

Workshop Organizing Committee

Team Leaders

Kathleen Bailey Boomer, PhD *Leader*
Watershed Scientist
The Nature Conservancy, MD/DC Chapter
Bethesda, MD 20814

Rebecca Schneider, PhD *Co-Leader*
Assoc. Professor, Dept. Natural Resources
Cornell University, NY 14850

Donnelle Keech *Lead Facilitator*
Allegheny Forests Project Director
The Nature Conservancy, MD/DC Chapter
Cumberland, MD 21502

Matt Ellis *STAC Administrative Assistant*
Scientific and Technical Advisory Committee
Chesapeake Research Consortium, Inc. (CRC)
Edgewater, MD 21037

Steering Committee

Steve Bloser
Director, Center for Dirt and Gravel Road Studies
Penn State University
University Park, PA 16802

Jennifer Greiner
Chesapeake Bay Program Liaison
U.S. Fish and Wildlife Service, NE Region -
Science Applications
Annapolis, MD 21403

Ray B. Bryant, PhD
Research Soil Scientist
USDA - Agricultural Research Service
Pasture Systems /Watershed Mgmt Research
University Park, PA 16802

Katherine Bunting-Howarth, J.D., PhD
Associate Director, New York Sea Grant
Assistant Director, Cornell Cooperative Extension
Cornell University, NY 14850

Peter R. Clagget, PhD
Geographer
U.S. Geological Survey
Annapolis, MD 21403

Amy Jacobs
Watershed Restoration Director
The Nature Conservancy, MD/DC Chapter
Easton, MD 21601

Alan Girard
Eastern Shore Director
Chesapeake Bay Foundation
Easton, MD 21601

David P. Orr, PE, PhD
Director/ Senior Engineer
Cornell Local Roads Program
Cornell, NY 14850

Normand Goulet
Senior Environmental Planner
Division of Planning and Environmental Services
Northern Virginia Regional Commission
Fairfax, VA 22031

Michael Slattery
Chesapeake Coordinator
U.S. Fish and Wildlife Service
Annapolis, MD 21401

Re-plumbing the Chesapeake Watershed:

*Improving roadside ditch management
to meet TMDL
water quality goals*

9-10 October 2014
The Tidewater Inn
Easton, Maryland



Overall Workshop Goals

- ✚ Increase awareness of the critical impacts of roadside ditches and best management practices to reduce these impacts
- ✚ Inventory the current status of ditch management across the Chesapeake Bay watershed
- ✚ Develop recommendations for how best to improve roadside ditch management to meet TMDL goals, reduce flooding, and buffer impacts of climate change

AGENDA – DAY 1

- 9:30 **Welcome** Mr. Dirck Bartlett, Talbot County Council, MD
9:35 **Welcome Address** Dr. Robert Summers, Secretary of Maryland's Department of Environment
9:50 **Dr. Kathy Boomer (TNC)** Overview and Goals of the Workshop

State of the Science: Sizing Up the Problem

- 10:00 **Dr. Rebecca Schneider** (Cornell) Overview of the contribution of roadside ditches in rural and suburban settings: floods, pollution, and sediment
- 10:35 **Coffee Break**
- 10:45 **Dr. Beverley Wemple** (Vermont) Understanding the effects of roads in upland settings on hydrology, geomorphology and water quality
- 11:15 **Dr. Zach Easton** (Virginia Tech) Lessons from agricultural ditches – modeling and management of ag drainage
- 11:45 **Dr. Robin Van Meter** (Washington College) Road impacts on aquatic ecosystems
- 12:15 **LUNCH (1 hour)**

Mitigating Ditch Impacts: Strategies for “Re-plumbing” our Watersheds

- 1:15 **Mr. Steve Bloser** (PA Center for Dirt and Gravel Roads) Successful BMPs - 2,500 projects and counting
- 1:45 **Mr. David Wick** (Exec Director, Lake George Park Commission) NYS storm water management case studies – success stories and challenges
- 2:15 **Dr. Ray Bryant** (USDA- Agricultural Research Service) Filtering mediums for treating stormwater runoff
- 2:45 **Dr. Bernard Sweeney** (Stroud Water Research Center) Level –lip spreaders
- 3:15 **Afternoon Break**
- 3:30 **Dr. Lauren Christianson** (Conservation Fund Freshwater Institute) Wood chip bioreactors: A cutting edge strategy for water quality
- 4:00 **Mr. Jason Keppler (MD Department of Agriculture)** Agricultural ditch management of Maryland's Eastern Shore
- 4:30 **William Ryall (Environmental Concern, MD)** Swale design considerations
- 5:00 **Dr. Rebecca Schneider / Dr. Kathy Boomer** Day 1 Wrap-Up
Ms. Donnelle Keech Day 2 Preview
- 5:30 **“DOWN IN THE DITCHES” HAPPY HOUR – cocktails and appetizers**
Hosted by the **Chesapeake Bay Foundation** (102 E. Dover Street, Easton) with additional sponsorship by **Cornell University and the Cornell Local Roads Program**

AGENDA – DAY 2

Linking Ditch Management Science and Policies, Across Multiple Spatial Scales

- 8:30** **Welcome Back and Overview of Days 1 and 2**
- 8:45** **Mr. Jeff Sweeney** (Chesapeake Bay Program) Roadside ditches and the current CBP Model:
 Opportunities for future CBP model development
- 9:15** **Ms. Kari Dolan** (Vermont DEC) Case Study - Vermont Lake Champlain TMDL Program
- 9:45** **Dr. David Orr** (Cornell Local Roads) Overcoming Barriers to Change:
 Training and Technical Assistance
- 10:15** **Mr. Robert Shreeve** (Deputy Director, Office of Environmental Design - Maryland State
 Highway Administration) Understanding road maintenance concerns in managing
 water quality improvements
- 10:45** **Coffee Break**
- 11:00** **Breakout Group Discussions - Donnelle Keech, Facilitator**
 Key questions:
- How do roadside ditch impacts and practices vary across the Chesapeake Bay Watershed?
 - What is needed to improve roadside ditch management watershed-wide?
- 12:30** **Lunch**
- 1:30** **Group Discussion and Recommendations**
- Report from Breakout Groups
 - Group Discussion - areas of consensus, areas of divergence, gaps in knowledge
 - Key recommendations
- 3:15 – 3:30** **Rebecca Schneider and Kathy Boomer Workshop Wrap-Up**



Speaker Bios

(In order of the Presentations)

Mr. Dirck Bartlett is serving his second term on the Talbot County Council. Though Mr. Bartlett was born in Baltimore, his family has roots on the Eastern Shore dating back more than 300 years. For the past 20 years, he has worked for Ilex Construction & Woodworking, a firm with offices in Maryland and Virginia that specializes in home renovation and the construction of custom architect-designed homes. He is past president of the Talbot Preservation Alliance, Citizens for Sound Growth, the Talbot County Historical Trust, Inc., and has served on the Board of Historic Easton and the Talbot County Historical Society Board.

Dr. Robert Summers was appointed Secretary of the Maryland Department of the Environment in 2011. Dr. Summers leads the Department's 1,000 professional and administrative staff in their efforts to protect and restore the quality of Maryland's air, water, and land resources, while fostering smart growth, a thriving and sustainable economy and healthy communities. Dr. Summers has served the citizens of Maryland for 30 years in various capacities within Maryland's progressive and nationally recognized environmental programs, with emphasis on scientific and technical issues related to water pollution control, drinking water protection and federal, State and local government environmental laws and regulations. Prior to being appointed Secretary, Dr. Summers served at MDE as Deputy Secretary, Director of the Water Management Administration and Director the Technical and Regulatory Services Administration. Throughout his career, Dr. Summers has been a key contributor to the multi-jurisdictional Chesapeake Bay restoration effort. Dr. Summers received his B.A. (1976) and Ph.D. (1982) in Environmental Engineering from the Johns Hopkins University. Prior to joining Maryland's environmental programs, he worked as a post-doctoral research associate at the State University of New York, Marine Sciences Research Center in Stony Brook, NY and as a research assistant at the Johns Hopkins University's Chesapeake Bay Institute.

Dr. Kathy Boomer has almost twenty years of experience working on water resource issues. She currently is the Watershed Scientist for The Nature Conservancy's Chesapeake Bay Whole System Restoration project. With a background in wetland hydrology, plant nutrient dynamics, and watershed modeling, Dr. Boomer focuses much of her efforts on developing decision support tools to best place management practices for achieving water quality and habitat goals. She earned her Master's and Doctoral degrees from Cornell University, NY.

Dr. Rebecca Schneider is an Associate Professor in the Department of Natural Resources at Cornell University, Ithaca, NY. She received her Ph.D. from Cornell University; M.S. degree from the University of Virginia, and her B.S. degree from Loyola College. Dr. Schneider's research program focuses on integrated, watershed-based, and sustainable water resource management in the face of climate change. Her research, extension, and teaching all revolve around different facets of this topic. Currently, her primary research program is focused on how networks of roadside ditches that criss-cross watersheds contribute to flooding, droughts, and degraded water quality in downstream waters. A second effort is investigating how restoration of organic matter in wetland and terrestrial soils can help to improve hydrologic and biogeochemical functions. She has also developed a successful companion undergraduate course that teaches the broader set of ecological issues associated with water resource management.



Dr. Beverley Wemple is an Associate Professor of Geography and Natural Resources at the University of Vermont, Burlington, VT. Her work focuses on hydrologic and geomorphic processes in upland, forested landscapes, using a combination of empirical field studies and simulation modeling. She has worked in the Cascade Range in the Pacific Northwest, the Appalachians in northern New England, and more recently in the northern Andes in Ecuador. She is currently engaged in an interdisciplinary project to assess impacts of climate change on watershed processes and lake biogeochemistry within the Lake Champlain basin.

Dr. Zachary Easton graduated from Cornell University in 2007 and is now an Assistant Professor in the Department of Biological Systems Engineering at Virginia Tech, Blacksburg, VA. The primary focus of his work is to improve our understanding of hydrologic and terrestrial processes that control the biogeochemical cycles and fluxes with the ultimate goal of developing policies and management practices that protect water, soil, and other natural resources. Water is typically his central focus because it is arguably the most critical and at-risk resource to humans and entire ecosystems. His research addresses both native and managed systems, considers processes at plot- to large river basin-scales, and is relatively evenly divided among field study/monitoring, modeling, and application of results to real world problems. Three broad and somewhat overlapping research themes around which Dr Easton's work foci are: 1. Impact of land use and climate (change) on water quality and quantity, 2. Impact of watershed management practices on water quality, and 3. Bridging basic research and modeling to management and application.

Dr. Robin Van Meter is an Assistant Professor of Environmental Science/Studies and Biology at Washington College, Chestertown, MD. Her research merges ecotoxicology and herpetology to evaluate the impacts of pollutants at the population and community level. Before coming to Washington College, she was a post-doc at the US EPA in Athens, GA where she studied dermal uptake of pesticides in amphibians. Dr. Van Meter earned her M.S. from Drexel University and her PhD from the University of Maryland, Baltimore County.

Mr. Steve Bloser is Director of the Center for Dirt and Gravel Roads, a non-profit entity under the Larson Transportation Institute at Penn State University, University Park, PA. Steve leads an interdisciplinary team which assists communities throughout PA by providing education, guidance, and technical assistance to minimize the impact of unpaved roads and trails on natural landscapes and hydrology. The Center teaches and implements "environmentally sensitive maintenance practices" to reduce runoff and sediment pollution coming from low-volume transportation corridors.

Mr. David Wick is the Executive Director of the NYS Lake George Park Commission. He has been serving in this role since 2012, after more than 19 years as District Manager of Warren County Soil and Water Conservation in NYS. Dave has more than 20 years of experience working on stormwater management projects and has worked with all levels of highway departments on improved stormwater runoff and ditching initiatives. Dave has a Master's Degree in Hydrology and Water Resources Management from the University of Wyoming, and he lives in the Town of Lake George in upstate New York.



Dr. Ray Bryant is a Research Soil Scientist for the USDA Pasture Systems and Watershed Management Research Unit, located in University Park, PA. He contributes to research projects “Management and conservation practices to improve water quality in agroecosystems of the northeastern US” and “Managing farms for environmental stewardship and profit.” Dr. Bryant uses knowledge of soil and landscape processes to devise strategies, such as chemical- and bio-filtration, for preventing the movement of nutrients from agricultural fields to drainage waters that eventually flow to the Chesapeake Bay. Most of his current research is conducted in partnership with faculty and students at Penn State and the University of Maryland - Eastern Shore.

Dr. Bernard Sweeney is Director and President of the Stroud Water Research Center located in Avondale, PA and also serves as an Adjunct Professor of Biology at the University of Pennsylvania. His research has focused on the role of water quality monitoring in conservation, the population and community ecology of temperate and tropical aquatic invertebrates, pollution assessments using macro-invertebrates, the roles and functions of streamside forests, and impacts of global warming on stream ecosystems. Dr. Sweeney has published dozens of peer-reviewed journal articles on these topics. He was formerly the Curator, Associate, and Assistant Curator of the Academy of Natural Sciences in Philadelphia from 1978-1999.

Dr. Laura Christianson has been a Research Agricultural Engineer for The Conservation Fund – Freshwater Institute at their Shepherdstown, WV research campus since May 2013. Laura’s professional interests involve the use of natural processes to prevent and mitigate negative water quality impacts from agricultural systems. She has a particular expertise in denitrification ‘woodchip’ bioreactors, a technology she has been researching since 2008 (Ph. D., Iowa State University). Laura previously completed a M.S. in Biological and Agricultural Engineering at Kansas State University and a B.S. in Biosystems Engineering at Oklahoma State University, and was a Fulbright Fellow at Massey University in New Zealand.

Mr. Jason Keppler is the Watershed Implementation Program Manager for the Maryland Department of Agriculture, Annapolis, MD. He has over 19 years of experience in agricultural conservation program delivery. He currently oversees the implementation of the agricultural sector’s responsibilities under the Chesapeake Bay TMDL. Prior to his current position, Mr. Keppler reviewed conservation grants administered through the Maryland Agricultural Water Quality Cost-Share (MACS) Program and was a Non-Point Source Environmental Technician for the West Virginia Conservation Agency. Mr. Keppler received his B.S. in Agriculture from West Virginia University and M.S. in Environmental Management from University of Maryland University College. He is a certified Nutrient Management Consultant in Maryland and is a Past President of the Old Line Chapter of the Soil and Water Conservation Society.

Mr. William Ryall works for Environmental Concern Inc, St Michaels, Md. He specializes in designing living shorelines, wetland restoration projects and stormwater management practices. He has been involved in the construction of several ditch retrofit projects around Talbot County. He is focused on bringing an insight into the practical constraints of ditch retrofitting on Chesapeake Bay’s Eastern shore.



Ms. Donnelle Keech grew up in Frederick, Maryland. She studied Anthropology at New York University, and environmental science and applied ecology at Indiana University in Bloomington Indiana. She returned to Maryland to work for The Nature Conservancy in 1996. She joined the Maryland/DC Chapter as Assistant Director of Stewardship, and has gone on to become part of the Nature Conservancy's Chesapeake Bay Program, working on forest conservation, local engagement, dirt and gravel road management, and healthy watersheds. Donnelle lives in Cumberland, MD where she and her husband enjoy juggling two environmental careers and parenting their two sons.

Mr. Jeff Sweeney has been with the Chesapeake Bay Program partnership since 1998 as an employee of the Chesapeake Research Consortium, University of Maryland Extension, and most recently, the Environmental Protection Agency, Annapolis, MD. He was trained as a Chemical Engineer and Environmental Engineer and his roles with the Bay Program have focused on environmental modeling and quantifying the impacts of better management with the partnership's Watershed Model. Recent projects have included stakeholder development of Milestone and Watershed Implementation Plans and the Chesapeake Bay TMDL.

Ms. Kari Dolan is an Ecosystem Restoration Program Manager and manages the Vermont DEC's Ecosystem Restoration Program, in Montpelier, VT which focuses on restoring and safeguarding the State's rivers, lakes, and wetlands by reducing nonpoint source pollution. Prior to this job, Kari was the manager for the State river corridor and floodplain program and National Flood Insurance Program Coordinator for Vermont. Ms. Dolan holds two Masters degrees from the University of California, Berkeley and a biology degree from Princeton.

Dr. David P. Orr, PE is Director / Senior Engineer for the Cornell University Local Roads Program, Ithaca, NY. With over 25 years in the local highway community, David has experiences covering the gamut from the field to the office and from storms to sunny days. He has a broad range of expertise and experience in highway engineering and construction, including design, inspection, project management, purchasing, budgeting and supervision. He has an excellent understanding of the needs of the local highway audience and a unique perspective on their interest.

Mr. Robert E. Shreeve is Deputy Director, Office of Environmental Design, Maryland State Highway Administration. Rob has worked at the State Highway Administration for nearly 30 years. He has worked in SHA's Office of Structures, Office of Maintenance and Office of Environmental Design. He has a B.S. in Biology from Towson University. A focus of his work has been working to minimize the environmental effects from highway construction/maintenance on streams, wetlands and wildlife. Rob led the environmental management effort for Maryland's Intercounty Connector Project which included construction of over 18 miles of 6 lane highway, reduction of wetland impacts by 40%, wildlife passage/exclusion, restoration of over 88,000 linear feet of stream, construction of over 88 acres of wetlands and over 800 acres of reforestation as mitigation and stewardship. Rob is now leading SHA's program to improve water quality as part of Maryland's Chesapeake Bay restoration effort. Rob is finishing his M.S. in Environmental Management at University of Maryland University College and coaches high school girls' lacrosse in his spare time.



NOTES

