



The Watershed Congress along the Schuylkill

*Marking 15 years of sharing information, tools,
and practices on watershed protection and restoration*

Saturday, March 10th, 2012
Montgomery County Community College,
West Campus
101 College Drive,
Pottstown, Pennsylvania

French Creek. Photo: J. Hoekstra

Presented by the **Delaware Riverkeeper Network** in association with:

Alliance for Aquatic Resource Monitoring • Appalachian Mountain Club • Brandywine Valley Association • Bucks County Planning Commission • Cadastral Consulting • Center in the Park Senior Environmental Corps • Clauser Environmental, LLC • Chester County Conservation District • Clean Water Fund • Delaware River Greenway Partnership • Department of Civil and Environmental Engineering, Villanova University • Eastern Pennsylvania Coalition for Abandoned Mine Reclamation • French and Pickering Creeks Conservation Trust • Friends of Mingo Creek • Greater Pottstown Watershed Alliance • GreenSpace Alliance • Hay Creek Watershed Association • Heritage Conservancy • Hopewell Big Woods Partnership • Landscape Architecture Program, Philadelphia University • League of Women Voters of PA WREN Project • Maiden Creek Watershed Association • A.D. Marble & Co. • Meliora Design, LLC • Monocacy Hill Conservation Association • Montgomery County Community College • Montgomery County Conservation District • Natural Lands Trust • Octoraro Native Plant Nursery, Inc. • Pennsylvania Department of Conservation and Natural Resources • Pennsylvania Environmental Council • Pennsylvania Horticultural Society • Pennsylvania Outdoor Lighting Council • Pennsylvania Sea Grant, Penn State University • Perkiomen Watershed Conservancy • Princeton Hydro, LLC • Protecting Our Waters • Reading Area Community College • River Network • Schuylkill Action Network • Schuylkill Canal Association • Schuylkill Headwaters Association • Schuylkill River National and State Heritage Area • SSM Group, Inc. • Stell Environmental Enterprises • Stroud Water Research Center • Temple University Center for Sustainable Communities • United States Fish and Wildlife Service • Valley Forge Trout Unlimited • West Chester Fish, Game & Wildlife Association • The Write Beat

WATERSHED CONGRESS INFORMATION

About the 2012 Watershed Congress

This year marks our 15th anniversary! The Watershed Congress has evolved over the years to advance the best available information and techniques for protecting and restoring watersheds. The focus on networking across disciplines means that Watershed Congress melds science, policy and practical applications into one program. As a result, the annual Watershed Congress is a highly anticipated event for people interested in understanding, protecting and restoring their local streams.

Why Attend?

Whether you are a volunteer dedicated to improving your watershed, a municipal official who cares about water resources, a conservation professional charged with protecting our waterways, a teacher who wants to inform others about watersheds, or a student who wants to know more about stream function, the Watershed Congress offers something for you.

Take it from participants at the 2011 Watershed Congress:

"The sessions were terrific and the networking is always unparalleled."

"We came away with lots of new knowledge to share with folks over here across the river!"

"I had a great time at this year's conference. And I won a great door prize again!"

"The information provided in sessions was well worth the cost of attending."

Who Should Attend?

Federal, state, and local agency representatives • Municipal officials and staff • Environmental consultants and contractors • Watershed organizations • Community groups • Educators and students • Members of the general public.

Registration Fees

Despite rising costs to organize the Watershed Congress, registration fees for this highly anticipated annual event are **still only \$40** (\$50 for those registering between February 18th and March 2nd, and \$60 for anyone registering after March 2nd). Registration fees for comparable events can run two to three times the cost of the Watershed Congress.

Scholarships

The Watershed Congress is a great value, but even the low registration fee may be too much for some to pay. You can help ensure that cost is not a barrier to those interested in protecting and restoring their local streams. Become a ***Friend of the Congress*** by underwriting a scholarship someone who needs financial help to participate in this event. You can **underwrite the cost of a scholarship for as little as \$40.**

The **Schuylkill Action Network** is making a limited number of scholarships available to people living within the Schuylkill River watershed. Scholarship requests will be reviewed on a first-come, first-served basis, one per organization due to the limited number of scholarships available. Additional applicants from the same organization will only be considered if scholarships are still available as of March 1st.

Schuylkill Action Network scholarships are awarded on a reimbursement basis. Successful applicants will be required to contribute a short update to the Schuylkill Action Network blog, highlighting something interesting or useful learned during the 2012 Watershed Congress. Expenses will be reimbursed upon our receipt of Reimbursement Form, original event receipt, and successful submission of blog post.

Sponsorships

Consider becoming a financial sponsor of the 2012 Watershed Congress. Sponsorship opportunities are available at the \$250, \$500, and \$1,000 levels. Donations will be used to ensure that we can continue to offer the high-quality event our audience has come to expect and still keep the cost to participants low. Sponsorships will also support scholarships, acquire resources, and enhance the Congress program. For more information about sponsorship opportunities, call 215-369-1188, ext. 109, or email chari@delawariverkeeper.org.

2012 Program

This year's program features **28 concurrent sessions, 6 poster sessions, and 2 extended workshops** covering a broad range of watershed topics. Session abstracts and speaker bios can be found on the pages that follow.

Please Note: *The speakers, topics and times are correct at the time of printing. The Program Committee reserves the right to alter, delete or replace items in the Watershed Congress program in the event of unforeseen circumstances.*

Workshops

The 2012 Watershed Congress program includes two extended training opportunities:

Environmental Investigation:

Boontown led by Jen Fields, a popular presenter from past Watershed Congresses, and *Watch-Dogging the Gas Drillers* by Faith Zerbe, Delaware Riverkeeper Network.

Environmental Investigation: Boontown is appropriate for any members of the general public interested in gaining insight into pollution incident response procedures. Municipal officials, educators, representatives from land trusts, community-based conservation organizations, and watershed groups are encouraged to attend. **Participants should bring a calculator.**

Seating in *Watch-Dogging the Gas Drillers* is limited. No prior experience is necessary but monitors should live within the Delaware River watershed and be willing to commit to monitoring regularly. **Anyone wishing to participate must sign-up in advance by emailing the presenter directly at faith@delawareriverkeeper.org.** Please provide your name, address, and the watershed you are interested in monitoring. Monitoring kits can be pre-ordered (cost, \$150) to have available for this training.

One-on-One Nonprofit Consultation Sessions

Is your organization struggling with Fundraising? Are you looking for some guidance on Collaboration and Partnerships? Do you need a sounding board for your plans for Volunteer Development? If so, take advantage of special opportunities to benefit from One-on-One coaching and consultation with experts presenting at the 2012 Congress.

Peter Lane, the Institute for Conservation Leadership, and Mary Ellen Olcese, River Network, will be available for a limited number of 30-minute one-on-one nonprofit coaching and consultation opportunities in the afternoon. Peter Lane is presenting *Volunteerism 2.0: Skilled Volunteers Bring New Talents to Organizations* and Mary Ellen Olcese is presenting *Donor Prospecting Strategies*.

You must sign up to take advantage of these valuable consulting/coaching opportunities. These sessions are available on a FIRST-COME, FIRST-SERVED basis. Look for sign-up forms at the Congress Registration Desk.

Continuing Education

For current information about Continuing education credit, call 215-369-1188, ext. 109, or email chari@delawareriverkeeper.org. (Continuing education credits may involve additional cost.)

Past Congresses have been approved for continuing education for **attorneys, educators, landscape architects, recreation and park professionals, Water and Wastewater Treatment Plant Operators.**

Schedule At A Glance

7:30 am – 8:30 am

Registration

8:30 am – 8:45 am

Welcome and Opening
Comments

8:45 am - 9:45 am

Keynote Panel

10:00 am - 11:00 am

Concurrent Sessions

10:00 am - 12:10 pm

Workshop #1

11:10 am - 12:10 pm

Concurrent Sessions

12:10 pm - 1:20 pm

Lunch and Networking

12:30 pm - 1:10 pm

Poster Sessions

12:30 pm - 3:30 pm

Workshop #2

1:20 pm - 3:30 pm

20-minute Consultations Sessions

1:20 pm - 2:20 pm

Concurrent Sessions

2:30 pm - 3:30 pm

Concurrent Sessions

3:30 pm - 4:00 pm

Closing Comments



Displays

Unstaffed exhibits, displays, and information tables will be on display from 7:30 am through the close of the program at 4:00 pm. Displays are located in the corridors of South Hall providing high visibility throughout the day. Exhibits may be table-top or free standing. Half table (30" x 30") or full table (30" x 60") display spaces are available on a **FIRST-COME, FIRST-SERVED BASIS**. Limited access to electricity is available upon advance request. Please indicate your display space requests on the Registration Form.

Door Prize Drawing

Our annual door prize drawing, with goodies donated by Congress Organizers and participants, is always a highlight. The drawing will be held at 3:30 pm in the Community Room. You must be present to win. **Do you have a door prize to donate?** Call 215-369-1188, ext. 109, or email chari@delawariverkeeper.org.

Door prize donors include:

Appalachian Mountain Club • Brandywine Valley Association • Cadastral Consulting, LLC • Clauser Environmental, LLC • Chester County Conservation District • Delaware Riverkeeper Network • Octoraro Native Plant Nursery, Inc. • Pennsylvania Outdoor Lighting Council • SSM Group, Inc. • Schuylkill Canal Association • Valley Forge Trout Unlimited • West Chester fish Game and Wildlife, and more.

Financial Support

The 2012 Watershed Congress is made possible in part by grants from the Pennsylvania Department of Conservation and Natural Resources, Bureau of Recreation and Conservation's Environmental Stewardship Fund, and Pennsylvania Sea Grant.

Major Sponsors:



Supporting Sponsor:



Associate Sponsor:



Friends of the Congress:

These people and organizations also contributed financial support toward scholarships, resources and growing the Watershed Congress program. Thank you!

Delaware River Greenway Partnership
Valley Forge Trout Unlimited

Questions?

Call Chari Towne, the Delaware Riverkeeper Network's Schuylkill Watershed Specialist, at 215-369-1188, ext. 109 or chari@delawariverkeeper.org.

Conference Venue



Founded in 1964, Montgomery County Community College has grown with the community to meet the lifelong learning needs of Montgomery County. Known for its academic excellence and based on the successes of more than 30,000 alumni, the College's mission is to offer high quality, affordable, and accessible educational opportunities. The College's

comprehensive curriculum includes 82 associate degree and certificate programs in 48 areas of study, including eight complete degrees offered entirely online, and specialized workforce development and continuing education programs. More information about the College and its wide range of professional development opportunities, extracurricular activities and cultural programs is available online at www.mc3.edu.

Directions to the Montgomery County Community College

The Montgomery County Community College - West Campus is located in **Pottstown, Pennsylvania**. The Watershed Congress is presented in **South Hall, at 101 College Drive**, two blocks south of the intersection of High and Hanover Streets.

From Chester County: Take Route 100 north to King Street. Turn right on King Street, go three blocks to Hanover Street, turn right, go to the third light, turn right on College Drive.

From Route 422 West: Take the Hanover Street exit, turn right on Hanover Street, go to the second light and turn left on College Drive.

From Route 422 East: Take Route 100 north to King Street, turn right, go three blocks to Hanover Street, turn right, go to the third light, turn right on College Drive.

For detailed Google Maps and directions, go to: www.mc3.edu/aboutUs/directions/wc.aspx



Consider Carpooling

A private group has been created at eRideshare for those who want to carpool.



- Go to <http://schuylkillwc.erideshare.com>.
- Enter the group password, *CongressCarpool*, to view ride postings.
- You will need to become an eRideShare member (it's free!) to place listings for rides offered or wanted. Use the links at the top of the page to register, add a listing, or view listings.

Public transportation

The Pottstown Campus is served by both SEPTA Route 93, and Pottstown Urban Transit (PUT). Call SEPTA for schedules at 610-279-8400. Timetables can be obtained through the mail by calling 215-580-7777 (both numbers operate daily from 6 a.m. to midnight). Or go to SEPTA's website at www.septa.org. For PUT schedules call 610-326-5413.

Non-Smoking Policy

Montgomery County Community College is a non-smoking facility and the Watershed Congress is smoke-free.

2012 Watershed Congress Program

7:30 am to 8:30 am		Registration	
8:30 am to 8:45 am		Welcome and Opening Comments	
8:45 am to 9:45 am		Keynote Panel: Carol De Wolf and Jim Thorne, <i>Natural Lands Trust and Helen Delano, Pennsylvania Geological Survey</i> Topic: Realizing the Potential of Light Detection and Ranging (LiDAR), and its uses in the Schuylkill Highlands Natural Resource Greenway for Habitat Monitoring and Sustainability	
10:00 am to 11:00 am		A. Greening Schools: Innovative and Effective Stormwater Projects and Programs at Schools in the Schuylkill River Watershed, Tom Davidock, <i>Partnership for the Delaware Estuary</i> and Lisa Armstrong, <i>Greening Greenfield Project</i> B. Reforestation: Getting the Bad Plants Out and the Good Plants Growing, Sarah Low, <i>Strategic Nature, LLC</i> , and Jim MacKenzie, <i>Octoraro Native Plant Nursery</i> C. Municipal Referendums for Land Conservation in Tough Economic Times, Michael Frank, <i>Heritage Conservancy (retired)</i> D. Geology in the Schuylkill Watershed, Helen Delano, <i>Pennsylvania Geological Survey</i> E. Delaware River Basin Commission: Natural Gas Development Monitoring Strategy, Robert Limbeck, <i>Delaware River Basin Commission</i> F. Applications for Regenerative Design on Urban Ephemeral and Perennial Streams, Joe Berg, <i>Biohabitats, Inc.</i> G. Volunteerism 2.0: Skilled Volunteers Bring New Talents to Organizations, Peter Lane, <i>Institute for Conservation Leadership</i>	Workshop #1, Environmental Investigation: Boontown, Jennifer Fields
11:10 am to 12:10 pm		H. Use of Constructed Wetlands for On-Lot Waste Water Treatment, Jeff Moyer, <i>Rodale Institute</i> I. An Interactive Process for Greenway Design Using Google Earth, Diane Rosencrance and Megan Boatright, <i>Natural Lands Trust</i> J. North Coventry Township: Success in Open Space Preservation, Andy Paravis, Chris Washburn and Jay Erb, <i>North Coventry Township</i> K. Next Steps in American Shad Restoration in Pennsylvania, Joshua D. Tryninewski, <i>Pennsylvania Fish and Boat Commission</i> L. Changes in the Quality of Schuylkill Tributaries Since 1996, John Jackson, <i>Stroud Water Research Center</i> M. BVA's Red Streams Blue Program: Successful Model for Stream Restoration, Kathy Bergmann, Jane Fava, and Robert Struble Jr., <i>Brandywine Valley Association</i> N. Donor Prospecting Strategies, Mary Ellen Olcese, <i>River Network</i>	
12:10 pm - 1:20 pm		Lunch and Networking	
12:30 pm to 1:10 pm	Poster Sessions	1. Sustainable Stormwater Initiative at Cynwyd Train Station, Sarah Francis, <i>Lower Merion Historical Society</i> 2. Effects of Land Use on Water Quality in the Maiden Creek Watershed, Richard Jayne, <i>Kutztown University</i> 3. Quantification of Alkane-Degrading, PAH-Degrading and Total Heterotrophic Bacteria in Sediments along the Schuylkill River using a Combination of Cultivation-Dependent and Cultivation-Independent Methods, Nicole Khan, <i>The Center for Natural Resources Development and Protection</i> 4. Characterization of Ecological Conditions in the Delaware Shorelines, Jacob Price, <i>The Center for Natural Resources Development and Protection</i> 5. Plant Nutrient Levels in the Sediment of the Morris Arboretum Wetland, Cynthia Smith, <i>Chestnut Hill College</i> 6. Introducing Large Property Owners to Stormwater Management, Lisa Wool, <i>Partnership for the Delaware Estuary</i>	Workshop #2 Watch-dogging the Gas Drillers, Faith Zerbe, <i>Delaware Riverkeeper Network</i>
1:20 pm to 2:20 pm		O. Green Infrastructure Design and Construction in Philadelphia – Lessons Learned from a Pennvest Stormwater Tree Trenches Project, Altje Hoekstra, Meliora Design, LLC and Nancy O'Donnell, <i>Pennsylvania Horticultural Society</i> P. Model My Watershed: An online hydrologic model for the Schuylkill, Susan Gill, <i>Stroud Water Research Center</i> Q. Examining Marcellus Shale Region Grassroots Mobilization, Kathryn Tomsho, <i>ALLARM, Dickinson College</i> R. Dam Removal and Streambank Restoration in Upper Bucks County: A Case Study, Meghan Rogalus, <i>Bucks County Conservation District</i> and Jeffrey Boyer, <i>Gleim Environmental Group/John W. Gleim, Jr., Inc.</i> S. Evaluation of Small-Scale, In-Lake Management Techniques for Westtown Lake, a Shallow Impoundment in Chester County, PA, Fred S. Lubnow, Ph.D., <i>Princeton Hydro, LLC</i> T. A Success Story Waiting to Happen: PA Delaware CREP, Diane Wilson, <i>PA Department of Environmental Protection</i> U. Winter Plant I.D. for Habitat Restoration, John Nystedt, <i>Delaware Riverkeeper Network</i>	
2:30 pm to 3:30 pm		V. Community Involvement - A Different Kind of Sustainable Stormwater Best Management Practice, Jenni Woodworth, <i>A.D. Marble & Company</i> W. Monitoring and Evaluating Conservation Success in the Hopewell Big Woods, James Thorne, <i>Natural Lands Trust</i> X. Natural Gas Pipelines: A Technical, Environmental and Legal Primer, Aaron Stemplewicz, <i>Delaware Riverkeeper Network</i> Y. Wissahickon Dam Removal- Challenges Met, Lessons Learned, Bob Adams, <i>Wissahickon Valley Watershed Association</i> Z. 12 Step Program to Get Your Lawn Off Drugs, Mark "Coach" Smallwood, <i>Rodale Institute</i> AA. Source Water Protection Through Agricultural Best Management Practices, Lyn O'Hare, <i>SSM Group, Inc.</i> BB. The Imagination of Poetry, Mort Malkin, <i>Poet</i> , and Christine San Jose, <i>Storyteller</i>	
3:30 pm to 4:00 pm		Closing Comments, Announcements, and Door Prizes	

Keynote Panel Discussion

8:45 am to 9:45 am

Realizing the Potential of LiDAR (Light Detection and Ranging) and its Uses in the Schuylkill Highlands Natural Resource Greenway for Habitat Monitoring, and Sustainability

Keynote Panel:

Carol De Wolf, *Director of the Schuylkill Highlands Conservation Landscape Initiative*, Natural Lands Trust

Jim Thorne, *Senior Director of Science*, Natural Lands Trust

Helen Delano, *Senior Geologic Scientist*, Pennsylvania Geological Survey

Abstract: The Schuylkill Highlands Natural Resource Greenway is delineated by the highest valued areas of key natural resources that contain sensitive environmental elements, and unique habitats. This greenway consists of 173,603 acres of highest valued critical habitat to maintain: 62% of the greenway area is in forest cover; 22% is in Important Bird Areas; and 15% is in Important Mammal Areas. It also includes 510 miles of streams, 24% of which are Exceptional Value with another 21% being High Quality. It is a rich and diverse area of opportunities located at the intersect of the Schuylkill River Watershed and the Highlands.

The establishment of the greenway will serve to protect wildlife and habitats as well as our critical water supply. Monitoring the greenway woods and the critical habitat they provide will be critical to ensuring the sustainability of the greenway corridor. Research suggests that structural complexity of habitat can be used as an indicator for biological diversity. LiDAR (Light Detection and Ranging) is an optical remote sensing technology with the capability to measure many different structural attributes providing the potential not only to effectively characterize forests but also to monitor change.

This keynote will present the basic of LiDAR: what it is and how it measures objects. The utility of LiDAR will be demonstrated through its application in the Birdsboro Waters Forest Legacy Easement and through its potential use for habitat monitoring within the Schuylkill Highlands Natural Resource Greenway.

Keynote Speaker Bios:

Carol De Wolf is Director of the Schuylkill Highlands Conservation Landscape Initiative at Natural Lands Trust helping both government and non-governmental partners and stakeholders work together to advance a focused set of land conservation, recreation, and economic development goals. Prior to joining Natural Lands Trust, Ms. De Wolf worked for over 25 years on various environmental research, planning and public policy projects in Chester and Berks Counties and the Denver to Boulder Front Range Regional Area. Her experience has spanned a wide range of subjects, including water resource management, land forms and soils, trail and park master site plans, comprehensive plans, sewer, and fiscal impact studies.

De Wolf's educational experience includes a Bachelor of Arts in Environmental Conservation and Planning from University of Colorado and a Master of Public Administration from Kutztown University. She is serving her eighth year on the Board of Supervisors for Westtown Township; she is President of the West Chester Regional Council of Governments, and National Trustee for CISV, an international peace education organization.

Jim Thorne does conservation planning, implementation, and research for the Natural Lands Trust. Dr. Thorne spends most of his time coordinating a public-private partnership effort known as the Hopewell Big Woods Project. Before joining the Natural Lands Trust in 2001, Jim worked eight years for the Pennsylvania Chapter of The Nature Conservancy and 10 years for the University of Pennsylvania.

Helen L. Delano, P.G., has worked for the Pennsylvania Geological Survey since 1980, in both the Pittsburgh and Harrisburg area offices. She has expertise in landslides and other geologic hazards, geomorphology, and sedimentology. Her current position involves coordinating the survey's outreach and education activities, as well as overseeing the PAMAP program of digital aerial photography and elevation data. This has provided her an opportunity to work extensively with PAMAP LiDAR data for geological applications and to advise users about the advantages and limitations of these data. She has Bachelor's and Master's degrees in Geology and is a Registered Professional Geologist in Pennsylvania.

Concurrent Session Descriptions

10:00 am to 11:00 am

A. Greening Schools: Innovative and Effective Stormwater Projects and Programs at Schools in the Schuylkill River Watershed

Presenter: Tom Davidock, *Partnership for the Delaware Estuary*, and Lisa Armstrong, AIA, LEED AP, *Greening Greenfield Committee*

Level: Introductory

Abstract: The presentation will provide an overview of the Greening Greenfield school yard makeover project as well as the Schuylkill Action Network's *Schuylkill Action Students* program. Both efforts demonstrate innovative approaches to addressing stormwater pollution through school-based partnerships.

Stormwater pollution is one of the most serious threats to water quality in the Schuylkill River watershed. Addressing this problem requires the participation of many stakeholders. Schools, which can serve as a catalyst for community action, can be among our most effective partners. This presentation will provide examples of school-based stormwater projects and programs in both urban and rural settings.

Demonstrating that schools can be environmentally-friendly and take an active role in community improvement, Lisa Armstrong will talk about the Albert M. Greenfield school's innovative play yard makeover project. This center-city Philadelphia project, which has transformed a large impervious surface into an innovative stormwater management system, vibrant green space, and hands-on learning resource for students, is effectively capturing 97% of the school yard runoff.

Tom Davidock will also discuss the Schuylkill Action Network's *Schuylkill Action Students* (SAS) program, which is completing innovative stormwater practices on school campuses along priority streams throughout the 1,700 sq. mile watershed. Schools, often the largest landowners in a watershed, can provide a direct connection to many critical waterways. This presentation will introduce Congress attendees to the SAS program and provide examples of how working with schools is helping the Schuylkill Action Network achieve its restoration goals. Attendees will also learn about the process of identifying priority sites, recruiting school partners, securing financial support, maintaining partnerships, and organizing and completing projects.

B. Reforestation: Getting the Bad Plants Out and the Good Plants Growing

Presenter: Sarah Low, *Strategic Nature, LLC*, and Jim MacKenzie, *Octoraro Native Plant Nursery*

Level: Intermediate

Abstract: This presentation will focus on ways that you can address invasive plant management and native planting to encourage long-term forest health. We will delve into the world of native plant growing and discuss the challenges and solutions. A critical component in watershed protection efforts is increasing forest cover. Reforestation, however, can be a challenging activity in disturbed areas due to invasive plants, deer, human activities, and stormwater runoff. During this presentation, we will discuss ways that you can address invasive plant management and native planting to encourage long-term success. We will discuss the role of plant biology in invasive plant management and how to time control efforts for the best results. We will also discuss how and when to plant on your site so that your trees and shrubs have the best chance for success.

This presentation will also include a discussion informed by 20 years of success and failure between the grower and those that do the planting. We will discuss common questions and challenges such as: "I can't find the plants I want, when I want them." "My plants died so there was clearly something wrong with the plants." "I need a 1" caliper tree from seed source within 25 miles of the site next week...do you have them?" and "Why don't you grow hickories?"

Come enjoy a frank and casual conversation about your restoration successes and failures and we'll share some of ours. Audience participation required and encouraged.

C. Municipal Referendums for Land Conservation in Tough Economic Times

Presenter: Michael Frank, *Heritage Conservancy (retired)*

Level: Intermediate

Abstract: Even in difficult economic times, there are good and compelling reasons to ask voters to approve money for land conservation. The costs of land and easements are less expensive than in the past. Interest rates are at historic lows. In these tough economic times, there are very willing, motivated sellers. And voters in several municipalities have approved referendums for land conservation dollars since 2008. People believe in saving land in their communities. Now is the right time to explore the public temperament for an open space referendum. Now is the best time to get the most for the public dollar spent.

D. Geology in the Schuylkill Watershed

Presenter: Helen L. Delano, P.G., *Pennsylvania Geological Survey*

Level: Introductory/Intermediate

Abstract: Introduction to geology and geologic history of Pennsylvania with focus on the Schuylkill Watershed area. The Schuylkill watershed includes the oldest and some of the youngest rocks in Pennsylvania and crosses four Physiographic provinces. Geology was a major influence on the historical development of the area, controlling distribution of anthracite coal, iron ore and agricultural soils. Transportation routes, water power and building stone sources were also dependent on geology. This presentation will discuss basic principles of geology and an overview of local geologic history while making connection to the human history and past and current environmental concerns of the watershed.

10:00 am to 11:00 am (continued)

E. Delaware River Basin Commission: Natural Gas Development Monitoring Strategy

Presenter: Robert Limbeck, *Delaware River Basin Commission*

Level: All

Abstract: This session provides an overview of the monitoring activities related to natural gas development being undertaken by the Delaware River Basin Commission. A discussion of monitoring and assessment requirements contained in the Delaware River Basin Commission's (DRBC) natural gas development regulations will be presented. Within the overall DRBC strategy, specific types of described monitoring activities include:

1. Continuous monitoring using data sondes and HOBO conductivity / temperature loggers.
2. Re-Analysis of Archived 2009-2010 SRMP Samples
3. Scenic Rivers Monitoring Program 2009-2011
4. DRBC Macroinvertebrate Monitoring 2011
5. DRBC/Stroud Mayfly Toxicity Testing Methods Investigation

F. Applications for Regenerative Design on Urban Ephemeral and Perennial Streams

Presenter: Joe Berg, *Biohabitats, Inc.*

Level: Intermediate

Abstract: A presentation of two recently completed stream restoration projects using innovative type of stream restoration that improves ecosystem function in storm water dominated watersheds. This stream restoration work is based on the premise that it is in our best interest to handle storm water running off of our developed landscapes as a valuable resource rather than a waste product. Towards this end, the longer we hold water on our landscape, the better for aquatic and riparian ecosystems, the greater the contact time for material processing, and the greater social benefits delivered from our restoration projects. This presentation will focus on two adjacent streams in Rock Creek National Park in Washington DC. One channel was an unnamed ephemeral gully formed by increased runoff and concentration along the edge of a roadway. The second stream, Milkhouse Run, is a perennial tributary to Rock Creek enlarged by the increased runoff from Oregon Avenue and the surrounding neighborhood. Both systems were restored using similar techniques, involving carbon-rich granular fill, riffle grade controls, and pools along the flowpath. Independent research work by the University of Maryland on nitrogen processing, sediment removal, and hydrologic modification in streams documents the greater treatment occurring in this type of restoration project relative to unrestored streams or streams restored using 'normal' bankfull channel designs.

G. Volunteerism 2.0: Skilled Volunteers Bring New Talents to Organizations

Presenter: Peter Lane, *Institute for Conservation Leadership*

Level: All

Abstract: Based on the Institute for Conservation Leadership publication, "Volunteerism 2.0," this session will give participants a framework for increasing involvement by skilled volunteers. Is your organization ready to take full advantage of today's volunteers? At this workshop, you will gain new insights and a fresh perspective on how highly skilled volunteers can make a difference at your organization. Shifting trends require that all of us re-think what it means to be a volunteer, how to position volunteerism in our organizations, and how to successfully involve untapped talent in our communities. In this session, you will:

- * Receive a copy of ICL's publication
- * Discuss trends, success stories, and Volunteerism 2.0 best management practices
- * Identify your next steps for increasing volunteer involvement

H. Use of Constructed Wetlands for On-Lot Waste Water Treatment

Presenter: Jeff Moyer, *Rodale Institute*

Level: Intermediate

Abstract: Mr. Moyer will present information about the newly constructed wetlands water purification system at Rodale Institute to showcase how municipalities, consultants and property owners can work together to develop and install waste water treatment systems. The guiding concept of Rodale Institute's Water Purification EcoCenter (WPEC) was to construct a system that utilizes the materials coming out of restrooms (both liquid and solid) as resources. In keeping with Rodale Institute principle of "Healthy Soil = Health Food = Healthy People", the WPEC Project uses proven existing environmentally effective technologies to construct a man-made waste water treatment system that utilizes natural, biologically based filtering and flow systems to remove contaminants and utilize the nutrient-rich water for drip irrigation, emphasizing homeowner aesthetics. The system is presented as an alternative to both standard septic and sand mound systems commonly found in residential communities throughout Pennsylvania's watersheds. The WPEC constructed wetland system, set up as an experiment under Pennsylvania's Department of Environmental Protection (PADEP) regulations, brought together representatives of US EPA, PADEP, township code enforcement, and multiple engineering firms to design and construct the roof-top rainwater collection system, wetland cell, and drip irrigation system that waters the ornamental and vegetable gardens surrounding the facility.

11:10 am to 12:10 pm

I. An Interactive Process for Greenway Design Using Google Earth

Presenters: Diane Rosencrance and Megan Boatright, *Natural Lands Trust*

Level: Intermediate

Abstract: Attendees will participate in an instructor-led Google Earth design exercise to identify and design greenway connectivity. The Schuylkill Highlands Greenway Plan identifies opportunities to conserve and provide an interconnected system of natural, agricultural, recreational, historical and cultural features. Many of these identified opportunities require further planning and design. Google Earth, a user friendly and free downloadable program, can be used to view and overlay multiple sources of information, from digital geographic data (i.e. GIS) and static maps (i.e. municipal planning documents). This information assists in identifying natural and agricultural resources to conserve while planning wildlife corridors, trail routes, and public recreation areas. It can also serve to identify potential methods to conserve the areas identified. By using an area identified in the Schuylkill Highlands Greenway Plan, presenters will demonstrate how appropriate data, as identified through attendee participation, can be viewed in Google Earth to assist in planning and design. **Participants should have an interest in utilizing digital mapping technologies for planning and design.**

J. North Coventry Township: Success in Open Space Preservation

Presenters: Andy Paravis, Chris Washburn, and Jay Erb, *North Coventry Township*

Level: All

Abstract: North Coventry Township's open space preservation has proven to be a successful model for municipal open space planning. Active community involvement, leveraged funding, and partnerships come together to preserve our community for the future. North Coventry Township's open space preservation program began with an open space bond referendum in 2002. The appointed Open Space Review Board began activity in 2002 and 2003 with a series of public forums, followed by evaluations of environmentally sensitive and historic resources and a plan for the best opportunities for land preservation. Combined efforts of the Board of Supervisors, Open Space Review Board, Planning Commission, Parks and Recreation Commission and Natural Lands Trust have resulted in the preservation of 1,278 acres with support from state, county, federal and private donors. Currently the Open Space Review Board is undertaking a new strategic review of needs moving forward. This presentation focuses on our successes and challenges, outlining how this model can be replicated in other communities.

K. Next Steps in American Shad Restoration in Pennsylvania

Presenter: Joshua D. Tryniewski, *Pennsylvania Fish and Boat Commission*

Level: All

Abstract: With American Shad populations in Pennsylvania remaining low, the Pennsylvania Fish and Boat Commission is considering new tactics for restoring this and other anadromous species. The Pennsylvania Fish and Boat Commission (PFBC) and anglers alike want to experience more robust populations of American shad. Shad restoration has been a major program area for PFBC since the Commission's inception in 1866. With access to historic spawning reaches being re-established through construction of fishways or breaching and removal of obsolete dams in recent years, PFBC's focus intensified. Over 25 million American shad fry were stocked in the Schuylkill, Lehigh and Delaware Rivers between 1985 and 2010, but some 4.4 million fry were stocked in the past five years (2007-2011).

However, shad populations within the state and throughout its range along the Atlantic coast remain low. PFBC is considering new tactics in its shad restoration efforts. In 2011, PFBC proposed including American Shad in the Pennsylvania Wildlife Action Plan. Approval by the U.S. Fish and Wildlife Service (FWS) of the amendment would not only highlight the role of the American shad as a bellwether species, it would provide PFBC with more flexibility to fund, or receive funding for projects that would benefit the species like alternative passage to restore access to historic spawning reaches.

The session will provide overviews of American shad populations in the Delaware River watershed, update on the status of fish passage projects, and address the implications of adding American shad to the Pennsylvania Wildlife Action Plan. Also, the implications of regulatory changes, such as catch limits and making the Schuylkill and Lehigh Rivers catch and release fisheries, for shad populations of will be touched on. This session will also include an update on the FWS's American shad tank spawning pilot study at Easton.

11:10 am to 12:10 pm (continued)

L. Changes in the quality of Schuylkill tributaries since 1996

Presenter: John Jackson, *Stroud Water Research Center*

Level: Advanced

Abstract: We will summarize the results of macroinvertebrate monitoring at 19 sites between 1996 and 2010, and discuss these results relative to changes in land and water use as well as protection and restoration efforts. Between 1996 and 2010, we sampled macroinvertebrates and basic water chemistry at 19 sites distributed across 15 major tributaries that, together, provide a general assessment of the overall health of the Schuylkill River basin. These sites were located near the downstream end of watersheds, and thus each site integrated most of upstream land and water uses within each watershed. On average, three sites were classified as Good (Manatawny, West Branch Perkiomen, and Maiden), eight as Good/Fair (Pickering, Northkill, Upper Perkiomen, French, Hay, Angelica, East Branch Perkiomen, Lower Perkiomen), four as Fair/Poor (Unami, Valley, Skippack, Little Schuylkill), and four sites as Poor (Tulpehocken, Wissahickon, Headwaters of the Main Stem Schuylkill, West Branch Schuylkill). Among non-Acid Mine Drainage sites, urbanization measures (i.e., population density, percent developed or impervious cover, conductivity, chloride, sulfate) were the strongest predictors of stream condition (all negative relationships). Relationships with percent forest and percent row crops were positive because urbanization decreased when percent forest and row crops increased. All sites exhibited variation among years, and were classified into 2-3 categories over the period of study. Differences among years did not translate into linear trends of increasing or decreasing stream condition except at Tulpehocken (increased) and Lower Perkiomen (decreased).

M. Brandywine Valley Association's Red Streams Blue Program: Successful Model for Stream Restoration

Presenters: Kathy Bergmann, Jane Fava, and Robert Struble Jr., *Brandywine Valley Association*

Level: Introductory

Abstract: The Brandywine Valley Association's (BVA) *Red Streams Blue Program* has proven to be a successful model for stream restoration that has leveraged funding, established partners, educated and engaged the community in watershed stewardship, and completed multiple stream improvement projects. BVA initiated its *Red Streams Blue Program* in 2006 to address the problem of impaired streams in the Brandywine Watershed. The BVA began this initiative by creating maps showing impaired streams in red and streams attaining their designated use in blue. The approach was to complete a comprehensive assessment of smaller subwatersheds. From the assessment, restoration plans were developed that identify projects, their priority and their costs. BVA using both private and public funding, has completed six subwatershed assessments, developed six restoration action plans, implemented three major stream restoration projects and completed several smaller demonstration projects since the program started. The three major stream restorations have weathered the flooding rains of the past year and have significantly reduced bank erosion and sediment loads in the stream. Our program also includes resident education and outreach on good watershed practices and a volunteer monitoring program. The *Red Streams Blue Program* has evolved from a concept to an effective stream restoration model that has leveraged funding, established partners, educated diverse groups of residents and completed multiple on-the-ground projects. This presentation focuses on our successes, problems and outlines how you can make a red stream

N. Donor Prospecting Strategies

Presenter: Mary Ellen Olcese, *River Network*

Level: All

Abstract: This workshop explores a variety of strategies for identifying and researching potential donors within a community, so that participants can adapt practical principles of prospect research to their own organization. Many times organizations miss opportunities to garner individual gifts, beyond member dues, by not identifying the potential donors that are in their area. This workshop will explore the various techniques and tools that can be employed to find your individual donors. We will introduce high tech and low tech strategies that each organization can incorporate into its fundraising plan. The workshop will give participants the tools to assess capacity and inclination of potential donors, including a donor profile, the tenets of prospect research, the vocabulary and process of searching for donors, and donor research software.

Poster Session Descriptions

12:30 pm to 1:10 pm

1. Sustainable Stormwater Initiative at Cynwyd Train Station

Presenter: Sarah Francis, *Lower Merion Historical Society*

Level: Introductory

Abstract: Innovative rainwater harvesting and stormwater best management practices to protect an historic train station, and trailhead to Cynwyd Heritage Trail, a linear park in Lower Merion, PA. The sustainable stormwater initiative was created to analyze runoff patterns and develop cost-effective, low-maintenance solutions to the ongoing problem of preserving Lower Merion Township's and the Lower Merion Historical Society's investment in the Cynwyd Train Station, a historic structure built by the Pennsylvania Railroad in 1890 and still used as an active SEPTA stop on the Cynwyd line. The station's basement is continually wet, and will soon threaten the foundation and the habitability of the structure. An additional goal is to manage the stormwater runoff that is polluting Vine Creek, a tributary of the Schuylkill River and one of the highlights of the Cynwyd Heritage Trail.

The sustainable landscape was designed by North Street Design, LLC, in conjunction with students of the Engineering School at Villanova University. The most impressive element of the initiative is its innovative, multifunctional rainwater harvesting system, designed specifically for the station. Tanks made from recycled materials can also be used as benches for trail users and commuters, and the collected water will irrigate surrounding gardens, lowering our tap water use, while also preventing runoff from causing more soil erosion in the gardens. As a highly visible amenity in the community, the system will also serve as a demonstration project on sustainable rainwater and stormwater systems.

2. Effects of Land Use on Water Quality in the Maiden Creek Watershed

Presenter: Richard Jayne, *Kutztown University*

Level: Intermediate

Abstract: Water quality data collected throughout the Maiden Creek watershed was analyzed to determine the effect of land use on stream ecosystems. Runoff from agriculture, urban, and residential land uses can alter stream water quality and the biota that reside in them. Land use within the Maiden Creek watershed is dominated by agriculture and forests, with small areas of suburban and urban development. While the effects of these types of land uses in general are widely accepted, we do not know how we are directly affecting our surface waters locally within the Maiden Creek watershed. Volunteers with the Maiden Creek Watershed Association have been sampling water quality since 2002. We analyzed data on dissolved oxygen (DO), conductivity, pH, temperature, turbidity, nitrate, and phosphate. In addition to the long-term dataset, we collected water quality samples at 31 sites on October 23, 2011 to provide a snapshot of the water quality at the same time. While pH values were relatively consistent (7.65-9.00), there was a wide range in DO (3.20-12.9 mg/L), conductivity (85-603 μ S/cm), nitrate-nitrogen (0.2-6.42 mg/L), and turbidity (0.22-16.57 NTU). Analysis of this data with respect to watershed land use will help guide land management practices in the watershed.

3. Quantification of Alkane-Degrading, PAH-Degrading and Total Heterotrophic Bacteria in Sediments along the Schuylkill River using a Combination of Cultivation-Dependent and Cultivation-Independent Methods.

Presenter: Nicole Khan, *The Center for Natural Resources Development and Protection*

Level: Intermediate

Abstract: Previous experience of petroleum contamination has shown that oil residues can persist in the sediments for years or decades. There is no significant known abiotic mechanism for natural removal of oil residues from the environment. However, even though biodegradation of oil components is very fast in the initial stage, it is usually followed by maturation and weathering processes that leave heavier and more recalcitrant oil fractions for decades after the contamination. Many hypotheses have been formulated to explain incomplete and slow removal oil biodegradation including the lack of nutrients and electron-acceptors, low oil bioavailability, and absence of competent microorganisms.

Oil biodegradation proceeds mainly through aerobic oxidation by competent microorganisms. Oil degradation does not occur significantly at room temperature without the activity of microorganisms and their enzymes (biocatalysts).

4. Characterization of Ecological Conditions in the Delaware Shorelines

Presenter: Jacob Price, *The Center for Natural Resources Development and Protection*

Level: Introductory

Abstract: The measurement of nutrient concentration, in waterways, is an important tool in evaluating the current conditions within the Delaware River banks. Measurements of nutrients (nitrate, ammonia, and phosphate) were conducted on Tinicum Island and surrounding water bodies which consisted of the Main Channel of the Delaware River (or Shipping Channel) and a side channel located between Tinicum Island and the contiguous territory of Pennsylvania.

Results showed that the nitrate concentration is, in general, low in the upper 0.75 m of the sediments (approximately) while that of ammonia is high. A reversal occurs with depth where the concentration of ammonia reaches the detection limit, while that of nitrate remains essentially the same. This could be due to two reasons: 1) There is no source of ammonia at depth and 2) ammonia is being converted efficiently to nitrate. If the latter is true, this would mean that the upper portion of the beaches are anoxic while the lower parts are oxic, which is in contrast to what is reported in the literature (Slomp and VanCappellen, 2004).

The NRDP staff are in the process of analyzing and interpreting more samples to explain the present observations.

12:30 pm to 1:10 pm (*continued*)

5. Plant Nutrient Levels in the Sediment of the Morris Arboretum Wetland

Presenter: Cynthia Smith, *Senior at Chestnut Hill College undergraduate program*

Level: Introductory

Abstract: The purpose of this study is to perform a preliminary analysis to determine the level of plant nutrients stored in the sediment of the Morris Arboretum wetland. The Morris Arboretum wetland area is a spring fed pond located in a natural depression of the landscape. Since 2001 the area has been left to naturally fill with water to form a shallow pond. During major rain events, the wetland helps to slow storm water run-off and collect sediment. A four week study was performed during the summer of 2011 on several soil samples collected from around the wetland area pond. LaMotte colorimetric field tests were used to test for nutrients: nitrate, nitrite, ammonia, phosphorous, calcium, potassium, magnesium, manganese, chloride, sulfate, iron, and aluminum. More study is needed on the soil, preferably during February and before the next growing season when plant roots are still dormant. In addition to plant nutrients, water flow rate should also be measured since it is a determining factor in the amount of nutrients that can be stored in the sediment. Vegetation type and soil texture are intimately related to water flow rate and may also be contributors of nutrient retention levels.

6. Introducing Large Property Owners to Stormwater Management

Presenter: Lisa Wool, *Partnership for the Delaware Estuary*

Level: Introductory

Abstract: The presentation will highlight a guidebook as well as graphics available online to assist outreach specialists in teaching large property owners about stormwater management. The Partnership for the Delaware Estuary and the Schuylkill Action Network developed a large property owner's guide for stormwater management that helps property owners identify innovative green projects to reduce stormwater runoff. In 2009, the Philadelphia Water Department initiated its *Green Cities, Clean Water* program, a large-scale implementation of green stormwater infrastructure to manage runoff at the source on public and private lands and reduce demands on its sewer infrastructure. This program encourages developers, businesses, homeowners, and public and private institutions that own property in Philadelphia to rethink their stormwater management strategies. As part of this program, the PDE worked closely with the PWD to develop the Green Guide for Property Management. Recently, this guide was revised and updated to create a document that is not specific to any one region (city or watershed) and can be used for stormwater outreach throughout the Schuylkill Watershed and in other areas. This poster presentation will introduce congress participants to this guide, make available printed copies, and show individuals how to access the online version and associated photos and files for specific outreach needs. The presentation will also provide some guidance and instruction on using the guide to encourage innovative stormwater projects.

Workshop Descriptions

10:00 am to 12:10 pm

Workshop #1. Environmental Investigation: Boontown

Presenter: Jenifer Fields, Citizen

Level: Intermediate

Abstract: This is a hands-on session where small groups of participants will become the investigators for an environmental incident. Workshop participants will assess the situation, determine impacts, and explain their results to the "concerned residents."

Role-play scenarios can provide opportunities to train for real world environmental incidents and improve incident response procedures. Boontown is a role-play scenario involving a fire at a chemical warehouse. The day following the fire, officials begin to get complaints from nearby residents regarding drinking water. Workshop participants will be assigned roles (chemist, public relations coordinator, business owner, homeowner, etc.) and be provided with background information about their part in scenario.

As the environmental incident unfolds, participants will work in small groups to assess the information received about potential impacts. Monitoring data will be made available to participants in stages simulating data gathering during a real event. Workshop participants will work together to determine whether the impact to the drinking water of nearby homes was caused by the fire water runoff. In addition, participants will role play presenting to the residents exactly what they think happened, and whether it is safe for them to drink their water, and if not, what can be done to give them safe water. The debriefing for this exercise will include evaluation of communication strategies utilized by participants.

Who should attend: This workshop is appropriate for any members of the general public interested in gaining insight into incident response procedures. Municipal officials, educators, and representatives from land trusts, community-based conservation organizations, watershed and outreach groups are encouraged to attend. **Participants should bring a calculator.**

12:30 pm to 3:30 pm

Workshop #2. Watch-dogging the Gas Drillers

Presenter: Faith Zerbe, Delaware Riverkeeper Network

Level: Intermediate

Abstract: This hands-on training is designed for citizens willing to become part of a corps of volunteers in the Schuylkill and Delaware River watersheds collecting field data for streams that are threatened by natural gas drilling and pollution that may come from it. Volunteer monitors have performed monthly testing for 45 stations in PA since March 2010 in the Upper Delaware but as drilling may become more prevalent in Pennsylvania, there is a need to also target tributaries and streams where illegal dumping may occur. Data collected by trained volunteers is sent to Delaware Riverkeeper Network and has already been used to testify and provide important comment about the conditions of Upper Delaware tributaries and what may be lost if drilling is permitted in the Basin. Volunteers will collect data for conductivity, total dissolved solids, and temperature, and also make visual observations for the streams they monitor.

Consider becoming a volunteer monitor to learn the tools you will need to help accomplish this vital river protection. Streams in need of coverage include streams in abandoned mine drainage areas, streams in Wayne, Bucks and Pike County PA, and other areas that will be determined based on fracking waste protocols for the Delaware River watershed (if drillers are allowed to begin drilling) and coordination with Delaware River Basin Commission automatic data logging systems.

No prior experience is necessary but monitors should live within the Delaware River watershed to monitor regularly and year-round, and equipment will be made available for loan for priority areas. Groups or individuals may sponsor kits to help with this important effort. Pre-order kits in advance to have additional equipment available by the training – kits cost \$150 (and include electronic LaMotte meter, chloride test kit, and calibration solution).

Seating in this workshop is limited. Anyone wishing to participate must sign-up in advance with Faith Zerbe by emailing directly to faith@delawareriverkeeper.org. Please provide your name, address, and the watershed you are interested in monitoring. Additional instructions for participants will be provided by email.

Concurrent Session Descriptions

1:20 pm to 2:20 pm

O. Green Infrastructure Design and Construction – Lessons Learned from a Pennvest Stormwater Tree Trenches Project

Presenters: Altje Hoekstra, *Meliora Design, LLC* and Nancy O'Donnell, *Pennsylvania Horticultural Society*

Level: All

Abstract: The successes and challenges of the design and construction of multiple stormwater tree trenches in Philadelphia will be presented for a PENNVEST-funded Green Infrastructure project constructed in 2011. As part of its *Green City, Clean Waters* plan, Philadelphia is making large strides in managing stormwater runoff using Green Infrastructure, which uses vegetation, soils, and stone to improve water quality and infiltrate stormwater, mimicking the natural hydrologic cycle. In a PENNVEST-funded project to support this effort, the Pennsylvania Horticultural Society and Meliora Design developed Stormwater Tree Trench designs throughout the City of Philadelphia to manage stormwater runoff from the public right of way. This presentation covers the design challenges encountered in site selection, working in streets and sidewalks with existing utilities and other constraints, and meeting the requirements of various Philadelphia agencies and Pennvest. The project was successfully constructed in the Summer of 2011, which provided additional lessons learned through the construction process that may have applications in other Green Infrastructure projects.

P. Model My Watershed: An online hydrologic model for the Schuylkill

Presenter: Susan Gill, *Stroud Water Research Association*

Level: All

Abstract: The *Model My Watershed* project, funded by the National Science Foundation, is an online hydrologic model that uses an enhanced version of TR55 to calculate runoff under existing land-use conditions and to predict the benefit of best-management practices on hydrology at the site, neighborhood or watershed level. In the *Show My Watershed* module, this application uses climate, soils, elevation and land-cover data to partition rainfall into a water budget for either annual rainfall or an individual storm. In the *Modify My Watershed* module users can alter existing land cover to evaluate the potential impact of proposed development and the benefit best management practices. The outputs of this model provide watershed associations, private citizens and students a first approximation of the impacts of current and proposed land use. This information will be useful in responding to development proposals or to demonstrate how BMPs can improve existing conditions.

Attendees of this session will have the opportunity to use the application (**please bring your laptop**). In the *Show My Watershed* module, they will model water budgets under varying rainfall amounts within the Schuylkill River watershed. In the *Modify My Watershed* module, attendees will change land cover types and implement BMPs, in two areas – Phoenixville and Valley Creek.

There will be no technical support provided, so please get to the session early and be ready to login to the Internet.

Q. Examining Marcellus Shale Region Grassroots Mobilization

Presenter: Kathryn Tomsho, *ALLARM, Dickinson College*

Level: All

Abstract: This session will focus on the creation of a documentary focused on Pennsylvanians involved with organizations concerned with Marcellus Shale gas extraction. Recent technological developments in High Volume Hydraulic Fracturing have brought natural gas drilling to the forefront of energy resource extraction in Pennsylvania. The largest shale play, located in the Appalachians, contains the Utica and Marcellus Shale formations. The swift development of this industry has stimulated diverse and sometimes emotional reactions by the citizens located within the Marcellus Shale region. As a result, the best manner of proceeding has quickly become a point of contention within Pennsylvania.

One conduit for exploring this issue is oral history. By interviewing Pennsylvania citizens involved with grassroots organizations, we may better understand the dynamics driving their actions. Their stories provide us insight into the array of impacts drilling has had on the citizens of Pennsylvania, and how they have organized themselves in response.

This session will focus on the creation of a documentary focused on Pennsylvanians involved with organizations concerned with Marcellus Shale. Discussion will center on the experience of interacting with these community members while highlighting their personal accounts. Attendees can expect to obtain a more complete understanding of the variety of local reactions to natural gas drilling in Pennsylvania, as well as the economic, historical, and social factors that have shaped these concerns.

R. Dam Removal and Streambank Restoration in Upper Bucks County: A Case Study

Presenters: Meghan Rogalus, *Bucks County Conservation District* and Jeffrey Boyer, *Gleim Environmental Group/John W. Gleim, Jr., Inc.*

Level: Intermediate

Abstract: This presentation will provide a detailed account of this dam removal and streambank restoration project on a tributary to the Unami Creek, completed in August 2011. In July 2010, the Bucks County Conservation District received a grant from the Pennsylvania Fish and Boat Commission (PFBC) to remove the breached, formerly 200-foot wide, 11-foot high Achey Mill dam and restore approximately 300-feet of severely eroded stream banks in the East Branch Swamp Creek. The project location, on private property in Milford Township, Bucks County, provided very limited access for construction on the High Quality, Trout-Stocked Fishery tributary to Unami Creek. BCCD selected Gleim Environmental Group to provide design-build services for this project. Come join us to hear about the evolution of the project, including details on the design, permitting and construction process from the project outset to final construction, and see how the project fared Tropical Storms Irene and Lee.

1:20 pm to 2:20 pm (continued)

S. Evaluation of Small-Scale, In-Lake Management Techniques for Westtown Lake, a Shallow Impoundment in Chester County, Pennsylvania

Presenter: Fred S. Lubnow, Ph.D., *Princeton Hydro, LLC*

Level: Introductory/Intermediate

Abstract: This presentation will review the results for in-lake management techniques implemented over the 2011 growing season and included quantifying their nutrient (phosphorus and nitrogen) removal capacities. Westtown Lake is a 5.9 ha (14 acres) lake located on the campus of the Westtown School located in the Township of Westtown, Chester County, Pennsylvania. The lake serves as one of the main features of the campus and historically has been the site of various recreational activities ranging from fishing to ice skating and boating. In addition to recreational activities that take place in and around the lake, it serves as an educational tool for the several departments of the school. Westtown School was awarded a grant from the Pennsylvania Lake Management Society to implement and evaluate some innovative in-lake management techniques, specifically designed for shallow ecosystems such as Westtown Lake. The first technique was the use of an amphibious harvester called a Truxor DM 5000, designed to harvest nuisance submerged vegetation from lakes where water depths are less than 1 meter (3.3 feet). The second technique was to install a series of Floating Wetland Islands to provide a means of assimilating nutrients directly from the water column. Both techniques were implemented over the 2011 growing season and included quantifying their nutrient (phosphorus and nitrogen) removal capacities.

T. A Success Story Waiting to Happen: PA Delaware CREP

Presenter: Diane Wilson, *PA Department of Environmental Protection*

Level: All

Abstract: Agriculture remains a major industry in some of the Delaware River Basins PA counties. Sediment, nitrogen and phosphorus loads from agricultural operations have a significant impact on water quality. Intensive cropping systems and farm animal densities on agricultural lands can greatly alter natural ecosystems resulting in reduced habitat for wildlife. The Pennsylvania Delaware River Basin Conservation Reserve Enhancement Program seeks to retire 20,000 acres of marginal cropland, pastureland and/or environmentally sensitive land by providing economic incentives to retire these acres and establish conservation practices. The goals of this project are: (1) to improve water quality in the Delaware River by reducing sediment, nitrogen and phosphorus loading from croplands (2) to provide habitat for aquatic and terrestrial wildlife species. In order to meet the water quality and wildlife habitat goals of the program, 20,000 acres of conservation practices will need to be established on cropland and pastureland (16,000 acres of highly erodible cropland and 4,000 acres of conservation buffers). The estimated economic benefit to the region is \$100,000,000 over 15 years in cost share, incentives and soil rental payments to farmers and other landowners.

U. Winter Plant I.D. for Habitat Restoration

Presenter: John Nystedt, *Delaware Riverkeeper Network*

Level: Introductory

Abstract: Learn how to identify trees, shrubs and herbaceous plants in winter; hands-on review of species samples; focus on habitat restoration issues. Determining the specifics of a habitat restoration project can be difficult when trying to identify species in winter or early spring. This session will present the approaches and resources for identifying species, and will also cover the identification of selected species that are common friends or foes of habitat restoration efforts. Species reviewed will include those present locally in riparian corridors, woodlands, wetlands, and meadows. Native species as well as non-native invasive species will be discussed.

A goal of this session is to give participants "knowledge keys" to further advance their own skill at plant identification -- useful for many purposes including species inventories, wetland delineation and invasive plant management.

Participants will be able to review species samples, and will be given a few practice plants for ID to help them become familiar with the resources and techniques. Depending on the weather and available nearby vegetation, the group may take a short walking tour for field ID.

2:30 pm to 3:30 pm

V. Community Involvement - A Different Kind of Sustainable Stormwater Best Management Practice

Presenter: Jenni Woodworth, *A.D. Marble & Company*

Level: Introductory

Abstract: Sustainable stormwater management is attainable through rigorous, informed communication between stormwater management planners, stormwater management engineers, community officials, code enforcement officers, and, most importantly, the residents of your community. Urban and suburban runoff pollutes thousands of miles of streams in Pennsylvania and adds to the problems caused by flooding. Suburban runoff carries chemicals, sediment, fertilizers and other pollutants directly into our streams; and eventually the Delaware Bay. Millions of people live on the land that drains into the Delaware Bay, and the actions that residents take in their daily lives have an important impact on the environment. We all can make a difference in the health of this national treasure. Citizens need to think about the choices they make in their community, their businesses, their roadways, their yards, their home and even at their dinner tables.

Sustainable stormwater design treats rainfall runoff as a valuable resource. Several stormwater Best Management Practices (BMP's) have been recommended to be implemented throughout Pennsylvania. Stormwater Best Management Practices (BMP's) include implementing practices such as rain gardens, infiltration swales, permeable pavement, permeable concrete, tree trenches, tree boxes, and rain barrels. All these BMP's have been extensively tested and documented as successful ways to treat stormwater.

This paper will focus on a different kind of sustainable stormwater Best Management Practice - community involvement. For sustainable stormwater management to succeed, members of a participating community need to be shown how they can contribute to pollution prevention through stormwater BMP's that can be applied by homeowners. Residents will need to be educated and encouraged, and township ordinances will need to be modified to promote and enforce stormwater management practices.

Through applying sustainable stormwater Best Management Practices at the homeowner level, the residents of your community can improve the quality of stormwater runoff to the Delaware Bay while also increasing the pride in their community.

W. Monitoring and Evaluating Conservation Success in the Hopewell Big Woods

Presenter: Jim Thorne, *Natural Lands Trust*

Level: Advanced

Abstract: Monitoring and Evaluation define desired conditions and current baseline conditions, and then monitors progress toward conservation success as defined in the six conservation goals: 1) conserve 15,000 acres of forest, 2) conserve water quality and quantity, 3) conserve large scale conservation projects such as the Hopewell Big Woods Project are difficult to manage because of the size of the goals, the varied interests of partners and the resultant need for more deliberate accounting needed to measure success. The Hopewell Big Woods Partnership has chosen to engage in a monitoring and evaluation project to more clearly define how to achieve conservation goals, to better articulate the set of conservation actions needed to achieve those goals, and how to set desired conditions that result when conservation goals are achieved. The Hopewell Big Woods Partnership has just completed a monitoring and evaluation plan in response to these needs. The presentation will discuss the assembly of the plan, including how desired conditions are set, how we are approaching the setting up of the monitoring network and how we expect the results of monitoring and evaluation to redirect our conservation actions.

X. Natural Gas Pipelines: A Technical, Environmental and Legal Primer

Presenters: Aaron Stemplewicz, *Delaware Riverkeeper Network*

Level: Introductory/Intermediate

Abstract: This session offers a holistic view of natural gas pipeline construction and its corresponding implications for the health and vitality of the Delaware River basin. The presentation is broken up into four primary sections. First, an overview of the way in which pipeline delivery systems are constructed and operated is offered. This includes a description of the different ways gathering lines, transmission lines, distribution lines, compressor stations, and other appurtenant facilities function together in a typical natural gas delivery system. Second, the presentation provides a technical review of the different construction methods and techniques used by pipeline builders to cross water bodies. This section includes a description of the Delaware River basin and the water bodies contained therein. Additionally, in this section a detailed analysis of the two primary categories of water body crossings is provided (i.e. "wet ditch" and "dry ditch" pipeline construction). Next, different environmental degradation problems are reviewed that arise as a result of the different water body crossing construction methods. Included is a description of the effect construction has on forest fragmentation, fish habitats, benthic invertebrate habitats, sedimentation, loss of riparian vegetation, stream geomorphology, and cumulative stream impacts. Lastly, the presentation provides an overview of the legal regime that attempts to govern pipeline construction within the Delaware River basin, and concludes with some legal analysis and recommendations for future action.

2:30 pm to 3:30 pm (continued)

Y. Wissahickon Dam Removal - Challenges Met, Lessons Learned

Presenter: Bob Adams, *Wissahickon Valley Watershed Association*

Level: Advanced

Abstract: We will discuss the process of designing, funding and managing the removal of an orphan dam on the Wissahickon Creek. The Wissahickon Valley Watershed Association (WVWA) received ownership of an orphan dam as part of a land donation. WVWA decided to remove the dam, both for water quality benefits to the Creek and to be in compliance with state law. Complicating the process were an old trail crossing and a sewage line in the project area that had to be dealt with. We will tell the story of that process, from concept to removal, including funding, regulatory challenges, and project management.

Z. 12 Step Program to Get Your Lawn Off Drugs

Presenter: Mark "Coach" Smallwood, *Rodale Institute*

Level: Introductory

Abstract: Ways to achieve a pesticide and chemical-free lawn. 12 steps to creating and maintaining an organic lawn, focusing on products, weed control, cultural practices and methodologies.

AA. Source Water Protection Through Agricultural Best Management Practices

Presenter: Lyn O'Hare, *SSM Group, Inc.*

Level: Intermediate

Abstract: The Schuylkill Action Network's Agricultural Workgroup will showcase agricultural Best Management Practices that reduce sediment and nutrient impairments to the Schuylkill River watershed. Berks County comprises 40% of the overall Schuylkill River watershed, and has a large impact on source water protection for both the watershed and the drinking water. Approximately 36% of the Berks land use is in agriculture, which has added sediment and nutrient impairments to the river and its tributaries. Through the Schuylkill Action Network, conservation partnerships have provided both education and boots-on-the-ground projects in an attempt to help reduce further pollutants from entering local waterways. The Schuylkill Action Network has an active Agricultural Workgroup, which meets quarterly to discuss issues and formulate projects that provide watershed improvements on farms. Members of the Ag Workgroup partner to implement numerous Best Management Practices on local farms by combining resources and leveraging funding. This presentation will focus on recent projects in the Schuylkill River watershed that have assisted in preventing additional pollutants from reaching the waterways, used multiple resources in attaining its goals, and provided education on the importance of source water protection.

BB. Safeguarding the Delaware River with Poetry, Satire, and Storytelling

Presenters: Mort Malkin, *Poet*, and Christine San Jose, *Storyteller*

Level: All

Abstract: This session promotes using the highlights of literature — original poetry, satirical essays, and classic stories — to defend the National Treasure that is the Delaware River. Original lyric poems will tell of the High Delaware River in all its four-season glory: pools & rapids, bluestone cliffs, sounds & silences, and Nature's creatures. Satirical essays and classic stories will point to the tomfoolery of man and the dangers to the River. Several poems presented will preview an illustrated book of poetry to be released next year by the National Park Service and its publisher Eastern National. Audience participation will be encouraged.

Concurrent and Poster Presenters

Bob Adams came to the Wissahickon Valley Watershed Association as a land manager 13 years ago, after interning with the Delaware Riverkeeper Network. He has since become Director of Stewardship at WVWA, and is responsible for restoration, conservation, and management of WVWA-preserved lands in the watershed. Mr. Adams holds a degree in Geography and Urban Studies, with a minor in Environment, from Temple University.

Lisa Armstrong, AIA, LEED AP, has been working as a parent volunteer since 2006 on the Greening Greenfield project. She is the founder and principal of A K Architecture, LLC. Renamed in 2006, A K Architecture was previously known as Armstrong Kaulbach Architects. Serving non-profits, community development corporations, and the City of Philadelphia, Ms. Armstrong has led A K Architecture (AKA) in the design of exterior public spaces, multi-use community facilities, early childhood education centers, and affordable housing in Philadelphia. Ms. Armstrong was partner-in-charge of Lloyd Hall, the new recreation and community center on Boathouse Row in Fairmount Park, one of AKA's most visible projects. AKA's other notable projects include the Calcutta House III AIDS Hospice, Columbus Square Recreation Center, Woolston Family Center, Chinatown Community Center, Philadelphia Parent Child Center, Society Hill Child Care, Wilmot Meadow and Cloud Street Affordable Homes for the Frankford Community Development Corporation, and the addition to and renovation of Vesper Boat Club. AKA worked with the Schuylkill River Development Council to study the feasibility of a new community water sports center on the Schuylkill River in Center City. As development manager for Keating Development Company, representing Brandywine Realty Trust, she also coordinated the design and construction team for the core and shell renovation and restoration of the historic 30th Street Post Office Building from 2007-2011.

Joe Berg is an ecosystems ecologist with more than 30 years experience in the assessment and analysis of natural resources; development, preparation, and implementation of restoration plans; and the range of studies, documentation and permitting experience required for these activities. His focus has included the restoration of integrated stream, wetland and floodplain functions as a means to deliver ecosystem services to society, increase natural capital, and integrate local community needs with an appreciation of natural resource values. Mr. Berg graduated with a Master of Science in Marine, Estuarine, and Environmental Science from the University of Maryland.

Kathy Bergmann has a bachelor's degree in Biology from Waynesburg College and a master's degree in Microbiology from Ohio State University. She has experience in both developing water quality monitoring protocols and training and coordinating volunteers. She also works with municipalities in Chester County on their education and outreach requirements and Total Maximum Daily Load plans for their stormwater permits. Currently, she is a project coordinator for the Brandywine Valley Association's *Red Streams Blue Program* and she oversees the development and implementation of stream restoration projects. Ms. Bergmann serves on her Township's Environmental Advisory Council and is a certified raingarden installer and trainer.

Megan Boatright joined Natural Lands Trust (NLT) in 2007 and completed her Master of Arts in Geography at West Chester University in 2009. Using GPS technology and GIS, she creates maps for conservation easements, land acquisitions, and municipal planning. She has been involved in stewardship plan mapping for the Lehigh Gap Wildlife Refuge and the Haverford Community Park. She has also worked on several public visitation plans for NLT preserves and is a principal member of the Progressive Technology Committee. Recently, Ms. Boatright has been working to provide Google Earth training to municipal officials and other conservation organizations in the region.

Jeffrey Boyer's background as a heavy equipment operator set the stage for a transition to the river restoration department of a larger excavation company. With over twenty years of experience in the business, Jeff is now the manager of Gleim Environmental Group, a design/build contractor focusing on dam removal and stream restoration projects. Combining the vast experience of more than fifty restoration projects with continuing education specific to fluvial geomorphology, which includes all four levels of Rosgen classes, Mr. Boyer has led a team of restoration specialists who have become well known and respected in the river restoration community. His responsibilities include project design, estimating, construction management, and occasionally he still finds time to operate equipment.

Tom Davidock works as the Schuylkill Action Network Coordinator for the Partnership for the Delaware Estuary. In this position, Mr. Davidock works with a broad range of stakeholders to restore and protect the environmental health of the Schuylkill River watershed. These partners include academics, businesses, conservation organizations, local municipalities, water suppliers, and state and federal government agencies. Prior to this position, Mr. Davidock worked as the program director for Delaware Valley Earth Force, an environmental service-learning organization serving southeastern Pennsylvania. He also worked for five years as a natural resource specialist with the Schuylkill County Conservation District.

Helen L. Delano, P.G., has worked for the Pennsylvania Geological Survey since 1980, in both the Pittsburgh and Harrisburg area offices. She has expertise in landslides and other geologic hazards, geomorphology, and sedimentology. Her current position involves coordinating the survey's outreach and education activities, as well as overseeing the PAMAP program of digital aerial photography and elevation data. This has provided her an opportunity to work extensively with PAMAP LiDAR data for geological applications and to advise users about the advantages and limitations of this data. She has Bachelor's and Master's degrees in Geology and is a Registered Professional Geologist in Pennsylvania.

Jay Erb, an experiential educator, has been a member of the North Coventry Township Parks and Recreation Commission since 1995 and staff member Chester County P& R Department since 1998.

Jane Fava has a bachelor's degree in Psychology from the University of Maryland. She has worked for the Brandywine Valley Association for the last 20 years. For the past 10 years, Ms. Fava has been the Watershed Watch Coordinator, establishing the volunteer water quality monitoring programs and the erosion and sediment control monitoring programs at BVA. She also works with municipalities in Chester County to meet their education and outreach requirements and TMDL plans for their NPDES permits. Currently, she is a project coordinator for the Brandywine Valley Association's *Red Streams Blue Program* and she oversees the development and implementation of stream restoration plans. Ms. Fava is a certified rain garden installer and trainer. She is the 2007 recipient of the Watershed Stewardship Award from the Chester County Water Resources Authority.

Jenifer Fields works in environmental protection. She is a strong advocate for environmental education, and participates in the development of training programs for treatment plant operators. She has lived in Pennsylvania for 19 years, and is a graduate of the University of Delaware.

Sarah Francis has extensive and interdisciplinary knowledge in the fields of community engagement, public health, and environmental policy. Ms. Francis is a U.S. Green Building Council LEED Accredited Professional with a specialty in existing buildings, and holds a Master of Public Administration in Environmental Science and Policy from Columbia University and the Earth Institute. As a policy fellow for the Sustainable Business Network, she wrote a white paper analyzing environmental and economic impacts of the Philadelphia Water Department's *Green City, Clean Waters* plan. For two years she has served as green consultant for the green renovation of the historic Cynwyd Train Station, an 1890 Pennsylvania Railroad depot that is the trailhead to the Cynwyd Heritage trail. In her day job, Ms. Francis currently supports the U.S. Department of Energy with environmental assessments, communications and outreach, and program management.

Michael Frank served as Director of Community Planning with Heritage Conservancy for 10 years. He also served as Director of Community Planning (14 years) and Community Planning Consultant for municipalities (11 years) with the Bucks County Planning Commission. Mr. Frank has helped numerous municipalities prepare for referendums for conservation funding. He is the author of *Opportunity Knocks: Open Space is a Community Investment* (Heritage Conservancy, 2002). Frank has a Bachelor of Science in Business Administration and Master's in Regional Planning from The Pennsylvania State University.

Susan Gill is an environmental scientist and educator with 20 years of experience working with audiences of all ages. As Director of Education at the Stroud Water Research Center, Dr. Gill develops innovative educational programs for audiences from middle school through adult.

Altje Hoekstra's professional experience includes water resources management in urban areas, including numerous Green Infrastructure projects in Philadelphia. She uses her foundation in environmental science and policy to aid in decision making for sustainable water management designs. Ms. Hoekstra has supported the development of site design and stormwater management plans for small- and large-scale development projects throughout the country.

John Jackson has been a Research Scientist at the Stroud Water Research Center since 1990, and during that time has used macroinvertebrates to assess stream condition at over 300 sites in the Delaware River basin. He has a Bachelor of Science in Biology from the University of Notre Dame, a Master of Science in Zoology from Arizona State University, and a Ph.D. in Entomology from the University of California, Berkeley.

Richard Jayne is currently a senior at Kutztown University double majoring in Environmental Biology and Environmental Geology. He conducted research dealing with the water quality in local streams in the Maiden Creek Watershed in Fall 2011. He plans to pursue a Master's degree in Geology specializing in Hydrogeology and will continue research with regard to water quality.

Nicole Khan is a second year graduate student pursuing her degree in environmental engineering. Her focus is biodegradation in coastal sediments impacted by oil spills. Her research work includes the Exxon Valdez Oil Spill and the Deep Water Horizon incident. She is currently working as a research assistant at The Center for Natural Resources Development and Protection (NRDP) and works under the direction of Dr. Michel Boufadel, the Center's director.

Peter Lane is a Senior Program Associate with the Institute for Conservation Leadership (ICL), where he has been employed since 1998. Mr. Lane currently manages ICL's programming in the mid-Atlantic region. He also manages ICL's custom-designed services with grassroots environmental and conservation organizations by assessing the needs of groups, and managing the planning and delivery of training, consultation, and other technical assistance projects. In addition, Peter is an instructor for ICL's *Leading From Within* program. Mr. Lane also facilitates strategic planning processes and retreats, and has led workshops on organizational change, board development, organizational assessment and benchmarking, volunteer management and leadership development. He has over twenty years of experience working with a variety of nonprofit organizations throughout the Washington, DC area. Mr. Lane was also a Peace Corps volunteer in the Congo. He holds a Bachelor of Arts from Clark University in Worcester, Massachusetts and a Master of Education from the University of Massachusetts at Amherst.

Robert Limbeck is a Watershed Scientist with the Delaware River Basin Commission.

Sarah Low, founder of Strategic Nature, LLC, specializes in strategic planning around urban forestry, park planning, ecological restoration, and trail design. She focuses on bridging the gap between policy, planning, and science, specifically as it relates to the interaction of people and nature. Her passion for the natural world drives her interest in environmental conservation and community engagement. She holds a Bachelor of Science in Fish and Wildlife Conservation and a Master of Science in Watershed Science and Management from the University of Massachusetts Amherst. She has done ecological restoration and park management for over ten years and has worked for consulting companies, non-profit organizations, and government agencies.

Fred S. Lubnow is the Director of the Aquatic Programs at Princeton Hydro, and is the office manager of the Exton, Pennsylvania office. Dr. Lubnow received his Bachelor of Science in Biology from Susquehanna University (1988), his Master's degree in Environmental Sciences (1992) from the University of California Davis and his Ph.D. in Limnology (1994) from the University of California Davis.

Jim MacKenzie graduated from Penn State University with a Bachelor of Science in Landscape Architecture in 1986. In 1994 he became co-owner of Octoraro Native Plant Nursery and presently manages the business as President. In 2003 Governor Rendell appointed him to the Statewide Water Resources Committee where he served as Vice-Chair for 5 years. He currently serves as Chair of the Board of Directors of the Pennsylvania Landscape and Nursery Association (PLNA).

Mort Malkin is a formally trained poet, having studied at Brooklyn College, The New School, and the invited workshop of Jose Garcia Villa. Mr. Malkin has been an active participant in a number of different workshops over the years. He is a founding member of the Milanville Poets Unlimited, a group which has given several performances in venues in the High Delaware Valley. Mr. Malkin has had his poems published in many newspapers, magazines, and journals, as well as in three poetry books. He is also a painter, working in several mediums, and has been exhibited at several galleries.

Jeff Moyer has worked at Rodale Institute for over 30 years, currently serving as Farm Director. He also recently completed a full term as Chairman of the National Organic Standards Board. He manages Rodale Institute's nationally recognized *Organic No-Till Project*, its Water Purification EcoCenter, as well as its *Tree as a Crop Program*, helping farmers to utilize hedgerows as income-producing, environmentally friendly wood production areas. In addition, Mr. Moyer also sits on the Leonardo Academy's (ANSI) Committee for Sustainable Agriculture, is a founding member of Pennsylvania Certified Organic (PCO), and is Board Chair of the Seed Farm in Northampton County.

John Nystedt is a registered Landscape Architect and manages the habitat and river restoration projects for the Delaware Riverkeeper Network. His prior experience includes 17 years of designing and leading ecological restoration projects for Andropogon Associates, Ltd., in Philadelphia. His volunteer work has included serving as Director of Forestry for the Saddlers Woods Conservation Association in Haddon Township, NJ, where he is currently an Advisory Director and restoration team leader. John is also a commissioner on the Haddon Township Shade Tree Commission.

Nancy O'Donnell is the Director of the Pennsylvania Horticultural Society's *Philadelphia Green* program, which seeks to improve the well-being, aesthetics, and environmental health of neighborhoods across Philadelphia through horticulture. Ms. O'Donnell's expertise is in landscape and green design with an emphasis on native plants, and she is also heavily involved in community outreach and education.

Lyn O'Hare is a Water Resources Specialist at SSM Group, Inc. in Reading, PA. O'Hare focuses on development of plans for water systems in the Department of Environmental Protection Source Water Protection Technical Assistance Program, and provides support for water system steering committees. She currently leads the Agriculture Workgroup for the Schuylkill Action Network (SAN), and participates in SAN's Planning Committee. Prior to working at SSM, Ms. O'Hare was the Assistant Manager at the Berks County Conservation District, and also provided environmental services in the landfill industry. She received her bachelor's degree from the Pennsylvania State University.

Mary Ellen Olcese joined River Network as the Mid-Atlantic Program Manager in late 2007. She works with river and watershed groups throughout the area with special focus on Chesapeake Bay groups. Based in St. Michaels, Maryland, she brings to the position 20+ years of experience working with nonprofit organizations, as an education director, development director, and executive director. From 1999 through 2007 she worked as an independent consultant for community and conservation groups on issues of fundraising, strategic planning and organizational development. She received a Bachelor of Arts and a Bachelor of Science from the University of Pennsylvania and a Master's degree from Boston University.

Andy Paravis is currently chair of the North Coventry Township Board of Supervisors. Mr. Paravis was recently re-elected to serve his third term on the Board of Supervisors. He has also served as past president of the Chester County Association of Township Supervisors, past chairman of the Pottstown Metropolitan Regional Planning Commission, and past vice chair of the Northern Federation of Chester County Townships.

Jacob Price is a graduate student at Temple University, working for The Center for Natural Resources Development and Protection (NRDP), as a research assistant. He is currently in his second semester working toward his Ph.D. in environmental engineering. He works under the direction of Dr. Michel Boufadel, director of the NRDP Center.

Meghan Rogalus received a Bachelor of Arts in Biology/Environmental Science from Colby College in Waterville, Maine, and earned a Master of Science in Water Resources from the University of Vermont studying toxic cyanobacteria blooms in northern Lake Champlain. For the past 3 years, Ms. Rogalus has been the Watershed Specialist for Bucks County Conservation District (BCCD). In this position, she provides technical assistance and support to volunteer watershed associations, administers grants, manages environmentally beneficial projects sponsored by BCCD, and conducts public outreach on a variety of water resource concerns. Ms. Rogalus is currently serving as President Elect of the Pennsylvania Lake Management Society. In her spare time, she enjoys skiing, hiking and kayaking with her husband, Michael.

Diane Rosencrance is a registered landscape architect and joined Natural Lands Trust in 1997. She manages regional projects including the *Schuylkill Highlands Greenway Plan* and implementation of *SmartConservation®* for municipalities, watersheds, and communities. At a more localized scale, Ms. Rosencrance assists landowners in preserving their properties through conservation easements and fee simple transactions and institutes the development of public visitation plans for Natural Lands Trust. Ms. Rosencrance is responsible for the management of the Geographic Information System (GIS) team at Natural Lands Trust.

Christine San Jose's undergraduate education was in England, the home of Geoffrey Chaucer, William Shakespeare, and the romantic poets. She speaks with a delightful British accent and still can get by in Middle English. Her post-graduate work and doctoral studies in education were in the U.S. She has had many books published and is a sought-after storyteller in communities around the Delaware River. She has been an editor at *Highlights For Children* and has written several books for Boyds Mills Press.

Mark "Coach" Smallwood's professional experience has been dedicated to environmental sustainability and organic farming. Previously, he served as the Mid-Atlantic Green Mission Specialist and Local Forager at Whole Foods, where he was a 2010 National Award Winner for "Best Whole Foods Market Spokesperson." Additional accomplishments include: founder of an organic lawn care company, messenger for Al Gore's Climate Project, school teacher and basketball coach. Last, but certainly not least, as a long-time organic farmer and biodynamic gardener, Mr. Smallwood has raised chickens, goats, sheep, pigs, and driven a team of oxen.

Cynthia Smith is a senior in Chestnut Hill College's undergraduate program majoring in Environmental Science. A non-traditional student, Ms. Smith is the mother of three young adults and has two grandchildren. She hopes to be an expert in Environmental Science so that she may pass on her knowledge to her children and grandchildren. She wishes to be an advocate for our precious earth.

Aaron Stemplewicz received his Juris Doctor from Temple University Beasley School of Law in 2011. He has written articles relating to natural gas drilling which have been published by the Duquesne Business Law Journal and Buffalo Environmental Law Journal. Additionally, he was selected to be a panelist/speaker at a conference sponsored by the Baldy Center for Law and Social Policy: *Hydrofracking: Exploring the Legal Issues in the Context of Politics, Science and the Economy*. He is currently a staff attorney at the Delaware Riverkeeper Network, focusing on gas drilling litigation.

Robert Struble, Jr., is the Watershed Conservation Director for Brandywine Valley Association and Red Clay Valley Association. In his 35 years with the two Associations he has been involved with watershed improvement projects that have included land application of wastewater effluent, flood control and water supply projects, water quality assessments, and stream restoration. To chronicle improvement in the two watersheds he began publishing State of the Watershed Reports in 1997. Mr. Struble serves as a Director of the Chester County Conservation District and the Chester County Water Resources Authority.

Kathryn Tomsho is a senior Environmental Studies student at Dickinson College, a small liberal arts college located in Carlisle, Pennsylvania. She has worked for three years in various capacities for the Alliance for Aquatic Resource Monitoring (ALLARM), a non-profit organization focused on providing technical assistance to watershed groups throughout Pennsylvania. During her time there, ALLARM became involved with the issue of Marcellus Shale, an arena in which quick development of natural gas drilling has sparked concern over the numerous potential impacts. Ms. Tomsho became involved with the development of the Marcellus Shale Monitoring protocol. She has participated in and presented at multiple workshops throughout the state. Her interactions with concerned citizens at these workshops sculpted the path she took in college, and ultimately led her to create a documentary to capture the complexity of the community impacts of natural gas drilling in Pennsylvania.

Joshua D. Tryninewski is a Fisheries Biologist for the Pennsylvania Fish and Boat Commission's Anadromous Fish Restoration Unit.

Chris Washburn, after graduating from Hamilton College and the Wharton School, was a tax partner for KPMG LLP for 33 years. He is the former Chairman of the Philadelphia Zoo and the Philadelphia Estate Planning Council and has served on the boards of several non-profits. He currently is Chair of North Coventry Township's Open Space Review Board and Treasurer of Natural Lands Trust.

Diane Wilson is Chief of the Watershed Support Section in the Bureau of Watershed Management for Pennsylvania's Department of Environmental Protection (DEP). Her section has responsibility for a number of statewide programs including DEP's role in the *Conservation Reserve Enhancement Program*, the *Riparian Forest Buffer Initiative* and the *Lake Assessment and Management program*. Ms. Wilson previously worked as DEP's Citizens' Volunteer Monitoring Program Coordinator, a Biologist in the Wetlands program and a Peace Corps volunteer teaching Math and Science in Swaziland, Africa. She holds a Master of Science in Biology.

Jenni Woodworth has over 12 years of experience with a primary focus on Water Resource Engineering. She is responsible for the preparation of hydrologic and hydraulic reports; erosion and sedimentation control plans; drainage report; floodplain management reports; post-construction stormwater management plans; preparedness, prevention and contingencies plan;s and the Department of Environmental Protection NPDES and water encroachment permits.

Lisa Wool started at the Partnership for the Delaware Estuary in 1999. She has accumulated over 10 years of experience creating stormwater runoff pollution prevention programs geared toward very specific target audiences such as children, teachers, municipal officials, gardeners, dog owners, retail businesses, home owners, auto repair shops, restaurants, corporations, boaters, and urban and suburban dwellers. Prior to the Partnership, Ms. Wool worked for Delaware Greenways, Delaware State Parks, and the Delaware Department of Fish and Wildlife's Office of Wetland Rehabilitation. She holds a Bachelor of Science concentrating on wildlife conservation from the University of Delaware.

Faith Zerbe is Water Watch Director for Delaware Riverkeeper Network. Ms. Zerbe joined DRN in 1999 after spending three years as an assistant staff scientist with a private environmental consulting firm performing Natural Resource Damage Assessments related to oil spills. She assisted with the development and planning of habitat enhancements and restoration projects to compensate for natural resource impacts. Ms. Zerbe directs DRN's Monitoring Program and is responsible for water quality data analysis, monitoring study designs, and recruiting, training, and maintaining a strong citizen volunteer monitor base. She serves as a steering committee member for Pennsylvania's *Citizens' Volunteer Monitoring Program* and *New Jersey Water Watch* to work to increase the usability and credibility of citizen data. She has a Bachelor of Science in Biology from Ursinus College and has participated in the Student Conservation Corps and the School for Field Studies in Queensland, Australia.