



Upstream Newsletter, Vol. 2014, Issue 4, December 2014

Louis “Sandy” Sage Lobby Dedication Evokes Tears and Laughter

Stroud Water Research Center Director Bernard Sweeney, Ph.D., was standing at the top of a ladder in his garage on a Saturday morning this past summer with a paint brush in his hand when his cell phone rang.

It was Sandy Sage and his wife Honor, calling to let him know that they were with Nathan and Marilyn Hayward in the Berkshire Mountains. The Haywards had just shared with them Bern’s letter to them and their foundation confirming approval of the Hayward’s proposal regarding a naming opportunity granted to their foundation in return for a generous donation to the Stroud Center’s new LEED Platinum Moorhead Environmental Complex.



Louis E. “Sandy” Sage, Ph.D. (left) and Bern Sweeney, Ph.D. at the lobby dedication. “Sandy was my official boss, in the early 80s,” Sweeney recalled, adding

Indeed, the main lobby area of the building would be named for Sandy in recognition of his many years of help and assistance to the Center and its mission.

The conversation soon moved everyone to tears of joy and quickly forced Bern down the ladder.

“I started crying, and they started crying and then I started crying harder. Later on I had to explain to my wife why the paint job looks so diluted,” he quipped.

HONORING STEADFAST SUPPORT

Sweeney said his emotions had also welled up months earlier when the Haywards first proposed the concept of the “Sandy Sage Lobby” which took him by surprise because such naming opportunities usually involve the names of the individual donors or a very close relative.

The inscription on the plaque reads: “Dr. Louis E. ‘Sandy’ Sage whose steadfast support and encouragement has helped the Stroud Water Research Center become a world-class science, education and restoration center — from a family of his closest friends.”

The October dedication ceremony was an opportunity to celebrate Sage’s long history with and contributions to the Stroud Center.

Sage, who holds a Ph.D. in marine biology, worked for 23 years as a scientist at the Academy of Natural Sciences in Philadelphia, under which the Stroud Center operated as a field station before becoming an independent institution. During 14 of those years, Sandy was Vice President of

Environmental Research and Sweeney’s direct supervisor.



The ribbon pull at the dedication.

A BOSS, A MENTOR, A FRIEND

“Sandy was my official boss, in the early 80s,” Sweeney recalled, adding that he and Sage became close friends.

I don’t think I would have been as successful in my career without his coaching in my early years,” Sweeney added that Sage also provided, well, sage advice.

For example, when Stroud Center was expanding its original facilities, Sage advised Sweeney to invest in constructing basement laboratory space. But Sweeney argued that the Center didn’t need all that space. “Just trust me,” Sage replied. Sweeney said he was glad he took Sage’s advice, since those labs quickly became filled and remain crucial to the Center’s work.

“I never felt that Sandy got his just due for everything he did for us and for the Academy overall,” Sweeney said. He recalled Sage spending countless hours helping with research projects and securing donors to fund the Center’s work.

Nathan Hayward said his family’s decision to honor Sandy Sage was an easy one. “Our families have been the closest of friends for 50 years. It gives us an enormous amount of pleasure to honor Sandy and to help Bern and the Stroud Center because of the incredible amount of good work done here.”

Sandy Sage became choked with emotion when he recalled pleasant memories at Stroud Center.

“I always had a big smile on my face when I knew I was coming out here,” Sandy said, adding that whenever he needed a place to think he would find an excuse to venture into the “muddy fields by the streams.”

Sage expressed his deepest thanks to the Hayward family. He also thanked his children for taking the time to travel from Massachusetts, Rhode Island and Washington, D.C. to attend the dedication ceremony.

Afterwards, during a luncheon for the guests, Sweeney gave a slide presentation of pictures taken when Sage was head of the Academy of Natural Science's Benedict Estuarine Research Laboratory in Benedict, Md. Many of these served as a tongue-in-cheek roasting, at Sandy's good-natured expense. One slide included a rather contrived explanation of how Sage acquired the nickname "Sandy."



The Sage and Hayward families have been the closest of friends for more than 50 years. They gathered at the Stroud Center in October for the lobby dedication.

Sweeney showed a photo of a mocked-up sign that had been concocted many years ago when

Sandy was his boss and was making a site visit to the Stroud Center. He posted the sign along the creek right outside the Center. It designated a section of stream as "Sage Run." The sign read, in part: "... It is fact (and now legend) that the first benthic sample [of stream critters] taken by the doctor netted only sand and no biological specimens. A companion on site [...] recorded the events on film and memory and immediately suggested that the doctor change his name from Louis to Sandy in commemoration of his first sample."

Sage retired in 2007 from his position as executive director of Bigelow Laboratory for Ocean Sciences, in Boothbay Harbor, Maine.

Robert F. Kennedy, Jr. Honored at Water's Edge Gala

"We have to leave something for our children, not impoverish them," Robert F. Kennedy Jr. told about 300 attendees who paid up to \$500 to attend Stroud Water Research Center's annual Water's Edge gala.

Kennedy, the son of former U.S. Attorney General Robert Kennedy Sr., is president of Waterkeeper Alliance, a global advocacy organization advancing a mission for "swimmable, drinkable, fishable waterways worldwide." For this, as well as his work as an environmental attorney (he is Chief Prosecuting Attorney



Robert F. Kennedy, Jr. shared his experiences in environmental advocacy with an engrossed audience at Longwood Gardens. Photo: Yeda Arscott

for Riverkeeper) and numerous books, articles, and lectures he authored about the sources and impacts of stream and river pollution, Kennedy received the 2014 Stroud Award of Freshwater Excellence.

In the fall of each year, Stroud Water Research Center gives this prestigious award to an individual or organization for outstanding achievement in freshwater environmental stewardship or freshwater research and education.

“Stroud Center’s board of directors and senior staff applaud Kennedy’s efforts to improve the level of scientific integrity that forms the basis of our nation’s environmental policies and laws, especially those that impact water quality,” said Director Bernard W. Sweeney, Ph.D. prior to the October event.

THE AIR AND WATER BELONG TO ALL

Kennedy said the argument that we must choose between economic prosperity and responsible environmental stewardship is untrue. “Good environmental policy is tied to good economic policy. Environmental injury is deficit spending.”

Kennedy also praised Stroud Water Research Center for its diligent search for objective truth. “In a democracy you have to stand for truth, and funding the existential search for truth is one of the functions of democracy,” he added that Stroud Center is indifferent to whether its scientific findings offend pollution-causing industries or freshwater advocacy organizations, like Waterkeeper Alliance.



The 2014 SAFE Award sculpture presented to Robert F. Kennedy, Jr. at Longwood Gardens. Photo: Yeda Arscott

“The air and water are in the commons. They belong to all of us,” Kennedy said, explaining that the legal precedent dates back to antiquity. “One of the first things a tyrant does is to privatize the commons.” He added that businesses that pollute are forcing the public to pay for the costs of their operations: “We have to force polluters to internalize those costs.”

Kennedy said his interest in environmental issues dated back to his childhood and recalled bringing an ailing salamander to his uncle, President John F. Kennedy, to see if anything could be done for the creature. It was released to die peacefully in the White House rose garden. However President Kennedy later introduced his eight-year-old nephew to Rachel Carson, author of the book *Silent Spring* which exposed the dangers of the pesticide DDT. Kennedy was so inspired that he developed a lifelong passion for environmental advocacy.

THE ORIGINS OF THE RIVERKEEPERS ALLIANCE

Kennedy then told the story about the founding of Riverkeepers Alliance. He said it's the offspring of the Hudson River Fishermen's Association (HRFA), founded in 1966 by a group of concerned fisherman who met in at the American Legion Hall in Crotonville, New York. The group was incensed that polluters were destroying the lifestyle of recreational fishermen and the livelihoods of commercial fishermen by destroying a habitat that was once rich with a wide diversity of fish.

Kennedy said when the HRFA discovered that their government officials were "in cahoots with the polluters" they schemed ways to take revenge. One person suggested floating a raft of dynamite beneath the Con Edison piers, where it would be sucked into the intake. Another suggested that Penn Central's pipe could be plugged with a gasoline-soaked mattress and ignited with a match.

However, Bob Boyle, a fly fisherman and outdoor writer for *Sports Illustrated*, suggested a less violent and, ultimately, more effective solution. In

researching a story, Boyle learned of two little known laws: the Rivers and Harbors Act of 1888 and the Refuse Act of 1899. Both forbade pollution of American waters and provided a reward for those who reported the violation. Boyle told the fishermen: "We shouldn't be talking about breaking the law; we should be talking about enforcing it."

Under Boyle's leadership, the HRFA agreed to track down and prosecute Hudson River polluters one at a time. Two years later they shut down the Penn Central Pipe and collected \$2,000, the first bounty ever awarded under the 19th-century statute. Soon they were collecting other, more lucrative, bounties.

They used the winnings from these cases to build a Riverkeeper boat, which today patrols the Hudson searching out environmental lawbreakers and bringing them to justice. In 1983, they hired their first full-time Riverkeeper. Kennedy joined the organization as its Chief Prosecuting Attorney a year later. The HRFA changed its name to Riverkeeper in 1986. The organization has since brought hundreds of polluters to justice and forced them to spend hundreds of millions of dollars remediating the Hudson.

"Because of our work, the Hudson, which was a dead river, is now one of the richest water bodies on Earth, with strong, spawning species of fish," Kennedy said.

He added that the river's recovery has inspired the creation of more than 200 Waterkeeper organizations worldwide and predicted that that number would swell to 500 in a few years.

The audience responded to Kennedy's speech with a standing ovation.



Robert F. Kennedy, Jr. chats with Stroud Board Member W.B. Dixon Stroud, Jr. (left) and Director Bernard Sweeney, Ph.D. Photo: Yeda Arscott

Outreach For Healthy Streams

By Lamonte Garber



As forests marked autumn's brilliant arrival to the Mid-Atlantic, Stroud's Watershed Restoration staff and Director Bern Sweeney covered thousands of miles to bring our vision of healthy streams to audiences from New York to Maryland and across Pennsylvania. Here, in brief, is our approach to outreach to distant watersheds and new communities.

The future of fresh water depends on how we live on the land, build our homes, conduct commerce and produce our food. Business as usual will neither correct the mistakes of the past nor solve current problems. An informed public is critical.

Fortunately, many solutions are straightforward and cost-effective. For example, our Long Term Research in Environmental Biology project, a groundbreaking study of White Clay Creek, helps confirm that restoring forests along stream corridors is a necessary "best practice." These riparian forests enhance the stream's plant and animal communities and its physical properties.

Restored stream ecosystems process both natural substances and unwanted pollutants more effectively than degraded waterways. Healthy streams and their inhabitants break down, assimilate, and eliminate many water contaminants around the clock, seven days a week.

A comprehensive review of scientific literature pertaining to forested stream buffers, recently published by Director Bern Sweeney, Ph.D., and Research Scientist Emeritus, Denis Newbold, Ph.D., found that streams typically need buffers at least 100 feet wide on each side to protect and restore the stream ecosystem and its services. The study helps address a long-standing debate regarding buffer width and gives land managers new insights for protecting their own land and water.

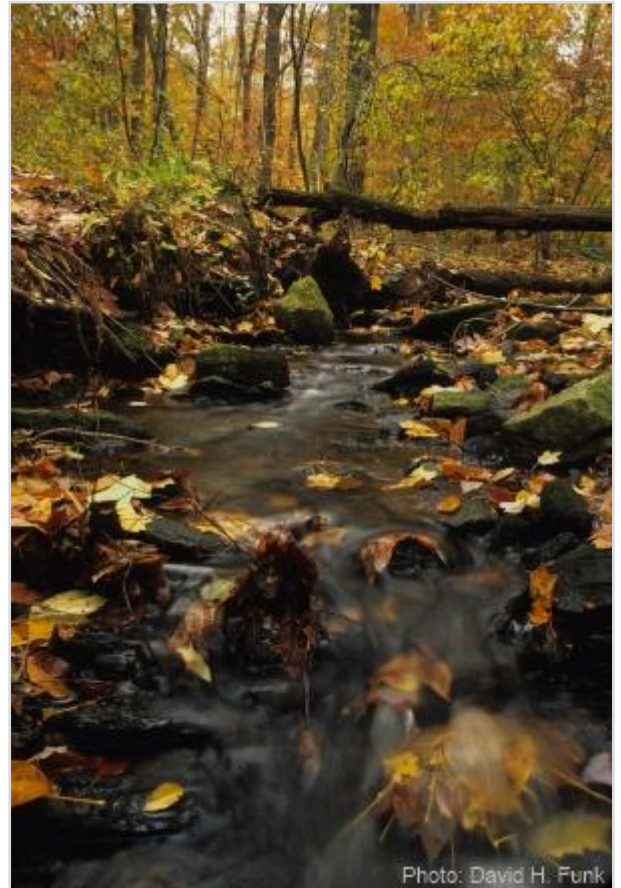


Photo: David H. Funk

USING NATURE AS A MODEL

Matt Ehrhart, Watershed Restoration Director at Stroud, feels that many communities are ready for watershed protection techniques that use nature as the model.

"Natural resources are resilient, with tremendous capacity for regeneration and renewal," Ehrhart said. "But we need to create the conditions in which natural processes can flourish. Technology alone is not enough."

Based on this model, Stroud’s Watershed Restoration Program helps landowners reduce pollution from the land and at the same time restore the streams’ ability to process pollution. Planting and caring for new streamside forests is combined and integrated with other improvements with an overall objective of whole farm conservation.

REACHING DISTANT WATERSHEDS AND NEW COMMUNITIES

We rely on many partners to deliver this “higher bar” program, and we share our science and strategies with natural resource managers, farmers, local governments ... anyone with a stake in clean water. This fall, for example:

- We addressed soil and water district staff from across New York.
- We collaborated with Maryland partners to host a gathering of Chesapeake Bay conservationists.
- We partnered with USDA-Natural Resources Conservation Service (USDA-NRCS) to share soil and stream science with farmers in New Holland Pa.
- We traveled to western Pennsylvania to share strategies with colleagues working to protect the Ohio River watershed.
- We spoke to groups in Wilkes-Barre, Willow Street, and State College, Pa. and Big Flats, New York.
- We partnered with Pennsylvania Department of Conservation and Natural Resources and Chesapeake Bay Foundation to share our latest restoration science with conservation professionals.



Stroud and USDA-NRCS shared soil and stream science with 225 farmers in New Holland, Pa. Photo: Lamonte Garber

LEARNING AS SHARED DISCOVERY

Stroud’s approach to outreach takes to heart these words from Ben Franklin: *“Tell me and I forget. Teach me and I remember. Involve me and I learn.”*

Learning works best as shared discovery, and we gain many insights from these exchanges with our colleagues and the public.

For example, we’ve learned that preventing soil erosion is just the beginning of good farming practice.



A USDA-NRCS demonstration of how healthy soils reduce rainfall runoff, on a field day hosted by Cover Crop Solutions, LLC. Photo: Lamonte Garber

Building soil health is the future. Healthy soils have excellent tilth, organic matter, and healthy microbes. Rain infiltrates in these soils and runoff declines.

Innovative farmers understand such connections intrinsically. They approach their fields and pastures as ecosystems, not simple growing media. When asked to summarize what he took away from a recent soil-stream workshop, one farmer simply said, “*Worms-Bugs-Trees-Fish.*”

That’s natural capital.

Lindsey Albertson Takes Over Stream House

The flumes in the Stroud Water Research Center stream house flowed intermittently this summer. At first they all flowed swimmingly, but a few weeks later some were dry. A few weeks after that, the previously dry flumes were flowing again, but others were dry. And so it went, on again, off again, all summer long.

Signs on the stream house doors informed Stroud staff that this was all perfectly fine and that no one was to touch the contents of the flumes — wet or dry — because their condition was part of an important experiment.

Lindsey Albertson, who earned her Ph.D. in Ecology at the University of California in Santa Barbara last year, has been doing postdoctoral research at Stroud, investigating how animals influence sediment erosion in streams during storms.



Lindsey Albertson, Ph.D., working with the flumes in the stream house. Photo: Kay Dixon

“When there’s a big rainstorm, and all this water is rushing down a creek, we need to understand both the biological and the physical forces that govern the impact of floods and how much sediment is moved during those high waters,” says Albertson.

Her experiments involve caddisflies and crayfish. One of her caddisfly studies was recently accepted by the *Journal of Geophysical Research* and will be published soon. (Look for a feature story about Albertson’s studies in our 2014 Annual Report to be published this spring.)

Albertson grew up in Deerfield, Massachusetts and completed her undergraduate work at Brown University in Providence, RI.

She thoroughly enjoyed the time she spent in California while earning her Ph.D. “A lot of grad students kept surfboards in their offices and would go out and surf for an hour during lunch,” she recalled, although, she admits, she wasn’t among the surfing crowd.

Albertson was working as a long-term substitute, teaching high school biology in Jackson Hole, Wyoming, when she learned about the post-doctoral position at Stroud on Ecolog, a listserv for jobs in the natural sciences.

When she finishes her work at Stroud, Albertson says she will seek a faculty or research position.

2014 Publications from Stroud Center Staff and Collaborators

Peer-reviewed publication of our research, education, and restoration activities is a fundamental tool for all staff at Stroud Water Research Center. This process often represents years of hard work, collaboration, and interacting with our peers throughout the world.

*The articles below represent the pinnacle of our annual effort to communicate our research and education findings to our respective peer-communities. Many of these articles are published online via professional society journals and are available throughout the world at libraries and institutions of higher education. **Stroud authors** are indicated by bold text.*

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hydrological connectivity: a comparison of temperate, subtropical, Mediterranean and semiarid river floodplains. *Freshwater Biology*, 59:630-648.

- **Gill, S.E.**, N. Marcum-Dietrich and R. Becker-Klein. 2014. Model My Watershed: Connecting Students' Conceptual Understanding of Watersheds to Real-World Decision Making. *Journal of Geoscience Education*, 62(1):61-73.
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- **Jackson, J.K., J. M. Battle**, B.P. White, E.M. Pilgrim, E.D. Stein, P. E. Miller, and **B.W. Sweeney**. 2014. Cryptic biodiversity in streams: a comparison of macroinvertebrate communities based on morphological and DNA barcode identifications. *Freshwater Science*, 33(1):312-324.
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Education News

By Tara Muenz



The Education Department at the Stroud Center was a busy place this fall! Staff members trained “watershed ambassadors” in New Jersey, kicked off a citizen monitoring program in Costa Rica, presented curriculum tools in North Carolina, and hosted a Leaf Pack Workshop and Stream School programs for adults as well as middle and high school classes right here at home.

BRANCHVILLE, NEW JERSEY

On a beautiful early autumn day in September, Education Program Manager Tara Muenz, along with the staff from the New Jersey Department of Environmental Protection (NJDEP), instructed 20 “watershed ambassadors” in stream macroinvertebrate monitoring and identification at the New Jersey School of Conservation in the Stokes State Forest.

Every year the state of New Jersey establishes a group of watershed ambassadors for each of their 20 sub-watersheds. These ambassadors lead outreach and education activities within their watershed while using their training to collect important baseline water quality data for NJDEP.



Tara Muenz (center) helps train watershed ambassadors in macroinvertebrate identification.

Muenz returned to New Jersey in late October to assist NJDEP staff in a second workshop for more than 20 citizen monitors from the Raritan River area.

OSA PENINSULA, COSTA RICA

Early in October, two of Stroud's staff embarked on a journey to the Osa Peninsula of Costa Rica to begin training local citizens to understand and protect their local waterways.

After several months of planning and discussions with the staff of Osa Conservation, Allegheny College professor Dr. Mike Palmer, Blue Moon Foundation staff, Stroud scientist Willy Eldridge, Ph.D. and Education Program Manager Tara Muenz finalized materials needed to launch a citizen monitoring program.

The team spent two days training Osa Conservation's staff and then together launched a citizen training workshop at Osa Conservation's field station.

The goal of the program is to empower citizens to have a greater connection to their landscapes and waterways and to help identify sites and activities that may need better management to protect water quality.

Training materials and a water atlas for displaying monitoring data will be available on the new Spanish language website at RiosSaludablesDeOsa.org.



ASHEVILLE, NORTH CAROLINA

In early September, Susan Gill, Ph.D., Director of Education, traveled to the 2014 Water Education Summit in Asheville to present the Model My Watershed project as part of a seminar titled "Understanding Watershed Connectivity" that was co-led with Lucy Laffitte from UNCTV NC Science Now.

Navigate a Watershed, an online educational curriculum, was also presented to the more than 200 education professionals at the conference. Gill, Stroud Assistant Director David Arscott, Ph.D., and Stroud Web Developer Heather Brooks assisted Laffitte in the curriculum production.

STROUD WATER RESEARCH CENTER, AVONDALE, PENNSYLVANIA

In all, more than 550 students and citizens from Boy Scouts and Brownies, to local schools, to students and teachers from Cabrini College visited Stroud Water Research Center this fall to participate in our Stream School programs.



Stroud helped produce Navigate a Watershed, an online curriculum that allows students to explore watersheds from headwaters to rivers.

Thank you to the schools and nature centers that experienced our Stream Programs this fall!

Tatnall School ~ Tyler Arboretum Camp ~ Cabrini College ~ West Chester University ~ Friends School Haverford ~ The Montgomery School ~ Kennett High School ~ Charles F. Patton Middle School

On a cold but beautiful Saturday in November, 20 teachers and naturalists from across the country participated in a workshop, led by Muenz and sponsored by 3M and Tyler Arboretum, that explored area streams for leaves and stream macroinvertebrates utilizing The Leaf Pack Network® protocols.



20 teachers and naturalists from around the country attended a Leaf Pack workshop at Stroud.

The Leaf Pack Network® offers a unique and fun way to engage students and citizens about the aquatic world while collecting important water quality information. To find out more about the program and to be notified about upcoming workshops, visit the Leaf Pack Network website at www.stroudcenter.org/lpn.

Watershed Restoration News

In between the flurry of watershed restoration planning and field work, our Watershed Restoration team was busy working with watershed planning professionals, leading workshops in partnership with the USDA's National Resource and Conservation Service program and the Smithsonian Conservation Biology Institute, hosting workshops here in Avondale, Pa., presenting recent developments in Cumberland, Md., and speaking at conferences and annual meetings in Maryland and Pennsylvania.

WILKES-BARRE AND ROCK SPRINGS, PENNSYLVANIA

In August, more than 40 watershed planning professionals attended and Penn State Extension Service hosted training in Wilkes-Barre where David Wise, Stroud's Restoration Program Manager, discussed the ecology of forest buffers and strategies for maintaining reforested sites.

Also in August, Bern Sweeney, Ph.D., Stroud Center Director, attended a Penn Ag industries Association meeting to share "Research, Education, and Restoration Programs of the Stroud Water Research Center" with meeting attendees.



Photo: Lamonte Garber

NEW YORK AND VIRGINIA

In September, Sweeney and Matt Ehrhart, Stroud Center Director of Restoration, traveled to Big Flats and Cortland N.Y. to deliver riparian forest buffer workshops in partnership with the USDA's National Resource and Conservation Service program.

Also in September, David Arscott, Ph.D., Stroud Center Assistant Director, and Ehrhart traveled to Front Royal, Va. to lead workshops as part of a week-long buffer training sponsored by the Smithsonian Conservation Biology Institute.

AVONDALE, PENNSYLVANIA

In October, Sweeney and Wise led two buffer training workshops at Stroud Water Research Center. The workshops were sponsored by the Chesapeake Bay Foundation, the Pennsylvania Department of Conservation and Natural Resources Bureau of Forestry, and Stroud Water Research Center.

CUMBERLAND, MARYLAND

In November, Stroud's restoration team traveled to Cumberland, Md. to the National Fish and Wildlife Foundation's Annual Agriculture Forum.



Sweeney taking a buffer workshop group on a walk of the White Clay Creek watershed and its many different zones of buffer history. Photo: Tara Muenz

Wise presented Stroud's recent developments in forested buffer work, including tests of methods to improve reforestation methods and the latest outcomes of the Stroud Farm Stewardship Program that works with farmers to do whole farm conservation.

THE EASTON-GRANTVILLE-EAST EARL-HOLTWOOD-STATE COLLEGE-MILL RUN EXPRESS

Sweeney then went "on tour" throughout the region to:

- Easton, Md. for a conference titled "Re-plumbing the Chesapeake Watershed: Improving roadside ditch management to meet TMDL water quality goals," where he presented "Level Lip Spreaders as BMP for mitigating roadside ditch impacts on streams"
- Grantville, Pa. to present "Building Healthy Soils For Healthy Streams" at the Keystone Crop and Soil Conference
- East Earl, Pa. to present "Caring for Streams as Living Systems" at the Shady Maple Conference "Unlocking the Secrets in the Soils and Streams"
- Holtwood, Pa. to present "Monitoring the Effects of Soil Conservation Practices on Stream Quality" at the Meeting of the Minds Cover Crop Field Day (Groff Farm)
- State College, Pa. to present "Stream Ecology and Forest Riparian Buffers: Cleaner Water at a Fraction of the Cost" at the Annual Meeting of the Pennsylvania Association of Conservation Districts

- and most recently, to Mill Run, Pa. to present “In Support of Streamside Forests” at the 2014 Riparian Buffer Workshop of the Western Pennsylvania Conservancy.

Whew!

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