CHESAPEAKE
BAY JOURNAL
March 2024 Volume 34 Number 1
Independent environmental news for the Chesapeake region

Striped bass harvest limits have widespread impact
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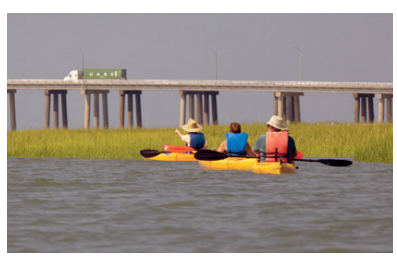
PLAN OF RETREAT

Elizabeth River center aims to adapt and fall to water PAGE 11

NUTRIENT PREDICTIONS



Will climate change help or hinder Bay goals? PAGE 22

EMBRACING FIRE

Use of controlled burns is returning to PA PAGE 12

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Snowy ground helps frame the view from Miller Mountain in Pennsylvania, where steep slopes inspired plans for a ski resort that never came to fruition. The state recently purchased the mountain and opened it to the public. Read the article on page 21. (Ad Crable)

ON THE COVER

New harvest limits for striped bass aim to help the species rebound. (Dave Harp)

Bottom photos: Left by Lauren Hines-Acosta, center by Dave Harp, right by Stephen Ruswick of the Nature Conservancy

EDITOR'S NOTE

A state buys a mountain and a city buys an island

Conserving land won't solve every environmental problem in the Chesapeake Bay region. But it helps.

Healthy air, clean water and thriving wildlife depend on natural landscapes where ecosystem functions help offset the pollution generated by developed lands. Forests and other green spaces support outdoor recreation and refresh the human spirit. Protections for working forests and farms support local economies and set aside areas that will not be converted to roads, rooftops and parking lots.

This issue of the *Bay Journal* highlights two recent acquisitions that add to the acreage of protected, public land in the Bay watershed — a mountain and an island — wonderfully different moves in two very different parts of the region. Pennsylvania purchased Miller Mountain in the rural northeastern part of the state, near the Susquehanna River. Much farther south, Richmond took ownership of Mayo Island in the James River. Miller Mountain had been slated for various development projects that never happened. Mayo Island has seen waves of commercial use and lots of pavement, but planners aim to return it to a more natural state that nurtures and celebrates its riverine environment.

It's part of a good news story: The region has protected about 1.64 million acres of land since 2010, putting it on pace to meet its goal of preserving 2 million acres by 2025. But, approximately 50,000 acres are covered by impervious surface every five years, an area that is nearly the size of the District of Columbia.

In a recent newsletter, the Chesapeake Conservation Partnership said that land protection should be "foundational" in strategies to protect the Bay. "It's not merely a strategy," they wrote, "but a secure preventive approach that can position the program for success, providing a sustainable framework beyond the current goals set for 2025."

— Lara Lutz

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BY THE numbers

1,139
Public access points in the Chesapeake Bay watershed in 2010

1,379
Public access points in the Bay watershed in 2022

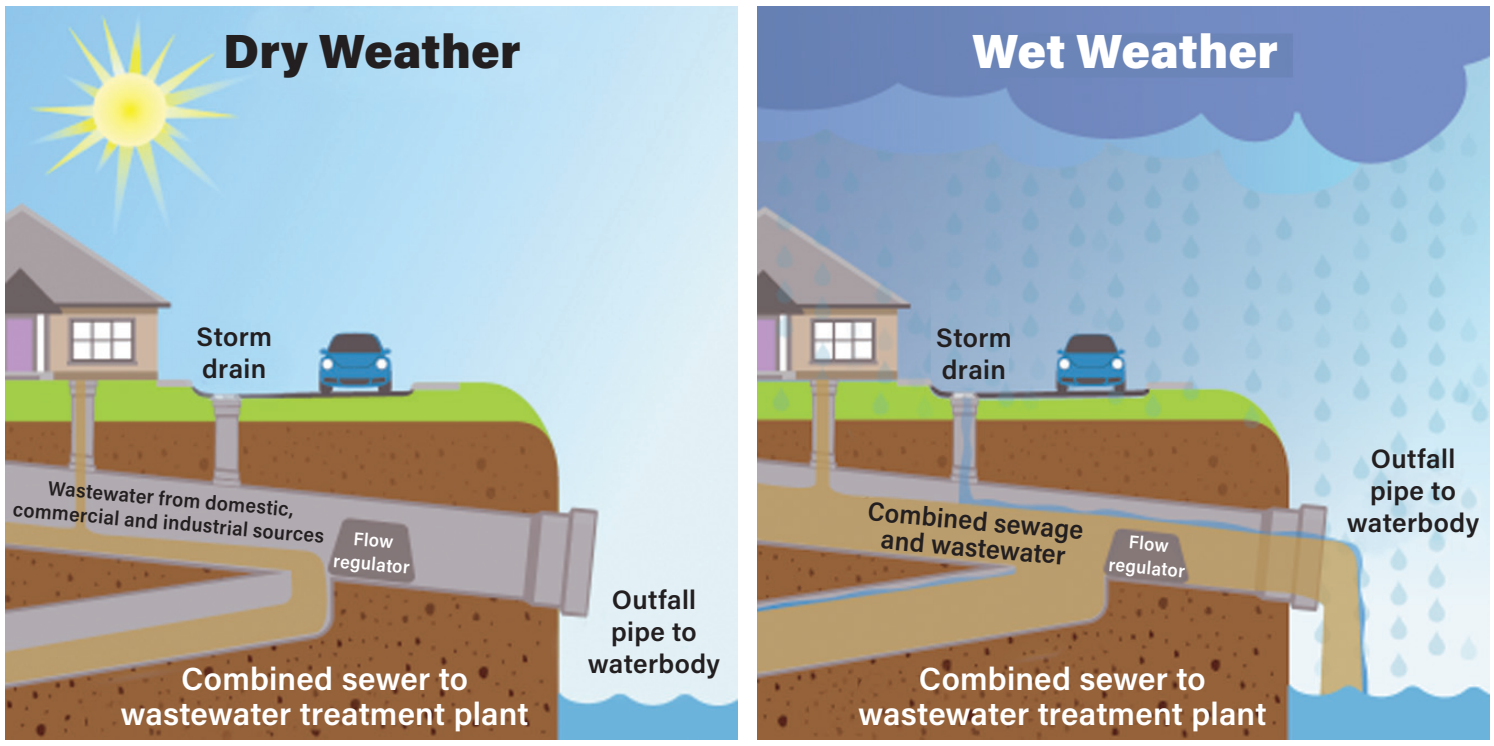
1,924
Acres of oyster reefs constructed in 11 Bay tributaries since 2014, making it the world's largest oyster restoration effort

1,927,940
Acres of impervious surface in the Bay watershed as of 2018 (4.6% of the total)

29
Species of waterfowl supported by the Bay ecosystem

8,000
Pounds of food web production needed to support 1 pound of commercial fish production

The journey of a raindrop



Many residents in the Chesapeake Bay region experience flooding from heavy rains. But how a raindrop flows down driveways and roads — and sometimes surges back up — isn't as easy to see.

In modern city water systems, a raindrop hits the pavement and rolls into the storm drain. From there, it flows to the nearest stream or river. Meanwhile, sewage heads to the treatment plant in a separate pipe.

But in older "combined" systems, rain mixes with wastewater in one pipe. To avoid backing up treatment plants during heavy rain, the mixture will flow over a short wall called the flow regulator. From there, the water, mixed with untreated sewage, falls into a nearby river or creek.

Cities built combined sewer systems in the mid- to late- 1800s because they were more affordable. Today, though, the systems are often overwhelmed by the increasing population and intense rain from climate change. ■

– L. Hines-Acosta

Graphic courtesy of the U.S. Environmental Protection Agency

bayjournal.com/podcasts

LOOKING BACK

30 years ago

146 bald eagles spend winter in MD

A midwinter survey found the highest number of bald eagles in Maryland since 1979. ■

— *Bay Journal,* March 1994

20 years ago

Bay cleanup effort needs huge boost

Bay Program figures showed that the cleanup pace would have to increase threefold to meet the 2010 restoration goals. ■

— *Bay Journal,* March 2004

10 years ago

Streamside tree plantings falter badly

Just 202 miles of forest buffers were planted in across the region in 2013, the lowest rate since 1998. ■

— *Bay Journal,* March 2014

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.

The *Bay Journal* is available in print and by email and is distributed free of charge. The print edition is published 10 times a year, and bundles are available for distribution at offices, libraries, schools, etc.

The Bay Journal News Service distributes *Bay Journal* articles and opinion columns for free use in hundreds of newspapers across the region.

Publication is made possible by grants, reader donations and advertising revenue.

Views expressed in the *Bay Journal* do not necessarily represent those of any funding agency, organization, donor or advertiser.

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Bay Journal writer Ad Crable led his 25th winter backpacking trip in early February, hiking and camping on Miller Mountain in Pennsylvania. (Erin Farmer)

Steep climbs, reflections and outreach

On the first weekend in February, *Bay Journal* writer **Ad Crable** marked an anniversary: leading a winter backpacking trip in Pennsylvania for the 25th time. Over the years, 55 people have followed Ad into the state wilds, on expeditions that involved two to 18 campers and a combined total of 355 miles. This year's trip provided fodder for a *Bay Journal* article about the conservation of Miller Mountain. It was a physical challenge, too, with an elevation gain of 1,300 feet in 2 miles. "Now that's steep," he said.

Congratulations are also due to staff writer **Whitney Pipkin**, who released her first book, *We Shall All Be Changed: How Facing Death with Loved Ones Transforms Us*, on Feb. 6. In it, she reflects on her experience as caregiver for her mother, who was diagnosed with terminal cancer, and shares hard-earned insights from her battle with grief. In the process, she invites readers to consider how discussions of death can lead to a richer life.

Other *Bay Journal* staffers were busy highlighting conservation issues with the public. On Feb. 16, photographer **Dave Harp**, along with Chesapeake Born columnist **Tom Horton**, shared the new *Bay Journal* film, *A Passion for Oysters*, with an audience of approximately 100 people at the Chesapeake Bay Maritime Museum in Solomons, MD.

Editor-at-large **Karl Blankenship** moderated an hour-long panel for approximately 120 people attending the quarterly meeting of the Virginia Soil Health Coalition on Feb. 14. The panel tackled questions about the Bay's future after the 2025 deadline for cleanup goals has passed, especially as it relates to the impact of agriculture. On Feb. 21, Karl shared his expertise on the topic with a presentation to the Eastport Sailing Club in Annapolis.

Meanwhile, **Lauren Hines-Acosta**, our newest staff member, has been attending policy events, meeting with nonprofit groups, delving into Bay science and penning short articles. Watch for more from Lauren in the months ahead.

— Lara Lutz

NEWS briefs

LOCAL
REGIONAL
NATIONAL

VA legislature pushes menhaden study to 2025

The Virginia House Rules Committee pushed a bill to the 2025 session on Jan. 29 that would have funded a three-year study on menhaden. The Rules Studies subcommittee voted on the bill with no discussion.

The bill directed the Virginia Institute of Marine Science and the state's Marine Resources Commission to study the ecology, economic importance and fishery impacts of menhaden in the Bay.

Menhaden is a food source for other wildlife in the Bay, like striped bass and ospreys. But anglers use them for bait and Omega Protein, a subsidiary of Canada-based Cooke Inc., uses them to make fish oil. The impact of the Bay's menhaden harvest, as well as which species prey on the fish and how much, has been debated for years.

In the Atlantic States Marine Fisheries Commission's latest report from 2022, the commission determined the species was not being overfished along the Atlantic coast. But there is little research that's specific to the Bay, and environmentalists worry that the industrial harvest there could decrease the food supply for wildlife.

To obtain data on the state of menhaden in the Bay, former Democratic Sen. Lynwood Lewis introduced a bill in 2023 that would have directed VIMS to begin the three-year study. But the House and Senate amended it to first assemble a workgroup and framework of the study. Members of the workgroup represent a variety of stakeholders, including recreational anglers, conservationists and the commercial fishery. *— L. Hines-Acosta*

Fox Island education center destroyed in fire

Authorities are investigating the cause of a fire that destroyed a former Chesapeake Bay education center cherished by generations of students and other visitors. The Fox Island structure, built in the 1920s as a rod-and-gun club, rested on pilings just above the Bay's lapping waves.

The Chesapeake Bay Foundation purchased the building and adjacent marshland in the 1970s, using the site as an education center until 2019. Over the years, tens of thousands of children and adults visited the island, lying just east of Virginia's Tangier Island, for extended immersions in nature. The remote location could only be reached by boat.

Erosion and sea level rise scoured away most of the island during the Bay Foundation's ownership. The group ended programming there out of concern for visitor safety. It sold the property in 2020 for $70,000 to a limited liability company, which reverted the facility back to a hunting lodge.

A fire on the night of Feb. 9 left little but singed pilings in its wake, according to photographs posted to social media. Virginia State Police and the Accomack County Sheriff's Office couldn't immediately determine the cause. *— J. Cox*

Mine drainage cleanup may turn PA stream into fishing spot

Nearly 20 years in the making, a $68 million federal grant will enable the construction of an acid mine drainage treatment plant to restore 20 lifeless miles of the Tioga River in northcentral Pennsylvania.

When in operation in 2026, it is expected to make the river — currently tainted orange by contaminants — an almost instant angling destination. The Pennsylvania Fish and Boat Commission has already signaled its intent to stock the river with trout, which will help boost the recreational potential of the area.

The grant was awarded to the Susquehanna River Basin Commission through the Bipartisan Infrastructure Law. State agencies and the nonprofit Tioga County Concerned Citizens Committee have been pushing to restore the river and its tributaries for two decades.

The treatment plant will collect acid mine drainage from five large, deep mine discharges and use 11 miles of pipe to deliver the water to the plant. There, the degraded water will be treated with hydrated lime slurry to increase the pH of the water and collect dissolved metals. The plant will treat up to 15 million gallons a day, though on average it is expected to handle 5.3 million gallons per day.

— A. Crable

VA, MD provide grants to remove invasive fish

Virginia Gov. Glenn Youngkin awarded $250,000 to Sea Farms, a family-owned and operated aquaculture and seafood processing business, on Jan. 29 as part of the state's Blue Catfish Processing, Flash Freezing, and Infrastructure

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briefs

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Grant Fund. It's focused on decreasing invasive blue catfish in the Chesapeake Bay and its rivers.

The Maryland Department of Natural Resources is also accepting grant applications to help remove blue catfish from the Bay and its rivers. It's open until April 15, and its grants are up to $5,000 each.

Blue catfish were introduced to the Bay in the 1970s as sportfish and now are top predators. They eat everything from menhaden to American shad to blue crabs. The species has spread into almost every major tributary in the Bay watershed.

The Virginia grant program was slated to receive $4 million last February but the amount dropped to $250,000 before the state voted on the budget in September. This year's award to Sea Farms used all the money in the fund. Virginia has not yet funded the program for a second year, said Michael Wallace, communications officer for the state Department of Agriculture and Consumer Services. However, there is a budget amendment aimed at funding the program with another $250,000.

The grant was made to help process the fish, which poses a bottleneck for commercial sales, said Virginia Del. Keith Hodges, R-68.

"I see them as the number one threat to the Chesapeake right now," Hodges said in the House Chesapeake subcommittee meeting on Jan. 29.

— L. Hines-Acosta

PA orders disclosure of fracking chemicals

Following up on a recommendation from a 2022 statewide grand jury report finding that Pennsylvania officials had failed to protect its residents from the health effects of the hydraulic fracturing of natural gas, Democratic Gov. Josh Shapiro has ordered fracking companies to identify the chemicals they use. The state will post the lists publicly.

Fracking involves the use of sand, water and chemicals that are injected underground to fracture rocks and release gas. More than 1,000 chemical mixtures have been used in Pennsylvania.

Debate has already arisen over the new rule's effectiveness in making communities near fracking wells aware of the chemicals that may be injected underground or brought to the surface as wastewater. Under the "Halliburton Loophole" passed by Congress, companies don't have to publicly disclose chemicals that are proprietary or considered trade secrets.

On request, the state had been able to obtain a list of all chemicals, even proprietary ones, as part of the preparedness plans for each site. But the lists were not made public. And in some cases, gas drillers purchase fracking mixes with elements not listed for trade reasons, so the drillers can't submit an accurate report.

The new rule requires gas drillers to submit a list of chemicals to be used before a well is drilled. But DEP said the loophole still applies, and chemicals the industry considers proprietary will not be disclosed to the public.

— A. Crable

Alexandria sewage cleanup might get extension

Virginia lawmakers are considering a measure that would push the deadline to fix Alexandria's combined sewer system to July 1, 2026. At press time, the state's Senate had not yet voted on the measure, which had been passed by the House.

Combined sewer systems capture both sewage and stormwater in their pipes. This means the system is often overwhelmed during heavy rain, and untreated sewage overflows into nearby rivers. Combined sewer overflows occur across the Chesapeake Bay watershed and are common in older Virginia cities like Alexandria, Lynchburg and Richmond. Modern systems handle sewage and stormwater in separate pipes.

In 2017, Virginia passed a law requiring Alexandria to overhaul its CSO by July 1, 2025. Alexandria Renew Enterprises, or AlexRenew, the local wastewater treatment facility in charge of the overhaul, asked for the extension. The facility cited supply-chain problems from the COVID-19 pandemic, the war in Ukraine and a concrete shortage in Virginia for its construction delays.

A 380-ton machine has for months been digging an underground tunnel for storing excess stormwater until it can be treated. That way, the overflow won't be diverted into and the Potomac River. So far, AlexRenew has used 64% of its budgeted $615 million. But, without the needed supplies, AlexRenew can't continue its tunnel-boring work.

Even with the one-year extension, Alexandria's deadline would still be one of the fastest timeframes in which a city has addressed its overflow problems.

— L. Hines-Acosta

PA's largest solar array begins producing power

The largest solar project in Pennsylvania, built on more than 1,755 acres of former farmland, is producing power.

The Great Cove Solar Project by AES Corporation, an energy company based in Arlington, VA, involves two sites in Franklin and Fulton counties that are now producing 220 megawatts of electricity, according to AES. The Solar Energy Industries Association says that's enough to power approximately 38,000 homes. Production began in December.

All of the power is being purchased by the University of Pennsylvania campus in Philadelphia and the University of Pennsylvania Health System.

The project broke ground at both locations in 2022. A 150-megawatt solar farm was built on more than 1,000 acres of farmland in Peters and Saint Thomas townships in Franklin County. A separate solar array was erected on 755 acres owned by six different landowners in Ayr Township, Fulton County.

— A. Crable

Navy to seek permit for Potomac River weapons testing

Decree resolves suit alleging clean water violations from projectiles, chemicals fired over river

By Timothy B. Wheeler

A dustup over the environmental impact of naval weapons testing in the Potomac River has been resolved, at least for now. The U.S. Navy has agreed to settle a lawsuit filed by two environmental groups over the long-running activity by applying for a pollution discharge permit.

A federal court in Maryland approved a consent decree on Jan. 10 that requires the Navy to apply for a permit from the Maryland Department of the Environment covering any munitions or other test materials that wind up in the river.

The decree resolves claims made in a lawsuit filed in June 2023 by the Potomac Riverkeeper Network and Natural Resources Defense Council. They contended that the Navy has been violating the federal Clean Water Act by firing munitions and releasing chemicals into the Potomac near Dahlgren, VA, without a discharge permit.

The Navy has used the Potomac for more than a century as a proving ground to develop and test small arms, large-caliber guns, explosives, lasers, propellants and targeting systems. The 51 nautical mile stretch of the river downstream from the Naval Surface Warfare Center, Dahlgren Division, has been the nation's largest over-water firing range, the groups' lawsuit said.

A 2013 environmental impact statement prepared by the Navy said it annually fires about 4,700 large-caliber projectiles from Dahlgren and sets off more than 200 explosions in the river. It also said it releases substances over the water 70 times a year on average to simulate chemical or biological attacks.

Until now, the activity has gone unregulated, the groups complained, even though they estimated the Navy discharged more than 33 million pounds of munitions into the river since test firing began in 1918. They contend the cannon shells and rockets contain toxic metals, solvents, explosives and other potentially harmful constituents.

The weapons testing at the Dahlgren facility stirred controversy a year ago when boaters and watermen learned of the Navy's proposal to expand its "danger zone" in the river for various testing activities, including the release of "airborne chemical or biological agent simulants, directed energy testing and for operating maned or unmanned watercraft."

Their initial concerns about the impact of repeated closures of the river to watercraft during testing shifted to water quality after Potomac Riverkeeper Dean Naujoks informed them about the volume and kinds of material the Navy had put in the river.

A Navy official initially maintained that the service did not need a permit and that the U.S. Environmental Protection Agency and Maryland and Virginia had concurred. But the environmental groups said that by law the service either needed a discharge permit or a presidential exemption from that requirement, neither of which it had.

In the consent decree, the Navy admits no wrongdoing but agrees to apply for a permit within 30 days. It also agrees to share with the environmental groups all unclassified or nonconfidential information it provides to MDE in its permit application. The groups reserve the right to oppose the permit. And U.S. District Court Judge Deborah Chasanow retains jurisdiction over the case until the final discharge permit is issued.

Virginia waterman Michael Lightfoot welcomed the settlement, saying he is "concerned about water quality and how it could impact our fish and crabs that enable our livelihoods."

Naujoks pledged to work through the state regulatory process "to ensure that Maryland issues a permit that fully protects water quality in the river."

The two environmental groups had also accused the Navy last year of violating the federal Endangered Species Act by not considering the impacts of its weapons testing on protected critical habitat for endangered Atlantic sturgeon. The Navy has agreed to study and consult with the National Marine Fisheries Service about whether its activities are harming sturgeon. ■

New Bay Program director takes over at critical time

Martha Shimkin draws on international experience to help forge path forward for Bay cleanup

By Karl Blankenship

As an avid hiker and bicyclist, Martha Shimkin follows the mantra of "leave no trace" when outside, but she also tries to go one step farther.

"I want to go beyond that and say not just 'leave no trace,' but 'how do I make it better?'" she said. That could mean picking up some litter or sprucing up a cabin along the trail.

Now, as the recently named director of the U.S. Environmental Protection Agency's Chesapeake Bay Program Office, she hopes to apply that philosophy to Bay restoration efforts.

"What we're really looking forward to is not just restoring and protecting and conserving but also handing up something to the next generation that is even better," Shimkin said.

The office coordinates state and federal efforts to restore the nation's largest estuary, and she is its fifth director or acting director in less than four years.

Martha Shimkin was named director of the U.S. Environmental Protection Agency's Chesapeake Bay Program Office in December 2023. (Will Parson/Chesapeake Bay Program)

Unlike her immediate predecessors, most of whom came from outside the program, Shimkin is already deeply involved in the state-federal partnership, having served as the Bay Program deputy director since May 2021.

As she put it, "I'm not hitting the ground running but rather continuing the sprint."

Mid-Atlantic EPA Regional Administrator Adam Ortiz chose Shimkin for the post in December, saying it was a "critical time for the Chesapeake Bay" and that her leadership "will be crucial in carrying that effort forward."

It is, as Ortiz said, a pivotal time for the 41-year-old partnership. Bay restoration progress has been made, but it has often been slow. That's led to frustration from many advocates, while others question whether some cleanup goals are achievable in a watershed that has seen significant population growth and development since efforts began in 1983.

Shimkin acknowledged some surprise that her career path led to the Bay Program. She is a native of Kansas who went to college at North Park University in Chicago, where she studied Swedish, German and business administration.

While there, she joined a service project that built a school in Haiti.

Afterward, she served with the Peace Corps, helping people with disabilities in Costa Rica before joining the EPA in Washington as a junior budget analyst working on pesticide programs.

"I thought I was in the extreme dorkiest position," she said. "I didn't want my friends to know I was the budget analyst for pesticides."

But she worked her way up, joining the agency's international office, where she was able to use her earlier experiences to negotiate an agreement with Central American counties to remove lead from gasoline, which would help improve the health of children.

That led to increased focus on child health initiatives. For six years she operated a consulting business that worked with United Nations agencies to protect children from environmental hazards. She then returned to the EPA, where she went on to hold several positions related to water, chemical safety and fiscal management.

It was partly her international work that led people several years ago to encourage her to consider working with the Bay Program, a voluntary partnership that makes decisions by building consensus among Bay states and the EPA.

"The reason … I was asked if I might be interested in the Chesapeake Bay Program is because of that international experience I have in negotiating, coordinating and finding consensus, knowing that everyone is kind of sovereign and on their own but that we have a common cause for the good," she said.

It is a uniquely challenging time for the Bay Program. Much of its work is guided by the 2014 *Chesapeake Bay Watershed Agreement,* which established 31 "outcomes" covering issues such as nutrient pollution, oyster restoration, tree cover in urban areas, environmental education, fish passage and others. Most were to be attained by 2025.

The program is on track to meet about half of those but will miss at least 10 — many by a wide mark — including key goals for wetland restoration, streamside forests and nutrient reduction.

It will be the third time the Bay Program missed a goal to reduce the amount of water-fouling nutrients that reach the Chesapeake. While reductions have been made, it is far short of its objective, and there is no clear trajectory to indicate that the goals could be attained in the foreseeable future.

A landmark report from the Bay Program's Scientific and Technical Advisory Committee last year noted that current programs and policies are unlikely to achieve nutrient reduction goals and that some of the water quality objectives may not be attainable at all.

It called for placing more emphasis on improving water quality and habitats in shallow water areas and tributaries where efforts would provide more direct benefit to fish, shellfish and other aquatic life.

Shimkin said that determining what happens after 2025 is the greatest challenge facing the Bay Program. She is co-chair of a 29-member committee tasked with making recommendations about what comes next — something sure to put her negotiating skills to the test. The committee could suggest modifying and extending some objectives and deadines based on new scientific information; recommend drafting a new Bay agreement; or offer ideas for something totally different.

"I think that coming out with a good solid recommendation that we all can get behind is the most daunting project before us, and the most important, for so many aspects of the partnership," Shimkin said.

In the meantime, she said, the goals of the 2014 agreement remain in place, and the EPA and states will continue striving to meet them.

"We do have an agreement," she said. "It doesn't expire in 2025. If we don't meet all the goals — and we've heard we won't meet all the goals — we will continue to work as hard as we can and keep going."

While there are challenges, she also sees opportunities. Record amounts of federal money are coming into the Bay region to bolster restoration efforts. And she sees establishing a clear path forward post-2025 as a chance to build broad support for Bay efforts not only among the states, but the public at large.

In the end — just as when trying to do better than "leave no trace" on a trail — she sees that effort as an opportunity to leave the Bay better off for future generations. "That's inspiring and motivating to me," she said. ■

‘Finally getting it’: Justice advocates applaud climate report

Update addresses environmental ills in low-income and historically marginalized communities

By Jeremy Cox

To “fully” combat climate change, policymakers at every level of government cannot ignore longstanding social and economic inequities. That would simply reinforce past injustices.

That, for the first time, is one of the major themes of the latest National Climate Assessment, the federal government’s periodic update on the nation’s response to warming temperatures, rising seas and other impacts of climate change. In the Chesapeake Bay region, environmental justice advocates and experts have taken notice.

“The fact that this ‘Social Systems and Justice’ chapter is the first ever included in a National Climate Assessment is remarkable and historic in and of itself,” said Marccus Hendricks, an urban studies and environmental planning professor at the University of Maryland. “It shows we’re recognizing at the highest level that environmental justice is a critical part of climate change.”

Queen Zakia Shabazz, who leads the Virginia Environmental Justice Collaborative, said the assessment signals that federal officials are taking justice considerations seriously.

“They’re finally getting it — what we’ve been yelling at the top of our lungs for so many years,” she said. “We need to take some action now, so we leave a safe world for those who are coming behind us.”

The assessment, released in November, is the fifth such report since 1990, when regular climate updates were mandated by Congress. Authored by governmental and scholarly experts, it represents the fullest scientific accounting of how a changing climate is changing America.

But an analysis by *Inside Climate News* found that inequities ingrained in climate change consequences have often been treated as an afterthought in previous assessments, with the terms “social justice,” “climate justice” or “environmental justice” barely mentioned in the lengthy documents.

In addition to the standalone chapter, the newest assessment sprinkles discussions of social and economic disparities throughout the text of chapters with titles such as “Water,” “Forests,” “Coastal Effects” and “Human Health.” For instance, a subheading in the “Air Quality” chapter states, “Air pollution is often worse in communities of color and low-income communities.”

Queen Zakia Shabazz of the Virginia Environmental Justice Collaborative applauds the authors of the Biden administration’s climate assessment for putting a stronger emphasis on racial and economic inequities. (Garrie Rouse)

In the “Social Systems” chapter, the authors describe how “growing evidence” points to the linkages between society and climate science. It noted that “conscious and unconscious tendencies and biases, and visible and invisible social rules” often distribute climate risks and benefits in inequitable ways.

Hendricks, the director of UMD’s Stormwater Infrastructure Resilience and Justice Lab, was among the chapter’s contributors. One of his biggest climate concerns for the Bay region, he said, is the growing risk of intense rainstorms. In many cities, the existing infrastructure was not designed to handle such flooding. Or sewer systems are failing because of their age. Or both.

“In our region, it’s only a matter of time before we face another catastrophic flood,” Hendricks said.

The assessment found that households inhabited by people of color or low-income residents are more susceptible to natural disasters, such as hurricanes, because of discriminatory practices that sorted them into riskier neighborhoods. Those past actions include predatory lending and redlining — the use of government maps from the 1930s–1960s to exclude Black residents from white neighborhoods.

In Norfolk, VA, the Ohio Creek watershed project seeks to address high-tide flooding, storm surge and shoreline erosion in a pair of predominantly Black neighborhoods. The project is touted as an example of climate resilience. (Submitted by VHB)

A report released by McKinsey Climate Analytics in November underscored those modern hazards. It found that in 11 southeastern states, including Virginia and Maryland, Black communities are 1.4 times more likely to experience extreme heat, with an average of 37 days a year of temperatures of 90 degrees or more compared with 27 days for white neighborhoods.

The report also suggested that those disparities extend to hurricanes. By 2050, the authors said, about 17% of Black-owned homes will be at risk of storm damage. That’s above the 10% risk for all property owners.

“It is clear that climate change will disproportionately impact disadvantaged communities across the United States because of relatively higher population concentrations in areas that are being impacted, existing inequalities that impact recovery and socioeconomic mobility,” said Munya Muvezwa, one of the report’s authors, in an email.

“As the need for climate adaptation continues to increase,” Muvezwa added, “it is imperative that we keep an acute focus on the impacts of climate change on Black lives and livelihoods in order to create an equitable path forward.”

Marginalized communities share many infrastructure ills: a lack of green space to soak up excess stormwater, spotty maintenance of storm sewers and a proliferation of pavement that amplifies heat. In places such as Baltimore and the District of Columbia, suburb of North Brentwood, Hendricks’ research has looked for climate solutions from the bottom up, seeking historical context and ideas from community members.

Shabazz cheers that approach. She has seen too much of the opposite, she said, even though “often times, the answers and the solutions are right there in the communities.”

The new climate assessment also promotes community collaboration. And it suggests a step-by-step process. The protocols include establishing well-defined, measurable goals; sharing technical information in accessible ways; and bridging ideological and cultural divides by emphasizing “the things people care about most,” such as their homes and investments.

As Shabazz sees it, Congress can put the climate assessment’s goals into action by passing the proposed A. Donald McEachin Environmental Justice for All Act. Named after the late Democratic congressman from Virginia who originally championed the bill, the measure would require regulators to consider cumulative impacts in permitting decisions and expand legal remedies for those facing disparate levels of pollution.

In an April 2023 executive order, President Biden called on his administration to enact several pieces of the proposal. But the bill itself has stalled, with Republicans’ control of the House making its demise likely.

Although the new climate assessment offers a roadmap for environmental justice, Shabazz said, it’s not enough to wait for government action. She became a prominent advocate against lead two decades ago after her son was diagnosed with lead poisoning.

“Gone are the days where we waited for someone to come in and save us,” she said. “We realize we can’t wait. We saw that with [Hurricane] Katrina. We saw that with Flint [MI]. We realize the onus is on us to save us.” ■

Group's VA headquarters designed to live with rising water

Elizabeth River Project expects new waterfront center to be swallowed by sea level rise

By Jeremy Cox

The massive cisterns and rooftop solar panels. The three-floor office building adorned with the eco-friendly touches. The native honeysuckle limbs bobbing in the breeze. The circular boardwalk and the floating shed.

Time is ticking down on their collective demise. And that's by design.

If all goes according to plan, the Elizabeth River Project's new $8 million headquarters is unlikely to survive much beyond 2085. As the water level of the adjacent creek rises in the coming decades, the Norfolk, VA, campus will slowly drown.

The Elizabeth River Project won't stand in the water's way. The group will deconstruct all of the buildings and clear away any pavement or foundations, except for a kayak launch or a floating dock to retain public access to the creek. The goal is to give the low-lying property back to nature.

The group's leaders say the complex, formally known as the Pru and Louis Ryan Resilience Lab and Learning Park, is intended to demonstrate to policymakers, builders and fellow landowners in one of the most vulnerable places in the country how to live with rising seas.

"This was a bet on the future," said Marjorie Mayfield Jackson, the group's co-founder and executive director. "We know 80% of wetlands around the area are expected to drown in the next 100 years. We used to be about fixing old problems and restoring wetlands that had been filled in. Now, we need to think of the future."

Life in the Chesapeake Bay region relies on its vast network of tidal marshes. They help filter pollutants from stormwater. They provide valuable habitat for birds and fish. And they act as buffers against erosion during strong storms.

But, according to the U.S. Army Corps of Engineers, Norfolk is surpassed only by New Orleans as the place most endangered by sea level rise nationally. Experts blame the slowing of the Gulf Stream for piling more water along the Virginia coast. On top of that, the ground is sinking because of substantial groundwater withdrawals and the ongoing subsidence of the Earth's crust in response to the retreat of the Ice Age's glaciers.

If the marshes in Norfolk and other urban areas are going to win their race against rising seas, they will need space to migrate to the higher ground to behind them, Mayfield Jackson said. But they can't do that if a building or a steel bulkhead is blocking the way.

Victoria Dunch, Casey Shaw and Marjorie Mayfield Jackson (left to right) of the Elizabeth River Project explain the resilience features of the group's news headquarters and "learning lab." (Lauren Hines-Acosta)

Across the Hampton Roads region, shipyards, factories and homes crowd most of the shoreline. As Mayfield Jackson and her colleagues see it, the situation demands a new way of developing in the floodplain.

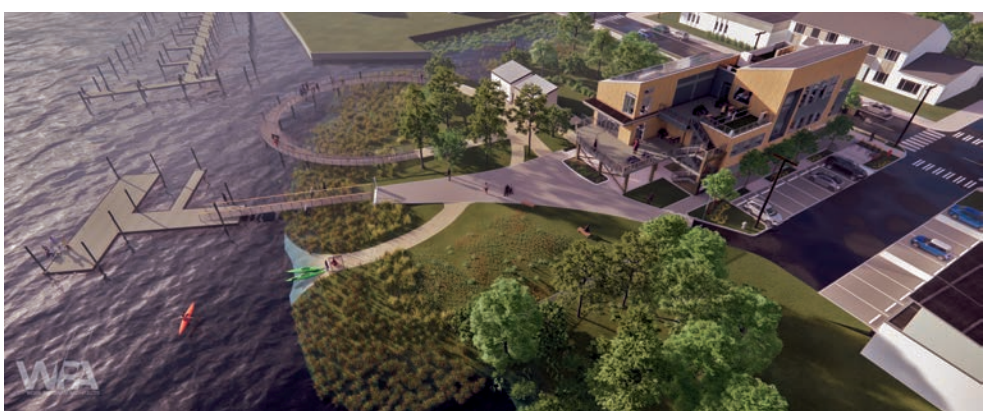
Former Virginia First Lady Pamela Northam, now a science educator for the Elizabeth River Project, said she views the resilience lab as a "beacon of hope."

"We know sea level rise is coming," she said. "We're dealing with it already, so what are we going to do about it? That's what gives me hope about this place."

The project kicked off in 2019 with the group's board members, Old Dominion University engineering students, Hampton University architecture students and Norfolk officials participating in design talks. The organization settled on the 0.75-acre site of an old marina in a bustling business corridor along Knitting Mill Creek, a tributary of the Elizabeth River.

The resilience lab serves as both 6,500 square feet of office space for the nonprofit and a waterfront learning environment. The ground level is open on the creek side to allow storm-whipped floodwaters to sweep in and out. The first finished floor is perched on pilings more than 10 feet above the floodplain. The "learning park" has a boardwalk, a floating dock, permeable pavers and native plantings still taking root.

What about that promise to cede the property back to nature? What is holding the organization — or potentially anyone else with similar aspirations — to that pledge?



An artist's rendering of the Elizabeth River Project's headquarters. (Courtesy of Elizabeth River Project)

That would be a "rolling conservation easement," believed to be the first of its kind in the country. The concept is borrowed from traditional conservation easements, which are voluntary but legally binding agreements wherein landowners agree to end or limit development, often in exchange for tax incentives. The Coastal Virginia Conservancy will hold the easement, and the estimated tax credit is at $585,000. The savings will help pay for the removal of structures and cover a fee to the conservancy for managing the easement.

As sea level rises, the easement will trigger increasing levels of maintenance and demolition to make room for migrating wetlands. Those actions will be set into motion by water levels recorded by a new tide gauge on the property.

The final demolition is designed to happen when the water rises about 5 feet higher than its current height. That's expected to occur around 2085, said Molly Mitchell, a Virginia Institute of Marine Science coastal expert who advised the environmental group on the project. "This is demonstrating an important concept that our shorelines are changing," she said.

Wetlands Watch, another Norfolk-based conservation group, devised the easement over three years of consultations with climate researchers and legal experts.

Wetlands Watch executive director Mary-Carson Stiff said she envisions rolling easements as a lifeline for owners of existing homes in flood-prone areas. "It basically gives them an out," she said, "when their property becomes so inundated from sea level rise or storms that they then agree to demolish the structure."

On a morning in late January outside the resilience lab, the end seemed sooner rather than later. It hadn't rained, but many low-lying parts of the city were underwater. The cause: An unusually high tide and a northerly wind had sloshed brackish water into low-lying parts of the city. Such "nuisance flooding" is cropping up more often as sea level continues to rise. Within view of the lab's shoreline, water stood so deep on the street on the opposite side of Knitting Mill Creek that passing cars left huge rooster tails in their wakes.

Nonetheless, Mayfield Jackson was optimistic about her investment's future.

"It's not designed to fail," she said. "It's designed to succeed for a long time." ■

Long-banished use of controlled burns is returning to PA

Managed fire embraced again as strategy for renewing habitat, supressing invasives

By Ad Crable

The deliberate, controlled burning of forests and grasslands is spreading across Pennsylvania, sweeping away policies that had mostly banned such fires for fear they would destroy everything, including wildlife and mature trees.

With those notions debunked, state agencies and land trusts in the state are increasingly using controlled burns, also known as prescribed fires. It's a practice once used by Native Americans who intentionally set fires to boost wildlife populations. Early settlers followed suit, using fire to create grasslands for livestock and nurture plants and trees they needed for food and lumber.

Later, it was common for railroad companies to set blazes along tracks to prevent the growth of vegetation that could catch fire as coal-fired trains barreled by.

But most forest fires in Pennsylvania until recent years were only those accidentally set by careless humans or their equipment.

The new wave of controlled burns is creating more diverse and healthier forests, beating back invasive species such as multiflora rose and barberry, reducing the threat of wildfires from droughts, baked soils and other ills made worse by climate change. The fires also increase food and shelter for wildlife.

Some vegetation — pitch pines and scrub oaks, for example — evolved with regular fire burning, and reproduction actually depends on the heat from flames. Native plants and grasses such as clasping milkweed, sundial lupine and little bluestem thrive in fire-adapted ecosystems.

Fires provide a reset on serpentine barrens where lack of fires enable other species to overwhelm native plants.

"These ecosystems are meant to burn so they come back greener, lusher, healthier and more resilient than if we had never conducted the burn," said Scott Bearer, chief of habitat planning for the Pennsylvania Game Commission.

And, by burning the accumulating dried leaves and branches, there is less on-the-ground fuel available for wildfires. Pennsylvania is not known for large wildfires like those in the West, but more occurred in the first six months of 2023 than in all of 2022. The Crystal Lake Fire burned more than 4,000 acres in the northeastern part of the state and temporarily closed the Pennsylvania Turnpike.

In 2023, the Pennsylvania Department of Conservation and Natural Resources conducted 1,471 controlled burns on state forests and state parks. One focus is to keep oak trees — among the most valuable trees for wildlife and commercial timber — from being outcompeted by maple and birch trees. Oaks have a deeper tap root and can survive a fire while other species cannot. Moreover, timed burning can clear the forest floor of leaf litter and expose nurturing mineral soil right before a good oak acorn crop.

The Pennsylvania Game Commission burns about 20,000 acres annually on its 1.5 million acres of state game lands, mainly to benefit wildlife and more broadly to "restore ecosystem health." The commission has 150 burns planned now and is just waiting for suitable weather.

Since 1993, the Nature Conservancy, a nonprofit land trust that has played a major role in the comeback of prescribed fires in the state, has led burns on 15,500 acres of its preserves and on land managed by other partners.

"While fire isn't a cure-all, it can abate many invasive species issues, increase plant diversity and resilience to future climate shocks and provide forage for endangered and failing insect, bird and animal populations," said Stephen Ruswick, the conservancy's land steward and fire specialist in Pennsylvania and Delaware.

Top left photo: Grass is intentionally ignited to improve wildlife habitat and plant diversity on State Game Lands 226 in Pennsylvania. (Stephen Ruswick/Nature Conservancy)

Top right photo: Wild lupine, which needs fire to germinate seeds, grows in Pennsylvania after a controlled burn. The plant is an important host for native butterflies. (Stephen Ruswick/Nature Conservancy)

Bottom right photo: A controlled fire removes invasive plants at the Nature Conservancy's West Branch Forest Preserve in Clinton County, PA. (Stephen Ruswick/Nature Conservancy)

A controlled burn is used at Fort Indiantown Gap in Pennsylvania to create habitat for regal fritillary butterflies and other pollinators, as well as to prevent wildfires from military weapons. (Joseph Hovis/ PA Department of Military and Veterans Affairs)

"In Pennsylvania, burns have grown significantly in the last decade, largely because it wasn't that long ago that you simply couldn't burn without facing extreme liability," said Kip Adams, chief conservation officer for the National Deer Association.

The two groups are part of the Pennsylvania Prescribed Fire Council, a public-private partnership formed in 2007 to increase the use of controlled burns statewide. Among the members are state and federal agencies, Longwood Gardens, the National Wild Turkey Federation, Pheasants Forever and the Ruffed Grouse Society.

As a first step, they got state lawmakers to pass legislation in 2009 that encouraged controlled burns as a forest management tool. The law gives public agencies and nongovernmental organizations with trained "burn bosses" protection from liability and prosecution if fires get out of control.

"When I started being a burn boss before the legislation, every new site was a battle. You had to get fire companies involved," said Pat McElhenny of the Nature Conservancy. "Now, people understand better."

Burns heat up

The use of controlled burns in Pennsylvania forests may now take another leap forward.

In January 2024, the Pennsylvania Prescribed Fire Council announced a training program in which private landowners, land management consultants and others can get trained and certified to conduct burns, as well as obtain a burn permit and be protected from liability.

This is a significant development because 70% of Pennsylvania's forests are privately owned. Any private landowner can legally burn his or her property, but they would be liable for damages and even prosecution if a fire went out of control.

Initially, the fire council will manage testing and certification. Eventually, DCNR will conduct the program.

"We know there's a need. We get calls from folks who either want to [conduct] burns themselves, or from hunt clubs," said Pat McElhenny of the Nature Conservancy.

The group has offered two "Learn and Burn" seminars to gauge interest. Both were sold out.

Todd Breininger, a program specialist in DCNR's Division of Forest Fire Protection, said the opportunity to educate and train private landowners is key. In southern states, for example, controlled burns are part of the culture and a mainstay in managing both public and private forests. Of the 9 million acres of forests burned under controlled conditions annually in the U.S., about 6 million acres are in the Southeast.

"I think [the new program] is really going to increase the amount of prescribed fires within the state," Breininger said.

Fighting headwinds

One of the first large controlled burns to be established and repeated year after year in Pennsylvania has a strange origin.

At Fort Indiantown Gap, a 17,300-acre Pennsylvania National Guard and military munitions training ground north of Harrisburg, live firing from tanks, bombs and artillery were touching off wildfires on the base's vast grasslands.

So, beginning in 1998, controlled burns were used to reduce the dried fuel that could combust. Not only did the method prevent fires, but the burns combined with earth disturbances from military maneuvers to help restore one of the largest sections of grassland and early successional forest in Pennsylvania.

One celebrated benefactor is the regal fritillary butterfly, which is found nowhere else on the East Coast.

Butterflies notwithstanding, until the late 1990s, the pervasive view across Pennsylvania was to make intentional burns taboo. Many thought you couldn't burn forests without killing most of the living things in it, including wildlife.

Even today, 911 calls from residents seeing smoke and flames in a forest can hinder controlled burns. And agencies still field concerns that the burns kill the forest's inhabitants.

Not true, land managers patiently respond. Burns are carefully planned, highly orchestrated events. The noise of burn crews moving into the woods or fields flushes most wildlife out of the area. Escape lanes are planned into the burn. The fires are set in stages.

Unlike wildfires that can race from treetop to treetop, controlled burns are slow affairs, mostly impacting the understory.

Snakes crawl under rocks, and deer, turkeys, squirrels and mice run away. "These aren't scorched-earth types of practices. Maybe it looks black and scorched immediately after the fire, but we see wildlife using these areas right after the fire," said the Game Commission's Bearer.

A drone equipped to start a controlled fire hovers over state game land in northeastern Pennsylvania. (Stephen Ruswick/Nature Conservancy)

Fire burns on the Scotia Barrens, part of State Game Lands 176 in Centre County, PA. The pine and scrub oak forest would disappear without periodic burning. (Stephen Ruswick/The Nature Conservancy)

High-tech burns

Modern controlled burns have evolved with technology that has made them more efficient in shaping the environment and safer for fire crews.

Ignition moved from handheld drip torches to helicopters and now drones, which are cheaper than helicopters and can fly much lower. On command, drones drop small balls known as dragon's eggs that catch on fire 15–30 seconds after hitting the ground. Flames reach a controllable 3 inches or so. Drones also act as eyes in the sky and can accurately monitor a fire's progress.

Many controlled burns must take place during a narrow seasonal window — usually spring, when desired vegetation is still dormant — that includes a specific temperature, humidity, wind speed and direction.

Fire crew safety is one consideration, but there are others. "We don't want to blow smoke into a community or across Interstate 80," Bearer said. "We may need a really hot fire to blow open those pitch pine cones, or we may want to kill many maple trees but not damage the oak."

Fires may be set on the landscape at different times of the year to rid the landscape of certain species or to help others reproduce. For example, invasive species, not having evolved in the area, may still be growing and can be killed by an early winter fire when native vegetation is already dormant.

Advancing technology, the realization that fires can be good for a forest, and legislation that embraces the benefits of fire are together bringing back a long-banished tool in Penn's Woods at a time when the landscape is struggling.

Erica Smithwick, director of the Earth and Environmental Systems Institute at Penn State University, believes it's a necessary move. "We have to learn to live with fire," she said. ■

Park honors Frederick Douglass and the land he loved

Visitor center, tower expected to draw local, international tourists

By Jeremy Cox

At the confluence of the Norwich and Tuckahoe creeks in Maryland, a community park is undergoing a transformation. Beneath an inviting canopy of American beech trees, tulip poplars and sycamores, visitors can now experience a different kind of confluence: a mingling of history and nature.

The 107-acre park in Talbot County on Maryland's Eastern Shore is devoted to communicating the story of famed abolitionist, orator and native son Frederick Douglass.

The county park has been open since 2020. There is a sign summarizing Douglass' biography, a short walking trail, a pollinator meadow, a handful of parking spaces and a portable toilet. But if local officials have their way, more will be on the way soon — much more.

A computer-animated video accompanying a 2021 master plan depicts a series of attractions that would rival those of just about any national park. Visitors would encounter an ultramodern observation tower; a 25,000-square-foot visitor center constructed from concrete, granite, steel and glass; and a memorial courtyard with quotes from Douglass' writings displayed on metal or stone slabs.

The loftiness of the county's aspirations is reflected in the projected price tag: $120 million.

If the finished version approaches anything close to the architectural drawings, it will be a site of international significance, said Cassandra Vanhooser, director of Talbot's tourism and economic development department.

"On Frederick Douglass' 200th birthday on Feb. 14, 2018, we broke ground on this park," she said. "Every day since then, I have worked on it."

To help guide the project, the county has established a permanent advisory committee that includes residents, local officials and Douglass' descendants.

The master plan was the product of two years of public meetings and consultations with experts in the environmental, tourism, historical and landscape architecture fields.

As part of that effort, the Northern Virginia firm Design Minds developed an interpretive plan. It declares that the park "should attract both domestic and international tourists as the only unique location to tell the story of Douglass' childhood." The site is perched along Tuckahoe Creek just less than 2 miles upstream from Douglass' birth site, which is on private property.

Cassandra Vanhooser, tourism director for Talbot County, MD, visits Frederick Douglass Park on the Tuckahoe River. (Dave Harp)

A fox trots along the shoreline at Frederick Douglass Park in Talbot County, MD. (Dave Harp)

The park is nestled in a rural setting a few hundred yards south of the town of Queen Anne. For tourists traveling toward Delaware's beach resorts, getting there only requires venturing about a mile off Maryland Route 404.

This is a critical time for the project, Vanhooser said. The county has invested $300,000 in state economic development grant funding toward developing a final engineering and interpretation plan for what is dubbed "phase two" of the project. That plan is scheduled to be completed by the end of the year.

The county has tasked its authors with answering several questions, including how much of the site can be developed without undermining its environmental value, Vanhooser said.

It also will provide a clearer cost estimate. The master plan suggested a preliminary phase-two budget of $2 million, which would pay for a pair of platforms overlooking the adjacent waters, a kayak launch, a covered pavilion, brick-and-mortar restrooms and a fully realized walking trail. It won't include the grander elements of phase three, such as an observation tower ($20 million) and a visitor center ($37 million).

The county purchased the former farm property for $1.8 million in 2006 with funding from the Maryland Department of Natural Resources' Program Open Space. At the time, officials wanted to transform it into a park with a working farm for educational purposes. But that plan never materialized, leaving the acreage to lie fallow for several years.

"It was just kind of open space," said Preston Peper, the county's director of parks and recreation. "People could come out here, but there really wasn't anything to do. Birders came out here, and we probably had some [unauthorized] hunters..."

The idea of memorializing Douglass came to Vanhooser when she and her colleagues were preparing celebrations to mark the 200th anniversary of his birth. Although the site doesn't encompass his birthplace, it offers hundreds of feet of frontage on the creek where the young Douglass would have traveled many times.

Douglass only spent the first six years of his life in the area before he was taken about 12 miles away to toil in slavery. But his memories of growing up along the Tuckahoe under the care of his grandparents, Betsy and Isaac Bailey, left such an indelible mark that he addressed them in all three of his autobiographies. One of the strongest of those was of watching farmers hauling grain to be ground into meal.

In his biography of Douglass, Dickson Preston wrote, "Frederick Douglass' memories of the cabin and his life there were idyllic, and he recalled it as a wild and free existence totally unlike anything he would ever experience as he grew old enough to grasp the implications of what it meant to be a slave."

His daring escape from slavery and written account of it set him on a course toward becoming one of the most influential Americans of his time. Several monuments and historical sites have been established in his honor, including his home-turned-museum in the District of Columbia's Anacostia neighborhood and a bronze statue in New York City's Central Park.

In his native Talbot County, Douglass is commemorated by memorials such as a road sign marking the location of his birth, a statue on the courthouse lawn and a small park in St. Michaels. Because the latter had already taken the name Frederick Douglass Park, the newer facility bears the somewhat more cumbersome moniker of Frederick Douglass Park on the Tuckahoe.

One of the site's greatest assets is its undeveloped nature, said Will Saffell, a scientist with Environmental Systems Analysis, a firm consulting on the park project. The property and surrounding landscape have changed little since Douglass' day.

During walks along the undulating terrain, he has found himself enthralled by the sight of rare orchids and trees old enough to have swayed in the same breezes that touched Douglass's skin.

"It's very rare where we find ourselves in such healthy systems," Saffell said. "I've never seen such a diversity of healthy plants and communities." ■

Oyster rebound undercut by returning diseases, weak market

Higher salinity boosts reproduction, but also triggers MSX, Dermo

By Timothy B. Wheeler

Oysters have been enjoying a run of good news lately, suggesting that the Chesapeake Bay's keystone species is on the rebound after decades of decline and stagnation. There are a couple of clouds on the horizon, though, that could derail that upward trajectory.

In January, the Maryland Department of Natural Resources announced that its annual fall survey of oyster reefs found a bonanza of juvenile bivalves on the bottom of the Bay and its tributaries. The density of fingernail-size "spat" found in the dredged samples was the fifth highest in the last 39 years, DNR reported.

Not only that, but the survey crew found recently spawned oysters in places where they've been scarce for a long time, including the Potomac River and two of its tributaries: the Wicomico River and Breton Bay. The Patuxent and Tred Avon rivers also received what DNR called once-in-a-generation crops of juvenile oysters. The DNR crew found spat on 50 of 53 "key" reefs that are sampled every year around Maryland's portion of the Bay — a breadth of distribution not achieved since 1985.

With 2023 marking the fourth consecutive year of above-median spat production, DNR called it a promising sign that the costly, long-running effort to restore the Bay's historically depleted oyster population is finally bearing fruit.

But most of the credit for the spat proliferation goes to the weather. The lack of rainfall in 2023 reduced the flow of freshwater from rivers into the Bay. That raised the Chesapeake's salinity above average, providing an ideal condition for oyster reproduction.

The state's watermen have likewise enjoyed four straight years of increasing harvests. They landed more than 700,000 bushels in the 2022–23 season, the most in 36 years, with a dockside value of more than $30 million.

As a point of reference, Maryland's wild harvest bottomed out in 2004 at 26,000 bushels. That was largely the result of two oyster diseases that flared up in the 1980s and devastated the bivalve population until about a decade ago.

Jennica Moffat (left), Jen Walters and Eric Amrhein from the Oyster Recovery Project monitor oysters taken from the Tred Avon River oyster sanctuary near Oxford, MD, in 2022. (Dave Harp)

A shucked oyster at Wittman Wharf Seafood in Wittman, MD. (Dave Harp)

Those diseases, Dermo and MSX, have quieted down but linger in the Bay. They tend to revive when water salinity is elevated, as it was last year.

For the first time in six years, DNR's reef survey last fall detected above-average prevalence and intensity of Dermo. More than 60% of the oysters tested for the disease in a laboratory had it. The heaviest infections tended to be from the Choptank River south, tracking with increasing salinity down the Bay.

DNR said in January that it was still checking oysters for MSX, but results from just eight sampled reefs showed an "alarmingly high prevalence" of it.

Neither disease can be passed to people, but both can kill an oyster before it grows to harvestable size, or even before it can spawn for the first time. DNR's survey found more than half the oysters dead on one reef in the mouth of the Choptank, with mortality ranging from 21% to 50% down the Bay from there, although it was less severe in several of the tributaries.

Watermen say they're seeing more "boxes" or dead oysters in their dredges and tongs, making it harder to harvest their limit. They're also getting paid less this season than last, by at least $5 per bushel. And on top of that, there have been days when seafood dealers or oyster-shucking houses have declined to buy watermen's catch at any price.

"In spite of modest numbers of oysters, we have next to no market and the prices [are] down from previous years," said Ed Farley, captain of the oyster-dredging skipjack *H.M. Krentz* in a mid-February text. Calling it a crisis, he added that he and his crew "only worked one day a week for the previous two weeks." That was also the case in the first week of January and for a period after Thanksgiving.

Skipjacks are permitted to harvest up to 100 bushels per day but can only do so under power two days a week. The other three days, they can only harvest under sail, a method hampered by rough weather that is less efficient even in the best conditions.

"Last year I sail dredged a lot," Farley recalled, "and did really well with it. But this year I haven't even got all the push days in."

J.C. Hudgins, president of the Virginia Waterman's Association, said that there's been some "dead loss" from diseased oysters in his end of the Bay, and "the market's been slow the whole year." Even so, his members still hope to do at least as well this season as last, when they too landed a 35-year record harvest from public oyster grounds of 300,000 bushels. Another 400,000 bushels came from oysters grown on bottom or in waters leased by the state.

Robert T. Brown Sr., president of the Maryland Watermen's Association, said the supply of oysters is simply exceeding the demand, especially with food prices higher as a result of inflation.

"Seafood is a luxury, not a necessity," he said. "There's a lot of people who just don't have the money for it."

Some think the problem runs deeper, reflecting long-term changes in public attitudes about cooking or eating oysters. Others blame competition from oysters harvested in the Gulf of Mexico for glutting the market and driving prices down.

Actually, said Matt Parker, an aquaculture business specialist with the University of Maryland, "Nobody really has a good understanding of the oyster market and what's going on nationwide."

Even so, Bill Sieling, executive director of the Chesapeake Bay Seafood Industries Association, said he and a few others concerned about the issue met recently to brainstorm ways to sell more oysters, either by marketing them in new places or in new ways.

"There's a lot of reasons this product should be enjoying a renaissance in demand," Sieling said, "but it isn't happening."

Despite the positive survey news, the Chesapeake Bay Foundation cautions that the oyster's apparent rebound is at a critical juncture, facing long-term challenges from climate change as well as near-term threats from disease and overharvesting. More needs to be done to ensure their recovery continues, it said.

The foundation released a report in mid-February calling for Maryland and Virginia to target 20 more Bay tributaries for large-scale oyster reef restoration, on top of the 10 projects now nearing completion. It also called for expanding aquaculture in Maryland and improving oversight and management of the wild fishery in both states.

"We've been blessed the last couple years with really good spat sets and harvest," said Chris Moore, the foundation's Virginia executive director. "We know we're not going to have those all the time." ■

Striped bass harvest restrictions trigger widespread impact

With Bay reproduction flagging, Atlantic fisheries commission acts to reduce fishing pressure

By Timothy B. Wheeler

Charter boat customers haul in a catch. New curbs on recreational and commercial fishing for striped bass in the Bay and along the Atlantic coast are set to take effect May 1. (Will Parson/Chesapeake Bay Program)

It's going to be a lean year for those who like to catch or eat Atlantic striped bass — with perhaps still leaner times to come.

The Atlantic States Marine Fisheries Commission, which regulates inshore fishing for migratory species, has ordered new curbs, starting May 1, on both recreational and commercial catches of the popular finfish, also known as rockfish in the Chesapeake Bay region.

Amid persistent signs of trouble with the species, the commission's striped bass management board decided Jan. 24 to limit all anglers in the Chesapeake and its tributaries to landing one striper a day, and only if it's between 19 inches and 24 inches long. Ocean anglers likewise can keep just one fish a day, but with a narrower legal-size window of 28 to 31 inches.

Maryland and Virginia watermen, meanwhile, face a 7% reduction in their allowed commercial harvest of the fish.

The board ordered those curbs with the hope of restoring the species' abundance after a worrisome decline in recent years. Whether this will be enough for the struggling species to rebound is a toss-up. Equally uncertain is how many people who now earn a living pursuing them will be able to do so in years to come.

One of the most sought-after commercial and sport fish in the Bay and along the coast, striped bass range the Atlantic from Canada to the Carolinas. The Chesapeake serves as the primary spawning and nursery ground for 70–90% of the coastwide population. For five straight years, they've suffered from poor reproduction in Maryland's portion of the Bay and its tributaries, with below-par spawning reported last year in Virginia.

The commission had already tightened catch limits after scientists warned in 2019 that striped bass were being overfished and that the number of adult female fish had fallen below what is needed to sustain the population. Scientists noted then that the widespread practice of catch-and-release fishing was killing a significant number of striped bass, especially in summer when warm water temperatures and lower oxygen levels further stress fish that are caught and handled.

After cutting recreational catches to one fish a day virtually everywhere, East Coast fishery managers thought that would be enough to eventually restore the population. They were jolted last year when surveys indicated the estimated recreational catch had nearly doubled in 2022.

In response, the commission took emergency action in May 2023, imposing a 31-inch maximum size limit on all recreationally caught fish. That was an interim measure to protect fish spawned in 2015, the last year of abundant reproduction. But managers agreed then that more curbs likely would be needed to help the fish back reach a sustainable level by the legally mandated deadline of 2029.

This is not the first time the Bay's rockfish have been in trouble. Fishing pressure whittled away at the population until the early 1980s, when surveys found few juveniles in the Bay. In 1985, Maryland imposed a moratorium on recreational and commercial harvests, and Virginia followed suit a few years later. The stock rebounded quickly, allowing limited fishing to resume in 1990.

The situation now is not as dire as it was then, but fishery managers and conservationists say they are determined not to let it go that far.

Strong reactions

Few decisions by the Atlantic states commission have generated as much public debate as the menu of recreational and commercial catch cuts that it weighed prior to the January meeting. Nearly 700 people spoke at 15 hearings in 13 states in November and December; the commission also received more than 2,800 written comments.

The debate continued during the board's five-hour January meeting in Arlington, VA, as commission members from different states pondered how to spread the pain of reducing the catch.

The new recreational catch size "slots" were chosen with the hope of conserving two groups of fish: those not yet old enough to spawn and larger ones that are prolific spawners.

The board's scientific advisors project that the new size restrictions will reduce the overall recreational catch of striped bass by 14.5%. For Maryland's charter fishing industry, though, the cutback will be more severe because until now their customers have been allowed to keep two fish a day.

That's been a sore point with many sports anglers, who pressed the board to impose a one-fish limit across the board this year, with no exceptions.

Mike Luisi, a commission member and fisheries manager with the Maryland Department of Natural Resources, warned that cutting the state's charter boat clients' catch to one fish a day "will put people out of business." He tried, without success, to persuade the board to soften the economic impact on the for-hire fleet or place some less onerous alternative restriction on them.

Others, though, insisted on a uniform one-fish daily limit in the Bay and coastwide.

"The dark days are coming," warned David Sikorski, a commission member and executive director of the Coastal Conservation Association of Maryland. "It's time to buck up [and] reduce fishing mortality."

The striped bass management board also struggled over what do about the commercial harvest.

Some members, heeding appeals from recreational anglers, wanted to cut the fishing industry's catch quota by 14%, roughly on par with the recreational reductions

they'd agreed to. But others argued the industry shouldn't pay for the excesses of recreational anglers along the Atlantic coast, who had been mainly responsible for the big increase in estimated fishing mortality. More than half of the 2022 recreational catch came from New Jersey and New York, the commission said, with just 20% from the Bay.

"The problem is not with the commercial fishery," argued Robert T. Brown Sr., president of the Maryland Watermen's Association. Commercial fishing is tightly regulated, he pointed out, with each fish caught, tagged and accounted for, and the catch quota already reduced in previous years. The recreational fishery accounts for 90% of the coastwide loss of striped bass, commission estimates show, though in the Chesapeake, commercial harvest accounts for more than one-third of the total catch.

In the end, the board compromised on a 7% reduction in harvest quota.

"The commercial fishery is responsible for some mortality of striped bass, and I believe they should pay into what's needed to restore [the population]," said Jeff Kaelin, a commission member from New Jersey.

Charter boat impacts

But in ordering that the cut take effect May 1, the board made it difficult if not impossible for Maryland and Virginia to comply. The 2024 commercial fishing season for striped bass is already underway in both states, and fishery managers said they had already distributed fish tags to individual license holders based on the previous year's quota. If watermen catch what they've been authorized to take by virtue of the tags, they'll exceed the new quota and be penalized by having their allowable catch reduced that much more next year.

After the commission meeting, Brown was resigned to the cutback.

"It could be worse," he said. "But we'll live with it."

Brian Hardman, head of Maryland's charter boat association, said he expects at least some of the state's 377 for-hire fishing businesses to founder. He said many clients won't be interested in going out for just one fish, and some repeat customers have already called to cancel bookings for this year.

"If we had a whole host of other fish to fish on, we would have other options," he said. But with business already down from what it had been before the pandemic, Hardman predicted bookings would decline another 35–50%. "How long can we sustain that?" he asked.

The Maryland charter fleet reported catching 101,000 striped bass in 2022,

Fisheries biologists with the Maryland Department of Natural Resources survey and tag striped bass in the Chesapeake Bay each year to survey the species' population. (Stephen Badger/MD DNR)

according to state data. That's a tiny fraction of the total recreational catch of around 3.4 million fish in the Bay and coastwide that year, according to estimates drawn from voluntary angler surveys.

"We're the smallest user group and catch the least amount of fish," Hardman said. "You can't solve any problems on our backs."

Luisi of the state Department of Natural Resources had, to no avail, asked the striped bass board to delay the charter industry's one-fish-per-customer daily limit until 2025 to give skippers time to prepare for the cutback. The board also rejected his suggestion to impose tighter length limits for the charter catch, which he said would offset the impact of the two-fish allowance.

Afterward, Hardman said he's called on DNR officials to defy the Atlantic states commission's directive and let charter fishing clients keep two fish a day, at least for the rest of this year.

But Kristen Fidler, assistant DNR secretary for aquatic resources, said officials aren't contemplating bucking the commission. Violating the commission's order, she said, risks the federal government imposing a total moratorium on fishing for striped bass in Maryland. "It would be a worse outcome," she pointed out.

Conservationists welcomed the commission's actions while acknowledging it may cause financial hardship for some.

"I think we're at the point with striped bass that we have to pull every single lever we can pull," said Allison Colden, Maryland director of the Chesapeake Bay Foundation. "When things get really hard, it's incumbent on everyone involved in the resource to participate in its conservation."

Three striped bass lie in the hold of a charter fishing boat in Chesapeake Beach, MD. (Will Parson/Chesapeake Bay Program)

She noted that still more curbs may be needed. The cuts made so far improve the odds of restoring striped bass to sustainable levels by 2029, but only to about 50–50, according to the commission's scientific advisors. They are to provide an updated assessment by year's end, incorporating more recent data. If the population rebuild is still not on track, the commission agreed to take prompt action.

"This may not be the end of things, depending on how that assessment update turns out," Colden said.

MD takes extra steps

Meanwhile, Maryland is imposing additional striped bass fishing restrictions beyond what the Atlantic states commission has ordered.

A joint legislative committee in February approved emergency regulations that lengthen the time in spring when recreational fishing for striped bass is prohibited in Maryland's portion of the Bay and its tributaries. "Targeting" of striped bass, which includes catch-and-release, will be barred from April 1 through May 15.

Fishing for striped bass was already prohibited in April, but the new rules extend the closure by two weeks. That eliminates the state's "trophy" striped bass season — the first two weeks of May, when recreational and charter anglers had been able to keep one fish a day 35 inches or longer.

The rules also extend an existing early-season prohibition on fishing for striped bass in the Susquehanna Flats, prime fish habitat, until the end of May.

Amid complaints about the rules from both recreational and commercial fishing groups, the House-Senate committee on Administrative, Executive and Legislative Review held a hearing on Feb. 2.

Some recreational anglers have objected to being prohibited from catch-and-release in the spring, arguing that there's no evidence fish die from being handled then. They did not testify, however.

Before the hearing, DNR's Luisi acknowledged that there's little risk in spring of killing spawning striped bass that are hooked and then let go. But scientists don't know what impact catch-and-release might have on spawning behavior and success, he said.

"We wanted to give striped bass as much chance as possible not to be interacted with [in April and May] to complete their spawning activity," he said.

Hardman, the charter captain, countered that DNR's proposal didn't go far enough. If the state really wants to promote successful spawning, he said, then it should stop allowing recreational catch-and-release fishing even earlier — during the first three months of the year, when there's evidence the big fish are entering the Bay to spawn earlier than in the past. "You're going to put a Band-Aid on May and act like you're doing something. It's ridiculous," he said. "If you want to protect them, protect them. Close it down."

DNR has said it intends to propose further regulations later this year, including a one-week extension of the summertime "no targeting" closure of striped bass fishing. That would run from mid-July through the first week of August, when hot temperatures weaken fish and increase the likelihood that even catch-and-release kills them. Luisi said DNR might consider including a March closure in those proposed rules. ■

From parking lot to public park: Richmond buys an island

Fifteen-acre Mayo Island in the James River is rich with park potential and history

By Whitney Pipkin

Pieced together by one generation and paved over by another, an island in the middle of the James River could finally have a new future as a public park.

For more than 40 years, city planners and nonprofits have been hoping to transform Mayo Island — which has long been in private ownership — into an outdoor resource for the public. Today, about seven of the island's almost 15 acres are covered with asphalt or buildings.

In January, the City of Richmond finalized the nearly $15 million purchase, which had been years in the making. Once conservation easements are in place on the property, a pair of grant programs that made the purchase possible will reimburse the city for more than half of the cost.

About $7.5 million will come from the Virginia Department of Conservation and Recreation through the state's Community Flood Preparedness Fund. Money in the fund comes from the auction of carbon allowances through the Regional Greenhouse Gas Initiative (RGGI). (Virginia's continued participation in that program is under debate.) Another $1.5 million will come from the Virginia Land Conservation Foundation.

"There was a window of time, and it was going to be the only chance we had," said Parker Agelasto, executive director of the Capital Region Land Conservancy, who helped shepherd the purchase.

A family by the name of Shaia owned most of the island since the 1980s until selling it to the city. They listed the property for sale in 2022 with an asking price of $19 million.

The Capital Region Land Conservancy had the property under contract for $11.8 million for about a year until the deal fell through in 2023. Last-minute details could not be worked out for a small portion of the island that includes a large billboard under a 10-year lease, which towers at the east end of the property near Interstate 95. It currently features a Virginia Lottery ad.

Top photo: Richmond bought Mayo Island in the James River in January 2024. The city and its partners plan to transform the island, shown here in October 2021, into a natural area for the public. (Capital Region Land Conservancy)

Photo right: A historic photo dated Feb. 25, 1921, shows Mayo Island as it was excavated for one of its many uses over the last two centuries. (Cook Studio and The Valentine Museum)

In the end, the city reached a $14.9-million agreement that included the land with the billboard.

"There's been a number of efforts to acquire the property by different groups in the city," said Alex Dahm, an operations manager with Venture Richmond, Inc., and a member of the James Scenic River Advisory Committee. For years, "no one could get the deal sealed with the owners."

Mayo Island marks the downstream edge of the river's fall line, where a sharp change in elevation makes Richmond the only city in the country with class IV whitewater rapids in the midst of its downtown area. Several islands dot the river here, like land the water forgot to wash away. Many of them have become part of the sprawling James

River Park System, which has been protected from development by a conservation easement since 2009.

The park's 600 acres run piecemeal along both sides of the river and on its other islands, drawing about 2 million visitors annually for hiking, biking, kayaking, rock climbing, fishing and swimming. It helped put Richmond on the map as an outdoors destination, named the best river town in America by *Outside* magazine in 2012.

Still, Richmond is not rife with parks. When the city was first settled, very little land was set aside for public use. Its first parks weren't created until 1851.

That legacy lingers, with only about 7% of the city's land currently dedicated to parks and recreation. That's compared with a national median of 15% in other cities, according to the Trust for Public Land.

"The only way we're going to ever increase the open space and park lands [in Richmond] is to go and acquire private land," Agelasto said.

His organization has been doing just that in recent years, with a focus on properties along the river that, like Mayo Island, could be added to the James River Park System. The Richmond area, meanwhile, has had the fastest-growing population in Virginia for the past two years, according to census data. Real estate prices have followed suit, making acquisitions even harder.

The Manchester neighborhood near Mayo Island, for example, has been under its own transformation. It's the fastest-growing residential area in the city, with hundreds of new apartment buildings under construction, protected by a floodwall that also serves as a riverfront walkway.

The river that served as a transportation and economic engine in Richmond's earliest days is taking on those roles again, but in a very different way.

Storied past

Mayo Island's history mirrors that of the river. The land was once three separate islands that looked like many of the others in this stretch: wild, undeveloped and subject to the river's dramatic flooding. But its strategic position at the bottom of the falls, where the island sits level with the shore on either side, made Mayo Island ideal for serving a wide range of purposes over the last two centuries.

A sign along the Richmond Slave Trail depicts an early version of the bridge crossing Mayo Island and describes the role of the U.S. Colored Troops in putting out fires in the city when it was burned during the Civil War. (Whitney Pipkin)

Many of the trees growing on the perimeter of Mayo Island in Richmond pushed their way up through concrete and dirt. (Whitney Pipkin)

The island has been home to a water-powered sawmill, a Virginia Boat Club, several gas stations and a baseball stadium.

Agelasto, who has a background in museum curation and history, said both Babe Ruth and Lou Gehrig played at the stadium during its time on the island, from about 1900–41. Their home run hits off the island became the stuff of folklore, with Babe Ruth's rumored to have landed in a train car that carried the ball as far as Baltimore or Boston, "making it the longest home run in history." Agelasto can't confirm that story, but the local newspaper did report that a home run ball hit by Lou Gehrig from the stadium was seen bobbing in the river.

Mayo Island was also the halfway point of the first bridge spanning the James River in the late 1700s. The series of rudimentary bridges that followed were regularly washed out by powerful waters when it flooded. (The bridge was also burned along with much of the city during the Civil War.)

Flooding is a big part of the island's history, too. Photographs of the island nearly or entirely underwater stretch back across the years, depicting a complicated relationship between its uses and its place in the middle of a river that easily rises.

The roofs of structures on the island were barely visible beneath the floodwaters that came with Hurricane Agnes in 1972. A floodwall built along this stretch of the James River in 1995 is intended to protect low-lying parts of Richmond from future Agnes-level floods. It also ensures that islands in the river will experience even more flooding should the rising river have nowhere to go but up.

Chris Moore, Virginia executive director for the Chesapeake Bay Foundation, said in a press release that the effort to conserve Mayo Island from further development — and the potential to remove asphalt in the future — underscores the importance of funding for flood resiliency projects.

"The Mayo Island purchase highlights why RGGI and the Community Flood Preparedness Fund are so important," Moore said. "Now this treasure situated in the floodplain can be restored and preserved for generations to come."

Pulling up pavement

The bridge that crosses the river and island (at ground level), known as the 14th Street Bridge, carries U.S. Route 360 to and from the city's southern neighborhoods and has so far stood the test of floods and time since it was built in 1913. The city's oldest highway bridge across the James, it is scheduled to be replaced in 2026, a project expected to close the crossing for two to three years.

Parker Agelasto, executive director of the Capital Region Land Conservancy in Richmond, stands near the gated entrance to an industrial building on Mayo Island. The island's "intensely developed areas" were essentially granted exemptions when ordinances were passed to restrict that sort of development. (Whitney Pipkin)

Now that Mayo Island is in the city's possession, Agelasto hopes the bridge work can coincide with the extensive effort needed to reimagine the land beneath it as a park. That's because, starting in the 1940s, the land began to look far more like a parking lot than an island.

After the baseball stadium, Mayo Island was used as a trucking depot. Not far from a confluence of railways and highways, the island was seen as a hub for distribution, storage and refueling.

It may not count as paradise, but they basically paved Mayo Island and put up a parking lot — more than one. Many of the trees growing on the perimeter of the island pushed their way up through concrete and dirt. The island's "intensely developed areas" were essentially grandfathered in when ordinances were passed restricting that sort of development near — let alone in — the river.

But Agelasto is hopeful it won't be that way much longer. It could take a year for the conservation easement to be finalized. It will be jointly held by the Capital Region Land Conservancy and the state Department of Conservation and Recreation.

Eventually, the partners would like to pull up pavement and restore the island to "a more natural area," Agelasto said. That may be trickier than it sounds because the island sits entirely in a federal floodway — a designation that comes with restrictions on structures that could block the flow of the river.

Removing pavement could also be a boon for important fish species that spawn near the fall line of the James River, including striped bass, river herring and Atlantic sturgeon.

A project in Calgary, Canada, successfully restored St. Patrick's Island in the Bow River to function ecologically while also creating an urban park in 2015. The project entailed restoring river channels on the 31-acre island while creating a plaza and play areas throughout.

Agelasto would like to see something like that happen on Mayo Island, too.

"In our community, it's been a dream," he said. "We're beginning to not just embrace our river but to do it in a more restorative way." ■

Mentor, businessman aims to boost diversity in 'green' fields

Randy Rowel tackles environmental causes in the Bay region from many angles

By Jeremy Cox

Editor's note: This interview is the third in a series highlighting young professionals at work in the Chesapeake Bay arena. Listen to the full interviews in our Chesapeake Uncharted podcast.

Forget a business card. Randy Rowel needs a legal pad to list his various ventures.

He oversees the Chesapeake Research Consortium's internship-placement and mentoring program, chairs the city of Annapolis Environmental Commission, operates a private company that builds green infrastructure, and is working remotely on his doctorate from the University of Miami in applied learning sciences. As Rowel sees it, he has to stay busy.

"Some of my white counterparts in my industry, they're always amazed. 'You're in this commission or that commission? You're a grant writer? You're doing this? How do you do it all?'" said Rowel, who is Black. "My response always is this: I wish I did not have to do all of that. But being a person of color, we have to fight extra hard to get at the minimum bar."

After a sustained increase from 2017–21, the hiring of people of color has slowed in the environmental sector in recent years. According to Green 2.0, a nonprofit that advocates for more diversity in environmental fields, the growth in board members identifying as people of color ticked up by less than 1 percentage point from 2021 to 2023. The group's nationwide survey found a similar trend among senior staff.

Rowel, 43, hopes that his own narrative — a story of transforming from a disaffected youth into a respected environmental authority — inspires his students and others to overcome their own challenges. His interview with the *Bay Journal* has been edited for length and clarity.

Question: Your main job is running C-StREAM, the Chesapeake Student Recruitment, Early Advisement and Mentoring program. Help us understand what you do.

Answer: The program focuses on providing internships, professional development and paid internships for those seeking a leadership position in the environmental industry throughout the Chesapeake Bay region. We help with connecting interns to research projects throughout the summer at various institutions, such as the Virginia Institute of Marine Science, or the U.S. Environmental Protection Agency, the Chesapeake Bay Program Office and the National Oceanic and Atmospheric Administration, just to name a few.

Randy Rowel serves in several positions in the Annapolis area, all aimed at increasing environmental stewardship and promoting inclusiveness and equity within the field. (Dave Harp)

Q: How many undergraduate students do you work with each semester?

A: Anywhere between eight to twelve interns.

Q: What was it that drew you to that position?

A: I had to figure out something that made sense for what my cause was. I worked on the Diversity Action Workgroup for the EPA for many years, and I did a lot of advocating for this exact thing. When you talk about providing HBCUs [historically Black colleges and universities] and other organizations that are underrepresented with more resources, what better fit? And myself being an HBCU graduate who also understands the programmatic side of development and the environmental components of this type of work? It's a very rare connection.

Q: Why is a program like C-StREAM needed?

A: There are a lot of disparities as it relates to people of color around the environmental field. Individuals from underserved and underrepresented populations have long comprised a disproportionately smaller percentage of degree recipients in the STEM fields. They collectively form around 20% of the U.S. population but only account for 13% of the science and engineering workforce. Clearly, this is a major roadblock toward creating a network where institutions can help diversify the faculty, as well as role models and mentors who can help break the cycle.

Q: It sounds like you're talking about a lack of social capital.

A: Yes, and that's why it's so important for C-StREAM to offer a variety of services around cohort-building events, in person, to engage our fellows in a way to make them build a community. We offer lunch-and-learns. And we award them travel monies to attend events and professional development.

Q: You'd mentioned that you're studying at the University of Miami remotely, seeking a Ph.D. What are you hoping to do with that degree?

A: As an entrepreneur, I want to lead by example, showing there are other avenues in which you can engage with this industry, not necessarily always working for the federal government or for some other organization. I want to be at the forefront of providing input around environmental curriculums for environmental literacy, environmental education and culturally appropriate materials that are attractive to diverse audiences.

Q: A theme that we keep coming back to is supporting diversity in the environmental workforce. Why do you think that matters so much?

A: For years, there's been a great monopoly in the environmental industry as it relates to those who are actually installing environmental restoration projects or doing science and research. It's important that contractors look like the communities that they're serving.

With the [federal] stimulus package, we want those funds to be directed where they matter most, and for those that are making decisions to get it right the first time. We want to use this as an opportunity to level the playing field and provide some resources to communities that are most vulnerable to climate change — and those are Black and brown communities.

A: It seems like a throughline in your life is helping people overcome adversity. From what I understand, you have had some yourself. Do you mind sharing a bit of a bit of your own story?

Q: Yeah, I failed 11th grade. I was taken out of regular school and middle school and put in a Sylvan Learning Center. To me, I was having trouble with making a transition to the public school system, much of which was because I didn't have teachers that looked like me and [understood] how to teach a young black boy in the '80s and early '90s. … When I was 15, I got in trouble with the law, where I got into a fight at a party. I got community service, and I did go to a Scared Straight program. I went to Jessup [Correctional Institution] and sat down with lifers one-on-one to get input. I guess it kind of worked. They scared me straight.

I never really got into trouble with the law after that. But when I talk to young kids, I talk about all this. I tell them how we can relate. How often do you hear environmentalists with that type of backstory?

Q: Do you have any thoughts for employers in this sector about how to improve diversity within their own ranks?

A: Please put an end to volunteer work. If you're still relying heavily on volunteerism by people of color, you are doing a disservice to that community. You are not recognizing the value in the assets that they represent in their community. You are not recognizing the historical and cultural context of the discriminatory practices that existed over the last 400 years in America. Let's advocate for them to get more of what we call wealth resource powers. ■

Listen to the full interview at bayjournal.com/podcasts.

PA's last large private mountain preserved for public use

Once eyed for a ski resort, Miller Mountain expected to become a top hiking spot

By Ad Crable

Miller Mountain in Pennsylvania is visible throughout the Tunkhannock area northwest of Scranton, PA. (Baron Daniels Photography)

Miller Mountain, the last privately owned, freestanding mountain in Pennsylvania, will not be a ski resort or junkyard. Nor will it carry a bypass around the Susquehanna River town of Tunkhannock, which it has long watched over.

In late December, Pinchot State Forest took ownership of the 2,500 acres of mostly forested land and opened them for hiking, camping, photographic vistas, mountain biking, hunting, wildlife management and other passive recreational uses that are the mission of the Pennsylvania Department of Conservation and Natural Resources. As with other state forests, sustainable timber harvesting will also be allowed.

Part of the vast Appalachian Mountains, Miller Mountain is the highest peak in the area, at 2,216 feet. Just west of the Pocono Plateau, it serves as the eastern gateway to the state's Endless Mountains and can be seen from miles away.

The mountain stands out because it is not attached to any ridge. "I feel its biggest attraction is [that it's] a landscape-level acquisition. It's not half a mountain. It's like a sugar bowl sitting on its own," said Nicholas Lylo, district forester of Pinchot State Forest.

And, added Timothy Latz, assistant district forester, it's "one-stop shopping" for a wide variety of habitats.

"I really think it can be just a premier hiking and outdoors destination," said area resident Jeff Mitchell, a former Wyoming County district attorney who has written four popular hiking and backpacking guides to Pennsylvania.

"The mountain is just beautiful and it has these great views and streams and gorges and a lot of meadows and fields."

Already, Mitchell and others are forming a Friends of Miller Mountain group to aid the state and explore possible trails to the mountain's natural treasures.

Logging roads, ski slope openings, farm roads, informal all-terrain vehicle paths and a gas pipeline right-of-way give forest managers and grassroots planners a large and varied canvas to work with.

For decades, the fate of the mountain kept area residents ill at ease.

In the late 1960s, a developer from Philadelphia bought the mountain and began planning a ski resort. With a vertical drop of 1,300 feet in the proposed ski area, it would have had the steepest slopes in the state. Sleepy Tunkhannock, built on the river's edge to accommodate lumbering, shad fishing and farming, could be transformed into a ski town.

But a problem developed when Eaton Township, a "dry" municipality where the mountain is located, refused to grant a special exception for the resort. Undeterred and apparently defiant, according to local officials, the developer, who had timbering rights on the property, began cutting down trees.

"You could look up there and see ski trails take shape," recalled Matthew Hawley, who grew up within 5 miles of the mountain and still roams it year-round, often overnighting there in a hammock.

When the ski resort developer died, his son abandoned the project and sold the land in the late 1990s to Scranton businessman and banker Louis DeNaples, whose holdings included landfills, trash collection, junkyards and a casino.

A nervous Eaton Township Board of Supervisors amended its ordinances to hedge against landfills and junkyards, said Kenneth White, chairman of the current board. Like many people in the area, White remembers riding ATVs on the mountain in its many years of uncertainty.

DeNaples began wholesale timbering on the mountain, using helicopters to remove trees from its steepest flanks. That lasted only a few years. By 2007, DeNaples had sold the land to a Scranton area real estate company, which ultimately sold it to the state in December for $5 million.

The deal was brokered by the Conservation Fund, a national nonprofit, and financed mostly by a $4.5 million donation from the Williams Companies, Inc., a Tulsa-based energy company whose Atlantic Sunrise natural gas pipeline runs through the region. The remaining $500,000 came from the Keystone Fund at the state Department of Conservation and Natural Resources.

Backpackers on Miller Mountain enjoy the view from a gas pipeline swath. (Ad Crable)

"There's a history of the community rallying around the preservation of Miller Mountain as open space and a public resource," said Kyle Shenk, the Conservation Fund's northeast regional director.

Though the state Bureau of Forestry has yet to even mark the boundaries of its new state forest, which includes a historic farm, locals have been swarming to the mountain.

On a frosty early February weekend, dozens of people, some with their dogs, explored the newly public land on unmarked logging roads, improvised ATV trails and incomplete ski trails. Many were there to explore the mountain they had seen daily but had never set foot on.

That was the case with Shane and Christopher Powers of nearby Factoryville. The 50-something couple, heading carefully back down the mountain, talked excitedly about having just seen their home from what has been dubbed the Tunkhannock View, a clearing on the side of the mountain that had been mapped out as the beginning of a major ski trail.

"The nice thing is, I really think it's going to bring a lot of people into the community. You can already see it," said Shane.

Also descending the mountain on a recent weekend was Ken Nichols, 50, hiking with his 12-year-old son, Ethan. The elder Nichols marveled at the mountain's raw beauty — and the surprising effort required to climb it. Some trails have inclines of nearly 40 degrees. "I've done the White Mountains and the Adirondacks. I think this is the hardest climb in Pennsylvania, just for the elevation," he said.

The saving of Miller Mountain "is going to bring a lot of people here," predicted Cain Chamberlain, executive director of the Endless Mountains Heritage Region. "And it will also be an economic boost. Tunkhannock is a beautiful recreational town at the base of this scenic mountain." ■

Will climate change add more pollution to the Chesapeake?

Some studies predict more problems from nutrients, while others see potential for less

By Karl Blankenship

Climate change has already transformed the Chesapeake Bay: It's brought higher water, warmer temperatures and even new species, such as shrimp that have migrated in from the South.

But is it also bringing more nutrient pollution into the Bay?

The official answer, for now, is yes.

The state-federal Chesapeake Bay Program estimates that more rain is increasing the amount of nutrients — nitrogen and phosphorus — reaching the estuary, creating a headwind that offsets a portion of recent cleanup work.

Those estimates come with a high amount of uncertainty, though. Figuring out how rain and temperature patterns will affect nutrient trends is one of the most complex and consequential questions facing efforts to improve Bay water quality.

It's complex because many interrelated factors affect the amount of nutrients running off the land: More rain can cause more runoff, but warmer temperatures trigger processes that could act as a counterbalance.

Determining the outcomes from such competing factors is difficult. Some studies forecast conditions that could accelerate nutrient runoff significantly more than the Bay Program computer models currently estimate. On the other hand, a few suggest that conditions could reduce nutrient-laden runoff.

It's consequential because the Bay Program's computer models not only show that climate is already increasing nutrient runoff, but also predict that the rate of increase will sharply accelerate in coming decades. With the region already struggling to meet Bay nutrient reduction goals, that would be a huge additional challenge.

A recent analysis by Bay Program scientists, published in the *Journal of the American Water Resources Association,* highlights the importance of the issue. They found that nutrient increases triggered by climate change in the next three decades would be significantly greater than the nutrient impacts of development, population growth and economic activity combined.

The issue is slated for a closer look in coming years. The Bay Program is updating its computer models and aims to refine estimates of climate impacts over the next decade — and through the end of the century.

Predicting the impacts of climate change on the annual load of nutrient pollution to the Chesapeake Bay is a complicated but critical task. (Dave Harp)

This May, the Bay Program Scientific and Technical Advisory Committee is conducting a workshop to consider how the models could be improved to better predict climate impacts.

"We're at the edge of science here," said Lewis Linker, modeling coordinator with the U.S. Environmental Protection Agency's Bay Program Office. "That's the challenge."

The ultimate answer, he said, is important not only for the Bay, but for coastal waters around country, most of which also suffer from degraded water quality caused by increased nutrient runoff.

Potential for big impacts

Understanding how climate will affect nutrients is important for Bay water quality.

Nutrient pollution comes from a variety of sources, such as animal manure, crop and lawn fertilizer, sewage, and pet waste, which wash off surfaces and travel through groundwater to reach waterways.

Excess nutrients essentially fertilize the Bay, spurring algae blooms that cloud the water and kill underwater plants that provide important habitat. When the algae die, they decompose in a process that draws oxygen from the water, creating "dead zones" that are largely off limits to aquatic life.

Excess nutrients in waterways trigger algae blooms that kill fish, underwater grasses and other aquatic life. (Dave Harp)

To improve conditions for fish, shellfish and other aquatic life, the EPA in 2010 established the Chesapeake Bay Total Maximum Daily Load, which set nutrient limits for each state and major tributary.

When established, the TMDL recognized that climate change could affect those numbers, but the models used at the time couldn't estimate the impacts with confidence. The TMDL committed to adjusting the goals, if needed, when new models came online after 2017.

When that happened, updated information showed that precipitation and streamflow had already increased from the mid-1990s period, which had been used to establish "average" climate conditions.

That change was enough to show that the amount of nitrogen predicted to reach the Bay in 2025 was 2.3% more than what was originally estimated. That meant the region would have to achieve about 5 million additional pounds of nitrogen reductions to achieve the same water quality goals.

Put another way: Under the TMDL, states by 2025 needed to reduce the amount of nitrogen reaching the Bay each year by 71 million pounds. Through 2022, they had taken actions to achieve 31 million pounds of reductions. But already, climate change has essentially offset a fifth of that effort.

And the challenge accelerates in the future. The recent analysis shows that the rate of the climate-related nitrogen increase from 2025 to 2055 will be four times greater than during the last 30 years.

Similarly, the updated models estimate that the amount of phosphorus reaching the Bay in 2025 would be 4.5% greater than originally projected. But the rate of increase in the next 30 years will be six times higher than that.

Sorting out rain, heat effects

To be clear, there is not much uncertainty about climate change impacts as a whole: There is widespread scientific agreement that recent increases in temperature and precipitation will continue to grow, along with the intensity of storms.

But exactly how that affects the amount of nutrients delivered to the Bay is less certain.

More precipitation and more intense storms are generally associated with increased nutrients. Rain picks up nitrogen and phosphorus as it runs off the land and

Increasing volumes of stormwater could drive more nutrient pollution toward the Chesapeake Bay and its rivers. (Dave Harp)

carries them into streams — more rain equals more nutrients.

But temperatures are also warming, and that means longer growing seasons and an increase in the rate that plants and trees absorb water and release it into the air. That process, known as evapotranspiration, reduces the amount of water that reaches streams. And it could reduce runoff.

Further, increased carbon in the atmosphere fuels more rapid plant growth, which also results in more water uptake and less runoff.

Other variables, such as the times of year that have greater or lesser amounts of precipitation, also influence nutrient runoff. Having more rain and less snow is also an important change. The list of variables goes on and on.

"It all depends on so many other things," said Zach Easton, a Virginia Tech professor who worked on several reviews of Bay Program models. "And all those interactions are kind of tied together. The more complex the process, the more uncertainty you are going to have about any prediction."

A team of outside scientists, including Easton, reviewed the studies that informed the Bay Program climate modeling and agreed that the underlying assumptions were reasonable.

But their review also found that most of the available studies dealing with climate change and nutrients focus on how the balance between increased precipitation and increased evapotranspiration might play out. Most suggest that increased rain would have greater weight, resulting in more runoff.

That contributed to the Bay models' general findings that precipitation and increased streamflow would be the greatest factor in driving increased nutrient runoff.

Other outcomes possible

But some climate-related studies suggest that warming temperatures could also change the way nutrients are transformed, or cycled, on the landscape.

That's a much harder issue to assess, and there are far fewer studies that examine those processes. But some analyses suggest it could be important and potentially lead to less nitrogen reaching coastal waters.

For instance, warmer temperatures could greatly increase denitrification — the process by which bacteria convert nitrogen into a harmless gas — because warmer conditions accelerate microbial activity.

A computer modeling exercise by scientists at the U.S. Geological Survey found that over a 30-year period, if all other conditions remained the same, increasing temperatures would reduce the amount of nitrogen reaching the Chesapeake by about 6.5%.

Their paper suggested that increased denitrification is a likely suspect, along with some other heat-related factors.

Scott Ator, the study's lead author, cautioned that "there are an awful lot of assumptions" behind those results. But "what it shows is that in warmer areas, all else being equal, we get a smaller percentage of nitrogen that is applied in the watershed reaching streams than we do in cooler areas."

A study published last fall by researchers at Stanford University reached a similar conclusion for North America as a whole.

It said that while increased precipitation has historically been closely related to the amount of nitrogen runoff to waterways, rapidly warming temperatures would tip the scales toward denitrification. Nitrogen loads, it noted, are typically less in warm regions and greater in cooler areas.

The study also acknowledged that sorting out the exact impact, especially for future conditions that will likely be different from anything observed in the past, is "extremely challenging."

James Galloway, professor emeritus at the University of Virginia who edited the Stanford team's journal article — titled *Warming may offset impact of precipitation changes on riverine nitrogen loading* — cautioned that "a key word in the title of the paper is 'may.'"

Galloway, an expert on nitrogen cycling, said he expected that the impact of climate change on nitrogen, and how precipitation and temperature interact, would be "quite variable" depending on local conditions.

Larry Band, a professor emeritus at the University of Virginia who has long studied hydrology and nitrogen movement in watersheds, said increased denitrification could be important, but is hard to estimate with confidence because so many factors are involved.

The bacteria that perform denitrification require moist conditions. That means soil moisture, water table levels, the frequency and extent of wet and dry spells, all influence denitrification rates. Most denitrification takes place in relatively small "hot spots," Band said, but those hotspots could still have a cumulative impact for the Bay.

"If you have very heavy rainfalls and intense precipitation, that will mobilize more nitrogen, especially from urban and agricultural areas," he said. "But you have to think about the offset from these other effects, and that's where the interactions become more interesting — and more uncertain."

A 'horse race'

Other climate-related factors will affect the amount of nutrients reaching the Bay as well, potentially creating opportunities and challenges.

A significant amount of the Bay's nutrient reductions in the last quarter century resulted from air pollution regulations that reduced emissions of nitrogen oxides, a byproduct of burning fossil fuels. When that material falls to the ground, it adds to the Bay's nitrogen problem.

But new policies to further reduce fossil fuel use could yield additional, unexpected benefits. Linker said an analysis is underway,

Warmer temperatures could lead to greater water uptake by plants, which would help reduce the amount of nutrients reaching waterways. (Matt Rath/Chesapeake Bay Program)

and it appears the impact is "not trivial."

"We're going to get a little bit of a lift under our wings from the necessary decarbonization that's taking place," Linker said.

More uncertain is how actions taken to reduce runoff from farms and developed lands will be affected by climate. The Bay Program recognizes more than 200 types of "best management practices" — such as stormwater detention ponds, stream buffers and cover crops — as means of meeting nutrient reduction goals.

But how those will fare under future climate conditions is highly uncertain. Increasingly intense rains could overwhelm stormwater basins and other measures aimed at slowing runoff.

Longer growing seasons could boost the performance of vegetative practices, such as stream buffers. On the other hand, summertime droughts could reduce their effectiveness.

Linker said the EPA is funding research that could shed more light on the performance of best management practices — and could lead to revised recommendations about how some things, such as detention ponds, should be designed to withstand storms of the future.

Meanwhile, the Bay Program is working to update its computer models by 2027. In the next several years, it should become a bit clearer how those competing factors — increased precipitation, increased evapotranspiration and perhaps increased denitrification — will affect nutrient trends. Researchers might also provide insight on how those trends may be further influenced by policies and the effectiveness of pollution controls.

Linker characterized it as something of a "horse race" between competing variables. But for the Bay, the ultimate outcome of that race, he noted, "is a really big deal." ■

EPA officials visit Brown Grove to hear community's concerns

Tour highlighted impact of commercial, industrial development on historic VA neighborhood

By Whitney Pipkin

Atanya Lewis said she didn't know the full story of Brown Grove when she was growing up there. Her grandparents considered the history of their community, built by formerly enslaved people, too painful to talk about at the time.

But the Virginia community has recently been named a Rural Historic District and a National Historic Landmark. And its story is one that that Lewis, co-executive director of the Brown Grove Preservation Group, and others were eager to share with officials from the U.S. Environmental Protection Agency who visited there in late January. Now, they hope it can somehow make the increasingly industrial corridor somewhere they can continue to live.

Brown Grove is a relatively small area north of Richmond in Hanover County. The area includes about 140 households mostly on rural, wooded lots.

But the once-cohesive community has over the years been divided in two by Interstate 95. It is now boxed in by a municipal airport, a 600-acre industrial park, a landfill, two concrete plants, an I-95 truck stop and, residents point out, an old gas station that some suspect wasn't properly closed.

The historic recognitions came about, in part, because of the community's opposition to yet another facility: a sprawling Wegmans Food Market distribution center. More than a million square feet of the facility has already been built, half a mile from Brown Grove Baptist Church, on forested land that includes about 15 acres of wetlands. The church has been a cornerstone of the community since its inception in 1870.

A second phase of Wegmans' construction is expected to begin soon that will bring the footprint of the distribution center to 1.7 million square feet. But the community hasn't given up.

Advocates began reaching out to the U.S. Environmental Protection Agency more than a year ago, asking for help. The Brown Grove Preservation Group has asked the EPA to study the cumulative impacts of several industrial facilities near homes in this predominantly and historically Black community.

They've also asked EPA officials to visit so they can show them the proximity of these facilities to homes that have been there for generations. On Jan. 23, EPA's Mid-Atlantic Regional Administrator Adam Ortiz did just that, along with the region's Chief of Staff Terri Dean and Branch Chief Jose Jimenez. Both Dean and Jimenez have visited Brown Grove before, but this was the first trip for Ortiz.

Adam Ortiz and Terri Dean of the U.S. Environmental Protection Agency's Mid-Atlantic region look at a map with Renada Harris, center, who is co-executive director of the Brown Grove Preservation Group in Virginia. (Whitney Pipkin)

Carolyn Blake spoke to Ortiz by phone as he stood in her yard because she couldn't get away from her work on a Tuesday morning. Blake's home backs up to the Wegmans property. Construction of the distribution center, critics say, was at the expense of scattered wetlands — the extent and location of which became a point of contention with residents and the subject of legal disputes.

Terri Dean, left, chief of staff for the U.S. Environmental Protection Agency's Mid-Atlantic Region, listens to Lakshmi Fjord, an anthropologist who has been helping Virginia's Brown Grove community tell its story. (Whitney Pipkin)

Rust-colored well water

The Brown Grove group contends that changes in the water table from the construction on wetlands are affecting the well water at several residences. Blake told Ortiz that she is no longer able to drink or cook with the water that comes from her tap, which now looks rust-colored and "has a smell to it."

"Have you talked to anybody from the county or the health department about the water? Have you received any assistance?" Ortiz asked.

"No," she said. "I'm scared to talk to anybody, or to the county, because I'm scared they might make me move out of the house."

Renada Harris, co-executive director of the Brown Grove group, said they are working with the Southeast Rural Community Assistance Project to get water filters installed on 32 homes where the well water has become unpalatable. Ortiz thanked Blake for sharing her story and told her his office would "work with authorities to look out for you."

An email to Wegmans spokespersons seeking a response to nearby residents' concerns was not returned.

In the front yard of another home where Fawn Dendy lives with her family, it can be hard to hear her voice over the near-constant drone of incoming airplanes. The Hanover County Municipal Airport is virtually in her backyard. Beyond the airport is the sprawling industrial park and I-95, and her nearest neighbors in another direction are a concrete plant and concrete fabricator.

None of those facilities were there when Dendy's grandparents built the house back in the 1940s. Until the airport planned an expansion a couple decades ago, four neighboring homes were occupied by Dendy's family. But they're gone now. Other things have changed, too, since Dendy inherited the property and moved in with her husband and two children in 2016.

"The air is different here," said Dendy, whose family struggles with allergies, asthma and occasionally burning eyes. "This is something that we have just dealt with as long as we've lived here. So, as my children have grown … it's not good, but they've become accustomed to it."

Dendy said her family continues living there because of their family's history with

Adam Ortiz, administrator of the U.S. Environmental Protection Agency's Mid-Atlantic region, walks through a forest in the Brown Grove community in Hanover County, VA, on Jan. 23, 2024. (Whitney Pipkin)

the property but also "on principal." She said the county offered to buy her property, but she declined. If she leaves, there would be little evidence that her grandfather's home — and the community around it — ever existed.

Later, in a meeting room at the church, anthropologist Lakshmi Fjord shared with the group information she had collected from EPA databases that indicates toxic releases to the air are 90–95% higher and the related cancer risk is 90% higher in the Brown Grove Rural Historic District than U.S. and Virginia averages. These percentages aren't necessarily reflected in the census tract that includes Brown Grove, because that tract includes other nearby communities that are newer.

"Our concern is that families just like Fawn's are experiencing higher rates of asthma. They're experiencing higher rates of cancer," Fjord said. "But the screen tools may not catch it, because there are so many other communities around it. It can be made invisible."

'Generational harms'

At one of the grave sites where members of Renada Harris' family are buried, she mentions relatives who are likely buried in unmarked graves farther back in the woods. Wegmans hired a third party to look for the graves before beginning construction, but none were found, Harris said.

"You can see how our history is being erased starting from the dead and now to the living," Harris said at a grave site on her parents' property that shares a border with Wegmans. Eventually, she fears, "they're going to have to move out, because they don't want to live in a community with all of this industry."

Brown Grove's fight against a growing industrial presence has unfolded just as state and federal environmental agencies have begun to focus on environmental justice for communities like theirs. In early 2023, the EPA released updated guidance on legal tools and resources the agency can use to address the cumulative impacts that might be overburdening certain communities.

EPA's Terri Dean said during the tour of Brown Grove that her office is working with the Brown Grove group to supply them with air quality monitors through the agency's loan program. The monitors could help residents collect baseline data for the current air quality and monitor for worsening conditions.

Linda Mann, a professor who specializes in racial redress initiatives, aimed to summarize the community's requests at the end of the visit. She said she thinks the EPA should adopt Brown Grove as a special case that's not just about the latest permitted project but about "generational harms."

Other speakers made cases that the Wegmans project — and specifically its delineation of wetlands — had not proceeded according to the letter of the law. They asked the EPA to look into it.

Mann said time is of the essence for the community as the grocery distributor plans to begin a second phase of construction.

"If they don't get the data to fight against the next steps, there will be continued erasure," Mann said. "This community is still standing. I think that's a reason for you to stand along with them."

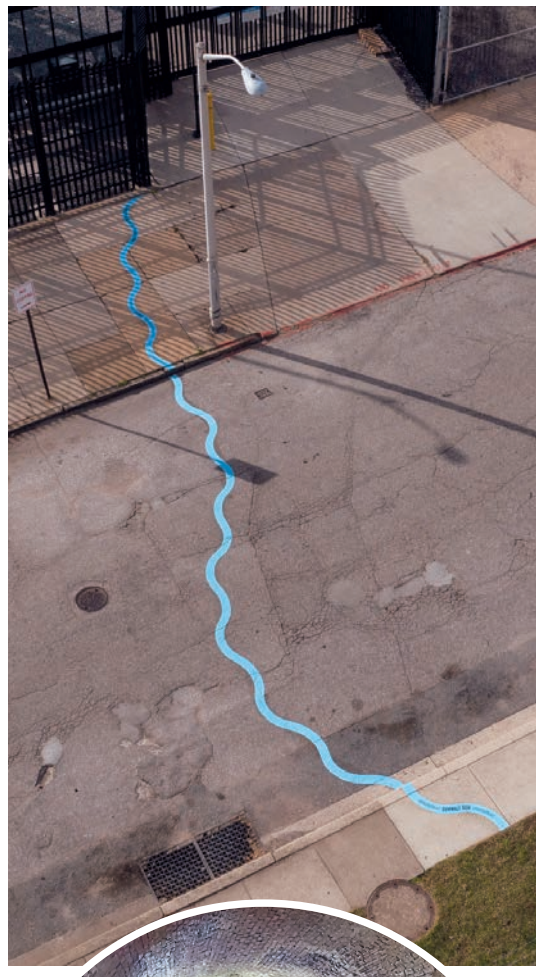
"The air is different here," said Fawn Dendy, a resident of the Brown Grove community in Virginia, who shares a home with her husband and two children that now sits next to an airport runway, two concrete plants and a highway. (Whitney Pipkin)

Brown Grove residents Bonnica Cotman and Diane Smith Drake also asked the officials to "do something for us," even as they asked the agency what could still be done.

Ortiz promised to give the project his due diligence.

"I had an idea of what was happening here … but once you're really on ground level, seeing things, you can see those connections," he said.

Ortiz said Brown Grove was one of the first topics he was briefed on when he was appointed to his position in November 2021, and that the community is firmly on his agency's radar. Chief of Staff Dean put it another way: "You've got all eyes on Brown Grove." ■



Art project lets you tour haunts of a Baltimore 'ghost river'

By Jeremy Cox

You can't spell "Baltimore" without "more" — as in more asphalt, more factories, more rowhouses, more parking garages, more office buildings, more of everything. But Bruce Willen's new public art project invites observers to imagine Maryland's most populous city with less.

The longtime Baltimorean has created a walking tour through a pair of neighborhoods just north of downtown along the former path of a streambed. There are 10 way-finding markers — soon to be 12 — along with wavy, light-blue ribbons of color slathered across the pavement.

The tour follows the story of rapidly changing demographics, rising and falling economic fortunes, and evolving attitudes toward nature. But mostly, the narrative revolves around water.

"Most people who live in the neighborhood," Willen said as he gave a tour of the project on a foggy January morning, "they had no idea, unless they're, like, a super history nerd, that the stream existed and still exists."

People may have forgotten. But the water hasn't.

Sumwalt Run once meandered among tree roots and rocks at the bottom of a deep ravine. Mature beech and oak trees shaded the water. The stream zigzagged along the falling terrain for about 3 miles before spilling into the Jones Falls just north of North Avenue.

More than 100 years ago, as Baltimore's inner core overflowed into the surrounding countryside, two neighborhoods — Remington and Charles Village — settled on top of the old waterway. Today, except for a few feet before its terminus, Sumwalt Run exists entirely underground, impounded within an aging storm sewer.

Willen's project has brought the stream back to the surface. Not literally, of course. Multiple city blocks would have to be demolished for Sumwalt Run to experience daylight again. But here and there — bolting across a city street, hopping a curb, springing from the foot of a building — a stylized visual representation now traces the route of the buried stream.

Sumwalt Run is one of many streams in Baltimore that were paved over during the 1800s and early 1900s. It was a commonplace practice at that time in cities big and small, Willen explained. By entombing waterways underground, urban areas gained more (relatively) dry land for development. The practice also was seen as a boon to public health because many urban waterways had devolved into open sewers.

Willen named his project "Ghost Rivers." The reason: "These waterways really are just ghostly presences," he said. "They're still there. You can hear them at certain points whispering up through the storm drains. And also, I think they do kind of haunt us."

Willen's project encompasses Sumwalt Run's last downstream mile. He designed the tour to be self-guided. There is a sleek companion website (ghostrivers.com) with stop-by-stop directions, deeply researched historical accounts and archival photographs. But Willen also led small gatherings on tours shortly after the project's initial completion last fall. More tours are set to take place this spring.

John Marra of Blue Water Baltimore, an environmental nonprofit engaged in monitoring and restoring the city's waterways, co-hosts the tours with Willen.

"We're trying to bring people knowledge of what's under their feet constantly," he said. It's more than historical curiosity, he added.

Top left photo: Artist Bruce Willen visits one of the stops on the Ghost Rivers trail that he created in the Remington neighborhood of Baltimore. (Dave Harp)

Top right photo: Painted lines trace the underground path of Sumwalt Run, a buried stream in Baltimore. (Frank Hamilton)

Inset photo: This tunnel carries Sumwalt Run under the streets of Baltimore. (Bruce Willen)

Baltimore artist Bruce Willen holds photographs he made inside the underground tunnel where Sumwalt Run now flows. (Dave Harp)

A painted line crosses a road in Baltimore's Remington neighborhood as part of an art installation project that shows the path of long-buried Sumwalt Run. (Dave Harp)

Pipes like those that carry Sumwalt Run through the city offer no filtering of stormwater pollutants, such as sediment and nutrients. Those contaminants then flow into waterways that empty into the Chesapeake Bay, intensifying the estuary's ecological headaches.

For Willen, art is a way of life. He owns a design outfit called Public Mechanics. Among the firm's more notable works: the recent rebranding effort for the Baltimore Museum of Art, a series of chair sculptures outside the Anacostia Public Library in the District of Columbia and the graphics found throughout the Maryland Film Festival's SNF Parkway Theatre.

The Ghost Rivers project began taking shape about a decade ago, as Willen tells it, when he stumbled across an old map of the Remington neighborhood, where he lives. On it, a stream was depicted where no stream now existed. That fact nestled into the deepest recesses of his mind, half-forgotten.

Fast forward to 2020, the year of the pandemic. He found himself spending a lot more time outdoors. During one of his walks among Remington's brick-faced rowhouses and rehabilitated warehouses, the memory of that lost waterway came flooding back to him.

"Walking around, I started encountering the stream at low-lying points. I'd hear the very faint sound of water coming up through the storm drains and remember, 'Oh right, this is sort of where that stream on the little map was,'" Willen recalled. "That was the genesis."

He drew further inspiration from another salient topic during that troubled year: the pitched conflicts in many cities over monuments to historical figures with ties to slavery.

"I was thinking about what a monument that is not actually to a person or event look like," Willen said. "How can you have a remembrance of a landscape?"

In all, he cobbled together about $160,000 in grants to cover the project's costs. Its backers include the Maryland State Arts Council, Gutierrez Memorial Fund, Maryland Heritage Areas Authority, Chesapeake Bay Trust, Baltimore City Department of Public Works and the utility contractor Spiniello.

His research was exhaustive and, at times, soggy. In addition to consulting historic photo archives and old plat maps, Willen ventured 30 feet beneath the city's streets to find where Sumwalt Run now flows. Clad in wading boots, he splashed into a pitch-black storm sewer, trying not to slip on the algae-slickened floor.

The pipe was tall enough for him to stand in. Not far into his journey, Willen found himself shrouded in inky darkness. His flashlight beam revealed ever-changing construction materials: stone, mortar, brick, concrete. Stalactites loomed overhead. All the while, murky water gushed in its confined course at his feet.

In case this is not already obvious, the underground portion is not part of the tour. "It was a little sketchy," he said. "I definitely don't want to encourage anybody to try it."

Appropriately enough, the tour begins near the front steps of the Baltimore Museum of Art. The first stop is at Wyman Park Dell, a 16-acre park with a broad, grassy lawn and no shortage of shade. It's notable in the context of Willen's tour as the only place where the Sumwalt Run stream valley is still intact.

Much of the steep-sided park is sunken about 30 feet below the surrounding street grid. But the stream itself is nowhere to be seen. The park was designed by Olmsted Brothers Co., the landscape architecture firm behind Central Park. In their initial plans, the brothers sought to preserve the waterway. But, according to Willen's research, they scrapped that idea after subsequent development on adjoining parcels all but obliterated the stream.

But now, things have come full circle. Community activists and conservation groups have been working citywide to capture and store rainfall at the surface to improve water quality. Some also hope to revive plans for the citywide network of green spaces envisioned by the Olmsteds.

Beyond Wyman Park Dell, there is virtually no evidence that a stream gully ever existed. The eye is greeted by block after block of rowhouses. With the blessing of the city's public works department, Willen applied his wavy, light-blue artistic version of the Sumwalt Run streambed through this bustling urban landscape.

It's made from the same material used for marking bike lanes, he said, making it "theoretically … a little bit more durable than paint." The neighborhood association is formally responsible for the upkeep of the project.

The way-finding placards, fabricated from powder-coated steel and aluminum, are planted at various locations along the route. The signs tell of the stream and the environment. But they also unpack the history of the people who have resided here: the factory workers, the migrants from Appalachia, the waves of gentrification in recent years.

Willen hopes that his project enlightens people and perhaps even prods them to advocate for resurfacing Baltimore's streams. This time, literally.

"We do talk a little bit about daylighting and some of the possibilities — not so much for this stream, but the Jones Falls," he said. "It's something that people have been talking about for a while. I would really love for this project to bring more conversation and have that conversation get taken more seriously." ■

IF YOU GO

Sumwalt Run Walking Tour

Self-guided walking tours of the Ghost Rivers art installation follow the path of Baltimore's Sumwalt Run. Sites can be visited in any order. But the artist, Bruce Willen, recommends beginning at Site 1, located off Charles Street at Wyman Park Dell. There are a total of 12 sites. More information and a map of the sites are at ghostrivers.com.

A snowy owl, a rare winter visitor this far south, perches on a tree branch near the Choptank River in Cambridge, MD. (Dave Harp)

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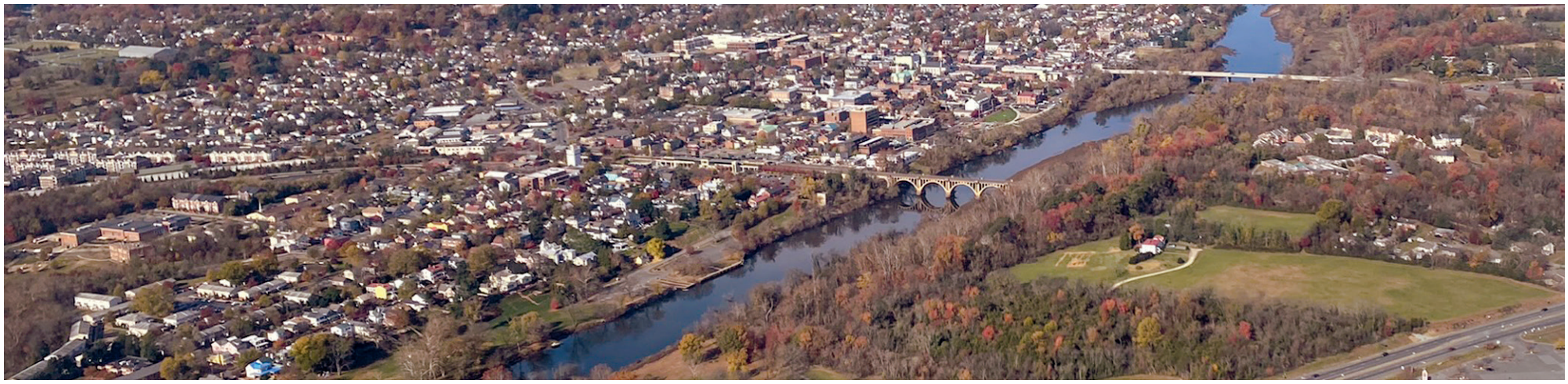

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For stream revival, ask WWBD? (What would beavers do?)

By Tom Horton

Nita Settina and Kevin Smith stand atop the deeply incised banks of Jabez Run in Anne Arundel County, MD. The stream will be reconnected with its floodplain after an extensive restoration. (Dave Harp)

Why am I smiling? I'm walking a broad and muddy gash just bulldozed into the forested floodplain draining to a creek called Jabez Branch, which until recently had been the last stream in Maryland's portion of the Coastal Plain to hold native brook trout.

Piles of earth and stone, and heavy construction equipment await some 10,000 dump trucks' worth of dirt that will smother a mile or so of this important tributary of the Severn River, between Baltimore and Annapolis. They come not bury the stream, but to raise it — likely the best hope for bringing back the trout.

The concept, which could someday extend throughout the Severn's headwaters and other subwatersheds, is to literally elevate the waterway and raise streamflow back up to the level of its floodplain.

This reconnection — of water to watershed — will dramatically slow and spread the flow, forming multiple channels, braiding and trickling and seeping through wetlands. The stream will have time to percolate into groundwater, which would be there to recharge the Jabez in droughts.

In floods, the swampier waterway will absorb the runoff that blasts from a nearby highway exchange and from suburban developments, where a nearby street sign reads "Stormwater Way". What is now an ever-deepening gash in the land will flower as a swamp.

It's all way cool — basically emulating what beavers with their dams and ponds did across the Chesapeake Bay watershed before they were trapped nearly to extinction centuries ago (modestly coming back now).

It's also way too hard to accomplish and therefore uncommon, which is why I came to the Jabez on a late-October morning with Kevin Smith, Sara Caldes and Nita Settina. All have long experience working with the Chesapeake environment.

With others, they've formed a nonprofit called the Center for Ecosystem Recovery to push projects like this. It's harder sledding than it should be.

Smith directs me to where 13 different permits — state, federal and local — are posted on the site: permission to grade, to fill, to deal with stormwater and sediment, and to comply with Maryland's Critical Areas law.

There were no objections to any of these permits, he says, but it still took seven years to get them. Seven years in which raging stormwater from Interstate 97 and Maryland Route 32 continued to wreck the stream, turning it into a sterile gully, drying out wetlands, and carrying sediment and polluting nutrients into the Severn.

Underwood & Associates, the cutting-edge restoration company that designed and is executing the project, Smith says, is maybe the only firm that would have hung in that long while waiting to start work.

Caldes, the Severn Riverkeeper, and Smith, who directs the Maryland Coastal Bays Program, say the project would have happened sooner if it followed a more traditional restoration route that stabilized the stream within a single, meandering channel. To many people that would look good — resembling the forested, babbling brook of outdoor calendar pages.

"A prettier ditch," Smith calls it. But the science, he says, shows that it doesn't have nearly the habitat and water quality benefits of the floodplain swamp that will be created here.

Restoring degraded streams to a single channel has its place in steeper headwater creeks, says Keith Binstead, Underwood's lead project designer; "but here in the Coastal Plain, in most streams adjacent to the Chesapeake, it doesn't work."

"The permitters just don't get it," said Keith Underwood, the company's founder.

The "permitters" are mainly the Maryland Department of Environment and U.S. Army Corps of Engineers. MDE in the last decade has made "major changes" to speed up permits, said Lee Curry, the agency's director of water and science. They now meet a goal of approval or rejection within 90 days about 90% of the time, as opposed to 30% of the time formerly, he said.

Stream restoration is often complex, he said, especially in Maryland, the nation's fifth most densely populated state. Ecological benefits of reconfiguring streams must compete with public perceptions, fears of flooding and loss of favorite trees during construction.

The Jabez project, Curry said, was particularly marked by strong opposition from state and private fisheries groups, worried that slowing and spreading the stream flows would heat the water too much for trout.

"That wasn't an illegitimate concern," Kevin Smith said. "But while trout do thrive in fast-moving, single channels, they co-evolved with beavers and the way they shaped the hydrology."

My take is that the Jabez experience holds important lessons for the whole Chesapeake restoration. We have the need and the potential to restore tens of thousands of miles of streams in coming decades, spending billions on the process. The one-mile Jabez project will cost about $7 million — less than building the I-97/Route 32 interchange that destroyed it.

So we need to get it right, and right can't mean just the easiest way to get a permit approved. A whole separate track for stream restoration permitting at government agencies might be in order. MDE does have a dedicated restoration review team. "But right now," Riverkeeper Caldes said, "restoration gets the same treatment as if you proposed a 7-11 store in the stream valley."

We know the pre-European Chesapeake was far greener and mostly forested. But, with millions of beavers, it was also far wetter — a huge factor in sustaining the Bay's health and resilience.

So the first question should be, "WWBD?" What would beavers do? It should be at least a starting point for any discussion of stream restoration. Permitting agencies, meanwhile, could start signaling that to applicants.

While beavers controlled the hydrology of the Bay — and of North America — for millennia, they've been gone long enough that we don't really know what "natural" streams looked like.

Reconnecting waterways like Jabez to their watershed is the easy part. The bigger work is reconnecting humans to what a natural ecosystem was like. ■

Tom Horton, a Bay Journal columnist, 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.

We can get the Bay we want, but not without a total reset

By Rich Batiuk and Roy A. Hoagland

When it comes to restoring the Chesapeake Bay, it is time for a change.

Since the early 1980s, those working to restore the Bay have invested incredible time and talent, pursued only the best science, developed new and creative programs, and advocated for the investment of millions of dollars. Those efforts have not been in vain. They have yielded significant, measurable improvements:

- Pollution loads declined, even though the population more than doubled.
- Sewage treatment plants modernized the processing of human waste.
- Farmers added forested riparian buffers to streamside fields and pastures.
- Power plants reduced air pollution emissions dramatically.
- Thousands of acres of newly conserved lands provided permanent natural resource benefits.
- Oyster reef construction and oyster aquaculture restored a commercially extinct resource.

And in 2023, the Chesapeake Bay had the smallest "dead zone" on record. But all of the effort and progress were not and are not enough.

Despite past strong and effective leadership, despite engagement from communities across the watershed, despite the best available science, state-of-the-art monitoring and modeling, along with the establishment of clear, measurable goals, the work to restore the Bay has fallen short. The scientifically driven goals for pollution reduction — the Chesapeake Bay total maximum daily load (TMDL) or "blueprint" goals — will not be met by the 2025 deadline.

And the problems confronting the restoration effort are more complicated than ever before.

While we once sought a restored Chesapeake that reflects some semblance of a glorious past, the realities of climate change show us that tomorrow's Bay will be a different Bay. Its shoreline will be radically altered. Many of its wetlands — the "kidneys" of the Bay — will convert to open water. The flow of freshwater from the Susquehanna and other rivers will carry the flush of more intense and more frequent floods. Historic species of underwater grasses will die, altering the protective habitat of the Bay's iconic blue crab. New species of finfish will populate the Bay, while striped bass migrate further north.

Heavier storms and rising sea level have made scenes like this one, along Dock Street in Annapolis in January 2010, more common than ever. (Matt Rath/Chesapeake Bay Program)

We also saw the Chesapeake as a resource accessible to and available to all. Our awakened consciousness has revealed that this vision was faulty. Vulnerable, underrepresented communities have suffered and continue to suffer inequitable harm. We now recognize that too often communities of color are not part of the equation when it comes to Bay restoration. Our failure to include them effectively in the process and the outcomes now challenges us to realign priorities and efforts.

It is time for a change.

But what does that change look like?

As an environmental manager and an environmental attorney, each with too many years to count invested in the restoration work, we suggest several possible changes as a new generation of leaders looks to solve the challenges of ensuring a healthy Bay and healthy Bay communities over the next 50 years:

Change the Chesapeake Bay restoration partnership structure: What worked for the 80s and the 90s is not working now. The multi-jurisdictional Chesapeake Bay Program Partnership — once led successfully by the administrator of the U.S. Environmental Protection Agency; the mayor of Washington, DC; the chair of the Chesapeake Bay Commission; and the governors of Maryland, New York, Pennsylvania, Virginia, and West Virginia — is no longer led successfully by any of them. At its annual governance meetings, few of the leaders attend. This past year, even the EPA administrator failed to participate. The structure is failing. It is time for a new or at least significantly reformed structure. It is time to consider new or revised federal Clean Water Act legislation that redefines jurisdictional obligations toward ensuring a healthy future Bay. Or perhaps we should consider the creation of a new regional authority to manage the challenges of tomorrow.

Confront and prioritize climate change and its impacts: While water quality in the Bay and its rivers must remain a significant focus of ongoing efforts, there is a need for a pervasive commitment to respond to climate change's threats. Investments in strategies to reduce greenhouse gas pollution, expand nature-based solutions and implement new tools to improve flood resilience in communities — particularly disproportionately impacted localities — must be a priority.

Reward performance: In a recently released report from the Chesapeake Bay Program's Scientific and Technical Advisory Committee, more than 70 scientists from academic institutions, municipal authorities, the business community and government agencies concluded that it is time to invest in "pay-for-performance" programs that channel results-based funds to priority areas and encourage solutions not funded under existing programs. To support this strategy, there is a need to use 21st-century mapping of our landscape to identify and target priority areas to yield the biggest bang for the buck. All of this will require significant changes at the federal, state, local and property owner levels.

As former leaders within the Bay restoration movement, we acknowledge that we did not get everything right. But we did not get everything wrong, either. Now is the time for new leaders to define not only the future they want for the Bay, its watershed and its communities, but also how they hope to get there.

It is time for a change. ■

Rich Batiuk is the former associate director for Science, Analysis and Implementation for the U.S. Environmental Protection Agency's Chesapeake Bay Program Office. Roy Hoagland is the former vice president for Environmental Protection and Restoration for the Chesapeake Bay Foundation.

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 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 410-746-0519, tsayles@bayjournal.com or P.O. Box 300, Mayo, MD 21106. Please include your phone number and/or email address.

How PFAS, microplastics join forces as a synergistic threat

By Tamela Trussell

The prevalence and pervasive nature of per- and polyfluoroalkyl substances (PFAS) in our waterways are alarming. A study by the U.S. Geological Survey (USGS) and the Pennsylvania Department of Environmental Protection, published in August *Science of the Total Environment,* found that 76% of rivers and streams tested in Pennsylvania contained PFAS — highly toxic chemicals that pose severe health and environmental risks.

With nearly 15,000 variations, according to the U.S. Environmental Protection Agency, these substances, often referred to as "forever chemicals," bioaccumulate in fish and animals and persist in the environment, leading to widespread contamination across various sectors, including industry, consumer products and even the water cycle itself.

PFAS contamination stems from a dizzying array of sources, including industrial production, firefighting foam, plastics manufacturing, electronics, mining, agriculture, and wastewater. Their ubiquitous presence in everyday items, from cookware to clothing, ties them intricately to the life cycle of plastics. Moreover, studies indicate that PFAS are found in the environment, wildlife and human blood, with alarming health implications.

The maximum safe levels of these chemicals are extremely low, with the EPA setting health advisories at minute concentrations — in some cases less than 1 part per trillion — emphasizing their potent dangers. Eliminating existing contamination would be extraordinarily impractical, so identifying the sources of contamination is critical to tackling the problem.

Another USGS study showed that 45% of drinking water contains one or more PFAS. Researchers with the New Jersey Department of Environmental Protection found that four polyfluoroalkyl substances, in particular, showed up in all of the samples taken from 11 rivers around the state.

Wildlife studies reveal the presence of PFAS in various species, highlighting the extensive reach of these contaminants across ecosystems. The Environmental Working Group, a national public health watchdog, analyzed more than 200 recent peer-reviewed studies and concluded that PFAS were found in more than 600 wildlife species worldwide. "It is urgent that ongoing releases of PFAS be identified," said David Andrews, an EWG senior scientist.

A study by the U.S. Geological Survey found PFAS, often called "forever chemicals," in 45% of drinking water systems studied. (Dave Harp)

Microplastics, another apparently ubiquitous pollutant, are interlinked with PFAS, amplifying contamination. In 2020, researchers in Illinois and Michigan studied the interaction of PFAS and microplastics in lake water and concluded that PFAS adsorption (adherence) was common in three widely used types of plastic: polypropylene, polyethylene and polyester. "Given the prevalence of PFAS and microplastics in natural waters, coupled with the extremely long persistence time of both classes of pollutants," the team reported, "these two groups of emerging contaminants may act synergistically in food webs to cause adverse effects in fish and wildlife, as well as humans."

And it's now abundantly clear that microplastics are in all of our waters. Studies in Pennsylvania's streams and rivers, even those deemed ecologically valuable, show high rates of microplastic pollution. A 2015–19 study of microplastics in a 200-mile stretch of the Delaware River by the USGS and National Park Service found microplastic fragments, mostly in the form of fiber, in 100% of the water and sediment samples and 94% of the fish.

The issue expands beyond water bodies. Farmlands and wastewater treatment plants contribute to the problem. Biosolids, a fertilizer byproduct of sewage treatment, are a potential carrier of PFAS, impacting agricultural lands and, subsequently, the food supply. The lack of comprehensive testing methods and standards for PFAS in biosolids poses a significant challenge.

There are 516 major sewage plants in the Chesapeake Bay region. A study found that each plant releases an average of 4 million microplastic particles daily. Biosolids are created from processing municipal sewage. Many known or suspected PFAS contamination sites in Pennsylvania are located near the state's 51 sewage treatment plant. The EPA and Pennsylvania's DEP permit six of them to produce biosolids for land application.

Many Pennsylvania farms have been contaminated by the spreading of biosolids since 1989. Biosolids have also been used in mine land reclamation projects around the state — an estimated 750,000 tons of it, covering about 4,500 acres. Farms also become contaminated with PFAS from microplastics and the application of pesticides, herbicides and fungicides. Introducing microplastics and PFAS into our soil creates a vicious cycle of food contamination. Even organic farmers are devasted by legacy applications of sludge laced with PFAS. PFAS have been found in hay, tree fruit and more.

Urban and industrial areas are not immune to contamination. Current and legacy sites, like landfills and manufacturing facilities, are identified as primary contributors of PFAS and other toxic chemicals and microplastics. The challenge lies not only in identifying these sources but also in regulating and remediating them effectively.

More research is needed to assess the contamination and its impact on wildlife and human health, and it is essential to identify areas less affected for comparative studies. As the evidence grows, it becomes clear that PFAS represent an unavoidable and hazardous chemical class that threatens ecosystems, human health and the environment.

Addressing this issue requires a multifaceted approach: manufacturing and disposal regulations, responsible waste management, developing alternatives — and holding producers accountable for testing, monitoring and remediation. And it requires immediate action at both regulatory and industrial levels.

Awareness, stringent monitoring and proactive measures to limit PFAS use are imperative for safeguarding all life forms from their silent but destructive impact. ■

Tamela Trussell is the founder and president of the organization Move Past Plastic, based in Carlisle, PA.

CHESAPEAKE CHALLENGE

— Kathleen A. Gaskell

Wind Windup

March winds and April showers bring forth May flowers … or so they say. But what brings forth wind in the first place?

Hot v. cold: Earth's land and water surfaces absorb heat from the sun at different rates. This causes areas of dense, high-pressure cold air and less dense, low-pressure warm air. When these two pressure systems meet, the less dense hot air rises and is replaced by the colder, heavier air. This exchange creates what we experience as wind. The greater the temperature difference between these two pressure systems, the stronger the wind.

And that's not hot air: The strongest winds in the solar system are said to be on the icy planet of Neptune, where sustained winds reach speeds of more than 1,100 miles per hour. Compare that to the highest speed recorded on Earth: a 253-mph gust recorded during Tropical Cyclone Olivia on April 10, 1996, near Barrow Island, Australia.

To and from: A weathervane points to the direction the wind is blowing to. But a wind pattern is named for the direction it's flowing from. In a "northeast wind," the vane points southwest.

Whirl-wounds: We refer to "biting winds," but the kamaitachi, a weasel in Japanese folklore with long razor-sharp claws, rides whirlwinds and inflicts bloodless cuts on its victims' legs. Rubbing the wounds with the ashes of a burnt calendar is said to cure them.

Celebrating wind: Speaking of calendars … why does Global Wind Day occur on June 15 and not in March?

Title image: *A crab themed weather vane. (Tim Green/CC BY 2.0)*

A *Seeds from a dandelion flower blow in the wind. (David Cyklarz/CC BY 3.0)*

B *"Flagged" trees are shaped by the wind at the Dolly Sods Wilderness in West Virginia. (Lara Lutz)*

C *A luna moth, one of many creatures that incorporate wind into their lives. (Whitney Pipkin)*

Gone without the wind

It would be a cruel blow to many plants and animals if winds suddenly ceased to exist. Many have adapted to the wind and depend on it to survive. Will this quiz be a breeze for you? Answers are on page 36.

1. Wind plays an important role in broadcasting many seeds. The word for wind-dispersed seeds is derived from the Greek word anemoi, the collective term for gods of the winds. What is the word?
   A. Anemoboreas B. Anemochory
   C. Anemozephrus

2. Six of these plants in the Chesapeake Bay region depend on wind for seed dispersal. Can you identify the five that do not?

Black locust	Marsh marigold
Burdock	Maples
Cardinal flower	Milkweed
Cattail	Poison ivy
Dandelion	Wild columbine
Jewelweed	

3. When wind blows on a tiny seedling or newly sprouted plant, that plant releases a hormone called auxin. While auxin performs many functions, which is wind-related?
   A. It stimulates the growth of cells that strengthen stems.
   B. The wind carries the scent of auxin's pest-repelling toxins.
   C. Combined, auxin and the wind regulate the plant's temperature.

4. Animals have also adapted to make use of wind. Match the animal with how it uses wind.
   Blackpoll warbler Flying spider
   Eastern cottontail Luna moth

   A. I am territorial. When the neighborhood gets too crowded, I release silk threads into the wind, then use them to "balloon" to a new location.
   B. When ready to mate, I release a few pheromone molecules, then wait for males from miles around to find me using their feathery antennas to track my scent on the wind.
   C. I twitch my nose 20–120 times a minute so that my roughly 100 million scent receptors can detect dangerous scents in the wind. (On the flip side, predators are using the same wind to sniff me out.)
   D. When migrating, I fly with a tailwind to push me so I use less energy and get more quickly to my destination, up to 2,100 miles away.

BULLETIN BOARD

VOLUNTEER OPPORTUNITIES

WATERSHEDWIDE

Alliance Treelay
The Alliance for the Chesapeake Bay's 24-hour tree planting relay, *Treelay*, takes place April 5–6 at sites in Pennsylvania, Maryland and District of Columbia. Info: Web search "Alliance Treelay."
- *April 5:* 6–9 pm Upper Oxford Township Arboretum, PA, then 9 pm–12 am Mahantango Boat Launch, Port Trevorton, PA.
- *April 6:* 12–2 am Lititz, PA; 2–6 am Abbotstown Park, PA; 6–9 am Wakefield Valley Park, Westminster, MD; 9 am–2 pm Millersville, PA; 12–4 pm Big Elk Creek State Park, PA; 4–6 pm TBD, Washington, DC.

Project Clean Stream
The Alliance for the Chesapeake Bay, through 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.

Potomac River watershed cleanups
Learn about shoreline cleanup opportunities in the Potomac River watershed. Info: fergusonfoundation.org. Click on "Cleanups."

PENNSYLVANIA

Susquehanna volunteers
The Middle Susquehanna Riverkeeper is looking for volunteers in these areas:
- *Sentinels:* Keep an eye on local waterways, provide monthly online updates. Info: Web search "Susquehanna sentinels."
- *Water Sampling:* Help is needed in various parts of the watershed on a regular basis. Web search "Susquehanna Riverkeeper Survey."
- *The Next Generation:* A growing number of watershed organizations are aging out. Workers are getting older and there's a need for younger people to help with stream restoration work, litter cleanups. Individuals, families, scouts, church groups welcome. Info: middlesusquehannariverkeeper.org/watershed-opportunities.

Nixon County Park
Volunteer at Nixon Park in Jacobus. Info: 717-428-1961, NixonCountyPark@YorkCountyPA.gov.
- *Front Desk Greeter:* Ages 18+ can work alone. Families can work as a team.
- *Project Feederwatch:* 9 am–4 pm Tuesday or Wednesday through spring. (Participants sign up for 1-hour shift every other week.) Beginners, one-time visitors 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. The data is used to track winter bird population trends. Visitors can drop in any time.

PA Parks & Forests Foundation
The Pennsylvania Parks and Forests Foundation, a Department of Conservation and Natural Resources partner, helps citizens become involved in parks and forests. Learn about needs, then join or start a friends group. Info: paparksandforests.org.

State park, forest projects
Help with Department of Conservation and Natural Resources projects at state parks and forests: clear & create trails, habitat; repair & install plants, bridges, signs; campground hosts; interpretation programs & hikes; technical engineering, database assistance; forest fire prevention programs; research projects. Web search: "PA DCNR conservation volunteers."

VIRGINIA

White House Farm Foundation
The White House Farm Foundation needs volunteers, ages 13+, 8:30–11:30 am every Friday for its Conservation Corps. Maintain trails, restore habitat, manage invasive plants, clean up trash in Leopold's Preserve in Broad Run. Register: leopoldspreserve.com/calendar. Info: whfarmfoundation.org.

Become a water quality monitor
Volunteer with the Izaak Walton League or train online to become a certified Save Our Streams water quality monitor. Follow up with field practicals, then adopt a site of your choice in Prince William County. Info: Rebecca Shoer at rshoer@iwla.org, 978-578-5238. Web search: "water quality va iwla."
- *Stream Selfies:* Collect trash data, take photos of local stream.
- *Salt Watchers:* Test for excessive road salt in a stream.
- *Check the Chemistry:* Spend 30 minutes at a waterway with a handful of materials, downloadable instruction sheet.
- *Stream Critters:* Use app to identify stream inhabitants. Number, variety of creatures reveal waterway's condition.
- *Monitor Macros:* Become a certified *Save Our Streams* monitor with one day of training. Learn to identify aquatic macroinvertebrates, assess habitat, report findings, take action to improve water quality.

Pond cleanup programs
Join a Prince William Soil & Water Conservation District *One-Time Pond Cleanup* in fall or spring. Kayaks needed to support this effort. Volunteers also needed to take on longer-term commitments on a variety of waterways. Info: waterquality@pwswcd.org.

Cleanup support & supplies
The Prince William Soil & Water Conservation District in Manassas provides supplies, support for stream cleanups. Groups receive an *Adopt-A-Stream* sign recognizing their efforts. For info/to adopt a stream/get a proposed site: waterquality@pwswcd.org. Register for an event: trashnetwork.fergusonfoundation.org.

Goose Creek Association
The Goose Creek Association in Middleburg needs volunteers for stream monitoring & restoration, educational outreach, events, zoning & preservation projects, river cleanups. Info: Holly Geary at 540-687-3073, info@goosecreek.org, goosecreek.org/volunteer.

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

Reedville Fishermen's Museum
The Reedville Fishermen's Museum needs volunteers for docents and in the gift shop, boat shop, research collections/library. Info: office@rfmuseum.org, rfmuseum.org.

Chemical monitoring program
Help collect monthly water quality data on conductivity, pH, dissolved oxygen, temperature and turbidity from waterways across Prince William County, Manassas and Dumfries. Support a team with data from your backyard or nearby stream. To adopt a site under the Water Quality Program, contact Veronica Tangiri at waterquality@pwswcd.org.

MARYLAND

Bay safety hotline
Call the Maryland Department of Natural Resources' Chesapeake Bay Safety and Environmental Hotline at 877-224-7229 to report these issues: fish kill or algal bloom; floating debris that poses a navigational hazard; illegal fishing activity; public sewer leak or overflow; oil or hazardous material spill; critical area or wetlands violation.

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

Severn River Association
Volunteer at the Severn River Association. Visit severnriver.org/get-involved, then fill out the "volunteer interest" form.

Annapolis Maritime Museum
The Annapolis Maritime Museum & Park needs volunteers. Info: Ryan Linthicum at museum@amaritime.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.
April issue: March 11
May issue: April 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. Items sent to other addresses are not always forwarded before the deadline.

Answers to CHESAPEAKE CHALLENGE on page 35

1. B: Anemochory
2. Black locust (gravity), burdock (hooklike seed attaches to passing animals), jewelweed (seed pod explodes), marsh marigold (water) and poison ivy (eaten by animals and deposited in manure elsewhere)
3. A: Plants that start growing where wind is absent are more likely to break or fall over than plants that emerge in windy places.
4. A: Flying spider; B: Luna moth; C: Eastern cottontail; D: Blackpoll warbler

BULLETIN BOARD

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: volunteerpatapsco.dnr@maryland.gov, 410-461-5005.

Volunteer training at Ladew
Ladew Topiary Gardens in Monkton is offering training for those interested in leading school field trips. Learn about the garden's plants, animals; ecology concepts; outdoor teaching techniques. Attend at least three of these sessions: 9:30 am–12:30 pm April 9, 12, 16, 19. Background checks, fingerprinting required. Register/details: Sheryl Pedrick at 410-557-9570, x226, spedrick@LadewGardens.com.

National Wildlife Refuge at Patuxent
Volunteer in Wildlife Images Bookstore & Nature Shop with Friends of Patuxent, 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. Visit the shop in the National Wildlife Visitor Center and ask for Ann; email 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 March, April and May at Ruth Swann Memorial Park in Bryans Road. Meet at Ruth Swann Park-Potomac Branch Library parking lot. Bring lunch. Info: ialm@erols.com, 301-283-0808 (301-442-5657 day of event). Carpoolers meet at Sierra Club Maryland Chapter office at 9 am; return at 5 pm. Carpool contact: 301-277-7111.

Maryland State Parks
Search for volunteer opportunities in state parks at ec.samaritan.com/custom/1528. Click on "Search Opportunities."

St. Mary's County museums
Join the St. Mary's County Museum Division Volunteer Team or Teen Volunteer Team.
- *Adults:* Assist with student/group tours, special events, museum store operations at St. Clement's Island Museum or Piney Point Lighthouse Museum & Historic Park. Work varies at each museum. Info: St. Clement's Island Museum, 301-769-2222. Piney Point Lighthouse Museum & Historic Park, 301-994-1471.
- *Teens:* Ages 11+ Work in the museum's collections management area on artifacts excavated in the county. Info: 301-769-2222.

Lower Shore Land Trust
The Lower Shore Land Trust in Snow Hill is looking for volunteers to help with their events. Info: Beth Sheppard at bsheppard@lowershorelandtrust.org.

EVENTS / PROGRAMS

VIRGINIA

Owl Prowl
Meet, learn about raptors in the care of Natures Nanny Wildlife Rehabilitation 6:30–8:30 pm March 23 at Hoffler Creek Wildlife Preserve in Portsmouth. Later, search for owls on preserve's trails. $15. Registration required: Web search "Hoffler Creek owls."

MARYLAND

Youth-only trout fishing day
The Maryland Department of Natural Resources' first *Youth-Only Trout Fishing Day* (ages 15 & younger) is set for 6:30 am–10 pm March 23. The state's put-and-take trout areas under closure to other anglers at that time will be stocked in advance. Fishing areas are listed online and in the *Maryland Guide to Fishing and Crabbing*. Youth anglers may catch and keep up to two trout each, except brook trout, which must be released if caught. Not all locations are open or accessible during fishing hours; confirm operating hours before attending. Opening day for anglers of all ages is 6:30 am March 30.

Eden Mill Nature Center
Attend an event at Eden Mill Nature Center in Pylesville. Preregistration required: edenmill.org. Info: edenmillnaturecenter@gmail.com.
- *Owl Prowl:* 6:30–8 pm March 22 & 7:30–9 pm April 12, 26. Pavilion. Ages 8+ Learn about native owls while calling, searching for them in the woods. $14 per date.
- *Bluebird Box Build:* 1–3 pm March 16. Ages 10+ Assemble a bluebird box to take home, learn how to attract bluebirds to the box. $20.
- *Preschool Nature Series:* 10–11 am April 9, 10, 16, 17, 23, 24. Ages 2–5 w/adult. Nature games, activities, story, craft, snack & (weather permitting) short hike. $11 per date.
- *Homeschool Environmental Study Series:* 3-session class meets 12:30–1:30 pm April 10, 17, 24. Ages 6-11. Participants learn about environmentalist Gifford Pinchot through literature, journaling, activities, hikes. $33.

Kayaking class
Chesapeake Paddlers Association's SK101-Introduction to Sea Kayaking takes place 9 am–3 pm April 13 at Cult Classic Brewery on Kent Island. The classroom workshop includes an overview of boat styles, picking a paddle, where to paddle, PFDs, paddling garb, gear. No boat needed. $40 fee includes lunch, snacks, beverages. Tickets/info: https://sk101_2024.eventbee.com.

CBMM Shipyard
Chesapeake Bay Maritime Museum's Shipyard, in St. Michael's has an array of hands-on programs. Info: Web search "CBMM shipyard events."
- *Shipyard Workdays:* 10 am–4 pm March 30, April 13. All ages (15 & younger w/adult) Shipyard staff, experienced guest instructors teach fundamentals of boat building, repair while working on new construction, restoration projects. Fee: $60. Preregistration required.
- *Marine Welding Processes:* 3-session class meets 6–8:30 pm March 22, 9 am–4 pm March 23 & 24 at shipyard & Chesapeake College. Ages 18+ No welding experience necessary. Learn environmental concerns of welding in a marine environment. Focus is on steel, stainless steel, aluminum, copper-based alloy; galvanic scale; degradation above and below the waterline. Tools, materials included w/ $795 registration (20% discount/CBMM members).
- *Coffee & Wood Chips:* Virtual program 10–11 am March 26. Shipyard Education Programs Manager Jenn Kuhn highlights work being done on CBMM's historic floating fleet. $10. Preregistration required.
- *Small Diesel Engine Familiarization & Maintenance:* 4-session class meets 6–8:30 pm April 8, 9, 15, 16 at 109C Mill St. Ages 16+ (15 & younger w/adult) Entry-level, hands-on discussion on small diesel engine systems, basic maintenance using a working diesel engine simulator. Clothing might get oily. No previous experience necessary. $65. Preregistration required.

Patuxent Research Refuge
Patuxent Research Refuge offers free public programs on its North Tract [N] and South Tract [S] units, both in Laurel, MD. No registration, except where noted: 301-497-5887. Note special accommodation needs when registering. Info: 301-497-5772, https://fws.gov/refuge/patuxent-research/visit-us.
- *Kids' Discovery Center:* 9 am–12 pm (35-minute time slots, on hour) Tuesdays-Saturdays [S]. Ages 3–10 w/adult. Crafts, puzzles, games, nature exploration; free booklet. March: Songbirds of Maryland. April: Rabbits. (Preregistration urged. Call 301-497-5760 for this program only.) Group special arrangements possible.
- *Family Fun/Habitats & Adaptations Drop-in:* Staffed 10 am–1 pm March 15, 16 & April 12, 13. Explore on your own 9 am–4:30 pm Tuesdays–Saturdays [S] All ages. Hands-on activities, games, crafts.
- *Photo-Adventure Scavenger Hunt Drop-in:* 9:30 am–1 pm March 16, 30, & April 6 [N] Start at contact station. All ages. Learn about refuge while using clues to hunt for objects, plants, animals. Requires driving 1–2 miles, walking short distances. Bring camera/cell phone.
- *North Tract Bicycle Trek:* 10 am–12:30 pm March 16 [N] Meet at contact station. Ages 10+ 12-mile guided ride is weather-dependent. Road may be unsuitable for narrow tires. Bring bike, snack, water bottle, helmet. Preregistration required.
- *Screech Owl & American Kestrel:* 10 am & 11 am March 16 [S] All ages. Live birds.
- *Untold Stories of the North Tract:* 1-4 pm April 6 [N] Meet at contact station. All ages. Drive your own vehicle while joining a former refuge manager for auto tour of Wildlife Way. One short hike possible. Binoculars, water recommended. Preregistration required.

Learn about lawn care
Stop by the Queen Anne's Public Library in Kent Island 10 am–12 pm April 13 when Master Gardeners will present *Lawn Care To-dos* and answer questions about gardening, pests, plant problems. They will also offer tips on troubleshooting tricky growing situations. Info: Rachel Rhodes, at 410-758-0166, rjrhodes@umd.edu or visit facebook.com/QueenAnnesCountyMasterGardeners.

Learn about healthy soil
Visit the Kent County Public Library in Chestertown 10 am–12 pm March 16 when Master Gardeners will present *How Healthy Is Your Soil?* and answer questions about gardening, pests, plant problems. They will also offer tips on troubleshooting tricky growing situations. Info: Rachel Rhodes, at 410-758-0166, rjrhodes@umd.edu or visit facebook.com/QueenAnnesCountyMasterGardeners

Ladew spring lectures
Attend a lecture at Ladew Topiary Gardens in Monkton either in person or virtually. In-person/$40 (includes pastries, coffee and tea) virtual/$20. Recorded lectures will be made available for all paid registrants to view later. Info: Caroline Graf, 410-557-9570 x261; cgraf@ladewgardens.com. Lectures begin at 10:30 am (refreshments at 10 am for in-person attendees).
- *Planting For Pollinators:* March 28. Garden writer and consultant Heather Andrews will discuss how to attract pollinators to and decrease pests in your yard to increase your yield in a sustainable garden.
- *The Secret Life of Wildflowers:* April 4. Ellen Lake, director of conservation and research at Mt. Cuba Center, will discuss spring ephemerals, wildflowers, their adaptations to challenges, their relationships with pollinators, seed dispersers.

RESOURCES

VIRGINIA

Apply for runoff assistance
The Prince William Soil & Water Conservation District no longer requires application periods for the Virginia Conservation Assistance Program, which helps HOAs, homeowners, schools, places of worship and others with urban soil erosion and water runoff. Those interested can simply contact the district at 571-379-7514, pwswcd.org/vcap, or Nicole Slazinski at nicoleethier@pwswcd.org.

The dos and don'ts of invasive species management

By John Montgomery

Volunteers with the Maryland Department of Natural Resources remove invasive water chestnut floating among American lotus plants in Maryland's Sassafras River. (Alicia Pimental/Chesapeake Bay Program)

Invasive species are everywhere in the Chesapeake Bay watershed, and the more you know, the more you can do to stop the negative effects associated with their spread. Some of these impacts include economic devastation — compromising the resources of local farms — and decreased biodiversity for the native wildlife and pollinators that are critical to the ecosystem.

If you're thinking about joining the fight, whether it be in your own space or the public spaces you like to frequent, here are some tips to be as effective as possible.

Do: Research your problematic plant.

There are plenty of ways that invasive species spread, and a control tactic that may work for one species may be unwise to use on another. Familiarize yourself with the management and maintenance techniques known to work for a specific invasive. One plant may spread by rhizomes (root systems), which requires a completely different removal technique from a plant that spreads through seed dispersal.

Seek advice from a local or regional invasive species resource — a county or state extension service, a native plant nursery or even a garden club — to help you identify your plant and determine how to control it. There are also many great landscaping companies that specialize in invasive species removal.

Don't: Assume your work is done.

Invasive species tend to stick around, even after a hard-fought, hard-won, initial battle to remove them. Maintenance plays an integral part in making sure they can't return after you've worked so hard to eradicate them. Check back in those areas at key points during the year (learn when these are for the species) to follow up and stymie their regrowth. Don't worry, though — the first battle is usually the biggest challenge!

Do: Learn about common invaders.

I like to compare learning about a new invasive species to learning a new word. Once you learn a new word, you start to hear it everywhere. Similarly, once you can identify an invasive species, you begin to realize how ubiquitous it is. Given our growing awareness of invasive species, the usual suspects in your area will show up in a quick web search. You can also look up your state's most common invasives to familiarize yourself with them for when you're out and about. If you live in an urban area, remember that plenty of species can force their way through sidewalk cracks.

Meagan Allyn of the Maryland Conservation Corps prepares an ash tree at Maryland's Patapsco Valley State Park for an infusion of insecticide that will protect the tree from deadly invasive emerald ash borers for two to five years. (Will Parson/Chesapeake Bay Program)

Some are even used in landscaping.

Don't: Help the hitchhikers.

There are simple steps you can take to make sure you're not part of the problem. If you have a boat, be sure to wash aquatic plant matter off it before bringing it home or to another water body. Don't dump leftover bait bought elsewhere in the water; take it with you and dispose of it where it can't survive and compete with natives. The Chesapeake is the largest U.S. estuary, so if water recreators commit to these simple steps, they can make a huge impact!

Terrestrial explorers can take similar precautions when going from one natural area to another. To keep hitchhiking plants and insects to a minimum, always clean your shoes, clothes, bicycles and vehicles, as well as pets' paws before you move to a different location. If the trail you choose doesn't have a boot brush installed at the trailhead (many do), you can always keep a handheld brush in your car and use it before and after hiking. When you're camping, be sure to buy locally sourced firewood, so as not to spread invasive tree insects and fungi.

Do: Avoid exotic pets.

If you don't buy nonnative aquarium pets — like goldfish, turtles, reptiles, etc. — you won't be faced with the conundrum of what to do with them when they grow too big or otherwise overstay their welcome. Even something as seemingly harmless as a goldfish (an Asian species) or a nonnative turtle can, and does, upset the natural balance when introduced to a new ecosystem.

Don't: Think you can't make a difference.

Once you've honed your identification skills, put them to work. If you see an invasive at one of your favorite recreation spots, it's an easy call to your parks department or other organization managing that land. Better yet, you can join a network of volunteers who help in the mapping of invasive species — one example is iMapInvasives, operating in the northern parts of the Bay watershed. Look into the mapping applications that are active in your area to help volunteers, scientists and decision makers target efforts to control invasives.

There are plenty of volunteer opportunities to help organizations near you manage or remove a problematic species or, even more satisfying, help restore a site after invaders have been vanquished. Look into invasive species volunteer events near you. (You might find some in the Bulletin Board of the *Bay Journal's* print editions.)

If you're interested in managing your own space, do your research, do your maintenance, then consult a native plant resource like the Alliance for the Chesapeake Bay's online Native Plant Center to choose beautiful, effective native plants that help keep your environment more resilient and sustainable. ■

John Montgomery is communications and social media coordinator for the Alliance for the Chesapeake Bay.

Once-abundant black ducks make a case for saving habitat

By Alonso Abugattas

The story of the American black duck over the last century or so is complicated. Black ducks used to be one of the most abundant breeding ducks in the U.S., mostly in the upper Midwest and Northeast. The majority now nest and breed in Canada, as far north as the shores of Hudson Bay from late May to mid-July.

Here in the Chesapeake Bay watershed, we're far more likely to see them in the winter through early spring — though, as with many waterfowl, there are some year-rounders this far south.

Today the American black duck (*Anas rubripes*), although still possibly declining in some parts of its breeding and wintering habitat, is considered a species of least concern, with an estimated breeding population in 2023 of 732,000, according to the U.S. Fish and Wildlife Service and Cornell Lab of Ornithology.

But the 20th century was not kind to *A. rubripes*, which likely numbered in the millions in previous centuries. Historical population estimates, and even modern ones, vary widely, but there is general agreement that the species declined by well over 50% between the early 1950s and early 1980s, when strict hunting controls were enacted.

Hunting is thought to have been the main factor. The black duck is an extremely popular game bird for both its elusiveness and culinary appeal.

But there were other pressures too, notably loss of wetland habitat throughout its range. Pesticides took a toll as well; *A. rubripes* was not spared the ravages of DDT, which weakened the eggshells of countless bird species.

And there was — and still is — competition from the common mallard duck, one of its closest relatives. Previously, the two species had mostly separate breeding and wintering grounds. But habitat loss is less detrimental to the more adaptable mallards, which not only outcompeted the black ducks but also crossbreeds with them.

An American black duck takes flight, likely a female because of the duller-colored bill. (Henry T. McLin/CC BY-NC-ND 2.0)

Mallard males are known for ganging up on and forcibly mating with females — not just with their own kind, but with other species and black ducks in particular. An estimated 4% of the breeding American black ducks are mallard hybrids, a percentage that might be higher if it weren't for a tendency, according to a study of captive ducks, for female hybrids to die in their first year, before reaching sexual maturity.

Except for a yellow bill on the male and a dull olive bill on the female, black duck sexes look very similar — like a darker-than-usual version of the female mallard in the body, with a contrasting pale brown head and neck with a dark crown. On the ground, their most notable difference from the female mallard is their violet-colored speculum (a patch of contrasting color on the secondary wing feathers), bordered in black, compared with the mallard's blue-purple speculum, bordered in white.

This male American black duck was photographed during breeding season in Newfoundland. (Alan Schmierer/public domain)

Black ducks form pairs over the winter, well before heading north to their breeding grounds. There, the hen builds a nest, usually on the ground of elevated hummocks and the dry edges of wetlands.

The male black duck can look like a slightly darker than normal version of a female mallard. The giveaway is its violet wing patch, which is closer to blue and bordered in white on the mallard. (Mark Nenadov/CC BY 2.0)

She lays 6–12 cream or greenish-buff eggs, which she incubates for 26 to 29 days. All of the young hatch within a few hours and are ready in a few more hours to follow the mother, usually at night, to marshy edges. There, the ducklings feed almost exclusively on larval and adult invertebrates, particularly in the first few weeks.

The young fledge at about two months and are ready to head south with the grownups by fall.

They are usually sexually mature the next season. Black ducks have only one brood per year and show remarkable nest fidelity, often returning to within a few yards of where they nested the year before. Barring disease and predation, these birds can live 20 or more years; the oldest American black duck on record lived 26 years and 5 months. It was banded in Pennsylvania in the early 1950s and recovered in 1978 in Delaware.

The American black duck's diet varies widely, depending on both season and habitat, according to Cornell. "Animal foods are essential during pre-laying and laying stages," according to the bird's profile in Cornell's online resource, *Birds of the World*. The adults eat mayflies, caddis flies, dragonflies and true flies, as well as snails and clams, supplementing this high-protein diet with the seeds of bur reed, sedges, rice cut-grass and pondweed. Although they are dabbling ducks, they can dive 12 feet or more to get food. Sometimes, they even feed at night.

In 2016, the Atlantic Coast Joint Venture named the American black duck one of three "flagship" species — along with the saltmarsh sparrow and black rail — most in need of saltmarsh habit restoration and preservation.

The group's Black Duck Conservation Plan calls for "restoring and enhancing" about 400,000 acres of the birds' wintering habitat and protecting existing high-quality habitat. The 2023 population estimate of 732,000, referred to earlier, is an 8% increase from the year before. So, if last year is an indication of their future, American black ducks appear be holding their own, despite all of the threats they face. Let's hope the trend continues. ■

Alonso Abugattas, a storyteller and blogger known as the Capital Naturalist, is the natural resources manager for Arlington County (VA) Parks and Recreation. You can follow him on the Capital Naturalist Facebook page and read his blog at capitalnaturalist.blogspot.com.

Frog's loud call lets the world know he's ready for love

By Kathy Reshetiloff

For some, robins are the first sign of spring. But the changing of the seasons may be more accurately forecast by songs from a wet forest floor.

On a warm night, wander near any fresh water and you'll likely be serenaded by a chorus of tiny spring peeper frogs. Their song, which to some people sounds like sleigh bells, signals the winter's end and the arrival of spring.

Most of the year, spring peepers live in the forest. Adhesive pads on their toes make them expert tree climbers. Peepers are brown, gray or olive and sport a dark cross in the shape of an X on their backs. These tiny frogs, only 0.75–1.5 inches long, can jump up to 28 inches, more than 20 times their body length.

From February to March, spring peepers leave the trees to mate in open water. Forested wetlands are their main breeding sites. Because forested wetlands are subject to periodic flooding, they form temporary ponds, known as vernal pools. These ponds may last from a few days to a few weeks and are critical to the life cycle of many amphibians, including spring peepers. Forest wetlands also contain a rich food supply.

Spring peepers breed a week or two behind wood frogs, and their timing sometimes overlaps, but they're easy to tell apart. The wood frog's mating call is lower pitched, not unlike the quack of a duck. But the peeper's call, as the name suggests, is high-pitched: a short, urgent, ascending whistle.

Because of the species' vast range, it is one of the most recognizable frog calls in North America — from the Maritime Provinces to Manitoba in Canada and the entire eastern half of the U.S., and as far south as central Florida and as far west as Texas.

As the vernal ponds appear in early spring, the males arrive first and start their incessant peeping, which can be heard as far as a half-mile away. The calls attract females, who make no calls of their own.

A spring peeper clings to a tree branch. In spring, these tiny tree frogs leave their forest haunts to mate in vernal ponds. (Mark Beckemeyer CC BY-NC 2.0)

X marks the frog. Spring peepers vary widely in overall color, but most have a prominent X-like mark on their backs, though not all as neatly rendered as seen here. (Judy Gallagher/CC BY 2.0)

All frogs produce calls by moving air back and forth over their vocal cords, which causes them to vibrate and produce sounds. Spring peepers also have stretchy vocal sacs that amplify their calls. The male inflates its vocal sacs by pushing air through slits in the floor of its mouth. As it calls, the inflated sacs resonate the sound. Peeping is loudest on relatively warm nights and all but stops if the temperature drops below 30 degrees.

With its vocal sac expanding to amplify the sound, a spring peeper calls for potential mates at the edge of a vernal pool at Kings Gap State Park in Thurmont, PA. (Will Parson/Chesapeake Bay Program)

After the female has chosen her partner, he latches onto her and fertilizes the eggs — as many as 1,300 — as she releases them, singly, to settle on underwater vegetation. This can take an entire day and, after the work is done, both males and females return to the trees.

Spring peepers, like all frogs, toads and salamanders are amphibians. The Greek word *amphibious* means beings with a double life: aquatic and terrestrial.

After two or three weeks, tiny tadpoles, less than 1/5 of an inch long, emerge from the eggs. Tadpoles are exclusively herbivores, feeding by inhaling water and filtering out blue-green algae. One ounce of tadpoles can remove algae from 12 gallons of water every day.

In about five months, tadpoles metamorphose into adults. Gills are replaced with lungs, legs grow and tails are reabsorbed into the body. Adult frogs are primarily insectivores, so a tadpole's intestines shrink, and its mouth becomes large enough to eat and digest insects. The new generation leaves the water for the forest, reaching sexual maturity in three to four years.

Adult peepers eat whatever animals they can find, as long as it's small enough to fit in their tiny mouths. Insects are the staple of their diet. Peepers, in turn, are food for birds and small mammals.

During autumn, peepers may sometimes call from the woods. This is known as the fall echo. Scientists speculate that light and temperature conditions, similar to those in the spring, stimulate the peepers to call — though it doesn't lead to mating. Spring peepers hibernate during winter under logs and tree bark. A high concentration of sugar in their blood helps peepers survive harsh winter temperatures.

Although spring peepers have a large range and are not considered threatened or endangered, they are subject to the same threats that plague other amphibians.

Loss or fragmentation of both woodlands and vernal pools can reduce populations. Many adult frogs return to the ponds where they were born to breed. If these natal areas are disturbed or lost, those amphibians will not seek another pond. They simply won't breed.

Protecting forested wetlands and woodlands is the first step to preserving amphibian populations. Adults require wooded tracts as adults, but they also need access to vernal pools. Rivers and floodplains provide excellent corridors that connect isolated or fragmented woodlands, allowing amphibians to move between existing woodlands and wetlands and helping to ensure healthy and diverse populations. ■

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