

CHESAPEAKE

# BAY JOURNAL

January/February 2023

Volume 32 Number 10

Independent environmental news for the Chesapeake region



**The heat is on:  
Warming water threatens aquatic life**  
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## PLASTICS REPORT



Should producers help bear the cost of recycling? **PAGE 16**

## FRACKING CASE SETTLED



Company pleads no contest but fracking can resume **PAGE 11**

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Conservationists are celebrating the protection of more land along Fones Cliffs on Virginia’s Rappahannock River. Read the article on page 10. (HeatherRichards/TheConservationFund)

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EDITOR’S NOTE



The temperature is rising

At the coldest time of the year in the Chesapeake Bay region, we bring you a story about warming water.

As explained in the article by Karl Blankenship on page 20, scientists with the Chesapeake Bay Program have released a report that says water temperatures are rising in streams, rivers and the Bay itself. They say it ranks among the biggest problems facing the aquatic ecosystem.

There are many facets to the problem. Taken together, they highlight the depth of simple-sounding truth: We are part of an interconnected web of existence. Small ripples in that web can accumulate into large impacts. Temperatures in the Bay are driven by air temperatures across the globe, which influence ocean water and, in turn, the Bay. Temperatures in the headwaters, though, are determined by local land use and need local solutions. Some stormwater management strategies actually add to the problem, holding and heating the water before it rejoins waterways.

Scientists have documented some impacts of warmer water, and they point to dynamics that indicate future problems. For example, crabs have shortened their hibernation. Eelgrass, a critical habitat for juvenile crabs, has declined dramatically. Brook trout are decreasing, imperiled by the loss of coldwater streams. Warmer water holds less oxygen (already a problem in the Bay’s “dead zone”) and promotes the growth of bacteria and harmful algal blooms.

Other dynamics are hard to predict, because so much is connected in intricate ways. Temperature-driven changes will ripple through the ecosystem, scientists say, with a mix of benefits and drawbacks. Oysters might have a longer growing season but suffer more from disease. Striped bass might grow more quickly but die at greater rates from summer heat stress. Predators and prey might find themselves in mismatched seasons.

Karl’s article explores the layers of the problem. It’s concerning, but also a reminder of our marvelous and marvelously connected world. As part of that web, I hope we seek wisdom, humility and stewardship.

— Lara Lutz

ON THE COVER

Brook trout, like one shown here caught from a West Virginia stream, are among the aquatic species threatened by rising water temperatures in the Chesapeake Bay Region. (Steve Droter/Chesapeake Bay Program)

Bottom photos: Left and center by Dave Harp; right courtesy of PABucketlist.com



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14.5

Inches of sea level rise in Norfolk over the past 80 years

1

Ranking of Isle of Wight County, VA, out of 133 Virginia counties and independent cities for production of hogs and pigs (as of 2017)

15

Number of companies that paid penalties (among 256 cited for violations) over the past six years for abandoning oil and gas wells in Pennsylvania

282

Number of bird species documented at the Patuxent Research Refuge in Maryland

98%

Amount of samples taken from Chesapeake Bay surface waters that contained microplastics in a 2012-2013 study

10

Number of cemeteries in Maryland offering "green" burials

# Snowfall in the Chesapeake Bay region

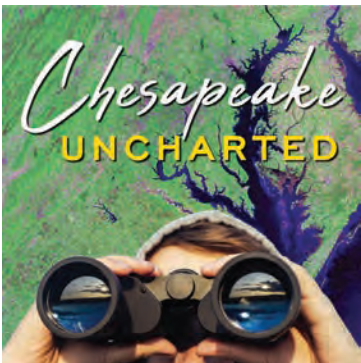
As people settle in for the cold winter months, here's a look at average annual snowfall amounts around the Chesapeake Bay watershed in recent decades. As with so many other things, what's been "average" in the past is likely to be different in the future. Climate change predictions call for more winter precipitation in the Mid-Atlantic region but also warmer temperatures, which likely means less snow.

Average snowfall in inches over recent decades	
Binghamton, NY	86.5
Frostburg, MD	72.1
Scranton, PA	45.1
State College, PA	43.8
Elmira, NY	41.8
Williamsport, PA	35.8
Romney, WV	28.6
Charles Town, WV	28
Harrisburg, PA	23.9
Frederick, MD	23
Staunton, VA	20
Baltimore, MD	19.3
Charlottesville, VA	17
District of Columbia	14
Annapolis, MD	12
Fredericksburg, VA	11.3
Richmond, VA	8.8
Salisbury, MD	8
Norfolk, VA	6.2

Sources: currentresults.com, extremeweatherwatch.com, bestplaces.net



(Dave Harp)



[bayjournal.com/podcast](http://bayjournal.com/podcast)

## LOOKING BACK

### 30 years ago

#### Three Bay-region groups receive presidential awards

Save Our Streams, the Chesapeake Bay Foundation and Maryland's Bay license plate program each received the Presidential Medal for Environmental Excellence. ■

— Bay Journal, January–February 1993

### 20 years ago

#### Chesapeake Futures report released

Scientists found that emerging technologies would make it possible to slash by half the amount of nutrient pollution entering the Bay by 2030. ■

— Bay Journal, January–February 2003

### 10 years ago

#### Bay Program creates system to track pollution controls

The system aimed to ensure that practices were installed, working as designed and weren't double-counted. ■

— Bay Journal, January–February 2013



# ABOUT US

The *Chesapeake Bay Journal* is published by Bay Journal Media, an independent nonprofit news organization dedicated to environmental reporting in the Chesapeake Bay region. *Bay Journal* reporting reaches well over 250,000 people each month through news articles, columns, films and the *Chesapeake Uncharted* podcast.

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# BAY JOURNAL NOTEBOOK



*Bay Journal writer Whitney Pipkin interviews Howard Berg, founder of Serenity Ridge, a "green" cemetery near Baltimore, MD. (Dave Harp)*

## Green burials, e-bikes, and oysters on screen

The *Bay Journal* staff closed out 2022 working on new stories to bring to you in 2023. In December, writer **Whitney Pipkin** paid a visit to a new natural cemetery near Baltimore, MD, to report on the growing interest in "green" burials. Proponents describe it as "a way of caring for the dead with minimal environmental impact." With no upright headstones or mausoleums, the cemetery is intended to look more like a nature preserve than a graveyard.

"The story on green burials is the sort that gets in your head and leaves you thinking," Whitney said. "What sort of impact do I want to leave? What sort of place would I like my family to visit in remembrance?" Learn more about it on page 24 of this issue.

Writer **Ad Crable** has been flagging down bikers, hikers and joggers along rail trails in Pennsylvania to get their reaction to the growing number of electric bike riders with whom they must share the path. Trail managers around the Chesapeake Bay watershed are weighing whether regulations are needed to protect safety and serenity. Ad tried out an e-bike and said, "I see the appeal." Look for his story in an upcoming issue.

As usual, our photographer **Dave Harp** has been spending a lot of time outdoors. By kayak, skiff and even airborne drone, he filmed watermen dredging for oysters on Maryland's Eastern Shore. He's working on yet another *Bay Journal* film — the eighth — focusing on the Bay's beloved bivalves and their ecologic, economic and cultural importance. Stock up on popcorn for the premiere this fall.

Our *Chesapeake Uncharted* podcast, meanwhile, is scheduled to wrap up its exploration of the legacy of Tropical Storm Agnes, the storm that forever changed the Bay watershed 50 years ago. Host **Jeremy Cox** says the last two episodes of the series will look at how the storm affected the nation's preparation for and response to natural disasters and "what Agnes can tell us about future calamities." They will be landing on our website and in your favorite podcast service in the coming weeks.

— T. Wheeler



### Cargo ship grounding leads to oyster restoration

The owner of the *Ever Forward* container ship that spent more than a month grounded in the Chesapeake Bay near Baltimore has agreed to pay nearly \$700,000 to restore oyster reefs.

Evergreen Marine Corp., based in Taiwan, is making the payment to offset the environmental impacts of the ship's grounding and the subsequent dredging that took place to free it. The container-laden vessel strayed from the deep shipping channel and ran aground March 13. It remained there until April 17, after extensive dredging and the removal of hundreds of cargo containers made it more buoyant. An investigation by the Coast Guard found that the Bay pilot aboard to guide the ship had been talking on a cellphone, sending texts and drafting an email just before it ran aground.

The grounding and dredging affected about 14 acres of Bay bottom, including 11.5 acres within the boundary of a natural oyster bar. The Maryland Department of Natural Resources found there were "no discernable impacts on oyster populations" because the vicinity was "almost exclusively natural

mud with little if any oyster habitat."

The payment approved Jan. 4 by the Maryland Board of Public Works will underwrite the enhancement and seeding of 41 acres of oyster reefs, to be divided between commercially harvestable waters and a sanctuary area where no harvest is allowed. Reefs in Anne Arundel County waters near where the ship ran aground will get priority for restoration, the state said.

— T. Wheeler

### Update: Grant to aid resiliency planning for Turner Station, MD

The historically African American community of Turner Station near Baltimore has received a \$500,000 grant to develop a climate resiliency "roadmap" to deal with current and future flooding issues. Baltimore County put up \$208,000 to match the grant from the National Fish and Wildlife Foundation.

The county and nonprofit partners plan to engage Turner Station residents via small working groups and surveys to design "green" stormwater management and other projects intended to improve aquatic habitat and resiliency for the

waterfront community, which is bordered by Bear Creek, a Patapsco River tributary.

Turner Station residents recently celebrated the planting of 140 "witness trees" and shrubs to help enhance the community, mitigate the impacts of climate change and absorb runoff and air and noise pollution from a busy highway and the Dundalk Marine Terminal nearby.

— T. Wheeler

### Update: Federal bill offers smaller lifeline to Tangier Island

Lawmakers from Virginia pushed for securing \$25 million in December's federal omnibus spending bill to fortify Tangier Island against climate change. They fell well short of that goal, getting \$300,000 instead.

The offices for senators Mark Warner and Tim Kaine, both Democrats, characterized the allocation as a necessary first step to move the project forward. The spending will enable the U.S. Army Corps of Engineers to complete a scoping and feasibility study that's necessary before construction can begin, they said.

Tangier Island, Virginia's only inhabited island not

connected to the mainland by a bridge, is shrinking from erosion and sea level rise, scientists say.

The project, if finalized, would transport dredge material from Chesapeake Bay navigational channels to the island, where it would be used to create earthen barriers near the shoreline.

— J. Cox

### Bay Commission names new executive director

The Chesapeake Bay Commission, a panel that represents state legislators from across the Bay watershed, has named Anna Killius as its new executive director.

Killius, who has experience working with lawmakers at both the state and federal levels, succeeds Ann Pesiri Swanson, who retired last November after holding the post since 1988. The commission, which includes legislators from Maryland, Virginia and Pennsylvania, plays a critical role in passing Bay-related legislation in state general assemblies and works with Congress to advance Chesapeake initiatives.

Killius, the advocacy director for the James

See **BRIEFS**, page 6

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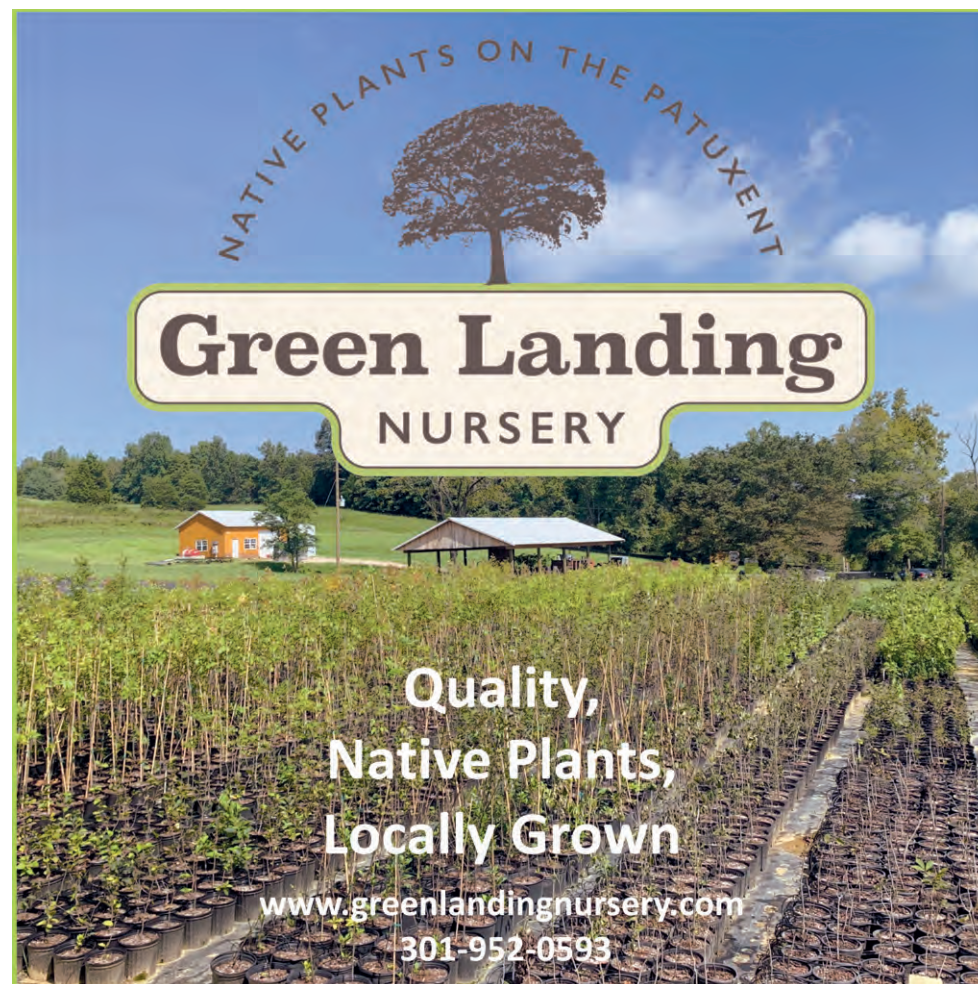
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# briefs

From page 5

River Association, works with Virginia lawmakers to advance conservation policy and legislation. She previously worked in Washington, DC, on the staff of U.S. Rep. John Sarbanes (D-MD), handling environmental and resource issues, including those related to the Bay.

"Anna's breadth of experience at the state and federal level working with policymakers to find common sense and bipartisan solutions for protecting the Bay, combined with a keen vision for the future of this work, will continue the legacy of accomplishment that has defined CBC," said Democratic Maryland Sen. Sarah Elfreth, chair of the Bay Commission, in making the announcement Jan. 6.

Killius is a 2013 graduate of the William & Mary School of Law. While in law school, she was a legal intern with the Chesapeake Bay Foundation's Richmond Office.

After graduation, she was selected by the National Oceanic and Atmospheric Administration as a 2014 Knauss Sea Grant Legislative Fellow to work on Capitol Hill in Washington, after which she joined Sarbanes' staff.

For nearly five years, she has held several positions with the nonprofit James River Association, working with lawmakers, conservation groups, industry stakeholders and others to

advance programs, policies and legislation related to the James River. In those roles, she served on the Virginia Conservation Network's Legislative Committee and as a representative on various state advisory committees.

"Anna just has tremendous knowledge and skills and sound judgment beyond her years," said Bill Street, president and CEO of the James River Association. "She'll do a fantastic job and I'm delighted that she'll continue to work to help the whole Chesapeake and not just the James River. I'm really sad to lose her from our team."

— K. Blankenship

## Study: Controlled burns reduce ticks, Lyme disease

As tick-borne Lyme disease continues to spread in Pennsylvania and other Chesapeake Bay drainage states, a new study suggests more prescribed burns on public and private forests could help reduce both the numbers of ticks and incidence of the disease.

In a paper published in *Ecological Applications*, researchers from Penn State, the U.S. Forest Service and New Jersey Department of Environmental Protection said the increased use of prescribed fire by forest managers to control invasive plants, improve wildlife habitat and restore ecosystem health can also help knock down the tick problem.

The fire and heat kill some ticks, but, more importantly, burning creates less favorable habitat

for the parasites. The absence of burning allows vegetation to grow more densely, creating better opportunities for ticks to brush against hosts. Moreover, thick vegetation, along with climate change, creates warmer and more humid forest litter, resulting in microclimates that help ticks survive the winter.

"These changes have created conditions known to drive tick abundance, tick-wildlife host interactions and the expansion of ticks' geographic range," said Erica Machtinger, a co-author of the study and assistant professor of entomology at Penn State University.

Burning can reduce the forest canopy, thin the understory and create gaps that make conditions hotter and drier in the day and colder at night, hindering tick survival, Machtinger said.

The researchers noted that forest ecosystems in the eastern U.S. depended on fire for thousands of years. Fire suppression only began in the early 1900s.

In 2020, West Virginia had the third-highest incidence of Lyme disease in the United States. Pennsylvania ranked sixth; Washington, DC, 10th; Maryland 14th; and Virginia 15th.

— A. Crable

## Great Dismal Swamp could become National Heritage Area

The Great Dismal Swamp, a bastion of bald cypress trees and black bears along the southern edge of the Chesapeake Bay watershed, is one step closer to gaining recognition for its cultural importance.

President Joe Biden on Jan. 6 signed legislation putting the swamp on a potential path toward becoming a National Heritage Area. The law tasks Interior Secretary Deb Haaland with assessing the suitability and feasibility of creating the designation for the area, which straddles the Virginia and North Carolina border.

A little less than one-fifth of the Great Dismal Swamp's acreage drains toward the Chesapeake Bay. The rest flows south toward Albemarle Sound, the estuary bounded by the Outer Banks and North Carolina's mainland.

The measure was touted by several Virginia lawmakers, including Democratic Congressman Donald McEachin, who died on Nov. 28. Advocates point to the swamp's connections to African American and Native American history.

The swamp is the home of many indigenous tribes, including the present-day lands of the Nansemond Indian Nation. It was one of the only known water-based stops on the Underground Railroad. It also was home to a thriving community descending from free people of color in the early Colonial era.

The designation, if approved, would allow the U.S. National Park Service to provide technical assistance and support while allowing private entities to continue exercising full ownership and authority over their lands.

Much of the region is already part of the 113,000-acre Great Dismal Swamp National Wildlife Refuge, which was established in 1974.

— J. Cox

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# Bay Foundation grades Chesapeake health a D-plus, again

## Water quality sees little improvement, report says

By Timothy B. Wheeler

The ecological health of the nation's largest estuary remains stuck at a low level, according to the Chesapeake Bay Foundation.

The Annapolis, MD-based environmental group graded the Bay's overall vitality a D+, the same lackluster mark it got in 2020.

In a note introducing its biennial *State of the Bay* report, CBF President and CEO Hilary Harp Falk said it "shows there is still a long way to go to create a watershed that works for all of us."

CBF said that seven of the 13 pollution, fisheries and habitat indicators it tracks remained unchanged, while three improved and three worsened.

The amount of water-fouling nitrogen and phosphorus flowing into the Bay in 2022 from its major rivers was below the

10-year average, CBF acknowledged. But the past two years saw no real progress in water quality, it said. While phosphorus levels improved a bit, already poor water clarity declined, and nitrogen pollution stayed unchanged.

Excess amounts of the nutrients nitrogen and phosphorus trigger algal blooms in the Bay and its rivers. The blooms reduce water clarity and sometimes trigger fish kills. When the algae die, the decomposition process robs the water of oxygen. That creates the Bay's summertime "dead zone," where low-oxygen levels make the area uninhabitable for most aquatic life.

The federal-state Chesapeake Bay Program has been struggling for decades to restore water quality, but recently acknowledged it was likely to miss a self-imposed 2025 deadline for reaching pollution reduction goals set in 2010.

The group's assessments are a blend of science and policy, scoring not just the condition of the Bay and its resources but also the federal and state efforts to restore it.

"The state of the Bay is at a precipice," said Beth McGee, CBF's director of science

and agricultural policy. "We need to accelerate our efforts at reducing farm pollution to ensure the watershedwide restoration effort is successful."

Falk noted that much of the water quality gains to date came from upgrading wastewater treatment plants. To make further progress, she said, increased efforts are needed to reduce pollution from farms — especially in Pennsylvania — and to curb urban and suburban stormwater runoff.

In one of the few bits of good news, CBF upgraded the status of the Bay's oyster population, citing record reproduction in both Maryland and Virginia in 2020 and 2021. But the group still didn't give the keystone species a passing grade, saying more is needed to end overfishing and restore lost reef habitat.

CBF's assessment of striped bass ticked up a point, crediting states with tightening catch limits enough to rebuild its population from dangerously low levels of just a few years ago.

CBF downgraded the status of blue crabs more than any other Bay health indicator, though, citing the 2022 survey


estimating the population at its lowest level in 33 years. Fishery managers in Maryland and Virginia tightened catch limits in response.

As for habitats, CBF rated conditions of underwater grasses, stream side forest buffers and wetlands unchanged from 2020. But it downgraded slightly the status of "resource lands" — forests, natural open areas and farmland. It cited aerial surveys estimating that 95,000 acres of farms and forests had been lost to development across the Bay watershed over a five-year period ending in 2018.

"While we've made significant progress," Falk said, "far too much pollution still reaches our waterways, and climate change is making matters worse."

Still, the CBF president saw reason for optimism.

"The good news is that the Bay is remarkably resilient and there is tremendous energy around the table," Falk said. "With many new leaders taking charge — EPA administrators, governors, legislators and within environmental organizations — we have an opportunity to prove that restoring clean water is possible." ■



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# PA passes emergency rule to trim emissions at oil, gas wells

## State narrowly meets deadline for setting lower limits

By Ad Crable

Pennsylvania has adopted new rules to bring down smog and global-warming methane emissions from conventional oil and gas wells.

Democratic Gov. Tom Wolf and the state Department of Environmental Protection used a rare emergency rule process to get around Republican legislator opposition to tougher emissions limits. Failure to tighten limits could have deprived the state of \$800 million in federal highway aid.

The state's independent Environmental Quality Board on Nov. 30 approved the emergency rule by a 16–2 vote. The new limits on emissions of volatile organic compounds (VOCs), which frequently contain methane, went into effect Dec. 10 — less than a week before the U.S. Environmental

Protection Agency's deadline for all states to have new emissions limits in place.

DEP says the lower limits for VOCs and methane, mandated by the EPA, apply to more than 27,000 conventional oil and gas well sites, though only about 95 of them produce enough gas to face DEP inspections with leak-detecting equipment. Environmental groups had lobbied for smaller-producing wells to fall under inspections as well, claiming smaller wells are responsible for a majority of methane releases.

Conventional wells — generally smaller, older and shallower — account for about 80% of the methane released from the industry in Pennsylvania. Unconventional gas wells, mostly using fracking extraction methods, are less numerous and already under tougher emissions limits.

DEP estimates that it will cost the conventional oil and gas industry \$9.8 million annually in new equipment to lower emissions. But the agency says that will be more than offset by preventing gas, valued at \$36.4 million annually, from escaping into the air.



A conventional well pumps natural gas in Clearfield County, PA, home to the West Branch of the Susquehanna River. (Ad Crable)

The EPA required the new limits in 2016 but gave states until Dec. 16, 2022, to have them in place or lose highway funds. DEP said it did not act to adopt them until earlier this year because of gaps in data at the state level and changing federal requirements.

DEP initially sought to approve identical emissions limits for both conventional and unconventional oil and gas facilities. Public hearings and a public comment period took

place, eliciting thousands of responses, mostly in support of tougher limits. The Independent Regulatory Review Commission approved them in November.

But Republican state legislators cited a state law that stipulates conventional oil and gas wells must be regulated separately. DEP split the regulations, and the Environmental Quality Board passed them.

But the House Environmental Resources and Energy Committee, which has consistently been protective of the gas industry, disapproved the regulation. That action triggered a mandatory legislative review of the emissions rule. But the legislature wouldn't be back in session until after the deadline, prompting the governor and DEP to seek the emergency rule route to avoid losing federal highway aid.

The gas industry has lobbied against the new emissions rules on conventional wells. The *Marcellus Drilling News* called the new regulation “onerous” and said it would add new layers of reporting and new equipment requirements “that won't change a thing.” ■

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# Brown Grove, VA, seeks to become EJ case study

## Community hopes to leverage new rural historic district status

By Whitney Pipkin

Members of a historic Black community in central Virginia are asking the U.S. Environmental Protection Agency to make their ongoing concerns a case study for environmental justice. But progress has been slow.

Representatives from the EPA's Mid-Atlantic region held an online meeting with a handful of advocates from the Brown Grove community on Oct. 31. The meeting was supposed to include Regional Administrator Adam Ortiz, but he was called away to another engagement at the last minute. Also on the call were anthropologists and environmental justice experts who have taken an interest in the community's plight.

On the call, Renada Harris of the Brown Grove Preservation Group asked the EPA

representatives to conduct an "environmental risk assessment" or some similar study that would add up the cumulative impacts of several industrial facilities located in such close proximity to residents. This would include testing for air, stream and well-water quality in the Brown Grove area to assess whether residents are enduring a higher cumulative load of pollution.

"Each of the individual pollutants may fall within acceptable levels. But when you look at the aggregate impact of all of those together on the community, it can be staggering," said Melissa Hartman, a board member from the organization Resolutions Addressing Systemic & Structural Racism, during the call.

The Brown Grove community, about 8 miles north of Richmond in Hanover County, was in the midst of fighting the approval of a sprawling grocery distribution center when the state recognized the community as a rural historic district — only the second of its kind in Virginia — in June 2021. Many of the current residents of Brown Grove trace their lineage back to

Caroline Dobson Morris, the "mother of Brown Grove," who settled there with 13 children after being freed from slavery.

Lakshmi Fjord, an anthropologist who specializes in environmental justice communities, commended the Brown Grove residents for their work to get landmark recognitions in such a short period of time.

"People spend 10 years and \$100,000 to do what they've done in less than two years. It's a huge accomplishment," Fjord said.

The historic designation gave Brown Grove more defined boundary lines, including two historic churches, gravesites and the remains of a 1927 school, all of which may have made its case against proposed development projects stronger. But the Wegmans distribution center had already earned almost all of the permits needed by mid-2021. Construction on the more than 200-acre site, which includes forested wetlands, began soon after. Residents say it is already impacting local water resources and their quality of life.

Brown Grove is a relatively small area that today includes about 200 homes on rural,

wooded lots. It also includes a landfill, a concrete plant, an airport, a truck stop off the nearby highway and an old gas station that some suspect wasn't properly closed. The Wegman's distribution center, residents say, will greatly increase truck traffic on the two-lane road that leads to it.

A lawsuit contending that Brown Grove residents should have legal standing in zoning decisions that could adversely impact them — through excess traffic, noise and pollution — has been taken up by the Virginia Supreme Court. The court heard oral arguments on the case in November.

During the call with the EPA, Samantha Beers, director of the office of communities, tribes and environmental assessment for the EPA's Mid-Atlantic region, said she would continue to convey the Brown Grove community's concerns to other departments and to look into whether a more formal study can be conducted.

She also said she'd try to reschedule the meeting with Administrator Ortiz but that his schedule is out of her hands. ■



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*The Conservation Fund finalized its purchase of 964 acres along this stretch of Fones Cliffs on Virginia's Rappahannock River on Dec. 8 and intends to transfer the land to the Rappahannock Tribe.*  
(Heather Richards/The Conservation Fund)

# More conservation clinched at Virginia's Fones Cliffs

## Another tract likely to be returned to Rappahannock Tribe

By Whitney Pipkin

**T**he threat of development that has long loomed over a historic stretch of cliffs along Virginia's Rappahannock River has lifted. The Conservation Fund's purchase of 964 acres of land was finalized on Dec. 8, more than doubling the length of Fones Cliffs shoreline protected from development.

The Conservation Fund, which bought the property for \$8.1 million through a bankruptcy auction on Nov. 3, will own it only temporarily. Plans are underway to permanently protect the land and eventually transfer ownership to the Rappahannock Tribe later in 2023.

"Years of tracking this property through multiple owners and a complex bankruptcy proceeding has finally brought us to this acquisition," said Heather Richards, the fund's Mid-Atlantic regional director. "We're thrilled that we were able to seize our chance to purchase the property and work with our partners to protect this significant place for future generations."

The land represents the largest previously unprotected portion of land along Fones

Cliffs — several miles of steep sand-colored cliffs, in some places rising 100 feet above the river. The area is home to one of the largest concentrations of bald eagles in the country and is historically and culturally important to the Rappahannock Tribe.

The acquisition means that nearly 95% of the adjacent land is now conserved, including almost 3 miles of shoreline.

It is the Conservation Fund's third purchase of acreage along the cliffs.

The fund buys properties to protect important landscapes but does not intend to be the final owner. Before making a purchase, it usually lines up an agency or organization to which it will sell or transfer the property and ensures that they have the necessary funds for the transaction. But this situation is a bit more complicated.

Richards said the organization plans to sell a conservation easement to the U.S. Fish and Wildlife Service, which will ensure that protections are legally attached to the land and cover "a significant portion of the value of the property." The Conservation Fund will then seek additional money to help cover the cost of their purchase before transferring ownership of the land to the Rappahannock Tribe.

"We're working with the tribe, the Chesapeake Conservancy and others to put together [enough money to cover]

whatever's not paid for by the easement," said Richards, whose organization has helped protect more than 84,000 acres in Virginia alone. "We've taken a bit of a leap of faith here. But we feel confident we'll be able to find [the funding]."

Rappahannock Tribe Chief Anne Richardson said the recent transaction and the tribe's future ownership will be "incredibly healing" and "of upmost importance for the Rappahannocks to be able to return to the lands of our ancestors."

Conservation groups have been keeping an eagle's eye on this nearly 1,000-acre property since a development was first proposed there eight years ago.

Its previous owner, the Virginia True Corp., earned county approval in 2015 to build an 18-hole golf course, spa and hundreds of homes. But those plans ran into strong headwinds after a manager of the property illegally cleared 13 acres of trees near the riverbank in 2017, triggering costly fines and additional oversight from state regulators during the following two years.

In 2019, Virginia True filed for bankruptcy in New York. The filings included a revamped plan for the property: a combination of federally funded housing, a hotel and luxury condos in 10-story towers.

The Conservation Fund's \$8.1 million bid

at the bankruptcy auction was enough to beat a new group of developers — including some of the previous property owners — who intended to resurrect plans for a golf course and housing along the river.

"Being able to acquire it looked so grim for so long," Richards said. "There were so many low points." As recently as this summer, "we thought we wouldn't even have the opportunity to bid on [the property] through the bankruptcy process. We thought it might get transferred internally."

Conservation groups have played key roles in purchasing two other large chunks of the Fones Cliffs landscape.

One 252-acre property that had also been slated for development was purchased by The Conservation Fund in 2018 and then by the U.S. Fish and Wildlife Service the next year. The Chesapeake Conservancy purchased another 465-acre property from Northern Neck Lumber Co. and donated it in April to the Rappahannock Tribe.

The newly protected 964-acre property is believed to include the location of the historic village of Wecuppom. This stretch of the river is along the Captain John Smith Chesapeake National Historic Trail. During his 1608 exploration of the Bay region, Smith and his crew fled from arrows shot by the Rappahannocks as his boat sailed the river below Fones Cliffs. ■



# Gas company pleads no contest in PA fracking pollution case

## But some Dimock residents feel betrayed after state allows fracking to resume

By Ad Crable

In the latest chapter of a saga that has been the face of opposition to “fracking” for natural gas, a Houston-based gas company has pleaded no contest to a criminal charge related to dangerous levels of methane in the wells of several dozen families in the rural town of Dimock, PA.

By pleading no contest to the charge, Coterra Energy accepts responsibility for the violation of Pennsylvania’s Clean Streams Law without admitting guilt.

Coterra Energy — formerly Cabot Oil & Gas — entered the plea Nov. 29 as part of an agreement and consent order revealed at a press conference in Susquehanna County led by state attorney general and incoming governor Josh Shapiro and three Dimock residents.

Shapiro filed 15 charges, including nine felonies, against the company in 2020 for its alleged role in the water pollution.

In addition to the no-contest plea to one of the charges, Coterra has signed a consent order and agreed to pay \$16 million to create a public water system for affected residents and cover the cost of their water bills for 75 years. Until the new facility is built, Coterra will pay for in-home filtration systems and bottled water. The other 14 charges were dropped.

Dimock residents hailed the latest development in the case as vindication and a victory for accountability.

But some became angry just a few days later when they learned that, as part of the new consent order and plea agreement, the



A hydraulic fracturing rig for natural gas rises near a barn in Dimock, PA, in 2010. (Hudson Riverkeeper)

state Department of Environmental Protection had removed a 12-year moratorium on drilling for gas under the town.

The Associated Press reported that some residents felt betrayed.

“We got played,” the AP quoted Ray Kemble, a spokesman for the small group of Dimock residents who have continued to fight the drilling company and criticized DEP for its handling of the case.

The controversy has flashed off and on since a shed over a private well in the community exploded on New Year’s Day in 2009. Flammable methane gas had escaped from water in the well and built up in the structure.

Natural gas is made up mostly of methane, which can leak from pipes and wells used in the fracking process.

The saga was thrust into the limelight in the 2010 anti-fracking documentary *Gasland*, which was nominated for an Oscar and won an Emmy award. The documentary produced the indelible image of Dimock residents lighting their tap water on fire at faucets because the water contained so much methane.

Celebrities such as Mark Ruffalo and Yoko Ono attended rallies in Dimock, where some residents complained of headaches, nausea and rashes after bathing.

The notoriety of the case was a factor in the Delaware River Basin Commission’s controversial decision to ban fracking in the nearby Delaware River watershed, which includes portions of Pennsylvania,



Craig Sautner of Dimock, PA, holds jugs of contaminated drinking water collected in his home in 2010. (Hudson Riverkeeper)

New Jersey, New York and Delaware.

Cabot had steadfastly denied that its gas operations had caused methane to contaminate residents’ wells, instead arguing that natural migration of existing underground gas was to blame.

Through the years, the case has triggered intervention and studies by the state, U.S. Environmental Protection Agency and federal Centers for Disease Control and Prevention. DEP concluded that faulty construction in natural gas wells was to blame for contaminating water supplies in 19 homes, though the company disagreed.

Residents also sued. All but two of the 15 families who filed a federal lawsuit — many of whom had leased the mineral rights on their properties to fracking operations — settled with the company in 2012. In 2016, a federal jury found Cabot negligent and awarded \$4.24 million to the

two other families, but a year later a federal judge vacated the award.

Under the new consent order with DEP, Coterra is permitted to seek permits to drill horizontally underneath a 9-square-mile area, including the town, to extract gas thousands of feet under the earth.

Among its conditions, DEP has stipulated that interim water supplies must be in place for residents and that Coterra must pay a \$444,000 civil penalty for past violations. Also, 18 gas wells used previously will be plugged and new wells must be monitored for leaks.

“Coterra committed to strict controls, monitoring and evaluation, resulting in some of the most restricted conditions on any drilling in the commonwealth,” said DEP spokesman Jamar Thrasher.

Coterra said in a statement that it was eager “to resolve historical matters.” ■



Dimock resident Norma Fiorentino is shown here in 2009, after her water well shed exploded from methane leaks. (Dave Harp)

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# New leadership in Bay states raises hopes for action in 2023

## Environmentalists ask MD and PA governors to keep their promises on climate initiatives

By Jeremy Cox, Ad Crable  
& Timothy B. Wheeler

New Democratic governors with “green” pedigrees in Maryland and Pennsylvania are fueling environmentalists’ hopes of progress during this year’s legislative season.

Meanwhile, a Republican governor in Virginia is trending greener than many had expected as he enters his first full calendar year in office. That has some activists seeing opportunities for compromise.

Here’s how environmental issues are shaping up in the three key Chesapeake Bay watershed states during their 2023 lawmaking sessions.

### Maryland

Maryland environmental groups hope to make big strides in 2023, with a new governor taking office. Democrat Wes Moore ran on a platform pledging aggressive actions to fight climate change, protect the Chesapeake Bay and push for environmental justice.

That would be a change from the past eight years, when climate and environmental activists often sparred with two-term Republican Gov. Larry Hogan. At times, they successfully lobbied the overwhelmingly Democratic legislature to buck him, including overriding his vetoes of bills protecting oyster sanctuaries and promoting renewable energy.

Moore will have a new legislature to deal with, but one still firmly controlled by Democrats, who in 2022 pushed through sweeping climate legislation and a wave of other environmental bills. The 90-day General Assembly session began Jan. 11.

“Maryland voters have elected leaders who are committed to protecting the environment, improving public health and addressing inequities,” wrote Rich Norling, the Maryland Sierra Club’s political chair, on the group’s website. Environmentalists hope to work with the new administration and legislature to enact “big and bold solutions” for the climate crisis, environmental justice and “good, family-sustaining green jobs,” he said.

During his campaign, Moore faulted the Hogan administration for a “failure of executive leadership” on fighting climate change, and he pledged to make it a priority. He embraced the ambitious goals law-



*Carmen Cortez, a bus driver for public schools in Montgomery County, MD, sits at the wheel of the electric bus she drove for the county in 2022. Incoming Democratic Gov. Wes Moore said he plans more investments in climate-friendly transportation. (Dave Harp)*

makers set in 2022 of reducing greenhouse gas emissions 60% by 2030 and reaching net zero emissions by 2045. He further promised to set the state on a path to get 80% of its energy from clean sources by 2030 and 100% by 2035.

To get there, Moore said that he’d “leverage” billions in federal funds being distributed to all states to increase solar installations, expand Maryland’s wind industry and invest in battery storage research and development. He also said he’d invest more in climate-friendly transportation, including electrifying public transit and school bus fleets.

The incoming governor said he’d work with climate scientists, local governments and others to mitigate coastal flooding caused by rising sea level and land subsidence and to ease extreme heat experienced in the state’s urban areas.

To help restore the Bay, Moore said he would “promote accountability and enforcement” in Maryland as well as in neighboring states. He vowed to increase the number of environmental inspectors, something lawmakers had pressed Hogan to do in 2022. Moore said he’d again use federal infrastructure funds to upgrade

water and wastewater systems, improve stormwater management and clean up Baltimore’s sewage-plagued Inner Harbor.

Encouraged by Moore’s election, environmental groups hope to advance legislation that fell short in previous years. They’ve banded together seeking to expand solar energy, require more sustainable buildings, extend energy conservation to low-income households and protect more of the state’s lands from development.

“We’re working very hard to ensure that the administration is postured to make really ambitious progress on climate and equity issues,” said Kim Coble, executive director of the Maryland League of Conservation Voters and co-chair of the Moore transition committee on climate and the environment.

Maryland’s pilot “community solar” program is slated to expire in 2024 unless reauthorized this year. Under it, residential and commercial utility customers unable to install their own photovoltaic panels could subscribe to receive electricity from small to medium-size solar projects. In addition to renewing the program, green groups want to expand access to solar projects for middle- and low-income households.

After coming up short repeatedly, activists hope to finally win passage of sustainable buildings legislation, which would require state-funded structures to conserve energy and prevent bird deaths. Advocates are also looking to revive the Maryland the Beautiful Act, a land conservation measure that failed in 2022. The new version of the bill would aim to conserve up to 40% of the state’s land and water by 2040.

Josh Kurtz, Maryland director of the Chesapeake Bay Foundation, said his group also intends to seek legislation to promote more “living shorelines,” address the findings of a recent study showing the state continues to lose forest to development, and boost the state’s modest oyster farming industry.

### Pennsylvania

Pennsylvania’s environmental groups see an opening for meaningful advances in legislative action in 2023.

Their guarded optimism is buoyed by an influx of federal energy funding, an apparent new slim Democratic majority in one chamber, a new Democratic governor who has prosecuted the natural gas industry multiple times recently as state attorney general, and the retirement of a key committee head in the House who has frozen movement of environmental bills for years.

“With a new governor and a significant number of new legislators, this moment presents a strong opportunity to pursue a more comprehensive approach to energy and climate issues,” said John Walliser of the Pennsylvania Environmental Council.

Among the priorities of environmental advocates is an expansion of Pennsylvania’s expired mandate for renewable energy known as the Alternative Energy Portfolio Standards. It called for 8% of the state’s electricity to be generated by renewables, which was met in 2021 and has plateaued.

“We want at least 30% renewables by 2030,” said Ezra Thrush, senior director of governmental affairs for the environmental group PennFuture. “We really could be a leader in clean energy. We could be a leader in solar. But public policy spurs that.”

Passage of a bill to allow “community solar” in Pennsylvania is high on the environmental wish list.

That would allow residents who can’t install solar panels on their own home, or people who live in apartments, to pay for a





*This solar array is one of two recently built near Mercersburg, PA. The state reached its goal of obtaining 8% of its electrical power from renewable sources in 2021. Environmentalists are advocating for 30% by 2030. (Dave Harp)*

portion of a local, privately developed solar array. They would then receive a credit on their electric bill for the solar power generated, saving them money.

Despite bipartisan support, community solar bills have stalled in the House Environmental Resources and Energy Committee for several years. But Rep. Daryl Metcalfe, the Republican chair of the committee and a climate-change denier, is retiring.

Democrats hope to appoint one of their own to head the committee. But, to begin the 2023 session, Republicans will still control the House because one Democrat who was elected has died and two others were elected to other offices. Special elections must take place in the Democratic-leaning districts before the party could have a majority in the House.

The battle to complete Pennsylvania's enrollment in the carbon cap-and-trade Regional Greenhouse Gas Initiative (RGGI) will likely continue in the upcoming legislative session but may finally see a resolution. Pennsylvania formally joined 11 other states in their efforts to reduce greenhouse gases in April after a combative three-year effort by Democratic Gov. Tom Wolf. But Republican legislators, who consider Wolf's executive action for RGGI membership an impermissible overreach, have blocked membership with court appeals.

Democratic Governor-elect Josh Shapiro has not committed to joining RGGI but has promised to resolve the issue as soon as he gets in office.

Mark Szybist, senior attorney for the Natural Resources Defense Council and a member of Shapiro's transition team, said he is confident Shapiro will defend the state's RGGI membership in court and add Pennsylvania as a full-fledged member.

As attorney general, Shapiro levied three

high-profile prosecutions of natural gas and pipeline companies for pollution violations. He also convened a special grand jury that found fracking is harming human health and the environment. The grand jury made several recommendations, including expanding no-drill zones, requiring fracking companies to reveal all chemicals used in the process and exploring the health effects on people living near wells.

Groups intend to press Shapiro and legislators to act on those recommendations.

"Some of those recommendations could fairly easily be translated into legislation," said Jennifer Quinn of the Pennsylvania Chapter of the Sierra Club.

## Virginia

In his first budget proposal, Virginia's Republican Gov. Glenn Youngkin put forward spending amendments that exceed his Democratic predecessor's totals for restoring the Chesapeake Bay. Conservation

groups say they are pleased on that front but are less enthused with his climate and energy policies.

In Virginia, state budgets are negotiated for two-year periods. Youngkin's amendments bring the state's spending to clean up local waterways and the Chesapeake to nearly \$1 billion more than the 2023 and 2024 fiscal years. The budget put forward in December suggests layouts of:

- \$237 million to Virginia's wastewater treatment plants for investments that reduce nutrient pollution in waterways. That would be added to the \$70 million already budgeted by Youngkin's predecessor, Ralph Northam.
- \$137 million for Virginia's programs that help farmers adopt important conservation practices. This amount, if approved by the legislature, would be in addition to the appropriation of \$286 million over two years made by the General Assembly last year.



*Farms dot the landscape in Virginia's Shenandoah Valley. Republican Gov. Glenn Youngkin's amended budget for fiscal year 2023-24 includes an additional \$137 million for programs that help farms adopt environmentally friendly practices. (Dave Harp)*

- \$100 million to update Richmond's combined sewer-stormwater system, which discharges pollution to the James River during heavy rains.

"It's good to see the Gov. Youngkin administration walk the walk," said Reed Perry, manager of external affairs for the Chesapeake Conservancy. "They've said the Chesapeake Bay is going to be a priority, and accelerating [restoration] progress, and it's nice to see the budget backing that verbal commitment."

The legislative session began Jan. 11 and will last for 30 days unless lawmakers vote to extend its length. A final budget will likely involve a compromise. Republicans hold a four-seat majority in the House while Democrats hold a three-seat majority in the Senate.

The biggest battle will likely involve the state's participation in the Regional Greenhouse Gas Initiative. The Youngkin administration has begun taking steps to withdraw Virginia from the climate program. In December, the state Air Pollution Control Board, reconstituted under four Youngkin appointees, voted to end the state's involvement in RGGI, putting the administration a step closer to its goal.

Several environmental groups argue that Youngkin cannot pull out of the program without the legislature's support.

Youngkin's budget suggests replacing the money that would have been raised by RGGI with what it calls a Resilient Virginia Revolving Loan Fund. The first year would make available \$200 million in loans or grants, but that funding relies on the emergence of surplus revenue.

Some environmental groups welcome the proposal. But they say it should not replace RGGI, which has raised \$150 million so far for flood resilience efforts in the state. The loan fund's critics also say that, unlike the RGGI fund, it doesn't dedicate 25% of its receipts to limited-resource communities.

"We're certainly open to what's been proposed, but we don't think it needs to be an either-or scenario," said Pat Calvert, campaigns manager for the Virginia Conservation Network.

In a move long sought by many conservationists, the administration also calls for spending \$225,000 to assess the Bay's blue crab population. Proponents say that such a study would help protect the crustaceans from overfishing.

Some environmentalists, though, are less supportive of Youngkin's \$10 million proposed investment in the Virginia Power Innovation Fund, which would fund a study of small modular nuclear reactors, carbon capture technology and hydrogen energy. Critics call the technologies unproven. ■



# Oyster farming co-op's deal with MD county a 'win-win-win'

**Charles County pays watermen for planting oysters, earns water quality credits after harvest**

**By Timothy B. Wheeler**

Sunlight glinted off the water as Billy Rice stood on the gunwale of *Miss Jill*, his 24-foot Chesapeake Classic boat. Gripping the wooden handles of his scissors-like oyster tongs, he repeatedly worked them open and shut.

From the murky depths of the Wicomico River came a scraping sound as the teeth in the metal claws of the tongs raked up shells lying on the bottom.

"Yessir! That looks pretty," exclaimed Kevin Warring as Rice lifted the tongs out of the water and deposited a batch of muddy oysters on the boat. Nine of the bivalves clung together in a clump that Rice said watermen call a "flower."

Those oysters represent a new wrinkle in the centuries-old business of harvesting the Chesapeake Bay's once-bountiful shellfish. Rice and Warring are members of an unusual oyster farming cooperative in Charles County, MD. They and the other 10 co-op members are raising oysters on 28 acres of leased bottom in the Wicomico, a Potomac River tributary.

There's nothing out of the ordinary about farming oysters that way. There are nearly 480 oyster farming leases in Maryland, and more than three-fourths of them are for raising bivalves on the bottom. Many are held by watermen looking to supplement what they can forage in the wild from public waters.

But what's sending ripples across the Bay area is that the co-op is getting paid to plant oysters. In July 2022, Charles County struck a deal with the co-op, agreeing to annually pay at least \$53,000 for the next eight years to cover its costs for planting fresh batches of hatchery-spawned oysters. Aquaculture operations generally must come up with their own operating capital.

The co-op still gets to harvest and sell the oysters when they've grown to marketable size after two or three years. What the county expects to get out of the deal are water-quality credits that those oysters can earn from the state of Maryland for removing nutrients — nitrogen and phosphorus — from the water as they feed and grow.

It's a novel arrangement, which advocates hope will inspire other deals in a so-far moribund market for nutrient removal credits that oyster farmers can earn.

"It seemed like not just a win-win, but a



*Billy Rice tongs oysters from the Wicomico River in Charles County, MD, as Kevin Warring looks on. Rice and Warring are members of an oyster farming co-op that is earning money by providing water quality credits for the county. (Dave Harp)*

win-win-win situation," said Mark Belton, Charles County's administrator and a former secretary of Maryland's Department of Natural Resources. The nutrient removal credits will help the county meet its regulatory obligations in the Bay cleanup, he said, while the county is helping to sustain a fishing industry that's an important part of the local culture.

"Plus, it's a food security issue," Belton said, because it ensures residents still have access to fresh local seafood.

Members of the co-op, all of them watermen, say the payments reimburse them for the time they spend planting and tending their underwater crops, then doing the necessary paperwork to earn water-quality credits.

But Warring, the co-op's managing director, said that money is not really the main driver.

"Many of our members want to see a thriving oyster population and a thriving set of local watermen who can provide fresh food for residents," he said.

## **New way to control pollution**

The Wicomico River once brimmed with oysters. In 1973, Rice recalled, when he started working on the water fulltime, there were 163 boats in the river on the opening day of oyster season. "Everyone caught their limit," he said.

Oyster populations have declined precipitously since then throughout much of the Bay mainly because of pollution and diseases, but also overharvesting. While oysters have rebounded some in the last decade or so, the generally low salinity in the Wicomico hasn't been conducive to natural reproduction that might restore reefs in the river.

Rebuilding the Bay's oyster population is a priority for the Chesapeake restoration effort because of the bivalves' ecological benefits as well as their economic value. Oysters filter nutrients and some sediment from the water as they feed, and the reefs formed by their accumulated shells provide habitat and food for a variety of marine organisms and fish.

The reefs also can help reduce shoreline erosion by buffering wave action.

In 2017, looking for ways to incentivize the fight against nutrient pollution, the federal-state Chesapeake Bay Program approved oyster aquaculture as a best management practice for reducing nitrogen and phosphorus in the Bay, similar to approved land-based practices such as planting streamside forest buffers and fall cover crops.

A few years later, after working out the regulatory details, Maryland incorporated



oyster aquaculture into its water-quality trading program. Under it, oyster farmers can earn nutrient reduction credits for the oysters they raise and harvest. They can then sell those credits to a business or municipal wastewater plant needing to reduce or offset its nutrient discharges.

For Maryland oyster farmers, the credits offer an opportunity to earn a little extra income in an industry that's making no one rich right now. Regulatory delays and leasing disputes have slowed the industry's growth. It took a hit in 2018 and 2019 when record rainfall turned Bay water so fresh it stunted and even killed some oysters. Then the COVID-19 pandemic shut down restaurants and oyster bars, shrinking the market.

### Finding a buyer

Since 2020, about a dozen oyster farming operations have earned nutrient reduction credits for their harvests and posted them for sale on MDE's online market board. There were a couple of deals struck that first year, but none since.

Part of the reason for that may be a matter of scale. The prospective buyers on the MDE website are industries or government entities looking to buy more nutrient credits than any individual oyster farmer has to offer. It takes at least 2,000 oysters to earn credit for removing a single pound of nitrogen from the water, and many industrial or municipal dischargers need to offset hundreds of pounds.

Geographic restrictions also may handicap oyster farmers. To ensure that trades offset pollution where it occurs, MDE specified that credits can only be sold in the watershed where the oysters are grown. Many oyster farms are in rural areas on the Eastern Shore and in Southern Maryland, where there are relatively few industries or wastewater plants.

Blue Oyster Environmental, a Cambridge-based company formed by the father-son team of Johnny and Jordan Shockley, has tried to overcome those hurdles. It brokered one of the initial oyster credit deals, and it has tried to land others by bundling credits earned by more than one aquaculture operation.

They've struck out so far, though, and think part of the problem may be that there isn't sufficient regulatory pressure on polluters to reduce their nutrient output. They said they've made sales pitches without success to several businesses and local government entities that had posted "credits wanted" notices on MDE's trading website. Those notices are still there.



*Billy Rice examines oysters from the co-op's leased bottom while Kevin Warring works the tongs. (Dave Harp)*

*This clump of oysters, shells attached, was brought up from the co-op's leased bottom in the Wicomico River. Watermen call such clusters "flowers," Billy Rice said. (Dave Harp)*

"The biggest reason for lack of trades comes down to lack of enforcement," contended Jordan Shockley, Blue Oyster's CEO.

Johnny Shockley said he's excited, though, to hear about the oyster farming co-op and its deal with Charles County.

"That business model is one we've been pushing for," he said. "I totally believe that's the future of the oyster industry."

The concept isn't new to Charles County watermen. About half of them participate in an informal co-op with counterparts from Virginia to manage an oyster reef on the Potomac River.

The Wicomico River co-op took that a step further. To demonstrate their commitment, every member put up \$1,000 to begin a small-scale planting of juvenile oysters before the deal with the county came through.

"What we did on our own, it showed we were willing to take the gamble and do the work," explained Warring.

County officials credit Warring with leading the effort to nail down the deal. A county native with a bachelor's degree in physics, he works at the Naval Surface Warfare Center in Indian Head. But he also crabs and helps work the family farm, and he's secretary of the Charles County watermen's association.

### Closing the deal

The roots of the co-op's deal with the county go back to 2018, when local watermen appealed to the county commissioners for financial support during the record-setting rainfall that year, which affected wild as well as farmed oysters.

In response, the county agreed to provide \$50,000 to plant hatchery-spawned oysters in a state-designated sanctuary. They couldn't be harvested there, but everyone hoped they'd survive and reproduce over time, helping to naturally restore oysters in neighboring areas.

Belton and other local officials joined the watermen on the water to witness that planting. On the boat, they began discussing how the county might do more to help sustain the local seafood industry.

In June, buoyed by the pending deal with the county, the co-op deposited about 1,800 bushels of oyster shells containing 14 million baby oysters, or spat, in the water on their leased bottom. The oysters had been spawned by the University of Maryland's hatchery at Horn Point, then set on shells

by a private aquaculture concern in neighboring St. Mary's County.

Charles Rice, assistant county chief of planning (and no relation to Billy), said the credits to be gained from the farmed oysters will be applied to meet the county's obligation under its state-issued stormwater permit. Per MDE requirements, he said, the county must put best management practices in place over the next five years sufficient to treat runoff from about 1,000 acres of impervious surfaces, land covered by pavement or buildings.

Charles Rice said that oysters planted by the co-op in June will likely yield only enough nutrient reduction credits to count for treating about 10 acres of impervious surfaces. Assuming no calamities befall the crop, those credits could still be a bargain, considering the costs of more typical measures to treat runoff from developed lands.

Suzanne Dorsey, deputy secretary of MDE, called the Charles County deal "an investment in innovation." She said she hopes it will inspire others to follow suit.

"We're not talking about [removing] hundreds of pounds of nitrogen here," she said. "But we're talking about a new way for Charles County to ensure their waterways are continuing to be clean."

She said that oyster farmers may find more opportunities to sell their credits under tweaks in 2021 to Maryland's Clean Water Commerce Act, under which the state can spend \$20 million a year on projects that reduce nutrient and sediment pollution.

The Bay Program also is eyeing the awarding of water quality credits for planting hatchery-reared oysters in sanctuaries and to an even more limited degree for putting them on harvestable reefs.

Co-op members say they will consider their enterprise a success if they see oyster abundance return to the Wicomico River. They plan to leave a portion of what they plant every year to grow and keep reproducing.

"I think it would be unrealistic to think we could see oysters in the river like I saw in my lifetime," said Billy Rice, who began crabbing at age 10 and divides his time between fishing and farming. But he does believe it's possible "that we could get them back to a point where [the population] can replenish itself and support a fishery as well as the environmental benefits."

Meanwhile, Warring, Rice and the others check on their oysters periodically to monitor their growth. Some of the small batches planted in prior years are about ready to harvest.

"We're going to take every dollar we make, divide it by 12 and share it equally," Warring said. "It's something that to me is special about what we're doing here." ■



# Could producers of plastics be required to help recycle them?

## Policy report explores possibility for states in Chesapeake region

By Whitney Pipkin

**A** growing number of states are passing laws that require producers of plastics to fund or participate in recycling them. Could one of the Chesapeake Bay states be next?

A policy report from the Chesapeake Bay Commission and Chesapeake Legal Alliance released in November explores the potential.

The concept is called “extended producer responsibility,” and it shifts the burden for recycling or disposing of certain materials back to companies that produce them. Such measures can also encourage producers “to introduce fewer [plastic] products and more recyclable materials into the market to begin with,” the report states.

The report and many of the laws in other states focus on plastic packing materials, which represents 40% of all plastic waste globally.

Maine, Oregon, Colorado and California have each passed extended producer responsibility laws over the past two years. Maine was the first, in 2021. And as of October 2022, nearly 20 states — including Pennsylvania, Maryland and Virginia — had considered similar legislation. The details of the laws and the bills vary widely between states.

According to the report, the most successful laws cater to a state’s specific needs by considering the industries that will be impacted and the state’s existing recycling infrastructure and economics. Still, the report found that state-based legislation layered with a regional approach could make the recycling process easier on both producers and consumers.

Pollution-reduction efforts for the Bay and its rivers have historically focused on nutrients and sediment. But plastic pollution has become an intractable, widespread problem in waterways. Nearly every survey looking for plastics in aquatic systems has found them. Researchers are just beginning to understand what the presence of plastics throughout the natural environment means for local wildlife and their habitats.

“The impacts of plastics are being felt in our waters, in our wildlife and on our



*Some states have laws that shift the costs for recycling plastics and other materials back to the companies that produce them. (Dave Harp)*

land,” stated Virginia Del. David Bulova (D-Fairfax), a member of the Chesapeake Bay Commission, in a press release about the report, “but the Chesapeake may be even more vulnerable to plastics pollution than many other watersheds.”

A 2021 study found that because of the Bay’s unique shape and flow, it’s likely serving as a “sink” for plastic pollution in the region. An estimated 94% of the plastics that enter the Bay and its waters do not leave the watershed. A committee of researchers convened by the state-federal Chesapeake Bay Program in 2019 to look further into the problem concluded that plastics pose a serious potential risk and launched a series of research projects and oversight measures.

Meanwhile, the United States alone creates more than 35 million pounds of plastic waste per year — and less than 10% of it is recycled, according to the U.S. Environmental Protection Agency. The largest recent influence on recycling trends was a decision by China in 2018 to severely limit the import of plastic waste from other countries. Without this option, many states

and localities have struggled to fund costly domestic recycling programs.

“Suddenly, we’ve been forced to deal with [recyclables] in our own communities. And how to do that effectively and economically has forced this conversation forward,” said Molly Brown, a senior attorney for the Chesapeake Legal Alliance and an author of the policy report.

Much of the plastic pollution laws in the Bay watershed have been piecemeal, focused on a city or county banning materials, such as polystyrene food containers and plastic straws, which commonly end up in the water. “But a comprehensive approach to plastics waste has yet to be successful,” the report states.

In Maine, producers pay into a program based on the amount and recycling potential of their products. Those funds are used to reimburse local governments for the costs of recycling. In Oregon, the program funds improvements to the state’s recycling system. But in Colorado, legislation passed in 2022 establishes a statewide program that’s fully funded and managed by producers.

Kate Bailey, chief policy officer of The Association of Plastic Recyclers and a lead author of the Colorado law, said the program represents “a fundamental shift around how we think about recycling and why we do it.”

“The goal of recycling isn’t to keep packaging out of landfills,” Bailey wrote in an email. “The goal of recycling is to create a circular economy where companies make new products from our old stuff.”

The fees in Colorado apply to all companies that sell products in the state, regardless of where they’re made. This prevents companies that are based in Colorado from having a competitive disadvantage against those based elsewhere.

“Holding the producers of plastic packaging accountable for its end-of-life management is an increasingly popular policy globally,” said Maryland Del. Sara Love (D-Montgomery), who also serves on the Bay Commission, in a press release. “A regional program, such as one focused on the Chesapeake Bay, would offer producers stable and uniform requirements, costs and expectations.”

In Maryland, bills for extended producer responsibility were introduced during the 2021 and 2022 legislative sessions but did not make it out of committee. The legislation would have required producers of certain packaging materials to pay into a program to reduce waste and begin contributing to the cost of recycling for localities. The bills gained the support of industry, including the Consumer Brands Association and the Flexible Packaging Association.

Pennsylvania considered a bill in 2021 that would make manufacturers responsible for the collection, transportation and recycling of single or short-term use packaging materials. The bill proposed a fee but did not make it out of committee.

In Virginia, a 2022 bill would have established and funded a program to reimburse local governments for recycling costs by requiring larger producers to pay an annual fee based on weight, volume and recyclability of materials. That bill, which stalled in a subcommittee, faced pushback from forest products businesses that argued paper products were already being effectively recycled in the state. Virginia leaders did form a Plastic Waste Prevention Advisory Council that will study and advise the governor on plastic waste reduction policies. ■



# Appeals court vacates operating license for Conowingo Dam

## Federal regulators ordered to consider tougher requirements for mitigating pollution

By Timothy B. Wheeler

The long-running debate over how to deal with Conowingo Dam's impact on the Chesapeake Bay is on again. A federal appeals court on Tuesday vacated the license granted in 2021 to operate the hydropower facility on the Susquehanna River.

Siding with environmental groups, a three-judge panel of the U.S. Court of Appeals for the District of Columbia found that the Federal Energy Regulatory Commission exceeded its authority by accepting a privately negotiated deal between Maryland and the utility that owns the dam as part of the license agreement. Under that deal, the state had greatly scaled back what it had originally required of the dam's operator to reduce pollution coming downriver to the Bay.

Spokespeople for groups that had challenged the license hailed the court's ruling, saying it clears the way for making the dam's operator, Constellation Energy, to play a bigger part in dealing with the water-fouling nutrients and sediment building up behind Conowingo before flowing downriver.

"This decision will not only protect the Susquehanna River and the Chesapeake Bay for the next 50 years of this license term but will also ensure that all water quality certifications for large projects can't just be thrown out when it is politically expedient or when the state is pressured to do so," said Betsy Nicholas, executive director of Waterkeepers Chesapeake. "This is a big win for the Chesapeake Bay, watermen, downstream residents and the entire Chesapeake Bay cleanup plan."

The Waterkeepers group, along with two of its member organizations — the Lower Susquehanna Riverkeeper and Sassafras Riverkeeper — and the Chesapeake Bay Foundation filed suit in June 2021. They asked the court to overturn FERC's acceptance of what some called a "sweetheart deal" between Maryland and Constellation's corporate predecessor, Exelon Corp., over how the company should address the dam's impacts on water quality and aquatic habitat.

The 94-foot-high dam straddles the Susquehanna in Maryland, about 10 miles upstream from the Bay. Its turbines generate enough emission-free electricity to power 165,000 homes, according to Constellation. After the dam's completion in 1928,



*Conowingo was built in 1928 to generate electricity, and it inadvertently acted as a trap for nutrient and sediment pollution flowing downstream to the Chesapeake Bay. Over the years, sediment buildup behind the dam has reduced its pollution-trapping capacity. (Dave Harp)*

it captured a portion of the nutrients and sediments washing down the river. But now its 14-mile reservoir is mostly filled, and more nutrients and sediment from farm runoff, municipal wastewater and stormwater flow through the dam and into the Chesapeake, where they contribute to algae blooms and other water quality woes.

The dam also blocks many migratory fish from getting upriver to spawn. And it impedes the upriver movement of American eels, which in turn has depleted freshwater mussels that once helped filter nutrients and sediments out of the river.

Under the Clean Water Act, no license could be issued for the dam unless Maryland certified that it would not harm water quality or waived its right to do so. In early 2018, after years of studies, the Maryland Department of the Environment issued that certification with the condition that the dam's operator must reduce nutrients flowing downriver from the dam enough to meet water quality standards or pay the state \$172 million a year to have it done.

Exelon sued, contending that the state was making it responsible for upriver pollution that the dam did not generate. The company also petitioned FERC to rule that Maryland had exceeded the one-year timeframe that states have for acting on license applications.

In 2019, MDE and Exelon reached an out-of-court settlement, under which the company agreed to provide more than

\$200 million to address a variety of dam impacts, with only about \$19 million of that for directly reducing nutrients and sediment. Approximately \$25 million would go toward restoring mussels. In turn, the state waived its right to impose its previous conditions on the dam's operating license.

Environmental groups and others petitioned FERC not to accept the deal, arguing that it fell far short of what's needed. But the five-member commission issued Exelon a new license that accepted the terms of the MDE settlement and did not impose any other conditions.

The appeals court agreed with the environmental groups that FERC should not have allowed Maryland to backtrack on the conditions it set in 2018. It ordered the commission to reconsider its decision and restart the entire application process, or else accept Maryland's original water quality certification and greater conditions on the company's continued operation of the dam.

MDE spokesman Jay Apperson issued a brief statement saying agency officials are "disappointed with the court's ruling and will work with the office of the attorney general on the implications and next steps."

But Bay Foundation vice president Alison Prost called the ruling "a cause for celebration."

"We urge the state to use this opportunity to force Constellation to invest in upstream environmental projects that will

offset the harm caused by the dam's presence and protect the Chesapeake Bay for generations to come," Prost said.

Paul Adams, spokesman for Constellation Energy, said company officials were "surprised and disappointed" by the court's decision.

"No one who cares about clean air and the health of the Chesapeake Bay should be cheering this decision, which potentially jeopardizes the state's largest source of renewable energy," Adams said. The company has in the past argued that the dam's hydropower generation isn't a big money maker, implying it could shut it down if operation costs grow too high.

He also said the ruling threatens to disrupt funding the company had pledged to spend, not just as part of the water quality settlement with Maryland but also to improve passage over the dam for spawning American shad, river herring and eels. The company estimates that its license-related commitments total about \$700 million. Among other things, that includes approximately \$300 million pledged in a separate agreement with the U.S. Fish & Wildlife Service for fish and eel passage and \$175 million to meet requirements for providing recreational access and protecting threatened and endangered species.

But the court said FERC could prevent such disruption by issuing the company an interim operating license, renewable annually, that requires Constellation to continue such efforts. In the meantime, the court said, the commission could resume reviewing additional conditions that could be attached to a license to operate the dam for the next 50 years.

Environmental groups believe the commission should impose the terms Maryland originally set forth in its certification. The state did not specify how to meet those, the Waterkeepers' Nicholas said, so the details are still subject to negotiation. But the ruling will ensure that stakeholders have an opportunity to participate in those deliberations, she added, a role denied them by the closed-door talks leading up to the out-of-court settlement.

Now, as the state-federal Chesapeake Bay Program tries to raise the funds necessary to reduce the flow of nutrients and sediment flowing down the Susquehanna, Nicholas said the court ruling could mean that "we have another big partner at the table, who should have been there all along." ■



# Black communities in Norfolk see major climate overhaul

## Federal funds provide \$112 million for flood resilience in overburdened neighborhoods

By Jeremy Cox

**G**raige Johnson is sick of the flooding in his community a few blocks east of downtown Norfolk.

A burst of rainfall turns low spots into ponds and some roads into canals. Even without a raindrop in sight, the water can still collect. A few times a year during abnormally high tides, the Eastern Branch of the Elizabeth River backs up into the storm drains, causing water to bubble up into the streets.

Things weren't always this bad, said Johnson, who has lived in the largely African American neighborhood known as Chesterfield Heights, since 1991. He blames climate change.

"As far as I'm concerned," said Johnson, a 75-year-old retired longshoreman, "it's real."

A growing line of research shows that the burdens of climate change are likely to be borne by underrepresented groups. A study led by the University of Bristol in Britain last year captured the problem in sharp detail, suggesting that Black communities in the U.S. will see flooding costs increase at about double the rate of those that are predominantly white.

Gathering data from flood insurance claims, building inventories, population projections and other sources, researchers identified which census tracts are likely to experience the highest flood risks by 2050. Most were in the Southeast and home to large Black populations.

The study shows dozens of high-risk Black communities around the Chesapeake Bay watershed, with the biggest clusters lying in Prince George's and Dorchester counties in Maryland, the Northern Neck of Virginia and a corridor straddling the James River between Norfolk and Richmond.

Chesterfield Heights and its neighbor, the Grandy Village public housing complex, are like many African American neighborhoods facing climate perils, with one major exception: Something tangibly monumental is being done about it.

### 'Historic' effort

Since work began after a February 2020 groundbreaking ceremony, the communities have undergone a visible transformation.

The rapidly eroding shoreline along the Eastern Branch has been replaced by a 2,000-foot-long earthen berm averaging



The floodwall built in Norfolk to shield the Chesterfield Heights and Grandy Village neighborhoods from tidal flooding is shown here under construction in October 2020. (Courtesy of the city of Norfolk)

8 feet in height. Asphalt has been torn out from the three blocks closest to the river and replaced with red brick permeable pavers that allow water to soak into the ground. Two pump stations stand ready to fight flood waters. A new soccer field has been designed with hidden drains to soak up excess rain. And there's much more.

The \$112 million project is expected to be substantially completed by the end of January, with the remaining minor tasks set to be wrapped in March or April, said Kyle Spencer, Norfolk's chief resilience officer.

"It's historic," he said of the venture, dubbed the Ohio Creek Watershed Project. "It means a lot to a lot of people."

People like Johnson. From his front porch, he can see newly installed bioswales — shallow depressions along the street stuffed with vegetation to catch and treat stormwater. He supports the project. But enduring the whirlwind of road closures, dust and noisy construction vehicles, he added, has been "a pain."

"Let's get this [stuff] over with," Johnson said as workers nearby raced the waning light of a mid-December sun. "Let me live to see this complete."

Recent headlines across the country tell the story of climate resilience action

beginning to move forward. Typically, though, the largest public investment proposals seek to protect important infrastructure or high-end real estate, such as highway tunnels in Baltimore, glitzy condos in Miami Beach or expensive properties at the lower tip of Manhattan.

Norfolk itself needs an influx of \$1.8 billion in climate protection, according to a 2017 report by the U.S. Army Corps of Engineers. The low-lying city of 230,000 residents could have launched its public works offensive in any number of flood-prone places, including a downtown filled with high-rise buildings or majority-white communities such as the Larchmont neighborhood or the Ghent District.

Yet city leaders chose Chesterfield Heights and Grandy Village, where nearly 90% of the 2,000 residents are Black, according to census figures. The median household income is \$33,958, about \$20,000 less than the citywide figure. Flanked by Interstate 264 and a waterfront industrial hub, the census tract containing the two neighborhoods ranks among the worst in the state for health risks from toxic air and proximity to hazardous waste facilities, according to the U.S. Environmental Protection Agency's EJScreen tool.



Graige Johnson, 75, sits on his front porch in the Chesterfield Heights neighborhood. The retired longshoreman supports the new flood-protection measures in his community and is eager for them to be completed this spring. (Jeremy Cox)

"We saw it as an opportunity to show how [to] adapt a historic neighborhood that hasn't had as much attention as it has probably needed over the years," Spencer said.





Kyle Spencer, Norfolk's chief resilience officer, stands in front of a new structure in the Grandy Village community that resurrected a long-buried stream. (Jeremy Cox)

### Rare chance for funding

The Ohio Creek project, named after the communities' main drainage feature, emerged after an alignment of the bureaucratic stars.

Norfolk's official plan to fortify itself against climate change began taking shape in 2013, when the city participated in a regional series of "Dutch Dialogues." Experts from the Netherlands were invited to discuss how the famously flood-affected country "lives with water" instead of trying to drain it as quickly as possible.

Members of Chesterfield Heights' civic association attended several of the meetings and made clear that they would embrace resilience efforts in their neighborhood. Wetlands Watch, a Norfolk-based conservation group, responded in 2014 by sponsoring the preparation of a plan for the community.

Funding a neighborhood-level construction project of such magnitude would be highly unlikely under normal circumstances. But then something equally unlikely happened: The federal government had leftover money — \$1 billion — from the Superstorm Sandy recovery.

So, the U.S. Department of Housing and Urban Development urged states and communities to submit proposals for projects that would protect areas from future disasters. The agency received more than \$7 billion in funding requests. It awarded Norfolk \$120 million, with \$112 million of that total dedicated to the Ohio Creek project.

### Fighting for help

Karen Speights, a Chesterfield Heights resident who has worked for years to call attention to the area's flooding woes, said she is mostly happy with how the project has turned out. She was 5 years old in 1963 when her family moved into the neighborhood. She left as an adult but returned in 2008, moving in with her aging mother.

Speights said her home, which has about

2 feet of crawl space beneath it, had never flooded during the first 45 years her family owned it. Then came a nor'easter in 2009 that deposited a foot of water on the first floor. "When the high tide started to come in," she recalled, "we were looking down through the floor vents, and we could see the water down there with the waves."

In 2011, Hurricane Irene inundated the house again. After both floods, Speights had to replace water-logged flooring and purchase new appliances. When city officials and planners started hosting workshops nearly a decade ago seeking community input on flooding fixes, Speights became one of Chesterfield Heights' most vocal advocates.

"I want mostly for people to understand, like in all matters, it's not just my problem ... other people face it," she said.

The city didn't just invest in moving water from one place to another. Acting on residents' suggestions, the Ohio Creek project is adding several new amenities to the neighborhoods, including refreshed sidewalks, a fishing pier and a park with walking trails, built-in chess boards and charcoal grills.

Speight said her only significant complaint is that there was no assistance set aside to help homeowners flood-proof their own properties. But as she sees it, the project largely reflects what community members said they wanted.

"I do believe this can work for other areas," she said.

### High cost of adaptation

Whether there will be enough money to help the growing number of communities in harm's way is another matter. The University of Bristol study projected that the annual cost of flood damage in the U.S. will soar to \$40 billion by 2050, a 25% increase from current levels.

Black communities are expected to bear a disproportionate amount of that cost. According to the study's authors, that's because the area with the densest Black populations — a band stretching across the Southeast from Texas to the Chesapeake Bay area — is also where climate change is expected to trigger more extreme rainfall and flooding.

In Virginia, the state's Coastal Resilience Master Plan forecasts that, by 2080, the overall population living in homes at risk of coastal flooding will nearly triple, to 943,000. Annual flood losses in the state will go up from \$400 million to \$5 billion over that span, it predicted.

The nine-figure federal sum that Norfolk won for the Ohio Creek project was a one-time federal windfall. But more help may be on the way.

The Inflation Reduction Act that Congress passed last year represented the largest single investment made in climate action. In a nod to the climate disparities faced by overburdened communities, the law set aside \$60 billion in spending on environmental justice, including \$3 billion in block grants to spur community adaptation efforts. Environmental justice advocates have applauded the resilience funding.

Not long ago, Speights said she considered leaving Chesterfield Heights and the home that has been in her family for so many decades. She couldn't bear facing another flood with her mother. But she reconsidered after seeing how much had been accomplished by the Ohio Creek project, especially near her own property.

There's a new berm behind her house to protect it from storm surges. A tide gate now manages the flow of water in and out of the nearby creek. And there's a pump station just around the corner if the water does start to rise.

Speights decided to use the money that she would have spent on a new house to remodel her current one.

"Hopefully, in my lifetime," she said, "it won't flood." ■



In Norfolk's Chesterfield Heights neighborhood, a newly installed bioswale is designed to capture and treat stormwater before it reaches the Eastern Branch of the Elizabeth River. Meanwhile, new permeable pavers allow water to soak into the ground beneath the street. (Jeremy Cox)





# Warming water threatens aquatic life in Bay region

**Experts worry that rising water temperatures will reduce benefits of Bay cleanup**

**By Karl Blankenship**

**W**arming water is threatening to undo decades of efforts aimed at improving aquatic habitat in the Chesapeake region, from headwater streams to the open water of the Bay itself.

The increasing water temperatures, which threaten species like brook trout and striped bass, are already offsetting some of the habitat benefits of the multibillion-dollar Bay restoration effort, a new report warns. Worse, some actions taken to reduce pollution are actually contributing to warmer, more stressful, stream conditions for fish.

“We’re behind the eightball right now in considering this in our major policies,” said Rich Batiuk, a former senior science official with the state-federal Bay Program partnership, who helped organize a 2022 workshop focused on the region’s rising water temperatures.

Batiuk was a leading architect of the current Bay cleanup strategy for reducing nutrient and sediment pollution to clear the Bay’s water and shrink its oxygen-starved “dead zone.” The resulting water quality improvements were intended to boost aquatic life. But some of the assumptions underlying that effort didn’t account for the negative impact that rising water temperatures would have on fish, crabs and even worms and algae.

Now, a report from the Bay Program’s Scientific and Technical Advisory Committee, stemming from last year’s workshop, warns that those changes could undermine progress toward Bay Program goals for “fisheries management, habitat restoration, water quality improvements, and protecting healthy watersheds.”

Just one example: A 2013 study found that meeting all Bay nutrient reduction goals would increase habitat for Atlantic sturgeon, an endangered species, by 13%. But an increase in water temperature of 1.8 degrees would reduce available sturgeon habitat by 65%.

Batiuk and other scientists, as well as government and nonprofit organization representatives who participated in the workshop, stressed the urgent need to save areas that can still be protected from rising temperatures while mitigating harm to places where changes are inevitable. “We’ve got to be thinking about temperatures in the same way we talk about nitrogen, phosphorus and sediment,” Batiuk said.

The failure to account for such impacts has resulted in the widespread use of nutrient control devices, such as detention ponds, which increase stream temperatures. At the same time, actions that would help reduce the threats from warming water — such as planting trees along streams and in urban areas — are far off track.

“We are behind on our goals that may most help this,” said Rebecca Hanmer, a former Bay Program director who helped organize the workshop. “To say that we have to take rising water temperatures into account is not to say that’s a new goal for the Bay Program. It’s a new reality.”

## **For aquatic life, the heat is on**

In the Chesapeake, the average summer water temperature has increased about 1.8 degrees since 1995 — driven primarily by warming air temperatures.

Across the watershed, a U.S. Geological Survey analysis found that stream temperatures increased 2.52 degrees on average from 1960 to 2020. That increase stems not only from warming air, but land use changes that warm stream temperatures.

These increases have already impacted aquatic life. Nearly a century ago, when pioneering crab biologist Reginald Truitt was working with the Bay’s blue crabs, the crustaceans spent nearly five months burrowed into mud as they hibernated during cold months.

*Photo: Warmer water temperatures have caused blue crabs in the Chesapeake Bay region to shorten their winter hibernation by about four to six weeks. (Dave Harp)*





*Shrimp have moved into the Lower Bay as the water there grows warmer. (Dave Harp)*

Typically, the crabs would begin digging in by early December and remain until late April. Today, the crabs usually don't bed down until mid to late December, and they emerge by late March or early April.

"They've probably shaved three weeks at either end," said Tom Miller, who heads the University of Maryland Center for Environmental Science's Chesapeake Biological Laboratory. "So their winter has gone from five months, down conservatively to four months, possibly to as little as three-and-a-half months."

Such changes could have implications for the winter survey of hibernating blue crabs, which assesses their population each year. It could also factor into future harvest management.

Meanwhile, eelgrass beds, one of the Bay's most important underwater habitats, have been declining for decades. Scientists fear that the heat-sensitive plant, which is the only underwater grass species in many portions of the Lower Bay, will largely disappear in coming decades, dramatically reducing important habitat for juvenile blue crabs and fish, waterfowl and other species.

In the headwaters, brook trout, which typically do not tolerate water warmer than 68 degrees, also have been declining for decades. Other coldwater-dependent species, such as the checkered sculpin, a small fish, are facing similar habitat losses. Many less-studied fish, mussels and amphibians may also be at risk.

As water warms, it holds less oxygen, creating problems for species like sturgeon, which require high oxygen concentrations. In the summer, low-oxygen levels in bottom areas of the Bay force striped bass toward warmer surface waters, which are stressful to the fish and cause increased mortality when the fish are handled.

Warmer temperatures also increase the toxicity of some heavy metals and other chemicals, promote the growth of bacteria and harmful algal blooms, and spread pathogens that can infect fish.

Scientists are also concerned that warming temperatures could disrupt predator-prey relationships that have existed for millennia. That could be especially worrisome for migratory fish, which evolved to spawn in specific habitats at certain times so their young can take advantage of abundant food. As temperatures change, food sources may no longer be available at the right place or right time.

"Those rising temperatures could affect spawning, other prey relationships, nonnative species or pathogens [and] diseases," said Stephen Faulkner of the USGS Eastern Ecological Science Center in Leestown, WV. "There's a whole suite of potential indirect effects related to rising temperature."

### Waves of heat

Creatures living in the water are not only facing warmer temperatures in general, but also aquatic heat waves that push temperatures into abnormally high territory for days on end.

Researchers at Virginia Institute of Marine Science found that from 1986 to 2010, the Chesapeake averaged four to five heat waves of at least five days' duration per year. Since then, there have typically been six to eight events per year, and their frequency and duration are expected to continue to grow.

Increasing heat waves are showing up in rivers and streams as well. "Back in 1996, the average number of heat wave days that a site would experience in a year was about 15," said Spencer Tassone, a doctorate candidate at the University of Virginia, who participated in a study of 70 stream sites nationally, though none in the Bay watershed. "In 2021, that value was 31 days."

Most of the events occur in the summer, when stream dwellers are already stressed by low water levels and are crowded into smaller spaces. Even if not directly deadly, heat waves may make fish and other stream life more vulnerable to other stresses and can reduce spawning.

While overall temperatures are edging up over time, Tassone said heat waves often determine whether creatures disappear from a stream. "It's really these heat waves that are extreme in nature, but short-lived, that have a disproportionate impact on the organisms," he said.



*Striped bass are among the many aquatic species stressed by warmer water, with more dying after handling during summertime fishing. (Dave Harp)*



*A thermometer shows water heated to approximately 95 degrees flowing into a stormwater drain in Maryland. (Dave Harp)*

### Managing for heat

Temperature is already bringing a "regime shift" to the Chesapeake, in which the mix of species is significantly altered from what persisted for decades, even centuries.

"We may be looking at a very different ecosystem and Chesapeake Bay in the future," said Julie Reicher-Nguyen of the National Oceanic and Atmospheric Administration Chesapeake Bay Office. "It may look more like estuaries in the Carolinas than what the Chesapeake Bay looks like now."

Some southern species, such as white shrimp and red drum are already moving into the Bay in increasing numbers. Shrimp are even starting to support a commercial fishery in Virginia's portion of the Bay.

There is no crystal ball that predicts how such changes will play out. Papers prepared for the workshop suggest that blue crabs and some forage species, such as bay anchovy and menhaden, may benefit as warmer temperatures increase productivity and expand their range.

For blue crabs, fewer severe winters would reduce mortality during hibernation. But other changes could counter that. Growing numbers of red drum could increase predation on blue crabs, and eelgrass losses will remove an important refuge for young blue crabs.

Likewise, oysters may benefit from longer growing seasons, but warmer temperatures may also promote diseases that have plagued their populations.

Some species, such as striped bass and flounder, may experience both positive and negative impacts from warming waters at different life stages. For instance, warmer temperatures might increase growth rates for small striped bass, but heat-sensitive adults will be more stressed by warmer summer conditions.

Bay water temperatures are driven largely by increasing air temperatures. With little ability to control that, management could focus on mitigating impacts by reducing other stresses, the workshop report said.

For instance, near-shore habitats could be improved by limiting the hardening of shorelines, promoting the use of "living shorelines" to reduce erosion, and restoring forest buffers along the water's edge.

The report suggests that large-scale restoration projects, which mix living shorelines, oyster reefs and underwater grass beds, could help mitigate conditions for a variety of species when conditions get bad. "Doing restoration on a large scale to enhance fish habitat can help create refuges to climate change," said Bruce Vogt, ecosystem science and synthesis manager with the NOAA Chesapeake Bay Office.

Meanwhile, continued efforts to reduce nutrients could improve water clarity, which helps underwater grasses,

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controls harmful algal blooms and improves oxygen conditions.

Warmer water could also require some changes to fishing — and fishing management. Adult striped bass are more likely to die when handled during warm temperatures. Educational efforts, which the Maryland Department of Natural Resources is already working on, could encourage anglers to refrain from fishing during stressful conditions.

That type of program could be refined and expanded to other areas, and possibly for other species, the report suggests.

And because heat waves in particular create high-stress, lethal situations, it calls for exploring the creation of a heat wave warning system to alert anglers when they may want to reduce or avoid handling fish.

“If we’re able to detect heat waves when they’re happening in waters beyond the optimal temperature range for certain fish, then maybe that could help adjust what people do,” Reicher-Nguyen said.

## Sizing up stream opportunities

Stream temperatures in many parts of the watershed have risen more than temperatures in the Bay, and at a faster rate than air temperatures, data show. But the workshop report notes that those increases are not necessarily baked in.

While climate drives overall temperature increases, land cover continues to have a major influence on stream temperatures. Generally, forested areas moderate the impact of rising temperatures, while developed landscapes magnify the warming.

Forests can cool local air temperature by several degrees as trees evaporate water through their leaves. Shade from trees can also moderate ground temperatures, keeping sunlight from heating water as it runs off the land. Larger forests also promote the infiltration of rain into groundwater, where it is further cooled.

That’s why coldwater streams — the habitat for brook trout and other temperature-sensitive species — tend to be heavily forested. A recent Maryland Department of Natural Resources study found that brook trout typically require at least 70% of a watershed to be forested and brown trout 52%. No trout are found when a watershed is less than 46% forested.

In many areas, conserving existing forests and planting new streamside trees can mitigate the impacts of warming air and even reduce water temperatures in smaller headwater streams.

“We’ve had a really strong negative impact on temperatures in the watershed



Steam rises from a warm street surface in Cambridge, MD, during a summer rain. (Dave Harp)

for decades,” said Matt Ehrhart, director of watershed restoration at the Stroud Water Research Center in Pennsylvania. “And we have the opportunity to really play offense, I think, for many of our smaller streams, and make improvements, not just try to defend against the impacts of greater temperature change.”

Unfortunately, those efforts are lagging throughout the Bay region. Tree cover is generally declining in the watershed, and efforts to plant streamside buffers are far below Bay Program goals — just 169 miles were planted in 2020, far less than the 900-miles-a-year goal.

As forests are lost and land developed, the hardened surfaces that replace trees warm rainfall and speed that heated water into streams. A study in the Anacostia watershed found that runoff after summer storms could increase stream temperatures 5–7 degrees.

Urban areas with large amounts of roofs, pavement and other impervious covers have little opportunity to help stormwater soak into the ground where it can be cooled. While new stormwater best management practices, or BMPs, promote infiltration, many include drains to reduce the potential for flooding. That minimizes the time the water spends in the ground.

“It’s not like the water is spending days and weeks underground before the runoff emerges,” said Tom Schueler of the non-profit Chesapeake Stormwater Network. “BMPs are not refrigerators.”

In many urban areas, he said, probably the best that can be hoped for is “to do no harm” when it comes to temperature.

That, in itself, would be an improvement because the region is rapidly installing BMPs that add to the problem. Generally, these are ponds that capture rain running off heated surfaces, allowing it to be further warmed by sunlight before being released into streams. Examples are stormwater detention ponds and lagoons at animal

feeding operations.

An analysis prepared for the temperature workshop suggested that such “heater” practices are being installed in the Bay region at three times the rate of “cooler” practices.

Planting more trees in developed landscapes can help reduce stream temperatures by cooling the air and shading pavement. But Bay Program goals to increase urban tree cover are also off track. Instead of adding 2,400 acres by 2025, the region has actually lost 12 times that amount since 2013.

Still, workshop participants said there are opportunities to improve urban waterways. For instance, restoration efforts could target streams in developed areas that have the potential to serve as refuges for fish and other species, especially during heat waves.

The report called for more work to better identify where tree planting can have the most impact in both rural and urban settings.

It also pointed to another potential source of help for agricultural areas without much tree cover. Some farm practices, such as those that promote infiltration to nurture healthy soil, might help offset warming air temperatures by diverting rainfall into cooling groundwater rather than sending it directly into streams. But that needs more research, the report said.

## Treating temperature as pollution

All of the states in the watershed have regulations aimed at protecting aquatic life from the impacts of heated water, but those mostly deal with the discharge of water from industrial or commercial use, typically power plants.

In the era of climate change, though, Maryland is using its water quality standards to protect trout streams from rising temperatures — an approach that might be adapted by other states.

Maryland’s policies already call for

preserving forest buffers along designated coldwater streams. But it is planning to apply a new regulatory tool as well.

The state has 170 miles of coldwater streams that are considered impaired because they exceed 68 degrees much of the time. So, it’s treating temperature as a pollutant and writing cleanup plans — total maximum daily loads — to help cool warming waters.

The Maryland Department of the Environment is establishing pilot TMDLs in four watersheds, located in urban, suburban and rural landscapes in Baltimore, Carroll and Frederick counties. This will trigger the development of action plans for reducing heat pollution.

Using computer models, officials say they can estimate the amount and width of forested stream buffers, forest canopy and other green infrastructure improvements that would be needed to meet stream temperature goals. Municipalities will also have to make sure that permit decisions that could influence stream temperatures are consistent with the TMDLs.

Lessons learned from those areas could be applied to other waterways, said Lee Currey, director of MDE’s Water and Science Administration.

“These are the ones that are most restorable in various settings, so we can put together a TMDL, then learn from that and take that knowledge and put it toward the other ones,” Currey said. “The idea is to cool the stream down.”

But the time frames for meeting water quality goals will be “challenging,” especially in more urbanized areas, Currey said. “You’re talking, once trees are planted, five to 10 years out before you start seeing something that will provide the shade cover.”

Managing rising water temperatures is, indeed, a long-term problem — but one the region needs to start addressing now, the report emphasizes. More water quality monitoring is needed to identify areas where the warming can be reversed, and more research is needed to understand the full impact of temperature changes on aquatic life.

Whether through regulatory efforts like those in Maryland or voluntary efforts that target tree planting and habitat restoration, the fate of many species long associated with the Bay watershed rests with decisions and actions being made now.

“Essentially, we’re asking the Bay Program to add a new lens onto how we look at just about everything — every decision we’re making out there — from runoff control practices to education and communication,” Batiuk said. “It all needs to be looked at in the context of rising temperatures.” ■



# Delmarva chicken ammonia debate remains up in the air

**Parties generally agree more information on emissions is needed**

**By Jeremy Cox**

For more than two years, scientific instruments positioned near chicken houses on Maryland's Eastern Shore did what few humans would volunteer to do: sniff the air.

Their purpose was to help clear up a debate about whether the ammonia-laced air emitted by the region's chicken farms poses health risks to nearby residents and threatens progress toward the Chesapeake Bay's restoration.

Now that the results of the assessment are in — showing modestly higher pollution levels near poultry farms — chicken industry leaders and some environmentalists have divergent interpretations of the study.

But both sides agree that much more research is needed to resolve the debate.

"The fact that we got a tenfold increase in poultry house density with an increase in ammonia speaks to poultry as a source," said Richard Snyder, a researcher with the Virginia Institute of Marine Science. He presented the findings during a Dec. 13 webinar on behalf of the Delmarva Land and Litter Collaborative, a coalition of academic, industry and environmental entities.

But he added that "we need more data, and we need more monitoring stations to determine what's going on with ammonia emissions."

Farmers raise tens of thousands of chickens inside each of the poultry houses, and there are nearly 5,000 of the enclosed buildings on the Delmarva Peninsula. The bird droppings fill the indoor air with harmful pollutants — ammonia being one of most concern — so the farms use giant fans to blow the air outside.

What happens from there? That's what the study was designed to learn, because ammonia emissions historically have been difficult to monitor.

Still, some observers criticized the design of the study from the start, questioning whether the effort would be worth the time and \$500,000 expense.

"I wouldn't call what they did a study," said Abel Russ, director of applied environmental science with the Environmental Integrity Project, a group that has long been critical of the chicken industry. "It



Top photo: Chicken houses stand along Maple Dam Road near Cambridge, MD. (Dave Harp)

Bottom photo: Exhaust fans expel air from a chicken house near Princess Anne, MD. (Dave Harp)

was a literature review, and they looked at some monitoring data. It doesn't answer the questions we have."

The monitors should have been moved much closer to the chicken houses, Russ and other critics say. "We're interested in what the most-exposed people are being exposed to," he added.

The project was designed to measure ambient air, its backers say. One of the primary financial supporters was the Delmarva Chicken Association, but the industry group said it had no input on the way the study was conducted.

The effort included four monitoring sites. One was in downtown Baltimore, for an urban air comparison. The others were on Maryland's Eastern Shore: one near Cambridge but far from any chicken houses, to assess background conditions; one in Princess Anne, where the surrounding poultry house density was measured at 0.5 houses per square mile; and one near Pocomoke City, where the density was 5.6 houses per square mile.

Between April 2020 and March 2021, according to the study, the ammonia levels were lowest outside Cambridge, averaging 2.1 parts per billion. The concentrations in Princess Anne and Baltimore were within the margin of error of one another, both hovering around 6 parts per billion. And Pocomoke recorded the highest average value, with 8.6 parts per billion.

Over shorter time scales — measured at one-hour intervals — the Pocomoke station often had the highest numbers, especially during warmer summer months when emissions are highest. The peak hourly ammonia concentration at that site hit 218.7 parts per billion in the early evening of March 9, 2021, though the data show exceedances of 100 ppb are rare. That was still below the Maryland Department of the Environment human health threshold of 350 parts per billion.

The highest ammonia reading at the Baltimore site was 27.1 parts per billion.

Ammonia is a form of nitrogen, one of the main nutrients that foul Bay water

quality. Some of the ammonia emitted by chicken farms drifts to the ground and runs off into the Bay. There, it can fuel algae blooms, which lead to oxygen-starved "dead zones."

While the study determined that there were elevated ammonia concentrations in the air near chicken farms, VIMS researcher Snyder stressed that ammonia at a given site can come from many sources because some emissions travel great distances. The levels detected by the monitors may be mixed up with urban emissions as well as other agricultural sources, such as fertilizers spread on cropland.

Snyder said that he expects to gain more insight from another air study that was recently awarded \$500,000 by the U.S. Environmental Protection Agency. The organization behind it is the Socially Responsible Agriculture Project, one of the chicken industry's biggest critics.

That three-year study will focus on three Delmarva communities: Somerset County in Maryland and Seaford and Millsboro in southern Delaware. Community participation will be at the core of the effort, said Maria Payan, a senior regional representative with the group.

"We're very grateful for this opportunity and excited that the Biden administration is valuing community-based science in frontline and fence-line communities," she said. "It's so important the communities have a seat at the table, and finally they're getting the opportunity to do that."

Meanwhile, Maryland's top judges could make a decision soon that upends how the state regulates emissions from concentrated animal feeding operations like Delmarva's chicken farms to protect water quality. Currently, it doesn't. But in 2021, a Montgomery County Circuit Court judge ruled that the state should, under the federal Clean Water Act.

"Ammonia deposition, we know, is [affecting] the health of not only the Chesapeake Bay but also the [Atlantic] coastal bays," said Gabby Ross, the co-keeper for the Assateague Coastal Trust, the group challenging the state.

MDE officials argue that confusion and regulatory chaos would ensue if the state were required to limit ammonia emissions from poultry operations to improve water quality. The agency appealed the lower court decision. The state Supreme Court heard oral arguments in the case in November and is expected to issue its final ruling in the coming months. ■



# Options for 'green' burials grow in Chesapeake region

## More people seeking to depart the world with a lighter footprint

By Whitney Pipkin

As a recently retired surgeon, Howard Berg has always had an uneasy relationship with death. But the four-year process of opening a cemetery at the end of 2022 — Maryland's first certified natural cemetery — on land that's been in his family for decades has made him far more comfortable with the subject.

"Your last act on Earth is to go back to the earth — dust to dust," Berg said. "To me, rather than impact the environment, why not improve the environment?"

Berg didn't initially decide to open Serenity Ridge Natural Burial Cemetery and Arboretum, located in Baltimore County, MD, for such lofty reasons. He and his two brothers were looking for the best use of former farmland with forested edges that they had inherited in an area with options limited by zoning. After visiting a natural cemetery in New Jersey, Berg came to see the approach as a way to generate revenue from the land while maintaining its natural beauty.

He didn't conceive at the time that there would be such a pent-up demand in the state — and growing interest nationally — in the type of natural or "green" burials the site offers. The Chesapeake Bay portion of Virginia has two cemeteries offering natural burials, one of them certified, like Serenity Ridge, by the national Green Burial Council. Pennsylvania, Maryland and the District of Columbia also have "hybrid" cemeteries that offer green burials on a portion of their land, and the options are expanding.

The Green Burial Council defines the term as burying "without impediment" to natural decomposition — no embalming, plastic liners, concrete vaults, metal handles or exotic wood caskets. Green burials aim to reduce the environmental impact associated with modern methods by allowing the body to naturally decompose, often in the top few feet of soil, in biodegradable containers or fabric shrouds without embalming chemicals that can leach out over time.

Most green burial facilities allow cremated remains to also be buried onsite, in biodegradable containers, as a way of giving families a place to visit. But, for many people,



Howard Berg (left), founder and owner of the Serenity Ridge Natural Burial Cemetery and Arboretum in Maryland, stands with general manager Kelly Joseph (center) and community outreach liaison Chelsea Berg in a burial area called Inspiration Point. (Dave Harp)

green burials are a conscious alternative to the growing practice of cremation, which the Green Burial Council says is "erroneously thought by many to be greener."

Cremation, the council says, uses fossil fuels to reach and maintain 1900 degrees for about two hours per body, releasing mercury and other pollutants into the air in the process. During a peak in pandemic deaths in 2021, residents of Arizona, where cremation rates are high, complained of foul smells and polluted air wafting from overbooked crematoriums. In 2021, nearly 58% of bodies in the United States were cremated, a number projected to reach 64% by 2025, according to the Cremation Association of North America.

Increasingly, facilities offering alternatives to cremation and traditional burials are focused not simply on reducing impacts; they want to transform burials into a benefit for their surroundings. They see caring for the dead in congruence, not in conflict, with conservation.

And it's not just on the fringe. The Nature Conservancy was recently involved in creating Tennessee's first "nature preserve for natural burial," offering burials on conserved land next to a state natural area.



Wooden stakes mark purchased plots at Serenity Ridge, the first entirely "green" burial cemetery in the state to be certified by the national Green Burial Council. (Dave Harp)

As of March of 2022, there were 350 green burial cemeteries in the U.S. and Canada, according to the Green Burial Council, and more have been added in the Chesapeake Bay area since then.

In the National Funeral Director's Association's 2022 consumer report, more than 60% of survey respondents said they would be interested in investigating green funeral options, up from nearly 57% in 2021. While only about 5% of today's burials are green, the association considers them a fast-growing segment of the funeral business.

The top reasons survey participants said they would consider a green burial are its lower cost and potential environmental advantages. But there are a host of others.

Jewish, Muslim and Orthodox Christian traditions have practiced forms of green burial for generations, eschewing cremation and embalming to promote natural decomposition. Facilities opening now say they are getting inquiries not just from those who would normally be considering end-of-life decisions, but also from younger people interested in doing things differently.

Jennifer Downs, a founding board member of the Green Burial Association of Maryland, a nonprofit focused on educating the public on green burial, sees her generation fueling much of the natural burial interest.

"There are a lot of us Baby Boomers out here," said Downs, who helped start the group in 2015. "We were around for natural food, natural birth ... and now we're getting to the end of our lives and saying, 'What do we do with our bodies when we die?'"

Chris Palmer, who recently became president of the Maryland association, agrees.

"I've spent almost all my life working with environmental organizations," he said, making it unpalatable "for me, when I die, to dispose of my body in a way that creates pollution and energy consumption."

### Different approaches

Glenn Jennelle had been in the funeral and cemetery business for years when, about a decade ago, customers started asking new questions. Why do we need to have embalming? Why a casket or vault?

At the time, Jennelle helped run Kyger Funeral Homes & Crematory, which opened in Harrisonburg, VA, in 1975 and started the first crematory in the Shenandoah Valley in 1979. The business has seen cremation rates in Virginia soar from 1% when it opened to more than 50% today.

Now, the business is banking on a different future for burials. In 2012, the Kyger family purchased 113 acres of former dairy farmland near Penn Laird, VA. After a couple of years of research, Duck Run Natural Cemetery opened as the state's first location devoted to green burials and certified by the Green Burial Council.

"We think of it as a 150-year project," said Jennelle, Duck Run's general manager. "We're doing a total land restoration. A lot of people start at the beginning, but we jumped to the end and said, 'What do we want it to look like then?'"

To that end, the cemetery works with horticulturalists to replace nonnative trees and flowers with native species. A covered





*"Your last act on Earth," said Serenity Ridge owner Howard Berg, "is to go back to the earth, dust to dust. (Dave Harp)*

shelter for ceremonies overlooks a duck pond, meadows and mown areas with burial plots scattered along the paths. An 8-acre field is set aside for monarch butterfly habitat. All of the landscape planning is done in conjunction with burials.

Serenity Ridge in Maryland is in the early stages of a similar approach. At both places, families can plant trees near graves only after the burial plots of that section have been filled. This prevents tree roots from being cut by future burials. Some areas of both sites are maintained as open meadows while others are forested. Customers have options to bury loved ones in a variety of settings.

At Cool Spring Natural Cemetery, a green burial ground on 1,200 acres maintained by monks at Holy Cross Abbey in Berryville, VA, plots vary in price based on their proximity to beautiful views or drivable walkways. Burials near the outdoor chapel, which can be easily reached by car, are higher priced than those a good walk away in the woodlands, where there is more space available. But, with costs between \$2,000 and \$4,000, green burials still tend to fall below conventional options.

"Some people are willing to pay extra, because they know they can pull up and visit the gravesite often," said Vern Conaway, the cemetery manager. "We get people of all faiths and no faith. At our place, they just fall in love with the beauty of it."

The monastery added the cemetery business in 2012 "because other monasteries in their order in Georgia were doing it, and they found it was filling a need," Conaway said. "People were interested in being buried on sacred ground."

Cool Spring uses green burial practices but has not sought any certifications.

All three of these green burial sites mark graves with natural stones that lay flat on the ground instead of upright headstones to maintain a natural landscape. The stones can be engraved with names and dates. Burial locations are tracked with GPS coordinates should the stones fade in the future.

"The stones lay flat on the ground, so you don't look out at the fields and see them," Jennelle said of Duck Run, describing the unobstructed view that is similar at the other two locations. "Our hope is to have it look like an arboretum."

Thin wooden stakes at each site mark plots that have been purchased but not yet used. One section of the cemetery at Duck Run offers something few other locations in the country do so far: reusable plots. Jennelle said green cemeteries in Europe reuse the plots every 50 years, but these will go for 75.

"After 75 years, we'll take the headstone up and place it in the grass walkway, like a cobblestone," he said. "My thinking is maybe a grandchild would want to take that space and it could be a family plot for generations."

### In the weeds

Not all of the cemeteries' acres are open for burial at once. Opening sections one at a time allows the cemeteries to cut costs, since states require significant "perpetual



*Duck Run Natural Cemetery in Penn Laird, VA, is the only natural burial cemetery in the state certified by the national Green Burial Council. The landscape features flat stones instead of upright gravestones to preserve the views. (Glenn Jennelle/Duck Run)*

care" trust fund deposits based on the number of acres receiving burials. Operators emphasized that, despite ongoing interest, opening a green burial cemetery isn't as easy as it sounds.

One family tried to open a "conservation burial ground" in Baltimore County, MD, in 2015 but could not get zoning changes approved. At the time, the community was

concerned about water quality.

The Green Burial Council has research on its website about soil and water quality concerns related to green burials. In its certification process, the council stresses choosing sites with appropriate soil types and monitoring the way water flows across a property.

Other green burial advocates emphasize that the absence of embalming fluids and other products that leach chemicals into the groundwater makes a green burial an inherently safer option for the environment. (State laws do not require caskets or embalming, according to The Pew Charitable Trusts. But many funeral homes recommend these practices, giving consumers a sense that they are required.)

At Serenity Ridge, for example, bodies will be buried in the top 3 feet of the soil, where the microorganisms that aid in decomposition are most active. Sticks and stones will be added to the soil to provide pockets for oxygen, which helps fuel the process.

"When you're completely decomposed in natural burial, you actually are, as they say, feeding the tree," Berg said.

At some of these sites, the burials are also helping to fund the landscapes' protection and improvement, making a loved one's final resting place a more beautiful place to visit over time.

"Death is never an easy thing to deal with," said Chelsea Berg, community outreach liaison for Serenity Ridge. "But I think having a place like this can ease it a little bit." ■



*Members of the Green Burial Council of Maryland hear remarks by Serenity Ridge owner Howard Berg during a gathering at the site in October 2022, shortly before the cemetery opened. (Green Burial Council of Maryland)*



# Community wins round in fight to curb industrial activity

## County officer orders shutdown of former mining site in rural MD, but company to appeal

By Timothy B. Wheeler

Some rural Maryland residents complaining of being overburdened with polluting industrial activity in their midst recently won a skirmish in their fight for relief. But their struggle is far from over.

On Dec. 6, an Anne Arundel County hearing officer rescinded a special zoning exception granted 55 years ago for Westport Reclamation to mine sand and gravel and produce concrete in the Lothian area of the county.

Westport Reclamation is one of several industrial-scale operations along a short stretch of Sands Road paralleling the Patuxent River. Among the other operations are a large sand and gravel mine, two former quarries undergoing reclamation and two rubble landfills, now closed.

Although the area is zoned for rural agricultural land use, sand and gravel mining is allowed with a “special exception” to the zoning code. Residents have complained for years, though, about the concentration of mining and waste disposal activities in their neighborhood. They contend that 75–100 heavy trucks use their narrow, two-lane road daily, filling the air with diesel fumes and threatening the safety of children at play and other drivers.

The complaining residents say theirs is a fight for environmental justice. The percentage of African Americans living near the facilities is greater than it is countywide, according to U.S. Environmental Protection Agency data.

Tracy Garrett, a longtime resident who lives near Westport Reclamation, and Patuxent Riverkeeper Fred Tutman filed a petition in July asking the county to revoke or modify Westport Reclamation’s special exception, arguing that the mining is no longer taking place.

Although the old quarry is undergoing reclamation now, the property is also used for unpermitted activities, they say, including the acceptance of construction debris and resale of soil for use in composting. They contend that at a minimum, the company should have to reapply for permission to continue the reclamation and any other activities not specifically authorized 55 years ago.

After hearing from both sides in October, administrative hearing officer Douglas Clark Hollman found that little if any



*Celestine Brown, left, and Tracy Garrett are among those challenging the concentration of mining and waste disposal activities along Sands Road in the Lothian area of Anne Arundel County, MD. (Dave Harp)*

mining is occurring at the site, which has since become a base for what he called “commercial purposes.” He cited evidence that the property was being used as a contractor’s yard and for storing unregistered vehicles and dumping debris.

Belle Grove Corp., the owner of Westport Reclamation, has insisted that its operation there complies with all relevant local and state requirements. But Hollman noted that the county adopted new rules for commercial operations in rural areas after the company was awarded its special exception. He likened the company’s position to that of an “automobile owner saying they are not subject to the emissions laws because they got the plates for their car in 1967.”

Celestine Brown, another area resident, called the ruling long overdue.

“It is unimaginable this organization has been allowed to operate under a ruling 50 years ago while changing the methods of operation without new approvals,” she said. “Finally, the citizens of Lothian [and] Harwood are being heard.”

The hearing officer’s ruling comes after the company settled a lawsuit the county had

filed against it earlier this year alleging that it was conducting business at the site that was not permitted under its special exception. The company agreed to pay a \$3,000 penalty, remove any unregistered vehicles and cease using the site as a contractor’s yard. But the District Court also declared that soil composting and concrete recycling are allowed under the special exception.

The residents, who had pressed the county to act, want more: an end to the decades-long parade of trucks.

Tutman said that even with the hearing officer’s decision to revoke the special exception, he expects the county would grant the company a new one to continue reclamation of the old quarry. But he noted that it would then have to comply with current standards for controlling storm-water runoff, among other things.

The process of considering a new special exception also could give residents a voice, Tutman noted, in setting the conditions under which the county would allow work there to proceed.

But Anthony Gorski, Belle Grove’s lawyer, said the company plans to appeal

the hearing officer’s decision to the county’s Board of Appeals.

Getting the county to award a new special exception is a lengthy process, he said, and if the ruling stands, Westport would have to shut down in the interim. Gorski contends that Hollman erred and that the company is not legally required to seek new permission to continue operations.

Meanwhile, trucks continue to roll in and out of Westport Reclamation. Lori Rhodes, deputy Anne Arundel County administrator for land use, said the county is not obligated to carry out the hearing officer’s ruling “until the property owner has exhausted all administrative remedies,” including going to court if the Board of Appeals does not reverse it.

Tracy Garrett, one of the two petitioners, expressed dismay at the county’s decision not to act promptly on the hearing officer’s shutdown order, even though an appeal has yet to be filed.

“That is a slap in the face and punch in the gut,” she said in an email, adding that it “feels like once again Westport has more rights than the residents of Sands Road.” ■



# CHESAPEAKE CHALLENGE

— Kathleen A. Gaskell



## Seeing green in winter's scenery

Evergreens aren't necessarily trees. Look for these leafy plants the next time you are outside in winter. For now, and match them with their description. Answers are on page 40.

**American alumroot** (*Heuchera americana*)  
**Christmas fern** (*Polystichum acrostichoides*)  
**Common clubmoss** (*Lycopodium clavatum*)  
**Kinnikinnick** (*Arctostaphylos uva-ursi*)  
**Mountain laurel** (*Kalmia latifolia*)

**Title image:** Mountain laurel (Michele A. Danoff)

**A** Christmas fern (Wasp32/CC BY 4.0)

**B** American alumroot (Salvor/Public Domain Wikimedia)

**C** Kinnikinnick (Walter Siegmund/CC BY 2.5)

**D** Mountain laurel (Michele A. Danoff)

**E** Common clubmoss (Bernd Haynold/CC BY-SA 3.0)

1. Look for this 6- to 15-foot-tall shrub on rocky slopes and mountainous forests, sometimes in closely packed thickets that make areas of the forest floor almost impassable. It is tallest in lower Appalachia, turning shrubbier as it grows farther north. Its glossy leaves can be nearly 5 inches long and 1.5 inches wide but are often considerably smaller.
2. Look for this 1- to 3-foot-tall plant along riverbanks and in ravines, woodlands and hillsides. It grows in circular clumps of two to three individual plants that are part of a larger colony. Each dark green, leathery, pinnate leaf consists of 20-35 pairs of stocking-shaped leaflets. Deer leave this plant alone.
3. Look for this plant in woods containing chalk or limestone outcrops, or amid crevices and ledges in cliffs. Its stem is underground and its fuzzy, multi-lobed leaves grow in clumps out of the soil. Don't just look for green; this plant's marbled or veined leaves can also be purple or brown.
4. Look for this plant in bogs, forest edges and meadows. It resembles a miniature conifer seedling. Some stems have fanlike branches; others are branchless and spiky. Small, dense, spirally arranged microphylls (tiny leaves with one vein) cover the stems like the bristles of a bottle brush. The leaves (less than 0.2 inch long and 0.04 inch wide) taper to a hairlike white point. On the erect branches, sporophylls (spore-producing leaves) enclose the spore capsules at the stem's tip.
5. Look for this dense, mat-forming shrub in coniferous forests, sandy or rocky slopes, and dry mountain meadows. Its shiny, paddle-shaped leaves are darker green on top and stay on the plant for three years before turning reddish-green or purple in autumn, when they finally drop.

### Evergreen facts to spruce up the whitest wintery days

**They're everywhere, almost:** Evergreen plants can be found on every continent except Antarctica, covering nearly one-sixth of the world's land.

**Stop pining:** If the word "evergreen" conjures up conifers in cold climates, you need to expand your horizons. Cacti and coconut trees are also evergreens. Also, the definition of evergreen is a plant that retains its leaves through the year as well as the next growing season. The leaves of some evergreens are not always green.

**Time to leave:** The leaves or needles of evergreens do fall off, just not all at the same time. Depending on the species, a leaf will stay on its plant from one to six years. New foliage is produced each year to replace older foliage, which usually turns yellow or brown before dropping.

**Tea-rrific!** The tea in your cupboard, whether black, green, white or oolong, comes from the leaves of an evergreen plant (*Camellia sinensis*).

**Critter comforts:** Gray squirrels, chipmunks, woodpeckers, bald eagles, owls and chickadees nest and/or take shelter in evergreen trees. When woodpeckers move out of their holes, other animals move in.

**Saving the green:** In winter, evergreens cut heating costs by buffering homes from strong winds. Their shade reduces cooling costs in summer. They also block and/or absorb traffic noise year-round.





## Warm, cozy stays await state park visitors in the Bay region

By Ad Crable

The snow shovel propped outside the entrance to the stout stone and log cabin — erected by the Civilian Conservation Corps in the 1930s — told me I had come to the right place at the right time.

Gone were the swarming summer fans of Black Moshannon State Park on northcentral Pennsylvania's Allegheny Plateau. Gone were the pursuits of paddling, swimming and hiking in shorts. Moving in were we imbibers of winter and its simple pleasures of bare trees, snowy trails, star-pricked skies and the sensory thrill of sidling up to a log fire on a chilly night.

Black Moshannon is one of 36 state parks in Pennsylvania that offer lodging for those who don't shy away from a winter experience. The Pennsylvania Bureau of State Parks has been increasing access to its state parks during cold months and offers 378 modern or rustic cabins, lodges, camping cottages (think wooden tents with electricity), unique houses and campsites.

Once mainly the province of warm-weather recreation, state parks in Pennsylvania have met the increasing demand of those looking to get outdoors in cold weather. Last winter, Black Moshannon recorded almost 59,000 visitors.

In addition to my rustic cabin (recently updated with electric heat), there are six modern cabins — occupied mostly by deer hunters during my midweek stay in early December.

Over the coming months, others will fill with people interested in ice fishing, sledding, ice boating, cross-country skiing, snowshoeing, snowmobiling, star gazing, elk spotting, elk antler hunting, trout fishing and, most recently, riding fat-tire bicycles on frozen Black Moshannon Lake. The park also keeps an area of the lake cleared of snow for ice skating.

Not everyone will be eager to get outside. The guest journal in my rustic Cabin 14 included an entry from a couple last winter who wanted to ring in the New Year off the grid, and another from a family who spent most of their stay piecing together puzzles, watching crackling fires and napping.



"Some of our folks stay at the cabins and that's all they want to do. Or they go to the warming hut, start a fire and eat dinner with family," said Rachel Eckman, park superintendent.

But a winter zealot like me couldn't resist the outdoors offerings in the 3,394-acre, high-altitude park and the surrounding southern unit of Moshannon State Forest, not far from State College in Centre County.

To sample the different environs crossed by its 20 miles of trails, I first took the Star Mill Trail that follows the lake to the site where an 1879 sawmill once helped turn the towering pines and hemlocks clearcut from surrounding mountains into lumber and shingles that were floated down the Susquehanna River.

I was mesmerized by the beauty on my initial venture and nearly lingered too long. A barred owl was just beginning its night shift when I reached my car at dusk.

Black Moshannon Lake, like its feeder stream, is dark — nearly black, actually, as its name suggests. The color comes from water being steeped

Top photo: A visitor at Black Moshannon State Park in Pennsylvania surveys the frozen lake. (Courtesy of PABucketlist.com)

Inset photo: In addition to six more modern cabins, this 1930s stone and log cabin, built by the New Deal era Civilian Conservation Corps, is available for overnight stays at the park. (Ad Crable)





*A boardwalk provides a route for exploring the quiet beauty of winter wetlands in Pennsylvania's Black Moshannon State Park. (Ad Crable)*

in sphagnum moss and other wetland plants. A necklace of beaver ponds and peat bogs once used by Seneca Indians was smothered when the creek was dammed during the Great Depression to create the recreational lake.

Thankfully, plenty of those boggy backwaters remain. In 1994, the state Department of Conservation and Natural Resources recognized these important habitats and created the 1,592-acre Black Moshannon Bog Natural Area.

For a sampling, take the 0.3-mile Bog Trail, a handicap-accessible serpentine boardwalk through wetlands bordering the lake. Along the way you might see carnivorous pitcher plants, which use nectar to lure unsuspecting insects into the plant, then drown them in rainwater and digestive juices.

In many areas, the edges of the lake are blanketed by a watery cushion of sphagnum moss. When underfoot, it gives you the sensation of walking across a giant wet sponge.

The surroundings are far from dreary, even in winter. Blueberry plants tinge the wetlands in a dark russet cloak, with splashes of evergreen from hemlock trees and rhododendron shrubs.

Continue past the boardwalk onto the nearly 8-mile Moss-Hanne Trail to see remote beaver ponds, pine plantations and hemlock bottomlands through the heart of the bog natural area. I saw no other soul on the trail; my only company was a wind that whispered in the pine boughs above me and rattled the withered oak and beech leaves still clinging to branches.

A communal celebration of winter outdoors is marked by the annual Fun in the Snow at Black Mo festival, which takes place Jan. 28. You can try your hand at ice mini golf or ice



*Elk graze on a December day near the West Branch of the Susquehanna River north of the park. (Ad Crable)*

bowling, or just hike into the woods in search of winter wildlife.

One morning, I rose before sunrise and made the 40-minute drive north to an old strip mine just outside the borough of Karthaus. It was a dream come true as I wound my way above mist hanging over the Susquehanna River and into a herd of about 40 elk bulls, cows and calves contentedly munching on grasses and tree buds. Elk bulls don't drop their heavy antlers until early spring, so you can see them in their full antlered glory throughout the winter.

After a bracing day in the cold, there was no more deserved and satisfying pleasure than being warmed by a fire in my cabin — a shelter built of stones and wood planks to endure the ages.

As the Kodiak wood stove creaked from the intensifying log fire in its womb, I made a hot cup of soup and pulled up a chair with no agenda other than being warmed to the core.

I put my slippers on, stretched my legs as close to the fire as I could without being roasted, and fell in love with a book. ■

## BLACK MOSHANNON & OTHER PENNSYLVANIA PARKS

Black Moshannon State Park is about 8 miles east of Philipsburg, PA, in Centre County. It has six modern cabins for winter accommodations as well as one rustic cabin with heat, electricity and a separate bathhouse. There also is an old ski lodge at 4216 Beaver Road that has recently been remodeled and opened for year-round use. For information, call 814-342-5960.

To make reservations for lodging at Black Moshannon or the other 35 state parks in Pennsylvania that offer winter stays, visit [dcnr.pa.gov/stateparks](http://dcnr.pa.gov/stateparks) and click on "online reservations."

## AROUND THE WATERSHED

### VIRGINIA

Virginia has 51 cabins, five lodges, one house and 10 camping sites across five state parks. For a list of winter lodging and campsites, visit [dcr.virginia.gov/state-parks/cabin-rentals](http://dcr.virginia.gov/state-parks/cabin-rentals) or call 800-933-7525.

**Tip 1:** At Belle Isle State Park in Lancaster County you can rent Bel Air House, a 1942 mansion that sleeps six, plus a guest house that sleeps eight, on a 33-acre peninsula at the mouth of Deep Creek just off the Rappahannock River. Call 804-462-5030.

**Tip 2:** If you want to want to camp out in the elements, Caledon State Park on the Potomac River in King George County has six primitive campsites. The park is a national natural landmark known for its high concentration of bald eagles. You'll have to paddle to the camping area or hike or bike 3 miles to reach it. Call 540-663-3861.

### MARYLAND

Maryland rents cabins, camping sites and two houses across 12 state parks. For reservations, visit [dnr.maryland.gov/publiclands/Pages/campinginfo.aspx](http://dnr.maryland.gov/publiclands/Pages/campinginfo.aspx).

**Tip 1:** Janes Island State Park near Crisfield, on Maryland's Eastern Shore, offers four rustic but full-service waterfront cabins as well as backcountry campsites. Call 410-968-1565.

**Tip 2:** Easter Hill Chalet is nestled in the rugged mountains of Western Maryland's Rocky Gap State Park in Flintstone. It sleeps up to eight people, and its deck overlooks Lake Habeeb, which is said to have the bluest water in the state. Call 301-722-1480.

### WEST VIRGINIA

West Virginia has 197 cabins across 14 state parks, 846 rooms in lodges across 10 state parks, and camping sites across six state parks. For a list (including 24 former company houses in the Cass Scenic Railroad State Park), visit [wvstateparks.com/places-to-stay/cabins](http://wvstateparks.com/places-to-stay/cabins).

**Tip 1:** Blackwater Falls State Park near Davis has 39 cabins and a 54-room main lodge. In addition to the park's eponymous waterfall, it has one of the longest tube-sledding runs in the East. Call 304-259-5216.

**Tip 2:** Enjoy the rustic charm of The Old Inn at Cacapon Resort State Park, about 9 miles south of Berkeley Springs. The lodge with hand-hewn log beams was built by the Civilian Conservation Corps and was the first to be built in the state park system. It has 12 bedrooms. Call 304-258-1022.





## Savor the history, grounds of VA's Windsor Castle Park

By Jeremy Cox

**B**ut for the insistence of my GPS app, I would have missed the entrance. The little arrow on my phone pointed left, but all I could see was a brick driveway. For all I knew, the road, which was only wide enough to carry a single vehicle at a time, belonged to one of the homes on either side of it.

With a healthy degree of trepidation, I plunged down the narrow lane. The ribbon of brick sank below the horizon a little beyond the houses. Where it led from there was anyone's guess.

To my surprise, it just kept going. Where the road dipped and transformed into asphalt, I entered a different world. The colonial town of Smithfield, VA, which stands on higher ground, gives way to a saltmarsh and a glasslike creek.

I learned later that, contrary to what your GPS might tell you, this northern access point is not the main entrance to Windsor Castle Park. But I'm glad I went the "wrong" way because it immediately immersed me in the history-meets-nature vibe of the park experience.

The 208-acre park rests on the site of a former plantation. Several historic structures remain, including the fully restored, two-story manor house that has stood on the property since at least the 1750s. While much of the land was farmed and remains open space, nature lovers will enjoy the scenes that await them along the margins.

Smithfield is about a 40-minute drive west of downtown Norfolk. The community of about 8,700 residents lies along a dramatic bend in the Pagan River, a tributary on the south side of the James River. Windsor Castle acreage is tucked into the upper slice of the Y-shaped confluence of the Pagan River and a curvy feeder waterway known as Cypress Creek.

The town seems to hug the park from all directions. I was struck that so much land close to a fairly urban corridor has evaded development. The little creek that I crossed on my way in — named Little Creek, by the way — is the only natural barrier between the park and the shop-lined downtown.

English settlers moved into what is now Smithfield by 1634, less than 30 years after Jamestown was established a short distance upstream on the opposite side of the James. According to town history, the community was formally founded in 1752 by Arthur Smith IV, the great-grandson of the recipient of the original land patent for the region.

A historical assessment conducted in 2000 suggested that Smith's home was very likely the same house that currently graces the property — with additions and alterations.

"Property records in Isle of Wight County are problematic," the historian wrote. "However, it is known that a colonial dwelling was on the site by 1750 when Arthur Smith IV established the neighboring town of Smithfield. There is considerable architectural evidence that the current Windsor Castle has colonial origins and could be reasonably assumed to be the house, thus giving it a conservative [circa] 1750 construction date."

From the 1600s to the early 2000s, the property passed through the hands of only three families. The last owner died in 2001, leaving it vacant. A few years later, a developer purchased the land and proposed constructing 445 homes around the manor house. That triggered a public-private effort to protect the acreage as a public asset.

The name of this small burg in southeastern Virginia might sound familiar. Yes, this is *that* Smithfield — as in Smithfield hams. Smithfield Foods, the meat industry giant, is based here.

Just about every recent civic improvement around town can be traced back to the company and, in particular, to one man: former CEO

*Photo: This view from a historic home in Windsor Castle Park near downtown Smithfield, VA, overlooks Cypress Creek. (Jeremy Cox)*





*Windsor Castle, the house from which the park in Smithfield, VA, draws its name, was originally built some time before 1750 and underwent extensive remodeling in the mid-1800s. (Jeremy Cox)*

Joseph W. Luter III. His charitable investments over the years have buoyed the civic center, YMCA, local theater, sports complex and more.

In 2007, he donated \$5 million toward the park's purchase. Then, Luter gave another \$2.2 million to kickstart its development. In May 2010, the park officially opened.

I was greeted at the manor house by Amy Novak, director of Smithfield's parks department. Our first stop was the basement, where the oldest existing parts of the structure are found. During a more than \$3 million restoration, completed in 2019, workers took care to preserve the exposed-brick walls on this lowest level, she noted.

The original pine floors on the upper two floors were brought back to life and filled with period furniture.

The Isle of Wight County Museum conducts public tours of the house and outbuildings the first Sunday of each month. Otherwise, the house is open by reservation only. It has also become a popular wedding destination.

An 1840 remodeling is largely responsible for the house's current bearing. Heavily influenced by the Greek Revival style that was popular at the time, the new touches included two stately porches, Tuscan columns and handsome interior stairs.

But do these accoutrements add up to a castle? I don't think so. Architecturally speaking, this Windsor Castle is an "excellent example of a colonial tidewater Virginia farm," as it was described in the 2000 historical assessment. But it can't hold a candle to its namesake in England.

So why call it a castle? No one knows. The first mention of Windsor Castle appears on a deed of transfer in 1884. It offers no explanation.

"That's just what people have always called it," Novak said.

The outbuildings offer insights into rural life in the 1700s and 1800s. If you're a carnivore, I would direct you to the 1800s era smokehouse. Open the doors and let the smell of decades of Southern barbecue envelop you. (My nose equated it with smoky bacon.) Try to maintain your appetite as you gaze upon the congealed fat hanging like icicles from the rafters.

Inside certain rooms in the main house and in front of various outbuildings, placards guide visitors through the park's many layers of history. For much of the property's past, the wealth of the owners was built on forced labor. The interpretive materials acknowledge the existence of enslaved people, but mentions are fleeting and barely speak to their contributions or experiences.

That presents an opportunity for improvement: Additional interpretation through a Black lens would do much good for all visitors.

The town has already made some strides to connect the site's history to the modern world. For example, it has turned over a plot of space where the local chapter of the NAACP operates a community garden. The organization calls it a Prolific Space, which it defines as a place where "creativity, love and peace will unite community members through gardening."

There's a second entrance on the south side of the park, which serves as the main gateway. You'll encounter welcome signs and even room for two cars to pass one another.

But I'm glad this wasn't my first impression of the park. This entrance skirts a modern subdivision for much of its length. And once inside the park, the route overlooks the property's least-attractive feature: a vast field of closely cropped grass that doubles as festival grounds.

Beyond the reach of mowers, the landscape is



*Joyce and Jim Maw walk their King Charles spaniel, Watson, in Windsor Castle Park as they scout for birds along a wooded trail. (Jeremy Cox)*



*Left photo: There are nearly 4 miles of walking trails at Windsor Castle Park, including a scenic overlook of Cypress Creek, a tributary of the Pagan River. (Jeremy Cox)*

diverse and lovely. The path that flanks Cypress Creek is a must-visit. Here, plants and trees grow toward the sun with little human intervention. Several ancient-looking oaks, pines and cedars give new meaning to the term "old growth."

Two wooden fishing piers grant access to yet another realm. Wading birds and marsh grasses inhabit this threshold between water and land.

On the opposite side of the park, a larger forest beckons with earthy, organic smells and the clatter of red-bellied woodpeckers. This is a community park, after all, so you'll also find two fenced-in dog parks, a mountain biking trail and a playground.

To the town's credit, the play area has been designed to blend in with the surrounding natural features. This includes the 30-foot metal slide that follows the slope of a ravine at ground level.

Novak said that she often meets people who have traveled from Virginia Beach or other surprisingly far-flung locales to reach her park.

"I still love to hear that," she said. And it inevitably leads her to respond: "Wow, you passed seven parks to get to mine." ■

## If You Go

Windsor Castle Park is located near downtown Smithfield, VA, at 705 Cedar St.

The manor house and outbuildings are open for tours the first Sunday of the month.

A canoe/kayak launch is available dawn to dusk 365 days a year. Kayaks and paddleboards are available for rent on Saturdays and Sundays from Memorial Day weekend to Labor Day weekend.

For information, visit [windsorcastlepark.org](http://windsorcastlepark.org) or call 757-542-3109.





Snow geese take flight from a field on Maryland's Eastern Shore. (Michele A. Danoff)

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A beaver lodge is ready for winter in Elk Neck State Park. (Michele A. Danoff)

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A snowy day on the Tubman Trail at Blackwater National Wildlife Refuge. (Dave Harp)

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## The importance of being earnest, scientifically speaking



### CHESAPEAKE BORN

By Tom Horton

*Men and women of science ... making sense of a mysterious world, an age-old quest that stretches from magic and shamans to modern laboratories.*

— from *Beautiful Swimmers Revisited*, a Bay Journal film

As I verge on 15 years of teaching about the Chesapeake Bay at Salisbury University, where my grandad was a founding faculty member almost a century ago, one theme that has run throughout is this: Where we have done the science, we've made progress on the Bay's health. Where we haven't, we haven't.

I don't mean just "eureka" breakthroughs but also the routine data gathering that, if pursued long-term, is crucial to comprehending what's going on in hyperdynamic ecosystems like our estuary, where natural variability can render short-term measurements useless.

Doing the science with blue crabs and striped bass has paid off with at least a solid framework for sustainability. With shad and oysters, it was too little or too late, and we're playing catchup.

The science that identified nitrogen from sewage and farms as a key Bay pollutant transformed restoration efforts. Ignoring science that showed dirty air was also a major nitrogen source set us back years.

For a scientist, doing the science is often all they need to do, but sometimes public advocacy is appropriate. And it can be perilous: High state officials tried to fire the late Dr. Donald Heinle, a University of Maryland scientist who had lent critical support to a lawsuit that overturned Maryland's faulty pollution control strategy.

Which brings me to a shoutout to Dr. David Secor, a fisheries ecologist at Maryland's Chesapeake Biological Laboratory.

Secor has done fascinating work using the otoliths, or ear bones, of Bay fish. He can age them by counting annual growth rings, as you would with a tree. The bones can also reveal how many times a fish has returned from the ocean to the Bay to spawn, as well as its daily growth rate after being spawned — relating survival in this vulnerable stage to environmental conditions.

He got one venerable striped bass that was 33 years old, older than Secor was at the time. It remains the oldest documented rockfish — though not the largest, because it was a male, the smaller of the sexes.

Secor's otolith work with trophy rockfish caught in the 1990s was elegant confirmation of earlier science that had led to a Chesapeake moratorium on catching them from 1987 to 1992.

That moratorium came in the nick of time. Counting growth rings showed overfishing had been so severe that there was a decade-long gap where virtually no females reached spawning age.

A spectrum of spawning ages lends resilience to the striper's perpetuation, Secor says. Some years, the majority of spawners simply "guess wrong," releasing eggs and sperm as the Bay warms, to be devastated by an untimely cold front. But different age fish spawn across a range of times, insuring against a wholesale wipeout.

Which brings me to Atlantic sturgeon, far more endangered than rockfish ever were, extinct from most of the Bay's rivers, federally endangered in the rest.

The Bay's environmental community came together wonderfully and successfully a few months ago to oppose a shameful decision by Maryland's Department of the Environment to allow a giant salmon aquaculture facility to discharge directly into the spawning grounds of the last two or three dozen sturgeon in the entire Maryland portion of the Chesapeake.

Opposition was a textbook campaign, involving a range of large and small environmental groups and locals who'd never before protested. As a result, AquaCon, the Norwegian backer, withdrew its project (quite



Fisheries ecologist Dave Secor of the Chesapeake Biological Laboratory lowers a monitoring instrument into Maryland's Marshyhope Creek, searching for tagged sturgeon coming upstream to spawn. (Dave Harp)

graciously, based on their announcement).

So congrats are in order all around, from the Chesapeake Bay Foundation down to the mayor and council of tiny Federalsburg on Marshyhope Creek, the Nanticoke River tributary where the remnant sturgeon hang on.

But the real key — in my opinion and that of others' I've talked to — was that Dave Secor weighed in on the issue. He'd been researching sturgeon in the Marshyhope for 10 years, ever since one of the prehistoric-looking fish jumped into an angler's boat, announcing to the world that its kind was not extinct in Maryland.

Secor's research — aided by Maryland Department of Natural Resources biologists who weren't as free to speak publicly — lent priceless credibility and made arguments very hard for AquaCon to refute.

And he went beyond that, in testimony at hearings and in op-ed columns, framing the issue better than anyone else could have:

The sturgeon, which can grow to 14 feet (about 10 feet seen so far in the Marshyhope) and live for many decades, "have no choice where they can go," Secor said. Their evolutionary mandate draws them back each fall to the river of their birth, where the rare mix of fine cobble on the bottom offers a perfect substrate for their eggs.

Unlike the fish, AquaCon had many choices.

The untested scope of the salmon facility, expected to produce more seafood annually than that of Maryland's entire crab harvest, posed an "existential threat," Secor said.

He didn't use that term lightly, but he used it accurately: Given the small size of their population, sturgeon supremely lack the resilience of, say, rockfish spawning by the tens of thousands across dozens of river systems. It was, even without additional threats, "balanced on a knife's edge."

I don't think anyone wanted to gamble with extinction to make farmed filets.

Tom Miller, director of his lab, "had my back," Secor told me. "And the administration [University of Maryland Center for Environmental and Estuarine Studies] was supportive." Indeed, decades ago, Don Heinle's boss also had his back when he opposed the state in court.

"The message was not opposing aquaculture," Secor said of his defense of sturgeon. "It was just that this was the wrong place."

So here's to sturgeon, and to academic freedom and courageous scientists. ■

*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.*



## Don't fall for the happy talk: Bay leaders have failed us

By Gerald Winegrad

**A**t a carefully orchestrated and self-congratulatory annual meeting of the Chesapeake Executive Council in October, the U.S. Environmental Protection Agency and Bay state governors and their representatives agreed to a one-year pause to recalibrate (read “abandon”) the Chesapeake cleanup plans under the EPA-dictated “pollution diet” — the Bay’s total maximum daily load, or TMDL.

While touting the great successes of the Bay Program and state initiatives, these putative leaders of the restoration failed to propose any new measures to achieve the TMDL-required reductions in nitrogen, phosphorus and sediment set in 2010.

In planning to again move the goalposts, the parties failed to detail the abject failure to meet the 2025 deadline for TMDL reductions. States collectively need to reduce Bay nitrogen loads by 72 million additional pounds to meet the 2025 goals after achieving a 30-million-pound reduction through 2021. Most must come from agriculture. Current state plans will meet only 42% of nitrogen reductions and 64% of phosphorus reductions by 2025.

This marks strike three after agreed-upon pollution reductions set under 1987 and 2000 Bay agreements were missed by wide margins. The EPA was forced by Clean Water Act lawsuits to impose the 2010 pollution diet and gave states 15 years to achieve the reductions to remove Bay waters from the impaired list.

Despite knowing for years that states were not meeting the dictated reductions, including the 60% reductions ordered by 2017, the EPA failed to impose any sanctions, sacrificing the Bay’s recovery on the altar of political expediency by refusing to enforce the TMDL. The EPA has a long list of possible sanctions at their disposal that were shared with the states in 2009.

The states’ failure to do what needs to be done to turn the tide is being met by an enforcement agency refusing to enforce the Clean Water Act. Instead, the EPA agreed on a recalibration delay that appears likely to condemn future generations to a



*Dead menhaden and other fish, killed by oxygen deprivation from an algal bloom, wash up on the shore of Stoney Creek off Maryland's Magothy River. (Steve Droter/Chesapeake Bay Program)*

Chesapeake no better, and possibly even worse, than it is today.

This capitulation occurs 39 years after the first Chesapeake Bay agreement was signed on Dec. 9, 1983, in which the EPA and Bay states solemnly pledged — in front of 700 enthusiastic witnesses — to restore the Chesapeake. I was one of those witnesses while serving as a state senator on the Chesapeake Bay Commission. Under the 1983 agreement, the newly established Chesapeake Executive Council was to “assess and oversee the implementation of coordinated plans to improve and protect the water quality and living resources of the Chesapeake Bay.”

Those bright-eyed optimistic witnesses at the 1983 signing would now be hugely disappointed and alarmed, as am I. If environmentalists had drummed up a doomsday scenario for failing to take the necessary actions for Bay restoration, we now have arrived at that nightmare scenario.

Flesh-eating diseases are threatening life and limb as the *Vibrio vulnificus* bacteria has proliferated in Bay waters, clearly a result of unchecked nutrient pollution and warming water temperatures.

Collapsed or collapsing fisheries —

oysters, soft clams, shad, rockfish, sturgeon, crabs — are another result of this abysmal failure. The Bay’s critical underwater grasses are at a mere 67,470 acres, only 36% of the 185,000-acre goal to be achieved by 2010. The Chesapeake watershed lost 29,000 acres of tree canopy from 2014 to 2018, while the goal was to increase it by 2,400 acres by 2025.

The EPA data document a striking failure to meet Clean Water Act requirements. A little more than 70% of Bay waters remain polluted (impaired), down only marginally from 74% in 1985.

After 50 years of environmental advocacy, I was thoroughly disgusted by the October Executive Council meeting, where the capitulation was greenwashed to appear as progress.

Only two of six Bay state governors bothered to show up — outgoing Maryland Gov. Larry Hogan and comparatively new Virginia Gov. Glenn Youngkin — and both have their eyes set on the U.S. presidency. At the council meeting, both governors touted their states’ “great” accomplishments.

Hogan ignored his abysmal record on the enforcement of critical water-quality

regulations governing farm animal manure, wastewater from treatment plants and development projects. And of course, he made no mention of his attempts to weaken forest protections against development, or that during his terms he has raked in millions of dollars from land development deals.

Youngkin has been notably anti-environmental — attacking longstanding regulations, trying to withdraw Virginia from a regional greenhouse gas compact and attempting to install Trump EPA chief Andrew Wheeler, a former coal lobbyist, as the state’s natural resources secretary.

The parties touted the prospective influx of millions of federal dollars to Bay programs under the Biden Inflation Reduction Act, as if these millions would substitute for the needed regulatory actions to curb pollutants from agriculture as well as new and existing development and the clearing of forests.

Yes, under the Bay Program, the Bay is better off than it would have been. The nutrient reductions achieved from sewage treatment plants have been extraordinary — a singular success attributable to tighter EPA regulations and financing.

But as longtime Bay warrior and Patuxent Riverkeeper Fred Tutman noted, “The abandonment of the enforcement of the Chesapeake Bay cleanup plan is a betrayal of the aspirations of millions of residents and taxpayers. Oct. 11 is a date which will live in infamy. How could we be betrayed in our quest to simply have our government assure us that it complies with Clean Water Act mandates?”

On Dec. 9, 1983, we all expected that with 10 or 20 years of concerted effort, water quality would be vastly improved, living resources would thrive again and Bay waters would be safe. These lofty expectations have been crushed by repeated failures to rein in agricultural and development pollutants. The house of cards that was the Bay restoration plan has collapsed, and we are left with only broken promises and a Chesapeake facing a bleak future. ■

*Gerald Winegrad served as a Maryland state senator and chaired the Senate Subcommittee on the Environment and Chesapeake Bay.*



## Rewilding wetlands: the clear path to clearer water

By Joseph Sweeney & Drew Altland

We commend the *Bay Journal* for publishing the recent opinion piece, *Rewilding our streams to save the Chesapeake Bay*. This is an important topic that needs more attention, context and recognition as a restoration approach that has become well-established in the Chesapeake watershed.

The major paradigm shift referenced by the author is not new; it's the result of more than 20 years of continued innovation by restoration practitioners and contractors who have designed and conducted projects to reestablish stream-wetland complexes or "messy streams."

These practitioners have benefitted greatly from collaboration with academic researchers and cooperation and support from forward-looking landowners and open-minded regulators. The result has been many successful rural and urban stream-wetland restorations, particularly in Maryland and Pennsylvania. Collectively, they show how this approach addresses widespread historic and contemporary impacts created by deforestation, damming, legacy sediment, channelization and floodplain encroachment.

This record of constructed restoration projects has helped lead the effort to promote more ecologically beneficial rewilding approaches. Here we offer several inter-related areas where policy and practice are helping to accelerate this paradigm shift.

First, rewilding approaches have been incentivized by refinements in pollution removal credits for towns and counties that upgrade to separate stormwater/sewer systems (MS4 upgrades, to use the lingo) and for municipal efforts to reduce non-point nutrient and sediment runoff into waterways. The state-federal Chesapeake Bay Program and Chesapeake Stormwater Network have facilitated these efforts.

A series of expert panels met in 2019–20 to review, assess and incorporate the latest research and project outcomes to improve the existing stream restoration protocols. The revised guidance encourages ecosystem rehabilitation by emphasizing floodplain



*The smokestacks of the Chesterfield Power Station rise above Dutch Gap Conservation Area at sunset in Chesterfield County, VA. The area protects 810 acres of woods, wetlands and wildlife along the James River. (Will Parson/Chesapeake Bay Program)*

reconnection to wetlands, connecting restored floodplain wetlands to ground-water, and retaining and treating sediment and nutrients within the restored stream/wetland complex.

Approximately 15 years of comprehensive research and monitoring by the Pennsylvania Department of Environmental Protection and academic, government and nongovernmental partners on the Big Spring Run project in Lancaster County, PA, were instrumental in advancing these protocols. The research shows that the project is highly effective in reducing sediment output and promoting denitrification, results directly tied to the boost in organic carbon sources within the restored wetland mosaic.

Second, compensatory mitigation for stream, wetland and aquatic resources in the Bay region has been evolving to align with the paradigm shift. The Baltimore District of the U.S. Army Corps of Engineers has recently updated their stream mitigation framework to provide additional credit for multi-threaded channel systems as well as support riparian wetland mitigation within the stream/wetland complex approach.

Also, Pennsylvania's DEP has recently developed a function-based mitigation model that breaks river systems into land-coverages that focus on the stream and

floodplain. The intent is to look beyond the stream channel to promote the long-term health and viability of a full range of ecosystem services with physical, biological and habitat improvements.

The model also incentivizes restoration approaches with higher mitigation credits for projects that remove legacy sediment.

Third, the accelerated pace of dam removal presents a significant opportunity to enhance stream and wetland rewilding.

Traditionally, dam removals were heavily focused on fish passage and public safety with limited consideration of broader attributes. This approach provides less ecosystem benefit and creates policy and practice challenges for achieving local and state water quality mandates. For example, significant public investments in practices designed to reduce sediment and nutrient pollution — such as streamside buffers, cattle fencing, no-till farming practices, and stormwater management — are offset by sediment releases from channel and floodplain erosion following removals that ignore holistic outcomes.

Recognizing this challenge, the Pennsylvania office of the National Resource Conservation Service, DEP and other partners are supporting strategies that address long-term legacy sediment erosion

by incorporating comprehensive rewilding approaches. Aligning these goals with sediment reduction crediting for MS4 and Bay cleanup purposes will further encourage dam removals that promote enhanced holistic ecological and water quality outcomes.

Decades of scientific research and project implementation have been key contributors to the rewilding approach in the Bay watershed. But in the past, projects that focused on removing legacy sediment to reestablish buried wetland ecosystems were criticized as "bulldozing streams," "valley dredging" or "engineered." Similarly, dam removal was largely a "blow and go" practice that discounted related environmental consequences and opportunities.

Future success in the watershed will require continuing education and engagement by the environmental community and public because research suggests that the riparian system of the Bay watershed prior to 1600 was likely not dominated by large, free-flowing channels lined with hardwood forests and elevated floodplains. Consequently, prioritizing funding and policies to preserve or construct such systems limits ecological and water quality benefits and reduces public confidence that tax dollars are being spent wisely.

While sharp differences of opinion still exist at the margins regarding the effectiveness of specific best practices and the temporary impacts required to achieve holistic restoration, a shift is clearly taking place. Today, most conservation and restoration professionals recognize that a "one size fits all" approach is neither practical nor effective for the Bay's recovery. Highly altered riparian zones filled with legacy sediment created by centuries of anthropogenic impacts have less capacity to treat and clean the waters delivered to the Bay.

If we truly want to "save the Bay," then simply "checking the box" for best management practices is unlikely to yield the desired outcomes until we recognize the full potential of rewilding our riparian systems. ■

*Joseph Sweeney is the executive director of the Water Science Institute. Drew Altland is a director of ecological engineering for Ecotone, LLC. Both live in Lancaster County, PA.*



## Time for a 21st-century park for the Chesapeake Bay

By Joel Dunn

In November, I joined 20,000 others for the Bay Bridge Run, a once-a-year opportunity to cross the Chesapeake Bay Bridge on foot.

As I hit my stride and the running endorphins kicked in, I soaked in the incredible view of the Bay and reflected on our collective progress to restore it. But what really got my attention was seeing so many other people on the bridge that day connecting to the Chesapeake in such a powerful way.

A significant step toward connecting people to the Chesapeake took place the next day. At a Nov. 14 press conference, Sen. Chris Van Hollen (D-MD) and Congressman John Sarbanes (D-MD), joined by members of a congressional working group, announced draft legislation for a proposed Chesapeake National Recreation Area that would bring National Park Service status to the Chesapeake.

Nobody tells the story of our nation's history better than the National Park Service. Through national parks, monuments and recreation areas, the agency recognizes and honors some of the most cherished landscapes in our nation. Yet, many are surprised to learn that the Chesapeake Bay is not represented in our national parks system. After all, it is our nation's largest estuary, rich in biological diversity, the birthplace of U.S. identity and the setting of countless untold stories, including those of indigenous peoples, free and enslaved Blacks, and watermen and women.

A national park unit dedicated to the Chesapeake Bay is not a new idea. In fact, people have advocated for such recognition for more than 30 years.

Thanks to the leadership of Van Hollen and Sarbanes, it is an idea whose time has come. A July 2022 public opinion poll showed remarkably strong support, with 83% of Maryland, Virginia and Washington, DC, respondents in favor of establishing the recreational area.

It would be a land-based, 21st-century park, uniting a “string of pearls” — new and existing Park Service sites, trails and partner parks — to increase access to the



Kayakers return to shore after a day of paddling on Little Blackwater River on Maryland's Eastern Shore. (Dave Harp)

Bay and create a national park-caliber visitor experience for all to enjoy.

Importantly, the proposed legislation includes incontrovertible language that the recreational area cannot negatively impact fishing, hunting or boating in any way.

At the press conference, Van Hollen said that the park “will not impact water rights, it will not impact fishing rights, it won't supersede state regulations on fishing and wildlife management, it won't supersede state regulations on commercial water

business, and it won't require the participation of any parties or landowners who are not interested. It is all on a voluntary basis.”

Along with protecting natural and historic resources and connecting people to nature, national parks have a proven, positive economic impact on surrounding local economies. The Chesapeake National Recreation Area would strongly support the Bay region's outdoor recreation economy, which contributes billions of dollars annually through recreation and tourism activities. It would also celebrate and elevate our region's traditions and cultures.

Establishing a unit of the national park system is a major endeavor, but the Chesapeake Bay is as grand as the Grand Canyon, as great as the Great Smoky Mountains. We can be the generation that achieves this landmark for the Chesapeake and inspires everyone to care for the Bay and do their part for current and future generations.

Please take a moment to submit your public comment on the draft legislation at [vanhollen.senate.gov/cnra](http://vanhollen.senate.gov/cnra). The deadline is Feb. 12. It is our hope that supportive comments come from every corner of the watershed. You can learn more about the proposed recreational area at [united4cnra.com](http://united4cnra.com). ■

*Joel Dunn is president and CEO of the Chesapeake Conservancy, based in Annapolis.*



Passengers aboard a replica of the 1768 schooner Sultana enjoy a two-hour journey near Solomons, MD, where the Patuxent River meets the Chesapeake Bay. (Will Parson/Chesapeake Bay Program)

### SHARE YOUR THOUGHTS

The *Bay Journal* welcomes comments on environmental issues in the Chesapeake Bay region. Letters to the editor should be 300 words or less. Submit your letter online at [bayjournal.com](http://bayjournal.com) by following a link in the Opinion section, or use the contact information below.

Opinion columns are typically a maximum of 900 words and must be arranged in advance. Deadlines and space availability vary. Text may be edited for clarity or length. Contact T.F. Sayles at [tsayles@bayjournal.com](mailto:tsayles@bayjournal.com), 410-746-0519 or at P.O. Box 300, Mayo, MD, 21106. Please include your phone number and/or email address.





# BULLETIN BOARD

## VOLUNTEER OPPORTUNITIES

### WATERSHEDWIDE

#### Project Clean Stream

The Alliance for the Chesapeake Bay, through its Project Clean Stream, provides supplies for stream cleanups anywhere in the watershed. To volunteer, register an event, report a site needing a cleanup: Lauren Sauder at [lsauder@allianceforthebay.org](mailto:lsauder@allianceforthebay.org).

#### Potomac River watershed cleanups

Learn about shoreline cleanup opportunities in the Potomac River watershed. Click on "Cleanups" at [fergusonfoundation.org](http://fergusonfoundation.org).

#### Become a water quality monitor

The Izaak Walton League invites people of all ages to join one of its monitoring programs. Info: [SOS@iwla.org](mailto:SOS@iwla.org) or 301-548-0150 x229.

- **Clean Water Hub:** Explore water quality data in your community, around the country.
- **Salt Watch:** Test for excessive road salt in a stream.
- **Check the Chemistry:** Spend 30 minutes at a waterway with materials, downloadable instructions.
- **Stream Critters:** Use app to identify stream inhabitants.
- **Monitor Macros:** Become a certified Save Our Streams monitor. Learn to identify aquatic macro-invertebrates, collect stream data.

#### Clean Swell app

Use the Ocean Conservancy's free Clean Swell app to instantly upload your cleanup results from anywhere in the world to a database that provides a global snapshot of trash and supplies researchers and policymakers with insight to inform solutions. The app also keeps track of your results and lets you share them on social media. Earn badges based on the type, quantity of trash, cleanups recorded. Web search "Ocean Conservancy Clean Swell app."

### PENNSYLVANIA

#### Susquehanna Sea Scouts

Middle Susquehanna Riverkeeper Association is seeking youths, ages 14-20, and adult leadership for its newly chartered Sea Scout program, an initiative under the Boy Scouts of America umbrella. The program is a co-ed, youth-led and adult-mentored experience that includes valuable certifications in SCUBA, boating safety, lifesaving, CPR, as well as advancement in rank from Apprentice to Quartermaster. Info: Riverkeeper John Zaktansky at [midsusriver@gmail.com](mailto:midsusriver@gmail.com); Steve Smith, who be serve the unit's Skipper (similar to a troop Scoutmaster) at [smitty7997@yahoo.com](mailto:smitty7997@yahoo.com); Sean Dresang at [sdresang52@gmail.com](mailto:sdresang52@gmail.com). For scouting questions or needs in Northumberland, Snyder and Union counties, contact Marissa Cramas at [mjcrames@outlook.com](mailto:mjcrames@outlook.com).

#### York County Parks

Volunteer at Nixon Park in Jacobus. Contact: 717-428-1961, [NixonCountyPark@YorkCountyPA.gov](mailto:NixonCountyPark@YorkCountyPA.gov).  
■ **Front Desk Greeter:** Ages 18+ can work alone. Families can work as a team.

■ **Project Feederwatch:** 9 am-4 pm through April. (Participants sign up for 1-hour shift every other week). Beginners welcome. This citizen science program, which is part of a North American effort run by the Cornell Lab of Ornithology, counts birds that visit feeders November through April. The data tracks winter bird population trends. Visitors are welcome to drop in any time.

### VIRGINIA

#### Reedville Fishermen's Museum

The Reedville Fishermen's Museum needs volunteers for docents and in the gift shop, boat shop, research collections/library. Info: [rfmuseum.org](http://rfmuseum.org) (click on "About us"), [office@rfmuseum.org](mailto:office@rfmuseum.org).

#### Goose Creek Association

The Goose Creek Association in Middleburg needs volunteers for stream monitoring & restoration, educational outreach & events, zoning & preservation, river cleanups. Projects, internships for high school, college students. Info: Holly Geary at 540-687-3073, [info@goosecreek.org](mailto:info@goosecreek.org), [goosecreek.org/volunteer](http://goosecreek.org/volunteer).

#### Check out cleanup supplies

Hampton Public libraries have cleanup kits that can be checked out year-round, then returned after a cleanup. Call your local library branch for details.

#### Virginia Living Museum

Virginia Living Museum in Newport News needs volunteers and interns ages 11+ (11-14 w/adult) to work alongside staff. Opportunities include educating guests, native plant propagation, installation of new exhibits. Some positions have age requirements. Adults must complete a background check (\$12.50). Financial aid applications available. Info: [volunteer@thevlm.org](mailto:volunteer@thevlm.org).

#### Chemical water monitoring teams

Help the Prince William Soil and Water Conservation District and Department of Environmental Quality by joining a chemical water quality monitoring team. Training provided. Monitoring sites are accessible. Info: [waterquality@pwsacd.org](mailto:waterquality@pwsacd.org), [pwsacd.org](http://pwsacd.org).

#### VA Master Naturalists

VA Master Naturalists is a corps of volunteers who help manage, protect natural areas through plant & animal surveys, monitor streams, rehabilitate trails, teach in nature centers. Training covers ecology, geology, soils, native flora & fauna, habitat management. Info: [virginiamasternaturalist.org](http://virginiamasternaturalist.org).

### MARYLAND

#### Lower Shore Land Trust

The Lower Shore Land Trust is planning a training session for new volunteer land stewards. Info: Frank Deuter at [fdeuter@lowershorelandtrust.org](mailto:fdeuter@lowershorelandtrust.org).

#### Anita Leight Estuary Center

Remove invasive plants, install native species 1-3 pm Jan. 22 & Feb. 12 at the Anita C. Leight Estuary Center in Abingdon. Volunteers, ages 14+, learn about problem plants, removal & restoration strategies. Wear sturdy shoes, long sleeves, work gloves. Weather permitting. Preregistration required: 410-612-1688, 410-879-2000 x1688, [otterpointcreek.org](http://otterpointcreek.org).

#### Lower Shore Land Trust

The Lower Shore Land Trust works with individual landowners who wish to protect the natural heritage of their properties. Info: [lowershorelandtrust.org/volunteer-sign-up](http://lowershorelandtrust.org/volunteer-sign-up).

#### Annapolis Maritime Museum

The Annapolis Maritime Museum & Park needs volunteers. Info: Ryan Linthicum at [museum@amaritime.org](mailto:museum@amaritime.org).

#### Patapsco Valley State Park

Volunteer opportunities include: daily operations, leading hikes & nature crafts, mounted patrols, trail maintenance, photographers, nature center docents, graphic designers, marketing specialists, artists, carpenters, plumbers, stone masons, seamstresses. Info: 410-461-5005, [volunteerpatapsco.dnr@maryland.gov](mailto:volunteerpatapsco.dnr@maryland.gov).

#### National Wildlife Refuge at Patuxent

Volunteer in Wildlife Images Bookstore & Nature Shop with Friends of Patuxent Research Refuge, near Laurel, for a few hours a week or all day 10 am-4 pm Saturdays; 11 am-4 pm Tuesdays-Fridays. Help customers, run the register. Training provided. Info: Visit the shop in the National Wildlife Visitor Center and ask for Ann; email [wibookstore@friendsofpatuxent.org](mailto:wibookstore@friendsofpatuxent.org).

#### Ruth Swann Park

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

#### Invasive Species Tool Kit

The Lower Shore Land Trust is offering a free, online Invasive Species Tool Kit to identify, remove weeds on your land. Residents can also report invasive clusters in their neighborhood, parks, public lands. Info: [lowershorelandtrust.org/resources](http://lowershorelandtrust.org/resources).

#### Citizen science: angler surveys

The Volunteer Angler Survey app helps the Department of Natural Resources collect species, location, size data used in developing management strategies. Surveys: artificial reef initiative, blue crab, freshwater fisheries, muskie, shad, striped bass. Win quarterly prizes. Info: [dnr.maryland.gov/Fisheries/Pages/survey/index.aspx](http://dnr.maryland.gov/Fisheries/Pages/survey/index.aspx).

#### Chesapeake Bay Environmental Center

Volunteer at the Chesapeake Bay Environmental Center in Grasonville a few times a month or more often. Help with educational programs; guide kayak trips, hikes; staff the front desk; maintain trails, landscapes, pollinator garden; feed or handle captive birds of prey; maintain birds' living quarters; monitor wood duck boxes; join wildlife initiatives. Or, participate in fundraising, website development, writing for newsletters, events, developing photo archives, supporting office staff. Volunteering more than 100 hours of service per year earns a free one-year family membership. Info: [volunteercoordinator@bayrestoration.org](mailto:volunteercoordinator@bayrestoration.org).



## Submission Guidelines

### SUBMISSIONS

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 Bay region.

### DEADLINES

The *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 are posted at least two months in advance. March issue: February 11  
April issue: March 11

### FORMAT

Submissions to *Bulletin Board* must be sent as a Word or Pages document or as text in an e-mail. Other formats, including pdfs, Mailchimp or Constant Contact, **will only be considered if space allows** and type 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 if 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](mailto:kgaskell@bayjournal.com). Items sent to other addresses are not always forwarded before the deadline.

### Answers to CHESAPEAKE CHALLENGE on page 27

1. Mountain laurel
2. Christmas fern
3. American alumroot
4. Common clubmoss
5. Kinnikinnik





# BULLETIN BOARD

## Maryland State Parks

Search for volunteer opportunities in state parks at [ec.samaritan.com/custom/1528](http://ec.samaritan.com/custom/1528). Click on "Opportunity Search" in volunteer menu on left side of page.

## EVENTS/PROGRAMS

### WATERSHEDWIDE

#### Wild & Scenic Film Festival

The Alliance for the Chesapeake Bay's Wild & Scenic Film Festival takes place March 9 at theater or theaterlike venues in Virginia, Maryland, Pennsylvania, and Washington, DC. Ten to 15 short films highlight topics related to nature, community activism, adventure, conservation, water, energy and climate change, wildlife, environmental justice, agriculture, Native American and indigenous culture. Ticket prices for this fundraiser start at \$15 and include in-person and virtual options. Info: [allianceforthebay.org/get-involved/newsletters/](http://allianceforthebay.org/get-involved/newsletters/)

### PENNSYLVANIA

#### Susquehanna Nature Book Club

The Middle Susquehanna Riverkeeper's Nature Book Club meets at 7 pm at 112 Market Street in Sunbury. as well as on Zoom. The session will discuss *American Canopy, Trees, Forests, and the Making of a Nation* by Eric Rutkow. It is free and open to the public, but the organizers need to know how many to expect. Info: Ann Fisher at [fisherann531@gmail.com](mailto:fisherann531@gmail.com).

### MARYLAND

#### Waterfowl hunting days set for youths, veterans, military

On Feb. 4, hunting for ducks, geese and coots on public and private lands in Maryland will be offered exclusively to eligible hunters 16 years of age or younger, military veterans of any age as defined in section 101 of title 38, United States Code, and members of the Armed Forces on active duty, including members of the National Guard and Reserves on active duty (other than for training). Youth hunters must be accompanied by an unarmed adult at least 21 years old or eligible military personnel also participating in the hunt. All eligible hunters and adult mentors must possess Maryland hunting licenses or be exempt from hunting license requirements. Any adult participating in this hunt will need to purchase both a Maryland Migratory Game Bird Stamp and a Federal Duck Stamp. Youth hunters, including those possessing an apprentice license, must purchase a Maryland Migratory Game Bird Stamp but do not need to purchase the federal stamp if younger than 16. Details: Contact the Maryland Department of Natural Resources Wildlife and Heritage Service at 410-260-8540.

#### CBMM speaker series

Talks in the winter Chesapeake Bay Maritime Museum's Speaker Series, which take place in its Van Lennep Auditorium will offer insight into how the events of the past influence our lives today. Cost per session (in-person or virtual) varies. Info: [bit.ly/CBMMSpeakerSeries](http://bit.ly/CBMMSpeakerSeries). The schedule includes:

- *From the Ground Up: An Archaeologist's Perspective on Native Chesapeake Foods*: 3 pm Feb. 1, Local archaeologist, TimeChef and food historian Henry Ward will share a culinary exploration of recipes that celebrate indigenous foods, native cuisine of the Chesapeake region.
- *205th birthday of Frederick Douglass*: 5:30 pm Feb. 16. The program pairs excerpts of Douglass' writing and speeches with images from St. Michaels resident Jeff McGuiness' book, *Bear Me Into Freedom: The Talbot County of Frederick Douglass*, a photo essay tracing the places central to Douglass' early life as an enslaved person on the Eastern Shore of Maryland before he escaped to freedom and became a national leader in the fight to abolish slavery.
- *Hurricane Agnes - Fifty Years After Catastrophe*: 3:30 pm March 8. Gary Letcher, author of *Bold Forecast: The Hurricane Agnes Deluge*, will recount the story of the 1972 storm that brought the most rain and wreaked the worst damage in U.S. history up to its time, making an impact on the Bay that is still felt 50 years later, as well as the power of ordinary people in the face of epic catastrophe.
- *Old Line Plate: Uncovering the Stories Behind Maryland's Historic Recipes*: 5:30 pm. March 15. Kara Harris, author of the *Old Line Plate* blog, will dig into the state's culinary past by examining the kind of cookbooks that have raised money for churches and charities, while also documenting regional food traditions over generations and the culinary legacies left behind.

#### Patuxent Research Refuge

The Patuxent Research Refuge's National Wildlife Visitor Center, (South Tract on Scarlet Tanager Loop - [S]) and North Tract (Bald Eagle Drive - [N]), both in Laurel, invite the public to their free programs. Except where noted, preregistration is required. Notify the center of any special accommodation needs when registering. Registration, info: 301-497-5887. Schedule:

- *2022 Federal Junior Duck Stamp Competition*: January. [S] Art exhibit in lobby.
- *Kids' Discovery Center*: 9 am–12 pm (35-minute time slots on the hour) Tuesdays–Saturdays. Ages 3–8 w/parent. Parent-child teams create crafts, solve puzzles, play games, explore nature. Call 301-497-5760 to register for this program. January's theme: Maryland's Wildlife Visitors. February: Deer.
- *Winter Bird Walk*: 9–10:30 am Jan. 14. [S] All ages. Look for birds that overwinter at Patuxent. Inclement-weather alternative available. Binoculars recommended. No registration.
- *Meet a Live American Kestrel*: 1–1:30 pm Jan. 21 & Feb. 11. [S] All ages. Informal show-and-tell. No registration.

- *Welcoming Creatures to Your Backyard*: 2–3 pm Jan. 21 & Feb. 18. [S] All ages. Learn basic habitat needs, best winter foods for common native animals. Discover online resources to attract/see more wildlife.
- *Intro to DSLR Photography*: 1:30–2:30 pm Jan. 22 [N] Ages 11+.
- *Family Fun/Winter Wildlife*: All ages. Monthlong, independent, hands-on activity stations with games, crafts. Volunteer-led sessions take place 10 am–1 pm Jan. 27 & 28 and Feb. 17 & 18. No registration.
- *Winter Wonderland*: 2–3 pm Jan. 28. [S] Ages 4–7. Learn how animals survive winter's challenges.
- *Skulls Identification*: 1:30–2:30 pm Feb. 12. [N] Ages 5+ Learn how to examine teeth, eye placement, skull shape to make an educated guess about an animal's behavior.
- *Nesting, Already?* 2–3 pm Feb. 25. Ages 4–7. Interactive program. Learn why some birds nest much earlier than others.

#### Anita C. Leight Estuary Center

Meet at Anita C. Leight Estuary Center in Abingdon, except where noted. Ages 12 & younger with adult. Registration required for all programs; payment due at registration. Info: 410-612-1688, 410-879-2000 x1688, [otterpointcreek.org](http://otterpointcreek.org).

- *Critter Dinner Time*: 10:30–11:30 am Jan. 14. (register by 1/13) & 1:30–2:30 pm Feb. 18 (register by 2/17). All ages. Learn about turtles, fish, snakes while watching them eat. Free.
- *Snowflake Study*: 1–2 pm Jan. 15. Ages 5+ Discover how frozen water crystals form in the sky. Create a unique snowflake of your own. \$10/family. Register by 1/11.
- *High School Homeschool/Significance of Soil*: 1–3 pm Jan. 19. Ages 14–17. Learn the ecological significance of soil. \$15. Register by 1/11.
- *Music of the Forest*: 1:30–2:30 pm Jan. 21. Ages 3+ Use musical instruments to recreate forest sounds. \$10/family. Register by 1/18.
- *Paws, Claws, Scales & Tails*: 1:30–2:30 pm Jan. 22. Ages 6+ Explore how animals have adapted to get around in their environment. \$10/family. Register by 1/18.
- *Groundhog Day*: 1–2:30 pm Jan. 29. Ages 5+ Learn the lore, natural history of Groundhog Day. Explore park for early signs of spring. Take-home craft. \$10/family Register by Jan. 25.
- *Family Feed*: Participants choose time Feb. 2, 9, 16, 23. All ages. Behind-the-scenes opportunity to help feed the animals. Free. Register at least 24 hours ahead.
- *High School Homeschool/Acid Rain*: 1–3 pm Feb. 2. Ages 14–17. \$15 Register by Jan. 25.
- *DIY Recycled Valentine's Day Cards*: 12–1:30 pm Feb. 4. Ages 2+ Turn recycled paper into cards. Light refreshments, music. \$10. Register by Feb 1.
- *Full Moon Campfire*: 6–7:30 pm Feb. 4. Ages 2+ Hot chocolate/ s'mores, too. \$10/family, Register by Feb. 2.
- *Meet a Critter*: 1:30 p.m Feb. 5. All ages. Learn about a live animal up close. Free. Register by Feb. 4.

- *Middle School Homeschool/Basic Chemistry*: 10 am–12 pm Feb. 7, 14 & 21. Ages 11–13. Learn about reactions. \$36. Register by Feb. 1.
- *Nuts about Squirrels*: 1–2 pm Feb. 12. Ages 5+ Learn about the native gray squirrels' adaptations to winter. Look for them in the park. Squirrel craft. \$10/family. Register by Feb. 8.
- *High School Homeschool/Dissection*: 1–3 pm Feb. 16. Ages 14–17. Animal dissection. \$15. Register by Feb. 8.
- *Lifetime Love*: 1:30 – 2:30 pm Feb. 19. Ages 6+ Learn about animals that mate for life. Paint a rock for a loved one. \$10/family. Register by Feb. 15.
- *Sunset Hike/Campfire*: 4:30–6 pm Feb. 25. Hike, campfire, s'mores. \$8. Registration required.
- *Tracks, Scat & Mud*: 1–2:30 pm Feb. 26. Meet at Bosely Conservancy. Ages 5+ Search Bosely Conservancy for signs of wildlife. Create a track mold. \$10/family. Register by Feb. 22.

## RESOURCES

### VIRGINIA

#### VA rivers atlases

The Virginia Canals & Navigations Society has published detailed atlases for the state's rivers above the fall line that are designed for recreation, historians, monitors and researchers. The base maps are standard USGS 7-1/2' topo maps with a km-square grid, annotated with historical and archaeological information including fish dams, batteau sluices, mills, boat ramps, other river sites. In some of the atlases, rivers are marked every 0.1 mile, providing a published mileage system for noting historic sites, hazards, pollution and erosion sources. Atlases covering the Bay watershed include:

- *Shenandoah River Atlas*: mainstem, North Fork, South Fork, North River.
- *Goose Creek Scenic River Atlas*: Goose Creek, Little River.
- *Rappahannock Scenic River Atlas*: Rappahannock, Hazel River, Dragon Swamp.
- *James River Batteau Festival Trail Atlas*: below Lynchburg.
- *Upper James River Atlas*: James River, Jackson's River, Dunlap's Creek, Potts's Creek, Cowpasture River, Craig's Creek.
- *Maury River Atlas*.
- *Rivanna Scenic River Atlas*: mainstem, North Fork, South Fork.
- *Slate & Willis's Rivers Atlas*: Slate; Willis's.
- *Falls of the James Atlas*: James; Tuckahoe Creek.
- *Appomattox River Atlas & Falls of the Appomattox Atlas*: Appomattox River, Buffalo Creek, Flat Creek, Deep Creek.
- *Chickahominy River Atlas*: below the fall line.
- *Great Dismal Swamp Atlas*: 100+ canals, ditches. Prices vary and proceeds benefit the projects of the VC & NS. Info: 252-301-1747, [Bill@vacanals.org](mailto:Bill@vacanals.org), [www.vacanals.org](http://www.vacanals.org), or write to: Virginia Canals & Navigation Society at 3806 S. Amherst Highway, Madison Heights, VA 24572



# For a resilient Bay, we need an even more resilient effort



By Kate Fritz

In my 18-year career focused on restoring the Chesapeake Bay watershed, I've seen a lot of changes: from how we plan for and manage land development, to how we apply nutrients to agricultural crops, to upgrading major wastewater treatment plants, to the diversity of community voices joining the fight. A lot has happened in that timeframe.

I think often of how we're building resilience into our landscapes, our communities and our partnerships. Resilience is defined as the ability to bounce back from adverse conditions, a concept that is at the root of the restoration efforts in the Bay watershed. When we focus on building something resilient for the future, it forces us to concentrate on the steps between now and that future state.

I started my career as an ambitious environmental scientist helping to collect water quality data in Maryland streams under intense land-use and development pressure. This was at a time when the population of the watershed was roughly 16 million.

As I crunched the data, it became clear that what we were doing on the land was directly impacting the water. I took this epiphany and turned my work to local environmental planning in Prince George's County, MD, where I helped build consensus for long-range sustainability and environmental policies to guide where and how the county would grow through 2040.

In my seven years in the county's planning department, I saw new legislation and policies come down from the federal and state levels that presented opportunities to become better at building resiliency into our systems for managing growth and population.

In my last five years, as director of the Alliance for the Chesapeake Bay, I have seen the amount of funding available for on-the-ground restoration projects grow exponentially.



*During her fieldwork at St. Mary's College of Maryland, the author, pictured here in 2003, learned how to monitor the water quality in the St. Mary's River. (Alliance for the Chesapeake Bay)*

But the long-term work needed to restore our Chesapeake Bay requires more than just ecological resiliency. The restoration effort itself needs to be resilient, as do the partnerships that have formed around that common goal in the last 50 years.

When the 2014 *Chesapeake Bay Agreement* set out pollution reduction goals with 2025 as the horizon, I don't believe it was ever meant as an end point. I see it as a meeting point, a destination along this long journey of continuing to build resiliency into all levels of our watersheds. It was meant as a place for all of the partners in this work — government, nonprofit organizations, communities, companies — to set coordinates for and to move in a unified direction. It's been a roadmap for all of us to follow, to set our navigation systems to a common address, and a promise to meet each other there, no matter which road we were taking.

That pivotal 2014 agreement set out 10 broad goals and 31 specific outcomes and was signed by all seven Chesapeake jurisdictions. The agreement has had its challenges, but it has purposefully created a system that is meant to be reevaluated regularly in coordination with all of the partnership's members. It has resiliency built into it through techniques of adaptive



*While serving as the executive director of the South River Federation (now Arundel Rivers Federation), the author helped deploy a water quality monitoring device in Church Creek, near Annapolis. A leadership position in environmental restoration, she says, "often brings business-casual attire and muck boots together." (Alliance for the Chesapeake Bay)*

management that allow us to innovate in new ways and evolve according to new information and new science.

This work hasn't been easy, and in some ways we're just at the beginning, but we have persevered, and we have succeeded in many areas. There are so many examples of how the overarching coordination of the Bay restoration effort is playing out around the watershed.

The rate of restoration practices on the ground is accelerating. In 2014, Lancaster, PA, was declared a "national model" for green infrastructure work. Richmond's RVAH2O initiative was awarded the National Environmental Achievement Award from the Water Environment Foundation in 2022. With the RiverSmart Programs in Washington, DC, we have helped thousands of landowners install and maintain green infrastructure practices to reduce polluted stormwater. In Maryland, the Anne Arundel County Bureau of Watershed Protection and Restoration has implemented sophisticated, holistic, systems-level restoration efforts.

These local actions, replicable across the watershed, are critical to building ecosystems that can weather whatever storms are ahead.

While I've learned and seen a lot of change during my career, I know there is still much more work to do. Every generation of restoration work is built on the preceding generation's efforts — the systems and practices they put in place to bring us all together toward a shared goal. The collaborative system we have created is built to weather political, economic and literal storms, as well as stand up the perpetually stubborn elements that continue to challenge our efforts.

And what I see looming next on the horizon — building truly resilient human and environmental systems in the Chesapeake region — is an exciting outlook for future generations. ■

*Kate Fritz is CEO of the Alliance for the Chesapeake Bay, based in Annapolis, MD.*



# Cambridge cameo: Birders flock to rare snowy owl sighting



By Mike Burke

A clear but cold December day greeted us as we entered the Blackwater National Wildlife Refuge near Cambridge, MD.

We had just passed through the gate when dozens of northern shovelers appeared in the first pond. Our friend from Kentucky, who had joined us for the outing, was delighted. My wife, Pat, and I had seen such flocks often over the years, but we were just as thrilled as our friend.

The day would continue like that, with thousands of snow geese, hundreds of Canada geese, tundra swans, bald eagles, ring-billed gulls and lots of ducks on every pond.

By midafternoon the skies had turned a pearly gray unique to winter. We started the two-hour drive home but first made our mandatory stop at the foot of Oakley Street in Cambridge to see more winter ducks. Parking was difficult. It was our first sign that something unusual was going on.

We walked toward the end of the block, where the only thing separating us from the 2-mile-wide Choptank River was a waist-high concrete barrier. The place was packed with photographers, some with lenses that might rival the James Webb Telescope. We looked in the same direction, but nothing appeared out of the ordinary. “What’s going on?” I asked one of the photographers. “Snowy owl,” he replied.

The snowy owl (*Bubo scandiacus*) is a bird of the high Arctic. In the summer breeding season, it can sometimes be found well inside the Arctic Circle, approaching the North Pole. Even in winter, the owl usually goes no farther south than lower Canada. A few come down to the Great Lakes area and New England. A snowy owl on Maryland’s Eastern Shore was a true sensation.

The owl was just a block away, we were told, standing on the deck of a boat tied to a pier just downriver. Unhelpfully, the vessel was white with a white cabin and white equipment lockers on a white deck.



Perched on a boat docked on the Choptank River in Cambridge, MD, this snowy owl drew birders and photographers to the river’s edge. (Matt Felperin)

None of us could find the owl despite a lot of helpful instructions.

Finally, a woman with a powerful spotting scope trained on the bird stepped aside to allow us a closer look. Several of us in turn looked through the scope, and each of us had trouble at first because of misconceptions about what we were about to see. I had expected a medium-size white bird. Instead, I saw a bruiser of an owl, standing 2-feet tall with the build of a refrigerator. It had lots of grayish brown bars over its white wings and body. The round head and upper breast were pure white.

Males take up to five years to achieve the snowy appearance of its name. Females and immature males have extensive barring. Females are larger than males and can weigh up to 6.5 pounds, easily the heaviest of all North American owls. All birds, regardless of sex or age, have white underwings and yellow, catlike eyes. The sharply down-curved bill is all black but mostly obscured by facial feathers.

The snowy owl can survive year-round in its breeding territory, even during the 24-hour darkness of an Arctic winter. Frigid temperatures can drop to a brutal minus-68 degrees F. Dense feathering from head to toe is essential for survival.

Snowy owls breed on the treeless, windy tundra. The female scrapes out a roughly

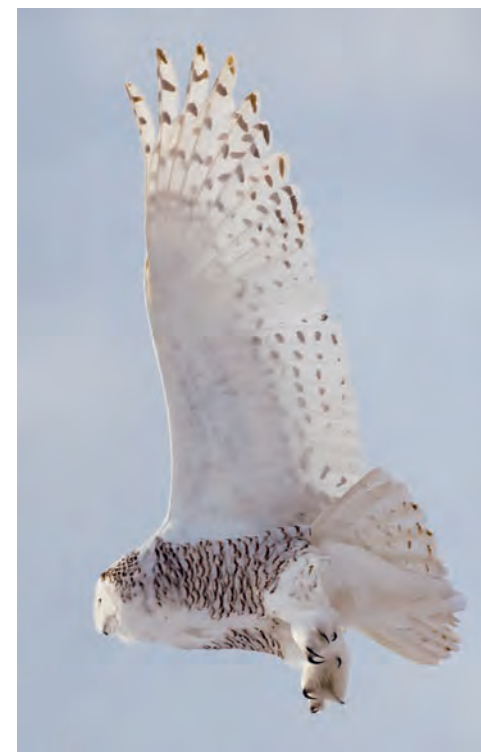
round depression in the ground, then begins laying eggs. In abundant food years, that number can grow to 11. If food sources are scarce, her nest may hold as few as five eggs. In particularly bad years, she may not nest at all.

The male is solely responsible for feeding his mate and their chicks, as well as himself. He hunts at any hour of the 24-hour daylight during summer.

Snowy owls rely heavily on a diet of lemmings, eating an average of 1,600 annually. Lemmings aren’t the only food source. Snowys also eat larger mammals like snow hares, as well as other birds, including ptarmigans (a type of grouse), ducks and geese. They also eat crustaceans, amphibians, insects and fish. Snowy owls have even been seen eating carrion from creatures as large as whales and caribou.

So, what was this owl doing in Cambridge? Periodically, snowy owls fly well south of their normal winter range. These unpredictable irruptions, as they’re called, might be triggered by a lack of sufficient food sources up north.

Or it may be because it has been an especially good breeding year, and young birds love to roam. These erratic migrations can result in birds flying as far south as northern Virginia. One bird was recorded in Texas! In truth, more research is needed



A snowy owl in flight near Calgary in Alberta, Canada. (Sunny/CC BY 2.0)

to understand the phenomenon.

After breeding in the Arctic, snowy owls migrate south all around the globe, not just into North America. In winter, they can be found in Greenland, Norway, Sweden, Finland and Russia, including Asian Siberia. It is the same species throughout its range, with no subspecies.

Despite its adaptable diet, longevity (it can live 20-plus years) and global range, the snowy owl is in real trouble. Over a 50-year period, ending in 2018, the population dropped by nearly two-thirds. Partners in Flight now estimates that just 29,000 breeding birds remain worldwide. Snowy owls are listed as an international bird of concern because of their rapid decline and the effects of global warming.

Maybe this is a story of an extinction happening in our lifetimes, but I choose to see a story of wonder and hope. With its singular beauty, the snowy owl reminds us of the stakes in the climate change battle.

Despite all odds, we saw a snowy owl. Despite all odds, I choose to spend my retirement years dedicated to implementing climate change solutions. As Emily Dickinson famously wrote, “Hope is the thing with feathers.” I choose hope, feathers and all. ■

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



# Keep it simple: Small resolutions can add up to big changes



By Kathy Reshetiloff

**H**appy New Year! Did you make any resolutions? Have you broken any yet? I have never been a big fan of the whole ritual, mostly because I tend to choose New Year's resolutions that are simply too hard to keep. But with a new year upon us, we often feel obliged to make changes in our lives or turn over a new leaf. So, if you're like me and need to keep it simple and realistic, here are a few easy actions that will support your environment, health and community.

## Replace some lawn with native plants

To stay lush and green, lawn grass requires fertilizing, constant watering and mowing. Nutrients in chemical fertilizers, like nitrogen and phosphorus, can run off from yards into local waterways and eventually drain into the Chesapeake Bay, where they provide fuel for algae blooms. When you decrease the size of your lawn, you decrease nutrient input into the Bay — not to mention cutting back on water consumption and reducing air pollution by mowing less. Pound for pound, gas lawn mowers are far worse than modern cars when it comes to harmful emissions.

Also, native plants, shrubs, ground covers and trees that are already suited to your local conditions require much less energy and attention than turf grass — and they provide food and shelter for local wildlife.

## Don't litter

This may seem like a no-brainer, but take a walk along any street or country road and notice all the trash. It's everywhere, and all it takes is a little wind or rain to move garbage from the edge of the road to waterways and the Bay.

Much of what you see are plastic products that don't break down easily. Birds and fish often mistake plastic fragments for viable food. Even if you don't litter, keep a bag in your car or boat or with you when you're out and about. Don't just walk past litter,



Visitors explore a vernal pool at Kings Gap State Park in Cumberland County, PA. (Will Parson/Chesapeake Bay Program)

muttering under your breath; bag it and dispose of it. Recycle cans, glass and paper, and compost yard waste.

## Conserve and protect water

The more water we use, the more we must treat — either in wastewater treatment plants or septic systems. To reduce water use, repair leaking faucets inside and out.

Inside the house, consider replacing conventional faucets with low-flow types. The same goes for toilets. Also avoid doing small loads of laundry; fill that washer up to make the most of every gallon of laundry water. Everything that goes down the drain eventually ends up in waterways.

Household cleaning products, car care products and paints are just a few of the chemicals that people in the U.S. dump down their drains every day. Sewage treatment plants and septic systems can't remove all of the substances from the water. Dispose of chemicals properly and, where possible, substitute environmentally safe alternatives to chemical cleaners.

## Become involved in local issues

We don't always like the decisions made by our county, city or local community. But often those decisions are about issues that we don't pay attention to until it's too late.

There are many environmental organizations that provide citizens with information about local, state or national issues. Watershed organizations focus their efforts on issues that affect the land draining into a particular waterway. By joining a local environmental organization, watershed group or community association, you can stay informed about local issues. And don't settle for just being informed; insert yourself into the decision-making process.

## Experience your world

Everyday responsibilities consume so much time that we often lose connection with our natural world and its importance. Make an effort to get out and experience the natural world. If you have children or elders in your life, take them with you.

If there is a break in the cold weather,

put on your rubber boots and explore that little stream that runs through the woods near your house. Turn over some rocks to see what is there. Listen for birds and frogs. Explore a marsh, swamp, forest or meadow. Trudge through the snow. Splash in the rain. Look for spring's first blooms. Hike a hill. Watch a sunset. Lie in a field and look at the night sky. Catch a moon rise. The more we know and experience our home, our planet, the more likely we are to help conserve the things we love about it.

You may think these small actions won't really help your local community, much less the Chesapeake. But consider this: Everyone living in the Bay watershed is within minutes of one of more than 100,000 tributaries that eventually drain into the Bay.

Today, more than 18 million people live, work and play in the Bay watershed. If each of us commits to simple changes, the combined impact can be huge. ■

*Kathy Reshetiloff is with the U.S. Fish and Wildlife Service's Chesapeake Field Office in Annapolis.*