CHESAPEAKE
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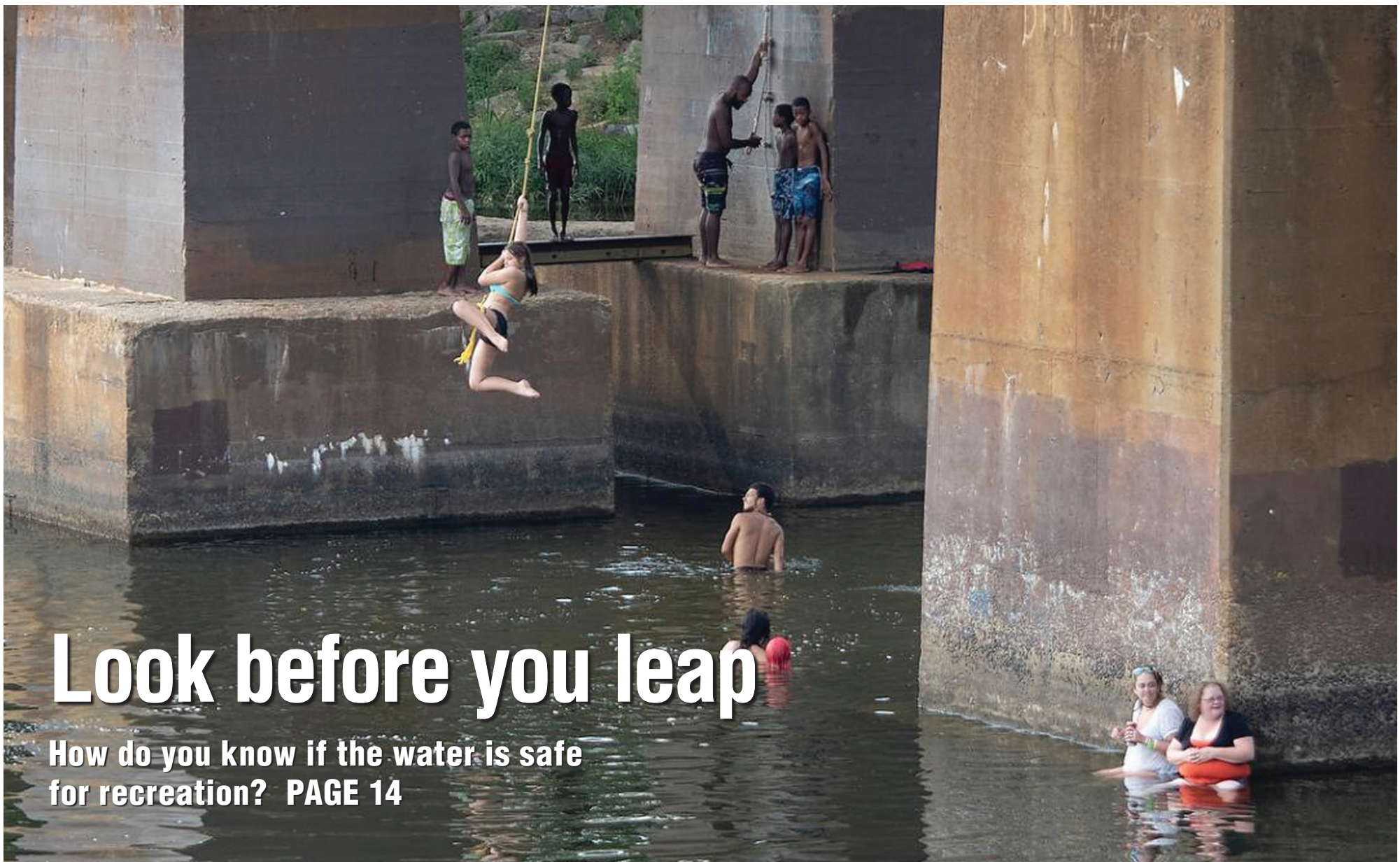
Independent environmental news for the Chesapeake region



Look before you leap

How do you know if the water is safe for recreation? PAGE 14

'INSPIRING & CAPTIVATING'

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Invasive water chestnut is spreading through Virginia streams PAGE 29

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Scientists say that the number of blue crabs in the Chesapeake Bay has taken a downturn this year but the overall population "is regaining its natural resilience." See story on page 22. (Dave Harp)

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EDITOR'S NOTE

Brand new look, same dedicated coverage

As you have noticed, we've made big changes in the way the *Bay Journal* looks. They're the fruition of thinking that began years ago about ways to freshen up the appearance of the paper in advance of its 30th anniversary, which we will be marking next year.

Much of the hard work to get it over the finishing line was done by Michele Danoff, an Annapolis area designer who brought some new perspectives to the task.

Overall, we've tried to better highlight photos and other visual elements and to provide a cleaner look to the publication. We've also added some bite-size information, including a section of news briefs to help keep readers updated on a wide variety of issues affecting the region.

The new design also incorporates suggestions from our readers. For instance, we've heard in reader surveys that people don't like it when an article "jumps" from one page to a location several pages away. We've tried to make sure that all articles flow to adjacent pages.

Here's what hasn't changed: Our in-depth coverage of issues. Readers overwhelmingly tell us that they appreciate, and trust, our comprehensive reporting, which they often find nowhere else. There's plenty of it in this issue, including articles about:

- The safety of recreational water contact around the region
- The need for much greater diversity and inclusion in Chesapeake Bay restoration efforts
- The continuing legacy of PCBs in waterways
- Pennsylvania's problem with combined sewer overflows

We'll continue to tweak our new look in coming months, and we value your input. So keep an eye out for our annual reader survey. It will show up in your mailbox over the summer, and it's a great way to share your feedback about the new design, topics that are important to you, and any other thoughts or suggestions you might have.

And, if you like what you're seeing in the *Bay Journal*, please introduce us to your friends! ■

— Karl Blankenship

CORRECTION

The pdf version of this issue has been updated to revise an error on page 21 originally stating that there are no people of color on the Chesapeake Conservancy staff. The *Bay Journal* regrets the error.

ON THE COVER

A group enjoys cooling off in the James River near Richmond. (Dave Harp)

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BY THE numbers

270,011
Bushels of wild oysters harvested in Maryland during the 2019-20 season

64
Natural preserves in Virginia

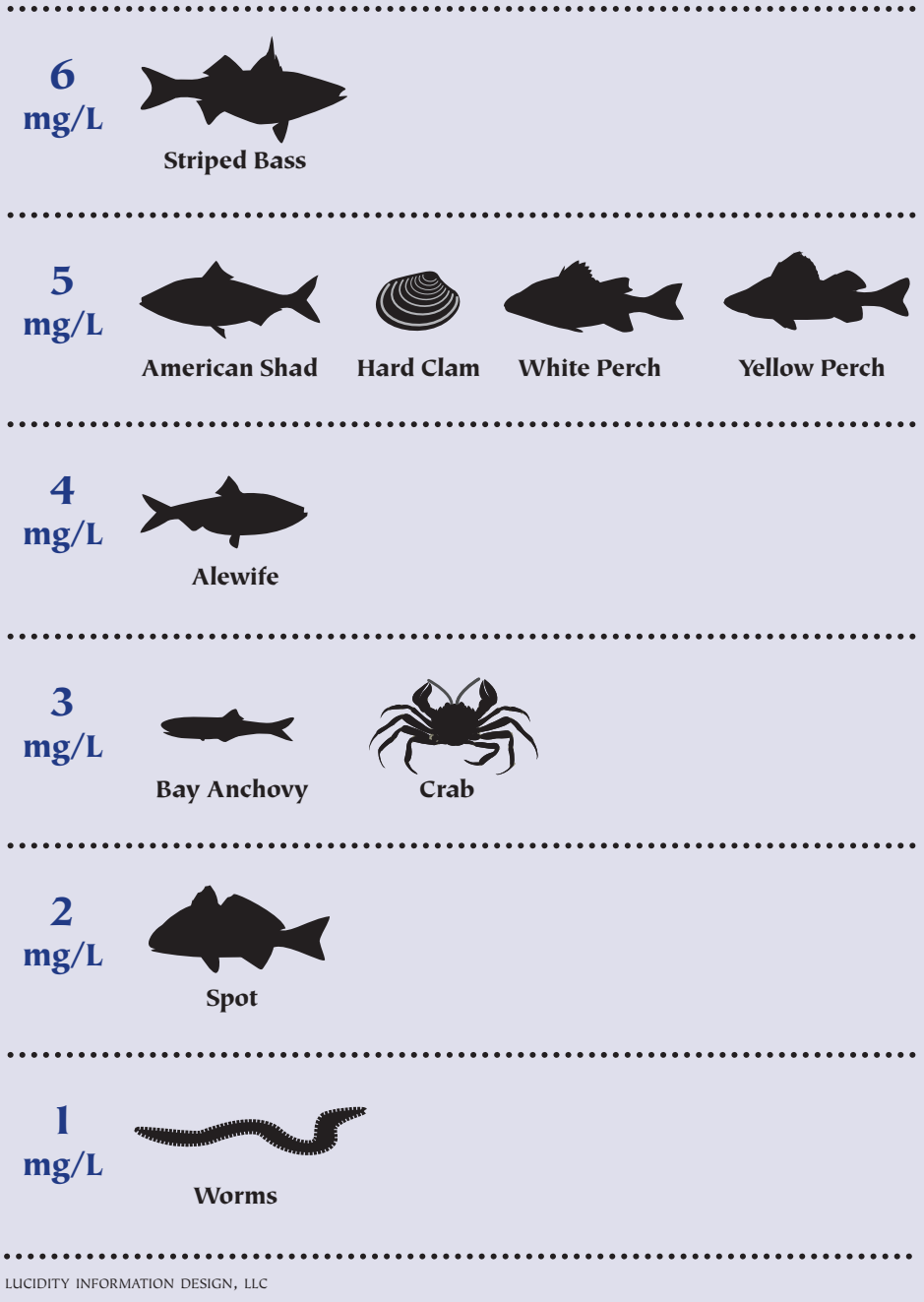
289
Number of young adults who have participated in the Chesapeake Conservation Corps

11
Hotspots for PCB contamination in the lower Anacostia River

1,315
Sites where you can enjoy being on or along the water in the Chesapeake Bay region

242,900
Acres of Pennsylvania farmland lost to low-density development between 2001 –2016

Minimum Amount of Dissolved Oxygen Needed to Survive in the Bay, by Species



LUCIDITY INFORMATION DESIGN, LLC

UNDERSTANDING THE 'DEAD ZONE'

- Scientists are predicting that 1.37 cubic miles of the Chesapeake Bay, or 11% of its total volume, will become a "dead zone" this summer. In July, the area of severe hypoxia — or low oxygen is expected to swell to 1.9 cubic miles — or about 16% of the Bay.
- Oxygen is essential for terrestrial life, but it is also critical for most aquatic species. They just need less of it. While the atmosphere has about 210,000 parts per million of oxygen, water in the Bay has a tiny fraction of that — typically less than 14 ppm (or milligrams per liter).
- The dead zone has 2 mg/l or less of oxygen.
- Different aquatic species require different amounts of oxygen. If there isn't enough, those that can will flee an area; those that can't get away may die.
- Oxygen concentrations are usually highest near the surface where it is replenished from the atmosphere.
- Deeper areas are prone to oxygen depletion in large part because too many nutrients (nitrogen and phosphorus) enter the Bay, where it spurs algae blooms. When algae die, the decomposition process draws oxygen out of the water and sometimes depletes it entirely.
- While nutrients drive the dead zone, a variety of factors determine the size of its summertime peak. Wind tends to reduce the dead zone by helping Bay waters to mix, recharging deep areas with oxygen-rich water from the surface. Warm temperatures worsen conditions; warm water holds less oxygen and speeds up algae decomposition.

LOOKING BACK

25 years ago

Forest recovery trend reversed
A U.S. Forest Service study finds the Bay watershed has lost 4.5% of its forest cover during a 14-year period ending in 1992, reversing a long-term trend in forest recovery that lasted most of the century. The loss of forests is a concern for Bay water quality because forests, on average, generate less nutrient and sediment runoff than any land cover except wetlands. ■

15 years ago

Stream restoration takes off
The Bay region leads the nation in stream restoration, with more than 4,700 projects undertaken since 1990, spanning more than 2,200 miles of waterways and costing more than $400 million. That could make it a testing ground to identify effective restoration approaches — except that researchers could only find follow-up monitoring records for 5.4% of the projects. ■

10 Years Ago

Public responds to draft TMDL
About 90% of 7,980 submitted comments supported the U.S. Environmental Protection Agency's draft plan to clean up the Bay: the total maximum daily load or "pollution diet." Most comments came from letter-writing campaigns organized by environmental groups. Of the roughly 700 more detailed comments, many either expressed opposition or reservations about the draft TMDL. ■

5 years ago

PA needs to step up pollution reduction
Pennsylvania needs to double the number of farm acres under nutrient management and plant seven times as many acres of forest and grass buffers as it did in 2014 to get it back on track to meet Bay nutrient reduction targets. The U.S. Environmental Protection Agency warns that if the state does not ramp up efforts, the agency could take actions such as requiring greater nutrient reductions from wastewater treatment plants, which would be hugely expensive. ■

ABOUT US

The *Chesapeake Bay Journal* is published by Bay Journal Media, an independent nonprofit news organization dedicated to producing journalism that informs the public about environmental issues in the Chesapeake Bay watershed. The *Bay Journal* is available in print and by email and is distributed free of charge, reaching approximately 100,000 readers each month. The print edition is published ten times a year, and bundles are available for distribution at offices, libraries, schools, etc. Material may be reproduced, with permission and attribution.

Bay Journal Media also operates the Bay Journal News Service, which distributes *Bay Journal* articles and op-eds about the Chesapeake Bay and regional environmental issues to more than 400 newspapers in the region.

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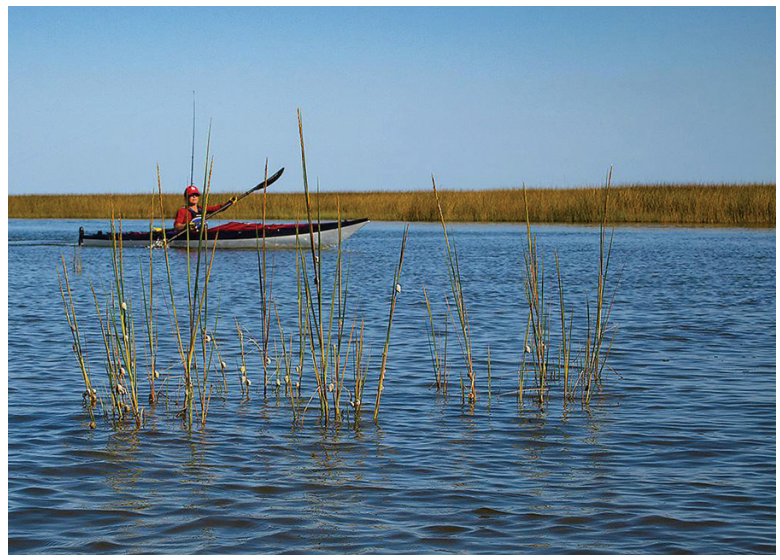


A kayaker enjoys serene waters along the Chesapeake Bay. (Dave Harp)

Bay Journal ambassadors take many forms

The *Bay Journal* reaches approximately 100,000 people every month through our printed edition, email newsletter and website. By sharing articles through the Bay Journal News Service, we reach several hundred thousand more.

It's no exaggeration to say that we couldn't do it without you.

Our readers are our biggest champions. While this has been an enormously difficult spring for everyone, many of you stepped forward and made a financial gift to the *Bay Journal*. We are truly grateful for your generosity. And we take it as a sign that you find news about clean water, clean air and a healthy ecosystem for all to be as important as we do.

Our champions support us in other ways, too. Some take it upon themselves to act as *Bay Journal* ambassadors, introducing the paper to friends, family and students. I've talked to some readers who request bundles of *Bay Journals* to hand out at community meetings. And we recently heard from Len Zuza, who planned to promote us to local papers in Southern Maryland to tell them it was free to use our material and collect contact information for our mailing list.

These small actions really do make a difference! Our audience is growing, and that means we are supporting more people than ever in their work to be engaged with environmental issues.

I also have a bit of staff news to share. Reporter Whitney Pipkin welcomed a baby into her family on June 17. We wish her the best while she takes some time off to be with Ruby Mae and the rest of her family. In the meantime, be sure to check out her article on the safety of recreational water contact on page 14 of this issue. ■

— Lara Lutz
Managing Editor

U.S. renewable energy consumption surpasses coal

In 2019, the United States' annual energy consumption from renewable sources exceeded coal-based energy consumption for the first time since before 1885, according to the U.S. Energy Information Administration. The administration reports that this mainly reflects a decline in the amount of coal used to generate electricity along with growth in renewable energy, mostly from wind and solar. Compared with 2018, consumption of energy from coal decreased nearly 15%, and consumption from renewable sources grew 1%.

In 2019, coal-based energy consumption dropped for the sixth consecutive year to 11.3 quadrillion Btu, the lowest level since 1964. Electricity generation from coal fell to its lowest level in 42 years. Natural gas consumption in the electric power sector has increased significantly in recent years and displaced much of the electricity generation from retired coal plants.

Renewable energy consumption in the nation increased in 2019 for the fourth year in a row to a record 11.5 quadrillion Btu. In 2019, electricity generation from wind surpassed hydro for the first time and is now the most-used source of renewable energy for electricity generation in the United States on an annual basis.

The last time renewable energy consumption topped coal was more than 130 years ago, when wood supplied most of the nation's energy and was the only commercial-scale renewable energy source until hydropower plants began producing electricity in the 1880s. ■

UPDATE: MD sues paper mill for pollution in Potomac River

Maryland environmental regulators have filed a federal lawsuit against the owner of the closed Luke paper mill in Allegany County, accusing it of continuing to pollute the North Branch of the Potomac River with toxic contaminants.

The complaint, filed May 28 in U.S. District Court in Baltimore, alleges that a toxic black substance that appears to include paper "pulping liquor" and possibly coal ash is leaking into the river from the facility owned by Verso Corp.

In the lawsuit, the state Department of the Environment seeks to intervene in a federal case making much of the same allegations as a suit filed in March by the Potomac Riverkeeper Network. Brent Walls, the Upper Potomac Riverkeeper, said the nonprofit organization welcomed the state's involvement.

In 2019, electricity generation from wind surpassed hydro for the first time. (publicdomainimages.net)

The state had previously sued Verso in December in Allegany County Circuit Court, alleging multiple environmental violations. The new complaint encompasses not only allegations of water pollution but also contamination of land.

The lawsuits are the outgrowth of an investigation that began in 2019 when an angler re-

See **BRIEFS**, *page 6*

briefs

From page 5

ported seeing "pure black waste" going into the river by the mill. State inspectors sampled liquid seeping from the riverbank and found that it was caustic enough to burn skin and contained toxic mercury, lead, antimony and arsenic.

The mill closed in June 2019, and the company took steps to collect the black liquid and submitted a cleanup plan. But the state lawsuit asks the court to order a full remediation and impose civil penalties on the company.

A Verso spokesperson said the company has been "working in cooperation" with regulators from Maryland and West Virginia and has an approved plan to "take immediate action" to remedy the issues raised by the lawsuits. ■

Upper Potomac Riverkeeper Brent Walls stands in the North Branch of the Potomac River at the wastewater outfall that served the Luke, MD, paper mill owned by Verso Corporation. (Dave Harp)

UPDATE: MD chicken residual tank fight heads to Wicomico County Circuit Court

A lawsuit filed in Maryland by neighbors of a 3-million-gallon tank of poultry residuals claims that its building permit should be revoked because the structure fails to meet stormwater management standards.

The property's owner, Edmond "Biff" Burns, received a permit from Wicomico County in May 2019 to build the open-air tank in a rural area south of the small town of Mardela Springs. It is designed to store a waste product from chicken processing during parts of the year when state environmental regulations bar it from being sprayed on farmland as a fertilizer.

The stormwater plan submitted to the county is missing key information and is insufficient to meet the project's drainage needs, a group of 15 neighbors argued in the lawsuit, which was filed in February in Wicomico County Circuit Court.

County planners found the initial stormwater calculations to be adequate, said Maryland Department of the Environment spokesman Jay Apperson. A post-construction review of the system is all that remains pending, he added.

The county's Board of Appeals last fall turned down the neighborhood group's appeal of the permit, arguing that it was submitted 100 days beyond the 30-day deadline to intervene. The group is challenging the board's decision in a separate court action.

The uproar over the tank prompted the Wicomico County Council in November to enact a six-month moratorium on future permits. It voted April 7 to extend that for six more months. The moratorium doesn't apply to the Mardela Springs tank because it was permitted before the stoppage went into effect, officials say. ■

NRDC, partners sue to protect river herring

The Natural Resources Defense Council and a coalition of fishing and watershed protection groups filed a lawsuit on April 30 in federal court to protect river herring from extinction.

The complaint alleges that the National Marine Fisheries Service violated the Endangered Species Act and the Administrative Procedure Act when it declined last year to list alewife and blueback herring — collectively referred to as river herring — as threatened species.

A court previously found that the agency's 2013 decision to not list the species was arbitrary.

"River herring are facing warming waters, extreme flooding events and other threats that NMFS has chosen to minimize," said Sam Eisenberg, attorney for NRDC. "The agency is ignoring the science by speculating that river herring will quickly 'recolonize' rivers after their populations are wiped out and ignoring the threat climate change poses beyond 15 years. Its policy for these vulnerable species is essentially 'cross your fingers.'"

Alewife and blueback herring may be small, but they are a critical part of the coastal riverine and ocean food chains. River herring were once abundant up and down the eastern seaboard, with spawning runs in larger rivers numbering in the millions of fish each year. Their populations collapsed in the 1970s and have never recovered. They are now a mere 3% of historical levels, according to estimates. ■

Manure-to-energy project to produce natural gas for the Eastern Shore

A Maryland-based company that struck a 20-year agreement with Perdue Farms to take over its litter composting operation in Delaware has inked a deal to generate and sell the natural gas it expects to produce there to a utility serving the Eastern Shore.

Bioenergy DevCo, a Maryland-based company, entered into an agreement in June with Chesapeake Utilities Corp. to produce natural gas from poultry litter, a combination of manure and wood shavings removed from the floors of poultry houses. The company said in November that it plans to expand the former Perdue composting facility and build an anaerobic digester on the same 220-acre site that will be able to treat 100,000 tons of manure and poultry processing byproducts a year.

Anaerobic digesters use naturally occurring microbes to break down organic material and extract methane. Composting the byproducts of digestion yields a fertilizer that's easier and safer to store, ship and use than manure.

Marlin Gas Services, an affiliate of Chesapeake Utilities, will transport the fuel to an interstate pipeline, where it will connect with a distribution system serving natural gas customers.

Bioenergy said in a press release that, along with environmental and energy benefits, this project will support the economy in the Delmarva region. ■

Edmond (Biff) Burns stands by the site he owns in Wicomico County, MD, where a new storage tank will contain residuals from poultry processing. Burns said the tank would be made of glass-fused metal to prevent harm to the environment. (Jeremy Cox)

States seek stimulus support for Bay

Congress in July is expected to start consideration of a fourth round of stimulus funding to help the nation recover from the economic downturn caused by the coronavirus pandemic.

If they do, state environmental leaders around the region are urging lawmakers to support programs that would help Chesapeake Bay restoration efforts.

In a letter, they call for more federal funding for clean water infrastructure, increased funding to help farmers implement conservation practices on their land, support for projects that would help rebuild oyster reefs and other habitats, and more funding for parks, especially in areas that serve people of color.

"These projects not only create jobs, they also advance the restoration of our natural environment, which increases climate resilience, and improves public health," said the letter signed by environmental agency heads from all six states in the watershed and the District of Columbia, as well as the Chesapeake Bay Commission, which represents state legislatures. ■

Bay grasses help offset acidification

Scientists have discovered that underwater grasses in the Chesapeake Bay not only remove nutrient pollution and provide habitat for baby crabs and rockfish, but they may also offset the growing problem of acidification as climate change impacts the nation's largest estuary.

Acidification of ocean and estuarine waters is driven by the increasing levels of carbon dioxide in the atmosphere. When water absorbs carbon dioxide from the atmosphere, it can become more acidic.

Researchers who studied grass beds in the Susquehanna flats found that the grasses there were producing an acid-reducing compound called calcium carbonate. The team included scientists from the University of Delaware, University of Maryland Center for Environmental Science, St. Mary's College of Maryland, Oregon State University and Xiamen University in China. They determined that strong photosynthesis of the plants in flats and other shallow, nearshore waters generates very high pH, which facilitates the formation of calcium carbonate minerals.

When calcium carbonate particles move downstream, they enter acidic subsurface waters and dissolve — helping to reduce acidity of the water four times more than it otherwise might have been.

"Just like people take Tums to neutralize the acids that cause heartburn, [grass] beds send carbonate minerals to the Lower Bay to neutralize acids there," said Jeremy Testa, associate professor at UMCES.

The implication is that underwater grasses can potentially help to make deeper Bay waters more hospitable to shell-forming organisms. Under more acidic conditions, larval mussels and oysters are negatively impacted, and the growth of adult shell-formers may be more difficult. ■

An aerial photo taken by volunteer pilots shows construction of the Atlantic Coast Pipeline in West Virginia in 2018. (Pipeline Compliance Surveillance Initiative / pipelineupdate.org/csi)

Atlantic Coast Pipeline axed

Project was plagued by delays, high costs

By Jeremy Cox

The big energy companies behind the proposed Atlantic Coast Pipeline announced July 5 that they are dropping the controversial project, blaming legal setbacks and economic uncertainty.

The 600-mile pipeline would have carried natural gas from West Virginia through Virginia to North Carolina. Dominion Energy and Duke Energy launched the project in 2014 to address what they said was "a lack of energy supply and delivery diversification" in the region.

The announcement came less than a month after the U.S. Supreme Court ruled 7–2 in favor of allowing the pipeline to cross the Appalachian Trail and 21 miles of national forest lands. But several other permits have been vacated by lower courts, leading to a construction stoppage dating to late 2018.

Those legal challenges cost the developers time and money. In a joint statement, Dominion and Duke estimated that the earliest the pipeline could have been in service would have been 2022 — 3.5 years later than initially planned. Meanwhile, the price tag soared from $4.5 billion to $8 billion.

Dominion and Duke said cases decided elsewhere also undermined the pipeline's financial viability. The U.S. District Court for the District of Montana overturned long-standing federal authority to permit pipelines to cross wetlands and water bodies. The Ninth Circuit on May 28 upheld the lower court's freeze on the fast-track permitting approach.

"This announcement reflects the increasing legal uncertainty that overhangs large-scale energy and industrial infrastructure development in the United States," Dominion CEO Thomas F. Farrell II and Duke CEO Lynn G. Good said in a joint statement. "Until these issues are resolved, the ability to satisfy the country's energy needs will be significantly challenged."

Opponents included environmentalists, environmental justice advocates, farmers and residents in the pipeline's path. They characterized the project's cancellation as a watershed moment in the nation's slow transition away from reliance on fossil fuels.

"The fossil fuel era is rapidly drawing to a close in Virginia and nationwide thanks to the ferocious six-year opposition to this destructive pipeline,"said Mike Tidwell, executive director of the Chesapeake Climate Action Network.

The Southern Environmental Law Center, another courtroom foe, called the decision a victory against a "risky and unnecessary" project. The group led the successful fight to overturn a federal air permit for a compressor station associated with the pipeline in the predominately Black community of Union Hill in Virginia.

In that case, the Fourth Circuit of the U.S. Court of Appeals ruled that the state had failed to adequately consider the environmental justice implications of constructing the compressor.

"This is a great day for the people of Union Hill, for public lands, for landowners in the path, and for all North Carolinians and Virginians who deserve a clean energy future and are no longer on the hook to pay for this $8 billion pipeline," said Greg Buppert, an SELC senior attorney.

In a separate announcement on July 5, Dominion said it was selling its gas transmission and storage assets to Warren Buffett's Berkshire Hathaway Energy. The transaction was valued at nearly $10 billion. ■

Capt. Tyrone Meredith, right, harvests oysters with mate Lamont Pollard using a hand tong near Broad Creek, a tributary of the Choptank River in Talbot County, MD, in February 2018. (Will Parson/Chesapeake Bay Program)

MD's oyster population stages partial rebound

Study finds less overfishing, but scientist says 'we're still not where we want to be'

By Timothy B. Wheeler

Maryland's oyster population has staged a partial rebound in the past two years, according to a new study, with abundance up and overfishing down. But a scientist leading the study cautions that the Chesapeake Bay's iconic shellfish are still a long way from where they need to be.

In an update of a grim assessment presented in 2018, scientists reported in June that the number of market-size oysters in Maryland's portion of the Bay has grown about 50%. Meanwhile, the overharvesting found to be occurring in half of the state's waters has shrunk while the harvest itself grew.

Even so, the state's market-size oyster stock is still estimated to be 25% below where it was just two decades ago.

"We're making progress," said Michael Wilberg, a fisheries specialist at the Chesapeake Biological Laboratory of the University of Maryland Center for Environmental Science. "But we're still not where we want to be."

Two years ago, a team of scientists led by Wilberg warned that Maryland's stock of market-size oysters had declined by half since 1999 and was threatened in the long term by widespread overharvesting.

In response, the DNR imposed new harvest limits last season. Fishery managers reduced the maximum allowable daily catch 20–33% and trimmed the workweek for oystering from five days to four. Watermen braced for hard times.

But contrary to expectations, the state's wild oyster harvest topped 270,000 bushels last season, nearly double the 145,000 bushels landed the previous year.

Watermen and fisheries managers say that in hindsight, the harvest bounce is understandable. Record rainfall in 2018 lowered the salinity of the Bay, which stunted oysters' growth and even killed them in a few places. But as salinity levels recovered last year, the expected crop of market-size oysters was enlarged by those late-growing bivalves that had failed to reach legally harvestable size the rainy year before.

Oysters' overall abundance also improved, according to Wilberg, because the diseases that ravaged their numbers in the 1980s through the early 2000s have abated, and many more are surviving. And while oyster reproduction hasn't been particularly bountiful in recent years, it was good in some areas like Tangier Sound and overall enough to boost the stock significantly.

The estimated abundance of market-size oysters grew from 300 million in 2017, the end point for the earlier stock assessment, to 450 million last year.

The rebound is far from even, with adult oysters actually surpassing their 1999 abundance in the Choptank River while showing little or no improvement in the Chester and the Severn rivers, where populations are considered essentially depleted.

The picture varies by age as well. The new data found that the number of oysters too small to be legally harvested last season was "slightly below the long-term average." Moreover, the abundance of recently spawned juvenile spat — which usually need three to four years to grow to marketable size — hit the sixth lowest level seen since 1999.

With all of that in mind, the DNR has decided to maintain the harvesting restrictions imposed last season. Officials announced the decision July 1, in time to have them in place for the start of the wild harvest seasons, which traditionally runs Oct. 1 through March 31.

Chris Judy, manager of the DNR's shellfish division, explained that while managers believe their actions so far have put the fishery on the path toward sustainability, they aim to proceed cautiously.

"This is progress," he said, "but oysters haven't recovered. We're not there yet."

Overharvesting isn't fixed, for one thing. Though the number of areas where it is occurring have shrunk from 19 (out of 36), the five remaining overharvested areas accounted for more than half of the state's overall harvest last season.

Allison Colden, fisheries scientist with the Chesapeake Bay Foundation, said that while the state may be taking steps to stabilize its fishery, that could still leave the population far below what it used to be. Scientists estimate that the Bay's oyster abundance today is just 1–2% of what it was historically.

"We have no goal; we have no target," she said. "We don't want the status quo to be where we are forever."

Robert T. Brown, Sr., president of the Maryland Waterman's Association, said that the scientific assessments are "a work in progress," and that natural factors and market conditions play a major role in oyster abundance and harvests. He noted that many watermen worked fewer days than allowed last season because of rough weather and low demand from buyers, yet still landed more bivalves. Even so, he said, watermen would like the flexibility to work any or all of the weekdays, the way it was before last season.

Brown said he believes there's been too much development around the Bay to bring its oysters back to where they were in the industry's heyday in the late 19th century. He's not even sure, he added, that they can be brought back to where they were when he was a young man 50 years ago.

"If Mother Nature doesn't throw us some kind of curveball, I believe we are headed in the right direction," he said. "You are more sustainable than what you were last year, but we need to go further than where we are now." ■

Great American Outdoors Act passes in Senate

If signed into law, the act will protect the largest source of federal land conservation dollars

By Ad Crable

The Assateague Island National Seashore along the Atlantic Ocean in Virginia and Maryland and the Appalachian National Scenic Trail farther inland.

Yale Heights Park, a community park in a neighborhood of Baltimore.

Chickies Rock, a landmark overlook on a cliff towering above the Susquehanna River in Pennsylvania.

The George Washington Memorial Parkway, a scenic string of places to play and rest outside the nation's capital.

The Flight 93 National Memorial in Pennsylvania and Allegheny National Forest, the state's only national forest.

Spruce Knob, WV, the highest point in a state of mountains.

Historic retreats of Teddy Roosevelt and Franklin Delano Roosevelt in New York state.

All have been funded by the federal Land and Water Conservation Fund. Since 1965, the LWCF has been the largest source of federal conservation dollars, allocating $19 billion for recreation projects in almost every county in the United States with the mission of ensuring Americans have access to outdoor recreation that supports healthy living. States and communities that receive support from the fund have to match the amount dollar for dollar.

It's also the vehicle federal agencies use to protect and purchase land for national forests, parks and refuges.

But the LWCF has been plagued with siphoning through the years, as Congress has continually raided the fund for non-conservation purposes. A coalition of groups seeking full, guaranteed funding for the LWCF tracks the total amount of earmarked money that has been taken from the fund. As of June 15, it stood at more than $22 billion — more than half of the money accrued to support public lands and outdoor recreation.

Now, for the first time, the LCWF is on a fast-track to be guaranteed full funding and protect it from annual funding raids.

The U.S. Senate voted 73–25 on June 17 to approve the Great American Outdoors Act, a bipartisan move to permanently and fully fund the Land and Water Conservation Fund. It calls for continuing annual funding of $900 million — almost all of it from offshore oil and gas leases, not tax dollars — to be allocated for public recreation around the country each year.

Community Park, in Lancaster County, PA, was East Lampeter Township's first park. It was made possible with funding from the federal Land and Water Conservation Fund. (Dave Harp)

The Susquehanna overlook at Chickies Rock County Park in Lancaster County, PA, is one of southeastern Pennsylvania's natural landmarks. It was created with funding from the federal Land and Water Conservation Fund, one of nearly 3,000 recreation projects in the Chesapeake Bay drainage states since 1965. (Dave Harp)

The U.S. House is expected to follow suit quickly and President Donald Trump already has announced his support for the legislation. The House is scheduled to vote on the bill sometime in July.

One priority in the bill is to allow the fund to help address the $21 billion in maintenance backlogs in national parks, national forests, wildlife refuges and Bureau of Land Management facilities. Shenandoah National Park, alone, has $1.1 billion in needed maintenance.

The growing backlog of unmet maintenance has already closed trails, restrooms and campgrounds.

Through the decades, the LWCF has left a big footprint on states in the Chesapeake Bay drainage.

It has sent $101 million to launch or improve parks and trails in local communities and state and federal agencies in Pennsylvania, helping approximately 990 projects get off the ground. Virginia has been the recipient of $42 million over the years, funding 251 projects. In Maryland, $35 million was used on 157 projects. West Virginia received $27 million for 304 projects in 54 of its 55 counties. New York has been the largest beneficiary, receiving $239 million for 1,138 projects around the state.

The types of eligible projects are varied, including local and state parks, trails, land purchases, battlefields and historic sites, national wildlife refuges and forests, wilderness areas, campgrounds and community parks.

Nationwide, more than 44,000 state and local parks, urban wildlife refuges, trails and open spaces have been funded on the state, county and local levels. The LWCF has protected 2.6 million acres of forests across the nation through outright purchases or obtaining conservation easements.

Bill advocates say Americans flocking outdoors for relief during the coronavirus pandemic underscores the need to ensure the future of the LWCF. In recent years, a new initiative requires greater emphasis on funding for outdoors projects in underserved urban areas and in minority neighborhoods.

Other groups pushed for the Great American Outdoors Act on the grounds that LWCF is needed more than ever to fight climate change.

"This bill is a once-in-a lifetime opportunity to protect and restore America's precious natural heritage," said Jad Daley, president of the American Forests group.

"The past two months have spotlighted the crucial role public lands and outdoor recreation play in supporting the health of people, businesses and communities across the country," added Drew McConville, of The Wilderness Society.

In 2019, after a lengthy fight, Congress kept the LWCF from expiring and permanently reauthorized it. But, no action was taken to prevent the fund from being raided for other uses.

The Great American Outdoors Act has bipartisan support and the endorsement of more than 1,000 environmental, conservation, sportsmen, tourism and other groups.

Though support is broad, it is not unanimous. Some groups and legislators, especially in the West, oppose continuance of the fund because they think the federal government already controls too much land. ■

A family bicycles the Warwick-to-Ephrata Rail-Trail in Lancaster County, PA, to get a dose of the outdoors during the coronavirus. (Dave Harp)

Virus lockdown unleashes swarms of visitors at parks, trails

Land managers hope new visitors will develop respect, support for resources

By Ad Crable

Lynne Napoli of Boiling Springs, PA, lives near the Appalachian Trail, normally her refuge for quiet mental sustenance.

But, this spring, things changed. "It has been so packed I don't go," she explained. "When I do, it is trashed. Other sites have been ridiculously spray-painted. I'm glad people got out, especially children. Unfortunately, not many seemed to respect nature. This makes me so sad."

Parks, trails and natural areas in Chesapeake Bay states have been slammed this spring and early summer as the masses head outdoors seeking relief from coronavirus stay-at-home orders. The effects have been widespread and varied across Bay states. Hiking, hunting, boating, paddling and fishing have all been affected.

"It's been unprecedented in every sense of the word," said Jason Bulluck, director of Virginia's 64 natural area preserves, where the priority is to protect rare species and unique natural communities, rather than provide recreation. Three of the preserves had to be closed for overuse. Parking lot gates at others had to be manned seven days a week to control entry into the sensitive areas.

"It's like summer holiday weekends," said an exhausted Melissa Baker, Virginia state parks director, who had to lay off 70% of her staff at the peak of the pandemic because of loss of revenue from lodging at cabins and campgrounds.

The swarming has land managers sorting out blessings and curses and wondering how to handle what may be the new norm.

During the surge in attendance, natural resources have been damaged by illegal all-terrain vehicle use, trash dumping, littering, increased spray painting, unauthorized creation of new erosion-prone shortcut trails, blocked boat launches, vandalism, and trees cut and boulders thrown from landmarks. Park staff has also been taxed by frivolous rescue calls and worrisome behaviors such as camping and building campfires in illegal places, walking dogs off leashes and a lack of social distancing.

But untold numbers of people have discovered the physical and mental gifts the outdoors has to offer, and perhaps the ranks of those who will clamor for protecting nature has grown.

Maryland's 53 state parks had record attendance this spring, reports Maryland Department of Natural Resources spokesman Gregg Bortz.

May attendance, alone, was up by nearly 1 million people over the previous May, an increase of 56%. Parks, or parts of parks, were closed because of overcrowding 65 times through June 12. State parks with the most frequent closures include Patapsco Valley, North Point, Sandy Point, Calvert Cliffs, Greenbrier, Cunningham Falls and Assateague.

Maryland hunters took a record number of turkey gobblers this spring, at least partly attributable to hunters having more time to take to the woods.

Virginia state parks got such heavy use that maintenance projects were dropped and staff assigned to manage overflowing parking lots. Others worked to ensure proper social distancing and group size on trails.

Like other states, Virginia's parks and natural area preserves saw increases in environmental damage and problematic behavior.

"It's not just more people, it's different people that are not familiar with [the ethic of] 'leave no trace,'" Bulluck said.

Spring turkey hunters killed 20,525 gobblers, the second-highest total on record. The Department of Game and Inland Fisheries said increased hunters from stay-at-home restrictions played a role.

In Pennsylvania, fishing licenses were up 20% this spring. Required permits to launch kayaks, canoes and paddleboards at Pennsylvania Fish and Boat Commission ramps were up nearly 55%.

"Every day is like a weekend day now," said John Wengert of the Lebanon Valley Rail-Trail.

The rise in outdoor activity has not been entirely good for Pennsylvania's natural resources, either. Between March 1 through May 20, the Pennsylvania Game Commission issued 248 citations to people illegally driving all-terrain vehicles on state game lands, almost three times as many as the same period a year ago.

According to the Pennsylvania Environmental Council, use of 67 trails, parks and natural areas around the state spiked as much as 200% during March and April over the same period a year ago. And the Pennsylvania Parks & Forests Foundation said the average increase in state parks and state forests was up 29% in March, even without public programs, camping, open restrooms and volunteer activities.

Because of the coronavirus, the Game Commission did not monitor populations of peregrine falcons in the state this spring. All four rattlesnake roundups in Pennsylvania canceled their June events. Trout season had a surprise early opening to keep anglers from crowding each other. And bass fishing tournaments are being postponed.

For all of the strains and abuses on the environment during the pandemic, land managers in Bay states see a silver lining, hoping that the increased use of the outdoors will attract more volunteers, donors and advocates for nature. Studies have consistently shown that being outdoors improves mental, as well as physical, health.

"The good news is that I believe that it reconnected people to these areas and helped people stay safe, healthy and to de-stress," said Marci Mowery, president of the Pennsylvania Parks and Forests Foundation. "I also believe that for those reconnecting to the outdoors or new to the outdoors, that we will continue to see them visiting our parks and forests.

"We have had many visitors who have not been to parks before," reflected Virginia state parks' Baker. "I do think we're going to see a whole new group of people that realizes that these resources are their resources and as they learn about ways to care about the resource, my hope is that the constituency for what we provide and the people that we can reach grows from this." ■

Stormwater in the Susquehanna River surges through Conowingo Dam in September 2018. (Dave Harp)

Heavy rains clobbered water quality, but it wasn't a total washout

Nutrient, sediment reductions helped to lessen impact on Bay ecosytem

By Karl Blankenship

From Virginia to New York, residents of the Chesapeake Bay watershed were hit with a deluge of water in mid-July 2018. And it wasn't just another summer storm.

The rain kept coming, off and on, for months, stretching though much of spring 2019.

Rain — and the high river flows it creates — is typically bad news for the Bay, because it flushes water-fouling nutrients and sediment off the land and into the estuary.

In recent months, scientists have been getting a glimpse at the impact those persistent rains had on the Chesapeake.

The University of Maryland Center for Environmental Science released its annual Bay report card, rating its health at 44 on a 100-point scale for 2019. That's the lowest score since 2011, when Tropical Storm Lee and Hurricane Irene tore through the region, unleashing a flood of sediment and nutrient pollution.

Data from the report card and other analyses show that the Bay took a tremendous hit last year, with impacts rippling from its bottom to its surface. Oxygen-starved water suffocated some bottom dwellers, while murky conditions at the surface delivered some of the poorest water clarity in the last three decades.

Still, scientists say, had it not been for the billions of dollars spent to reduce nitrogen and phosphorus runoff — nutrients that trigger massive algae blooms in the Bay — conditions would have been much worse.

"As much as we've been hit with these environmental insults, we are maintaining some resilience in the Bay," said Bill Dennison, vice president for science application with UMCES.

But the high flows also show that the Bay remains vulnerable to the whims of nature — and those whims, including hotter temperatures and more runoff, are expected to become even more pronounced as the region's climate continues to change.

"Climate change is real, and it is now," Dennison said. "This isn't something that we can put off into the future. We are starting to see these effects."

Why river flows matter

Rainfall gradually makes its way into the more than 100,000 miles of streams that drain the Chesapeake's 64,000-square-mile watershed. Along the way, the water gathers nutrients, sediment and other pollution from fields, lawns and parking lots, and they, too, ultimately make their way into the Bay.

Typically, the more it rains, the greater the amount of nutrients and sediment carried into the Bay. When the nutrients reach Bay waters, they spur huge algae blooms. The sediment contributes to murky water conditions, and can smother bottom-dwelling organisms.

According to the U.S. Geological Survey, the 2018–2019 "water year" had the highest average river flows in 82 years of monitoring, averaging 131,000 cubic feet per second. (A water year starts in October, when river flows begin to pick up after dry summer months, and runs through September.) Put another way, that means about 974,000 gallons of fresh water surged into the Bay each second, 65% more than the long-term average.

USGS monitoring takes place where the Bay's nine largest rivers meet tidal waters. In most places, this is near where Interstate 95 crosses the rivers, along a geographic feature called the Fall Line.

Altogether, about 60 percent of the nutrients from the watershed flow past those monitoring stations before reaching the Bay — the rest flow directly into the Chesapeake or the tidal stretches of its rivers, where monitoring is difficult.

According to USGS preliminary estimates, that amounted to 332 million pounds of nitrogen and 22.7 million pounds of phosphorus during the last water year — the third highest load for nitrogen and sixth highest for phosphorus since nutrient monitoring began in 1985.

After adding in the remaining 40% that flows directly into the Bay or the tidal portion of its tributaries, the total amount of nutrients entering the Bay last year was significantly above the 217 million pound nitrogen goal and 14 million pound phosphorus goal set for the Bay watershed for a "normal" flow year in order to achieve healthy water quality conditions.

That illustrates that although the average nutrient trends have decreased over time, precipitation has a huge impact on nutrients, water quality and — importantly — the multitude of species that call the Bay home. That includes everything from striped bass and crabs to worms and underwater grasses.

"The living resources in the Bay do not experience [average conditions]," said Doug Moyer, a USGS hydrologist. "They experience the actual, what came in."

Suffocating the Bay

When nutrients spur the growth of more algae than can be consumed by oysters, fish and other Bay dwellers, the excess ultimately dies and sinks to the bottom. The decomposition process draws oxygen out of the water that aquatic species need to survive.

Warm temperatures further accelerate algae growth, contributing to an oxygen-starved "dead zone" in deep waters each summer, but the zone persists longer and covers a larger area in high flow years, when nutrients surge into the Bay.

High flows also set up a barrier, known as a pycnocline, between freshwater on the surface of the Bay and saltier water near the bottom. The pycnocline prevents water on the bottom from mixing with water on the surface, which typically has a greater amount of oxygen.

That makes the dead zone worse because oxygen used by decaying algae in deep areas is not easily replenished with oxygen from the surface.

Those dynamics were evident last year, according to Virginia Institute of Marine Science researchers, who use a computer model to estimate the extent of the dead zone. Areas of low oxygen, or hypoxic, water started to form earlier than normal last year, possibly fueled by nutrients left over from the previous fall, and extended well into October. The hypoxic area covered portions of the Bay for 136 days in 2019, just shy of the 143-day record. By the time it peaked at 13.1 cubic kilometers or about 17% of the Bay, most aquatic life couldn't survive there.

"Last year was kind of depressing, but it clearly would have been much worse without all those years of nutrient reductions," said Marjy Friedrichs, a VIMS scientist who was the co-developer of the hypoxia model.

Work by Luke Frankel, a graduate student working with Friedrichs, estimated that the amount of hypoxia would have been 30% greater had there been no nutrient reductions since 1985, when Bay cleanup efforts began.

But for many fish, the area off-limits was larger than just the dead zone. Scientists typically define hypoxic conditions as those with less than 2 milligrams of oxygen per liter of water, and many fish or shellfish need more than that. For example, blue crabs require 3 mg/l, and striped bass require 6 mg/l. Even when it's not lethal, suboptimal oxygen conditions can harm fish reproduction and make them more susceptible to disease.

Species that can move seek out areas with adequate oxygen, but some don't have that option. Last year was particularly brutal for clams, worms and other bottom-dwelling species that can't relocate. Many died.

Benthos, a catch-all term for bottom-dwelling organisms, are an important part of the Bay's food web, providing food for striped bass, blue crabs, spot, croaker and other species. Just 38% of the Bay met its restoration goal for healthy benthic habitats last year, down from 58% the previous year, and the lowest score on record, according to data from the scientific consulting firm Versar.

Robert Llanzo, a Versar scientist who compiles the benthic data, said it appeared the severe hypoxia, which extended unusually late into the summer, was most likely to blame for the decline. "When summer hypoxia is high, we typically see a higher level of benthic community degradation in the Bay," he said.

A heron perches on a rock in the Susquehanna River, away from the turbulent flow crashing through Conowingo Dam. (Dave Harp)

Grasses hard hit

High flows, and the poor water quality that results from them, are often bad news for underwater grasses as well.

Those underwater meadows, which are critical habitats for juvenile blue crabs, fish and other species, require sunlight to survive. But algae blooms and sediment-clouded water keep sunlight from reaching them.

That proved to be the case in 2019. The Bay lost a bit more than 33,000 acres of submerged aquatic vegetation, erasing nearly a third of the plants from the shallow waters around the Bay. That was the largest single-year loss since VIMS began aerial surveys of the beds in 1984.

The nearly 66,400 acres of Bay grasses mapped in 2019 represented just 35.9% of the Bay Program restoration goal of 185,000 acres.

Still, some scientists last year feared the losses could have been greater, possibly erasing half of the Chesapeake's grass beds.

Instead, many areas of the Bay escaped with little impact. A disproportionate amount of the loss took place around Tangier Sound and nearby areas, which have large beds of widgeon grass — a species notorious for rapid declines when conditions get bad.

But grasses in many low salinity areas of the Bay and its tidal tributaries expanded in 2019, and Susquehanna Flats — the largest grass bed in the Bay — held its own despite the continued heavy flows.

"It is easy to treat the Chesapeake Bay as this monolithic estuary, and it's not," said Christopher Patrick, assistant professor of biology at VIMS. "It's a very different system from place to place."

Overall, the 66,387 acres of grasses observed in the Bay last year is still greater than the low of 38,228 acres when the survey began.

"We've fallen to a level that is comparable to where we were at five years ago or so. So it is not like we've gone backward a huge amount," Patrick said. "We have wiped some recent gains off the map. That doesn't mean that they won't come back."

Of particular concern: Back-to-back warm summers in 2018 and 2019 appear to have taken a toll on eelgrass, the dominant grass species in high-salinity areas of the Bay. Eelgrass is sensitive to heat and is near the southern end of its range in the Chesapeake.

Grass coverage in high-salinity areas has been trending downward since the mid-1990s and is near its lowest level since the survey began. Scientists fear eelgrass may further decline as the Bay continues to warm, hampering efforts to reach restoration goals.

"Really, we are dealing with climate impacts at this point," said Brooke Landry, a biologist with the Maryland Department of Natural Resources.

Climate challenge looms

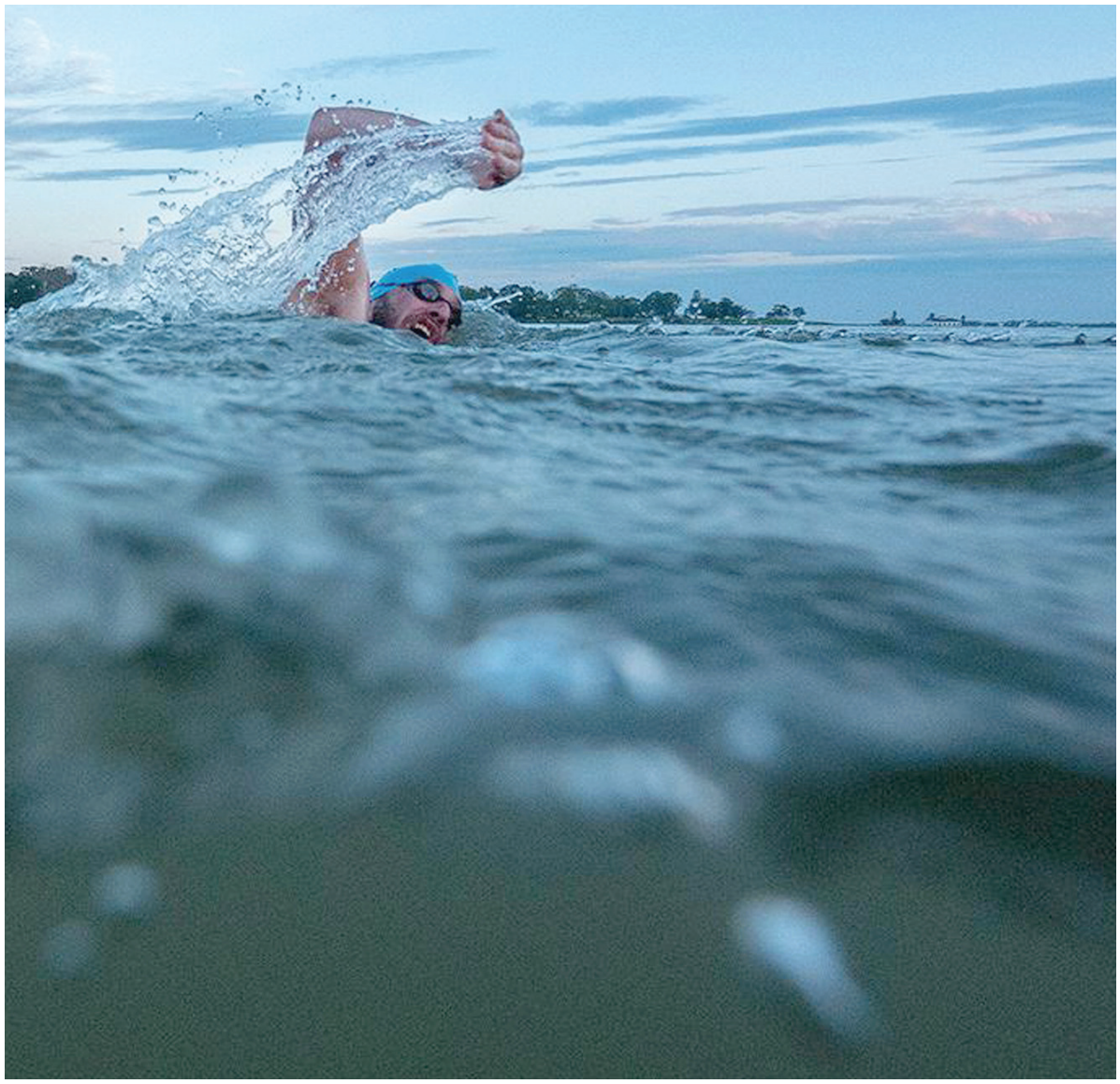
While it's difficult to say whether the rain experienced in 2018–19 was the direct result of climate change or natural weather variations, the region has been getting warmer and wetter.

"We were seeing some positive trends, we are reducing nutrient pollution," said Matt Strickler, Virginia Secretary of Natural Resources. "But the warmer temperatures and the wetter weather that are holding back progress are exactly what models have predicted that manmade climate change would bring to our region."

Water temperatures in the Bay have increased about 1.5 degrees since the early 1990s. Rainfall has increased in the watershed, on average, by about 10% over the last century. And an increasing proportion of the rain comes during severe storms. Climate scientists expect those trends to continue in coming decades.

Rain and warm temperatures seen the last two years, scientists say, illustrate how a changing climate may offset some of the cleanup efforts in years to come.

"You can reduce all the nutrients and sediment in the world, but if it just keeps raining, that rain is going to find stuff to wash into the rivers and into the Bay," Landry said. ■



Riverkeeper Matt Pluta swims in the Choptank River on Maryland's Eastern Shore. Water quality monitoring there helps warn swimmers when they are at risk from high bacteria levels. (Dave Harp)

Look before you leap

Water quality for recreation can vary from site to site, day to day

By Whitney Pipkin

When the mercury rises in midsummer, water quality in the Chesapeake Bay — as well as its streams and rivers — matters as much to people as it does to fish, crabs and oysters.

And this year, many people might be exploring watering holes across the region for the first time as the coronavirus limits access to swimming pools.

But government agencies and watershed groups are working to remind residents that swimming in a natural water body is not the same as diving into a chlorine-treated pool. In Northern Virginia, for example, Fairfax County authorities sent out an alert in late June retelling residents that swimming in the county's 1,600 miles of streams is still "highly discouraged."

"It is important to remember that swimming in streams and stormwater can be dangerous and hazardous to your health," the message stated. "These natural waters are continuously changing and can be susceptible to pollution that can cause health risks to people and their pets."

The risks vary widely between locations and even at the same location on different days, as pollution is driven by the types of potential contamination sources nearby, the amount of recent rainfall and even the amount of current in the water.

"Just because there's public access to a river doesn't necessarily mean it's a safe place to go swimming or wading," Upper Potomac Riverkeeper Brent Walls said.

A frequent concern is *enterococci* or *E.coli* bacteria, fecal organisms that indicate the presence of potentially harmful bacteria. These bacteria are present in higher numbers after a rainfall, which can flush animal waste and raw sewage into the water.

In sufficient numbers, these bacteria can cause gastrointestinal illnesses, skin and ear infections, and some conditions that can be life-threatening. They can enter the human body through the nose, ears or other openings as well as through small cuts.

Other naturally occurring toxins and bacteria, such as *Vibrio vulnificus*, also enter the body through cuts and openings. But their presence is not necessarily linked to rainfall and can be difficult to predict, though some are more likely to occur in the summer. The diseases they cause grab headlines when they lead to death or the loss of limb but are quite rare.

The number of people sickened by water contact in the Bay region is unclear because tracking at the state and county levels varies widely. State departments of health track the number of sicknesses from *Vibrio*, for example, and report them to the national Centers for Disease Control and Prevention. The latest numbers from Virginia indicate that about 40 people there contract the disease each year.

Virginia also has a harmful algal bloom hotline that the public can use to report symptoms after potential contact with a bloom, which can include rashes, an upset stomach, diarrhea and vomiting. Dogs can have symptoms from ingesting bloom-tainted waters, too, including staggering, drooling, difficulty breathing and seizures. The state can investigate whether a bloom is harmful and could close public swimming areas in response.

But often — because water quality is quite literally a moving target — it can be too difficult to determine what caused an illness and whether the contaminant is still lingering in the water in real time.

So far, researchers say there is very little risk of contracting COVID-19 through water contact. (See *Ready for a dip, but what's in the water?* June 2020).

Does your chosen spot for water play contain bacteria or pathogens that could make you sick? The answer depends on many factors. To find out, you may have to navigate a sporadic patchwork of testing and public reports.

"Even when water is tested, it can be difficult to answer the question, 'Is it safe to swim?' or 'Am I gonna get sick?'" said Gabrielle Parent-Doliner, director of swimmable water programs at Swim Drink Fish.

The Canadian nonprofit runs *Swim Guide*, a website and phone app that aggregates recreational water quality data for the public from 8,000 sites in nearly a dozen countries, including a growing number of locations in the Chesapeake Bay watershed.

But the testing reported through *Swim Guide* is not consistent across popular recreation areas or by the same entities in each state. A local government might test a bayside beach every week, while a popular watering hole in a rural area may not be tested at all.

Mixed messages

Chesapeake Bay advocates say they are often asked whether it's safe to get on or in the water. But distilling water conditions and the latest data — which are rarely available in real-time — to a simple yes or no answer isn't always easy.

Advocates also don't want to frighten the public away from the water, because people who recreate in streams, rivers and the Bay often become champions for water quality.

"It's a message we struggle with," said Choptank Riverkeeper Matt Pluta, echoing a sentiment shared by many of the region's waterkeepers.

People who recreate on open waters should pay attention to currents and weather conditions, as well as water quality problems that could impact human health. (Charles McMillan)

"We want to provide this information, but we don't want to scare people."

There are plenty of occasions when the waterways Pluta monitors on Maryland's Eastern Shore are swimmable. "But it's not all the time," he said, "and that's what we need to address."

In 2018, Pluta started organizing an annual swim across the Choptank River as a tribute to clean water, complete with water-quality monitoring to ensure safety. But — between high bacteria levels one year and a coronavirus-related closure this year — the swim has only taken place one of the past three years. In 2018, a record-breaking rain the week before the late-May event washed farm fertilizer and other pollutants off the surrounding landscape and into the river, rendering it unsafe for a swim.

Expecting climate change to contribute to heavier rainfalls in coming years, Pluta said he'd consider it a win if the event actually takes place every other year.

"A good sign was that people were reaching out to me the week leading up asking if it was safe enough for them to swim. They were making that connection that lots of rain meant polluted water," Pluta said.

Now that people are taking weekly swims in the river with a monitoring program in place, he said, "People are constantly asking me, 'How much rain did we get last night? Is it safe to swim?'"

Not everyone makes that correlation, though. Pluta is dismayed when he sees families splashing at the water's edge after a recent rain. And he still hears from locals who think the water might be cleaner right after heavy rain, mistakenly assuming that pollutants or bacteria would be diluted with relatively clean precipitation.

In Virginia, the Department of Health monitors water quality at 46 coastal beaches in the state, but most of the inland monitoring is done by riverkeepers or other groups, if at all. Still, Margaret Smigo, the department's waterborne hazards program coordinator, is frequently asked whether local waters are safe for recreation. She often answers that question with one of her own: "Safe for whom?"

"There are people who have compromised [immune systems], so any natural water body might not be safe for them," she said.

Signage at many water access areas warns the public to stay out of the water 48–72 hours after rainfall.

Public health and water quality experts say there are good reasons for this. For one, bacteria levels typically remain high for about that long after rain has carried pollutants into the water.

Another reason is, in areas where bacterial testing takes place, it can take about 48–72 hours to culture the bacteria in a lab and provide needed warnings to would-be swimmers. In the future, those tests could inch closer to real-time, but for now, many tests can only reveal weekly, biweekly or historical conditions.

If it rains between the time a test was taken and a sunny weekend, most groups now add additional warnings that the water quality has likely worsened since their last sampling.

Urban waters in flux

For several older cities in the Chesapeake Bay watershed, the advice to stay out of the water after it rains is more strongly worded. That's because, in addition to other water quality problems, places like the District of Columbia, Baltimore, Alexandria, Richmond and Harrisburg still have raw sewage overflowing or leaking into local waters during heavy rain. (See *Costs clog efforts to prevent sewage overflows*, p. 24.)

Most of the larger cities that have sewage overflow problems have begun the costly process of correcting them. Local governments and riverkeepers tend to base their goals for when a river will be swimmable on the timeline for those improvements.

In the Anacostia and Potomac rivers around the District, work is under way to make the waterways swimmable by 2025, but pollution is still a challenge. A decades-old ban on swimming remains, even as local water testing shows that the rivers would be clean enough for a swim on some days.

"People are hearing stuff on public radio and thinking about swimming in the Potomac after all these years of people saying, 'OMG, I'm not getting in that water,'" Potomac Riverkeeper Dean Naujoks said.

Naujoks said he still wants the public to maintain a level of concern about water contact. Several portions of the river his group monitors were swimmable for most of the summer in 2019, but that was not the case during a rainy 2018.

Not all urban waters have good news to report, though. And the look of the water won't tell the full story.

Olivia Anderson, project coordinator for Anacostia Riverkeeper, said their team has seen more kids and families splashing around in the District's sprawling Rock Creek Park this summer. While the District is working to fix leaky sewage pipes that run near or under the creek and its tributaries, the leaks still regularly occur, resulting in high bacteria levels that could make people sick.

"They have this lovely water that people walk by, and some people don't know that Rock Creek frequently tracks the highest with a lot of bacteria," Anderson said.

"When we give boat tours, I expressly tell people, 'Do not let your kids go swimming in Rock Creek Park,'" said Robbie O'Donnell, the watershed program manager for Anacostia Riverkeeper. "That area where we monitor at Melvin Hazen Run — it looks like a pristine creek and it's one of the dirtiest water bodies we monitor."

Anacostia Riverkeeper Trey Sherard said those portions of Rock Creek are the only

See **WATER SAFETY**, *page 16*

A bilingual sign in Anne Arundel County, MD, warns the public against swimming in Spa Creek for at least 48 hours after rainfall. (Dave Harp)

A group enjoys snorkeling on the South Fork of Shenandoah River during the 2018 RiverPalooza, hosted by the Potomac Riverkeeper Network. The Friends of the Shenandoah River conducts water quality monitoring for bacteria. (Potomac Riverkeeper Network)

WATER SAFETY *from page 15*

waters in eight years of river-keeping that have ever made him sick. Sherard said he had eaten lunch a couple hours after fetching a stray whiffle ball out of the water near Pierce Mill Dam; his hands weren't even wet anymore.

"I was miserable for 24 hours," he said of the gastrointestinal symptoms he connected to the water contact that day. "It's the sickest I've ever been, stomachwise."

The Anacostia Riverkeeper group is in its third year of consistently monitoring water quality at several sites in Rock Creek and the Anacostia, in part to track progress toward safe swimming. The results are posted to *Swim Guide*, where the District pages remind readers that it is still illegal to swim in those waters, though many people come in contact with the water through wading or other activities. This year, the monitoring is being expanded to several Maryland tributaries to the Anacostia as well.

Anderson said it's difficult for river advocates to keep people engaged with their local waterways but also warn them about risks from water contact.

"There's a fine line of sharing the good news that's happening but also cautioning people to restrain themselves," she said. "We do want to share that the river is making strides, but we're not there yet."

Baltimore Harbor Keeper Alice Volpitta juggles a similar message. Every year, she said, someone jumps in the Baltimore Harbor for a swim despite its reputation for pollution. Advocates for local water quality had been working toward a 2020 goal for making Baltimore's waters swimmable, but sewage still routinely leaks into local waters.

"One day [bacteria levels] can be well below the [safety] threshold, and the next day it's 20 times the threshold," Volpitta said. "With our leaky infrastructure, you can't predict which day will be safe. We need to focus on fixing the problem before we get ahead of ourselves about what's to come."

Rural waters still at risk

Figuring out whether a waterway is safe for swimming, wading or paddling can be even harder in rural areas where there is little to no monitoring and a perception that less populated areas are more likely to be clean.

And suburban swimmers accustomed to bayside beaches — which are more likely to be monitored for bacteria by state or county officials — might be surprised to find that a popular rural watering hole near a state park often doesn't get the same level of oversight. Shenandoah Riverkeeper Mark Frondorf said the correlation between recent rain and unsafe water quality still holds true in areas where fertilizer, animal waste or leaky septic systems could be contributing bacteria to the water.

"If the water looks chocolate and muddy, chances are there will be other pollutants in there," Frondorf said. "I encourage people to trust their spidey senses. If it looks bad, don't go in it."

That's an oversimplification, he admits, but it's not a bad place to start. People who plan to go tubing on the Shenandoah or the South Branch of the Potomac might want to postpone the trip for a few days if heavy rain occurs along the float route or in upstream areas.

The Friends of the Shenandoah River conducts water quality monitoring for bacteria. Though the testing isn't frequent enough to be a deciding factor on a given day, the historical results posted to *Swim Guide* provide a sense of how often an area is safe for water contact.

Upper Potomac Riverkeeper Brent Walls suggests avoiding water contact near cow pastures, especially in slow-flowing areas. And if the water is green, scummy or smelly from algae, steer clear. While not all algal blooms are harmful, blue-green algae and red tides are among those that can make humans sick.

Walls is extra cautious about where children jump in, because they are more likely to ingest water while splashing around.

Some of the easiest places to access the water — such as boat ramps where fuel, trash and stagnant water are also present — could be the worst places to go for a swim, he said.

Ted Evgeniadis, the Lower Susquehanna Riverkeeper in Pennsylvania, wades in the river wearing a pair of shorts all summer fly fishing for smallmouth bass. But after a good rain, you will find him at home, or at least wearing chest waders.

He's not willing to take a chance that bacteria from sewage overflows, fertilizer runoff from farm fields, or even oils and fluids from roads, will get in a cut and make him sick.

Pennsylvania's streams and rivers are tested periodically to see if they are safe for recreation. But not day to day, or even week to week.

Evgeniadis recommends checking the state's designation of a stream. Is it a coldwater or warmwater fishery? Coldwater streams tend to have higher water quality. If the water supports aquatic life, is rated exceptional value or high quality, the need for caution is low. Most streams in Pennsylvania and their categories may be found on an interactive online map maintained by the state Department of Environmental Protection. To find it, search for the latest Pennsylvania Integrated Water Quality Report in your browser.

Seek info, take precautions

There are several sources to check for information about water quality. A good place to start is the *Swim Guide* app and website, which a growing number of groups use to share monitoring data about beaches and swimming holes.

You can also search the web for the name of state-run beaches combined with the phrase "water quality." It will likely lead you to a website where recent monitoring results are posted, often by the state or local health department.

Also, try to find out if a nonprofit group exists for the stream or river you want to visit. They may monitor water quality and offer data to help you decide when and where to take a dip.

Kellogg Schwab, a professor of water and public health at the John Hopkins University and director of the university's Water Institute, said people assessing their level of risk before entering a natural water body should start by talking to their physician. If they're healthy, there are still other precautions that can help them recreate safely.

Chief among them, Schwab said, is avoiding the water after rain, but he also recommends keeping your head above the water when possible and having children wear ear and nose plugs. And water shoes are a good idea for all. Yes, he said, recreating in natural waters comes with some risks, but — as someone who studies food– and waterborne diseases — so do a lot of other daily activities.

"When it rains, you need to wait and let that clear out," he said. "But the Bay is a wonderful ecosystem that recharges itself and purges. The more we protect our small streams, the better it will be." ■

Water contact safety tips offered by the Department of Health in Anne Arundel County, MD, include:

- Cover cuts, scrapes, sores and wounds with waterproof bandages.
- Wear heavy cotton or leather gloves when handling crab pots or cleaning and processing fish.
- Wear water shoes to avoid cuts and scrapes.
- If you get a cut or scrape while in the water, clean it immediately with soap and clean water. If soap is unavailable, clean the wound with hand sanitizer and wash as soon as possible.
- Always wash off after recreating in natural waters.
- Avoid swallowing recreational water.

If you do get sick after recreating on natural waters, seek medical attention as soon as possible and tell your doctor about recent water exposure.

Large-lot housing popping up like weeds in PA farmland

New subdivisions start domino effect that leads to continuing loss of farms

By Ad Crable

When the American Farmland Trust recently assessed threats to farmland in Pennsylvania, it was surprised to find that urban sprawl and anemic profit margins for milk and crops didn't top the list.

The biggest problem? The growth of large-lot subdivisions leapfrogging urban areas and popping up in farm country.

In its nationwide study, *Farms Under Threat: The State of the States*, the trust found that Pennsylvania ranked eighth in the nation for the rate of conversion from ag land to low-density housing. In fact, 70% of the 347,000 acres of farmland lost in the state between 2001 and 2016 was because of such pop-up neighborhoods.

Fragmenting of the agrarian landscape and the disruption of ag economies often leads to a slow but inexorable domino effect. While being amidst new neighborhoods may benefit some farmers in the near term with direct-market sales, it's more likely that over time the critical mass needed for a viable farm community is lost.

Farmers have trouble moving equipment between their fields, and new residents complain about odors. Grain and equipment retailers that farmers depend on move out and land prices go up, making it harder for farmers to buy property.

Low-density residential development is 23 times more likely to make surrounding ag land urbanized than other agricultural land, according to the report, which the trust bills as "the most comprehensive assessment ever undertaken of U.S. agricultural land use."

"While urban sprawl is still a threat to farmland, low-density residential land use is as much of a threat to farmland as urbanization," said Jamie Mierau, American Farmland Trust's mid-Atlantic regional director. "Unlike urban highly developed development, conversion to low-density residential is not closely tied to population growth."

Such housing developments often fragment working landscapes into residential farmettes, she said.

The findings back up the urgent warnings sounded recently by the head planner in Lancaster County, the state's most intensively farmed county.

"When we saw the report, it just confirmed what we've been saying. It was like, wow, now they're talking about it on the national level, too," said Scott Standish, executive director of the county's Planning Commission. "Our concern is that all these other uses fragment opportunities to have these large blocks of farmland. It changes the quality of life, creates traffic issues and has a cultural impact."

The trend exasperates Standish, whose agency has been pleading for the county's many municipalities to set urban growth boundaries and stick to them. But not all have. For example, about 17,000 acres are now zoned for large-lot suburban development outside of the urban growth areas set by local officials. Yet only about 8,400 acres are needed to accommodate the county's projected population growth through 2040.

Moreover, calls for denser development to save land from being gobbled up are lagging.

"We have too much large-lot residential development within our rural areas," agreed Jeff Swinehart of Lancaster Farmland Trust, a private nonprofit group that buys conservation easements, mainly from Plain Sect farmers. "You have some fairly extreme variations within communities and [officials'] philosophies on how they manage the land within their communities."

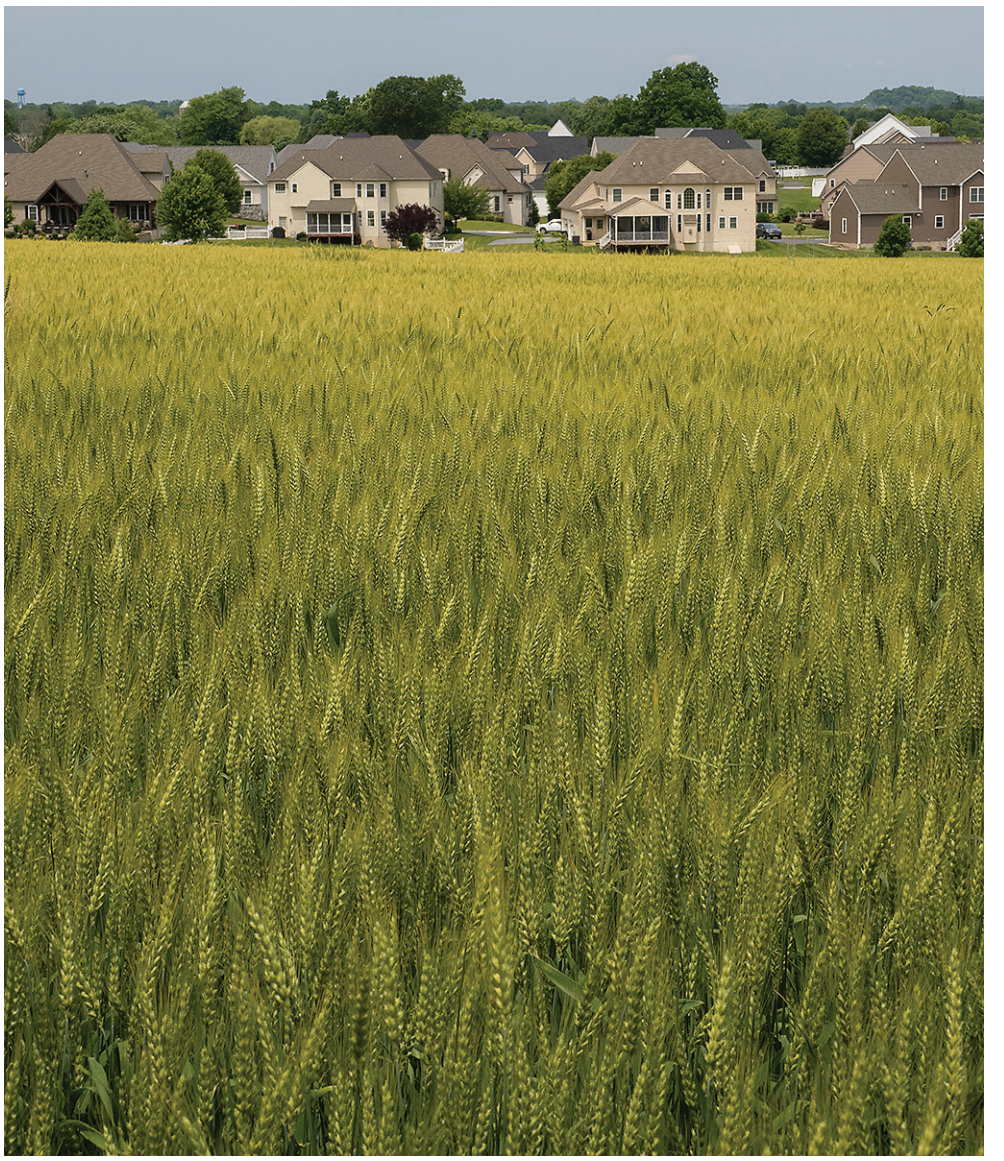
The Pennsylvania Farm Bureau shares that concern. "We agree that residential development growth is an increasing challenge for Pennsylvania agriculture as it puts additional pressure on the availability of farmland," said Liam Migdail, communications director with the Farm Bureau.

Both Migdail and Swinehart think one solution is to expand farm preservation efforts, not just by the well-established state program and groups such as Lancaster Farmland Trust, but at the local level.

The future of farmland is at a critical point, Swinehart said, because many older farm owners will be dying or retiring in the next 15–20 years and, unlike in the past, there are fewer family members willing to continue farming.

"It's really going to be imperative for local communities to make the decision that protecting their farms is important to them for quality of life," Swinehart said.

Current or aspiring new farmers don't know about farm sales or can't afford to buy them because development has made the land more valuable. "Access to land remains one of the greatest challenges we hear about from beginning farmers," Migdail noted.



A housing development sprouts amid farmland in Manheim Township in Lancaster County, PA, the state's most heavily farmed county. A new report says large-lot homes built in otherwise solid farming areas are the state's top threat to agriculture. (Dave Harp)

Last year, the Pennsylvania Farm Bureau succeeded in getting the state legislature to create a Pennsylvania Beginning Farmer Tax Credit program which gives farmers a tax break if they sell or lease land to new farmers. And the Pennsylvania Farm Bill was changed to waive realty transfer taxes for preserved farmland sold to beginning farmers.

Outward sprawl from urban areas also remains a pressing threat to Pennsylvania's farmland. Hotspots for development were Philadelphia, Harrisburg and Pittsburgh.

Still, the trust's report ranked Pennsylvania as the fourth-best state in efforts to protect farmland. It was ranked fourth for land protection, fourth for purchase of ag conservation easements, 10th for land use planning, fifth for property tax relief, sixth for creating ag districts and 12th for farmland leasing programs.

Pennsylvania leads the nation in the number of farms and acres permanently protected. Since 1988, state and county conservation easement programs have protected 5,675 farms. Its comprehensive planning policies, a preferential tax program known as "Clean and Green," recognized agricultural security areas and state leasing programs all ranked among the highest efforts in a scorecard that the trust prepared for all states.

"Pennsylvania is well-recognized across the country for its leadership in agricultural land protection," Mierau said. "Innovative, coordinated and well-balanced against the threat. But unfortunately, development pressure continues unabated." ■

Gunpowder Riverkeeper Theaux Le Gardeur collects a water sample from the river. He has notified the U.S. Environmental Protection Agency that he may sue over what he considers an inadequate Maryland strategy for addressing PCB contamination in locally caught fish. (Dave Harp)

PCB cleanup makes uneven progress

DC prepares to tackle hotspots, but in Gunpowder River little is to be done

By Timothy B. Wheeler

It's been a slog, but efforts are making headway to rid the Anacostia River of long-banned toxic chemicals that make it unsafe to eat many locally caught fish.

After years of sampling and studies, District of Columbia officials have proposed tackling 11 hot spots of contamination in the lower Anacostia, which flows through DC before joining the Potomac River. The sediments in those places are laden with PCBs, or polychlorinated biphenyls, a pernicious family of synthetic chemicals still making their way into fish more than four decades after being outlawed because of their risks to human health and wildlife.

"We are making real progress," Tommy Wells, director of the district's Department of Energy and the Environment, said at a cleanup planning meeting in June. The department's "early action" plan, unveiled late last year, calls for a combination of dredging, capping and treatment of the PCB-tainted sediments. The projected $30 million cost is nevertheless only a down payment on dealing with the full mixture of toxic wastes, pesticides and other harmful substances fouling the river.

But officials hope that by addressing these hot spots, they can at least reduce the health risks from eating locally caught fish. After reviewing hundreds of comments on the plan, they intend to announce Sept. 30 how they'll proceed.

"I have to temper my desire to have it all done yesterday," said Jim Foster, president and CEO of the Anacostia Watershed Society. "But it seems as if we are finally on a trajectory to get it done."

Elsewhere, there's far less getting done about the PCB contamination that's widespread throughout the Chesapeake Bay and its tributaries. In the Gunpowder and Bird rivers north of Baltimore, Maryland regulators have concluded there's little they can do to reduce the PCBs that are responsible for fish consumption advisories there on channel catfish, carp, and white and yellow perch, among other species.

Anglers hoping to eat uncontaminated catch from those two linked rivers may have to wait for PCB levels to decline on their own, state officials said. But it could be a long wait for the persistent chemicals to break down naturally or become buried under cleaner sediment. In the Gunpowder, that could take 49 years, officials project; in the Bird, 93 years.

Theaux Le Gardeur, the Gunpowder Riverkeeper, finds that intolerable. "In many cases, that's three generations of Marylanders subject to fish consumption advisories due to PCBs," he said.

Earlier this year, Le Gardeur notified the U.S. Environmental Protection Agency that he intended to sue it for approving what he contends is an inadequate study by the Maryland Department of the Environment of what can be done about PCBs contaminating the rivers. He argues that state officials didn't sample enough and overlooked potential local sources of the chemicals that, if dealt with, could deliver results sooner.

Still a widespread problem

The Anacostia and pair of Baltimore County rivers illustrate the challenges Bay watershed communities face in dealing with problems posed by PCBs and other toxic contaminants.

While Bay watershed states, localities and federal agencies have focused on reducing water pollution from nutrients and sediment, they've done much less to deal with PCBs, mercury, pesticides, pharmaceuticals and toxic metals in sediment, water and fish.

According to the state-federal Chesapeake Bay Program, 82% of the Bay and tidal waters of its tributaries are considered either fully or partially impaired by toxic contaminants.

In 2014, all six watershed states, the district and the EPA pledged to make the Bay and its rivers "free of effects of toxic contaminants on living resources and human health." They agreed specifically to go after PCBs.

Once widely used as coolants or insulators in electrical equipment and other products, PCBs were banned by the EPA in 1979 amid research linking exposure to cancer and other health effects.

PCB concentrations in water and sediment have declined in many places since then. But PCBs bioaccumulate, meaning that seemingly miniscule doses build up in the fatty tissue of fish when they ingest the chemicals. The contamination is passed up the food chain as predators, including humans, consume tainted fish.

PCBs are the basis for many of the fish consumption advisories in effect throughout the Bay and its tributaries. Anglers are urged to limit or even avoid eating many locally caught fish including, in some places, the highly prized striped bass.

Over the last two decades, the EPA and Bay watershed jurisdictions have developed

pollution-reduction strategies, known as "total maximum daily loads," for eliminating PCB contamination in dozens of tidal waterways, mostly in Maryland.

The District worked with Maryland, Virginia and the EPA to develop a PCB-reduction strategy for its stretch of the Anacostia and Potomac in 2007. The plan unveiled by the district last December came after years of studies.

District officials say the measures they're considering for dealing with hot spots in the lower Anacostia should reduce health risks from eating fish caught there by 90%. Some dredging is proposed, but in other areas the district is weighing sequestering contaminated silt under a layer of clean sediment or treating it on the river bottom.

Upal Ghosh and Kevin Sowers, a pair of researchers at the University of Maryland Baltimore County, have shown that depositing activated carbon pellets on contaminated sediment can "lock up" the PCBs and dramatically reduce what's getting into the water. Coating the pellets with certain bacteria can even speed up the normally slow breakdown of the chemicals "from decades to months," according to Sowers.

Fresh sources of PCBs

But cleaning up legacy contamination in sediment won't be enough as long as more PCBs are getting into the river, as studies have shown, Ghosh said.

A 2019 report by the U.S. Geological Survey concluded that lower Beaverdam Creek is the dominant source of fresh PCBs to the lower Anacostia. A study that Ghosh and other researchers presented to the district earlier this year found dissolved PCB levels in the creek to be "screaming high," as he put it — up to 20 times the levels measured in the river.

In March, Maryland regulators reported finding elevated PCBs in both sediment and water in two stretches of the creek in Prince George's County. One is by the Landover Metro Station, they said, and the other is near the creek's confluence with the Anacostia. That stretch flows through a metal recycling facility owned by Joseph Smith & Sons. The MDE said PCB levels in creek sediment "spike rapidly" at this location, "indicating that there may be legacy contamination" on land there.

State inspectors last year also sampled a retention pond at the 16-acre scrapyard and found PCBs in the water, according to information supplied by the MDE.

Dale Mullen, a lawyer representing the company, said it is voluntarily cooperating with the state and has taken steps to address the situation, including building a new concrete wall to prevent runoff or seepage to the creek and installing a new stormwater treatment system capable of removing PCBs and other contaminants. All stormwater outfalls from the site have been closed for now.

"Small fish tell a big story," said Fred Pinkney. The U.S. Fish & Wildlife Service biologist spent two years collecting mummichogs and other minnow-like fish (shown here) from the Anacostia River. Because they don't move around much, analysis of PCBs in their bodies can help guide efforts to clean up hot spots in the river's sediment and reveal locations of fresh contamination. (Dave Harp)

The next steps in the investigation, MDE officials said, include checking storm drains for PCB-tainted sediment that may be flushed out when it rains as well as other possible sources of runoff and seepage from tainted soil.

Elsewhere, there's not been as much activity. Maryland has produced PCB-reduction strategies for 31 of its rivers. But nearly half of those, including the one for the Gunpowder and Bird rivers, don't identify any sources of contamination to be remediated.

State officials say that's because water sampling and computer modeling indicates the vast majority of PCBs in those rivers come from other waterbodies, particularly the Susquehanna River. PCBs from there are flowing into the Bay, they say, where currents and tides carry them into the tributaries.

"To see meaningful progress, you would need to change what's flowing in from the Chesapeake," said Lee Currey, director of MDE's water and science administration. The agency is working on a strategy for reducing PCBs in the lower Susquehanna, including in the sediments built up behind the Conowingo Dam.

Problems on the Gunpowder

But Le Gardeur, the Gunpowder Riverkeeper, contends that the state's PCB reduction strategy for the Gunpowder and Bird rivers doesn't address the major source: chemicals already in the sediments, which can get back into the water to be ingested by fish.

Le Gardeur argues that the state also overlooked potential local sources of PCBs, such as Aberdeen Proving Ground, where the Army tests munitions and at one time tested chemical warfare agents. The entire base is a federal Superfund site undergoing multiple cleanups as a legacy of past releases and the burial of hazardous and explosive materials.

In developing its strategy, the MDE said a review of its records didn't find any legacy PCB contamination in the areas of the proving ground that drain into the Gunpowder.

But a 2016 consultant's report measured high levels of PCBs, along with other contaminants, in upper Canal Creek, which drains into the Gunpowder from the proving ground's Edgewood area. The Army is studying the feasibility of options for remediating the PCBs in Canal Creek, according to Bethani Crouch, a base spokesperson.

MDE spokesman Jay Apperson acknowledged the PCB contamination in Canal Creek and said it "will be considered" in any future revision to the rivers' cleanup strategy.

Le Gardeur questioned why the MDE didn't consider dredging or treating contaminated sediments in the rivers, as was done in waters just south of the Gunpowder. From 2016 through 2018, Lockheed Martin Corp., which for decades has produced aircraft and aviation electronics on Middle River, removed PCB-laden sediment from two of its tributaries, Darkhead Cove and Cowpen Creek. The company also treated an undredged portion of the bottom with activated carbon to keep the chemicals there from getting back into the water.

The MDE has said it generally doesn't favor dredging because it could stir up contaminated sediments and harm aquatic life. In Middle River, Currey said the agency approved dredging and treatment of the bottom because it was a relatively small area with documented high levels of the chemicals.

Brady Locher, deputy director of Baltimore County's Department of Environmental Protection and Sustainability, said the county "has worked diligently" to address PCB contamination, which impairs Back River and Baltimore Harbor in addition to the Gunpowder and Bird.

The county partnered with state regulators and the UMBC researchers to assess PCB levels in fish tissue, aquatic insects, sediment and water in Back River. County officials are now looking to contract with an external laboratory capable of analyzing contaminant concentrations.

"Because PCB remediation is so expensive, it is crucial that we base our actions on reliable and comprehensive monitoring results," Locher said.

The county is preparing to dredge more than 50 acres of the Bird River — but to improve boater access, not remove PCBs. The MDE is reviewing the county's plan. Apperson said a study of dredging in Baltimore Harbor, where contamination is worse, indicated only "limited impact" on fish tissue levels.

Meanwhile, the county should soon have more resources for combating PCBs. Officials expect to get more than $7.5 million from a federal class-action lawsuit against Monsanto Corp., which at one time made PCBs. The company agreed to pay a total of $550 million to settle water contamination claims by nearly 2,000 towns, cities, counties and port districts.

Le Gardeur has yet to decide whether to go ahead with a lawsuit, but said he had little choice given the lack of action proposed. Similar lawsuits alleging inadequate cleanup plans have on occasion led to revisions that strengthened them.

A spokesman for EPA's mid-Atlantic regional office said the agency can't comment on Le Gardeur's threatened suit.

The tidal Gunpowder and Bird are used by boaters and swimmers, the riverkeeper noted. They're also popular for fishing and crabbing. Bill Temmink, a local angler, said he doesn't eat what he catches in the Gunpowder, but he knows of "a bunch of people who are out here three and four times a week and keep the fish."

Of the projected date when the MDE said the river's fish should be free of PCB contamination, Temmink said, "50 years is a long time." ■

Chesapeake Bay restoration scrutinized for lack of diversity

State, federal leaders may endorse new initiative in August

By Jeremy Cox

Virginia Gov. Ralph Northam has made environmental justice a cornerstone of his administration. He revived his predecessor's Council on Environmental Justice in January 2019 and signed a bill last March establishing it as a permanent body of the executive branch.

But under Northam's watch, state regulators approved a permit for a pair of powerful energy companies to build an air-polluting compressor station in a community founded by people freed from slavery. A federal appeals court overturned the permit in January, citing the state's failure to adhere to its own law, which requires officials to weigh whether a project disproportionately impacts minority communities.

For activists on the front lines of environmental justice, the episode is symptomatic of the racism embedded within the historically white-dominated environmental movement. The dissonance within the Northam administration showed that well-meaning words often don't lead to action, critics say.

"It feels like it's a lot of hot air," said Mary Finley-Brook, a professor of geography and environment at the University of Richmond who was a member of an earlier version of the governor-appointed council.

Across the Chesapeake Bay watershed — and environmentalism writ large — the nationwide protests sparked by a white police officer's killing of a George Floyd, a Black man, in Minneapolis have increased scrutiny of the color problem plaguing the green movement.

Photo: Reggie Parrish of the U.S. Environmental Protection Agency speaks during a meeting of the Chesapeake Bay Program Diversity Workgroup in 2016. (Will Parson/Chesapeake Bay Program)

Meanwhile, the COVID-19 pandemic has disproportionately sickened Black and Hispanic populations, adding fuel to the drive for change, activists say.

Mainstream environmental groups historically have been dominated by white people who, often in the pursuit of so-called "universal" objectives such as saving bald eagles and ending acid rain, largely ignored issues important to people of color. Bereft of widescale advocacy and often battling racist land use practices that put them at a disadvantage, minority communities repeatedly lost battles against new landfills, industrial plants and other polluters.

In the days after Floyd's death, many Chesapeake area groups dispatched press releases or posted social media messages declaring solidarity with the Black Lives Matter movement — more than 40, according to one count. Many vowed to launch or redouble efforts to right past wrongs, such as increasing the diversity among their boards and employees.

The multi-state and federal partnership leading the cleanup of America's largest estuary was already undergoing its own racial reckoning. The Chesapeake Bay Program hired Virginia-based Skeo Solutions to study the regional partnership and develop a "diversity, equity, inclusion and justice" strategy in 2018. The 61-page draft report was published in April.

Program officials are drafting a two-page statement that the Chesapeake Executive Council may sign in August to reaffirm their commitment to diversity, equity, inclusion and justice in all areas of the Chesapeake Bay Program. The council includes the governors of the watershed's six states; the mayor of the District of Columbia; the administrator of the U.S. Environmental Protection Agency; and the Chesapeake Bay Commission, a body of state legislators from across the region.

"Jurisdictions are rallying behind this very timely and important statement to take action," said Ben Grumbles, head of the Maryland Department of the Environment and chair of the Bay Program's Principals' Staff Committee.

The statement won't carry the weight of a law or regulation. It's voluntary and, according to the proposed language, "subject to the availability of appropriated funds." But Grumbles said it will represent a "very strong and clear commitment with numbers and guideposts and milestones."

The initiative is drawing mixed reviews from Black environmentalists. It is badly needed, they say, and long overdue. They're also skeptical as to whether the states and agencies back up their words with thoughtful, sustainable actions.

For the Bay Program and other predominately white environmental organizations in the watershed, "it's all about building a relationship authentically," said Mariah Davis, policy and campaigns managers for the Choose Clean Water Coalition. She also heads its equity workgroup. "The trust has to be there."

"All these organizations are signing these [diversity] commitments. The governors are going to sign this [Bay Program] commitment," said Chanté Coleman, vice president of equity and justice with the National Wildlife Federation. "We need to see action. It has to be more than just virtue-signaling."

A history of exclusion

People of color have led and participated in environmental battles for decades, said Whitney Tome, executive director of Green 2.0, which pushes for diversity in green groups. But from John Muir to Al Gore, the conventional narrative about environmentalism has largely been framed around white action.

"They were led by middle– to upper-class whites who had the money and time to get involved in the regulatory system," Tome said. But "the environmental justice movement and people of color were looking to protect places near their homes because they were often harmed by environmental degradation and pollution. Where was the landfill placed? These were often placed near where people of color lived."

Calls for environmental justice first rang out in the 1960s and '70s, seeking equitable treatment and meaningful participation for all people in

Patuxent Riverkeeper Fred Tutman attends a rally in Annapolis, in 2010. (Matt Rath/Chesapeake Bay Program)

the creation and enforcement of environmental policies.

Fred Tutman, a longtime Maryland environmental activist who is Black, said that for people of color, environmental and social issues often overlap. An all-too-common example: neighborhoods with high cancer rates because of toxic contamination. But predominately white environmental groups rebuff his pleas to intervene because, they say, doing so would go beyond their mission statement.

"They're one-note organizations," said Tutman, the Patuxent Riverkeeper and currently the nation's only Black riverkeeper. "My sense is they don't do much in the Black communities unless there's a grant in it for them."

Missing diversity

The Chesapeake Bay watershed's environmental workforce historically has been composed of mostly of white people.

The watershed drains a 64,000-square-mile swath of land stretching from Cooperstown, NY, to Virginia Beach, VA. People of color represent 35% of the region. But they accounted for just 14% of the people who work for or with the Bay Program during the first programwide demographic survey in 2016. Among the program's leaders, people of color were more scarce — just 9%.

By 2019, those percentages had risen only about 1% apiece. Skeo's report recommends increasing diversity to 25% for all staff and to 15% among leadership. About half of the 750 people associated with the Bay Program responded to the surveys; the questionnaires didn't go out to the full workforce of the environmental agencies in each of the participating states.

Similar trends permeate the nonprofit sector. A 2019 survey of staff representing more than 100 environmental groups in the Bay watershed found that less than 20% of respondents believed their boards and senior managers reflected the region's diversity. Only about a quarter thought their organization had proper diversity training.

Lack of diversity is a problem for environmental organizations across the country, big and small. A 2014 study prepared on behalf of Green 2.0 found that 16% of environmental group boards and staff were minorities. Only 12% were in leadership positions.

The Annapolis-based Chesapeake Bay Foundation is the largest group advocating to clean up the Bay. But its president, William C. Baker, acknowledges that the organization remains underrepresentative of the population it serves. People of color make up just less than 10% of its staff, he said.

"It's a failure of our organizations to be deliberate" about whom to hire and promote, Baker said. The group now steers recruiters toward historically Black colleges and universities, he added. The foundation has made strides on its board, raising its minority membership to 24%.

The Chesapeake Conservancy has increased board diversity to a similar level. Its staff of 35 includes members of the Asian American, Black, Latinx, LGBTQ+, Middle Eastern, Native American and other communities working at all levels of the organization, including the executive vice president of programs. President and CEO Joel Dunn said diversity is a priority. "The health of the organization is at stake, because leaders of the future will not look the same as leaders of today."

'Smoke and mirror games'

If the Chesapeake Executive Council endorses the proposed strategy in August, it will apply only to the state and federal partners in the Bay Program. But nonprofit environmental leaders across the region say its adoption would stoke their own efforts.

"They're a North Star for all of us," said Kate Fritz, executive director of the Alliance for the Chesapeake Bay. "This is a great step for the movement in general."

Structural barriers, however, often impede access to environmental jobs, Finley-Brook said. Younger people of color, for instance, usually can't afford to accept unpaid internships the way many of their white counterparts can, so they struggle to get a foot in the door.

The few who manage to get hired, she added, tend to grow disillusioned and quit. Starting positions are usually part-time or temporary.

With few co-workers who look like them, people of color in the environmental field say they can feel distanced from their white colleagues. Sometimes, that's reinforced by micro-aggressions or what one Black environmental professional calls "sophisticated racism."

"I don't think there is a lot of awareness and sensitivity among many white environmental groups," said Zora Lathan, a former National Audubon Society employee and founder of the Chesapeake Ecology Center in Anne Arundel County, MD.

Lathan said she grew tired of having white environmentalists speak to her as if she were a novice. On the other hand, she has received many invitations from white groups to participate in events or on boards. When she's the only person of color who shows up, she notices.

"There are a lot of smoke-and-mirror games going on with white groups," Lathan said. "I've even had it where people want to take pictures and put me on the brochure, and that's it. It's to show we're working with people of color, but it's only telling people of color what to do."

Funding favors white communities?

Chesapeake environmental efforts lack outreach to people of color, research suggests.

A 2017 analysis of 40 Virginia environmental groups' websites, for instance, found it is "exceptionally unlikely" for their mission statements to mention environmental justice. Any remarks on the concept in newsletters or issue papers were "sporadic" and rarely represented a broad commitment, the College of William and Mary study showed.

Few studies in the Bay watershed have examined environmental work in a racial context. But one study cited by the Bay Program's diversity committee found that projects in part of the Bay watershed favor white communities.

The analysis looked, in part, at where new nontidal wetlands had been created in Maryland. Of the 75 state-sponsored wetlands projects that were performed, only three were in census tracts in which people of color were a majority. More often, they represented about 16% of the population. That's well below the their 40% statewide population, according to the 2014 study, which was a collaboration among two University of Maryland researchers, Tutman and a fourth author.

The study also investigated how the state spent federal Clean Water Act funding to address polluted runoff. From 1999–2012, Maryland doled out $28 million under the program. Only two watersheds where the number of people of color is greater than the statewide average ranked among the top 10 funding recipients: the Anacostia and Back River watersheds.

To close the funding inequity, the authors recommended that state and federal officials

Zora Lathan, founder of the Chesapeake Ecology Center in Anne Arundel County, MD, said that race was a continual dynamic throughout her career in the environmental field. (Dave Harp/2014)

clear hurdles for urban stormwater retrofits to get more financial support. Locally, such a change would benefit areas with a more diverse population, including the Patuxent River region, Anacostia watershed and Baltimore, they argued.

Tutman and fellow researchers said the Chesapeake Bay Program's emphasis on curtailing nutrient and sediment pollution has come at the expense of addressing urban problems such as trash, microplastics and toxic contamination.

Treating urban areas as "sacrifice zones," Tutman said, is partly a product of the lack of diversity among the watershed's governmental and nonprofit leadership.

"These movements need us," he said. "They need our singing and dancing and our energy. Who ever thought white people could save the Chesapeake Bay all by themselves, and we [people of color] will all stand by and applaud? We're a part of this."

Report details shortcomings

The Chesapeake Bay restoration was formally launched in 1983. But it wasn't until 2014 that the federal government and participating jurisdictions added a "diversity outcome" strategy. To ensure the effort's success, it said, the partnership would have to do a better job of engaging people of color, said Rachel Felver, spokeswoman for the Bay Program.

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DIVERSITY *from page 21*

The partnership hired a consultant and designated a team to identify the next steps.

Over the past six years, "the Chesapeake Bay Program has been working together to understand the situation, learn from history, listen to experts and know what has informed the shortfalls," Felver said.

Among the problems they uncovered:

- A lack of diversity in leadership roles at all levels
- Too few programs targeted to youth in underserved communities
- Not enough employment opportunities and professional development targeted toward people of color
- Inadequate communication and outreach
- Not enough effort to address environmental justice issues

The proposed diversity statement urges the states and federal government to, among other things, hire a more-diverse staff, account for environmental justice in grant-making decisions and develop long-term relationships with organizations predominately serving people of color.

Signs of progress

Some environmental justice advocates see signs of hope that the Bay Program's adoption of diversity, equity, inclusion and justice goals could bear long-awaited results. And some momentum is already visible in the nonprofit sector. The Chesapeake Bay Trust, best known for running Maryland's Bay plate program, had no minority staff a little more than a decade ago. Today, it's 45%. Over the same period, it has increased the diversity among its volunteers from 10% to 49%.

Executive Director Jana Davis credits the organization's creation of a diversity committee in the early 2000s. The key was accountability, she said. In 2008, at the committee's behest, the Trust began tracking and publicly reporting its diversity data.

Last year, the nonprofit partnered with the Chesapeake Bay Funders Network and the Choose Clean Water Coalition to author an environmental justice guide for watershed groups. "A lot of people in our community care about these issues, but they're not doing a lot to make change," said Kacey Wetzel, the Trust's outreach director.

The Chesapeake Bay Foundation now has an attorney, Taylor Lilley, focused solely on environmental justice.

The state of Maryland's establishment in 2010 of the Chesapeake Conservation Corps, a training program for environmental workers ages 18–25, has emphasized recruiting a diverse workforce of young adults who launch careers with regional nonprofits and government agencies.

In 2014, the Maryland League of Conservation Voters created an environmental program targeting the Latinx community. Chispa, meaning "spark" in Spanish, can trace its accomplishments to the way it frames its environmental initiatives, said Ramon Palencia-Calvo, the director.

For instance, instead of flatly imploring Hispanic subsistence fishermen not to eat fish caught in the contaminated Anacostia River, Chispa recommends ways they can consume it as safely as possible.

"I think that is a key to our success, to meet them where they are, rather than them come to us," Palencia-Calvo said.

Black environmentalists say the past few weeks and months — trapped indoors by COVID-19 quarantine, outraged by repeated acts of police violence — have taken a toll on their mental health. It's time, they say, for white people to stand up and join the pursuit for environmental justice.

"People of color who are doing this work are tired or exhausted," said Mariah Davis of the Choose Clean Water Coalition. "We were already tapped because this is such a huge need in our community. But now given COVID-19, we're even more tapped. So, this is the time for white environmentalists to reflect internally and do their own research and lead their own [diversity, equity, inclusion and justice] trainings and not to expect people of color to do their work."

White-led environmental groups are increasingly pitching in to help communities

Mariah Davis of the Choose Clean Water Coalition said that improving diversity and inclusion in the environmental sector depends on white environmentalists taking the time for research, self-reflection and building authentic relationships with others. (Dave Harp)

of color fight such battles. But Davis cautions against "parachuting in" without forging lasting relationships with those communities.

"It's all about building a relationship authentically," she said. "We're going to continue to lose on environmental issues if we don't invest in people who bring us value." ■

Blue crab population dipped in 2019

Committee says numbers are not cause for action yet

By Karl Blankenship

Although the Chesapeake Bay blue crab population declined last year, the overall population of the popular crustacean is neither overfished nor depleted, according to the most recent scientific review.

The overall population declined from 594 million in 2019 to 405 million in this year's winter dredge survey, but the review by the Chesapeake Bay Stock Assessment Committee found the overall population was still near the long-term average observed over the three-decade history of the survey.

It also reported that last year's harvest of 61 million pounds was the highest since 2011, but still below the long-term average since the survey began in 1990.

The committee includes fishery scientists and managers from around the region who annually review results of the winter dredge survey, as well as other data such as harvest estimates from recent years, to determine the status of the blue crab population and make suggestions for any needed changes to regulations.

They then make recommendations to the three agencies that manage blue crab harvests around the Bay: the Maryland Department of Natural Resources, Virginia Marine Resources Commission and Potomac River Fisheries Commission.

After the population reached dangerously low levels, the states acted in 2008 to reduce the harvest of female crabs to help maintain reproductive potential. Since then, the average number of females has typically been at a higher level. This year's survey estimated there were 141 million female crabs in the Bay, which was more than double the minimum threshold number of 70 million, though below the management target of 215 million.

Still, the report said, the number of females in the population over the last decade has increased over those seen in the decade prior to 2008, which has "allowed the stock to regain some of its natural resilience to environmental changes."

As a result, the report said the states should continue implementing regulations that are in place. But it also said that jurisdictions should implement ways to more accurately track commercial and recreational harvests, such as electronic reporting and harvest validation, which would support even more precise management.

It also made a number of research suggestions, including supplementing the annual winter dredge survey, which samples crabs buried in the mud at 1,500 sites each winter, with a shallow water survey. It noted that a large fraction of the juvenile blue crab population winters in areas not covered by the current survey.

Soft crabs are packed for shipping from Smith Island, MD. (Dave Harp)

Much of the decline in this year's survey was in juvenile crabs.

Blue crabs are one of the species most closely associated with the Bay and popularized in the book, *Beautiful Swimmers*. But their population can vary naturally from year to year, based on weather, water temperature and other environmental conditions, as well as on how many are caught, and that can make management a challenge. ■

Wegmans proposal stirs up land use controversy in VA

Hanover County residents worry about impact on wetlands, pollution, historic sites

By Tamara Dietrich

Charles Morris, Carolyn Blake and Bonnie Cottman (left to right) are among those criticizing a plan to build a food distribution complex in Brown Grove, VA. They are descendants of Caroline Morris, a freedwoman who helped found the community during Reconstruction. (Clement Britt)

Charles Morris, 77, can remember as a young boy picking berries before dawn in the deep woods off Sliding Hill Road in the rural, historic Black community of Brown Grove in Hanover County, VA.

He can remember his father honking the horn for him to hurry. And he can remember heading back to the car and running across graves.

"I saw the cemetery that's closer to the corner of Sliding Hill Road and Ashcake Road," Morris recalled. "And further back up toward the middle there were other graves, individual graves."

Today, Morris couldn't tell you exactly where those graves are, but they're a growing point of contention — one of many — over plans to put a 1.7-million-square-foot regional food distribution complex on 217 acres in those same woods.

The project represents a $175 million investment by Wegmans Food Markets Inc., a supermarket chain with 101 locations from Massachusetts to North Carolina.

Few dispute that the distribution center will be an economic boon. Gov. Ralph Northam called it a "significant win" for the state, generating tax revenue and creating 700 full-time "well-paid" jobs.

Wegmans President and CEO Colleen Wegman said it will enable the company to "deliver products to our southernmost stores with increased speed and freshness, and will help support our growth well into the future."

But criticism is mounting. Residents worry about the loss of wetlands on the site, as well as the method used to map them. The Army Corps of Engineers, which must permit construction on wetlands, has received 169 public comments on the project — 167 opposed.

Residents are also concerned about fumes, noise and residential roads ill-equipped to handle the 3,165 additional vehicles — including 860 tractor-trailers — projected to be rumbling through every day at all hours.

And they question the fate of graves and historic sites, including the sparse remains of what's believed to be the first segregated black schoolhouse in the county and the footprint of a building that might be a tavern with connections to Patrick Henry.

Residents Chris French and Roderick Morgan are helping to spearhead the opposition. French has 22 years of working in the natural resources and restoration field, including the Virginia Department of Environmental Quality, while Morgan is in finance and accounting and lives about 500 feet from the proposed development site.

The two claim the Corps of Engineers used the wrong method to map wetlands at the site, resulting in an undercount, and that stormwater and other environmental impacts aren't being adequately addressed.

The mapping method, called wetland mosaics, is part of the Corps' mapping arsenal, but it's rarely used — and is typically applied to flat locations along coastlines that are difficult to assess.

The method basically ascribes percentages of wetlands to nonwetlands in a given parcel, rather than declare the parcel to be all one category or the other.

Elaine Holley at the Corps' Richmond field office said she used it at the Hanover site because it was so difficult to assess.

"The topography was very up and down," she said. "And very small areas were wet, and then 10 feet over next door were [drier] uplands."

In 2012 and 2016, the site owner had routine delineations conducted that found no wetlands, Holley said. But hydrology can change over time, and a delineation last year found about 34 wetland acres.

But Holley, said her site visit last fall didn't confirm that assessment and instead found about 18 wetland acres. After realigning the footprint of the proposed facility to render it the least harmful, she determined that 6.12 acres would be impacted.

French and Morgan contend the mosaic method resulted in a "severe undercounting" and estimate there are 18.5 acres of impacted wetlands.

They also believe using this method at this site sets a dangerous precedent "for minimizing wetlands impacts across the commonwealth," Morgan said.

French, who has a background in stormwater management, claims the proposed facility, which would sit at the very top of the watershed for Totopotomy Creek, has no proper plan to address runoff.

The water volume from a 1.7 million-square-foot facility, not including parking lots, he said, "could be very disastrous for the downstream water body. It can completely blow out the channels downstream."

The only massive stormwater management practice currently planned on the property, he said, is a retention pond.

"It's basically the least common denominator best management practice," French said. "You may be meeting state requirements, but you're barely meeting them."

To help offset wetland impacts, Wegmans plans to purchase water quality credits offsite. But French said these credits are designed for "small, constrained sites" with no other options.

"If you have 217 acres," French said, "you definitely have options. …That is basically an abuse of the water quality trading program."

DEQ leaves it to localities, like Hanover County, to present a stormwater management plan that addresses post-development runoff, water quantity and quality for approval under the state's Stormwater Management Program.

DEQ has already drafted a permit under the Virginia Water Protection program that addresses impacts to surface waters onsite. The draft drew so much attention during a public comment period in April that another hearing is set for July 20. The comment period will stay open 15 days beyond that before the State Water Control Board takes it up at its September meeting.

"We believe all of our permits are protective of water quality," said Ann Regn, DEQ communications manager. "Whether it's a VWP permit or a discharge permit, the goal is to protect water quality and water supply. We're not allowed to degrade water quality."

Grappling with a broader set of concerns, community members are asking how much more industrial development Brown Grove, co-founded during Reconstruction by a freedwoman named Caroline Dobson Morris, can take.

Charles Morris is Caroline Morris' great-grandson. In his lifetime, he's seen the community absorb a municipal airport, landfill and concrete plant. In 1995, a large parcel of land was rezoned for light industry over community objections. That's the site of the proposed Wegmans complex.

"In Brown Grove," Morris said, "they cut it up, do this, do that. And it's just — it's systemic discrimination.

"I believe that the real thing behind this is to force all the Blacks out of the community, because eventually that's what's going to happen."

Holley said the Corps is working to address residents' concerns, including ways to protect and preserve graves and cultural sites, and build buffers where needed. They're enlisting residents like Morris as consulting parties.

"We didn't anticipate that this project would have so much interest," Holley said. ■

Costs clog efforts to prevent sewage overflows

Fix for Pennsylvania's overflow pollution — worst in U.S. — neither quick nor easy

By Ad Crable

It was a good idea at the time. In the mid-1800s, Pennsylvania's cities and towns wanted to end the stench and slippery surfaces caused by open sewers on streets. Their solution was to get both human waste and rainwater out of sight by shunting them together through buried terra cotta, iron and wooden pipes to the nearest stream or river.

This now outdated form of engineering is called a combined sewer system. It is still very common in many older localities throughout the Chesapeake Bay region. In contrast, modern sewer systems in the United States are built with separate pipes to carry sewage and stormwater.

Pennsylvania, because of the age of its communities, has many combined sewer systems. And during rainy days and sudden snowmelts, as water surges through the pipes, that relic from a bygone era overwhelms dozens of sewage plants within the Bay drainage portion of the state.

To keep sewage plants from being inundated — and prevent sewage backups into basements and streets — the pipes are designed to divert overflows of stormwater and raw sewage directly into streams and rivers during heavy rainfalls.

The watery soup can contain a range of contaminants: viruses, coliform bacteria, microbial pathogens and parasitic worms that can be harmful to humans, along with feces, urine, oils and grease and chemicals that harm the environment.

This pollution is called a combined sewer overflow, or CSO.

Across the United States, CSOs have degraded water quality and contaminated drinking water sources. They have also led communities to close beaches, ban swimming and declare shellfish unsafe to eat.

Pennsylvania has the unwanted distinction of having the most CSOs in the nation, accounting for about 17% of the total. Its overflows make up almost two-thirds of all CSO discharges in the Chesapeake region, an area that includes parts of six states and the District of Columbia.

In 2019, according to state records examined by the *Bay Journal*, 28 Pennsylvania municipal sewer systems released more than 3 billion gallons of stormwater mixed with raw sewage into streams that flow into the Susquehanna River and eventually the Bay.

Many communities contain dozens of individual overflow pipes that discharge into streams. Some of those overflows were caused by as little as 0.08 of an inch of rain. At the Greater Hazleton wastewater treatment plant, 16 different outfalls had overflows an average of 48 days last year. The Ashland Borough Wastewater Treatment Plant had 134 days in which rain triggered a CSO.

A 2019 report by the Environmental Integrity Project found that 58 CSO outfalls in Harrisburg released almost 1.4 billion gallons of combined stormwater-sewage in 2018. One of the 58 Harrisburg CSOs identified in the report came from the governor's residence. Testing of the Susquehanna River along the city's popular waterfront park after overflows found unhealthy levels of *E. coli* bacteria up to 10 times the level deemed safe for swimming. City officials reject such findings, though, saying pollutants coming downriver already make the water unsafe.

Indeed, the state Department of Environmental Protection said it has no record of a CSO being identified as the sole reason for a stream to be listed as impaired.

But some think that may reflect a gap in sampling. Susquehanna Riverkeeper Ted Evgendiadis says the citizens group is planning to expand testing in Pennsylvania's other CSO communities.

A costly and growing problem

Fixing CSO problems is expensive and often requires working around utilities and pipes already buried under streets. Many communities in Bay states struggle to meet cleanup mandates, but some have attacked the problem and seen water quality vastly improve.

For example, the District of Columbia, which was sued because of CSOs, is building miles of massive underground storage tunnels to hold stormwater, then send it to a sewage plant for treatment. The project's overall price tag — $2.7 billion — illustrates the primary challenge of controlling CSO discharges. But it illustrates its benefits as well. After the first stretch of tunnels went online in 2018, they captured almost 90 percent of stormwater that normally would go into the Anacostia River — 4.48 billion gallons.

Left photo: Ruth Hocker, stormwater program manager for Lancaster, PA, stands by an outfall point where combined overflows of stormwater and sewage empty into the Conestoga River. (Dave Harp)

Right photo: Water gushes out of a manhole cover as a surge of rainfall overwhelms underground drainage pipes. In older systems, overflows like these can contain a mix of both stormwater and raw sewage. (Dave Harp)

Later that year, the river received its first passing grade in more than a decade from a regional environmental group.

But most communities struggle with the cost of CSO solutions, while the problems are on the rise. Many saw their overflow discharges soar in the last two years, driven by record-setting rainfall. The Mid-Cameron Sewer Authority, which has eliminated its combined sewer system, nevertheless saw its first overflows in years in 2019.

And a changing climate is likely to make that more common. Scientists say precipitation from extremely heavy rainstorms has increased 70% in Northeastern states, including Pennsylvania, since 1958. Harrisburg saw a 13% increase in rain events of a half-inch to an inch.

The increase in intense rainfall worries regulators in their quest to decrease CSOs.

"There are places where improvements have been made that are getting unmade, due to rainfall," said James Shallenberger, manager of the monitoring and protection program for the Susquehanna River Basin Commission.

Federal and state agencies have been trying to arrest this pollution since 1994 with varying success.

The U.S. Environmental Protection Agency has fined and obtained consent decrees (legal agreements that set terms for improvements) from 10 of the 28 Pennsylvania communities with CSOs.

The goal is not to completely eliminate all CSOs — the EPA acknowledges that's economically unfeasible in most cases — though a few communities have done it. Rather, the aim is to reduce the discharges so that they don't violate water quality standards under the federal Clean Water Act.

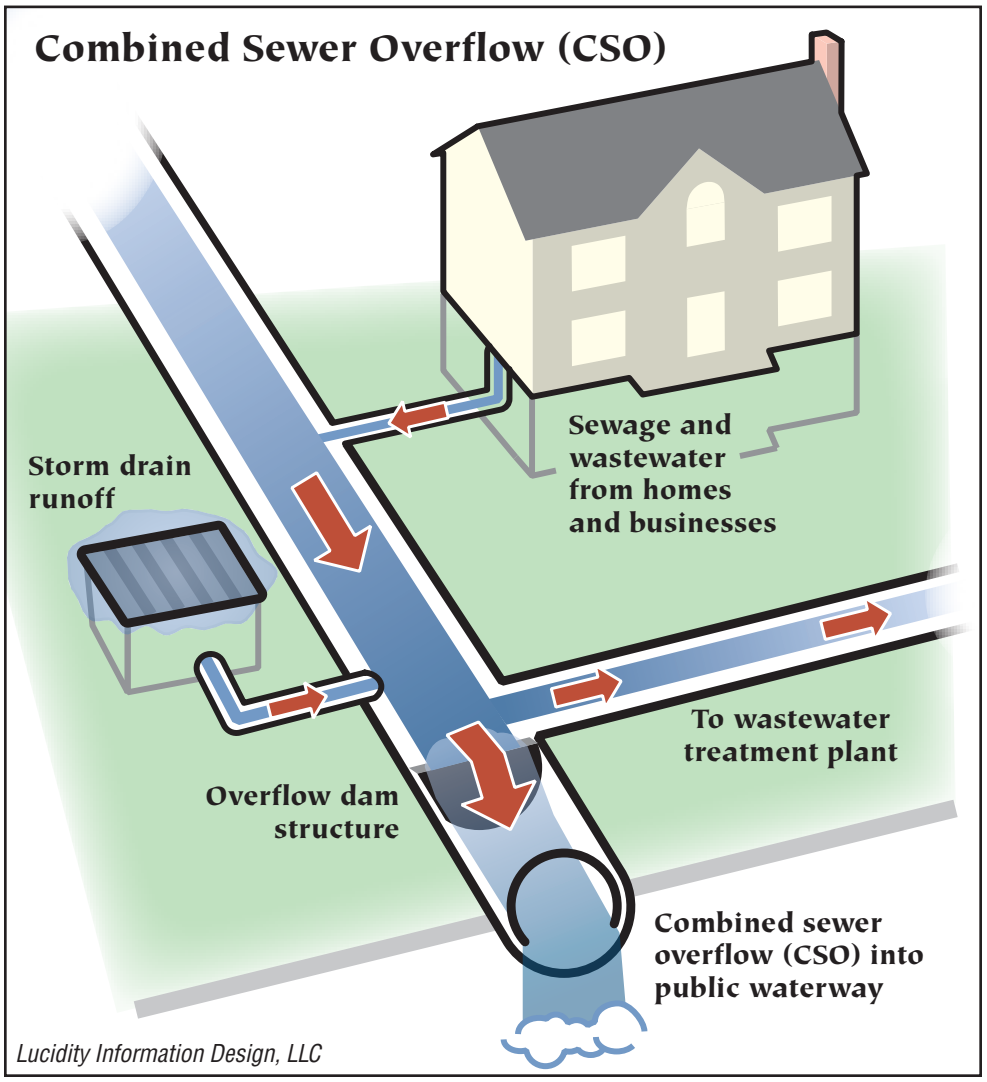
Often, that comes down to capturing 85% of stormwater overflows. It's a daunting and hugely expensive task.

What's the harm?

How much are ongoing releases of raw sewage harming people, local waterways and the Chesapeake Bay?

In terms of impact to the Bay, it appears not much.

Stormwater delivered by CSOs carries the nutrients nitrogen and phosphorus, the main form of pollution in the Bay and the source of its oxygen-starved "dead zone." But nutrients from agriculture, sewage plants and other sources dwarf CSO input.



Lucidity Information Design, LLC


Lower Susquehanna Riverkeeper Ted Evgeniadis samples the Susquehanna River in Harrisburg. The Environmental Integrity Project said in a 2019 report that sewage released during combined sewer overflows made a riverside beach unsafe for swimming. (Tom Pelton/Environmental Integrity Project)

The 927,495 pounds of nitrogen and 112,983 pounds of phosphorus estimated by Bay Program computer models to have reached the Bay from Pennsylvania CSOs in 2018 is less than 1% of the state's total nitrogen load for that year. They also contributed just 3% of the phosphorous load and 0.3% of the sediment.

Still, that was nearly double the total nutrient contributions from CSOs in the rest of the Bay watershed.

Even if funding materialized for the billions of dollars required to eliminate CSOs from the Bay drainage portion of Pennsylvania, "That money would not show up as a cleaner Bay if that is all we did," Shallenberger said.

Impacts on local water quality are a greater concern.

Although state laws forbid municipalities from degrading streams, studies about the impacts of CSO pollution on local waterways and drinking water are scarce.

Most Pennsylvania municipalities with CSOs in the Bay watershed downplay harm and point to the vast dilution effect of relatively clean rainfall mixing with the sewage. As much as 85% of the mix is rainwater, they say. In addition, officials say the "first flush" of stormwater that carries the bulk of pollutants washed off roads, parking lots and lawns does go to a treatment plant before the system begins to generate overflows.

"Of course we impact water quality. Every CSO does," said Charlotte Katzenmoyer, chief executive officer of Capital Region Water, which maintains Harrisburg's much-criticized 1880s era sewage system. "But whether we are impacting the Susquehanna with a huge dilution rate and with other pollution loadings coming down, I would be shocked that we would not be able to meet water-quality standards."

Lancaster city, which sent 514 million gallons of overflows into the Conestoga River in 2019, maintains the releases don't violate water quality standards except for fecal coliform bacteria. And they plan testing with EPA oversight to prove it. Tests already have proven that no water intakes are affected downriver, said Ruth Hocker, the city's stormwater program manager.

"The loads are higher coming from upstream problems like failing septic systems," she said. "If we were to remove all our CSOs, there would still be water-quality problems."

All cities with consent decrees, including Lancaster, have to post warning signs on streams and rivers where there are CSO outfalls and known swimming areas. Lancaster city's say," Warning: Combined Sewage Outfall. Avoid contact with discharge."

But CSOs are not good for the health of streams, at least in the area of discharges.

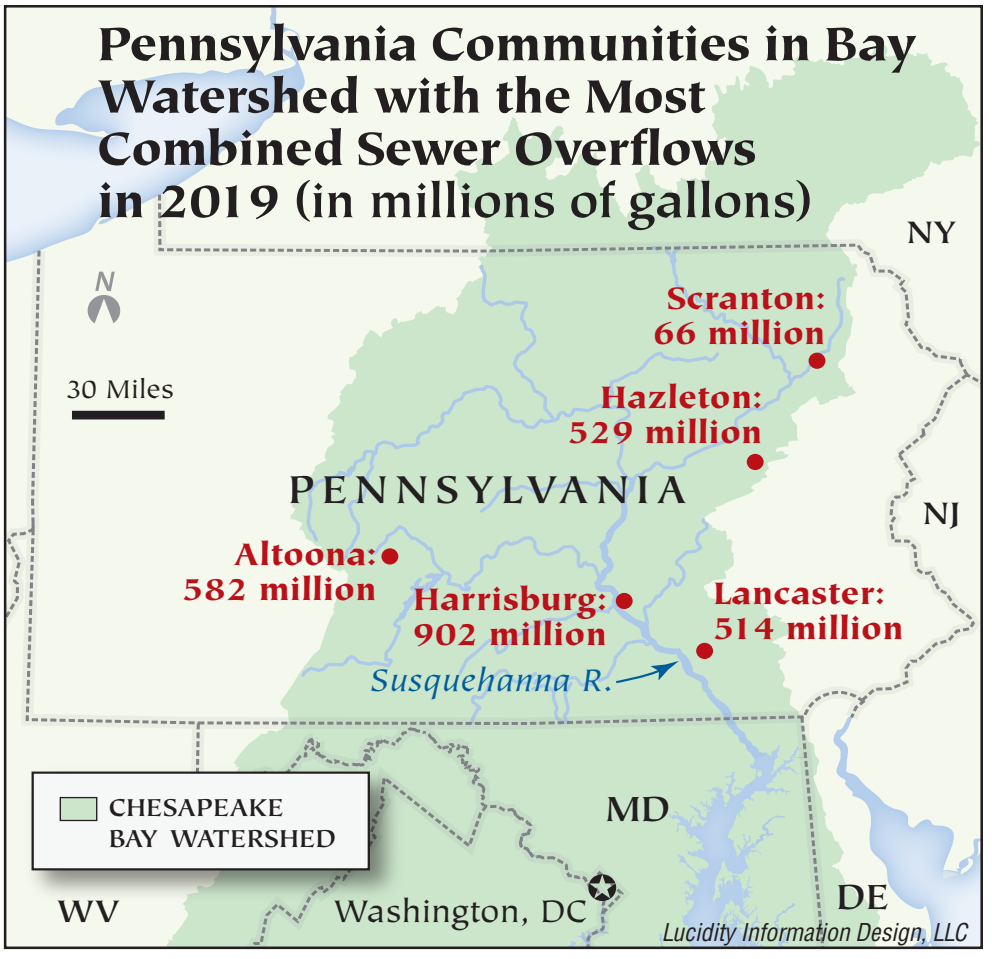
Pumping sewage into streams or rivers is never good, said SRBC's Shallenberger. "Any release of unregulated sewage is something to be very concerned about."

Greg Scott, who has written about Pennsylvania CSOs for the American Society of Civil Engineers, agreed. "Anything you are doing to put organics into a river is going to have a detrimental impact on the water quality and fish and Chesapeake Bay," he said.

An EPA official, who asked not to be named, said, "Untreated waters just don't belong in the water we swim in and drink from. Its time has long since passed."

*See **CSO**, page 26*

A rain garden installed along the Lancaster Brewing Company in Lancaster, PA, is designed to reduce the amount of water traveling through underground pipes by capturing and absorbing some of the stormwater runoff before it enters the system. (Dave Harp)



CSO *from page 25*

Varied solutions

If money was no object, the most direct way to reduce or eliminate CSOs would be to separate the pipes: one system to carry sewage and industrial waste directly to the treatment plant and another to capture stormwater and send it either to the plant or into a stream during severe storms.

But separating a combined sewer system, long-buried under streets and buildings, is complicated and expensive.

Lancaster and Harrisburg are attempting to capture stormwater before it enters the underground system by investing tens of millions of dollars in "green infrastructure," such as rain gardens, porous pavement and tree plantings. By holding rain on the ground longer, and encouraging it to sink it, they hope to prevent overflows from happening.

Other strategies include enlarging pumping stations to increase stormwater storage and reduce flows by removing illegal connections from sump pumps and rain gutters into sewer.

Some communities are building new treatment plants capable of handling more stormwater, though CSO prevention is rarely the motivation. Williamsport, Altoona and Scranton have built large storage tanks to temporarily store stormwater until treatment plants can again handle the overflow.

All CSO communities must have what the EPA calls Nine Minimum Controls to reduce related problems. They include such things as making sure plastic bottles, litter, plastic bags, cigarette butts and other floatables are captured by screens during overflows, and sweeping streets to minimize the amount of sediment and debris that can be swept into stormwater.

But while CSOs still number in the billions of gallons annually in the 28 Pennsylvania communities that drain into the Bay, some progress has been made.

From 2009–19, nitrogen reaching the Bay from Pennsylvania CSOs declined by 17% and phosphorus by 11%, according to modeling data from the Bay Program.

Twelve combined sewage systems have been completely removed. And five communities have satisfied the terms of their consent decrees. Each of the 28 communities has an approved Long Term Control Plan with time frames to bring down CSOs.

Mark Glenn, the Altoona Water Authority's engineer, likes to point out that because of CSO reductions and sewage plant upgrades over the last 30 years, two local streams now support trout.

"DEP believes there is a long-term downward trend in the mass of pollutants discharged from CSOs," the agency said. But it added, "DEP acknowledges that there has also been an upward trend in annual precipitation across the state."

"There's more awareness now," said Scott of the American Society of Engineers. "You don't see people dumping grass down [stormwater] basins anymore. They're still working hard at it. But we're not in a position now to throw money at a problem. If you want it done tomorrow, there is not a program to fund it."

Unfunded mandate?

The cost to bring Pennsylvania CSOs into compliance is massive. EPA estimated it at $2.8 billion in 2012.

Harrisburg has launched a $600 million project to correct its many CSO problems. Pennsylvania American Water has committed $140 million to fixing Scranton's longstanding CSO ills. Lancaster's next phase will cost $25 million.

But most of the CSOs in Pennsylvania come from small, depressed communities that cannot afford massive infrastructure overhauls.

"We're a small beat-up town in the middle of coal country with a pretty elderly population," said Matt Lawrence, plant manager for the Mahanoy City Sewer Authority, where the average value of a home is just $44,000. "We just do what we can."

The sewage system serves a population of not even 4,000 people, and its receiving stream is yellow, a legacy from acid mine drainage. Yet an initial estimate to separate the town's combined sewers and modify the treatment plant came in at $270 million. The plan was rejected.

In many communities, the overflows are compounded by leaky sewer pipes, which allow groundwater to seep into the system, as well as illegal connections and problems involving pipes clogged with congealed cooking oil.

Sewer authority officials complain of a lack of state and federal funding to help make expensive changes needed to bring down overflow discharges. Instead, most CSO efforts come on the backs of ratepayers.

"All the big shots in Harrisburg don't understand what it's like up here in a town with 1,200 people," said Tony Adami, president of the Galeton Borough Authority. "We're trying. We're making progress every year, but it's not getting done overnight."

The Williamsport Sanitary Authority, which serves about 51,000 people, has handed out four rate increases of 25% each to deal with its CSOs and sewer plant upgrades to the tune of $130 million so far. Authority board member Wendy Walter complains that the same amount of focus is not placed on a much bigger source of nutrients — agriculture.

"It's not that we don't want to. We just want to get the bigger bang for the buck for nutrients," she said.

The Shamokin Coal Two Joint Sewer Authority, levied with a consent decree in 2012, originally drew up a plan to separate its combined sewer system but abandoned it because of "stark financial realities."

"We're $50 million in debt. We're all for cleaning up CSOs, but [the government has] got to drop some change, too," said Paul Petrovich, the authority's general manager.

Many people are still unaware of CSOs and their impact, including some public officials. When Roger Hadsall became manager of Tunkhannock Borough's Municipal Authority, he was surprised to find out that raw sewage was flowing into a local stream. "I said, 'What? We let sewage overflow into the creek? We have to stop this.'"

Shallenberger said that reaction is common. "It is a shock to the senses to hear that sewage is being discharged to our waterways. Lay people don't expect that." ■

Mercury widespread in Chesapeake Bay headwaters fish

Study focused on the type of mercury most toxic to humans

By Jeremy Cox

Nearly half of all gamefish in freshwater lakes, streams and rivers in the Chesapeake Bay watershed may be unsafe to eat because of high levels of mercury, a new study suggests.

In the first study to examine mercury across a spectrum of fish in the six-state region, scientists found that the pollutant remains prevalent in the environment in its most toxic form despite years of declining mercury emissions.

The totals vary widely by location, a possible indication that local conditions are raising or lowering the risk of contamination, according to the research conducted by three U.S. Geological Survey scientists.

"Our goal here was to really do a first cut of what we saw across the landscape," said Collin Eagles-Smith, a USGS research ecologist. "Hopefully, that can be a springboard for future studies to get a better sense at why."

The study centers on the type of mercury that is most toxic to humans: methylmercury. The neurotoxin is formed when inorganic mercury interacts with certain bacteria. It is particularly harmful to fetuses and children, potentially leading to intellectual deficits and problems with motor skills.

In the Chesapeake Bay watershed, mercury is the main trigger for fish-consumption advisories. Coal-fired power plants and trash incinerators are the largest sources of the pollutant in the region, scientists say. Once released into the air, mercury can travel great distances before getting deposited into waterways through rainfall or as a gas.

The Chesapeake watershed's mercury levels — with 45% of all fish in the study exceeding the consumption standard — are similar to those found in many parts of the country, the authors say. The findings underscore the importance of checking for public health advisories before eating any wild-caught fish, said James Willacker, the study's lead author.

"I would pay attention to your public health officials and be as informed as you can about the information they're providing," he said.

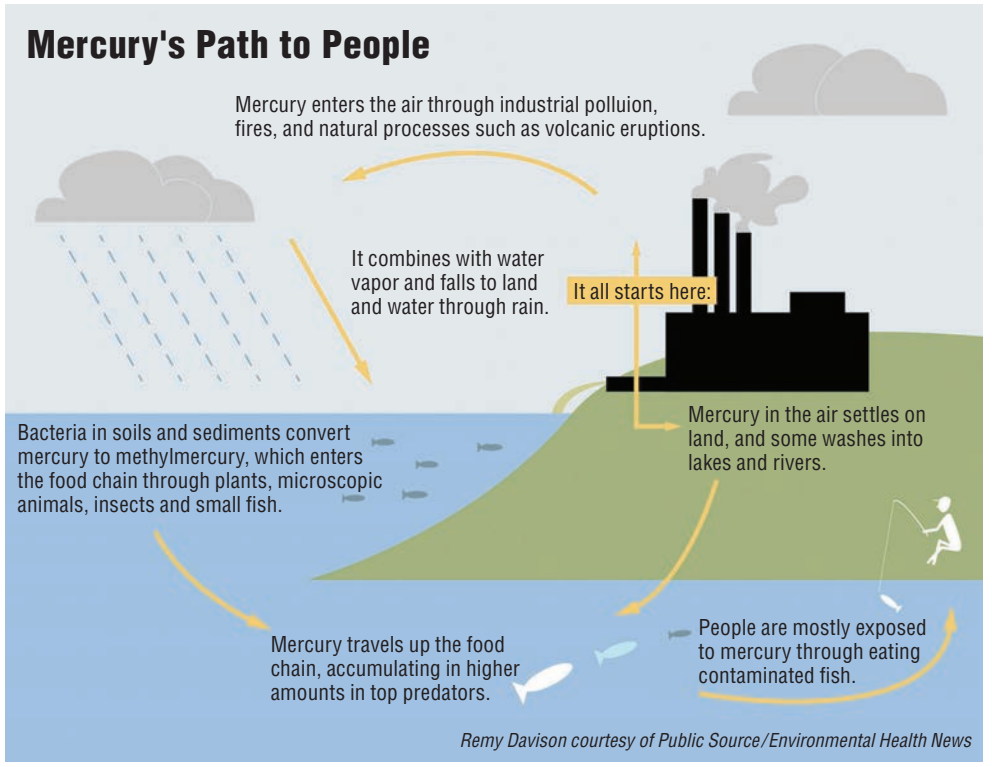
The USGS researchers culled fish contamination records from two sources: a study conducted by the agency in the watershed from 2013–17 and state monitoring programs with reporting dating as far back as 1990. Together, the collections contained measurements from nearly 8,000 fish caught in 600 locations.

The researchers found that the basin with the highest mercury concentrations was the Susquehanna. More than half of the basin's freshwater areas ranked among the most toxic spots across the Chesapeake Bay watershed, which stretches from Virginia Beach, VA, to Cooperstown, NY.

Many people who eat the fish they catch don't realize what they're ingesting. (Dave Harp)

Next was the Potomac, where 18% of waters landed in that tier. No water body outside of the Potomac and Susquehanna drainage areas fell into the most-polluted category. In contrast, at least half of the water bodies in the James, Rappahannock and York watersheds — all in Virginia — placed in the category with the lowest levels.

Eagles-Smith said it's unclear why the watersheds in the northern end of the Chesapeake Bay basin have higher mercury levels in fish than those in the south. Regional air patterns would suggest the opposite — mercury tumbles from the atmosphere to the ground at higher rates in the South than in the North, according to the study.



Remy Davison courtesy of Public Source/Environmental Health News

Because methylmercury levels intensify with each step up food chain, the USGS scientists found the highest amounts in larger fish, including some of the region's most prized sportfish.

Striped bass, a gamefish popular on restaurant menus, had the most mercury in its meat of the 32 fish tracked in the study, with a typical concentration of 0.31 parts per million. The U.S. Environmental Protection Agency has set a consumption limit for mercury of 0.3 parts per million.

"There are lots of people out there recreationally consuming that [fish]," said Betsy Nicholas, executive director of Waterkeepers Chesapeake. "These people don't realize what they're ingesting and how much of a detrimental impact that can have."

Striped bass was followed, from more contaminated to less, by bowfin (0.2), walleye (0.19), largemouth bass (0.18) and flathead catfish (0.17), according to the report. The species with the least mercury included three types of trout and the creek chub.

"Trout are a great choice if you're trying to avoid mercury exposure," Eagles-Smith said.

James Smith and his 11-year-old son go fishing two or three times a week around the interior of Maryland's Eastern Shore. About once a week, the Wicomico County residents take home what they catch and eat it — usually white perch or catfish.

Smith said he isn't too concerned about whether those fish might contain mercury.

"The government's not making a big issue about the tuna, and the tuna's at the top of the food chain," he said, adding that he feels safe taking fish from his favorite spot, the Pocomoke River, because it has little industry along its banks.

Mercury is a naturally occurring element, but its burden in the environment has tripled since the Industrial Revolution by some measures. Levels have been falling dramatically in the United States over the past three decades largely because of pollution controls being implemented at power plants and the closure of others.

The Trump administration has moved to relax an Obama era mercury emission regulations at such plants, citing its cost. The regulation remains on the books, but the change — which removed the legal reasoning behind it — opens the protection to potential legal attacks, critics say.

The USGS paper was published in March in the scientific journal *Ecotoxicology*.

Greg Allen, a scientist with the EPA's Chesapeake Bay Program Office said the program remains in "looking and watching mode" when it comes to the contaminant.

"We expect the loads and concentrations in the fish to be coming down," Allen added. "So, we intend to stand by and monitor. If that is the trend, then we can work on other pollutants." ■

Menhaden's ecological role to play part in harvest limit

Managers considering tradeoffs to account for impact on other species

By Karl Blankenship

Normally, fisheries management aims to set harvest limits at levels that sustain the population of a particular species.

In August, East Coast fishery managers are poised to grapple with a different question — determining how many fish *not* to catch in order to help *other* fish.

The species in question is menhaden, a small fish that has been the focal point of big fisheries debates for decades. Measured by collective weight, menhaden harvests are the largest of any species along the coast and in the Chesapeake Bay. Nonetheless, recent assessments have found its stock to be in good shape — "not overfished and overfishing is not occurring" in fisheries lingo.

But conservation groups have long contended that such analyses don't account for menhaden's role as a food source for everything from whales to birds — and especially for striped bass.

After years of work, the Atlantic States Marine Fisheries Commission, which manages migratory fish in state waters along the East Coast, is expected to take tentative steps toward recognizing that role by adopting its first-ever "ecological reference points" for menhaden at its August meeting. The reference points — or population goals — for menhaden would be based largely on what's needed to support a restored stock of striped bass.

"Although the process has taken a long time … I think they are getting to a good place," said Chris Moore, a fisheries scientist with the Chesapeake Bay Foundation. "Hopefully, the outcome is that we have a more robust stock of menhaden, and we have healthy and robust populations of those predators as well."

In February, two reviews of the menhaden stock were presented to the commission's Menhaden Management Board. One used the traditional single-species review focused only on the menhaden stock, and one accounted for its ecosystem role.

Both showed the overall menhaden population to be in good shape, but the one that accounted for menhaden's role as a "forage" fish for other species suggested that its population should be managed more conservatively.

Computer modeling that contributed to the analysis indicated that the fish most sensitive to menhaden abundance is striped bass. If the striped bass were at their targeted population level — right now they are far below it — they would require more menhaden.

But presentations to the menhaden board also pointed out how complex this issue may become in future years. Most of the focus is on the link between menhaden and striped bass, which has the best data and where the connection seems strongest.

But other menhaden predators, such as bluefish and weakfish, are at low levels. If their populations rebounded, it's conceivable they would need more menhaden as well.

On the other hand, spiny dogfish, another menhaden predator, is highly abundant right now. One commissioner mused that maybe harvests of the spiny dogfish — a mud shark — should be promoted to boost menhaden numbers.

That highlights the trade-offs fishery managers will face in the future as they embrace ecosystem management. It is impossible to manage all species — predators and prey — to have maximum populations at the same time, and managers will eventually, in effect, be placed in the role of determining winners and losers of their management actions.

"It is not like we can give you one magic answer," acknowledged Katie Drew, the stock assessment team leader with the ASFMC. "You really have to start thinking about what do I want out of this fishery, what do I want for all of these predators?

"How do you evaluate those trade-offs between harvesting menhaden, which has socioeconomic benefits itself, versus leaving menhaden in the water which provide environmental and socioecomic benefits to other species?"

Any initial steps are not likely to have much impact on the Bay, where most of the menhaden harvest takes place and where battles have raged for decades over whether enough menhaden are being left uncaught.

Right now, the models only examine coastwide relationships between menhaden and other species because data — and modeling capabilities — are limited. But scientists say that both will improve over time, allowing consideration of more species and specific regions, like the Bay.

Menhaden are vacuumed from a purse seine onto a boat for transport to the processing plant. (Dave Harp)

"This will be a big change for menhaden, obviously, on the coastwide level, but I don't see it as a huge change for the Chesapeake Bay at this point," Moore said.

Nor will making more menhaden more abundant by itself be a panacea for solving the problems of predators that are overfished like striped bass. More menhaden may be helpful, but striped bass catch restrictions are needed for its population to rebound, scientists said.

"You could set your menhaden at zero fishing, and your striped bass won't come back," said Matt Cieri of the Maine Department of Marine Resources, who chaired the commission's ecosystem reference point workgroup.

If the commission sets reference points in August as expected, it would most likely consider how those goals would translate into harvest levels at its October meeting.

Menhaden are caught for bait used in other fisheries, as well as for use in products from fish oil to animal feed.

The size of any catch limit changes is unclear. The commission has set current menhaden harvest levels below "safe" levels in part out of concern for other stocks, so ecological reference points may not trigger significant additional reductions.

But, most seem to agree that the upcoming decision will signal the beginning of a new era of fisheries management along the East Coast.

"Ecosystem-based management is the future of fisheries management, including the menhaden fishery," said Ben Landry of Omega Protein, which operates a menhaden fishing fleet operating out of Reedville, VA, and is the largest harvester of the fish in the Bay and along the coast. ■

Invasive water plant poised to overwhelm Potomac watershed

Scientists warn if not nipped in the bud now, it could spread anywhere

By Jeremy Cox

It springs to life each year in freshwater ponds and lakes as temperatures rise. By the middle of summer, the foliage is so thick and bushy at the surface that the water below is plunged into darkness, with hardly any oxygen seeping in from the air above.

Across Northern Virginia, the invasive aquatic plant has spread to dozens of locations, according to state and federal scientists. It looks a lot like *Trapa natans*, the water chestnut that has blanketed waterways on Maryland's Upper Shore and the Northeast United States, but it isn't.

It's a different type of water chestnut: *Trapa bispinosa*. And Northern Virginia is the first place it has been found growing in the country.

Biologists want to keep it that way.

If eradication efforts don't ramp up soon, though, they warn that the species could spread beyond its current backwater haunts to the Potomac River and become a much bigger ecological headache. The 400-mile river's currents could whisk *T. bispinosa* seeds just about anywhere, dampening hopes of containing the invasive plant, said Nancy Rybicki, a George Mason University professor and retired U.S. Geological Survey aquatic plant ecologist.

"Here, we have a chance to manage it while it's only in stormwater ponds, farm ponds and homeowners association ponds," she said. "This horse is not out of the barn."

The biggest obstacle, Rybicki said, is that no one seems to be in charge of dealing with the problem. There is no management plan to guide its removal and no agency with clear authority to tackle it.

John Odenkirk, a biologist with the Virginia Department of Game and Inland Fisheries, said he began working on the water chestnut infestation a few years ago even though controlling aquatic plants falls outside of department's mission.

"We took it upon ourselves because we realized it could be an issue and it could be linked to habitat for fish," Odenkirk said. Other agencies, such as the state agricultural and environmental divisions, have a regulatory stake in it, he added, "but it's unclear who has the authority to deal with nonnative aquatic plants."

"It's just a gray area in Virginia regulations," Odenkirk said.

He was the first to spot it in Virginia. Odenkirk said he was working in Pohick Bay along the Potomac in Fairfax County in 2014 when he saw a patch of vegetation he didn't recognize. He called Rybicki. Both agreed that it resembled water chestnut. But that species had been driven out of the Potomac at great expense and effort by the U.S. Army Corps of Engineers in the 1950s.

The new plant also exhibited subtle differences from *T. natans*. Their leaves share the same serrated pattern, but the underside of *T. natans* is light green, not red like what Odenkirk had discovered. *T. natans* has white flowers; these new ones are pink. The seed pods differ as well, with four hooklike horns on *T. natans* vs. two on the new plant.

By 2019, after scouring resources from around the world and sequencing the plant's DNA, Rybicki arrived at an identification: a variant of water chestnut native to Taiwan.

How did it get to Virginia? Rybicki can only speculate.

This invasive species of water chestnut, Trapa bispinosa*, is spreading through streams in Virginia's portion of the Potomac River watershed. (Nancy Rybicki)*

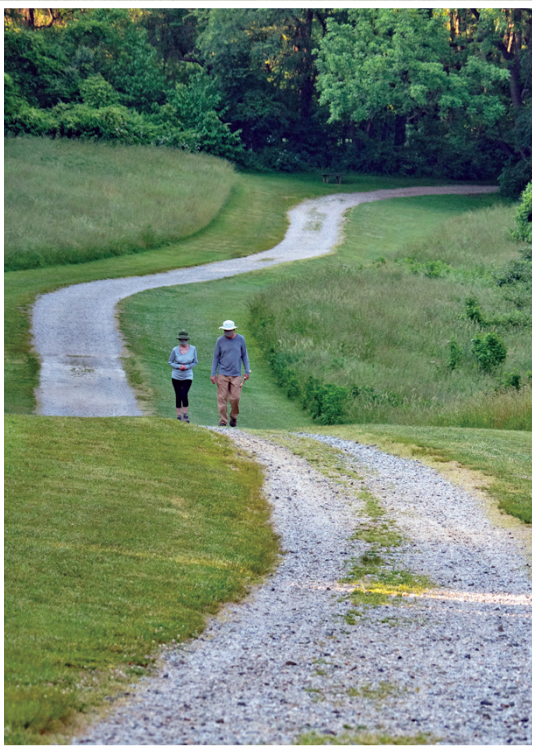
The seed pods of Trapa bispinosa*, a water chesnut invading the Potomac River watershed, has two hooklike horns. (Nancy Rybicki)*

Botanical records suggest that *T. bispinosa* arrived in the Potomac watershed as early as 1995 in Westmoreland and Stafford counties, her investigation found. Perhaps someone planted it in their own pond, and it escaped. The hooks on the seed pods can become attached to waterfowl feathers or a boat's anchor line — and off they go.

Rybicki's surveys have sighted *T. bispinosa* in 54 locations across five counties, all of them in Virginia within the Potomac River watershed. Some have been successfully knocked down by using herbicides or simply being yanked out by hand. But 31 sites remain "active," putting more than 500 water bodies within a 3-kilometer radius of the outbreaks at risk of infestation, according to Rybicki's research.

Odenkirk echoed Rybicki's call for more help defeating their pesky foe.

"Basically, she and I are the team so far," he said. "I just don't have time to manage this. It's going to take somebody almost full-time, 40 hours a week for a year, year and a half, and building a [volunteer] network to take care of it." ■



Elk Neck State Park a peak Chesapeake experience

By Jeremy Cox

For an unparalleled view of the Chesapeake Bay, drive to the end of Maryland Route 272, leave your car in the gravel lot and hike down an old farm lane that gradually becomes engulfed in trees. Then step out into a final clearing containing an antique lighthouse and get as close to the edge of the 100-foot bluff as comfort and safety will allow.

Stand there for a moment. From left to right, the entire Upper Bay lies before you in one sweeping panorama: the reddish cliffs, the forested shoreline of Aberdeen Proving Ground, the jungle of underwater grass known as the Susquehanna Flats, the sandy beaches, the steep slopes guarding the mouth of the Susquehanna River, the marshes.

"It's a beautiful viewshed of the headwaters of the Chesapeake Bay," said Jeanette Thayer, an assistant park manager at Elk Neck State Park at the head of the Bay on Maryland's Eastern Shore. "It is inspiring and captivating, and I'm always awestruck."

If that sight was all the 2,300-acre state park had to offer, it would be enough to commend the trip. But it's not.

Elk Neck could be considered a complete Chesapeake playground. There are beaches for sunbathing; walking trails for forest bathing; a marina for boating; a campground with some sites gussied up for glamping; and water on three sides for paddling.

"It has just about everything you'd want to do outside," Thayer said.

Let's not forget the pièce de résistance: the Turkey Point Lighthouse. The 35-foot tower stands nobly atop a cliff at the end of the 15-mile-long peninsula, making it a favorite among photographers.

Operated by a nonprofit called the Turkey Point Light Station, the lighthouse was built on the bluff to help ship captains change course into the mouth of the C&D Canal. A resident keeper tended the light until 1948; four of its 10 keepers were women.

The lighthouse normally is open to climbers 10 a.m.–2 p.m. on weekends May through October. But I was greeted by a sheet of paper taped to the door that said it and the nearby gift shop were closed for the 2020 season to contain the spread of the coronavirus. It seemed a reasonable adaptation, given that the structure is fully enclosed and rife with tight squeezes.

Photos by Dave Harp

Top photo: The still-functioning Turkey Point Lighthouse looms above the Chesapeake Bay on a 100-foot bluff.

Bottom photo: A gravel trail leads hikers a short distance from a parking lot to the tip of the Elk Neck peninsula at Turkey Point.

The grassy area around the two buildings remains open, so visitors can still take in the spectacular view it affords.

My exploration of this peninsula on a sticky morning in June was separated into two experiences: a reconnaissance of the state park and a guided kayak tour of the upper reaches of the North East River, the waterway on the north side of the land mass. The peninsula is bounded on the south side by the Elk River. Both are tidal rivers that flow directly into the Bay.

The park encompasses most of the lower end of the peninsula, but not all of it. The eastern section comprises nearly 2,000 acres. Portions there have been a public park since 1939. The 300-acre western section, which includes the lighthouse, was added later.

These two green spaces are bisected by a 1960s era subdivision called Chesapeake Isle.

If you prefer your nature to be in a perfectly pristine state, Elk Neck is probably not the park for you. Besides the encroachment of the housing development, there are the park amenities: more than 250 campsites, more than a dozen cabins, a park headquarters, various maintenance buildings and picnic pavilions.

The park can also get rather busy, especially during weekends and holidays between Memorial Day and Labor Day. Like many parks in the Chesapeake region, Elk Neck has seen a boost in traffic as people have begun emerging from coronavirus lockdowns. During the first week in June, nearly 30,000 people tramped into the park, about twice as many compared with the same week in 2019, Thayer said.

To avoid the crowds, she advises visiting during the cooler months, on weekdays or some time on either side of the 10 a.m.–3 p.m. rush.

My visit checked two of those boxes – it was on a Thursday and shortly after 7 a.m. when I pulled into the lighthouse parking lot. I followed the well-kept gravel trail to the lighthouse, my way scented by the ubiquitous white flowers of multiflora roses. Sure, it's a pesky invasive shrub, but for a few weeks in early summer, you almost don't mind its presence.

For a more-rugged experience, take the trail that follows the shoreline heading north from the light house area. You will quickly find yourself enveloped by oaks, maple and pawpaw trees. The trail leads down to a sea-level clearing, a small crescent of a beach that is as close to a private hideaway as these parts can offer. Starting from the parking lot, the roundtrip is 1.5 miles.

The North East Beach Area in the eastern segment of the park is one of the premier spots in this part of the Bay for sunseekers. It features copious parking, restrooms with showers, picnic shelters and charcoal grills. For a more-secluded setting, stop by one of the several pull-offs along 272 and clamber down through a tunnel of trees until you dead-end at a sandy shoreline.

For the second part of my day, I drove 15 miles up the neck to the charming town of North East, population 3,600. Here, Bay Venture Outfitters rents kayaks and paddleboards along the narrow, uppermost segment of the North East River. I joined the proprietor, Kelly Benson, for a paddle into its marshy realm.

He led me into Stoney Run, a half-mile long stream bordered by an unbroken wall of greenery

on either side. A beaver den was the only constructed edifice in sight. Blue herons glided above us. Carp gave an occasional heavy splash. At one point, my paddle alerted a river otter to my presence, and I caught a glimpse of its slick, brown fur as it disappeared in the murky water beside me.

All of this nature is to be found barely 2 miles away from Interstate 95. "It's neat because you can be in town and in two minutes be here," Benson said.

Just below Stoney Run, the river suddenly opens into a broad, bay-like spread. The going is rougher. But it's worth plowing ahead, Benson said, to reach an area on the other side of a railway bridge that he calls "Hidden Marsh." It's an Instagram-ready cove where nature has somehow gained a tenuous foothold in an otherwise suburban landscape. (Benson will give you a map to help you find it.)

The pandemic has canceled or curtailed many types of social escapes. But with paddling, social-distancing is inherent in its design, making it a good outdoor option for groups, Benson said. ■

Visiting Elk Neck State Park

WHERE:
4395 Turkey Point Road, North East, MD

COST:
Weekdays: $3 per Maryland-tagged vehicle, $5 for out-of-state vehicles.
Weekends and holidays: $3 per Maryland resident, $5 for out-of-state resident.

THINGS TO KNOW:
Some trails remain closed because of damage from a 2019 tornado. Due to COVID-19 restrictions and staff shortages, picnic pavilions and some portions of the campground may be closed.

About Bay Venture Outfitters

WHERE:
From Main Street in downtown North East, turn west on West Church Point Road. The operation is at the end of the road on the water.

COST:
Kayak and paddleboards start at $25 for up to an hour. An all-day rental is $60.

SOMETHING TO KNOW:
Because of COVID-19 restrictions, watercraft are available by advance reservation only.

Top left photo: Kelly Benson, owner of Bay Venture Outfitters, paddles down Stoney Run, a North East River tributary.

Top right photo: Mountain laurel bloom in the forest at Elk Neck State Park.

Bottom right photo: Small, sandy alcoves enable Elk Neck State Park visitors a measure of privacy while catching some sun.

Photos by Leslie Middleton

Left photo: Paddlers explore Virginia's Appomattox River, which flows into the James River near Hopewell.

Right photo: Bridge piers carried successive railroad lines across the Appomattox River though the historic settlement of Ettrick, where Virginia State University now sits.

Paddle Appomattox River's past, witness the progress

By Leslie Middleton

The Appomattox River in Virginia has long been a river I've wanted to explore. Its name conjured up associations with the Civil War, but otherwise I knew little about it. Lucky for me, a water trail helped me to tackle the adventure.

The Appomattox is the largest tributary on the tidal portion of the James River, originating near Appomattox Courthouse where Confederate Gen. Robert Lee surrendered to U.S. Gen. Ulysses S. Grant in 1865. It flows roughly east 146 miles to join the James at the city of Hopewell, 20 river miles downstream from Richmond.

With close to a dozen possible small boat launch sites on the tidal section alone, I was grateful for some local knowledge. On a cloudy May morning, Brad Flynn and Aaron Reidmiller from Hopewell's parks and recreation department introduced me and my husband to two sections of this river, starting in Petersburg.

We put in at Pocahontas Island — a slender peninsula adjacent to the cobbled streets of Old Town Petersburg — and paddled upstream past remnants of the river's rich history. Signs of modern urban progress were visible through the dense green foliage of trees and shrubs anchoring the banks and muffling Route 301.

We paddled underneath the roadway on our half-mile trip up the river, with hopes of glimpsing one of the oldest known Native American fishing weirs, a stone structure built to catch Atlantic sturgeon and other species. Local lore says that this is where the Appomattoc Indians shared knowledge about the river's bounty with the English colonists.

Some of that bounty was still on display as I tucked into an eddy below the last rapids of the fall line where the river turns tidal. Above us, an osprey reported a successful catch as it winged away, fish in talons. A long-nosed gar left a broad splash in the rapids. A fisherman on the bank pulled a striped bass to shore.

Flynn pointed to a pillow of swirling water that was likely marking the fish weir below the surface. "You can really see it well at lower water," he said.

Here, too, we saw the rubble remains of the Harvell Dam, one of many obstructions that channeled the river for navigation and harnessed its power for mills and electricity from colonial times to the present. The dam was removed in 2014 to enable fish passage.

We turned and floated back downstream. From time to time, a break in the trees revealed walkers on the Appomattox River Trail, a 22-mile bike-and-walking trail system flanking the river. The trail is a project of the Friends of the Lower Appomattox River, a 20-year partnership between the cities and counties bordering the river. This includes Hopewell, which offers multiple programs that promote healthy choices, including on-the-water activities for youths and adults.

The friends group also maintains an online mapping tool showing river access points for hiking, paddling and fishing. We floated past one of them: Appamatuck Park at Colonial Heights, on the north side of the river near a parking lot and trailheads.

The spelling of the park's name honors the river valley's original inhabitants, the Algonquin-speaking Appomattoc, encountered by Christopher Newport in 1607 and Capt. John Smith in 1608.

Smith's spelling of the tribe's name, "Appamatuck," is reflected on a historic map that shows the limits of the Smith's travels in the Chesapeake region, as well the location of bronze crosses he used to mark them. A replica of this cross was installed at the park in 2016.

After loading our boats back onto our vehicles, we caravanned COVID 19-style in separate vehicles through the streets of Pocahontas Island, the historic commercial hub on what was once Petersburg Harbor. Here, free and enslaved African Americans toiled on the water and in tobacco warehouses.

By the Civil War, the island was home to the largest settlement of free African Americans in the region who lived side-by-side with Quakers and other abolitionists. Several structures still standing in adjacent old town Petersburg served as shelters on the Underground Railroad, a network of routes and safe houses that helped people escape slavery.

Campbell Bridge at the north end of Pocahontas Island is a perfect spot to view the river frothing through Narrow Falls, a rocky chasm ending in a churning whirlpool. For 7 miles above these narrows, the river tumbles through intermittent drops sufficient to power the many factories and mills that once crowded its banks. Today, rapids with names like Jughandle, Spiked Dam and Target Rock lure whitewater paddlers.

But even this section of the river offers multiple access points for hiking and fishing, along with a 1.5-mile section of the 1810-era Appomattox Canal system that offers paddlers a flatwater route to bypass some of the rapids.

Today's maps of the lower Appomattox show multiple channels, remnants of canals dug for upstream navigation or diversion to power cotton and grain mills. Other channels were built to bypass river sections prone to shoaling.

Benjamin Uzel, president of the Colonial Heights Historic Society, has researched these historic changes. Uzul said that the river below Petersburg has undergone at least three re-routings. Evidence of this and the multiple railroad lines serving the area are found along the river in remnants of stonework, brick and concrete.

From Campbell Bridge, we drove 20 minutes to White Bank Park and a small boat launch onto Swift Creek, a 45-mile tributary that joins the Appomattox River just west of Interstate 295 and barely 5 miles above the James.

We slid our kayaks onto the dark waters of the tidal freshwater marsh, its channel lined with dense rafts of arrow arum and pickerelweed. Within minutes, we ducked under low-hanging branches to enter the Swift Creek Conservation Area, a 495-acre undeveloped and mostly swampy natural area owned by Chesterfield County.

The waterway soon opened up into a series of longitudinal ponds interspersed with islands, some barely large enough for a scrubby bush of viburnum, others large enough to grow a few trees. Much of the area was actively mined for sand and gravel until recently, but now nature is certainly having its way.

With the help of GPS, we navigated a route through an intriguing maze of channels, past cul-de-sacs that dead-ended onto scant deposits of earth sporting bright spots of yellow and purple irises. Woodpeckers rattled hollow tree trunks in the drowned landscapes as we circled a small island draped in the pink blossoms of wild azalea.

Multiple birdhouses perched on metal poles rose out of the swamp. Tidal wetlands on the Appomattox and nearby James River are one of the spring destinations of scores of brightly colored yellow prothonotary warblers migrating from South American. The bird boxes have facilitated years of research by local biologists and birders.

The lower Appomattox also hosts an isolated population of water moccasins (or cottonmouths). As we traversed the wetlands that felt increasingly primeval, we shared stories of encounters with the only venomous water snake in Virginia.

But Susan Watson, a biologist with the Virginia Department of Game and Inland Fisheries, said their presence shouldn't keep paddlers away. "These snakes have no interest in biting or attacking humans. They simply are not aggressive," she said, though they may be provoked if they feel threatened.

Stories of water moccasins coming after paddlers can be attributed to the snakes' curiosity or mistaking a boat as a potential place to haul out and sun themselves. In fact, Watson said, we should be grateful for their habit of showing their fangs — it's a warning and one we should heed.

The possible presence of snakes reminded me how easily we can forget that the wildness we seek — and that conservation areas like Swift Creek offer — comes with the responsibility to be informed paddlers, armed with the knowledge of river obstructions, tides, and the plants and animals that make their homes here.

After thanking our guides, my husband and I drove to Hopewell's Old City Point Waterfront Park where the Appomattox widens into a broad bay as it meets the James River. The high bluffs on the southern shore there have provided a strategic vantage point through the centuries. Sir Thomas Dale, governor of the Jamestown colony at various times between 1611 and 1616, explored the possibility of moving the Jamestown settlement to Hopewell. Though that idea never took hold, Hopewell is the oldest continuously inhabited English settlement in the United States.

Just upriver from Old City Point, Appomattox House commands a wide view of both rivers. From here, Grant plotted the final months of the Civil War as Union troops laid siege to Confederate troops in Petersburg, transforming Hopewell into a busy Union supply base. President Lincoln visited the site twice.

From historic cities and canals to woodlands and wildlife, it turns out that my curiosity about this river was well-founded. After sampling just a few of the river's offerings, I wasn't disappointed. The lower Appomattox flows through a rich and varied landscape, washed by the changing tides of water and time, with shoreline communities committed to providing residents and visitors abundant options for river time. ■

FOR INFORMATION

Learn about river access points at folar-va.org/access-points.

Check tidal information for Puddledock, VA, at tidesandcurrents.noaa.gov/tide_predictions.

After coronavirus restrictions are lifted, explore outdoor recreation programs, including kayak trips for beginners, offered by the town of Hopewell: hopewellrecandparks.com/outdoors.

Top photo: A foot bridge carries hikers across the water at Appomattox Riverside Park in Petersburg, VA.

Bottom photo: The Hopewell Riverwalk offers an intimate view of the tidal shoreline and broad bay where the Appomattox meets the James River.

Turtles bask on the Wicomico River in Salisbury, MD. (Dave Harp)

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A tree swallow perches on a dock line on Peachblossom Creek near Oxford, MD. (Dave Harp)

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Sites for outdoor activities more important than ever

By Rachel Felver

Our access to the outdoors has a new meaning these days. With the spread of the novel coronavirus and the stay-at-home orders that followed, our green spaces have become a haven for us to breathe in some fresh air and forget about the stresses of life for a while.

When the most recent Chesapeake Bay Watershed Agreement was signed in 2014, the many Chesapeake Bay Program partners committed to increase the public's access to the Bay and its tributaries by creating 300 new access sites by 2025.

These sites are developed, funded and maintained by a variety of partners, including local, state and federal agencies, as well as nongovernmental organizations. Selecting a site takes into consideration a variety of factors, including looking at the way people generally use and access water resources. As the population of our watershed continues to grow and diversify, it is integral that our partners honor the culture, history and social concerns of local populations and communities and include them in the decision-making and planning process.

In 2019, we opened an additional 18 public access sites for boating, fishing, swimming and other recreational activities. Since 2014, we've added a total of 194 new sites, meeting 65% of our goal. What are you waiting for? Read on for highlights of the new sites that opened in 2019 and get out there and start exploring!

Appomattox River

- *Hopewell Boardwalk* (Hopewell, VA): Visitors to the waterway now have a fishing pier and an 8-foot-wide, 1,700-foot long boardwalk in which they can stroll through a tidal cove and wetlands. When it is high tide, the boardwalk is surrounded by water, giving you the illusion that you are out in the middle of the river. During low tide, take in the marshes and sandy river bottom.

Chesapeake Bay

- *Lake Whitehurst* (Norfolk, VA): Lake Whitehurst is one of eight freshwater reservoirs that delivers drinking water to Norfolk and the surrounding area. It drains into the Chesapeake Bay and allows for fishing, boating, canoeing, kayaking and paddleboarding. The lake features a much-needed, new launch pad for motorized boats. The previous one closed back in 2009.
- *Tylerton Harbor* (Smith Island, MD): Folks looking to bring their canoes, kayaks or paddleboards with them to Smith Island now have a new soft launch site in which to access the Bay. Remember, this site is only reachable by water but offers a pier to take in the views.
- *Wellington Beach and Park* (Crisfield, MD): This beach and park is a hidden gem along Maryland's Eastern Shore. A wide stretch of sandy beach allows for swimming, fishing and launching canoes, paddleboards and kayaks, while the park offers parking and restrooms.

Elizabeth River

- *Ferry Point Park* (Virginia Beach, VA): Off the eastern branch of the Elizabeth River, the Living River Restoration Trust acquired 9 acres of undeveloped land to permanently protect forested shorelines and wetlands. It is open to the public.
- *Paradise Creek* (Portsmouth, VA): A handicapped-accessible kayak, canoe and paddleboard launch is open for visitors to get on the water and explore 11 acres of restored wetlands. Paradise Creek Nature Park is the outdoor field station for the Elizabeth River Project, and is used to teach how an urban river can be brought back to life.

Jackson River

- *Intervale River Access and Trailhead* (Covington, VA): The trailhead of the Jackson River Scenic Trail features restrooms, a pavilion, parking and now, a launch for kayaks, canoes and paddleboards. Either walk or bike the gravel trail, or traverse the river which runs parallel for over 14 miles.
- *Jackson River Sports Complex* (Covington, VA): The City of Covington wanted to further expand the recreational activities for residents, so in 2019, they used their waterfront access to the Jackson River to create a launch for kayaks, canoes and paddleboards.

James River

- *James River National Wildlife Refuge* (Hopewell, VA): The refuge supports hundreds of native plant and animal species throughout forests, wetlands and grasslands. With the addition of a new canoe, kayak and paddleboard launch, visitors can experience these wonders from the water as well.

Jonathan Kurtz fishes with his sons Grady, 6, and Jake, 9, at the Lower Marlboro Pier in Calvert County, MD, in June 2020. A platform for launching canoes and kayaks was added to the pier in early 2019. (Will Parson/Chesapeake Bay Program)

Nanticoke River

- *Mardela Springs boat launch* (Mardela Springs, MD): A new soft launch access point allows canoers, kayakers and paddleboarders to join motorized boat owners on Barron Creek, a tributary of the Nanticoke River.
- *Phillips Landing* (Laurel, DE): Motorized boaters can launch from a new three-lane ramp, which features two floating docks and wing walls, allowing for an easier and safer experience. Additional revisions included the construction of a new canoe/kayak launch, as well as a repaved parking area, stone path for shoreline fishing, portable toilet enclosures and solar lighting.
- *Woodland Wharf* (Laurel, DE): Located near the historic Woodland Ferry, this new facility features a boat dock with a canoe/kayak launch, six-space parking area, shoreline fishing access, benches and bike racks.

Patuxent River

- *Jefferson Patterson Park & Museum* (Calvert County, MD): Out for a leisurely boat ride and want to stop for some history and culture? The park now features a day-use docking facility. Dock up and take in the home of the Maryland Archaeological Conservation Laboratory or spend the day exploring, hiking, biking or picnicking on the 560-acres of preserved land.
- *Lower Marlboro Wharf* (Owings, MD): A soft launch access has been added to the existing fishing pier at Marlboro Wharf for canoers, kayakers and paddleboarders. This was one of 20 steamboat landing wharves in Calvert County, helping residents, businesses and farms access the Chesapeake Bay.
- *Solomons Island Fishing Pier* (Solomons, MD): Canoers, kayakers and paddleboarders can join motorized boat owners on the Patuxent River, thanks to a new soft launch access point. The fishing pier features restrooms, a tackle-and-bait shop and parking.

See OUTSIDE, page 39

Chesapeake Bay cleanup is in jeopardy; if the EPA is unwilling to act, we will

By Lisa Feldt

In a show of solidarity unprecedented in the history of the Chesapeake Bay restoration effort, citizen groups, a county and four Bay jurisdictions have put the U.S. Environmental Protection Agency on notice that we won't allow it to give up on clean water.

In late May, the Chesapeake Bay Foundation and our partners — the Maryland Watermen's Association; Anne Arundel County, MD; and Virginia cattle farmers Jeanne Hoffman and Bobby Whitescarver — filed a Notice of Intent to sue the EPA for its failure to require Pennsylvania and New York to develop plans that will achieve the 2025 Bay restoration goals in accordance with the Chesapeake Clean Water Blueprint. The attorneys general of Delaware, Maryland, Virginia and the District of Columbia also filed their own notices of intent to sue.

The reason is simple. The Blueprint is our last, best chance to achieve the fishable, swimmable waters guaranteed by the Clean Water Act. As the only entity with the authority to enforce the state's commitments to reduce pollution, the EPA's inaction puts the success of the entire restoration, and all of the progress we've made, at risk. The agency can choose a different course.

The Clean Water Act requires providing the EPA with a notice of intent 60 days before a lawsuit can be filed, giving the agency the opportunity to resolve issues without litigation. There are a number of steps the EPA can and should take.

First, the EPA must use its authority under the Clean Water Act to ensure that Pennsylvania and New York develop plans that meet their commitments for reducing nitrogen, phosphorus and sediment pollution in waterways that feed into the Bay by 2025. These commitments were agreed upon by all of the Bay jurisdictions in the 2014 Chesapeake Bay Agreement, which the EPA is mandated to uphold. At present, neither Pennsylvania nor New York have submitted plans that achieve their share of reductions.

Second, the EPA should lead federal efforts to provide additional resources to reduce pollution and help the states achieve their goals, including targeting federal agriculture conservation dollars to the most effective practices and locations. This is especially critical in Pennsylvania, where elected officials have not invested sufficient funds to support farmers and local conservationists who are working on the ground to reduce pollution in waterways.

Taking the actions necessary to reduce pollution will support local businesses, create jobs, and provide additional environmental and public health benefits.

We encourage the EPA to take these steps, but we are also fully prepared to use litigation if the agency does not enforce the Clean Water Act and hold these states accountable.

After decades of failed commitments, the Blueprint is working. Pollution is down, and crabs are rebounding. The dead zone in the Bay is getting smaller over time — this year, the volume of low-oxygen water is expected to be 9% lower than the 34-year average.

We're only five years away from the Blueprint's 2025 deadline. Clean water is essential to our region's health, economy, outdoor heritage and quality of life. The EPA must be held accountable now if we are going to leave a legacy of clean water to future generations. ■

Lisa Feldt is with the Chesapeake Bay Foundation, where she is vice president for Environmental Protection and Restoration.

OUTSIDE *from page 38*

Shenandoah River

■ *Seven Bends State Park* (Woodstock, VA): Visitors to the park already have access to hiking, boating, restrooms and pavilions, but with the addition of a canoe slide, it is easier to get on the water.

Potomac River

■ *Neabsco Creek Boardwalk* (Woodbridge, VA): Visitors to Neabsco Creek just got another reason to hang out on the almost one-mile boardwalk — the addition of a viewing platform. Now people can spend more time looking at the great blue herons, mallards, wood ducks and red-winged blackbirds that live around the creek, while reading interpretative signs to learn more.

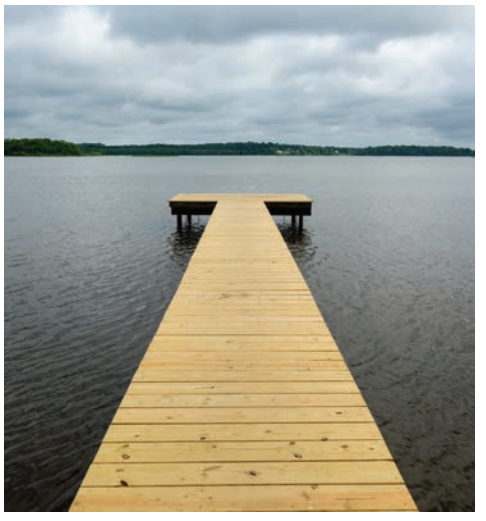
■ *Potomac River Industrial Park* (Cumberland, MD): A new boat ramp for all types of watercraft is available at the park. This is the last access point before reaching the Blue Bridge Dam in Cumberland.

York River

■ *Wormley Creek* (Yorktown, VA): A new, handicapped-accessible launch for kayakers, canoers and paddleboarders is available at this unique intersection of the York-James peninsula. This is the only access point in York County that is accessible to those with disabilities. A new pier was built to accommodate the launch.

To learn even more and discover a public access site near you, please visit ChesapeakeProgress.com. ■

Rachael Felver is the communications director for the Chesapeake Bay Program.



A fishing pier is part of the 1,700-foot Riverwalk in Hopewell, VA. The boardwalk faces the confluence of the Appomattox and James rivers. (Will Parson/Chesapeake Bay Program)

LETTER TO THE EDITOR

Cave owes its restoration to Endangered Species Act

The story of Virginia's newly minted Cave Hill Natural Area Preserve might never have happened without the Endangered Species Act See *Virginia cave, home to unique isopod, gains permanent protection*," (June 2020). As noted in the article, the Madison Cave isopod, which was protected as a threatened species in 1982, was the headliner in the reasons for protecting these special caves. Ensuring species aren't driven extinct, including this unique isopod, by protecting their habitats is one of the primary purposes of the Endangered Species Act. It's also one of the main benefits that the law provides people: preserving parts of the natural world for future generations to marvel over.

Unfortunately, this important conservation law is under unprecedented attack by polluters and other special interests. The Trump administration last year watered down rules governing the implementation of the act, including weakening protections for species protected as "threatened" like the isopod.

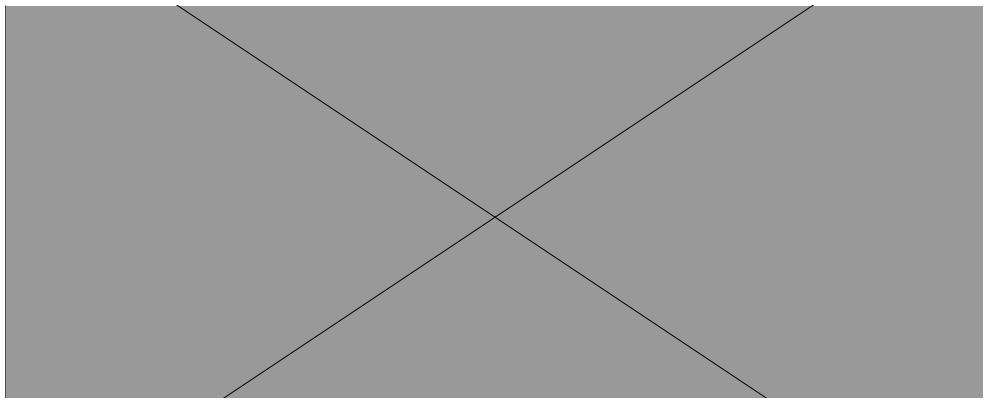
I sincerely hope Virginians enjoy their new nature preserve and with this enjoyment recognize that it was created in large part because of the Endangered Species Act — a law that needs the vocal support of everyone who cares about the natural world.

Noah Greenwald
Portland, OR

SHARE YOUR THOUGHTS

The Bay Journal welcomes comments and perspectives on environmental issues in the Chesapeake region. Letters to the editor should be 350 words or less. Opinion columns should be arranged in advance. Contact editor Karl Blankenship at kblankenship@bayjournal.com or 717-428-2819. You can also reach the Bay Journal by mail at 619 Oakwood Drive, Seven Valleys, PA 17360-9395. Please include your phone number or email address.

E-ferry evaluation: Electric propulsion cheaper than diesel



The E-ferry Ellen serves the island of Ærø (Aeroe) in the southern Danish seas. (Halfdan Abrahamsen)

By Halfdan Abrahamsen

As part of the team that works with the fully electric "E-ferry" Ellen in Denmark, it was exciting for me to get requests from the Chesapeake Bay area for information, and I was intrigued when I found out that the Ellen was featured in a Maryland study about the potential use of a ferry for crossing the Bay. (See *Maryland officials zap electric ferry proposal for Chesapeake crossing*, April 2020.)

With that in mind, I wanted to share that we have recently published our performance data and calculations on the costs of building and operating an electric ferry. Everyone is invited to make use of it. We hope this will help managers make decisions on the basis of valid and current figures. The lack of data in connection with building fully electric ferries has been a real hurdle to getting projects under way, and we hope that our data will fill a void.

Our conclusion is clear: It is cheaper to build and operate a fully electric ferry than a diesel or diesel-electric ferry.

The homeport of the E-ferry Ellen is Søby, a small town on the island of Ærø (Aeroe) in the southern Danish seas, inhabited by 6,000 people. The only connections to the mainland are by ferry, so ferry sailing and ferry building is both a matter of necessity and pride to the islanders.

The Ellen was built with support from the EU's Horizon 2020 program, and has been in operation since August 2019, making five round trips a day — and seven trips is an option. Ellen spends around 1600 kWh as she travels the route of 22 nautical miles (25 miles) and carries a maximum of 31 cars. She is fast, and typically "sails" just short of 13 knots.

Moreover, the Ellen travels a route that is seven times longer than any other electric ferry in operation. She covers the 22 nautical miles without a recharge, and can actually go at least 45 nm. After being fully charged during the night, she only needs quick spot charges during turn-arounds in Søby Harbor.

Our calculations show that fully electric sailing is the best solution, economically, for a local or regional ferry operator. Investment costs are higher, but the savings in operation offset those costs after four to eight years. Thus, as the lifespan of a ferry is typically around 25–30 years, an operator can look forward to significant savings after a few years of operation.

An E-ferry is also good for the local and global environment, because it releases neither greenhouse gases nor dangerous particles. We save the atmosphere from more than 2,500 tons of carbon dioxide per year compared with the diesel ferry it replaced.

How does Ellen perform so well? The local ship architects, Jens Kristensen Aps, designed the ferry for fully electric operation from the start. It has pointy ends and a slight bulge in the middle, which lets her slip through the water very effectively. Also, the passenger salon sits close to the waterline, on the same level as the car deck, most of which is uncovered to cut down on weight.

The designers also did not waste weight on fossil fuel tanks and emergency generators. Instead, the Ellen has two separate battery rooms connected to individual propellers. This makes the systems fully redundant, and we can always get home on just one battery room and propeller.

Passengers love the Ellen. We offer light food and drinks, but elaborate kitchen facilities, cabins and electronic entertainment items have been left out. Such things are superfluous on short crossings, and passengers have not requested them. Instead, they often praise the sundeck, where there's none of the usual smog, no noise and no rumbling.

The captains also love the ship, in part because the power is instantaneous. This makes it easier to navigate tight ports and gives them greater confidence in maneuvering.

Many people are surprised to learn that the Ellen's system is more environmentally sound that diesel propulsion even if you charge the batteries with electricity from fossil fuels. This is because the energy efficiency of the total system is 85%, which is more than twice that of a diesel ferry. That results in direct savings to the operator.

Furthermore, the fundamentally simple technology means that Ellen is certified to sail without a ship engineer onboard. This also translates into savings.

Thus, for both environmental and economic reasons, we are confident that our new data will be a positive surprise to many and change conventional wisdom on going fully electric in the maritime world.

Write us an e-mail with "Information package" in the title to receive the evaluation report by e-mail: energylab@aeroekommune.dk. ■

Halfdan Abrahamsen is the Information Manager for Ærø EnergyLab.

LETTER TO THE EDITOR

PA NRCS has been promoting soil health for decades

The Pennsylvania Natural Resources Conservation Service is responding to *Soil health practices increasingly helping farmers hit pay dirt*, June 2020. The article contained a quote from Mark Goodson, NRSC state agronomist, that was taken out of context. The context was that PA NRCS, Penn State University and conservation districts were slow to promote soil health principles compared with nongovernmental organizations and other private industries.

On the contrary, PA NRCS has recognized healthy soil as the foundation of prosperous farms and healthy water since the agency's inception in 1935. Together with its partners, PA NRCS has been a proponent of healthy soils for decades. When the soil health grassroots effort began in the 1990s and early 2000s, PA NRCS created technical publications with PSU to advise farmers on adding organic matter, improving aggregate stability, reducing tillage and minimizing compaction. Both financially and technically, PA NRCS supported the development of groups like the Pennsylvania No-Till Alliance and Pennsylvania Grazing Coalition.

Today, PA NRCS hosts 3,000-5,000 producers annually at PA soil health events that take place locally, regionally and statewide. Working with Penn State Cooperative Extension and local conservation districts, those events have included hands-on demonstrations, pasture walks and training. This has precipitated more than 1.6 million acres of soil health practices on PA landscapes since 2002 with a commitment of approximately $479 million.

Today, there are many new opportunities in soil health. In fiscal year 2020 and beyond, producers may take advantage of soil health testing, financial assistance for soil health assessments and soil health enhancements. NRCS continues to fund soil health-related practices through its Conservation Innovation Grants, including demonstration trials, a soil health benchmark study, carbon markets, grazing of annuals/perennials, cover crop interseeding and nutrient management. PA NRCS has also begun using field level Pasture Condition Scoring.

PA NRCS has long recognized healthy soil as the foundation for working lands in our state. Together with our partners and customers, we will continue to invest in soil health and conservation.

Denise Coleman
NRCS state conservationist

If we are to deserve our world, we must re-examine our living

By Tom Horton

Nearing yet another majestic tree, light and birdsong sifting through its boughs, I get my hopes up that it's not doomed like so many we've passed today in the ancient headwaters forests of lovely Miles Creek.

"Binocular botany," says Paul Spitzer, meaning he'll need his field glasses to identify the tree by its leaves. They are that tall — oaks, beeches, tulip poplars.

But damn. On the other side of its trunk we see another slash of red paint. It's marked for cutting. The logger knew what he was about: only the biggest and best. That amounts to a sizeable portion of all the trees along this stream valley draining into the Choptank River near Trappe, MD. Hauling out the old giants will trash much of the surrounding forest.

"High grading" is the technical term for this, and it's the antithesis of good land stewardship, according to a Penn State forestry bulletin: "[It shows] no concern for species composition, quality and density of the remaining forest … removing important seed sources … leading to a decline in long-term forest health."

But, of course, this is not about stewardship. It's about quick profit for the owners of several farms and estates around Miles Creek, a perfectly legal, widely accepted degradation of bird habitat, water quality and beauty centuries in the making.

And it is not even the worst thing about to happen to this underappreciated gem of southern Talbot County that lies between U.S. 50 and a great arc described by the Choptank for miles upstream from Cambridge.

"A well-kept secret," said Spitzer, a professional naturalist who's inhabited and roamed this region for decades. It's a capillary sprawl of forest-lined creeks riving a quiet landscape of farms and estates, a world away from nearby tourist towns like St. Michaels and Tilghman, from yachty Oxford and bustling Easton.

Miles Creek is in my personal top 10 of sublime Chesapeake paddles — meanders edged with creamy hibiscus and green-golden wild rice, shaded by ancient beech forest, inaccessible to power boats thanks to a low bridge near its mouth. It's a place lousy with the sounds of birds and frogs, a place where one can see eagles teaching their young to fish for spawning white and yellow perch. It teases the paddler to push on and on, to what will be revealed around the next bend, and the next.

Socrates is said to have said, "A life unexamined is not worth living." My rambles through this "Great Bend" region of the Choptank with Spitzer convince me that, in the Socratic spirit, a place unexamined is not worth living in. Or, perhaps more accurately, we are not fit to live in a place whose nature we scarcely consider.

Which brings me to the bloated and ill-considered would-be mega development known as Trappe East or Lakeside, which would add several thousand people and 2,500 homes and stores and shops to sleepy Trappe, with its population of around 1,000. It also would spray half a million gallons a day of treated sewage on lands adjacent to Miles Creek and increase the paved surfaces in the creek's watershed by more than threefold, to about 9%, according to the Shore Rivers environmental group.

That last is a biggie, as the science in the last couple of decades has proven that after impervious surfaces around a creek reach 10%, water quality degradation is inevitable. With the Choptank getting a B-minus grade in recent water quality surveys, more paving and more sewage would seem … oh, I don't know, nuts?

Back when the feckless elected leaders of Trappe first approved plans for the new megatown nearly 20 years ago, the environmental equation was perhaps less defined. But even then, it was a tacky proposal — no design standards to blend in with the rural nature of the region, no real water quality guarantees, no consistency with the Talbot County master plan.

Binoculars at the ready, Paul Spitzer enjoys a fall paddle on the upper Miles Creek in Maryland. (Dave Harp)

It hasn't aged well in those two decades, to put it mildly. And yet it lives. The 2008 recession had put it out of sight and out of mind, but it lives again — because the tiny town exploited a legal loophole that allowed it to annex more than a square mile of rural county land, effectively letting a few hundred voters decide development policy affecting a whole region.

It lives because years back, inexplicably, the Maryland Department of Environment allowed the town and developer Robert Rauch to make an end run around Talbot County, granting permits for sewage treatment construction that are historically the province of counties, not the state.

It lives because the county council is considering an amendment letting the development move ahead at an accelerated pace — an amendment written by Rauch's lawyer.

It lives because too many of Talbot County's elected leaders (like too many elected leaders Baywide) just don't feel comfortable with even seeming to oppose growth, never mind that this one development would account for the next couple of decades of growth projected for all of Talbot.

"We can't keep letting developers define who we are." Among the conversations I had with landowners around Miles Creek who oppose the development, that line from Jay Corvan, an architect, sticks with me.

He says the "planning disaster" that is Lakeside / Trappe East "essentially happened because people in Trappe wanted their own place to shop [Easton is 15 minutes away], and Rauch said if they'd give him 2,000 homes, he'd get them shopping."

It's all connected. Attempts to interest the state in protecting the soon-to-be-cut forests — which include land owned by Rauch — elicited an email that said forest preservation would not be a wise investment for the state, being so close to where thousands of homes could be built.

Mr. Corvan and others continue to try to interest the county in smaller, better designed additions to Trappe, and environmentalists are exploring ways to pay the forests' owners to not cut the big trees. All this seems like Hail Mary stuff at this writing.

"We can't keep letting developers define who we are." I keep coming back to that quote.

Maybe, in Talbot County, this is who we are. ■

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

BULLETIN BOARD

VOLUNTEER OPPORTUNITIES

WATERSHEDWIDE

Project Clean Stream
The Alliance for the Chesapeake Bay's *Project Clean Stream* takes place in all six Bay states and DC on and around the National Day of Service, Sept. 11. Pick up trash in waterways & parks using supplies (trash bags, gloves) provided by the Alliance. Residents, local businesses, environmental organizations, local governments, community groups, houses of worship, schools and universities welcome. Info: chesapeakenetwork.org/groups/project-clean-stream, projectcleanstream@allianceforthebay.org.

Citizen Science: Creek Critters
Use Audubon Naturalist's *Creek Critters* app to check a stream's health by identifying small organisms, then creating a report based on what is found. Get the free program at App Store or Google Play. Info: anshome.org/creek-critters. Learn about partnerships / host a Creek Critters event: cleanstreams@anshome.org.

Chesapeake Network
Join the Alliance for the Chesapeake Bay's *Chesapeake Network* to learn about events or opportunities that protect or restore the Bay, including webinars, job postings and networking. Stay connected with the conservation world. Info / search engine: *Chesapeake Network*.

WORKDAY WISDOM

Make sure that when you participate in cleanup or invasive plant removal workdays to protect the Chesapeake Bay watershed and its resources that you also protect yourself. Organizers of almost every workday strongly urge their volunteers to wear long pants, long-sleeved shirts, socks and closed-toe shoes (hiking or waterproof). This helps to minimize skin exposure to poison ivy and ticks, which might be found at the site. Light-colored clothing also makes it easier to spot ticks. Hats are strongly recommended. Although some events provide work gloves, not all do; ask when registering. Events near water require closed-toe shoes and clothing that can get wet or muddy. **Always bring water.** Sunscreen and an insect repellent designed to repel both deer ticks and mosquitoes help. Lastly, most organizers ask that volunteers register ahead of time. Knowing how many people are going to show up ensures that they will have enough tools and supervisors. They can also give directions to the site or offer any suggestions for apparel or gear not mentioned here.

MARYLAND

Master Naturalist Training
Get *Master Naturalist* training at Gunpowder Falls State Park in Baltimore & Harford counties 9 a.m.–3 p.m. Mondays Sept. 14–16 & two Saturdays (TBA). Learn about the state's plants & animals. Participants complete 60 hours of classroom and hands-on learning in natural history, geology, interpretation, botany, birding and more. Certification awarded after class completion and 40 hours of volunteer service. Applications: extension.umd.edu/masternaturalist (use the piedmont or coastal links on right side of page). Fee of $250 due upon acceptance into the training. Info: Shannon Davis at 410-477-0757, shannonm.davis@maryland.gov or visit extension.umd.edu/masternaturalist.

Severn River Association
Work independently on land & water to track conditions in the Severn River's watershed using COVID-19 safety protocols developed with the MD Department of Natural Resources to protect staff and volunteers working in the field. Training will be offered as circumstances allow. Citizen scientist opportunities include:
- ***Water Quality Monitoring:*** Through October. Conduct weekly boat tours to monitor the river's health.
- ***Water Quality Crew:*** Morning river cruise collects scientific data and monitors wildlife habitat.
- ***Join the SAV Navy!*** Set your own hours through September. Use kayak, canoe or small boat to map SAV beds, identify submerged aquatic vegetation. Paddlers of all skill levels welcome. Gear supplied.
- ***Tell Severn's Story?*** Writers, photographers, reporters, memoirists needed to record story of river's wildlife, people, forests, history, culture and sailing. SRA can create internships for journalists of all ages who want to tell a story, cover meetings, take pictures.
- ***GEMS Expedition:*** Explorers, naturalists & foresters needed for a land-based expedition to map 500 ecological features throughout the Severn watershed: wetlands, trees, ferns, plants, wildlife, creeks, historical & cultural features to create a GIS map of watershed's ecology.

Info: Info@severnriver.org. Put "volunteer" in message box.

Patuxent Research Refuge
Volunteer in the Wildlife Images Bookstore at the National Wildlife Visitor Center of the U.S. Fish and Wildlife Service's Patuxent Research Refuge in Laurel. Responsibilities include opening & closing store, helping customers select merchandise, operating point-of-sale register. Training provided. Info: 301-497-5771, lindaleechilds@hotmail.com.

Ruth Swann Park
Remove invasive plants. 10 a.m.–4 p.m. the second Saturday in July, August & September. Meet at Ruth Swann Park-Potomac Branch Library parking lot. Bring lunch. Run by Maryland Native Plant Society, Sierra Club & Chapman Forest Foundation. Info: ialm@erols.com, 301-283-0808, (301-442-5657 day of event). Carpoolers meet at Sierra Club MD Chapter office at 9 a.m. & return at 5 p.m. Carpool contact: 301-277-7111.

Chesapeake Bay Environmental Center
Help CBEC in Grasonville. Drop in a few times a month or help more frequently. Openings: help with educational programs; guide kayak trips & hikes; staff front desk; maintain trails, landscapes & pollinator garden; feed or handle captive birds of prey; maintain birds' living quarters; participate in CBEC team of wood duck box monitors or other wildlife initiatives. Other opportunities: fundraising, website development, writing for newsletters & events, developing photo archives; supporting office staff. Volunteers donating more than 100 hours of service per year receive a free one-year family membership to CBEC. Info: volunteercoordinator@bayrestoration.org.

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

Citizen Science: MD volunteer angler survey
Help the Department of Natural Resources collect species, location, size data using its *Volunteer Angler Survey* on a smartphone. Data are used to develop management strategies. The artificial reef initiative, blue crab, freshwater fisheries, muskie, shad and striped bass programs also have mobile-friendly methods to record data. Win quarterly prizes. Info: dnr.maryland.gov/Fisheries/Pages/survey/index.aspx.

Mount Harmon Plantation
Help with manor house student tours, colonial crafts, hearth cooking, guided nature walks & herb garden at Mount Harmon Plantation in Earleville, MD. Special events include manor house tours, admission/ticket sales, gift shop, auction & raffle fundraisers. Training provided. Docents are asked to commit to eight service hours per month during tour season: 10 a.m.–3 p.m. Thursdays–Sundays, May–October. Info: 410-275-8819, info@mountharmon.org.

VIRGINIA

VA Master Naturalists
VA Master Naturalists are a corps of volunteers who help to manage and protect natural areas through plant & animal surveys, stream monitoring, trail rehabilitation, teaching in nature centers. Training covers ecology, geology, soils, native flora & fauna, habitat management. Info: virginiamasternaturalist.org.

Cleanup support & supplies
The Prince William Soil & Water Conservation District in Manassas, VA, gives stream cleanup events the supplies and support they need for trash

Submission Guidelines

ONLINE
The *Bay Journal* website has a new look! It also has a new section called ***Bulletin Board***, where you can log in and post your own events — and even include a photo. Visit bayjournal.com and click on "Bulletin Board."

IN PRINT
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 Chesapeake Bay region.

DEADLINES
The printed edition of ***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 run at least two months in advance.

September issue: August 11
October issue: September 11

FORMAT
Submissions to ***Bulletin Board*** must be sent either as a Word or Pages document or in the body of an e-mail. Other formats, including pdfs or Mailchimp, *will only be considered if space allows* and information 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 whether the program is free or has a fee; has an age requirement or other restrictions; or has a registration deadline or welcomes drop-ins.

CONTACT
Email your submission to kgaskell@bayjournal.com. Items sent to other addresses are not always forwarded before the deadline.

removal projects. Groups also receive an Adopt-A-Stream sign recognizing their efforts. For info, to adopt a stream, get a proposed site: waterquality@pwswcd.org. Register events: trashnetwork.fergusonfoundation.org.

Chemical Water Quality Monitoring Teams

Volunteers with the Prince William (County) Soil and Water Conservation District and Department of Environmental Quality Chemical Water Quality Monitoring Teams collect data from local streams. Training includes collection techniques, reading data. Monitoring sites are accessible for easy collection. Info: waterquality@pwswcd.org, pwswcd.org.

Hoffler Creek Wildlife Preserve

Volunteer 10 a.m.–1 p.m. the second Saturday of August and September at Hoffler Creek Wildlife Preserve in Portsmouth. Remove brush piles/ debris from trails, widen trails, trim invasive vines from trees, help with kayak tours / rentals. Recommended ages 16+ (18 & younger w/adult). Parents of children ages 10–15 who would like to volunteer are invited to contact the preserve for age-appropriate tasks. Because of COVID-19 concerns, the park is limiting the size of volunteer groups & will work to set up projects for groups or 10 or more. Individual volunteers / families can help w/projects at their own convenience outside of the monthly workday. Info & volunteer questionnaire: hofflercreek.org Hoffler Creek Wildlife Foundation, 757-686-8684, hofflercreek@hofflercreek.org.

PENNSYLVANIA

Middle Susquehanna River

There are many ways to get involved with the Middle Susquehanna Riverkeeper Association:

- ***Susquehanna Stewards:*** Deliver programming and information to people in their region, help develop new initiatives. Info: middlesusquehannariverkeeper.org
- ***Water Reporter app:*** Help to track the health of various fish species in the Middle Susquehanna watershed by sharing photos, locations and other info about their catches via the app. Reports are made available to view via an interactive map at middlesusquehannariverkeeper.org.
- ***Share Concerns:*** The Middle Susquehanna Riverkeeper Association takes reports of any concern regarding the river or its tributaries very seriously. If you have a report of something out of the ordinary, email Riverkeeper John Zaktansky at midsusriver@gmail.com or call 570-768-6300.

EVENTS / PROGRAMS

VIRGINIA

Virginia Vistas photo contest

Scenic Virginia is accepting photos for its annual contest in these categories: cities & towns, coastal & Chesapeake Bay, farms & open space, highways & byways, mountains & valleys, scenic trees, vistas featuring wildlife and rivers & waterways (To mark the 50th anniversary of the state's "Scenic River" program, entrants in this category are restricted to photos taken along designated sections of the state's scenic rivers this year.) Judges will select a Best in Show & eight category winners. Scenic Virginia supporters will choose the winning Fan Favorite photo. The deadline to submit photos is July 31. Visit scenicvirginia.org for rules, entry form.

MARYLAND

Chesapeake Bay 101

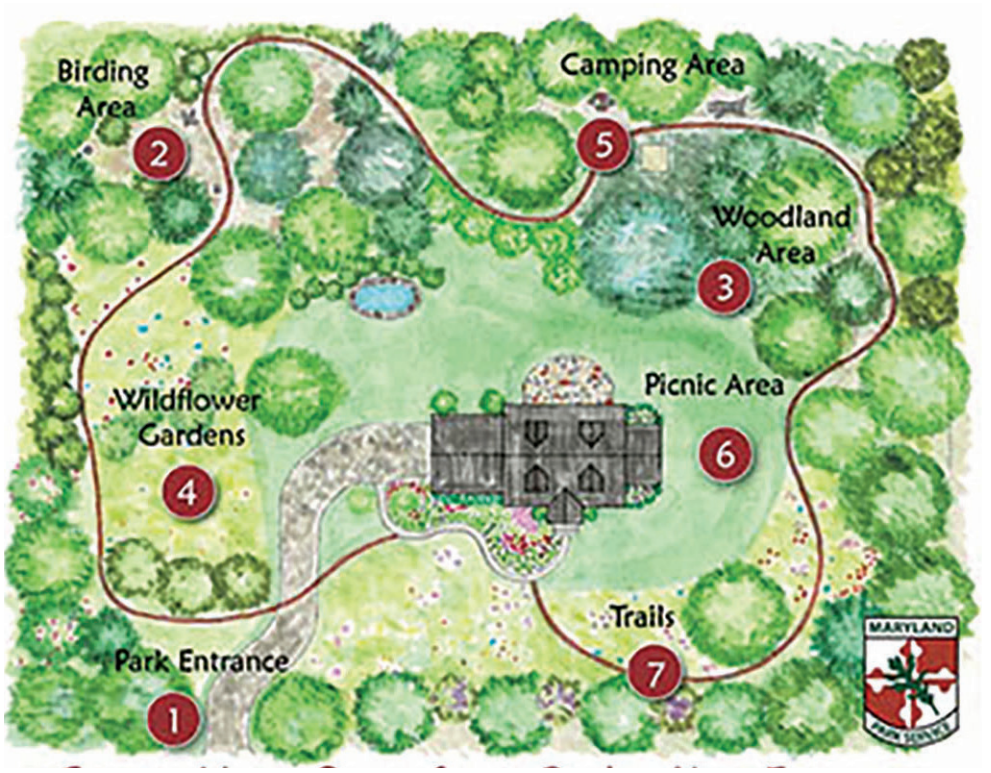
The University of Maryland Center for Environmental Science's Horn Point Laboratory in Cambridge is presenting Chesapeake Bay 101, virtual seminars that shed light on the mysteries and natural elements of the Bay. Seminars are 5–5:30 p.m.

- ***News on Living Shorelines to Protect our Waterfronts:*** July 15. Speaker: Cindy Palinkas
- ***Bolstering the Maryland Oyster Aquaculture Industry:*** July 22. Speaker: Shannon Hood.
- ***Modeling: What it is and How it Helps Predict the Future of the Chesapeake Bay:*** July 29. Speaker: Kenny Rose.
- ***Chesapeake Bay Underwater Grasses:*** Aug. 5. Speaker: Lorie Staver.

Free. Registration required. Info, registration: umces.edu/hpl or contact Carin Starr at cstarr@umces.edu.

Create your own state park

Relax, connect with nature and be revitalized by the wonder of the outdoors without leaving home in the Maryland Department of Natural Resources' Create Your Own State Park Challenge. Turn your own home into a state park by making a map (see illustration at top of page) of your property that includes some of these features: park entrance, birding, woodland, picnic & camping areas wildflower gardens, trails, activity sheet, other activities. Visit a list of activities at tinyurl.com/createyourown2020, (complete rules are also found here). After completing at least 10 of the activities, submit your entry, along with the map and 3 documentation photos by Sept. 7 to parksmarketing.dnr@maryland.gov. Participants receive a Create Your Own State Parks certificate from Maryland State Parks and are entered to win prizes. Info: Ranger Melissa Boyle Acuti at melissa.boyle@maryland.gov.



You can connect with nature without leaving your home. Make a map of key features and submit it to the The Maryland Department of Natural Resources' Create Your Own State Park Challenge. See item at bottom of column two on this page. (MD DNR)

Guided paddles with CBMM

Chesapeake Bay Maritime Museum in St. Michaels MD, invites the public to these beginner and intermediate kayak paddles.

- ***San Domingo Creek:*** 9 a.m.–1 p.m. July 26. Launch from end of E. Chew Street in St. Michaels. Paddle around the Hambleton Islands concludes with a tasting from Eastern Shore Brewing included with cost of registration. Fee: $40 / bring your own kayak; $65 / rent a kayak from CBMM.
- ***Tred Avon River:*** 9:30 a.m.–1:30 p.m. Aug. 15. Meet at Bellevue-Oxford Ferry in Royal Oak. Stop midway to cool off with ice cream at Scottish Highland Creamery included with cost of registration. Fee: $40 / bring your own kayak; $65 / rent a kayak from CBMM.
- ***Harvest/Corn Moon Paddle:*** 6:30–8:30 p.m. Sept. 2. Launch from CBMM to paddle along Miles River into Long Haul Creek. Watch the sunset, gaze at the moon. Bring a head lamp. Fee: $20 / bring your own kayak; $40 / rent a kayak from CBMM.

Registration required. Ages 16 & younger must be w/ adult. Participants are required to wear and provide their own PFDs whether renting a kayak or using their own. Facial coverings are required upon exiting your vehicle and launching & hauling out kayaks. Out on the water — while keeping a safe distance from fellow paddlers — coverings can be removed. Hand sanitizer will be provided at onset & close of each excursion. Info: cbmm.org/paddles.

Adze to Whittling Knife exhibit at CBMM

Visit a new exhibition, *Adze to Whittling Knife - Chesapeake Boatbuilders as Decoy Carvers* Chesapeake Bay Maritime Museum in St. Michaels, MD. through March 7 in the Waterfowling building. Times are Nov. 9 a.m.–5 p.m. through October & 10 a.m.–4 p.m. November to April. (Exhibit travels to Waterfowl Festival in Easton, MD, Nov. 13–15.) Bay area craftsmen produced boats — and decoys —

See **BULLETIN**, *page 44*

CHESAPEAKE CHALLENGE

ANSWERS

1. Jerusalem Artichoke 2. Swamp Sunflower 3. Common Sunflower
4. Thinleaf Sunflower 5. Common Sneezeweed

BULLETIN *from page 43*

that were regionally distinctive. Boatbuilding was often a full-time occupation; decoy carving was more typically a sideline. Included with general admission (good for two days): $14 / ages 18–64; $11 / ages 65+ & students & ages 17+ w /college ID; $10 / retired military w/ ID; $4 / ages 6–17; free / active military & ages 5 & younger. Info: cbmm.org, 410-745-2916.

RESOURCES

Treat yourself to a tree

Using the extra time at home time to spruce up your landscape? Put "How to plant a container tree Maryland DNR" in your search engine for a YouTube video.

Property pointers

The Alliance for the Chesapeake Bay offers resources for property owners who want to make their landscapes more friendly:

- ***Wood you Like to Learn about Forests?*** Put "Alliance Websites, Resources, Videos, Blogs" in your search engine, then scroll to the Tree Talks under Videos. Titles include: *How to Plant A Tree, What's That Conifer?, Live Staking, Gray Dogwood, Boxelder, Poison Ivy, Black Raspberry, Pawpaw, Blackgum, Snags, Witch Hazel, Christmas Fern, White Cedar, Mountain Laurel, Atlantic White Cedar,* and *A Hobbyist's Guide to Maple Sugaring.*
- ***Bouquets for the Bay:*** Visit NativePlantCenter.net to find the perfect native species for your landscape.
- ***Right as Rain Landscape:*** Learn how to design a stormwater runoff plan to help you better manage water running off your property. Visit the Alliance for the Chesapeake Bay's Yard Design Tool at stormwater.allianceforthebay.org.

Severn River speakers online

Severn River Association's John Wright Speaker Series presentations are available online. Titles include *Oyster Farming in St. Jerome's Creek; The Demise of Our Yellow Perch Fishery; Land Preservation: How Does it Work?; Tree Care In The Critical Area; Enjoy The Severn River – Standing Up!; Runoff, Permits & Water Quality; Annapolis Neck – Mud Floods, Fishing on the Severn;* and *Will Butterflies & Bees Survive?* These, and other titles, are available at severnriver.org/category/speaker-series.

Bilingual educator resources

Educational programs are available in English and Spanish from the Interstate Commission on the Potomac River Basin. Info: potomacriver.org/resources/educator.

Track Severn River's health

Check the health of the Severn River online at cmc.vims.edu/#/home. Water quality data collected from the Severn River Association's network of 41 monitoring stations, from Indian Landing near the headwaters to Lake Ogleton and the creeks of Whitehall Bay, are posted on Data Explorer, a data-sharing platform run by the Chesapeake Monitoring Cooperative. The site also contains SRA water quality monitoring data for 2018 and 2019 and fecal bacteria levels collected by *Operation Clearwater*, run by Professor Tammy Domansky at Anne Arundel Community College. Anne Arundel County's bacteria reports are also posted.

The Maryland Department of Natural Resources and Alliance for the Chesapeake have tree-planting videos. See top two items under Resources. (Will Parson / Chesapeake Bay Program)

Watershed Capsules

Prince William (VA) Soil and Water Conservation District's Watershed Capsules, which teach students about the important functions of watersheds, are available, first-come, first-served. Info: pwswcd.org/capsules.

Boating safety instruction

Boating safety classes are required for operators of recreational boats in Virginia, Maryland and the District of Columbia, most other states. Online opportunities include:

- ***Virginians:*** boat-ed.com/virginia
- ***Marylanders:*** boatus.org/maryland
- ***DC residents & nonresidents:*** boat-ed.com/districtofcolumbia
- ***Comprehensive list of training options:*** uscgboating.org/recreational-boaters/boating-safety-courses.php
- ***Free boating safety tools & materials from the Coast Guard Auxiliary:*** Put "recreational boating safety outreach" in your search engine.

Stormwater class

The Alliance for the Chesapeake Bay's Municipal Online Stormwater Training Center's Dig Once Course suggests how local leaders can integrate green infrastructure into community capital projects: road construction and school & park improvements. Interactive lessons and videos in a user-friendly format give communities tools to build and enhance local stormwater programs. Info: mostcenter.org.

Is your yard Bay-Wise?

Master Gardeners in Prince George's County, MD, are part of *Bay-Wise*, a program offering free consultations on environmental practices to help county residents certify their landscapes. Those who demonstrate healthy lawn maintenance, efficient watering, pest control and create habitat for native trees & plants for wildlife receive Bay-Wise signs. Homeowners can evaluate their property online using the *MD Yardstick*, which tallies pollution-reducing gardening and landscaping practices. To be certified, though, a landscape must be visited, evaluated by a Master Gardener. Info: Esther Mitchell at estherm@umd.edu, extension.umd.edu/baywise/program-certification. Click on "download the yardstick" to evaluate a landscape and/or vegetable garden online.

Wetlands Work website

The Chesapeake Bay Program's website, Wetlands Work, at wetlandswork.org, connects agricultural landowners with people and programs that can support wetland development and restoration on their land.

Marine debris toolkit

The National Oceanic and Atmospheric Administration's National Marine Sanctuaries and Marine Debris programs have developed a toolkit for students and educators in coastal and inland areas to learn about marine debris and how to monitor local waterways. The toolkit supports efforts to reduce impacts on marine ecosystems through hands-on citizen science, education and community outreach. Info/search engine: marine debris monitoring toolkit for educators.

Turf / lawn programs

For information on Prince William (VA) Cooperative Extension's 12 Steps to a Greener Lawn / Building Environmental Sustainable Turf BEST Lawns low-cost, research-based programs for lawn education, contact: bestlawns@pwcgov.org, 703-792-4037.

Wildlife education trunks

Maryland Department of Natural Resources Wildlife Education Trunks are available to teachers, home-school educators and naturalists. Free, interdisciplinary tools are designed to interest students in local wildlife while building on art, language arts, math, physical education, science, social studies skills. It contains an educator guide, lesson plans, hands-on K–12 activities, supplies, books, furs, replica tracks, videos. Subjects include aquatic invasive species, bats, black bears, furbearers, white-tailed deer and wild turkeys. Trunks can be borrowed on a first-come, first-served basis for up to two weeks. Info/search engine: Wildlife Education Trunks.

Floatable monitoring program

Help the Prince William Soil & Water Conservation District in Manassas, VA, assess and trace trash in streams to reduce nonpoint source pollutants in urbanized and industrialized areas in relation to the County's Municipal Separate Storm Sewers (MS4) permit. Cleanup supplies provided. Info: waterquality@pwswcd.org.

Baltimore Biodiversity Toolkit

To help meet habitat needs of native plants & animals, the Baltimore Biodiversity Toolkit identifies species that represent habitats within and historic to a community. It shows how to support specific wildlife needs; helps citizen scientists monitor and collect data; and develops a culture of conservation and stewardship. Using 20 ambassador species from four habitats, the toolkit helps prioritize community greening projects based on representative species, citizen science data and spatial analysis that includes social, economic and ecological indicators. Info: fws.gov.

Call for watershed management abstracts

The Center for Watershed Protection is accepting abstracts for its virtual *2020 Watershed Management in Coastal and Island* conference, which takes place Nov. 16–17 on Zoom. Abstracts may be for a traditional presentation, poster presentation, and/or workshop session that can fit into the virtual meeting format. Topics of interest include: mitigating pollution at the land-sea interface; hydrology & stormwater management; watershed planning & management; and biological integrity & habitat protection. Submission deadline is July 20. Info: wh@cwp.org , cwp.org/wp-content/uploads/2020/06/Call-for-Abstracts.pdf.

CHESAPEAKE CHALLENGE

— Kathleen A. Gaskell

Sunflower Smarts

Love them, love them not: Sunflowers (genus *Helianthus*) are part of the daisy (*Asteraceae*) family. Fear of sunflowers is called helianthophobia.

Homegrown goodness: Sunflowers are native to North America, where they were used for food, healing, oils and dyes as early as 3000 BC.

HEAL-ianthus: Native Americans and others have long used the sunflower medicinally. The Cherokees used it to treat kidney problems; the Dakotas, chest pains and lung ailments. Others have used it to treat high fevers, sores and swellings, as well as snake and spider bites.

Super sprout: All of that Vitamin D from the sun does a plant good. The tallest sunflower on record was 30 feet, 1 inch. Even non-champions can grow 8–12 feet in as few as six months.

Here comes the sun: Young sunflower blossoms face east in the morning, then follow the sun as the Earth rotates throughout the day. This behavior, called heliotropism, even takes place on cloudy days and will continue until the stem stiffens to bear the heavy load of growing seeds. Mature flower heads often face east, and these plants can attract five times as many pollinators as westward-facing ones because they warm up more quickly.

That's sun math! A sunflower can produce 1,000–2,000 seeds. The seeds in the middle are arranged in the Fibonacci sequence (1, 2, 3, 5, 8, 13, 21…) where each number is the sum of the two that precede it.

Bird grub to dirt scrub: Learn how to harvest sunflower seeds for birds and use what's left of the flower head as a scrubber for grungy jobs at homeguides.sfgate.com/collect-sunflower-seeds-replanting-41735.html.

Soil soother: Sunflowers can help remove toxins, including lead, arsenic and uranium, from the soil. They were used after the nuclear disasters at Fukushima and Chernobyl to absorb strontium. The fast-growing plants quickly collect the contaminants in their leaves and stems in concentrations that are much greater than the surrounding soil. Thus, the low concentration of radioactive isotopes in a large area of soil is transferred in high concentration to a plant that can be disposed of and replaced. (The absorption process slows down once flowers start appearing, so the plant is quickly harvested and disposed of before birds can eat the radioactive seeds.)

Mighty small flowers: The sunflower is a composite flower that consists of two florets. The yellow petal-like ring is made up of sterile ray florets. The brown center, depending on the species, can consist of thousands of brown seed-producing disc florets. Each produces one seed that is pollinated by insects or the wind. Should these fail, the flower will self-pollinate by twisting its stigma to reach its own pollen.

A. Jerusalem Artichoke (Paul Fenwick / GFDL)
B. Sneezeweed (Kurt Stueber / GFDL)
C. Thin-leaved Sunflower (Fritz Flohr Reynolds / CC BY-SA 3.0)
Top left: Giant Sunflower (PublicDomainPictures.net)
Top right: Swamp Sunflower (Eric Hunt / CC BY-SA 4.0)

Sunflowers

Sunflowers are a symbol of happiness, optimism and faith — things that the world could use right now. May this quiz about these members of the sunflower genus brighten your outlook! Just match the flower to its description. Answers are on page 43.

Common Sunflower (*Helianthus annuus*)
Common Sneezeweed (*Helenium autumnale*)
Jerusalem Artichoke (*Helianthus tuberosus*)
Swamp Sunflower (*Helianthus angustifolius*)
Thinleaf Sunflower (*Helianthus decapetalus*)

1. Forget sunflower seeds and try my tubers boiled, roasted or raw! I taste like a nutty potato but lack the starch. The Italian word, *girasole*, which means "turning to the sun," was used to describe me. Its mispronunciation led to my more exotic name. My 3-inch flowers grow on stalks 5–10 feet tall from July to September. I am found in sunny, disturbed areas with moist soil.

2. Songbirds, ruffed grouse and pollinators love me! I am a host plant for the silvery checkerspot butterfly, a species of special concern. I can grow up to 5 feet tall and just one of me grows three to 16 flower heads 1–3 inch wide. I start to blossom in September and don't stop until the first frost. I grow in wet areas of the Atlantic Coastal Plain.

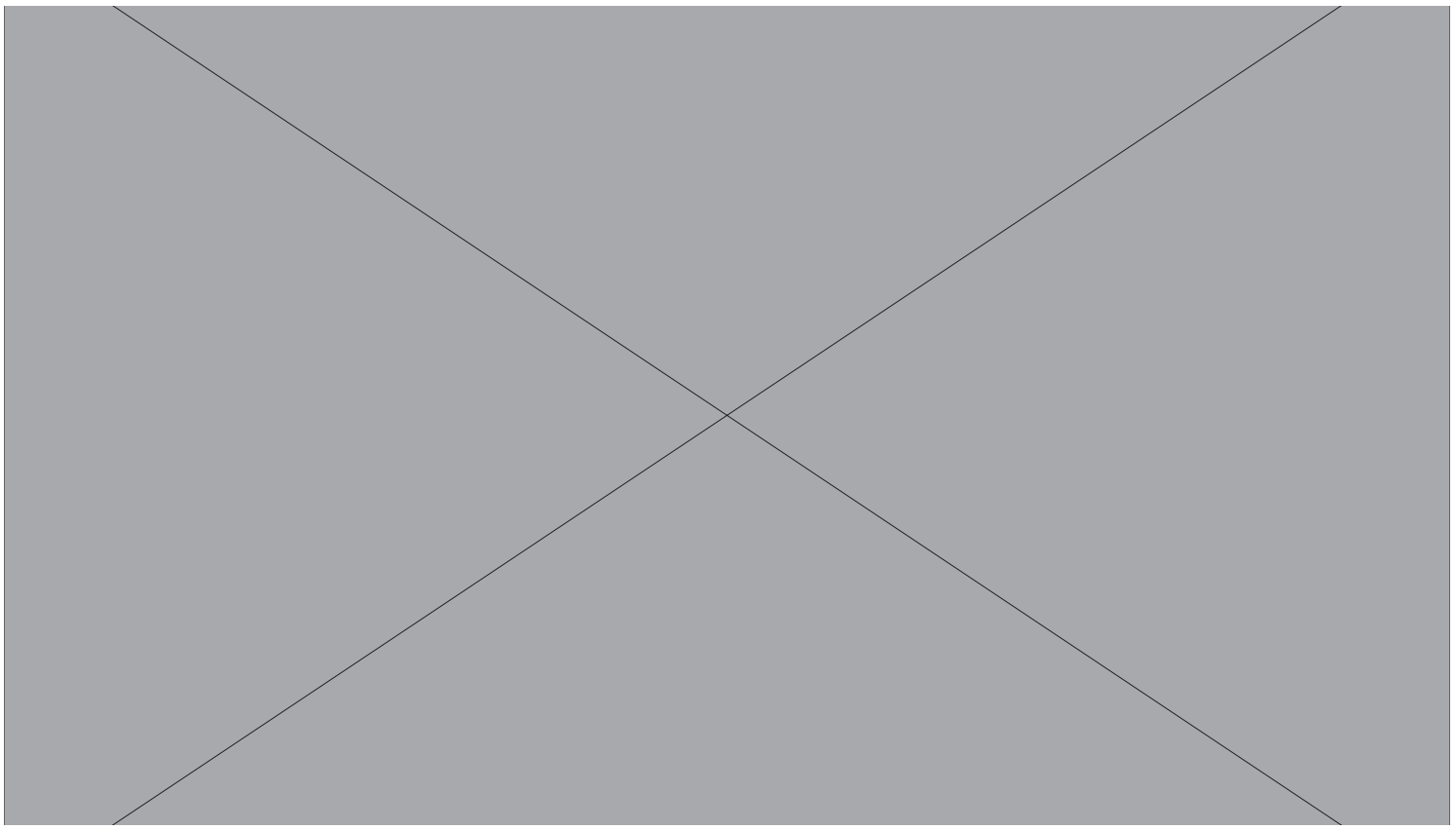
3. My ancestors were domesticated 3,000 years ago by natives in Western North America. Over time, they increased the size of our seeds by 1,000%. As word of our nutritious seeds and oil and our dye and medicinal properties spread, we were carried eastward and are now found in all of the contiguous United States. We can grow up to 12 feet tall and produce flower heads up to 6 inches wide.

4. Muskrats eat my leaves and use my stems to build their lodges. My scientific name announces that I have 10 petals, but here's the truth: I have 8–12 yellow ray florets; my petals are on the 21-50 brown disc flowers in my center. I grow about 2 feet tall and bloom in woods, floodplain forests and riverbanks from August to October.

5. Pollen allergies? Quite the opposite! My leaves were dried and made into snuff to help the body expel evil spirits. I have 2-inch flower heads and grow in clumps 3–5 feet tall in moist woods or banks from August to October. ■

Amplifying environmental diversity through the lens of film

By Erin O'Grady



The water trails through the wetlands of Blackwater National Wildlife Refuge in Dorchester County, MD, are intrinsically linked, just as human connections are. Both systems must be nurtured and protected if each is to survive and thrive. (Will Parson/Chesapeake Bay Program)

In 2018, the Alliance for the Chesapeake Bay began a strategic review of our organization, a usual practice for many nonprofits but one that yielded inspiring results on our end.

Among the goals, priorities and focus areas arose one definitive value among our staff and board: inclusivity. As a regional organization working for and representing more than 18 million people in the Chesapeake Bay watershed, there was a clear desire to reflect inclusive ideals in all of our work. We were happy that we had begun taking these steps in some of our programs, and I felt proud of the strong dedication. While this decision and the progress we have made is exciting, it has also provoked some questions.

Often, inclusion, equity, diversity or general racial issues are put in a box. People assume that they are part of a standalone topic, or something only for human resources to consider. Perhaps some believe that this topic shouldn't be combined with others.

I understand where this thought process can come from. For many people, this feels like an organization is taking on a new mission, expanding to become both an environmental nonprofit *and* a social justice/civil rights organization. But what if we considered another option?

At their core, diversity, equity and inclusion are woven into every topic, action and effort in our lives. It may be nuanced instead of blatant, but whether we have experienced it or not, whether we even care about the issue or not, it exists in everything we do.

I recently participated in a management seminar, and when the program lead started the event, she shared with the group, "This is not an equity and inclusion seminar, but we choose to include this topic because it can't be ignored. It is in our communities and policies. It is part of everything we do, so we are making it as such."

And so the Alliance has decided to make it a more conscious part of our organization as well. We want to create space in our programs for these efforts and discussions. Diversity, equity and inclusion work is part of everything we do. These topics cannot be ignored.

You may wonder what this looks like. How is the Alliance integrating such a huge topic and sometimes overwhelming discussion into our programs? We work in many facets from stormwater, forestry and agriculture projects to collaborative conferences, roundtables and festivals. How can we add such a different and new topic to all of the work we have been doing for 50 years? Well, by taking this idea step by step for each program area, region and event, we can find many opportunities for integrating these conversations. One of my favorite examples of this effort is our Wild & Scenic Film Festival.

The Wild & Scenic Film Festival is a global event created by the South Yuba River Citizens League and coordinated at various locations by partners like the Alliance. In 2018, when we became interested in hosting a film festival, I thought we would be watching films akin to *Planet Earth* — pure visual majesty. However, the SYRCL has chosen films that intentionally challenge our idea of what the term "Wild & Scenic" means. It was not until we began the film selection process that I realized just how impactful these films could be on a much larger scale.

The diverse topics and themes were truly moving and inspired our team to use the event as a platform for discussion. In addition to the beautiful imagery of the films, there were raw, wild stories about the people and communities that make up our scenic world.

The films displayed enthralling environmental tales from communities with poor water access, to a man's fascination with bees, to new friends who get to see the moon through a telescope for the first time. There were tales of avid adventurers just wanting to be part of a community like the National Brotherhood of Skiers and members of a Puerto Rican bouldering group who did what they could to aid in the recovery after Hurricane Maria.

Amplifying the voices of diverse communities by featuring such stories helps to cultivate an inclusive environmental understanding. In elevating these conversations, I realized something else: Perhaps the "Wild & Scenic" name does not just describe the variety of genre offered, but also the heart and soul of each story. And perhaps our environmental work doesn't have to just help the lands and waters of our watershed, but the hearts and souls of *all* of our communities as well.

Integrating diversity, equity and inclusion into our projects will take a while, with many more events and programs to keep it moving. The Wild & Scenic Film Festival is just one way that we can spark continued engagement and diverse storytelling. There is still much work that needs to be done in the environmental movement to effect organizational, programmatic and community change on a systemic level.

The potential impact is inspiring in itself, and I hope the Wild & Scenic Film Festival can serve as an example of one way we can continue conversations about how the environment and diversity, equity and inclusion are intrinsically linked.

This is just one step along our wide road for true equality in the environmental movement. Its footprint will join many others as we continue to share our diverse knowledge and experiences for equitable change. ■

Steward's Corner is a column from the Alliance for the Chesapeake Bay. Erin O'Grady is the Alliance's DC programs manager and Diversity, Equity and Inclusion Team chair.

Eastern towhee, both feet on the ground, achieves its goals

By Mike Burke

Binoculars in hand, I was on alert as my scooter slowly rolled around the corner. I wasn't disappointed. The object of my search was easily spotted. The eastern towhee is our largest sparrow, and he was noisily rustling through the leaf litter. I pulled up the binoculars for a better look.

Boldly patterned, the bird I was viewing was a male. He had a black hood, an arresting red eye, black wings and tail. Rusty sides and undertail coverts contrasted with his white breast and belly. He also had a white patch on his folded wing. As he energetically sifted through the detritus, bright white outer panels on his long tail flashed.

The eastern towhee (*Pipilo erythrophthalmus*) is a captivating bird to watch. It uses both feet at once to flip away loose matter in search of various beetles, bugs, and spiders, which constitute major parts of its diet.

When the bird finishes searching in one spot, it will flit a short distance and continue its noisy pursuit, endlessly flipping away leaves with those feet and swiping more to the side with its bill. It looks like a lot of work for each morsel uncovered.

As my wife, Pat, and I watched, we noticed a second bird farther back in the scrub. Through the thicket we could make out another towhee, a female. Nearly identical to the first, this bird was dead leaf brown where the male was jet black. Both birds had substantial, black conical bills.

A bit smaller and stockier than a robin, towhees are most often found on the forest floor. Besides insects, they are looking for other food items such as seeds, snails and berries.

These birds even build their nests on the ground, relying on their camouflage coloring for protection.

Females do all of the nest construction, forming a cup nest well hidden in the undergrowth. Only females incubate the average clutch of three to five eggs for 12–13 days. Both parents feed the chicks until they leave the nest on day 12. The pair may produce a second brood in the summer.

The bird gets its name from its call, a sharply rising, emphatic *tow-HEE*. Its song is usually described as a metallic "drink-your-tea," followed by a trill.

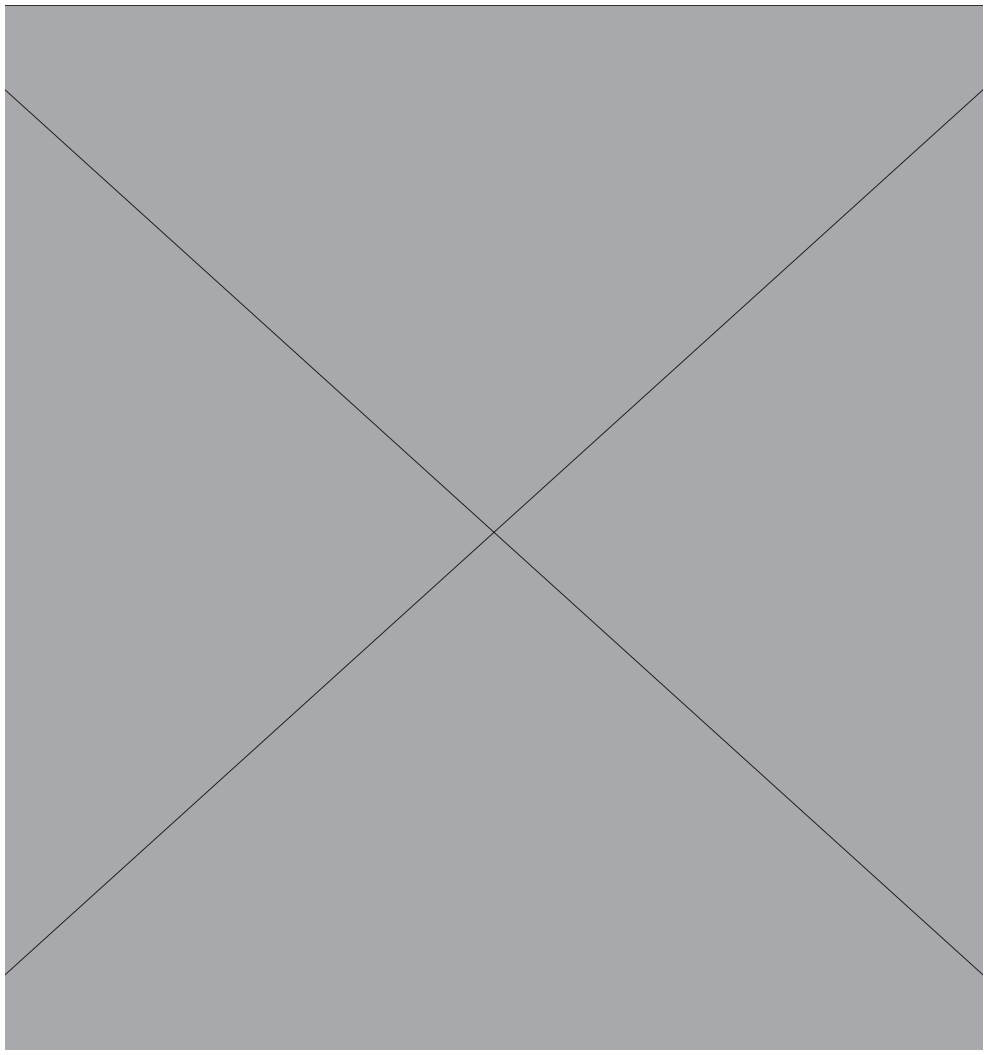
Although their coloration is well-adapted to their habitat, their rummaging behavior and big voice usually make them easy for birders to find.

More than 2 miles of paved paths encircle the 125-acre, heavily wooded senior living community where we now live. The paths go by a 6-acre pond and through a meadow. Mostly, though, they hug the tree line of the forested nature preserve, Regent Park, that borders the campus. A few sections of the paths even dip into woodlands.

I am quite limited in my ability to walk these days, so the scooter and paths are a godsend, affording me the opportunity to be outside and engage in my favorite pastime: birding.

The coronavirus has hit Prince George's County, MD, where we live, especially hard. We have been confined to campus since early March. We are lucky beyond words to live at this oasis during such a time of peril.

As we become familiar with our peaceful patch, we have gotten to know the favorite haunts of various species. I slid around that sharp bend in the path primed to see the towhees. We had seen them there often.



This is a male eastern towhee. The female is almost identical; where the male is jet black, she is dead leaf brown, which helps to camouflage her when she is sitting on the nest. (Bill Thompson, U.S. Fish and Wildlife Service Northeast Region / CC BY 2.0)

The Chesapeake watershed represents a transition zone for eastern towhees. From the Delmarva and southern Virginia across to Iowa and south to the Gulf, these towhees are year-round residents. The towhees that winter here in Maryland are short-distance migrants. In April they head north to breed, a few traveling as far as southern Canada. A number of birds that winter in the South fill in behind them, giving us towhees every month, although the mix of individuals changes with the seasons.

At times the world seems out of kilter. A virus rages, unemployment soars and racial injustice spreads like a plague.

I take these short scooter rides around campus as a respite from the news. They are a balm to a battered soul. But I know that they are no more than that…a moment of joy in an isolated area. I looked up from the towhee and saw Pat's masked face. It was a stark reminder that all is not well.

The work ahead of us is monumental and sometimes feels futile. Can COVID-19 be stopped, and the economy restarted? Can we really turn the tide in the extinctions inexorably rolling across the globe? Is it even possible to stave off the worst of climate change? Will we ever confront systemic racism?

I took another look at the towhees in front of us. We need these moments in nature to refresh our psyches and strengthen our resolve.

After a deep sigh, I decided to follow the example of the towhee: dig in with both feet and thrash ahead. Eventually, the goal will come into view and another small victory be achieved. Then it's on to the next struggle. Like those birds, the key is to stay at it, endlessly. ■

Mike Burke, an amateur naturalist, lives in Mitchellville, MD.

These small horses graze in Bay's underwater grass beds

By Kathy Reshetiloff

Lined seahorses anchor to underwater plants at the Virginia Living Museum. When mating, the male seahorse incubates 100–300 of the female's tiny eggs for two weeks before they hatch. (Will Parson / Chesapeake Bay Program)

In the Lower Chesapeake Bay, a small horse moves through the underwater beds of eelgrass looking for food. No, it's not a pony like the famous wild horses of Assateague Island National Seashore. It's a lined seahorse (*Hippocampus erectus*), the only species of seahorse found in the Chesapeake Bay.

The lined seahorse inhabits a range from the northern point of Nova Scotia, Canada, to the southern area of Venezuela in South America. Locally, lined seahorses are usually found from the Lower to Mid Chesapeake, although in drier, saltier years they may move as far north as Maryland's Bay Bridge.

Seahorses are vertebrate fish belonging to the family *Syngnathidae*. Other family members include the snapdragon, ghost pipefish, sea moth and pipehorse. The lined seahorse is most closely related to the pipefish: Both share the characteristic elongated tubular jaw with a small toothless mouth at the end.

A seahorse's body is covered with a kind of bony armor of jointed rings. A dorsal fin, made up of 16–20 rays, beats so rapidly that it appears transparent. It also has an anal fin with three or four rays. The top of its head, the coronet, is almost as distinctive in each animal as a human thumbprint. Mature lined seahorses can reach a length of 6.7 inches. They range in color from pale yellow to black and are marked laterally with dusky spots and lines.

The Chesapeake's underwater grass meadows are the lined seahorse's preferred habitat. It swims erect, pausing to curl its tail around strands of grass to stabilize its body, then stay very still. This skill, combined with the creature's ability to quickly change its color, camouflaging its skin to match the surroundings, makes the seahorse an ambush predator. It uses its long, tubular snout to suck in tiny crustaceans, plankton, worms and other invertebrates swimming by.

Effective camouflaging also helps to protect the seahorse from potential predators such as ray, fish, birds, crabs and sea turtles, as well as people, who collect them for medicines, aquaria or souvenirs. The seahorses' sophisticated camouflage makes them hard to find, creating a few problems for scientists who want to learn more about the animals.

One of the most striking characteristics of this species is its reproductive cycle. In many fish species, parental care often falls to the male, which is responsible for fanning or guarding the eggs and making sure they remain oxygenated. Seahorses takes this a step further — the males actually guard and nurture the eggs in a pouch on their body.

After an elaborate courtship, which the monogamous pair may repeat during a later reproductive cycle, the female lays 200–300 eggs in the male's pouch before he fertilizes them. The male provides oxygen and transfers nutrients to the developing embryos through a network of capillaries in its pouch. The young remain in the pouch for about two to three weeks, depending on water temperature.

After a convulsive "birth," during which the male seahorse's body expels the contents of the pouch, tiny juvenile seahorses emerge. The male usually becomes pregnant again almost immediately. Despite the frequency of these pregnancies and the volume of young produced, on average only two of the thousands of juveniles a pair produces reach maturity each breeding season.

A lined seahorse, can change its color, which makes it difficult to find in the wild. (Will Parson/ Chesapeake Bay Program)

In summer, the lined seahorses inhabit the shallower areas and swims to water only a few feet deeper in winter. The weight of their body "armor" and their erect habit makes the poor swimmers.

They spend most days feeding while attached by their tail to vegetation. And when they do swim, they use their dorsal fin (which beats 20–30 times per second) to propel themselves forward, gliding slightly up and down through the water.

Lined seahorse populations were assessed by the International Union for Conservation of Nature in 2017. It was listed as a vulnerable species because of its proximity to the highly populated coasts of North, Central and South America. Specific worldwide threats include bycatch in shrimp trawl fisheries and collection for the aquarium trade, tourism curios and cultural medicines.

In the Chesapeake Bay, their population is considered stable. But the loss of their primary habitat from shoreline development and nutrient pollution could harm local populations. Reducing nutrient and sediment pollution and conserving our coastal shoreline habitats, particularly underwater grass beds, will help ensure the continued existence of this unique seahorse of the Chesapeake Bay. ■

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