

CHESAPEAKE

BAY JOURNAL

July/August 2026

Volume 36 Number 5

Independent environmental news for the Chesapeake region

American sturgeon A curious case of survival

Page 18



COST OF A NEW STADIUM



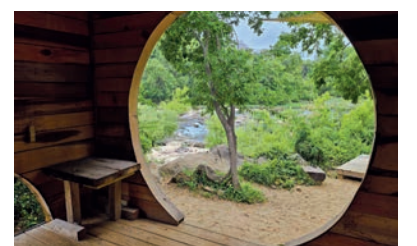
Anacostia advocates leery of potential impacts **PAGE 21**

THE BEASTLY BACTERIUM



Vibrio cases steadily rise, in step with water temps **PAGE 14**

A RIVER RUNS AROUND IT



An acre of camp-style solitude on a Richmond island **PAGE 24**

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Steve Storck of Garrett County, MD, describes the proposed route for a transmission line through state-designated wildlands. The line would largely serve data centers in Northern Virginia. (Lara Lutz)

ON THE COVER

Margi Whitmore, a biologist with the Virginia Department of Wildlife Resources, holds a sturgeon that was netted in the Pamunkey River. (NOAA Fisheries)

Bottom photos: left courtesy of the National Capital Planning Commission, middle by Dave Harp, right by Lauren Hines-Acosta

CORRECTION

One of the answers in the June Chesapeake Challenge about turtles was incorrect. "Pyramiding" is a shell deformity in which the abnormal growth of individual scutes creates raised, cone-shaped bumps. We apologize for the error.

CONTENTS

NEWS

- 8 Sewage solution ends development ban in Baltimore suburbs
- 9 New system gleans real-time data for Bay rivers
- 11 'Wildlands' in Western MD imperiled by transmission line
- 12 Warehouses add to air pollution in PA's Cumberland Valley
- 13 In Southern Maryland, data center bid prompts larger debate
- 14 Vibrio on the rise as climate warms the Chesapeake Bay
- 16 Could the 'whole watershed' approach fix this MD river?
- 17 VA facility releases a year's worth of pollution in a day
- 18 Sturgeon are full of surprises, including that they're here
- 20 VA well owners are 'last on the list' for PFAS protections
- 21 New Commanders stadium poses environmental challenges
- 22 VA passes budget with new energy tax for data centers

TRAVEL

- 24 Rock with the James River's rhythm on Sharp's Island

FORUM

- 26 Chesapeake Born | The words of Gilbert Klingel
- 27 Why marina policy matters to the Bay's 'pollution diet'

QUIZZES | EVENTS | RESOURCES

- 23 Chesapeake Challenge | First aid for hiking missteps
- 32 Bulletin Board | Volunteer | Events | Programs | Resources

COLUMNS

- 34 Steward's Corner | School is out, but wildlife is hard at work
- 35 On the Wing | Frankly, Scarlet, it's a tanager
- 36 Bay Naturalist | The great blue heron

EDITOR'S NOTE

A pioneer in nonprofit news

Not to brag, but ... ok, I'm going to brag. It seems like — in some ways — the *Bay Journal* has been ahead of the curve for decades. I mulled this over as I attended the national conference of the Institute for Nonprofit News in June. It was a terrific opportunity to meet representatives from nonprofit newsrooms all across the country, conferring on shared experiences and learning from one another. Nearly all of those operations, though, were launched recently, while the *Bay Journal* developed its nonprofit model more than 30 years ago. We have always operated with a remote staffing structure as a way to cover a large area with a small staff, even before technology offered efficient ways to support it. We have always shared our content for free use by other media, a service that others are beginning to champion in their own sectors — and a service almost unheard of in for-profit journalism. Also, we developed fundraising programs, grantmaker relationships and a board structure that both protects and enhances independent journalism. Those accomplishments grew under the leadership of founding editor Karl Blankenship and previous board members, and I'm proud to play a continuing role in that enterprise along with our current, fantastic board and staff. And, of course, with support from our amazing readers! Our team is now focusing on ways the *Bay Journal* can become an even more dynamic presence in the Chesapeake watershed, and the conference also pointed toward ways we can improve. In the near future, we will be setting goals to increase our reporting capacity, host more reader events and further supply newsrooms across the Bay region with high quality environmental reporting. As this work is underway, your feedback matters! Our annual readers survey is now open at tinyurl.com/bayjournal2026. I know firsthand how reader input has shaped *Bay Journal* reporting, as well as our website, publication format and public events. That's true more than ever, as we develop our goals and strategies for the next few years. If you could take a few minutes to share your thoughts, I'd truly appreciate it. You'll help us chart the path forward!

— Lara Lutz



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2026 Readers Survey

Your feedback matters

The 2026 Bay Journal readers survey is underway! Look for a copy in your mailbox or complete the survey online at tinyurl.com/bayjournal2026.

For years, the reader survey has helped us learn which topics interest you most, what you enjoy about the *Bay Journal* and how we can improve. Here's a look at some findings from last year.

Top 5 topics of interest to Bay Journal readers

1. Health of the Bay
2. Health of rivers and streams
3. Wildlife and fisheries
4. Environmental policies
5. Land conservation/development

Top 5 actions inspired by the Bay Journal

1. Talk about environmental issues with others
2. Share the *Bay Journal* with others
3. Support land conservation
4. Take a trip to enjoy the outdoors
5. Change personal habits

Why some readers prefer the Bay Journal in print

- Reading print for me is superior to electronic formats, especially for retention, engagement and rumination.
- It's easier to read that way. Good reading when power goes out too.
- It's all right there in front of you. Page through easily. Keep for reference and share with others.
- Always available. Calls attention to itself.
- It doesn't get lost in the online clutter. I am more likely to finish articles.
- Easier to read and absorb and the excellent photos stand out more than online.
- Easy to pick and choose what I want to read — a few paragraphs or one story or re-read.
- Easy to read and make notes. Can carry on boat to read.
- Much prefer to digital. Enough screen time already!

Photo by Dave Harp



Psst! Have you heard? The Bay Journal Newscast has launched

Tune in at the beginning of each month for the latest episode of this new podcast. *Bay Journal* reporters highlight environmental news and share insights from their reporting. And test your own watershed smarts with a short quiz segment, Two Truths and a Lie. Here's a practice: Which of these is a lie? The answer is on page 32.

- A. The Chesapeake is the largest estuary in the U.S. (true), and Puget Sound is the second largest.
- B. About 6% of West Virginia's population lives in the Chesapeake Bay watershed.
- C. Invasive blue catfish have no scales.

Find the Newscast on your streaming app or at bayjournal.com/podcasts.

ABOUT US

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

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STAFF

Lara Lutz, Editor / Executive Director (llutz@bayjournal.com)
Karl Blankenship, Editor-at-Large (kblankenship@bayjournal.com)
T. F. Sayles, Managing Editor / News Service Editor (tsayles@bayjournal.com)
Timothy B. Wheeler, Associate Editor / Senior Writer (twheeler@bayjournal.com)
Jacqui Caine, Marketing & Advertising Director (jcaine@bayjournal.com)
Jeremy Cox, Staff Writer (jcox@bayjournal.com)
Dave Harp, Photographer (dharp@chesapeakephotos.com)
Lauren Hines-Acosta, Staff Writer (lhinesacosta@bayjournal.com)
Connie Hurley, Administrative Assistant (churley@bayjournal.com)
Content is selected and managed solely by Bay Journal editorial staff.
Copy editing by Speros Zakas.
Layout by Michele Danoff, Graphics By Design.

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This photo unexpectedly resurfaced from the collection of Tom Guidera, who captured the image in 1996 — showing Bay Journal photographer Dave Harp facetiously fishing in a storm drain. (Tom Guidera)

Welcoming new board members

In July, we welcomed three new members to the *Bay Journal*’s Board of Directors. Overall, our board members are from Maryland, Virginia, Pennsylvania and the District of Columbia. But the newest members — lawyer Tom Lingan, communications consultant Kristen Peterson and scientist Christine Knauss — all hail from Maryland to help represent that state as the terms of other Maryland members came to an end. Don Boesch and Kim Coble stepped back from the board earlier this year, and we are deeply grateful for the energy, time and talent they have shared with the organization.

Meanwhile, *Bay Journal* staff continued their ongoing education about Bay science and the evolving opportunities for nonprofit newsrooms. Editor-at-large **Karl Blankenship** and reporter **Jeremy Cox** attended the Chesapeake Research Consortium in June, one of the more technical watershed conferences that mainstream media usually doesn’t attend. Among the topics they learned about are efforts to put real-time water-quality monitoring in the hands of the public, the impacts of climate change on tree growth and how low-cost sensors help track flooding in the Eastport community of Annapolis. Also in June, editor **Lara Lutz** attended the national conference of the Institute for Nonprofit News, exploring partnerships, project opportunities and strategies for growth.

And growth is taking place now with the *Bay Journal Newscast*, available through your streaming service or at bayjournal.com/podcasts. This new podcast, released at the beginning of each month, is a round-table with *Bay Journal* reporters, highlighting hot topics and reporting projects. Test your knowledge at the close of each episode with a fun quiz segment called Two Truths and a Lie.

Work also continues on a new film about the impacts of resident Canada geese, drawing on the talents of *Bay Journal* photographer **Dave Harp**, columnist **Tom Horton** and film editor **Sandy Cannon-Brown**. Look for a debut this fall.

Fallout, lawsuits continue after Potomac sewage spill

More than five months after millions of gallons of untreated sewage spilled into the Potomac River, aftershocks continue.

Litigation, emergency repairs and a major leadership shakeup have followed in the wake of the Jan. 19 rupture of the Potomac Interceptor sewage pipe in Montgomery County, MD. As much as 300 million gallons of sewage spewed from the 6-foot-wide pipe into the Potomac River for about a week before it was stopped.

In April, the U.S. Department of Justice and Maryland's attorney general announced separate legal actions on the same day against DC Water, the pipe's owner. The lawsuits seek financial penalties and restoration of the spill site. In June, the Potomac Riverkeeper Network filed motions to intervene in both cases.

"We at PRKN had long feared that this disaster was not an accident. It was a failure of decision-making, accountability and urgency," said PRKN president Betsy Nicholas.

Also in June, DC Water's board removed the utility's chief, David Gadis. The utility has faced

intense scrutiny from Congress and the public over years of permitting delays that pushed back the replacement of that section of pipe before its collapse.

Work is expected to continue into late summer on the first phase of the environmental cleanup, which includes removing contaminated soil from the C&O Canal. During the pipe's repairs, the historic canal was used as a bypass for an estimated 2 billion gallons of sewage.

The second phase is expected to be completed in the fall. That includes replanting trees and shrubs, regrading wetlands, repairing the canal's clay liner and adding topsoil.

The January spill didn't impact drinking water because it happened downstream from the region's intake pipes. But subsequent surveys conducted by DC Water crews have revealed deteriorating segments upstream of the withdrawal pipes — immediately prompting repair work on a 1,700-foot section of line, expected to be done in September.

Boating charters and outfitters report a sharp decline in business on the Potomac because of bad publicity over the spill. The Potomac Conservancy has called on the area's congressional representatives to offer them economic assistance.

Under pressure from environmental groups, DC Water has committed to extending daily water-quality testing through at least the end of July. It had previously planned to transition to weekly testing beginning on July 5. Groups continue to push for the utility to do the daily testing through the summer season.

Also, recent spikes in E. coli levels at three testing sites downstream from the spill have prompted calls for DC Water to investigate the situation.

— J. Cox

Court favors Rappahannock Tribe on water use project

The Virginia Marine Resources Commission approved the construction of a water intake facility on the Rappahannock River on June 23. That approval comes just two weeks after the Rappahannock Tribe in Virginia found out it will have its day in court to fight the project.

The project is designed to supply nine million gallons of water per day to Caroline County and its incorporated towns from the Rappahannock River. The county believes the Potomac aquifer that currently serves the region could run dry by 2055.

The Virginia Department of Environmental Quality approved the project's permit in November 2025. The Rappahannock Tribe filed an appeal in January arguing that the state did not properly consult the tribe on the project proposed for its namesake river. The tribe is particularly worried that the water won't be returned to the river after used by the public but instead discharged to the Mattaponi and York rivers.

The tribe is also demanding that the state pause the project until the Virginia Institute of Marine Science completes a study evaluating the cumulative impacts of water withdrawals from the Rappahannock.

On June 8, the Richmond County Circuit Court denied motions filed by DEQ and the county to dismiss the tribe's claims regarding their fishing rights to the river under the Treaty of Middle Plantation.

DEQ and the county had until July 8 to file briefs. The court was expected to then schedule a hearing date for the tribe to present its claims.

— L. Hines-Acosta

See **BRIEFS**, page 6

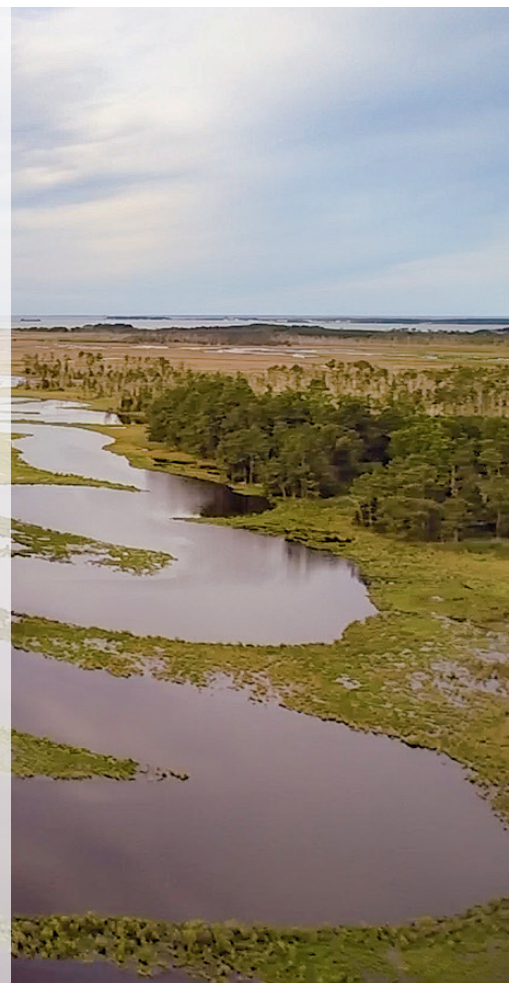
Congratulations to the Bay Journal

The Board of Directors of Bay Journal Media is extraordinarily proud of the many recent and acknowledged accomplishments of the talented editors, writers and photographers of the *Bay Journal*. They are truly a Chesapeake treasure, committed to keeping informed on all matters related to environmental issues in the Bay watershed. Their deep knowledge, access to sources, clarity in writing and photojournalistic artistry never cease to enthrall and educate us.

We offer our congratulations to the staff for their awards from the Virginia Press Association and Maryland/Delaware/District of Columbia Press Association for work published within our designated publication category in 2025:

- Timothy B. Wheeler: "Tree cover still shrinking in the Chesapeake region," first place for Environmental Reporting (MDDC)
- Timothy B. Wheeler and Whitney Pipkin: "'Ticking time bombs' — Coal ash pits pepper the Bay watershed," second place for Investigative Reporting (MDDC)
- Staff award: "Federal crackdown brings chaos to Bay efforts," second place for Government Reporting (MDDC)
- Lauren Hines-Acosta: Integrity in News Reporting award (VPA & Center for Integrity in News Reporting)

(Dave Harp)



briefs

From page 5

Grants expected to reduce industrial air pollution in PA

Pennsylvania Gov. Josh Shapiro announced in April \$267 million to fund 31 projects aimed at reducing air pollution through the state's Reducing Industrial Sector Emissions in Pennsylvania (RISE PA) program. The grants will be given out throughout the summer.

The money will go toward projects that help industrial facilities reduce their greenhouse gas emissions by shifting to electrification, increasing energy efficiency, adding renewable energy or through other means. The program is funded by the U.S. Environmental Protection Agency's Climate Pollution Reduction Grants.

Industry contributes the largest share of the state's greenhouse gas emissions, at 30%. The council and the governor expect the investments will reduce carbon emissions by about 1.3 metric tons within the program's first year of implementation.

Below are a few of the awarded projects:

- Alouette Cheese USA: Almost \$45 million to add energy efficiency measures, implement truck refrigeration unit electrification and install an

anaerobic digester and wastewater treatment plant at its food manufacturing facility in Lancaster County

- Wheeland Lumber Company: \$3.7 million to install a biomass steam boiler and combined heat-and-power system that will generate 0.275 megawatts (MW) of power at its lumber facility in Lycoming County
- G&S Foods: \$3.4 million to install a 4 MW solar system with almost 2 MW of battery storage at its food manufacturing facility in Adams County

— L. Hines-Acosta

Delaware lawmakers pass freshwater wetlands bill

For Delaware's wetland advocates, the seventh time was the charm.

Six previous legislative attempts to enact state-level freshwater wetland protections had come up short. But on July 1, the General Assembly passed the Wetlands Stewardship Act, creating the state's first nontidal wetlands regulatory program.

The legislation is a "game-changer," said Emily Knearl, Delaware director of government affairs at the Nature Conservancy. "Freshwater wetlands are nature's superheroes," she said, "and for years these vital ecosystems were under-protected in Delaware."

The First State is the last state in the Mid-Atlantic region not to have its own protections for freshwater wetlands, though it has had a tidal wetlands program since 1973. But multiple efforts dating to 1988 to extend state oversight to their freshwater counterparts had typically been squelched by concerns over hindering the building and agricultural sectors.

Discussions were renewed after a 2023 U.S. Supreme Court ruling that upheld a narrower definition of wetlands, removing federal protection from millions of acres nationwide, including 75,000 in Delaware.

The Nature Conservancy and other advocates credited the bill's passage to its lead sponsor, Sen. Stephanie Hansen, a Democrat who conducted nearly 20 bill-drafting sessions over two years with some of the state's most powerful interest groups.

The measure includes a wetlands screening tool for streamlining field evaluations, sets timelines for permit decisions, and establishes a wetlands committee consisting of agricultural, business, conservation and scientific experts. That committee is charged with submitting a raft of regulations for agency approval by Aug. 1, 2027.

As this issue went to press, the act was still awaiting Gov. Matt Meyer's signature. — J. Cox

Study searches for alternatives to Potomac River water supply

A two-year study, called Secure the Source, will look at large-scale solutions that could provide emergency water supply for weeks to more than 5 million people in Maryland, Virginia and the District of Columbia.

The \$25 million study, announced June 9, is aimed at finding potential alternatives to the Potomac River water supply. Project partners include water utility leaders from Washington Suburban Sanitary Commission Water, Fairfax Water, the U.S. Army Corps of Engineers (USACE) and the Interstate Commission on the Potomac River Basin.

Water utilities and local officials want to find drinking water alternatives to the Potomac River, which is the sole source of drinking water for many people in the greater DC area. Officials have flagged this as a concern should any major event render the river water unusable.

While the recent Potomac River sewage spill did not impact drinking water, it has highlighted infrastructure failure as a potential interruption.

Other interruptions to water supply from the river could include natural disasters, deliberate attacks by bad actors and climate variability. As of June 25, most of the river watershed was in a "moderate drought," with 30% of its watershed experiencing

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briefs

"severe drought" due to dry spells this summer.

After the study is finished in two years, the group plans on finding funding to design and build the recommended alternative water supply source.

— L. Hine-Acosta

Richmond secures final parcel to create Mayo Island Park

The Capital Region Land Conservancy acquired the final quarter-acre parcel on Mayo Island in Richmond on June 12 and plans on transferring it to the city.

"This important milestone is critical to the ongoing effort to transform [Mayo Island] into a vibrant public park and riverfront destination," said Richmond Mayor Danny Avula.

The island has long been a derelict, former industrial space. Now, the city wants to transform it into a park with walking trails, river access and green space.

The city, with help from the Capital Region Land Conservancy, the state Department of Conservation and Recreation and the Virginia Land Conservation Foundation, bought most of the island for \$15 million in 2024.

The last parcel was privately owned by Louis Heindl, who received the property in 1973 from the Virginia Boat Club. The piece of land has a building that was originally a service station in 1933. Heindl

asked for \$1.65 million for the land in 2024 but settled for \$675,000.

The conservancy plans on repurposing the building to house park maintenance operations or park activities. Now that the island will be fully publicly owned, the city will have more flexibility over what to do with the bridge that crosses the island. Community members have advocated for the bridge to be more pedestrian-friendly.

The park is expected to open in October.

— L. Hines-Acosta

Champion of Potomac mussels summons a 'science barge'

The Potomac Riverkeeper Network is expanding its mussel-growing operation on the Potomac River with what the group is calling a "science barge."

The vessel will serve as a floating platform for specially designed cages used to raise mussels. The pair of "floating upwellers" will hold the mussels in the river throughout the year while keeping them off the bottom, where they would be susceptible to being smothered by sediment.

The barge is based at National Harbor in Oxon Hill, MD. The Riverkeeper group launched the "50 Million Mussel Project" there in 2019 with the installation of a mussel nursery next to its floating lab on the MV *Sea Dog*.



Potomac Riverkeeper Network volunteers and others work on the upweller barge at National Harbor, built to raise mussels that will eventually be released in the river. (Courtesy of PRKN)

The addition of the upwellers will allow the organization to raise mussels in far larger volumes, officials say. The group also says it will enable further studies on water quality, habitat resilience and ecosystems services in partnership with Virginia Tech and Georgetown University.

By restoring the Potomac's mussel population, the Riverkeeper Network hopes that cleaner waters won't be far behind. Like oysters, mussels are filter feeders that can siphon out pollutants, such as nutrients and sediment.

— J. Cox

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Sewage solution ends development ban in Baltimore suburbs

BWI Airport to share unused sewage treatment capacity with Anne Arundel County

By Timothy B. Wheeler

With a pair of Maryland state agencies coming to the rescue, the sewer moratorium in part of Baltimore's suburbs has been lifted after just a few months.

Anne Arundel County Executive Stuart Pittman on June 3 announced an immediate end to the ban on new sewer connections in the northwestern portion of the county, which had threatened to stifle development there for years to come.

Wastewater from that area travels through a sewer line maintained by neighboring Baltimore County before being treated at the Patapsco Wastewater Treatment Plant in south Baltimore city.

Anne Arundel's public works department announced an immediate moratorium on Feb. 26, saying that peak wastewater flows in that part of the county had exceeded the capacity of the sewer network to handle them — a situation that threatened to increase sewage overflows into the Patapsco River.

The sewer lines can handle average daily wastewater flows. But according to county officials, rainfall leaking into the aging, cracked pipes caused the peak flows to exceed limits set decades ago under an agreement Anne Arundel has with neighboring jurisdictions.

The moratorium applied to new residential and commercial development on three sides of Baltimore-Washington International Thurgood Marshall Airport, a regional travel and business hub that supports more than 100,000 jobs, according to BWI. County officials identified 18 projects in the planning pipeline that they said would be put on hold until the sewer capacity crunch could be eased.

When the moratorium was announced, officials said they would seek to divert wastewater flows from the city-owned Patapsco plant to one or more of Anne Arundel's own treatment plants — a project that could take at least five years to complete. Pittman pledged nearly \$60 million toward the effort in his proposed county budget for fiscal year 2027.



The community along Dorsey Road in Hanover, MD, would have been one of many near BWI Thurgood Marshall Airport where development would have been halted for lack of sewage capacity. (F. A. Martin/CC BY-SA 4.0)

But county officials found a much quicker workaround. BWI also pipes its wastewater to the Patapsco treatment plant, and the airport is not using all the flow it is allowed

under the multi-jurisdictional agreement that governs access to the regional sewer network. The Maryland Aviation Administration, which manages BWI, agreed to lend its unused sewer capacity to Anne Arundel while the county works to build the sewer lines that can divert wastewater elsewhere.

The Maryland Department of the Environment further eased the crunch by allowing Anne Arundel to use different, somewhat lower measurements of its peak wastewater flows to the Patapsco plant.

Lifting the moratorium means that three development projects ready to hook up to the sewer system can go forward without delay.

Pittman thanked state officials and neighboring localities for “working with us to identify a regional solution that allows us to protect the Patapsco River while continuing to deliver the housing and the jobs that our region depends on.” ■



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New system gleans real-time data for Chesapeake rivers

Conditions posted online for nine sites in the Potomac, Anacostia, Shenandoah

By Lauren Hines-Acosta

The Reservoir Center for Water Solutions and its partners launched a new Water Quality Monitoring Program on June 3 that will serve the Anacostia, Potomac and Shenandoah rivers. And, unlike many monitoring systems in the Chesapeake Bay region, it will provide the public with real-time data about river conditions.

The system collects water quality data from nine buoys: five on the Anacostia, two on the Potomac and one each on the North Fork and South Fork of the Shenandoah.

On the online dashboard, anyone can see the current and historical trends of a range of river health characteristics. For instance, the public can check the temperature before going paddling or track where oxygen levels in the water are high to follow fish.

The buoys don't measure E. Coli, or bacteria, which are a prime water-contact concern for humans and their pets. But the center has partnered with the Chesapeake Monitoring Cooperative to provide bacteria

results from the previous day.

Nicole Horvath, program manager of the Reservoir Center for Water Solutions, cautions that this tool does not show if the water is "safe" but whether it's "good" or "impaired" based on the data.

The Potomac Riverkeeper Network, the U.S. Geological Service and a host of other organizations have monitored these waterways for decades. But they often rely on volunteers, and the data isn't always publicly available. There is also often a delay between when the data is collected and when the information is released. Instead, this program uploads data every 15 minutes, which can be accessed at reservoircenter.org, under "Water Quality Program."

Kayak and boat outfitters in the area plan on using the new technology. Cam Costello, director of programs at DC Sail, organizes programs that make sailing fun and affordable on the Anacostia.

"We now have real time monitoring that we can access," Costello said. "It just makes it both more practical in terms of our



A buoy holding water quality sensors bobs on the Anacostia River in the District of Columbia. (Lauren Hines-Acosta)

day-to-day operations, but also it's sort of a peace of mind thing for our members."

Beyond checking if it's a good day for fishing, the data can also act as "an early warning" system before a harmful growth of algae occurs or if there is an undetected spill, according to Betsy Nicholas, president of the Potomac Riverkeeper Network.

Environmentalists hope the project will change the public's attitudes toward the District of Columbia's recovering waters.

Between the recent rupture of the Potomac Interceptor, which released 300 million gallons of untreated sewage into the Potomac River, and the Anacostia recovering from decades of dumping and toxic contaminants, the highly urbanized capital region has been tough on its waterways. But they're improving. Although problems continue, most recreational and fish advisories have been lifted in the Potomac, and the Anacostia has been spared anymore sewage since the District completed its Anacostia River Tunnel Project in 2023.

The Anacostia health has been steadily improving over the last decade. Chris Williams, president of the Anacostia Watershed Society, has been working to lift the swimming ban on the river. But there's another hurdle he must tackle — the public's perception that the river will never be clean.

"It's not just a matter of cleaning up the river, it's a matter of educating folks that the river is ready for them, and that's one of the things this system is really going to contribute greatly to," said Williams. ■

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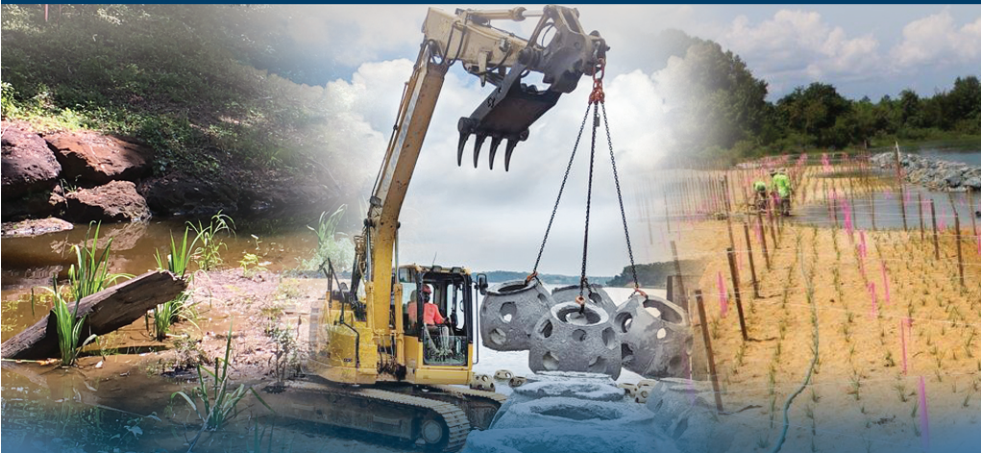




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Western MD ‘wildlands’ imperiled by transmission line

Power line right of way could cut through wild acreage protected for decades by the state

By Jeremy Cox

Through acts of the Maryland General Assembly, thousands of acres of forests in Western Maryland have been preserved as “wildlands.” State law requires those lands to be managed in a way that “will leave them unimpaired” for future generations.

With a crucial assist from that same legislative body, though, a Florida-based energy company is on track to remove those protections from nearly 60 acres of state-designated wildlands. NextEra Energy Transmission MidAtlantic wants to clear-cut those wooded acres to support the construction of a 107-mile overhead transmission line from Pennsylvania to Virginia.

The project, called the Mid-Atlantic Resiliency Link, or MARL, is part of a larger transmission expansion throughout the Mid-Atlantic intended to help quench rising energy demands partly fueled by data centers.

Last year, Maryland lawmakers passed legislation at NextEra’s behest, repealing protections from portions of three separate wildland tracts to make way for the line. It was the first time in the wildland program’s 55-year history that the state had moved to take property out of the system.

But it’s not a done deal. The wildland acreage can still be spared if the state Public Service Commission, which regulates the energy industry, denies the MARL project or forces NextEra to use a different route. The agency is expected to decide the case in late 2027 or early 2028.

Environmentalists are deeply ambivalent about the potential loss of wildlands. Some were grateful for the concessions that lawmakers wrung from NextEra, including a requirement that the line run adjacent to existing transmission corridors and that every lost wildland acre be replaced with 2 acres elsewhere of equal quality. But others argue that the action violates the intent of the wildlands legislation.

“Those [wildlands] have been designated as areas not to be touched,” said Judy Fulton, an advocate with the Maryland Sierra Club. “When you put a 200-foot-wide line right-of-way through an area, it’s of course a major disturbance. You’ve got to have roads and a footprint to put it in.”

The entire MARL project is expected to cost more than \$1.1 billion by its expected 2031 completion date. NextEra officials say



A transmission line cuts through Big Savage Mountain Wildlands in Maryland, erected before the area was designated as state wildlands. A new line could double its width. (Lara Lutz)

that installing the new line parallel to existing transmission lines will reduce habitat fragmentation and the need for more access roads.

PJM Interconnection, which operates the power grid in the Mid-Atlantic region, tapped NextEra in December 2023 to construct the line. Without it, backers say, the region could face dire reliability issues in the not-too-distant future.

“These types of upgrades are really critical to keeping the lights on in Maryland and the neighboring states,” said Kaitlin McCormick, a senior director of development for NextEra. “Electricity is not focused on state lines and that power is going to be moving throughout that network.”

Proponents also say that the line would give Maryland more capacity to bring renewable energy projects within its borders onto the grid. The MARL project has a planned connection to the Black Oak Substation in Allegany County.

Del. Lorig Charkoudian, a Democrat from Montgomery County, championed the environmental mitigation measures in the 2025 legislation that paved the way for the transmission line to traverse wildlands. She said it demonstrated how the state can strike a balance between its needs for energy and environmental protection.

“I am someone who wants to both protect wildlands and to have a future where climate change requires us to have more [energy] transmission,” Charkoudian said. “Ultimately, we ended up with something

that was stronger than what we had before.”

Under existing law, the state could have repealed the wildlands designations without placing controls on the new development or requiring acreage to replace it.

Critics, however, allege that the line has little purpose outside of delivering more fossil fuel-derived energy from Pennsylvania and West Virginia to Northern Virginia’s Data Center Alley. “It would allow the energy to come over the mountains to the epicenter of data centers,” said Brent Walls, the Upper Potomac Riverkeeper. “This is what this is all about.”

Those critics have a point, said Anurag Srivastava, an electrical engineering professor at West Virginia University. “The infrastructure benefits the whole region,” he said, “but it mainly exists because of the increase of demand in Virginia.”

In addition to Maryland, the MARL project still needs approval from energy regulators in the three other states in its path: Pennsylvania, Virginia and West Virginia.

There are nearly 40 separate tracts designated as wildlands in Maryland, totaling 66,000 acres. The MARL project would impact portions of three of those: Big Savage Mountain and Bear Pen Run in Garrett County and Dan’s Mountain in Allegany County.

Lawmakers passed the Wildlands Protection Act in 1971, patterning it after the federal Wilderness Act. The law defines a wildland as any land or water that has

“retained its wilderness character,” even if human activity has disturbed it in the past. It also can be a place that hosts rare or vanishing plant or animal species.

Wildlands can be used for certain types of passive recreation, such as hunting, fishing, hiking and horseback riding. New infrastructure is generally not allowed, including roads and transmission lines.

All three sites are ranked as “Type I” wildlands, the program’s most pristine designation. But they’re not completely untouched. Overhead lines already bisected or abutted the wildland areas before they got their designations. The MARL proposes widening that right of way for a total length of about 2.5 miles through those tracts.

Steve Storck, who lives near Oakland, opposes the wildlands route. At stake, he said, is a landscape that, if developed, can never be fully restored. The wildlands are crucial for sending clean water downstream to the Chesapeake Bay, he said.

Recalling a daylong hike in the Bear Pen Run wildlands a few years ago, Storck said, “It was just rocky, rugged, beautiful streams, small waterfalls, dense, dense vegetation — what you would expect when you think of wildlands.”

An analysis conducted by the Maryland Department of Natural Resources suggested that at least 60 rare, threatened or endangered species may be found within a quarter mile of the MARL’s proposed route. Among them: the state-endangered Allegheny woodrat and the federally endangered northern long-eared bat.

DNR officials noted that another route proposed by NextEra, which skirted around the wildlands to their north, would have fewer wildlife impacts. Meanwhile, the “Southern/Wildlands Route,” according to their report, “would disproportionately impact these species and habitats to a much greater degree” and, therefore, would not be the agency’s choice.

The proposed route is 7 miles shorter than the northern path, according to an analysis by ERM International. It also impacts 40 fewer structures, parallels more existing transmission line right-of-way and is expected to cost about \$70 million less. While the northern route treads into more transmission-line-free territory, Storck said much of it is far from pristine, including wind turbines, strip mines and a landfill. ■

Warehouses add to air pollution in PA's Cumberland Valley

Study shows regulations have helped, but growth and geography still cause problems

By Carolyn Beans

Over the past few decades, Cumberland Valley communities in southcentral Pennsylvania — home to the Interstate 81 corridor through Franklin and Cumberland counties — have seen rapid growth in the number and size of warehouses.

The industry, which includes fulfillment and distribution centers, has been a major economic boon. In those two counties, roughly 10% of workers are in the warehouse industry. But these massive facilities also draw air-polluting truck traffic.

Now, an analysis led by researchers at Shippensburg University reveals links between warehouse expansion, health risks and economic benefits within the Cumberland Valley.

The analysis shows that air pollution is higher within the valley, where warehouses are concentrated, than outside the valley. There have been improvements over the past decade, though, as clean air regulations reduced air pollution, even as warehouses and truck traffic increased.

That means air quality is still a concern, said study author Tim Hawkins, a Shippensburg earth scientist. “But we’re allowing [warehouses] to be here as a society because there’s a lot of economic benefit,” he said.

The region became a draw for warehouses, in part, because of its geography. By way of Interstate 81 through the valley, trucks can reach about two-thirds of the U.S. population within about a day, Hawkins noted.

The area also boasts ample farmland adjacent to urban areas like Shippensburg and Carlisle — open space ripe for massive warehouse projects in close proximity to highways.

Amazon moved in, as did many retailers, such as Walmart, Target, Lowe’s and Home Depot, all of them building fulfillment centers for online shoppers.

Exhaust from diesel trucks stopping at these facilities contributes to a form of pollution known as particulate matter, or PM2.5. These tiny particles measuring 2.5 micrometers across or less can travel deep into the lungs and cause respiratory and even cardiovascular diseases.

To weigh the pros and cons of the warehouse boom, Hawkins, undergraduate researcher Grace Coffman and others collected data on the industry’s local



Trucks leave warehouses at the Key Logistics Park in Cumberland County, PA. (Dave Harp)

expansion from the late 1980s through early 2020s. They also trained a computer model to identify fulfillment and distribution centers in aerial images of Cumberland and Franklin counties taken periodically from 2004 onward.

Records showed that there had been four such facilities in 1988. By 2022, there were about 200. The average size of new warehouses in the region doubled, from less than 10 acres in 2003 to more than 20 in 2022.

The team also tracked changes in truck traffic using PennDOT data on average daily tractor-trailer traffic surrounding Carlisle. From 2001 to 2023, that increased more than 20% on the Pennsylvania Turnpike and 43.5% on Interstate 81.

To gauge how air quality differs between the Cumberland Valley and the surrounding region, the researchers compared data from an EPA sensor in Carlisle with an EPA sensor south of the valley in Arendtsville. They also used readings from nine other sensors that generate publicly available data, eight of them within the valley and one just outside.

The two EPA sensors showed that average daily particulate matter levels are 14% greater, on average, in Carlisle than in Arendtsville. In winter, the particulate matter levels are 31% greater.

Of the nine additional sensors, the one outside the valley registered the lowest air pollution levels. Additional data from NASA satellites also suggested that particulate matter concentration is higher in the valley than in the surrounding area.

The authors attribute the heightened air pollution to the concentration of warehouses and associated truck traffic in the

Cumberland Valley, as well as highway traffic in general. Valley geography also plays a role, Hawkins said. Mountains on either side of a valley often block wind that would otherwise carry pollutants away. And in winter, warmer air overtop a valley can act as a lid that traps colder air within the valley, along with pollutants.

The team also used an EPA model to predict the amount of pollution within the valley coming from warehouses specifically over time, based on emissions expected for a warehousing industry of a given size.

They found that PM2.5 emissions from warehouses declined in the Cumberland Valley by 45% between 2014 and 2020. Consequently, the monetized public health impacts associated with warehouses in Franklin County — a proxy for the valley as a whole — dropped by 66% over the same period.

Meanwhile, from 2017 to 2020, the gross domestic product for the Franklin County warehousing industry grew by 30%.

Hawkins’ team attributes the decline in particulate matter to improvements in engine efficiency, as well as laws that prevent trucks from idling. “The Clean Air Act works,” Hawkins said. “Pollutants have come down at national levels, and so this is just a nice local example.”

Large drops in particulate matter levels over the past 20 years across the eastern U.S. are also linked to reduced emissions from coal power plants, said Daniel Goldberg, an air quality scientist at George Washington University in the District of Columbia, who was not involved in the study.

But despite improvements, summer

and winter particulate matter levels in the Cumberland Valley still regularly bump up against the EPA’s limit for safe air and surpass the stricter World Health Organization limit, Hawkins said.

There are other environmental impacts of warehouses not captured in the study. In 2024, Goldberg and colleagues reported that concentrations of nitrogen dioxide, another diesel exhaust-related pollutant, are elevated by about 20% near warehouses across the country. But because the data was collected by satellites at a resolution of about 8 square miles, the authors do not know how pollutant levels may vary across individual neighborhoods. Some residents downwind of heavily trafficked warehouses may experience pollutant levels even higher than the estimate.

Warehouses, with their massive impermeable footprints, also create stormwater management challenges, Hawkins said. “You’re dumping warmer water, potentially, into the streams that historically have been groundwater fed.”

Kirk Stoner, director of planning for Cumberland County, said that the Shippensburg study “provides great information on air quality in our valley.” But as an advisor to the county’s 33 municipalities on zoning issues, he said he would be hesitant to use the study to make zoning guidelines for warehouses, or any other transportation intensive uses, because there are so many other contributors to air pollution in the valley, including highway traffic unrelated to the warehouses.

Cumberland Valley municipalities are now bracing for the next big development push: data centers, which can pollute the air with their backup diesel generators and, like warehouses, create stormwater management challenges.

Warehouse construction in Cumberland County, meanwhile, has slowed. Much of the available land close to interchanges has already been developed into warehouses, Stoner said. “Our municipalities don’t appear to be willing to rezone land that is farther away.” ■

Carolyn Beans is a freelance science writer based in Pennsylvania.

In Southern Maryland, data center bid prompts larger debate

Redevelopment of Charles County power plant included in plans for hyperscale data center

By Jeremy Cox

For nearly four hours, residents living near the site of a proposed data center in Charles County, MD, approached a microphone inside a mostly full auditorium. One by one, they lectured, thundered, exhorted and pleaded against an ordinance that would pave the way for data centers to be built in the Southern Maryland county.

But the prevailing sentiment may have been best encapsulated by a shout from a female voice that rang out during one of the meeting's many emotional crescendos: "You're playing with fire! You're playing with our lives!"

The June 1 meeting — an opportunity for the county planning commission to weigh in on the proposal for the second time in three months — was a microcosm of the state's larger debate about data centers.

From the Atlantic Ocean to the Allegheny Mountains, residents have been turning their hostility toward public officials whenever data centers are the topic of conversation. The "hyperscale" complexes often sprawl across hundreds of acres. While they're seen as vital to artificial intelligence and maintaining the digital economy's growth, they are just as often criticized for their massive consumption of public resources, including electricity and water.

That political pressure is starting to yield results, with Harford County in June enacting the state's first outright ban on their development. And at least six other Maryland counties — Baltimore, Carroll, Howard, Montgomery, Prince George's and Queen Anne's County — as well as Baltimore city have approved pauses within the last several months.

Charles County is different. There, data centers are already effectively banned because the county's zoning codes don't mention them explicitly. County commissioners must pass a zoning text amendment to make construction possible.

The issue is heading to a high-stakes vote in the coming weeks by the county commissioners. It will be the second time that the measure has come before them.

The planning commission urged denial of the first version of the amendment in March while suggesting restrictions. Those included limiting data center development to industrial zones, banning the use of



Jace Thompson-Luckett, 9, holds a sign at a June 1 protest in Charles County, MD, decrying a data center proposal in the Southern Maryland county. (Jeremy Cox)

drinking water sources for cooling and requiring the companies to pay for any infrastructure costs. In April, county commissioners voted 3-2 to send those changes back to the planning board on June 1 for another hearing — leading to a second denial recommendation from the board.

The debate comes amid a developer's double-pronged proposal for a 355-acre site on the Potomac River near the small community of Newburg: to build what would be Maryland's largest data center and to power it by converting the old coal plant on the site to natural gas.

Nearby residents fear that the development will compete for their drinking water reserves, raise electricity bills and pollute the air whenever the facility fires up its backup diesel generators.

"I'm sure this represents a huge opportunity for revenue in the county," Kevin Corcoran told the planning commission at the June meeting. "But it needs to be done in a way that's going to completely safeguard our community. I think you're hearing from our community right now that's not being done."

About 200 people attended the hearing. Dozens demonstrated outside beforehand. Inside, energy remained high. Chants of "No data centers!" ebbed and flowed. The board's chairman, Kevin Wedding, admonished the audience more than once.

"This is what it sounds like when you dismiss people," Whitney Ingram, a La Plata resident, shot back during her turn to speak.

Alana Davis, coordinator of the Charles County Against Data Centers Coalition, said that a big reason for the pushback is that the massive, warehouse-like buildings are often proposed in communities already plagued by pollution. The census tract surrounding the proposed Newburg site is listed as "overburdened," according to the Maryland Department of the Environment's environmental justice mapper.

"They target vulnerable communities," she said in an interview.

Much of Newburg's environmental woes are tied to the existing power plant, the Morgantown Generating Station. Past violations include illegal storing and handling of toxic coal ash at the site.

The power plant opened in 1970 and operated six oil generators and two coal generators at its height. GenOn Holdings, the facility's current owner, shut down the coal generators in 2022, citing adverse market conditions and high environmental compliance costs. The oil-fired units are still running.

TeraWulf, the company behind the Newburg proposal, didn't return messages seeking comment. The firm is based in Easton on Maryland's Eastern Shore.

The company has announced plans to "repower" the Morgantown plant with the addition of up to 1 GW of natural gas-derived energy. But that could pose a technical challenge, according to opponents like the advocacy group Public Citizen, because the closest natural gas transmission

line is 20 miles away. Either a new pipeline will be needed or gas tankers will have to deliver the fuel by way of the Potomac River to a newly built terminal at the facility.

The company's efforts received a boost in December when Gov. Wes Moore's administration pledged to "expedite" the review process of the redevelopment of the Morgantown facility.

Serena McIlwain, secretary of the Department of the Environment, told TeraWulf officials in a letter that their plans to clean up the site's pollution represent a "great benefit" to the state. She vowed to "expedite as efficiently as possible" reviews of those remediation plans as well as those for any necessary permits, including securing rights of way for natural gas pipelines.

The letter has drawn strong criticism, including from Angie McCarthy, clean energy campaign manager for the DC-area group Nature Forward. "Permitting is one of the strongest tools in our toolbox, and I'm disheartened that our MDE ... has perhaps a difference of opinion with us on energy sources," she said.

MDE spokesman Jay Apperson told the *Bay Journal* that the agency is "currently engaged in technical discussions" surrounding the redevelopment proposal. He added that those reviews will adhere to "Maryland's stringent environmental standards, specifically concerning land remediation, air quality and water protection."

The Federal Energy Regulatory Commission is expected to decide this summer whether to sign off on TeraWulf's acquisition of the Morgantown plant. Several prominent groups, including the market monitor for PJM, which operates the regional power grid, and the Maryland Office of People's Counsel have called on the agency to reject the proposed transaction.

The OPC, the state's official consumer watchdog, told regulators that TeraWulf's operational and financial history put the project on shaky ground. Net losses of more than \$660 million in 2025 and further losses on its balance sheets in 2023 and 2024 raise questions about whether the company can afford the debt it would incur from the purchase, the OPC said.

Furthermore, the OPC letter points out that 90% of TeraWulf's revenue comes from its bitcoin-mining operations, a sector with high financial volatility. ■

Vibrio on the rise as climate warms the Chesapeake Bay

Infections are still relatively uncommon, but the costs of infection are severe

By Timothy B. Wheeler

One day last July, Vernon Spear scratched his forearm on a crab pot as he pulled it out of the Choptank River from his pier in Cambridge, MD. He put hydrogen peroxide on the tiny cuts, thinking that would disinfect them.

That night, his forearm swelled up, and he spiked a high fever. The next morning, the fever was gone, and his arm didn't hurt. But the wounds were bright red and oozing. Alarmed, his wife and son insisted that Spear go to the local emergency room.

The physician who saw him there immediately recognized that Spear was in imminent danger of losing his arm — and maybe his life — from a *Vibrio vulnificus* infection. He was rushed by helicopter to the R Adams Cowley Shock Trauma Center in Baltimore, which specializes in treating severe injuries and critical illnesses.

Spear was fortunate: He survived and kept his arm. But he's spent most of the past year undergoing treatment, including skin grafts, to restore his arm from what's often called the "flesh-eating bacteria."

Cases like Spear's remain relatively uncommon, but their number is increasing because of climate change, scientists say. And as the Chesapeake Bay warms along with the rest of the planet, its mildly salty and nutrient-gorged waters offer prime habitat for the potentially deadly microbe.

Naturally occurring

Vibrios are naturally occurring bacteria found in warm, brackish coastal waters, including the Chesapeake and its tributaries. There are more than 80 vibrio species, and many play an ecological role. They recycle carbon and nitrogen in the estuary by breaking down chitin, the tough substance in the shells of blue crabs, insects and even tiny zooplankton.

But about a dozen species can make people ill, either through swallowing them or getting them in a wound. Nationwide, the U.S. Centers for Disease Control and Prevention (CDC) estimates there are about 80,000 vibrio infections each year.

The majority are food-borne illnesses, mostly from eating uncooked oysters or other shellfish. In those cases, people can suffer diarrhea, stomach cramps, nausea, vomiting, fever and chills. The symptoms



Vibrio bacteria cultured by scientists at the National Oceanic and Atmospheric Administration show up as blue spots in petri dish. (Dave Harp)

usually abate within a few days, but they pose more serious health risks for individuals with immune deficiencies.

V. vulnificus, the type that infected Spear, can also enter the body through open wounds or even scratches exposed to bacteria-infested waters. When that happens, the infection can lead within hours to sepsis, a dangerous overreaction of the immune system that can kill human tissue, shut down organs and cause death if not treated promptly.

There were more than 400 vibrio cases — from all species — reported in Maryland and Virginia in 2025, according to the states' health departments. But they are likely undercounted. Many people who get sick from eating vibrio-infested shellfish or fish probably weren't ill enough to be hospitalized or even see a doctor.

"Food-borne illness overall is vastly underreported," said Kelsey Holloman, food-borne disease epidemiology program manager for the Virginia Department of Health.

Reported cases increasing

In recent years, the number of vibrio infections reported in Maryland has more than doubled — from 100 in 2018 to 260 in 2025, according to the state Department of Health. This year, 72 cases had been reported by late June.

The vibrio case count in Virginia, though lower overall, has nearly doubled in the same period, from 86 infections reported in 2018 to 151 in 2025, according to the state Department of Health. By late June this year, 42 cases had been reported.

Improved testing technology accounts for some but not all of the increase, experts say.

"I think environmental conditions have changed," said Dr. Clifford Mitchell, environmental health bureau director of the Maryland Department of Health.

"Vibrio do thrive in warmer waters," Holloman noted, "so as the temperatures rise and stay warm longer, we would expect [cases] to increase."

Over the past 30 years, driven by warming air, the average water temperature in the Chesapeake Bay has increased by 1.8 degrees, according to the National Oceanic and Atmospheric Administration.

V. vulnificus, the so-called "flesh-eating" species, thrives when the water is warmer than 64 degrees and has salinity between 10 and 20 parts per thousand. Those conditions are met for at least part of the year throughout most of the Bay and the lower portions of its tributaries.

Add to that mix the elevated levels of nutrient pollution throughout the Bay, and conditions are optimum for vibrio to thrive.

"Vibrios are present in very, very low numbers in traditionally unpolluted waters.



*Vernon Spear of Cambridge, MD, still bears scars on his forearm from a *Vibrio vulnificus* infection that put him in the hospital after scratching his arm on a crab pot. (Dave Harp)*

They're part of the natural flora," said Rita Colwell, a microbiologist and marine scientist with the University of Maryland who's spent much of her six-decade career studying the bacteria.

"But as soon as we create eutrophic [low-oxygen] conditions and with increased temperature of the water," she added, "that's sufficient to change the composition of the microbial population."

Temperature major driver

Warming water is the major driver of increased vibrio. The prime season for vibrio traditionally has been from May through October, but with coastal waters trending warmer, infections have been popping up earlier and later in the year. A *V. vulnificus* case occurred in April this year, the Maryland Department of Health reported.

Colwell's research has focused in part on *V. cholerae*, which is responsible for cholera, a potentially life-threatening illness caused by consuming contaminated water or food. According to the CDC, 1 to 4 million people worldwide get cholera annually, and 20,000 to 140,000 die.

There are other illness-causing microbes in the water, too. Oysters can pick up norovirus and salmonella from contaminated water.

People who eat them might experience stomach cramps, diarrhea and vomiting.

But vibrios are a special concern because they can proliferate in oysters and other seafood harvested from otherwise untainted waters, and in places considered safe for swimming. Also, the consequences of an infection can be more severe, especially for people with underlying medical conditions.

A 2024 study found a 39% increase in the per capita incidence of vibrio infections in Maryland from 2006 through 2019, with the greatest increase from *V. vulnificus*.

All along the East Coast, another study estimated that wound infections from *V. vulnificus* grew eightfold, from 10 cases in 1988 to 80 in 2018. Florida has the most cases, but the northernmost case reported has shifted gradually northward. As sea waters continue to warm and vibrio spread to New York and beyond, the study warned that *V. vulnificus* cases could double in 20 to 40 years. In 2024, a Rhode Island resident died from an infection, that state reported.

Nationwide, 150 to 200 *V. vulnificus* infections are reported to the CDC annually. About one in five infected people die, sometimes within a day or two of becoming ill.

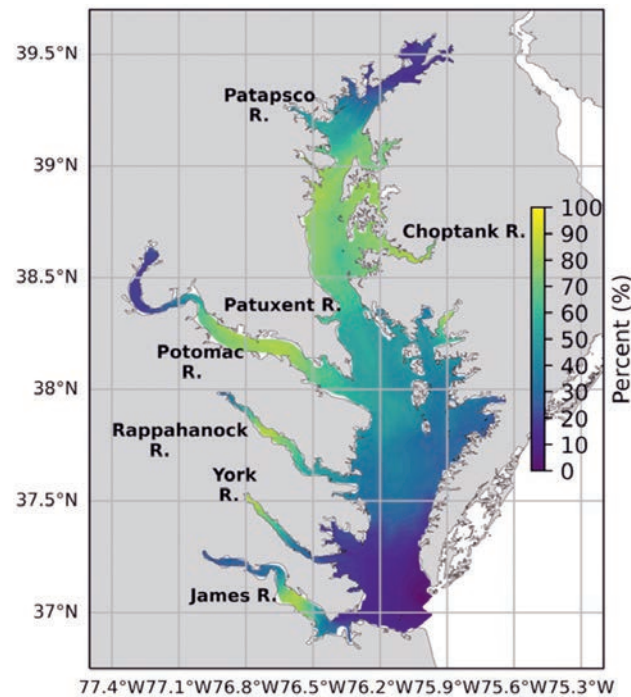
A handful of deaths each year

In Maryland last year, there were 14 confirmed cases of *V. vulnificus*, including an outbreak in Wicomico County tied to a crab feast. Three deaths were attributed to the infections. Virginia reported 11 confirmed cases in 2025, with one death. Infections from other vibrio species accounted for four other deaths combined in the two states.

To put those numbers in perspective, people are much more likely to die from a motor vehicle accident than from vibrio. The nationwide traffic fatality rate in 2024 was 11.5 per 100,000 people, compared with a total of eight vibrio deaths in 2025 in a combined population of roughly 15 million in Maryland and Virginia.

While still relatively uncommon, the pain and suffering from a vibrio death are significant. The costs to society are also substantial. Infections from eating seafood contaminated with *Vibrio parahaemolyticus* impose about \$20 million annually in health care costs and lost income, according to one study.

Because *V. vulnificus* has such a high mortality rate, the health care costs and estimated lost income from illness and premature death are much greater — about \$238 million, the study added.



This map by the National Oceanic and Atmospheric Administration shows the probability of *Vibrio vulnificus* being present in the Chesapeake Bay on June 26, 2026.

Shellfish safety precautions

Foodborne illnesses from vibrio and other microbes are also an economic risk for oyster growers, whose business depends on customers trusting their products' safety. Federal and state agencies have laid out rules for the harvesting and handling of shellfish to prevent transmission of bacteria and other pathogens.

Farmed oysters can be harvested year-round, even in warm weather. But they must be landed in the morning from May through October, and they must be refrigerated within two to five hours of being pulled from the water, depending on time of year, to limit the chance that vibrio might proliferate.

JD Blackwell, owner of 38° North Oysters, said he purposely selected the site in rural St. Mary's County where he raises oysters to steer clear of sewage spills and other contaminants. He said he finds government rules on harvest and handling quite reasonable, and he does his best to go beyond those requirements by shortening the time to land his shellfish and getting them quickly iced down.

"Anything I can do to get behind the issue, we execute on," he said.

Blackwell said he's only had one of his employees get a suspected and relatively mild case of *V. vulnificus* in the past 15 years, but it wasn't clear how or where he acquired it. All of his staff wear wet suits and gloves when handling the oysters, he said.

Forecasting vibrio levels

Given the consequences of vibrio infections, scientists and industry experts have developed computer models that can forecast where and when vibrio levels might increase.

"We can't predict what number [of infections] will occur," Colwell said, "but we can predict the risk."

Working with the U.S. Food and Drug Administration, state agencies, and university scientists, the National Oceanic and Atmospheric Administration has developed tools for assessing vibrio risks along the nation's coasts, including in the Chesapeake Bay.

In the Chesapeake, one model aims to help oyster farmers gauge the best time to harvest their product. It uses water temperature and salinity data to predict concentrations of *V. parahaemolyticus* around the Bay up to 48 hours in advance. Another tool tracks air temperatures and projects how quickly the vibrio will proliferate in oysters once removed from the water. That can give growers an idea how quickly they should refrigerate their shellfish.

For the public at large, a third tool aims to assess levels of *V. vulnificus* around the Bay and in its tributaries. Drawing on two decades' worth of water sampling by state agencies and molecular testing for vibrio DNA in the water, it estimates concentrations of the bacteria based on temperature and salinity for the previous six days, the current day and the next one. To view it,



University of Maryland scientist Rita Colwell (left) reviews Potomac River water sampling data with Vicki Judson of the Sycamore Island Canoe Club. (Timothy B. Wheeler)

search the web for "NOAA vibrio forecast."

"It's an inherent risk of recreating in a natural body of water," said Ava Ellett, a marine biologist with NOAA's National Ocean Service in Oxford, MD. "We're not trying to prevent people from recreating in the water," she added, but "just provide that context." To take it one step further, she and others are working on yet another model they hope can provide a long-range forecast of expected vibrio illnesses every summer in the Chesapeake region.

Henry Sage, one of Colwell's graduate students looking for *V. cholerae* in the Potomac River this summer, said the point of his and others' work is not to scare people away from eating oysters or going in the water.

"I do recreate on the Potomac at times," he said. "I want to know if I'll be affected."

There is no vaccine to prevent vibrio infections, so risk reduction is up to each individual. Cooking oysters and other fish kills the bacteria, for instance. Covering up cuts or wounds or staying out of the water until they heal avoids that infection pathway.

After his ordeal with *V. vulnificus*, Vernon Spear isn't taking any chances. His crab pots washed away while he was undergoing treatment and, with his focus on recuperating, he hasn't replaced them.

Meanwhile, he said, "I love raw oysters, but I'll never eat another." ■

Could the ‘whole watershed’ approach fix this MD river?

Five-year Severn River restoration effort gets underway in Anne Arundel County

OUR WATERWAYS

By Jeremy Cox

Editor’s note: This article is part of a series about the health of streams and sections of rivers in the Bay watershed. To suggest a waterway, contact Jeremy Cox at jcox@bayjournal.com.

Despite more than four decades of cleanup efforts, the Chesapeake Bay is still plagued with ecological problems, such as massive algae blooms, oxygen-depleted waters and an oyster population that remains a fraction of its historic size.

Could it be that those efforts have been too haphazard?

There’s typically a lot of fanfare when a restoration project focuses on a given watershed within the Bay’s drainage basin, said U.S. Rep. Sarah Elfreth, a Democrat from Maryland and a leading proponent for the Bay cleanup.

“But then we move on to another watershed and do another random act of restoration over there, and when we turn back, we wonder why we haven’t made substantive water-quality improvements in the Chesapeake Bay,” she said.

Elfreth delivered those remarks on the edge of a Giant supermarket parking lot in Annapolis. She and other state and local VIPs had gathered there May 29 to celebrate the completion of two “bio-retention cells”—resembling artificial bogs—aimed at reducing nutrient and sediment pollution in the parking lot’s stormwater runoff.

This was no “random act of restoration,” Elfreth said, but rather one of the first steps in a carefully orchestrated five-year plan to boost the health of the Severn River in Anne Arundel County. Supporters hope that by concentrating funding and improvements in one watershed, they can achieve a faster, more appreciable environmental response.

And the Severn isn’t alone. There are four other Maryland watersheds receiving similar makeovers: Antietam Creek in Washington County, Baltimore Harbor, Newport Bay near Ocean City and the upper Choptank River on the Eastern Shore.

They represent the inaugural class of waterways receiving help under the state’s



Ben Fertig of the Severn River Association sits near “step pools” in Annapolis’s Wardour neighborhood, which are designed to slow down and absorb stormwater. (Dave Harp)

Whole Watershed Act. The measure was inspired by a landmark 2023 report by the Bay effort’s scientific advisers. The *Comprehensive Evaluation of System Response* pushed for shifting the focus toward improving shallow waters to deliver more direct benefits to people and aquatic life.

“I think what we learned from that was we needed to move faster,” said Josh Kurtz, head of the Maryland Department of Natural Resources. “We needed to make sure that we linked the solutions together.”

Elfreth, who sponsored the Whole Watershed Act legislation in 2024 as a member of the Maryland Senate at the time, described the effort as an “entirely coordinated and full watershed approach.”

“Imagine this,” she said, motioning to the newly installed project behind her, “but in every single parking lot in the city of Annapolis within the Severn River watershed.”

The law required the five selected watersheds to represent a mix of urban, suburban and rural areas with at least two being in “an overburdened or underserved community.” The Severn, whose 80-square-mile basin includes communities such as Annapolis, Severna Park and Arnold, was chosen for the suburban category.

“You have distributed impervious surfaces unlike, say, Baltimore city, where you’ve got an urban core that is extremely developed,” said Ben Fertig, restoration manager for the Severn River Association,

part of the coalition coordinating the river’s Whole Watershed program.

Impervious surfaces are hardened land coverings, such as roads and rooftops, that block rain from percolating into the ground. But even though suburban areas have less concentrated impervious cover than their urban counterparts, they contribute to the Bay’s problems in their own way, Fertig noted.

“Here, you do have lawns and gardens and fields and so on,” he said. “But that also presents a challenge in terms of nutrients because those [landscapes] require water, fertilizers and a bunch of pesticides and herbicides.”

The Severn watershed is home to the state capital and the U.S. Environmental Protection Agency’s Chesapeake Bay Program Office, from which the Baywide cleanup is coordinated. And the U.S. Naval Academy stands sentinel where the river meets the Bay.

But such proximity to power hasn’t resulted in sweeping water-quality improvements. Among the lowlights:

- Once a stronghold in the Bay’s oyster industry, the river has been closed to harvesting for a century because of bacteria.
- The river’s water quality received a C-plus on its most recent report card in 2023, a marginally higher grade than the previous year partly because of drier weather.
- A large expanse of nearly oxygen-free water occupies much of the river during the summer, killing aquatic life that isn’t able to flee.

The \$250,000 project at the Giant on Bay Ridge Road should not only reduce pollutants in the stormwater but also lower its temperature before it reaches a Severn tributary called Back Creek, said Jesse Iliff, executive director of the Severn River Association. Warmer water is more likely to form algae blooms, which rob the water of oxygen as they die.

The two bio-retention cells capture stormwater flowing off the 1-acre parking lot, filtering it through a bed of sand, soil and organic material. They’re designed to hold up to a foot of stormwater before the excess water spills into a raised overflow inlet.

This isn’t the first time that state officials have attempted a coordinated approach to watershed-level restoration.

For instance, the Targeted Watershed program, launched under Republican Gov. Robert Ehrlich in 2005, devoted nearly \$20 million toward restoring the Corsica River within five years. A 2020 assessment found improvements in nutrient management and habitat but little progress on water clarity, underwater grass acreage and the extent of algae blooms.

Those middling results have led Bay scientists to question whether restoration projects, even when massed together, can have a measurable impact on a waterway’s health, especially larger ones like the Severn where there’s more land to treat.

The goals of the Whole Watershed Act are open-ended. The law defines its purpose as “accelerat[ing] restoration of the Chesapeake Bay and Atlantic coastal bays and their watersheds” in ways that are “cost-effective” and “likely to demonstrate a rapid systemic response.” That response can include removing a waterway from the federal list of impaired waters.

Each of the five watersheds have received \$2 million to cover this year’s work. Future funding is uncertain, though state officials say the goal is to maintain at least that level of funding going forward.

None of those involved in the Whole Watershed effort expect it to resolve the Severn’s pollution woes within five years. If they don’t make it, well, they’ll just find ways to keep going, they say.

“The Whole Watershed Act is an important piece of the puzzle, but it’s not *it*,” Iliff said. “It wouldn’t be enough to do it alone.” ■

VA facility releases a year's worth of pollution in a day

Sterilization facility is one of many pollution sources in historically Black community

By Lauren Hines-Acosta

A Virginia company that sanitizes medical equipment released almost 600 pounds of ethylene oxide, a carcinogen in cases of constant exposure, due to a faulty valve at a facility just east of Richmond on April 9. The Virginia Department of Environmental Quality (DEQ) published a consent order in May fining the company, Sterilization Services of Virginia, for exceeding its annual emission limit — in a single day.

The facility, which sterilizes medical equipment, is one of many pollution sources in the historically Black community east of the state's capital. Virginia Interfaith Power and Light, the Southern Environmental Law Center and eastern Henrico County residents are pushing the state to revoke the facility's permit and examine the cumulative impact of permitted pollution from industrial sites.

Community members submitted comments to the state department during a public comment period, which ended June 19.

Eastern Henrico residents, particularly those near Gravel Hill, are proud of their community. They say it's built on family, faith and a love for the rural lifestyle and greenery just outside of Richmond. Gravel Hill was founded in 1777 by 78 freed slaves.

But James Greene is worried about the health of his community. He and his wife, Wilhelmina, have lived there for decades and have seen industries slowly move in. In addition to the medical sterilization facility, eastern Henrico has three landfills, a natural gas power plant, the Richmond International Airport, two crematoriums and two data centers.

For the most part, each of those facilities stays within its individually permitted emission limits. But together, residents say, they emit an excess of greenhouse gases, leach heavy metals or release "forever chemicals," such as the ones from fire-fighting foam at the airport during Air National Guard trainings. A recently passed state law requires the airport to discontinue its use of forever chemicals, technically known as per- and polyfluoroalkyl substances, or PFAS, by Jan. 1, 2030.

Now, residents are worried about unpermitted releases. DEQ allows Sterilization Services of Virginia to release up to 400



Residents of Henrico County, VA, listen as staff from Virginia Interfaith Power and Light talk to them about sources of pollution in the community. (Lauren Hines-Acosta)

pounds of ethylene oxide per year. But 580 tons leaked out of storage on April 9. DEQ verified the cause as a faulty check valve and fined the company \$53,616.75. DEQ will allow the company to continue operating. Since then, the facility has replaced its check valves and installed equipment that will periodically test them.

Ethylene oxide is a colorless, sweet-smelling gas that sanitizes material, killing microbes by damaging their DNA. The U.S. Environmental Protection Agency has conducted two risk assessments for the gas. One found that there is less than a 1% chance of developing cancer from the gas for those who live near a facility all day, every day for 70 years.

"While 1% may seem like not a lot of people, when we have over 100,000 people [within five miles of the facility] who are living and working and playing next to these facilities, in addition to all of the other sources of pollution in the area, that matters," said Connor Eppley, communications manager for Virginia Interfaith Power and Light.

Some people in Eastern Henrico, like Wilhelmina and James Greene, have lived in the area for 75 years. And they want accountability from these facilities.



Reverend Faith Harris with Virginia Interfaith Power and Light talks with residents of Henrico County, VA. (Lauren Hines-Acosta)

"That's what concerns me, that they don't realize that we are people, we have lives ... That bothers me," Greene said.

The Sterilization Services of Virginia declined to comment after multiple requests from the *Bay Journal*.

The Biden administration enacted stricter rules for ethylene oxide emissions in 2024 as part of the former president's Cancer Moonshot agenda. The 2024 rule established standards for emissions, tightened rules for sterilization chamber vents and required continuous monitoring. In October of last year, the sanitization facility began operating the new equipment necessary to comply with the 2024 rule and its state permit.

Then, last July, the Trump administration granted exemptions to the stricter rules for 40 commercial sterilizers across the country — including the Henrico County facility. According to DEQ, though, the facility is still operating under the stricter controls as part of its state permit.

The Southern Environmental Law Center is nevertheless suing the Trump administration over that move, arguing that it was an illegal use of presidential exemptions. That lawsuit is on pause as the administration works to entirely reverse the 2024 rule, saying it threatens to disrupt the domestic supply chain of sterile medical equipment.

"The Trump EPA is committed to ensuring life-saving medical devices remain available for the critical care of America's children, elderly and all patients, without unnecessary exposure to communities," EPA administrator Lee Zeldin said in a statement.

Virginia Interfaith Power and Light is asking DEQ to revoke the sterilizer facility's permit, require fence-line and real-time monitoring conducted by the state, notify residents of breaches in protocol and raise penalties for exceeding other permits.

Eppley added that the health costs of exposure from not using emission mitigating technology "is far greater than any costs that the industry would have to bear to be a good neighbor in the community."

The nonprofit has also been pushing for a law that would require state agencies to evaluate the cumulative environmental impacts on communities before approving new permits. A watered-down version of that law passed, requiring DEQ to update a "guidance memo" for the permit process. The agency said it's still updating the guidance, and it will hold two town halls before July 31, 2026. ■



Sturgeon are full of surprises, including that they're here

Once thought wiped out in Bay waters, multiple populations have been found, more are suspected

By Karl Blankenship

Last fall on Marshyhope Creek, which flows into the Nanticoke River on Maryland's Eastern Shore, biologists found something they thought they might never see: six adult female sturgeon that appeared ready to spawn.

"For us to get a female is, like, a monumental thing. But to get six of them in one year..." said Chuck Spence, a fisheries biologist with the Maryland Department of Natural Resources.

Even better, he said, one of them was a "spent female," meaning she appeared to have just released her eggs into the creek.

Stence and other DNR biologists have been trying to prove that the endangered fish spawn in the creek since 2013. That's when a sturgeon, a species biologists thought had long vanished from the waterway, proved it was present. The five-and-a-half foot fish jumped into the boat of two fishermen.

Sturgeon have been providing such surprises for decades — including the mere fact that they still exist.

Atlantic sturgeon are the largest fish native to the Chesapeake Bay. Adults are routinely five to six feet long, sometimes larger, and weigh 100-300 pounds. Historically, they reached lengths of 14 feet and weights of 800 pounds.

That such gigantic fish could be overlooked seems remarkable, especially given that Capt. John Smith reported in 1609 that the James River was filled with "more sturgeon than could be devoured by dog and man."

But sturgeon were a victim of overfishing

to meet global caviar demand in the 1800s and early 1900s. By the 1990s, many thought spawning populations had vanished from the Bay and its rivers.

Biologists were surprised when evidence of remnant spawning populations emerged first in the James, then the neighboring York River, and potentially in the Marshyhope/Nanticoke system.

The discoveries may not be over.

Biologists suspect a remnant population remains in Virginia's Rappahannock River, and some believe there is potential for their presence in several Maryland rivers, including the Potomac, Pocomoke, Patuxent, Chester and Susquehanna.

There's reason for their optimism. "If there's one thing that's been consistent across the coast over the last 30 years with Atlantic sturgeon, it is that the more we look, the more we find," said Dave Kazyak, who specializes in fish genetics at the U.S. Geological Survey's Eastern Ecological Science Center.

Those discoveries have forced biologists to reconsider what they thought they knew about sturgeon. That's led to even more questions, many of which are critical for trying to manage and protect the species, which was listed as endangered in 2012.

They may live longer than previously thought — perhaps more than a century. Populations in some rivers spawn in the fall; in others, they spawn in the spring. In some places, like the James River, they spawn in both seasons.

Sturgeon wander among rivers more than other fish, and in some cases they seem to visit spawning grounds but not spawn.

In some rivers, they spawn in deep water. In others, they spawn in tiny, shallow creeks you could skip a stone across.

Understanding those details is critical to protecting the fish. Their complex life cycle exposes them to a host of threats, from invasive blue catfish in Bay spawning grounds to ship strikes in the ocean. They could be caught in the bycatch of other fisheries, and they are vulnerable to pollution. Some people worry about the impacts of offshore wind farms, and development can threaten spawning areas.

"They're constantly surprising you," said Margi Whitmore, a fisheries biologist with the Virginia Department of Wildlife Resources. "And it feels like the more you learn, the more you need to know."

Genetic confusion

One of the surprising things about sturgeon in the Bay region involves the Marshyhope/Nanticoke fish, and it illustrates why so little about the species is straightforward.

Sturgeon are anadromous fish. That means they spawn in freshwater but spend much of their lives in the ocean before returning to their native river to create the next generation.

Typically, anadromous fish that spawn in a particular river are genetically distinct from those of other rivers — presumably because, over time, each population adapted to conditions unique to that system.

But genetic analysis of Nanticoke sturgeon in Maryland turned that idea on its head: They look just like sturgeon from the York River in Virginia, 100 miles farther south and on the other side of the Bay.

"They're very, very, very similar," Kazyak said. He studies sturgeon DNA and has identified 18 unique populations along the East Coast. Right now, the Nanticoke is not one of them.

"Looking up and down the coast, they are the only spot that I see where we have two different rivers [with populations] that look basically identical to one another," he said.

Nor is it the only genetic surprise in the Bay. While sturgeon from the York and the Nanticoke seem to be the same, the James has two distinct populations.

One spawns in the spring, like other anadromous fish on the East Coast, while the other spawns in the fall, like sturgeon in the York. Genetically, the spring and fall fish are not closely related, and neither population is closely related to York fish.

Kazyak said there could be logical explanations. Sturgeon are an ancient fish, dating back tens of millions of years — they're called the "fish that swam with dinosaurs."

They also outlasted the dinosaurs, and of course they predate the Bay and the current arrangement of the East Coast, the ages of which are measured in mere thousands of years.

At one point, perhaps millions of years ago, Kazyak said separate spring and fall populations may have formed along the coast, and spread independently to different rivers, explaining why two populations in the James are not closely related.

Photo: Atlantic sturgeon are an ancient species covered with bony plates rather than scales like modern fish. (Dave Harp)

Similarly, their spawning habitats may trace back to ancient rivers that predate the Bay. That could explain the similarities of York and Nanticoke fish. Together they could be a “meta-population” from the same long-gone river. Or the Nanticoke could represent efforts of York sturgeon that have tried to colonize new areas but have not had time to differentiate themselves.

Or they could just be passing through.

Implications for management

It is more than an academic question. Fish from different populations often behave differently.

Fish in the James, for instance, seem to spawn in deep water, while those in the York and Nanticoke go far upstream into small, shallow creeks that many biologists thought, until recently, were off-limits to such big fish.

Spring and fall spawning fish in the James appear to spawn in different areas of the same river.

Sturgeon science has benefitted from tracking efforts taking place along the coast over the last 10-15 years. Telemetry tags in thousands of captured fish have allowed scientists to track their movements and to recapture them.

It shows that sturgeon from different populations take different routes in and out of the Bay and at slightly different times. Trying to track distinct populations doing different things complicates management and protection efforts.

“There are so many little nuances about what these fish are doing,” said Matt Breece, a fisheries scientist at St. Mary’s College in Maryland. “All these populations are behaving a little bit differently, so it’s pretty fascinating. But also makes it a little bit tricky to manage.”

Scientists once thought that sturgeon, which don’t reach maturity until they are about 10 years old — likely older for females — only returned to spawning rivers about every five years.

But tracking has shown that males often return every year, and females every two-to-three years. Tracking has also revealed a surprising degree of “wandering” from river to river, especially within the Chesapeake.

In some cases, sturgeon from one river venture to spawning grounds in another river during spawning time. But it’s unclear whether they intend to spawn there. In some cases, they seem ready to attempt spawning. In others, recaptured fish don’t seem likely to spawn. Why would a fish spend the energy swimming up a river with no intent to spawn?



Maryland DNR biologist Mike Porta, left, and Matt Baldwin, prepare to weigh a sturgeon they caught in Marshyhope Creek in 2014. (Dave Harp)

“It’s one of those sturgeon mysteries, and one of those things that we really need to dig down into, because it affects how we measure their abundance,” Whitmore said.

It’s important because scientists assume that fish returning to spawning grounds are from that river — and that they actually spawn.

While fish like striped bass occasionally wander, too, it is more pronounced among sturgeon. “It’s really a lot,” said Dave Secor, a migratory fish expert with the University of Maryland Center for Environmental Science. “It’s a real head scratcher.”

It’s also why Maryland biologists were relieved to find a “spent” female in the Nanticoke system last fall: It was the most concrete sign to date that the fish were still spawning in the river and not just passing through.

“It’s the only fish we ever captured that had eggs actively flowing out of her when they caught her,” said Ashlee Horne, a Maryland DNR fisheries biologist.

Survival concerns

Perhaps the biggest mystery about sturgeon, though, is whether they will persist.

While there are signs that populations on the York and James are increasing — and hopeful evidence of spawning on the Nanticoke — these long-lived, wide-ranging fish face threats throughout their lives.

Spawning habitats, especially in shallow water, can be threatened by development. That’s one reason scientists are anxious to learn whether sturgeon are spawning in more rivers around the Bay.

But their top concerns are blue catfish predation and ship strikes.

In the last 20 years, nonnative blue catfish have surged in Bay tributaries, first

in Virginia and more recently in Maryland.

Scientists in both states say that when they trawl for young sturgeon, their nets get filled with thousands of young blue catfish that would happily eat any sturgeon eggs or larvae in the area.

“I think blue catfish is kind of, unfortunately, a smoking gun here for predation on juvenile native species,” said Secor, who has participated in fruitless searches for young sturgeon and eggs in the Marshyhope.

Biologists have been tagging adult sturgeon on the James since the late 1990s, hundreds of which have been recaptured as they return to spawn. But recaptured fish are mostly from the 1990s and early 2000s, said Matt Balazik, a conservation biologist with Virginia Commonwealth University.

Fish spawned later, which are now old enough to return to spawning grounds, are mostly absent, Balazik said. “That’s the red flag,” he said. “They should be spawning around age 10 ... and we’re not seeing them.”

While blue catfish threaten young sturgeon, ship strikes are a growing concern for adults. Dead sturgeon thought to be boat strike victims often turn up in both the Bay and the Atlantic.

Biologists worry that egg-bearing females, which grow larger than males and do not return to spawning grounds as often, may be particularly vulnerable. Balazik found an egg-filled dead female that he estimated to be 15 years old, clearly ready to spawn.

“This was probably her first spawning run, but she never spawned,” he said. “She was chopped up probably hours before her first spawn. That is a big concern.”

The toll on adult fish in relatively small populations can be substantial.

On the Nanticoke, where the spawning

population is estimated in the dozens, biologists have found one sturgeon killed in recent years from a boat strike. They suspect two others were also victims, but the bodies were too decomposed for it to be certain.

Outside the Chesapeake, sturgeon are vulnerable to strikes as they migrate along the coast. A study in the Delaware River estuary found 28 adults were killed by ships between 2005 and 2008. But that is probably just a fraction of the mortalities, because most the bodies of dead sturgeon likely sink, drift out to sea or wash up on deserted shorelines. A follow-up study, in which scientists released dead sturgeon into the water, found that only 5% got reported.

It’s not just a threat to the Delaware population.

“We’ve done some genetics work on carcasses that have appeared in the Delaware River and estuary, and there are many, many populations represented amongst those mortalities, including quite a few Chesapeake Bay fish,” Kazyak said.

A resilient fish

But the characteristics that make sturgeon surprising in so many ways may help their survival.

Their straying between rivers, Secor said, means that if the population in one river gets severely depleted, it might get bolstered by fish from another river. “These systems can beg and borrow from each other.”

Work on the York and James rivers has shown that adult fish grow much more slowly than thought — adult males nearly stop growing altogether. And biologists now think sturgeon may be living a century or more, rather than the 60-year maximum once thought.

That surprising longevity means their populations can continue even if fish are only occasionally successful at spawning.

And the fact that they eluded detection in the Bay for so long gives biologists hope that they will continue to turn up in more Bay tributaries and along the coast. Rivers with only fall spawning populations might turn out to also have spring spawners. No one is actively looking.

“They are rule breakers,” said Chris Hager, a biologist with the research firm Chesapeake Scientific who has worked extensively with sturgeon. “That’s how they’ve maintained their existence for millions of years. When one of them is doing ‘this,’ there’s always another group doing ‘that.’ This is why [a comet] killed the dinosaurs, yet the sturgeon are still here.” ■

VA well owners are 'last on the list' for PFAS protections

Residents, nonprofits scramble for resources after toxin policy fails to advance

By Lauren Hines-Acosta

Forever chemicals” are extremely long-lived in the environment, and they are a growing concern among residents and lawmakers across the Chesapeake Bay region. Some jurisdictions have begun testing for them and trying to address the problem in public water systems. But well users, who must monitor water quality on their own, have limited resources to detect the contaminants and filter them from their water. So, communities are turning to each other for help.

Forever chemicals are formally known as PFAS, or per- and polyfluoroalkyl substances. They are used in a wide range of products for their stain-resistant and heat-resistant properties. Their toxicity varies, but many have been linked to health issues such as cancer, developmental effects and cardiovascular problems.

Sites like airports, landfills, wastewater plants and military installations use products with PFAS or process PFAS-contaminated liquid. Runoff from those sites can trickle through soil and reach groundwater. In turn, those chemicals can contaminate wells.

Overall, 22% or 1.6 million people in Virginia rely on private wells for drinking water. One Virginia Tech dissertation looked at 382 water samples from wells across 10 counties in the state. About 2% and 5% of samples exceeded proposed federal standards for two compounds, PFOA and PFOS, respectively.

The U.S. Environmental Protection Agency released a proposed rule in May that maintains standards for two of the six PFAS compounds that the Biden administration tried to regulate in 2024. In its current proposal, the EPA sets standards for PFOA and PFOS, two possibly carcinogenic compounds, at 4 parts per trillion each in drinking water. The public comment period on the rule is open until July 20.

But private wells are not regulated by the federal Safe Drinking Water Act. So, the responsibility for monitoring well water and taking any needed safety measures falls onto the user.

Brent Walls, program director with the Potomac Riverkeeper Network, said private well owners are “very last on the list” for toxin protections because the tests are



Virginia resident Jennifer Campagne holds up a glass of water drawn from her kitchen faucet. She learned in 2025 that her well contains PFAS or “forever chemicals.” (Tim Wheeler)

expensive and many well testing programs don’t look for forever chemicals.

Walls has been leading a PFAS testing program for wells in Virginia’s northern neck. Results aren’t out yet, but well users in that area can still get their well tested by emailing madeleine@prknetwork.org.

Virginia law requires owners to test for coliform bacteria just once for a new well. Otherwise, well users don’t know what’s in their water, let alone which PFAS compounds might be there, unless they get a test from a state certified lab. PFAS tests can cost about \$300 per sample.

Lawmakers passed new bills this session that address forever chemicals in biosolids, dried sewage sludge from wastewater treatment plants that some farmers use as fertilizer. Rural well users are typically near farms that could be using these contaminated biosolids.

Senate bill 386 prevents biosolids from being used if they contain PFOA and PFOS at a certain concentration. But the limits set in the bill are above the concentrations that have already been found in biosolids. Another measure authorizes counties to test

for these chemicals in biosolids but doesn’t provide any funding to do so.

One bill was going to close that gap. Del. Ellen McLaughlin (R-Rockbridge) carried house bill 348, which would have earmarked \$3 million for the Residential Well Water Testing and Treatment program. The bill would have provided grants for well owners below a certain income level.

Jarrett Harlow, legislative director for McLaughlin, said they were getting calls from throughout Virginia and other states applauding the bill.

“The PFAS issue and contaminants in water aren’t exclusive to the 36th district,” Harlow said. “It’s all over the place.”

The bill ultimately died in the House Appropriations Committee. Harlow said it came down to the money. They plan on bringing the bill to the General Assembly next year. Barbara Walsh, hydrogeologist formerly with Rockbridge Conservation, said she was “extremely disappointed and surprised” when the bill was voted down.

“We’re leaving our rural residents completely open to these health risks, and we’re

spending all of the state money on our more urbanized areas, and I think that’s just not the right way to do things,” Walsh said.

Instead of waiting on new policy, Rockbridge Conservation is looking for ways to help its community. At least 81% of Rockbridge County residents rely on well water, according to the Virginia Department of Health.

Joe DiNardo, a retired toxicologist working with the nonprofit, started testing wells and streams after he found out that biosolids were on nearby farms. Rockbridge Conservation asked Virginia Tech researchers to test wells, and they found detectable levels of PFOA in 49 wells tested in the county.

Now, the group is exploring ways to provide free PFAS tests to more well users in the area. Executive director Jamie Goodin said it might be possible to use grant money or earmarked donations to cover the cost of the tests. He said they hope to complete the planning phase by the end of the year.

On May 18, the EPA awarded Virginia \$14 million from the Emerging Contaminants in Small or Disadvantaged Communities Grant Program. The money will go to the Virginia Drinking Water State Revolving Fund. Communities can apply for grants to support infrastructure projects, including well improvements, that reduce PFAS exposure. Another EPA fund under the agency’s Real Water Technical Assistance Initiative provides money to supply PFAS test kits for wells. Individuals can’t apply, but technical assistance providers can use the funds to supply kits.

Erin Ling, senior extension specialist, coordinates the Virginia Household Water Quality Program. It provides affordable water quality tests for well users. While it doesn’t test for forever chemicals, the program can provide filter recommendations and include well users in future PFAS studies.

Ling recommends that well owners test their water annually, at least for lead and bacteria. If people are concerned, she recommends testing through a private lab and limiting use of products known to contain PFAS such as non-stick cookware and stain-resistant items. ■

New Commanders stadium poses environmental challenges

Some worry the project could undo years of restoration work for Anacostia River, Kingman Island

By Jeremy Cox

Trey Sherard pushed his Carolina skiff around the tip of Kingman Island, leaving the Anacostia River behind and entering Kingman Lake. It's a lake in name only because it's connected to the river's mainstem on both sides of the island.

And Kingman Island itself isn't a naturally created island. It's the result of a dredging project in the early 1900s aimed at deepening the Anacostia for commercial boat traffic.

But here on the edge of the nation's capital, the natural world doesn't seem to mind such technicalities. Birds, frogs, muskrats, beavers, turtles and fish flock to this oasis, said Sherard, the Anacostia Riverkeeper. And it's become more popular, he added, thanks to long-running efforts to restore the river and its watershed.

But as he sees it, that progress is now in jeopardy. The reason: an \$8 billion proposal to transform Kingman Lake's western shore into a 65,000-seat roofed stadium for the NFL's Washington Commanders and a miniature city's worth of associated development.

Welcome to the once and future home of RFK Stadium. The old stadium stood on the site from 1961 until earlier this year, when workers finished demolishing it. Little remains on the 180-acre property except its sprawling parking lots, which, Sherard pointed out, are far from a boon to the river's health.

"A giant parking lot is not great for the river, right?" he said as his boat crept along the marsh-fringed shoreline. "So, we're excited for what this kind of redevelopment could mean for the river."

But whether the development is a net win or loss for the river's fragile comeback will depend on decisions being made right now and in the coming months, he said.

"We need everybody involved in this project to be really, really smart and really, really careful," Sherard said.

He is among the environmental advocates and community activists monitoring the project closely. In addition to looking out for the Anacostia, they want to make sure it doesn't compromise local air quality, wreak havoc on surrounding neighborhoods or upend public access to nearby natural preserves.



This rendering depicts the new RFK stadium planned for a site along the Anacostia River in the District of Columbia. (Courtesy of the National Capital Planning Commission)



Lora Nunn, co-founder of the Friends of Kingman Park, visits a dock on Kingman Island in the District of Columbia. (Dave Harp)

The project is being jointly developed by the Commanders organization and the District of Columbia. Groundbreaking is tentatively scheduled for early 2027, with the stadium targeted for a fall 2030 opening. The related developments, which include up to 6,500 housing units as well as restaurants and stores, are expected to roll out over the next decade.

In the meantime, several key approvals are needed. The most critical is the federal sign-off on the project's Environmental Impact Statement. Such reviews are required under the National Environmental Policy Act for projects involving major federal actions that affect the environment or health. The National Park Service is leading the effort because the site is federally owned land.

The stadium site will be tucked against the Kingman Park neighborhood, which

was developed beginning in the 1920s as an African-American residential enclave. It's mainly composed of two-story brick row-houses and is now part of a historic district.

The Kingman Park Civic Association said in a February letter that it supports the project. But it is raising red flags about a parking garage proposed for the stadium's north side, closest to the community. Plans call for a second garage and "temporary" surface lots, with 8,000 available spaces by opening day.

Kingman Park residents say they would like to see a new metro station built instead. But the metro system's operator says it can't be done, citing an estimated \$1 billion price tag and maintenance costs. The District's master plan for the development, released June 30, proposes expanding capacity at the existing Stadium-Armory stop.

The stadium's vehicle-dependent plans are "the same old stew, just warmed over," said Frazer Walton Jr., president of the neighborhood association. "We're back where we started with air pollution and water pollution."

History hasn't been kind to the area, which was initially a marsh where human sewage collected on its way toward the river. It later became a collection site for sediment dredged from the river.

"The sediment we're talking about is old," Sherard said. "This whole site is marsh mud, and some of that marsh mud received a bunch of metals like lead and who knows what else."

During the construction of recreational fields at the start of the redevelopment effort in 2019, for instance, workers uncovered lead-contaminated soil. Remediating the

pollution boosted the project's price tag by nearly \$4 million.

The stadium project, according to documents submitted to the Federal Register, will be designed to align with the Anacostia Waterfront Initiative. That effort, which stems from a compact signed by 19 federal and District agencies, targets restoring the river as well as adjoining neighborhoods and parks. While the main purpose of the project is to create a "vibrant, mixed-use development," the documents also say it will be "aiding in environmental restoration" and "creating additional public access" to the river.

The master plan shows 30% of the site being maintained as parks and open space. Due to its riverfront location, engineers say it will require stormwater best management practices, such as green roofs, landscaped bioretention areas, permeable pavers, rainwater-collecting cisterns and added tree canopy.

"We'll have additional sorts of implementation measures ... specifically related to flooding and other sorts of environmental impacts that come along with any sort of new development," said Alex Freedman, a DC community planner.

Some of the construction is proposed within the 100-year floodplain. Larry Martin, chair of the DC Sierra Club Committee on Water and Natural Places, said he hopes the development steers clear of it as much as possible.

"It's important for everything downstream," he said. "You don't want to restrict your flood zones because they play a very important part of keeping the downstream areas from flooding."

Kingman Island, which is managed as a park, could be connected to the stadium developments by a new pedestrian bridge crossing over to its remote southern end, according to the master plan. Opponents worry that additional visitation could upset birds and wildlife there.

If the island is no longer a refuge from the city, residents have virtually no other options, said Lora Nunn, a Kingman Park resident and a founder of a nonprofit dedicated to preserving Kingman Island.

"They want nature to be part of their daily lives," she said. ■

VA passes budget with new energy tax for data centers

Menhaden study, RGGI program, data center water regulations also in the package

By Lauren Hines-Acosta

Risking a government shutdown, Virginia lawmakers debated for weeks about how to make data centers “pay for their fair share” before finally passing a budget that counts on \$1.2 billion in tax revenue from the industry. In other moves, Virginians will see energy bill credits as the state re-joins the Regional Greenhouse Gas Initiative, and long-awaited menhaden research received last minute funding.

Data centers were a focal point of debates. Virginia has more data centers than anywhere else in the world. They enable internet traffic, bring construction jobs and pay local taxes, but environmentalists worry about the industry’s impact on water supply, air quality and energy demand.

Sen. Louise Lucas (D-Portsmouth) was adamant that Virginia should terminate the retail sales and use tax exemption that the industry has enjoyed since 2010 and that isn’t slated to end until 2035. Last year, the industry saved \$1.9 billion from the exemption.

“[The industry is] not going to go anywhere,” Lucas said in April. “So, they might as well deal with us, because other states are going to feel the same way we do about them taking money from the voters and giving it to these large, large corporations. It’s not going to work.”

In filings to the Virginia Department of Taxation, 56 data centers self-reported that they invested \$48.5 billion in Virginia and added about 1,600 jobs in 2025. Don Slaiman, director of community relations for IBEW Local 26, said the industry has allowed construction workers to stay at local jobs and has doubled annual work, from 14 million to 28 million hours over the last decade.

But ending the tax exemption ultimately fell by the wayside. Lawmakers instead passed a budget that includes an energy use tax, at \$0.011 per kilowatt hour, that each data center must pay for the electricity they consume from July 1, 2026, to July 1, 2028. The estimated \$1.2 billion paid by the industry will go back into the general fund to boost infrastructure and education.

“There appears to have been no serious consideration given to the feasibility of the budget’s onerous new regulations or what impact they may have on job creation, investment and Virginia’s economy,” said Josh Levi, president of the Data Center Coalition.



Virginia Gov. Abigail Spanberger signed energy affordability bills on May 12, 2026, in Charlottesville, VA. (Office of the Governor)

The General Assembly also softened the language of new water regulations related to cooling systems in data centers. The facilities must cool their computer servers and can do so in many ways. Evaporative cooling is when cold water is evaporated to cool the air that blows on the servers. Closed loop cooling uses less water and recirculates a cooling fluid. Air cooling acts much like air conditioning but uses more energy.

To address concerns about water use, the budget directs the Department of Environmental Quality to establish criteria for “cooling water scarcity areas.” By July 1, 2032, any data center in those areas must show that it has minimized water use for cooling, and no data centers may use evaporative cooling unless it is supplemented by a more water-efficient method.

Any new data centers applying for an air emissions permit after Jan. 1, 2027, in the Eastern Virginia Groundwater Management Area east of Interstate-95 must follow the same rules. For existing data centers in the area, DEQ must, by Oct. 15, make guidelines available for retrofitting cooling systems to use air, closed loop or recycled water technologies.

Another late addition to the budget will redirect revenue from the Regional Greenhouse Gas Initiative (RGGI) into public hands. RGGI is an agreement among 11 states to reduce carbon dioxide emissions by

pay \$13 per month for the initiative. Josephus Allmond, chief energy officer for the governor, estimates the credit will come out to be \$3 per month, leaving ratepayers with a monthly charge of approximately \$10.

RGGI generated \$228 million in 2021 for flood mitigation and energy efficiency projects when the state first joined. After rejoining, even with 45% of the overall RGGI revenue diverted toward ratepayer credits, Allmond estimates that Virginia will receive \$605 million this year for such projects. Some environmentalists still contest the move.

“Where we were before was still billions of dollars underfunded, and so it’s like we’re pegging it to a standard that was insufficient,” said Jay Ford, Virginia policy manager for the Chesapeake Bay Foundation. “So, it’s sort of cold comfort to be like, ‘You’ll get just as much as you got before,’ which is not enough to solve the issue.”

Four days before lawmakers had to pass a budget, Gov. Abigail Spanberger added \$2 million to fund long-awaited research on menhaden in the Chesapeake Bay.

Menhaden are fatty fish that are a food source for wildlife, such as osprey and striped bass. Watermen catch them to sell as bait for crabs or other fish. That harvest is dwarfed, though, by the menhaden “reduction” fishery in the Bay, which pulverizes them by the millions to make fish oil and meal products.

Many debate whether menhaden are overharvested in the Bay specifically and whether that affects the wildlife with diets that depend largely or in part on menhaden. Both the Chesapeake Bay Foundation and Ocean Harvesters, a partner with Omega Protein in the reduction fishery, have expressed support for the research.

The money will “inform a scientifically defensible and ecologically meaningful” limit on how much the reduction fishery can harvest from the Bay. The Virginia Institute of Marine Science can draw from the study it designed in 2023. It can also use recommendations from the industry-backed Science Center for Marine Fisheries research roadmap, which is expected to be completed in December. The budget language also requires state agencies to analyze the workforce impacts of the proposed Bay cap. ■



Virginia Sen. Louise Lucas answers questions after presenting a budget proposal on June 16, 2026. (Lauren Hines-Acosta)

charging power plants a fee for exceeding emission limits.

Originally, 50% of the revenue went to low-income energy efficiency programs, 45% to the Community Flood Preparedness Fund and 5% to administrative costs. But the new budget redirects 45% of that revenue to be a credit on the bills of ratepayers, churches and electric cooperative customers.

Republicans have been critical of RGGI, saying it’s a “hidden tax” that Dominion Energy passes off to ratepayers. Before Virginia left the program in 2023, the company covered its costs by charging ratepayers \$4 per month for RGGI. According to Dominion Energy, customers will soon



— Kathleen A. Gaskell



Haute couture, trail edition

Experienced hikers know that fashion-forward is all about function. This quiz offers tips on outfitting yourself from toe to head. Answers are on page 32.

1. Well-fitting, broken-in hiking shoes/boots are the way to go, especially on rocky terrain or when carrying a backpack. Because feet expand at certain parts of the day, it is important to shop for footwear when they are the most swollen. What time of day is this?
A. Morning B. Afternoon C. Evening
2. Socks that reach above your boots help to prevent chafing and blisters. They also help to shield you from ticks and poison ivy (tuck your pants into them). Which two of these materials are recommended for socks?
A. Pure, heavyweight cotton
B. Merino wool
C. Polyester/nylon/elastane/lycra blends
3. Jeans can chafe legs and dry slowly after getting wet. What features should you look for when looking for hiking pants?
A. Abrasion resistance
B. Loose fit for mobility
C. Breathability
D. All of the above
4. Cotton poses a large hypothermia risk in cold weather. It absorbs sweat and, once wet, can conduct heat away from the skin up to 240 times faster than with dry cotton. Your best bet is moisture-wicking synthetic fabrics or natural fibers such as silk or merino wool. Wool is preferred. Why?
A. It never goes out of style.
B. It doesn't hold smells like some synthetic fabrics.
C. It is insulating, even when wet.
5. Many fabrics used for hiking shirts have built-in sun protection or UPF (ultraviolet protection factor). A UPF 40 shirt only lets 1/50th of the sun's UV rays pass through. What is the approximate UPF factor of a lightweight cotton T-shirt?
A. 0 B. 5 C. 15
6. A jacket that protects you from the elements is crucial. Do you know the difference between waterproof and water-resistant? Match the terms with their description.
A. It has microscopic pores that allow sweat to escape but prevent all but the heaviest rain from getting in.
B. Sweat doesn't escape, and rain doesn't penetrate.



Most hiking gear advice focuses on taking only what's needed to conserve weight. The exception is a first aid kit, and everyone who packs one hopes it will never be needed. You can buy a ready-made kit or, if you want to assemble your own, here's a list culled from outdoor and first aid websites for some of the most common mishaps on a day hike. It does not address every possible situation or extreme terrain that might involve additional recommendations. For short hikes, some of these items may not be necessary.

We all fall down (sooner or later)

For bleeding: Adhesive bandages in many sizes. Alcohol-based sanitizer. Cleansing/antiseptic pads with anesthetic. Topical antibiotic. Tweezers to remove debris in wounds (also for splinters and ticks). And more for (bad) luck: Four-inch wound-closure strips and a variety of sterile gauzes to dress wounds. Gauze roll and/or medical tape to hold dressing in place. Scissors or small knife to cut bandages/gauze. Nitrile gloves.

For bones, bumps, bruises: ACE or other rubberized bandage. Safety pins. A splint or something that can function as one.

Pain & suffering

Pack what works for you! Ibuprofen, aspirin, acetaminophen. Don't forget remedies for known conditions. Put prescriptions in a labeled bag. If you have allergies, pack antihistamines and/or hydrocortisone for mild reactions. EpiPen for severe allergies. Inhaler for asthma.

Can't take the heat? Consider dehydration or heat exhaustion remedies like rehydration salts or an instant ice pack.

For burns and blisters: Sunscreen. Moleskin (apply as soon as hotspot presents itself to prevent a blister). Didn't heed earlier advice? Non-adherent sterile dressing (cover blisters, burns).

Miscellaneous: CPR/first aid card/booklet. Be familiar with its contents: An emergency is not the best time to read the information for the first time. Notepad with waterproof pencil/pen.

Common sense: Not found in stores. Many injuries are avoidable; know your limits. Also, know how to properly use first aid items before the hike.

Title image: Self-adhesive bandages. (Alexandra Parris/CC BY-NC-SA 2.0)

A A knee or ankle strain from a misstep is one of the most common hiking injuries. (Prostock-Studio)

B ACE brand or other rubberized wrap is essential for strains and sprains. (Jean-Etienne Minh-Duy/CC BY-SA 2.0)

C A first aid kit, whether ready-made or customized, may come in handy on even the easiest hike. (CC 0/public domain)

D Socks reaching above the boots guard against friction soreness. Tucking pants into boots keeps out ticks. (Rydale Clothing/CC BY 2.0)

E Hikers explore False Cape State Park, VA. (Virginia State Parks)

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



Rock with the James River's rhythm on Sharp's Island

Top photo: Andy Thompson, a co-owner of Sharp's Island in Richmond, paddles toward the island in the James River. (Lauren Hines-Acosta)

Bottom photo: Rapids reach across the James River on both sides of Sharp's Island. (Lauren Hines-Acosta)

By Lauren Hines-Acosta

Sonya Silver and her family had been paddling on the Rivanna and James River for the last seven days. Rainstorms had soaked them, and their weathered hands pushed their canoes through 100 miles of low water. But they had never been freer of life's demands.

"[We were] living on the edge, and kind of living the life of a pirate," Silver said.

Their voyage began in Charlottesville, VA, on the Rivanna River. Their destination: Sharp's Island, in the shadow of downtown Richmond.

It's one of the only privately owned islands on the James River where people can camp. Many have tried to make a more lasting mark on the patch of land, only for the river to remind them who really owns it. Visitors can experience the natural rhythms of the river while the opportunity remains.

Rapids bisect the island, which has rocky outcrops on its western tip and sandy beaches on the eastern end. It lies squarely across the last line

of rapids at the downstream edge of the fall line, where Piedmont granite meets the lower and softer Coastal Plain. It's only a few hundred feet from the busy 14th Street bridge and a few thousand feet from downtown Richmond, but the rushing river generally masks the sounds of city life. The island offers an intimate, hidden view of the ecosystem just under Richmonders' noses.

Andy Thompson, co-owner of the island, lists Sharp's Island on Airbnb and Hipcamp. He outfitted it with an artistic shelter, a grill and an outhouse. And there's a wooden platform that could be used for camping, sunbathing or concerts. Plus, direct access to the river invites visitors to fish or paddle. For those with no interest in running rapids, the island also has a sort of natural bathtub — a pool lined with smooth rock — for relaxing dips.

Thompson isn't the first to build on the island. This acre of land earlier changed hands between members of the Sharp family, starting with a Richmonder named George Sharp in 1873. Newspaper archives show that he built a



two-story brick house on the island. He also held parties there for associations and clubs that he led.

A few generations later, descendent Russel Sharp inherited the island, sometime before 1931. Then, in 1935, his friend Fred Hastings began living there as caretaker of the house and island. That brick house likely holds the record for staying intact the longest, despite flooding.



Henry Tenser and his architecture colleagues attempted to build a cube structure on Sharp's Island in Richmond in 1972. (Courtesy of Henry Tenser)

In 1968, architect Henry Tenser was commuting from Powhatan County to Richmond one day when he saw the two-story house from the 14th Street Bridge. He bought the island from Sharp for \$2,000. He had a vision for building an avant-garde cube structure there, very different from his usual projects like the American Tobacco Company restaurant in the city.

Flooding had damaged the brick house beyond repair, so the city let Tenser burn it down. But in 1972, soon after he had finished building frames for a structure made of cubes, Hurricane Agnes delivered a devastating flood. Remnants of the cubes can be found along the south bank of the island.

Tenser moved on, and the island changed hands many times until 2018, when Andy Thompson and nine other families purchased it. Some people tell Thompson it was a crazy decision, but he felt he had to jump on the opportunity.

"It's like you see the vision of what it could be, and I just get like obsessed with that," Thompson said.

Thompson built two previous shelters, and floods washed them away. But he's not trying to tame the island. He knows he's at the mercy of the river.

"What I'm hoping is that the James will give me maybe five, maybe 10 years," Thompson said. "That'd be nice, but obviously there are no guarantees."

The land truly is wild. He can't take a week off or else nature will overtake the island. He said this as he pulled weeds from the deck like a clown pulling endless handkerchiefs from a sleeve.



This shelter, available to rent on Sharp's Island in Richmond, is the third built there by current owners. Flooding washed away the previous two attempts. (Lauren Hines-Acosta)

"You're always fighting Mother Nature for control of this island," Thompson said.

During the eight years he has managed Sharp's Island, he has noticed the river's rhythms. He sees geese nest on the island from April to May. He sometimes spots Atlantic sturgeon, once thought to be extirpated from the Chesapeake Bay watershed, in spring and fall. Ospreys arrive in the spring to build nests and raise their young. In the winter, the isolated island is perfect for a small campfire and smores.

One *Richmond Times-Dispatch* article applauded Russel Sharp for catching a 250-pound sturgeon by the island in 1922. But life in the river has changed since the Sharp family owned the island.

Overfishing from commercial harvesting decimated some fish species, like Atlantic sturgeon and American shad, by the late

1800s. Pollution and dam construction altered their spawning grounds in the river. The National Oceanic and Atmospheric Administration listed sturgeon as endangered under the Endangered Species Act in 2012, and American shad have not returned to the James. Nonprofit groups throughout the watershed are actively working to build back these populations.

Silver said she and her family were "so emotional" after reaching Sharp's Island. Filled with a sense of accomplishment, they were rewarded with blue herons transiting a sunset and the river soothing them to sleep.

"[Sharp's Island is] just so uniquely situated," she said, "and the amount of wildlife activity that is happening there — I mean it's just kind of this magical, powerful joining of the sea and the mountains all coming together right there." ■



Permitted visitors can only access Sharp's Island in Richmond by crossing the James River in canoes or kayaks. (Lauren Hines-Acosta)



IF YOU GO

Sharp's Island in Richmond can be booked on Airbnb and Hipcamp. Weekends fill up fast, but weekdays are often open for concerts, corporate parties and co-working. The cost is \$75 to \$135 per night. Visitors can park overnight for free along streets in the Manchester neighborhood. The island can only be accessed by canoe or kayak, so bring your own or rent one from the island's manager (one for \$65 or two for \$100). Visitors can check the James River Association's James River Watch map for the latest water quality data.

OTHER ISLANDS TO VISIT IN THE BAY WATERSHED

Tangier Island, VA, is one of the few inhabited islands in the Bay. Visitors will encounter a unique culture of working watermen and their families. Along with fishing and kayaking, you can enjoy historical tours or go crabbing with an experienced fisherman. Be sure to stop by the Tangier Island Museum.

Janes Island State Park, MD, lies just offshore of Crisfield. It features almost 3,000 acres of saltmarsh and 30 miles of water trails. Visitors can fish, crab, paddle or boat along the shore. Day-use is free, but use of the boat ramp costs \$7 for Maryland residents and \$9 for out-of-state residents. Campsites and rental lodges are available on the mainland portion of the park.

Hart-Miller Island, MD, is a state park offshore of Baltimore. The 1,100-acre island offers a long beach for wading or sunbathing. The two connected islands, Hart and Miller, have calm waters for fishing and boating. More than 20 campsites are available for \$6 per night from May 1 to Sept. 30.

Photo above: A view from the Sharp's Island camping shelter. (Lauren Hines-Acosta)

Seventy years later, the words of Gilbert Klingel still hit home



CHESAPEAKE BORN

By Tom Horton

I have attempted to set down something of the character of the Bay and its moods ... the sleek, still calms, the gray fogs, the sparkling lusty northwesterners, the goodly smell of the swamps ... and especially beneath the dark green waters where strange events take place.

— Gilbert Klingel, *The Bay*

Imagine you could travel back to the Chesapeake Bay of 70-some years ago, your guide a born naturalist, sailor, diver and adventurer who had closely observed the estuary's shorelines and depths his whole life using boats and diving chambers he built himself.

Most elegantly, you can do just that in the pages of Gilbert Klingel's 1951 book, *The Bay*, describing the natures of a bygone Chesapeake as richly as anyone has.

I urged Johns Hopkins Press to reprint it in 1985, as good a contribution to the literature of the Bay as any I've written myself.

DDT had not poisoned birds here when Klingel essayed *The Bay*. The author beached his small sailcraft one spring morning on Virginia's Smith Point, where the Little Wicomico River discharges. On a short walk he estimated well over 100 osprey nests, some built to heights of seven feet, and almost all holding chicks and eggs.

"I was the center of a whistling, wheeling swarm of excited fish hawks ... as though all the ospreys of the Bay had congregated there," he wrote.

A chill, gray November dawn found him off Bloody Point near the southern tip of Maryland's Kent Island when a fringe of the shoreline that "seemed to give off a light



Legendary Chesapeake photographer A. Aubrey Bodine captured this photo of Gilbert Klingel communing with ospreys in a Bay marsh, circa 1950. (©Jennifer B. Bodine, courtesy of AAubreyBodine.com)

of its own" turned out to be a massive flock of some 900 tundra swans, just descended after migrating all the way from Alaska or the Yukon.

A long shaft of soft, rosy light pierced the mist and bathed the whole flock in "a luminescent glow ... brilliant pink of graceful bodies against the background of gray sky and dull green sea ... I rate it as one of the most enthralling spectacles I ever witnessed."

Great blue herons inspired a several-page homage: "A heron's life is an unending succession of graceful poses ... they were meant to be painted or sculptured. As long as there are marshes to shelter them and fish on which to feed they will endure ... and the Earth will remain a more artistic place."

Where Klingel's writing is most unique is in his observations from the Bay's bottom — first in only a diving helmet, later in the two-person steel and glass diving chamber he built in 1935, which he called a bentharium.

During one dive, as Klingel rested on the sandy bottom some 50 feet down, holding a bag of bait, a large eel came suddenly from out of the haze. "It was a thing of exceeding grace," he wrote, "but its real beauty was in the hitherto unsuspected iridescence of its soft silken skin ... no evidence of the slime

or the dull-green hue so commonly associated with eels ... it was of a soft lustrous glow, leaf green above and pearl pink below ... one moment it flashed pale-lavender fire, next delicate and evanescent yellows."

Later, he would summarize: "When one goes underwater one must abandon all preconceptions of the colors of fishes ... [Fish out of the water] that are plain gray or silvery may become the colors of pearls, brilliant yellow, old rose or iridescent green or blue ... Menhaden become glittering objects of burnished coppery gold ... anchovies flaming lavender ... butterfish a procession of smoldering jewels that has no counterpart in the air."

Klingel describes "fish highways," narrow corridors marked by nothing one could see, which all manner of creatures swam along. They would vanish after a storm rearranged the bottom, reappearing elsewhere, he supposed.

He watched a big jimmy crab feeding on a dead fish: "[It] slit open a line across the abdomen, then another at right angle to the first, and finally a third parallel to the first ... then peeled back the square of flesh as one would open the cover of a book." He hadn't expected such "surgical cleverness" from the animal.

Gilbert Klingel was born and raised in

Baltimore, but on childhood vacations he fell in love with Gwynn's Island, VA, near the mouth of the Piankatank River. He joined the Maryland Academy of Sciences at age 10. He seemed instinctively to have loved roaming the Bay's edges. Smith Islanders would call him a "progger."

He learned metallurgy during World War II and, having been shipwrecked when his wooden boat hit a coral reef in the Bahamas, he decided to make his living building boats out of steel at Gwynn's Island. (He authored another classic book, *Steel Boatbuilding*.)

My favorite chapter of *The Bay* remains "The Chesapeake Marshes." Klingel knew the science of the Bay, but he also knew the limits of science in expressing why we love these waters.

"A Chesapeake marsh is a multitude of mind portraits done in a host of colors, but always with delicacy," begins his account. "It is the splash of fish and the liquid burble of a marsh wren ... sunshine and blue sky and sparkling waters; also grayness and dull brown, the gleam of moonlight upon a layer of mist ... the glare and heat of quivering hot air ... the smell of dried mud ... the dancing of swarms of hovering gnats, the red, black and yellow bodies of painted turtles sunning themselves."

My book *Bay Country* and Klingel's *The Bay* won the same national award — the John Burroughs Medal — for nature writing, many decades apart. It's hard to compare books across eras, but they seem more complementary than competitive (and no reason you can't have both!).

For more on Klingel, there's a nice documentary, *The Legacy of Gilbert Klingel, Man of Steel*, which aired on PBS's Chesapeake Bay Week several years ago and is still available on YouTube. There's also his May 1955 *National Geographic* article, "One-Hundred Hours Beneath the Chesapeake." ■

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.

Why marina policy matters to the Bay's 'pollution diet'

By Dave Tyler

Along the shores of the Chesapeake Bay, marinas are more than gateways to recreation. They are places where environmental policy intersects with everyday activity at the water's edge.

Since 2010, restoration of the Bay has been guided by the Chesapeake Bay total maximum daily load (TMDL), a "pollution diet" established by the U.S. Environmental Protection Agency to limit nutrients and sediment entering its water.

The TMDL depends on coordinated action across all Bay jurisdictions — Virginia, Maryland, Pennsylvania, Delaware, New York, West Virginia and the District of Columbia — each with their own mandatory policies for reducing pollution loads.

Yet within this coordinated framework, one area remains notably uneven: marina management.

Virginia illustrates the challenge. With an estimated 18,000 boat slips across roughly 300 facilities, its marinas support a wide range of users, from recreational boaters to a smaller number of long-term occupants. There's also a wide range of regulations and business practices governing how marinas handle wastewater and other pollutants. Some facilities maintain clear, enforceable standards; others rely on informal or inconsistently communicated practices. In some cases, legacy users remain under "grandfathered" arrangements while new users face different expectations.

Many boats have holding tanks, classified as Type III marine sanitation devices (MSDs), which allow human waste to be stored until it can be emptied at marina "pump out" facilities that are connected to onshore sewage systems. That is the only legal way to discharge untreated sewage within 3 nautical miles of the U.S. coastline.

Other boats have Type I and Type II MSDs — miniature treatment plants, essentially, that disinfect and macerate waste before flushing it away. Broadly speaking, MSD I and II waste can be legally discharged into Bay waters, except in a handful of federally designated "no-discharge zones" around the Bay.



A mix of sailboats and powerboats populate a marina on Spa Creek in Annapolis. (londonexpat/CC BY-SA 2.0)

But maybe the Bay as a whole should be a no-discharge zone, or at least the enclosed waters of marinas, where the discharge is concentrated and the waters are enclosed and poorly flushed. Many operators of marinas do in fact prohibit the discharge of treated waste by boats in their slips as a condition of their lease. But some do not, perhaps mostly because it's not illegal. And both Virginia's and Maryland's clean marina initiatives only require operators to "discourage" emptying treated waste when docked.

Type I and II MSDs sanitize and macerate waste, but they do not remove nutrients. So, from the standpoint of the TMDL, this variability is more than an administrative inconsistency. It represents a gap between environmental goals and on-the-ground practices.

Environmental oversight at marinas has been focused traditionally and necessarily on toxic runoff associated with boat maintenance activities: motor oil disposal, hull cleaning, pressure washing and applying antifouling paints. But wastewater management and other operational impacts represent a separate area where policy consistency also matters.

While sewage from recreational boats is increasingly managed through pump-out infrastructure, marinas also generate gray-water and other wastewater that may be

discharged directly into waters. These discharges can contain nutrients, bacteria, detergents, food waste, oils and other pollutants.

In enclosed or poorly flushed marina basins, cumulative discharges can contribute to localized nutrient enrichment, bacterial contamination, oxygen depletion and broader ecosystem stress. While marina-related nutrient discharges are modest compared to major sources such as agriculture or urban runoff, marinas concentrate vessel activity and wastewater generation in relatively confined waters, where impacts can become significant.

The Chesapeake's restoration depends not only on controlling major pollution sources, but also on reducing the cumulative effect of smaller ones. In that context, consistent marina oversight should be part of the broader effort to improve water quality throughout the Bay.

Many of the regulatory tools needed to manage these risks already exist. Federal standards under the Clean Water Act, along with programs such as the Clean Vessel Act, have supported the installation of pump-out facilities. Some marinas have systems tied to municipal sewage treatment, providing a reliable pathway for proper waste disposal.

But infrastructure alone does not guarantee effective environmental outcomes. The TMDL depends on consistent implementation, measurable compliance and accountability across jurisdictions.

When marina policies vary significantly, environmental protections will vary in effectiveness. Without clear expectations, compliance becomes uneven. Without consistent implementation, accountability weakens.

Uneven marina oversight matters because the Bay's health depends on cumulative progress across all pollution sources. Marinas represent a manageable area of environmental impact, but only when clear standards and reliable practices are in place. Yet across the watershed, approaches continue to vary. Some states incorporate marina management into wider watershed protection efforts. Others rely more heavily

on local control. The result is a regional system in which shared environmental goals are pursued through uneven local practices and differing levels of oversight.

A more coordinated approach does not require a one-size-fits-all mandate. Instead, it could emphasize several practical measures: Baseline wastewater management standards applicable to all marinas; clear and transparent policy disclosure so expectations are understood; monitoring and reporting mechanisms that support measurable compliance; and targeted infrastructure investment, particularly in high-use or aging facilities.

These measures would preserve local flexibility while better integrating marina operations into the broader TMDL framework.

The Bay restoration effort has long depended on closing gaps between policy and practice. Marinas represent one such gap — localized, manageable and directly connected to water quality outcomes.

Addressing it is not about limiting access or favoring one group of users. It is about ensuring that all uses of the Bay operate within a framework that supports its long-term health.

For a restoration effort built on precision, accountability and measurable progress, consistency in marina policy is not peripheral. It is foundational. ■

Dave Tyler is a retired information technology executive who lives on his boat in Cape Charles, VA.

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The *Bay Journal* welcomes comments on environmental issues in the Chesapeake Bay region. Letters to the editor should be 300 words or less. Submit your letter online at bayjournal.com by following a link in the Opinion section or use the email address below. Opinion columns are typically a maximum of 900 words and must be arranged in advance. Deadlines and space availability vary. Text may be edited for clarity or length or to conform to *Bay Journal* style rules.

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Paddleboarders and kayakers participated in a circumnavigation of Tilghman Island, MD, in 2025. (Dave Harp)

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Plant Walk & Nature Journaling

6–7:30 pm, Aug. 7; Kenilworth Aquatic Gardens. Begin with a guided plant walk through the gardens, learning to identify the wild plants as well as discussing their history, mythology, and culinary, medicinal and practical uses. End with some nature journaling. Free. Registration: kenaggardens.org/explore/lotus-lilies (Event Calendar).

PENNSYLVANIA

Susquehanna Floating Classrooms

10–11 am, Aug. 11; Williamsport. Take a paddleboat cruise and learn about the importance of bats to the river, with an overview of species and some of the main threats they face. Aug. 25: Learn about muskrats, their declining numbers and an overview of aquatic mammal species. Registration: middlesusquehannariverkeeper.org/floating-classroom.html.

Bat Night

6–10 pm, July 18; Greenwood Furnace State Park, Huntingdon. Learn all about bats and other night creatures during this hands-on program. Includes bat box building and a bat count. Free. Info: events.dcnr.pa.gov/event/2026-bat-night.

Stream Study

3 pm, Aug 29; Sizerville State Park, Emporium. Join the park educator to look for macroinvertebrates in the stream. Short talk followed by exploring the stream. Free. Info: events.dcnr.pa.gov/event/stream-study-9559.

VIRGINIA

Butterfly Walk

9:30 am, Aug. 29; Bell Haven Park, Alexandria. Join guide Larry Meade for a butterfly walk. Bring water in a reusable container, sun protection and insect repellent. Free. Info: fodm.org/get-involved/volunteer-events.html.

Bat Walk

7:30 pm, Sept. 10; Dyke Marsh, Alexandria. Join an educator with Bat Conservation and Rescue of learn about local bats using sonar detectors. You can pre-arrange using your iPhone or Android phone. Registration: fodm.org/get-involved/volunteer-events.html.

Butterfly Count

9 am–3 pm, July 25; multiple locations. The Clifton Institute hosts this annual butterfly count to contribute data to the North American Butterfly Association. Butterfly enthusiasts of all levels are welcome. Participants will be assigned to small teams, led by an experienced butterfly counter. Registration: cliftoninstitute.org ("Events").

Naturalist Walk

10 am–12 pm, July 12 and 7–8:45 pm, Aug. 5; Leopold's Preserve, Broad Run. Guided walk led by a professional naturalist. July: Things That Fly. August: Bats & Bugs. Registration: leopoldspreserve.com ("Calendar").

Pollinator Palooza

11 am–2 pm, July 18; Mason Neck State Park, Lorton. Enjoy hands-on activities from park interpreters, Fairfax Master Naturalists, N. Virginia Bird Alliance, Fairfax Tree Stewards. Tour pollinator gardens and learn how planting a few common plants in your yard can support wildlife. Free event; parking fee only. Info: dcr.virginia.gov/state-parks/events (enter date).

Kayak Tours

8:30–10 am, Aug. 2, 16, 30 and Sept. 5, 13. Widewater State Park, Stafford. Join park rangers as they discuss the history, ecology and culture of the Widewater peninsula. Travel in a solo kayak or tandem. Children 6–12 w/parent in the watercraft. \$25/pp including equipment rental and parking. Registration: dcr.virginia.gov/state-parks/events (enter date).

MARYLAND

Regenerative Farm Tour

5–8 pm, Aug. 6; Poolesville. Join Future Harvest and the University of Maryland Extension for a pasture tour of Plow and Stars Farm. See multi-species grazing, virtual fencing, transitioning conventional grain fields to regenerative agriculture, and silvopasture. Free. RSVP: futureharvest.org/event/plow-and-stars-farm-pasture-walk.

Composting for Everyone

10–11 am, July 18; Center for Maryland Agriculture and Farm Park, Cockeysville. A master gardener demonstrates the essentials of composting using commercially available composting systems as well as DIY designs. Free. Registration: agnr.umd.edu/home ("Events").

Fruits and Berries Seminar

10–11 am, Aug. 8; Center for Maryland Agriculture and Farm Park, Cockeysville. An experienced master gardener shows how to care for fruits and berries, from pruning to picking. Free. Registration: agnr.umd.edu/home ("Events").

Edible Flowers for Flavor and Health

10:30 am–12:00 pm, July 22; Brookside Gardens, Wheaton. Learn how common garden blooms and herbs can enhance healthy recipes. Explore over 20 common varieties, plus exotic options for next season. Dried flowers and herbs will be provided to take home. \$50. Registration: montgomerycountyparks.org/events.

Homegrown Pickling Demo

1 pm, Aug. 9; Mount Harmon Plantation, Earleville. Learn how pickling was done in colonial times. Demo with pickle tasting. \$10. Registration: mountharmon.org/special-programs-tours.

The Nanticoke People's Lasting Legacy

6–7 pm, Aug. 5; Caroline County Public Library, Denton. Dr. Bonnie G. Hall, historian for the Nanticoke Indian Tribe, presents a program about the Nanticoke people's rich history, vibrant culture and unique traditions. Free. Info: ctoribio@carolib.org or carolib.org.

Beehive Maintenance

3:15–4:15 pm, July 23 and Aug. 20; Eden Mill Nature Center, Pylesville. Observe honey bees in action as frames are pulled from the hive. This program is geared for the general public. Free. Registration: edenmill.org ("Program Calendar").

Patuxent Research Refuge

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.

■ *Environmental Mini Fair*: 10 am–2 pm, July 25. All ages. Part of the 90th anniversary celebration(s) for the refuge. 20+ local environmental groups, live music, continuous film showings of "The Extraordinary Caterpillar," photo exhibit, children's activities, food for purchase. Visitor Center area. Rain or shine.

■ *Hollingsworth Wildlife Art Gallery*: Artist Keith Kozloff will host his legacy-of-Rachel-Carson exhibit reception at the Mini Fair (above) July 25, 12–2 pm, with a talk at 1 pm. Gallery info for July–Sept.: fws.gov/refuge/patuxent-research/patuxent-visitor-center.

■ *Kids Click!* Youth summer nature and wildlife photo contest now through Aug. Ages 5–14. Cash prizes. In-person entries only, w/adult, 10 am–3:30 pm, Wed.–Sat., at visitor center. Details: friendsofpatuxent.org/kidsclick.

■ *Nature Photography Talk/Walk*: 11 am–12:30 pm, July 18. Ages 5+. Bowie-Crofton Camera Club members present a talk on nature photography in the visitor center, followed by a photo walk outdoors.

■ *Wild Bird Meet and Greet*: 2–3:30 pm, July 25, Aug. 29, Sept. 26. All ages. Meet in the visitor center lobby to "greet" a live bird of prey. Cameras and questions welcome.



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. October issue: September 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 TWO TRUTHS AND A LIE on page 3

B is the lie. About 12% of West Virginia's population lives in the Bay watershed.

Answers to CHESAPEAKE CHALLENGE on page 23

1. B 2. B & C 3. D 4. A 5. B
6. A) Water-resistant, B) Waterproof



BULLETIN BOARD

■ **Bike Ride:** 8:30–10:30 am, Sept. 13, North Tract. Ages 8+. Meet at visitor center for a family-friendly, relaxed-pace road ride. Observe wildlife, ask questions, learn about the refuge. Bring bike, helmet, water. Info: (301) 875-5839, mtomassoni770@gmail.com.

VOLUNTEER OPPORTUNITIES

WATERSHEDWIDE

Potomac River Watershed Cleanups

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

VIRGINIA

Friends of the Rivers of Virginia

Volunteer projects include river access, dam removals, water quality work, bluweways, fisheries, river-related legislative issues. Info: forva.org.

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

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

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 ("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 ("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 ("Volunteer Opportunities").

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@lsit.org, 443-234-5587.

RESOURCES

WATERSHEDWIDE

River Hero Resources

The James River Association has a series of webinars that are a free resource for watershed protectors and managers. The collection includes: Riparian Buffers, Benefits of Trees: Reducing Stormwater Runoff, Living Shorelines, Local Ecotype Plants, River Hero Homes, Impacts of Climate Change. Webinar links: thejamesriver.org/webinar-series.

Explore the Appalachian Trail Map

Use the free Appalachian Trail interactive map to explore sections by state, plan your route, find trailheads, and locate shelters and campsites. Info: appalachiantrail.org/experience/interactive-map.

Bee Conservation

The MD Dept. of Natural Resources has everything you need to know about Mid-Atlantic bees, from ID 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. Bee Cause Project resources 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

Free Pumpout Adapter Kits

The MD Dept. of Natural Resources is offering state boat owners and marinas free kits to help empty holding tanks securely at pumpout stations. The kit has a plastic adapter that screws into the existing waste discharge deck fitting, instructions, protective gloves, storage tube. Web search "MD DNR free pumpout kit".

Spotted Lanternflies in Home Gardens

The University of Maryland now considers the spotted lanternfly to be mainly a nuisance pest in residential gardens that does no significant damage to 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 in Centreville features hazelnut, persimmon, American plum, black chokeberry, paw paw, high bush blueberry. They produce fruit or nuts that are edible, and they're free for the taking! Video on YouTube: Search "White Marsh Park Edible Trail."

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 MD Dept. of Natural Resources has a free "MD Outdoors" app that 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 state's 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 plus 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.

School is out, but Chesapeake wildlife is hard at work



STEWARD'S CORNER

By John Montgomery

For children, the summer months signify a time of freedom and leisure. For most kids, there's no school, no homework and nothing to accomplish except having fun. For wildlife in the Chesapeake Bay region, though, it's time to get to work. From the water to the land and the sky, summer for many species is breeding and nesting season. Being productive during this time is paramount to ensuring the success of the next generation — and the Chesapeake offers some great real estate for species across the board.

Of course, one of the Bay's most iconic species, the blue crab (*Callinectes sapidus*), is busy mating from May to October, and it's quite the courtship process. First, a male must prove himself worthy with a choreographed display of strength and size. If a female is pleased, she then molts to become soft enough for mating. While the female has molted up to 20 times while growing to adulthood, this will be the last molt of her lifetime — so choosing a suitable mate is no light decision.

A female crab may save her eggs after mating for up to two years, so consistently clean, healthy water is important to keep them going until the right time and place to release the fertilized eggs. Consistent habitat is also necessary for young blue crabs as they undergo multiple stages of development until they reach adulthood and continue the reproduction process. Habitat loss and pollution, though, can affect blue crab health in the Bay. It's a sensitive species that requires a sensitive ecosystem to thrive.

Meanwhile, some northern diamondback terrapins (*Malaclemys terrapin terrapin*) and eastern box turtles (*Terrapene carolina carolina*) are ready to welcome their offspring. Both species generally mate from spring to fall, but some are currently nesting. Their preferred nesting areas are in sandy soil. Terrapins prefer coastal marshes, estuaries



A blue crab takes shelter in a patch of eelgrass near Smith Island, MD. Eelgrass is struggling to survive in the warming waters of the Chesapeake Bay. (Dave Harp)

and brackish waters, while box turtles are predominantly terrestrial. They prefer shrubby grasslands, marshy meadows, or woodlands with a nearby stream or pond. That sounds a lot like what the Chesapeake Bay area has to offer.

So, it's important to keep our coastal lands clean and healthy for all of our shelled friends. Whether doing your part by picking up trash on the beach or supporting projects like living shorelines (which mimic natural nesting habitat), Chesapeake wildlife will thank you.

Speaking of coastal habitat, laughing gulls (*Leucophaeus atricilla*) and multiple species of terns (*Laridae*) are in the midst of their nesting seasons as well. From late

spring to roughly early August, both species are commonly nesting on coastal sand, rocks and matted vegetation — something healthy Chesapeake shorelines and coastal farms can provide.

Both species especially like nesting on island sites to avoid terrestrial predators. Common terns also use strength in numbers, sometimes nesting in large colonies of pairs. Like living shorelines, there is engineered assistance for coastal birds as well. The Maryland Coastal Bays Program reported in 2022 that its artificial island, or tern raft, in Chincoteague Bay hosted the largest breeding site of common terns in the region. The floating platform hosted 155 pairs of common terns, and the numbers have

grown since then. Terns are clearly telling us they appreciate our efforts! Like many coastal birds, gulls and terns also eat just about anything, including crabs. So, the better our crab population is doing, the fuller the birds' bellies can be.

Back in the water, another Chesapeake native is hard at work. Striped bass, or rockfish (*Morone saxatilis*), use the fresh and brackish waters of the Chesapeake to spawn during the springtime. The larval stage of rockfish typically lasts 35-50 days and relies on adequate food resources and appropriate water temperature.

Not only are coastal tides important to the success of these larvae, but rising water temperatures due to climate change also can affect rockfish populations. As rockfish enter the juvenile phase, they become even more sensitive to water conditions. We must remember that aquatic ecosystems are fragile, so helping ensure the water can sustain delicate young rockfish or eggs, as well as their food sources, is paramount.

Another Chesapeake food web connection is that rockfish, along with menhaden, are a favorite meal of ospreys — which are also raising their young in the Chesapeake area during the summer. The better every species does, the better every species does (feel free to use that turn of phrase with your friends).

After a look at the breeding and nesting seasons of Chesapeake wildlife in the summer, it's clear that common factors affect them all. Regardless of whether a critter flies, crawls or swims, it needs clean water, healthy habitat and plenty of food to sustain and grow the species population. Threats to fish and wildlife in the Bay watershed come from climate change caused by human activity, polluted runoff from impervious surfaces and agricultural activity, and even beach litter. The rising sea level can also reduce the delicate coastal habitat that's important to all of these species we live with and love.

Check out what you can do in your own space to help reduce your stormwater runoff and provide habitat for other summer visitors. And be sure to clean a beach when you find yourself there. Any simple act, combined with others, can help sustain all of these busy species and more. ■

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



This "tern raft" has been deployed for several years in Chincoteague Bay to accommodate nesting common terns. (Kim Abplanalp/MD Coastal Bays Conservation Program)

Frankly, Scarlet, it's a tanager ... but not really a tanager



By Alonso Abugattas

Scarlet tanagers are one of the more colorful songbirds present in the Chesapeake Bay region during summer, at least the males. The males are brilliant red with black wings and tails, making them one of the most recognizable of our perching birds when breeding. Females are olive-green above and yellowish below, to blend in when nesting or other times of the year.

Males dramatically molt after breeding season, their plumage reverting mostly to the olive and yellow colors of the females — but usually with black wings, compared to the dark gray of the females. It's this olive-green look that gives us the second part of their Latin name, *Piranga olivacea*. The genus name *Piranga* comes from the Indigenous Tupi dialect of northern South America, where there are several species of colorful tanagers. It means something along the lines of “basic small bird.”

But scarlet tanagers are, in fact, not real tanagers. They and other *Piranga* species were once part of the Thraupidae family, or “true tanagers,” found mostly in Latin America and northern South America. That classification was mostly because of color similarities, but recent genetic studies have led to their reassignment to the Cardinalidae family, along with the cardinals, grosbeaks, buntings and others. Behaviorally this makes sense, because true tanagers mostly eat fruit while *Piranga* species feed mostly on insects, especially while nesting. They are also different in that both males and females sing and vocalize, as with northern cardinals, while only males of true tanager family are singers. That's the case with many other songbirds, too.

Despite how colorful the males are, they are actually difficult to spot, because they spend most of their time high in the tree canopy. What many birders realize, as I did when assisting in studies of *P. olivacea*, the best way to find them is by listening



A male scarlet tanager clings to a branch in Maryland's Patapsco Valley State Park. (Laura Wolf/CC BY 2.0)

for their songs and calls. Their “chip-burr” call — which both sexes make, though the females are quieter — can help you locate them. Some say they sound like a robin with a sore throat.

Scarlet tanagers prefer intact mature forests for nesting and have a broad breeding range from the Eastern Seaboard to the Midwest, including southern Canada. Their range is thought to be one of the largest among songbirds. Males arrive in the Chesapeake region in May and June, a week or so before the females, and establish territories with their songs and calls. Males can be aggressive with perceived rivals, though combatants rarely do more than chase and “yell” at each other. Males attract mates by moving to branches below the females and spreading their wings to show their bright colors.

These birds tend to be monogamous for the breeding season and occasionally may stay with the same mate for several years. The female selects the nest site, often in an old oak on a horizontal branch well away from the trunk and usually 30-50 feet up, if not higher. The female builds the nest in 2-7 days, using twigs, pine needles, grasses, bark strips and rootlets. She lays two to five eggs, typically four, that are pale blue-green speckled with brown.

The altricial, or helpless, chicks hatch after 12-14 days of incubation by the mother.

The young fledge in 9-12 days, with both parents feeding them. They stay nearby, still dependent on their parents, for several more weeks. The pair has only one brood per year and, unlike many songbirds, will not re-nest if the chicks don't survive.

Insects and other invertebrates make up most of the food that the young eat and make up most of the adult food when available. They have various ways of obtaining this food, gleaning it from bark and foliage and catching aerial insects in mid-air, sometimes hovering to do so. Their thick, blunt-tipped bills help them with prey of most sizes. The bills also help with stinging insects such as wasps, bees, and hornets, which they sometimes scrape along the branch to not just kill but to pull out the stingers. Females tend to feed higher in the canopy. They also feed on berries and fruits, especially outside the breeding season.

Scarlet tanagers migrate south in small groups, often leaving their summer territory by October — and they are strong, long-distance fliers. Flying at night, they travel up to 4,000 miles, ending up anywhere from southern Central America to the Andean foothills of Venezuela, Peru, Columbia and Bolivia, as well as parts of Brazil. On their wintering grounds, they feed in mixed flock groups with other tropical tanagers, flycatchers, antbirds and wood creepers.



Unlike breeding males, which put the scarlet in scarlet tanager, the females have yellow and olive plumage year-round. (Laura Wolf/CC BY 2.0)

Scarlet tanagers face many dangers. As adults, they are preyed upon by hawks of the accipiter group, several owl species, outdoor cats and especially merlins. Their nests are raided by snakes, squirrels, raccoons, blue jays, crows and grackles. While their normal response to these predators is to noisily mob them, they respond to crows and merlins by remaining quiet, in the hopes they're overlooked.

To minimize threats, which include heavy nest parasitism by cowbirds, they prefer to nest in interior forests, avoiding edge habitat and small forest fragments. In developed areas, where intact forests are few and far between, they are much more vulnerable to predation and parasitism.

The good news is that, unlike so many other songbirds, the population of scarlet tanagers has held steady since the 1960s, according to the North American Breeding Survey. Partners in Flight estimates their breeding population at 2.6 million, making them species of low conservation concern, despite some localized declines. ■

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.

The great blue heron: a Chesapeake icon stalking the marsh



By Kathy Reshetiloff

The stoic bird stands perfectly still, like a statue, its eyes fixed on the shallow water at its feet. It waits patiently to strike at any fish swimming nearby until the sound of a human — a branch snapping underfoot — breaks its attention. Pumping its enormous blue-gray wings, almost clumsily at first, the bird takes flight, its long neck tucked into a tight S shape, and the bird disappears over the treetops.

This is the great blue heron, *Ardea herodias*, the dignified silhouette of which has been emblazoned on magazines, signs, logos, clothing and even license plates. Surpassed only by the blue crab as a Chesapeake Bay icon, the great blue heron is the largest and most widely distributed of American herons.

Easily distinguished from other herons, the great blue is 4 to 5 feet tall and sports a dark gray body, chestnut thighs, a white throat and cheeks, and a black cap with a white stripe down the middle. Two long, black “occipital” feathers trail from the back of its head.

Typical of herons, the bird has a short tail, extremely long legs and neck, and a long, sharply pointed bill. While in flight, its legs trail behind and the bird is kept aloft by powerful wings that can span six feet. Many people say its looming silhouette against the sky is downright Jurassic.

Great blue herons breed across the United States and southern Canada, mostly east of the Rockies but also along the Pacific Coast. More than half of the Atlantic Coast breeding population nests in the Chesapeake Bay region. They are the most readily recognized wading birds, found in cities, suburbs and rural areas and usually near wetlands, ponds, creeks, rivers and bays — anywhere with water, food and places to nest.

Although many herons migrate, breeding and raising young in their northern territories and then flying south for the winter, many



A great blue heron lands on a log in a Chesapeake marsh. (Dave Harp)

stay in the Chesapeake Bay region year-round. Silent hunters, they stalk small fish, which they swallow headfirst. They also eat frogs, salamanders, lizards, snakes, crawfish, small birds, rodents and insects.

According to Cornell University’s Ornithology Lab, not much is known about how herons court and form mating pairs, but in temperate climates like that in the Chesapeake watershed they gather as soon as early March to form colonies, sometimes called rookeries or heronries, which can support hundreds of nesting pairs. Egg-laying can begin anywhere from mid-March to mid-April.

In the Bay region, nesting sites include living or dead trees and sometimes bushes. Nests are built of sticks and twigs and are lined with reeds, mosses and grasses to cushion three to seven eggs. Nests that survive the winter mostly intact may be repaired and used again. Males choose the nest, though they don’t ordinarily choose the same one from one year to the next, according to Cornell.

Eggs hatch after about 28 days, and both parents care for the chicks. The young are initially fed a diet of regurgitated food, but eventually eat whole fish dropped into the nest. Juveniles leave the nest about two months after hatching and, if they survive their first winter, may live up to 15 years.



A great blue heron hunts along a stream. (Alyenaa Buckles/CC-BY 2.0)



A great blue heron takes flight, legs trailing behind, neck tucked into an S shape. (Robert Pos/U.S. Fish & Wildlife Service)

In southernmost Florida and the Caribbean, there are great blue herons that are not blue at all, but rather pure white. Called great white herons, for obvious reasons, they are widely considered a “color morph” and not a separate species. Ornithologists are not in unanimous agreement on this, though. Some say they should be considered a separate species or at least subspecies. There is a hybrid of the blue and white herons, called a “Wurde mann’s heron,” that is mostly gray with a white throat and head. This bird is much less common than the great blue and is found only in the neotropics.

In the past, many species of herons and egrets were shot for their feathers, which were used to adorn hats and clothing.

Because of their size, herons were often the victims of target practice. The slaughter of these birds went relatively unchecked until 1900, when the Lacey Act was passed, prohibiting the foreign and interstate commercial trade of feathers. Greater protection came in 1918 with the Lacey Act’s successor, the Migratory Bird Treaty Act, which allows regulated hunting of game birds but prohibits killing migratory birds or collecting their nests, eggs or body parts.

Despite these protections, great blue herons and other wading birds — egrets, for example — still face challenges. Deterioration of water quality results in fewer fish and other prey. Care must be taken to preserve nesting colonies. Frequently disturbed herons may neglect their young or abandon a nest altogether. To minimize disturbance, nesting sites should be observed from a distance of about 600 feet.

Presently, the Chesapeake Bay watershed is home to stable populations of great blue herons, but we cannot become complacent. Preservation of shallow water feeding areas and rookeries must remain a priority if we want to enjoy this majestic symbol of the Chesapeake Bay. ■

Kathy Reshetiloff is with the U.S. Fish and Wildlife Service’s Chesapeake Bay Field Office.