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YOUTH AND WATER RESOURCES

AWRA
Community, Conversation, Connections
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YOUTH AND WATER RESOURCES

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Engaging youth in the water resources field is an exciting and unique opportunity that we have as water resource professionals and educators. This issue of *Water Resources IMPACT* focuses on a few examples of the many tools there are to reach our youth and expose them to water resources. Whether bringing the stream to the classroom or the class to the stream, these are the hands-on opportunities that will leave their mark. This issue covers an array of ways to bring together youth and water resources to offer you a new perspective on how to reach youth and impact our next generation of water advocates.

FEATURE ARTICLES

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GREEN JOBS FOR URBAN YOUTH IN WILMINGTON, DELAWARE

Martha Corrozi Narvaez

YOUTH AND THE ENVIRONMENT

Today's youth may understand global environmental threats but their connection to their local environment and understanding their role in it is diminishing over time. Schools may teach broader environmental concepts but the value of personal experience in one's local environment is often overlooked or neglected. How can this be changed? In my opinion, and as can be seen in the many youth environmental programs, focusing on getting youth outside and touching, feeling, and seeing what's in their neighborhood awakens appreciation for and connection to the outdoors and the environment. Additionally, research suggests added benefits to connecting our youth with nature include reducing childhood obesity and increasing community pride and awareness.

Many programs engage youth and the environment varying slightly in their host groups, administration, and number of participants, but generally they introduce urban youth to green jobs and the environment to empower the next generation of conservationists. Whether it be the LEAF program run by The Nature Conservancy, the DC Green Corps program, Philadelphia's Youth Environmental Stewardship (YES) program, Pittsburgh's Green Jobs Corp run by the Student Conservation Association (SCA), or the Bronx Green Jobs for Youth program run by the Van Cortlandt Park Conservancy, all of these programs provide conservation skills, environmental education, career training, and increase student awareness of higher education and career paths in the conservation and environmental field. These programs get youth outside and expose them to the environment in many different ways.

Similar to the programs listed above, the Wilmington Green Jobs program was established so that Wilmington's youth have opportunities to transform the city into a greener, cleaner, safer community while engaging in meaningful environmental experiences through employment, education, and mentoring. This article discusses how and why this program was started, its key concepts and activities, and its future direction.

THE INCENTIVE FOR A PROGRAM

Northern Delaware is largely urbanized and is home to Wilmington, Delaware's largest city. With a population of over 70,000 people and a population density of approximately 6,500 people per square mile, this area accounts for high water demands, wastewater loads, urban/suburban pollution loads, and incidences of floodplain damage. The city must comply with several federal regulations to maintain its sewer system and meet Clean Water Act requirements for water quality.

The federal Clean Water Act requires that all municipal, industrial, and commercial facilities discharging wastewater or stormwater directly from a point source (a discrete conveyance such as a pipe, ditch, or channel) into U.S. waters must obtain a National Pollutant Discharge Elimination System (NPDES) permit. Wilmington is responsible for meeting permit requirements to ensure that receiving waters will achieve their water quality standards. Like many older Northeastern industrial cities, Wilmington has a combined sewer system carrying sewage and rainwater runoff to the city's wastewater treatment plant. To prevent water and sewage from backing up into homes when heavy rains come, untreated combined sewage is released into local waterways; this release is called a Combined Sewer Overflow, or CSO. The federal Environmental Protection Agency (EPA) requires municipalities with CSOs to meet the standards outlined in the Environmental Protection Agency's (EPA's) Combined Sewer Overflow Control Policy, a framework to control CSOs through the NPDES permitting program. In 2005, the EPA assigned nitrogen, phosphorus, and bacteria Total Maximum Daily Loads (TMDLs) to the Christina Basin, the watershed in which Wilmington is situated. For Delaware's portion of the Basin, a watershed-based implementation plan [the Christina Basin Pollution Control Strategy (PCS), November 2011] was developed by citizens and government agency personnel, reflecting the community's priorities for reducing pollution.

In addition to the city's critical role, the key to this program is participion and coordination of eight project partners that include nonprofit, government (local and state), and academic entities

The regulatory programs discussed above (NPDES Permit, CSO Control Policy, and the Christina Basin PCS) each include public education and outreach requirements related to improving Wilmington's water quality. This creates an impetus to seek out programs meeting public education and outreach goals outlined in its permits and plans; this is one of several reasons why the city was spurred to undertake a Green Jobs Program. The Green Jobs program provides the city with the mechanism to fulfill some of its regulatory education and outreach requirements while also achieving additional citywide initiatives and providing a unique youth employment program.

THE PROGRAM

In the summer of 2010 Delaware's State Department of Natural Resources and Environmental Control (DNREC), the city of Wilmington, and the University of Delaware Water Resources Agency discussed a federal grant opportunity and talked about a possible youth employment program centered around the environment and water resources. This discussion became the impetus for

the Green Jobs Program. The idea was to bring environmental topics, hands-on experiences, and environmental careers to urban youth in Wilmington. Not only would it bring unique experiences to youth who are not typically exposed to this type of experience but it would also help the city meet the public education and outreach requirements of the NPDES, CSO, and TMDL programs.

With city approval, the University of Delaware's Water Resources Agency took the lead and invited several local partners to meet and discuss ideas on how to create this type of city program. Participants at this first meeting included local and state government, environmental organizations, and local nonprofit organizations. Meeting attendees' interest was high and each organization committed to providing the interns with a hands-on work experience accompanied with environmental education that introduces them to environmental issues and careers. Wilmington's Green Jobs Program, coordinated by the University of Delaware's Water Resources Agency, officially began in 2011.

Wilmington committed to adding this program to their existing Youth Employment Program and provided funding. The city's Parks and Recreation Department, housing the Youth Employment Program, committed to identifying and hiring the youth and a counselor to oversee the participating youth, provide employment and work-etiquette training, and transportation to and from each organization's job site. Program interns (usually 10-12) are chosen based on a lottery system and must be 14-18 years old. Green Jobs participants are selected based on those expressing an interest in the program and an interview process. The program typically commences on or around July 1st and runs for six weeks (25 hours/week), and participants earn minimum wage paid by the city. A counselor assigned to the interns also serves as a mentor and intermediary between the interns and their host organizations.

In addition to the city's critical role, the key to this program is participation and coordination of eight project partners that include nonprofit, government (local and state), and academic entities. Project partners host interns for multiple days throughout the six-week program and expose them to different environmental careers and issues through a variety of activities while also serving as mentors. Each host organization has committed staff and supplies to this program and has made it a success.

KEY CONCEPTS AND ACTIVITIES

Green Jobs is focused on bringing urban youth outside and exposing them to environmental issues and careers. Host organizations work hard to ensure the interns exit the six-week program with a greater understanding of the local environment, how to improve it, and their individual impacts on it (both positive and negative).

Program activities and topics have a heavy focus on water based on its inception from a discussion on meeting federal water quality requirements, its coordination by the University of Delaware Water Resources Agency, the participating organizations, and the geography of the city. Wilmington is located at the confluence of Brandywine Creek and the Christina River, a short drive from the bay, and about 90 miles from the ocean. The city's geography and its surroundings provide an ideal teaching ground for interns to learn about many hydrologic systems (river systems, estuaries, marine, and wetlands). There is a focus on stormwater and watershed management, including activities such as riparian or rain garden planting, storm drain marking, and clean water education and outreach. Education topics such as estuaries, climate change, and nonpoint source pollution in our region are part of the key concepts discussed. Interns get their feet wet in the local rivers and survey mussels, search for aquatic life such as macroinvertebrates, learn about fishing skills and fishing responsibly, and learn to canoe. The Partnership for the Delaware Estuary has allowed the interns to team up with their teacher-training program and has taken them to the University of Delaware's Lewes campus where students learn about the coastal ecosystem and marine environment, participate in a seining activity, and visit research labs.

Brandywine Creek provides Wilmington's drinking water. It is critical for the public, and especially our youth, to understand where their drinking water is coming from and where their waste goes. Thus the program incorporates a tour of the drinking water treatment and wastewater facilities including the primary source of stored fresh water and the largest major water storage facility in New Castle County with over two billion gallons of raw water. While touring the drinking water treatment plant students learn about the city's water supply source, the impact of citizens' activities on our water sources, pollution prevention, and how water quality technicians sample and purify drinking water. The students also tour the wastewater treatment plant, learn about the combined sewer system, and current projects to reduce CSO impacts on adjacent water bodies.

Although there is a strong emphasis on water resources, water isn't the only focus of this program. The Delaware Nature Society engages the interns in trail maintenance in an urban wildlife refuge that includes path clearing, weed-whacking, mowing, pruning, and brush removal. Marsh restoration including invasive plant species removal and planting and care for native plant species are recurring activities, accompanied by an orientation (why we do this), training (how we do this), and onsite support for the crew, especially in terms of educational components. Interns assist the Delaware Center for Horticulture with maintaining city trees, planting gardens, and gardening in urban gardens. The Challenge Program engages interns in community gardening and farming and introduces the concept of local and sustainable foods. The Urban Environmental Center teaches interns the importance of and how to compost and involves interns in environmental education to school groups.

By summer's end of 2012, program coordinators determined interns not only needed field work, but also to learn about different environmental careers and develop skills they would need to work as professionals in any field. Subsequently the Delaware Department of Natural Resources and Environmental Control (DNREC) introduced interns to several environmental careers throughout the program including: naturalists, local zoo careers, the county conservation district, and state planners. Led

by the Challenge Program, interns were also introduced to career-oriented skills necessary in any field, including resume writing and public speaking and Geographic Information Systems (GIS) training led by University of Delaware's Water Resources Agency.

Based on the organizing committee's recommendations after the first year, three additional components were added. The group felt that introducing the interns to photography and journaling and also incorporating mentoring into the program would benefit the interns. With donations from Pepco, a subsidiary of Pepco Holdings, Inc., digital cameras and journals were purchased in 2012. Photography lessons provided by the Delaware Nature Society's staff exposed interns to nature photography and seeing the natural world differently through a camera lens. The program retains the cameras for use in subsequent years but the skills taught remain with the interns. Regarding journaling, interns were given a primer on journaling and given time at each day's end to write about their experiences. The hope is that journaling will help students with their writing skills and serve as an activities record. Finally, the mentoring program was introduced as a way to pair interns with environmental professionals from host organizations. Mentors have dedicated times to meet with their interns to discuss the program, their experiences, and to benefit from one-on-one communication and expertise.

BUILDING A BETTER PROGRAM

Each year the program culminates in mid-August with a barbeque at The Challenge Program's new LEED Gold headquarters on the Christina Riverfront. The location of its closing event is no accident; the headquarters will be among the first LEED Gold buildings in Delaware. The building utilizes green building technology throughout the site, including a green roof; an innovative stormwater-management system, including planters filled with native plants and a rain garden; geothermal heat; solar panels; and recycled building materials. Although the location is remarkable, the interns are the highlight of the closing ceremony. Each intern gives a brief presentation to invited guests who include state and local dignitaries, individuals from the host organizations, and the interns' family and friends. Interns present to the group on their experience and what they have learned, including their likes and dislikes. It is typical that this is one of the first opportunities the interns have to speak in front of a group such as this and each intern's presentation includes photos reflecting their experience and providing a unique portrayal of each intern's six week journey.

The program has received strong support from the city's mayor, the secretary of the state environmental organization, and other state and local representatives. Each intern receives recognition from the state and city for their participation in and completion of the program, which is meaningful recognition for interns and their families.

At the closing ceremony interns are asked to complete evaluations of the program. Overall, the program and host organizations have received extremely positive reviews from them. Interns note that they gained a better understanding of the environment and environmental careers. Each year interns comment that the activity they most enjoy was canoeing. Many students have never paddled a canoe or kayak and experienced that feeling of excitement and trepidation when getting into that wobbly vessel for the first time and beginning their adventure on the waters that crisscross the city landscape. These evaluations also provide guidance in highlighting where improvements can be made and additional topic areas to cover, such as alternative wind energy (as recommended by one intern). Evaluations also provide a bit of humor as the interns' biggest complaints are often the quality of the lunches and the hot and humid weather while weeding and pruning.

Program partners continue to enhance and improve the program. Immediate goals include: expanding the number of participating host organizations, seeking funding to enhance recruitment and provide equipment and a stipend for host organizations, strengthening the mentoring component of the program, and following-up with the interns after the program. So far we have added a program partner, the Delaware Chapter of the Nature Conservancy in the 2013 program, and applied for private grant funding in 2013.

The Green Jobs program was extremely successful in its first two years. The program is centered on the environmental field and helping to improve our environment, but many skills learned apply to any field in which the interns will choose to work. It is our hope that this program continues with improvements and enhancements that will make it a hallmark program of the city that expands the minds, encourages positive environmental behavior, and enhances the senses of Wilmington's youth.

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Martha Corrozi Narvaez is an Associate Policy Scientist with the Institute for Public Administration's Water Resources Agency at the University of Delaware. She is responsible for providing regional watershed technical, policy, education, and research support to state and local governments; University of Delaware staff, students, and faculty; and nonprofit organizations in Delaware and the Delaware Valley. Martha has 14 years experience in the water resources field and received her Bachelor of Science (B.S.) in Biology from Lehigh University and her Master of Public Administration (M.P.A.) degree from the University of Delaware where she specialized in watershed management.

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AWRA'S 2013 SPRING SPECIALTY CONFERENCE STUDENT PRESENTER COMPETITION WINNERS ANNOUNCED

Congratulations to the Student Presenter Competition winners of AWRA's 2013 Spring Specialty Conferences on *Agricultural Hydrology and Water Quality II* that was held during the conference in St. Louis, Missouri, on March 25-27. Thirty-four students participated and were scheduled throughout the 39 sessions and the poster session. Conference attendees were given the opportunity to judge the students during their scheduled session. The following criteria was used for all competitors:

- Efficient use of allotted presentation time or poster space;
- Quality of responses to audience questions in oral or poster sessions;
- Effective integration of audio-visual materials;
- Perceived preparedness;
- Logic and understandability of material (problem, methods, results, conclusions);
- Adequate description of context for material – conveyed purpose of paper, identified relevant literatures, etc.;
- Overall style and presence; effective communicator – enthusiasm or persuasiveness;
- Suitability for AWRA/professional audience; and
- Significance and originality of the material presented.

Everyone did a terrific job and made the decision difficult. However, the following individuals were selected as the outstanding winners. Again, our congratulations on a job well done to all those students who were in the competition and we wish them all the best in their future endeavors. We look forward to hearing more from everyone at future AWRA conferences!

Oral Session Presenter
MARK R. WILLIAMS
Penn State University ~ University Park, Pennsylvania

Nitrogen Concentrations and Transport Potential in Shallow Groundwater: Contrasting Seep and Non-Seep Regions of a Riparian Zone in an Agricultural Watershed
(co-authors: Anthony Buda, Hershel Elliott, Elizabeth Boyer)

Mark is a Ph. D. candidate in the Department of Agricultural and Biological Engineering at Penn State University in University Park, Pennsylvania. He is currently working on a project with the USDA-Agricultural Research Service (ARS) Pasture Systems and Watershed Management Research Unit evaluating the fate and transport of nitrogen in headwater agricultural watersheds. Specifically, Mark's research is aimed at elucidating the role of hydrology on nitrogen transport in emergent groundwater seeps and determining how seeps influence stream water quality.

Mark received a B.S. in environmental resource management with minors in soil science and water resources management from Penn State University in 2008. Following his B.S. degree, Mark worked with scientists from the USDA-ARS and Penn State on a project to determine nutrient losses following manure application in the late-fall and winter. He received his M.S. in Agricultural and Biological Engineering from Penn State University in 2010. Upon completion of his Ph.D. (May 2013), Mark will be working with the USDA-ARS Soil Drainage Research Unit in Columbus, Ohio, as a postdoctoral agricultural engineer.

Poster Session Presenter
MARGARET KALCIC
Purdue University ~ West Lafayette, Indiana

Farmer Perceptions of Targeting Agricultural Conservation Practices
(co-authors: Linda Prokopy, Jane Frankenberger, Indrajeet Chaubey)

Margaret is a PhD student at Purdue University in the Agricultural and Biological Engineering Department and Ecological Sciences and Engineering Interdisciplinary Graduate Program. Her research focus is on targeting of agricultural conservation practices, including the watershed models used, spatial optimization, and the human dimensions of targeting. She earned her BS at Franklin W. Olin College of Engineering in Needham, Massachusetts, and her MS from Purdue University.

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