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Newsletter of the Partnership for the Delaware Estuary - Host of the Delaware Estuary Program

ESTUARY

NEWS

DIRECTOR'S MESSAGE



This is a Good Year to Volunteer

By Kathy Klein, Executive Director, Partnership for the Delaware Estuary

Happy New Year! 2020 is going to be a very exciting year for the Partnership for the Delaware Estuary, and we invite you to be part of the action.

Opportunities to get involved include cleanups in the Christina River Watershed in Delaware, the Schuylkill River Watershed in Pennsylvania, and along waterways in New Jersey through the South Jersey Scrub.

We are always looking for help in bagging recycled oyster shells for living shoreline projects. We are also busy planning the 50th anniversary celebration of Earth Day with our Earth and Arbor Day event in Wilmington on April 22. Of course, the annual Delaware River Festival will take place in September at Penn's Landing in Philadelphia and across the river in Camden, New Jersey.

And before we know it, the days will be getting longer and warmer, and our science team will be out in the field monitoring critical wetlands, installing and maintaining living shorelines, and engaged with many other on-the-ground projects. Information about all of

These volunteer opportunities and many more are available on our website at DelawareEstuary.org.

I am excited to report that soon we will select a design and construction team for the freshwater mussel hatchery we are building in partnership with Bartram's Garden and funded by PennVest.

As we look forward to our organization's 25th Anniversary in 2021, we will spend this year developing a new strategic plan that will build upon the priorities of Clean Waters, Healthy Habitats, and Strong Communities in the Delaware Estuary Program's revised Comprehensive Conservation Management Plan.

Thank you for all YOU do to protect and improve the health of the Delaware River and Bay. By working together, we can achieve meaningful and lasting results. ♡

Best wishes,

Kathy Klein, Executive Director
Partnership for the Delaware Estuary

MEETINGS CONTACT LIST

Meetings conducted by the Delaware Estuary Program's implementation and advisory committees occur on a regular basis and are open to the public. For meeting dates and times, please contact the individuals listed below:

Estuary Implementation Committee

Kathy Klein, Executive Director (Chair)
(800) 445-4935, ext. 102
kklein@DelawareEstuary.org

Monitoring Advisory & Coordination Committee

Elaine Panuccio, Water Restoration Scientist, Water Quality Assessment
Delaware River Basin Commission
(609) 883-9500, ext. 307
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Ron MacGillivray, Ph.D.
Senior Environmental Toxicologist
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Science and Technical Advisory Committee

Danielle Kreeger, Ph.D.
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FOLLOW US ON:



ON THE COVER A non-profit organization called Brandywine Shad 2020 would like a series of dams on the Brandywine Creek to be demolished or modified so American shad can swim and spawn freely.

Our Shared Waters Expands Its Reach Within the Delaware River Basin

By Peter Eschbach, DRBC



People have many viewpoints about the Delaware River Basin. To give those viewpoints a forum, the Delaware River Basin Commission (DRBC) started an online campaign and invited individuals and organizations to share not just their views, but data, events, photos, and much more.

With funding support from the William Penn Foundation, DRBC launched its Our Shared Waters campaign in August. It has multiple platforms, including:

- A webpage that serves as a gathering point for organizations and people serious about their water, their watershed, and their role in the larger interconnected Basin.
- A Facebook page (the handle is @OurSharedWaters), which has more than 2,700 followers from around the Basin.
- A crowdsourced online site that encourages evaluations of individual watersheds within the Basin, reports, activities, and photo postings.

Joint community outreach at events around the Basin. i.e., participation with the Tookany/Tacony-Frankford Watershed Partnership at Pennsylvania State Senator Art Haywood’s block party in Philadelphia.

There are additional collateral materials to assist in raising public awareness of the Basin’s water resources. These include a 3-D plastic model map of the Basin that will be displayed by several partners, including the Partnership for the Delaware Estuary. ♦

New Tool WATCH-es Wetland Health

By Josh Moody, Ph.D, PDE Restoration Programs Manager and Kate Layton, PDE Marketing and Communications Manager

Imagine you’re a doctor trying to diagnose a medical condition. You’ll look at factors of a person’s health to interpret their symptoms and diagnose the problem. Do all of that correctly, and you can develop a plan to treat and heal the condition. Misdiagnose the problem, and you could prescribe a

treatment that’s ineffective or that exacerbates the problem.

The same concept can apply to salt marsh restoration. Salt marshes, or wetlands, are areas that are constantly or periodically saturated with water. They provide food and homes to a variety of animals, clean water by filtering out pollutants, and

provide flood protection for our communities. Salt marshes are vital to the health of the Delaware Estuary. Unfortunately, many salt marshes are in poor health today, requiring protection or restoration. So how do people who work with salt marshes correctly diagnose problems to

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New Tool WATCH-es Wetland Health

cont'd from p3

prescribe appropriate treatments? Due to the high costs related to restoring a salt marsh, that can be a million-dollar question.

In 2018, the New Jersey Department of Environmental Protection (NJDEP) awarded a \$50,000 grant to Partnership for the Delaware Estuary (PDE) to develop a computer-based tool for evaluating salt marsh health. This new tool fills a vital need in PDE's attempts to find appropriate treatments to repair site-specific wetland problems.

WATCH: HOW IT WORKS

PDE's new Wetland Assessment Tool for Condition and Health (WATCH) is a computer spreadsheet into which users can enter data concerning a series of factors that affect a specific salt marsh's health. It calculates how each element is performing today as well as projected performance. WATCH then combines the individual factor assessments into a comprehensive marsh-wide evaluation. By putting all the calculations together into one place, the tool encourages users to look holistically at all facets of marsh health – a need that has been recognized by the science community for quite some time. Its simple interface and output make it suitable for people of varying technical skill levels,

from marsh scientists to municipal employees, to estimate a salt marsh's health.

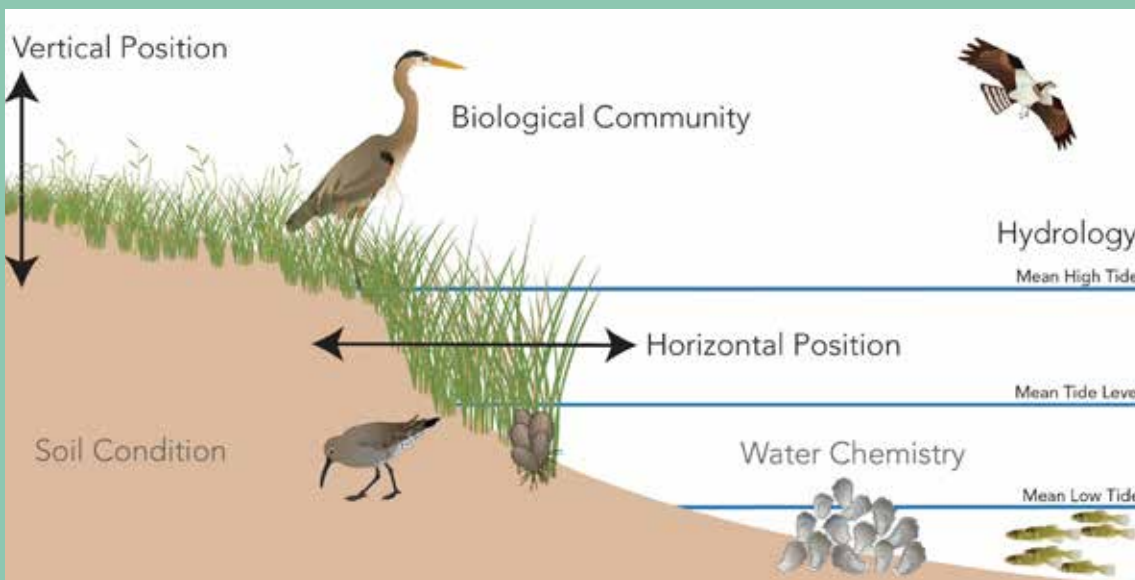
NECESSARY INNOVATION

Evaluating the factors that determine salt marsh health is not new to the world of marsh science. A variety of technical tools exist to evaluate each quality independently. The real innovation of WATCH is the way it combines factors for a holistic evaluation. It uses a type of mathematical logic employing "and/or/not" statements to look for unique combinations of factors that are indicative of particular problems. For example, a marsh with dying grass could indicate poor water drainage and/or poor elevation. If you are unaware of the poor drainage and only repair the elevation, the grass will likely die. But, if you repair both the elevation *and* the water drainage, the grass will probably live.

NEXT STEPS

In 2019, PDE received another \$175,000 from a grant from the National Fish and Wildlife Foundation to continue work on WATCH between 2020 and 2022. PDE will work with partners in New Jersey and Delaware to refine the tool and test it at long-term wetland

monitoring sites. Two workshops will be held this spring to introduce potential users of WATCH and to get feedback. For more information, contact Joshua Moody at jmoody@delawareestuary.org.



Plastic Free Delaware: Helping People Shed Plastic Bags One at a Time

Last July, Delaware Gov. John Carney signed the state's new single-use plastic bag bill outside of PDE's office in Wilmington. This bill will take effect in January 2021 and will limit the distribution of certain types of plastic shopping bags at large retailers. Single-use plastic bags are a significant source of pollution in oceans and waterways.

Plastic Free Delaware, a community-based organization focused on making Delaware a better, cleaner, healthier place by reducing the use of single-use plastic products, wants to help people shed the plastic bag habit altogether. For nearly a year, it has made and given away reusable cloth bags to people who can't afford to buy them.

"Our three goals for these bags are to provide free, reusable grocery bags to those who are economically vulnerable, to keep fabric out of the landfills, and to keep single-use plastic out of the environment," said Patti Isaacs-Hansen, one of the board members of Plastic Free Delaware.

Plastic Free Delaware attended last July's bill signing event and gave away cloth bags to spread awareness about the bag program and the reduction of plastic use. The reusable bag program started last May when the bag bill first cleared the Delaware House of Representatives. Since then, the group has produced and given away more than 400 reusable bags. The bags and the bag program are called Morsbags — named after a movement of the same name in Europe and the United Kingdom. According to the Morsbags website, each bag has the



Since 2019, Plastic Free Delaware has made and given away more than 400 reusable cloth bags

Credit: Patti Isaacs-Hansen

potential to eliminate hundreds of plastic bags over its lifetime and prevent them from polluting the environment.

Morsbags take about a half-yard of fabric to make. Cloth comes from repurposed furniture upholstery fabric, old curtains, and other sturdy medium-weight cotton cloth. Plastic-Free Delaware sets up volunteer groups to sew the bags at community locations. The organization supplies the fabric, sewing machines, and other sewing materials.

Plastic Free Delaware is looking for donations of cloth and sewing notions such as needles, thread, and portable sewing machines. It's also looking for volunteers to help in sewing. Volunteers who already know how to sew, or are willing to learn how to sew bags, are welcome to contribute. Isaacs-Hansen said the group intends to help train and organize start-up groups throughout Delaware. To donate or volunteer to make Morsbags, or to schedule a sew-a-thon for the bags, e-mail Isaacs-Hansen at patti.isaacshansen@gmail.com. For more information about Morsbags, visit www.morsbags.com. ♠

Back to a Free-flowing State for the Brandywine Creek

It happens every spring. Waters get warmer, and American shad heed the call to leave their ocean homes and head toward fresh water. Instinct drives these fish to swim against the current to spawn in the places where they were born. One of those waterways is the Brandywine Creek.

Shad have spawned in the Brandywine for centuries. For the last 300 years, however, man-made dams have hindered these spawning grounds. A non-profit organization called Brandywine Shad 2020 feels the time is long overdue to free the waters for fish passage and recreational opportunities for fishing, kayaking, and more.

"Here in Delaware, we are making a difference in restoring this important and historic habitat back to before the Europeans got here and made decisions to harness water power for their mills. Those decisions that hold Shad hostage, we want to reverse," said Hunter Lott III, the co-founder, and co-director of Brandywine Shad 2020.

The Brandywine Creek – sometimes referred to as a river – is a tributary of the Christina River and part of the Delaware River Watershed. It's nearly 75 miles long and spans between Delaware and Pennsylvania. Settlers built dams for mills that produced flour, paper, cotton, and gunpowder. The significance of 2020 in the organization's name, Lott said, is this year marks

"Shad have spawned in the Brandywine for centuries. For the last 300 years, however, man-made dams have hindered these spawning grounds."

the 300th anniversary since the first dam went up in 1720.

Over time, the mills went away while many of the dams stayed. Brandywine Shad 2020 would like to see 10 dams removed or modified on more than 17 miles of Delaware's portion of the creek and restore the waterway to a pre-colonial, free-flowing state.

ECOLOGICAL BENEFIT

Shad spawning season spans from March to June. After they migrate, female shad lay hundreds of thousands of eggs in the water to be fertilized by male fish. About 10 percent of the eggs hatch a week or so later.

"Anything that we can do to open up more habitat for [the shad] is going to be beneficial to the ecology of the system," said Mike Stangl, program manager for freshwater and anadromous species at Delaware's Department of Natural Resources and Environmental

"If we can do what we can to allow them to return to their homes, their natal spawning grounds, that would be a real plus for the state of Delaware."

—Mike Stangl

Control (DNREC). He has been working with Brandywine Shad 2020 on the biological and ecological aspects of the project. "If we can do what we can to allow them to return to their homes, their natal spawning grounds, that would be a real plus for the state of Delaware."

THE RIGHT THING TO DO

Lott and fellow Wilmington resident Jim Shanahan co-founded Brandywine Shad 2020 in 2017. Founding member organizations include

the Brandywine Conservancy, Hagley Museum and Library, and the University of Delaware. Nine other entities, including the Partnership for the Delaware Estuary, are listed as supporting organizations.

Lott and Shanahan, who each live along

city's water supply, so a fishway or another modification will be necessary, Lott and Shanahan said.

Kauffman said the university, which is providing technical assistance to the Brandywine Shad 2020 project, was part of the White Clay

“It just spoke to me to have the fish do what they did for centuries and centuries.” —Jim Shanahan



Hunter Lott III, left, and Jim Shanahan, are the co-founders and co-directors of the non-profit organization Brandywine Shad 2020. They would like to see the Brandywine River returned to a pre-colonial, free-flowing state for the benefit of American shad

the Brandywine, independently developed an interest in the dams and American shad before the issue brought them together.

“I think it was just for the pure objective of restoring our ecology to the way it was before humankind's interference,” Shanahan said. “I just thought it was sort of the right thing to do. It just spoke to me to have the fish do what they did for centuries and centuries.”

FUNDING AND FEASIBILITY

Last summer, the City of Wilmington removed one dam on the creek near Brandywine Park. Brandywine Shad 2020 didn't play a role in this project but the group supported it. Gerald Kauffman, director of the University of Delaware's Water Resources Center, said the goal is to have three dams go in 2020.

Dam No. 2 in Wilmington is integral to the

Creek Wild and Scenic River Committee to remove a dam built in 1777.

Brandywine Shad 2020 is working to raise funds for the project. So far, it has raised \$482,000. In 2018, the National Fish and Wildlife Foundation, through the Delaware Watershed Conservation Fund, awarded the group a \$241,000 grant. The Delaware Bond Bill matched that grant with an additional \$241,000. Kauffman said these awards are paying for Pennsylvania consulting firm, Kleinschmidt, to run the necessary feasibility studies. Lott said the consultant roughly estimates it will cost between \$2.5 and \$3.5 million to remove or modify the dams.

“What's good for the fish is going to be really good for the people,” Kauffman said.

For more information about Brandywine Shad 2020, go to <https://bit.ly/34AXMME>. ♠

FOR TEACHERS

Grace Meredith remembers her first art show. It was 2002, and Meredith was in the second grade at Germantown Friends School. That year, Meredith won first place for her age group in Philadelphia Water Department's Student Art Contest. Her drawing depicted her in a forest cleaning up after her Yorkshire terrier, Teddy.

She remembers the ceremony where she received a certificate and had her picture taken. The older students she met seemed like grown-ups to her.

"I remember thinking that it was amazing that I was in the same league as they were," Meredith said.

Art remained a part of Meredith's life. She eventually earned a bachelor's degree in visual studies from the Tyler School of Art at Temple University. Today, Meredith, 26, works in marketing and communications for the Philadelphia Museum of Art and is a professional artist.

"I always grew up loving art, but until the contest happened, I never took it that seriously," she said. "It just inspired me to keep with it."

This school year marked the 20th anniversary of the contest. In a few months, the Philadelphia Water Department (PWD) and the Partnership for the Delaware Estuary (PDE) will recognize the next generation of winners.

Since the contest first started during the 1999-2000 school year, students have created artwork that shows the importance of clean water and how to prevent water pollution. Kathy Klein, PDE's Executive Director, came up with the contest idea as a way to start a dialogue between students, their family members, and



Philadelphia Still In Student Art Teach Contest: Lesson

friends about the importance of water in their everyday lives. For many years, the winning drawings appeared on SEPTA buses and trolleys to spread the "clean water begins and ends with you" message even further.

From crayon drawings of sea creatures to stop motion videos of pollution moving through our storm drains, Philadelphia students in kindergarten to 12th grade have submitted more than 20,000 works of art. Of those, 228 students have won awards in four age categories.

Jim Lint, the art teacher at Maritime Academy Charter School in Philadelphia, has entered his students in the art contest since 2003 when he first started teaching. Maritime Academy has had 51 winners in the history of the contest.

Lint said he didn't think much about what is in stormwater before he started teaching about it for the contest.

"The more I learned, the better I became at passing along that information to my students," Lint said.

"The contest has provided a great way for me to connect — not just as an art teacher, but the science behind it and the way the infrastructure is created. It's something that we, as citizens, need to take action on and not just depend on the city to take care of. I thought, 'this is an important thing for the kids



Inspiring, Still ing Environmental ns 20 Years Later



to learn so that we can try to stop the problem of our streams and rivers being polluted with trash, and oil, and chemicals.”

Chris Anderson,
PWD’s

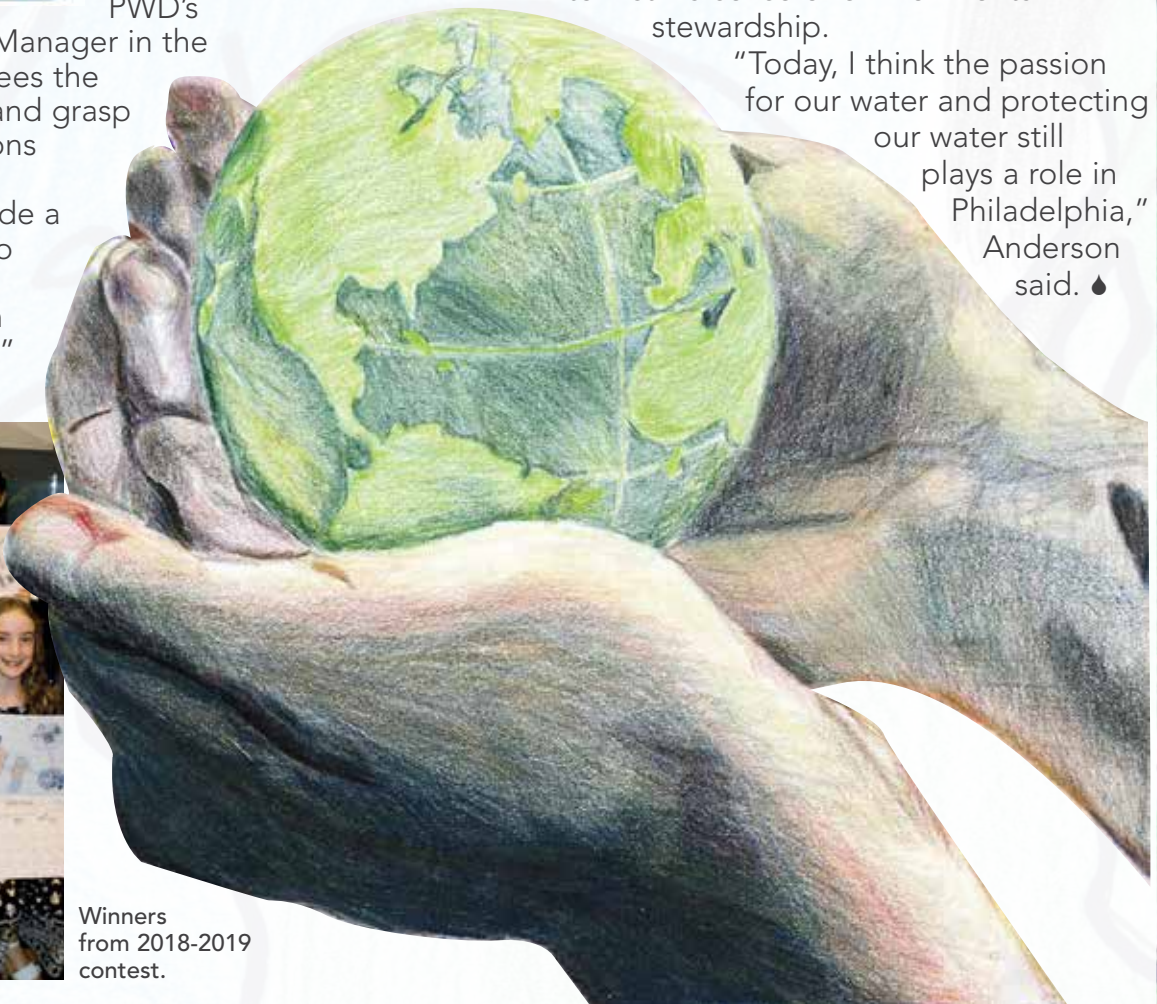
Watersheds Program Manager in the Public Affairs Office, sees the students’ passion for and grasp of environmental lessons through their artwork.

“The students provide a really good insight into what resonates with them in terms of clean water and stormwater,” Anderson said. “It

provides a really great window into their views and their community’s view of how they see water through those issues. It’s nice to see how kids connect to water in terms of trash or animals, or something new they’ve learned about green infrastructure.”

He hopes that the contest will continue to instill a sense of environmental stewardship.

“Today, I think the passion for our water and protecting our water still plays a role in Philadelphia,” Anderson said. ♣



Winners from 2018-2019 contest.

Meg McGuire: Bringing the Delaware River Watershed to Our Doorsteps

Raise your hand if polar bears and melting ice caps are the first things that spring to mind when the topic of the environment gets raised. If they are, you're not alone. For Meg McGuire, the environment is a lot closer to home.

"I think what's fascinating is to bring the environment into our backyards," said McGuire, the founder, writer, and editor of *Delaware Currents*, the independent online news magazine about the Delaware River Watershed.

Since 2015, McGuire has written and tweeted stories about the watershed from the Delaware River's headwaters in upstate New York down into the tidal waters of the bay. The Delaware River is about 20 minutes from McGuire's home, and she

recognized a need for news coverage about issues within and stemming from the Delaware River Watershed. *Delaware Currents* was a way for McGuire to mesh community-focused news with environmental journalism. McGuire publishes about two or three stories per month on the website, and posts to social media from conferences and events. She additionally publishes a monthly newsletter to subscribers and donors.

"My goal with *Delaware Currents* is to speak to the community of the watershed, about the watershed, to help them understand the watershed, and then make decisions that they think are smart about the watershed," McGuire said. "I don't necessarily want to preach at people about the decisions that they should

make. I just want them to be informed about things and then stand up for whatever they think is right. That is a little old-school journalism, I think. That's sort of why I entered the field

30-some years ago."

McGuire spent most of her journalism career as a reporter and editor at community newspapers in Connecticut and New York. Community news often focuses on local or state governments, suburbs, and the people who live in those places.

"My community is the Delaware River Watershed," McGuire said. "It's 330 miles long, and it's way more complicated than I ever imagined."

People not only get their water from the Delaware River and its tributaries,

but governmental decisions, development, tax, and environmental justice concerns related to the river can affect people's lives. There can be questions as to how much water we're using from reservoirs, questions about water storage, and questions as to who is using that water from city to city. Those questions can turn into multi-community, multi-city, issues that have to do with the whole water system.

"I am more convinced than ever that understanding the water system is crucial in the era of climate change. I just believe that to the marrow of my bones." ♦

To read *Delaware Currents*, visit www.delawarecurrents.org. To send an e-mail, go to delawarecurrents@gmail.com.



Meg McGuire is the founder, writer and editor of the online news magazine, *Delaware Currents*

"My community is the Delaware River Watershed. It's 330 miles long, and it's way more complicated than I ever imagined." —Meg McGuire

Philadelphia Adds Community Cans Program Puts an Artistic Spin on Collecting Trash

Philadelphia is already known for its colorful and storytelling urban murals on buildings across the city. In mid-December, 50 trash can lids in the Juniata and Southwest neighborhoods became the latest canvases for art in the City of Brotherly Love.

Partnership for the Delaware Estuary (PDE) and partners at the Philadelphia Water Department, Mural Arts Philadelphia, The Tookany/Tacony Frankford Watershed Partnership, the Southwest Community Development Corporation, the African Cultural Alliance of North America, and the City of Philadelphia's Zero Waste and Litter Cabinet worked with the Philadelphia's Community Cans program, which combines art and community engagement to reduce litter across neighborhoods. Funding for 48-gallon wire trash cans with rounded lids was provided through a grant



Trash can lids along streets in the Juniata and Southwest neighborhoods in Philadelphia are works of art thanks to the Community Cans program.

from the Environmental Protection Agency's Trash Free Waters program. The grant also paid local artists to create designs for the trash can lids, which residents painted during community events held at Ferko Playground and Tilden Middle School.

Research shows that residents are more likely to put trash in cans they have decorated as well as encourage others to keep the neighborhood beautiful. The decorated cans are for public trash from pedestrians. Community sponsors, including local businesses, empty the decorated trash cans and combine the contents with their own trash for pickup.

Reducing litter and debris in city streets prevents pollutants like plastic water and soda bottles from reaching local streams and rivers. The less pollution that goes into our waterways, the healthier they are, and the better the quality of life for residents who rely on the Delaware and Schuylkill rivers for their drinking water.

Community groups, business associations, and other organizations interested in exploring how to get Community Cans into their neighborhood can learn more about the program by visiting www.cleanphl.org/communitycans. ♦

The Egypt Diaries: Tales from 10

Egypt is an ancient country that has its eyes on the future. As the country urbanizes, protecting natural resources is more important than ever. The country is rising to the challenge and turning to sustainable solutions. Last fall, I learned all this during a 10-day trip to Egypt, along the Nile River. The trip was part of my Executive Master of Natural Resources program at Virginia Polytechnic Institute and State University. I was one of 32 students and four university faculty members who traveled to Egypt to study the country's sustainability challenges and solutions by experiencing its people, culture, and lifestyle.

First Stop: Cairo and Garbage City

Cairo is one of the largest metropolitan cities in the world, with over 20 million people. Egypt's population is growing at roughly 2 percent per year, and with it, so does Cairo's square mileage

and the use of natural resources.

On Cairo's outskirts lies Garbage City, a slum where the residents (the Zabbaleen, or "garbage people") make their livelihoods by sorting trash and selling recycled materials. Their efficiency is exceptional, with 80 to 90 percent of the garbage recycled. As I walked through the area, I was amazed by how much of a city it encompassed, with apartments, stores, and schools. The people seemed happy, and for the most part, healthy. I struggled to reconcile my views of Garbage City. Is it a poor slum, or is it an innovative example of community-led efforts to manage waste? Perhaps it's both.

Next Adventure: "Sailing" on Dahabiyas

In Luxor, we boarded three boats and set sail for five days up the Nile on sailboats called dahabiyas. The Nile is one of the few rivers in the world that flows south to north. "Sail" is a

A cardboard recycling operation in Garbage City, Cairo.



Days on the Nile

Story and photos by Virginia Vassalotti,
PDE's Schuylkill Action Network Coordinator

loose term. Most of the time, diesel-powered tug boats towed us upriver.

As the boats chugged ahead, I guiltily counted the environmental impacts of this trip — airplane carbon emissions from Washington, D.C. to Cairo, daily transportation in gasoline-powered vans, diesel-operated tug boats, and multiple single-use plastic bottles. I later estimated that in just 10 days, our 30-plus person group used over 2,000 water bottles — YIKES! Every night, I heard the boat discharge wastewater into the river. With my conscience stinging, I looked for a bright side. Then I remembered that Virginia Tech offset our airplane carbon emissions through Terrapass, a company that invests in sequestering carbon and renewable energy.

Farming on the Island of Besaw

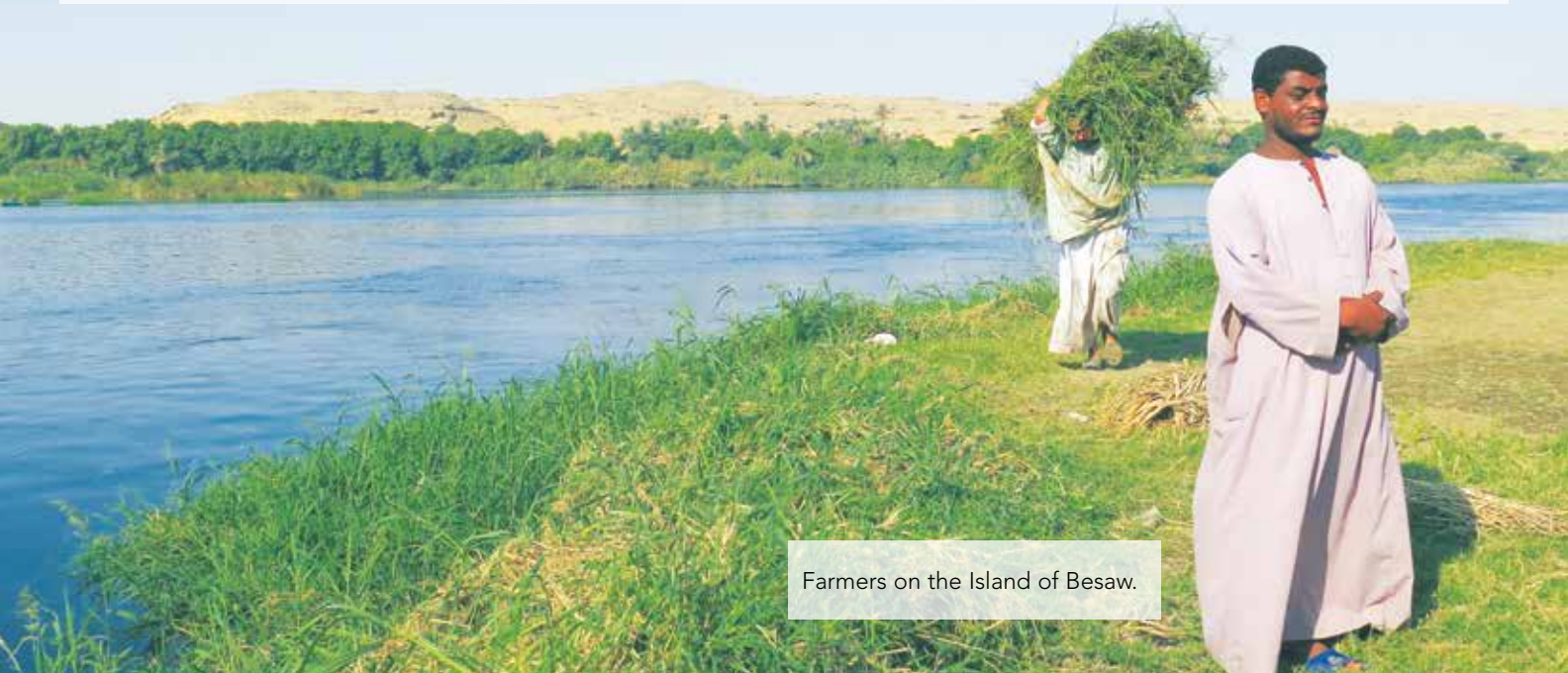
The Island of Besaw is a traditional agricultural community on the Nile. Sayeed, an island resident, welcomed us into his home, where his wife made us all hibiscus tea, a delicious staple of Egypt. We discussed his life as a small-scale farmer. Like others who farm there, Sayeed's livelihood depends on the quality and quantity of water in the Nile. Water insecurity, low productivity, fluctuating product prices, and other factors are all challenges to the farming community.

Final Stop: Aswan

Built in the 1960s, the High Aswan Dam provides hydroelectric power to Egyptians. In its heyday, the dam provided nearly half of Egypt's energy. Now, hydropower comprises only 3 to 9 percent of the country's power. To the south, Ethiopia is building the Grand Ethiopia Renaissance Dam (GERD), which will be the largest hydropower dam in Africa. The GERD is on the Blue Nile River, where roughly 80 percent of the Nile's water originates. Ethiopia and Egypt are negotiating water rights and the fill rate for the reservoir. I assumed this would be a huge topic of discussion throughout our trip. Surprisingly, most of the Egyptians my group talked to didn't seem concerned.

"The Nile has always been here and always will be," one resident said. "Egyptians are resilient."

That resiliency put things into perspective for me as an American. Environmental solutions cannot be developed in a vacuum. We must take a true systems-based approach, considering the three "P's" - people, profit, and the planet. I also realized that culture plays into environmentalism. Not all western solutions would necessarily work in Egypt. The solutions are different. Different isn't bad, it's just different. ♦



Farmers on the Island of Besaw.

DIGGING DEEPER: Getting to the Root of Your Gardening Questions

By Sarah Bouboulis, PDE's Habitat Project Coordinator

Q: I am interested in putting native plants in my garden this spring. Is late winter a good time to start planting seeds indoors, as I do with my vegetables? I was thinking of planting milkweed, black-eyed susans, and cardinal flower. —GREG, WYOMING, DELAWARE

A: Hi Greg, I can provide some insight into the specific plants you suggested. Black-eyed Susans (*genus Rudbeckia*), are generally very easy to start in pots. You can start them indoors, but they have better success when sown directly outdoors since they prefer a period of cold before germination — but it's not required.

Cardinal flower (*Lobelia cardinalis*) is one of the best plants to start indoors, but germination rates can be low, and seeds can take several years to germinate. Sow a lot of seeds for the best results.

Finally, milkweed (*genus Asclepias*) can be a little tricky. The seeds require a full season of cold and some sunlight before germination. The best way to accomplish this is to sow seeds outdoors on the soil surface in the fall. You can achieve similar results by keeping the seeds in the refrigerator over winter and then sow them indoors (or out) in late winter/early spring.

Most wild native plants grow on their own timelines. Native plants have evolved to germinate, given the environmental conditions in our area. Therefore, indoor or greenhouse germination can be detrimental to plants. In general, my suggestion for most seeds is to sow them directly into your garden in the fall (don't forget to mark them). You won't have 100 percent success (maybe not even 50 percent), but you will provide environmental conditions that are well suited to plants throughout the winter.

For more information about starting native seeds and the various requirements of different species, visit the Wildseed Project (www.wildseedproject.net) and the Ecologist Landscape (www.ecolandscaping.org). To get to the root of more gardening questions, subscribe to Perennial Pages. E-mail sbouboulis@delawareestuary.org.

Black-eyed Susans

Schuylkill Acts & Impacts is Taking Applications

Pennsylvania students who are looking for something to do this summer can apply now for Schuylkill Acts & Impacts. This is a weeklong watershed expedition along the 120-mile Schuylkill River from its headwaters in Schuylkill County to where it meets with the Delaware River in Philadelphia.

High school students from Schuylkill, Berks, Montgomery, Chester, and Philadelphia counties who are chosen for this program will spend the week camping, kayaking, learning about different water quality impacts in the watershed, interacting with environmental professionals throughout the watershed, and much more! Participants are selected through a competitive application review and phone interview process. For more information, including dates and the application deadline, please contact Alexa Smith at outreach@schuylkillheadwaters.org.



Photo courtesy of Schuylkill Headwaters

Wilmington Earth & Arbor Day Celebration



10 a.m. to 2 p.m., Wednesday, April 22

H.B. DuPont Plaza, Wilmington, Delaware

Celebrate the 50th anniversary of Earth Day at the Wilmington Earth and Arbor Day Celebration.

The Partnership for the Delaware Estuary (PDE) and the City of Wilmington invite people of all ages to stop by H.B. DuPont Plaza between 10 a.m. and 2 p.m., and visit more than 25 eco-friendly vendors. There will be crafts and games for children, free plants, prize raffles, a tree climbing demonstration, food trucks, and more! We will also

recognize the winners of the Clean Waterways Wilmington Student Art contest.

Please attend this free celebration of our planet, trees, and our waterways. For more information, contact Sarah Morales at smorales@delawareestuary.org.

Time to Clean Up

Ready for some spring cleaning? Here's a chance to get involved in your community! Starting in March, there are community cleanups, often called scrubs, taking place throughout the Delaware River Watershed and Estuary.

SCHUYLKILL SCRUB – March 1 to May 31

Throughout the Schuylkill River Watershed. Visit www.schuylkillscrub.org for cleanup dates, times, and locations.

SOUTH JERSEY SCRUB – March 28 to April 26

From Trenton to Cape May, New Jersey. Visit www.southjerseyscrub.org for dates, times, locations, and other information. A kickoff event is set for Wednesday, March 27 at D & R Canal State Park in Trenton (time to be announced).

CHRISTINA RIVER WATERSHED CLEANUP – Saturday, April 4, 8 to 11 a.m., In Wilmington and New Castle County, Delaware. Visit www.christinarivercleanup.org for details. ♡



2019 Christina River Watershed Cleanup.



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The Partnership for the Delaware Estuary: Connecting people, science, and nature for a healthy Delaware River and Bay

The Partnership for the Delaware Estuary, Inc. (PDE), is a private, nonprofit organization established in 1996. PDE is the host of the Delaware Estuary Program and leads science-based and collaborative efforts to improve the tidal Delaware River and Bay, which spans Delaware, New Jersey, and Pennsylvania. To find out how you can become one of our partners, call PDE at (800) 445-4935 or visit our website at www.DelawareEstuary.org.

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Estuary News encourages reprinting of its articles in other publications. *Estuary News* is produced four times annually by the Partnership for the Delaware Estuary, Inc. (PDE), under an assistance agreement (CE-993985-15-0) with the U.S. Environmental Protection Agency (EPA). The purpose of this newsletter is to provide an open, informative dialogue on issues related to PDE. The viewpoints expressed here do not necessarily represent the views of PDE or EPA, nor does mention of names, commercial products or causes constitute endorsement or recommendation for use. For information about the PDE, call 1-800-445-4935.

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