CHESAPEAKE
BAY JOURNAL

May 2025 Volume 35 Number 3

Independent environmental news for the Chesapeake region

Headwinds slow equity progress in land conservation, green spaces

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CONSERVATION SETBACK

USDA cancels funds for climate smart farm projects PAGE 18

THE CLEVEREST SHOREBIRD

Broken wing? No, just a killdeer up to its tricks PAGE 39

GHOSTS OF THE FOREST

Coastal woodlands dying off from saltwater assault PAGE 21

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Maryland and Virginia have taken different approaches to controlling invasive blue catfish. Story on page 16. (Will Parson/Chesapeake Bay Program)

ON THE COVER

Tavon Benson visits the new Etting Street Green Space in Baltimore, which he spearheaded as director of community resources for the Druid Heights Community Development Corp. (Jeremy Cox)

Bottom photos: Left and right by Dave Harp, center by Lorie Shaull/ CC BY-SA 4.0

CORRECTIONS

In our April Chesapeake Challenge, we misidentified one of the pictured butterflies. The one identified as a "red-colored variety" of a banded hairstreak is in fact just a banded hairstreak butterfly.

In the April article about Virginia's 2025 legislative session, we said that the governor vetoed a bill to establish a fund that developers can pay into when they remove trees. In fact, he approved that bill.

In our April "By the Numbers" column, the 524 miles we cited as the length of the Chesapeake Bay watershed is the measurement of driving miles. As the crow flies, a cartographer informed us, it is 415 miles. By water, it is 678 miles.

CONTENTS

EDITOR'S NOTE

Paddling into the wind

Raystown Lake in Pennsylvania: Staff writer Whitney Pipkin highlights this lovely place in our May travel article. She describes a fun but challenging canoe trip, discovering that lakes can still have current and, paired with a stiff breeze, paddling on the return trip can be much harder (especially when youngsters help wield the paddles).

And I recalled a similar outing, years ago. Three of us in our early twenties, with little open water paddling experience, took a rowboat onto one of the Finger Lakes in upstate New York. A lovely day. We traveled far and fast, with the breeze in our favor ... at first. Hours later, we had made almost no progress toward the shore. We sat there slumped and exhausted. A nice man in a motorboat pulled up and towed us to shore. Amusing for him, no doubt.

The memory seems appropriate: I feel like a lot of people working for the Bay and its watershed are paddling into the wind right now.

Changes to environmental policies, frozen and cancelled grants, staff reductions, defunding of climate science, stalled projects and an overall atmosphere of uncertainty — those are significant headwinds. But let's remember that, metaphorically speaking, it's still a beautiful day and absolutely worth being on the water.

The winds will likely lead to greater creativity, resilience and strength. Whitney tells me that, halfway through the return trip to shore, her 10-year-old daughter learned to "row with her core" and make progress despite resistance. And we will all no doubt be gifted with help along the way and remember to accept it gratefully. Sometimes, you just need a tow.

The *Bay Journal* is still coping with a frozen federal grant that supports Bay-related public outreach. It's a challenge to be sure, but we're committed to keeping the *Bay Journal* as robust as ever. To all of our readers who have stepped forward with donations and kind notes during our spring fundraising efforts, we couldn't be more grateful. Keep paddling.

— Lara Lutz

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BY THE numbers

750,000,000
Approximate number of river herring captured in the Potomac River near DC annually in the early 1800s, according to the Interstate Commission on the Potomac River Basin

22,500,000
Approximate number of American shad captured in the Potomac River near DC annually in the early 1800s, according to the Interstate Commission on the Potomac River Basin

20
Number of days earlier that allergy season starts in the U.S. compared to 1990 because of climate change, according to a 2021 study in the Proceedings of the National Academy of Sciences

21%
Average increase in pollen concentrations in the U.S. compared to 1990 because of climate change, according to a 2021 study in the Proceedings of the National Academy of Sciences

How did the Chesapeake Bay form?

Glaciers, space rock and rivers formed the Chesapeake Bay as the sustaining ecosystem we know today.

It began with the Susquehanna River, which formed 340 million years ago — long before mammals existed. Over the next 40 million years, land that is now eastern North America collided with what is now western Africa and formed the Appalachian Mountains. The new range redirected the Susquehanna River's flow to run southeast. Over time, the continents pulled apart and created the Atlantic Ocean.

The most explosive change came from a massive asteroid or comet. It crashed 35 million years ago near today's Cape Charles, VA. It left a dry crater larger than Rhode Island, which would later be home to the lower Chesapeake Bay.

Glaciers that formed in the last Ice Age and reached as far south as current-day Pennsylvania began to melt 18,000 years ago. The water flooded the ancient Susquehanna River, forcing new streams and rivers to barrel toward the coast. The water reached the crater and fully transformed the cavity into the Bay's familiar shape about 3,000 years ago.

— Lauren Hines-Acosta

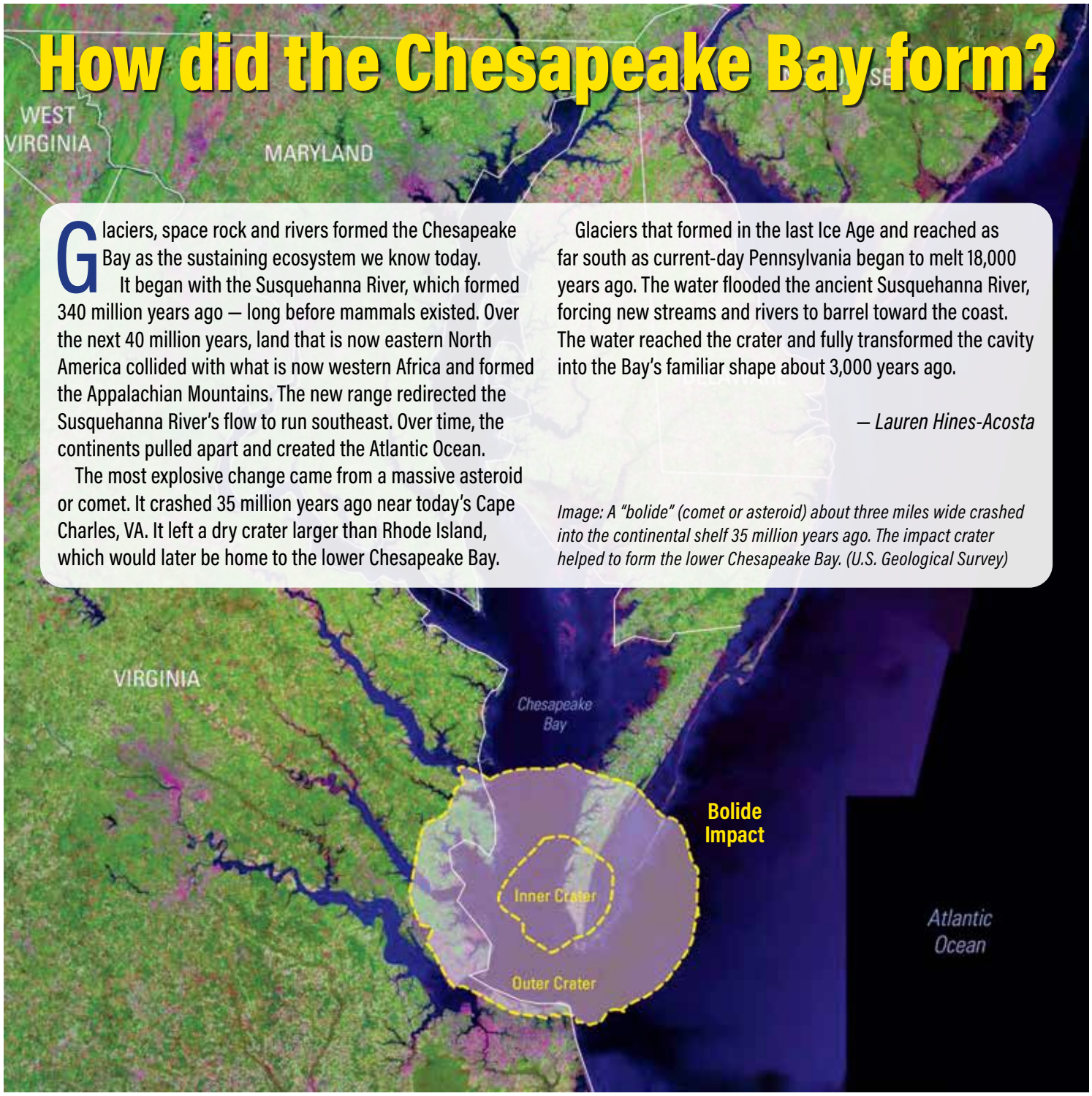
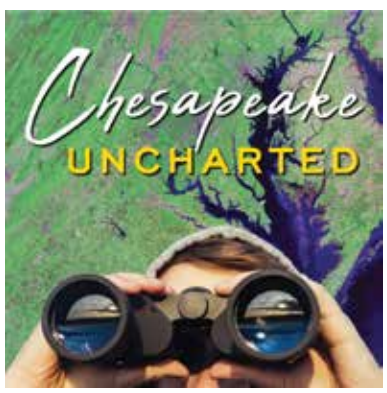


Image: A "bolide" (comet or asteroid) about three miles wide crashed into the continental shelf 35 million years ago. The impact crater helped to form the lower Chesapeake Bay. (U.S. Geological Survey)



A new season of Chesapeake Uncharted

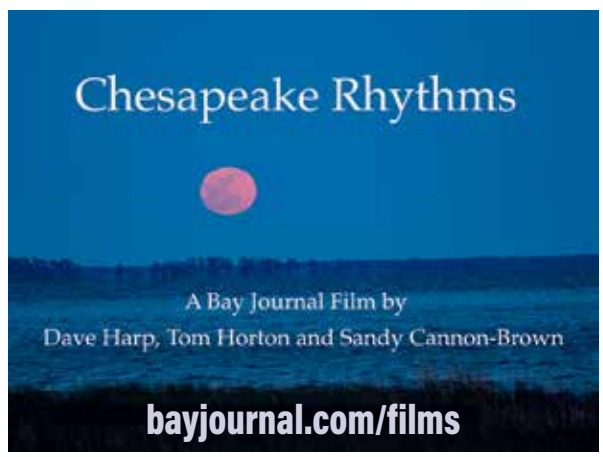
Coming on May 21! Tune in to the next season of our *Chesapeake Uncharted* podcast, which taps into the new *Bay Journal* film, *Chesapeake Rhythms.*

The film explores the migrations in the Chesapeake Bay region: graceful tundra swans, beautiful monarch butterflies, elusive eels and flocking shorebirds.

Adding to a film already rich with the sights and sounds of the Bay watershed, this podcast season will immerse you in the remarkable journeys of these creatures. Learn how the filmmakers caught perfect moments, like a butterfly emerging from its cocoon, and how the decades-long working relationship between Dave Harp and Tom Horton has thrived.

bayjournal.com/podcasts

Listen to the new episodes at *bayjournal.com/podcasts* or wherever you get your podcasts.



ABOUT US

The *Chesapeake Bay Journal* is published by Bay Journal Media, an independent 501(c)3 nonprofit news organization dedicated to environmental reporting in the Chesapeake Bay region. *Bay Journal* reporting reaches an average of approximately 250,000 people each month through news articles, columns, films, the *Chesapeake Uncharted* podcast and more.

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.

The Bay Journal News Service distributes *Bay Journal* content for free use by other news outlets across the region. Material may be reproduced, with permission and attribution.

Publication is made possible by grants, reader donations and advertising revenue. EIN #26-2359058.

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 NOTEBOOK

Bay Journal photographer Dave Harp gets footage of columnist Tom Horton for the 2020 Bay Journal film, High Tide in Dorchester. (Sandy Cannon-Brown)

An award-winning spring

The Chesapeake Bay Maritime Museum has recognized environmental filmmakers **Tom Horton**, **Dave Harp** and **Sandy Cannon-Brown** — the team behind the *Bay Journal's* eight films — with its Bay Heritage Award. The award acknowledges their contributions to the preservation of regional culture.

"Their repeated collaboration — Tom as the writer and narrative voice, Dave as the photographer and videographer, and Sandy as the filmmaker artfully weaving the content together — has deepened our understanding and appreciation of a fragile and changing Chesapeake Bay and the impact of those changes on communities and individuals who have called this region home," said the museum's president and CEO Kristen Greenaway.

Chief historian Pete Lesher presented the award to the trio on April 16 following a screening of their latest *Bay Journal* film, *Chesapeake Rhythms*, which focuses on the migrations of some of the region's most iconic creatures, from eels to monarch butterflies. The screening was part of the Chesapeake Bay Week Film Festival. Previous recipients of the award include broadcast journalist Walter Cronkite, naval architect Thomas C. Gilmer and log canoe preservationist Judge John C. North II.

You can watch *Chesapeake Rhythms* for free at *bayjournal.com/films*.

The Virginia Press Association also recently recognized the work of *Bay Journal* staffers in its 2024 News and Advertising Contest. Winners were announced in April.

Staff writer **Lauren Hines-Acosta** garnered three awards from the competition. Her videos on planting mussels in the James River and electrofishing for invasive catfish earned first and second place in the contest's specialty category. Her article on opposition to a gas plant in Chesterfield, VA, earned second place for in-depth or investigative reporting. Staff writer **Whitney Pipkin** earned second place in the general news writing category for her article about EPA officials' visit to Brown Grove to hear community concerns.

Lauren and staff writer **Jeremy Cox** have also been hard at work on the next season of our *Chesapeake Uncharted* podcast. It will serve as a companion to *Chesapeake Rhythms* and be released on May 21. Find it wherever you listen to podcasts or at *bayjournal.com/podcasts*.

NEWS briefs | LOCAL REGIONAL NATIONAL

Settlement to fund trash wheel for Back River

The family of googly-eyed trash wheels keeping Baltimore's harbor tidy is about to get a new relative next door — on Back River in Baltimore County, MD.

That litter interceptor stood out among 21 environmental restoration projects announced recently — to honor the settlement of a lawsuit over a string of pollution problems at Baltimore city's two wastewater treatment plants, one on Back River and one on the Patapsco River.

Officials with the Maryland Department of the Environment, the city and the county joined community activists at a riverfront park in Essex in April to mark the awarding of $1.7 million for the projects and to report major progress in the treatment plants' performance.

As part of a 2023 consent decree, Baltimore agreed to pay $4.75 million to settle lawsuits brought by MDE and the nonprofit Blue Water Baltimore over repeated violations at the two plants. Blue Water had alerted state regulators to problems with the Patapsco plant, which prompted an investigation and ultimately a temporary state takeover of the Back River facility.

A trash wheel similar to this one at the mouth of Baltimore's Jones Falls will replace a floating trash boom on Back River east of the city. (Kaitlyn Dolan/Chesapeake Bay Program)

Under the decree, 40% of that sum was to go to environmental restoration projects, while MDE was slated to collect $1.4 million in penalties. The city would be able to avoid paying another $1.4 million if it complied with the terms of the settlement.

According to MDE, nitrogen and phosphorus discharges from the two plants have declined by 60% to 80% since 2022.

The biggest recipient of the funds was the Back River Restoration Committee, which had joined Blue Water Baltimore to press for state action to fix the plants' maintenance and treatment problems. It is to receive $655,363 to design and build the wheel, which will replace a floating trash boom that must be constantly cleared manually of litter.

The remainder of the funds went to 20 other civic, neighborhood and religious groups around Baltimore for a variety of projects, including stream cleanups, rain barrels, permeable pavement, youth education, workforce development programs and native plantings. The Chesapeake Bay Trust is handling disbursement of the grants.

—T. Wheeler

PA opens new round of Growing Greener grants

The Pennsylvania Department of Environmental Protection is taking applications for a new round of Growing Greener Plus grants to help communities tackle stormwater runoff pollution and other problems like flooding and acid mine drainage.

See **BRIEFS**, *page 6*

briefs

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Watershed groups, counties, municipalities, conservation districts, educational institutions and nonprofit organizations can apply for the grants through June 20.

Since its inception in 1999, the Growing Greener program has provided almost $420 million in grants for more than 2,800 environmental projects. About half of of Pennsylvania's impaired waterways are polluted by runoff, one of the problems targeted by the grants.

"These grants empower communities to build environmental improvements right where they live — ensuring cleaner water, healthier ecosystems and more resilient infrastructure," said DEP Acting Secretary Jessica Shirley.

Shirley announced the new round of grants on Earth Day during a visit to a floodplain restoration project on Swatara Creek in Pine Grove Borough. Pine Grove has suffered 10 major floods since 2004. With almost $1.8 million in Growing Greener funding, the project restored 20.9 acres of floodplain, created 8.1 acres of wetlands and stabilized 8,139 linear feet of streambank.

For information about applying to the grant program, visit *pa.gov* and enter "Growing Greener Plus" in the search box.

—T. Wheeler

Rachel James, a Southern Environmental Law Center attorney, spoke at a hearing hosted by Friends of Chesterfield in Chesterfield, VA, in 2024. (Lauren Hines-Acosta)

VA gas plant progresses despite opposition

In response to increasing energy demand because of extreme weather and the rapid growth of data centers, Dominion Energy plans to build a natural gas plant in Chesterfield, VA. But the nearby community, which was home to a coal plant for 71 years and currently has two existing gas plants, has resisted the project for months, citing concerns about air quality.

Still, Dominion Energy is one step closer to building the new plant after applying in early March for a Certificate of Public Convenience from the State Corporation Commission, which evaluates utility projects' costs and rationales for increasing rates. Dominion expects to go before the commission in November.

Dominion disclosed in its application that the plant will earn $4.5 billion through 2064, with residential ratepayers contributing 50% of that revenue. According to the group opposing the project, Friends of Chesterfield, only 11% of the projected revenue will come from data centers, even though they account for most of the region's burgeoning power needs.

"Chesterfield residents will not only bear the added utility costs but the added air pollution as well if this plant is built," Glen Besa, chair and co-founder of Friends of Chesterfield, wrote in a statement.

Besa anticipates the Virginia Department of Environmental Quality will release a draft air permit in May or June and a public comment period will follow.

In preparation, anthropologist and Virginia environmental justice scholar Lakshmi Fjord is conducting a study on the plant's impact. For the study, Friends of Chesterfield collected surveys from citizens in a three-mile radius of the plant site to see if the project would have a disproportional impact on the nearest residents. The group will submit the findings to DEQ during the comment period.

Besa and two other residents also filed a legal challenge in January. They're asking for a court ruling on whether or not Dominion needs a

briefs

conditional use permit to build the plant. The utility argues that since the proposed site already has active power plants, it doesn't need the permit. The court hearing will be on May 21.

— L. Hines-Acosta

Baltimore area property with toxic past draws lawsuit

Neighbors of a sprawling commercial development under construction near Baltimore are suing the developers, alleging multiple environmental violations that they say might be threatening their health.

Residents say that developers are violating sediment and erosion regulations and operating without an adequate stormwater management plan. They say they have observed polluted stormwater runoff flowing off the site into a nearby creek and Middle River, the setting of a major underwater grass die-off in recent years.

The lawsuit, filed March 20 in Baltimore County Circuit Court, pits seven neighbors and the Chesapeake Bay Foundation against two limited liability companies affiliated with Reich Brothers, a New York-based real estate firm. A third company, Missouri-based TKG III Middle River LLC, is also named as a defendant.

This photo, included in a Chesapeake Bay Foundation complaint, shows muddy water flowing from the Aviation Station construction site near Baltimore toward a tributary of the Bay. (Courtesy of CBF)

Known as Aviation Station, the development will comprise 1.5 million square feet of commercial, office and industrial space, including a Walmart Supercenter.

The lawsuit asks the court to make the developers halt the alleged pollution and comply with state and Baltimore County environmental controls.

Responding to the *Bay Journal*'s request for comment, a Reich Brothers representative issued a statement, emphasizing that the project has been in compliance with applicable building regulations and permits.

"Aviation Station is a premier example of how successful brownfield redevelopment can breathe new life into communities," the statement said. "The lawsuit is without merit, and we will respond appropriately in court. The project has overwhelming support from the community, has received all necessary permits and is compliant with county and state regulations."

The 53-acre site includes a portion of the former Martin Aircraft plant, which manufactured B-26 bombers during World War II. During the 1950s and '60s, the Navy Reserve Industrial Aircraft Plant is believed to have used polyfluoroalkyl substances (PFAS) at the site.

The ongoing clearing and construction activity, the lawsuit claims, may be exposing residents and the environment to that toxic history anew.

"Progress shouldn't require destroying something to make it better," said plaintiff Paul Treash, a Middle River resident for 20 years. "The pollution and runoff this development has caused, and lack of oversight and transparency, needs a solution for the sake of our community, our environment and our wildlife."

— J. Cox

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briefs

From page 7

Land once slated for resort returns to Rappahannock Tribe

The Rappahannock Tribe in Virginia has regained almost 1,000 acres of ancestral land along the cliffs that line the tribe's namesake river.

With the new plot of land, the tribe now stewards 1,435 acres along Fones Cliffs. The area has one of the largest concentrations of nesting bald eagles in the Mid-Atlantic, according to the U.S. National Park Service. The site was also home to three of the Rappahannock communities that encountered and resisted Captain John Smith in 1608.

"This is the answer to the prayers of many generations to be returned to the lands of our fathers," Chief Anne Richardson said in a statement. "Now this land will be preserved for our tribe forever, and we will be able to return and commune with the land to heal the brokenness of our people."

The Virginia True Corp. previously owned this particular 969 acres of land on Fones Cliffs and had planned to develop it into a luxury golf resort. The corporation illegally cleared 13 acres of trees along the river, bringing fines from the state and leading to the company's bankruptcy in 2019. The owners then put up the property for auction.

The Rappahannock River flows along Fones Cliffs about 40 miles southeast of Fredericksburg, VA. (Lisa Hull/Northern Neck National Heritage Area)

In 2022, the Nature Conservancy had the highest bid at $8.1 million. Working with the conservancy and the tribe, the U.S. Fish & Wildlife Service purchased a conservation easement on the land using money from the federal Land and Water Conservation Fund. The conservancy then transferred the land to the tribe.

The Rappahannock Tribe plans to use traditional ecological knowledge to manage the land and expand its Return to the River program, which teaches tribal youth about traditional river knowledge. The tribe also wants to create hiking trails to inform visitors about native species and the tribe's history. *— L. Hines-Acosta*

Half of VA solar sites built on former forestland, report says

Researchers from Virginia Commonwealth University took a closer look at the types and total acres of land that have been converted into solar arrays during a blitz of solar construction in Virginia over the past nine years.

In 2016, there were no utility-scale solar arrays, or "solar farms," in Virginia, the researchers note. By the end of 2024, a little more than 30,000 acres of land had been developed into often-large fields of solar panels. That number, the researchers said, would be significantly higher if it included the total acreage impacted by solar development in general — because the solar panels themselves only cover a portion of the land set aside to also include buffer zones.

The research team, led by VCU professor Damian Pitt, used GIS technology and dated comparisons to discover that 50% of the solar arrays built in Virginia were constructed on formerly forested land. That comes in sharp contrast to earlier estimates suggesting that most solar arrays, at least from 2017 to 2021, were built on former cropland and pastureland.

VCU's study found that 28% of the land featuring solar arrays was formerly cropland, 11% was formerly pasture and about 11% was on miscellaneous land types.

The forested land use, the researchers said, is proportional with Virginia's average land cover, with 54% of the state forested. But the solar industry appears to be disproportionately impacting cropland, which makes up just 5% of the state's overall landcover. The American Farmland Trust recently found the rate of farmland-to-solar conversion to be a threat to Virginia farming,

one that could consume about 7% of the state's farmland by 2040.

VCU's Pitt said his team's research supports "the notion that better legislation could either prohibit or discourage the conversion of those high-quality forest lands."

"We could minimize those impacts with little functional impact on the potential to grow the solar industry," he said. *— W. Pipkin*

Suspected source identified in Perdue PFAS contamination

Investigators believe they have identified a potential source of the groundwater contamination that has threatened dozens of household water systems near a Perdue-owned soybean plant in Salisbury, MD, with "forever chemicals."

Consultants are pointing to firefighting foam as a likely cause, the poultry giant said in an April 17 statement. The company said a fire-suppression system in service in 2019 discharged foam on the property, but the statement didn't specify how much was released at the time.

Forever chemicals, as they're called, linger in the environment and human blood for many years. They are a group of more than 12,000 chemicals, officially called PFAS, or per– and polyfluoroalkyl substances. They have been used for decades in a wide variety of products, such as firefighting foam, carpeting and food packaging.

Investigators suspect firefighting foam as the cause of PFAS found in groundwater near the Perdue Agribusiness soybean processing plant in Salisbury, MD. (Jeremy Cox)

Experts have linked PFAS exposure to certain cancers, high cholesterol, liver damage, decreased fertility, developmental delays and weakened immune systems, among other health problems.

The Maryland Department of the Environment detected PFAS in wastewater at the Perdue facility in September 2023 as part of a statewide campaign to test potential hot spots. But neither the state nor Perdue notified the public until about a year after the initial discovery.

The matter is now the subject of a class-action lawsuit. In the meantime, MDE has designated Perdue as the party responsible for the cleanup.

Perdue officials say that well-water testing is nearly complete, having been conducted at 97% of properties that have requested them. The company has been paying for and installing PFAS treatment systems in the affected homes and expects to complete those efforts by the end of spring.

— J. Cox

PA black fly spraying operation launched for the summer

The Pennylvania Department of Environmental Protection in April began its 40th summer of spraying rivers and streams to suppress the population of black flies, or biting gnats.

Using the naturally occurring soil bacteria insecticide Bti (*Bacillus thuringiensis* ssp *israelensis*), the department says, it monitors some 1,800 miles of rivers and streams in the state and sprays when necessary, using both helicopters and ground crews. The survey relies on citizen complaints of black fly concentrations, using a web-based system.

If you want to report a black fly problem, go to *tinyurl.com/PAblackfly* and fill out the form.

— T. Sayles

Richmond schools pave way for environmental ed in VA

Statewide plan to roll out during the next school year, but city's plan is already in action

By Lauren Hines-Acosta

Along the banks the James River in Richmond, Boushall Middle School students were sword fighting with sticks, taking water samples and snapping selfies on the rocks. Even on a dreary day, eighth grader Maryam Al-Azzawi said she found the field trip "peaceful" and intriguing compared with her windowless science class.

This trip is one example of how Richmond Public Schools can use the school district's new Environmental Literacy Plan to help students learn about the James River watershed. The Virginia Office of Environmental Education is working on the first statewide environmental literacy plan, but Richmond's is one of the first already in place.

Environmental literacy goes beyond science education. Environmentalists say it could empower young people as they grow up and face problems caused by climate change. Students also learn how humans impact the ecosystem, how to solve environmental problems and how to think analytically about their surroundings.

Virginia mandates that students learn about the environment in two ways. They must pass the science standards of learning assessments, which include earth science. And, as part of the 2014 Chesapeake Bay Watershed Agreement, every Virginia student should have a meaningful watershed educational experience (MWEE) in elementary, middle and high school. MWEEs are outdoor hands-on experiences during which students learn about environmental issues.

In 2022, 37% of school districts in the Bay watershed responded to the Chesapeake Bay Program's survey asking how prepared they felt for teaching environmental literacy. Only 17% said they were "well-prepared" with a systemic approach.

A budget item in Virginia's legislative session this year tried to increase the amount of funding for environmental education to $500,000, but Gov. Glenn Youngkin removed it.

Josh Bearman was Richmond Public School's science specialist in 2019. He saw that teachers' ability to lead environmental education field trips and lessons was limited to MWEE funding and by a lack of goals within the school system. So, he wanted to make something that would last even after grants money ran out.

Penelope Davenport, an outdoor education program supervisor with the James River Park System, explains to Boushall Middle School students how the James River formed. (Lauren Hines-Acosta)

In May 2022, Richmond received almost $150,000 from the National Oceanic and Atmospheric Administration to design a plan outlining how teachers can employ meaningful experiences and environmental lessons. Led by its staff from the Department of Parks and the James River Park System, the city partnered with the school district and contracted the Alliance for the Chesapeake Bay and a Richmond area nonprofit called the Blue Sky Fund.

Now, the Environmental Literacy Plan is ready for any Richmond teacher of any grade level to use. Using the template isn't mandatory, but it includes a list of community partners that teachers can collaborate with to make their outings more educational. For example, the James River Park System works with teachers to focus the field trips on what students have learned in class. In March, at a safe distance from the rushing water, park staff explained to Boushall Middle School students how geology formed the rapids.

Boushall student Maryam Al-Azzawi, left, and a classmate watch the James River flow through Richmond. (Lauren Hines-Acosta)

The plan includes worksheets in Spanish for the district's growing Hispanic population. The number of Hispanic students in school system has increased by almost 50% since 2017. The plan also acknowledges environmental racial disparities, like redlining. The student body in Richmond is predominately Black.

Chloe Tremper, a Boushall Middle School teacher, was on the plan's teacher advisory board. She said she's most interested in the matrix the plan provides that outlines how a teacher can weave environmental literacy into their lesson plans with whatever resources they have.

Tremper said it's difficult for teachers to include environmental literacy due to low funding, lack of people to supervise students on trips, and limited access to transportation and green space. Her school doesn't have an outdoor space with enough shaded seating for a full-sized class.

But suggestions in the plan can help alleviate some of those challenges. Tremper teaches eighth-grade earth science and needs to achieve certain standards of learning. Specifically, students must learn how water has shaped Virginia's landscape, rocks, minerals and natural resources. To achieve that milestone, the plan suggests using the linked classroom lesson plan, looking for erosion in the schoolyard or partnering with the James River Park System to learn about the geology around the river's fall line.

Tremper chose the field trip, which the park system provides at no cost to the schools. Beyond taking water samples and geologic history, Tremper took every opportunity to teach her students something new. She distracted one student from the cold by asking her where the coal they could see in a passing train came from, highlighting Virginia's natural resources.

"I'm helping these students build a relationship with Richmond, with the James, with the environment, so that in the future, they're going to care about it more, and they'll be able to help educate other people more about it," Tremper said.

Students from five schools in the district formed a student advisory group that discussed the plan over four meetings. Students highlighted the need for outdoor breaks, merging science and society, and more windows in schools — with one student

Boushall Middle School students gravitate toward geese in the James River during an environmental education field trip in Richmond. (Lauren Hines-Acosta)

pointing out how just seeing trees through a window can make schoolwork easier.

Meredeth Dash, a Virginia environmental education specialist with the Alliance for the Chesapeake Bay, also helped design and write the plan. She said experiencing nature is vital for students from kindergarten to fifth grade.

"Those that have developed a sense of self and nature [by that age] are more likely to make decisions about the environment in a positive way or be stewards of environmental causes," Dash said.

Dash is working on environmental literacy plans for three Virginia counties in the Middle Peninsula that focus on their own watersheds. Learning from Richmond's plan, she's ensuring community, teacher and student input are collected from the outset.

At the state level, the Office of Environmental Education is working on Virginia's first statewide environmental literacy plan. The General Assembly funded and revived the office in 2022 and mandated that it create a plan. The resulting plan lists four goals for environmental literacy in Virginia for the next five years, including making a map of environmental education providers statewide and hosting networking opportunities.

Nonprofits, retired scientists, students and the public commented on the draft — with suggestions ranging from increasing focus on climate change to developing content standards and involving students in community science programs.

Cassiopeia Camara, an environmental education specialist in the office, said she wants to leave the content up to school districts, where staff know what's most relevant to their students. That way, districts can use the statewide plan as a guide to develop their own.

Willa Moffatt, an outdoor educator with the James River Park System, teaches Boushall students how the river formed. (Lauren Hines-Acosta)

The statewide plan is on track to be available during next school year. As for Richmond, Dash hopes to increase awareness of the existing plan and of the city's four locations filled with equipment for teachers to access. ■

‘Forever chemicals’ in sludge fertilizer resisted in VA, MD

Residents, watermen worry about PFAS in water and seafood, object to increased spreading on crops

By Timothy B. Wheeler

The glass of water that Jennifer Campagne draws from her kitchen faucet looks clear and clean. But ever since she had her household well tested and found “forever chemicals” in it, she’s leery of using it, even to make coffee.

Campagne lives in a small cinderblock cottage in Hague, VA, on the overwhelmingly rural Northern Neck between the Potomac and Rappahannock rivers. There are no nearby military bases, fire houses, factories or other likely sources of the per- and polyfluoroalkyl substances, or PFAS, detected in her well. There is, though, a farm field about 30 yards from her home where “biosolids,” or treated sewage sludge, has been spread as fertilizer for corn and soybeans.

The biosolids applications have been a recurrent nuisance, she said, because of the stench that wafts onto her property for days afterward, but she figured that was the price of living in farm country. Now, she worries they could be a health hazard.

“I never knew it was more than just the smell,” she said. “It’s a lot to take in.”

Every year, hundreds of thousands of tons of biosolids are spread as fertilizer on farm fields throughout Virginia and the rest of the Chesapeake Bay watershed. Treated to remove pathogens, biosolids provide farmers with a relatively cheap form of organic nourishment for their crop fields and pastures.

Yet the widespread practice is coming under increasing scrutiny because biosolids often are laced with PFAS, a group of thousands of chemicals used in a wide range of products, from firefighting foam to weather-resistant clothing and even food packaging and tooth floss. Per their nickname, they don’t break down easily and have spread so widely in the environment that they’re detected almost everywhere that researchers look for them: in drinking water wells and in rivers and streams and the fish that live in them. Studies have linked long-term exposure with cancer, liver problems and decreased immunity.

The U.S. Environmental Protection Agency in 2024 set stringent drinking water standards for five of the most commonly detected compounds and one mixture of them. It also developed draft criteria for limiting certain PFAS in waters that support aquatic life, though it has not finalized those.

Jennifer Campagne of Virginia holds up a glass of water drawn from her kitchen faucet. She learned recently that her well contains PFAS or “forever chemicals.” (Timothy B. Wheeler)

And earlier this year, in the final days of the Biden administration, the EPA published a draft risk assessment. It concluded that fertilizing farm fields with sewage sludge containing as little as one part per billion of a couple PFAS can pose unacceptable health risks, sometimes “by several orders of magnitude,” for anyone consuming crops or livestock raised there or drinking water from wells on the site.

The EPA is still weighing feedback on its draft risk assessment of PFAS in biosolids. If finalized, it could be the basis for regulatory action. Given the push by the Trump administration to reduce or revoke regulations, environmental advocates have their doubts, but an EPA spokesperson noted that the agency developed a national PFAS action plan during the first Trump administration.

Leaving it to the states

Unwilling to wait for the EPA, activists and concerned residents and watermen are demanding state action now. In two counties on Virginia’s Northern Neck, there was enough opposition to land application to force public hearings on requests to expand the practice. In Maryland, environmental advocates pressed — unsuccessfully — for legislation this year that would have set limits on PFAS in biosolids applied to farmland in that state.

Potomac Riverkeeper Dean Naujoks collects water from Virginia’s Nomini Creek to have it analyzed for PFAS or “forever chemicals.” (Michael Lightfoot)

Maryland’s municipal wastewater plants produced 595,000 wet tons of biosolids in 2023, the most recent year for which data is available, according to the Maryland Department of the Environment. Nearly 59,000 tons of it was spread on crop fields and pasture around the state. But most of it was shipped out of state, with Virginia the leading destination, MDE reported.

Indeed, about one-fourth of the 115,000 dry tons of biosolids spread on farmland in Virginia in 2024 came from Maryland, according to the Virginia Department of Environmental Quality. (Semisolid sludge is often dried, reducing its volume by anywhere from 20% to 60%.)

Maryland is among a handful of states that have already taken some initiative to regulate PFAS in biosolids. One state, Maine, banned all land application of biosolids in 2022 after finding PFAS contamination at more than 50 dairy farms in their wells, soil and products.

In 2023, MDE imposed a moratorium on new permits for spreading biosolids on land and had sludge from wastewater plants tested for PFAS. Then, in August 2024, state regulators recommended limiting or even stopping land application of biosolids if the PFAS concentrations in it exceeded certain thresholds. That action was modeled on limits imposed in Michigan, said MDE spokesman Jay Apperson.

The agency recommended no land application in Maryland if biosolids contained 100 parts per billion or more of certain PFAS. All but one of the Maryland wastewater treatment plants that have tested their biosolids so far have PFAS levels below MDE’s maximum, according to Brent Walls, the upper Potomac Riverkeeper. That plant that exceeded the limit sends its treated sludge to Virginia for disposal, he said.

Environmentalists welcome MDE’s moves but say they’re not enough. The state’s PFAS limits are guidelines only, and the maximum permitted for farm biosolids is 100 times greater than the level EPA said poses unacceptable health risks.

Virginia’s biosolids regulations mirror existing federal standards. While the state mandates a 100-foot setback from wells and 200-foot buffer from homes for any land application, it does not require any testing for PFAS. DEQ spokesperson Irina Calos noted that the EPA’s risk assessment is still in draft form and not a regulation that must be followed.

Citizen pushback in VA

Regulations notwithstanding, there has been citizen pushback. In what might have been a routine request, Synagro, a Baltimore-based biosolids management company, sought to increase the farm

acreage on which biosolids could be spread in Westmoreland County, VA. But residents there raised objections after learning that much of the biosolids being applied to farmland in Virginia comes from Maryland wastewater treatment plants that have PFAS in their sludge.

The Potomac Riverkeeper Network obtained testing data from MDE, which showed PFAS in the biosolids of all but one of 22 Maryland wastewater plants permitted to spread it on Virginia farmland.

Adding to locals' concerns, Virginia DEQ found PFAS last year in the water of Nomini Bay, a Potomac tributary in Westmoreland County. Though the levels detected there were below the EPA's drinking water standards, they still exceeded the draft water quality criteria the agency has proposed to protect people who might eat wild-caught fish from PFAS-tainted waters.

As word got around the county last fall, watermen and residents filed written objections to Synagro's request to spread biosolids on five new sites in Westmoreland comprising about 1,900 acres. The company already is permitted to spread on 2,500 acres.

"The Northern Neck is laced with streams and creeks that flow into the Potomac and Rappahannock rivers, one objector wrote to DEQ. "The whole area is used extensively for water recreation, crabbing and fishing. With the PFAS chemicals flowing from farm fields into these waterways during heavy rains, we are putting the health of many of us at risk."

There were enough objections that DEQ was required to schedule a public hearing on Synagro's request. Two weeks before the March 17 hearing, the company withdrew its application, citing delays in the processing of its permit.

A Synagro spokesperson said by email that the company applies biosolids "in accordance with regulatory requirements." Without elaborating, the spokesperson contended that the assumptions and methodology the EPA used in assessing health risks of PFAS in biosolids "are in question."

But Betsy Southerland, a retired senior scientist and manager at the EPA, defended the work of agency staff she once supervised. "This was the most cautious risk assessment I've ever seen," she said at a March press conference, "and it still finds high risks," particularly for the families of farmers eating food produced from biosolids-treated fields.

Public objections have now forced a hearing May 19 on another Synagro request to expand its biosolids land application in neighboring Essex County, which borders the Rappahannock to the south. DEQ heard from 28 residents, businesses and organizations, including the Rappahannock Tribe of Virginia. Many accused the agency of failing to do its job of safeguarding against contamination of water, fish and shellfish.

Municipal biosolids are loaded onto a spreader for land application. (U.S. Geological Survey)

"If we have one bad outbreak from these forever chemicals, our market could be ruined," warned J.C. Hudgins, president of the Virginia Waterman's Association, who crabs, fishes and oysters in the Rappahannock.

Also weighing in were some of Virginia's largest aquaculture businesses, which raise oysters on leased grounds in the Rappahannock. AJ Erskine, with Cowart Seafood Corp. and Bevans Oyster Co., wrote to register concern about "potential contamination with PFAS … that will eventually infiltrate our tributaries." Tommy Kellum, with W.E. Kellum Inc., warned of "unintended consequences" that could hurt not only his family's longtime oyster enterprise but also tourism and recreation.

Legislative nonstarter in MD

While a couple of biosolids permits have led to hearings in Virginia, Brent Hunsinger, advocacy director for the nonprofit Friends of the Rappahannock, said the issue of PFAS contamination of biosolids "likely needs a fix at the state level, not just on a permit-by-permit basis."

State remedies can be hard to come by, though. Prompted by MDE data showing PFAS contamination in biosolids from the state's largest wastewater plants, concerned lawmakers introduced legislation in January that would have barred any biosolids application to farmland in Maryland if the PFAS content exceeds the 1-part per billion level cited in the EPA's draft risk assessment.

While environmentalists and scientists testified for the measure, as did Virginia waterman Mike Lightfoot, who lives in Westmoreland County, operators of wastewater treatment plants opposed it, saying it would in effect ban any agricultural use of biosolids, depriving farmers of a cheap source of organic fertilizer. Also, they said, water and sewer rates would skyrocket to cover the costs of landfilling or incinerating tainted sludge.

Activists offered to compromise, amending the legislation to phase in PFAS limits on biosolids starting at 50 parts per billion, half the threshold now recommended by MDE. While endorsed by state regulators, it failed to win over all treatment plant operators, and the legislation didn't get out of committee.

Wastewater utilities say they're simply conduits for PFAS piped to them, and most of the contamination comes from household rather than industrial waste. They argue that the best way to clean up biosolids is to eliminate harmful PFAS from so many consumer products, not force the utilities and their ratepayers to bear the costs of dealing with it.

The Potomac Riverkeeper Network, which has done its own testing of Nomini Creek, Jennifer Campagne's well and one Westmoreland farmer's soil, aims to continue sampling in the area to develop a clearer picture of the sources and impacts of PFAS, said Walls, the Upper Potomac Riverkeeper.

Just 'triage' for now

"Nobody's really ready to solve this problem yet," said Evan Isaacson, an attorney with the Chesapeake Legal Alliance, which has worked with the Potomac riverkeeper group on the issue. "It's going to require some investment," he added, both in removal technologies and in developing alternatives to PFAS.

"Until that time," Isaacson said, "it's basically triage mode. Don't put it next to someone's well, don't put it next to a school."

Jennifer Campagne said she really didn't dwell on the biosolids being applied to her neighbor's field until another neighbor, Lightfoot, alerted her to the possibility of contamination. Then she got the distressing results of a test showing PFAS in her shallow well.

It's been two years since any biosolids were applied next door, Campagne said. The level of perfluorooctanoic acid, or PFOA, in her well is below the 4 parts per trillion the EPA has set as the safe limit for drinking water. But the test also detected three other unregulated PFAS compounds. While those are all at similar seemingly low levels, research indicates they may have health effects, too.

"It does bother me now," she said, noting that she has lupus, a long-term disease that often inflicts chronic pain and fatigue and can be life-threatening if not properly managed. "I have so many family members that have passed from cancer. I feel like that's an added risk." ■

MD lawmakers trim environmental funds, revise energy policy

Both solar and natural gas boosted in a session with only modest steps to curb pollution

By Timothy B. Wheeler

It could have been worse — and it almost was. Maryland environmental advocates saw most of their legislative priorities get short shrift in the 2025 session of the state General Assembly, as lawmakers focused almost exclusively on closing a massive state budget gap and overhauling energy policies.

A handful of green bills made it to the desk of Gov. Wes Moore, a Democrat, for signing into law, most notably a measure aimed at resolving chronic disputes over the siting solar of energy projects. Others promised to make incremental progress in cleaning up the Chesapeake Bay, address dozens of potentially polluting coal ash piles around the state and eliminate state subsidies for waste-to-energy incineration.

But environmental advocates spent at least as much energy fending off budget cuts and working to kill or soften legislation they feared would stall efforts to reduce pollution and address climate change.

"This year was a lot about defense and making things less bad," said Kim Coble, executive director of the Maryland League of Conservation Voters. None of her group's four priority bills passed, though elements of one were tucked into the energy legislation.

Maryland lawmakers trimmed funds dedicated to reducing polluted runoff and preserving land but mostly ignored legislative analysts' recommendations to make even deeper cuts. (Dave Harp)

Budget disaster averted

Funding for land preservation, clean energy, climate action and water pollution prevention took hits as the governor and lawmakers hammered out a deal to balance the budget. To close a $3.3 billion deficit, they agreed to cut $2 billion in spending for fiscal year 2026 and raise the remainder with new and increased taxes and fees.

It was a roller coaster ride getting there. In presenting his budget, Moore had proposed cutting the state's four environmental agencies by 25%, or $255 million. Legislative analysts later suggested taking another $180 million, virtually draining funds dedicated to promoting renewable energy, preventing pollution and preserving farmland and other green space.

In the end, lawmakers ignored the recommendations and stuck mostly to Moore's proposed reductions. That left enough money to keep paying for some runoff control projects and land preservation deals, including in the five Bay watersheds in Maryland recently targeted for concentrated cleanup efforts.

The Chesapeake and Atlantic Coastal Bays Trust Fund, which underwrites efforts to reduce polluted runoff from farms and communities, lost $10.5 million in the coming year. The money raised via gasoline and car rental taxes went to partially offset budget cuts at the Department of Natural Resources.

Program Open Space, financed through a real estate transfer tax, will lose $25 million a year for the next four years, reducing funds used to acquire parkland and preserve farmland and natural areas from development.

Considering the budget squeeze, Bay cleanup and restoration efforts survived "relatively unscathed," said Allison Colden, Maryland executive director of the Chesapeake Bay Foundation. Land preservation advocates, though, chafed at the reductions.

The biggest cut of all — $315 million — came on the climate front from the state's Strategic Energy Investment Fund. It provides grants and loans to install solar energy projects, geothermal systems and electric vehicle chargers. It also helps homeowners, businesses and local governments reduce their utility bills by becoming more energy efficient.

The fund, flush with payments from utilities for their fossil fuel plants' greenhouse gas emissions, was cut in half by cash-strapped budgeteers. That leaves less money for the state's efforts to reach its climate goal of reducing greenhouse gas emissions 60% by 2031.

Meanwhile, lawmakers tabled a pair of revenue bills that might have offset some cuts. One would have raised a projected $300 million by taxing coal transported across Maryland to the port for shipment elsewhere. The other promised up to $9 billion by levying fees on the world's largest emitters of greenhouse gases — though likely not without lengthy and far-from-certain litigation. While not committing to levy fees, legislators directed the state comptroller's office to tally climate change cost impacts, a first step some saw as progress.

"I don't know how we meet our climate goals if we don't find some dedicated revenue," the conservation league's Coble said.

Energy: a mixed bag

Lawmakers labored until the final day to pass a grab bag of energy legislation that would encourage solar projects and battery storage facilities — but also natural gas and even nuclear power plants. With Maryland importing most of the electricity it consumes, officials believed more in-state power generation would help moderate soaring utility bills.

The centerpiece package of the was the Next Generation Energy Act, which originally called for the state to solicit and fast-track regulatory approval of up to 10 new power plants.

Although the bill didn't specify, climate and environmental advocates insisted that only plants that burn natural gas could be built in the time frame called for. The carbon emissions from gas plants, though much less than coal burners, would undermine the state's efforts to reach its climate goals, opponents said.

The bill passed, pushed by the Assembly's Democratic leaders, but with an amendment that required state regulators to approve four "zero emission" energy projects for every gas plant greenlit. It also restored environmental review and public comment requirements that had been severely weakened in the original legislation.

Those conditions were enough to reassure some advocates.

"All of our opportunities to fight new gas generation in the state have been restored," said Brittany Baker, Maryland director of the Chesapeake Climate Action Network.

Lawmakers further greened up the bill by calling for more battery storage facilities to help reduce peak power demand. They even added a provision eliminating state subsidies for waste-to-energy incineration of trash. That's something long sought by climate and environmental justice advocates, who have complained that air emissions from a WIN Waste incinerator in South Baltimore endangers human health in downwind neighborhoods already overburdened with industrial pollution.

Solar siting: In a separate bill, lawmakers waded into recurring controversies over solar projects, curbing local governments' ability to block new facilities while also imposing landscaping and other requirements on projects to minimize their visual and environmental impacts.

Currently, the state's Public Service Commission has sole authority to decide whether to approve large utility-scale solar projects, but conservation and farming groups have pushed back and local officials have responded by imposing zoning restrictions on solar installations. With Maryland lagging in meeting its goal of getting 14.5% of its energy from solar power, lawmakers decided that localities may block solar projects only after 5% of their prime farmland has been covered with solar panels.

Lawmakers also reformed the way utility rates are set, directed that every household get $80 in annual rebates on rising power bills and required greater justification for building new gas pipelines.

A Maryland State Senate committee directed the developer of a proposed shipping terminal at Sparrows Point to preserve or compensate these two yacht clubs, which were slated for removal. (Dave Harp)

Maryland lawmakers approved a pilot program aimed at curbing the spread of invasive blue catfish. (Dave Harp)

"Some of those bills by themselves would have been landmark bills to pass," said Josh Tulkin, director of the Maryland Sierra Club. But when weighed against building more gas power plants, he said it was unclear whether the energy policy overhaul would be a net positive or negative.

Electrification stop-and-go: Lawmakers were similarly conflicted about electric vehicles and buildings in Annapolis.

In the final days of the session, Moore issued an executive order delaying enforcement for the next two years of Maryland's law requiring increasing sales of electric vehicles, a key part of the state's climate policy. He did so after environmentalists succeeded in blocking a bill to do that. The bill's sponsor, Del. Dana Stein, a Baltimore County Democrat who is usually an environmental stalwart, said auto manufacturers were warning they would stop offering even gasoline vehicles for sale in Maryland if not given a reprieve from the EV sales mandate.

With the lighting, heating and cooling of buildings identified as another major source of greenhouse gases, legislation that would have made minor tweaks to Maryland's rules to require more energy efficient new buildings wound up exempting industrial facilities and delaying the program's implementation.

A year after the Moore administration angered environmentalists by pushing through a bill to lower permitting hurdles for electricity-gobbling data centers, lawmakers commissioned a study of their environmental, energy and economic impacts.

And despite fierce controversy over a proposed transmission line that would take farmland and protected green space in central Maryland, lawmakers opened the door for another high-voltage power line that could cut through three state-protected wildlands in Western Maryland. Advocates did get lawmakers to require that additional forested land be protected if the line won approval to slice through the wildlands.

Bay action and inaction

The Moore administration's lone environmental initiative, the Chesapeake Bay Legacy Act, passed overwhelmingly. It would encourage farmers to adopt conservation practices, promote oyster farming and restoration, and give greater emphasis to water quality monitoring efforts.

Another bill, dubbed the Near-Shore Farm and Finance Act, did not pass. It would have prohibited the application of fertilizer within 100 feet of Bay tributaries while offering farmers greater financial incentives to leave natural buffers in place along streams and wetlands. The Bay Foundation's Colden estimated the bill would have prevented 80,000 pounds of nitrogen, a form of nutrients that is polluting the Bay, from washing off fields. But she noted that lawmakers inserted language in the governor's Bay Legacy Act that listed natural buffers as one of the recommended conservation measures.

Coal ash: After failing in 2024, legislation passed this year addressing dozens of potentially polluting coal ash landfills and pits scattered around Maryland. A report released earlier this year by the Department of Natural Resources identified nearly 70 such deposits dating back to the 1950s, many in the Baltimore area and some in areas that have since been converted to residential neighborhoods. Under the Biden administration, the U.S. Environmental Protection Agency last year closed a loophole in federal coal ash regulation that requires monitoring of inactive sites. The Trump administration's EPA announced in March that it is reviewing the 2024 Biden rule and considering extending compliance deadlines. The new state law requires the Maryland Department of the Environment to adopt the 2024 federal rule.

Fisheries: Lawmakers passed a bill aimed at curbing the spread of invasive blue catfish in the Bay and its tributaries. The bill directs DNR to launch a pilot program that would expand opportunities for commercial harvest of the fish, which prey on native fish and crabs.

Another bill eases Maryland's penalties for oyster poaching, reducing the penalty for first-time offenders from a lifetime ban to a 5-year license suspension. The Bay Foundation opposed the measure initially because it would have reduced penalties even more but withdrew its objections once the bill was amended to grant just one second chance.

"Once is a mistake, twice is likely intentional," said the Bay Foundation's Colden. "That's why we landed where we did."

Priorities stymied: Several measures that environmental advocates had set their sights on floundered, including the perennial quest for a "bottle bill" that would encourage recycling. Also failing to get traction was proposed legislation requiring regulators of water and air pollution permits to consider cumulative impacts and environmental justice concerns.

PFAS: Two bills aimed at addressing sources of potential human exposure to so-called "forever chemicals" likewise failed to pass. The House approved one that would have barred the use of pesticides containing PFAS (per- and polyfluoroalkyl substances), but not before delegates severely narrowed the measure's scope at the behest of farm and industry groups. Advocates then withdrew their support and successfully lobbied to block it in the Senate.

The other measure would have restricted the land application of "biosolids," or treated sewage sludge, if it contained PFAS chemicals, which are used in a range of household and industrial products. They are not removed by wastewater treatment, and there is evidence they are subsequently taken up in some crops that are fertilized with contaminated biosolids. Municipal wastewater utilities warned legislators that restricting biosolids application could cause water and sewer rates to soar, and efforts to negotiate a compromise failed.

Yacht club reprieve

In a footnote to the budget debate, a Senate committee threw a lifeline to a pair of Baltimore County yacht clubs threatened with eviction by a state-subsidized container ship terminal project. Tradepoint Atlantic, the company redeveloping the former steel mill complex at Sparrows Point, has said that as part of its mitigation for dredging and filling the Patapsco River for the new terminal, the land that the North Point and Pleasant yacht clubs have occupied for decades would be converted to open water. The committee called on Tradepoint, which is in line to get $38 million in state aid for the project, to compensate both clubs if they had to be removed, and to consider alternatives to demolition for the Pleasant Yacht Club, which was founded and built by Black steelworkers at a time when segregation was in force. ■

MD, VA try to boost blue catfish harvest, with mixed success

One state eases some rules and eyes electrofishing, while another balks at expanding it

By Timothy B. Wheeler

Maryland recently has taken a few tentative steps aimed at boosting commercial harvest of blue catfish (*Ictalurus furcatus)*, the voracious nonnative predator devouring blue crabs and many native fish in the Chesapeake Bay and its tributaries. Efforts to do likewise in Virginia, though, have been at least partially thwarted by resistance from recreational anglers and fishing guides who want to maintain them as lucrative trophy fish.

In Maryland, the Department of Natural Resources announced a pair of pilot programs in February that officials hope will give extra momentum to the upward trend in blue catfish harvests in that state, which topped 1 million pounds last year for the first time.

One would let charter boat captains sell any "excess" blue catfish caught that their paying customers don't want to keep. It would also let skippers bring more crew members along and sell their catch as well.

The other program would allow a handful of watermen to go after blue catfish in the Bay mainstem south of the Bay Bridge using baited finfish trotlines. That is an increasingly popular gear for targeting catfish that until now has been permitted for use only in the Chesapeake's tributaries.

"We're relying on any and everybody to increase removals," said Branson Williams, DNR's invasive fishes program manager.

Blue catfish, introduced in Virginia in the 1970s, have spread throughout the Bay and have become the dominant fish in some tributaries. They prey on blue crabs, striped bass, menhaden, American eels and other economically and ecologically important species.

Maryland's charter fishing businesses have been suffering because of restrictions imposed last year on catching striped bass, the mainstay of their industry, and some have shifted to targeting the invasive fish. The number of blue catfish charter trips has more than doubled in the last four years, according to DNR, but with anglers only allowed to keep fish within a narrow size range, the number thrown back has also increased.

"If you're a client and you're on charter and really catching fish, there can be a limit on how many filets you want to take home," Williams said.

Maryland DNR biologists Branson Williams and Tim Groves haul in an enormous blue catfish caught with electrofishing gear in the Potomac River in 2014. (Dave Harp)

Not so with everyone. Greg Bruckner, owner of Miss Susie Charters, said his three boats are each running two trips a day going after blue catfish on the Potomac River this spring. But his clients all want to keep whatever they hook, so there is no excess for him to sell.

Even so, six charter captains have been permitted to participate in the pilot program allowing them to sell any excess catch, and there are another 11 applications in process, according to Williams.

With the other program, DNR has permitted 8 commercial fishers to deploy trotlines with baited hooks in the mid- and lower Bay. It's the gear of choice these days for targeting blue catfish in the rivers and is responsible for a growing share of the overall harvest.

Blue catfish, though, reportedly have been scarce lately in the mainstem below the Bay Bridge. They favor freshwater but can survive in brackish water. That's how they spread throughout the Bay. But the Chesapeake's salinity has been above normal lately, the result of drought conditions in the watershed.

"So far, it seems like most of the fish are upriver right now, so we've only had a handful of trips in that newly opened area," Williams said. "Catches have been low."

Jerry Parks, one of a few commercial fishermen in Virginia licensed to catch blue catfish by electrofishing, pulls a stunned fish out of the James River. (Timothy B. Wheeler)

Maryland lawmakers endorsed the DNR pilot programs but also pushed to go further. They passed legislation this year calling for the department to allow much longer trotlines than are currently permitted. It also directs the department to consider permitting commercial electrofishing. That is a technique seeing limited use in Virginia, in which a low-frequency electric shock transmitted into the water momentarily stuns fish and brings them to the surface for a minute or two, where they can be scooped up with a dip net.

DNR's Williams said the department is going to proceed slowly, letting a few commercial fishers help collect and sell blue catfish stunned by DNR biologists when they conduct their surveys this year. Fisheries managers are considering launching a pilot program for that practice, he said.

Electrofishing has gone on in Virginia for more than a decade and has proven successful, if not trouble free. It's only allowed from April 30 to mid-October, and for only 4-1/2 days per week on portions of three rivers: the James, Rappahannock and Pamunkey. Yet the three holders of electrofishing permits account for 11% of the state's overall blue catfish harvest, which surpassed 3 million pounds last year.

"It's by far the most effective means," said Pat Geer, fisheries chief for the Virginia Marine Resources Commission.

Recent efforts to expand the fishery, though, have gone sideways. VMRC staff proposed increasing the number of electrofishing permits to 10 and adding a couple of new tributaries where the gear can be used. They also proposed doing away with limits on the size of blue catfish that can be harvested from electrofishing.

But commission members questioned if the electricity might harm fish eggs and cited reports of other finfish being injured or killed by the shock — though Geer pointed out that the voltage permitted is low enough that it stuns only scale-less fish like catfish. Commissioners also cited complaints, mainly from the Rappahannock, about electrofishing conflicting with recreational and other commercial fishing.

In February the commission chose not to expand the number of permits or the areas open to electrofishing. They did away with size limits but added restrictions on where electrofishing can be done, barring it within 300 yards of any public or private piers.

George Trice, who pioneered commercial electrofishing in Virginia and is licensed to do it on the James River, said eliminating size limits was a help. But David Johnson, who has the permit to electrofish in the Rappahannock, said because blue catfish like to hang out around underwater structures, including piers, he had probably lost half the area in that river where he could hope to harvest them.

A separate effort to lift the one-fish daily limit on fish longer than 32 inches sailed through the Virginia General Assembly, a victory for commercial fishers who chafed at the catch restriction. But Republican Gov. Glenn Youngkin vetoed the bill, saying it would undercut recreational fishing for blue catfish, especially the economically important trade of fishing guides helping big-spending anglers hook trophy-sized fish. ■

Sediment buildup complicates dam removal in PA

Centuries of 'legacy' soil trapped behind dam delays demolition by 5 years or more

By Jeremy Cox

OUR WATERWAYS

Editor's note: This article is part of a continuing Bay Journal series examining the health of smaller streams and sections of rivers in the Chesapeake Bay watershed. If you would like to suggest a waterway to feature, contact Jeremy Cox at jcox@bayjournal.com.

Carol Koser, carrying her "grandpup" Marley, strolls along the banks of Chiques Creek with her husband Leon just upstream from the dam they own in Manheim, PA. (Jeremy Cox)

When Carol and Leon Koser bought the two parcels of land in 1997 on which they eventually built their home, another property was thrown into the deal.

"An investor Realtor had it. He said if he can't sell this lot off, we would get it by default," Carol Koser recalled. "So, we inherited this. We didn't really want it."

That's how the Manheim, PA, couple became owners of a dam on Chiques Creek. Although they got it for free, the Kosers have been paying for it ever since. Maintaining the streambank to keep trees from falling into the creek has become a regular chore. And more than once they also have needed to dump boulders and fill dirt where the dam meets the bank and tends to leak.

The Pennsylvania Department of Environmental Protection has decreed that the aging dam is unsafe and must go. That declaration triggered a years-long debate over how the dam can be removed without unleashing thousands of tons of sediment pollution stored behind it.

The complexity involved with tearing down the dam and restoring the creek has led to the demolition date being pushed back five years ... and counting.

The dam's removal likely will have little benefit for migratory fish because two more dams stand downstream before the Chiques reaches the Susquehanna River. But environmental officials and advocates are optimistic that the project will breathe new life into the creek, especially the stagnant waters above the dam.

"You see what a beautiful little stream system it is below," said Adam Schellhammer, Mid-Atlantic regional director for the group American Rivers, which is leading the dam project. "That's what we would like to see for the rest of the stretch."

The Chiques (pronounced "chick-ies") winds generally southward for 31 miles from the mountain ridges of southern Lebanon County to its intersection with the Susquehanna River between the boroughs of Marietta and Columbia in Lancaster County. But its watershed comprises a network of 192 miles of connected waterways — 95% of which fail to meet the state's health criteria for supporting aquatic life.

To make the Chiques healthy enough for such creatures, scientists estimate that the sediment it carries annually to the Susquehanna would have to be dramatically reduced from 70 million pounds to 48 million pounds.

The main driver of its health woes, experts say, is "legacy" sediment. That refers to the nutrient-rich silt that has washed into the bottom of river valleys over centuries. There, the muck has become trapped behind dams like the one in Manheim and washes downstream during increasingly frequent heavy rain events.

Today, about 60% of the Chiques' sediment pollution originates with these legacy deposits, scientists say.

"There's a time release capsule that goes on in that watershed," said Joe Sweeney, executive director of the Water Science Institute, a regional nonprofit research center.

That glut of sediment, researchers say, can be traced back to centuries of human disruption in the watershed, including the removal of forests, the spread of farming and the installation of flood-control measures that prioritized the quantity of water removed over its quality.

Reducing sediment pollution is one of the central pillars of the Chesapeake cleanup. Silt clouds the water, blocking sunlight for underwater grasses and potentially smothering bottom-dwelling creatures, such as mussels and clams. The dirt also comes laced with nutrients, which can spawn ecosystem-altering algae blooms.

These problems have been magnified for Chiques Creek because its 126-square-mile watershed lies almost entirely inside Lancaster County, home to some of the most fertile agricultural land in the country. About 60% of the land that drains into the creek is cropland, and the runoff is often rich with nutrients.

In addition, the creek was the subject of a high amount of dam construction even by Pennsylvania standards, with 42 being erected along the creek or its tributaries, according to one mapping effort.

Only four dams still stand in the Chiques watershed. But much of the sediment was never removed when the other dams were either torn down or came down on their own. That polluted mud remains embedded in stream bottoms and along banks to this day, Sweeney said.

"There was a lot of dam removal, but there weren't a lot of consequences being considered," he said.

Local officials and environmentalists don't want to repeat those mistakes at the Kosers' dam. The first dam there was built around 1730. The current 10-foot-high, 130-foot-long structure, formally known as the Chiques Creek Roller Mill Dam, holds back the equivalent of about three years' worth of the total sediment allowed annually under the entire watershed's pollution limit, engineers estimate.

"It's kind of a muck pit," said Shellhammer of American Rivers.

Shreeram Inamdar, a University of Delaware professor, said he was stunned by the elevated nitrogen levels his instruments recorded when he first began studying the Roller Dam impoundment a few years ago. He was finding concentrations of ammonium nitrogen, a key nutrient, as high as 30 parts per million in the streamside groundwater, at least 30 times the normal value.

"That was unbelievable," Inamdar said. "For a while, I thought our instruments were broken or maybe we did something wrong in the lab."

After confirming the results, he theorized that the persistently high water and low-oxygen conditions were impeding the chemical process that naturally removes nitrogen from the water. "The dam should be removed to restore the natural, dynamic flow regime, which will help dissipate the nitrogen," he added. "The big question is what happens to the sediment behind it."

Digging up and hauling away sediment, though, can get expensive fast. To remove most of the sediment trapped by the dam would cost $8 million, according to one estimate. American Rivers is looking to spend $2 million or less.

The project's design will likely include some alternative approaches toward reducing legacy sediment pollution, such as reconnecting the waterway with its floodplain and stabilizing the streambank to cut down on erosion, Schellhammer said. Construction is now slated to begin in 2026 at the earliest.

"We just have to see what's the right fit for this this location," he said. "I like when Mother Nature can do most of the work and find a new equilibrium." ■

USDA shuts down 'climate smart' agriculture program

Hundreds of millions of dollars for conservation efforts in the Bay watershed affected

By Karl Blankenship

The U.S. Department of Agriculture in April announced the termination of its $3 billion "climate smart" program, a grantmaking initiative that was supporting hundreds of millions of dollars in conservation work in the Chesapeake Bay watershed.

An April 14 USDA press release called the Partnerships for Climate-Smart Commodities, which promoted farm conservation measures with climate benefits, as a "slush fund" with high administrative costs and often low payouts to farmers.

It said some of the projects may continue under a new initiative called Advancing Markets for Producers, but only if 65% or more of the project's funds were going directly to farmers and the work aligns with Trump administration priorities.

Agriculture Secretary Brooke Rollins said the Biden administration's climate smart program was designed to "advance the green new scam" and benefited nongovernmental organizations more than farmers.

"We are correcting these mistakes and redirecting our efforts to set our farmers up for an unprecedented era of prosperity," Rollins said.

The climate smart program was launched in 2022 as part of a "once-in-a-generation investment" that would enable universities, businesses and nonprofits to work with farmers to promote conservation measures that would help them adapt to climate change and market the products they produced.

Most projects did not begin until 2023 or later because of delays in paperwork, and some had just started up last year.

But the USDA froze funding for the program in January, leaving organizations that had incurred costs unable to recoup all of their expenses. In its announcement, the department clarified that it would honor eligible expenses incurred prior to April 13, 2025, but would review existing grants to determine if they could continue.

Some working with the program said it appeared they would be able to successfully reapply under the new program, but others were unsure.

Pasa Sustainable Agriculture, a Pennsylvania-based nonprofit, was managing a $59 million climate smart grant that supported work it was carrying out with a dozen other organizations on farms from Maine to South Carolina. With funding stalled, it laid off 60 employees in early April, leaving it with fewer than 10.

The Oregon Dairy Farm in Lititz, PA, is renowned for its conservation practices, which include composting food waste and cow manure, planting cover crops and using a methane digester to provide the farm with electrical power. (Will Parson/Chesapeake Bay Program)

"We are honestly not sure what the announcement means for our project," said Hannah Smith-Brubaker, Pasa's executive director. "They said we can reapply, but we don't know if that means for our current project or a completely new project under the new program."

Smith-Brubaker said Pasa's project did not meet the 65% farmer payment threshold because the USDA was not counting costs of providing technical assistance to farmers for planning, implementing and maintaining projects.

She said about 45% of the project's funding went directly to farmers, but if the technical assistance were included, farmer support under the grant would be between 75%-85%.

Richa Patel, a policy specialist with the National Sustainable Agriculture Coalition, also said it was "disappointing" that the department was not counting technical assistance as part of the farmer support funding.

With the USDA already reducing its own staff, Patel said, "the administration must take every opportunity going forward to increase access to technical assistance and support the staffing levels necessary to provide efficient and dependable customer service for our farmers — those working directly with USDA and those working with the farmer-serving organizations it partners with."

Hannah Brubaker-Smith, executive director of Pennsylvania-based Pasa Sustainable Agriculture speaks at a press conference in 2022. Nearly $60 million in grants managed by the organization have been thrown into doubt by the USDA's termination of the "climate smart" program. (pa.gov/governor/CC BY 2.0)

Lack of technical support is considered a major impediment to widespread adoption of conservation measures by farmers.

Mike Lavender, the national coalition's policy director, said he welcomed the ability to continue some projects under the new initiative, but said the USDA did not provide any clarity about whether grant recipients can make modifications to meet the new criteria.

As a result, he said the announcement brings "unnecessary hardship nationwide to farmer-serving organizations and likely farmers as a result of USDA changing program requirements and cancelling projects midstream."

Nationwide, the climate smart initiative made awards to 140 organizations, businesses and institutions, which were supposed to benefit more than 60,000 farms and cover more than 25 million acres of farmland. The USDA estimated that, if successful, the work would sequester an amount of carbon equivalent to removing more than 12 million gas-powered cars from the road.

Hundreds of millions of dollars of that work was to have taken place in the Chesapeake watershed, managed by nonprofit organizations, universities, agribusinesses and others. The five-year program was one of the largest investments ever made in support of conservation measures on farmland in the Bay region.

It supported many traditional conservation practices such as nutrient and manure management techniques that reduce emissions of nitrous oxide, a powerful greenhouse gas. It also supported measures that curb runoff, such as cover crops, stream fencing and no-till farming. Those measures also help build organic matter in the soil, which allows it to absorb and store carbon dioxide from the atmosphere.

Smith-Brubaker noted that just a 1% increase in organic matter in a farm's soil absorbs 22,000 more gallons of water per acre, keeping it from washing nutrient-laden runoff into local streams.

The climate smart program also promoted monitoring efforts to quantify how well the conservation efforts were working, and it supported marketing efforts to inform consumers about the environmental benefits of that work — which could increase the value of those products and expand markets. ■

Elevated heavy metals found in James River near coal ash pits

Study finds elevated levels of toxic metals in sediment, but not surface water, near power plant

By Whitney Pipkin

A researcher has found contaminants associated with coal ash present in another Virginia waterway, this time the James River, near a site where the waste product has long been stored in the ground.

Tyler Frankel, an associate professor of environmental science at the University of Mary Washington in Fredericksburg, began testing waters near coal ash storage sites a few years ago to help fill gaps in the data, he said. An aquatic toxicologist, he wanted to understand whether elevated levels of trace metals associated with coal ash might be found in the sediment or fish of nearby rivers, even if they are no longer present in the surface water.

In 2023, Frankel published a study that found contaminants associated with coal ash in Quantico Creek near the Possum Point Power Station in Dumfries, VA, where the waste product was stored in clay-lined pits near the Potomac River. He wanted to learn if this was an isolated incident or if waterways near other coal ash storage sites in the state might also contain such contaminants.

A subsequent study, published early this year in *Environmental Toxicology and Chemistry*, reported elevated concentrations of some heavy metals in the sediment of the James River near Dominion Energy's Chesterfield Power Station.

The study did not confirm a causal relationship between the coal ash pits and the presence of those contaminants. However, it did highlight "the potential localized impact of coal ash" on the surrounding environment. Other studies have shown that trace metals can have harmful effects on aquatic ecosystems and human health.

"Because coal-based power plants continue to fulfill the energy needs of most communities globally … this study highlights the need for additional efforts to understand and address the impacts of coal ash … on aquatic ecosystems," Frankel writes.

Dominion spokesman Jeremy Slayton called the study "incomplete," saying it "fails to acknowledge historical and current land uses in this area of the James River and their impacts."

"The report makes an inconclusive connection between metals concentrations in sediment and coal ash storage at Chesterfield Power Station contrary to years of data publicly available," Slayton wrote in an email.

Dominion's Chesterfield Power Station, seen here a few years before it was deactivated in 2023, burned coal along the James River for seven decades. (Whitney Pipkin)

Following state law, Dominion is in the process of permanently closing the unlined pits that have long stored ash at Chesterfield and other power stations along rivers in the region. Since it was built in 1952, the Chesterfield station has generated an estimated 15 million cubic yards of coal ash.

About 7 million cubic yards, or just under half of the total, will be transported offsite to be recycled into new materials, as required by a 2019 Virginia law. The other half of the coal ash will be permanently stored in a synthetic-lined landfill at the Chesterfield site. The plant is south of Richmond along the banks of snake-like curves of the James River, near the Dutch Gap Conservation Area in Chesterfield County.

Once the largest power plant in Virginia, the Chesterfield station shut down its last two coal-fired units in May 2023.

Groundwater monitoring is required as part of the closure of the previously unlined or clay-lined pits from which ash is being removed. Monitoring by a third-party contractor so far has indicated elevated levels of certain heavy metals in the groundwater around the ash pits.

In 2023 and 2024, the monitoring effort at Chesterfield revealed "statistically significant" exceedances of the state's groundwater protection standards for coal ash, or "coal combustion residuals," specifically for arsenic, cobalt and lead. Other elements, such as cadmium, were present in groundwater at levels elevated above a comparative background sample.

Frankel's study did not find significant increases in heavy metals in the surface waters of the James River, compared with what was present upstream of the power plant. (The study area was a little more than 10 miles downstream from the Richmond city limits.) But Frankel did find elevated concentrations of a handful of heavy metals in river sediment samples collected from the mainstem of the James River not far from the plant.

Those samples indicated elevated concentrations of aluminum, arsenic, cadmium, chromium, iron, lead and zinc. Some of those elements were found in elevated amounts both upstream and downstream of the plant as well, but levels of cadmium and lead, for example, exhibited high enrichment rates adjacent to the power station, compared with upstream and downstream samples.

The presence of trace metals, particularly in sediments, the study said, "poses a significant environmental threat as they can remobilize back into the water column and are persistent." The study also used environmental DNA to identify 22 species of fish that frequent the sample area, including species that have been identified as vulnerable or endangered.

Environmental groups have long advocated for energy companies to move coal ash stored at unlined pits either to lined landfills or to places where it can be recycled into concrete or other materials. Virginia has passed laws requiring such measures. But it's not clear what remediation might be required following evidence that groundwater surrounding the pits had already been contaminated. ■

University of Mary Washington associate professor Tyler Frankel (right) and a colleague take water from a creek near the shuttered coal-fired generating plant. (Courtesy of Tyler Frankel)

Dave Harp

Rulemaking at the state level: How to make your voice heard

Laws are not the only way that policies are set within a state. The agencies tasked with enacting the laws also have authority to iron out details that are not specified within the laws themselves. This is called the administrative rulemaking process, and it offers another opportunity for the public to help shape policies that impact the environmental health of their waterways, forests, air quality and communities.

Kennedi Fichtel, staff attorney and associate director at the Chesapeake Legal Alliance, talked with the *Bay Journal* about public participation in the rulemaking process. Public participation, she said, is a foundational tenet of democracy and environmental law. Within Chesapeake Bay states, the "town hall" model is where the bulk of public participation happens and where residents can impact state policies.

Question: How does public participation in the process work?

Answer: Well, there are many well-known avenues for public participation in government, like calling and emailing your legislators, participating in community meetings, attending town halls, and voting. But, for the policymaking process specifically, each state agency has its own codified procedure — it's called administrative law. For example, citizens concerned about industrial facilities in Maryland can address [air pollution] and stormwater runoff by sending comments to the Maryland Department of the Environment for its statewide permit. They could also ask MDE to require an industrial facility to obtain an individual operating permit with more stringent pollution controls.

Q: How is the administrative rulemaking process different from passing laws?

A: Proposed laws, called bills, are debated among lawmakers before being passed by both the state House of Delegates and the state Senate, then signed by the governor. But it's impossible for the laws to cover every tiny detail of how the law should be implemented in local areas. For example, a new law may say that it applies to "all residential and commercial lands." But what is included in "residential" or "commercial" lands? Is it just land zoned as residential or commercial? What if there is a zoning exception that allows commercial development on what is currently zoned as farmland? This is where agency rulemaking has to fill in the gaps by expanding definitions and creating exceptions at the local level. State administrative agencies are granted authority to make rules and regulations to carry out the intent of the underlying statutes. That includes setting limits on pollutants in our air and water, where and how areas may be developed, where highways can be built and much more.

Q: How does the public learn that a state agency is making a new rule?

A: The first step an agency must take is providing formal notice to the public. Regulations govern how agencies must provide the notice. Generally speaking, notices can be found on the agency's website. For example, Virginia provides all agency meetings and materials on its "townhall" website [*townhall.virginia.gov*], providing access to hearings, guidance documents, public petitions and other public meetings. The formal notice or "draft rulemaking" provides the proposed language to be included in the rule. These notices also explain how the public can participate, including submitting comments on the draft regulation. The public comment period is typically 30 days long, and the notice should state when it opens, when it closes and whether it can be extended. The notice also contains directions on how to submit both written or electronic comments, and information regarding upcoming public hearings.

Q: What can or should be included in public comments?

A: There are no strict guidelines as to what can or should be included in a public comment. Comments are meant to express what you're concerned about and potentially draw attention to something that may impact the rulemaking. Sharing significant information, including publicly available data, is especially important. This is because the agency must consider all "substantial" public comments and provide a written response. The standard for a comment that must be [considered] may change from jurisdiction to jurisdiction, but the spirit of the requirement remains the same: the agency has to explain itself. A reviewing court will hold the agency accountable to that explanation.

Q: Is there any way to participate after comments are submitted?

A: The public notice must also explain how a community member may request a public hearing on the issue. Depending on the state, a public hearing may be scheduled before or after public comments are due. In either scenario, there is a listed procedure for how you can sign up to speak for a limited time at the hearing, making your concerns known to the agency in person. This is a powerful remnant of the traditional town hall model that is somewhat unique to the administrative law system.

Q: How do I know the agency will even read my comments?

A: Again, the agency must explain its decision-making in the final rule. This includes addressing "substantial" comments submitted during the public comment period. If a person believes their comment was not addressed adequately, this could be grounds for moving forward with legal actions to stop or change the rule.

You can contact the Chesapeake Legal Alliance to learn more about public participation in the administrative rulemaking process. Call 410-216-9441 or email evan@chesapeakelegal.org.

As 'ghost forests' multiply in Bay region, answers lag behind

Thousands of acres of coastal woodlands suffer the deadly insults of saltwater intrusion

By Jeremy Cox

If the District of Columbia were nine times larger, it still wouldn't equal the acreage of forests lost to saltwater intrusion along Maryland's coasts in the past decade alone.

Every July, when Heather Disque surveys the landscape from her Cessna, she documents thousands more acres of trees in death throes. It's only a matter of a few years before they wither into desiccated husks and topple over, she said. By then, the ground itself likely will be wetter, having converted to a saltmarsh.

During her first few years conducting the aerial surveys, Disque was surprised by how rapidly the forests were failing. Then, she looked at computer climate models, showing which areas are expected to become inundated first because of sea level rise.

"A lot of these forested areas we're seeing are in those predicted impact areas," said Disque, who studies forest health as part of the state Department of Natural Resources' pest management efforts. "So, it's not surprising to see what was predicted is coming true."

Across many of the low-lying shorelines along the Chesapeake Bay, once healthy coastal woodlands are transforming into "ghost forests" — stands of dead trees sandwiched between marshes on lower ground and living forests on higher ground. Human-caused climate change is accelerating sea level rise, the main culprit behind the phenomenon, scientists say.

A similar process is playing out on coastal cropland, and a recent spate of research has begun to propose strategies to help farmers cope with saltwater intrusion. But no such aid appears to be in the offing for timber, the fifth largest industry in Maryland and the second largest in Virginia.

"The question I get over the last five years is what can a forest landowner do," said Matthew Hurd, who oversees the Maryland Forest Service's Eastern Shore region, which has been the epicenter of the ghost forest blight in the state. "And the answer is pretty abstract at the moment."

He added, "If they're already being impacted, it's already too late."

Matt Kirwan, a coastal ecologist with the Virginia Institute of Marine Science, is one of the region's leading ghost forest researchers and owns a salt-impacted forest tract with his father in Maryland's Dorchester County. It's rare to find any formal advice for landowners, he said.

VIMS scientist Tyler Messerschmidt crosses part of a flooded "ghost forest" he is monitoring in Virginia. (Dave Harp)

Phragmites and other grasses fill in the open spaces as the trees succumb to saltwater. (Dave Harp)

"The advice is basically 'pay attention,'" Kirwan noted. "There are almost no recommendations."

For many observers, ghost forests stand out as a palpable symbol of climate change.

"Some of the changes are really dramatic," said Greg Noe, a U.S. Geological Survey wetland ecologist based in Delaware. "Ghost forests are enigmatic. They're big changes. They're an effective canary in the coal mine for demonstrating sea level rise on the landscape."

They haunt coastlines along parts of the East Coast, bending around the Gulf of Mexico as well. The Chesapeake region has been particularly susceptible, experts say, because much of its land is sinking due to groundwater withdrawals and the falling of the Earth's crust in the post-glacial period. As a result, the "relative" rate of sea level rise has been about twice the global rate.

Yet, paradoxically, the region's shore-hugging trees are dying back at a significantly slower pace. Kirwan and a fellow VIMS researcher analyzed four decades of satellite imagery along the coastline from New Jersey to Virginia, finding that healthy forests retreated upland at a rate of 2.7 vertical millimeters per year. The relative sea level rose 5.5 millimeters per year over the same span.

Their scientific paper, published in 2023 in the journal Global Change Biology, estimated that forest retreat lags behind sea level rise by "roughly half of a century." That finding has potentially big implications for how climate experts forecast landscape changes, Kirwan said. Existing computer models assume that forests disappear instantaneously when the water moves in instead of lingering for many years, as Kirwan found.

"Because it takes decades for trees to die, we're never seeing the full extent of forest loss," Kirwan said. "We won't see the full extent of sea level rise until decades after it's happened."

Flooding induced by sea level rise is harmful enough just because of standing water. But the Atlantic's seawater and the Chesapeake's brackish water both contain salt, and that ingredient supercharges the ghost forest process, Kirwan explained.

"Salt makes it much worse," he said. "Some tree species can grow in standing water, but none can tolerate much salt. Forest retreat rates across the Bay are positively correlated with salinity of adjacent rivers."

Ghost forests lurk several miles upstream along some rivers in Maryland and Virginia. In fact, Kirwan's research found forest loss up to 6 miles inland from any major water body, a consequence of drainage ditches carrying salt-laced waters into the interior during strong storms and unusually high tides.

Disque's aerial survey only focuses on the Delmarva Peninsula in Maryland from Talbot County south to Somerset County. Her most recent flight in July 2024 showed that 27,000 new acres of ghost forest had been created over the previous year, more than half of it classified as "severe" or "very severe" in nature. Since 2016, her mapping has uncovered about 415,000 acres of salt-affected forests on the peninsula, she said.

Maryland forester Hurd said that private landowners facing ghost forest encroachment should have the state perform a health assessment on their property. Weaker trees may need to be thinned to reduce stress on stronger specimens. Landowners may also consider harvesting trees before they lose their value as lumber, he added. But that's only possible if the land around them hasn't gotten too mushy to support heavy equipment.

Kirwan and his colleagues are trying to develop a fuller picture of the mechanisms behind saltwater intrusion in forests by studying 36 test plots on the oceanside of Virginia's Eastern Shore. Standing in a ghost forest on a recent morning, Tyler Messerschmidt, a VIMS lab and field manager, suggested that there is another way of looking at the changes in the landscape.

"A lot of people are worried because the trees are dying here," he said. "We're trying to facilitate to the best of our ability successful marsh migration into these areas so that as marshes are eroding and drowning on one end, we have space for the marsh to form on the upland side."

Some conservation groups say the best solution to ghost forests is to allow nature to take its course. They're encouraging landowners to protect their increasingly wet properties from development with easements or by selling them to land trusts. ■

Video online at bayjournal.com

Focus blurs on conservation efforts in marginalized areas

Equity in green space and land protection picked up pace recently, but challenges remain

By Jeremy Cox

Ten years ago, Baltimore's Druid Heights neighborhood hardly had any parks, and those that existed offered little respite.

"There was nowhere for me or anyone to sit down in our own community and relax except for on our stoops," Tavon Benson recalled. "There's definitely a lack of green space in communities like this."

Benson said that his boss at the Druid Heights Community Development Corp. tasked him with doing something about it. After getting input from residents and scraping together $50,000 from various sources, the nonprofit transformed two adjacent vacant lots into a "peace park," complete with benches, trees and a rain garden.

Benson was off and running. Today, several small parks dot the community's otherwise rowhouse-crowded landscape. The latest, called the Etting Street Green Space, attracted a VIP-studded ribbon-cutting last November.

The Druid Heights CDC isn't a traditional conservation group, but it frequently partners with its environmental counterparts to expand the neighborhood's green inventory. What's happening in this corner of West Baltimore is a microcosm of the shift taking place in land conservation across the Chesapeake Bay watershed and beyond.

Leaders of land trusts say they aren't turning away from their traditional goal: preserving vast, rural landscapes where real estate costs are relatively low and environmental benefits are high. But they are increasingly prioritizing land in underserved urban communities — places where a lack of green space is just one of many disparities.

"There has been a sense, I think, that we haven't been talking to the future demographics of urban residents, and the fact that your future constituents are going to be coming from a variety of backgrounds," said Matt Gerhart, conservation director for the Northern Virginia Conservation Trust. "It's changed from a thing you do on the side to a fundamental thing you do as a land trust."

But urban conservation advocates say the effort still faces many barriers, such as grant-scoring metrics that favor larger tracts and a shortage of political capital in deprived communities.

Tavon Benson, director of community resources for the Druid Heights Community Development Corp. in Baltimore, visits the Etting Street Green Space, which opened last November and replaced two trash-strewn empty lots. (Jeremy Cox)

"I feel right now if you look at our map, there are areas of great need where we don't have green space, and we have parks and green space in areas where we don't have great need," said Phyllis Joris, executive director of NeighborSpace of Baltimore County. "I'm not hearing from these communities that are lighting up most on this map."

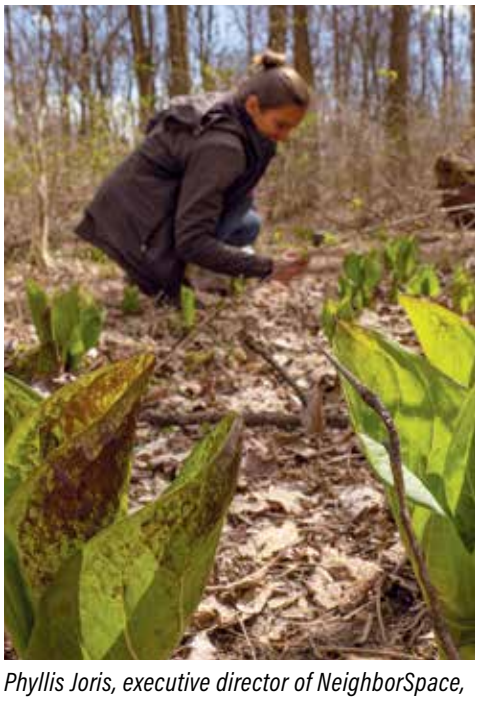
In addition, the movement finds itself facing challenges as the new Trump administration cancels support for diversity, equity and inclusion (DEI) programs. Funding that was disbursed during the Biden era is in danger of getting clawed back, and future federal resources are anything but assured.

The nature gap

The plight of Druid Heights offers a window into why advocates say disadvantaged communities need more green spaces.

The neighborhood measures about 40 football fields in size. More than 40% of its properties lie vacant. The population declined steeply beginning in the 1960s as residents fled from drug activity, disproportionately high crime rates and increasing blight.

About 90% of the populace is Black. Their health outcomes tend to be worse than the city's average, with residents experiencing higher rates of diabetes and heart disease.



Phyllis Joris, executive director of NeighborSpace, photographs skunk cabbage in the urban forest at Tollgate Wyndham Preserve in Baltimore County, MD. (Dave Harp)

The root causes of Druid Heights' problems, community leaders say, include a toxic blend of segregationist housing policies dating to the early 1900s, a plunge in local manufacturing jobs and an education system that leaves many behind.

No one believes that green spaces are a cure-all. But research shows that having access to nature has many benefits for community members, including providing opportunities for social interaction, improving mental and physical health, enhancing air quality and mitigating summer heat.

Greening an empty lot, Benson has found, also tends to discourage people from using it as a trash dump.

"When people feel like no one cares about a particular space, it's a freefall," he said.

Yet, among many conservation organizations, "there's a mentality that large acreage gives you more bang for the buck," said Katie Lautar, executive director of Baltimore Green Space, which manages more than 60 acres of community gardens, pocket parks and forests in the city.

"The truth is," she said, "built landscapes have borne more of the burden of having their environments degraded for longer periods of time, and their last remaining green spaces are not being prioritized for preservation because they're too small."

As a result, marginalized communities like Druid Heights have struggled to overcome their deficit of protected lands, said Jenny Rowland-Shea, director for public lands at the Center for American Progress, a left-leaning think tank. She was the lead author of a 2020 report that dubbed this phenomenon "the nature gap."

Her research showed that 74% of communities of color in the contiguous U.S. occupy census tracts that rank among the top half of those with the most losses of nature due to human activity. Racially and ethnically diverse communities were three times more likely to have nature deprivation than their white counterparts.

Across the Chesapeake Bay region, the likelihood of communities of color facing a scarcity of nature ranged from 56% in the District of Columbia to 85% in West Virginia.

Nationally, social class also appears to play a role; low-income communities have 20% higher rates of low-nature surroundings compared with those with moderate or high incomes.

"The findings not only confirmed our hunches but showed just how serious the problem is," Rowland-Shea said. "I don't think conservationists should wash their hands of this issue. Racism cuts through conservation work the same way it does the rest of our society."

Roots of inequity

The Black Family Land Trust was founded in 2004 to help African American landowners preserve their land, especially Black-owned farms and family assets. The organization, based in North Carolina and operating in Virginia and South Carolina as well, filled a need that white-run land-protection groups had failed to address, executive director Ebonie Alexander said.

"It is a movement that has been primarily led by white people," Alexander said. "It's an issue of language that separates Black communities and white communities."

She said that property negotiations between Black landowners and land trust representatives often break down over the same sticking point: Who will own the land after the money changes hands?

"Remember, we were in bondage for 200 years, and one day we were free and we owned absolutely nothing. But we did know the land because that's what we were here for. So, we developed institutions that taught people to be better farmers," said Alexander, whose own family has been on the same land for at least six generations.

"Ownership meant something different than it did maybe to whites," she added. "That land meant something, that you could take care of your family. That land was all-powerful. As a people, we don't tend to donate our land. And if we do it's usually to a church or a school, but not to a land trust."

Her organization operates differently, allowing owners to keep their land by putting it into a limited liability company or a family trust. If anything is sold, it's legally tied to a conservation easement that removes the property's development potential in exchange for a one-time cash payment.

John Griffin, a former secretary of the Maryland Department of Natural Resources under two governors, noted that government and nonprofit efforts to protect land for the benefit of marginalized communities have scored significant victories over the years. He points to the preservation of recreation areas that are popular among diverse visitors, such as the Gunpowder River stream valley near Baltimore.

But he acknowledged that the goals of the mainstream conservation movement didn't always align with those of disadvantaged communities. Those organizations often prioritized the acquisition of rural land to satisfy cost-benefit concerns and ensure habitat would be available for imperiled species. Parcels of 5 acres or less, like those in urban areas, were typically excluded.

High school students visit the Masonville Cove Environmental Education Center in South Baltimore. The nation's first Urban Wildlife Refuge Partnership, it provides green space and shoreline access in an area where industrial development had once severed the waterfront from the local community. (Will Parson/Chesapeake Bay Program)

"But in more recent times, particularly given the Biden administration's emphasis on serving urban areas with green space, we realized we haven't done the job we should have done to target acquisitions in urban areas at smaller scales but at no less value," Griffin said.

Halting progress?

The nation's racial reckoning in the wake of the police murder of George Floyd in 2020 spilled over into environmental policy. For many land conservation groups, equity considerations shifted to the front burner, Rowland-Shea said.

"People are becoming more central," she observed.

Examples of how conservationists and government officials are stressing equity in the Bay region include:

- Establishing more urban land trusts. They began proliferating in the early 2000s. "People are here to stay and need green space for a variety of reasons," said Joris of NeighborSpace, founded in 2002. "That social reason is weighing in heavier and heavier."
- The development of a Green Space Equity Mapper. Released by the Chesapeake Conservation Partnership in 2023, the online tool shows the locations of underserved communities and their proximity to nature. "It's really important that we look at more than just bucks and acres," said Ben Alexandro, the group's program manager. "People need to find places with peace and solace. I think this tool can help show folks who does and doesn't have access."
- The passage of the Chesapeake Watershed Investments for Landscape Defense (WILD) Act of 2020, which includes increasing equitable public access to nature among its five focal areas. In its most recent year, the program funded 30 projects for a total of nearly $9 million.
- The inclusion of equity in Pennsylvania's statewide outdoor recreation plan. It names "supporting inclusive and equitable recreation" among its five priority goals.

Volunteers work at Terborgh Terrace Garden in Arlington County, VA, where fruits and vegetables are grown for donation to food pantries in the county. The project is a collaboration the Northern Virginia Conservation Trust and Friends of Urban Agriculture. (Courtesy of NVTC)

These steps forward, though, have been accompanied by some steps backward elsewhere.

In Maryland, for example, advocates applauded state lawmakers' passage of the 2023 Greenspace Equity Program, which dedicates funding for acquiring and developing parks in underserved communities.

But in this spring's legislative session, the program's entire $7 million budget was rerouted to three parks not among the original list of applicants. That included $500,000 spent on a project in Roland Park, an affluent Baltimore neighborhood where white people account for 74% of the population versus 27% citywide.

At the federal level, equity advocates are alarmed by the Trump administration's efforts to undo gains achieved during President Biden's time in office.

Trump's own words condemning DEI have also stoked fears that future funding for parkland in underserved areas could be in doubt. Some groups have seen existing funding temporarily frozen — until federal judges unfroze it.

"The next four years, how much funding is going to be available?" Joris asked. "I don't know."

Meanwhile, some land conservation advocates are calling on the Chesapeake Bay Program, the state-federal partnership that administers the estuary's cleanup, to put more emphasis on protecting nature in underserved areas. The calls come as the Bay Program works toward revising its regional agreement by the end of the year.

The Bay Program set a goal in its 2014 agreement of conserving 2 million acres of land by 2025. Through 2022, 1.6 million acres had been protected. If that rate continues, analysts expect the goal to be reached by the deadline. But the race to stockpile land for nature shouldn't bypass low-income and racially diverse communities, advocates say.

"Achieving previous goals does not mean the work is complete, as many communities still lack access to open space," said Kerri Batrowny, a preservation planner with the Delaware Department of Natural Resources and Environmental Control, in a letter to the panel drafting the agreement revisions. Her letter urged the program to incorporate "measurable indicators" for assessing progress of "land protection efforts [that] extend beyond large landscapes to benefit small towns and underserved areas." ■

Permit challenged for salmon farm on the Susquehanna

Bay Foundation, watermen raise concerns about impacts of wastewater discharge

By Timothy B. Wheeler

A Norwegian aquaculture company looking to build an indoor salmon farm in Maryland faces a legal challenge to its proposed location along the lower Susquehanna River.

The Chesapeake Bay Foundation and two upper Chesapeake Bay watermen filed suit April 21 in Cecil County Circuit Court challenging a wastewater discharge permit granted to the planned facility by the Maryland Department of the Environment.

AquaCon Maryland LLC plans to produce up to 20,000 metric tons of Atlantic salmon a year at the $320 million facility it proposes to build at a former naval training center in Port Deposit, MD.

This is the Norwegian company's second attempt to open a salmon farm in Maryland. In 2022, it withdrew a bid to build in Federalsburg on the Eastern Shore amid concerns from environmentalists, scientists and local residents that its plan to discharge into Marshyhope Creek could harm Maryland's only known spawning reach for endangered Atlantic sturgeon, as well as other fish.

Most salmon farming occurs in open water cages or pens, which raises concerns about the impact that pollution, disease and nonnative fish could have on native fisheries and surrounding waters.

AquaCon says its salmon will be produced sustainably on land using a "recirculating aquaculture system," with hatchery spawned fish raised in recycled-water indoor tanks. The biological waste they generate will be converted to energy to help run the operation.

For the Port Deposit location, MDE gave final approval March 5 for AquaCon to discharge up to 1.9 million gallons of "purge" water daily into the Susquehanna. Purge water comes from tanks where fully grown salmon are briefly held before being harvested for processing and shipment to market. While free of fish waste, the water would contain geosmin, a naturally occurring organic compound that, while harmless to consume, has an earthy odor, often likened to the smell of rain on dry soil.

Before the water is discharged, the company plans to filter it and treat it with ultraviolet light to kill bacteria. The MDE permit sets water quality thresholds for the discharge, and it requires the company to offset the nutrient levels in the released water. It also requires the facility to monitor geosmin in its discharge for three years to ensure the levels being released are no higher than what's normally found in the river.

AquaCon has secured an option to lease land at this industrial park in Port Deposit, MD, for its proposed indoor salmon farm. (Conlan Company)

But the Bay Foundation and the two watermen — Steve Lay of Havre de Grace and Blair Baltus of Essex — contend that the facility's discharges of nutrients, sediment and other pollutants will cause or contribute to water quality problems downstream, including low dissolved oxygen levels, increased murkiness and algae blooms.

Allison Colden, the foundation's Maryland executive director, stressed in comments filed on MDE's draft permit that the lower Susquehanna provides spawning and nursery habitat for a variety of fish, including striped bass, American shad, hickory shad, alewife, white perch and yellow perch. She noted that striped bass have been suffering a years-long slump in reproduction, with studies indicating that suitable habitat for juveniles has been declining.

Farmed salmon traditionally have been raised to market size in open water pens. Parasites, disease and regulatory limits have fueled a shift to land-based aquaculture, particularly to supply a growing U.S. demand for the fish. (Dave Harp)

Colden said in a recent *Bay Journal* interview that MDE had "marginally improved" the limits it placed on AquaCon's discharge in response to criticism of the draft permit made by her group, the lower Susquehanna Riverkeeper and the Maryland Department of Natural Resources, among others. But she said concerns remain.

One in particular is the potential for harm from sediment discharge into the lower Susquehanna, which she said is already impaired by that pollutant. Just downstream is the Susquehanna Flats, a vast underwater meadow where the river meets the Bay. It provides abundant food and shelter for many fish and waterfowl and is a popular fishing spot.

Along with the rest of the Bay's underwater grass beds, the flats declined in the 1970s and 1980s. They have gradually regained much of their former abundance amid extensive pollution control efforts. But Colden said there are indications the Bay grasses in the flats are being impacted by algae blooms and that increases in sediment discharge won't help.

MDE pointed out in responding to such criticism that the concentrations of sediment in the discharge will actually be less than what was drawn from the river to fill the fish purge tanks. But the petitioners aren't convinced.

"We don't need any more environmental stress on the Susquehanna, on the flats or the upper Bay," said Baltus, president of the Baltimore County Watermen's Association. And while there is no documented sturgeon spawning in the lower Susquehanna or upper Bay, he said that watermen frequently see and even accidentally net the big fish there.

Lay, a waterman for the past 50 years, fishes for white perch, yellow perch, blue catfish and striped bass, also known as rockfish. He also fishes for American eels in the Susquehanna Flats.

"There's just, to me, too many things that are unproven and are still questionable, since this is a very new thing with a fish that is not native," Lay said.

MDE spokesman Jay Apperson declined to comment on the permit appeal. Ryan Showalter, AquaCon's attorney, could not be reached. ■




Filmmakers document rhythms of the Chesapeake Bay

Bay Journal team turns its lens toward butterflies, swans and other paragons of the 'migration shed'

By Lauren Hines-Acosta

Editor's note: This interview is featured in the new season of our Chesapeake Uncharted podcast, which will be released May 21 as a companion to our latest film, Chesapeake Rhythms. The film and podcast explore wildlife migrations in the Bay region.

Twenty years ago, Tom Horton was kayaking on the first day of spring. While paddling, he found a small bush sprinkled with monarch butterflies. He persuaded his friend, Dave Harp, to go there the next morning before sunrise. Harp was there in the morning, camera ready, as the sun's warmth woke the butterflies. The bush quivered as each one continued their thousand-mile journey, almost posing for a photo.

As a writer and photographer respectively, Horton and Harp have documented the Chesapeake Bay for decades in their books, photo series and films. That includes work for the *Bay Journal*: Harp is the staff photographer, and Horton writes the Chesapeake Born column. Together with filmmaker Sandy Cannon-Brown, they have produced eight *Bay Journal* films. The latest, *Chesapeake Rhythms*, was released in March. It explores the epic migrations of graceful tundra swans, beautiful monarch butterflies, elusive eels and flocking shorebirds.

The *Bay Journal* spoke with the three producers about the new film. The interview has been edited for length and clarity.

Question: Dave, you and Tom have been talking about this film for years. How did it become a reality?

Harp: Tom and I have been exploring the Bay for 40-some years, and we've always been conscious of the rhythms of the Bay: the tides, the wind, the migration of all the different animals coming through. So, this is something that's innate in us. … And then all of a sudden, we're looking for our next film. This is what we thought about.

The filmmakers behind Bay Journal documentaries are (left to right) Tom Horton, Sandy Cannon-Brown and Dave Harp (George Sass/Courtesy of the Chesapeake Bay Maritime Museum). Top photos by Dave Harp.

Q: Out of all the creatures that visit the Bay region, why did you focus on swans, eels, shorebirds and monarchs?

Harp: They're just some of our favorites. We've covered swans for most of the time Tom and I have been working together. We're avid kayakers, and you can't be in the Bay in September, kayaking around and not having monarch butterflies waft over you. Shorebirds are just everywhere, and there are so many varieties. And eels are just sort of a mystery — where they came from and where they're going, and they're very difficult to chronicle.

Q: Tom, your words and narration bring such a calming presence to the film. What inspires your writing?

Horton: I guess I was inspired by the Bay almost from birth. I grew up eating oysters and hiking in the marshes and fishing and hunting out with my dad and just loving it, never thinking that I might make my living writing about it. But knowing Dave, I've gotten out all times of the day, generally the crack of dawn. I can make up a sunrise based on lots of sunrises I've taken notes on. But Dave has to be there, and since I go with him, I have to be there too. So, he gets me outdoors.

Harp: We definitely have a symbiotic relationship. I remember being out with Tom, years ago, right before dawn. We're getting ready to go into a heron rookery on South Marsh Island, and he's scribbling in his notebook. And I said, 'Tom, what are you writing about?' and he said, 'The color of the water as the light changes.' That's an inspiration to me.

Q: Sandy, from the confines of your studio, how did you go about editing the film?

Cannon-Brown: When you have Tom's words and Dave's material to work with, it really isn't hard at all. And Dave and I work very closely in the editing. But the beauty of it is that I'm the first audience. I'm the one who gets an impression, an emotion and a feel for what there is. And then what I love and what I understand, I can give back out.

Q: What do you want viewers to take away from the film?

Horton: I hope it furthers this concept of a "migration shed." We started 50 years ago. We paid a lot of attention to the Bay, meaning the water, and at some point, we paid attention to the watershed, which is 16 times bigger. And then it became clear a lot of pollution comes from the air. So, we started paying attention to the air shed, which goes clear up into Canada. And this just expands that to an even bigger layer, the migration shed, which stretches from Argentina to the Arctic to the Bering Sea.

Cannon-Brown: For me, this is an education. When they told me we were going to have a segment on eels, I kind of went, "Oh, really? They're not very pretty, and who likes eels?" But the story is absolutely amazing. And you begin to appreciate all these critters out there and the lives that they lead, and some of those lives are very, very short and going thousands and thousands of miles. But I hope that people come away with a great appreciation that we as humans really are pretty do-nothing critters.

Harp: The migrations, to me, are just magical. I never ever tire [of hearing] the first tundra swans fly over on their way down. To me, it just sends chills every year. So, I think just learning to appreciate our environment, learning to appreciate the world around us and, especially on a micro level here on the Bay, taking care of a very fragile environment. ■

Closure of MD's last coal power plant may be pushed to 2029

Plant owner and regional grid operator agree on four-year delay, but federal approval still pending

By Jeremy Cox

The owner of Maryland's last coal-fired power plant had proposed shutting down the financially underperforming facility by June of this year. Then came a red light from the region's power grid operator, PJM Interconnection.

PJM officials say they can't allow the Brandon Shores plant near Baltimore to close until a $1.5 billion package of grid upgrades is completed, including new high-voltage transmission lines and substations.

PJM, an independent but federally governed company that coordinates electricity transmission in 13 states and the District of Columbia, reached a deal in January with Talen Energy, the plant's operator, to keep the northern Anne Arundel County facility open until June 2029. PJM's own market consultant and the state's independent utility watchdog, the Office of People's Counsel, have formally appealed the agreement, which must be approved by the Federal Energy Regulatory Commission.

In Maryland, 16 coal-fired units have shuttered since 2012, representing 3,866 megawatts of electricity, according to the industry tracker Global Energy Monitor. Experts say the trend is fueled by the emergence of cheap natural gas and increasing competition from renewable energy sources like wind and solar. They say stricter federal environmental regulations are also to blame.

But coal plants are finding new life in the Mid-Atlantic and beyond amid concerns about reliability and increasing energy demand from data centers. This comes as President Trump works to revive the flagging industry through executive actions that seek to expand mining, pave the way for coal leases on public land and temporarily allow aging plants to comply with less-stringent air-pollution rules, among other steps.

A recent *New York Times* analysis showed that nearly one-third of coal units facing retirements have had their lives extended since 2017. In this context, industry critics say, the delay of the Brandon Shore closure isn't such a surprise.

"It's disappointing they didn't make the deadline," said Kim Coble, executive director of the Maryland League of Conservation Voters. "But it will be closed. In the long run, that's what we're looking for."

The H.A. Wagner plant directly adjacent to Brandon Shores, also operated by Talen, fully converted from coal to fuel oil in December 2023, according to the Maryland Department of the Environment.

The two stacks in the distance are those of the coal-fired Brandon Shores generating plant near Baltimore. Slated to close in 2025, the plant might now continue to burn coal until 2029 if the Federal Energy Regulatory Commission approves the extension. To the right is the H.A. Wagner generating plant, which converted to natural gas in 2023. (Dave Harp)

Brandon Shores comprises two coal units, which have a combined capacity of about 1,370 megawatts of electricity. The power plant is located along the southern shore of the Patapsco River between its mouth at the Chesapeake Bay and the site of the collapsed Francis Scott Key Bridge.

The plant's extension is stirring concerns on several fronts. Those include how it could undermine efforts to reduce greenhouse gas emissions, imperil the health of nearby residents and drive up electricity bills.

Emissions from the plant have trended down sharply in recent years, plummeting from 6 million metric tons of carbon dioxide equivalent in 2011 to 1.2 million in 2023, according to the U.S. Environmental Protection Agency's tracking tool. But that was still the fourth-highest total statewide that year among power plants and fifth highest from any type of carbon emitter.

"They're fossil fuel. They're dirty. They need to be shut down," Coble said. She added that pollution from Brandon Shores and other industrial facilities likely contributes to Baltimore's having among the highest asthma rates in the nation.

A pile of coal awaits incineration at the Brandon Shores generating plant near Baltimore. (Dave Harp)

But the formal protests against the Brandon Shores reprieve largely center on its potential sticker shock to consumers. The Maryland Office of People's Counsel argues that the $180 million that consumers would have to pay annually under the deal to keep the plants open is $83 million more than Talen's costs.

"Talen is essentially using its market power because PJM has said we need to have these plants until a transmission solution is built," said David Lapp, head of the People's Counsel. "These companies have a lot of leverage in these negotiations."

The typical Baltimore Gas and Electric power bill is expected to go up $60 a year if the agreement is approved in its current form, the People's Counsel estimates.

A Talen spokesperson didn't return messages seeking comment. A PJM spokesman described the agreement as a "last resort" to ensure the grid's reliability until upgrades can be put into place.

"We're glad that the parties were able to reach agreement," PJM's Jeff Shields said in a statement. The agreement, he added, will ensure that the plants continue "operating for a fixed period to maintain reliability while needed transmission projects are completed."

The Sierra Club also signed on to the pact after gaining a concession that would offset some of the costs borne by ratepayers. "We did not contest the agreement is the best way to share it," said Josh Tulkin, the group's Maryland director.

In its filings, Talen has said it will shutter the plant if federal regulators don't ratify the agreement promptly.

Elsewhere in the Bay region, coal is showing similar signs of life.

In Virginia, no coal units have been operating within the state's portion of the Bay watershed since 2023, when Dominion Energy deactivated the remaining ones at the Chesterfield Power Station on the James River. But the state is seeking to augment the state's power supply with new transmission lines coming from plants in other states, many of them still coal fired.

Coal-fired power plants remain the third-largest source of energy in Pennsylvania as of 2023, but far behind natural gas and nuclear and accounting for only about 5% of the state's electricity. That was down from 39% in 2013, according to the U.S. Energy Information Administration.

Pennsylvania has more coal-fired plants than any other state, with 15. Environmentalists fear that the new Trump order could cause two coal-fired plants, the Conemaugh and Keystone plants near Pittsburgh, to remain open instead of following through with their scheduled closures in 2028. ■

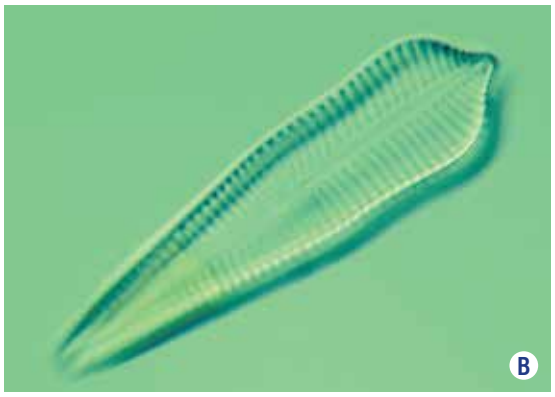
Staff writers Karl Blankenship and Whitney Pipkin contributed to this report.

CHESAPEAKE CHALLENGE

— Kathleen A. Gaskell

Nitty gritty on itty bitties

A



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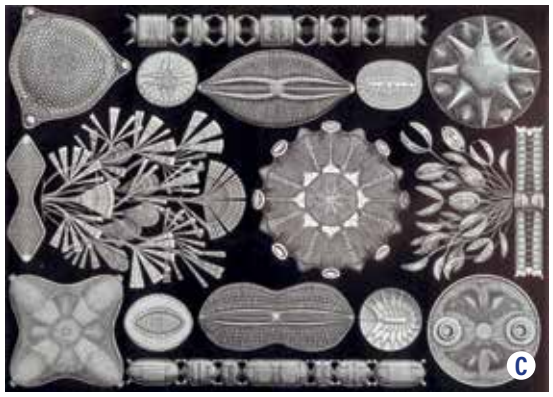


C

D

Phytoplankton are among the tiniest forms of plants and algae in the Chesapeake Bay. Microscopic diatoms, an algae, are some of the most common.

Food for all: Diatoms are rich in long-chain fatty acids, making them an important food for all animals, ranging from zooplankton to whales.

By the numbers: New diatom species are still being discovered. Estimates range from 20,000 to 2 million species. The largest diatom measures just one millimeter across.

Glass house: A cell wall made of transparent or semitransparent silica surrounds each diatom. Diatoms are often split into two asymmetrical sides, which no doubt inspired their name. Diatom is from the Greek for "cut through."

Diatom duo: There are two basic types of diatoms. Centrales, or centric diatoms, are wheel-shaped and radially symmetrical. They are usually found drifting near the ocean surfaces. Pennales, or pennate diatoms, are elongated and usually bilaterally symmetrical. They live in freshwater streams, swamps and ditches, as well as the shallows of oceans and estuaries.

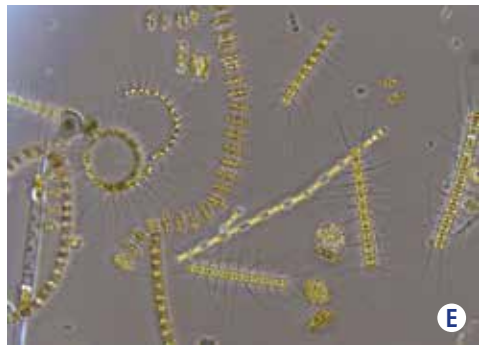
Detective diatom: Diatoms are picky about where they live. Species have different preferences for distinct ranges of acidity, salinity and water quality. They also have a range of tolerances for pollution — which makes them vital indicators to scientists who monitor the biological conditions of waterways.

Dino diatoms: Diatom fossils date to 185 million years ago.

Rising from the dried: In 1834, a scientist added water to dried-up 150-year-old diatoms, which revived and began to swim around.

Deep-sized and then some: When diatoms die, they sink to the bottom of waterways. Diatom layers are as deep as 984 feet in some areas. On dry land that was ocean bottom eons ago, fossilized diatoms are the main component of a soft rock called diatomite or diatomaceous earth. It's what makes up the sun-bleached cliffs along Virginia's lower Rappahannock River.

Columnist Kathleen A. Gaskell served as the Bay Journal copy editor for more than 30 years until her retirement.



E

Plankton-palooza

The Chesapeake Bay's three types of plankton — bacteria, zooplankton (animals) and phytoplankton (plants and algae) — are mostly tiny but have a large role in the Bay's ecosystem. How much do you know about them? Answers: page 36.

1. Although there are exceptions, most plankton are microscopic. They are categorized as plankton if they cannot swim well. Most of them merely float, their movements governed by tides and current. The word plankton, which is derived from the Greek "planktos," reflects this. What does planktos mean?
   A. Lost floater
   B. Wanderer/drifter
   C. Wave rider/sailor

2. While every fish or shellfish in the Bay eats one or two types of plankton at some point in its life, the third is eaten by the other two plankton types. The third type also decomposes dead material from animals, plants or algae, processing it into nutrients for plants. Which is which?

3. Which types of plankton are thought to produce 50%-80% of Earth's oxygen and take in about half of its carbon dioxide?

4. Zooplankton may remain plankton all of their lives. But they can also develop into other forms of aquatic life. Which of these creature(s) start out as zooplankton?
   A. Corals B. Crabs C. Fish D. Oysters

5. Most plankton are microscopic, but some zooplankton can grow quite large. Which of these is considered a zooplankton all of its life?
   A. Cuttlefish B. Jellyfish C. Octopus

Title image: *An electron microscope image of a diatom in the genus Pleurosigma. (John Whitley/CC BY-NC 2.0)*

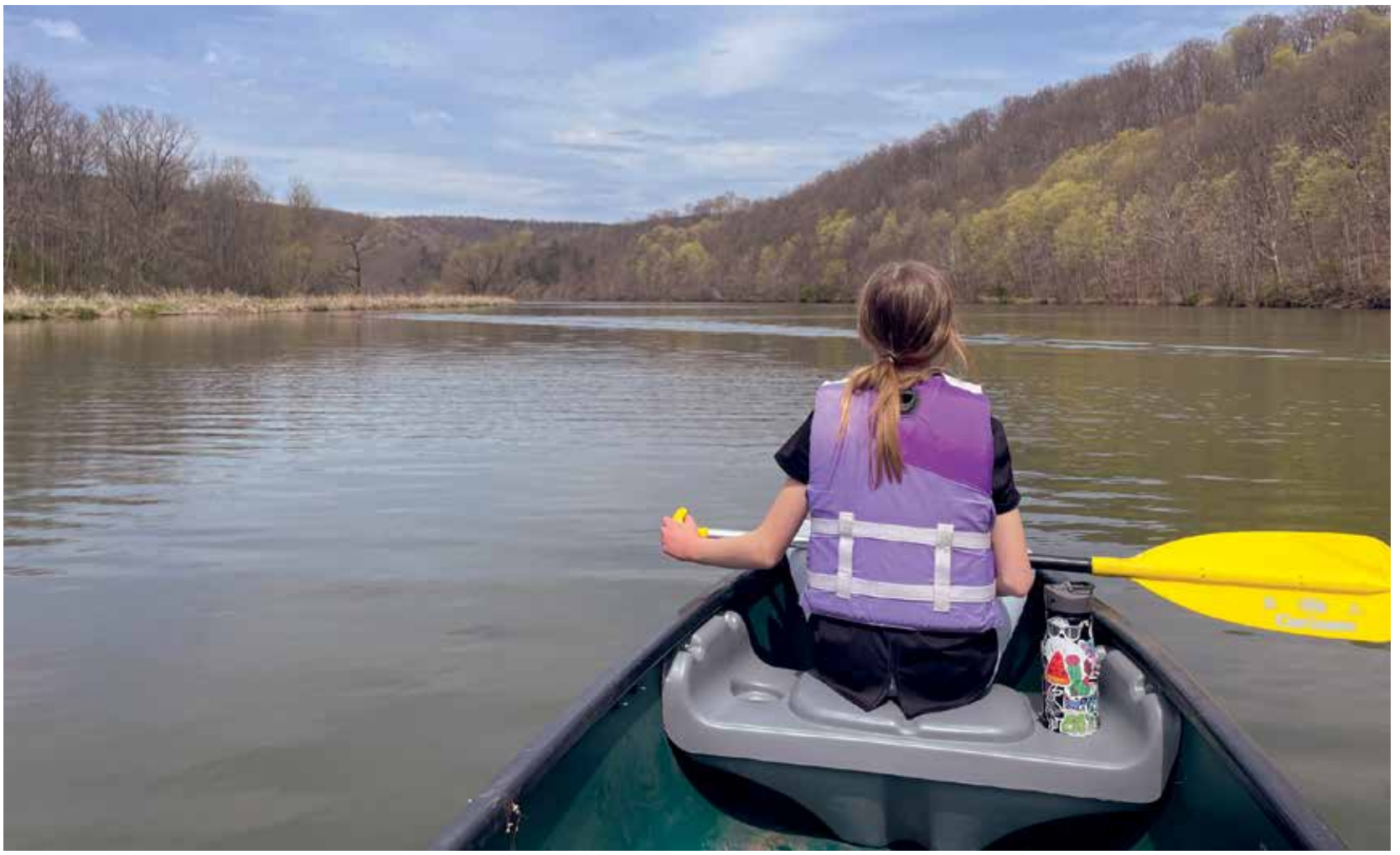
A *A microscopic photo montage of various zooplankton. (Andrei Savitsky/CC BY-SA 4.0)*

B *A pennate diatom, named for its bilaterally symmetrical pen shape. (Ivan Bachev/CC BY 4.0)*

C *Detail from "Diatomaea," a 1904 illustration of assorted diatoms by German zoologist Ernst Haeckel.*

D *A light microscopy image of a fossil diatom from New Zealand, estimated to be 32-40 million years old. (Anatoly Mikhaltsov/CC BY-SA 4.0)*

E *A mixed phytoplankton "community" under the microscope. (Stephanie Anderson/University of Rhode Island/CC 0)*



Despite campground closures, Raystown Lake in PA still open for business this summer

Top photo: Paddling Raystown Lake can be a great way to encounter central Pennsylvania wildlife. But a lake made from a dammed river still has a current that can be hard to paddle against. (Whitney Pipkin)

Right photo: The docks at Lake Raystown Resort Marina were still waiting to be filled with boats before the summer season kicked off, but the restaurant with a view opened in April. (Whitney Pipkin)

By Whitney Pipkin

It's important to remember at least two things when taking off in a pair of canoes with three kids aboard: One, if a lake was created by damming up a river, it still has a current. Two, paddling with the current on the way out will be lovely, but paddling against water and wind on the way back will be less so.

This was our introduction to the stunning waters of Raystown Lake, the largest human-made lake located entirely in Pennsylvania. Tucked into a valley in the Allegheny Mountains, the picturesque vistas across the lake unfold around bends of forested mountain roads. Depending on the route, it can take 30 minutes to an hour to drive from one end of the 28-mile-long lake to the other, though the views make it worthwhile.

The lake was created in the early 1900s by a 45-foot dam that brought hydro-powered electricity to the rural town of Huntingdon and surrounding communities. Over time, the need to reduce downstream flooding led to a larger dam, and the 225-foot-tall structure that stands today was completed by the U.S. Army Corps of Engineers in 1973.

The dam's 50th year was celebrated with fireworks on the lake last summer. Along with creating a recreational lake, the dam at the northeast end of Raystown Branch helps control flooding before the waterway's confluence with the Juniata River. (The Juniata flows into the Susquehanna River above Harrisburg.)

That's what can make the lake's current confusing: It gives the impression of flowing "upstream" from south to northeast. Also, this serpentine lake is big, covering some 8,300 acres. Or perhaps it's better to call it long — never much more than half a mile wide, but 14 miles long as the crow flies and easily twice that in paddling miles.

Surrounding it all are 21,000 acres of federal, state and private land largely devoted to recreation. Think hiking, boating, camping, fishing, hunting and mountain biking — enough activities to fill a week or a summer.

The area draws more than a million visitors each year, generating an estimated $19 million in related sales annually, according to the Army Corps. In addition to managing the dam at Raystown Lake, the Corps runs several public facilities around the lake, including eight boat launches and two swimming beaches, along with trails, overlooks, picnic areas and three campgrounds with 380 sites.

Hiking just a half mile from parking spaces at Trough Creek State Park in Pennsylvania brings visitors to a suspension bridge across Great Trough Creek. (Whitney Pipkin)

But the Corp's Baltimore District said that some of its most popular offerings will not open this year. As of mid-April, the campgrounds — Seven Points, Susquehannock and Nancy's Boat-to-Shore — were closed until further notice. The Corps attributed the closure to a federal hiring freeze that included seasonal workers.

In March the Corps began issuing refunds for campsite reservations that had already been made for this summer. The Seven Points Campground, on land that juts out into the lake, is one of the Corps' highest grossing campgrounds in the country, typically bringing in more than $1 million annually. A post on the Corps' Facebook page notifying users of the closure garnered more than 500 comments and left some scrambling for other accommodations.

But the lake and its surrounds are still open for business, even if planning an overnight stay takes a little more legwork than usual. State parks in the area offer overnight camping, and several private campgrounds and resorts are beefing up their staff to prepare for a busier summer season.

Places like the Lake Raystown Resort, which opened in the mid-1980s, offer full hook-up campsites, cabins, a water park and a restaurant, while several smaller operators offer a mix of tent, camper and cabin sites around and near the lake.

Alicia Copenhaver, co-manager of Heritage Cove Resort on the lake's south end, said she was already seeing an uptick in reservations for her private facility's 238 camper sites and eight cabins following the announcement of campsite closures. The resort, which has been undergoing extensive renovations in recent years, includes a boat launch and has storage and boat rental options as well.

Our family rented a cabin at Heritage Cove at the end of the kids' spring break for a couple of nights away from the bustle of Northern Virginia. We spent the morning wandering the pin-drop-quiet shores of the lake's south end, watching kingfishers and red-winged blackbirds take flight while the kids climbed rocky outcroppings.

In the afternoon, we launched a pair of rented canoes for a half day on the water, our first outing of the year requiring sunscreen. Paddling with the lake's current, we drifted around a bend to the Weaver Falls day use area featuring boat tie-ups, a playground and public restrooms.

On the way, we spotted a raft of hooded mergansers fishing at the bend ahead of us, until our approach startled them into flight. Passing under a bridge across the lake, which is comparatively narrow at this end, I used my bird ID app to find that the swallows darting after bugs overhead were of the northern rough-winged variety.

On the way back, struggling against the current and breeze, we spotted turtles sunning on branches and bald eagles and blue herons overhead. Besides wildlife, only a few anglers watched us from the shoreline on a 75-degree Friday afternoon, before the lake's busy season had truly begun.

After recovering from the paddle, we drove over to Trough Creek State Park to explore some of the 12 miles of trails alongside cool-water streams running down the mountain's rocky slopes toward the lake. Hiking just a half mile from the roadside parking area took us across a bouncy suspension bridge (Did my children run across it several times? Yes, they did), then up a stone staircase to the cascading water of Rainbow Falls. Still farther up was Balanced Rock, an enormous, fissured boulder that looks precariously and miraculously stuck to the edge of an overlook.

It was easy to see how the stone steps defining the trail's inclines could get slick with fallen leaves or rain, but dry weather and cooling temperatures drew us farther up and in. Mountain laurels not yet in bloom made the woods feel jungle-like, though without the humidity. And every inch of the landscape — even the signs warning of timber rattlesnake nests among the rocks — seemed to beg for further exploration.

On the drive out of the state park, we eyed nearby campgrounds and watched fly fishers hip-wading in James Creek, casting and recasting for the trout stocked in its babbling waters.

Not far from the state park is the Lake Raystown Resort, where one of the few lakeside restaurants is open to the public and features a new chef. (The municipality is dry, and the restaurant's carpeted interior is dated, so prepare to bring your own booze and possibly sit outside.) Venture down to the docks after dinner to see foot-long carp, clearly accustomed to being fed French fries, swimming up to the railing to beg for scraps. We may or may not have placated them.

Maybe on our next trip, we'll pick up fly fishing. ■

Surrounding the long, serpentine lake, formerly a branch of the Juniata River, are 21,000 acres of federal, state and private land, much of it wooded wilderness. (Whitney Pipkin)

Rainbow Falls is among the sights at Great Trough Creek State Park where streams crisscross the mountainside before entering Raystown Lake. (Whitney Pipkin)

IF YOU GO

If you're planning to stay overnight on or near Raystown Lake this summer, consider booking a campsite or cabin sooner rather than later.

Planning to visit a portion of the lake run by the U.S. Army Corps of Engineers? Check the Corps' website for the latest updates on seasonal closures due to federal hiring freezes: *tinyurl.com/CorpsRaystown*.

To learn about or book campground reservations at private or state-run sites, visit *tinyurl.com/RaystownPlaces*.

The Raystown Lake Visitor Center, as well as day-use facilities such as beaches, overlooks, picnic pavilions, walking trails, boat launches, disc golf courses and the mountain bike skills park, will remain open this summer. Areas that are leased or run by concessionaires, including Seven Points Marina (though not the campground), will operate according to their usual seasonal schedules, the Corps has said.

Ode on an estuary: Gaia takes a long view, speaks in verse

By Tom Horton

An illustration based on the famous "Blue Marble" photograph taken by the crew of Apollo 17. (NASA)

Giddy with spring, Mother Nature contemplates the latest satellite images of the Chesapeake Bay:

I declare, until the last few seconds —
as you reckon time —
I did not think you would ever get it, ever
come to see the way things really are

Columbus, gaze fixed distantly on
Asian wealth,
Stubbed his toe on a "new" world
and soon Cortez was pushing inland,
Entering gleaming Tenochtitlan,
"The most beautiful city in the world,"
he called the Aztec capital

Azure canals, their banks adorned by
a thousand perfumed and fruiting plants
Venice raised to the tenth power
And the birds!
Living rainbows, they shimmered and sang
Festooned the capital in magnificent
aviaries

And for wealth and power, for progress
as you humans saw it,
Cortez, canal by canal, took the place
and its people apart
And the exquisite aviaries, he burnt
to cinders

A century more, and on a grayer shore,
the Puritans taught Native Americans
about ownership of land:
Use it or lose it
Log it, fence it, plow it, plant it,
build there — or we will
And behind bulldozer ethics you pushed
toward new frontiers

Uprooting trees, plowing under prairies,
buffalo, native cultures

The ordained work of rivers, you said,
was to carry your commerce
On the Susquehanna, too shallow for
navigation, you sighed relief
When dams began to harness all that
"wasted" flow to the Chesapeake

Ten million shad and herring ceased
their upstream running
Severing old, rich circuits that linked
Atlantic to Appalachians,
Made the spring freshets crackle with the
procreative energy of spawning fish

On you went, filling, paving, mining,
damming, using
Looking for new frontiers to conquer
Oil in the Arctic, minerals in the Antarctic,
in the seabed
And space, the ultimate frontier,
"new" worlds without end

You rose to meet the challenge astride
polished steel shafts propelled on
pillars of flame

Big macho indeed. I wondered:
Would you rape the very heavens?

And then, expecting conquests ahead
beyond imagining
You looked back
You saw — oh, lovelier by far
than Tenochtitlan — the blue ball
whence you came
Floating, whole, alone and fragile

Where had the frontier been?
It was a globe, a circle
And the pioneer, the trailblazer, would
ultimately come upon tracks — his own
And a new feeling swept over you,
awed, protective

The astronaut Schweickart said, in words
strange for an explorer — and welcome:

"You realize that on that spot, that little
blue and white thing, is everything
that means anything to you
All of history and music and poetry
and art and war and death and birth
and love
Tears, joy, games

All of it is on that little spot out there
that you can cover with your thumb....

"And when you come back there's a
difference in that relationship between
you and the planet
And you and all those other forms
of life on that planet"

Well, I declare, I wondered what it would
take to make you see
The wholeness, the connectedness,
the blessedness of it all
Nothing less than strapping your butts
to a rocket, it turned out

The satellites do not blink, do not lie
Looking down they see
the rainforest shrinking daily
The tattering of the ozone
And great bays like your treasured
Chesapeake in true context

No great bay at all, rather a smallish skim
of moisture, embedded within a basin
20 times its size, connected
Great webs of branching water weave
a fabric of lands from New York,
West Virginia, Delaware
Maryland, Pennsylvania, Virginia

And every pipe and ditch and barnyard
within, every roof and road and barren
building lot sheds water, pays tribute
Nourishes and pollutes in one direction,
Bayward

Five hundred years it took, from
Niña, Pinta, Santa Maria — to Apollo
But you've finally got the picture
And lost your last excuse. ■

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

For data center sustainability in VA, state regulation is a must

By Eric Bond

Spreading out from Northern Virginia, data centers are being proposed in communities across the Chesapeake Bay region. They promise big bursts of local revenue, but they also consume huge amounts of energy and can sometimes negatively impact neighborhoods and natural areas. When data centers come knocking, what should local environmentalists do?

Given the inevitability of new development, perhaps the best that local advocates can do is push for greater data center sustainability. But regulation and transparency of this industry is sorely lacking in Virginia. This, along with data centers' tremendous energy needs, raises the question: What does sustainability in this industry even mean?

State-level guidance is the first order of business. Certainly, data centers can be located in better or worse areas in regard to neighborhoods and ecosystems. The Virginia General Assembly recently commissioned a report by its Joint Legislative Audit & Research Commission to study the costs, benefits and risks of data centers. In its findings, the commission did not mince words when it plainly stated that data centers are industrial facilities and should not be built next to residential neighborhoods or other environmentally sensitive areas.

Unfortunately, this is exactly what was recently approved by the city council in my hometown of Fredericksburg, VA. They gave their blessing to a data center campus that isn't just next to a neighborhood, which includes an assisted living facility — but surrounds it. The Rappahannock, which is a state-designated scenic river, also flows immediately adjacent to the new data center technology zone.

I know that leaders in my city care deeply about the environment. But officials ignored recommendations from the General Assembly's data center report because, it would seem, the potential new tax revenue was just too big to pass up. This experience indicates that, before we can talk about data center sustainability, communities in Virginia need state lawmakers to set limits that restrict these industrial facilities to land that is appropriately zoned for such use.

An aerial view of rapidly growing Loudoun County, VA, where data centers have proliferated over the last decade. (famartin/CC BY-SA 4.0)

Location aside, there are other ways that a data center might be better or worse for the environment, especially in terms of energy use and carbon emissions. So does it make sense for local environmentalists to push for renewable energy solutions — or at least strict energy efficiency standards — for new data centers? It does, but the lack of transparency in energy consumption makes this approach difficult. How can local communities demand using less of something when they aren't even being told how much is being used in the first place?

Sustainability requires the disclosure of important information so that the public can verify claims. Right now, there is no public database where we can learn about the amount of energy used by a given data center. A bill introduced in Virginia during this year's General Assembly tried to create such a clearinghouse, but it never made it to the floor. Virginians need state lawmakers to require industry transparency so that the public can better distinguish between real sustainability measures and greenwashing.

A local approach to data center sustainability is also insufficient because it misses the forest for the trees. Even if individual data centers use energy more efficiently, it makes little difference if we Virginians keep building more and more data centers at breakneck speed. The pace of increasing energy efficiency will be swallowed up by the increased buildout of the industry as a whole.

Maybe the next best approach is for local advocates to push new data centers to use renewable energy. Many of the big companies in the data center industry already have goals to be completely powered with zero-carbon energy by 2050, or they claim to have already achieved this goal through the purchase of renewable energy credits that are equal to the company's use of electricity from coal and natural gas.

The reality is that this industry is highly dependent on fossil fuels. There is only so much area in Virginia we can cover with solar panels, and there are only so many wind turbines we can build. Energy consumption in Virginia is set to double in the next 15 years, mostly because of the proliferation of data centers. Consequently, this industry is a major obstacle to achieving our climate goals, despite the renewable energy claims of individual companies.

Put succinctly, the Virginia General Assembly and Virginia's next governor need to do their jobs. Our lawmakers have left local communities in an impossible bind, torn between their dedication to the environment and the lure of big data center paydays and all the good things that additional tax revenue can provide. My hometown's recent decisions are solid evidence that, as much as local leaders love the environment, the desire for new revenue is difficult to overcome.

The environmental challenges posed by the data center industry can't be solved at a local level. We need statewide reform of the industry. Until we get it, any local effort to make a data center more sustainable is just lipstick on a pig. ■

Eric Bonds, PhD, is a sociology professor at the University of Mary Washington in Fredericksburg, VA. The views expressed here are his own and not reflective of positions taken by UMW.

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Baby hummingbirds wait in the nest for their next meal. (Michele Danoff)

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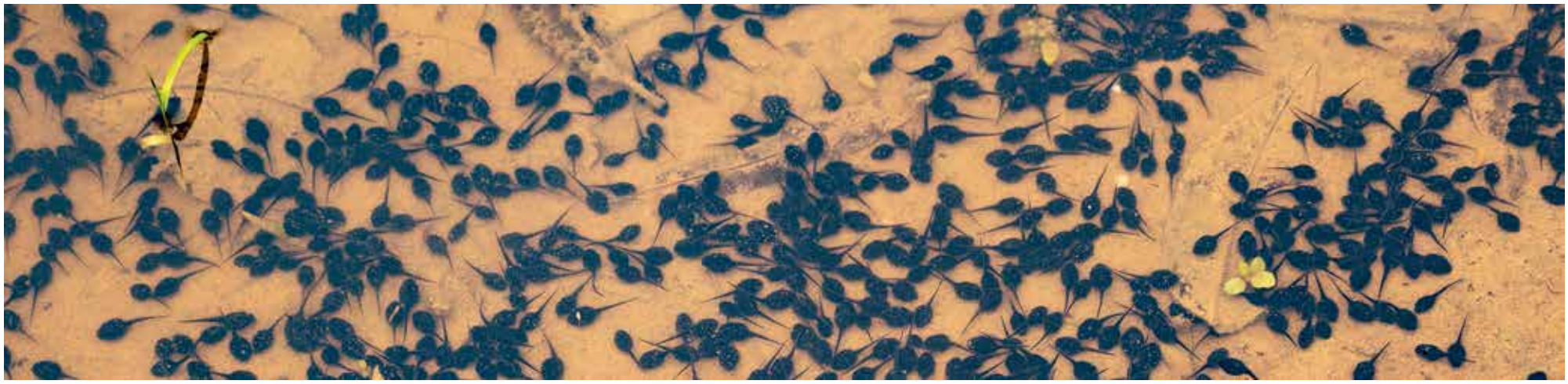

Tadpoles populate a puddle after a weekend of rain on a farm field in Caroline County, MD. (David Harp)

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Ghost pipe, also known as Indian pipe, is a perennial plant generally 4-8 inches tall, with small scale-like leaves and white flowers that bloom from June through September. (Michele Danoff)

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Shorebirds, mostly sandpipers, gather on Delaware's Slaughter Beach to feast on horseshoe crab eggs during the peak of the crabs' spawn on the full moon of May. (Dave Harp)

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Lewisburg, PA

James Graves
Lanexa, VA

Penny Gross
Alexandria, VA

Thomas Groton
Snow Hill, MD

Mark Haley
Jarrettsville, MD

David Haller
Hagerstown, MD

Ralph Hambrick
Richmond, VA

Kathleen Harmon
Catonsville, MD

Charles Harper
Three Springs, PA

George Hastings
Severn, MD

Joe Hawk
Greenbelt, MD

Anna & Russell Heath
Centreville, VA

Lester Herman
East Berlin, PA

Joyce Herman
Springfield, VA

Elaine Herr
Manheim, PA

Drew Hoff
Chestertown, MD

Chris Honcharik
Ellicott City, MD

Michael Horst
Columbia, PA

Franklin Horstman
Columbia, MD

Robert Hottinger
Bergton, VA

Patricia Houston
Vienna, VA

Beverley Jacobs
Crozet, VA

Bill Jahn
Bowie, MD

Bruce Jezek
Baltimore, MD

Gary & Margaret Kaline
Pasadena, MD

Glenda Kamosa
Columbia, MD

Oksana Keck
Havre De Grace, MD

Hindy Kempler
Havre De Grace, MD

Greg Kepley
Manheim, PA

Ray Kiefer
Willow Street, PA

Milton Kingsbury
White Stone, VA

Chuck Kinney
Rockville, VA

Larry Klotz
Shippensburg, PA

David & Jacqueline Kohr
Fredericksburg, PA

James Kraft
Towson, MD

David Krese
Charlottesville, VA

Kathleen Krous
Lancaster, PA

Robert Kuhn
Wrightsville, PA

Carol & Thomas Larkin
Loretto, PA

Richard Lewis
Emporium, PA

Dr. Marylin Lisowski
Pittsburgh, PA

Gwendolyn & Thomas Long
Harrisburg, PA

James Long & Nancy Reid
Ithaca, NY

James Lyle
Providence Forge, VA

Francesca Macchiarini
Cambridge, MD

Judy Major
Columbia, MD

M.K. Mallonee
Savage, MD

Carol Malloy
Norfolk, VA

David Martin
Lancaster, PA

Claude Martin
California, MD

Russell Martz
Chambersburg, PA

Beth Maxwell
Lititz, PA

Jack May
Falmouth, VA

Gregory Mayr
Baltimore, MD

Pam McAfee
Leesburg, VA

Jean McAlister
Lewistown, PA

Charles McClain
Severna Park, MD

Mickey McKitrick
Oxon Hill, MD

James Meholic
Easton, MD

Alan Merkel
White Stone, VA

Linda Merriken
Towson, MD

Jeff & Nancy Merryman
Whiteford, MD

John Meyer III
Edgewater, MD

Sharon Miller
Falls Church, VA

Ray Miller
Pasadena, MD

Reginald Mitchell
Arlington, VA

Kendalynn Morris
Greenbelt, MD

Eugene Morton
Cambridge Springs, PA

Peggy Murchake
Grasonville, MD

Linda Murphy
Hyattsville, MD

James Muscatello
Annapolis, MD

Suzanne Myers
Dover, PA

Claire Nemes
Frostburg, MD

Charles Newton
Stanley, VA

Dennis Obermayer
Fairfax, VA

Alfred Odierno
Deale, MD

John Pasley
Silver Spring, MD

Edward Pease
Pasadena, MD

Donald Pedersen
Bethesda, MD

Eric Peltosalo
Annapolis, MD

Edward & Elizabeth Pendleton
Winchester, VA

Thomas Pettit
McGaheysville, VA

Bruce Pfirrmann
Georgetown, SC

Ashleigh Piccoli
Owings, MD

Paul Pisano
Arlington, VA

David Place
Columbia, MD

Janice Radford
Gambrills, MD

H. Rapp
Sinking Spring, PA

Betty Jean Rehill
West Grove, PA

Mr. & Mrs. V.B. Richardson III
Alexandria, VA

Roger Ringgold
Ridgely, MD

Linda Ritter
Norfolk, VA

John Robson
Timberville, VA

Peter Rodriguez
Newport, PA

Judy Rosi
Reedville, VA

Richard Roth
Blacksburg, VA

Ronald Royer
Marietta, PA

Steve Sarro
Salisbury, MD

Tim Schantz
Washington, DC

Hannah Schmidt
Bel Air, MD

David Schofield
Abbottstown, PA

William Scott
Gettysburg, PA

Joe Scriptunas
York, PA

Deborah Sedinger
Shawsville, VA

John Seitz
Hyattsville, MD

Pack Sheffield
Midlothian, VA

James Sheffield
Midlothian, VA

W. Shellenberger
Centreville, MD

William Shepard
Glen Burnie, MD

Jere & Joan Shimp
Ephrata, PA

Price Shuler
Denton, MD

David Silverman
Ellicott City, MD

Soon Ballantine Slayman
Philadelphia, PA

Christina Slifko
Fairfax, VA

Vernon Smither
Pasadena, MD

Barb Spengler
Fawn Grove, PA

June Sapington Spiess
Winchester, VA

Ellen Starnes
Bel Air, MD

Wallace Steidle
Southampton, NY

Robert Stephenson
Trappe, MD

Mark Strassle
Lancaster, PA

Jeanne Strickler
Frederick, MD

Linda Strumsky
Ellicott City, MD

Joan Sweet
Havre De Grace, MD

Stephen Szafranski
Fredericksburg, VA

W. D. Tanner
Washington, DC

Miller Taylor
Laurel, MD

Donald Theune
St Michaels, MD

Lydia Thomas
Cambridge, MD

Robert Thomas
Chambersburg, PA

Mr. & Mrs. James Thorbahn
Lancaster, PA

Connie & Leonard Tritt
Carlisle, PA

Wesley Troup
Riverdale, MD

Catharine Tucker
Richmond, VA

Christine Tucker
Harwood, MD

David Turay
Glen Rock, PA

Allen Tyler
Pasadena, MD

Darrell Ulsh
Gardners, PA

Peter Warth
Silver Spring, MD

Dr. Stanley & Gail Watkins
Annapolis, MD

Dr. & Mrs. Donald Weaver
Rockville, MD

David Webster
Petersburg, WV

Tom Wenrich
Troutville, VA

Karen Westermann
West Point, VA

Andrew Winebrenner
Virginia Beach, VA

Dara Winfield
Preston, MD

Melvin Wolf
Rockville, MD

Lee Yohn
Mechanicsburg, PA

BULLETIN BOARD

BULLETIN BOARD GETS NEW ADDRESS

The new address for submitting items to Bulletin Board is: bboard@bayjournal.com

EVENTS / PROGRAMS

PENNSYLVANIA

Spring Bird Walk
9–11 am, May 17; Zimmerman Center for Heritage, Wrightsville. Join local bird enthusiast Sarah Gotwols with Susquehanna National Heritage Area staff to learn about the park's rich past, then set out on a guided 60-minute bird walk. Ages 18+. Free (donations appreciated). Registration: susqnha.org/events.

Phenology Walk
9–11 am, May 24; Welsh Mountain Nature Preserve, East Earl. Phenology is the science of seasonal change in nature. Join the Lancaster Conservancy phenology project team exploring the universal access trail at Welsh Mountain for signs of seasonal changes as nature turns toward summer. Study plants, birds and insects to determine how living things in this temperate forest signal that summer is coming. About one mile, easy, mostly flat. Ages 10+; under 18 w/adult. $7.18. Registration: lancasterconservancy.org/events.

The Magical World of Mushrooms Hike
1–3 pm, June 1; Clark Nature Preserve, Pequea. Mushrooms are responsible for many ecosystem services like decomposition and water/nutrient transfer into plants. Explore the amazing world of fungi and survey some common species found in the Susquehanna region. These preserves do not encourage mushroom foraging; edible species will not be identified. One mile hike on uneven terrain, elevation gain. Ages 10+; under 18 w/adult. $12.51. Registration: lancasterconservancy.org/events.

VIRGINIA

Potomac River Beach Cleanup
9–11 am, June 7; Caledon State Park, King George. As part of Clean the Bay Day join volunteers for a Potomac River shoreline cleanup. Take a wagon ride down to the beach to give back to our local waterways. Cleanup supplies provided. Free attendance and parking day of event. Registration: cbf.org/clean. Info: dcr.virginia.gov/state-parks/events.

Clean the Bay Day
June 7, various Virginia locations. Chesapeake Bay Foundation's Clean the Bay Day is dedicated to protecting and preserving the Chesapeake Bay watershed. Volunteers are invited to help remove litter, debris and pollution from rivers, streams and shorelines that feed into the Bay. Links to events and registration (required): cbf.org/clean.

Hike with a Naturalist
10 am–12 pm, June 4; Leopold's Preserve, Broad Run. Join a professional naturalist and discover the flora and fauna at Leopold's Preserve. Free. Info: leopoldspreserve.com/calendar.

National Trails Day Summer Tree Hike
1–3 pm, June 7; Chippokes State Park, Surry. Join Virginia Master Naturalists as they observe park woodlands and share how trees adapt to a constantly changing environment. This hike will specifically focus on trees in summer. Free and open to all ages. Standard parking or admission fee applies. Info: dcr.virginia.gov/state-parks/events.

National Trails Day
On the first Saturday of June, Virginia State Parks celebrates National Trails Day, an annual event encouraging outdoor enthusiasts of all ages and skill levels to explore hiking, biking and equestrian trails. Virginia's 43 state parks offer guided hikes, trail maintenance workshops and volunteer opportunities to highlight trail stewardship and the importance of preserving trails for future generations. List of Virginia State Parks National Trails Day events: dcr.virginia.gov/state-parks/national-trails-day.

National Kids to Parks Day
Kids to Parks Day (May 17) is a nationally coordinated day designed to connect kids and families with their parks. By discovering our public lands, kids across the country are learning about park stewardship, outdoor recreation, STEM and history. The programs include walks and hikes, arts and crafts, learning about wildlife and the natural world, and outdoor activities like fishing, paddling, archery. Programs vary by park; check out what each park is offering in Virginia at dcr.virginia.gov/state-parks/kids-to-parks-day.

Fossil Quest
10–11 am, May 17; Westmoreland State Park, Montross. Learn why fossils are found along the shoreline of Westmoreland State Park and adventure .6 miles down to Fossil Beach and see what the tide has brought in. Free and open to all ages; standard parking or admission fee applies. Info: dcr.virginia.gov/state-parks/events.

Homeschool Nature Programs
9:45 am–12 pm, June 3 and 10 am–12 pm, June 11; Leopold's Preserve, Broad Run. Bull Run Mountains Conservancy invites you and your child (all ages) to spend an adventurous outing interacting with and learning about nature. June program theme: freshwater ecology. $5 pp (including adults). Info: brmconservancy.org/calendar-of-events.

Bird Walk with Loudoun Wildlife Conservancy
8–11:00 am, May 24 and June 28; Sweet Run State Park, Hillsboro. Grab your binocs to discover and identify birds in the diverse habitats of this beautiful 900-acre preserve. Free with $10 parking payable at entry kiosk. Registration:loudounwildlife.org/event/birding-sweet-run-may.

MARYLAND

Biodiversity Walk
1-3 pm, June 8; Adkins Arboretum, Ridgely. Learn about and observe the natural ecosystems of Maryland's Coastal Plain on an expert-led walk, identifying as many species as possible along the way. $10 for non-members. Registration: adkinsarboretum.org/programs_events.

Spring Fest and Kids to Parks Day
10 am–12 pm, May 18; Croydon Nature Center, Rockville. Annual Spring festival activities will include nature games and crafts, live animal meet and greets, environmental and sustainability displays, woodland hikes and more. Free. Info: parktrust.org/event/spring-festival-and-kids-to-parks-day-celebration.

Monarchs in Children's River-Friendly Yards
1–2:30 pm, June 14; Stevensville. Families are invited to join Shore Rivers to learn about monarch butterflies and their relationship to river-friendly milkweed. Children can witness caterpillars in action and then pot some milkweed to take home and add to their own yards. Afterwards tour the farm and visit with the goats, pigs and chickens. This expedition is geared for children in grades two to five, but all ages are welcome. $10/child. Info: shorerivers.org/event/monarchs.

Birdwalking with Purpose
8–10 am, June 3; Pickering Creek Audubon Center, Easton. Bird watchers of all skill levels are invited to assist volunteer leaders with bird monitoring along the center's trails during this monthly bird survey. Help collect data for tracking long-term trends on the over 230 resident species. Registration: pickeringcreek.org/programs/upcoming-programs.

Soup 'n Walk: Wildflowers
11 am–1:30 pm, May 17; Adkins Arboretum, Ridgely. Immerse yourself in the beauty of late spring with a guided walk along Tuckahoe Creek. Discover wildflowers and blooming trees, including mountain laurel, pink lady's slipper, tulip tree blossoms, Solomon's seal, mayapple. After the walk enjoy a delicious and nutritious lunch. $35. Registration: adkinsarboretum.org/programs_events.

Pollinator Fest
10 am–1 pm, June 7; Howard County Conservancy, Woodstock. Learn about bees, butterflies, birds, moths and more at informative stations. Meet live insects and make insect-themed crafts. Enjoy hands-on, pollinator-themed activities and games, seed giveaways and more. Free. Registration: howardnature.org/event/pollinator-fest-2.

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.
June issue: May 11
July/August issue: June 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 bboard@bayjournal.com. Items sent to other addresses are not always forwarded before the deadline.

Answers to CHESAPEAKE CHALLENGE on page 27

1. B, wanderer/drifter
2. Zooplankton and phytoplankton are fish food; bacteria are plankton food and decomposers.
3. Phytoplankton
4. All of them
5. B, jellyfish

BULLETIN BOARD

Patuxent Research Refuge National Wildlife Visitor Center

Patuxent Research Refuge offers free public events and activities on its South Tract in Laurel. No preregistration required except where noted. List special accommodation needs when registering. Registration and info: 301-497-5772 or fws.gov/refuge/patuxent-research/events.

- *"Wingspan" Game Days*: 10 am-1 pm, May 9 and 24; June 13. Ages 12+. No experience needed. Come play the award-winning board game. Sign in at front desk or register online.
- *Free Film, speaker, Q&A:* "Turtles on the Hill," 4:15-7 pm, May 15. Celebrate Maryland's state reptile, the diamondback terrapin!
- *Family Fun:* Staffed:10 am-1 pm, May 16/17; independent: 10 am-4 pm, Wed.-Sat. All ages. Drop-in program, come and go as you wish. May and June theme: *BIRDS!* Hands-on learning activities, games, crafts.
- *North Tract Open House*: 4 pm-8 pm, June 14. All ages. Free activities: archery, birding, fishing game, cozying up by the fire pit and more!

Spring Foraging Hike

1:30–3 pm, May 31; Anita C. Leight Estuary Center, Abingdon. Learn how to identify some of nature's edible foods and the best methods for finding them. Finish with a delicious foraged treat. $10 pp. Pre-register: otterpointcreek.org/event/spring-foraging-hike.

Nature at Night Hike

8:30–10:30 pm, May 30; Pickering Creek Audubon Center, Easton. Explore Pickering Creek's forests at night using special UV flashlights to reveal nocturnal wildlife and unique plants and fungi not usually visible. Stop by a mothing station with the opportunity to see luna moths and other impressive early summer species. $7 pp. Registration: pickeringcreek.org/programs/upcoming-programs.

Water Quality/Climate Change Science

1:30–3 pm, May 24; Masonville Cove, Baltimore. Become a water scientist for a day! Learn what it takes to be a water scientist and help with climate change impact data collection. Registration: masonvillecove.org/events.

VOLUNTEER OPPORTUNITIES

WATERSHEDWIDE

Become a water quality monitor

Become a certified Save Our Streams water quality monitor through the Izaak Walton League of America and collect macroinvertebrates to determine the health of your local stream. Visit iwla.org/saveourstreams to get started. Info: vasos@iwla.org or 301-548-0150.

Potomac River watershed cleanups

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

PENNSYLVANIA

Middle Susquehanna volunteers

The Middle Susquehanna Riverkeeper needs volunteers in these areas: Monitor local waterways and provide monthly online updates: web search "Susquehanna sentinels." Water sampling: web search "Susquehanna Riverkeeper survey." New people are needed for stream restoration, litter cleanups, individuals, families. Scouts, church groups welcome. Info: MiddleSusquehannaRiverkeeper.org/watershed-opportunities.

Nixon County Park

Volunteer at Nixon Park in Jacobus. Front desk greeter: Ages 18+ can work alone, families can work as a team. Habitat Action Team: Volunteers locate, map, monitor, eradicate invasive species; install native plants, monitor hiking trails. Info: NixonCountyPark@YorkCountyPA.gov,717-428-1961 or supportyourparks.org (click on "Volunteer").

PA Parks & Forests Foundation

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

VIRGINIA

Virginia Living Museum

Virginia Living Museum in Newport News needs volunteers ages 11+ (11–14 w/adult) to work alongside staff. Educate guests, propagate native plants, install exhibits. Some positions have age requirements. Adults must complete background check ($12.50). Financial aid applications available. Info: thevlm.org/support/volunteer.

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.

MARYLAND

National Wildlife Refuge at Patuxent

Opportunities include: Kids' Discovery Center help, volunteering at the Bookstore & Nature Shop, help with events, hospitality, public conservation-education programs. Call 301-497-5772 during staffed hours (10 am–4 pm, Wed.-Sat.).

Chesapeake Bay Environmental Center

Help with educational programs; guide kayak trips and hikes; staff the front desk; maintain trails, landscapes, pollinator garden; feed or handle captive birds of prey; maintain birds' living quarters; monitor wood duck boxes; join wildlife initiatives. Participate in fundraising, website development, writing for newsletters, events, developing photo archives, supporting office staff. Info: bayrestoration.org/volunteer.

Patapsco Valley State Park

Opportunities include daily operations, leading hikes and nature crafts, mounted patrols, trail maintenance, photographers, nature center docents, graphic designers, marketing specialists, artists, carpenters, plumbers, stone masons, seamstresses. Info: 410-461-5005 or dnr.maryland.gov/publiclands/Pages/central/patapsco.aspx (click on "Volunteer").

Smithsonian Environmental Research Center

SERC in Edgewater is currently recruiting volunteers for: Chesapeake Water Watch, Environmental Archaeology, the SERC Lab and the Chesapeake Bay Otter Alliance. Info: serc.si.edu/participatory-science/projects.

C&O Canal National Park stewardship

Become a C&O Canal steward. "Adopt" a section of the park and throughout the year help ensure it remains clean and beautiful. You can participate individually, with your family or as part of a larger group: canaltrust.org/programs (click on "Volunteer").

Maryland State Parks

Search for volunteer opportunities in state parks at ec.samaritan.com/custom/1528. Click on "search opportunities."

Lower Shore Land Trust

The Lower Shore Land Trust in Snow Hill needs help with garden cleanups, administrative support, beehive docents, native plant sale, pollinator garden tour, community events. Info: 410-632-0090, fdeuter@lowershorelandtrust.org.

Annapolis Maritime Museum

Volunteer at the Annapolis Maritime Museum & Park. Info: Ryan Linthicum at museum@amaritime.org.

Eastern Neck Wildlife Refuge

Volunteer with Friends of Eastern Neck Wildlife Refuge in Rock Hall: Answer questions, handle sales at visitor contact station & gift shop/bookstore. Plant, weed butterfly garden. Staff information booth at community events. Visit the contact page at friendsofeasternneck.org.

RESOURCES

WATERSHEDWIDE RESOURCE

Creating a Backyard Buffet for Birds, Bees and Butterflies

Your yard can be an oasis — a rest area for birds, bees and butterflies to fuel up and raise their young. This Chesapeake Bay Foundation webinar takes you through the practical steps of assessing your yard, prioritizing changes, and planting with a purpose. Webinar: cbf.org/events/webinars/creating-a-backyard-buffet-for-birds-bees-and-butterflies-0222.html.

MARYLAND

Bird Flu Reporting & Resources

Anyone who sees sick or dead birds in the wild should not handle or move the birds but report them by calling 1-877-463-6497. More info and the latest updates are on the Department of Natural Resources website (web search "MDDNR, bird flu"). Anyone who owns poultry or has access to a backyard flock should register with the Department of Agriculture and follow important biosecurity measures to prevent the spread of HPAI. Info: mda.maryland.gov/Pages/AvianFlu.aspx.

University of Maryland Extension Home & Garden Info

Submit your questions to a team of Maryland certified professional horticulturists, Extension faculty and master gardeners; view gardening resources; connect with the master gardener program for local classes and other in-person learning opportunities. Info: extension.umd.edu (Programs/Home & Garden Information Center).

Bay Safety Hotline

Call the Maryland Department of Natural Resources' Chesapeake Bay Safety and Environmental Hotline at 877-224-7229 to report fish kills, algal blooms; floating debris posing a navigational hazard; illegal fishing activity; public sewer leak or overflow; oil or hazardous material spill; critical area or wetlands violations.

VIRGINIA

Living Shoreline Cost Share

The James River Living Shoreline Cost Share Program is administered by the James River Association and is available to homeowners whose property is within the James River watershed. Info and links to programs elsewhere: jamesrivershorelines.org/apply.html.

Virginia DWR public lands recreation search

With over 1,000 wild places to explore, *Explore the Wild* is your online tool to find the best public lands in Virginia to hunt, fish, boat, paddle, view wildlife, hike and go primitive camping. Info: dwr.virginia.gov.

Proggin' along the Bay is a natural treasure-hunting pastime

By Cathleen Anthony

When I was growing up in Maryland, my parents' idea of a vacation was tent camping — affordable and low tech with the added appeal of spending time on public land. The Western Shore of the Chesapeake Bay was one of our favorite spots. Along with a tent big enough to hold five, we packed the car with sleeping bags, a massive cooler, bathing suits, beach towels and a ton of library books, and we spent a week unplugged on the shores of Calvert County.

When I got older, my parents bought a beach house there, in a sleepy community of part- and full-time residents. No internet, no cable, not even AC — but with the house came the investment in a Windrider trimaran, a three-pontoon sailboat big enough for all of us. So, even with a house and an upgrade from sleeping bags to bunk beds, the summer pattern remained the same: bathing suits, library books and lots of unplugged time. There is no doubt that these experiences shaped who I became.

The author's family takes a moment to appreciate the shore of the Chesapeake Bay near the Cove Point Light in Calvert County, MD. (Courtesy of C. Anthony)

While some seahorse species are native to the Chesapeake Bay, they are harder to find at Maryland's Calvert Cliffs than shark teeth. (Courtesy of C. Anthony)

Worn down bits of bottles and vials, called sea glass, are prized by some Bay proggers. This collection belongs to the author's brother. (Courtesy of C. Anthony)

The pleasures of proggin'

At the beach, the pastime we found ourselves engaged with the most over those years is known in these parts as progging (usually pronounced proggin', with the final *g* dropped). It's a very Chesapeake-specific term for beachcombing. We'd spend hours just walking the shore, looking down at what washed up. The point was to be present, with the prospect of finding something really cool. And boy, do the shores of Calvert County, much of it in Calvert Cliffs State Park, have some cool things. The beaches there are loaded with fossils that have washed out of the clay cliffs.

Gear up

Now, if you're going proggin', you'll want to be prepared. You can go in any weather, but make sure you dress for it. On the top of the list is sunscreen and other sun protection like hats and sunglasses. It's surprising how long you'll accidentally spend outside when you're on the hunt. You also have to decide how wet you're willing to get. I prefer bare feet so I can wade, but wearing beach shoes is an option too. Lastly, you need to decide if you're a tool person. A sieve of some kind and a net with some reach might come in handy, as would a collection bucket.

Play it safe

The next thing to be aware of is safety. Trash, fishhooks and submerged hazards along the shore pose a risk for injury. Depending on the time of year, wildlife can also be a problem, like washed-up jellyfish tentacles. Currents aren't usually a big deal since this is a shore-based activity, but keep a lookout for warning signs all the same. Also, be aware of any laws that apply to your location about collecting, being on private property, disturbing historic sites and the like.

Share your finds, enjoy the process

Once you've gone proggin' a few times, you might find that you want something to do with all your treasures. How can you display or use them? The first option is decor. I have a glass jar turned lamp that I am slowly filling with whale bone fragments, and I have a bedside table with a removable glass top, so I can show off a lot of my finds. You can also turn items into art or jewelry. We've even replaced all the stones in our mancala game with shark teeth!

Another great idea is to connect with a local resource like a museum association. They can help identify your finds. And who knows? Maybe you'll have something really unique on your hands that you could contribute to a collection.

Proggin' is one of my favorite hobbies for so many reasons. It's accessible and affordable — no need to spend money on any fancy gear. It creates an extended period of time where you can unplug and just study the Bay and all it offers. When I was a kid, proggin' helped increase my attention span and stimulated my curiosity and appreciation for nature. I've learned so much over the years, and it all started with seeing something in the sand and thinking, "Huh, what is that?" ■

Cathleen Anthony is the Pennsylvania projects coordinator at the Alliance for the Chesapeake Bay.

‘Broken’ wings and dummy nests: The killdeer has its tricks

By Alonso Abugattas

A killdeer parent deploys its famous distraction strategy of faking a broken wing to draw predators away from the nest. (Andy Reago & Chrissy McClarren/CC BY 2.0)

The killdeer is a shorebird you’ve probably seen — though not necessarily at the shore. While it prefers to be near water of some kind, in spring and summer this most visible of North American plovers can be found on open landscapes anywhere on the continent. The Chesapeake Bay is at the northern edge of the range for year-round killdeer in the eastern U.S., though year-rounders can be found out West as far north as British Columbia. The migrators of the species, meanwhile, travel as far north as the Yukon to breed and wait out the winter as far south as Peru.

The bird’s common name and scientific name, *Chadarius vociferus,* both offer clues to what the bird sounds like. It’s a noisy thing, in flight and on the ground — hence the species name *vociferus*. And, while it has many vocalizations, the most common is a loud, incessant *kill-deer, kill-deer, kill-deer*, often repeated dozens of times. Even their common names of previous centuries, the noisy plover and chattering plover, had something to say about the bird’s talkative nature.

The killdeer (sometimes spelled “kildeer”) is larger and lankier than piping plovers and semipalmated plovers, the other two North American members of the *Chadarius* genus. Size-wise, they are comparable to or sometimes a bit larger than a very big blue jay, with long gray-green legs. They are most easily identified by the pair of prominent dark neck rings, as well as a dark stripe from eye to eye across the forehead. The birds are brownish tan overall on top and white below, with no significant plumage differences between the sexes. They have round heads, large yellow-ringed eyes and somewhat short bills, compared to other shorebirds.

One of the bird’s best-known behaviors is the fake “broken wing” display, performed to draw predators away from their eggs or hatchlings. One of the parents will pretend to have a damaged wing, dragging it theatrically away from the young, keeping just ahead of the attacker. Indeed, in my job as the natural resources manager for Arlington County, VA, I get reports every year of injured birds — which often turn out to be healthy killdeer. Other birds do this, but killdeer may be the best-known practitioners.

Killdeer have two more distraction displays, though they are less common. One involves feigning incubation to lead potential predators to dummy nest sites. Another, ordinarily a defense against livestock that threaten to trample the nest, is a false charge toward the animal, feathers raised and ruffled.

Killdeer feed mostly on invertebrates and insects, though they have been known to go after the occasional small amphibian. Less than 2% of their diet is seeds. You might also see them following a farmer’s plow, gobbling up earthworms and such that come to the surface. On open ground they have distinctive feeding behavior: dashing to a location, looking around, snatching the food, then dashing again to another spot.

Killdeer pairs often stay together for several years. They collaborate in choosing a nesting site, commonly a “scrape” in very short vegetation (usually less than an inch tall) or bare areas that have small pebbles. The nests are often close to people, in mowed lawns and fields — even on gravel driveways or roofs. The mating ritual involves raised tail feathers, loud calls and what is called a scraping ceremony, which seems to be aimed at choosing a nest site. They add small pebbles to the scrape, choosing light colors, apparently to make the nest cooler and better camouflaged.

A killdeer incubates its eggs at the Blackwater National Wildlife Refuge on Maryland’s Eastern Shore. (Judy Gallagher/CC BY 2.0)

The female lays 3-4 eggs, pale brown with darks spots, that hatch 24-28 days later. Despite the nest being well camouflaged, killdeer still suffer 53% egg predation, but have been known to build replacement nests as many as five times. The parents share incubation duty, with the male normally taking the night shift. The parents may soak their bellies to cool the eggs.

The downy young, with only one neck band at hatching, are precocial, leaving the nest the next day. For rooftop hatchlings, the youngsters must make a leap of faith. I’ve read an account of an entire brood surviving a seven-story fall. Both parents take care of the young as they learn to forage for invertebrates. In temperate climes, a killdeer will raise one or two broods per year, with the male often handling most of the incubation for round two. In the subtropics, they’re known to breed year-round. While normally solitary, killdeer do form small flocks, or “seasons,” when migrating.

Migrating killdeer often practice what is called leapfrog migration, passing over the territories of year-round or overwintering killdeer. This generally results in the most northernly breeding populations traveling the farthest south in winter to avoid competition for limited resources.

Killdeer were nearly wiped out by hunting in the early 1900s, but the population bounced back through the mid-1960s. Since then, though, the species has declined by 26%, according to the North American Breeding Bird Survey — which puts the current population at 2.3 million and considers it a species of “relatively low concern.” The bird’s preference for human-created open spaces became an advantage after hunting restrictions were imposed, but threats remain in the form of pesticides, tall buildings and busy roads. ■

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For bird safety, mark those windows and douse those lights

By Kathy Reshetiloff

The birds are back! Each spring, about 350 species of birds fly from southern wintering grounds to northern breeding areas. For some, that breeding territory is here in the Chesapeake Bay region. And whether or not you see them (or hear them) as they stop to rest in your neighborhood, possibly staying to nest, they face threats from our homes, apartments and commercial buildings: glass and lights.

It has been estimated that, in the U.S. alone, between as many as 1 billion birds (that's billion with a *b*) are killed every year by flying into glass — with most fatal collisions occurring at homes and buildings less than four stories tall. You may have seen this happen and then watched the bird fly away. But that doesn't mean it survived; in fact, most birds eventually die from window collisions, either from internal damage or because their injuries make them more vulnerable to predators.

Why do birds collide with glass? It's because they do not perceive windows as we do. They see reflections of attractive plants, trees and even the sky. They do not see windows as something they need to avoid. And people love to be able to look outside their homes and buildings. So what can we do?

There are actually many ways to treat windows so birds can see and avoid them. The simplest solution is to add some sort of pattern, paint or screen on the outside of the window to break up the reflections. And you don't necessarily have to improvise; there are many products out there, fitting many budgets. The simplest approach is to place adhesive white dots on the outside of the window, in a 2-by-2-inch grid. Or you can hang cords vertically, spaced less than 4 inches apart. There are also washable tempera paints and ready-made screens to mount on the window.

If you are planning renovations that include new windows, consider using a type of glass that not only prevents collisions, but is also energy efficient. Consider one of these bird-friendly glass types: etched glass, frosted glass, frittered glass (which has ceramic dots, lines or patterns), channel glass or ultraviolet (UV)-reflecting glass (which has patterns generally invisible to us but visible to many bird species). Check out the American Bird Conservancy for the latest recommendations in glass products and window-treatment techniques.

Pre-made screens like this one make window reflections look less like navigable air space for birds, greatly reducing the risk of collisions. (Courtesy of Elite Window Film)

The black-throated blue warbler is one of 10 songbird species most vulnerable to fatal collisions with buildings. (Laura Gooch/ CC BY-NC-SA 2.0)

Birds can collide with glass throughout the year, but most collisions happen when they are in long-distance mode — migrating north in the spring (April-May) and south in the fall (August-October). Most migrating birds travel at night, making them more vulnerable to buildings lit with artificial lights. Birds drawn into lights often become entrapped and circle the lit area, which can deplete their energy and put them more at risk of colliding with buildings. Low-cloud ceilings worsen the risk because birds tend to fly at lower altitudes, where light reflecting on clouds can be disorienting. Foggy conditions can also disorient them and make collisions more likely.

The gray catbird is another species considered especially vulnerable to building collisions. (Dennis Church/CC BY-NC-ND 2.0)

One of the simplest ways to make the night safer for migrating birds is to simply turn off unneeded lights between dawn and dusk — either by hand or with timers or motion sensors. Turning off lights not only protects birds but saves on energy costs. Blinds, shades and shutters in windows also reduce the light that escapes.

For outdoor lights, use them only where and when it is necessary and illuminate only the intended area. Consider the direction and color of lights. If you have lights that illuminate upwards, by all means turn them off at night or replace them with downward oriented lights. Also consider using warmer colored lights (amber, orange or red), which are less likely to trigger a behavioral response. Cooler light, in the blue and white spectrum, is the most troublesome for birds and wildlife — and in some cases for people. LED lights, available now for nearly every use, measure the warmth of light in kelvins (k), with the warmest light at 3500k or below. At the other end of the scale, 8000k or higher is the blue-white range.

As its name suggests, the common yellowthroat is one of North America's most widespread warblers. Studies show that it is in the top 10 bird species that collide with buildings. (Julio Mulero/CC BY-ND-NC 2.0)

Want to do more?

- Plant native trees, shrubs, wildflowers and grasses that provide food for birds, pollinators and other beneficial insects.
- Leave some leaves in your yard. Insects, many of which are important food sources for birds, rely on fallen leaves as habitat.
- If you live on a larger property, leave some areas unmowed to provide food and habitat for birds.
- If you live in an apartment with a balcony, put out potted native plants to support insects.
- Discontinue using pesticides and herbicides, which kill insects and plants that many birds rely on for food.

This year, World Migratory Bird Day will be celebrated on May 10 in the spring and October 11 in fall. The theme, Shared Spaces: Creating Bird-Friendly Cities and Communities**,** highlights the coexistence between people and birds by creating bird-friendly cities and communities. Learn more at *migratorybirdday.org.* ■

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