



From the Rooftop to the Bay:

Implementing Stormwater Management Strategies in
the Chesapeake Bay Watershed

March 9 - 11, 2010
Staunton, VA

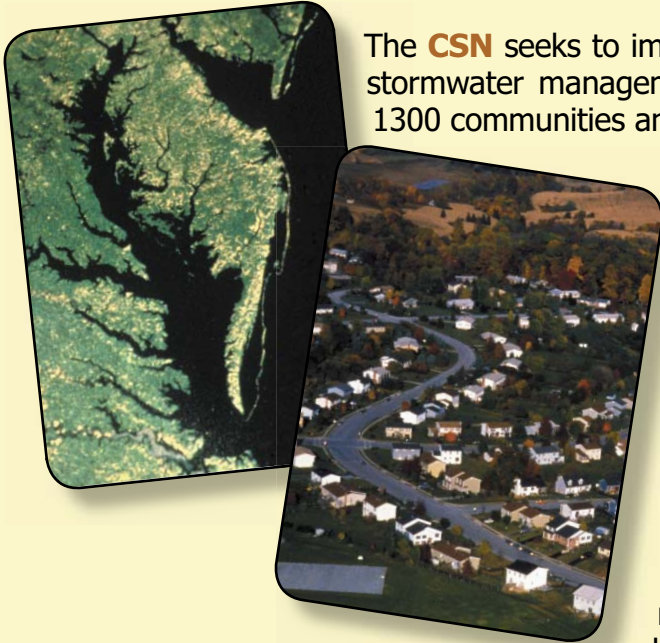


CENTER FOR
WATERSHED
PROTECTION



About Us:

The **Chesapeake Stormwater Network (CSN)** advocates for reform of federal, state and local laws, permits, regulations and design manuals to promote more sustainable stormwater management in the Chesapeake Bay. The interactive network aligns and integrates the efforts of thousands of individuals working on the stormwater problem across the Bay.



The **CSN** seeks to improve on the ground implementation of more sustainable stormwater management and environmental site design practices in each of 1300 communities and seven states in the Chesapeake Bay Watershed.

Founded in 1992, the **Center for Watershed Protection (CWP)** is an award-winning, national nonprofit organization that works to protect, restore, and enhance our streams, rivers, lakes, wetlands, and bays.

As the nation's leading watershed and stormwater clearinghouse, **CWP** has extensive experience with the synthesis of research, working directly with local communities, delivering targeted training, and evaluating a community's watershed management capacity. Our numerous publications define and illustrate a systematic approach, and partnerships with communities around the country provide the background to develop and implement sound watershed

management strategies and improve the integration of local watershed and stormwater programs. The Center has worked directly with scores of governmental agencies, watershed organizations, and consultants to provide effective engineering, regulatory, and programmatic solutions to stormwater managers in geographically diverse settings.

Our technical goal is to provide clear, condensed and scientifically defensible support that reflects our acute understanding of local conditions and specific needs of the practicing engineer, program manager, and regulatory official.

Our Partners:

We would like to thank our partners that have been instrumental in coordinating this workshop:

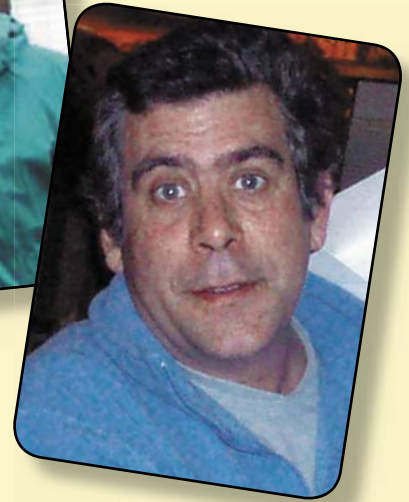


Major funding provided by National Fish and Wildlife Foundation.



Special thanks to Michelle Kokolis of James River Association for handling registration.

Welcome to From the Rooftop to the Bay!



On behalf of the program organizers, Tom Schueler and I would like to welcome you to "From the Rooftop to the Bay!" As I write this, my rooftop is still covered with snow, but, apropos to the workshop theme, it will soon become runoff (and probably groundwater recharge). In my particular case, that pathway involves the Rivanna River, the James River, and the Chesapeake Bay. Each participant in this workshop can recount that particular pathway for their own situation, and that is one thing that ties us all together.

Stormwater management in the Chesapeake region is at a dynamic moment. Stormwater initiatives at the state level have made tremendous strides, and have also hit occasional obstacles and snags. Federal initiatives, including the Bay TMDL, promise to re-write the rulebook on stormwater. Whatever the outcome of these efforts, it is evident that the stormwater community must prepare itself for the 'next generation of stormwater management' in the Bay region and beyond. The Rooftop to Bay workshop is a major milestone on that journey.

Through 29 interactive sessions involving over 40 staff instructors and invited experts, you will be exposed to a wide range of technical and policy topics. Our stormwater design track is the kick-off event for the on-going Chesapeake Stormwater Training Partnership that aims to raise the bar on stormwater design capabilities among legions of designers and plan reviewers. However, the real strength of this workshop lies in the experiences and talents of the participants from the Bay region and other watersheds. We look forward to each of your unique contributions to this workshop community.

We would also like to express our gratitude to the workshop funders, sponsors, and partners. Please let them know that you appreciate their support to make programs like this possible.

The Center for Watershed Protection and the Chesapeake Stormwater Network welcome you. We are confident that you will enjoy the lovely town of Staunton, VA, over the course of the next three days. We also want to thank you for your commitment to help realize the 'next generation of stormwater management' and the very tangible benefits this will have for the Bay and each little backyard stream.

A handwritten signature in black ink that reads "David G. Hirschman".

David Hirschman, CWP Program Director

A handwritten signature in black ink that reads "Tom Schueler".

Tom Schueler, CSN Coordinator

Things to Know

WORKSHOP TRACKS

Concurrent tracks are available throughout the three days so that participants may tailor their workshop experience. Participants are free to attend sessions in any track they wish. All classroom sessions are held at the Stonewall Jackson Hotel. The agenda distinguishes the tracks by color:

BLUE = Program Track

ORANGE = Monitoring Track

GREEN = Design Track

EXTRA-CURRICULAR

WELCOME RECEPTION — Tuesday, March 9, Colonnade Ballroom, 5:30 - 7:00

Mingle with other stormwater professionals! Hors d'oeuvres and refreshments provided. Free. Sponsored by Coca-Cola®, Eastern Division.

THE STONEROLLERS AWARDS — Wednesday, March 10, Colonnade Ballroom, 8:00 - 9:30

Save room for dessert and join us after dinner for an ice cream social and casual awards ceremony! We will be recognizing the movers and shakers of the stormwater world that are in our midst. Free dessert. Cash bar. Sponsored by ASCE, Virginia Chapter.

FIELD TRIP

Day 3 – Thursday March 11 – Session 3B & 4B: Stormwater Tour – James Madison University

This field trip (for pre-registered participants) will take you to James Madison University in Harrisonburg, VA, to visit and assess several stormwater BMPs. Participants should be prepared to walk a little and plan for the weather. Transportation will be provided on a chartered bus. A brown bag lunch will be provided.

MEALS

Light breakfast, lunch, and snacks are provided daily. Dinner is on your own.

CONTINUING EDUCATION UNITS AND VIRGINIA CERTIFICATES

Continuing Education Units (CEUs) are offered at no charge to participants, through James Madison University. Number of CEUs issued per day of attendance is variable, as shown below. Ten hours of instruction are equivalent to 1 .

Day 1 (Tu.) = 0.6 CEUs

Day 2 (Wed.) = 0.8 CEUs

Day 3 (Thurs.) = 0.6 CEUs

Attendance is required to earn CEUs. Please place a sticker on the Attendance Record sheet found at the back of your notebook, for each session you attend. Turn in this sheet at the registration table prior to leaving the workshop. A certificate will be mailed to each CEU recipient after the workshop. [Virginia-licensed engineers, landscape architects, architects, and land surveyors wishing to receive a separate certificate for Continuing Education Credits, must mark this option on their Attendance Record sheet.]

GETTING AROUND STAUNTON

The Stonewall Jackson Hotel is in easy walking distance to many restaurants, shops, several theaters, and parks. For more information about Staunton, see the hotel desk or visit:

Downtown Staunton Visitor Center

35 S. New Street
Staunton, VA 24401
540-332-3971

Hours: M-Su 9:30 am-5:30 pm

Trolley at the Staunton Visitors Center:

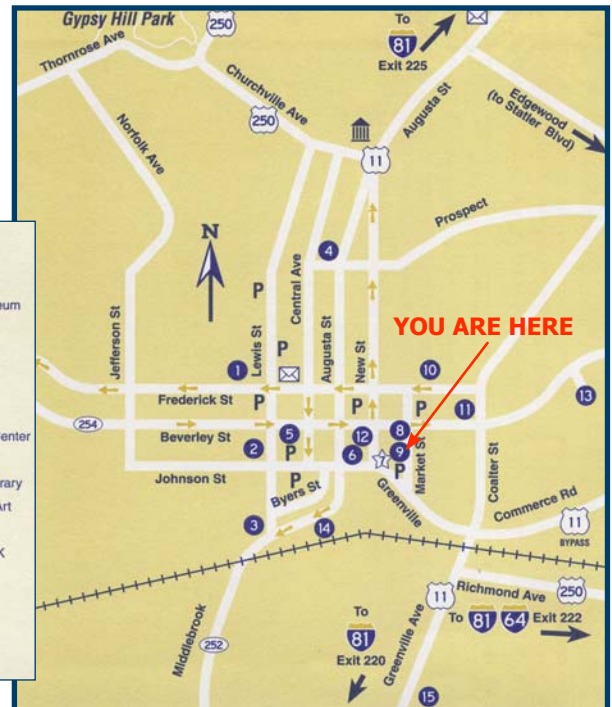
The free trolley is the ideal way to get around downtown. It stops at the Visitors Center for pickup at 15 minutes and 45 minutes after every hour. The Trolley makes a continuous loop around the downtown, Wharf area and out to Gypsy Hill Park once every 30 minutes.

Hours: 10:00 am-6:00 pm M-Sa (Jan-Apr)

Fees: Free

Map provided by
www.visitstaunton.com

- 1 Stuart Hall School
- 2 Trinity Episcopal Church
- 3 Sun Spots Glass Blowing Studio
- 4 Jumbo Antique Fire Engine Museum
- 5 City Hall
- 6 Augusta County Court House
- 7 Staunton Visitors Center
- 8 American Shakespeare Center
Black Friars Playhouse
- 9 Stonewall Jackson Conference Center
- 10 Mary Baldwin College
- 11 Woodrow Wilson Presidential Library
- 12 R.R. Smith Center for History & Art
- 13 Va School for Deaf and Blind
- 14 Staunton Train Station—AMTRAK
- 15 Colonial Mall Staunton
- P Parking
- ➔ One Way Street Direction
- 📖 Library
- 📧 Post Office



8:00 - 8:30

REGISTRATION - LOBBY

8:30 - 9:00

WELCOME & ORIENTATION - SALON A/B

9:00 - 9:45

Session 1: A National Perspective – You're Not Alone (General Session) - SALON A/B

Xavier Swamikannu has been at the helm at the California Water Quality Board for the last two decades, and will present his perspectives on lessons learned in stormwater permitting, TMDL integration and enforcement on the West Coast. His perspective will be timely as Chesapeake Bay States shift to more stringent stormwater permits and Bay-wide TMDLs in the coming years.

Keynote Speaker: *Xavier Swamikannu - Chief, Storm Water Program (ret'd), CalEPA Water Boards - Los Angeles Region*

9:45 - 10:45 - SALON A/B

Session 2A: Runoff Reduction Theory & Practice

Site design strategies aimed at reducing hydrologic impacts, such as Low Impact Development (LID), Environmental Site Design, etc., are intuitively considered to be "better" than conventional practices in meeting stormwater management goals. However, it can be difficult to implement site design strategies without a methodology or compliance tool to measure the effectiveness or value of the design. This presentation will provide an in depth look at the science and practice at the core of this strategy, and discuss the different metrics for assessing compliance.

9:45 - 10:45 - BLUE RIDGE ROOM

Session 2B: Stormwater 101 This session is geared to elected officials and local program staff. It will provide a basic overview on what stormwater management is, why it is important to communities, how it integrates into other local government program areas, and what regulatory mechanisms exist that guide stormwater management. This will be broad based and have information relevant to most states, however some information will be Virginia specific. **Guest Speaker:** Todd Janeski

10:45 - 11:00

BREAK

11:00 - 12:00 - SALON A/B

Session 3A: Implementing Environmental Site Design and Runoff Reduction in Bay States

So how do the new stormwater requirements in each Bay state stack up against each other? How are they actually translated in the real world of stormwater design and plan review. In this session, stormwater experts that have helped develop the new regulations will show you the real bottom line to expect in your community or state, and compare them on a real world site.

11:00 - 12:00 - SALON C

Session 3B: The Ball's In Your Court, Part I – Policy Decisions for Your SW Program

This session is geared to elected officials and local program staff. It will provide a big-picture overview of the policy decisions that must be made – one way or the other – to implement local stormwater regulations to comply with new statewide regulations.

12:00 - 1:15

LUNCH - COLONNADE BALLROOM

1:15 - 2:30

Session 4: The Road Ahead for Stormwater in the Bay (General Session) - SALON A/B

Times are a changing when it comes to stormwater in the Chesapeake Bay. This session will feature an update on what is coming down the road from EPA and the Bay states in terms of more stringent stormwater management requirements, followed by a spirited panel discussion on how these can be effectively absorbed and integrated by local stormwater managers.

Keynote Speaker: *Jeff Lape – Director, EPA Chesapeake Bay Program* **Panelists:** *Bill Street (James River Association), Frank Piorko (DNREC), Bill Stack (CWP - formerly Chief of Surface Water Mngmt Div., Baltimore City)*

2:30 - 2:45

BREAK

2:45 - 5:15 - SALON A/B

Session 5A & 6A: Stormwater Site Plan Design Workshop

There is a wealth of expertise on innovative environmental site design and stormwater BMP selection and design in the Chesapeake Bay watershed. Attendees of this session will interact with a wide range of professionals from different states and physiographic regions while exploring the new environmental site design criteria being adopted in the Bay watershed. An added feature of this interactive design workshop will be to discuss the numerous selection and design issues of the different Chesapeake Bay watershed regions.

2:45 - 4:00 - SALON C

Session 5B: The Ball's In Your Court, Part II – On-Site vs. Offsite SW Compliance

This session is dedicated to helping local officials and stormwater staff understand the economic, regulatory, and technical drivers for implementing an off-site compensatory stormwater treatment program. There have been many different names used to describe these programs in recent months: pro-rata share, nutrient offset, nutrient trading, buy-down, etc., this session will discuss the meaning of these terms and the associated regulatory and administrative implications for each. **Guest Speakers:** *Kurt Stevenson (VA Tech), Doug Beisch (Williamsburg Environmental Group), Keith White (Henrico County)*

4:00 - 5:15 - SALON C

Session 6B: Evaluating Local Codes to Support Innovative Stormwater Strategies

Innovative stormwater practices are only as good as a community's codes and ordinances allow. This session will provide some insight into common local codes that can inhibit the use of good stormwater management practices, and also review how to identify and change them. Local codes can be the decisive players that determine how new state stormwater regulations are applied on the ground. **Guest Speakers:** *John Tippet (Friends of the Rappahannock), Joan Salvati (VA DCR)*

5:30 - 7:00

WELCOME RECEPTION - COLONNADE BALLROOM

7:45 - 8:15**REGISTRATION - LOBBY****8:15 - 8:45****ORIENTATION - SALON A/B****8:45 - 10:00****Session 1: Performance Monitoring of BMPs (General Session) - SALON A/B**

This session will showcase some of the latest research on runoff reduction and the performance of innovative low impact development practices from two of the most prominent stormwater researchers on the east coast. Dr Hathaway will highlight the large body of monitoring on green roofs, filter strips, bioretention and permeable pavers conducted in NC. Dr. Roseen will describe recent results from his stormwater test facilities at the Univ. of New Hampshire. **Keynote Speakers:** *Dr. Robert Roseen – Director, UNH Stormwater Center; Jon Hathaway – NC State Stormwater Engineering Group*

10:00 - 10:15**BREAK****10:15 - 11:15 - SALON A/B**

Session 2A: Rooftop Practices Rooftop surfaces represent a significant amount of the total impervious cover in any type of development. If the goal is to control the runoff close to the source, you can't get much closer than rooftop practices. This session will explore the water quality and quantity impacts associated with rooftop runoff and provide basic design parameters associated with the treatment strategies. Strategies to be covered include vegetated (or green) roof design, as well as select downspout disconnection practices applicable in both urban and suburban settings. **Guest Speaker:** *Charlene Harper, P.E. (Timmons Group)*

11:15 - 12:15 - SALON A/B**Session 3A: Filter Strips and Soil Amendments**

An essential component of runoff reduction is using pervious areas on the site to filter and infiltrate runoff - yet compacted turf makes it really hard to put runoff into the ground. This session presents new techniques to boost runoff reduction in turf areas through deep tilling, compost amendments, filter strips and turf filter paths. Learn more reliable ways to make turf work for you through these important soil restoration methods. **Guest Speaker:** *Stuart Schwartz (Univ. of Maryland – Baltimore County)*

10:15 - 11:15 - SALON C**Session 2B: Getting the Most Out of Your Monitoring**

Monitoring to evaluate the effectiveness of a stormwater program is becoming increasingly necessary as communities are in need of data to support mandatory permit requirements. This session will address key steps and challenges to implement a monitoring study design with a focus on performance monitoring of stormwater practices. Case studies to include a Baltimore street sweeping paired watershed study and stream restoration projects. **Guest Speaker:** *Bill Stack (Baltimore City DPW)*

11:15 - 12:15 - SALON C**Session 3B: Regional Cooperation for Alternative Stormwater Monitoring**

A unique approach is being used in the Hampton Roads, VA region to pool monitoring resources and promote regional partnerships. Localities in this region worked with the stormwater permitting agency to move from the typical chemical monitoring requirement to a Stormwater Management Program Effectiveness Indicator Tracking Program. In this session, Jennifer Tribo will explain how this project evolved over the years, what role partnerships play, will share results from the effort, and discuss hurdles encountered during the process. **Guest Speakers:** *Jennifer Tribo (Hampton Roads PDC), Danny Barker (Hampton Roads Sanitation District)*

12:15 - 1:30**LUNCH - COLONNADE BALLROOM****1:30 - 2:30 - SALON A/B****Session 4A: Infiltration & Groundwater**

The Infiltration Muscle Gang wants you to infiltrate stormwater everywhere all the time. Others would apply severe discretion for use of the practice. When is it appropriate to use infiltration? What types of site conditions would suggest that it NOT be used? This session will introduce the new Infiltration specification and will also explore the science behind what happens to stormwater once it is in the ground (or tries to get into the ground). **Guest Speaker:** *Nick Evans (Virginia Groundwater LLC)*

2:30 - 3:30 - SALON A/B

Session 5A: Bioretention & Swales Bioretention can be bad or it can be beautiful. This session will focus on the critical design, construction and maintenance issues that make a difference between the two. The interactive session will change the way you think about bioretention and will provide tips to boost their performance in reducing runoff and pollutant removal.

1:30 - 3:30 - SALON C**Session 4B & 5B: Stormwater Retrofitting as a Program Tool**

Proper planning can do a lot to protect our watersheds from the impacts of future development, but what about existing development? Stormwater retrofitting is one way to improve or fix past mistakes or problems in your watershed. In this session, we'll learn about the key elements of an effective retrofitting program, and take a field trip to investigate a potential retrofit site. **Guest Speaker:** *Dan Frisbee (City of Charlottesville, VA)*

3:30 - 3:45**BREAK****3:45 - 4:30 - SALON A/B**

Session 6A: Permeable Pavement Recent advances in both research and technology have shifted permeable pavement into the stormwater forefront along with other runoff reduction practices. This session will provide practical design and maintenance tips to boost their runoff reduction and pollutant removal performance. Common myths and audience concerns will also be addressed in an expert panel discussion. **Guest Speakers:** *Dr. Robert Roseen (UNH Stormwater Center), Jon Hathaway (NC State Stormwater Engineering)*

4:30 - 5:30 - SALON A/B

Session 7A: Stormwater Wetlands This session will introduce the next generation of stormwater wetlands by focusing on design innovations for forested wetlands, submerged gravel wetlands and regenerative conveyance systems. These new approaches to wetland design boost runoff reduction, increase nutrient removal and create more sustainable wetland habitat. The session will also focus on the use of linear wetlands can be expanded in the "roof to stream sequence." **Guest Speaker:** *Erik Michelsen (South River Federation)*

3:45 - 5:30 - SALON C**Session 6B & 7B: BMP Maintenance Smack-Down**

Also known as the "Achilles Heel" of stormwater management, BMP maintenance is the most challenging task in operating a local stormwater program. This session will describe some common maintenance issues, as identified in a BMP field assessment, and will provide tips and tools for addressing technical and programmatic maintenance concerns. **Panelists:** *Steve Hubble (Stafford County, VA), Randy Williford (Loudoun County, VA), Amy Stevens (Montgomery County, MD)*

8:00 - 9:30**THE STONEROLLERS AWARDS - COLONNADE BALLROOM**

8:30 - 8:45

ORIENTATION - SALON A/B

8:45 - 9:45 - SALON A/B

Session 1A: Design Adaptations for Redevelopment and Urban Watersheds Redevelopment and infill creates unique challenges for managing stormwater in urban watersheds. This session will focus on how to integrate effective stormwater practices directly into the built environment. The session will profile some innovative forms of urban bioretention along streets, and adjacent to buildings and sidewalk zones that have been applied in Baltimore, and will also describe how to set an impervious cover mitigation fee for sites where full compliance is not possible.
Guest Speaker: *Bill Stack (Baltimore City DPW)*

9:45 - 10:45 - SALON A/B

Session 2A: Design Adaptations for Karst Terrain
 The parts of the Bay watershed that are underlain by carbonate rocks (known as karst) make both land development and stormwater management problematic, creating potential risks for sinkhole formation, groundwater contamination and infrastructure failure. A small working group has developed new guidance on site and stormwater design within karst terrain in the Bay watershed. This session will focus on how to assess sites and select and adapt stormwater practices to minimize these risks.
Guest Speaker: *Chris Anderson (Page County, VA)*

8:45 - 9:45 - SALON C

Session 1B: Stormwater Program Accounting Tools
 With existing and impending TMDLs in many communities across the country, and increasing mandates for MS4 accountability, there is an acute need for tools to help communities account for actions and practices to meet watershed goals and regulatory requirements. This session will focus on a CWP-developed accounting tool that can be used at the site and watershed scales. The spreadsheet-based "Watershed Treatment Model" will be presented and attendees will be provided with this resource that can be adapted to your community.
Guest Speaker: *Christy Williams (Tetra Tech, Inc.)*

9:45 - 10:45 - SALON C

Session 2B: Pollution Prevention, Good Housekeeping, & Source Controls
 Does your municipality suffer from unruly roadways, horrendous hot-spots, and lackluster landscapes? Are you wondering how to manage your municipal operations to protect water quality? In this session, you'll learn about developing and implementing an effective municipal pollution prevention and good housekeeping program. Hear about simple methods that can be used to assess and improve your own municipal operations.

10:45 - 11:00

BREAK

11:00 -12:30 - SALON A/B

Session 3A: Rainwater Harvesting Hands-On Workshop
 As some areas of the country experience drought and other areas are receiving too much rain, there is growing recognition of the benefits to capturing rainwater to be utilized as a resource, or managed in order to improve downstream conditions. This presentation will provide interactive training to give participants an opportunity to discuss the regulatory hurdles, concepts for quantifying the stormwater benefits, and explore the use of a spreadsheet tool for system sizing.
Guest Speakers: *Alex Forasté; Sarah Lawson (Rainwater Management Solutions)*

11:00 -2:30 - FIELD TRIP

Session 3B & 4B: Stormwater Tour – James Madison University This field trip will take you to James Madison University in Harrisonburg to visit and assess several stormwater BMPs. Through small group activities, we will explore several bioretention facilities, a sand filter, and extended detention ponds. We will discuss how they function and what design, construction, and maintenance features can provide better performance of each type of BMP we visit. Participants should be prepared to walk a little and prepare for the weather. **[Pre-registrants only] Board bus at Hotel entrance at 11:00.**

12:30 - 1:30

LUNCH - COLONNADE BALLROOM

1:30 - 2:30 - SALON A/B

Session 4A: Practical Pollution Prevention Assessment
 Pollution prevention doesn't have to be a boring paper work exercise. Learn how to perform a rapid site investigation at your municipal or corporate facility to develop an action plan to implement pollution prevention and retrofit practices. Learn how you can score your site against stormwater benchmarks every year to determine how Bay-friendly your site actually is.

11:00 -2:30 - FIELD TRIP

Session 3B & 4B (cont'd): Stormwater Tour – James Madison University
 See above. This session is from 11:00 – 2:30 with brown bag lunch provided.

2:30 - 2:45

BREAK

2:45 - 3:45 - SALON A/B

Session 5A: Stormwater Facilities as Community Spaces
 Stormwater management can be more than holes in the ground. At its best, stormwater can be incorporated into community spaces to enhance habitat, create recreational opportunities, add beauty and interest, and function as a community asset. This session will provide real-world examples for stormwater practices that are fun, artistic, and still provide water quality and quantity control. Ted Brown and Lee Mallonee with Biohabitats, Inc. will lead the discussion on how to overcome common obstacles and think outside the box for stormwater projects. They will also discuss the integration of stormwater with LEED and Sustainable Sites designations. **Guest Speakers:** *Ted Brown and Lee Mallonee (Biohabitats, Inc.)*

2:45 - 3:45 - SALON C

Session 5B: Program Funding & Financing
 There are a lot of good ideas, new initiatives, and new regulations in the stormwater management world right now. Exciting times? Definitely. But they also can be expensive times for a stormwater manager. This session will look at some of the funding options available for stormwater managers. Specifically, Glenn Barnes from the Environmental Finance Center will discuss funding options for NPDES requirements, and George Staber from the City of Staunton will review his community's efforts to set up a stormwater utility.
Guest Speakers: *Glenn Barnes (UNC Environmental Finance Center); George Staber (City of Staunton, VA)*

3:15 - 4:15

WRAP-UP & EVALUATIONS - SALON A/B

CSN and CWP Instructors

Tom Schueler, Coordinator - CSN

Tom has more than 25 years experience in practical aspects of stormwater practices to protect and restore urban watersheds. Tom founded the Center for Watershed Protection in 1992, but departed in 2007 to launch the Chesapeake Stormwater Network, with generous financial support of the Keith Campbell Foundation. Tom has written or co-written more than a dozen local and state stormwater engineering design manuals, and developed or refined the first design specifications for bioretention, wet ponds, constructed wetlands, filtering systems, and dry swales. Tom has also developed the Impervious Cover Model, which is widely used in watershed planning and restoration. **SESSIONS - Day 1: 3A / Day 2: 2A, 5A, 7A Day 3: 1A, 2A, 4**

Bill P. Stack, P.E., Deputy Director of Programs - CWP

William P. Stack just recently left his position as Chief of the Surface Water Management Division for the Baltimore City Department of Public Works (DPW) and joined the Center. Bill was with the DPW for 30 years and worked on such notable projects as the Jones Falls Nationwide Urban Runoff Project and the Loch Raven Clean Lakes Project. His most recent projects include the development of stormwater management regulations and the development of a stormwater utility. Throughout his career, Bill has been an advocate for the environment serving on the boards of several notable organizations including the Governor's Commission on Environmental Justice and Sustainable Communities, CWP and the State Water Quality Advisory Committee. **SESSIONS - Day 2: 2B / Day 3: 1A**

Bryan Seipp, Watershed Manager - CWP

Bryan joined CWP in 2009. He is knowledgeable in various watershed activities such as watershed planning and implementation, GIS mapping and analysis, conducting field assessments, and capacity building for local watershed organizations. His technical expertise includes stream assessment, forest delineation and management, watershed management plans, working with local governments and project management. His other areas of expertise include construction of agricultural BMPs including, stream fencing, livestock crossings, forest and grass buffers, off stream watering systems, as well as other BMPs, and environmentally sensitive maintenance of dirt and gravel roads. Bryan is a licensed professional forester in the state of Maryland. **SESSIONS - Day 1: 2B**

Cecilia Lane, Watershed Technician - CWP

Cecilia joined the Center for Watershed Protection, Inc. as a watershed intern in January of 2009. She provides technical and programmatic support for project work. She is knowledgeable in Geographic Information Systems, research and technical writing. In addition, she has skills in field work, cartography and water quality monitoring. **SESSIONS - Day 3: 2B**

Dave Hirschman, Senior Planner - CWP

In his current position at the Center, Dave manages stormwater programs for the Center, including development of local and state stormwater regulations and design guidance, stormwater retrofit inventory and design, as well as national guidance on stormwater program development. He conducts extensive training for municipal staff, watershed organizations, government agencies, and other audiences. **SESSIONS - Day 1: 3A, 5B Day 2: 4A, 5A, 6B-7B / Day 3: 5A**

Deb Caraco, P.E., Senior Water Resources Engineer - CWP

Deb has 15 years of experience in the field of watershed protection. Her areas of expertise include pollutant load estimation, stormwater management practice design, Illicit Discharge Detection and Elimination. She is experienced in working with local governments to craft codes and ordinances that improve watershed protection during the development process. **SESSIONS - Day 2: 3A / Day 3: 1B, 4A**

Greg Hoffmann, P.E., Senior Watershed Engineer - CWP

Greg is knowledgeable in several areas of watershed and stormwater management, including stream and watershed assessment, stream restoration, planning and design of stormwater management practices, low impact development design, hydrologic and hydraulic modeling, and development of stormwater regulations. **SESSIONS - Day 1: 2A, 3A, 5A-6A / Day 2: 4B-5B / Day 3: 5B**

Joe Battiatia, P.E., Senior Water Resources Engineer - CWP

Joe recently joined the Center for Watershed Protection and provides expertise in stormwater management technical and administrative program development and implementation, including the development of stormwater regulations, Municipal Separate Storm Sewer System permit compliance programs, structural and non structural Best Management Practices (BMP) sizing, design and construction specifications, and BMP operation and maintenance guidelines. Experience also includes developing and conducting technical training and education programs. **SESSIONS: Day 1: 2A, 3A, 5A-6A / Day 2: 2A / Day 3: 3A**

Julie Schneider, Watershed Planner - CWP

Julie joined the Center for Watershed Protection, Inc. in 2005 and coordinates the Better Site Design program that encourages communities to reduce the environmental impacts during the development process. Her areas of technical expertise include stream assessment, GIS mapping and analysis, field work, watershed management plans, analysis of local codes and ordinances, and capacity building for local watershed organizations. Julie is also trained in various field methods and has extensive project management experience. **SESSIONS - Day 1: 6B**

Kelly Collins, E.I.T., Water Resources Engineer - CWP

Kelly joined the Center for Watershed Protection, Inc. in 2008, and is knowledgeable in several areas of watershed and stormwater management, including stormwater retrofit evaluation, planning and design of stormwater management practices, hydrologic and hydraulic modeling and analysis, stream and watershed assessment, and local stormwater and watershed management program development. **SESSIONS - Day 1: 5A-6A / Day 2: 6A, 4B-5B / Day 3: 2B**

Laurel Woodworth, Stormwater and Watershed Planner - CWP

Laurel joined the Center for Watershed Protection in 2008, and is knowledgeable in several areas of stormwater management and watershed planning. These areas include the design features and maintenance of stormwater management practices, erosion control practices, and local stormwater and watershed management program development. Laurel has additional skills in technical writing, meeting facilitation, volunteer coordination, water quality monitoring, and grant writing. **SESSIONS - Day 1: 6B; Day 2: 6B-7B**

Neely Law, Ph.D., Senior Research Analyst - CWP

Neely joined the Center for Watershed Protection in 2004 and brings with her extensive research experience and knowledge in urban watershed management and water quality analysis. Her areas of project management expertise include coordination of inter disciplinary project teams, data management and facilitation. Her areas of technical expertise include modeling, monitoring study designs, survey development and GIS applications. Neely is also trained in various field methods to evaluate the condition of stream health and watersheds. **SESSIONS - Day 2: 2B**

Sadie Drescher, Watershed Planner - CWP

Sadie joined the Center in 2009, where she develops watershed management strategies and tools for local communities and watershed groups. She gained extensive coastal experience working in SC over the past seven years. At the Center, she develops sampling plans, analyzes data, writes technical memos, drafts grant proposals, manages projects, and translates science to end-user stakeholders. She is trained in the Center's Unified Subwatershed and Site Reconnaissance (USSR), Retrofit Reconnaissance Investigation (RRI), and Unified Stream Assessment (USA) methods. **SESSIONS - Day 2: 4A, 3B Day 3: 5A**

KEYNOTE SPEAKERS:

Xavier Swamikannu, Ph.D., Chief, Storm Water Program (Retired) California EPA Water Boards – Los Angeles Region

Xavier Swamikannu has a B.S. in natural and chemical sciences from St. Joseph 's College in Bangalore , India , his M.S. in environmental sciences from Texas Christian University , and his Ph.D. in environmental science and engineering from the University of California , Los Angeles. He served as Chief of the Storm Water Permitting Program for the Los Angeles Regional Water Board and the California EPA. His work focused on municipal storm water programs in Southern California, including the evaluation of pollutant discharges, determining the effectiveness of storm water control measures in treating storm water runoff, and better understanding their costs. In addition, he was the state project manager responsible for managing several industrial storm water research projects. He has served on several EPA, state and regional technical advisory committees, he is a founding member of the Storm Water Monitoring Coalition, and he has also served as a member of the National Research Council's special committee on urban storm water quality management in the United States.

Day 1: SESSION 1

Dr. Robert Roseen, Director University of New Hampshire Stormwater Center

Dr. Roseen has been the Director of the University of New Hampshire Stormwater Center since 2004 and has been involved in the development of the Center since its beginning in 2002. He is a licensed professional engineer and Assistant Research Professor in the Department of Civil Engineering. Dr. Roseen's area of expertise is broadly in water resources engineering, stormwater management, and Low Impact Development design. His expertise in water resource engineering includes hydrology and hydraulics evaluations, stream restoration and enhancement alternatives, dam removal assessment, groundwater investigations, nutrient and TMDL studies, remote sensing, and GIS applications. Dr. Roseen is active in the ASCE Task Committee on Guidelines for Certification of Manufactured Stormwater BMPs of the Urban Water Resources Research Council (UWRR), ASCE EWRI Permeable Pavement Technical Committee, and the Hydrology, Hydraulics, and Water Quality Committee of the Transportation Research Board. Dr. Roseen holds a position on the Board of Directors for the Low Impact Development Center, and consults both in review and design of development projects, specializing in LID stormwater treatment systems, and water resources investigations.

Day 2: SESSIONS 1, 6A

Jeffrey L. Lape, Director - EPA Chesapeake Bay Program

Jeff Lape has an Associates Degree in Public Health Technology from the State University of New York at Morrisville, Bachelor's Degree in Environmental Science from State University of New York at Plattsburgh and a Master's degree in Environmental Science and Engineering from Virginia Polytechnic Institute and State University. He has over 30 years of environmental and water program experience, in state and local government, including water resources, watershed management and water pollution control. Jeff has worked with the New York State Department of Environmental Conservation, the Washington Suburban Sanitary Commission, has nearly ten years in the private sector, and 20 years with EPA, leading the development and implementation of national water pollution control policies and programs dealing with point and non-point sources of pollution, including municipal and industrial wastewater management, combined sewer overflows, animal feeding operations, and watershed-based permitting. Currently, Jeff serves as the Director of the Chesapeake Bay Program.

Day 1: SESSION 4

Jon Hathaway, Ph.D. Candidate - North Carolina State University, Department of Biological and Agricultural Engineering

Jon Hathaway is a Ph.D. student specializing in stormwater management in the Department of Biological and Agricultural Engineering at North Carolina State University. Jon has taught at over 25 North Carolina Cooperative Extension training events and has been involved with the design, installation, monitoring, and/or data analysis on 22 stormwater BMPs. Jon's stormwater BMP experience is diverse, having taken part in studies on permeable pavement, bioretention areas, level spreaders, stormwater wetlands, green roofs, and cisterns.

Day 2: SESSIONS 1, 6A

GUEST SPEAKERS:

Alex Forasté, P.E., Senior Civil Engineer Water Street Studio and McKee Carson, Charlottesville, VA

Alex Forasté, P.E. holds a Bachelor of Science in Civil and Environmental Engineering from the University of Vermont and a Master of Science degree in Civil Engineering from the University of Virginia. He currently works with both Water Street Studio and McKee Carson in Charlottesville. In this capacity, he has provided site design services for owners of institutional, commercial and residential projects of varying scales over the past few years. Prior to this, he served two years as a Water/Sanitation Volunteer, with the U.S. Peace Corps in Cameroon, sub-Saharan Africa. Most recently, he has worked in collaboration with the Center for Watershed Protection and the Chesapeake Stormwater Network to develop the Rainwater Harvesting Specification and Spreadsheet for the Virginia Department of Conservation and Recreation's (DCR) state stormwater management program.

Day 2: SESSION 1 / Day 3: SESSION 3A

Amy Stevens, Stormwater Facility Maintenance Program Manager - Montgomery County, MD

Amy Butler Stevens is a Manager of the Stormwater Facilities Maintenance Program for Montgomery County, Maryland. She has worked for the last seven years with the County in the Department of Environmental Protection. Prior to that, Amy worked for over 3 years at Tetra Tech, Inc., where she provided NPDES regulatory support to the U.S. Environmental Protection Agency's, Office of Water. She received her BS degree in Biology from the University of North Carolina at Wilmington and her Master of Science in Environmental Science and a Master of Public Affairs from Indiana University, School of Public and Environmental Affairs.

Day 2: SESSION 6B - 7B

William "Bill" Street, Executive Director James River Association, Richmond, VA

William H. Street has a Bachelor of Science in Commerce from the University of Virginia, a Master of Environmental Management with a concentration in wetland ecology from Duke University, and a Master of Environmental Planning from the University of Virginia. Mr. Street has led state and regional policy initiatives related to water quality, watershed restoration, and agriculture and land protection. For ten years he worked for the Chesapeake Bay Foundation as the Director of Watershed Restoration managing and coordinating all of CBF's watershed restoration work. He currently serves as the Executive Director for the James River Association in Richmond, Virginia overseeing JRA's efforts to promote conservation and responsible stewardship of the James River's unique natural and historic resources and manages JRA's four core programs: River Advocacy, Riverkeeper, Watershed Restoration, and Education and Outreach.

Day 1: SESSION 4

Charlene Harper, Program Manager - Timmons Group, Inc.

Charlene Harper has worked on numerous civil and stormwater design projects for both public and private clients. She is a resident water resources expert at Timmons Group with a passion for sustainable design. Her duties include technical management, project management, project support, LEED and sustainable design consultation and project coordination from inception of a preliminary plan to certification of construction completion. Mrs. Harper's experience relates to all phases of civil project design development, and she has played a consistent role throughout her career in stormwater management design and master planning. In addition, Mrs. Harper trains and mentors junior engineers, has lectured at several conferences, has published articles on the practice of sustainable civil design, and serves on national Low Impact Development committees through the American Society of Civil Engineering.

Day 2: SESSION 2A

Guest Speakers

Chris Anderson, Environmental Coordinator - Page County, VA

Chris Anderson has worked for Page County for nine years. She now focuses on public outreach and education to increase awareness of environmental issues. Chris also writes a regular column in the local newspaper called "Water Matters" and holds positions on the Page County Water Quality Advisory Committee, the Page County Tree Board, Page County Transit Committee, Shenandoah National Park Association Board, Regional Water Resources Policy Committee, Blue Ridge Committee for Shenandoah National Park Relations, the Shenandoah Valley Soil and Water Conservation District, the Shenandoah RC&D Council and the Virginia Association of Forest Health Professionals. **Day 3: SESSION 2A**

Christy Williams, Senior Environmental Planner - Tetra Tech, Inc.

Christy Williams has worked in the water resources and land use planning and policy field for 17 years. She has worked at the state and local levels as an urban environmental planner and reviewer, a stormwater program manager, an outreach and environmental program coordinator, and a stormwater and erosion control construction inspector. As an EPA contractor, Ms. Williams has conducted nearly fifty audits of local stormwater programs around the country, managed and conducted stormwater management trainings, reviewed Phase II stormwater management programs, written state and federal stormwater permits, co-authored a federal audit guidance document, and assisted EPA in developing a guidance document on how to improve the connections between TMDLs containing wasteload allocations (WLAs) for permitted stormwater sources and associated NPDES stormwater permit requirements to achieve WLAs. **Day 3: SESSION 1B**

Dan Frisbee, Stormwater Program Coordinator City of Charlottesville, VA

Dan Frisbee has a Bachelor of Science degree in Geography, with a focus on environmental issues, including natural resource use, human interaction with our natural environment, and the political, cultural, and ecological aspects of environmental challenges from James Madison University in Harrisonburg, Virginia. He is the Stormwater Program Coordinator for the City of Charlottesville, Virginia. His responsibilities include coordination of the City's stormwater management program. He collaborates with numerous community partners, including the County of Albemarle, the University of Virginia, the Thomas Jefferson Soil and Water Conservation District, The Nature Conservancy, Streamwatch, and several other organizations. **Day 2: SESSION 4B - 5B**

Danny Barker, Environmental Scientist Hampton Roads Sanitation District, Virginia Beach, VA

Danny Barker is an Environmental Scientist with the Hampton Roads Sanitation District (HRSD) where he has more than 20 years of experience working in HRSD's Technical Services Division. He designs and manages environmental monitoring programs for numerous regulatory and research programs. He is the project manager and primary developer of HRSD's clean composite sampling system that was awarded a patent for its unique design. Danny manages HRSD's Municipal Assistance Program that provides sampling and consulting services to POTWs and other municipal governments that enable those entities to better comply with federal and state regulations. **Day 2: SESSION 3B**

Doug Beisch, Water Resources Program Manager Williamsburg Environmental Group, Inc.

Mr. Beisch is the Water Resources engineering program manager for Williamsburg Environmental Group. He has fifteen years of experience in the field of stormwater management and surface water quality management. Doug oversees four teams of designers and engineers conducting hydrologic and hydraulic modeling, preparing watershed studies and stormwater management BMP designs. His prior experience includes work at both the local and state government levels in Virginia, administering stormwater management and erosion and

Doug Beisch (cont.) sediment control requirements. He has extensive experience in stormwater regulatory coordination, and has developed statewide technical specifications and policy guidance related to stormwater management and water quality management. Doug has actively participated in numerous technical advisory committees related to water resource issues in Virginia. **Day 1: SESSION 5B**

Erik Michelsen, Executive Director South River Federation, Edgewater, MD

Erik Michelsen graduated from the University of Richmond and completed graduate work in experimental psychology at Villanova University. Mr. Michelsen served as a Project Manager at Underwood and Associates, an environmental consulting firm then transitioned to his current position as the Executive Director of the South River Federation. Michelsen also has previous experience with the Arlington Echo Outdoor Education Center as well as working with other non-profit organizations including the Alliance for Sustainable Communities, South Arundel Citizens for Responsible Development, and the County's Special Advisory Committee. **Day 2: SESSION 7A**

George Staber, P.E., Drainage Engineer - City of Staunton, VA

George Staber, P.E., is a civil engineer with 30+ years of experience in land development design in Maryland, Virginia and West Virginia. Mr. Staber graduated from the University of Maryland School of Architecture with a Bachelor of Architecture degree. Most of his working experience has been with private design firms performing residential, commercial and transportation project designs for public and private clients. Currently George Staber is serving as the stormwater engineer for the City of Staunton Engineering Department, where he has been instrumental in the development and implementation of the new Stormwater Utility, which was adopted by the City last year, and is went into effect February 2010. **Day 3: SESSION 5B**

Glenn Barnes, Project Director - Environmental Finance Center

Glenn Barnes is project director for the Environmental Finance Center, which is based at the University of the North Carolina School of Government in Chapel Hill. He has worked with the Environmental Finance Center since 2006. Glenn teaches courses, provides direct community assistance, and carries out research on a range of topics including wetland and watershed finance, stormwater management, water and sewer rate-setting, woody debris recycling, and green government. Prior to joining the Environmental Finance Center, he worked for non-profits in New England focusing on renewable energy, biofuels, and environmental regulation. Glenn holds a BA and MPA from The University of North Carolina at Chapel Hill. **Day 3: SESSION 5B**

Jennifer Tribo, Physical and Environmental Planner Hampton Roads Planning District Commission, Chesapeake, VA

Jennifer Tribo is a Physical and Environmental Planner for the Hampton Roads Planning District Commission in Chesapeake, Virginia. Jennifer has 9 years of experience in water resources management. Since joining the HRPDC staff in 2005, she has provided technical assistance to local government stormwater programs and facilitated local government involvement in the Total Maximum Daily Load (TMDL) Study and Implementation Plan processes. Ms. Tribo holds a Master of Environmental Management Degree with a focus in water resources from Nicholas School of the Environment and Earth Sciences at Duke University and a B.A. degree in Biology, Chemistry and Environmental Studies from Drury College in Springfield, MO. **Day 2: SESSION 3A**

John Tippett, Executive Director Friends of the Rappahannock, Fredericksburg, VA

John Tippett is Executive Director of the Friends of the Rappahannock, a nonprofit river conservation organization headquartered in Fredericksburg, Virginia. John has led successful advocacy and technical assistance projects that resulted in the passage of precedent-setting LID codes in Virginia's Stafford County, the City of Fredericksburg and the Town of Warsaw. Under contract for the Virginia

John Tippett (cont.) Department of Conservation and Recreation, he developed an LID Tutorial and Toolkit CD that has been distributed nationally. He has also conducted statewide trainings on LID for the Corps of Engineers. In 2004 he and his staff pioneered an approach to prioritize sites for LID retrofit using GIS analysis of impervious cover, soils, and water quality data. Mr. Tippett holds a Master's degree (1990) in Environmental Resource Management from Duke University. **Day 1: SESSION 6B**

Keith White, Engineer

Henrico County, VA Department of Public Works

Keith White is originally from Madison County, Virginia and currently resides in Powhatan. He received his B.S.C.E. from the University of Virginia and is a licensed engineer in Virginia with over 20 years of experience with local and state stormwater management programs. For the past 12 years, he has been employed by the Department of Public Works in Henrico County where he is directly involved with the development and implementation of the County's stormwater management programs. He has also been actively involved in the most recent stormwater regulatory processes, serving on a workgroup of the Technical Advisory Committee. **Day 1: SESSION 5B**

Kurt Stephenson, Professor - Virginia Tech Department of Agricultural and Applied Economics

Kurt Stephenson is a professor in the Department of Agricultural and Applied Economics at Virginia Tech. Kurt's research interests include market-based environmental policies and water resource economics and policy. Mr. Stephenson recently served on a National Research Council committee that reviewed and evaluated stormwater management and policy in the United States (Urban Stormwater Management in the United States, National Academies Press 2009) and produced an economic assessment of proposed changes to Virginia's stormwater rules. **Day 1: SESSION 5B**

Lee Mallonee, R.L.A., Landscape Architect - Biohabitats, Inc.

Lee Mallonee, R.L.A., is a landscape architect with over 30 years experience in land development, wetland delineation and permitting, stream and ecological restoration and innovative stormwater management design. Mr. Mallonee has served in the role of land planner, landscape architect, project manager and design team member on a broad range and scale of projects. Past and current projects include land planning for the Brandermill and Woodlake developments in Richmond, VA; regulatory permitting, stream restoration and stormwater, and landscape design for the Dell, the Emmet Street Garage and John Paul Jones Arena for the University of Virginia in Charlottesville, VA; and most recently wetland delineation and permitting for 1000 acres for the University of North Carolina at Chapel Hill. **Day 3: SESSION 5A**

Nick Evans, Ph.D., President & Chief Hydrogeologist Virginia Groundwater, LLC

Nick Evans obtained an undergraduate degree in Environmental Sciences from UVA, and a Ph.D. in Geology from Virginia Tech. He has worked for 25 years in geology and water resources management and is currently the President & Chief Hydrogeologist for Virginia Groundwater LLC. **Day 2: SESSION 4A**

Randy Williford, Chief, Stormwater Management Loudoun County, VA

Randy Williford is the Chief of Stormwater Management for Loudoun County, Virginia. His team is responsible for the management of Loudoun's MS4 Stormwater Permit and the maintenance of nearly all of the stormwater infrastructure. He comes to Virginia from the State of Utah where he owned and operated a Civil Engineering firm, led a county Public Works Department for seven years, and spent four years as an elected County Commissioner. Randy has been a Licensed Land Surveyor for 30 years and holds a Bachelor of Science Degree in Physics. **Day 2: SESSION 6B - 7B**

Sarah Lawson, Associate - Rainwater Management Solutions

Sarah Lawson joined RMS after completing her graduate work in environmental sciences at the University of Virginia. Sarah's interest in water quality and conservation began during her college years at Eckerd College in St. Petersburg, FL, where she studied environmental studies and public policy with an emphasis on international relations. This interest in international politics and the environment led Sarah to an undergraduate thesis on sustainable development, including field research in Ometepe, Nicaragua. Sarah's interest in water quality led to graduate research on the effects of sediment transport on shallow coastal systems. She has presented this work through oral and poster presentations and publication in an international journal. Ms. Lawson has also gained coursework and teaching experience in geology, hydrology, and fluid mechanics while at UVA. **Day 1: SESSION 2B**

Steve Hubble, Environmental Programs Manager Stafford County, VA Department of Public Works

Steve Hubble is the Environmental Programs Manager for the Stafford County Department of Public Works. Steve is responsible for the County's NPDES Phase II Permit for Stormwater Discharge, the County's Erosion Control Inspection Program, and the County's Stormwater Management program for construction and maintenance. Prior to this position, Steve was an Environmental Planner with Stafford County. Prior to working for the County, Steve worked as a contractor to the Federal Emergency Management Agency with Dewberry and Davis. Mr. Hubble has a B.S. in Geography from Radford University and a Masters in Public Administration from Virginia Commonwealth University. **Day 2: SESSION 6B - 7B**

Dr. Stuart Schwartz, Senior Research Scientist University of Maryland, Baltimore County

Stuart S. Schwartz is a Senior Research Scientist at the Center for Urban Environmental Research and Education (CUERE) at the University of Maryland Baltimore County. His research and professional interests focus on environmental systems analysis and multi-objective decision-making for risk-based policy and management. His current research includes hydrologic design and performance of pervious concrete, sustainable water resources management, and stormwater performance criteria for Environmental Site Design (ESD). Before joining CUERE, Dr. Schwartz directed the Center for Environmental Science, Technology, and Policy at Cleveland State University; was Associate Director of the Water Resources Research Institute of the University of North Carolina; and directed the Section for Cooperative Water Supply Operations on the Potomac at the Interstate Commission on the Potomac River Basin. **Day 2: SESSION 3A**

Ted Brown, P.E., Water Resources Engineer - Biohabitats, Inc.

Ted Brown, P.E., LEED AP has over 15 years of experience in environmental restoration, watershed management and planning and stormwater management services. With expertise in green infrastructure, Low Impact Development (LID), and regenerative design, Mr. Brown has been involved in numerous stormwater BMP design and planning projects for a range of projects types. Ted's particular focus over the last few years has been on stormwater and ecological master planning efforts for major Universities including: the University of North Carolina at Chapel Hill, Wake Forest University, Rutgers University, and the University of Delaware. **Day 3: SESSION 5A**

Todd Janeski, Coastal Nonpoint Source Program Manager - Virginia Network for Education of Municipal Officials

Mr. Janeski, of the Virginia Commonwealth University, manages the VA Coastal Nonpoint Source Pollution Program at the Virginia Department of Conservation and Recreation. Mr. Janeski is also the Program Manager for the Virginia Network for Education of Municipal Officials (VNEMO) program, a request based program that provides free technical help and leveraged financial assistance, helping communities implement sound planning and watershed protection. Through VNEMO Mr. Janeski helps communities foster well-planned growth, preserve water quality and protect natural areas. VNEMO is partnered with the Chesapeake NEMO Program. **Day 1: SESSION 2B**



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