CHESTER | MILES, WYE, & EASTERN BAY

FALL 2022

IN THIS EDITION

ShoreRivers Leads Research on Biostimulants in the Region Innovative Funding Strategy Accelerates Restoration Projects Empowering the Next Generation of Land Stewards

LETTER FROM THE EXECUTIVE DIRECTOR

If you're like me, driving through the farm fields of the Eastern Shore provides a sense of peace and place. I love the ability to buy fresh and local, and to know exactly what I'm putting on the table for my family. In order for this culture and ecosystem to be preserved, ShoreRivers prioritizes collaborative work with the farming community. Many of you have expressed interest in learning more about our agricultural restoration projects and our technical engineering expertise—*this issue is for you!*



Fifteen years ago, we hired a third-generation farmer and tasked him with working with local landowners to put practices in the ground that would prevent pollution from entering our rivers. Today, our agriculture and restoration department has grown to a staff of seven, with technical expertise that includes engineering, GIS analysis, surveying, identification of government funding and incentives, restoration site placement, and maintenance guidance.

Now, ShoreRivers is known region-wide as the expert on the Shore for research and implementation of innovative farming practices and technology.

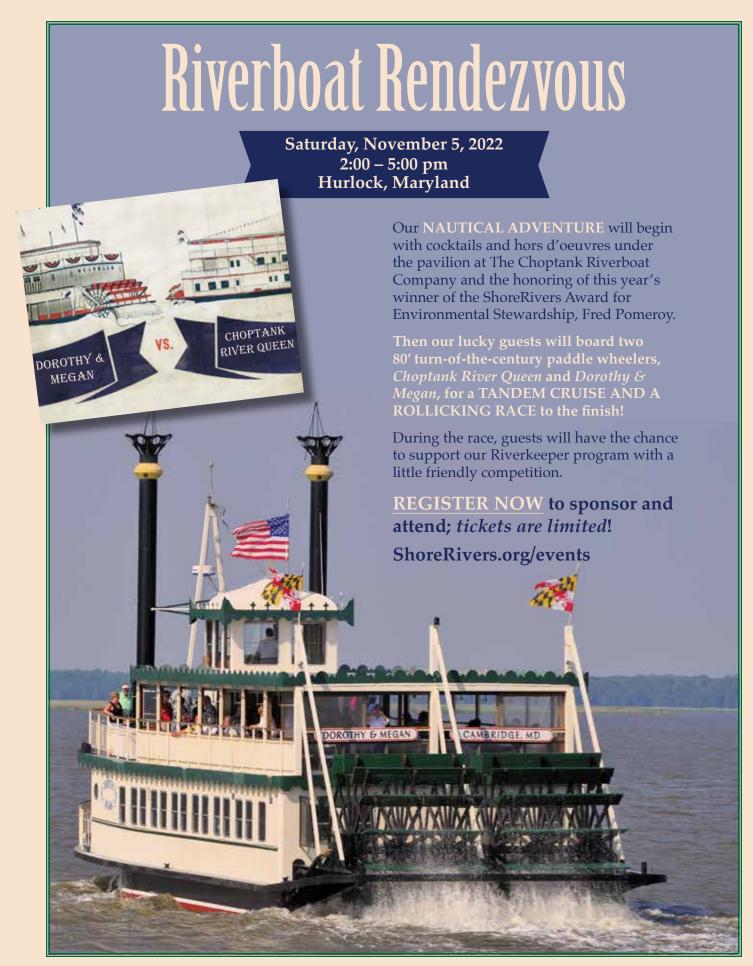
On the Mid and Upper Shore, row crop agriculture accounts for about 65% of the land use, with corn, wheat, and soybeans grown for feed to support the poultry industry. Because it is our largest land use, row crop agriculture is also the largest source of nutrient and sediment pollution in our rivers. Our staff works with our communities and collaborates with farmers, landowners, and ag service providers to achieve both agronomic and environmental goals, and to fund myriad ag projects and programs.

If you want to hear how we're cultivating a resource-sharing network of next generation farm- and land-owners, turn to page 8. If you're interested in our hypotheses and methods for conducting scientific research on the impacts of a new type of fertilizer on water quality and crop yield, flip to page 4. From reimagining the best way to work with communities (page 7), to putting river-friendly yards projects in urban centers (pages 10 and 11), to accelerating restoration through innovative funding mechanisms (page 6), this edition has something for everyone.

ShoreRivers is your local resource on land restoration, agricultural research and innovation, and best management practices—I hope you enjoy this edition and learn something new about what's happening all around our rural, working landscape.

Isabel C. J. Hardesty Executive Director

Cover photo: ShoreRivers' Agricultural Specialist Ariana Muñoz gathers soil samples from a farm in Wye Mills in August. All photos are by ShoreRivers staff unless otherwise noted.



SHORERIVERS LEADS RESEARCH ON

By Ariana Muñoz, Agricultural Specialist



Synthetic crop fertilizer from the agricultural sector is a primary contributor of greenhouse gas emissions and excess nutrients in waterways. The Chesapeake Bay Watershed Model estimates 17% of nitrogen and 19% of phosphorus loads to the Bay are derived from chemical, synthetic fertilizers applied to farmfields. About 50% of fertilizers applied to fields can be lost through leaching to waterways or volatilization in the nitrous

oxide form, which is a harmful greenhouse gas that contributes to climate change.

Many farmers implement conservation practices including cover crops and precision fertilizer application technology in order to retain fertilizers on their fields and keep them available for crop growth. Another emerging fertilizer practice—using biological sources of nitrogen (biostimulants), as opposed to synthetic—also has the potential to reduce nitrogen

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loss. However, we don't fully understand the impact of these biostimulants on water quality because we lack sufficient information about their impacts on corn yield, soil nitrogen retention, and general soil health.

ShoreRivers has embarked on a five-year research project to answer these questions through onfarm water quality monitoring and partnerships with University of Maryland, agribusinesses, and local farmers. This research will generate scientific data furthering our knowledge of the impacts of biological nitrogen on water quality and soil health that could have implications for region-wide onfarm fertilizing practices.

THE BACKGROUND

Crops need soluble forms of nitrogen to grow, but soluble nitrogen also moves quickly through soil once it comes into contact with water, making it less accessible for crops and more likely to leach into groundwater. Synthetic fertilizers—the majority of fertilizers used in grain production—are highly soluble, leading to a high percentage of nitrogen



BIOSTIMULANTS IN THE REGION

loss. A new practice currently being explored to combat this nitrogen loss is a range of nitrogen-fixing products called biostimulants.

Biostimulants are applied to seeds, plants, or soil to stimulate natural processes that enhance nutrient uptake and improve crop yield. By providing nitrogen to crops directly and in a less soluble form, biostimulants have the potential to reduce nitrogen leaching below the root zone, thereby reducing loss into waterways. This type of fertilizer is commonly used on specialty crops and legumes, but recent innovations have provided the opportunity to use them on other crops such as corn.

Biostimulants could reduce reliance on synthetic fertilizers and are currently advertised as replacing 40 to 50 pounds of synthetic nitrogen per acre. With all of these benefits, wide-spread application could have positive impacts on crop yield, reduce nitrogen loss into waterways, curb carbon emissions, and help farmers be more resilient to fluctuating synthetic fertilizer prices and to climate change.

However, biostimulants are a fairly new technology for corn, with research mainly from the Midwest focused on yield benefits, and limited data on their potential water quality and soil health benefits. ShoreRivers recognized an opportunity for environmentally focused research of the effects of these products on water quality, soil health, and yield information specific to the Mid-Atlantic region.

Partnering with University of Maryland researchers and local farmers, over five years we will collect crop yield and water quality data from six experimental field sites located in the Mid and Upper Shore regions and compare two different biostimulant products paired with reduced nitrogen fertilizer rates. If the data support agronomic, water quality, and soil health benefits, there are potential region-wide ramifications: biostimulants could be cost-shared through state and federal programs, provide farmers a new fertilizer option to help maintain profitability, and reduce reliance on synthetic fertilizers, which negatively impact water quality, climate, and soil health.



THE RESEARCH

For this project, we will collect crop yield, water quality, and soil health data on fields applying biostimulants in corn cropping systems. The objectives are to:

- 1. Determine the effect of biostimulants on corn yield when reduced synthetic nitrogen fertilizers are applied.
- 2. Measure nitrogen loss via leaching from farmers' fields where biostimulants are applied.
- 3. Track soil health to determine changes when biostimulants are used in the cropping system.

THE HYPOTHESES

1. Biostimulants will increase corn yield at higher nitrogen rates and will maintain yields at lower nitrogen rates.

- 2. Pairing lower synthetic nitrogen application rates with biostimulants will alter soil nitrogen pools and decrease nitrogen loss below the root zone.
- 3. Biostimulants will not impact soil health metrics compared to fields that follow normal nutrient management using synthetic nitrogen fertilizers.

Throughout the first season of research, ShoreRivers staff monitored farm plots with the help of lysimeters, devices that collect water samples from tiny spaces within the soil (see photo for reference). We sampled soil water at two depths: within and below the corn's root zone. We also collected soil samples at various depths to analyze nutrients before planting, during the growing season, and after harvest, and obtained yield data from each plot.

THE IMPACT

Biostimulants are a new category of products that could help build farm resiliency and protect the environment. Supplementing even a small amount of synthetic nitrogen fertilizer with biological sources has the potential to significantly improve the health of waterways throughout all corn-growing regions. This important research could lead to transformative improvements in water quality and help Delmarva's farmers maintain high crop yields and healthy soils. We look forward to sharing our results!

This research is partly funded by The **Keith Campbell Foundation for the** Environment, private donations, and two agribusiness partners; we are still pursuing funding to complete years two through five.

INNOVATIVE FUNDING STRATEGY ACCELERATES RESTORATION PROJECTS

By Kristin Junkin, Director of Operations & Finance, and Tim Rosen, Director of Agriculture & Restoration





Funding for conservation and restoration work has traditionally flowed through state and federal programs either as cost-share, where the government and the landowner each pay a portion, or through competitive grants typically restricted to local government entities or nonprofits such as ShoreRivers. These financial structures have been used for several decades to help fund the cleanup of the Chesapeake Bay. For example, the Chesapeake & Atlantic Coastal Bays Trust Fund provides restoration grants in Maryland to nonprofits and local governments based on proposed reductions of nutrient and sediment pollution.

But in recent years it has become clear that these traditional funding mechanisms are unable to ramp up the pace of conservation needed to comply with the U.S. Environmental Protection Agency's mandate for cleanup measures to be in place by 2025.

To address this, resources are being put in place for government funders to purchase outcomes generated by restoration projects rather than paying for the project directly. Outcomes in the conservation world are generally reductions of pounds of nitrogen, phosphorus, and sediment that are generated by a best management practice. An example would be a piece of land that generates 1,000 pounds of nitrogen pollution each year. A best management practice costing \$100,000 installed on that parcel is able to reduce the nitrogen pollution by 50%, generating a 500-pound nitrogen reduction outcome. With a typical project lifespan of 10 years, the cost would be \$20 per pound per year for this outcome.

The purchase of outcomes allows for non-traditional funders, such as private investment firms, to enter into conservation efforts because they can provide the capital required to fund the project before the government steps in to buy the outcomes. The funder is then reimbursed for the investment and makes a profit. The trickiest part of this funding mechanism is creating a marketplace where outcomes can be purchased. In Maryland, this was resolved with the passing of the Clean Water Commerce Act of 2021 and expanded by the Conservation Finance Act of 2022, which allow the state to purchase environmental outcomes from anyone, not just nonprofits, using state funds.

The Maryland Department of the Environment will oversee the Clean Water Commerce Account for Environmental Outcomes. Nitrogen outcomes, calculated in dollars per pound, will be purchased from projects through a competitive solicitation that ranks projects based on their cost per pound of nitrogen reduction. This process ensures the state is utilizing taxpayers' dollars to purchase outcomes from projects that produce the best reductions.

This funding mechanism will accelerate restoration efforts by shortening the timetable of bureaucratic processes from design to final installation and by shifting the risk to the entity financing the project; the state is simply purchasing the final outcomes.

All parties to outcome-based funding can benefit. Government and nonprofits win under this arrangement because they can reach Bay pollution reduction goals faster. When ShoreRivers leads these projects in our watersheds, we clean up our Eastern Shore rivers faster. Taxpayers win because, with larger scale projects, the government pays a more competitive price. And the private investment companies win by making a profit.

ShoreRivers is partnering with for-profit companies and actively pursuing projects that will be submitted to Maryland's Clean Water Commerce Account. Private companies want to partner with us because of our expertise in conservation and restoration work, as well as our knowledge of Eastern Shore restoration opportunities and our landowner relationships. We are also helping to facilitate discussion of this funding format in Delaware.

At ShoreRivers, we are taking advantage of all available financial mechanisms to restore our local waterways. Proactive participation in innovative funding programs will accelerate our efforts to clean up our waterways.

BUILDING TRUST WITH COMMUNITIES THROUGH FLEXIBLE RESTORATION FUNDING

By Darran White Tilghman, Director of Community Engagement



Restoring our environment and building trust with our communities: these are not easy jobs, and they cannot be accomplished quickly or separately. This is long-term work. As legendary singersongwriter Iris DeMent reminds us, "I'm working on a world I may never see."

More than ever, environmental restoration and community

engagement require innovation and flexibility.

ShoreRivers is proud to be working with *Envision the Choptank* to engage three communities from across the Choptank watershed that have historically been excluded from both the attention and resources of conservation work. The soils in these communities are marginal and poorly drained, as they are in many communities of color and lower incomes across the Eastern Shore, due to generations of discriminatory practices in housing, lending, and other systems of access to land and assets.

Over the past two years, with funding from Chesapeake Bay Trust, Envision the Choptank laid the foundation to address concerns including frequent flooding, polluted public ponds, and lack of access to gathering spaces within these three communities.

Engagement team members have shared community meals, participated in neighborhood walks, and hosted bilingual listening sessions to understand residents' needs and interests. After conducting site assessments, the team developed concept plans to address these specific needs.

Now, thanks to a grant from the National Fish and Wildlife Foundation, the partnership can begin putting community-centered projects in the ground, strengthening trust through continued engagement and support beyonda single grant cycle.

This grant will pilot two new adaptive strategies we are excited to bring into our watersheds:

AMBASSADOR STIPENDS: Community members have generously given their time and shared their perspectives with the *Envision* team. An ambassador fund will allow community members to be paid for their time as project consultants, a power- and resource-sharing model that honors the trust the engagement team has worked to build.

FLEXIBLE RESTORATION FUND: Rather than predicting or prescribing what restoration practices will be needed for these communities, this pool of funding can be applied to the projects community members and the *Envision* team decide to prioritize. This approach helps empower residents as stewards of native plantings and other stormwater management practices that improve shared spaces and foster human well-being.

Every one of us has a right to clean water, and our rivers need all of our voices. ShoreRivers believes that diversity, equity, inclusion, and justice are critical to achieving our mission of clean water, and the *Envision* partnership is a valuable resource in fulfilling that mission.

Envision the Choptank is a collaborative partnership that brings together nonprofits, federal and state agencies, scientists, local governments, and community groups to restore both the waters of Maryland's Choptank River and the communities that surround it.

SHORERIVERS EMPOWERS NEXT GENERAT

by Laura Wood, Ag & Outreach Coordinator



Our families had been neighbors and kin for 11 generations, but we didn't meet until we became coworkers at ShoreRivers. When Darran White Tilghman joined ShoreRivers in 2019, we soon realized that we not only both had connections to beloved family farms, but that our two families were linked from their earliest generations on Maryland's Eastern Shore. We learned this

about each other in our first conversation because these farms are a part of our stories, and our deep care for these properties was part of what led us to work for an organization that champions land stewardship.

In 2020, Darran and I gathered together our families for an afternoon of exploring each of our family farms and talking about the beauty, the worries, and the opportunities of being the next generation of stewards for these farms. The conversations sparked the idea for a ShoreRivers program. We knew we were not the only ones navigating the responsibilities of multigenerational land stewardship, and we wanted to connect with others to build a community of learning and support.

I am so excited to share that ShoreRivers is launching a new program focused on just that: supporting the next generation of land stewards on the Eastern Shore. Since 92% of land in Maryland is privately owned, it is crucial that landowners are engaged in conservation

When an Eastern Shore farm has been in a family for generations, its story will inevitably include strange twists, near catastrophic losses, and insights about our rural past that are recorded nowhere else. As the richness of memory and history accumulate, each successive generation may feel even



LAURA WOOD (left) is ShoreRivers' Agriculture & Outreach Coordinator. She and her sisters, Olivia Wood (right) and Julia Anderson, are next generation land stewards for two family farms on the Chester and Corsica rivers.

Having generational land provides an anchor for our family, for those of us who grew up here on the farm, but also for those who live elsewhere and always know they can come back. The daunting thing about being the 11th generation stewarding a family farm is the worry about being the generation that loses it. So, it feels really important to understand the financial side of running a farm as a business and taking advantage of all possible avenues that can diversify income while increasing sustainability.—Laura Wood

Living on or being responsible for generational land means that you are a bit like a time traveler. You're living in the present, but you're also living with the decisions and traditions of your ancestors and you have to figure out whether they are compatible.—Olivia Wood



DARRAN WHITE TILGHMAN is ShoreRivers' Director of Community Engagement. She and her husband, Ben Tilghman, are next generation land stewards for the Hermitage Farm on the Chester River.

We try to have a custodial mindset—that it isn't really land we own, but land we're caring for on behalf of the next generations. As Chief Seattle famously stated: we borrow the land from our children.

What's most daunting is the feeling that there is SO MUCH to be fixed, rectified, or even just acknowledged. Both in physical terms like caring for structures, but also in historical terms of making sense of the legacies of displacement, enslavement, and extractive land use. There's a huge sense of responsibility that often feels burdensome, so I try to remind myself of the great opportunities and privileges that come with it, too.—Ben Tilghman

ION OF LAND STEWARDS

Our vision is Eastern Shore family farms that are bountiful, intact, priceless conservation landscapes for the next generation and the many that follow.

if we wish to see significant improvements in our landscape's ecological function and in the health of our rivers. ShoreRivers will help rising stewards set conservation objectives alongside, and in support of, agronomic and profitability goals.

In 2023, ShoreRivers will convene the first cohort of Next Generation Land Stewards—people who are new or upcoming landowners—to share resources and expertise and create a network of peer support. Workshops with expert partners will explore topics such as succession planning, equitable farm leases that include conservation, forest stewardship, government incentives, and land easements. This program will connect participants to existing efforts and resources—such as the Conservation Reserve

Program and the Natural Lands Project, among others—that will educate and empower the next generation of land stewards to feel confident as they navigate the decisions that will define our landscapes and waterways for years to come.

Whether you are the first generation on family land or the 15th, this program is for you. To learn more or join our first cohort of Next Generation Land Stewards who will help build this program, contact: Laura Wood at *lwood@shorerivers.org.*

more keenly the sense of responsibility to that land, but we often also feel fear and confusion about its future. At ShoreRivers, we know these complexities firsthand because many of our staff are next generation land stewards.



COURTNEY LEIGH (children pictured) is ShoreRivers' Membership Manager, Together with her husband, Tom Leigh, she is a next generation land steward of family land on the Sassafras River.

Generational land is the heart of family history, curated with love. My husband's parents purchased a farm in Kent County near the town of Betterton where the family lineage runs back to the late 1800s. Purchasing the land extended existing family land and protected the area from a high density development project.

Our family recently partnered with the Eastern Shore Land Conservancy, ShoreRivers, and the Natural Lands Project with Washington College to put the farm into a conservation easement and transform the land use from farming to meadows. These decisions were made by the whole family. When it is our turn to take the helm, I hope we can prepare our daughters and the next generation for this gift in the same manner.—Courtney Leigh



KATIE DRUMMOND is ShoreRivers' Restoration Designer. She and her husband, Paul Drummond, recently moved to their family farm in Cecil County.

Although we are only second generation land owners, the Drummond family has been farming land in the Delmarva region since immigrating here from Europe. This farm was my father-in-law's passion. He passed away unexpectedly in one of his fields, doing what he loved. Making this farm our home, preserving the land, and maintaining it in agricultural production ensures that his life's work lives on through us and future generations. —Katie Drummond

My father used to say, 'If you want to make a small fortune: start with a really big fortune and then go into farming.' He would say it with a laugh, but it rings true for just about every farmer I speak with. To be able to persevere, you have to take the long view. What will the weather be like next year, and 10 years from now? Will my children be able to grow this same crop here when they're my age? Looking at the long view and adapting along the way will hopefully keep our farm durable, yet nimble.—Paul Drummond

RIVER-FRIENDLY YARDS PROJECT BRINGS SHORERIVERS' RESTORATION WORK INTO TOWNS AND CITIES

by Bethany Ziegler, Communications Specialist



Whether your property can be measured in postage stamps or parcels, what we do on land ultimately affects the water. By stitching together small, river-friendly habitats to create "conservation corridors," we can make the essential difference needed for all species, including our own, to thrive. ShoreRivers works with local partners, businesses, and organizations to create river-friendly environments in both urban and rural locations, on public and private lands. For more information or to request a consultation, visit our website at shorerivers.org/river-friendly-yards.

PLANTS AND SWALES REDUCE FLOODING AND CREATE BEAUTY IN COMMUNITY PARK

The Community Park in the Town of Galena is getting a muchneeded facelift this fall. Beginning in October, families enjoying the park will be treated to scenic upgrades of native flowering perennials and ornamental grasses that will offer not only beauty, but also provide pollinator habitats and filter stormwater.

Intentionally designed ditches will reduce flooding in the park, allowing for better community recreation. Currently, rainwater runoff from adjacent commercial and residential development leads to nuisance flooding in the park, making it unusable at

times for town residents looking to enjoy leisure time in nature. Additionally, three new "islands" in the parking lot planted with trees will provide habitat and shade to cool the adjacent pavement. All of these practices will reduce the amount of polluted rainwater flowing into Dyer Creek, one of the most impaired tributaries of the Sassafras River.

This project is supported by a grant from the Maryland Department of Natural Resources Trust Fund dedicated to Eastern Shore High Priority Areas.



MARINA WELCOMES VISITORS WITH **BEAUTIFUL MEADOW**

The Chestertown Marina Cerino Center—home to ShoreRivers' Chestertown office and the town marina office—is now a beautiful and purposeful demonstration of river-friendly plantings. Native shrubs and perennials with their showy yellow, orange, and purple flowers—are removing pollution from stormwater before it flows to the Chester River. All of the gutter downspouts have been rerouted to flow into a rock-lined pond in front of the building, where water filters slowly into the surrounding ground, leaving the soil and nutrients in place. The colorful flowers and foliage have transformed the Cerino Center into a happy and welcoming destination. Visitors can sit on the marina porch and enjoy the view of the little pond and surrounding meadow, with the Chester River as the backdrop.

This project was made possible by a grant from the Robert F. Schumann Foundation and the design team at South Fork Studio Landscape Architecture. Essential support and expertise were provided by Wye Gardens, Anthony's Flowers and Landscaping, Owen Excavation, and Edge Roofing. ShoreRivers volunteers put all 320 plants in the ground at a First Friday "Dig and Drinks" event in June.

OUTDOOR CLASSROOM AND MURAL DRAW STUDENTS TO NATURE

This spring, students at New Directions Learning Academy in Dorchester County helped create an outdoor classroom and mural for their school as part of a ShoreRivers' Environmental Education program. Research shows that being outside and interacting with nature improves learning and benefits physical and mental health. At New Directions, what had been a forgotten, barren corner of crabgrass and concrete is now a colorful and inviting place to learn and hang with friends.

As an opportunity for experiential learning, students were involved in every step of the process. A drab concrete wall has come alive with a mural designed and painted by students and staff, providing a happy backdrop for a circle of picnic tables surrounded by shrubs and trees. The native plantings will attract birds and butterflies and help capture and filter rainwater before it reaches the drainage ditch that runs next to the school and into the Choptank River. To celebrate the new outdoor classroom, students hosted a ribbon-cutting ceremony complete with invitations and signage.



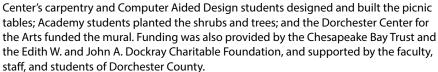
PARKING LOT RENOVATIONS **CURB FLOODING AND IMPROVE** STREAM HEALTH

The image of a parking lot in a storm rainwater rushing along curbs and collecting in huge puddles under cars—is a familiar one. The volume and velocity of stormwater emptying from parking lots into drains and ditches causes stream erosion and deposits soil, nutrients, trash, and oil into the rivers. Urban stormwater runoff is a significant and growing threat to our waterways as we continue to develop and pave over our land.

ShoreRivers and Washington College recently installed a series of renovations to a large parking lot on campus to address this issue of parking lot runoff. In between rows of parking spaces, we installed mini rain gardens with shrubs and trees to capture and slow rainwater, allowing pollution to filter out before entering the campus' stormwater pond and eventually discharging into Radcliffe Creek, a tributary of the impaired Middle Chester River.

These stormwater improvements were made possible with funds from Chesapeake Bay Trust's Green Streets, Green Towns, Green Jobs (G3) grant program.

We are thankful to all the partners who brought this opportunity for healing and learning to the students at New Directions Learning Academy. The **Dorchester Career and Technology**







STUDENTS WELCOMED TO SCHOOL WITH NEW WALKING TRAIL AND TREES

Students and staff at Galena Elementary School have a lot to look forward to this fall and winter, with several projects in the works to enhance their schoolyard and improve recreation.

ShoreRivers and the Town of Galena installed a new walking trail, which meanders for one third of a mile around the perimeter of the schoolyard. The trail will be made even more beautiful with wildflower meadows and native trees, planted this fall as part of ShoreRivers' Tree Stewards Program. ShoreRivers is

also working with the school to design an outdoor learning environment adjacent to the school building to allow the children to incorporate nature into their daily learning. The space will contain a vegetable garden, composting area, and outdoor seating.

Not only will each of these projects cultivate a more inviting space for the school's students, they'll also allow the schoolyard itself to contribute to a healthier environment.



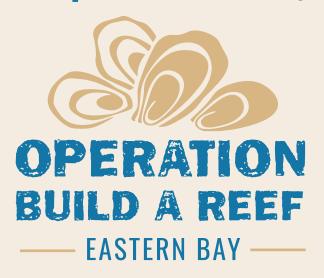
Eastern Shore Conservation Center 114 S. Washington St., Suite 301 Easton, MD 21601

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Help us build an oyster reef in Eastern Bay!





We're more than halfway toward our fundraising goal for Operation Build-a-Reef, which will result in 100 million spat planted in Eastern Bay. **EVERY \$100 DONATION PLANTS ANOTHER BUSHEL OF BENEFICIAL BIVALVES** in our watershed. We're proud to join Oyster Recovery Partnership, Horn Point Oyster Hatchery, and MD's Department of Natural Resources in this effort and we appreciate the kind sponsorship of Smyth Jewelers and Bosun's Marine.

GIVE TODAY AT SHORERIVERS.ORG/GIVE/REEF