

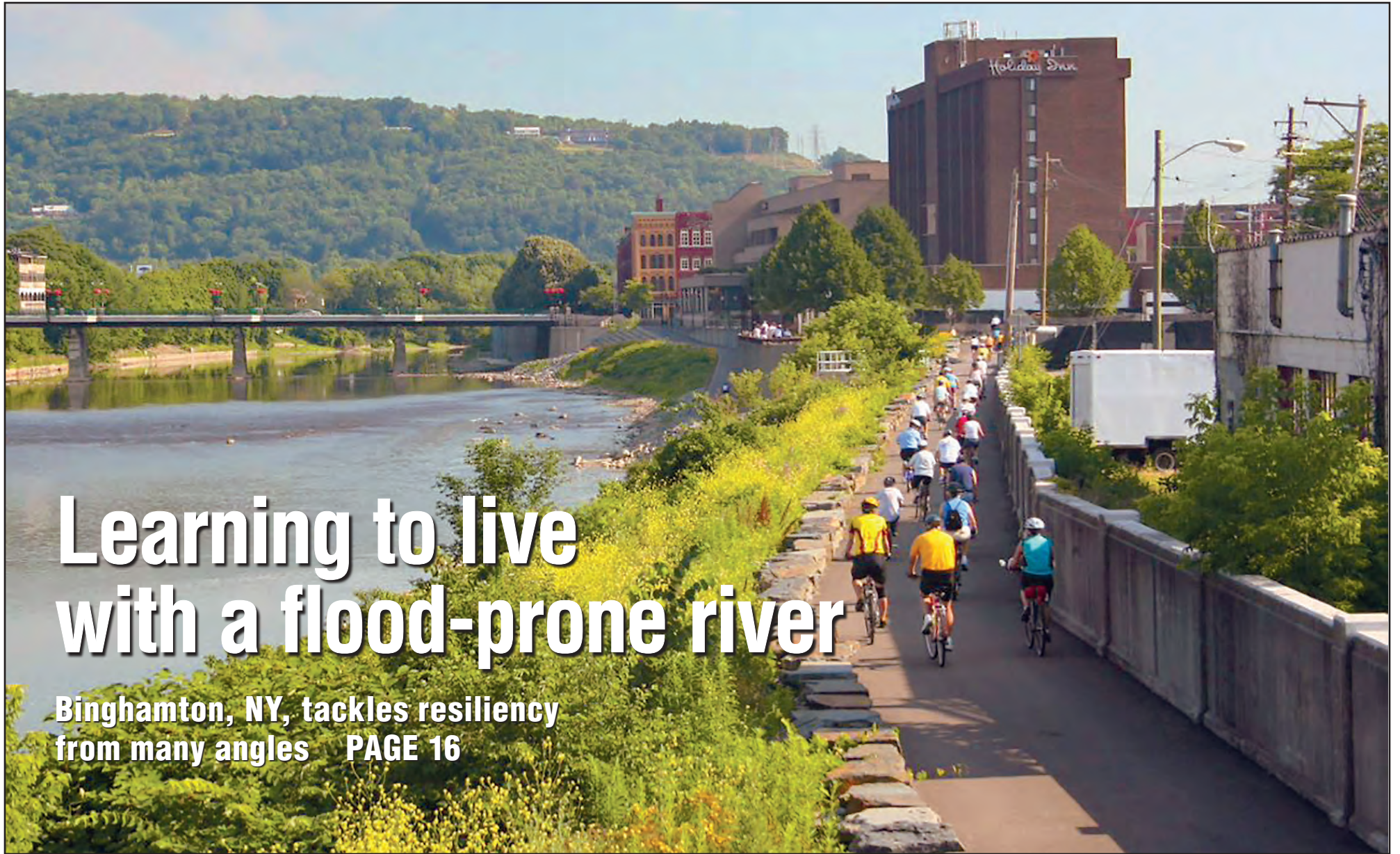
CHESAPEAKE

# BAY JOURNAL

December 2020

Volume 30 Number 9

Independent environmental news for the Chesapeake region



## Learning to live with a flood-prone river

Binghamton, NY, tackles resiliency from many angles **PAGE 16**

### OYSTER FARM CHALLENGE



MD may propose new rule that limits aquaculture **PAGE 22**

### RESTORING A PA STREAM



Large project under way in Lancaster County **PAGE 20**

### POTOMAC DOWNTURN



Latest report card lowers the river's grade **PAGE 9**

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A sea turtle hatchling in Florida finds itself in a discarded plastic cup. A new report details the impact of plastic litter on marine life, including turtles and mammals in the Chesapeake Bay. Read the article on page 18. (Nova Southeastern University, Broward County Sea Turtle Conservation Program; Courtesy of Oceana)

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## EDITOR'S NOTE

### 30 years: Chesapeake changes, challenges



When I started writing about the Bay 30 years ago, I wondered what I would do after 2000, which was then the deadline for the region to meet nutrient reduction and many other restoration goals. Now, with the region firmly on track to miss its third cleanup goal for 2025, it's clear I didn't have much to worry about.

Recently, I scanned through *Bay Journals* from those early days as editor to reflect on the past and ponder what lies ahead. Some stories predicted the future. A 1992 article about a new U.S. Geological Survey assessment that the reservoir behind Conowingo Dam would be filled in about 20 years and begin leaking nutrients into the Bay was shockingly accurate.

Some conventional wisdom at the time turned out to be wrong. Air pollution was just being recognized as a significant source of nitrogen to the Bay, but nitrogen oxide emissions were thought to be largely uncontrollable. Technology to remove nitrogen from wastewater treatment plants existed, but was thought to be too expensive for widespread use.

Today, wastewater and air pollution controls have turned out to be more achievable — and more effective — than imagined. They now account for the lion's share of the Bay's nutrient reductions.

That offers some hope for the future. While attaining 2025 cleanup goals is improbable, lessons from the past show that new technologies and approaches can make real differences, even if they seem far-fetched now.

I suspect other problems may prove to be more challenging in the future, though. The ultimate goal of the Bay effort isn't nutrient reductions, it's the restoration of its living resources such as fish, crabs and waterfowl. Reducing nutrient pollution to improve water quality is only one tool to accomplish that.

And it may prove easier than addressing other ongoing impacts on habitat. Shorelines continue to be hardened, coastal marshes drowned by rising water levels and historic oyster habitat smothered by sediment — all at worrisome rates.

Climate change, hardly mentioned in the *Bay Journal* three decades ago, will be an overriding issue that fundamentally alters the ecosystem as water levels continue to rise, temperatures and rainfall increase and storms become more severe.

Now, as I step down as editor to return to writing, I wonder when someone looks back 30 years from now, what their assessment of the past and future will be. No matter what, the *Bay Journal* should still be around to chronicle the changes.

— Karl Blankenship



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## ON THE COVER

Cyclists ride on top of a levee along the Chenango River that helps protect Binghamton, NY, from flooding. (Courtesy of the Broome County Planning Commission)

## BY THE numbers

**4,480**

Square miles in the surface area of the Bay and its tidal tributaries

**100 million**

Number of eggs a female oyster can produce each year

**444**

Length, in miles, of the Susquehanna River

**14,670**

Square miles in the Potomac River drainage basin

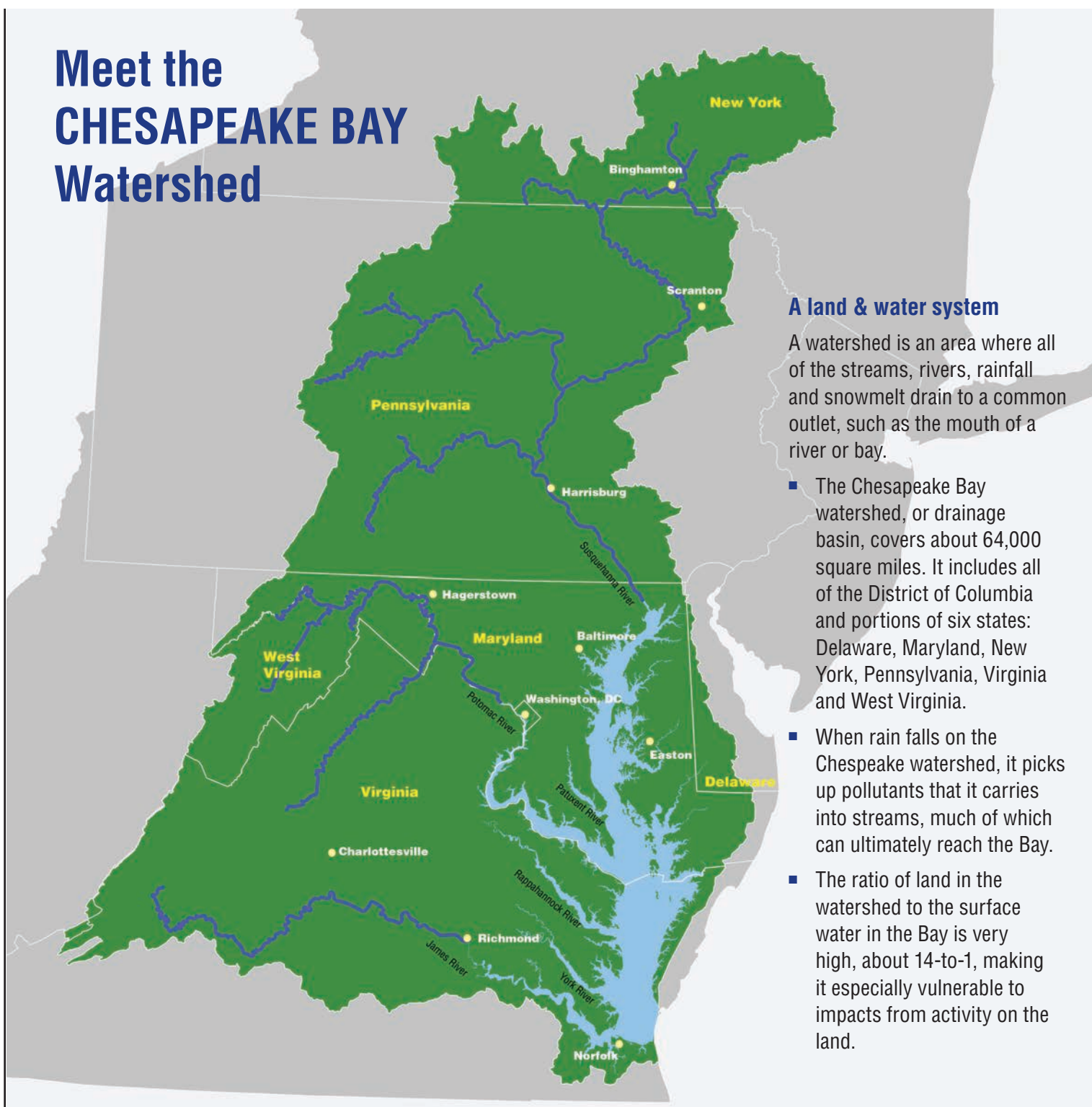
**524**

Miles between Cooperstown, NY, at the top of the Bay watershed, to Norfolk, VA, near the southern edge

**500**

Millions of pounds of seafood produced in the Bay during a typical year

## Meet the CHESAPEAKE BAY Watershed



### A land & water system

A watershed is an area where all of the streams, rivers, rainfall and snowmelt drain to a common outlet, such as the mouth of a river or bay.

- The Chesapeake Bay watershed, or drainage basin, covers about 64,000 square miles. It includes all of the District of Columbia and portions of six states: Delaware, Maryland, New York, Pennsylvania, Virginia and West Virginia.
- When rain falls on the Chesapeake watershed, it picks up pollutants that it carries into streams, much of which can ultimately reach the Bay.
- The ratio of land in the watershed to the surface water in the Bay is very high, about 14-to-1, making it especially vulnerable to impacts from activity on the land.

## LOOKING BACK

### 25 years ago

#### Oyster diseases make a comeback

After a short reprieve, oyster diseases returned in force to Maryland's portion of the Chesapeake Bay, and officials worried that it could foreshadow heavy mortalities in the coming year. The condition in Virginia was even worse as the impact of disease was compounded by a freshet that hammered the state's healthiest remaining oyster population. ■

— Bay Journal, Dec. 1995

### 20 years ago

#### Land conservation needs more money

The Trust for Public Land reported that Bay Program partners would need to spend approximately \$1.65 billion over the next decade to meet the program's goal of permanently preserving one-fifth of the watershed as open space. ■

— Bay Journal, Dec. 2000

### 15 years ago

#### Bay Program reports found faulty

Federal auditors concluded that Bay Program reports don't answer the most fundamental question about the Chesapeake: How is the Bay doing? As a result, the reports make it difficult for the public to determine whether the Bay is improving or is being depicted in a "rosier picture" than may be warranted. ■

— Bay Journal, Dec. 2005

### 10 years ago

#### Chesapeake Conservation Corp launches

Sixteen young men and women took the stage in Annapolis as the inaugural class of the Chesapeake Conservation Corps. The program provided a year of funding for each member to help in a restoration project in Maryland. Backers said they hope the young people, many of whom are college graduates, will embark on environmental careers. ■

— Bay Journal, Dec. 2010

## ABOUT US

The *Chesapeake Bay Journal* is published by Bay Journal Media, an independent nonprofit news organization dedicated to producing journalism that informs the public about environmental issues in the Chesapeake Bay watershed. The *Bay Journal* is available in print and by email and is distributed free of charge, reaching approximately 100,000 readers each month. The print edition is published ten times a year, and bundles are available for distribution at offices, libraries, schools, etc. Material may be reproduced, with permission and attribution.

Bay Journal Media also operates the Bay Journal News Service, which distributes *Bay Journal* articles and op-eds about the Chesapeake Bay and regional environmental issues to more than 400 newspapers in the region.

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## BAY JOURNAL NOTEBOOK



Staff writer Ad Crable interviews Pennsylvania farmer Steve Groff about practices that promote soil health and can in turn decrease the need for fertilizer and pesticides. (Dave Harp)

## Newsmatch makes now an opportune time to support in-depth coverage in *Bay Journal*

Whether you have been reading the *Bay Journal* for years or just a short time, you may have noticed that it isn't your typical newspaper. We specialize in a single topic — the environment of the Chesapeake region. That gives our reporters reason and opportunity to gain a deep understanding of the field: the science, the work of watershed groups, the social dynamics, and the policies and proposals that lead to change (or not). In addition to our email news and website, we publish a printed edition 10 times a year. Without facing an onslaught of daily deadlines, we encourage our reporters to provide the in-depth coverage that our readers value.

But one of the biggest aspects that sets us apart from traditional newspapers is this: We are a nonprofit media organization. Our journalism is not driven by shareholders and advertisers. It is driven by grants and donations from the people and organizations that value what we do. It helps us focus on our mission and ensures that readers come first. And it supports a very important part of our goals — making environmental news available to everyone who wants to read it by allowing us to offer subscriptions free of charge.

I know that not everyone is able to make a financial gift to the *Bay Journal*, especially during this very difficult time. But if you are able to help support our work with an end-of-year gift, we would be very grateful. Your generosity will help us gain a strong footing for 2021, when there will undoubtedly be a lot of environmental news to follow.

As a member of the Institute for Nonprofit News, the *Bay Journal* is participating in the NewsMatch program. From now through December 31, NewsMatch will double individual donations. In all, we can receive up to \$11,500 in matching gifts.

Thanks for considering us at 2020 draws to a close. I wish you and yours a happy, safe and peaceful holiday season. ■

— Lara Lutz  
Managing Editor

### New commercial oyster hatchery coming to MD's Eastern Shore

Ferry Cove Shellfish, a privately owned oyster hatchery, plans to open this spring just outside of St. Michaels on the Eastern Shore of Maryland.

The company will grow "seed" oysters to support private and public aquaculture operations.

The 20,000-square-foot facility will have a green building design and energy-efficient features, along with equipment for algal production, water filtration and seawater heating that will allow the hatchery to extend its larvae production beyond the April-to-September season. It will also include backup systems to ensure operations during tropical storms and periods of low salinity and poor water. ■

### Talen Energy to end coal-burning at PA & MD power plants

Talen Energy Corp. announced in November that it will stop burning coal at all facilities in which Talen is the sole owner.

Impacted facilities include the Montour generation facility in Pennsylvania and the Brandon Shores and H. A. Wagner generation

facilities in Maryland. Coal-fired operations will stop at those locations by the end of 2025 and repower, pending approvals by state agencies.

Talen's Brunner Island generation facility, along the Susquehanna River just south of Harrisburg, had previously committed to transition from coal by the end of 2028.

According to a company press release, the actions were developed through discussions with the Sierra Club and are a first step in moving the company's business model toward environmental sustainability.

"By moving to repower these sites for the future, we maintain our longstanding economic commitment to our communities, while also providing the environmental benefits of a lower carbon footprint," said Ralph Alexander, Talen's chairman and CEO.

"We applaud Talen's decision to join the ranks of leading power companies across the country in retiring climate-disrupting coal plants" said Mark Kresowik, deputy regional director for the Sierra Club.

Talen and the Sierra Club are working toward an agreement that aims to avoid future litigation or permit disputes related to coal at Talen's transitioning sites. ■



Plastic containers and other trash collect in a Northern Virginia stream. (Whitney Pipkin)

### VA litter from bottles and cans is greater than that of states with 'bottle bill'

Plastic bottles, glass bottles and aluminum cans are discarded as litter approximately two and half times more frequently in Virginia, which has no "bottle bill," than in states with bottle bills, according to a report released in November by Clean Virginia Waterways of

Longwood University.

Bottle bills require customers to pay a deposit when they purchase a beverage, with the option of redeeming the deposits when they return the empty bottle or can at the point of purchase or a redemption center.

See **BRIEFS**, page 6



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# briefs

From page 5

“We compared litter data from states with bottle bills to states without bottle bills,” explained Katie Register, executive director of Clean VA Waterways. “In Virginia, bottles and cans accounted for nearly 22% of all litter recorded by volunteers in 2019. But in states with container deposit bills, bottles and cans accounted for less than 9%, on average, of the total debris recorded.”

The report states that plastic bottles accounted for 11.5% of all the litter recorded in 2019 by volunteers who participated in the annual International Coastal Cleanup in Virginia. In states with bottle bills, plastic bottles accounted for 2% to 8.3%. Aluminum cans were also more frequently found littered in Virginia, accounting for 6.7% of all litter. In states with bottle bills — including California, Connecticut, Hawaii, Maine, Massachusetts, Michigan, New York and Oregon — beverage cans accounted for 2.5% of all litter, according to the report.

The International Coastal Cleanup is the largest volunteer effort for the world’s ocean and waterways. Thousands of volunteer-led events track the types of trash that are removed from coasts and inland waterways, providing a global snapshot of the litter and ocean trash problem from year to year. Data are collected

on the most commonly found items, including single-use consumer food and beverage items.

Clean Virginia Waterways of Longwood University has organized the cleanup in Virginia since 1995 and has a 25-year database of the litter found in Virginia. ■

## Freshwater mussels released in the James River

In late October, the James River Association, U.S. Fish and Wildlife Service and Virginia Department of Wildlife Resources released more than 5,500 freshwater mussels into the James River in downtown Richmond.

The conservation partners teamed up to help restore populations of freshwater mussels in their native James River habitat, where each mussel will filter between 10 and 20 gallons of water per day, helping to improve water quality by removing algae, bacteria and other small particles.

“Freshwater mussels are essential members of the ecosystem providing cleaner water, keeping sediment in place, and providing food and habitat for other organisms,” said Erin Reilly, staff scientist for the James River Association.

Two species — the alewife floater and yellow lampmussel — were carefully placed on the river bottom by divers.

Mussels were tagged with tiny markers called pit tags that are the size of a grain of rice. The tags will allow scientists to find these mussels in future years and collect data on their growth and survival.

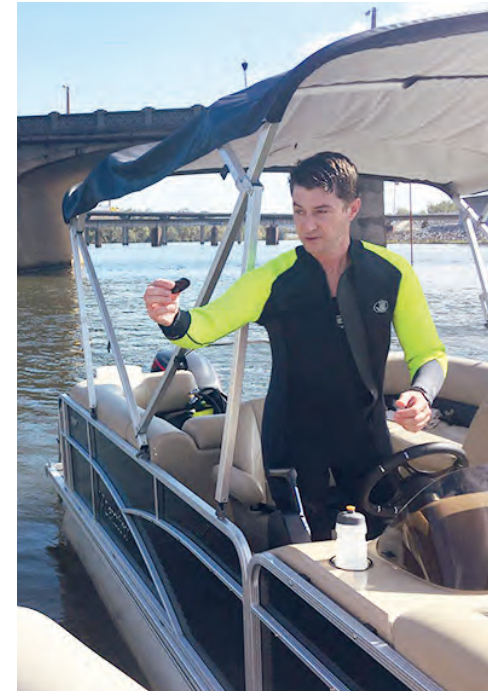
Once prevalent in the James River, freshwater mussels are imperiled due to pollution, dams and loss of suitable habitat.

Virginia is home to 81 freshwater mussel species, 41 of which are considered endangered or threatened in the state.

“Virginia has been propagating and releasing freshwater mussels for over two decades, with most of the conservation and restoration efforts in watersheds like the Clinch River in southwest Virginia and the Nottoway River in southeast Virginia,” said Brian Watson of the Department of Wildlife Resources. “With the positive results we have seen in those locations, we now hope to bring the same to the James River.”

Plans to continue releasing mussels through early November in the Upper and Middle James River, including areas in Lynchburg and Turkey Island Creek, are under way.

Funding to support the work of this partnership and the propagation of freshwater mussels is being provided by the Good Shepherd Foundation. ■



A diver helps place mussels on the bottom of the James River near downtown Richmond. Mussels help clean the water by removing algae, bacteria and other small particles. (Courtesy of the James River Association)

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# briefs

## Feds argue EPA isn't required to force PA, NY to meet Bay cleanup goals

Federal attorneys are seeking to dismiss a lawsuit from environmentalists and several Chesapeake Bay watershed states that aims to force the U.S. Environmental Protection Agency to take more aggressive action against Pennsylvania and New York.

Both states have fallen far behind in Bay cleanup efforts, and the states' updated plans, completed last year, fell short of meeting pollution-reduction goals.

In suits filed in September, Maryland, Virginia, Delaware, the District of Columbia, the Chesapeake Bay Foundation and others sought to force the EPA to require the two states to write adequate cleanup plans and do more to implement them.

But the U.S. Department of Justice, representing the EPA, filed a brief Nov. 20 with the U.S. District Court for the District of Columbia arguing that Bay cleanup plans are only planning documents.

Under the Clean Water Act, states are required to calculate the maximum pollution load an impaired waterbody, such as the Bay, may receive. But it does not require plans showing how any needed pollution reductions would be achieved.

To remedy that in the Bay watershed, the EPA and states agreed in 2010 to an "accountability framework" under which states would submit cleanup plans showing how they would meet new pollution reduction goals. Under the framework, the EPA can take a variety of enforcement actions if states are not making adequate progress.

But, the federal brief argues, the framework "does not require EPA to take such action."

In their suit, the Bay Foundation and downstream states contend that a separate section of the Clean Water Act creating the state-federal Chesapeake Bay Program gives the EPA additional authority to require states to develop and implement Bay cleanup plans.

The federal brief disputes that interpretation, arguing that the section is primarily intended to ensure that goals are met through the award of grants.

In response to federal brief, Bay Foundation President William C. Baker said, "we are disappointed, but not surprised, that EPA continues abdicating its responsibilities under the Clean Water Act. The fate of Bay restoration is now in the hands of the court. If EPA doesn't require Pennsylvania and New York to meet the commitments to reduce pollution, the Bay and its rivers and streams will never be saved." ■



The number of people seeking outdoor recreation has surged since the pandemic. (Dave Harp)

## Outdoor recreation generated \$63 billion in Chesapeake watershed states

Outdoor recreational activity in the states that include the Chesapeake Bay watershed generated \$63.39 billion in economic activity in 2019, according to recently released figures from the U.S. Department of Commerce's Bureau of Economic Analysis.

This year saw a huge upswing in demand for outdoor recreation in the Bay region as people

sought refuge from COVID-19, with many parks, trails and campgrounds becoming overwhelmed with visitors.

The study shows there is economic benefit to making sure people have such opportunities. Nationwide, it found that the outdoor recreation economy accounted for about 2.1 percent of the gross domestic product.

"The economic impact of outdoor recreation is not just impressive; it demonstrates that there is great demand by the public for outdoor recreation opportunities," said Joel Dunn, president of the Chesapeake Conservancy.

Dunn also said the report illustrates the need for the National Park Service to play a greater role in the watershed to help create more parks, enhance existing parks and to provide access for underserved communities around the Bay.

"Outdoor recreation is very clearly a significant contributor to our national economy and to the economies of states in the Chesapeake Bay watershed," Dunn said.

Nationwide, the report found that outdoor recreation generates \$459.8 billion in economic activity stemming from activities such as boating, fishing, RVing, hunting, winter sports, bicycling and hunting. ■

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# Impact on wetlands doubles for controversial Wegmans project

## Revised water permit draws another round of public comments

By Tamara Dietrich

**S**tiff opposition to a proposed \$175 million Wegmans regional food distribution complex in Hanover County, VA, spurred officials to seek more public input on a revised draft water permit. The revision more than doubles the amount of wetlands that could be impacted or destroyed.

The Virginia Department of Environmental Quality and U.S. Army Corps of Engineers is taking comments on the draft in December. The State Water Control Board is expected to take final action on the permit at a regular or special meeting.

The 1.7 million-square-foot complex would be built on 217 acres in the town of Ashland that contain forested wetlands and about the historic rural Black community of Brown Grove.

State and county officials tout the additional tax revenue and the promise of 700

full-time, good-paying jobs. Wegmans Food Markets says the facility is crucial to its ability to supply additional supermarkets in Virginia and North Carolina.

But Ashland residents and conservation groups object to the destruction of wetlands and potential damage to onsite archaeological and grave sites, along with heavy truck traffic on local roads, environmental justice concerns, and what they perceive as minimal transparency in the permitting process.

Wegmans had earlier considered and evaluated alternative sites in the Richmond area, including two others in Hanover County, but dismissed them as more costly or more environmentally damaging.

But opponents claim the search for sites has been tainted by bad information, including a flawed wetlands delineation.

“We don’t have any degree of faith that they’ve appropriately measured the wetlands,” said Roderick Morgan, a resident of the Fox Hill neighborhood adjacent to the development site. “But Wegmans made a number of decisions based on there being less wetlands on this property than there are. And that’s not fair to them, either.”

The Corps, which must permit

construction on wetlands, initially employed the rarely used “mosaics” method for its wetlands delineation. The mosaics method basically ascribes percentages of wetlands to nonwetlands in a given parcel, rather than declare the entire parcel as one or the other.

Elaine Holley at the Corps of Engineers has said she used that method because the site was so difficult to assess, with uneven topography pocked with very small wet areas next to drier uplands.

For the revised draft Virginia Waters Protection Permit, the Corps dropped the mosaics method, and the amount of wetlands that could be impacted or destroyed rose from a little more than 6 acres to nearly 15 acres. Hydrology on a given site can also change naturally over time.

Todd Miller, chief of the Southern Virginia Regulatory Section of the Corps of Engineers Norfolk District, said they performed additional field work in response to comments from the first public notice.

“And [we] found that the hydrology on the site presented differently than our first visit,” Miller said. “After our additional work, we decided it was more accurate to call the two mosaic areas all wetlands.”

Bonnica Cotman, representing Brown Grove, contends the Corps still hasn’t properly assessed the potential impact on the Black community, which was founded by freedmen and women after the Civil War.

“There are lives here in the Brown Grove community,” Cotman wrote to William T. Walker of the Corps of Engineers in October. “Real people with real roots from their ancestors woven into the soil of this community. Brown Grove may not mean much to other people, but it means the whole world to the people that live here.”

Jaime Robb, manager of the DEQ office of stormwater management, said the agency has been transparent, reaching out to community leaders, responding to information requests and phone calls, making materials available on its website and communicating through newspapers and social media. On Oct. 19, the Corps held a public meeting in Brown Grove on its work to locate unmarked graves.

Robb said the DEQ considered public comments when it revised the draft permit, which it “believes is in conformance with the state laws and regulations.” ■



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*Photographer Dave Harp, Cat's Point Creek in Virginia's Northern Neck. Photo by Leslie Middleton*





Increased rainfall and polluted stormwater runoff played a large role in the Potomac Conservancy's decision to lower their grade of the river's health to a B-minus. (Potomac Conservancy)

# Wet weather overwhelms some Potomac River progress

## The 'Nation's River' dips to a B-minus in latest report card

By Whitney Pipkin

After a decade of steady improvement, the Potomac River's progress seems to be plateauing. That's according to the latest letter grade — a B-minus this year compared with a B two years ago — issued to the river in a biennial report card measuring its overall health.

The Potomac Conservancy, which released the *2020 Potomac River Report Card*, said more polluted runoff from urban and suburban areas and fewer trees to slow and filter rainfall were among the factors causing the grade to slip. Based on data from 2018 and 2019, heavier-than-average rainfall likely played an outsized role in the outcome, too.

"This is the first time in a decade where the overall health grade has declined," said the conservancy's president, Hedrick Belin.

Costly improvements in wastewater treatment technology have reduced the amount of water-fouling nutrients making their way into the Potomac and downstream into the Chesapeake Bay. DC Water's federally mandated Clean Rivers Project, for example, is on track to sharply decrease the volume of untreated stormwater headed to the river as it continues to curb sewer overflows in the coming years.

But many of the factors contributing to pollution across the Bay watershed are under way in the Potomac's backyard as well.

Belin said he fears "unchecked" stormwater pollution in urban and suburban areas could threaten the river's steady progress, especially when combined with agricultural pollution. Heavier, more frequent rainfall flushing sediment into Potomac tributaries could exacerbate those trends.

The report noted the role of record-setting rainfalls in 2018, washing additional sediment and pollutants into local waters. Sediment loads in the Potomac River have improved since the 1980s and been relatively stable over the last decade. But the two-year period represented in the report saw higher-than-average rain totals, which pushed the river further away from meeting its sediment-reduction goals.

The District of Columbia and its metro area, which drains into the Anacostia and Potomac rivers, tallied its wettest recorded year in 2018, with more than 60 inches of rain compared with the more typical annual average of 40 inches.

"All of that is overwhelming systems and exceeding the carrying capacity of built infrastructure like stormwater systems and also the natural landscape," Belin said.

Of the 21 indicators of health considered in the report, shoreline or riparian trees fared the worst, receiving the only failing grade in the report. Maryland, Pennsylvania and Virginia completed a combined 23 miles of riparian forest restoration projects in the Potomac watershed in 2017, according to the report, but that number represents just 11% of the goal for the region.

Water quality in the Potomac's nontidal streams and creeks logged a slight improvement, with about half considered healthy.

But tidal water quality in the Potomac looked worse in 2018 and 2019 than in previous years, with less oxygen for aquatic creatures and conditions that were more favorable to algae blooms.

Murky, sediment-logged waters also make it harder for underwater grasses and several fish species to survive, but long-term progress to reduce pollution levels has buffered some of those impacts.

The Potomac River supports steady populations of shad, white perch and other popular game fish. The fish are helpful indicators of changes in the river's health — to a degree.

"In my discussions with people, they've been pretty happy with their fishing success anywhere on the river," said Martin Gary, executive secretary of the Potomac River Fisheries Commission.

The river plays a vital role in the life cycle of several fish species. But some of the most notable fish, such as American shad and striped bass "are not a perfect reflection of the river," Gary said, because they spend much of their time in other waters. Still, the Potomac provides critical habitat.

"The Potomac is the second-most valuable spawning area for striped bass on the entire Atlantic Coast," Gary said.

The report card issued a slightly higher grade than two years prior for the health of striped bass, but a slightly lower one to smallmouth bass, an introduced species that is a prized game fish. The report said smallmouth bass are considered good indicators of overall river health because of their dependence on good water quality. Changes in weather patterns and high stream flows

during their spring spawning in 2018 seem to have taken a toll on the species.

The Potomac River, meanwhile, has for several years been considered a safe haven for American shad, whose populations have declined sharply in other Chesapeake Bay rivers. While shad fared well in the Conservancy's report, assessments from this year indicate there is more "uncertainty" in the Potomac's shad population than previously thought, Gary said.

Nonnative blue catfish — and their voracious appetites, particularly for other juvenile fish — continue to be a concern. But the driving factor for any reductions in fish populations in 2018 and 2019 was most likely all of the rain and the sediment that came with it, Gary said.

Though the 2020 report indicates a slight setback, returning the river to a letter grade it last received in 2016, Belin said there is reason to hope for improvements in the coming years.

While the region is behind on its tree canopy goals, Belin said he's encouraged by the actions of Maryland localities to replace trees lost to development. Recent federal legislation to protect outdoor spaces helps to lay the groundwork for clean water protections, too.

"What's not reflected in this report — but what we've seen [during COVID-19] — is the importance of getting outside for your physical and mental health," Belin said. "What's good for the Potomac is good for us, too." ■

# High-tech ‘precision conservation’ comes into focus in PA

## Images with 1-square-meter resolution can pinpoint and help prioritize locations that need action

By Ad Crable

Since 2016, the Chesapeake Conservancy has pioneered the use of highly detailed images of landscapes taken from low-flying airplanes to pinpoint where conservation measures can best be deployed to clean up streams.

Those high-resolution images — down to a scale of 1 square meter — can pinpoint the locations of pollution hotspots, such as stormwater runoff from farms and developed land, and sites with bare, erosion-prone streambanks. Lidar (light-detection and ranging) technology uses a pulsed laser to measure distances and show elevation changes and steep slopes.

The conservancy is convinced that the new technology can transform the conservation movement. The promise, according to its motto, is “doing projects at the right place, the right scale, the right size, and the right time.”

Now, the group is expanding a suite of precision conservation projects in Pennsylvania with hopes of a Baywide profusion of similar data-driven cleanups.

If successful, the “rapid stream delisting” project will restore at least 17 streams in the Susquehanna River basin so that they can be removed from the state’s list of impaired waterbodies in 10–12 years.

A dozen years might not seem particularly fast, but John Cox, chair of the board of Turkey Hill Dairy and a partner in one of the projects, said, “It took hundreds of years to get these streams in this condition, so 12 years is rapid recovery.”

On-the-ground work won’t take a decade, but it will take years for the full range of benefits to kick in and improve the water quality and aquatic ecosystem to the extent that would allow the state to delist an impaired stream.

The work is taking place in Pennsylvania’s portion of the Susquehanna River drainage basin because it is the source of most of the Bay’s nutrient pollution problems.

Most of the projects will take place on farms.

Work is nearly complete in the counties of Huntingdon, Centre, Clinton and Lycoming, where the conservancy formed the Precision Conservation Partnership with dozens of partners including conservation districts and Trout Unlimited. Eight streams are the target there. Continued funding from the



Volunteers plant a streamside buffer along Elk Creek in Centre County, PA, as part of a “rapid delisting” project to get the stream removed from the state list of impaired waterbodies. (Peter Turcik/Chesapeake Conservancy)

National Fish and Wildlife Foundation is supporting an expansion into Union and Snyder counties, where more partners and streams will be added to the effort.

Nine streams stand to benefit in heavily farmed Lancaster County.

In an effort led by the Lancaster Clean Water Partners, more than 30 local organizations came together there to pore over high-resolution maps — kind of like MRI images — showing where on-the-ground conservation measures could be concentrated for the greatest impact. Financial support for the analysis was provided by the Campbell Foundation.

Scientists from research institutions and the state Department of Environmental Protection weighed in, offering guidance on the level of restoration needed to meet the water quality and habitat standards for delisting.

“People in Lancaster County have been hearing about cleaning up our streams for a long time, but have no sense it’s happening,” Cox said. “Part of what we’re excited about here is getting people to see that clean streams are an actual possibility.”

The next step will be to select site-specific best management practices and seek funding for them.

The U.S. Environmental Protection

Agency has backed the cutting-edge technology, paying the conservancy’s Conservation Innovation Center in 2013 to update the Chesapeake Bay Program’s data maps to show more information and provide greater accuracy.

That’s significant because the computer models previously used maps with resolution that covered a quarter-acre of surface area, while the new maps have a resolution of 1 square meter. That meant, in the past, sources of pollution and rates of sediment and nutrient runoff had to be generalized with a greater possibility of inaccurate land use designations and pollution sources. Now, that information can be gleaned down to the parcel level, showing details such as individual trees, single houses and small waterways.

The conservancy also has received \$6 million from the EPA to gather high-resolution images of every inch of the 100,000 square miles of land in and surrounding the Bay watershed. That work has been completed.

More recently, the EPA added a \$1.1 million grant so the conservancy can help local governments and nonprofits use the detailed images to plan stream restorations. The location of headwater streams and other water features can be shown at a parcel level.

Planners can also see changes in the landscape through the years to identify trouble spots and, conversely, where projects have improved stream quality.

“We subscribe to the social tipping point theory,” said Carly Dean, program manager at the conservancy. “The idea is, if a certain percentage of a community adopts this stewardship approach on their landscape, they’ll inspire their neighbors to do so as well.”

The watershedwide collection of imagery is free to use, but the conservancy has been hired in some cases to create tools that help local governments and other organizations use the data in particular ways.

In two southcentral PA counties, the conservancy used elevation information to map out roadside ditches, an unmonitored but significant source of nutrients and sediment pollution.

When the District of Columbia needed help in meeting its tree canopy goal, the conservancy helped develop a web-based decision-making tool to determine where best to plant trees to provide multiple benefits, such as providing shade and improving air quality.

Anne Arundel County, MD, was set up with a data tool that found the county had lost 2,356 acres of tree canopy from 2013–17, roughly double the amount of tree canopy loss that had been measured using older methods.

The Virginia Environmental Endowment used landscape data to help award \$4.6 million in grants for high-priority restoration projects in the James River watershed.

The use of precision mapping technology to drive water improvements was put to the test in northcentral Pennsylvania in 2017–19. Water quality, fish and insect populations, as well as sediment and nutrient levels, were measured before and after forested buffers were added on three stream segments degraded by agriculture runoff in Centre County.

“There were strong indications that we are on the right track,” Dean said of the results.

She thinks the rapid stream delisting projects in Pennsylvania will inspire a nationwide approach.

“We want to raise all ships,” she said. ■

# 'Forever chemicals' found in MD seafood, drinking water

## Group urges state to set limits on PFAS in absence of federal action

By Timothy B. Wheeler

**M**ore testing has found so-called “forever chemicals” in a striped bass, blue crab and oyster from the Chesapeake Bay, as well as in drinking water from household taps in Maryland’s Montgomery County.

Laboratory analyses released by the nonprofit group Public Employees for Environmental Responsibility detected 16 different per- and polyfluoroalkyl substances, or PFAS, in the tissues of each type of seafood collected from Bay tributaries in Southern Maryland. Eleven different PFAS compounds were also detected in tapwater sampled from three homes in Montgomery County, the group reported.

Timothy Whitehouse, PEER’s executive director, called the findings a “red flag,” saying, “PFAS should not be in our seafood or our drinking water.”

Ben Grumbles, secretary of the Maryland Department of the Environment, called PEER’s results “troubling” and said his staff wanted to know more about the group’s sampling.

PFAS are a group of more than 8,000 chemical compounds used in nonstick cookware, flame retardants, water-repellant and stain-resistant clothing and furniture, as well as in fire-fighting foams used at airports and military bases. They do not break down in the environment. They also spread easily through water and can build up in animals or organisms that ingest them, including people.

Exposures to PFAS have been associated with birth defects, damage to the liver and kidneys, and an elevated cancer risk. But PFAS in drinking water and food are not regulated at the federal level, and it’s not clear what the long-term health risks are of the levels detected in the PEER report.

The striped bass caught in a pound net in Cornfield Harbor near the mouth of the Potomac River had 23,100 parts per trillion (ppt) of nine different PFAS. The crab and oyster from St. Inigoes Creek, a tributary of the St. Mary’s River, had 6,650 ppt of eight PFAS and 2,070 ppt of five PFAS, respectively.

A handful of states with severe PFAS contamination problems have found high



Laboratory analyses have found PFAS contamination in the tissues of a blue crab, an oyster and a striped bass collected from Chesapeake Bay tributaries in Southern Maryland. (WillParson / Chesapeake Bay Program)

levels of the chemicals in wild fish and set fish consumption advisories, particularly for perfluorooctane sulfonate, or PFOS, one of the oldest and most frequently found types of PFAS.

New Jersey, for instance, urged its anglers to limit consumption of some recreationally caught fish from some rivers and lakes after finding PFOS levels that in some cases were comparable to what the PEER analysis found in the Potomac River striped bass.

PFAS in drinking water from two Bethesda homes measured 27 ppt and 48 ppt, respectively, while a sample from a Poolesville home had 15 ppt. The levels detected at the Bethesda homes exceed what the Washington Suburban Sanitary Commission found at its filtration plants, which process raw water from the Potomac and Patuxent rivers. The Poolesville home is on a well.

Commission officials took issue with the PEER findings, saying the lab that tested the water samples used a method that has not been approved by the U.S. Environmental Protection Agency. They also pointed out that the results are below the EPA’s non-binding health advisory level of 70 parts per trillion for two of the most common PFAS compounds.

The EPA released a plan in February 2019 pledging to begin the process of setting enforceable limits on PFAS in drinking water for the two most commonly found PFAS

and possibly more, but has yet to actually do so.

Impatient with the pace of federal action, 10 states where the chemicals have been found in drinking water have acted to set safety standards of their own that are stricter or cover more PFAS than the EPA guidelines.

Whitehouse said he hoped these test results spur Maryland to do likewise.

“The message we want to send is that the state, although they’re starting to do testing, really needs to get going on developing science-based health standards for fish consumption and drinking water,” he said. “This is really just the tip of the iceberg in terms of what’s being contaminated in Maryland and elsewhere.”

The MDE earlier this year tested water and oysters in Southern Maryland after independent testing found PFAS in St. Inigoes Creek in St. Mary’s County. That water sample was taken by a local activist near the Webster airfield annex of Naval Air Station Patuxent River, where firefighting foam is stored for emergencies and was reportedly sprayed once years ago.

“A seafood platter containing oysters, crab and rockfish with these levels of toxins is a danger to public health, especially women who may be pregnant or breastfeeding,” contended Pat Elder, the activist who also assisted PEER in its testing.

PEER had earlier reported finding about

1,000 ppt combined of several different PFAS in each of a pair of oysters it sampled from the St. Mary’s River. The MDE tests, though, found no detectable PFAS in the oysters it sampled and “very low concentrations” in St. Mary’s River water. It rated the public health risk from swimming in the water and consuming oysters as “very low,” based on its findings.

Grumbles said that report shouldn’t be read as saying there’s no cause for concern about PFAS. He said the MDE is working to address the risks comprehensively.

“We know we need to do more, and testing is the key,” he said during an online forum on Nov. 16 sponsored by several environmental groups.

The MDE has sampled 51 drinking water systems for PFAS so far and intends to check 137 statewide, spokesman Mark Shaffer said. The MDE also began to test recreationally caught fish around the state this fall after high PFAS levels were reported in the blood of smallmouth bass collected by the U.S. Geological Survey in Antietam Creek, a tributary of the Potomac in Western Maryland. The department hopes to complete sampling the first 12 locations by year’s end, Shaffer said.

Striped bass, a popular recreational and commercial species, migrate up and down the Atlantic Coast and feed on other fish, which can lead to a buildup of contaminants in them from a variety of places. ■

# DC spreads solar wealth to low– middle-income residents

## Solar for All initiative installs photovoltaic arrays at no cost

By Timothy B. Wheeler

Unlike most people, Sam Buggs actually looks forward to getting his electricity bill.

That's because his monthly statement from Pepco regularly includes a credit of \$40 to \$50. It's the discount he gets because of the power generated to the grid by photovoltaic panels on the rooftop of his apartment building in the District of Columbia.

Buggs is one of thousands helped so far by the District's ambitious Solar for All initiative, which aims to provide 100,000 low-income families with the benefits of locally generated clean energy — and cut their energy bills in half in the process. He lives in the Maycroft Apartments, 64 units of affordable housing in Columbia Heights where two-thirds of the residents earn 30% or less of the area's median income.

Because he's disabled and living on a fixed income, Buggs said the credit on his power bill means he can afford to buy a couple of extra meals every month or pay another bill he'd been putting off.

"It's a blessing, I can't say it enough," he said.

Buggs and his neighbors are in rarified company. As solar energy spreads across the Bay watershed and nationwide as part of a growing effort to stem greenhouse gas emissions, less affluent households are often left out because they lack the funds or property ownership necessary to join in that expansion.

That's starting to change, and the District has been a national leader in seeking to address that disparity, according to David Murray, executive director of the Maryland-DC-Delaware-Virginia Solar Energy Industries Association. The city government, he said, "has really leaned in toward programs that not only build a representative (solar) workforce but ensure that solar is accessible to low- to moderate-income individuals."

Even though the costs of photovoltaic panels have declined, they still require an upfront investment of thousands of dollars to install. Many solar companies offer no-cost installations that yield less energy savings for the consumers, but those also require the customer to own a roof or land on which to place the panels. That leaves out renters and many others without the



The rooftop of the Maycroft Apartments in the District's Columbia Heights neighborhood is covered with 192 photovoltaic panels, squeezed in among air conditioning units, skylights and vents. Electricity generated by the solar array goes to the grid, earning the building's residents sizable credits on their power bills. (Timothy B. Wheeler)

resources to finance installation.

The District, however, is investing about \$10 million a year in its Solar for All efforts to overcome those obstacles and ensure that low-income families can enjoy the fruits of the community's transition to renewable energy, said Tommy Wells, director of the District's Department of Energy and Environment.

The money for that comes from compliance fees paid by Pepco and other electricity suppliers for failing to meet the District's ambitious requirements to provide a growing amount of power from renewable sources, including solar.

"There's not another program quite like this," Wells said. It not only helps fight climate change by reducing the District's dependence on fossil fuel energy, he said, "it's a way to share the benefits of solar with everyone."

The District has pledged to see that 100% of electricity sold in the city will come from

renewable sources by 2032, with 5% of that coming from solar. Currently, solar provides just 1–2% of the District's power.

### Rooftop installations

Generating electricity from the sun requires a lot of space for photovoltaic panels, and in the densely developed District, there's very little open land that's not a park. Nearly all of the solar arrays there have to be put on rooftops.

The District's Department of Energy and Environment partners with several organizations to install photovoltaic arrays on single-family homes and develop community solar projects to benefit renters and residents of condo buildings. Through Solar for All, it offers incentives to income-qualified residents to either offset installation costs or let them sign up for free to community solar projects.

To help with that, DOEE has Solar Works

DC, a low-income solar installation and job-training program. Through the mid-Atlantic branch of the national nonprofit GRID Alternatives, the program aims to train more than 200 District residents and install photovoltaic systems on low-income single-family homes.

"We try to put in solar panels for free or no cost to the homeowners," Wells said. "We try to do 100 per year. ... Generally, we do more than that."

The Department has also partnered with other organizations to develop community solar projects that so far have more than 7,000 subscribers, Wells said. One has been installed on a brownfield in the southern part of the District to serve 750 households, he noted. But open space is at a premium. Finding appropriate rooftops can be challenging.

Another nonprofit, New Partners Community Solar Corp, is working to put photovoltaic arrays on the rooftops of commercial

buildings in the District and distribute the energy-generating benefits to low-income individuals and families.

Originally launched by a pair of District lawyers who just wanted solar on the roof of their downtown offices, New Partners has since recruited other commercial building owners to donate their rooftops for solar installations.

“It’s a good way for building owners to give back and use their resources,” said Sasha Srivastava, New Partners’ executive director. “Oftentimes, their roofs are unused in any other way.”

New Partners has since branched out to help put a community solar array on a District school building. It also helped to install a novel solar-powered battery storage system at the Maycroft Apartments, the affordable housing complex where Sam Buggs lives.

The Maycroft is owned by Jubilee Housing, another nonprofit that develops what it calls “justice housing,” affordable apartments coupled with on-site support programs and services. As part of a renovation of the century-old building that was completed three years ago, Jubilee installed 192 photovoltaic panels squeezed in amid the air-conditioning compressors, air vents and skylights on the roof.

The electricity generated by that rooftop array goes to the grid. Pepco pays it back in the form of credits on every tenant’s power bill.

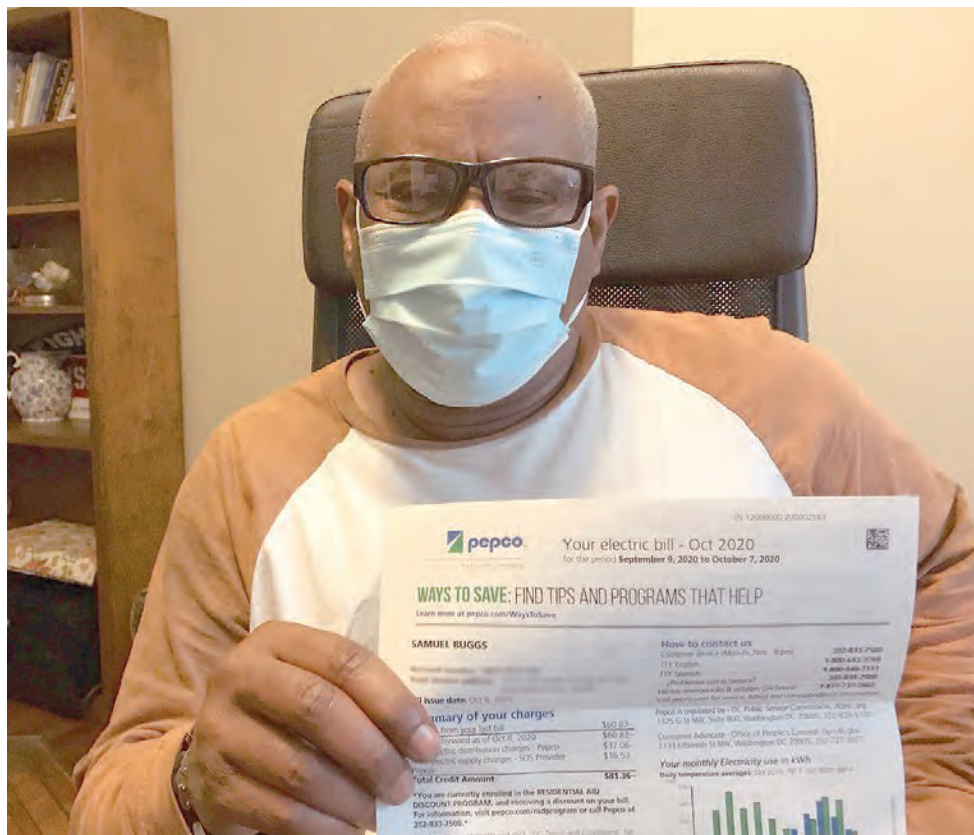
## Resiliency centers

With the help of New Partners and others, the Maycroft has an added feature: a battery-powered “resiliency center” where the electricity stays on even in a blackout

Many low-income residents don’t have the option to go elsewhere or get out of town if a storm knocks out the grid, explained Marty Mellett, Jubilee’s vice president for external affairs. With the resiliency center, he said, “there’s a place where people can gather to power their phones and medical equipment.”

The 16 big batteries can keep the power on for up to three days in the ground-floor complex of rooms, which in normal times serves as a family resource center with tutoring and meeting rooms, game tables and a kitchen equipped with an oven and refrigerator for keeping food and medicines.

The 70-kilowatt photovoltaic array on the rooftop recharges the batteries, but that took some extra electrical engineering because the resiliency center was set up after the rooftop array went in, Mellett explained. The \$130,000 for the batteries and installation was partially underwritten by a grant from the Pepco Foundation. Mellett said Jubilee has learned from that experience how to reduce the cost and is looking to install similar resiliency centers in future affordable



Sam Buggs, a resident and board member of the Maycroft Apartments, holds up his latest Pepco electricity bill, in which he received a nearly \$84 credit for the power generated by the solar array on the building’s rooftop. “Normally, low-income families and communities don’t receive these benefits,” he said. “It’s a blessing, I can’t say it enough.” (Timothy B. Wheeler)

housing projects.

The backup power system hasn’t been needed since it was installed last year, but it’s been tested to make sure it’ll work. Buggs said it’s a relief knowing it’s ready.

“I use a nebulizer,” he said, a machine that

converts liquid medication to a mist so it can be inhaled into the lungs. “There’s a lot of comfort knowing that power is there. It’s an overwhelming blessing.”

The District has a long way to go to achieve its Solar for All goals, DOEE’s Wells

acknowledged. “We need to do 7,000 a year to get there by 2032,” he said. “We’re ramping up.”

The District may be out in front, but it isn’t the only Bay watershed jurisdiction working to share solar energy’s benefits with low- and moderate-income households.

Maryland, which under a 2020 law calls for 50% renewable power by 2030, has launched a community solar pilot program intended to serve those without rooftops. A portion of the energy to be generated by those projects is earmarked for serving low- to moderate-income households.

The program was slow to get going, but is bearing fruit. Gary Skulnik, CEO of Neighborhood Sun, said his company has two projects in the Baltimore area where low- to moderate-income subscribers can get 25% discounts on their power bills. Two more projects are under construction in Western Maryland, and yet another is planned in Montgomery County.

Legislation passed just this year committed Virginia to achieve 100% carbon-free electricity by 2045. It requires that a small portion of the solar energy must come from rooftop mounted arrays, with a portion of that earmarked to serve low- to moderate-income households.

New York has a robust community solar program, which it recently enhanced to help it reach its ambitious goal of having 70% renewable electricity by 2030. The state offers its own Solar for All program, under which low-income households can save up to \$180 a year on a subscription to a community solar project. ■



Martin Mellett, vice president for external affairs of Jubilee Housing, explains how in a power blackout, backup batteries installed at the Maycroft Apartments can provide power for up to three days to the building’s Teen Center, a learning, recreation and meeting space which in such emergencies doubles as a “resiliency center.” Solar panels on the four-story building’s rooftop recharge the batteries. (Timothy B. Wheeler)

# VA prioritizes hiring its first environmental justice director

## Position is one of many steps planned to improve agency's track record with environmental justice

By Whitney Pipkin

Virginia's Department of Environmental Quality plans to fill a new environmental justice director position by early 2021 — despite budget shortfalls that will leave a few dozen other hoped-for positions unfilled for now.

DEQ Director David Paylor said the agency had to scrape together funds for the position in a fiscal year reshaped by the ongoing COVID-19 pandemic. Virginia Gov. Ralph Northam proposed at the end of 2019 nearly quadrupling the environmental agency's funding to restore resources and staff shed over the last two decades — then 2020 happened.

"I'm hopeful we will recover some of that additional funding, but it will depend on how the economy goes and what COVID does," Paylor said in mid-November. "But we've got to get started. We can't wait indefinitely for new funding."

Hiring a director to oversee a broader Office of Environmental Justice is the first of a suite of initiatives the DEQ plans to undertake in the coming years to improve its track record on environmental justice.

Paylor stressed that the process, already under way, will take time.

In October, independent consultants hired by the state released their 47-page analysis of how the agency could better integrate environmental justice into its planning and programs. The report was the fruit of an 18-month process that wrapped up during a summer of national unrest over issues of race and inequality.

Interviews with stakeholders ranged from companies regulated by the DEQ to groups typically underrepresented in permitting processes. The consultants from Charlottesville-based Skeo Solutions and the Washington, DC-based Metropolitan Group also assessed the DEQ's current authority under existing laws and considered similar environmental justice efforts in other states.

Some of the report's recommendations were being taken up even as the work was being completed.

In a session that ended early this year,

the Virginia General Assembly approved a statutory definition of environmental justice as "the fair treatment and meaningful involvement of all people regardless of race, color, faith, national origin or income, regarding the development, implementation or enforcement of any environmental law, regulation or policy" and began integrating that language into DEQ policy.

Legislators also have passed the Virginia Environmental Justice Act and created a Council of Environmental Justice to advise both the governor and an interagency work group focused on advancing the effort.

This month, Paylor said the DEQ will launch a more user-friendly website at [deq.virginia.gov](http://deq.virginia.gov), a process that was already well under way when the report suggested it. The agency will also begin to train staff on environmental justice issues through regular sessions.

"It's clear that we haven't done as good of a job as we should have done with communicating and connecting with the public, and that's not OK," Paylor said during a webinar on the report's

interviews this summer. "We need to learn how to listen better and how to include and connect with folks better."

Early this year, a judge for the Fourth Circuit of the U.S. Court of Appeals put an exclamation point on that statement when he sided with a group of residents from a historically Black neighborhood in Buckingham County, VA. The citizens and environmental groups opposed a proposed natural-gas compressor station that they believed posed a risk to public health in an already economically disadvantaged minority community, suing over a state board's approval of it.

In his Jan. 7 decision that the board did not weigh those impacts enough, the judge wrote that "environmental justice is not merely a box to be checked."

The recent report recommends several changes to how the state agency implements environmental laws to ensure that it's not



A compressor station planned as part of the now-terminated Atlantic Coast Pipeline project would have threatened Richard Walker's ancestral homestead in Union Hill, VA. The permit process for that station was one of the events that caused Virginia's Department of Environmental Quality to reconsider its approach to environmental justice. (Kenny Fletcher/Chesapeake Bay Foundation)

just checking boxes. To be fully implemented, many of those initiatives would require the agency to be granted additional authority or, in some cases, clarifications by state legislators.

The report recommends, for example, that existing regulations be adapted to evaluate environmental justice benefits and impacts, an additional step already being taken in states such as California, Arkansas and North Carolina, according to the report. Other recommendations would go further, requiring enhanced monitoring and enforcement in "environmental justice communities" similar to measures that exist in California or New York.

In a written response to the report, the agency listed several measures it plans to pursue first, such as hiring an environmental justice director, many of which can be done despite limited financial resources.

Since 2001, the DEQ's general fund appropriations have been reduced by \$46 million with 74 positions lost, leaving Virginia ranked near the bottom among states for the percentage of its budget going to natural resources. The agency had intended to begin closing that gap, with plans for 12 of the 85 additional new positions focusing on communications and environmental justice. But, for now, only the additional director position is being pursued, Paylor said.

Despite financial setbacks, one of the

consultants who compiled the report for the DEQ said the push for environmental justice is especially important in light of ongoing discussions in the country about race and equality.

"This year has been an especially trying one for frontline communities and communities of color as they've borne the brunt of the coronavirus pandemic and acts of racist violence," said Vernice Miller-Travis, executive vice president of the Metropolitan Group, in a statement. "However, the Commonwealth of Virginia has decided that this would also be the year they would step up their efforts to address environmental justice concerns. We hope these recommendations will support efforts to ensure equal environmental protection for all."

The Chesapeake Bay Foundation applauded the state's efforts, saying that the hiring of an environmental justice director will add "momentum" to the DEQ's commitments.

"For far too long, people in vulnerable communities in Virginia have disproportionately been subjected to water and air pollution, experiencing increased health problems as a result," the foundation's Virginia Executive Director Peggy Sanner said in a statement. "We hope that [the report] will mark a significant advancement of Virginia's honest reckoning with past environmental injustices." ■

# Some pollution reins loosened during pandemic's early days

## States, using discretion, deny many requests; but reduced staff, COVID-critical production led to waivers

By Jeremy Cox & Timothy B. Wheeler

Dozens of power plants, factories and other facilities across the Chesapeake Bay watershed were given latitude to skip pollution-monitoring deadlines, file late reports or release more pollutants during the COVID-19 pandemic's early days, a review of public documents shows.

In March, the U.S. Environmental Protection Agency announced a controversial policy, suspending the enforcement of a swath of environmental laws. Top officials at the agency said that the "enforcement discretion" strategy was necessary to allow industries to safely comply with social-distancing rules and lockdowns.

Several environmental groups and states sued to undo the agency's action. The EPA quietly ended the policy on Aug. 31. But environmentalists and public health advocates fear that the rollbacks undertaken during those five months inflicted lasting damage.

In the Bay region, most of the compliance is handled by the states, but they, to varying degrees, followed the EPA's lead.

The *Bay Journal* sought public records in each of the Bay region's six states as well as the District of Columbia, showing how many enforcement waivers they had received and how many were approved or denied. The agencies' information-gathering and reporting methods were too spotty to paint a full picture of the policy's impact. Here is a state-by-state breakdown:

### Pennsylvania

During the first wave of the pandemic, the Pennsylvania Department of Environmental Protection approved 43 requests for temporary suspension of regulations or permit conditions, but officials denied 200.

Many sought extensions on filing required reports or checking pollution controls because businesses were temporarily shut down or staff reduced. But some said they needed waivers to maintain production or operations deemed "life-sustaining" under Gov. Tom Wolf's orders.

The Kimberly Clark Corp. asked the DEP to let it exceed air pollution limits for boilers at its Chester Mill plant, which makes toilet paper — a commodity that flew off retail store shelves early in the pandemic.

Sanofi Pasteur, which produces vaccines at a sprawling 600-acre facility in Swiftwater in Monroe County, said it needed to make immediate changes to its operations to join

the fight against the novel coronavirus and couldn't wait for the DEP to process the needed permits.

And Sterman Masser Inc., one of the nation's leading potato producers, asked for a waiver from sediment and erosion control plans on four Pennsylvania farms to plant 1,000 acres in spuds this year. Pandemic-fueled consumer demand, coupled with a poor harvest last year, had depleted its reserves. Without that approval, it warned of a potato shortage.

The DEP's website says it stopped accepting requests July 1.

### Maryland

In September, after receiving inquiries from the *Bay Journal* and others, the Maryland Department of the Environment posted on its website a list of requests it had received for pandemic-related regulatory relief. That list had grown to 71 by early November, when the MDE updated it.

Most of the requests were for extensions of time to file monitoring reports on their water discharges or air emissions because facilities were either closed or staffing reduced. The MDE's updated list shows 50, or 70%, were granted, while 10 were denied and 11 were pending.

Among those denied: Baltimore city, Baltimore County and the Washington Suburban Sanitary Commission, which operate the state's largest drinking water and wastewater treatment systems. They all asked for leniency on consent decrees that automatically penalize them for sewage overflows or failures to meet deadlines on mandated upgrades.

The MDE, like other Bay state regulators, sent its staff home and stopped field inspections at the height of the pandemic.

### Virginia

Mirroring the EPA's language, the state Department of Environmental Quality proclaimed it was using "reasonable enforcement discretion." The state received 98 waiver requests through the end of August. It's unclear from the records exactly how many were approved, but a good number were.

One was granted, for example, to S. B. Cox Ready Mix, a concrete supplier in Meherrin, after it was twice late in submitting routine discharge monitoring reports. Another went to Cherrystone Family Camp- ing Resort on the Eastern Shore, which



Under a consent decree to fix chronic sewage overflows, Baltimore city requested extensions because of the pandemic on its mandated schedule for making sewer repairs like this one along the Jones Falls. The state denied them. (Dave Harp)

blamed having twice as much pollution in its settling ponds on stagnation caused by shutting its doors to campers.

NASA's Wallops Flight Facility, one of a handful of sites nationwide that launches rockets into space, also got a reprieve. NASA officials requested a 30-day extension on April 6 on the deadline to haul away hazardous waste, citing restrictions on interstate travel. The waste was removed May 27.

### West Virginia

West Virginia's Department of Environmental Protection didn't provide a full account of waiver requests. But it relayed several examples, including a 30-day extension on a deadline to dispose of industrial waste at a Chemours chemical plant in Belle.

In another case, the agency allowed the Berkeley County Public Service Sewer District to accept nearly 50% more industrial wastewater, effective April 7, from a nearby Procter & Gamble plant. The wastewater-treatment plant attributed the higher flows to an increase in production amid the pandemic at the P&G facility, which manufactures cleaning supplies and dryer sheets.

The treatment plant receiving the additional waste empties into Opequon Creek, about 12 miles upstream from its outlet at the Potomac River. The waiver period ended on July 1.

On March 27, the West Virginia Manufacturers Association requested the state's Department of Environmental Protection to extend all permits, regulations, renewals and compliance deadlines by at least 60 days

beyond the lifting of the Gov. Jim Justice's lockdown order. Not to be covered: reporting spills, discharges or other time-sensitive events.

No such "blanket" waiver was granted, said DEP spokesman Terry Fletcher. "If a company had a specific issue that was COVID-related, they were told to address it to the appropriate division director and those requests would be looked at on a case-by-case basis," he said.

### District of Columbia, Delaware & New York

As in other Bay states, inspections were put on hold in the spring in the District of Columbia, according to a spokesman for the Department of Energy and Environment. He did not respond to requests for more information.

In Delaware, environmental regulators said they had no reporting waiver requests for either stormwater or groundwater pollution related to the pandemic. The state recorded four late discharge monitoring reports through the first nine months of 2020, three of which were tied to one facility.

In New York, the Department of Environmental Conservation attorney Thomas Berkman said in an April 15 memo that the EPA's rollback had no bearing on the state's enforcement of environmental laws. He added, though, that the department would evaluate waiver requests in the context of the ongoing pandemic emergency. The *Bay Journal* is awaiting records requested from the agency. ■



# Floods drive Binghamton toward sea change of resiliency

## Solutions for city along the Susquehanna take many forms

By Ad Crable

**T**he Susquehanna River has the most flood prone basin east of the Mississippi. And Binghamton, NY, located entirely in a floodplain at the confluence of the Susquehanna and Chenango rivers and downhill of steep, flash-flooding watersheds, might be its most pummeled victim.

But now, after the twin punches of an all-time record flood in 2006 followed by an even more devastating 500-year flood only five years later, officials have decided to quit fighting its rivers and instead rebuild to roll with the punches.

The Federal Emergency Management Agency and state and local municipalities have pumped more than \$500 million since 2011 into making Binghamton and surrounding Broome County a model for flood resiliency. At the same time, officials are using the opportunity to remove blighted structures and remake the area — home to 190,000 people — by embracing the rivers and restoring residents' connections to them.

So far, the owners of more than 400 houses and other buildings at high risk of flooding have voluntarily accepted government buyouts. The structures have been demolished and trucked away, creating 146 acres of open space where floodwaters can spread out and soak into the ground. In their place are parks, greenway trails and a thriving 2.5-acre urban garden that helps supply area residents with healthy produce.

To achieve flood resiliency, more than 170 far-ranging flood-mitigation projects have been put in place. Among them: building an elementary school on stilts, enlarging culverts to channel more stormwater, creating wetlands at a highway interchange, raising bridges and building concrete

floodwalls around sewage treatment plants, a hospital, town hall and police station.

“There are no silver bullets. There are a lot of silver BBs,” is how Chip McElwee, executive director of the Broome County Soil and Water Conservation District, described the challenge.

### A flood town is born

Founded in 1803, Binghamton grew at the junction of the Susquehanna and Chenango rivers. The town became a major transportation hub in 1837 when the Chenango Canal was completed and connected to the Erie Canal. By 1850, it had also become an important railroad nexus.

Like many old cities, waterways were a sustenance. But Binghamton was in a precarious spot along the Susquehanna.

“The Susquehanna basin is so large, our location in the mid-Atlantic makes us susceptible to hurricanes and tropical storm systems, and in the summer there are a lot of west-to-east and Great Lakes thunderstorms,” said Ben Pratt, a water resources engineer with the Susquehanna River Basin Commission. “It’s all of those factors that stack up to make it a very flood-prone basin.”

Manufacturing grew along the rivers, producing cigars, shoes, sleighs, washing machines, pianos and patent medicines. Later, the area became known as a technological and defense stronghold. It is the birthplace of IBM and Link Aviation flight simulators.

Many of these industries were built in the floodplain. Currently, Broome County has 7,586 buildings vulnerable to a 100-year flood.

After the devastating flood of 1936 along the Susquehanna, Binghamton and Broome County made their first attempts to steel themselves against the next wave. The U.S. Army Corps of Engineers built 17.5 miles of earthen levees, 3 miles of concrete floodwalls with 179 sectional gates and a reservoir dam. Since then, another 20 flood-control lakes have been built to try to stem flash flooding in the steep ravines that loom over the area, which became known as New York’s “flood alley.”

With the supposed floodproofing easing minds, more homes and businesses were built in the floodplain and other areas bordering streams. The stagnant cloudburst from Tropical Storm Agnes in 1972 set record flood levels along the rivers, but the area fared better than many thanks to measures taken decades before. Many residents breathed a sigh of relief, thinking they had survived the worst flooding they would ever face.

But on June 26 and 28, 2006, 7 inches of rain soaked the area. Water overtopped parts of the floodwall in Binghamton, forcing the evacuation of 3,000 residents and the airlifting of 300 as well as causing \$175 million in damage. The water level reached an all-time high downtown.

Repairs were still going on when Hurricane Irene made landfall on Aug. 28, 2011. The area got 2.7 inches, which did little damage but saturated the soil and caused a moderate rise in the Susquehanna.

Ten days later, Tropical Storm Lee dumped another 6–12 inches on soggy Broome County. Incredibly, the Susquehanna crested 1–4 feet higher than the record set only five years earlier. This time, the levees and floodwalls were topped, many for the first time. Of the county’s 21 watershed dams, 19 overflowed into spillways for the first time. Without them, damage and loss of life might have been catastrophic.

At the height of the emergency, Binghamton’s fire and police headquarters were unusable. Cars floated in the parking lot of the area’s largest mall. Approximately 24,000 people were evacuated and 200 pets were sheltered.

The damage report: 229 homes destroyed and another 9,000 damaged. Property damage for the flood countywide topped \$500 million. It was among the worst natural disasters in New York state history.

### Going with the flow

The lessons — and frustrations — learned from back-to-back record flooding, combined with projections of even more extreme storms from climate change, swept in a dramatic reversal in how Binghamton and

*Photo: Flooding along the Susquehanna and Chenango rivers in Binghamton, NY, devastated the community in 2011. In all, 229 homes were destroyed and another 9,000 damaged. (Bill Walsh)*



Broome County officials would prepare for future flooding.

Flood resiliency became the new mantra.

The obvious place to start was removing homes in long-established neighborhoods closest to the rivers. Many homeowners and renters had already fled after the two floods, though others stayed and elevated their homes. No one had their homes condemned. Most of the 146 acres of open floodplain created by the removal of those homes since 2018 have become green spaces.

One example of repurposing floodplain land is the Binghamton Urban Farm, a nonprofit that grows 7,000 pounds of healthy produce each year on 2.25 acres on the footprint of 13 former homes.

Run by the nonprofit urban gardening organization VINES, the program acts as a community garden with hundreds of volunteers. VINES also hires 25 youths year-round to learn responsibility, communications skills and other lessons in life.

“It’s given the youth an experience they otherwise would not have,” said Amelia LoDolce, VINES executive director. “A lot of things they do help them to get ready for their next job or college.”

The produce goes to the public through farm shares, market stands and local restaurants. Partly funded with a state environmental justice grant, the farm sells shares of its crops at reduced prices to low-income families and donates part of its harvest to local food pantries.

But flood resiliency is not just about removing everything in the water’s path.

When the MacArthur Elementary School, in the heart of a vibrant neighborhood, was

destroyed by 5 feet of floodwater in 2011, students and teachers were displaced for four years. Officials decided to rebuild in the same floodplain location, but with a sustainable, flood-resistant building.

Neighbors, students, school staff and administration, and the community were approached for ideas. They adopted an overarching mission: “We will heal our relationship with the river.”

Three classroom pods were built on stilts, 5 feet above the reach of a 500-year flood. The ground floor has a playground that will be allowed to flood with minimal damage. Rain gardens, bioswales and native vegetation were planted to collect and cleanse stormwater.

Other flood-damaged structures were put back in service with flood resiliency in mind. High-rise parking garages are being built so that existing parking lots at shopping centers can be allowed to flood. At one shopping center, shoppers will reach stores on the second floor by a series of ramps.

Union-Endicott High School has a new floodwall and a new fieldhouse built on pillars. Ballfields will be used to capture floodwaters when needed. At Lourdes Hospital, which was closed for 12 days after the 2006 flood, a new flood wall up to 11 feet high was built.

Pump stations and essential infrastructure for sewage treatment plants were elevated. At one cloverleaf interchange, a wetland has been created to catch and absorb floodwater.

New floodwalls were built around a sewage treatment plant, a hospital and the Vestal Town Hall. Buildings have been retrofitted with shatterproof glass, submarine



*Levees and floodwalls in Binghamton, NY, built decades ago to help floodproof the city, also separated residents from the rivers. New flood resiliency projects are adding parks and multi-use shoreline trails, paired with events to get more people on and along the water. (Will Parson/Chesapeake Bay Program)*

doors and waterproof walls.

Broome County now has a flood-protection plan for its residents to estimate changes in flood risks from climate change. Done by the New York State Energy Research and Development Authority, it is the first study of its kind in the nation for inland flooding. One unsettling prediction: 500-year floods may become as frequent as 100-year floods.

Much of the \$500 million spent on flood resiliency has come from federal agencies such as the FEMA buyouts and community development block grants. County municipalities put up millions of dollars for matching grants, and the Binghamton City School District spent \$80 million on the new elementary school. The New York Rising Community Reconstruction program has added nearly \$19 million for stream improvements, stormwater upgrades, wetlands, riverfront trails and other projects.

### Facing the rivers again

Binghamton and Broome County are trying to reconnect to the rivers they have often shied away from.

Over time, many buildings came to face away from the Susquehanna. And the system of railroads, highways, levees and flood walls further cut off views and direct access to the river. “In places, it’s as if the city has turned its back on the rivers,” noted a video on efforts to revitalize the area.

Rust2Green Binghamton is a collaborative effort by Cornell University and local communities to make the area flood resilient and sustainable. One of its programs, Living with Water, tries to get residents to

reconnect to their rivers and not just view them as threats or a liability.

The group asked residents what they wanted to see from their rivers. “It’s exciting to hear stories about positive relationships that have emerged. They talked about how they used to fish on the river as kids and swim, and they want to do that again,” said Shorna Allred, a Cornell professor who leads the project.

The results so far include the revival of a floating symphony orchestra concert, raft races, docks and rentals for paddle sports, beaches, fishing spots, riverfront greenways and more open spaces in downtown Binghamton. Greenways were placed on top of earthen levees. The city has drawn up plans to revitalize its downtown waterfront.

There are even plans to make downtown accessible by boat from outlying neighborhoods.

“I think COVID is going to cause a big shift in how people view resiliency overall,” said Beth Lucas, acting director of the Broome County Planning Commission, referring to residents’ increasing interest in outdoor activities during the pandemic.

Like a river slowly changing course, McElwee thinks resiliency will take time and never completely overpower the forces of nature.

“We have chosen to live in the floodplain,” he said. “The bottom line is, if you got flooded before, you’re probably going to get flooded again. Maybe we’ll take the edge off of it.” ■



*Volunteers work at the Binghamton Urban Farm, which grows 7,000 pounds of produce each year for families in the Binghamton, NY, area. The farm is located on land where 13 homes were torn down to restore the floodplain and make the area more flood resilient. (Will Parson/Chesapeake Bay Program)*



A team from the Virginia Aquarium & Marine Science Center documents the 2014 death of a whale in the shallows of a creek off the Elizabeth River. The whale had ingested a piece of a plastic DVD case (right) that punctured its stomach and led to its death. (Courtesy of the Virginia Aquarium & Marine Science Center)



# Death by plastic: Bay's marine mammals, sea turtles imperiled by growing debris

## Oceana report reveals impacts of plastic pollution on aquatic animals

By Tamara Dietrich

Six years ago, a young, emaciated sei whale that normally inhabits the deep waters of the Atlantic was spotted swimming erratically in tidal rivers and creeks near the mouth of the Chesapeake Bay.

For about a week, a team from the Virginia Aquarium & Marine Science Center in Virginia Beach kept tabs on it, trying to keep it safe from boat strikes, hoping it would find its way back to the ocean.

But one morning the whale, a 46-foot female, was found dead in the shallows of a creek off the Elizabeth River. A necropsy found that the animal had ingested a large, sharp shard of a plastic DVD case that punctured its stomach and led to its death.

Mark Swingle, chief of research and conservation at the aquarium, is a longtime member of its Stranding Response Team and sees firsthand the impacts of plastic debris on marine life.

But the sei whale, he said, was “probably the most dramatic example that I’ve seen in my 30 years here.”

The saga of the sei ran in countless newspapers and even *National Geographic*. Now

it’s part of a report just released by the DC-based advocacy group Oceana, cataloging how plastic pollution in U.S. waters impacts sea turtles and marine mammals.

*Choked, Strangled, Drowned: The Plastics Crisis Unfolding in our Oceans* is the first compilation of data spanning 2009 to early 2020 from 51 marine life groups and government agencies.

But authors say what they’ve learned is but a “partial snapshot of a staggering problem.”

“We find news stories here and there about whales turning up on beaches and all sorts of things pulled out of stomachs and very sad tales, but those are just little synopses of stories,” co-author Kim Warner said. “As we try to assemble data, you can get a more comprehensive look at a problem and try to devise strategies for recovery.”

According to the report, about 15 million tons of plastic wash into the ocean every year — about two garbage trucks’ worth every minute. That deluge is projected to triple by 2040. Meanwhile, plastic production runs at roughly 400 million metric tons annually and is on track to quadruple by 2050.

Only about 9% of plastics are recycled, the report states. Most of what ends up in the ocean and on coastal beaches are single-use plastics like straws, bags, bottles, balloons and foam food containers.

By far the leading cause of death by plastic among marine animals, the report found, is their mistaking plastics for food — a sea turtle thinks a plastic grocery bag is a jellyfish, a hatchling with its egg tooth still intact gobbles up a bellyful of bright plastic bits, a filter-feeding baleen whale scoops up plastic shards or pliable shreds floating in the water column.

It can be the worst and last mistake of their lives.

Oceana considers its findings just the tip of the iceberg. They found records of almost 1,800 animals from 40 different species that had swallowed or been entangled in plastic in U.S. waters. Turtles disfigured from ingesting balloons that twisted up their intestines, seals strangled by packing straps, whales starved to death with a bellyful of plastic.

Like other estuaries, the Chesapeake Bay

is a sink for plastic pollution and home to countless creatures at risk because of it.

### Dangers in the Bay

Of the seven species of sea turtles in the world, five of them inhabit the Bay, if only seasonally. Most are juvenile loggerheads or Kemp’s ridleys; all are either threatened or endangered. In warmer months, it’s not unusual for 10,000 sea turtles to use the Bay as foraging grounds.

Among marine mammals, the bottlenose dolphin is known to cruise all the way to the Upper Bay, according to Jennifer Dittmar, director of animal rescue at the National Aquarium in Baltimore. They’ve also seen Florida manatees and harp and harbor seals. Humpbacks and other whales are occasional visitors.

In her 15 years at the aquarium, Dittmar has helped with numerous necropsies at the request of the state Department of Natural Resources, which handles marine animals that wash up on Maryland’s coasts.

“And almost every single dolphin or whale necropsy that I have assisted them with, we



The Virginia Aquarium Stranding Response Team saved a green sea turtle in 2008 by performing several surgeries, including this endoscopic procedure, to remove plastic, pieces of a balloon and other debris from its digestive system. (Courtesy of the Virginia Aquarium & Marine Science Center)

have found plastics, either in the stomach or the intestines — somewhere along the GI [gastro-intestinal] tract,” Dittmar said.

“We’ve seen things like plastic prescription bottles, pieces of plastic — hard plastic or softer plastic. We’ve seen balloon-like material. We’ve even seen things like rubber fishing gloves like watermen use.”

While plastic pollution is a regular feature along the Bay shorelines, there’s still inadequate research detailing its distribution.

Meredith Evans Seeley, a doctoral candidate and researcher at the Virginia Institute of Marine Science in Gloucester Point, is among those trying to learn more. Recently, while surveying a small, uninhabited marsh island at the mouth of the York River, she found “all sorts of plastic trash” on its shores.

“It’s surprising how much accumulates in certain spots,” Seeley said. “It can come in on a big tide or a big storm wave and then just never leave.

“Globally, but especially in the Bay, plastics pollution is not going down. It’s only going up.”

A new and disturbing trend, experts say, is a new form of plastic litter: face masks and gloves used during the

coronavirus pandemic.

Chronically insidious, Swingle at the Virginia Aquarium said, are balloons, which can travel far from where they were released and wreak all kinds of havoc once they come back down. In a decade of annual Bay clean-ups, he said, they’ve found balloons from neighboring states and as far away as Kansas, identifiable by personalized inscriptions.

“Most people don’t understand that, when you release a balloon, you’re really littering,” Swingle said.

Like their colleagues in Maryland, Virginia Aquarium staff routinely find plastics inside sick, dying and dead animals. They found 59 different pieces of balloons, candy wrappers and other plastic in the stomach of a deceased harbor porpoise.

“It’s always hard to see this,” Swingle said.

A Kemp’s ridley had ingested numerous bits of balloon and string, which caused the animal’s intestines to bunch up, reducing it in size to about a third of its length, Warner said.

“So this animal probably died a very painful death,” she said.

A green sea turtle was found thin and unable to feed, but luckily had a better fate.

“After doing an internal examination, we

found that its stomach was basically plugged up with plastic and debris,” Swingle said. So they went in with an endoscope camera and removed balloons, plastic mesh and other plastic bits too degraded to identify. The animal was rehabilitated and released.

### ‘Stop the tap’

When plastic degrades over decades or centuries, it doesn’t simply disappear — it breaks down into tiny microplastics. Microplastics are found all over the world, from the deepest ocean depths to the highest peaks. They’re also found in human organs and tissue.

“Part of what we have to think about with plastic pollution,” Seeley said, “is the life cycle of the plastics itself.”

Oceana and marine experts say it’s critical to reduce single-use plastics, the biggest culprits. They believe consumers will be receptive.

A pilot project that the University of Maryland Center for Environmental Science conducted in Solomons Island, MD, for instance, found that restaurants and their customers are happy to switch to reusable straws, cutlery and food containers if they’re given the option and understand the difference it makes.

Municipalities can be open to change, too.

Washington, DC, banned plastic straws and foam containers and taxes plastic grocery bags.

Virginia, which has outlawed releases of 50 balloons or more, will consider a bill in 2021 that would fine intentional releases of 49 or fewer. Swingle said the bill stands a good chance, now that the trade and lobby group The Balloon Council no longer opposes it. Earlier this year, though, state lawmakers opted not to tax plastic carryout bags after opposition from plastics manufacturers.

And on Oct. 1, Maryland became the first state to ban foam food containers. Beginning in January, single-use plastic bags will be banned in Baltimore, while the General Assembly will consider taking the ban state-wide. It’ll also consider banning intentional balloon releases, as Montgomery and Queen Anne’s counties have already done.

Warner considers such moves a solid step. More important, it is reducing the supply of plastics.

“They really need to stop the tap,” Warner said. “When a bathtub is overflowing, you don’t reach for the mop — you reach for the tap. And that’s what we need to do. We need local, state, federal and maybe global agreements, because it is a local, national and global problem.” ■

For information on Oceana and its report, visit [Oceana.org](http://Oceana.org).



Photos top to bottom: A dead harbor seal in Oregon with a packing strap encircling its neck (Kristal Talbot). A sea turtle entangled in plastic (The Sea Turtle Hospital at University of Florida Whitney Laboratory, under FWC permit MTP228). Plastic collected from a loggerhead turtle’s fecal matter (Gumbo Limbo Nature Center). All photos courtesy of Oceana.

# Record-length stream restoration taking shape in PA

## 'Wild idea' evolves into many partners set on healing Lancaster County's Little Conestoga Creek

By Ad Crable

What are the chances of getting 30 different landowners to participate in a 2.5-mile stream restoration project in suburban Lancaster, PA?

And allow the creation of 27 acres of new wetlands on their properties?

And consent to a public streamside trail of nearly 3 miles through their land to boot?

It appears to be happening in Lancaster County, where water quality improvements will play a critical role in the state's ability to meet its share of the 2025 Chesapeake Bay cleanup goals

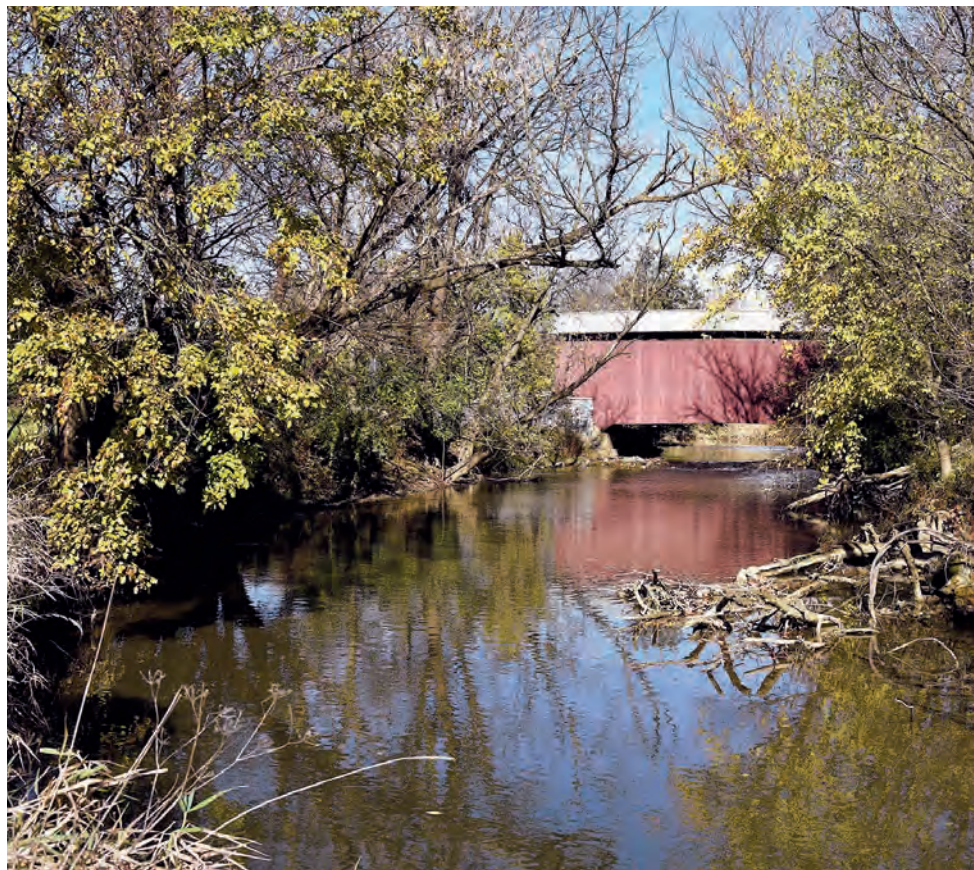
The \$14 million public-private project aimed at restoring Little Conestoga Creek is still nailing down funding but has secured interest from local, state and federal sources. One promising funding source is a newly revised state program that lets entities that are encroaching on small portions of wetlands pay to create wetlands elsewhere. Also, the state is looking at streamlining the permitting process by consolidating all of the needed permits into one.

If the project moves forward as planned, its backers say it will be the largest-ever stream restoration in Lancaster County and serve as a visible template for how large-scale, holistic stream cleaning with regional partners can be accomplished in other locations. They say it will not only improve water quality, reduce flooding and add wildlife habitat, but provide a paved, multi-use recreational trail that may also bring economic benefits as it connects about 200,000 people to their workplaces, health services and shopping centers.

"The opportunity to enhance the quality of life and in some cases create economic activity that's around our streams, and the enjoyment of those streams, is really a combination that I think exists at a lot of other locations in our county," said John Cox, chair of the board of Turkey Hill Dairy and a member of the project team.

Also, the project could help four townships meet pollution reduction requirements in their federal stormwater runoff permits. And it will be much cheaper than if they were doing it alone.

Once stream improvements are made, backers say sedimentation will be reduced by 202 tons a year. The nutrient phosphorus would decline by 611 pounds a year and nitrogen by 674 pounds a year.



An 1873 covered bridge spans Little Conestoga Creek in Lancaster County, PA, just a short distance from a large shopping center. Some sections of the creek are bucolic, but much of its length flows through suburbs and a commercial district, causing problems from polluted stormwater runoff. (Ad Crable)

"This opportunity is a once-in-a-lifetime chance to provide a vital, contiguous and replicable resource that solves some of the most pressing issues facing our community, environment and water quality today," said the feasibility study for the Little Conestoga Blue/Green Corridor.

The project also would be one of the largest efforts in the state to remove legacy sediment, which built up behind mill dams in the 1700s and 1800s, smothering the original streambed under 3–5 feet of highly erodible, nutrient-laden soil. That backwater soil is now being carved through by the stream, like a hot knife through butter, and calving away in clumps during freeze-thaw cycles. At one place, the silt backup causes the stream to flow backward during high water.

Healing the stream will require prodigious earth-moving.

Approximately 143,000 cubic yards of legacy sediment will be scooped away to restore the stream to its original bed and floodplain. Removing the sediment would allow 27.5 acres of wetlands to be restored to store floodwaters and filter runoff pollutants.

The stream will be returned to its original course in places where it was moved to make way for residential development, business and agriculture, which worsened flooding.

Little Conestoga Creek, like about half of the streams in Lancaster County, is listed as impaired by the state. Its silt and nutrient pollution stems from upstream agriculture runoff and urban stormwater runoff along the majority of the project's course.

The stream flows past the county's only shopping mall, many businesses and residential homes whose lawns are mown to the stream edge. Large swaths of the banks are bare of vegetation, and others are full of invasive, nonnative plants. A fair amount of old tires line its bottom.

Sedimentation from floods and the ever-eroding legacy sediment has plugged one of two channels under the county's largest highway and pinched flow under a partially filled-in 100-year-old railroad trestle.

The momentum for the project is largely the result of The Steinman Foundation, a Lancaster-based family foundation dedicated to improving the quality of life in the

county. The foundation has contributed nearly \$1 million for planning, a feasibility study and design and engineering work.

The foundation got involved when it looked at the "high, muddy banks" around one of its properties and decided to do something about it, said foundation president Shane Zimmerman. "We zoomed out on Google Earth and saw an opportunity to link to what's upstream. What seemed like a wild idea at first is evolving into a real exciting project and great opportunity."

Obviously, garnering support for such a project from several dozen landowners is tricky business. But almost all are aboard, including a college, waste authority, high-density apartment and senior living complexes, and a hospital health campus.

About \$2.2 million would be budgeted to buy land, rights of way and easements. The trail may cross the creek via pedestrian bridges in several places to avoid residential properties.

The Little Conestoga Watershed Alliance, a grassroots group that has been improving the creek little by little for 20 years, is giddy at the prospect for such an impactful restoration project.

"We see water sheeting off parking lots and roof areas," said Kate Austin, head of the group. Close-cropped backyards don't help either, she said. "A lot of folks imagine a grass lawn and think there is vegetation there so it must be good. But they don't absorb much water at all."

While the proposed project has many potential benefits, there remains concern about the sediment and nutrients that will still be flushed into the creek from upstream. As a safeguard, a zone will be established at the upstream end of the project to trap silt coming downstream that will be periodically removed.

"These projects are not going to individually solve all the problems in a watershed," said Kelly Gutshall of LandStudies, an ecological design company in Lititz, PA. She cites the nearby Lititz Creek watershed, where piecemeal restoration projects have been going on since the 1990s. Now, 85% of the watershed has been restored and Lititz Creek sustains wild trout.

"You start somewhere and build on it," she said. ■

# African American history focus of Bay mapping effort

## Aim is to assemble a clearinghouse of Black experience in the Chesapeake watershed

By Jeremy Cox

What isn't known about the 400-year history of African Americans and the Chesapeake region could fill the Bay itself to overflowing.

"This is part of the American story," said Jonathan Doherty, manager of the National Park Service's Chesapeake Bay Gateways Network, a partnership of 150 parks, refuges, museums and other significant sites. "For too long, parts of the American story have been untold and under-addressed."

Maybe for not much longer. The Park Service is joining the National Trust for Historic Preservation and three Bay area states on a \$400,000 effort to map sites and landscapes important to the Black experience within the watershed. An advisory committee of professionals will help guide the work.

The recently announced collaboration plans to gather the locations into a digital database. Once a site is registered in the

system, organizers hope that surrounding communities will work toward their preservation — or at least spare them from imminent destruction.

"We need to know where resources are in order to prioritize their preservation," said Kendra Parzen, a field officer with the National Trust, a Washington, DC-based nonprofit. "Lack of detail leads to those places being overlooked."

Historians won't be starting from scratch. African American history and culture in the 64,000-square-mile watershed have been documented in books, museum and university collections, articles and photographic collections. Many historical sites are already protected.

But there is no clearinghouse of Black historical sites for the multistate watershed. And many places of potential significance remain poorly documented or unknown to historians altogether. Other sites may be generally familiar to scholars but their connections to African American history may still be shrouded, Doherty said.

"There are sites that have been documented on a state or national level for some time," he said. "It may have been added because of the architectural attributes on the property, but there's no documentation of that particular site to show that it may have had a significance associated with African Americans."

Black history in the Chesapeake region dates at least as far back as 1619, when the first Africans arrived as slaves in Jamestown, VA. For much of the Colonial period, they toiled anonymously on tobacco plantations. But two of the most recognizable icons from the 1800s, underground railroad conductor Harriet Tubman and abolitionist Frederick Douglass, hailed from the Eastern Shore of Maryland.

The Chesapeake region is dotted with Civil War battlefields, many with strong links to Black valor. For example, at the Battle of the Crater in Petersburg, VA, soldiers with the United States Colored Troops led a counter-attack that drove back Confederate forces, staving off a potential Union rout.

From the Jim Crow era, the mapping



A group of African Americans pose aboard the bugeye *Thomas Blades* in the harbor of St. Michaels, MD, c. 1910. (Gift of Mary V. Thomas to the Collection of Chesapeake Bay Maritime Museum, 1051-0014)

effort is likely to identify dozens of sites, including Blacks-only schools and beaches. And there are physical touchstones of the civil rights movement scattered around the region as well.

What places qualify as historic? What does it mean to represent African American life in the Chesapeake region? Doherty said that the partnership will interpret its charge broadly. Sites won't necessarily have to be related to the water or seafood industry to be candidates for inclusion.

But the partnership's supporters expect some of their richest stories to be directly related to the region's waters. African Americans were — and continue to be — an integral part of the Bay's iconic water-based economy, working as watermen, oyster shuckers and crab pickers, among other roles.

Vince Leggett has been working to document that history for more than three decades. In 1994, he founded the Blacks of the Chesapeake Bay, which seeks to collect stories and artifacts of African American life in the watershed. The partnership has invited him to serve on its board of historical advisers.

Historically, Black people tended to live closest to the Bay's shores because the lower ground was viewed by White settlers as less hospitable, Leggett said. He hopes that the partnership captures not only the stories of the region's most well-known Black figures but also those of people from various walks of life.

"It's more than the Frederick Douglasses

and Harriet Tubmans," Leggett said. "They are the bookends of Black history. We lift them up. But we were more than slaves."

One measure of the recognition gap between Blacks and Whites in the Bay's history involves Leggett personally. In 2003, he was named an Admiral of the Bay, the highest honor a Maryland governor can confer upon someone for environmental accomplishments. African Americans account for only five of the more than 100 recipients of the designation since its creation in 1959.

The Gateways Network has put up half of the project's funding. The rest is coming from the Maryland Heritage Areas Authority, Virginia Department of Historic Resources, Pennsylvania Department of Conservation and Natural Resources, and the National Trust.

That money will cover three pilot projects, one in each state, designed to determine the effectiveness of different computer-mapping technologies. That phase is expected to take up to 18 months.

"We [historians] have captured more historic sites that are associated with White history," Parzen said. "We are working on shifting those priorities now." ■



Crew on the skipjack *Rebecca T. Ruark* sort through their haul of oysters from the Chesapeake Bay in 1976. (Dave Harp)



# Oyster farming in MD might get harder

**Aquaculture advocates say move sought by watermen will stifle growing industry**

By Timothy B. Wheeler

The Hogan administration is moving to block Maryland oyster farmers from leasing spots in the Chesapeake Bay and its tributaries where there's still a smattering of wild oysters — a step that aquaculture advocates warn will stifle the state's small but growing industry.

The Department of Natural Resources has announced that it plans to propose a regulation that would enable it to deny a lease application wherever it finds even a very low density of wild oysters on the bottom or when “physical, biological and economic conditions” warrant reserving the area for the public fishery.

The move comes in response to complaints from watermen, who contend that their livelihoods are threatened by having any more potentially productive oystering areas leased to private shellfish cultivation.

“We've given up enough bottom already,” Queen Anne's County waterman Troy Wilkins said at a recent virtual meeting of the DNR Oyster Advisory Commission.

Watermen have long chafed over the state's move a decade ago to greatly expand its oyster sanctuaries, which put some reefs off-limits to

wild harvest. They also have repeatedly protested aquaculture lease applications, citing potential conflicts with crabbing or wild oyster harvests.

DNR officials say they want to establish a process for creating or expanding Public Shellfish Fishery Areas, which are reserved exclusively for wild harvest.

“There are occasions — and they're rare — when a lease application comes forward, and there are populations of oysters [there that] the fishery has been working on or could be working on,” said Chris Judy, director of the DNR shellfish program.

But oyster farmers contend that the DNR has already been withholding approval or forcing changes to some lease applications when watermen or others object. The rule will only make it easier, they say, for watermen to block them from leasing good spots for cultivating shellfish.

“This is basically a big land grab to the detriment of aquaculture,” said Tal Petty, owner of Hollywood Oyster Co. in St. Mary's County, where he raises bivalves in cages in a creek off the Patuxent River.

## Oyster density debate

There are already 180,000 acres of the Bay and its tributaries that since 2009 have been officially designated as Public Shellfish Fishery Areas. There are another 110,000 acres that are unclassified but still open to wild harvest.

In comparison, about 325 leases encompassing about 6,500 acres have been issued over the past decade, according to the DNR. A few are used for raising clams or scallops, but the vast majority is for farming oysters. There are about 100 applications pending with the DNR seeking to lease another 2,000 acres. Protests have been filed against awarding about 15 of those pending leases.

Petty, a board member of the East Coast Shellfish Growers Association, said the rule would severely limit the state's aquaculture industry, which has grown since 2010 and produced about 60,000 bushels of oysters in 2019, according to DNR figures. The wild harvest during the 2018–19 season was 145,000 bushels, though it nearly doubled in the most recent season ending in March.

“The tragedy is that Maryland is about to significantly reduce the leasable area for aquaculture, using nonscientific methods and measures,” Petty said.

DNR officials say they're not expecting to create vast new areas off-limits to aquaculture but want to correct a regulatory imbalance. Under current rules, oyster farmers may petition to declassify a Public Shellfish Fishery Area so that it can be leased, but there is no comparable procedure for creating or expanding one.

Judy said the DNR was considering denying a lease application if a survey it conducts finds as few as 5 wild oysters per square meter on the bottom. But watermen have insisted that the threshold for denying a lease be set even lower, to block a lease for a site if there is even one oyster per square meter on the bottom.

Some watermen who use power dredges or patent tongs to harvest oysters contend they can get their limit of 10 to 24 bushels per day, depending on the number of license holders on a boat, even if there are fewer than five oysters per square meter on the bottom.

“If you give me two or three oysters a meter, I'll put a deck-load on my skipjack,” said Russell Dize, a skipjack captain from Tilghman. Skipjacks, which use sail or motor power to haul dredges, are allowed to harvest up to 100 bushels a day.

Watermen also complain that letting oyster farmers lease areas that already have some wild oysters effectively gives them a windfall, allowing them to make some quick money harvesting and selling those bivalves. But oyster farmers point out that they're required by state regulations to plant and cultivate far more oysters in the leased area, which requires substantial investment up front in gear and supplies. It takes at least two to three years before until planted oysters are large enough to harvest and produce an income.

*Workers tend oysters at an aquaculture operation in the Potomac River in St. Mary's County, MD. (Dave Harp)*

Two DNR advisory panels dominated by watermen and their supporters have voted to endorse the watermen's position that leases should be denied if there is even one wild oyster per square meter on the bottom. An aquaculture advisory commission urged the department to set the lease denial threshold much higher, at 25 oysters per square meter.

"It appears to be a one-sided proposal to increase the oyster harvest at the expense of restoration and aquaculture efforts that are helping to bring Maryland's oysters back," said Allison Colden, a fisheries scientist with the Chesapeake Bay Foundation.

Though outvoted, several members of the DNR Oyster Advisory Commission argued that the DNR should hold off on the rule and include it as part of a broader effort by the commission to forge a consensus among watermen, oyster farmers and environmentalists over how the state's oysters ought to be managed.

Tom Miller, director of the Chesapeake Biological Laboratory with the University of Maryland Center for Environmental Science, questioned the scientific basis for the rule. Miller, a fisheries scientist, said it's the DNR's purview to decide where to allow commercial harvest, but he said research shows that oyster populations need to be much denser than even five oysters per square meter to be likely to reproduce successfully and sustain themselves.

Ann Swanson, executive director of the Chesapeake Bay Commission, pointed out that experts working to restore the Bay's

severely diminished oyster habitat only consider a reef capable of sustaining itself when it has at least 50 oysters per square meter of varying ages and sizes covering at least 30% of its surface.

### Long history of friction

The friction between watermen and oyster farmers in Maryland has a long history.

"Watermen have wanted all of the Bay bottom from the time the first lease law was passed in 1830," said Don Webster, a Maryland Sea Grant aquaculture specialist and advocate for the industry.

Watermen, who once wielded considerable political clout, succeeded in getting laws passed that from the early 1900s until the early 2000s severely restricted leasing. All a waterman had to do to block a lease then was to swear that he had harvested oysters there sometime in the previous five years.

That changed in 2010, with the passage of a new law that made large areas available for leasing. The Bay's oyster population had been decimated by diseases, overharvesting and habitat loss. A study by the U.S. Army Corps of Engineers estimated that there were only 36,000 acres of productive oyster habitat left in Maryland's portion of the Bay.

State lawmakers decided it was time to encourage aquaculture to take harvest pressure off the struggling oyster population, and they also expanded Maryland's network of oyster sanctuaries, which now cover about 250,000 acres. Watermen contend that the expansion took away many productive



JD Blackwell sorts through baby oysters at his aquaculture operation on the Potomac River in St. Mary's County, MD. Blackwell said that the prospective regulation to further limit areas available for aquaculture leases could cause the industry to "wither and die." (Dave Harp)

harvest areas. Though some may have once brimmed with oysters, a review of DNR data show that only about 10% of the state's overall wild harvest came from those new sanctuaries in the year before they were set aside.

At the same time it moved to boost aquaculture and enlarge sanctuaries, the DNR also established Public Shellfish Fishery Areas that would be reserved for wild harvest. Those areas encompassed three-quarters of the remaining productive oyster habitat, according to a DNR report.

While harvests have rebounded some in the past decade, they remain well below their historic level, and watermen have pressed to get at least some of the sanctuaries reopened. The DNR in the Hogan administration attempted to do that but was blocked by the legislature amid an outcry from environmentalists.

Oyster farmers say the DNR has been conferring for a year or two with watermen and advocates for waterfront property owners to address their complaints about aquaculture. Meanwhile, they say they have had a harder time getting leases when watermen or property owners object.

"DNR has decided to kill oyster aquaculture," contended JD Blackwell, an oyster farmer who leases sites in St. Mary's County. "The excitement that existed in 2011 and 2012 to give birth to a new industry is gone. Oyster aquaculture will wither and die from this point forward. Opportunity missed."

Critics of the rule also say it's self-defeating for watermen because a growing number of them are getting into aquaculture to supplement or replace wild harvests.

One of those is Rachel Dean, a Calvert County waterwoman. She applied more than three years ago to lease 26 acres in the Patuxent River to raise oysters on the bottom. At least one waterman and a homeowner objected, she recalled. And when the DNR sampled the bottom there, it found "at least some" oysters on half of the proposed lease site, with an overall density of about 2 bivalves per square meter, according to a 2019 DNR memo.

The memo, signed by the DNR's Chris Judy, proposed roughly halving the size of the lease to exclude what it called a "functional oyster bar." Dean said the reduction would diminish the viability of the site for raising oysters, so they resisted it. The application remains on hold, and Dean said the department has not responded when she has asked whether it was formally denying the application.

Neither Judy nor Karl Roscher, head of the DNR's aquaculture division, responded to requests for interviews or information.

"We've got to find a balance," Dean said, between oyster farming and the wild fishery. "If this regulation goes through," she added, "there will be no more bottom leases." ■



Watermen harvest oysters from Maryland's Choptank River. Some watermen who use power dredges or patent tongs to harvest oysters contend they can get their daily catch limit even if there are fewer than 5 oysters per square meter on the bottom. (Dave Harp)

# 'Lost' river becomes latest hotspot for oyster restoration

## Work at VA's Eastern Branch benefits from funding windfall

By Jeremy Cox

Environmentalists and scientists call it the "lost" branch.

The Elizabeth River's Eastern Branch flows for 9 miles through the heart of some of the Hampton Roads region's largest communities: Norfolk, Virginia Beach and Chesapeake. But for most residents, the waterway is seen only in glimpses — flashing past on a highway bridge or squeezing into view at the dead-end of a back road. In an indication of its singular obscurity, its Wikipedia entry peters out after four sentences.

That veil of secrecy may be starting to lift. Virginia Gov. Ralph Northam and a pandemic-constricted entourage trekked to the Eastern Branch's shores Nov. 19 to announce that the state has laid the groundwork for the branch's oysters to make a comeback.

Bivalves were once so plentiful in the waterway that they were used to construct a shell-covered road through Chesapeake and Virginia Beach. But they have been largely missing in action since 1925, when bacteria-fouled waters forced the closure of commercial harvesting.

The branch was initially bypassed when



A mix of shell and stone was used to create oyster habitat in the Eastern Branch of Virginia's Elizabeth River. (Courtesy of the Virginia Marine Resources Commission)



Virginia Gov. Ralph Northam visits the Elizabeth River's Eastern Branch to celebrate the restoration of 21 acres of oyster habitat. (VA Office of the Governor)

Maryland and Virginia each selected five Chesapeake Bay tributaries for oyster restoration. Driven by evidence that the Bay's oyster population has fallen to less than 1% of its historic level, the states aim to revive hundreds of acres of reefs by 2025 under the state-federal Chesapeake cleanup effort.

Then came a surprise: In March 2019, a federal settlement involving a Superfund site cleanup in nearby Portsmouth led to a \$64 million windfall, and \$1.5 million was set aside for oyster restoration. In quick succession, the Eastern Branch was designated to be Virginia's sixth tributary in late 2019, and, during a busy six weeks in July and August this year, the work was completed.

Workers created a little more than 21 acres of hard bottom, using stones and fossilized shell fragments known as "oyster hash," said Andrew Button, who oversees oyster conservation efforts for the Virginia Marine Resources Commission.

Now, the plan is to wait and see whether oyster larvae attach themselves to their new home, he said. He is optimistic that will happen because monitoring of smaller attempts at restoration in the Eastern Branch has yielded promising results: dense clusters of oysters representing multiple year classes.

But if the oyster numbers look lean heading into spring, the state has funds remaining from that \$1.5 million budget to "seed"

the bottom with tiny baby oysters, also known as "spat."

The oyster project is the latest chapter of an environmental renaissance for the Eastern Branch, said Joe Rieger, deputy director of restoration for the nonprofit Elizabeth River Project.

"It's gone from basically being a river no one really cared about it to being one of the hottest areas for restoration" in southeastern Virginia, Rieger said. In just the past few years, the branch's shores have been the setting of the \$120 million climate retrofit of the Chesterfield Heights and Grandy Village neighborhoods, a constructed wetland being developed along West Brambleton Avenue and a spate of living shoreline projects undertaken by homeowners.

Rieger traces the turnaround to a restoration strategy authored by his group in 2014. Among its recommendations: restoring 10 acres of oyster reefs, averaging 1 acre a year from 2015–24. At the time, the report's authors assumed that only half of the "currently restorable" bottom would, in fact, be restored — the minimum amount necessary to meet the Bay cleanup's tributary goal.

But the 21 acres completed this summer, coupled with more than 3 acres from previous projects, bring the branch to about 100% of its restorable goal, Rieger said. "That was one of my highlights for 2020."

The restored reefs are scattered across three sites in the waterway. With its completion, the Eastern Branch becomes the second Virginia tributary to be finished with oyster restoration work. The first was the Lafayette River in 2018. The waterway, also an Elizabeth River tributary, was replenished with 32 acres of oyster reefs, which, when combined with 48 acres of historic reefs, met the effort's 80-acre target for the river.

The other waterways undergoing oyster restoration in Virginia are the Lynnhaven River in Virginia Beach; the Piankatank and the Lower York rivers, both in the Middle Peninsula; and Great Wicomico River in Northumberland County.

Because it's situated near the Bay's mouth, water in the tidal Eastern Branch tends to be more salty than fresh. That's good for oyster growth, Button said. But its urban surroundings could hamper the reefs, particularly if local officials and residents fail to get a handle on nutrient and sediment pollution caused by stormwater runoff. The 40-square-mile drainage basin contains more than 56,000 households and 166,000 residents.

The just-finished restoration may be on the small side, but it could offer a big lesson, Button added.

"If you can be successful there," he said, "you can be successful anywhere." ■



# For nutrient-laden Choptank River, cleanup takes a team

## 'Envision the Choptank' unites stakeholders to advance common agenda

By Jeremy Cox

Under a historic 2010 agreement, the states in the Chesapeake Bay drainage basin, along with the District of Columbia, embarked on an ambitious plan to restore the nation's largest estuary by putting themselves on a pollution diet.

Although their names didn't appear on any agreements, local governments would bear much of the heavy lifting to achieve the needed nutrient reductions — evaluating their cleanup options and marshaling the resources necessary to do the work.

In many localities, especially rural communities, that's a big ask. But along one Maryland river, nestled in a landscape of cornfields and small towns, a collaboration was created to help overcome those obstacles. Now, as the partnership charges past its fifth anniversary, it is pivoting to its next and most critical phase: turning promises into action.

The group aims to improve the health of the Choptank River while supporting the local economy, which revolves around seafood production, agriculture and tourism. But its participants also hope to demonstrate what can be accomplished when towns, counties, federal agencies and conservation groups work together.

"This is becoming a model for how we can bring the stakeholders together and work through a common-agenda process to achieve those goals,"

said Matt Pluta, the Choptank Riverkeeper. "If we're taking the same steps at the same time, we can get a lot more done."

Envision the Choptank isn't organized into a formal nonprofit. It doesn't regulate or legislate. Rather, it's part-think tank, part-meeting platform. Above all, supporters say, it's about getting things done.

"It takes a lot to collaborate," said Larisa Prezioso, a conservation assistant with the Eastern Shore Land Conservancy, one of the group's earliest and most-vocal participants. "Being an environmentalist, I want to believe everything is possible. But you have to write grants and think about funding and

who is going out to do the work."

There is no lack of work to be done in the Choptank's 1,000-square-mile watershed.

The Choptank is the longest river on the Delmarva Peninsula, rising in central Delaware and flowing southwest for about 70 miles before emptying into the Chesapeake on Maryland's Eastern Shore. Its blue crab fishery measures its value in millions of dollars per year, and more than 90% of the surrounding watershed remains undeveloped.

But pressure from urban growth is mounting. Since 1996, the region has lost nearly 3,000 acres of forests, largely to development, according to the National Oceanic and Atmospheric Administration.

Meanwhile, monitoring stations show that nutrient pollution has sharply increased since the 1960s due, in part, to heavy fertilizer use on adjacent farm fields.

The Choptank is in the buckle of Delmarva's own broiler belt, one of the nation's densest chicken production regions. Many farmers repurpose those chickens' droppings as fertilizer for corn and soybeans, grains that are grown to feed those hungry flocks. Scientists say such practices have contributed to a large surplus of nutrients in the region's soil. Nutrients carried by stormwater into nearby waters fuel algae blooms that deplete oxygen levels in the Bay, creating "dead zones" where aquatic life is all but nonexistent.

The river has lost about 70% of its underwater grass beds, which are an important nursery for young fish and crustaceans. In the upper portion of the watershed, nearly 50,000 acres of wetlands have disappeared since the Colonial era, representing 11% of the total Choptank drainage area. Such losses make it harder for the landscape to filter out harmful pollutants before they reach the river and the Bay itself.

To be sure, collaboration is not a new phenomenon in the Bay watershed. The Chesapeake Bay Program, which oversees the cleanup, is itself a conglomeration of federal agencies and representatives from the



Leslie Grunden, assistant planning director for Caroline County, MD, and participant in Envision the Choptank, stands by a bioretention pond at the Wharves of Choptank visitor center. (Dave Harp)

watershed's states. Examples at the local level include the Upper Susquehanna Conservation Alliance in New York, Shenandoah Valley Conservation Collaborative in Virginia, and Lancaster Clean Water Partners in Pennsylvania.

What distinguishes Envision the Choptank is its foundation in a nationwide federal program. Nearly a decade ago, NOAA named the river a "habitat focus area," making the region eligible for special funding and agency expertise. The Choptank is one of 10 places nationwide that have received the designation since its launch in 2012.

The agency's focus is the restoration of oyster reefs in three Choptank tributaries: Harris Creek, the Little Choptank River and the Tred Avon River. The agency's additional charge was to work with local organizations and communities toward meeting those restoration goals.

Envision the Choptank began hosting meetings in late 2015, said Joanna Ogburn, a conservation consultant and the collaboration's sole staff member. After several get-togethers with more than 35 partner organizations and a telephone and mail survey of watershed residents, the group developed a 28-page "common agenda" in 2018.

"We want to meet the community where

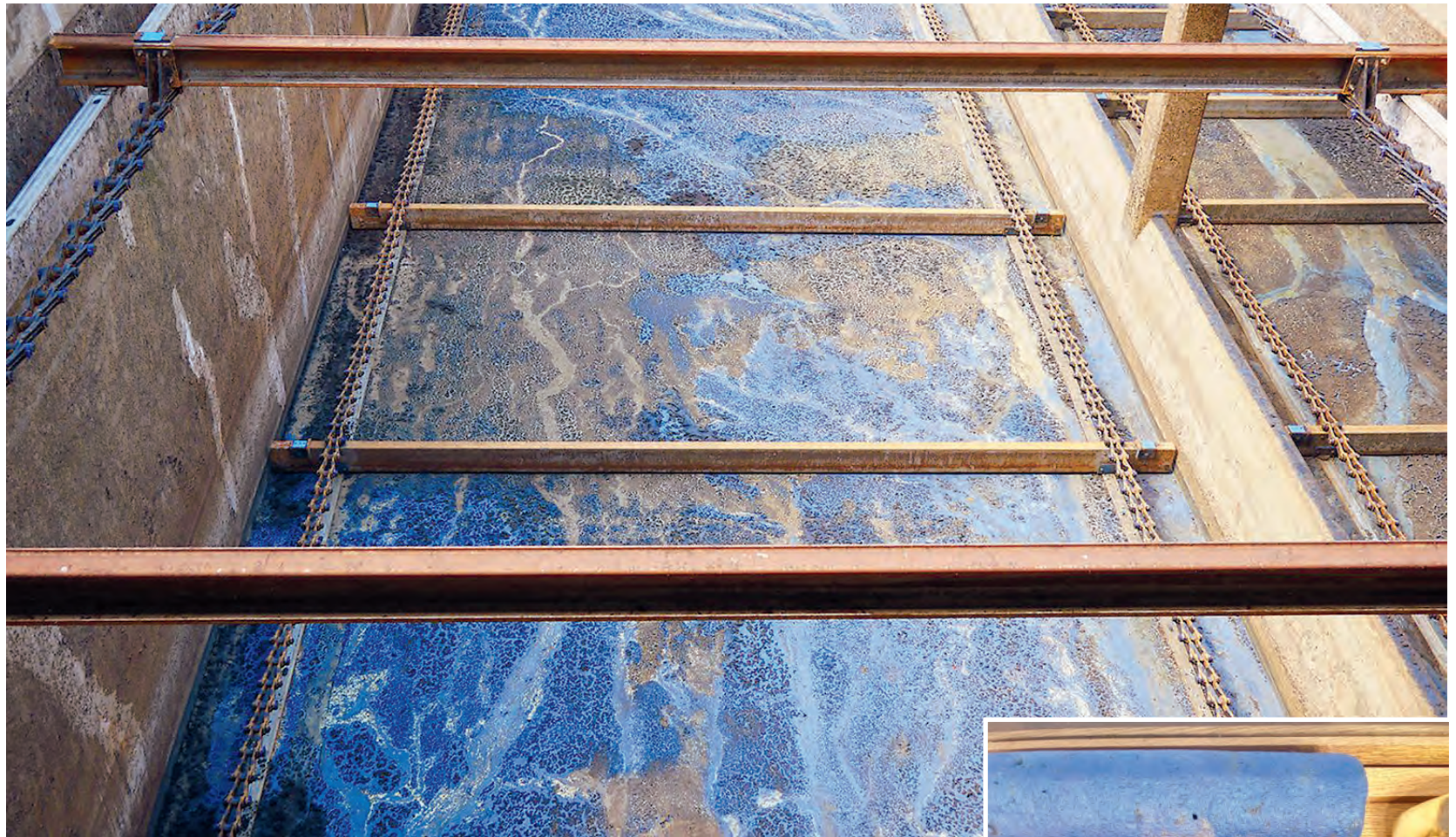
they are," said Alan Girard, director of the Chesapeake Bay Foundation's Eastern Shore office. "We don't want to assume."

Now, the collaborative's plans are starting to become a reality. Last year, the National Fish and Wildlife Foundation awarded the group \$1 million to design and install stormwater fixes on 200 acres of agricultural lands. Member organizations have been working to develop maps showing where those projects will have the most impact on water quality.

The partnership also has led to a regular convening, now held virtually in the COVID-19 era, of local and state government staff members representing about two dozen jurisdictions that work on environmental issues in the Choptank watershed.

In rural Caroline County, the Shore's only landlocked county, those discussions have turned into grant proposals for a stormwater project and community education efforts in the predominately black community of Jonestown.

"We have really small staffs and not a lot of people. We're so close to the ground we're almost unseen," said Leslie Grunden, Caroline's assistant planning director. At the Envision the Choptank meetings, she added, "I can address the group and kill 10 birds with one stone." ■



## Artist takes a deep dive into Alexandria's wastewater

An exhibit at a waterfront art center in Northern Virginia is bringing new meaning to the term “crowdsourced.” The only action residents of Alexandria, VA, had to take to contribute to the artwork was to flush their toilets.

Sto Len, a New York City-based artist who grew up along the Potomac River in Alexandria, said he likes to think that the work he has completed as the first artist-in-residence at a wastewater treatment plant is “endearing people to their own waste.”

The collection of photographs, prints and found objects on display at the city's Torpedo Factory Art Center is something of a collaboration, after all, with the city's residents.

In the exhibit, a pair of prints featuring brownish swirls was developed by applying paper to the surface of a settling tank at the AlexRenew Wastewater Treatment Facility. The plant treats a mix of sewage and stormwater, running the wastewater through a series of settling tanks and treatment processes to remove nutrients before discharging it to tributaries of the Potomac River.

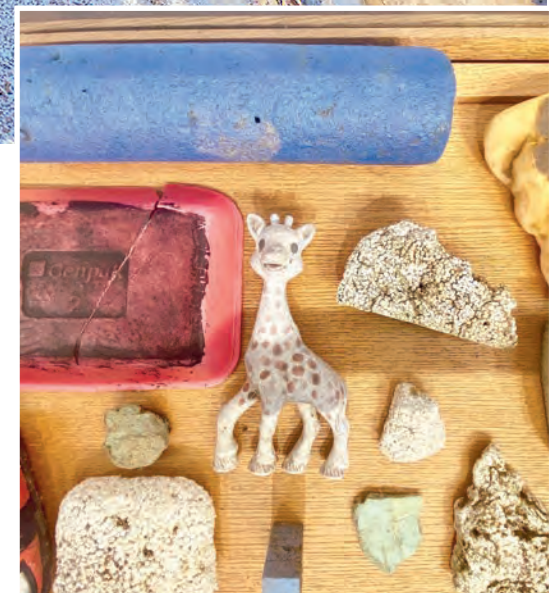
The brown-colored media? That was crowdsourced from thousands of area toilets (perhaps

even the art center's). Safely contained behind glass frames, the prints Len produced with it are striking, even as their origins begin to sink in.

“As gross as that might sound, water has this amazing way of making things beautiful,” said Len, whose exhibit also features photographs of swirling, multicolored wastewater before it's been treated at the plant. “People are like, ‘This is gorgeous,’ and they don't know what they're looking at yet. I like to show them that beauty and then educate.”

Len's unique perspective on wastewater fits right in with Alexandria Renew Enterprises, or AlexRenew, which has taken up the costly task of solving one of the city's biggest water quality problems in recent years.

Alexandria is among a handful of older cities in the Chesapeake Bay watershed working to turn off an unsightly spigot: sewage overflowing into local waterways. Like many centuries-old wastewater systems, Alexandria's was built to capture both sewage and stormwater in its pipes, diverting both to the nearest water body when wet weather makes it hard to treat higher volumes. This is known as a combined sewer overflow system.



*Top photo: Vivid blues contrast with sandy browns in the bottom of a settling tank at AlexRenew Wastewater Treatment Facility in Alexandria, VA. Artist sto Len is using images like this one in an exhibit to show that there can be beauty in the process of cleaning water.*

*Inset photo: At Len's exhibit at the Torpedo Factory Art Center in Alexandria, VA, a glass case features artifacts of modern life found in wastewater.*

*(Photos by sto Len)*

To reduce the flow of raw sewage into waterways, the city is building massive underground tunnels that can hold the polluted water until it can be treated at the plant. Residents who have been oblivious to these overflows might not have that luxury much longer as the project, in addition to receiving some state funds, will cause utility bills to increase as well.

The city saw an opportunity for the water utility to work with its Office of the Arts to help engage people in the project — and inspire new forms of art.

“How do you connect people with infrastructure, which is normally underground and unseen?” asked Monica Billger, community outreach and education specialist at AlexRenew, standing in the space where Len's art is on display. “Art can help them develop that appreciation.”



At the Torpedo Factory exhibit, photographs Len has taken over the course of his 18-month residency fill one wall of the concrete-floored space. Their subjects range from sprawling views of an iconic Potomac River to the concrete tunnels and tanks that help make it cleaner.

The most enchanting among them are closeups of the water at varying stages of treatment. Some feature vivid-blue oil slicks contrasting with sandy sediment. One showing water etching capillary-like lines through a layer of dirt looks like an artful interpretation of human lungs.

“It ties it back into [the idea] that we are bodies of water with these bodies of water around us,” Len said. “I like to think of us as kin.”

Len is not the first artist-in-residence at a wastewater treatment plant; a plant in San Jose, CA, hired a photographer to artfully depict its work in 2010. But he’s part of a new crop of artists working to explain difficult concepts in creative ways. The U.S. Water Alliance, a national coalition of water utilities, this year hired a hip-hop musician as its first artist-in-residence.

Len was thinking about humans’ relationship to waterways before he took up this project in Alexandria.

Since 2012, Len has been using a Japanese art technique called *suminagashi*, which works with ink floating in water to create unique prints. The technique, which Len also used in a public workshop earlier this year, was used by monks as far back as the 1100s. Participants describe it as contemplative.

“It’s almost like you’re collaborating with water in the process, capturing that moment,” he said. “It teaches us that we can’t control water, we have to work with it.”

That art form set Len on a course to advocate for the water around him. He started expanding the art technique to collections from the natural

world, capturing on paper the media floating on the surface of natural waters.

Len’s New York City neighborhood of Queens is near one of the area’s dirtiest canals, Newtown Creek, fouled for generations by oil spills and toxic waste. He’s filled plenty of pages with interesting finds from the creek’s surface — petroleum products, chlorinated solvents and oil residues among them — and realized how beautiful they can be on paper.

“I like the challenge of working with something ugly,” Len writes on his website, [stoishere.com](http://stoishere.com).

What Len makes of the waterways — and the pollution that fills so many of them — is surprisingly beautiful. For his Alexandria project, Len spent time hovering over the plant’s settling tanks, where pollutants are filtered out in stages, carefully placing paper on the surface to capture an



## If You Go

The Torpedo Factory Art Center is located at 105 North Union St. in Alexandria, VA. The high-ceilinged facility is open 10 a.m.– 6 p.m. Wednesday through Sunday and is taking precautions to keep visitors safe during the COVID-19 pandemic. sTo Len’s exhibit, *RENEWAL*, is located on the first floor near the entrance. Learn about the artist at [stoishere.com](http://stoishere.com).

Visitors can also view the exhibit virtually at [torpedofactory.org/renewal](http://torpedofactory.org/renewal) and participate in *SEEWATER*, a photo scavenger hunt, on their own. The hunt asks participants to observe the smallest details of the water in and around Alexandria’s waterfront. A list of 40 items to find and photograph for the hunt is available online and at the exhibit, and entries can be emailed to [seewaterarchive@gmail.com](mailto:seewaterarchive@gmail.com).

expression of its contents.

Billger said the plant urged the artist — who often does this sort of work from a boat that he pushes into New York City canals — to wear full hazmat gear for the work.

Also on display at the Torpedo Factory exhibit are a series of objects that Len found in the water or at the plant.

A glass case features several artifacts of modern life in their washed-up form: a piece of blue pool noodle, a foam food container, a giraffe baby toy and a dozen pieces of polystyrene at varying stages of degradation.

“All this stuff will potentially be [in the environment] for 500 years,” Len said of the collection of mostly plastic items. “I kind of go at it pretending I’m an archaeologist archiving our strange legacy.”

Len has particular interest in polystyrene, which is among the most common items found floating in waterways, and its ability to break down into smaller and smaller pieces over time. In one corner of the exhibit, he used varied chunks of the beady material as stamps, inking their shapes into stark black-and-white prints.

Another wall of the exhibit features a bright blue, floor-to-ceiling canvas print of an underwater photo. Floating in the center is discarded netting that, even in the still photo, looks as though it is dancing in the water.

The artist even devoted a book, published this year, to the subject of foam, which doubles as an acronym in the book’s title: *Future Of A Material*. The book is a collection of art and musings on the confluence of pollution and inspiration. It’s a window into the mind of an artist during a pandemic that has fueled even more trash (discarded masks and gloves) in waterways.

“Giving an artist a seat at the table gives that message another megaphone,” Len said. “That can attract people to the subject in a new way.” ■

*Top photo: Closeup photographs of water, soil and pollution, like this one making a wave shape, help artist sTo Len start discussions about how humans relate to the natural world. (sTo Len)*

*Bottom photo: New York City-based artist sTo Len, shown here by one of the city’s waterways, uses a Japanese printmaking technique to make art from the pollution on surface waters. (Courtesy of sTo Len)*



Things are looking up for this painted turtle. (Dave Harp)

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*Diane Stoecker captures a sunset (Dave Harp)*

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A campfire lights the trees on a starry night on Assateague Island off Maryland's Atlantic Coast. (Dave Harp)

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## Let's not throw out the forest out with the stormwater project

By Barbara Southworth

Tim Wheeler's article, *Stream restoration tactics challenged*, (*Bay Journal*, October) spotlights some of the growing body of published research and citizen resistance faulting the specious application of stormwater management schemes that gut suburban stream habitats in mature forest, reducing them to engineered landscapes with diminished ecological function.

Purported to lessen sedimentation and the nitrogen and phosphorus pollution that contribute to water quality decline, MS4 (short for Municipal Separate Storm Sewer System) programs require urbanized localities to gain pollution control credits for managing stormwater discharge. However, as the *Bay Journal* reported, as "states and localities scramble to meet their obligation for restoring the Bay's water quality" by achieving regulatory requirements to reduce stormwater pollution, localities often rely on the most ruinous options offered by Dave Rosgen's so-called Natural Channel Design system.

Engineering small stream courses, such as the Virginia sites featured in the recent article, that never had flood plains to begin with (according to former Hollin Hills resident and internationally recognized fluvial geomorphologist John Field) indicates that localities and the stream restoration industry fail to properly assess, weigh or protect the full range of ecosystem services provided by the old-age forests they destroy in a contrary application of Clean Water regulations.

Such ecosystem services include cooling stream and air temperatures, storing carbon, filtering pollution, recharging groundwater, enhancing property values, managing storm water and, importantly, supporting natural systems and food webs — not to mention the connections with natural forests that people value and seek out.

Diverse relationships among soil, water, native plants, insects and animals create complexity and stability that is impossible to fully engineer, and they take generational time scales to develop.

Alarmed about "stream restoration" projects contrived with scant regard for the biological wealth they squander, citizen groups are fighting to alert the public and



Rod Simmons, a botanist and outspoken critic of some stream restoration methods, stands in an unnamed tributary of Paul Spring Branch, one of two in the Hollin Hills neighborhood of Fairfax County, VA, that are slated for restoration. (Timothy B. Wheeler)

save cherished forests. We urge regulators, local officials and the stormwater industry to respect existing forest integrity, rethink stormwater management, and access robust systems biology based on actual site measurements and monitoring, not models using inappropriate and inflated reference values from distant and unlike watersheds.

Actual test results from the Hollin Hills stream sites slated for destruction reveal low to very low phosphorus and nitrogen, according to independent testing, as opposed to surprisingly high figures used by Fairfax County, VA. Will sediment transport (or non-existent pollution) decrease once the small headwater stream valley is laid bare, save for seedlings and saplings of a greatly reduced number of species than currently exists there?

Both parks in Hollin Hills are significantly more diverse and higher quality than what has been represented by Fairfax County. Currently, 87 native plant species are found in Goodman Park and 74 in Brickelmaier Park, documented by ecologist Rod Simmons working independently, that weren't discovered by Fairfax County. The number of species proposed for planting is far less, only 15% and 25% respectively of the number found in the parks, some do not exist in the parks. Invasive species have been shown to proliferate after such plantings.

The discrepancy between the plant

communities found in the Hollin Hills parks and the proposed plant list for revegetating the parks cannot be addressed by quantity alone, despite, as reported, the project manager's claim that "plans call for replanting more trees and shrubs than are being removed." As Mr. Wheeler's article indicates, the woodlands' massive oaks and their plant and animal community live in relationships developed over many decades.

Moreover, trees designated as "saved" trees on county plans will surely suffer root zone damage and later death, despite inadequate mitigation efforts, such as root-pruning up to 50% of the arc around the tree up to the trunk, because their proximity to paving and heavy equipment puts them smack in the danger zone.

Contrary to Fairfax County's assessment, the parks do, in fact, shelter forest interior-dwelling bird species, including migrating warblers and wood thrushes. Further fragmenting remaining forest habitat does these catastrophically declining birds no favors.

Among other significant critiques of drastically altering existing streams is the apparent violation of Clean Water regulations prohibiting changing one type of waterway to a different type, as obviously seems the case when forested stream habitat is converted to stormwater sewer conveyance; its form and function are distinct from the original.

To date, the U.S. Army Corps of Engineers has ignored a request to supply information about permitting this variance.

Rosgen's Natural Channel Design methods are not the only way to think about streams. But for all the controversy they have generated, they do include less invasive options, typically not considered when bulldozers and engineers are the tools of the trade dominating stream management plans. Option 4, Stabilize Channel in Place, includes softer, habitat-sparing bio-engineering methods. Think wood to reinforce the existing channel and much smaller equipment, not requiring engineering a new channel from scratch, nor constructing 12-foot-wide roads to clear and grade land and handle imported soils and 1- to 2-ton boulders.

Landscape management practices should not degrade local ecosystems and the co-evolved associations that are their glue, especially in the name of enhancing Chesapeake Bay water quality.

More sustainable development, regulatory and lifestyle approaches are needed to solve the problem of stormwater runoff from impervious surfaces in developed areas, not degrading headwater stream habitat for little Bay benefit. ■

*Barbara Southworth is an environmental science and policy specialist in Alexandria, VA.*

## Ag payments to control nutrients should be based on results

By Kurt Stephenson,  
Zach Easton, James Shortle  
& Leonard Shabman

**T**he first step to fixing a problem is recognizing that you have one.

This is a familiar motivator for many self-help programs. It is also applicable to the Chesapeake Bay Program.

The well-recognized problem in the Chesapeake Bay is excess nutrient loads (pounds of nitrogen and phosphorus) that degrade Bay water quality. The obvious fix — reducing nutrients — has been an objective of federal and state policy makers since the 1980s.

Much progress has been made in reducing nutrients from point sources, such as wastewater treatment plants. But, the water quality problem remains, largely due to nonpoint sources — typically runoff from the land. Agriculture has long been recognized as a leading cause of nonpoint source nutrient loads to the Bay. Yet, despite decades of effort and billions of dollars spent, recent analyses of nutrient levels in rivers flowing into the Bay show little to no improvement from nonpoint source control efforts.

Unlike the regulatory programs used to reduce point source loads, the Bay states rely primarily on voluntary compliance programs to reduce agricultural nonpoint source loads. These programs provide subsidies and technical assistance to agricultural producers to voluntarily adopt best management practices (BMPs) such as cover crops, stream buffers, stream fencing and nutrient management. The ineffectiveness of this approach is often attributed to insufficient funding and the lack of political will to increase it.

But what if funding isn't the only problem? Put another way, would an increase in funding, funneled through existing agricultural programs, achieve the needed reductions?

We doubt it.

The Bay Program estimates nonpoint source nutrient reductions based on large geographic averages. Nonpoint source reductions are calculated based on multiplying estimates of nutrient runoff (pounds per acre) by a percent reduction assigned to a BMP (percent removal) and the number of acres served by the BMP. The amount of nutrients running



Runoff from a soy field fills a farm ditch on Maryland's Eastern Shore. (Dave Harp)

off land is a computer-generated average over thousands of acres, and the BMP removal efficiencies typically applies to the entire watershed. In reality, though, the effectiveness of BMPs varies from place to place.

This approach discourages the identification and treatment of areas of the landscape that produce the largest nonpoint source loads. At the same time, state and federal cost-share programs that fund agricultural BMPs also limit interest in seeking high-loss areas and low-cost treatment options both in the agencies that administer the programs and the agricultural producers who receive the cost share.

A few illustrations: Consider the lack of incentive to identify and treat high-loss areas. Suppose that 80% of nutrient losses on a 250-acre farm is coming from only 15 acres. Research shows that disproportionality of this kind is common. Do the Bay Program crediting system and the technical/financial assistance programs work together to direct the cost share so that the producer will target those 15 acres? Not really. If the 250 acres is in the same land use (say crop production), Bay Program crediting gives the same reduction credit whether the BMP is placed on any of the 235 low-loss acres, or the 15 high-loss acres.

Now, consider an innovative BMP that could achieve thousands of pounds of nutrient reductions at a significantly less cost per pound than the existing BMPs. The BMP,

however, requires substantial upfront capital investment, ongoing operation and maintenance expenditures, and provides no direct benefit to the agricultural producer. In short, the innovation produces large quantities of inexpensive, high-quality nutrient removal services but at little benefit to the farmer. In this case, the producer has to pay part of the cost of installation and maintenance. Beyond altruism, why would a producer install and operate such a technology? From a strictly financial perspective, they would not. The structure of our cost-share programs does not directly pay producers for what we want: nutrient reductions.

Consider the incentives facing agencies who manage nonpoint source programs and the technical service providers who recruit and work with agricultural producers to implement BMPs. Suppose a technical service provider can work with two neighboring producers. One producer has low nutrient loss and is interested in adopting additional BMPs. The other producer has high nutrient losses and is reluctant to participate in government programs. Why would the technical service provider spend time with the second producer?

Service providers are overloaded with work and staff are numbers declining. Because of the Bay Program BMP crediting system, agencies can claim the same reduction credit for a

BMP installed by either producer. The actual amount of nutrient reduction achieved, however, will differ depending on who implements the BMP and where. Additional BMPs on land with low nutrient loss will produce much less nutrient reductions than BMPs applied to land with high nutrient loss. This is not a criticism of agency staff but rather is another example of how the structure of nonpoint source incentive programs shapes behavior.

To be clear, increased funding for nonpoint source programs would be helpful, but the Chesapeake Bay partners need new ways of choosing and rewarding who does what, and where.

The Bay Program acknowledges that nutrient nonpoint source loads differ by region, but one critical need is to incorporate finer-scale approaches for identifying high-nutrient-loss areas and for crediting systems aimed at reducing nutrient loss in those areas.

Bay Program partners also need new policies to better motivate and direct behaviors. Existing cost-share programs have the effect of paying people to install practices but not necessarily achieve nutrient reductions. Other voluntary incentive systems that pay directly for nutrient reduction outcomes, such as “pay for performance” systems, can create new avenues to achieve more reductions for every dollar spent. Targeted regulation that requires the treatment of high-nutrient-runoff areas, perhaps combined with a more generous cost share, could earn acceptance by producers and generate more nutrient reductions.

Changing crediting and incentive systems will require setting up new programs alongside existing ones and revising program rules and regulations. It might require targeted experimentation. There is no single change that will improve nonpoint source program outcomes, and no change will come easily.

But the first step in any self-help program is acknowledging that a problem exists. ■

*Kurt Stephenson and Zach Easton are professors of agricultural and applied economics and biological systems engineering, respectively at Virginia Tech. Leonard Shabman is a senior fellow at Resources for the Future, in Washington, DC. James Shortle is a professor of agricultural and environmental economics at Penn State.*



# Where solar arrays *shouldn't* go is as critical as where they do go

By Lee Epstein

Solar power is coming to the Chesapeake Bay watershed, and it is past time to prepare.

Maryland, Pennsylvania and Virginia are projected to collectively add more than 6,200 megawatts of solar power over the next five years, tripling current generation capacity, according to the Solar Energy Industries Association. Each of these states, which cover the majority of the Bay watershed's land area, have passed renewable power legislation for achieving certain percentages of renewable or carbon-free energy by 2030, 2045 and 2050.

With climate change action listed as a top priority of the incoming Biden administration, these trends will likely gain even more momentum.

This is clearly good news. Solar power will be essential to move the United States toward a zero-carbon future, as the nation and the world must do to reduce the extent and impacts of climate change. Cutting emissions also reduces harmful air pollution that contributes nearly one-third of the nitrogen that pollutes local streams, rivers and the Chesapeake.

Because the production of power from solar sources requires a substantial dedication of space — roughly five to 10 acres per megawatt produced — *where* and *how* we create this important clean energy must be crucial elements of any decision-making concerning its development.

Clearing forests, wetlands, or prime farmland for solar farms can degrade wildlife habitat and diminish the land's ability to naturally filter and clean water, adding more pollution to rivers and streams. Such actions can also undermine the effort to fight climate change. Forests and wetlands capture and store carbon in their own right, and they provide important buffers against extreme weather.

On the other hand, solar facilities that make use of degraded or developed land, such as warehouse roofs, marginal farmland, or landfills and other land uses, can both protect waterways and achieve clean energy goals.

To help safeguard water quality and other ecosystem services, the Chesapeake Bay



Solar panels that make use of rooftops, like these on the Maycroft Apartments in the District's Columbia Heights neighborhood, can both protect waterways and achieve clean energy goals. (Timothy B. Wheeler)

Foundation recently published a guide of best practices for solar development. Among the most urgent is forward planning.

States and local governments should prepare for solar now by conducting detailed siting studies prior to development, taking into account sensitive or natural resources as well as the proximity of power grids and transmission facilities that could accept the produced power. The value of these studies is not to definitively assign where solar projects must go, but rather to rule out areas that would be inappropriate for development and provide a snapshot of what's possible. The resulting maps can then provide guidance to developers and inform permit and land use approval decisions.

In states where Public Utility, Public Service, or State Corporation Commissions (PUCs, PSCs, or SCCs) have authority for permitting solar facilities, the commissions should undertake this work. In states where

local governments or regional planning agencies have primary planning authority, or the authority to accept or reject the placement of solar facilities, the same kind of work should be done at the local level.

To date, these types of studies have not been broadly conducted, though the recent Baltimore County pilot study conducted by the Chesapeake Conservancy is a good example of one. Nonetheless, in the Bay watershed, we are blessed with excellent,

satellite-based land cover maps of all 64,000 square miles, at the scale of one square meter. By next year, satellite-based Lidar (light detection and ranging) mapping will begin to spread watershedwide, allowing even higher accuracy concerning topography; the location of streams and buffers; tree canopy; impervious surfaces; and other land cover. In combination, this rich data set will provide states and localities with access to vast and detailed information about their land, which

can be used to help determine areas where solar arrays should preferentially be located or avoided.

The urgency of climate change and the need to meet renewable energy goals set by Bay states mean it is not a matter of if solar development happens, but how. Investing in the planning process now will help ensure Bay jurisdictions realize the promise of solar power, while protecting the natural systems and communities that are at the beating heart of achieving a stable climate. ■

*Lee Epstein is director of lands programs at the Chesapeake Bay Foundation.*

## SHARE YOUR THOUGHTS

The Bay Journal welcomes comments and perspectives on environmental issues in the Chesapeake region. Letters to the editor should be 300 words or less. Opinion columns should be arranged in advance. Contact editor Karl Blankenship at [kblankenship@bayjournal.com](mailto:kblankenship@bayjournal.com) or 717-428-2819. You can also reach the Bay Journal by mail at 619 Oakwood Drive, Seven Valleys, PA 17360-9395. Please include your phone number or email address.

## Tale of skipjack captain and caper still worthy of praise



By Tom Horton

This is the story of a gift of Chesapeake waters, no less important than any bounty of seafood.

It's about Art — the late Art Daniels, Jr., that is, legendary Deal Island oyster dredger, captain for more than half a century of the skipjack City of Crisfield.

It's also about the art of the oyster, which appears to be the least glamorous of Chesapeake seafood, no match for the blue crab's colors, the sportiness of striped bass or the eel's epic migration from Bay streams to Sargasso Sea.

But pursuit and capture of the humble "arster" has inspired more lore and photography, painting and passion (the "oyster wars" of the 1800s), than anything else from these waters.

No method of harvesting the Bay was more artful than the wind filling the outsize mainsail of a skipjack as the captain drove her skillfully, "licking" her twin dredges across the "rocks" (reefs) of oysters.

Among this fraternity, Art Daniels Jr., and the City of Crisfield were renowned. My late friend Tom Wisner, singer and storyteller of Bay tales, called Art one of the "elemental folk," one of the lives twined intimately with the estuary's nature.

He recalled Art showing him a fossil whalebone that came up in the City's dredges: "likely 12 million to 20 million years old," Tom ventured. Art quietly demurred — it could be no older than the time of Noah.

"Ahh, well, I dunno about that, Cap'n," Tom mumbled.

"Well that's just it, boy," Art smiled

broadly, "you don't know. But I *know*."

The two did share abiding faith, Tom in Nature, Art in the Lord, who surely governs nature. They traded stories, shared songs, Art in his fine tenor, Tom in a resonant baritone.

Perhaps it was that familiarity that led Tom to ask something of Art that would result in an act of high Chesapeake art.

In early January 1972, loaded with oysters, Tom aboard with his camera, Art had the City of Crisfield flying before a southeast breeze toward Solomons harbor on Maryland's Patuxent River. It was Jan. 6, 1972, a date of revelation, the Christian feast of Epiphany. At the wheel, Art hummed a hymn as he passed Drum Point Light.

"Y'know, Cap'n, I've heard some of these Eastern Shore captains can put a boat into dock under sail only," Tom said. Art hummed, lost in thought, hummed some more.

"Might be true," he said finally.

Only later would Tom realize what he was requesting: "[It was] like asking an 18-wheeler to come into a tight parking space at 65 mph ... throwing tons of old wooden boat and rigging against the hard concrete of Solomons wharf, with sure disaster if a single thing went wrong."

Art scanned the waves and currents, hummed another hymn. Silence. Then, to his crew: "Eddie, you go forward and take that jib off and stand by on the main halyard. Be ready to let 'er go. Elmer, you get forward with that bowline. Tom, put that camera down and hold this rope."

The Solomons dock was coming fast. The other skipjacks had all dropped sail for docking with the powered "pushboats" carried astern. They hung back. This would be something to see. A crowd formed along the catwalk of the Orca, a big barge that extended from one end of the dock.

Art held a collision course for the Orca. He would need to turn, or "come about," very sharply at the last possible moment, spinning the City of Crisfield in a great arc, dropping sails and luffing up into the wind, kissing the dock — or smashing it.

At such moments, Tom recalled, "watermen say a skipper has the whole universe in the palm of his hand." No sound



The City of Crisfield, a skipjack once captained by the late Art Daniels, Jr., stands in a boatyard on Deal Island, MD, where Bob Fitzgerald (pictured above) is conducting restoration work. (Dave Harp)

now but the rush of wind and water curling from the City's bow.

Art spun the wheel, and the boat's long bowsprit swept down the Orca's side so close the gawkers lined up on her fell backwards or sucked in their stomachs.

Sails down, boom drawn in, she was still whizzing past the dock. Elmer knew what to do; he hurled the dock line ashore, aiming for the man standing ready to quickly wrap it around a bollard.

And he *missed*. The rope slithered back into the water.

Art was already "striding forward from the wheel, running like an old rooster," Tom said. His whole body bent to gather the rope and whirl in one fluid motion and struck the dock man in the chest. And with a groan the City of Crisfield settled to the dock.

Art sauntered back to the stern as the crowd applauded. "How's that for docking one of 'em, Tom?"

It was a work of Art, captured vividly on *Follow on the Water*, Tom's last CD. And there's so much more.

There's *Watermen*, the hauntingly lovely 1968 film by Holly Fisher and Romas Slezas,

that follows Art and the Deal Islanders through a year of oystering, and there's *The Oystermen of the Chesapeake*, by Robert de Gast, arguably the finest photo book ever done on the Bay.

Also, at the Chesapeake Bay Maritime Museum, as part of photographer Dave Harp's *Where Land and Water Meet* retrospective photo exhibit, there's a continuously playing loop of roughly 60 photos from 1976, chronicling the last days of widespread sail dredging. And the Skipjack Heritage Museum on Deal Island will soon be opening a section featuring Art Daniels and the City of Crisfield. ■

*Tom Horton has written about the Chesapeake Bay for more than 40 years, including eight books. He lives in Salisbury, where he is also a professor of Environmental Studies at Salisbury University.*

# CHESAPEAKE CHALLENGE

— Kathleen A. Gaskell

## Em-bark on this Quiz

Bark offers trees all-around protection from outside forces. It is the first line of defense against insect pests. It helps the tree from turning soggy when it rains, and protects the tree from losing moisture during dry spells. It continually grows from the inside, acting as insulation from heat and cold.

Winter is a great time to observe a tree's bark. Here are the descriptions of five oaks in the watershed that are highly valued for providing food and shelter for wildlife, as well as shade and beauty in the landscape. Can you match the descriptions with the photos on this page? Answers: Page 37.

1. My bark starts out gray and smooth but roughens with age, turning black and furrowed to reveal a reddish inner bark. I can withstand drought better than many trees. My newly unfurling leaves have a reddish hue before turning green, and my red fall leaves last long into winter.
2. My dark, deeply fissured bark is the thickest of the Eastern U.S. oaks. It contains high levels of tannin and was extensively used to tan leather before the 1900s. (My lumber was actually thrown away at this point.) Once it was discovered that my wood is almost rot-proof, it became popular for items made from wood that touch soil, such as railroad ties and fences. I can grow as wide as I am tall.
3. The grooves of my light gray bark form rectangular scales, which can occasionally peel off. I'm the tallest oak species and, although slow-growing, I can live for hundreds of years, longer than many oaks. My wood is strong and waterproof and was prized for building ships. To this day it is used to make barrels for wine and whiskey.
4. My bark starts out smooth and reddish gray but roughens and turns gray as I get older. Still, my bark is relatively smoother than other barks in this quiz. I am mostly found along rivers or in flood plains — my species name means "marshy." I am able to self-prune, dropping useless branches as needed or stopping growth altogether. The former leaves knotholes that make my lumber less desirable.
5. My dark bark consists of deep furrows separating flat ridges that breaks off easily. My acorns are recognized for containing the least amount of tannin and need little preparation to be made edible. I grow more rapidly than most oaks. I am tolerant of mucky and wet soil.



Oak leaf for icon ([PublicDomainPictures.net](#))

A: *White Oak* (*Quercus alba*)  
([Derek Ramsey \(Ram-Man\)](#) ©2016)

B: *Scarlet Oak* (*Quercus coccinea*)  
([Chhe / Wikimedia Commons](#))

C: *Chestnut Oak* (*Quercus montana*)  
([Mwanner CC BY-SA 3.0](#))

D: *Pin Oak* (*Quercus palustris*)  
([Dodshe / CC BY-SA 3.0](#))

E: *Swamp White Oak* (*Quercus bicolor*)  
([Derek Ramsey \(Ram-Man\)](#) ©2016)

F: *Emancipation Oak* at Hampton University in Hampton, VA, in a 1907 photo. ([Public Domain](#))



## Oaklore

**“Every oak tree started out as a couple of nuts who stood their ground.”** — Henry David Thoreau

Stood their ground, they did. On average, only one in every 10,000 acorns becomes a new tree.

**Oodles of oaks:** Oaks (genus *Quercus*) make up the greatest tree biomass in North America.

**80th anniversary coming up?** Oak is the traditional symbol for this occasion.

**Stately trees:** The oak is the U.S. national tree and an oak species is the official tree in seven states, including the white oak (Maryland) and scarlet oak (District of Columbia).

**Itchy imitator:** Poison oak is not an oak. The shrub, which has leaves that resemble oak leaves, is a member of the genus *Toxicodendron* (“poison tree” in Latin).

**We'll leave when we want to!** Even though their leaves stay green all winter, live oaks, oak species common in the South, are not evergreens. They shed their leaves over a few weeks every spring.

**News flash:** Oaks are the tree most often hit by lightning. They are often the tallest tree around and filled with water, two factors that attract lightning.

**Celebri-tree:** The Emancipation Oak, a southern live oak on the campus of what is now Hampton University in Hampton, VA, is one of the National Geographic Society's 10 Great Trees of the World. During the Civil War, it grew outside Fort Monroe, a place of refuge for enslaved people seeking freedom. In 1861, the American Missionary Association asked Mary Smith Peake, its first black teacher, to teach these people, an activity earlier forbidden under Virginia law. Her classes, which took place under the tree, included around 50 children during the day and 20 adults at night. In 1863, the local Black community met under the oak to hear the first Southern reading of the Emancipation Proclamation, leading to its nickname.

**What is an acorn?** It's an oak tree, in a nutshell. Sorry, I couldn't resist telling a-corny joke. ■



# BULLETIN BOARD

## VOLUNTEER OPPORTUNITIES

### WATERSHEDWIDE

#### Citizen Science: Creek Critters

Use Audubon Naturalist's Creek Critters app to check a stream's health by identifying small organisms, then create a report based on what is found. Get the free program at App Store or Google Play. Info: anshome.org/creek-critters. Learn about partnerships / host a Creek Critters event: cleanstreams@anshome.org.

### VIRGINIA

#### Become a water quality monitor

Train online with the Izaak Walton League to become a certified Save Our Streams water quality monitor in Virginia. Follow up with field practicals, then adopt a site of your choice in Prince William County.

■ **Snap a Stream Selfie:** Collect data on trash at a local stream by taking a photo.

■ **Become a Salt Watcher:** Use a free, easy test kit to determine if there is excessive road salt in a stream.

■ **Check the Chemistry:** Spend 30 minutes at a local waterway with a handful of materials and downloadable instruction sheet.

■ **Survey Stream Critters:** Look for what's living in a local stream by matching pictures in an app. The number and variety of creatures reveals how clean the water is.

■ **Monitor Macros:** Become a certified Save Our Streams monitor with one day of training. Learn to identify aquatic macroinvertebrates, assess stream habitat, report findings and take action to improve water quality. Info:

Rebecca Shoer at rshoer@iwla.org, 978-578-5238, or put "water quality va iwla" in your search engine.



### WORKDAY WISDOM

Make sure that when you participate in cleanup or invasive plant removal workdays to protect the Chesapeake Bay watershed and its resources that you also protect yourself. Organizers of almost every workday strongly urge their volunteers to wear long pants, long-sleeved shirts, socks and closed-toe shoes (hiking or waterproof). This helps to minimize skin exposure to poison ivy and ticks, which might be found at the site. Light-colored clothing also makes it easier to spot ticks. Hats are strongly recommended. Although some events provide work gloves, not all do; ask when registering. Events near water require closed-toe shoes and clothing that can get wet or muddy. **Always bring water.** Sunscreen and an insect repellent designed to repel both deer ticks and mosquitoes help. Lastly, most organizers ask that volunteers register ahead of time. Knowing how many people are going to show up ensures that they will have enough tools and supervisors. They can also give directions to the site or offer any suggestions for apparel or gear not mentioned here.

#### Check out cleanup supplies

Hampton Public Libraries have cleanup kits to check out year-round, then return after a cleanup. Call your local library branch for details.

#### Cleanup support & supplies

The Prince William Soil & Water Conservation District in Manassas, VA, gives supplies and support for stream cleanup events. Groups also receive an Adopt-A-Stream sign recognizing their efforts. For info / to adopt a stream / get a proposed site: waterquality@pwsxcd.org. Register events: trashnetwork.fergusonfoundation.org.

#### Tree planting sites needed

Goose Creek Association, We Plant Trees, and Friends of the Rappahannock want to install 50,000 trees in their watersheds, particularly farms in Fauquier and Loudoun counties. The goal is plant at least 60 trees for a riparian buffer or reforestation project at each site. There is no cost to the landowner. Volunteers are needed to help plant trees. Info: info@goosecreek.org.

#### VA Master Naturalists

VA Master Naturalists are a corps of volunteers who help to manage and protect natural areas through plant & animal surveys, stream monitoring, trail rehabilitation and teaching in nature centers. Training covers ecology, geology, soils, native flora & fauna and habitat management. Info: virginiamasternaturalist.org.

#### Chemical Water Quality Monitoring Teams

Volunteers with the Prince William (County) Soil and Water Conservation District and Department of Environmental Quality Chemical Water Quality Monitoring Teams collect data from local streams. Training includes collection methods and reading data. Monitoring sites are accessible for easy collection. Info: waterquality@pwsxcd.org, pwsxcd.org.

### PENNSYLVANIA

#### Middle Susquehanna River

There are many ways to get involved with the Middle Susquehanna Riverkeeper Association:

■ **2020 Susquehanna Survey:** Your feedback on the Susquehanna River, its tributaries and programs is needed.

■ **HERYN (Helping Engage our River's Youth with Nature):** Help engage young people in outdoor activities.

■ **Susquehanna Stewards:** Deliver programming and information to people in their region and help to develop new initiatives. Info: middlesusquehannariverkeeper.org.

■ **Water Reporter App:** Help track the health of various fish species in the Middle Susquehanna watershed by sharing photos, locations and other information about your catches via the app. Reports are made available to view via an interactive map at middlesusquehannariverkeeper.org.

■ **Share Concerns:** The Middle Susquehanna Riverkeeper Association takes reports of any concern regarding the river or its tributaries very seriously. If you have a report of something out of the ordinary. Contact: Riverkeeper John Zaktansky at 570-768-6300, midsusriver@gmail.com.

### MARYLAND

#### Free streamside buffers

Stream-Link Education is looking for Frederick County residents who own streamside or riverside property on 2 or more acres of land and are interested in joining a large-scale reforestation effort to protect the Monocacy River and its tributaries. Stream-Link raises funds through grant awards and corporate sponsorships to take on buffer planting projects at no cost to the landowner and without restrictions (no easement required). Its volunteers plant and maintain the forest for at least three years to ensure an 85% survival rate. Interested? Fill out the form at streamlinkededucation.org/landowners. Info: streamlinkededucation.org/about, 301-473-6844, lisa.streamlink@gmail.com.

#### Cromwell Valley Weed Warriors

Join the Cromwell Valley Park Habitat Restoration Team for Weed Warrior Days 2-4 p.m. Dec. 5 & 19; Jan. 9 & 30; and Feb. 13 & 27 in Parkville. Remove invasive plants, plant natives and maintain restored habitat. Bring your own tools, water bottle. Gloves and a mask must be worn for the initial work discussion. All volunteers must sign both a general waiver of liability and COVID-19 waiver; parents or guardians must sign for ages 13-17. Work is unsuitable for ages 12 & younger. Meet at the Sherwood House parking lot. No preregistration. Info: Laurie Taylor-Mitchell at ltmitchell4@comcast.net. For disability-related accommodations, call 410-887-5370 or 410-887-5319 (TTY), giving as much notice as possible.

#### Report a fish kill

If you see a fish kill, call the Maryland Department of Environment's Fish Kill Investigation Section. Normal work hours: 443-224-2731 or 800-285-8195. Evenings, weekends and holidays, call the Chesapeake Bay Safety and Environmental Hotline: 877-224-7229.

#### Breeding Bird Atlas project

Help the Breeding Bird Atlas of Maryland & the District of Columbia, a five-year project documenting the distribution and abundance of local breeding bird populations by looking for nests in backyards and forests. Data are used to manage habitat and sustain healthy ecosystems. Info: ebird.org/atlasmdcc/about.

#### Severn River Association

The Severn River Association is looking for people to tell the Severn's story. Writers, photographers, reporters, memoirists and editors are needed to record tales of the river's wildlife, people, forests, history, culture and sailing. SRA can create internships for journalists of all ages who want to tell a story, cover meetings or take pictures. Info: info@severnriver.org. Put "volunteer" in the message box.

#### Patuxent Research Refuge

Volunteer at the Wildlife Images Bookstore at the National Wildlife Visitor Center of the U.S. Fish and Wildlife Service's Patuxent Research Refuge in Laurel. Open and close the store, help customers and operate the register. Training provided. Info: 301-497-5771, lindaleechilds@hotmail.com.



## Submission Guidelines

### ONLINE

The *Bay Journal* website has a new look! It also has a new section called **Bulletin Board**, where you can log in and post your own events — and even include a photo. Visit bayjournal.com and click on "Bulletin Board."

### IN PRINT

Because of space limitations, the *Bay Journal* is not always able to print every submission. Priority goes to events or programs that most closely relate to the environmental health and resources of the Chesapeake Bay region.

### DEADLINES

The printed edition of **Bulletin Board** contains events that take place (or have registration deadlines) on or after the 11th of the month in which the item is published through the 11th of the next issue. Deadlines run at least two months in advance.

September issue: August 11  
October issue: September 11

### FORMAT

Submissions to **Bulletin Board** must be sent either as a Word or Pages document or in the body of an e-mail. Other formats, including pdfs or Mailchimp, *will only be considered if space allows* and information can be easily extracted.

### CONTENT

You must include the title, time, date and place of the event or program, and a phone number (with area code) or e-mail address of a contact person. State whether the program is free or has a fee; has an age requirement or other restrictions; or has a registration deadline or welcomes drop-ins.

### CONTACT

Email your submission to kgaskell@bayjournal.com. Items sent to other addresses are not always forwarded before the deadline.



# BULLETIN BOARD

## Ruth Swann Park

Help the Maryland Native Plant Society, Sierra Club and Chapman Forest Foundation remove invasive plants 10 a.m.–4 p.m. the second Saturday in December, January and February at Ruth Swann Memorial Park in Bryan's Road. Meet at Ruth Swann Park-Potomac Branch Library parking lot. Bring lunch. Info: ialm@erols.com, 301-283-0808 (301-442-5657 day of event). Carpoolers meet at Sierra Club Maryland Chapter office at 9 a.m.; return at 5 p.m. Carpool contact: 301-277-7111.

## Chesapeake Bay Environmental Center

Help the Chesapeake Bay Environmental Center in Grasonville. Drop in a few times a month or more frequently. Help with educational programs; guide kayak trips and hikes; staff the front desk; maintain trails, landscapes and pollinator garden; feed or handle captive birds of prey; maintain birds' living quarters; and participate in CBEC's team of wood duck box monitors or other wildlife initiatives. Other opportunities include fundraising, website development, writing for newsletters & events, developing photo archives; supporting office staff. Volunteers donating more than 100 hours of service per year receive a free one-year family membership to CBEC. Info: volunteercoordinator@bayrestoration.org.

## Chesapeake Biological Laboratory

Help at Chesapeake Biological Laboratory's Visitor Center on Solomons Island. Volunteers, ages 16 & older, must commit to at least two, 3– to 4-hour shifts each month in spring, summer, fall. Training required. Info: brzezins@umces.edu.

## Citizen Science: volunteer angler survey

Help the Department of Natural Resources collect species, location and size data using its Volunteer Angler Survey on a smartphone. Data help to develop management strategies. The artificial reef initiative, blue crab, freshwater fisheries, muskie, shad and striped bass programs also have mobile-friendly methods to record data. Win quarterly prizes. Info: dnr.maryland.gov/Fisheries/Pages/survey/index.aspx.

## RESOURCES

### Virtual lighthouse tour

Take a virtual tour of Blackstone Lighthouse on St. Clements Island, MD, while the structure is closed due to COVID-19 protocols. Visit: my.matterport.com/show/?m=wbEixtSe1cB&lp=1.

### Piney Point coloring pages

Learn about Piney Point Lighthouse Museum & Historic Park in Piney Point, MD, while coloring pages featuring an osprey, blue crab and terrapin as they explore different parts of the site. The pages are samples of a larger coloring book designed by local artist Ellen C. Halbert that will be available once the museum store reopens. Visit visitstmarysmd.com/blog/online-museum-fun/.

## Wayback Wednesdays

St. Mary's County (MD) Museums are bringing history to the public, who is unable to visit them during the COVID-19 pandemic. Their weekly video series, Wayback Wednesdays, features everything from the quirky to the fascinating in the county's history. At present, there are more than 30 titles in the series, including: *Horse Racing in Leonardtown*, *The Old Jail & the Underground Railroad*, *John Donahoo & the Lighthouses of St. Mary's County* and *The Pony Express & U.S. Postal Service in St. Mary's County*. Visit facebook.com/watch/SCIMuseum/817869892069064/.

## CONFERENCES

### WATERSHEDWIDE

#### Coastal resilience webinars

The Horn Point Lab of the University of Maryland Center for Environmental Science has put together a virtual seminar series, *Assessing Coastal Risk and Enhancing Resilience*, featuring experts in coastal resilience. Seminars, which are open to the public, begin at 11 a.m. A question and discussion session is scheduled after each 30-minute seminar. Upcoming topics include:

- *Marsh Resilience under Climate Change: Management & Adaptation Considerations*: Dec. 16. Molly Mitchell, Virginia Institute of Marine Science.
  - *Green & Gray Infrastructure for Coastal Resilience: What Works Where?* Jan. 13. Bregje vanWesenbeeck, Deltares.
- The Zoom webinar program can accommodate up to 500 participants; registration is required: zoom.us/webinar/register/WN\_xh4KUKWVTsu\_X77JdA\_1w.

## EVENTS / PROGRAMS

### MARYLAND

#### Chesapeake Bay Maritime Museum

Events at the Chesapeake Bay Museum in St. Michaels, include:

- *Rising Tide Program*: 3:30–5:30 p.m. Tuesdays & Thursdays (in-person) and 3:30–5:30 p.m. Wednesdays (virtual). Grades 6–9. Both versions of the program offer challenging projects that build skills in design, woodworking and project management. Virtual projects subject material is different from in-person classes; participants may sign up for either or both. Info / registration (required): cbmm.org/risingtide, risingtide@cbmm.org. In-person participants must wear facial coverings inside buildings at all times and outdoors when within 6 feet of other guests: welcome.cbmm.org.
- *Climate Change in the Chesapeake Speaker Series (Virtual) / Climate Change & Racial Justice - the Resilience & Vulnerability of African American Communities on the Eastern Shore*: 2 p.m. Dec. 2. The story of Smithville — a historic African American community in Dorchester

County — illustrates how cultural legacies of racial discrimination have unfairly increased the vulnerability of Eastern Shore African American communities to climate change impacts. Smithville native the Rev. Roslyn Watts and University of Maryland anthropologists, Christy Miller Hesel and Michael Paolisso, will discuss the history of Smithville and their work to build coastal resilience to climate change. Fee: \$7.50. Info: cbmm.org/speakerseries.

#### Program pairs novice, veteran hunters

The Department of Natural Resources' new Maryland Mentored Hunt Program pairs new, novice or lapsed hunters of any age with skilled veteran hunters, who will help them build their skills, culminating in a hunt. Mentors and mentees submit applications and will be matched based on agency review and other criteria. The pair works at its own pace to schedule all aspects of the hunt. All participants are required to follow the state guidance on preventing the spread of COVID-19. The program encourages using video meetings, email, texts and phone calls as much as possible. For in-person meetings, individuals must practice social distancing and wear masks. Info: Chris Markin at Christopher.markin@maryland.gov, or put "Maryland Mentored Hunt Program" in your search engine.

#### Cromwell Valley Park

Programs at the nature center at Cromwell Valley Park in Cockeysville include:

- *Holiday Swags*: 1–3 p.m. Dec. 12. Ages 8+ Create a swag with a bow for a door. Dress for weather. Fee per swag: \$7.
- *Natural Holiday Ornaments*: 1–3 p.m. Dec. 13. Ages 5+ Collect natural materials to make ornaments. Fee: \$4.
- *Holiday Centerpieces*: 1–3 p.m. Dec. 19. Ages 13+ Build a centerpiece. Bring thin gloves if you're sensitive to sap, pine prickles. Dress for weather. Fee per centerpiece: \$10.
- *Winter Solstice Hike*: 1–3 p.m. Dec. 20 Ages 5+ Fee: \$4.
- *Visit the Nature Center*: Drop in between 11 a.m.–3 p.m. Dec. 26. All ages. No registration. Free.
- *Trivia Trail Trek*: Drop in between 10 a.m.–2 p.m. Dec. 27. All ages. Hike w/self-guided trail book, answer its questions, then return to the center for a prize. No registration. Free.
- *First Weekend Walk*: 1–3 p.m. Jan. 2. Ages 5+

Start the year off right. Join a naturalist for a walk in the great outdoors. Wear sturdy shoes. Fee: \$4.

- *Hibernation Hideouts*: 1–3 p.m. Jan. 3. All ages. Learn who the park's hibernators are, where amphibians hide during cold weather. Dress for weather. Fee: \$4.
- *Twig & Leaf Creatures*: 1–3 p.m. Jan. 9. Ages 2–10 w/adult. Collect twigs and leaves, then return to the Center to make to make a "Valley Creature." Parent must attend program with their child. Fee: \$4.
- *Scout Day - Fire Making*: 1–3 p.m. Jan. 10. Meet at Primitive Technology Lab. Boy & Girl Scouts, ages 8–13 w/adult. Learn how to make a fire using flint & steel and matches. Participants receive a steel fire striker if registered by Dec. 30. Do NOT bring siblings. Fee: \$10 per Scout. Ages 17 & younger must be accompanied by an adult. Except where noted, preregistration is required for each program: cromwellvalleypark.campbrainregistration.com. Info: (including COVID-19 protocols): cromwellvalleypark.org, info@cromwellvalleypark.org, 410-887-2503. For disability-related accommodations, call 410-887-5370 or 410-887-5319 (TTY), giving as much notice as possible.

## VIRGINIA

### VA Environmental Film Contest

The 11th annual Richmond Virginia Environmental Film Festival is accepting submissions for the 2021 Virginia Environmental Film Contest. The contest is open to state residents with films based on environmental topics pertaining to the state. Films of all formats and genres will be considered. A juried panel will select the winning films and award the \$1,000 grand prize, \$500 first prize; \$100 best cinematography; \$100 best short film; and two \$100 honorable mentions. Films must be submitted by Dec. 31 to RVAEFF.org. Click the film contest button to be taken to FilmFreeway.com, which explains contest rules, deadlines and how to submit films. Winning entries will be announced Jan. 15. Award-winning films, as well as other submitted films, will be shown Feb. 12–28 at various venues in the Richmond area and/or streamed online. Specific venues, platforms will be announced later and comply with COVID-19 guidelines. Admission is free, open to the public. Info: Put "rvaeff film contest" in search engine.



## CHESAPEAKE CHALLENGE ANSWERS

1 B 2. C 3. A 4. D 5. E

# Living shorelines offer hospitality to the Bay's migratory birds



## STEWARD'S CORNER

By Mel Throckmorton

As winter approaches, we at the Alliance for the Chesapeake Bay are looking forward to receiving our yearly seasonal guests along the Atlantic Flyway: migratory birds. These birds rely heavily on our coastal ecosystems to sustain them during their journey south to warmer temperatures, thanks to our shorelines' valuable habitat.

While only here for what appears to be a short time, migratory birds play an important role in the Bay's ecosystem. Coastal habitats rely on predation by waterbirds to help maintain stability and diversity by "weeding out" invasive species like phragmites, thereby significantly increasing ecosystem productivity.

But threats to shoreline habitat, such as erosion and sea level rise, are quite visible throughout the Bay watershed, and while "shoreline hardening" via the installation of bulkheads and stone revetments was once seen as the solution to erosion, they are often unable to preserve ecosystem integrity.

Since 2008, Maryland has pushed the creation of "living" or "softened" shorelines to combat erosion while also protecting these ecosystems from degradation.

The main difference between the two techniques is that living shoreline designs focus on long-term impacts by accounting for the ecosystem services that shorelines naturally provide, while bulkheads and shoreline hardening are geared more toward the protection of property. Studies have shown that creating hard physical barriers to deflect wave energy disrupts the natural hydrologic regime and results in increased shoreline erosion with associated issues including: suspended sediments obstructing water clarity, loss of vegetation and habitat and decreased food availability for migrating birds.

In contrast, living shorelines are distinguished by the way that they are carefully designed to focus both as protection from sea level rise *and* the preservation and



*Living shorelines, like the one above, help combat erosion while also providing shoreline habitat. (Dave Harp)*

*A group of nesting double crested cormorants, left, gather on a shoreline in the Chesapeake Bay watershed. (2010 / Alicia Pimental / Chesapeake Bay Program)*

expansion of the habitat. Living shorelines vary in type and many involve introducing changes, such as planting vegetation to anchor sediment and adding hardened structures off-shore, called breakwaters, to decrease incoming wave energy while maintaining the integrity of the shoreline. These efforts might seem simple but, if installed with proper planning and consideration, they can have significant positive ecosystem impacts such as the expansion of wetland habitats and shoreline accretion.

The Alliance believes that taking these steps to secure our coastal habitats in the long term is a way to contribute to both environmental and community resiliency. Our Maryland projects team has been working closely with the Cape St. Claire community in Annapolis to restore a stretch of shoreline to be enjoyed by residents — both human and avian. The significance of the migratory bird population on our coasts is re-enforced in this project, as the U.S. Army

Corp of Engineers has restricted the time of year for its construction to make sure the habitat is accessible during the winter. The project area, located near the confluence of the Magothy River and Chesapeake Bay, has been identified as an important nesting and foraging location for wintering birds, including nine species that are classified as being of greater conservation need in Maryland. It is anticipated that the shoreline restoration will provide more vegetation for foraging and nesting as well as an adaptive and resilient coastal area for birds and other organisms.

Laura Todd, the Green Infrastructure Projects coordinator at the Alliance, said, "It is our hope to educate coastal communities about the benefits of living shorelines and to protect existing crucial coastal habitats along with restoring fisheries and habitats that had been degraded by prior shoreline hardening."

For communities like Cape St. Claire, living shorelines provide a way for residents to connect with each other and enrich their

environment in a meaningful way. "These coastal ecosystems are vital to the health and resiliency of the Bay and its watershed. Communities like Cape St. Claire have shown great initiative in protecting such an important resource for their residents," Todd said.

Coastal wetlands created by living shorelines can provide direct protection for the greater ecosystem by absorbing floodwaters and reducing erosion through slowing the surface flow of the water. They also improve water quality by acting as a natural filter. These areas tend to be highly productive and rich in habitat complexity, creating an ideal location for safe nursery and feeding sites for fish and migratory birds.

In the face of rising sea level, wetlands give shorelines the opportunity to migrate upland instead of disappearing. Living shorelines, created with these ecosystem functions benefits in mind, make a highly resilient choice for protecting and maintaining our greater coastal ecosystems, both now and in the future. ■

*For a guide on living shorelines, visit [cbf.org/document-library/cbf-publications-brochures-articles/Living\\_Shorelines011a.pdf](http://cbf.org/document-library/cbf-publications-brochures-articles/Living_Shorelines011a.pdf)*

*Steward's Corner is a column from the Alliance for the Chesapeake Bay. Mel Throckmorton is a member of the Chesapeake Conservations Corps working with the Alliance on Maryland-based projects.*

# Collington Lake provides refuge for ruddy duck, author



By Mike Burke

Out on the lake, a male mallard drifted by in the early autumn sunshine. Farther out, a small duck bobbed its head slightly in the still waters.

The distant duck appeared to be quite small but judging size can be tricky at a distance. Its rigid black tail was cocked straight up, just like a wren. A moment later it disappeared below the surface. It had to be a ruddy duck.

I had fallen a week earlier and was still plenty sore. The report of a ruddy duck on the lake was just too tempting. Gingerly, I ventured out on my scooter to have a look myself. I wasn't disappointed.

The ruddy duck (*Oxyura jamaicensis*) is one of two "stiff-tailed" ducks in North America. The other, the masked duck, is a native of Central and South America. It is rarely seen farther north than Texas.

In some ways, Collington Lake in Prince George's County, MD, is an unlikely refuge for this duck. In function it is no more than a stormwater pond designed to meet the county's clean water requirements. In practice, though, it is a beloved 6-acre lake on the campus of Kendal at Collington, the retirement community in Mitchellville, where my wife and I reside.

In 2017, the county and a private company, Corvias, teamed up to turn the site into a high-functioning stormwater cleanup project.

Silt-laden rainwater that washes off buildings and parking lots is directed toward the lake. The dirty water filters through stone-filled wire cages called gabions. The silt and other pollutants are trapped behind the stone wall, allowing cleaner water to flow into the lake. The clean lake water, in turn, drains into nearby streams that flow into the West Branch of the Patuxent River. Rainwater falling onto Collington takes a circuitous route to reach the Chesapeake Bay.

Not to be outdone, the ruddy duck



Unlike most ducks, the ruddy duck male's plumage is most colorful in the summer. In the winter, the ruddy duck male turns a dusky brown and his blue bill becomes dull gray. (Dick Daniels / carolinabirds.org/)

navigated a much more challenging course covering more than 1,500 miles.

Ruddy ducks breed in the prairie potholes of the Dakotas and north and west into Canada. During the winter, ruddy ducks leave these breeding grounds for freshwater ponds on both coasts and the Gulf of Mexico. They also venture onto bays and rivers. The Chesapeake is a favorite destination.

Ruddy ducks, at just 15 inches, are one-third smaller than mallards. Unlike most ducks, the ruddy displays his most colorful plumage in the summer, just like a songbird. In summer, the male ruddy duck is a chestnut hue. He sports a dramatic bright blue, very large bill, a black cap, a bold white cheek patch, and a stiff black tail.

Females, juveniles and winter males, like the one on Lake Collington, are dusky brown with a black cap. The male's blue bill fades to dull gray. The white cheeks (actually, the tops of a broad strap that wraps under the chin) fade a bit. In the female's case, a sometimes faint but always discernible dark horizontal line crosses the cheek. Her cap turns brown.

Unlike most ducks, ruddy ducks wait to form mating pairs until they are back on

their breeding territory. They produce one or two broods of three to 15 eggs, which they lay in a nest of vegetation suspended just above the waterline in dense northern marshes and ponds.

The eggs are surprisingly large, about 2.5 inches. Proportionally, they are the largest of any waterfowl. Incubation lasts a bit more than three weeks. Big eggs produce big chicks, which are born with a full body of downy feathers. They leave the nest after just one day. Staying near their mother, the chicks begin feeding themselves right away. The young will take wing 45 days later.

Scientists in Canada survey the remote breeding grounds of ruddy ducks and other waterfowl annually. Data from the Canadian biologists suggest an expanding breeding population. In the United States, the annual Christmas bird count is run by the U.S. Geological Survey. The Midwinter Waterfowl Survey is conducted by the U.S. Fish and Wildlife Service and state resource agencies in early January. These surveys and others provide snapshots of population health. They suggest a stable breeding population that is gradually moving north.

Loss of habitat is a big threat. Recent

moves by the Trump administration have removed federal protection for many of the duck's natal ponds. Global warming presents an even graver threat.

The bird on Lake Collington had survived unprotected waters and a warming planet to arrive here a week or so earlier than normal. I continued watching the lone ruddy as he dove down to refuel after his long migration. Ruddy ducks have relatively large feet, which are placed way back on their bodies. This arrangement, much like that of loons, is ideal for diving and propulsion underwater. It makes the birds unwieldy on their feet, though. In their rare moments on land, they often flop forward onto their chests, unable to stand erect.

I know too well that sense of feeling awkward and unbalanced. But sitting on the banks of this man-made lake, watching this handsome bird slide beneath the surface, I was reminded anew of how graceful life can be. The challenge is to navigate alien landscapes to find a refuge that nourishes us. I think I have found mine. ■

Mike Burke, an amateur naturalist, lives in Mitchellville, MD.

# Holly, by golly, brightens the landscape beyond holidays



By Kathy Reshetiloff

**A**s I walked through a tiny wooded trail near my home, I tried to tread softly so I could spy any birds or mammals remaining for the winter. It was impossible as my feet crunched on the crisp orange, yellow and brown leaves that covered the ground.

Here and there leaves still hung, almost desperately, to a few large oaks. But, for the most part, what had been a fiery landscape of autumn had been replaced with a starker palette of grays and browns.

Amid this background, one tree stood out with glorious color. Ignored most of the year, an American holly (*Ilex opaca*) now caught my attention, taking center stage with its bright green leaves and ripe red berries feeding my passion for color.

Like all evergreens, the American holly does not lose its leaves at the end of the growing season. Thick and leathery, holly leaves do not lose water as cold weather sets in, a process that causes other deciduous trees to shed their leaves. Easy to identify, holly leaves sport spined teeth and are satiny-green and smooth with a yellowish-green underside.



*Like all evergreens, the American holly does not lose its leaves at the end of the growing season. Birds rely on its leaves for shelter and berries for food. (Tom Potterfield CC BY-NC-SA 2.0)*



*The green boughs of an American holly stand out in the fall and winter landscape. (Dave Harp)*

The American holly is only one of several hundred holly species found throughout the world. People have long been fascinated with these evergreens. Druids viewed the holly as a tree never abandoned by the sun that they worshipped. Romans presented holly boughs with gifts to esteemed friends. And, of course, many people “deck the halls” with holly, using them as seasonal decorations.

People aren't the only ones who enjoy

these evergreens. Hollies provide excellent shelter for many types of birds. Birds are also the principal consumers of the fruit. Northern flickers, gray catbirds, cedar waxwings, mourning doves, ruffed grouse, northern bobwhites, cardinals, blue jays, northern mockingbirds, white-throated sparrows, eastern towhees and wild turkeys all feed on the distinctive red berries.

Birds are important in dispersing holly seeds. Perhaps the most important in seed dispersal are the large winter-migrating flocks of small birds, such as cedar waxwings and American goldfinches.

Many other animals eat American holly, including white-tailed deer, gray squirrels, chipmunks, meadow voles, red foxes, raccoons, cottontail rabbits, white-footed mice and box turtles.

Hollies are dioecious, meaning that a single tree will have either male or female flower parts. Both male and female flowers are small and creamy white. They appear in late spring or early summer, and pollination occurs thanks to bees, wasps, ants and moths. Only the female trees bear fruit.

Often appearing more like a large shrub or small tree, the American holly is a slow grower, but they can reach up to 60 feet. The fruit, known as drupes, ripen from

September through December and stay on the tree throughout the winter.

Hollies grow best on well-drained, sandy soil but will tolerate somewhat poorly drained areas. Able to withstand shade as an understory tree as well as thrive in full sun, they are scattered from Massachusetts south along the coast to Florida. In the south, they range west to eastern Texas and southeastern Missouri.

This native holly makes a wonderful landscaping tree when planted singly and given sufficient space to grow. It is important to plant both males as well as females if berry production is desired. Many homeowners choose to group them as hedges to screen their yards from activity and noise or to serve as background plantings.

Hollies planted near our homes attract wildlife activity, especially the birds that they flit among the branches for cover and gorge themselves on the berries.

Hollies are not only good for animals but are pleasing to human eyes and balm for the soul. We can chase away some of the winter doldrums by decorating our homes with sprigs of holly. ■