoration projects: Impact on riparian groundwater quality"
    - Translation of the presentation by Ryan Cole, Assistant Chief, Water Programs Division, Maryland Department of Transportation State Highway Administration
- 10:00 am to 10:30 am – Ginny Rogers (Versar, Inc.) and Verl Emrick (Virginia Tech), "An evaluation of forest impacts as compared to benefits associated with stream restoration"
    - Translation of the presentation by Kevin Wilsey, Deputy Director, Office of Environmental Design, Maryland Department of Transportation State Highway Administration
- 10:30 am to 11:00 am – Solange Filoso (University of Maryland Center for Environmental Science (UMCES)), "Emerging patterns of sediment and nitrogen load reduction efficiency in upper and lower stream reaches"
    - Translation of the presentation by Ari Engelberg, Implementation Project Officer Chesapeake and Coastal Service, Maryland Department of Natural Resources
- 11:00 am to 11:30 am – Questions for the researchers
- 11:30 am to 12:30 pm – Lunch (provided)
- 12:30 pm to 1:00 pm – Keith Eshleman (UMCES), "- Stream Restoration Monitoring" Taking a step back to determine how best to monitor your stream restoration load
- 1:00 pm to 1:30 pm – Bob Hilderbrand (UMCES), "Effectiveness of urban stream restoration for improving habitat and benthic invertebrates"
    - Translation of the presentation by Scott Stranko, Director, Environmental Services, MANTA Director, Resource Assessment Service, Maryland Department of Natural Resources
- 1:30 pm to 2:00 pm – Claire Welty (University of Maryland, Baltimore County), "Assessment of stream restoration impacts on urban sediment load and comparison with TMDL guidelines"
    - Translation of the presentation by Erik Michelsen, Watershed Protection and Restoration Program Administrator, Anne Arundel County's Department of Public Works
- 2:00 pm to 2:30 pm – Neely Law (Center for Watershed Protection) and Mitch Pavao-Zuckerman (University of Maryland), "A novel research framework to assess the water quality impacts of urban trees"
    - Translation of the presentation by Stephen Shofar, Watershed Management Division Chief, Montgomery County Department of Environmental Protection
- 2:30 am to 3:00 am – Vanessa Beauchamp and Joel Moore (Towson University), "Evaluation of legacy sediment removal and floodplain reconnection as a restoration technique"
    - Translation of the presentation by Scott Lowe, Director, Environmental Services, McCormick Taylor
- 3:00 pm to 3:30 pm – Questions for the researchers
- 3:30 pm to 4:30 pm – We want to hear from you! (Jana Davis, Executive Director, Chesapeake Bay Trust)
    - What did you hear that you can use and how will you use it? What does this research mean for me? What other research questions would you like to see in the next Restoration Research Request for Proposals that will be released this fall? Any other suggestions for us?
- 4:30 pm to ? – Continue the conversation at Nick's Fish House 2600 Insulator Dr, Baltimore, MD 21230

We are looking forward to a productive discussion with you!

More about the Pooled Monitoring Initiative's Restoration Research program speakers:

Sujay Kaushal, Ph.D., Associate Professor, University of Maryland. Sujay is an Associate Professor in ESSIC and Department of Geology at the University of Maryland, College Park. His areas of expertise are Biogeochemistry and Hydrology. He completed a B.A. in Biology (concentration in Ecology and Systematics) at Cornell University, and he completed his PhD in Biology (concentration in Biogeochemistry) at the University of Colorado, Boulder. He completed his postdoctoral research at the Cary Institute of Ecosystem Studies (2003-2005). Before he joined University of Maryland, College Park, he was an assistant professor at the University of Maryland Center for Environmental Science from 2005-2010. His research focuses on: long-term chemistry of fresh waters, effects of land use and climate on water quality, and managing and restoring freshwater ecosystems.

Kelsey Wood, Faculty Research Assistant and M.S. student at the University of Maryland. Kelsey has a B.S. from the University of Maryland in Geology (2015). Kelsey has over five years of experience in water research and publications in journals such as Biogeochemistry, Applied Geochemistry, and Philosophical Transactions of the Royal Society.

Ginny Rogers, Senior Project Manager, Versar, Inc. Ginny has a M.S. from Duke University (Environmental Studies) and B.S. from the College of William and Mary (Biology). Ginny has been at Versar, Inc. for over 20 years as an Environmental Scientist and most recently as a Senior Project Manager. Ginny's focus is on vegetation, habitat, water quality, and restoration assessments throughout the Chesapeake Bay.

Verl Emrick, Ph.D., Research Scientist-Ecologist, Conservation Management Institute at Virginia Tech within the College of Natural Resources and Environment. Verl has worked in the area of ecology and natural resource management for over 20 years. He currently works on research projects involving, ecosystem restoration, forest carbon sequestration, threatened and endangered species research and management, disturbance ecology and biogeochemistry. Verl was a research fellow with Oak Ridge National labs and the Army Corps of Engineers, held research and technician positions with Colorado State University, University of North Carolina-Asheville, Coweeta hydrologic lab and North Carolina State University. Verl has a Ph.D. in Biology from Virginia Tech and a BS Environmental Science and Ecology, minor in Biology from the University of North Carolina-Asheville.

Solange Filoso, Ph.D., Research Assistant Professor, University of Maryland Center for Environmental Science, Chesapeake Biological Laboratory. Solange is a watershed scientist with expertise in biogeochemistry and restoration ecology, and over 25 years conducting scientific research on various environmental topics related to the impacts of human activities on water resources (www.umces.edu). Areas of Expertise: Biogeochemistry and nutrient dynamics in aquatic ecosystems; impacts of human activities such as land use change, urbanization, and energy production on water resources; effectiveness of stream restoration and other types of management practices at improving water quality of waterways.

Keith Eshleman, Ph.D., Professor, University of Maryland Center for Environmental Science Appalachian Laboratory. Keith has published more than 60 peer-reviewed papers and dozens of technical reports. Prior to returning to academia, Keith was employed at the USEPA Environmental Research Laboratory in Corvallis, Oregon, and at The Ecosystems Center in Woods Hole, Massachusetts. Keith's research interests are in the areas of watershed and wetlands hydrology; groundwater/surface water interactions; biogeochemical processes in upland and wetland ecosystems; hydrochemical modeling; and ecosystem responses to natural disturbances, energy development, and land use change. Keith has a Ph.D. in Water Resources and S.M. in Civil Engineering from Massachusetts Institute of Technology and B.A. in Environmental Sciences from the University of Virginia.

Robert H. Hilderbrand, Ph.D., Associate Professor, University of Maryland Center for Environmental Science Appalachian Laboratory. Areas of Expertise: Ecology and conservation biology of running waters; Watershed and stream habitat restoration; and Linking landscapes and populations Education: Ph.D. from Utah State University: (Ecology) Bob has a M.S. from Virginia Tech (Fisheries Science) and a B.S. from Frostburg State University (Wildlife & Fisheries; Minors – Chemistry, Biology).

Claire Welty, Ph.D. Professor of Environmental Engineering, University of Maryland, Baltimore County and Director, Center for Urban Environmental Research and Education. Claire's research includes developing an end-to-end system of field-deployed sensors and fully coupled groundwater-surface water mathematical models to quantify and predict the urban hydrologic cycle and coupled biogeochemical cycles from neighborhood to regional scales. Our goal is to be able to assimilate sensor data into hydrologic and water quality models in near-real time for predicting flow paths, fluxes and stores of water and chemicals on land surfaces and in the subsurface. We work in collaboration with the NSF Baltimore Ecosystem Study Long-Term Ecological Research Site and the USGS MD-DE-DC Water Science Center. Claire has a Ph.D. in Civil and Environmental Engineering – M.I.T., M.S. Environmental Engineering – The George Washington University, and B.S. Environmental Sciences – University of Virginia.

Neely Law, Ph.D., Director of Education and Training, Center for Watershed Protection. Neely leads the development of the stormwater and watershed training program. Neely is involved in research-based projects to advance understanding and application of stormwater practices and programs urban and rural watersheds. Recent projects include leadership on Chesapeake Bay Program Expert Panels, Stream Health Work Group, stream restoration and health, and nutrient reduction credit development. Neely has a B.S. in Environmental Studies and Urban Planning from the University of Waterloo, a M.A. in Geography from the University of Toronto and a Ph.D. in Geography from the University of North Carolina-Chapel Hill.

Mitchell Adam Pavao-Zuckerman, Ph.D., Assistant Professor, Department of Environmental Science and Technology, University of Maryland. Mitch has a Ph.D. in Ecology from the University of Georgia, a M.S. from the University of Tennessee in Plant and Soil Sciences, and a B.A. in Environmental Studies from Binghamton University (S.U.N.Y.). Mitch's current research includes: 1) urban ecosystems, green infrastructure function, and ecosystem services where his current research looks at how soils, plants, and biogeochemistry of green infrastructure and the urban ecosystem function and provide ecosystem services and 2) Social-ecological systems, ecosystem services, and ecological resilience in a project that links ecology, hydrology, social science, and decision support in the San Pedro and Rio Sonora basins.

Vanessa Beauchamp, Ph.D., Associate Professor, Towson University. Vanessa's research program work tests and refines ecological models of succession, identify environmental thresholds involved in plant community change, and the role of arbuscular mycorrhizal fungi in plant community dynamics. A large part of her research program involves practical applications related to management, conservation and restoration of plant communities. Vanessa has a Ph.D. in Plan Biology from Arizona State University and a B.S. in Biology from the University of California, Irvine.

Joel Moore, Ph.D. Associate Professor of Geosciences, Towson University. Joel's areas of expertise include: 1) Connections between mineral weathering and soil chemistry, tectonics, ecosystems, and climate shaping the Earth's surface; 2) Understanding issues of societal relevance such as carbon sequestration, soil and water quality, and ecosystem sustainability; and 3) Investigating Earth surface processes, hydrology, and biogeochemistry. Joel has a Ph.D., Geosciences from Pennsylvania State University and a B.A., Geology and History from Wheaton College.