

CHESAPEAKE

BAY JOURNAL

June 2026

Volume 36 Number 4

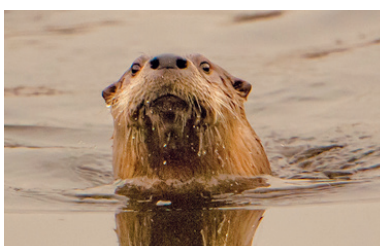
Independent environmental news for the Chesapeake region

Good news, bad news: a blue crab mystery

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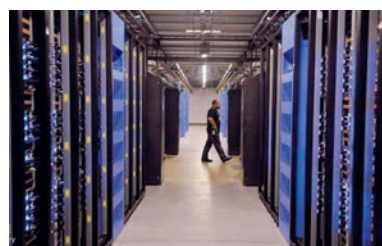


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AI & THE BAY: YAY OR NAY?



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PA'S FLORAL HIGHWAY



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sustainable future **PAGE 13**

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Volunteers use a "live stake" technique to plant trees and shrubs along Standing Stone Creek in Huntingdon County, PA. Read the story on page 19. (Chesapeake Conservancy)

ON THE COVER

A scientist gives a side-by-side comparison of an adult blue crab and a juvenile. (Timothy B. Wheeler)

Bottom photos: left by Dave Harp, middle by mahmoud9725/CC BY-SA 2.0, right courtesy of Pennsylvania Turnpike Commission.

CORRECTION

The Maryland legislative roundup in the May issue misstated the fate of the bottle recycling legislation. The bill received hearings in both the House and Senate but failed to get out of committee.

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EDITOR'S NOTE

Ode to a tree – and the seed from which it grew

In late May, a short but strong storm blew through my town. When it passed, a queen had fallen. An enormous copper beech lay in shambles across the width of my yard, its massive trunk dominating the horizontal plane as it had once dominated the heights above. It was at least 80 years old.

In the short time that my husband and I have been its stewards, neighbors have pointed out hawks in its canopy and asked to read a book under its limbs. Visitors reached out to touch it. Artists came to paint it. We met some of the children who climbed it, now grandparents themselves.

After the cleanup, an important job lies ahead: deciding what to plant next.

Our goal is to plant a tree that others will marvel at 80 to 100 years from now. We won't be here to see it, of course. It calls to mind an old adage with variations that say, more or less, that a society becomes great when its elders plant trees knowing they won't be the ones to enjoy their shade.

I don't know who planted that marvelous copper beech, but it was a gift to many, including me. It's mind-boggling to imagine that it once was a seed. And it's not the only "seed" I've been gifted. So many people in earlier generations than mine have nudged, inspired and sometimes kicked society to take better care of our natural resources. We enjoy the results, even as the job continues — and has become our own.

So I look for ways to plant seeds of all sorts. The work of the *Bay Journal* is among them. Our articles are seeds that can grow into the concerns and celebrations that keep environmental stewardship a vibrant part of the public conversation. Who knows how and where they will grow? The story will continue for generations to come.

Meanwhile, I'll be planting yet another tree in my yard.

— Lara Lutz



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BY THE
numbers

109°

Maryland's highest recorded temperature, at Conowingo Dam on June 21, 1988

110°

Virginia's highest recorded temperature, at Balcony Falls on July 15, 1954

112°

West Virginia's highest recorded temperature, in Martinsburg on July 10, 1936

111°

Pennsylvania's highest recorded temperature, in Phoenixville on July 10, 1936

110°

Delaware's highest recorded temperature, in Millsboro on July 21, 1930

106°

The District of Columbia's highest recorded temperature, on July 20, 1930

108°

New York's highest recorded temperature, in Troy on July 22, 1926

The Chesapeake Bay's largest rivers

Susquehanna River

- Length: about 440 miles
- Watershed size: 27,510 square miles
- Watershed population: 3.8 million people
- Special features: The Appalachian Mountains help feed the Susquehanna River with water.

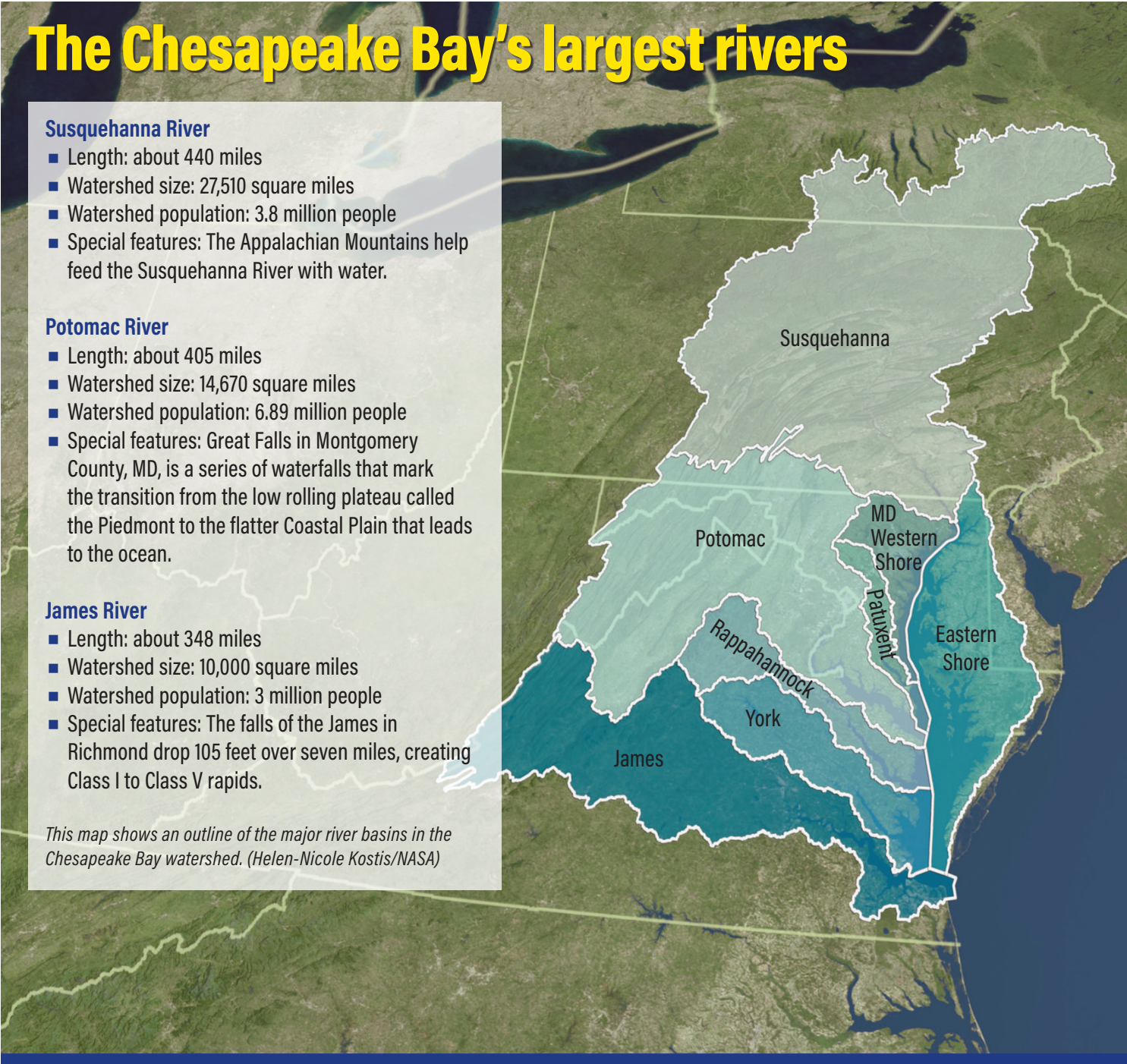
Potomac River

- Length: about 405 miles
- Watershed size: 14,670 square miles
- Watershed population: 6.89 million people
- Special features: Great Falls in Montgomery County, MD, is a series of waterfalls that mark the transition from the low rolling plateau called the Piedmont to the flatter Coastal Plain that leads to the ocean.

James River

- Length: about 348 miles
- Watershed size: 10,000 square miles
- Watershed population: 3 million people
- Special features: The falls of the James in Richmond drop 105 feet over seven miles, creating Class I to Class V rapids.

This map shows an outline of the major river basins in the Chesapeake Bay watershed. (Helen-Nicole Kostis/NASA)



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We've launched a new podcast. Join us for a monthly roundtable with *Bay Journal* reporters where you can get the inside story on environmental issues in the Chesapeake region. And test your own Bay savvy with our quiz segment, Two Truths and a Lie.

Find it on your podcast service, or visit bayjournal.com/podcasts.

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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.

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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



The Bay Journal Newscast, launched on June 1, is a monthly reporters roundtable available from your podcast service or at bayjournal.com/newscast.

Expanding the reach of environmental news

The *Bay Journal* was launched in 1991. And ever since then, founding editor **Karl Blankenship** has been reporting on nutrient pollution in the Chesapeake Bay and its rivers, mostly from agriculture. Now editor-at-large, Karl was invited to talk about that subject for an audience in an entirely different watershed: Lake Erie. Karl gave the keynote address for a nutrient reduction conference in May, explaining the history of the cleanup effort here and the difficult tradeoffs needed to accelerate progress.

Editor **Lara Lutz** spent time in circles beyond the Bay watershed too. She attended the Lenfest News Philanthropy Summit in May, hosted in partnership with Press Forward. The gathering drew more than 500 people from across the U.S. who are working to keep high quality journalism funded and accessible to all. Attendees shared ideas for engaging readers, increasing support and building partnerships between news outlets.

Partnerships have been front and center at the *Bay Journal* recently, with reporter **Lauren Hines-Acosta** reaching out to public radio stations to gauge their interest in sharing *Bay Journal* content. As a result, Lauren and reporter **Jeremy Cox** have begun producing audio packages that you might hear on your local station.

Our audio work is getting another boost with the launch of the *Bay Journal Newscast* on June 1. This new monthly podcast features a roundtable with our reporters as they discuss environmental issues in the Chesapeake region. Check out the first episodes through your podcast service or on our website at bayjournal.com/newscast.

Readers have shared many reasons for respecting and trusting the *Bay Journal*, which we appreciate. And here's another one. Lauren recently met someone in person who has been a source, via phone and email, for her reporting. He works for a large institution and often has contact with journalists. He told Lauren that he trusts the *Bay Journal* more than big names like CNN, because they keep trying to force him into a preset narrative. Lauren, he said, listens to the nuanced perspectives.

Smaller summer dead zone predicted for the Bay

As this issue of the *Chesapeake Bay Journal* went to press, the drought that has plagued much of the Chesapeake Bay watershed continued to strain drinking water supplies, hurt crop output and leave many rafters and boaters high and dry.

But there's an upside. Low river flows during the late winter and early spring led to reduced amounts of nutrient pollution flowing into the Bay. As a result, scientists say, the Bay's annual "dead zone" could rank among the smallest on record.

Dead zones are areas where the oxygen level in the water is so low that it can kill aquatic life, including blue crabs and fish. They form naturally in the summer when warming water temperatures mix with the nutrients nitrogen and phosphorus to fuel algae blooms, which rob the water of oxygen when they die and decompose. But decades of land-based problems, such as overfertilized agricultural fields and a lack of urban stormwater treatment, have caused the dead zones to mushroom.

This year's dead zone is expected to be among the lowest 10% in size since widespread monitoring began in 1985, according to a forecast by William &

Mary's Batten School, the Virginia Institute of Marine Science, FlowWest and the University of Maryland Center for Environmental Science.

From January through April, river flows entering the Bay were down 32% compared with the long-term average. That helped lower nitrogen inputs 39% below the typical amount, the researchers said. Overall, the summer dead zone is projected to be 31% smaller than average.

But other conditions could change the outcome, they cautioned. Weather during the summer — including heavy rainfall, prolonged calm conditions and heat waves — could still impact the dead zone's size and duration.

The 2025 dead zone was right around average as high amounts of spring rainfall were offset by a cooler, drier and unusually breezy summer, officials said.

— J. Cox

Controversial landfill gets new, shorter lease

A controversial commercial landfill in Maryland's Gunpowder Falls State Park will keep operating for another three and a half years, though under stricter state supervision.

Under a new lease approved May 19, the Days Cove Reclamation Co. must cease taking construction and demolition debris by the end of 2029. It then has three more years to cap the landfill and restore the 114-acre waterfront site for integration into the park.

The landfill was already there when the Maryland Department of Natural Resources (DNR) acquired the Days Cove tract in the 1980s. At that time, the state allowed the operation to continue under a lease, which has been renewed repeatedly despite promises to end it.

Anglers, environmental advocates and area residents concerned about declining water quality in the Gunpowder rose up in fall 2025 against a new wastewater discharge permit for the landfill, citing its pollution violations. Opponents then protested a proposal by DNR to renew the landfill's lease for another eight years. State officials delayed acting on the lease in December to address complaints.

Many opponents wanted the landfill closed immediately, calling Days Cove an "irreplaceable natural area." But a consultant's report cautioned it would need to keep adding rubble for a few more years to ensure minimal erosion. In response to community concerns, the state shortened the lease,

promised independent oversight and threatened a \$5 million penalty if the company violates the deal.

The Maryland Department of the Environment, meanwhile, granted the company a new discharge permit with tighter pollution limits and more monitoring requirements.

Opponents reluctantly accepted the need to let the landfill stay open a few more years. But they demanded tighter enforcement and transparency from the state, including an investigation of whether the operation is complying with Maryland's Critical Area law limiting waterfront development.

— T. Wheeler

MD state parks continue day-use reservations

The Maryland Park Service announced in May that it has added two more state parks to the week-end and holiday day-use reservation system it initiated for five parks last year. For 2026, in addition to Greenbrier, Sandy Point, Point Lookout, Newtowne Neck and North Point state parks, day-use reservations will be required at Rocky Gap and Swallow Falls state parks, both in Western Maryland.

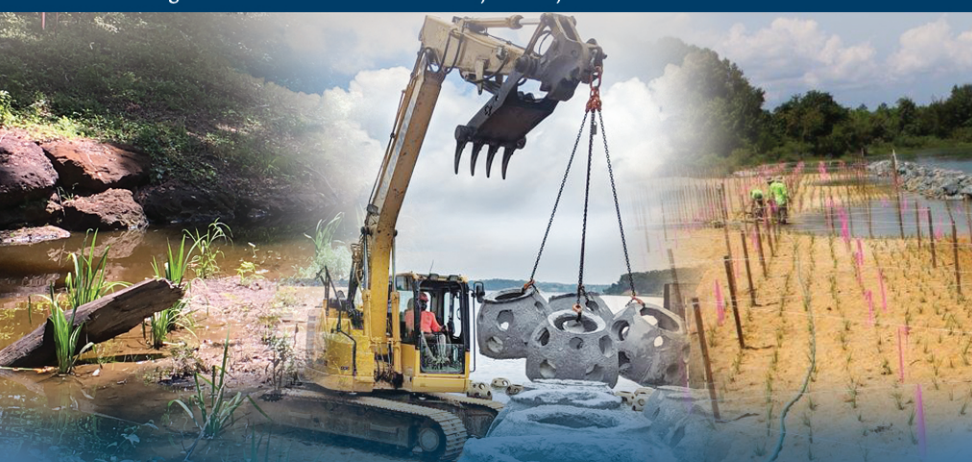
See **BRIEFS**, page 6



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briefs

From page 5

The two parks were added, the announcement said, in light of the “overwhelmingly positive” impact of the system last year. It brought a “dramatic reduction of traffic backups . . . and zero unexpected capacity closures” at parks where day-use reservations were required.

As was the case in 2025, the system went into effect on Memorial Day weekend and will be in place through Labor Day.

Reservations can be made at parkdayuse.maryland.gov up to eight days in advance and, according to the park service announcement, may be changed or cancelled until 8 a.m. the day before the visit. To check a park’s status at any time, visit dnr.maryland.gov and search for “park status dashboard.”

The park service said more parks and public lands in the state will be “added to the system this year and will be announced as the system goes live at those locations.” — Staff report

VA lowers rooftop solar rate, blocks metering change

In response to a petition filed last year by Dominion Energy, Virginia’s State Corporation Commission (SCC) rejected the company’s request

to change its current practice of making an annual tally of energy credits for homes and businesses with rooftop solar panels. Instead, Dominion wanted to use “real-time metering” — calculating the credits every 30 minutes.

Brandon Praileau, Virginia program director for Solar United Neighbors, argued that the change to real-time metering would have favored Dominion. It would be harder, he said, for homeowners to generate credits. As unlikely as it is for a home over the course of a year to generate more energy than it consumes, he said, it’s even less likely during any 30-minute period.

Greg Weatherford, director of Information Resources at the SCC, called the ruling “consumer friendly.” He said annual metering allows people with solar panels to accumulate credits during peak summer hours that can offset the times of year when solar energy is less strong.

In the same ruling, the SCC approved Dominion’s request for a lower credit rate for solar, as well as a \$1 monthly fee for new customers in the program. Low-income customers will be exempt. The company said the lower credit rate reflects the fact that solar customers should be credited only for electricity returned to the grid, not for its transmission, because Dominion provides the transmission infrastructure. — Staff report

MD dedicates state park to African American history

The Maryland Department of Natural Resources, the office of Gov. Wes Moore and several other partners on May 15 dedicated Freedman’s State Park to African American history.

The roughly 1,000-acre park in Montgomery County was established in 2022. It includes farmland once owned by the family of Enoch George Howard and Harriet Howard, who overcame slavery. Their children later became key players in Maryland’s civil rights movement. Their daughter, Martha Elizabeth Howard Murphy, financially supported the Black-owned newspaper, the Baltimore Afro-American.

Before the Civil War, Enoch George Howard was enslaved by the Gaither family. He saved enough money from his farm work to buy his and his family’s freedom in the 1850s, as well as the land where his wife was enslaved.

The park features the Howard Chapel Cemetery, Howard Family Cemetery and the remaining bricks of the plantation home Enoch George Howard bought in 1862. His son, Greenbury Howard, built a house nearby in 1870, which is currently under restoration by the park service.

The mix of agricultural and wooded land offers hiking and biking trails that connect the historical



This house, built by Greenbury Howard in 1870, is located in Maryland at Freedman’s State Park. (Anthony Burrows/MD Dept. of Natural Resources)

features. The park will also provide displays that will tell the story of the Howards and their legacy.

The family sold the land in 1960. The park was developed by Preservation Maryland, the Sandy Spring Museum, Sandy Spring Slave Museum, Maryland-National Parks and Planning Commission, Baltimore Afro-American and Afro Charities, and Maryland Historical Trust. — L. Hines Acosta



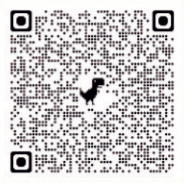
Photo by chipperbirder, iNaturalist CC-by-NC

Watch for this new invasive plant this spring!

Incised Fumewort

A small but highly invasive flower that covers forested floodplains in our parks, killing bluebells and spring beauties from late March through April.

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Groups urge federal protection for rare wood turtles

Scores of conservation groups press feds for Endangered Species Act decision

By Karl Blankenship

The wood turtle is colorful, considered intelligent, can breathe out its butt and, for a turtle, is relatively fast — able to move at the blistering speed of 0.2 miles per hour.

But it can't outrun all of the threats it faces, which include habitat loss, predation and poaching. Its population is declining throughout its range, which extends from northern Virginia to southern Canada.

In April, 66 conservation groups, scientists and citizens urged the U.S. Fish and Wildlife Service to protect the reptile under the Endangered Species Act.

The Center for Biological Diversity, which led the effort, first petitioned the agency in 2012 seeking such protection and is still waiting for a decision. Since then, the nonprofit conservation group said in the April letter, some populations of the turtle have experienced declines of 50%.

"Existing protections have done little to slow this decline," it said.

All states in the Chesapeake Bay watershed classify the wood turtle as a species of "greatest conservation need," but state-level conservation actions have not offset the loss.

Wood turtles face a host of problems throughout their lives, which can span more than 60 years. They require clean, cold-water streams ideally surrounded by forests and wetlands. During winter, the turtles hibernate on stream bottoms under banks, logs and beaver lodges, or simply buried beneath piles of leaves.

While hibernating underwater they use their cloaca, a multi-purpose rear opening, to absorb oxygen from cold water and release carbon dioxide, allowing them to stay submerged for months — an unusual ability that earns them the reputation of being able to "breathe out their butts."

In spring and summer, they venture onto land, building nests where they lay eggs and hunt for food. Among their unique habits, wood turtles are known for "worm stomping," in which they pound the ground with their chest to attract worms to the surface to feed



The colorful wood turtle is often targeted by poachers. (Jessica Piispanen/ U.S. Fish & Wildlife Service)

upon, which gained them a reputation for high intelligence.

But their eggs and young hatchlings face mortality rates estimated at 98%, in part because encroaching development creates ideal habitat for small predators such as raccoons.

Wood turtles also don't reach maturity until 14-18 years old. That, coupled with the low survival of eggs and hatchlings, means that many isolated populations

do not produce enough young turtles to replace adults.

A further complication is that wood turtle habitat is increasingly fragmented by roads, development and other land use changes. Isolated populations in fragmented habitats are more vulnerable to disease, continued habitat loss, predation and poaching.

Their long life, reputation for intelligence and colorful appearance make them attractive to illegal collectors. Wood turtles can sell for \$400 on the U.S. black market and fetch thousands of dollars when sold abroad. Poaching can quickly wipe out a local population. And there have been cases of poachers raiding restored habitats.

Tara Zuardo, a senior advocate with the Center for Biological Diversity, noted that the Fish and Wildlife Service had not followed through on its promise to make a decision about the turtle by 2023. "Without the lifeline of the Endangered Species Act, I'm afraid they'll slide into extinction," she said. ■

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Study: Tiny bacteria could ‘eat’ water-borne microplastics

Microbes have potential to reduce both plastic and nutrient pollution in waterways

By Lauren Hines-Acosta

A study published in 2025 in the journal *FEMS Microbiology Ecology* found that certain microbes that colonize microplastics have the potential to not only break down plastic but also remove nitrogen from the Chesapeake Bay’s waters.

“If we can figure out bacteria and grow bacteria and engineer them to ... actually effectively eat plastic and break it down naturally, then that’s going to hopefully be a much better way to deal with the plastic problem in the environment,” said Samatha Fortin, lead study author and former Virginia Institute of Marine Science (VIMS) graduate student. “But that’s likely still a long way away.”

Plastic pollution is an enormous problem around the world, and the Bay region is no exception. According to the Virginia Marine Debris Reduction Plan, for instance, 83% of the debris found on beaches near the Virginia Aquarium & Marine Science Center from 2014 to 2018 was plastic of one



Researcher Kelley Uhlig holds a rope of fiberglass mesh bags filled with different types of microplastics by the York River in Virginia. (Courtesy photo)

kind or another. Plastics don’t necessarily degrade but break into much smaller microplastics, which can carry hazardous chemicals and pathogens.

But there’s more to the surface of microplastics. Welcome to the “plastisphere.” And no, that’s not from a science fiction film. The plastisphere refers to the microbial

communities that form on plastic waste. Fortin wanted to find out what those microbes could do.

Kelley Uhlig, a study co-author also formerly at VIMS, started by placing three kinds of plastic beads into mesh bags. Then, she put nine sets of each plastic into the York River in Virginia. She retrieved a bag of each plastic after 7, 14 and 28 days. The microbes started to appear after a week. Fortin then used metagenomic sequencing to study the DNA of the different microbes. Plastic bags (polyethylene), she found, had the most plastic degrading microbes, and microbes on polyvinyl chloride (PVC) were the most promising for denitrification. That is, those microbes could potentially convert biologically available nitrogen into nitrogen gas, removing the form of nitrogen that, in excess, depletes the water of oxygen.

But while the microbes can potentially be achieving these pollution-punching feats, it doesn’t mean they are doing so. It would take more research to confirm whether the bacteria are actively using those genes.

Chris Burbage, environmental scientist with the Hampton Roads Sanitation District, said it would be extremely difficult to scale up these bacteria for use in a water treatment plant. The district funded this project and others by Fortin as she helped the utility identify microplastics in wastewater treatment systems.

“We’re not going to solve our marine debris plastic pollution problem with these specific [microbes] themselves,” Burbage said. “I just think the volume of plastic pollution is too great.”

A 2016 study published in the journal *Science* showed that bacteria with these genes can break down plastic, but it took over a month in lab conditions.

VIMS marine science professor Bongkeun Song said this recent study is just the beginning. While lead author Fortin is now a postdoctoral researcher at Princeton University, Song is working to learn whether the microbes can achieve what their genes promise. ■



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BAY JOURNAL June 2026

Beloved naturalist's boat becomes fish habitat in lower Bay

Maritime museum donates Gilbert Klingel's sailboat hull to VA's artificial reef program

By Lauren Hines-Acosta

After a life of traversing the Chesapeake Bay and open sea, the steel hull of *Freya*, a 30-foot sailboat, arrived under tow on April 10 at its final destination on Virginia's Windmill Point Reef. After a contractor opened the drain valves to let water rush in, Hunter Smith, an artificial reef specialist with the Virginia Marine Resources Commission, watched the water fill the hull. After the last bubble of air escaped with a burp, *Freya* sank to the bottom of the Bay in a blink.

The boat was built and owned by Gilbert Klingel, a Mathews County boatbuilder, Bay naturalist and author who died in 1983. It is the latest item to be donated to the marine commission's Artificial Reef Program. The program creates underwater habitat in the lower Bay and at a handful of sites offshore, using everything from purpose-made concrete "reef balls" to enormous sections of demolished bridges and other discarded steel and concrete



A contractor prepares the hull of Freya to be sunk to the artificial reef off Windmill Point in Virginia. (Virginia Marine Resources Commission)

infrastructure. And, of course, demoded boat hulls.

The reefs provide shelter and places for organisms to hide from predators. Over time, algae and oysters form on the surface. This in turn attracts small fish, then bigger fish, as the site becomes a place of food and safety.

Virginia's artificial reef program has been operating since the 1970s and has created 18 reef sites in the Bay watershed. People can donate materials, like *Freya*, to the commission. Smith then tests and preps the material, stripping it of potential pollutants.

"You can ship [materials] inland and have it chipped up and recycled, and that costs money and time," he said. "Or we could use it for something good, to build habitat."

The Mathews Maritime Foundation, which had cared for Klingel's boat since 2017, donated it to the marine commission because maintenance had become too costly. The foundation, based on Virginia's middle peninsula, preserves the maritime and cultural history of Mathews County, including the legacy of Gilbert Klingel.

Klingel was a self-taught naturalist who wrote articles based on his observations of the Bay. He studied marine life using a diving chamber he built in 1954, called an "aquascope," in which he and one other person could lie on the Bay floor off Windmill Point and watch fish swim by.

"I think, as a sailboat, [*Freya*] lives on," said foundation president Peter Hall. "The memories of Gilbert, the work that he did, lives on."

Artificial reefs can be suitable habitat for fish populations. A study published in *Frontiers of Marine Science* found that such reefs in North Carolina's Pamlico Sound attracted three times more fish than the surrounding unstructured areas.

Study author James Morley, though, said it's still not clear whether artificial reefs boost fish populations or just attract more fish. Plus, there are concerns that those concentrations of fish in turn attract people fishing for them, diminishing the natural benefits of built habitat.

To enhance fish populations, Morley recommends placing artificial reefs in places that are difficult for anglers to reach. Smith plans on revisiting *Freya* in June. Now, the boat can enjoy all the wonders at the Bay floor, just as its owner did. ■



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Questions linger about jet fuel leak into Potomac tributary

'People want answers and accountability' after spill at Joint Base Andrews

By Timothy B. Wheeler

Two months after jet fuel contaminated Piscataway Creek at Joint Base Andrews in Maryland, questions remain. It is still unclear how at least 22,000 gallons of the toxic liquid leaked from the sprawling air base near the District of Columbia, why it wasn't caught sooner and where it may have gone.

Maryland officials, including the state's congressional delegation, are pressing for answers. Its two U.S. senators and seven of its eight House members wrote to Air Force Secretary Troy Meink complaining of a lack of transparency about the incident. They contended there had been a "critical delay" by the base in providing full information to the Maryland Department of the Environment (MDE).

"The Air Force only came clean about [the] fuel spill at Joint Base Andrews after it was detected in and around Piscataway Creek," said Sen. Chris Van Hollen (D-MD), "and even then they failed to inform state officials of the full extent of the spill's impact until ... weeks later."

The base reported the jet fuel leak to federal and state authorities on March 23 after someone driving by the creek, which has its headwaters inside the base's fenceline, smelled fuel and spotted an oily sheen on the water. The tidal portion of the 18.6-mile Potomac River tributary is popular for fishing and boating.

It wasn't until April 8, though, that the base provided regulators an estimate of how much had escaped from its underground fuel storage and dispensing system.

Even then, there were conflicting figures. An April 13 news release by MDE — the first public disclosure of the problem — said "roughly" 32,000 gallons had leaked. The base then issued its own release, saying 22,000 gallons had been lost.

MDE is still investigating the incident but has faulted the base for not reporting the leak sooner and for not doing enough early on to stop or contain it.

The leak has cast a harsh spotlight on the 7,400-acre airbase in Prince George's County, which is home to the presidential plane, Air Force One.

Like most military bases, Andrews has a history of serious pollution problems. Petroleum and hazardous chemicals spilled or buried there have contaminated soil,



Maryland Department of the Environment staff collect water samples from Piscataway Creek inside Joint Base Andrews. (Courtesy of MDE)

groundwater and local streams. It has been on the U.S. Environmental Protection Agency's Superfund priority cleanup list since 1999.

"The base is taking this issue very seriously," said Air Force Col. Marie Harnly, who as civil engineer squadron commander for the 316th Wing oversees the base's environmental compliance efforts. The Air Force is working closely with MDE and the EPA to address the fuel release, she added.

Testing is to begin in early June to find and fix the suspected leak, she said. And work is already underway to track down where fuel has contaminated soil and groundwater so that it can be cleaned up.

About 37,000 gallons of fuel-tainted water have been pumped out of a stormwater outfall along the creek and taken off base to be properly disposed of, Harnly said. It isn't known yet, she added, what fraction of that removed liquid was jet fuel.

Meanwhile, the question remains: Could the leak have been spotted sooner and prevented or at least minimized?

In December, according to MDE, the base's fuel system failed a "tightness test" — a procedure for checking the underground storage tanks and pipelines that's usually capable of detecting even minor seepage.

of fuel in the base's underground storage system vary naturally with the temperature. Liquids expand when heated and contract when chilled, Harnly said, and the losses seen in those bitterly cold months were "within our tolerance."

The base's fuel system has leak detectors, but they're stationed beneath the storage tanks, not along the pipelines that deliver the fuel to the flight line — which is the suspected location of the leak.

It's still unclear whether the base had other chances to catch the leak early. Pressure tests are conducted weekly, Harnly said, but she declined to say what those tests showed in the weeks leading up to the leak's discovery. They are at least one focus of an internal investigation, she said.

"We are looking into it and as soon as we get fidelity out of that investigation, we will inform the community," a base spokesperson said.

Sampling in the creek in mid-April detected jet fuel constituents such as naphthalene and benzene, with some results exceeding action levels, according to MDE. Officials said they are sampling weekly but have yet to report more recent results.

"There's a lot of potentially harmful stuff" in jet fuel, said Natalie Exum, assistant professor of environmental health and engineering at Johns Hopkins University. She contributed to a study of another large jet fuel spill in Hawaii that contaminated drinking water.

Piscataway Creek is not a drinking water source. But Exum said, "The ecological damage is still to be determined."

State officials urged the public to avoid swimming or wading in areas of the creek where a sheen or odor is present or where there are containment booms across the water.

Since 2021, though, recreational anglers have been warned to limit or avoid eating certain fish from there. They are contaminated with perfluorooctane sulfonate, or PFOS, a toxic "forever chemical" that was discovered in the creek after a 2020 fish kill. MDE learned that there had been a large spill on the base of fire-fighting foam containing PFOS.

"This jet fuel is just highlighting the problems with the river," said Potomac Riverkeeper Dean Naujoks, who lives along Piscataway Creek. "People want answers and accountability." ■



Multiple booms were deployed on Piscataway Creek to keep leaked jet fuel from being carried downstream. (Courtesy of Joint Base Andrews)

State law requires facilities that store fuel to report promptly any indication of a release, the agency said, including failed system tests, inventory losses and any evidence of fuel in the soil or surrounding water.

That pressure test failure raised no alarms, though, Harnly said, because base officials knew they had a faulty valve in the fuel system.

Then in January and February, MDE said, the base's monthly fuel system reports showed inventory losses.

But Harnly said those didn't raise concerns either, because measurements of the volume

Huge oyster project in VA signals marked shift in strategy

Half of restored reefs would be sanctuaries, half would be open to harvest

By Jeremy Cox

State and federal officials are proposing an oyster reef restoration project in Virginia that would by itself more than double the amount of rehabilitated reefs around the Chesapeake Bay.

They don't intend to restore the entire 4,192 acres at once. Instead, the U.S. Army Corps of Engineers and the Virginia Marine Resources Commission (VMRC) plan to construct the reefs in many phases, beginning with a \$50 million project of 275 acres in 2028.

The work is targeted in the lower Pocomoke and Tangier sounds, which are considered among the most productive oyster harvest grounds in the Bay. The southern reaches of these adjacent sounds merge in the wide-open Virginia waters east of Tangier Island.

The project is the first to be announced in Virginia under the latest phase of the overall Bay ecological restoration. Last year, the principals of the Chesapeake Bay Program, a state-federal partnership, signed an update to the 2014 Chesapeake Bay Agreement that called for, among other things, adding 2,000 additional acres of oyster reefs by 2040.

"This is a great next step in the program and a great first step in the next phase of the larger Chesapeake Bay oyster restoration," said Russ Burke, a marine scientist with Christopher Newport University in Virginia.

For now, the title for the largest oyster restoration project in the Chesapeake Bay region belongs to the 441 acres of bottom restored on the Manokin River on the lower Eastern Shore of Maryland. Collectively, the bi-state campaign is considered the largest oyster restoration effort in the world.

Size isn't the only thing that's different about the Pocomoke-Tangier project. For the first time since the Baywide oyster restoration effort launched in 2014, federal funds are set to go toward restoring reefs that can later be commercially harvested — an arrangement that has long been opposed by environmentalists.

It would also be the first project under the program to design some reefs for the explicit purpose of inhibiting shoreline erosion. The first phase will include reefs along Tangier Island, a fishing community in the middle of the Bay that has garnered national attention in its battle to survive rising water. The reefs would shield the



The population center of Tangier Island in the Chesapeake Bay is located in this northeast corner of the island. (Dave Harp)



Moody "M.K." Miles says that since his childhood, the shoreline in Saxis, VA, has eroded 50 yards in this spot. He's 77 years old now. (Jeremy Cox)

beach on the southwestern side of the island.

Two additional locations would gain protection later: Watts Island, a shrinking nub of trees and sand east of Tangier Island that is part of the Martin National Wildlife Refuge, and the town of Saxis, an Eastern Shore waterfront community of about 200 people that's losing ground to the Bay.

"We've had a terrible erosion problem on the Pocomoke Sound side, and we've had it for 300 years," said Moody "M.K." Miles, a Saxis native who worked for the Army Corps for decades, rising to its highest echelons. "Nothing's changed."

Miles, 77, pointed to a sliver of sand that stands between the Bay's gently lapping waves and a long-vacant house. When he was a child, there used to be 75 yards of open space between the two.

Protection is long overdue for Saxis, Miles added. But it's hard to compete with

Tangier Island for attention and funding. "They have publicity," he said. "They're on the evening news. We're isolated and forgotten."

The Pocomoke and Tangier project might not be going forward if not for the lessons learned from the restoration projects that came before it, said Heather Lockwood, project manager for the Army Corps' Norfolk office.

This isn't the first time that the Army Corps has tried to give oysters a boost in the region. In 2002, during the infancy of efforts to restore oyster reefs in the Chesapeake Bay, the Corps completed a \$3.6 million restoration across 158 acres in the Tangier and Pocomoke sounds.

Only 8 acres of the project were set aside as off-limits to watermen. The rest were opened to harvesting. In 2012, when the Corps drafted its oyster management plan for the Bay, the agency pivoted to supporting only restoration projects in sanctuaries because the overall population was too low to afford having them taken.

That plan, though, left the door open to creating harvestable reefs, stating that "management approaches other than sanctuaries" would be considered, "if justified." The VMRC first pitched the idea of opening the restored Pocomoke and Tangier reefs to harvest in a 2024 letter.

By then, oysters weren't in such dire shape in the Bay, thanks largely to the ongoing restoration work, Lockwood said.

"It was, 'Can we have a little bit of both now? Can we mix it in?'" Lockwood recalled. "It's exciting 20 years later to not only construct sanctuaries but also harvest reefs as well, especially for a community like

Tangier. Their livelihood is on the water."

The original 2014 Bay Agreement committed to restoring oyster reefs in portions of 10 tributaries around the Bay, five each in Maryland and Virginia. Officials surpassed that goal, rehabilitating 11 waterways for a total of 1,900 "actively restored" acres.

The Pocomoke-Tangier plans call for splitting the restored acreage down the middle — half for sanctuaries and half for harvesting.

"We want a situation where everybody wins," said Rom Lipcius, an oyster researcher at the Virginia Institute of Marine Science. "Oysters are not only of ecological value but also economical value."

Watermen have long pushed for opening restored reefs around the Bay, saying that doing so would reduce overcrowding and oyster disease while helping keep silt from smothering the bivalves. Environmental advocates appear split on the issue.

Some, such as the Chesapeake Bay Foundation, point to scientific evidence suggesting that dredging damages oyster habitat. The organization says it's against it here, too.

But other groups say there are bigger concerns at play, such as encouraging watermen to support the Baywide oyster rehabilitation.

"I think we should [open some reefs to harvest], and I say that without reservation," said Bowdoin "Bo" Lusk, coastal scientist with the Nature Conservancy, which is undertaking a separate oyster restoration initiative in Pocomoke Sound. "Both types of reefs are valuable to the public."

To explain, he offered a metaphor. Oyster sanctuaries are like old-growth forests while harvest reefs are like "pine plantations" in which a single species of trees is grown to be logged for profit. Ecologically, the old-growth forest is preferable.

"But," Lusk added, "we like both a whole lot better than we like a parking lot." Despite their relative health, the Pocomoke and Tangier sounds are much more like parking lots than they used to be. Historically, there were an estimated 31,500 acres of oyster habitat in both. Today, barely 1,000 acres remain, according to Army Corps surveys. Researchers point to several reasons behind that decline, including loss of habitat, disease, overharvesting and climate change. ■

River otters are making a comeback — and in surprising places

Known for preferring clean water, otters are turning up in urban rivers too

By Karl Blankenship

Four decades ago, populations of the river otter, a playful, whiskered member of the weasel family, were so depleted that most states in the Chesapeake Bay region considered them endangered.

Today, the species known for its fondness of clean water is turning up throughout the Bay watershed, including seemingly unlikely places.

They inhabit a floating wetland constructed in Baltimore's Inner Harbor.

They've been spotted munching on fish in downtown Norfolk and in all branches of the Elizabeth River.

And they're seen in and around the District of Columbia, including Rock Creek and the Anacostia River.

Biologists once thought such urban areas were mostly off-limits to the semi-aquatic mammals, which are often associated with more pristine conditions. Their recovery in Baltimore Harbor and the Elizabeth and Anacostia rivers is especially notable because those areas were once considered the most "toxic hot spots" in the Bay region.

"We have a major conservation success story in terms of restoring a predatory animal that had declined significantly," said Tom Serfass, a river otter expert at Frostburg State University in Maryland.

"It's a good example that some of the water quality regulations have worked," Serfass said. "It also demonstrates the otter is a bit more tolerant if we give it a little protection."

While populations survived in many coastal areas like the Eastern Shore, where there was ample marsh for protection, they disappeared from much of the continental United States and Canada. The less dense populations strung out along river shorelines were vulnerable to trapping, shoreline disturbances caused by deforestation, and water pollution.

Serfass spearheaded otter reintroduction efforts in Pennsylvania, starting as a graduate student in the 1980s. Back then, otters had vanished from the state except for a remnant population in its northeast corner.

Serfass' work restored otter populations in nearly all major river basins in Pennsylvania, while Maryland, Virginia, West Virginia and New York undertook their own reintroduction efforts.



A river otter relaxes on a dock near the Nauticus battleship in Norfolk, VA, in 2018. (Eric Alton)

Today, otters appear to be expanding both from those efforts and from coastal areas where populations had survived.

Serfass has been surprised at the scope of the comeback. In a project funded by the National Park Service, he placed wildlife cameras every two miles along the Chesapeake and Ohio Canal towpath from Cumberland, MD, to just outside the District of Columbia. Otters have been seen crossing the towpath along the canal's entire length — an area with no otters only a few decades ago, he said.

Today, they're being touted as "clean water ambassadors" to highlight improving conditions and spur citizen science efforts to help monitor their abundance.

They are top-of-the-food-chain predators, which means they are essentially absorbing everything that's accumulated in the things they eat. That can reveal a lot about the local environment.

"You can't have otters in a body of water unless there's a healthy enough ecosystem to support them," said Victoria Dunch, resilience research manager with the Elizabeth River Project in Virginia.

The Elizabeth River, which runs between Norfolk and Portsmouth, was once considered nearly "dead" because of pollution. Scientists didn't even bother to conduct fish surveys there.

But that started to change as recovery efforts took hold — the Elizabeth River Project now gives the river a "C" on its report card. And the otters are weighing

in, too: "People have been telling us about their otter sightings for probably well over a decade," Dunch said.

To better quantify that recovery, the non-profit organization two years ago teamed up with the San Francisco-based River Otter Ecology Project to create a website that allowed people to report otter sightings.

So far, the site has logged about 150 observations from more than 90 people in the broader Hampton Roads area. They have been seen chowing down on fish in downtown Norfolk and denning in culverts.

Dunch said the organization incorporates otters into educational programs. "Otters for Water," for example, encourages people to take actions, such as reducing fertilizer use, to protect local waterways.

In Baltimore, the National Aquarium began constructing an 8,000-square-foot "floating wetland" in the adjacent harbor in October 2023.

Before it was completed, aquarium staff would get questions about what types of animals might eventually use it. They would run through the litany of possibilities: blue heron, eels, fish, cormorants. Maybe, eventually, they would say, even an otter.

In fact, the otters didn't wait for the wetland to be completed. A night watchman spotted otters in the wetland in June the following year, two months before it was slated to open. By November, the staff was seeing regular visits on their trail cameras in the wetland.

"It's just wild how quickly they showed

up," said Taylor Long, of the aquarium's field conservation department. "We're still very surprised about it."

The aquarium has incorporated otters into education programs, too. For example, students can examine otter poop through microscopes and try to identify fish scales that indicate what the otters have been eating.

There's plenty of poop to be found: Otters use the aquarium's wetland as a latrine.

The poop is also used for scientific work. The aquarium participates in the Chesapeake Bay Otter Alliance, created by the Smithsonian Environmental Research Center (SERC) in Edgewater, MD, as a regional network of organizations, parks and agencies working to map the presence of otters and collect their poop for analysis.

By analyzing the poop, the project's aim is to better determine the health of the ecosystem, in part by understanding the diversity of fish and other things in the otters' diets. More diversity should indicate a healthier system.

Eventually, they hope to look for contaminants and pollutants that could impact otters — and humans — using the rivers.

"I think using a top predator to assess, [and] kind of looking backwards down a food web, to try to figure out what's going on in an ecosystem, is kind of a cost effective approach," said Katrina Lohan, a senior scientist at SERC who oversees the project.

Trying to survey otters is difficult, though. Although otters are known for their playful antics, such as sliding down muddy or snow-covered riverbanks into the water, actually spotting the largely nocturnal animals isn't easy.

"I've been studying them for six years, and I've never seen one in the wild," Lohan said.

But their latrines, which can be used by generations of otters and also serve as a social gathering point, can more easily be located along shorelines using one's nose.

"Otter latrines are really stinky," said Callie Wise, a SERC field technician who works with Lohan. "They eat so many fish that usually an active latrine is just covered in otter scat, which is full of fish scales and just stink of fish."

But their latrines are common along streams on public lands and parks, confirming their regional comeback. "I found them almost everywhere," Wise said. ■

Will PA Turnpike be first ‘sustainable superhighway’ in U.S.?

Plans include expanding pollinator habitat, building solar facilities, increasing EV chargers

By Carolyn Beans

Each summer, motorists traveling on the Pennsylvania Turnpike as it passes south of Harrisburg will see a burst of blooms. Purple coneflowers, oxeye sunflowers, wild bergamots and many more nectar-producing flowers blanket the roadside below the Turnpike Commission’s headquarters there.

In 2022, the commission established this pollinator habitat across 1.72 acres, divided into four test plots — each planted with a unique mix of wildflowers that together can support pollinators through their entire life cycles. They also seeded more plots on nearly six acres at the Hickory Run Service Plaza on the turnpike’s northeast extension (Interstate 476) in Carbon County.

In the years since, they’ve added plots at five more locations along the turnpike, reaching a total of nearly 25 acres of land planted primarily with flowers and grasses native to Pennsylvania and the surrounding region.

The goal is to identify which mixes of seed best support pollinators, survive deer browsing and thrive with minimal maintenance. They’ll then use the most promising mixes to convert more of their 565 miles of roadside land into pollinator habitat.

“One seed mix won’t fix everything across the state, [which has] different hardiness zones and elevations,” said Brady Pnacek, a stormwater management specialist at the Pennsylvania Turnpike Commission and manager of the program.

Upon opening in 1940, the Pennsylvania Turnpike was celebrated as America’s first superhighway. Now, the commission is adding these wildflowers — along with EV charging stations, solar panels and more — in an effort to achieve a new distinction by its 100th birthday: America’s first sustainable superhighway.

“Sustainability is really baked into everything we do. It’s a core part of our strategic plan. It’s a core part of our values and our vision,” said Leslie Gervasio, director of communications for the commission and co-chair of its sustainability committee.

The idea for the pollinator habitat project dates to 2019, when the commission tasked a team of college interns with developing a way to reduce the greenhouse gas emissions and operating costs associated with regular mowing.

Establishing the pollinator habitats costs



Wildflowers flourish along the Pennsylvania Turnpike at the highway’s Harrisburg-west interchange. (Courtesy of PA Turnpike Commission)

around \$4,000 to nearly \$8,000 per acre. But over time, planners say, that cost is recovered in savings from less frequent mowing.

Since establishing the pollinator habitats, the commission has worked with consultants to regularly survey the plots. In 2025, they surveyed plants and pollinators monthly from May through October. This year, they’ll also use drones to capture aerial images of plant cover.

They also work with collaborators, such as PennDOT, to share good ideas and discuss challenges. In 2022, for example, they began trials with a PennDOT wildflower mix at several locations.

Already, they’ve learned some lessons. Hand-pulling the invasive species that inevitably move into plots proved too time-intensive. So the commission transitioned to targeted herbicide applications. One seedmix included too many grasses — it resulted in fewer flowers each year as the grasses outcompeted their showier neighbors.

And plots can take years to reach their full potential. Back in 2022, the commission spread the seeds of blue false indigo along with 31 other species in a single plot at

the Harrisburg-west interchange. But the plant didn’t germinate until last summer. “Not everything blooms that first year,” said Pnacek. “But if they’re given the right conditions, they’ll show up eventually.”

The pollinators show up, too, especially at sites filled with open flowers. Last year, surveyors observed more than 30 pollinating species in the Allentown Service Plaza’s 7.5-acre pollinator habitat seeded in 2024, including carpenter bees and many types of butterflies.

But at another site established in 2024 near a turnpike salt shed in Fulton County, few pollinators arrived, likely because the initial seed mix leaned more toward native grasses than flowers.

Highway managers in the U.S. have planted wildflowers along roadsides for decades, funded since 1965 by the Highway Beautification Act.

The commission is also pursuing other strategies to reduce greenhouse gas emissions. In a 2021 pilot project, they installed a solar microgrid to power a maintenance facility in Westmoreland County, reducing its carbon footprint and saving an estimated

\$450,000 in annual energy costs. Given its success, the commission is pursuing what CEO Mark Compton calls a “complete solar strategy.”

The commission has since installed a microgrid to power their 27,000-square-foot Western Regional Office in New Stanton and is currently installing solar panels on the roof of the headquarters building near Harrisburg. They’re planning additional solar installations for three more maintenance facilities and the Blue Mountain and Kittatinny Mountain tunnels.

By the end of this year, the administration building will have a solar canopy in the parking lot that will power an EV charging station. The station will showcase some of the most promising wireless, or inductive, charging technologies that might one day power cars along the turnpike. Eight of the turnpike’s service plazas already have universal, or “agnostic,” plug-in charging stations, and all 17 plazas will have them by the end of this year, for a total of more than 140 chargers.

EV purchases have slowed, but there are still more on the road every year, said Compton. “We’re foreseeing the demand in the future.”

The Pennsylvania Turnpike Commission is still working out how exactly it will become America’s “first sustainable superhighway” — a term it coined.

“What does it mean? How do we get there?” communications director Gervasio asked. In the coming months, she and the rest of the sustainability committee will develop a formal plan that prioritizes the planet, people and profit, and aligns with the United Nations’ 17 goals for sustainable development.

Already, the commission’s efforts are being recognized. It is the only state agency to have received a perfect score on the Pennsylvania GreenGov Council’s Certification Checklist for sustainability guidelines. And they’ve achieved that score for the past four years in a row.

“[The GreenGov Council raises] the bar every year,” CEO Compton said, “which tells you we continue to raise the bar.” ■

Carolyn Beans is a freelance science writer based in Pennsylvania.

Chesapeake blue crabs stage a rally amid long-term decline

Population has dropped 50% since 2010 with no 'smoking gun' to explain it

By Timothy B. Wheeler
& Jeremy Cox

The blue crab is a Chesapeake Bay icon — its most recognizable creature and most popular seafood, by far. Its abundance is a closely followed indicator of the estuary's ecological health.

It is also an enigma. The crustaceans' population swoons and rallies every year or two, for reasons the experts can't fully explain.

The latest survey released in May found that the crab population appears to have rebounded from a protracted slump. Yet the long-term trend has been downward, a separate, new study finds — and the cause or causes remain a mystery.

The Bay's blue crab population has declined by about 50% since 2010, according to that study, a comprehensive stock assessment released in draft form in early May.

For the assessment, scientists from five different research institutions and fishery managers for Maryland, Virginia and the Potomac River pored over decades of harvest figures, survey data and dozens of reports and studies. They looked for changes in water quality or climate and fishing pressure, among other things, and examined whether an influx of crab-eating fish could be responsible for depleting the population.

The basic problem, they agreed, is poor "recruitment," meaning there aren't enough young crabs surviving to produce the next generation. Their 281-page draft report concludes, though, that despite identifying some potential causes, they lacked the data to fully explain it.

"We suspect multiple causes, because the Chesapeake Bay is complex and the blue crab life cycle is complicated," said Mike Wilberg, a fisheries scientist with the Chesapeake Biological Laboratory of the University of Maryland Center for Environmental Science. He led the computer-driven assessment.

"There's no smoking gun," said Rom Lipcius, a fisheries scientist with the Virginia Institute of Marine Science who was part of the assessment team.

From rebound to decline

Stakes are high for figuring out what's going on. For decades, the crustaceans have been the Bay's most important commercial fishery, supplying about one-third of all the crabs



A team from the Maryland Department of Natural Resources examines a tiny juvenile crab during the 2026 winter dredge survey. (Dave Harp)

harvested nationally and worth \$74 million dockside in 2024. They're also one of the region's most popular recreational catches.

This is not the first time the Bay's crabs have been in trouble. Watermen struggled through subpar harvests for about a decade beginning in the late 1990s before scientists convinced managers to clamp down on

harvests of female crabs so more of them could survive to spawn. The population rebounded strongly over the next few years.

But warning signs began to appear again about a decade ago, with the survey that Maryland and Virginia scientists perform every winter reporting below-average numbers of crabs more often than not.



Blue crabs piled in a steel basket await steaming at J.M. Clayton Company, a seafood business in Cambridge, MD. (Dave Harp)

By 2022, after three consecutive years of below-average survey results, concerns grew. A significant deficit in the number of juvenile crabs was especially troubling. Scientists and managers agreed it was time for a new assessment. With last year's survey, the estimated crab population was below average for six years running.

No clear culprit

The assessment team created a new computer model that can help fishery managers in the years ahead, said Matt Ogburn, an ecologist with the Smithsonian Environmental Research Center in Edgewater, MD, who also participated in the study. The previous model had focused almost exclusively on female crabs because of their role in reproduction. The new model — consisting of "thousands of lines of code," according to Wilberg — incorporates a broad set of population influences, including juvenile survival, growth, fishing and death from natural causes.

This assessment finds little evidence that crabs are declining because of poor water quality, specifically the warm-weather condition known as hypoxia, which occurs when nutrient pollution leads to oxygen-starved "dead zones" where fish struggle to survive.

Researchers also ruled out overfishing. Although crabs had been under intense harvest pressure in decades past, the removal rates in recent years — especially of spawning-age females — has stayed within bounds.

The scientists did find that blue catfish are contributing to crabs' decline, as watermen have long contended. But the assessment ruled out the invasive fish as the main culprit.

Introduced in a couple of Virginia rivers in the 1970s, blue catfish have spread to rivers all around the Bay region. In 2023, the study estimated, the invasive fish consumed roughly 8% of the little crabs that year.

"They're not the primary cause," Ogburn said. "There's something five times bigger than that, and we're not sure what it is."

Even so, the assessment acknowledges that as blue catfish continue to spread throughout the Bay and increase in numbers, their impact is likely to increase. The assessment projects they could wind up consuming as much as 40% of the Bay's young crabs.

Knowledge gaps

The intensive analysis has given scientists a better understanding of crabs, Lipcius said. But it has also highlighted some big gaps in knowledge that might help explain the current slump.

For instance, the assessment skipped the earliest, most vulnerable portion of a young crab's life. Females release their eggs in salty water near the mouth of the Bay, and the millions of hatched larvae drift out into the Atlantic Ocean. After several weeks, they make it back to the Bay with the help of currents and tides. They spend their first year sheltered in shallow waters, growing to maturity among underwater grasses.

There was an episode several decades ago in which surveys detected a big drop in the number of crab larvae returning to the Bay, Lipcius said. The National Oceanic and Atmospheric Administration is now leading a study to see if there have been any changes in currents, climate or other conditions that might help explain the decline in young crabs. The results won't be available for a couple more years, he said.

Predation might still be a significant factor, Lipcius suggested. Striped bass and red drum also feed on the young crustaceans, as do their own species.

Indeed, a March study by Anson "Tuck" Hines, a veteran crab researcher at the Smithsonian research center, concluded that adult crabs are the leading killers of juvenile crabs in mid-salinity waters. There's no evidence that such cannibalism has increased over time, but Lipcius said that the topic deserves more study.

What's happening Baywide with young crabs in the shallows isn't clear, either. The vessels used by researchers in Maryland and Virginia to survey their population in the winter are too large to get close to shore.

Next steps unclear

Troubling as the crab slump has been for several years now, Wilberg said the situation does not appear to be dire — yet. Though the number of spawning age female crabs is also down, there are still enough to produce a healthy crop of young under the right conditions.

So, he concluded, "it's not time to panic, but the trend has been downward, which is worrying."

Without a clearer picture of what's happening, Wilberg said managers need to maintain a lid on crab harvests.

"My main takeaway from this assessment is that now is not the time to liberalize



Maryland watermen Fred Pomeroy (left) and Donnie Sellers sort their catch of blue crabs from the Little Choptank River. (Dave Harp)

regulations," he said. "Blue crabs are declining for largely unknown reasons, and adding more mortality through harvest would probably just lead to a faster decline."

That advice could be tested with the latest winter dredge survey, which sampled 1,500 sites throughout the Bay and its rivers from December to March. It estimated the overall crab population at 349 million this year. That is a 46% increase from the 2025 total of 238 million. The new figure remains just below the long-term average.

Two-thirds of that total, about 228 million, were juvenile crabs, a 121% increase over last year's tally. The 2025 survey had recorded the second-lowest abundance of young ever found.

Adult male crabs also recovered from last year's record-low. The survey estimated 37 million "jimmies," as watermen call them, a 42% increase from 2025.

But the survey found that the number of spawning-age female crabs, the linchpin of the overall crab population, hit its lowest level since 2014. The survey estimated 81 million of them, a 25% decrease from 2025 and the third straight year of decline.

Though far below their desired abundance, females — or "sooks" — are still numerous enough to produce a bumper crop of offspring, given the right environmental conditions. But their decline is getting close to the threshold fishery managers have set for imposing new harvest restrictions.



Mike Wilberg of the University of Maryland Center for Environmental Science said that, given uncertainties about declines in the blue crab population, "now is not the time to liberalize regulations." (Dave Harp)

With the survey and the stock assessment seemingly pointing in opposite directions, fishery managers in Maryland, Virginia and the Potomac River were to meet in late May with watermen and seafood industry representatives to discuss how — or whether — to change crab harvest rules for the season already underway.

Remain vigilant

"It's very encouraging to see higher levels of blue crabs and juveniles, especially after a few years of lower juvenile recruitment," Mandy Bromilow, DNR's blue crab program manager, said of the 2026 survey. "However, we'll still have to remain vigilant about the population, given that we have seen declines since 2011."

The Chesapeake Bay Foundation, the largest Bay-specific environmental organization, called on fishery managers to integrate the stock assessment's insights into their harvest decisions.

"It's vital that this information drives future blue crab management to protect the species for decades to come," said Allison Colden, the foundation's Maryland executive director.

Some crabbers, though, worry that the long-term stock assessment will be used to further limit their catches. Daniel Knott, a waterman based in Gloucester, VA, disputes that commercial harvests have diminished in recent years, suggesting that other factors are to blame, such as a drop in the number of crabbers doing the work.

"If they're telling me the abundance has been declining since 2010, I'm not going to say that's false, but I'm just not seeing the consequences of that," Knott said.

The numbers don't add up for C.J. Canby either.

"It's a disservice to the crabs to say they're down 50%," said Canby, a waterman from Anne Arundel County, MD. "I shake my head. It's hard to take it when I'm making my living doing this and people extrapolating from a computer are saying I'm not seeing what I'm seeing."

But not all crabbers dispute the findings.

Fred Pomeroy has been crabbing for more than 60 years from his base in Dorchester County on Maryland's Eastern Shore. He's not surprised that scientists say the crab population is on the decline. The species faces many threats, he said, from predation and recreational overfishing to loss of habitat to climate change.

"But the crab is a resilient creature," Pomeroy added, "and it's hard to wipe them out." ■

Data center boom raises environmental justice concerns in MD

Group challenges policies for data centers in Prince George's County

By Jeremy Cox

As Staci Hartwell sees it, her community has much more to lose than to gain from the development of a massive data center.

"I don't think it needs to be in the heart of a community that is suffering from cumulative impacts, which just happens to be a predominantly Black and brown community," said Hartwell, a resident of Prince George's County, MD, and strategist for the South County Environmental Justice Coalition.

Lerner Enterprises, a real estate firm operated by the family that owns the Washington Nationals, has proposed a \$5 billion, 4-million-square-foot data center complex on the site of the long-demolished Landover Mall. Those plans were put on hold last September, though, after County Executive Aisha Braveboy placed a temporary halt on processing data center permits.

Hyperscale data centers are sprawling buildings that house hundreds of thousands of computer servers, often used to power global cloud and AI applications. Their meteoric proliferation in the Chesapeake Bay watershed and beyond has been accompanied by a commensurate rise in concerns over strains to public water supplies, air quality and the electric grid.

In Prince George's County, the debate over data centers has an added dimension: worries that the industry will worsen health and environmental problems in communities already overtaxed by them.

"There needs to be a look at what impacts have happened to a community and make sure that data centers don't add to that burden," said Sacoby Wilson, director of the University of Maryland's Center for Community Engagement, Environmental Justice and Health (CEEJH).

Last November, a 20-member county task force released a report designed to be the last word on data center planning within the suburban DC jurisdiction. But it wasn't. In March, the NAACP's national office and CEEJH published a "counter-report," a full-throated denunciation of what they considered to be the county report's failure to address environmental justice.

Nearly 90% of Prince George's 960,000 residents identify as people of color, and 60% identify as Black. Compared to the rest of Maryland, the county has a higher percentage of people living in poverty and



Staci Hartwell of the South County Environmental Justice Coalition in Prince George's County, MD, said a massive data center at the site of the old Landover Mall is out of step with the community. (Jeremy Cox)

without health-care coverage. The county, meanwhile, has a history of "clustering" industrial facilities in marginalized communities, such as the predominately Black community of Brandywine, according to the report.

Wilson, a Bowie resident, fears that, given the county's proximity to DC, it will join a growing list of what he calls "digital sacrifice zones"—communities that are "used to host the negative externalities" of data centers but "don't see the benefits from them."

The counter-report highlights the vicinity around the proposed Landover data center as a prime example. The U.S. Centers for Disease Control and Prevention's Environmental Justice Index, which integrates environmental exposures and health indicators, gives the adjacent census tracts a score of 0.86 on a scale of 1, putting the area into the highest burden category.

Landover isn't alone. Nationwide, data center pollution could lead to 600,000 asthma cases and 1,300 deaths by 2028 under a "high-growth scenario," according to an analysis led by researchers at the University of California Riverside. That would equate to more than \$20 billion in public health burden nationwide—a 213% increase from the 2023 level.

That pain wouldn't be equally distributed. People with lower incomes are in line to bear

the brunt. All 10 counties with the projected highest data center-related health costs in 2030 have lower median income levels than the national median, the study noted.

"This substantial disparity highlights the need to carefully examine local and regional health impacts to support more responsible computing and data center siting," the authors wrote.

The paper suggests that Prince George's County is already paying a high price from hyperscale data centers, even though the county has none within its borders yet. That's because it's downwind of Northern Virginia, home to a large concentration of such facilities known as Data Center Alley.

The research team's modeling showed that if Virginia's diesel-powered backup generators emit pollutants at 10% of their permitted level, Prince George's would incur \$9 million in annual health burdens. That was the third-highest total after Maryland's Montgomery County at \$20 million and Virginia's Fairfax County at \$19 million.

Prince George's data center report was based on eight meetings held from May through November 2025 in which subject matter experts shared insights on how to manage data center growth. There were also four community meetings, which drew a combined 600 attendees, officials say.

The county report states that the task force considered the positive and negative consequences of data centers and concluded that the "economic and community benefits" would outweigh the potential downsides, which would include higher residential electricity bills.

Braveboy's office didn't respond to requests for comment. Representatives of Lerner Enterprises also didn't respond.

The main body of the county report mentions the term "environmental justice" three times in its 89 pages. It is mentioned as one of the discussion topics during a June 11, 2025, task force meeting, in a description of another community's data center ordinance and as part of the name of Staci Hartwell's organization. She was a member of the task force.

As the task force process unfolded, though, Hartwell said, "I became increasingly concerned that core environmental justice issues were not being fully addressed within either the structure of the task force or the recommendations that ultimately emerged from it."

County Councilwoman Wala Blegay, another task force member, said that environmental justice was brought up at the meetings, but there wasn't enough time to give it the attention it deserved. She and other members determined that more science needs to be conducted on data centers' health consequences before conclusions can be drawn.

Blegay said she is not in favor of the Landover data center moving forward. "It's too close to people's homes, and we don't know the impacts," she added. "I just want people to know we aren't going to make a decision and completely disregard the community."

Abre' Conner, director of the NAACP's Center for Environmental and Climate Justice, said that what's happening in Prince George's County demonstrates that local elected leaders in many parts of the country aren't listening to what their citizens are saying, especially those in vulnerable communities.

"What we were seeing from local, elected and appointed individuals," she said during a data center webinar in May, "was to say, 'We're going to move forward,' despite what community members were saying." ■

Proposed Baltimore waste site now eyed for streamside park

Pushback prompts developer to consider greening along Jones Falls

By Timothy B. Wheeler

Sometimes problems turn into opportunities, lemons into lemonade.

Only time will tell, but that could be what's playing out with Baltimore's Jones Falls, the long-abused stream that flows through the heart of the city before emptying into the Inner Harbor.

Last summer, Baltimore's public works department proposed moving a trash and recycling drop-off station from a bluff overlooking the falls in the Remington neighborhood. The new spot: even closer to the stream, just across the two-lane Falls Road.

The announcement sparked an outcry and a "Don't Trash the Falls" campaign. Residents, environmentalists and even local businesses warned that the new site was flood prone and likely to increase pollution and litter in the stream. They feared the move would also dash community hopes to eventually transform the once-industrial Jones Falls valley into a magnet for outdoor recreation and tourism.

The uproar prompted Mayor Brandon Scott to put the move on hold and form a task force to study the issue. After several months of back and forth, the group could not agree on a suitable alternative site for the drop-off center.

Then, in March, the script flipped. The developer whose interest in acquiring the existing drop-off site had triggered the relocation plan instead struck a deal to buy the construction equipment yard on Falls Road where the city had wanted to move it.

And while developer Thibault Manekin said the firm he co-founded, Seawall, wants to build something there — maybe housing, shops or both — he sees converting most of the rough-looking tract into park-like green space.

Jones Falls advocates welcomed the news, though with some wariness borne of decades of fighting to protect and clean up the stream.

Sandy Sparks, president of the Friends of Jones Falls, calls the potential development a "fantastic opportunity."

"We're pushing very hard that it have as much green space as possible," she said. "It should be a very active and attractive greenway."

Although Seawall had reportedly been interested in redeveloping the site of the



Baltimore's Remington trash and recycling drop-off facility is in the foreground of this photo. The equipment storage yard proposed to be its new location is beyond the stand of trees just left of center in the photo, closer to Jones Falls. (Dave Harp)

current recycling drop-off station, Manekin said it wasn't his idea to move the facility to the larger lot closer to the stream, which is now used as a storage yard by a construction contractor.

Amid the uproar over the proposed relocation, Manekin said he learned of the efforts of community activists to reimagine a greener, more attractive future for the Jones Falls valley. He sensed an opportunity to develop the old construction yard in a way that could be in harmony with the community's vision.

"I'm confident we'll be able to find the right cadence of how much open space and how much thoughtful development could go down there," he said. But to make much of it a park, he cautioned, "we're going to have to get creative on how that gets paid for" with public as well as private investment.

His firm has yet to complete the purchase of the Potts & Callahan storage yard, and there's still the possibility the deal may fall through if problems arise.

He acknowledged that "it's going to be a heavy lift," but said, "we're really excited."

Leanna Frick of the environmental nonprofit Blue Water Baltimore thinks Seawall's acquisition could benefit Jones Falls, but she points out that's not the only problem confronting the beleaguered stream. Her organization had alerted the

public and helped rally opposition to the trash facility's relocation.

Frick said she hopes any new development of the old storage yard will prominently feature a linear park, which would help buffer Jones Falls from stormwater runoff and pollution.

"I think there's some lemonade in progress," she said, but added, "I think there's some bigger lemons on the horizon, actually."

If the city simply closes the recycling drop-off center rather than relocating it, as officials have indicated is their plan, she worries that littering and illegal dumping could become much worse along Falls Road. An unsanctioned mound of debris has formed on the site of an old railroad roundhouse nearby, which the city's transportation department uses as a parking lot.

"There's always been rampant illegal dumping in our stream valleys and our marginalized neighborhoods," Frick said. "We are worried that would get worse without a safe and accessible site to bring trash."

In a recently released final report, the mayor's task force recommended closing the Remington drop-off station only after other recycling and bulk trash sites are upgraded and other steps taken. That could take several years.

Meanwhile, Frick pointed out, Jones Falls faces a more immediate threat:



Leanna Frick of Blue Water Baltimore holds a large patch of lead-tainted paint that fell from the 28th Street bridge behind her. (Courtesy of Blue Water Baltimore)

orange-and-white lead paint chips flaking off the 28th Street bridge, which spans the stream valley. It is one of four city bridges where the toxic paint, applied decades ago, is now deteriorating, dropping dust and chips on the ground and in streams.

"The ground there is covered with it," Frick said, referring to the Jones Falls Trail running along Falls Road near the construction storage yard. "It looks like it snowed. It's wild."

First spotted by the local news outlet *Baltimore Brew*, the chips prompted Blue Water Baltimore to file a complaint with the Maryland Department of the Environment. MDE issued a violation notice to the city, ordering it to clean up the chips and safely remove the deteriorating bridge paint.

Meanwhile, with Seawall mulling its plans, Sparks of the friends group is hoping to broaden the discussion. With the help of a \$150,000 grant from the National Fish & Wildlife Foundation, the group is developing a strategic plan for the entire Jones Falls watershed, from its headwaters in semi-rural northern Baltimore County to the Inner Harbor downtown.

The planning effort, which got under way with a series of public meetings in February, aims to promote environmental equity, responsible development, climate resilience, public access and habitat restoration.

"We're looking to reenvision the whole watershed," Sparks said. ■

VA, MD develop stricter coal ash rules as EPA pulls back

Federal agency proposes new rules that loosen regulation of contaminated disposal sites

By Lauren Hines-Acosta

The U.S. Environmental Protection Agency this spring proposed loosening environmental regulations on dump sites for coal ash, aiming to meet the energy industry's request for more flexibility. Virginia and Maryland are in the process of enacting stricter rules, but environmentalists are worried it may not be enough. The EPA is accepting public comments on the new rules until June 12.

Coal ash is a byproduct of burning coal. It contains heavy metals such as mercury, lead and arsenic, which are carcinogenic at high concentrations. Power plants dispose of this waste in landfills or pits. Excess stormwater or leaks in the linings of those landfills and pits can lead to contaminants entering groundwater or waterways.

A report by Earthjustice and the Environmental Integrity Project found groundwater contamination at 91% of coal ash sites in 2019 across the U.S. It's unclear how many impact drinking water. Across the Chesapeake Bay watershed, there are almost 100 coal ash dumps ranging in size and oversight.

The road to federal regulation of coal ash began in 2008 when a container wall broke at a pit in Kingston, TN. More than one billion gallons of coal ash slurry spilled across 300 acres.

It took lawsuits, the Obama administration and political will in the U.S. Senate to establish federal regulation for coal ash in 2015, creating safeguards against site failures. The Biden administration added a major change to the rule in 2024, requiring power plant operators to monitor and clean up inactive or legacy coal ash pits at closed power plants.

Lisa Evans, senior counsel with Earthjustice, said the law was just about to bear fruit when the EPA pushed to next year the February 2026 deadline for power plant operators to identify those legacy sites.

Overall, the newly proposed rules leave many groundwater monitoring and cleanup standards up to the states. For example, states could set their own safety limits for contaminants in groundwater, create rules for uncontained coal ash piles and establish groundwater monitoring standards.

However, environmentalists are most



Tyler Frankel (left) of the University of Mary Washington samples the James River in Virginia for traces of metals associated with coal ash. (Courtesy of Tyler Frankel)

concerned about legacy sites where utilities have dumped their coal ash for decades and were therefore grandfathered in the 2015 rules. Under the proposed rules, a coal ash dump can be considered “closed” — or safely shut down — if a state oversaw the

ash removal; it was completed before Nov. 8, 2024; and groundwater impacts were considered. Beyond that, it would be up to the states whether cleanup would be required. This is assuming the utility monitored groundwater contamination, and many didn't for legacy sites before 2024.

Plus, utilities wouldn't have to conduct an environmental assessment for using coal ash as soil. Tyler Frankel, ecotoxicologist at University of Mary Washington, said that could lead to contaminants leaching far beyond the intended area.

The EPA announced on May 14 that it will extend wastewater compliance deadlines for coal plants as well. This wastewater can carry pollutants that leach out of coal ash dumps. The plants will only have to treat contaminated groundwater if they pump it to the surface as part of a groundwater cleanup. Contaminated groundwater that reaches waterbodies would be exempt.

The proposed rules are a response to requests for more flexibility from the Utility Solid Waste Activities Group (USWAG), which represents the power generation sector for waste issues.

“While we are still reviewing the proposal, USWAG supports changes that move away from the existing ‘one-size-fits-all’ framework and incorporate site-specific flexibility,

an approach that is common in other environmental programs,” John Mavretich, executive director of USWAG, wrote in an email.

For instance, the proposed rules include allowing groundwater monitoring stations to be up to 500 feet away from the potential source of contamination instead of at the edge even when it's impracticable. That way, operators have flexibility because each site is different. However, Earthjustice worries this could be used as a “zone of contamination.”

“It's basic fairness [to say] the utility didn't put sufficient resources into disposing of their waste safely in the first instance,” said Evans of Earthjustice. “They should disclose where the waste is and then pay for the cleanup of the mess they made.”

USWAG stated in its 2017 petition to the EPA that the 2016 Water Infrastructure for Improvements to the Nation Act could provide flexibility. It allows states to regulate coal ash disposal with their own EPA-approved permit programs.

“It's not only an opportunity. It's an imperative. If a state wants to protect its water resources and the health of its citizens, it must ignore what the federal EPA is doing and establish protective regulations,” Evans said.

So far, states in the Chesapeake Bay watershed are stepping up. The Virginia Department of Environmental Quality proposed its own coal combustion residuals permit program in 2025. There will be a public hearing June 24 on the EPA-approved permit program. Virginia's program adopts federal rules from 2020, such as classifying clay-lined pits as unlined and requiring liners on all coal ash sites.

An existing Virginia law also requires operators of coal ash landfills or pits in the Bay watershed to move the ash into lined landfills or recycle the ash into concrete or other materials. Dominion Energy must recycle at least 6.8 million cubic yards of the ash from at least two of its four plants and safely dispose of the rest in a lined landfill by 2032, or by 2039 if the plants switch from coal to natural gas.

Meanwhile in Maryland, that state's General Assembly passed a bill last year that adopted the more restrictive 2024 federal rules and created a fee system that will pay for environmental impacts. The Maryland Department of the Environment has until Oct. 1 to complete its draft regulations. ■



The Possum Point Power Station on the Virginia shore of the Potomac River burned coal from 1948 to 2002, using expansive ash-filled ponds to store the coal ash waste. (Courtesy of Dominion Energy)

'Live-stake' streamside buffer plantings reach 100,000 in PA

Cuttings from some species of wetland trees and shrubs take root and grow

By Carolyn Beans

At first glance, the vegetation along the narrow creek in East Buffalo Township's Turtle Creek Park looks much like many other Pennsylvania streambanks degraded through centuries of development. There's a thick blanket of invasive species — largely reed canary grass — and not much in the way of tree cover.

But a closer look reveals something else popping up through the grass. Roughly foot-long sections of branches, cleanly lopped off at the top, protrude from the ground every few steps along a roughly 1,000-foot stretch. Most of them have put down roots and sprouted branches bearing leaves of the silky dogwood, a native shrub.

The sticks are, in fact, "live stakes" — branches cut from live wetland trees and shrubs and thrust into the ground by volunteers with the Live Stake Collaborative. The collaborative supports three riparian restoration initiatives led by the Chesapeake Conservancy.

In time, these stakes, planted in 2023 and 2025, will grow into shrubs large enough to shade out the invasive grass. As they mature, they'll soak up nutrients washing into the water from upland farms — turning excess nitrogen and phosphorous into native plant tissue rather than pollutants flowing into the creek and, ultimately, the Chesapeake Bay. Their deepening roots will secure the creekbank, preventing erosion.

These benefits will have been accomplished with little more than loppers, pruning shears and a team of enthusiastic volunteers.

Live staking is not a new restoration tool. It's been known for centuries that cuttings from certain plants, though certainly not all, will sprout new roots, stems and foliage when immersed in water or wet soil. But the Live Stake Collaborative, founded in 2019, has expanded the technique's use in planting forest buffers along streams, courtesy of refrigeration. This spring, the group announced that they have planted 100,000 live stakes on almost 40 acres along Pennsylvania streams with the help of more than 1,000 volunteers.

People are drawn to the project because they quickly see the impact of their work, said Michaela Rolecki, an AmeriCorps member and current volunteer coordinator for the Chesapeake Conservancy. "You can



A live-staked elderberry sprouts new growth at a demonstration buffer at Susquehanna University. (Chesapeake Conservancy)

literally put a stake in the ground and come back the next year and see it growing."

The program began in 2019 when aquatic ecologist Adrienne Hobbins, a program manager at the Chesapeake Conservancy, first learned that a nursery operated by the Pennsylvania Department of Conservation and Natural Resources (DCNR) was refrigerating live stakes until they were ready to plant them.

Hobbins had been part of a team that helped restore a watershed with live stakes purchased from a nursery. She also knew of conservation groups that saved money by cutting and then immediately planting their own live stakes, but that approach was only possible within a narrow timeframe each spring. If stakes can be kept refrigerated, Hobbins realized, volunteers could collect them all through winter and early spring.

"It just gives you a lot more flexibility on timing," Hobbins said.

Hobbins and the Chesapeake Conservancy teamed up with Susquehanna University, DCNR, Bucknell University and the Merrill W. Linn Land and Waterways Conservancy to assemble and train volunteers to cut live stakes. Approximately 25 helped that first year.

Since then, more groups have joined the



Matthew Wilson of Susquehanna University examines new growth from a live stake planted along Turtle Creek in Pennsylvania. (Carolyn Beans)

collaborative to provide volunteers, as well as knowledge about where stake collectors can find healthy stands of native wetland trees and shrubs. Homeowners often invite cutting teams onto their land.

Collections begin each fall after plants have gone dormant. A single long branch about the width of a finger can quickly be cut into several stakes about two feet long. Rolecki estimates that she and a group of seven volunteers can collect around 1,000 live stakes in about four hours.

They refrigerate the stakes until spring, when they hand over garbage bags full of them to conservation organizations, who plant the stakes along degraded streambanks. Volunteers tap the stakes with a mallet or simply push them in.

"We have some sites that are so wet, you can just [push the stakes into] the ground, and you can probably get a couple done in a minute," Rolecki said.

With the right species and in the right conditions, many of the stakes break dormancy and grow roots and branches in their new home.

The process is much faster and cheaper than planting saplings. But live stakes only work at locations where their bases reach the water table, which restricts their

use to within about 15 feet of a stream. For streams with especially steep banks, volunteers may only be able to plant into the bank itself. So, in some instances, the conservancy and their partners use both techniques: live stakes where they are viable and saplings where they are not.

Live staking is not nearly as widely practiced or well-studied as tree planting. Exactly why the approach works with some woody wetland species and not others isn't yet clear, said Matthew Wilson, a stream and restoration ecologist at Susquehanna University, who has been involved with the initiative from the start.

In 2019, Wilson and Hobbins set out to learn more about live stake survival rates by planting 1,800 stakes from eight species commonly used in streamside restorations. In 2023, they reported that there was huge variation in survival to one year. Silky dogwood plantings had a 67% survival rate, while only 9% of red osier dogwoods and 1% of gray dogwoods survived. Buttonbush performed about as well as the silky dogwoods. Not a single spicebush survived.

"There's got to be something species-specific about the physiology," Wilson said.

Matthew Baker, a watershed ecologist at the University of Maryland Baltimore County who is not involved in the Live Stake Collaborative, hadn't heard of planting live stakes as a streamside buffer strategy before the recent milestone announcement. But the approach immediately made sense to him because many wetland species spread through a similar natural process, called fragmentation, where portions of their branches break off, get carried along the waterway, and then root and form new trees. Staking, he said, seems to be mimicking that process.

One challenge moving forward is finding enough source shrubs and trees for new stakes. The team is careful not to damage healthy riparian buffers by overharvesting stakes in any one spot.

But in time, their own stakes — fully grown into shrubs and trees — could become source material. The team already collected from one of their earlier planting sites that really took off, Wilson said. "The willows are taller than me." ■

Carolyn Beans is a freelance science writer based in Pennsylvania.

This stream stayed mostly clean. It didn't happen by chance.

County and state protections have shielded Deer Creek from intense development

OUR WATERWAYS

By Jeremy Cox

Editor's note: This article is part of a series, Our Waterways, 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.

As someone who makes a living studying aquatic life in waterways across the Mid-Atlantic, Rich Raesly has seen his fair share of streams. And Deer Creek is one of his favorites.

"It really is a special place," said Raesly, who has worked as a biology professor at Frostburg State University in Maryland for nearly four decades. "It truly is one of the more diverse streams in the state."

Deer Creek, which winds from its source in southern Pennsylvania about 53 miles to the Susquehanna River in northeastern Maryland, is almost universally held in high esteem. Many of its fans point to a 2005 survey that ranked Deer Creek third in species diversity among 84 watersheds in Maryland.

Things could have easily turned out differently. About 80% of the creek's watershed lies in Maryland's Harford County, which from 1940 to 1970 saw its population surge 229%. It looked like only a matter of time before sprawl would replace the farms and forests around Deer Creek.

The inflection point in the creek's modern history came in 1977. That's when county leaders established a "development envelope" to concentrate new construction into the lower half of the county. Today, 99% of the Deer Creek drainage basin lies outside that envelope, shielding it from intense development.

"Historically, the county has been agricultural, and a lot of people wanted to keep it that way," said Charles Filburn, president of the Deer Creek Watershed Association, a nonprofit environmental group founded in 1966. "If you don't slow [development] down, you're going to lose a lot of the agricultural character."

Keeping new construction at bay also has helped sustain Deer Creek's health,



David Boniface of the Deer Creek Watershed Association paddles a section of the creek near the Benjamin's Bridge launch site in May. (Jeremy Cox)

environmental advocates say.

Experts say that "impervious cover" — such as roads, driveways, rooftops and parking lots — is a recipe for excess stormwater pollution and harmful algae blooms in receiving waterways. It is widely held that 10% of such hardening across a watershed is the tipping point at which a stream displays measurable degradation. Deer Creek's watershed remains at less than 5%.

County executive Bob Cassilly said next year's 50th anniversary of the development envelope is a cause worth celebrating. Those who supported its creation were "very forward-thinking," he added.

"I feel a lot of pressure on me at this point in our county not to let those folks down," said Cassilly, a Republican and former state senator, "because I know that what I've got now to work with is because of what they did."

Bay Journal reader Lars Skinner nominated Deer Creek for this series. He loves to hunt and hike in the area and hopes that future generations can enjoy it as well.

"Deer Creek to me just represents habitat we should be trying to save and protect," said Skinner, a retired Army colonel who lives in Aberdeen. "I wouldn't call it pristine, but it's as good as you'll get around here."

There are no guarantees that the estimated 86,000 acres of Deer Creek watershed within

Harford County will remain in their mostly bucolic state. The county lies along Interstate 95 between two major urban areas: Baltimore to the southwest and Philadelphia to the northeast. New residents looking for a slower pace of life continue pouring into its borders, Cassilly said.

And then there is growing development pressure from relatively new directions — data centers, mega-warehouses and solar farms — that require large expanses of open land.

Deer Creek is far from the only rural watershed facing potential development incursions in the Mid-Atlantic. But local advocates say it stands at an advantage because about one-third of the creek's watershed in Maryland is already protected from bulldozers.

The vast majority of that total has come from farmers agreeing to keep growing crops on their land instead of selling it to developers. In exchange, they receive one-time payments from land-preservation programs.

"It's not going to get into any development. It's not going to be in industrial sites. It's going to stay in agriculture," said David Boniface, a farming consultant and Deer Creek Watershed Association board member.

But therein lies another challenge to water quality. Farms themselves can be major

sources of stormwater pollution, unleashing nutrients and sediment into nearby waters. So, Boniface said he works with farmers to apply the right amount of fertilizer, at the right time and only where it's needed.

On a recent spring morning, he pushed his kayak into the creek at an access point called Benjamin's Bridge to observe the fruits of his labor. "You can see it right here," Boniface said as he paddled upstream against a moderate current. "We can see the bottom. If it was 20 degrees warmer, we'd want to jump in."

That's not unheard of. Deer Creek is popular for all kinds of recreation, but especially swimming. Much of its course through Maryland is flanked by parkland, namely Rocks, Palmer and Susquehanna state parks.

"Considering how close we are to Baltimore and I-95, it's really impressive how much preservation has gone on in that area," said Kristin Kirkwood, executive director of the Harford Land Trust.

Deer Creek's relative cleanliness has been a boon to other living organisms as well. The Maryland Department of Natural Resources, for example, has deemed its freshwater mussel community to be the best of its kind in the state's piedmont region.

It is also an important refuge for anadromous fish — species that hatch in freshwater, spend most of their lives in the ocean and return to freshwater to spawn. Species such as shad, eels and herring used to swim far up the Susquehanna River, but the Conowingo Dam, built in 1928, stops most of them, fish ladders notwithstanding.

Because Deer Creek lies below the dam, its waters remain open to them, Raesly said.

"As they come up the Susquehanna, they hit that dam and mushroom out into some of those tributaries that include Octoraro [Creek] and Deer Creek," he said.

But the creek's life-sustaining powers have their limits. A small fish called the Maryland darter once inhabited the Susquehanna and several of its tributaries. But by the time scientists recognized it as its own species in 1912, its population was already dwindling. In 1988, Raesly was the last human to record a sighting. It was in Deer Creek.

"It's a pretty good bet it is extinct," Raesly said. ■

Scientists weigh Bay cleanup benefits, challenges posed by AI

Used properly, AI could speed up restoration progress and monitoring, but there are limits

By Karl Blankenship

Artificial intelligence has the potential to be a “transformative tool” in understanding the Chesapeake Bay and improving restoration efforts, according to a recent report by Bay scientists.

AI helps sort and interpret immense amounts of data, allowing instruments like high-resolution maps to track land use change in detail never before possible, according to the state-federal Chesapeake Bay Program’s Scientific and Technical Advisory Committee (STAC). It has the potential to more precisely manage nutrients on farmlands, assess cleanup progress and help prioritize efforts.

But AI has triggered increased construction of massive data centers that have potentially negative consequences on the environment. They often rely on power sources that spew pollutants into the air, draw billions of gallons of water from the region’s aquifers and rivers, and create massive concrete footprints that can spell doom for local stream health.

Those tradeoffs were apparent at the committee’s virtual meeting in April, focused on the opportunities for AI to help the Bay restoration.

The committee, which issued a report about the transformative potential of AI for the Bay last year, began its April meeting with a disclaimer: “STAC acknowledges the many concerns about ethical and environmental impacts of AI usage, including water and energy usage, land use and potential community impacts.”

The statement, as much as anything, highlights the mixed-bag AI creates. It is already used effectively to improve forecasts of storm surges, surface waves, saltwater intrusion, oxygen levels in the Bay and harmful algae blooms.

It’s essential in sorting through the huge amounts of satellite imagery used to create high-resolution watershed maps, which are used to assess land use changes and predict future ones — all of which can aid decision-making and accelerate environmental efforts.

The Bay is uniquely situated to benefit from the new technologies. It is one of the best-studied and best-monitored coastal regions in the country.



Artificial intelligence relies on data centers that can have significant environmental impacts, but it could potentially improve Chesapeake Bay restoration efforts. (Dave Harp)

“Here in the Chesapeake, we have long-term monitoring, and we have data from all different sources,” said Qian Zhang, an associate research scientist with the University of Maryland Center for Environmental Science (UMCES), who chaired last year’s STAC workshop and spoke at the April meeting.

The sheer amount of accumulated data poses challenges, though, causing some of their potential to go untapped. It’s also not just one big pile of information: It’s data from many different sources, collected for many different reasons. “AI can both help us leverage that data and also integrate different data sources,” Zhang said.

Victoria Coles, an UMCES professor, touted the potential of AI to help with mundane jobs, such as identifying phytoplankton species in water quality samples. But developing AI models and “training” them with datasets is an energy-intensive task. Researchers, Coles said, need to consider whether the information gained is always worth the cost.

“We should be thinking about what is the incremental improvement in our modeling capacity and what is the energetic cost,” she said. “There’s no debate about whether we should be using AI, but we also need to be [asking if a 1% improvement] in model accuracy is sufficient to justify large training costs.”

AI does not eliminate the need for labor-intensive tasks such as collecting real-world monitoring data needed to feed models, or

to “ground truth” the results they produce.

Also, although AI can produce information quickly, it’s often unclear how AI models actually work. Scientists often describe them as “black boxes” and have raised concerns that, in some cases, they could produce results that look plausible — but for the wrong reasons.

Because of that, scientists warn that there should be limits on the ways that AI is used, especially in management and decision-making.

Those ethical questions were highlighted by Brian Erickson, a social scientist at Oregon State University who surveyed dozens of state and federal agency officials involved in reviewing public comments related to environmental rules.

Some felt AI would be helpful with the otherwise tedious job of reviewing the thousands — even hundreds of thousands — of public comments received about major rules. Some said it had the potential to remove bias, Erickson reported.

But because it’s not always clear what’s happening “under the hood” with AI models, others worried about accuracy and about losing nuance and context in comments. Agencies are typically required to review all substantive comments, and failure to properly evaluate them could lead to lawsuits.

One told Erickson: “When we’re in the business of working with people’s concerns and feelings that impact their everyday life or their business or their community, I’m

not really eager or interested in giving up my human interaction with that to save work time.”

But streamlining and accelerating some Bay conservation work might be more straightforward. For instance, to meet requirements of the state-federal Bay Program, conservation district staff spend large amounts of time verifying that farm and urban stormwater best management practices, like stream buffers and cover crops, are in place.

Using satellites, drones and other remote sensing technology along with AI could save time ensuring those measures are on the ground. That would free conservation districts to work with farmers and other landowners to implement new practices, rather than counting old ones.

“A lot of the professional conservation community is being asked to do the job of verification and it, in a lot of ways, can take away from tasks that they’re doing to put new conservation on the ground,” said Matt Royer, director of the agriculture and environment center at Penn State University.

One example of how AI could accelerate implementation is the “Conservation Concierge” under development by a nonprofit called the Commons, which uses high tech services to promote conservation efforts.

The tool uses satellite imagery, watershed information and other data to assess conservation practices that might be suitable for a particular farm. It also analyzes where those practices should be used and what state, federal or other funding sources could support it.

And AI can do it quickly. “It takes it less than two minutes to generate this kind of information, whereas if you’re doing it the old-fashioned way, it might be a couple of months,” said Alex Echols, the agriculture program strategist with the Campbell Foundation, which is funding the effort.

It doesn’t replace the need for conservation professionals, but it can allow them to work with more farmers, reduce red tape and get better results, he said.

Echols described himself as a bit of an AI skeptic and a “dinosaur,” but he said the technology can transform the current “clunky” system, which is critical if restoration goals are to ever be met. “To have this dinosaur, of all people, talking about AI is funny,” Echols noted. ■



Water quality standards and the Chesapeake Bay

Every summer, swimmers wade into water of the Chesapeake Bay region. Anglers cast lines, and watermen harvest crabs and oysters. And every year, scientists and regulators ask, “Is the water clean enough?”

The answer depends on how you define “clean,” and that definition is complex. Behind every headline about algae blooms, dead zones or pollution limits is a framework of legal thresholds, scientific measures and government responsibilities that most people never see.

Jackie Goodrum, an attorney with the Chesapeake Legal Alliance, explains the basics.

Question: What are water quality standards, exactly?

Answer: Water quality standards are legal thresholds set by states and approved by the federal government. They define what a body of water must achieve to support its intended uses, such as swimming, fishing, providing drinking water or sustaining aquatic life. When Congress passed the Clean Water Act in 1972, they made it unique in terms of timing and purpose, pushing for more progress and more stringent permit limits until all of the standards are achieved. Congress also set an enforceable goal in the 1980s to make all U.S. waters swimmable and fishable — which might surprise many people in the Bay region.

Water quality standards have three components: designated uses (what the water is supposed to be good for), numeric or narrative criteria (the measurable conditions required to protect those uses) and policies that prevent backsliding.

For the Bay, water quality is based on three main criteria: dissolved oxygen

(the amount available for fish and other aquatic life), water clarity (measured largely through the health of underwater grasses) and chlorophyll-a (which indicates algae growth fueled by nutrient pollution).

The Bay watershed has 92 tidal management sections that cover the Bay and some of its rivers. Each one has its own criteria based on local conditions. That’s because healthy water in a shallow Potomac tributary looks different from healthy water in the Bay’s deep mainstem.

In 2010, the U.S. Environmental Protection Agency took an unusually direct step to improve Bay water quality by establishing its total maximum daily load or “pollution diet.” It defines the amount of pollutants that the water can receive and still meet all applicable standards. The Bay TMDL is the largest ever developed. It set caps on nitrogen, phosphorus and sediment coming from the entire 64,000 square-mile watershed across seven jurisdictions. Still, only 29.4% of the Bay and its tidal rivers met water quality standards during the most recent assessment period in 2021–2023.

Q: Who sets and enforces these standards?

A: The Clean Water Act establishes the national framework. But primary responsibility for writing the standards into law belongs to states and tribes, which adopt their own standards that the EPA must review and approve. The Bay’s situation is unique, because the states adopted criteria for dissolved oxygen, water clarity and chlorophyll-a that were developed and recommended by the EPA. Also, the standards are locally tailored and cover Bay tidal segments as well as some streams and rivers.

Enforcement is layered. The EPA oversees the big picture: reviewing lists of impaired waters, evaluating progress and imposing consequences when progress falls short. But the pollution permitting process is where the oar meets the water. State environmental agencies issue and enforce discharge permits that must be consistent with TMDLs. In theory, and spurred by a 2025 U.S. Supreme Court decision, state agencies could place numeric pollution limits directly into the permits.

Q: Which level of government has the most power to protect waters near me?

A: The federal Clean Water Act establishes a baseline that no state or locality can legally fall below. But states hold significant power: they write the criteria for what healthy water looks like in their jurisdiction and decide how to reduce pollution through permitting and enforcement. Local governments regulate land use and have a big role to play in controlling polluted stormwater runoff. The Clean Water Act recognizes the critical need to control runoff from nonpoint sources, like agriculture, but leaves policy development to the states and local governments.

Q: How do I know if my local waterway is failing?

A: Every state must publish a list of waterways that don’t meet standards. This is the previously mentioned impaired waters list. Each listing specifies the offending pollutant and its cleanup priority.

States and tribes submit these lists to the EPA in even-numbered years. If a state or tribe omits waters that should be included, the EPA can add them.

You can search for local waterways in

your state environmental agency’s impaired waters database, the EPA’s TMDL search tool or the Chesapeake Bay Program’s watershed assessments on its website. Note that while there are tens of thousands of chemicals known to science (and registered by the EPA), only a few pollutants are addressed in the impairment lists and TMDLs.

Q: Do the standards change? How often?

A: Yes, and the pace matters. The Clean Water Act requires states and tribes to review standards every three years, though reviews are often delayed and revisions infrequent. Any change requires public comment and EPA approval. States can strengthen standards or propose weaker ones.

For the Bay, the core criteria have been remarkably stable since their development in 2003. The 2010 TMDL limits remain in force. But the 70,000-plus TMDLs in place across the nation are rarely revised or, sadly, achieved. For the Bay, shifts occur more regularly with the two-year milestone commitments that each state submits, allowing incremental course corrections.

The central question for Bay water quality is what comes next. Cleanup leaders did not meet their voluntary 2025 deadline for the TMDL. But the standards haven’t expired, and the TMDL is still in effect. The question is whether the will exists to provide enforcement mechanisms or to reallocate the responsibilities among polluters in order to make them more enforceable. The next generation of policymakers will also have to account for a changing climate, too. ■

Photo: Container ships travel past the beach at Sandy Point State Park in Maryland. (Steve Droter/Chesapeake Bay Program)

Proposed data center power line gets pushback in Northern VA

Route could impact park, school grounds — and a conservation easement

By Lauren Hines-Acosta

Lauren Lillestolen of the Coalition to Protect the Broad Run Stream Valley was walking through grasslands in Loudoun County, VA, when she suddenly crossed paths with a buck. The deer was just as surprised to see her and ran away, leaving Lillestolen to continue following the route where a power line might cut through her community.

On April 9, the Virginia State Corporation Commission approved the Golden-Mars transmission line, which is designed to supply energy to internet-enabling data centers. The exact route remains uncertain as opponents leverage conservation easements to delay the project.

The transmission line is one of three projects that make up what Dominion Energy calls its Loudoun Reliability Loop. The lines will connect the Aspen, Golden, Mars and Wishing Star substations near Ashburn, VA. The region is home to Northern Virginia's Data Center Alley, which consists of about 200 data centers.

The Golden-Mars power line is the final section of the loop. The towers would carry 500- and 230-kilovolt lines and cost about \$513 million. To ensure grid reliability, Dominion says, it must bring this online by June 1, 2028.

PJM Interconnection, which operates the power grid in the mid-Atlantic region, found that in some scenarios Dominion won't have enough energy for eastern Loudoun County by the summer of 2028. If a part of the power line system were out of service, PJM found, Dominion couldn't reliably provide 300 megawatts by then. The state commission said that data centers are primarily responsible for the increased demand.

Loudoun County has welcomed data centers and their tax revenue for decades. The county raked in \$875 million from the facilities in 2024 alone for roads, schools and transit. But now the region is paying the physical costs, with power lines that might go through green spaces and people's backyards — people like Vicky Hu.

"All this mess is because of the board of supervisors," said Hu, a real estate agent. "They approve something they don't understand."



Lauren Lillestolen of the Coalition to Protect the Broad Run Stream Valley walks near Rock Ridge High School in Ashburn, VA. The Golden-Mars transmission line might cross its grounds. (Lauren Hines-Acosta)

Last year, the Loudoun Board of Supervisors suspended the county's by-right development rule for data centers, meaning that the board must now approve every project. More data centers are requesting approval while the state is already expected to provide 14 gigawatts of energy by 2030 for the county.

The Loudoun Valley Estates Home Owners Association filed a petition on May 8 asking the commission to reconsider its approval of the Golden-Mars line. The group argues that it serves private interests and that data centers should pay for it.

"We've made a commitment as a society that there's certain infrastructure that everybody's entitled to," said Julie Bolthouse, land use director with the Piedmont Environmental Council. "Now, the problem is that we never envisioned that our grid would be so hijacked by a single industry."

Community members, county supervisors and the county school board have all advocated for burying the lines to avoid impacting homes. The commission ruled that it is possible but not "practicable." Dominion's proposed routes that included

partially buried lines could cost more than \$1.2 billion.

The Virginia General Assembly passed a bill this year that could lower the cost by allowing the state commission to approve up to four new underground 500-kilovolt power line projects. Any county that supports such a project would pay for half of the cost. The commission approved the Golden-Mars line before the bill was signed, though, so the homeowners association is asking the commission to retroactively apply the new law to the project.

Dominion Energy presented multiple routes for the transmission lines. The commission ruled that the shortest proposed route, option 4, would have the least impact. It's about eight miles long with over half of it along existing power lines. It impacts 69 homes within 500 feet of the towers, the fewest of all the options. Hu's property would not be affected.

"We were presented with multiple terrible routes, and it very quickly became apparent that these routes pitted neighbors against neighbors and split communities," Supervisor Koran Saines wrote in an email.

Option 4, though, crosses elementary and high school property and, because public land cannot be claimed by eminent domain, the Loudoun County Public Schools could block that route. The school board did not respond to the *Bay Journal's* request for comment.

If the school board blocks option 4 and all other options going through school property, that leaves option 3A as the only route that doesn't involve school grounds. But it would be within 500 feet of more than twice as many homes and would go through Broad Run Stream Valley Park. Broad Run is a tributary of the Potomac River.

Rock Ridge High School's cross-country team uses the park, and its science classes take water samples from the stream. According to the Virginia Natural Heritage Data Explorer, a mapping tool by the state's Department of Conservation and Recreation, the park is also part of the county's few designated wildlife corridors.

Both routes impact about 30 acres of wetlands and 65 acres of forestland. Aisha Khan, Dominion Energy spokesperson, said option 4 wouldn't involve any in-stream work and therefore would minimize impact on the yellow lampmussels in Broad Run.

Option 3A would go through a county conservation easement. Virginia's Open Space-Land Act says the landowner can allow development on the parcel, but only if it is replaced by land of equal ecological value. The coalition's conservation consultant argues that there is no replacement of equal value because the parcel connects two ecologically sensitive areas.

"What does even AI matter when we have no clean water to drink, healthy food to eat and clean air to breathe?" Lillestolen said.

Despite the state commission's ruling, the homeowner's association is holding out hope for putting the transmission lines underground — and they're getting closer to that goal. To block route 3A and preserve green space, the association is considering transferring land along the route to the school board. Their strategy is to make Dominion reconsider underground options or go back to the drawing board with routes through commercial corridors.

Their plan, though, hinges on the school board accepting the land and blocking eminent domain. ■



Get a preview of MD's newest state park at Wetipquin Creek

By Jeremy Cox

Maryland has 23 counties. All are home to at least one state park, except one. Wicomico County lies on the bucolic east side of the Chesapeake Bay, tucked below the Nanticoke River and the Delaware state line.

It has more than 60 locally run recreation facilities dotting its landscape. There are several state-maintained spots, including wildlife management areas and scattered pockets of state forest lands. Half of the county's terrain is either a forest or a wetland.

Yet there are no state parks.

The Maryland Department of Natural Resources, the parent agency of the Maryland Park Service, is now doing something about that. In February, the state closed on the purchase of 445 acres of land along Wetipquin Creek, seeking to transform it into Wicomico's first state park.

The park is still in the early phase of planning and development. There's no timetable yet for its opening, said Aubrey Kurtz, who manages the Wetipquin site along with two established Dorchester County state parks, the Harriet Tubman Underground Railroad State Park in Church Creek and the Bill Burton Fishing Pier State Park in Cambridge.

Wetipquin Creek meanders through brackish marshes and breeze-blown oaks and pines in the far western portion of the county. It twists and

turns for a total of about 3 miles in a generally westward direction before emptying into the Nanticoke River, the second-longest Chesapeake Bay tributary on the Delmarva Peninsula.

The park's planners envision educating the public about not only the region's ecology but also its history. The purchase includes a stately house built in the mid-1700s. Known as Long Hill (it's not much of a hill), the yellow-painted plantation house faces Wetipquin Creek about halfway down the its length.

The setting will allow for interpretation of the lives of the enslaved people on the property, the indigenous peoples of the region and the farmers who helped launch the Eastern Shore on its agricultural trajectory, Kurtz said.

Her department will lean heavily on community input as it pieces together the park's layout and offerings, she added. Nature has already provided a wealth of options, from wetlands and forests to tidal marshes and meadows.

"These all bring with them opportunities for people to come out and really immerse themselves in the natural world," Kurtz said.

While the house and surrounding property aren't open for visitation yet, people can certainly explore the creek, she added. There's a county-operated boat ramp on the Wetipquin just a few hundred feet upstream from where the creek joins the Nanticoke. The creek is navigable by kayak or canoe upstream as far as the Nanticoke



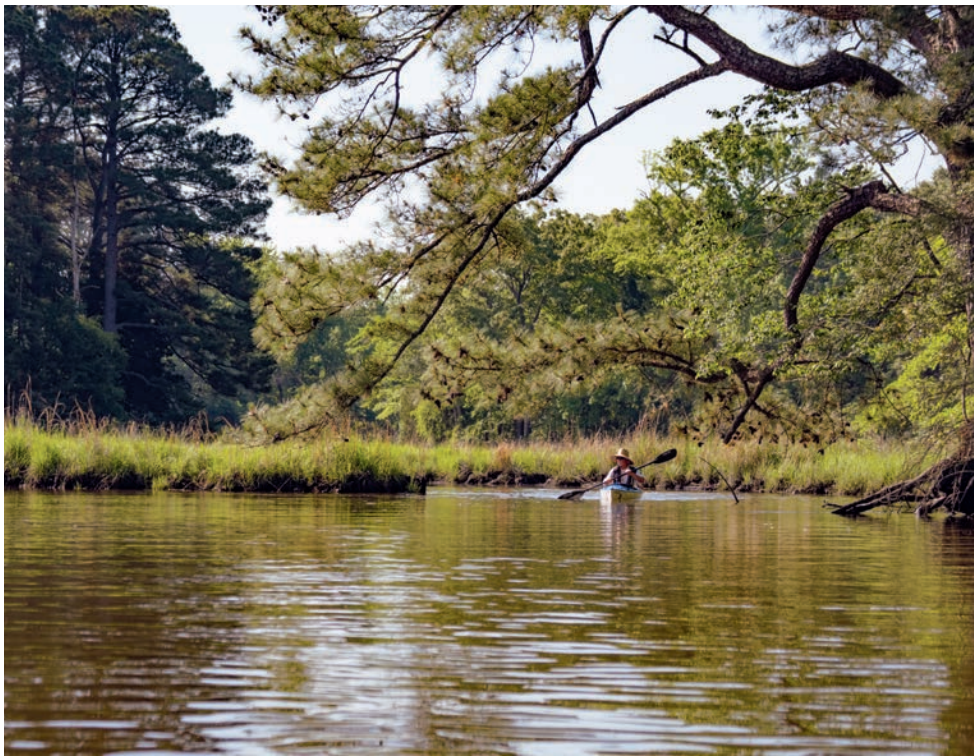
Road bridge — virtually its entire length.

But you'd better be prepared for twists and turns. I've paddled the Wetipquin twice and quickly lost count on both occasions of how many bends I navigated. And these are turns of the hairpin variety, like a watery switchback trail. Around every corner is a mystery to be explored.

My latest outing came on an almost-too-hot afternoon in the middle of May. I was joined by

Top photo: Wetipquin Creek in Wicomico County, MD, folds into hairpin turns on its course to the Nanticoke River. (Dave Harp)

Bottom photo: A sign at Tyaskin Park in Wicomico County, MD, lists launch sites for Wetipquin Creek. (Dave Harp)



Wetipquin Creek in Wicomico County, MD, has many scenic bends. (Dave Harp)



The Long Hill plantation house, built in the mid-1700s, will be part of the new Wetipquin Creek State Park on Maryland's Eastern Shore. (Dave Harp)

a couple of church pals on the inaugural voyage of our congregation's paddle club. We gamely put in at the concrete ramp, scraping along on our hulls until there was enough water to carry us. (Memo to park planners: A dedicated kayak launch along the creek would be a nice upgrade.)

Immediately, we had to decide whether to go left into the wide waters of the Nanticoke or right into the relative calm of the Wetipquin. It wasn't a difficult decision: We turned right. Not that there's anything wrong with the Nanticoke. Heck, it was good enough for Capt. John Smith during his famous expedition around the Chesapeake Bay in 1608. But beware: The Nanticoke is more than a mile and a half wide here, so you may find the limits of your endurance in all that wind, current and tidal pull.

As we eased our way up the Wetipquin, we passed under a two-lane bridge. There was only a foot or two of clearance between the top of our heads and the road deck. To everyone but adventurous powerboaters, that's a good thing. It reduces human-caused damage to the creek's fragile shoreline and preserves its overall peaceful atmosphere.

Almost immediately, we came to another decision: Go left into the Wetipquin's mainstem or turn right into a feeder stream called Tyaskin Creek. We turned right.

Some context may help explain our decision. The wind was blowing around 20 mph, and it was one member of our party's first attempt at kayaking. The Tyaskin is a bit narrower

than the Wetipquin. We also were concerned about the Wetipquin's tides, which can test even an experienced kayaker's stamina.

We decided that discretion was the better part of valor and turned into the quieter stream.

Tyaskin Creek bears off toward a blink-and-you'll-miss-it community of the same name. There are a couple of country homes protruding into view but no more than you see on the Wetipquin. We enjoyed the refuge of the smaller stream, taking ample time to soak in the calls of red-winged blackbirds and the distinctive whoosh of wind through pine needles.

If you look at both creeks from high above, you can see how the waterways are woven into a broader geography. The low-lying topography is hemmed in on three sides by patches of grain-growing fields and dark green woodlots. But a buffer of marsh extends for hundreds of yards in every direction around the creeks, protecting not only the viewshed but also an estimable habitat for wildlife and birds.

On the land side, you're apt to encounter coyotes, foxes, beavers and white-tailed deer, among other critters. I can personally attest to the presence of foxes. I got into a staring contest with one on a roadside about a half mile from the boat ramp while exploring the area by foot.

The Wetipquin's wetter spots are also an important stopover on the Atlantic Flyway, a major avian migration route along the East Coast. Commonly sighted birds and

waterfowl here include bald eagles, cedar waxwings, tundra swans, ospreys, black vultures, great blue herons and mallards.

The fishing is good as well. You can expect to reel in species like striped bass, channel catfish, crappie, smallmouth bass, longnose gar, white perch — and those now ubiquitous invaders, blue catfish. We asked a man fishing from his dock on Tyaskin Creek what he catches, and he boasted of snagging 37 blue catfish in a matter of hours a few nights earlier.

I reached out later to a couple of professors in the environmental science department at the local university to get their thoughts on the Wetipquin and the state park plan.

"It has the potential to be a very valuable park," said Judith Stribling, an emeritus professor of biology at Salisbury University, "if it's done the right way."

What's best about the Wetipquin is that it's remote and isolated, she said. She hopes that the creek doesn't get loved to death. That's certainly been a concern at several Maryland state parks of late, prompting officials to institute reservation systems during summer weekends to keep overcrowding at bay.

Michael Lewis, another Salisbury environmental studies professor, told me that waterways like the Wetipquin are the key to unlocking public appreciation for Delmarva's nature. When he first arrived on the peninsula more than two decades ago, he set out to hike as many trails as time would allow.

"But it occurred to me that's not the way to appreciate Delmarva," Lewis told me, explaining that there isn't enough elevation to challenge a hiker, and the views are pretty monotonous. "You really have to get out on the water."

Wicomico County is too often overlooked by nature lovers, he said. As the most populous county on Maryland's Eastern Shore, courtesy of Salisbury, it has a reputation as an industrial and commercial hub, overshadowing its plentiful natural amenities.

"There's this notion that if you wanted to appreciate the beauty of the Eastern Shore, you had to go to other parts of the Eastern Shore," Lewis said. "The [new] state park is like a great, big flag saying, 'Here, this is where you're supposed to be.'" ■

ABOUT WETIPQUIN CREEK

Wetipquin Creek on Maryland's Eastern Shore is accessible from the Wicomico Boat Ramp at 21688 Wetipquin Road in Tyaskin.

The 1-acre park there has some parking, a picnic pavilion, a wheelchair-accessible portable toilet and a short wooden pier where folks can crab and fish.

There are no state park facilities yet, and no public access is allowed at the historic Long Hill home, though it can be viewed from the creek.

The mysterious, worrisome case of the vanishing ospreys



CHESAPEAKE BORN

By Tom Horton

Colonial Beach, VA: It was a glorious spring here on the lower Potomac River in 2023 for ospreys and for the townsfolk like Joanie and Barry Millward who applaud their annual return from the tropics and thrill to watch them dive for fish.

This bird of prey, called a fish hawk by some, is known along shorelines from Japan to Australia, from India and the Strait of Hormuz to much of Europe and North America. “Ospreys and people have been overlapping since there were people,” said Alan Poole, author of two books about *Pandion haliaetus*.

In 2023, when Joanie began the Virginia Osprey Foundation out of the couple’s cottage at Colonial Beach, she observed robust production of 55 osprey chicks from 36 active nests around the community. Baywide, ospreys were continuing their heartening comeback from the dark days of DDT — from a historic 1972 low of about 1,500 nesting pairs to an estimated 10,000-12,000 pairs now throughout the Chesapeake Bay region.

Then, a sudden and mysterious population crash: Only five chicks reached adulthood in 2024, eight in 2025. Young ospreys were seen walking aimlessly, dazed and apparently starving. There were fish crows stealing osprey eggs as females left them in search of food the males could no longer provide. Adults were eating their dead babies.

“That is difficult to watch, and the whole town takes it to heart,” Barry said as they prepared for the town’s seventh annual osprey festival this spring.

Baywide, a similar picture was emerging, with poor nesting success throughout 80%



An osprey takes off from a snag on Raccoon Island on Maryland’s Choptank River, carrying what appears to be half of a menhaden. (Dave Harp)

of the estuary and its tidal rivers and an estimated 5,500 young ospreys starving to death, according to Bryan Watts, a Virginia scientist known for his decades of Chesapeake osprey research.

Ecologically, cannibalism of dead young “makes energetic sense when calories are scarce,” says Watts, who is the director of William & Mary University’s Center for Conservation Biology. But, Joanie said, it breaks your heart to watch.

The reversal of ospreys’ fortunes has been dramatic and well documented. While scientists mostly think there is no single cause, the decline has reinvigorated a dispute over the commercial harvest of menhaden by Omega Protein, a Canadian company with a fishing fleet based in Virginia.

Omega’s fleet of six ships, guided by spotter aircraft, takes about 125,000 metric tons of menhaden annually, fishing from the lower Chesapeake and along the Atlantic Coast.

Menhaden are small, oily fish that are packets of superbly calorie-dense energy, beloved by larger fish like striped bass, and by ospreys. Along with tinier but abundant Bay anchovies and silverside minnows, menhaden form the forage base underpinning the Chesapeake’s productivity.

Watts and others have documented that ospreys are doing worst in the saltier parts of the Chesapeake and Atlantic coastal bays where menhaden make up a critical part

of their diets. Only in areas with less salty water, the upper Chesapeake and its tidal rivers, are ospreys producing enough young to sustain their populations — though not enough to offset the plummeting reproduction in the rest of the estuary.

Prey options in fresher water are more varied, with gizzard shad and catfish providing ample calories. Nesting ospreys with young need to catch five or six fish a day to sustain the family.

Of all the world’s hawks and eagles, the osprey is most completely adapted to fish — and obligated to feed exclusively on live fish. (The bald eagle’s embrace of eating carrion caused Ben Franklin to call it a species of “low moral character,” unfit to be the national bird.)

Ospreys’ eyes have about five times the density of photoreceptors of human eyes, enabling them to spot small fish from 100 or more feet aloft. Their legs can extend two feet underwater, further aiding dives at speeds up to 50 mph. Fearsome talons lock from four directions to secure their catch.

One of Watts’s graduate students has shown that osprey reproduction can be revived if humans give them extra menhaden. He has heard from “quite a few people” around the Bay who are feeding hungry ospreys. “I’m fine with that,” Watts said, “but it’s not a solution to the current deficits.”

At a recent osprey conference in Rock

Hall, MD, Montgomery Diehl, CEO of Omega’s harvesting subsidiary, Ocean Harvesters, said their boats take less than 1% of the total menhaden biomass each year.

And, to general agreement from scientists present, he said the Atlantic coastal population of menhaden is healthy and not overfished. But he conceded that the numbers of adult menhaden, the favored prey of ospreys, don’t seem to be entering the Chesapeake like they used to.

Other factors could be contributing to the ospreys’ woes, ornithologists at the conference said. These range from nest predation by increasing numbers of bald eagles, to cooler, wetter spring nesting conditions, to poor water clarity making fishing harder. There may also be more competition for menhaden by fish, like red snappers, that are moving north into the Bay as climate change warms its waters.

Yet another pressure, minor so far but increasing, is that a growing number of non-migratory Canada geese are appropriating osprey nests. That was evident on a recent trip with Watts up the tidal, freshwater portion of Virginia’s James River. We saw several longtime osprey nests atop channel markers that now held nesting geese. The ospreys will be forced into nests on the shoreline that are more subject to predation by raccoons and foxes.

There is also a possibility, based on trends seen in other fish species, that today’s warmer Chesapeake is no longer as inviting to coastal menhaden as it once was.

Bottom line: One of the world’s great fishermen can’t catch enough fish anymore in much of the Chesapeake.

A better understanding of the reasons might come in the next couple of years from the first detailed study of menhaden in the Chesapeake, courtesy of \$2.6 million recently secured by U.S. Senator Chris Van Hollen of Maryland. Let’s hope it gives us some answers. ■

Tom Horton has written about the Chesapeake Bay for more than 40 years, including eight books. He is a professor emeritus at Salisbury University and lives in Salisbury, MD.

CHESAPEAKE CHALLENGE

— Kathleen A. Gaskell



Snappers 2, Dinosaurs 0

A

Snapping turtles look and live much like their ancestors did about 90 million years ago. Nine species survived the great extinction that killed off dinosaurs 65 million years ago. But by 2 million years ago, only two remained: the common and alligator snapping turtles, which are native only to North America. The common snapper (*Chelydra serpentina*) can be found in the Chesapeake Bay region in ponds, rivers, lakes, marshes and even the C&O Canal. Although alligator snappers (*Macrochelys temminckii*) occasionally turn up here, they are believed to be pets that have escaped or been set loose.

Meek & mild: Snappers, as a rule, are docile in water and not considered dangerous unless they feel threatened or are provoked. On land, especially during the breeding and nesting season, what is mistaken for aggression is actually defensive behavior caused by being out of their watery element. They have nasty bites, but there is no record of a common snapping turtle chomping off human toes or fingers. Alligator snappers, on the other hand, have been known to do so.

Snap chat: Snapping turtles make all kinds of noises: hisses, clicks, grunts and squeals.

Mud dragons: This nickname comes from the common snapping turtle's hunting method. They often bury themselves in mud with only their nostrils and eyes exposed. When a fish, frog or small bird passes by, the turtle strikes — instantly lunging as much as a foot to capture its prey with its strong beaklike jaws. Other prey includes smaller turtles, insects, crayfish, carrion and muskrats. They also consume a lot of aquatic vegetation.

You'd be peckish, too, if your bottom didn't fit: The lower part of the shell that shields the snapper's belly region doesn't cover the animal's entire bottom. This makes it impossible for the turtle to retract its limbs and head into its shell, as most turtles do, in response to perceived threats. Instead, it defends itself by snapping or biting with its sharp, beaklike mouth (turtles do not have teeth).

Cold snap: A snapping turtle spends the winter in a state of "brumation," in which its metabolism slows down about 90%. It stays in deep water, which is warmer than at the surface. It doesn't need to come up for air because it can absorb oxygen underwater through cloacal respiration: It diffuses oxygen and carbon dioxide in and out of the vent that is also used to mate and excrete waste.



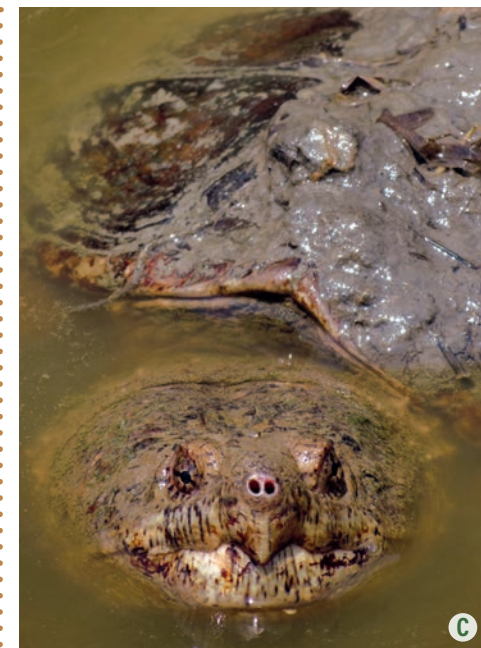
B

Title image: A common snapping turtle pokes its head from a pond. (Rhododendrites/CC BY-SA 4.0)

A A common snapping turtle explores dry land during breeding season at the John Heinz National Wildlife Refuge in Pennsylvania. (Chuck Homler, Focus On Wildlife/CC BY-SA 4.0)

B A clutch of two dozen or more eggs lies in a snapping turtle nest near a riverbank. (spycup/CC BY-SA 2.0)

C A common snapping turtle peers up from a pond in Fairfax County, VA. (Katja Schulz/CC BY 2.0)



C

Ready for turtle trivia?

A turtle's shell is made up of about 50 bones — ribs, shoulder bones, vertebrae — fused together to protect the reptile's vital organs. Match these terms with their description, then answer a couple of true-or-false questions. Answers on page 32.

Bridge	Pyramiding
Carapace	Scales
Plastron	Scutes

1. The part of the shell that covers the turtle's underside. To assist mating, a male's is often concave, while a female's is usually flatter or convex.
2. The dome-shaped top part of the turtle's shell. Each animal has its own unique shell pattern, like fingerprints in humans.
3. Overlapping keratin plates covering the shell that provide extra strength and protection.
4. Bony structure that connects the top and bottom shells.
5. The shedding of the plates on a shell's surface. In addition to accommodating growth, it helps the turtle stay streamlined and removes damaged, infected or algae-covered plates.
6. It covers the rest of a turtle: head, limbs, tail.
7. True or false? A turtle can leave its shell.
8. True or false? The shell is living tissue with nerves and blood vessels that provide a weak sense of touch.

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



Red-eared sliders vie for space to catch some sun on the upper Tuckahoe Creek on Maryland's Eastern Shore. (Dave Harp)

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With the water too shallow to paddle his boat, a kayaker walks toward a slightly deeper stretch of Raccoon Creek, a tributary of Maryland's Choptank River. (Dave Harp)

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James Kraft Towson, MD	Mike Malkiewicz Dover, DE	Jacob Myers York, PA	Paul Pisano Arlington, VA	Diana Schroeher Deale, MD	C.A. Thomas Manakin Sabot, VA	Kathleen & Stephen Witty Woodbine, MD
Dennis Krantz Churchville, MD	Warren Marchioni Caldwell, NJ	Jay Myers Arnold, MD	John Pjura Towson, MD	Heather Schwartz Clarksville, MD	Lydia Thomas Cambridge, MD	Thomas Wray Newburg, MD
Ken Krome Westminster, MD	Deborah Marcuson Lancaster, PA	William Nale McAlisterville, PA	Janet Prechtel Baltimore, MD	Sea Tow Lower Chesapeake Seaford, VA	Jeanne Trott Falls Church, VA	Diane Yeager Falls Church, VA
Michael Kurman Owings Mills, MD	Mar-Len Environmental, Inc. Westminster, MD	Gary Nelson Pasadena, MD	Carole Preston Baltimore, MD	Eddie Seaton Chesapeake, VA	Diane Truhan Zion Grove, PA	Sharye Young Ephrata, PA
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BULLETIN BOARD

EVENTS / PROGRAMS

PENNSYLVANIA

Lancaster Water Week

June 5-13, various locations in Lancaster County. Lancaster Water Week celebrates the 1,400 miles of streams and rivers in Lancaster County and how you can protect them for the future. Enjoy dozens of paddling, exploring and volunteering events. Info: lancasterconservancy.org/water-week.

Creek Stomp

1-3 pm, June 20; Graham Nature Preserve, York. Wade into the creek and flip rocks to see who is living under them, net some fish, learn about stream ecology and the importance of keeping water clean. Ages 5+, under 18 w/adult. \$7.18 pp. Registration: lancasterconservancy.org/events.

National Get Outdoors Day

1-5 pm, June 13; Prince Gallitzin State Park, Patton. Free outdoor recreation fair. Opportunities for the whole family to explore disc golf, geocaching, fishing, archery, kayak instruction, guided hikes, camping and more! Most stations will give you the opportunity to try out a new activity, others will provide information (camping, volunteering). Registration may be required for kayaking. Equipment provided. Free. Info: events.dcnr.pa.gov/event/national_get_outdoors_day_886.

Susquehanna Floating Classrooms

10-11 am, July 7: Take a paddleboat cruise and learn about the geological history of the Susquehanna. 10-11 am, July 14: Learn about local studies of microplastics connected to the river and some potential solutions. Registration: middlesusquehannariverkeeper.org/floating-classroom.html.

VIRGINIA

Seed Bombs

3-4 pm, June 7, 13, 28; James River State Park, Gladstone. In this hands-on program, you'll learn how to make your own seed bombs and discover why pollinator gardens are so important, not just for bees and butterflies, but for the food. A new twist: slingshots for launching your creations! Use seed bombs to start your own pollinator garden and make gifts for friends and family. Free; standard parking/admission fee. Info: dcr.virginia.gov/state-parks/events.

Firefly Hike

8:30-10 pm, June 30; Shenandoah River State Park, Bentonville. June is when fireflies are most active. Learn about firefly mating habits and their unique life cycle on this guided, 2-mile easy hike. All ages; under 16 w/adult. Free; standard parking/admission fee. Info: dcr.virginia.gov/state-parks/events.

Attacking Invasives on Your Woodland Property

10 am, June 20; Middleburg. Learn how to triage your work and some practical suggestions for removing invasives on a woodland walk with a certified wildlife sanctuary property owner. Registration: loudounwildlife.org/events.

Homeschool Programs

10 am-12 pm, June 2 (ages 15+), June 10 (all ages); Leopold's Preserve, Broad Run. Bull Run Mountains Conservancy invites you and your child to spend an adventurous outing interacting with nature. June theme: Freshwater Ecology. \$5 pp (incl. adults). Registration: brmconservancy.org (select "Events").

Naturalist Walk

10 am-12 pm, June 20, July 12; Leopold's Preserve, Broad Run. Guided walk led by a professional naturalist. June: Freshwater Ecology; July: Things That Fly. Registration: leopoldspreserve.com (select "Calendar").

MARYLAND

Maryland Big Tree Contest

Now through Dec. 31. Search Maryland's state forests for the largest white oak trees. Cash prizes of up to \$500 will be awarded to the top five finalists. Info: dnr.maryland.gov/forests/Pages/trees/Big-Tree-Centennial-Contest.aspx.

The Great Chesapeake Invasives Count

Now through March 31, 2027. Coastal Conservation Association Maryland hosts this year-round and research-backed tournament, which is free to enter and offers monthly prizes. Participants log catches of Chesapeake channa, blue catfish, and flathead catfish through a mobile app where you can input total length, weight, stomach contents. Info: ccamd.org/the-great-chesapeake-invasives-count.

Stream Water Chemistry

8-11:30 am; Jug Bay Wetlands Sanctuary, Lothian. Volunteers help you uncover the science of streams by conducting field tests on dissolved oxygen, acidity, temperature, nutrients in streams feeding Jug Bay. Water samples are submitted for lab analysis. Free; under 18 w/adult. Registration: jugbay.org/inspire_events/stream-water-chemistry-87.

Rachel Carson Conservation Park Summer Tour

9:00-11:00 am, July 14; Brookeville. Explore Rachel Carson's namesake park to learn how restoration projects protect these natural habitats as you journey through meadows with native perennials like beebalm and black-eyed Susan and a chestnut oak forest. \$30. Info: montgomeryparks.org/events/ (select date from calendar).

Helping Backyard Birds

10 am-12 pm, July 11; Piney Point Lighthouse Museum, Piney Point. Create your own pinecone bird feeder and dive into the fascinating world of native birds. All ages. Free, donations welcomed. Info: Flack@StMarysCountyMD.gov.

Guided Canoe Trips

5:45-8:15 pm, Thursdays, June 11 to Sept. 24; 9:15-11:15 am, Saturdays, July 18 to August 15, plus September 19; Eden Mill Nature Center, Harford County. Paddle along Deer Creek discovering its natural surroundings. Interpreter-led trips focus on environmental education. \$15. Registration: edenmill.org (select "Program Calendar").

Patuxent Research Refuge, National Wildlife Visitor Center

Patuxent Research Refuge offers free public programs and activities. Register (if required) online: fws.gov/refuge/patuxent-research/events

(note special accommodation needs). South Tract, Visitor Center: Wed.-Sat., 10 am-4 pm, (301) 497-5772. Grounds open daily. North Tract: Sundays 8 am-4 pm.

■ *Hollingsworth Wildlife Art Gallery*: 10 am-4 pm Wed.-Sat. All ages. June: Bowie-Crofton Camera Club wildlife and nature photographs. Reception/meet and greet: June 20, 1:30-3:30 pm. July: Keith Kozloff's exhibit is dedicated to Rachel Carson. Reception/meet and greet: July 25.

■ *Kids' Discovery Center*: 10 am-12 pm (35 minutes each; on hour), Wed.-Sat. Ages 3 to 10, w/adult. Crafts, puzzles, games, nature exploration. June: Reptiles, snakes. July: Insects, dragonflies, fireflies. Register: 301-497-5772.

■ *"Wingspan" Game Days*: 10 am-1 pm, June 12 & 27; July 10 & 25. Ages 12+. No experience needed. Play the award-winning board game; learn about BIRDS! Use ours or bring yours. Sign in at front desk.

■ *Family Fun*: Staffed: 10 am-1 pm, June 12 & 13; July 17 & 18. On own: 10 am-4 pm, Wed.-Sat. All ages. June and July: Colors in Nature.

■ *Build Your Outdoor Confidence*: 11 am-12:30 pm, June 13. Poison ivy basics (ID, role in nature, dealing with exposure), then a short walk outdoors to see some. All ages. Receive a wallet card to help ID.

■ *Wildlife/Nature Photo Contest*: June 13-August 15. Ages 5-14. Cash prizes. Details: fws.gov/event/kids-click-youth-nature-wildlife-photo-contest.

■ *Wild Bird Meet and Greet*: 2-3:30 pm, June 27 & July 25. All ages. Come to the visitor center lobby for a "meet-and-greet" with a live bird of prey. Camera and questions welcome.

■ *Story Trail*: Sunrise to sunset (Tuesdays to 4 pm). All ages. Explore the seasonal children's book, displayed along the outdoor, paved Loop Trail. June/August: "Bugs for Lunch/Insectos Para El Almuerzo" by Margery Facklam.

■ *Agents of Discovery*: Sunrise-sunset daily (Tuesdays to 4 pm). All ages. Self-guided nature-challenge game on refuge grounds: Download free phone app at home first. Complete challenges, earn patch. Info: fws.gov/media/agents-discovery-patuxent-research-refuge.



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. August issue: July 11
September issue: August 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. Plastron
2. Carapace
3. Scutes
4. Bridge
5. Pyramiding
6. Scales
7. False
8. True



BULLETIN BOARD

VOLUNTEER OPPORTUNITIES

WATERSHEDWIDE

Potomac River Watershed Cleanups

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

Become a Water Quality Monitor

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

PENNSYLVANIA

Middle Susquehanna Volunteers

Monitor local waterways, provide online updates: web search "Susquehanna sentinels." Water sampling: web search "Susquehanna Riverkeeper survey." Individuals, families, scouts, church groups welcome. Info: MiddleSusquehannaRiverkeeper.org/watershed-opportunities.

Nixon County Park

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

VIRGINIA

Friends of the Rivers of Virginia

Volunteer projects include river access, dam removals, water quality work, blueways, fisheries, river-related legislative issues. Info: riverdancer1943@gmail.com or Bill Tanger at 540-266-0237.

Virginia Living Museum

VLM needs volunteers ages 11+ (11-14 w/adult) to work with staff. Educate guests, propagate native plants, install exhibits. Info: thevlm.org/support/volunteer.

Prince William Soil & Water Conservation

Manassas district 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@pwsacd.org.

Friends of Dragon Run Land Trust

Volunteer opportunities include assisting with kayak trips and hikes, property monitoring, citizen science surveys, maintenance, educational and community engagement projects. Info: vicepresidentdragonrun@gmail.com or DragonRun.org.

Leopold's Preserve Friday Volunteering

8:30 am-12 pm, every Friday. Volunteers can stay as long as they'd like. Volunteer activities are outdoors, involving basic physical labor. Suitable for ages 13+, under 18 w/adult. Free. Info: leopoldspreserve.com (select "Calendar").

Mariners' Museum and Park

Be a part of the team that restores the natural beauty of Mariners' Park by removing invasive species. Weekday/weekends; morning and afternoon shifts. Ages 15+. Info: Beth Heaton at bheaton@marinersmuseum.org.

MARYLAND

Chesapeake Bay Environmental Center

Help with educational programs; guide kayak trips and hikes; staff the front desk; maintain trails, pollinator garden; care for captive birds of prey; monitor wood duck boxes. Participate in fundraising, website development, writing for newsletters, photo archiving, supporting office staff. Info: bayrestoration.org/volunteer.

Maryland State Parks

Search for volunteer opportunities at ec.samaritan.com/custom/1528 (select "Search Opportunities").

Patapsco Valley State Park

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

National Wildlife Refuge at Patuxent

To ask about helping in the Kids Discovery Center, Monarch Center, gardens and for general volunteer training call 301-497-5772, Wed.-Sat. 10 am-4 pm. To help in the Friends' Wildlife Images bookstore and nature shop, email Ann: wibookstore@friendsofpatuxent.org. To help with Friends of Patuxent's programs/events, other volunteering, email: friendspr@friendsofpatuxent.org.

Lower Shore Land Trust

LSLT in Snow Hill needs help with garden cleanups, administrative support, beehive docents, native plant sales, pollinator garden tour, community events. Info: infor@lslt.org, 443-234-5587.

RESOURCES

WATERSHEDWIDE RESOURCE

Bee Conservation

The Maryland Department of Natural Resources has everything you need to know about Mid-Atlantic bees, from identification to conservation. Find links to a bee field guide, how to create a pollinator-friendly backyard, how to build a bee house, organic approved pesticides. Info: dnr.maryland.gov/wildlife/Pages/habitat/wabees.aspx. *For educators:* The Bee Cause Project, a nation-wide initiative, seeks to inspire future environmental stewards with lesson plans, teacher guides, grant resources and more. All Bee Cause Project resources and content are free to use and download for your classroom and community. Info: thebeecause.org/resources.

Creating a Backyard Buffet

Your yard can be an oasis for birds, bees and butterflies to fuel up and raise their young. This Chesapeake Bay Foundation webinar takes you through the steps of assessing your yard and planting with a purpose. Webinar: cbf.org/resources/creating-a-backyard-buffet-for-birds-bees-and-butterflies-2.

MARYLAND

Spotted Lanternflies

The University of Maryland now considers the spotted lanternfly, an invasive insect from Eastern Asia, to be mainly a nuisance pest in residential gardens and landscapes that does not significantly damage otherwise healthy ornamental plants. Info on how to identify various life cycle stages, what to do (or not do) to control them, where to submit questions and report infestations: extension.umd.edu/resource/spotted-lanternfly-home-gardens.

White Marsh Park Edible Trail

This experimental food forest or native fruit and nut orchard in Centreville features six species: hazelnut, persimmon, American plum, black chokeberry, paw paw, high bush blueberry. All of them produce fruit or nuts that are edible, and they're free for the taking for any visitor to the park. Watch the video: <https://www.youtube.com/watch?v=yWYdx6h2SXs>.

Yards for Creation Meadow Program

Yards for Creation aims to turn lawns back into vibrant, connected habitat for pollinators and wildlife, while offering opportunities for communities to engage with the natural world. Organizations in Wicomico, Somerset and Worcester counties such as congregations, municipalities, schools and nonprofits are encouraged to apply: lowershorelandtrust.org/yards-for-creation or borr@lslt.org, 443-234-5587.

New Maryland Native Plant Guide

The Maryland Native Plant Society has a new guide, *Native Plant Guide Piedmont Region*. The 180-page book includes photos and descriptions of over 300 plants, site-specific plant lists, aquatic plant recommendations, managing invasive species and more. Available to download (free) or purchase. Info: mdflora.org/piedmont.

Maryland Outdoors App

The Maryland DNR's free "MD Outdoors" app includes maps, amenities of state parks, trails, wildlife management areas, boat launches, water access sites; sunrise/sunset times; tide tables; fish and shellfish identifier; fish records; hunting, fishing, boating regs. Download: dnr.maryland.gov/Pages/dnrapp.aspx.

University of Maryland Extension Home & Garden Info Center

Submit questions to a team of Maryland certified horticulturists, faculty, master gardeners; view gardening resources; find out about local classes and other in-person learning. Info: extension.umd.edu (select "Programs," then "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 navigational hazards; 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 available to homeowners whose property is within the James River watershed. Info and links to other regional programs: jamesrivershorelines.org/apply.html.

Virginia Public Lands Recreation Search

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/explore.

Chesapeake Bay or Blue Ridge? You don't have to choose



By Jake Solyst

They say that when you have a second child, the size of your heart doubles. Triples if there's a third. Well, a little over a year ago I moved from the Baltimore-Annapolis area, where I was raised, to Charlottesville, VA, in the foothills of the Blue Ridge Mountains, and I'm happy to report that there's room in my heart for both locales.

In fact, I like to think of the two regions as a kindred pair, stretching east across the Virginia Piedmont, past Richmond and into the very mouth of the Chesapeake Bay like one sinuous organism spanning space, time and dialects.

Of course, this is a convenient way for me to think. As a communications specialist working for a Chesapeake Bay nonprofit, I love it when people across the Bay watershed consider themselves connected to their downstream neighbors. Part of my job is to show people across the region that it's a good thing their state and federal tax dollars are being spent on the estuary, which is an economic boon to the entire nation. I also try to explain how environmental improvements are being made in their own communities, resulting in everyday benefits like cleaner drinking water, fewer floods, improved tourism and more.

For decades, the Chesapeake Bay restoration effort has been predicated on the idea that the 64,000-mile watershed is interconnected. When nutrient-rich pesticides wash off a farm in Pennsylvania, a stream-bank collapses in Virginia or a sewer pipe bursts in Delaware, it causes harm to the Bay. Blue crabs and oysters in the Bay and its tidal rivers suffer from nutrient and sediment pollution, but so does the freshwater aquatic life swimming through the Bay's tributaries.

In 1983, leaders from Maryland, Virginia, Pennsylvania, the District of Columbia and the U.S. Environmental Protection Agency



Paddlers navigate rapids on the James River near downtown Richmond. The river's headwaters start all the way in the Appalachian Mountains. (Will Parson/Chesapeake Bay Program)

all signed a one-page commitment to clean up the Bay and its watershed. This core commitment still holds today, with the most recent version of the Chesapeake Bay Watershed Agreement now including the other Bay watershed states: New York, West Virginia and Delaware. This agreement includes goals related to blue crabs and oysters but also broader concerns like brook trout, waterfowl, stream connectivity and public access.

Throughout the year, I get to meet residents and community leaders who have received funds made available to achieve the goals of the Watershed Agreement. This might include a farmer in Lancaster County, PA, who had acres of trees planted along their stream or a county parks official in Delaware who oversaw a local stream restoration project. If I'm lucky, I might meet a group of volunteers kayaking down the Shenandoah River to learn more about native species.

And yet, during all of these trips, the people I speak with are always far more concerned about their local lands and waters than they are about the Chesapeake Bay. And why shouldn't they be? The Bay

watershed is so culturally and geographically diverse that someone living in the rolling farmlands of central Pennsylvania or along the wetlands of Maryland's Nanticoke River will always cherish what's closest to them more than what's out of sight.

I've been watching the show *Pluribus* recently. The premise is that a virus infects almost the entire human population, causing a mind-meld phenomenon where everyone shares the same consciousness (except for our immune protagonist and a handful of others). In this strange new world, no human is an individual; everyone works together toward the common good (at least for now — I'm only a few episodes in). The show is a good reminder that while we all want unity, perhaps these days more than ever, individuality is a big part of what it means to be human.

So really it's best to think of the Blue Ridge Mountains and the Chesapeake Bay as distinct, yet equally amazing places. But here's the kicker: These distinct yet equally amazing places are pretty darn close together!

On the same day, I could reasonably take a morning hike through the Shenandoah National Park, go home and shower, and then drive a little over two hours southeast for a crab feast on the York River. If I take a slightly less southerly route, I could reach Fones Cliffs on the Rappahannock River well before sunset for some bald eagle spotting. If I was really mountain crazed, then I could head three hours west to Seneca Rocks in West Virginia, which is still in the Bay watershed.

Clearly, there are so many amazing places to visit between the Blue Ridge Mountains and Chesapeake Bay. And for me, the region's beauty and diversity underscore the importance of accelerating environmental conservation on a local and regional scale.

I consider myself very fortunate to have lived so close to the Chesapeake Bay and, now, on the doorstep of the Blue Ridge Mountains. But, as with kids, just don't ask me to choose. ■

Jake Solyst is the Chesapeake Bay Program web content manager with the Alliance for the Chesapeake Bay.

Orchard oriole or blackbird? Both — same family, more color



By Alonso Abugattas

To put it simply, not all “blackbirds” are black. Many of them are, to be sure, but the blackbird family, Icteridae, also includes meadowlarks, cowbirds and even the beautiful bobolink. And then there are the orioles — 32 species in the *Icterus* genus, though only two that you’re likely to see here in the eastern U.S. Those are the well-known Baltimore oriole and the one we focus on here, the not-so-well-known orchard oriole (*I. spurius*).

The word “oriole” is derived from the Latin *aureolus*, which means “golden” literally and “beautiful” figuratively. There are eight species of orioles north of Mexico, and orchard orioles are the smallest of them. They are also the darkest-colored, the males in particular. The specific epithet *spurius*, meaning false or fake, comes from them being initially misidentified as female Baltimore orioles, which are so similar in appearance.

All orchard orioles are slim and active, with straight sharp bills. Breeding age males have primarily black heads, throats, masks and tails. The wings are also mostly black with brownish shoulders and a narrow white wing bar. Depending on the light, their bellies and rumps vary in color from reddish-brown (chestnut) to brownish-red (maroon).

The females are quite different, with olive-green heads and mantles. Their wings are gray with pale edges and two distinct narrow white wing bars. Females are yellow below with olive-yellow tails. Due to their small size and coloring, I have mistaken the females for warblers. The immature males are quite similar to the females and take two years before attaining their adult plumage. Unlike females, though, immature males have a black throat and bib (called a beard by some).

Orchard orioles spend their breeding season in North America east of the Rockies from the Canada-U.S. border down towards central Mexico. They prefer scattered, open



A richly colored male orchard oriole stands out from the greenery. (Larry Wolf/CC BY 2.0)

woods, orchards or scrubland with deciduous trees, and they are often found within a quarter mile of water. I have most tend to found them near rivers and in close association with other birds. Orchard orioles are not very territorial and often form loose colonies. They are often found near other birds, including Baltimore and Bullock’s orioles (sometimes even nesting in the same tree), kingbirds and robins.

Breeding takes place during April after they’ve returned to their warm-weather haunts, which generally is earlier than Baltimore orioles. Males sing from trees to attract females in loud clear whistles that resemble those of a robin. Breeding displays consists of bows and seesawing (the male lowering and raising its head and tail), followed often with the female begging for food. The pair is monogamous for that single breeding season.

The female is responsible for building the nest, which takes about six days. The nest is a wonderful pouch-like structure, woven together with long grass blades and normally hanging from a forked branch 6-20 feet up. They often nest near kingbirds, likely because kingbirds are aggressive defenders, to the benefit of all residents of the tree. The oriole’s nest is lined with plant down, fur, feathers, other soft fibers and even yarn.

After laying 3-7 pale grayish-blue eggs with dark marks, the female incubates the eggs for 12-14 days while being fed by the male. Orchard orioles are heavily parasitized

by brown-headed cowbirds. The young are helpless, or “altricial,” and usually fledge within two weeks. Both parents feed the young on a diet of mostly insects. After the youngsters fledge, the parents divide the brood in half to finish raising them. Adults and young stay together until their southern migration.

Orchard orioles are nocturnal low-altitude migrants. They often start their return trip south earlier than many other birds, leaving in mid-July or August, flying at or below treetop level. They winter along the Gulf Coast, throughout Central America and even as far south as Colombia and Venezuela. While travelling, they forage together in groups and often gather overnight in large roosts. They also travel and feed in mixed flocks rather than strictly with other orchard orioles.

The main diet of orchard orioles is insects and spiders — especially while breeding, when that’s mostly what they feed the nestlings. They glean these invertebrates from the foliage or use aerial sallies from a perch to capture them. These orioles will also feed on fruits and berries such as mulberries, wild grapes, blackberries and blueberries. As occasional visitors to tree blossoms for nectar, they are considered minor pollinators. While you can’t attract them to your yard using typical bird feeders, you can sometimes attract them (and Baltimore orioles) with orange slices and grape jelly. There are purpose-built oriole feeders with pegs for



A female orchard oriole clings to a sapling. (Larry Wolf CC BY 2.0)

mounting orange slices and cups for jelly. And, again like their cousins, they have been known to visit hummingbird feeders.

Orchard orioles face many dangers. Aerial predators include owls, hawks and falcons. Their nests can be preyed on, despite precautions with nest placement and picking locations near birds who can aid in defense. Squirrels, raccoons, grackles, blue jays, crows and snakes raid their nests, and, of course, outdoor cats take their toll. Like many birds, they also suffer from habitat loss and fragmentation. And, as low-altitude migrators, they are prone to fatal building strikes.

Such dangers have caused a 1% annual decline and overall 46% decline from 1966 to 2019. That puts the current population at an estimated 12 million birds, according to the North American Breeding Bird Survey, which keeps them in the Species of Least Concern category. ■

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

What's the buzz, pollination-wise? It's the humble bumblebee



By Kathy Reshetiloff

As our landscape finally explodes with blossoms and flowers of all shapes and colors, it also explodes with some of our most interesting pollinators. Ruby-throated hummingbirds aggressively push each other away from flowers or feeders. Butterflies, from the tiny eastern-tailed blue to the iconic Baltimore checkerspot, delicately flit from flower to flower. But there's another pollinator group that works so hard collecting nectar and pollen you can hear them: bumblebees.

Bumblebees (*Bombus spp.*) are known for their large hairy bodies and black and yellow stripes, although on some species the stripes may be more rust or orange. Their fuzziness makes them excellent pollinators, as pollen sticks to their hairs while they forage for nectar in flowers. But it's their buzzing sound that sets them apart from other native bees.

Bumblebees contract their flight muscles, producing strong vibrations. This is called buzz pollination because the vibrations release pollen grains from the flower. The bee then uses its legs to comb most of the pollen from its hairs into pollen baskets on its hind legs, which it takes back to the nest as sustenance for the colony. Pollen grains that don't reach the baskets will not be wasted. As the bumblebee continues to forage and buzz, some of the pollen that doesn't get combed out will fall off onto other flowers, fertilizing them.

Although bumblebees are efficient pollinators for our native plants, they also pollinate some of our important foods, including tomatoes, peppers, eggplants, pumpkins, blueberries and cranberries.

Bumblebees are generalists, meaning they gather pollen and drink nectar from a wide variety of flowering plants close to their nests from spring through fall. But unlike European honeybee colonies, bumblebee colonies don't have storage space in their



A common eastern bumblebee finds nectar on a wingstem flower. (Judy Gallagher/CC BY 2.0)

nest, so they must consume their food shortly after gathering it. That keeps them busy.

There are 46 bumblebee species in North America, 21 of them in the eastern half, according to the *Bumblebees of the Eastern United States*, a collaboration of the USDA Forest Service and the Pollinator Partnership. They occupy a wide range of habitats: prairies, meadows, mountain ranges, farmlands, wetlands and cities. Besides needing blooming flowers from spring to fall for food, they also require nesting and wintering areas. Undisturbed sheltered spots like abandoned rodent holes or clumps of dry grasses and leaves with nearby flowering plants make good nesting sites.

Only potential future queens (fertile females) survive the winter. They do so by hibernating, often in decaying logs or underground burrows. Come spring, having mated the previous fall, they emerge from hibernation and establish new colonies. The males (drones) that they mated with in the fall either die immediately after mating or succumb to the cold weather, as do the infertile females (workers) and the "foundress" queen that started the colony.

Despite being generalists, about a quarter of North American bumblebee species are at some level of conservation concern. The American bumblebee (*B. pensylvanicus*), for example, was once one of the most common and widespread bumblebee species, but it has experienced sharp declines in recent decades. An assessment in 2014 found an 89% reduction in abundance of American



A rusty-patched bumblebee, once common in the Chesapeake Bay region, finds nectar on a flower in Minnesota. (Dawn Marsh/U.S. Geological Survey)



An American bumblebee queen visits a red deadnettle. (Louise Woodrich/CC BY 4.0)

bumblebees relative to other bee species that share their habitat. They, like most bumblebees, are victims of pesticides, habitat loss, urban development, climate change and diseases introduced by non-native bee species.

The public can help conserve and support North American bumblebees by creating nesting and wintering habitat. The simplest thing to do is leave some small part of your yard undisturbed — that is, don't mow or rake it. Also, since many bumblebees are sensitive to insecticides used on farm fields and urban and suburban landscapes, consider whether they are warranted. If you must use insecticides, refrain from applying them in early spring, when bumblebees are establishing their colonies.

Offering a diversity of native plants with blooming times from spring to fall ensures that bumblebees have enough food to support their colonies. Here are just a few common natives that you can plant to support bumblebees (and many other pollinators):

- Trees: red maple (*Acer rubrum*), eastern redbud (*Cercis canadensis*)
- Shrubs: Canadian serviceberry (*Amelanchier canadensis*), New Jersey tea (*Ceanothus americanus*), buttonbush (*Cephalanthus occidentalis*), pussy willow (*Salix discolor*)
- Flowers: common milkweed (*Asclepias syriaca*), butterflyweed (*Asclepias tuberosa*), partridge pea (*Chamaecrista fasciculata*), purple coneflower (*Echinacea purpurea*), dense blazing star (*Liatris spicata*), great blue lobelia (*Lobelia siphilitica*), beebalm (*Monarda fistulosa*), smooth beard tongue (*Penstemon digitalis*), narrowleaf mountain mint (*Pycnanthemum tenuifolium*), Maryland senna (*Senna marilandica*), seaside goldenrod (*Solidago sempervirens*), New England aster (*Symphyotrichum novae-angliae*)

For information on making your yard, garden or farm more bee-friendly, check out the resources of the Pollinator Partnership at pollinator.org and the Xerces Society at xerces.org. ■

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