CHESAPEAKE

BAY JOURNAL

July-August 2021 Volume 31 Number 5

Independent environmental news for the Chesapeake region

Celebrating 30 YEARS

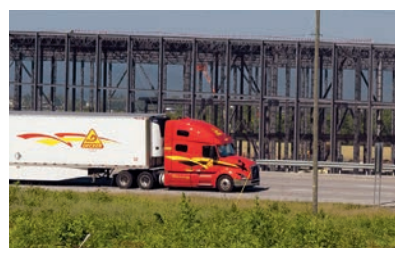
A push for 'green amendments' in four Bay states

PAGE 20

DOLPHIN ALERT!

Dolphin sightings increase across the Bay PAGE 11

WAREHOUSE CORRIDORS



Mega-warehouses transforming the landscape PAGE 12

FISH PASSAGE

Fish swimming upstream of former Bloede Dam PAGE 19

NONPROFIT ORG
U.S. POSTATE
PAID
PERMIT 280
LANC., PA 17604

Bay Journal | P.O. Box 300 | Mayo, MD 21106

CONTENTS

The acreage of underwater grasses in the Chesapeake Bay has decreased for the second year in a row, though some areas fared well. See article on page 16. (Dave Harp)

EDITOR'S NOTE

Hindsight is "30"/20

Thirty years ago, when the *Bay Journal* was first published, the Chesapeake Bay restoration effort was still picking up speed. The first regional agreement between states and the federal government, outlining a voluntary partnership to clean up the Bay, had been signed 10 years earlier. Science, policy and public outreach were being shaped and aligned into the foundation of what has become a massive, 40-year effort with no clear end in sight.

Karl Blankenship, the *Bay Journal's* founding editor, wrote most of those early articles. And in this issue, he takes a look at the headlines of its first decade, with an eye toward lessons learned. His perspectives are humorous, biting and educational. It can be a surprise to see how some old headlines could run virtually unchanged today and once-hot topics have fallen by the wayside.

I'm left wondering how the articles in this edition of the *Bay Journal* will appear after decades have passed. Will Tim Wheeler's report on the handful of fish edging their way toward a newly opened stretch of the Patapsco River be recalled as the first sign of thriving upstream spawning grounds? Will Karl's article about the decline of grass beds be among the final farewells to eelgrass in the Lower Bay? Whitney Pipkin has documented a recent burst of dolphin activity; will that become the norm or a fond memory? As advocates rally around the idea of adding 'green amendments' to state constitutions, are they poised to make history?

Lots of factors, some of which we can't even begin to predict, will determine the answers. Others we can name. Funding. Elected leadership. The ongoing impacts of pollution. And the number of people from all walks of life and political perspectives who decide to speak up or take action. I'm sure many *Bay Journal* readers will be among them.

— Lara Lutz

ON THE COVER

Maryland Del. Wanika Fisher, seen here in the city of Hyattsville, wants to pass legislation that would add an environmental rights amendment to the state constitution. (Dave Harp)

Bottom left photo courtesy of DolphinWatch app user Glen.

Bottom center and right photos by Dave Harp.

SIGN UP FOR THE BAY JOURNAL OR CHANGE YOUR ADDRESS | PLEASE PRINT CLEARLY

The Bay Journal is distributed **FREE** by Bay Journal Media, a nonprofit news organization.

Check one: ☐ New Subscription / Please choose: ☐ Print Only ☐ Email Newsletter Only ☐ Both Print / Email
☐ Change of address ☐ Please remove me from the mailing list *Please note that it may take up to two issues for changes to become effective.*

Name _____

Address _____

City _____ State _____ Zip _____

Email _____ Phone _____

OPTIONAL: Enclosed is a donation to the Bay Journal Fund for $ _____

☐ Please check here if you would like your gift to remain anonymous and not be recognized in the *Bay Journal.*

Please mail this form to: Bay Journal, P.O. Box 300, Mayo, MD 21106.

bayjournal.com

BY THE numbers

5
Width, in feet, of an osprey nest

8,000–10,000
Estimated osprey population around the Chesapeake Bay

72.6
Average U.S. temperature in June , the warmest on record for the month

5
Species of sea turtles that can be found in the Bay, out of 7 species found globally

6
Length, in feet, of the largest documented leatherback turtle, the largest of all sea turtles

231
Pounds of plastic waste produced per person in the United States each year

9%
Amount of plastic waste that gets recycled

8.8 million
Tons of plastic waste that end up in the ocean each year

A warmer world brings change to the Bay region

The United Nation's Intergovernmental Panel on Climate Change is preparing to publish a new report that will be released in stages starting later this summer. A leaked draft suggests that the report will contain a warning: The planet is approaching its "tipping point," when widespread and possibly irreversible changes will take place unless we take decisive action. Even then, the buildup of greenhouse gases in the atmosphere is so great that changes will continue for at least several decades.

Scientists are trying to anticipate what the future will look like for the Chesapeake Bay region. Here are some examples of things that have already shifted:

- ✔ The length of the growing season in the Bay watershed has increased by more than 30 days over the last century, starting earlier and ending later. This can extend the growing season but also prevent agricultural pests from dying off in winter.
- ✔ "Tropical nights," when the minimum temperature does not go below 68 degrees, have increased by about 30 nights per year during the last century.
- ✔ Water temperatures in the Chesapeake Bay have increased by an average of 1.6 degrees since the mid-1990s.
- ✔ Eelgrass, the most widespread and important species of underwater grass in the Lower Bay, is declining due to warmer water temperatures and has suffered three heat-related die-backs since 2005.
- ✔ The frequency and duration of harmful algae blooms have increased in both Maryland and Virginia.
- ✔ The amount of precipitation falling on the Bay watershed has increased by about 10% during the last century, with the largest increase in the northern portions of the region.

Learn more about climate change in the Bay region by listening to our new podcast, Chesapeake Uncharted.

Find it through your favorite podcast service or visit

ChesapeakeUncharted.com

LOOKING BACK

Celebrating 30 YEARS AT WORK FOR YOU

30 years ago

MD outlines Bay cleanup plans

Maryland officials announced that they planned to target air pollution, improve wildlife habitat and promote public participation during the coming year as part of the state's effort to clean up the Chesapeake Bay. ■

— Bay Journal, July 1991

20 years ago

Debate over reducing sprawl

The creation of plans that could help the Bay Program meet its goal to reduce sprawl were stymied as representatives from Bay states failed to agree on a definition of "harmful" sprawl and how they should measure it. ■

— Bay Journal, July 2001

10 years ago

'Ghost' pots causing problems

Approximately 120,000 lost and abandoned crab pots were estimated to rest on the Bay's bottom, where researchers say they continue to catch crabs and take away from the harvestable population and those that would otherwise reproduce. ■

— Bay Journal, June 2011

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 10 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.

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

Views expressed in the *Bay Journal* do not necessarily represent those of any funding agency, organization, donor or advertiser. Policies on editorial independence, gift acceptance and advertising are available at bayjournal.com/about.

STAFF

BOARD OF DIRECTORS

SCIENCE ADVISORY COMMITTEE

ADVERTISING

CONTACT US

by mail:
The Bay Journal | P.O. Box 300 | Mayo, MD 21106

by phone:
410-798-9925

by email:
llutz@bayjournal.com

WE'RE JUST A CLICK AWAY

Like us on FaceBook:
Chesapeake Bay Journal

Send us a Tweet:
@ChesBayJournal

Visit us online:
BAYJOURNAL.COM

BAY JOURNAL NOTEBOOK

Bay Journal *writer Jeremy Cox learns about the impacts of climate change at the Blackwater National Wildlife Refuge for the* Bay Journal's *new podcast, Chesapeake Uncharted. (Dave Harp)*

Our new podcast: Chesapeake Uncharted

As we reach our summer break at the *Bay Journal*, we have a new way to keep you informed about the region's environmental issues until the September issue shows up in your mailbox.

The first edition of our podcast series, *Chesapeake Uncharted*, rolls out in July, with future editions released about every two weeks.

Produced by staff writer Jeremy Cox, the series highlights the impacts of climate change in the Bay region — not the problems that we'll see sometime in the future, but the changes already altering our coasts, marshes and communities.

Jeremy has been traveling the watershed for months collecting accounts from those on the front lines. He saw the ruins on Tangier Island, VA, where the water is "lapping up and over the foundations of houses that two generations ago, families lived in. And now it's gone."

He visited places where efforts are being made to hold the line on sea level rise, such as Deal Island, MD, where the marsh will be built up with dredged material to keep it from sinking away.

In Richmond, he explored the "heat island" effect that occurs when ever-warmer summertime temperatures are magnified by the concrete in heavily built-up areas, and he examines why minority neighborhoods are more likely to suffer.

He chronicles "ghost forests" lost to rising water, changing agricultural landscapes and communities facing frequent flooding, and he takes field trips with researchers who study how climate is affecting fish and wildlife.

"This isn't just a national conversation," Jeremy said. "This is the type of thing communities are talking about around the dinner table." Indeed, the effects are already felt at the local scale where, for example, engineers are having to replace bridge culverts that are no longer large enough to handle the flows from more frequent, larger storms.

"What surprised me the most," Jeremy said, "is how much everything is tinged by climate. The impacts are interwoven with everything that is going on right now, and we don't even realize it."

You can find the series at ChesapeakeUncharted.com or on your favorite podcast service.

— *Karl Blankenship*

UPDATE: Public comment sought for Trappe wastewater permit

Maryland regulators are taking public comments again on plans to handle wastewater from a massive new development on the state's Eastern Shore by spraying it on farm fields.

The Maryland Department of the Environment had issued a wastewater permit in December 2020 for Lakeside, a proposed community of 2,501 homes and apartments plus a shopping center in the small Talbot County town of Trappe. But a judge ordered the department to give the public another opportunity to comment on the permit because of changes made in it before being issued.

The proposed permit allows the developer to eventually spray an average of 540,000 gallons of wastewater daily on grassy fields. It must be treated using enhanced nutrient removal to lower the levels of nitrogen and phosphorus. A lagoon is also required to store wastewater for up to 75 days during winter and when it's raining or too windy to spray.

Neighboring residents and environmental groups questioned the MDE's assurances that the nutrients and other contaminants in the wastewater would be soaked up by the grass in the fields. They fear it could seep or run off into nearby Miles Creek, a tributary of the Choptank River.

The MDE is taking comments until July 26. Written comments should be mailed to the Maryland Department of the Environment, Water and Science Administration, 1800 Washington Blvd., Baltimore, MD 21230-1708, Attn.: Mary Dela Onyemaechi, Chief, Groundwater Discharge Permits Division.

For information, visit mde.maryland.gov/programs/Water/wwp/Pages/19DP3460.aspx. ■

Director named for Virginia Institute of Marine Science

William & Mary has named ecologist Dr. Derek Aday as its next dean of the School of Marine Science and director of the Virginia Institute of Marine Science.

Aday, who will begin this role at VIMS Sept. 1, is head of the Department of Applied Ecology at North Carolina State University, university director of the Southeast Climate Adaptation Science Center, a fellow of the American Fisheries Society, and editor-in-chief of the society's flagship journal.

Derek Aday will become the new director of the Virginia Institute of Marine Science. (Courtesy of VIMS)

His selection follows a national search to succeed Dr. John Wells, who is retiring after 17 years at the VIMS helm.

"I've followed the great science and scientists at VIMS from afar for many years," Aday said, "and I'm humbled by the opportunity to join a community of talented scholars and educators that is making a real difference in the world."

Provost Peggy Agouris said that Aday has been equally followed by VIMS scholars and students. He has written numerous articles on topics ranging from the ecology of fresh– and saltwater fishes to the impacts of mercury pollution on aquatic ecosystems.

As university director of the Southeast Climate Adaptation Science Center, Aday led a consortium that included five academic institutions of higher education; federal collaborators from the U.S. Geological Survey; state climatologists and tribal partners from four nations.

Aday's leadership portfolio at VIMS will likewise include a wealth of institutional, state and federal partners.

As a department chair at NCSU, he helped to

See **BRIEFS**, *page 6*

briefs

From page 5

develop training programs for more effective mentoring of under-represented students and a new peer-to-peer network for incoming graduate students.

"My commitment to diversity, equity and inclusion is sincere, and I will be a tireless champion for diversity, in all its many forms, at VIMS and W&M," Aday said. ■

June broke nationwide temperature record

The average June temperature across the contiguous United States this year was 72.6 degrees, which was 4.2 degrees above average. That makes it the hottest June for the nation as a whole in 127 years of record keeping.

Eight states — Arizona, California, Idaho, Massachusetts, Nevada, New Hampshire, Rhode Island and Utah — also saw their hottest June on record. Six other states — Connecticut, Maine, Montana, Oregon, Washington and Wyoming — marked their second hottest June.

NOAA data show that temperatures across most of the Chesapeake Bay watershed were also above average, though not record-setting.

The average amount of precipitation across the U.S. during June was 2.93 inches, matching exactly the historical average for the month. Some states, though, experienced extremes, with either too much or too little rainfall. For example, South Dakota saw its driest June on record while Mississippi had its second wettest.

The January-June average temperature for the contiguous U.S. was 49.3 degrees, which is 1.7 degrees above the 20th-century average. That makes the first six months of 2021 the third warmest on record.

Nationwide precipitation for January-June, though, was 0.67 of an inch below average, coming in at 14.64 inches.

The data show that most of the Bay watershed was both warmer and drier than normal for the first six months of the year. ■

Doherty named Champion of the Chesapeake for conservation leadership

Jonathan Doherty, recently retired assistant superintendent of the National Park Service Chesapeake Bay Office, has been named a Champion of the Chesapeake for his leadership and achievements in Bay-related conservation work.

The Chesapeake Conservancy presented Doherty with the award in June.

In his 22 years of service with the NPS Chesapeake Bay Office, Doherty helped to build the Chesapeake Bay Gateways and Watertrails Network and the Chesapeake Conservation Partnership. He also helped create hundreds of public access sites to the water and oversee the Captain John Smith Chesapeake National Historic Trail.

"Jonathan can take pride in the tangible conservation legacy he established in the Chesapeake, including protecting valued lands on the Rappahannock River, Potomac River, James River, Nanticoke River, at George Washington and Jefferson National Forests, and many other places. And perhaps his crowning achievement: a direct role in protecting the internationally significant Werowocomoco, an indigenous cultural landscape, spiritual center and seat of leadership for Tidewater Algonquians," said conservancy President and CEO Joel Dunn.

Since 2014, the conservancy has recognized many individuals and organizations as Champions of the Chesapeake.

Earlier this year, the conservancy presented the award to Jason Fellon, watershed manager, Pennsylvania Department of Environmental Protection, and Marcus Kohl, regional director, Pennsylvania Department of Environmental Protection. ■

Groups file suit challenging Conowingo Dam license

The long-running Conowingo Dam controversy is back in court. On June 17, four environmental groups challenged the Federal Energy Regulatory Commission's decision in March to relicense the hydropower facility on the lower Susquehanna River.

The groups — the Waterkeepers Chesapeake, Lower Susquehanna Riverkeeper, Sassafras Riverkeeper and the Chesapeake Bay Foundation — asked the U.S. Circuit Court of Appeals for the District of Columbia to order FERC to rule that the relicensing decision violated the Clean Water Act.

The groups contend that FERC acted unlawfully by renewing Exelon Corp.'s license to generate electricity at the dam without requiring the steps Maryland regulators at one time said were needed to restore water quality in the lower Susquehanna and the Bay.

Betsy Nicholas, executive director of Waterkeepers Chesapeake, said the 50-year license issued to Exelon was "grossly insufficient" because it failed to require specific nitrogen and phosphorus reductions. Moreover, it had "absolutely no plan," she said, to deal with an estimated 200 million tons of sediment stored behind the dam.

Under the Clean Water Act, no license could be issued for the dam unless Maryland certified that it would not harm water quality. In early 2018, the Maryland Department of the Environment issued that certification, but with the condition that Exelon either clean up the nutrient and sediment pollution coming through the dam or pay the state $172 million a year to have it done.

Exelon sued, contending that it was being forced to shoulder an "unfair burden" for pollution from

briefs

upriver that the dam did not actually generate.

In October 2019, the MDE and Exelon reached an out-of-court settlement, in which the company pledged more than $200 million over the next 50 years on projects intended to rebuild eel, mussel and migratory fish populations in the river and to reduce nutrient and sediment pollution.

The state, in turn, waived its right to impose conditions via the water quality certification.

Environmental groups and others petitioned FERC not to accept the deal, but in March it issued Exelon a new license that accepted the terms of the MDE settlement and did not impose any other conditions. ■

Patapsco greenway spur will connect to Guinness brewery

Maryland is providing $1.5 million in state funds to support trail repairs along the Little Patuxent River and add a spur to the Patapsco Regional Greenway that will connect the town of Elkridge in Howard County to the Guinness brewery in Baltimore County.

"Our parks and our trails are one of our greatest resources as a county, and with today's announcement we're making significant progress toward expanded green infrastructure and connectivity to communities throughout our region," said Howard County Executive Calvin Ball.

Howard County, MD, Executive Calvin Ball announces $1.5 million in state funding to extend and repair hiking trails. (Courtesy of Howard County Recreation and Parks)

Most the funds will support the new spur for the Patapsco Regional Greenway. The extension will run from Historic Elkridge across a bridge over the Patapsco River, connecting to a site at an underpass near the Guinness Open Gate Brewery.

The $1.25-million grant provides Howard County with the match needed to secure additional funding for the project from the State Transportation Alternatives Program.

The Patapsco Regional Greenway Plan envisions a 40-mile, shared-use trail running through the Patapsco Valley from Baltimore's Inner Harbor to Sykesville in Carroll County. This trail would pass through or near the communities of Cherry Hill, Baltimore Highlands, Halethorpe, Elkridge, Catonsville, Ellicott City, Oella, Daniels, Woodstock, Marriottsville and Sykesville.

Howard County will use $250,000 of the state funds to make repairs to the Savage Mill Trail. The 1.16 mile-trail travels the southern side of the Little Patuxent River, along an old rail line that ends north of the mill ruins.

Tasks include replacing collapsed culverts, stabilizing steep slopes, fixing timber stairs used to access the trail and redesigning the picnic area.

"Especially during the past year, our residents and community have utilized Howard County's parks and trails more than ever, getting outside to walk, bike and more. We know what an asset our parks and trails are to our community, which is why we're constantly working to protect and improve these resources for our residents," Ball said. ■

VA changes freshwater bacteria threshold, increases testing

Lack of resources leaves rural areas without real-time swim advisories

By Whitney Pipkin

New bacteria standards are in full effect this summer for freshwater swimming spots in Virginia rivers.

The change raises the level of bacteria that would trigger water quality alerts for swimmers, rafters, paddlers and tubers, but it increases the frequency of the tests. Officials say the end result is better protection from potential health risks from recreational water contact, especially in rural areas.

"If you just look at the numbers, it looks like the criteria are not as protective, but the new statistical threshold is for a nine-day period, not a six-*year* period," said Tish Robertson, a monitoring and assessment scientist at the Virginia Department of Environmental Quality. "So that makes the new criteria in a way more stringent and protective than the old criteria."

But the Shenandoah Riverkeeper and a group that advocates for the organization say the change provides less public protection, especially when compared with the monitoring standard at beaches in more populated areas.

People swim and paddle in the South Fork of the Shenandoah River. (Alan Lehman/Shenandoah Riverkeeper)

"It's almost a five-hour drive for people living in the Shenandoah Valley to drive to a Virginia beach," Shenandoah Riverkeeper Mark Frondorf said. "For many folks, the Shenandoah River is their only option to swim in the summer months."

Rural areas like those surrounding much of the Shenandoah River can seem clean at first glance, but they can be polluted by fertilizer, animal waste or leaky septic systems, which increase bacteria levels in the water.

Many monitoring programs use the U.S. Environmental Protection Agency standard, which triggers short-term swimming advisories when bacteria levels exceed 235 *E. coli* per 100 milliliters of water. But, in most freshwater areas, testing is not conducted regularly enough to issue nearly real-time advisories offered at popular oceanside beaches.

In high enough concentrations, bacteria such as *E.coli* can cause gastrointestinal illnesses, skin and ear infections, and occasionally conditions that can be life-threatening.

Virginia's new standard for freshwater tolerates higher concentrations of *E. coli* (410 bacteria per 100 mL of water) but requires far more frequent testing. Previously, if water samples exceeded the lower *E.coli* maximum 10% of the time over a six-year period, a waterway would be considered unsafe for recreational use. The new criteria declare a stream unsafe if the *E. coli* count exceeds the threshold 10% of the time over a nine-day period.

The changes to the state's swim-safety monitoring protocols were approved in 2019 but delayed as COVID-19 disrupted the monitoring program in 2020. Robertson said the change resulted from years of study, prompted by a 2012 EPA recommendation to base advisories on shorter testing time frames.

Margaret Smigo, Waterborne Hazards Program Coordinator for the Virginia Department of Health, said her agency still lacks the funding and staff to conduct adequate testing in freshwater swimming areas of the state, like campgrounds along the Shenandoah River, which would make it difficult to issue nearly real-time advisories on water quality.

The DEQ is planning to increase the frequency of bacteria monitoring in certain high-traffic freshwater areas that are popular with swimmers. ■

Oyster rebound prompts MD to ease some harvest limits

As Wednesday ban is lifted, watermen praise move, CBF urges fresh approach

By Timothy B. Wheeler

Amid indications that Maryland's oyster population is on the rebound, state fisheries managers are easing some harvest limits they had imposed two years ago.

The Department of Natural Resources announced July 1 that it would permit commercial oystering Monday through Friday, ending the Wednesday harvesting ban.

The DNR also has proposed reopening most areas north of the Bay Bridge to harvesting in the upcoming season, which runs Oct. 1 through March 31, 2022. Only the Chester River would remain off-limits under the proposal, which is expected to be finalized in July.

Watermen welcomed the decision, though they had pressed for even more easing of the limits. The Chesapeake Bay Foundation, though, called the announcement "a missed opportunity" that could undercut the recovery of the Bay's oyster population.

Maryland watermen had pressed for lifting harvest restrictions in the wake of the DNR's updated assessment of the state's oyster population, released in June. It found that the number of legally harvestable oysters this year had increased to around 500 million, the third largest number in the last two decades.

Chris Judy, the DNR's shellfish program manager, said the stock assessment showed the oyster population was "trending in the right direction."

The update marks a turnaround from the DNR's 2018 stock assessment, which estimated that the state's population of market-size oysters had declined by half since 1999. The assessment also determined that oysters were being overharvested in more than half of the areas open to commercial harvest.

In response to the 2018 assessment, the DNR clamped down, banning oystering on Wednesdays and reducing the maximum catch on other days. The agency also closed most areas north of the Bay Bridge.

Despite the restrictions, watermen landed 330,000 bushels of oysters in the most recent season, a 20% increase over the previous season and more than twice the number landed in 2018–19, before harvest limits were imposed.

Watermen contend that the growth in the oyster population, even as landings increased, shows that the limits are no longer needed.

"We're seeing an increase over time," Jeff Harrison, president of the Talbot Watermen Association, said at a June 8 meeting of the DNR's Oyster Advisory Commission. "We have a great spat set, so we know in the future we're going to have oysters."

But the Bay Foundation warned that the DNR decision could backfire.

"The stock assessment continues to show overharvesting happening in several areas of the Bay, which these regulations fail to address," the foundation said in a statement. "In fact, this action opens the door for more harvest, which puts any chance of this year's record spat set contributing to the long-term recovery of oysters at significant risk."

The Bay Foundation urged the DNR to rethink the way it manages the oyster fishery, arguing that the increased harvest of the past two years shows that the methods for limiting harvest pressure aren't working.

The number of watermen paying fees to harvest oysters increased from 822 in 2018 to 1,239 last fall, the most in two decades.

The foundation said that fishery managers should require watermen to report their harvest online, as Virginia will begin doing this fall. It also said the DNR should set a total allowable catch for each area. That way, managers could monitor the harvest more closely and close it in areas where the cap has been reached.

The DNR's Judy said the state plans to begin a trial of online harvest reporting this fall.

Oyster populations in Virginia's portion of the Bay also are trending up in most places, according to Andrew Button, head of conservation and replenishment for the state's Marine Resources Commission. Surveys there show oysters of all sizes at or near 20-year-plus highs, he said.

The Virginia Marine Resources Commission is expected to announce its rules for the 2021–22 oyster season in August. ■

Chesapeake changes & challenges: What we thought then vs. what we know now

By Karl Blankenship

The Bay Journal was first published 30 years ago, in March 1991. This column is part of a series marking the Bay Journal's 30th anniversary, highlighting its coverage, its unique development as a nonprofit news source and our plans to continue serving readers in the years to come.

When the *Bay Journal* was first published in 1991, there were plenty of good things starting to happen. Striped bass were making a comeback, the reconstruction of Poplar Island began and general interest in Chesapeake Bay issues was on the rise.

But lately, as I've spent some time reviewing three decades of *Bay Journals*, I've found many articles that, in hindsight, serve as cautionary tales. Although the Chesapeake is considered well-studied, they show that we often know less about the Bay, and its resources, than we think. Some tasks were easier than thought; others proved harder than imagined or simply impossible. Often, the much-needed follow-up never happened. Here are some tales from the *Bay Journal* with cautionary lessons from the 1990s.

■ *Agreement reopens Susquehanna to shad (November 1992)*

There was lots of optimism about shad on the Susquehanna River when the owners of four hydroelectric dams on its lower reaches agreed to build fish passages, which biologists hoped would move 2 million shad and 5 million river herring annually upstream. But they've come up drastically short; 16,200 shad passed the dams in 2001, and that number has been decreasing ever since.

Sometimes, humans just can't engineer their way out of the problems they create.

■ *Managing the Bay as an ecosystem: Unheralded 'ecologically valuable species' are key to a healthy Bay (June 1993)*

The Bay restoration effort is aimed at restoring a healthy ecosystem, but a report from the state-federal Chesapeake Bay Program about "ecologically valuable species" warned that focusing only on nutrient pollution and economically important fish species might fail to produce the bountiful Bay that people expect because those species also require healthy populations of things like bay anchovies, zooplankton and silversides.

Despite that warning, there continues to be relatively little effort focused on these species, though the Bay Program today is at least working to identify and protect important fish habitats.

■ *Trees and the Bay: Restoring streamside forests may be an important key to restoring the Chesapeake (November 1993)*

A new Bay Program report said that streamside forest buffers should be a "priority tool" in developing plans to reduce nutrient pollution. We devoted four *Bay Journal* pages to covering the science that showed their benefits for reducing pollution and restoring healthy stream ecosystems.

The region has yet to coalesce around a single coherent message, strategy and clear prioritization for forest buffers. That explains a lot about where we are today.

■ *Some areas once thought "clean" are showing signs of toxic impacts (June 1994)*

Researchers were finding toxic chemical impacts on aquatic organisms around the Bay watershed, even in areas they thought were pristine. Nonetheless, focus on toxics as a Bay issue melted away over time.

As this story illustrated, sometimes you have to look for problems to find them. It's a lesson we continue to learn, as with the class of "forever chemicals" called PFAS and the lingering concerns about contaminants that lead to intersex fish.

■ *Save the sturgeon? Biologists ponder restoration potential for the Chesapeake Bay's largest fish (June 1995)*

In the mid-1990s, many biologists thought the Atlantic sturgeon, the Bay's largest native fish, were completely gone. They pondered whether a reintroduction program should begin. In recent years, despite the lack of such a program, biologists have found sturgeon present around the Bay, and they are surprisingly abundant in some places in the James River. It's surprising how often our assumptions prove wrong.

■ *BNR treatment exceeds expectations at Blue Plains (December 1996)*

When the *Bay Journal* launched, controlling nutrient discharges from wastewater

A 1993 report said planting streamside forests should be a "priority tool," but that hasn't always been the case for the Bay cleanup effort. (Will Parson/Chesapeake Bay Program)

treatment plants using a process known as biological nutrient removal was considered too expensive to be a viable solution to the region's nutrient pollution problem. But as it was implemented, BNR proved less costly and more effective than thought, as this pilot program at the massive Blue Plains plant outside the District of Columbia demonstrated.

Today, wastewater plants are the Bay's greatest source of nutrient reductions.

■ *New air rules would help the Bay (January–February 1997)*

Many *Bay Journal* articles in the 1990s focused on emerging science showing that the nitrogen oxide emissions from power plants, factories and vehicles were a major source of nutrient pollution in the Bay. But it was considered uncontrollable. Then, a stream of regulations to reduce smog, particulates and acid rain dramatically slashed those emissions.

Today, air emission controls are second only to those from wastewater plants as a source of nutrient reductions.

■ *Scientists investigate cause of sores on striped bass (November 1997)*

The year 1997 brought us *Pfiesteria piscacida*. The so-called "cell from hell" burst into headlines and was blamed for fish kills in Maryland and sickening people. The hysteria unleashed a wave of research money and new regulations on farms, which were blamed for contributing to the problem. Today, no one talks about *pfiesteria*, and some of the science has been called into question.

Overlooked during the commotion were sores that started showing up on the Bay's striped bass, caused by bacteria infections. Mycobacteriosis never garnered headlines, but today it infects most striped bass in the Bay. Ultimately, it kills many of them, but we don't know exactly how many because the overshadowed problem has gotten little attention or research.

■ *The Bay Program must clean Chesapeake by 2010 — or else (September 1999)*

The Bay Program was supposed to reduce nutrient pollution in the Bay 40% by 2000. By 1999, it was clear that wasn't going to happen, so Bay Program partners moved toward a new goal of cleaning up the Bay by 2010, with the U.S. Environmental Protection Agency threatening to use a more regulatory tool, the total maximum daily load, to enforce the matter if the new deadline was missed. Of course it was missed, and in 2010 a TMDL was issued with a 2025 deadline.

That goal will be missed, too, in part because we still haven't learned the right lessons. ■

Dolphins reported 'all over the place' in Chesapeake Bay

Researchers studying when they appear, what they eat

By Whitney Pipkin

Hundreds of Atlantic bottlenose dolphins are spending their summers in Chesapeake Bay waters. And now, with the help of crowd-sourced sightings reported each of the last four years, researchers are beginning to understand when and where these marine mammals are likely to emerge.

While dolphins have had a presence in the Bay since the late 1800s, researchers think they are arriving in larger numbers than before. That could be in part because warmer waters are pushing the ranges of both fish and the mammals that follow them farther north. It could also reflect rebounding populations after disease outbreaks impacted the region's dolphin numbers between 2013 and 2015.

The bottlenose dolphins (*Tursiops truncatus*) that travel to the Chesapeake are a migratory species that spend the rest of the year at other locations along the Atlantic Coast. While dolphins have been studied in captivity, research on their behavior in the wild — where hunting strategies can vary widely from one region to another — is still relatively new, particularly in the Bay.

After witnessing the first dolphin birth in the Potomac River in 2019, scientists now think the Bay could be providing a safe haven from predators where the dolphins can mate and, about a year later, give birth to their calves.

"We are not sure if the population is growing, because it's been monitored for a short time," said Lauren Rodriguez, a graduate research assistant at the University of Maryland Center for Environmental Science who authored the latest study as part of her work with Chesapeake DolphinWatch.

But, she said, "if they are having babies, then we assume that the population has the potential to grow here."

Since 2017, Chesapeake DolphinWatch has been tracking hundreds of dolphin sightings reported to its website and app to develop a picture of their presence in the Bay and its rivers. Many of the reports include photos or videos of fins slicing through the waves by the dozen. In May, scientists used these observations to publish the first study detailing when and where dolphins are spending time in the region.

Dolphins swim near a sailboat not far from the University of Maryland's Chesapeake Biological Laboratory in Solomons, MD, on Aug. 18, 2017. (Carolyn Wilson)

The study shows "that dolphins are all over the place, even past Annapolis, especially in the summer months," Rodriguez said.

Nearly 1,000 registered users of Chesapeake DolphinWatch reported 2,907 sightings between June 2017 and October 2019, enough for the researchers to begin seeing trends. By contacting users individually, they were able to confirm nearly 70% of those sightings.

Beyond the time period covered in the study, researchers have confirmed more than 2,600 sightings from June 2017 through the end of 2020. And users were already busy posting sightings this June.

The study concludes that dolphins are often concentrated around Bay shorelines, but they are spotted in the mainstem as well. Dolphins have been sighted at the mouths of multiple tributaries, primarily near and in the Potomac, Rappahannock and York rivers. The highest frequency of sightings (nearly 136) was logged at the mouth of the Rappahannock, but these were all made by a single observer.

"We were unable to test if the Rappahannock River was truly the most significant location for dolphin sightings, or if this user's diligent efforts created spatial bias," the report states.

Information contributed by hundreds of people scattered across the watershed makes this type of spatial research possible and affordable. Though the sightings are not conducted by scientists, a lack of dolphin lookalikes in the Bay (like seals, for example, which don't venture that far into Bay waters) makes them easy to identify.

But it can be hard to confirm whether the sightings increase at certain times of the year because there are more dolphins or because more people are on the water.

"The main week we get sightings is July 4th week," Rodriguez said. "We're not sure if that's because of human activity — a lot of people out on their boats — or if it's the dolphin activity."

The DolphinWatch researchers also use underwater microphones, called hydrophones, to listen for dolphin chatter and confirm the trends that emerge from sighting reports. The study found a significant correlation between the frequency of weekly acoustic detections and weekly sightings from 2017 to 2019.

But the July 4th peak also matches the rest of the data, with sightings increasing farther north in the Bay with warmer midsummer temperatures and ebbing as they cool off in the fall. Since tracking began here, the earliest dolphin sightings tend to be reported in early April in the Lower Bay. From June to August, dolphins can be spotted in the Lower, Middle and Upper Bay. And, at the end of October, they are seen primarily in the southern portion of the Middle Bay and the Lower Bay.

That bell curve of dolphin activity mirrors some trends in fish spawning behavior as well, which could be one of the factors driving dolphins farther north as waters warm. In 2018, DolphinWatch users reported 714 sightings in June, July and August alone.

Overall, Rodriguez said, "There are way more than anyone thought."

The study describing when and where dolphins appear in the Bay could help guide human activities, such as bridge construction or military training, that might harm the animals.

Rodriguez said her team provided comments to the U.S. Navy, for example, recommending that an environmental impact statement under way for the Patuxent River Complex should incorporate the latest research on bottlenose dolphins, which are included in the Marine Mammal Protection Act.

Helen Bailey, director of Chesapeake DolphinWatch, said the acoustic data scientists collect not only confirms where dolphins are but also provides clues about their behaviors.

Bailey said a mother dolphin nursing her calf will over the first year develop a specific whistle for the baby that becomes its name. Other whistle types indicate other behaviors. When dolphins feed, for example, their clicking noises bounce back and forth so rapidly it sounds like a door creaking. The researchers are even beginning to recognize the sound a dolphin mother makes when she is scolding her baby.

"Other members of my team are looking at these calls and trying to see what the dolphins are saying and how many dolphins there are with signature whistles," Bailey said.

Next, Rodriguez plans to use eDNA technology to better understand what the dolphins might be eating during their summer forays. The work would involve running water samples through filters and analysis to determine which fish species' DNA is present alongside that of the dolphins. Combined with what they can see and hear about the dolphins, this could help researchers understand what's drawing them farther into the Bay.

"Bottlenose dolphins are a protected species, so we don't want to harm them or bother them," Rodriguez said. "But we do want to study them." ■

A large warehouse rises along Interstate 81 near Greencastle, PA. (Dave Harp)

The big picture: Warehouses take toll on environment, localities

Increase in eCommerce, good jobs comes with more pollution, traffic

By Ad Crable & Jeremy Cox

If you have ordered something online and been amazed when it arrives at your doorstep the next day, you can probably thank a super-sized warehouse.

Driven by "eCommerce" and supercharged by the stay-at-home shopping habits induced by COVID-19, mega warehouses are reshaping the landscape.

The gargantuan, windowless structures along major highways, with 18-wheel tractor-trailers streaming in and out of loading bays, make a Walmart Supercenter look like a drive-through hamburger joint.

Ever-larger warehouses, some the size of nearly 35 football fields, are popping up in corn fields and next to suburban neighborhoods in parts of the Chesapeake Bay region. Among the epicenters: Interstates 78 and 81 in Pennsylvania and around Baltimore.

"Warehouse distribution has become a major industry," said Bill Wolf of CBRE, a commercial real estate service and investment firm. "It's become a major employer and a good employer. And it's probably here to stay."

But they are not always embraced. Residents and officials in some communities have packed town meetings and filed lawsuits to stop monster buildings in their midst.

The list of complaints can be as long as the buildings themselves: air pollution from increased truck traffic; the gush of increased stormwater; environmental justice conflicts; traffic woes; noise and light pollution; loss of farmland; and the abrupt change in community character.

"We all know about urban sprawl," said Nathan Wolf, a Pennsylvania attorney who has been involved in four challenges to mega warehouses along I-81. "There's also industrial sprawl."

Where the warehouses roam

To be sure, big warehouses have been a staple along major arteries for decades. But fueled by the big-box warehouse boom, the nation's industrial real estate market set a record in 2020 even as the country's overall economy was faltering.

Nowhere in the Unites States have more warehouses of at least 1 million square feet been built lately than along a 233-mile section of Interstates 81 and 78 in Pennsylvania, according to CBRE. Eleven of these structures, each the size of nearly 18 football fields, were built in 2020 alone.

Altogether, 554 warehouses classified as big-box facilities in the I-78/I-81 corridor, according to CBRE.

The reason is simple, industry analysts say. That stretch of expressway enables trucks to reach 40% of the U.S. population within a day. Access to major ports, low-cost land and favorable tax rates add to the area's appeal.

The I-81 corridor in Cumberland County, located just outside Harrisburg, has 76 warehouses, each covering at least 200,000 square feet of floor space, the definition used by CBRE to describe industrial big-box facilities.

County Commissioner Jean Foschi acknowledges that the warehouses have brought good jobs and increased tax revenue. But trucks serving facilities in Cumberland and nearby counties have taken a toll on local infrastructure and air quality, she said.

"Are you a good neighbor if you use the services of volunteer fire companies but don't support them financially?" she said. "Are you a good neighbor when you don't enforce the no-idling law on your property? It seems to me that the industry could be working harder to mitigate the stressors they create."

Central Pennsylvania leads the nation with the most square feet of warehouses leased. And more are on the way, including a 1.9-million-square-foot "fulfillment center" — 43 acres under a single roof — under construction in Franklin County, near the Maryland border.

Large warehouses have been built on 3,600 acres of farmland along I-81 in the largely rural county since the mid-1990s, converting fields to gleaming new rectangular buildings, with vast expanses of asphalt and truck bays.

Congestion on I-81 and clogged exits are becoming more of a problem. Truck volume has tripled on the bustling interstate over the past 30 years, and as much as 40% of the daily flow these days can be tractor-trailers. A new interchange will soon be added in Franklin County at a cost

Trucks leave warehouses at the Key Logistics Park near Interstate 81 in Carlisle, PA. (Dave Harp)

of $23 million to serve a growing cluster of big warehouses.

Pennsylvania may be leading the big-box race, but other markets aren't far behind. In the Baltimore area, developers completed 2.8 million square feet of warehouse space in 2020, placing it 10th in the nation. Another 3.1 million square feet is under construction, according to CBRE.

Fighting for air

Increasingly, the warehouses are coming under fire for exacerbating air pollution.

Exhaust from diesel truck engines is one of the main contributors to smog and soot. In Pennsylvania, more than 20% of nitrogen oxide emissions — a precursor of smog and an airborne source of water pollution — comes from diesel engines. Tiny invisible soot particles are also emitted and, when inhaled, can cause respiratory problems. That's especially a problem for the elderly, those with compromised breathing and heart conditions and young children whose lungs are still forming.

In 2005, the signatures of more than 100 local physicians were published in a newspaper ad blaming the growing concentration of truck traffic for contributing to Cumberland County's poor air quality.

Four years later, warehouse opponents successfully spearheaded a state law that prohibits large diesel trucks from idling more than five minutes. But county officials and opponents allege it is rarely enforced.

Smog levels have declined in Cumberland County since 2015 and in Franklin County since 2010, according to the American Lung Association. But monitoring stations operated by the state are not located near warehouses or I-81. And soot levels were not monitored because there were no sampling stations in the counties.

A national initiative could alter the air debate in the coming years. The U.S. Environmental Protection Agency is nearing completion of its Cleaner Trucks Initiative, which would set tougher emissions limits on heavy truck engines to greatly reduce soot and smog pollution.

A flood of runoff

Unchecked runoff from urban areas has proven especially tough to control as a source of pollution in streams and rivers that flow to the Chesapeake Bay, defying more than three decades' worth of efforts to turn that tide. According to computer models managed by the state-federal Chesapeake Bay Program, stormwater water runoff accounts for 16% of the nitrogen, 18% of phosphorus and 24% of sediment entering the Bay.

Trailers line up at loading bays at Key Logistics Park near Interstate 81 in Carlisle, PA. (Dave Harp)

New warehouses and parking lots add more impervious surfaces, where rainwater cannot penetrate the ground, causing pollutants to wash off more easily in each rainstorm. A review of recent stormwater research shows that sediment runoff is 20-fold higher in urban areas compared with forested lands.

The Bay Program, which governs the restoration effort launched in 1983, tracks 55 types of land uses in the Bay's drainage basin. Only three are devoted to impervious cover — roads, structures and other hard surfaces — but they do not distinguish among different types of development, such as an Amazon fulfillment center or a housing subdivision.

Researchers have long known that industrial buildings, such as warehouses, likely pose a bigger threat to stormwater quality than other development. A new Virginia Tech study offers fresh evidence of that problem.

The research team monitored stormwater quality for one year at six catchments in Virginia Beach, each dominated by a single land use. They included an industrial area with huge rooftops and acres of asphalt. The others were suburban landscapes: a commercial center, a highway strip, a park and low– and high-density housing zones.

Of the areas studied, the industry-dominated area had the highest concentration of nitrate, a key water pollutant, along with large amounts of sediment in its stormwater, according to the study, which was published in June.

In urban areas, developers are required to install "best management practices," such as shallow ponds, to allow pollutants to settle out. David Sample, one of the study's authors, said the research suggests that such controls at industrial facilities may not be capturing as much pollution as thought. Inadequate design or poor maintenance may be to blame, he said.

And, when outside urban areas, warehouses often are not covered by state and federal stormwater permit programs at all.

The buildings, and the surrounding sea of parking lots, can be devastating to the nearby streams. Research shows that when the amount of impervious cover in a watershed reaches 10%, stream health rapidly declines and sensitive species like brook trout disappear.

On the outskirts of Leesburg, VA, stormwater concerns threaten to derail an Indianapolis-based developer's plans to build a 200,000-square-foot distribution warehouse, covering nearly the same amount of space as four football fields.

The Loudoun County Planning Commission is urging the approval of the Scannell Properties project, contradicting county staff. County planners recommended rejecting the proposal because of impacts on stream buffers and concerns about the steep slopes on some of the property.

Proponents sought to contrast the project with the land-hungry internet data centers that have come to dominate Northern Virginia's landscape. Those facilities are often criticized for their high energy usage and intense water usage for cooling systems.

Colleen Gillis, a consultant representing Scannell, told the board at its May 24 meeting that the proposed warehouse is small for its type. "This property is planned for industrial uses. We're doing a distribution facility. A data center would blow out a lot more of those environmental resources. So, as much as people might say, 'Ugh, I'm not sure,' it's the most environmentally sensitive use for this place type."

The county's board was scheduled to hear the case on July 14.

Hampering environmental justice

The clustering of warehouse development in some cases has caused environmental justice problems.

In Hanover County, VA, for example, Wegmans Food Markets has been locked in a legal and regulatory battle over a proposed 1.7 million-square-foot distribution center near the historic Black community of Brown Grove. It lies about 15 miles north of Richmond. Residents there already deal with the effects of a bustling truck stop, a landfill and a concrete plant, said Kenneth Spurlock, the deacon at the Brown Grove Baptist Church. "I don't think I know of any other community that has those things going," he said.

In April, the local NAACP chapter sued to appeal a 4–3 vote by the State Water Control Board allowing the project to impact nearly 15 acres of wetlands.

"Right across this road, acres of wetlands will be destroyed," said Pat Hunter-Jordan, president of the Hanover County NAACP, at a news conference outside Spurlock's church announcing the lawsuit. "The foundation of a one-room Black school will be lost. Unmarked graves of our ancestors lay on this very property."

Where should monster warehouses go if not in farm country or next to neighborhoods? Developers in many areas are facing calls to steer facilities toward blighted industrial sites and urban areas where there are ready workforces that won't have to travel far. On the other hand, such sites could also pose environmental justice concerns if they are located in or near neighborhoods that are already burdened by industry and related problems with air and water pollution.

New Jersey made waves on the issue this spring when lawmakers considered a bill that would require warehouse developers to complete a regional impact report, though it failed to make it out of committee.

"Site location and conditions need to consider impacts to neighborhoods, nearby communities, environmentally sensitive land, scenic vistas and flood zones," said Taylor McFarland, chapter coordinator for Sierra Club-New Jersey. "There are economic benefits and jobs that can come from warehouse projects. However, we need to make sure sites for these projects are appropriate." ■

MD landfills pose bigger climate problem than previously thought

Municipal trash sites release 4 times more methane than estimated

By Timothy B. Wheeler

Maryland landfills in 2017 emitted a combined amount of methane and carbon dioxide that was four times the emissions from an average Maryland coal-fired power plant. (Tracey Saxby/Integration and Application Network /ian.umces.edu/media-library)

Throwing food away is more than wasteful. When it gets buried in a landfill, it generates methane, a climate-warming greenhouse gas many times more potent than carbon dioxide.

A new report by the nonprofit Environmental Integrity Project finds that Maryland's municipal landfills are releasing much more methane than previously estimated.

The group estimates that rotting food and other waste in Maryland's municipal landfills sent about 51,500 tons of methane into the atmosphere in 2017, the most recent year for which complete data were available. That was four times the 12,500 tons that had been estimated by the state Department of the Environment.

"This shows that Maryland really needs to do a better job of reducing, controlling and measuring greenhouse gases from landfills," said Ryan Maher, an attorney with the group and lead author of the report. "We need to reduce our food waste, compost more and impose strong new air quality regulations that require improved methane control systems at our state's landfills."

Carbon dioxide from burning fossil fuels and other activities is by volume the main cause of global climate change. But even though much less methane is released and it is relatively short-lived in the atmosphere, it has drawn increasing scrutiny because its warming potential is 25 to 86 times greater than CO_2.

While much of the concern with methane has focused on leaks from natural gas wells, compressor stations and pipelines, the EIP report found that landfill emissions are actually the leading source of methane in Maryland.

Maher said that because of errors in the way it was modeling landfill emissions, the MDE had been underestimating the amount of methane released since 2006.

MDE Secretary Ben Grumbles issued a statement saying regulators agree with the group's findings and have revised their landfill emission estimates to correct the mistakes. The MDE now estimates that net emissions from landfills in 2017 were about 58,000 tons — even more than the environmental group calculated.

"The revised estimates reinforce the need for new actions to control methane emissions from landfills," Grumbles said, "and also boost efforts to reduce the amount of waste going to landfills, which is exactly what we are doing."

The EIP report estimates that the state's landfills also emitted about 500,000 tons of carbon dioxide. Included in that figure are 64,000 tons produced by flares installed at some landfills to burn off methane that has been collected from the buried waste. That figure is also four times greater than the MDE's estimate.

Altogether, the state's 40 landfills effectively emitted as much greenhouse gas pollution as about 975,000 motor vehicles driven for one year, the report stated. That is four times the emissions from an average Maryland coal-fired power plant, it noted.

"Landfills are a much bigger source [of methane] than previously thought," said Russ Dickerson, an atmospheric chemist with the University of Maryland. The EIP report dovetails with what he and other academic and federal researchers have found, he said.

During the winters of 2015 and 2016, researchers with the University of Maryland and Purdue University detected unusually high methane emissions when flying over the Baltimore-Washington area in airplanes equipped to collect or detect methane in the atmosphere.

By reviewing wind speed and direction at the time of the flights, Dickerson said, they were able to track some of the gas to large landfills in the region. In a 2018 paper published in the *Journal of Geophysical Research*, the team identified landfills as a major source of methane, along with leaking natural gas infrastructure.

A number of Maryland landfills collect methane in a network of subsurface pipes and then "flare" or burn it as a safety measure. Others use it as a fuel to generate energy. But only 21 of the 40 landfills in the state take such actions, according to the EIP report, and only four are required by federal regulations to ensure that those systems work. The U.S. Environmental Protection Agency had been moving to tighten its rules, but those were shelved during the Trump administration.

Maher suggested that Maryland should enact rules modeled on those that have been in effect for years in California and are under development in Oregon. But he also said the state needs to do more to curtail the disposal of food in landfills.

"It's the least efficient and least desirable way to deal with food waste," he said.

Grumbles said the MDE is planning to go beyond the federal requirements for methane collection.

The MDE has already established a new office for recycling markets, Grumbles noted, and it has developed new requirements for mandatory food scrap recycling at certain organizations. The MDE is looking to hold a "food recovery summit" before the end of 2021, Grumbles said.

The impacts of climate change are already impacting the Chesapeake Bay region through rising sea levels, warming temperatures and shifts in wildlife abundance and migration patterns. It's also expected to make it harder to restore the estuary's water quality to maintain fish and shellfish populations.

Dickerson, the University of Maryland researcher, said he's optimistic the methane problem can be addressed. Recent studies suggest there are relatively inexpensive ways to increase the efficiency of landfill gas collection, he noted.

"I think the planet and people of the state of Maryland will benefit from this," Dickerson said. ■

Township rejects large solar project proposed for PA farmland

Critics say 1,000-acre project would harm agriculture, tourism

By Ad Crable

These solar panels, shown here in 2011, were installed as part of a 240-panel array at Seldom Rest Farms in Myerstown, PA, to generate energy for the farm, as well as for a neighboring farm and homes on the local electrical grid. (U.S. Department of Agriculture)

Township supervisors near Gettysburg, PA, pulled the plug June 3 on what could have been Pennsylvania's largest solar energy project.

After 18 months of virtual public hearings, Mount Joy Township supervisors voted against granting a conditional-use permit that would have allowed Florida-based NextEra Energy Resources to build 330,000 12-foot-high swiveling solar panels on 1,000 acres of 18 different farms.

The vote was streamed on Zoom and residents, who were not allowed into the building where the meeting took place, held a rally outside. No supervisors commented on their vote.

The final vote was a 2-2 tie, which, under township rules for conditional-use permits, is considered a no vote. A fifth supervisor recused himself because he had signed leases on his farm for the project.

The project, called Brookline Solar 1, faced a strong backlash from 168 property owners that border the project and others.

Organized as Residents for Responsible Solar and Agriculture, citizens have attacked the project as an industrial-scale power plant that would harm Adams County's two largest industries: agriculture and Civil War tourism.

"While Residents for Responsible Solar and Agriculture are not opposed to renewable energy per se, the proper siting, adjacent landowner rights and property values, and decommissioning surety for these monstrous projects is key to all stakeholders in preserving and protecting our agricultural nature and rural character of Mount Joy Township and Historic Gettysburg," said Todd McCauslin, founder of the group.

During testimony at 20 public hearings on the conditional-use permit, a real estate appraiser said property values of homes adjacent to the solar arrays would decline by 20%. In contrast, NextEra witnesses said previous solar projects around the country have not affected property values and that the solar array would not produce glare problems for homeowners or motorists.

Other criticisms included that only 50-foot setbacks from neighboring properties and roads were required.

Before the June 3 vote, one supervisor proposed new conditions for a permit, including making NextEra put up a $3.3 million bond to pay for the solar array's removal when it is eventually decommissioned. The proposal also included a requirement to make the panels of non-reflective materials, and the builder would have been "encouraged" to buy materials made in the United States. Most components for solar equipment currently come from China.

The 75-megawatt, $90 million solar project would have produced power for the 13-state regional electrical wholesaler PJM Interconnection, on behalf of an unnamed buyer. The state's current largest solar array started operation in October in adjacent Franklin County. That 70-megawatt facility produces power to the regional electric grid for Penn State University.

In March, the state announced plans to purchase power from a solar project that would generate 191 megawatts spread out on 1,800–2,000 acres in six counties. The project has a 2023 completion date. That project would have a larger power capacity than the project proposed for the Gettysburg area but would be much more spread out.

> *"We are evaluating our options and look forward to the continued development of the project."*
>
> — Lisa Paul, NextEra spokeswoman

Opponents of the Gettysburg area solar project celebrated after the permit denial but do not believe the project is necessarily dead.

"I'm still apprehensive that there is going to be a Plan B," McCauslin said.

McCauslin, whose home borders the proposed solar project, noted that in February, NextEra sought a permit for the 10 properties that were not subject to a conditional-use permit. The township's Zoning Hearing Board denied the request because it was incomplete and did not contain a required stormwater management plan.

"I'm happy, but at the same time I feel the vultures are still circling," McCauslin said. "I don't think we're out of the woods yet until we get our zoning ordinance revised and amended to make it like surrounding townships that have protective, reasonable ordinances."

Indeed, Lisa Paul, a spokeswoman for NextEra, which could appeal the township supervisors' decision, indicated the company was not dropping the project. "We were hopeful the township supervisors would have voted on a clear approval of the conditional use permit for the portion of the project in the Baltimore Pike corridor. We are evaluating our options and look forward to the continued development of the project."

Over the last year, Pennsylvania had been criticized by renewable energy advocates for not doing enough on the solar front. PennFuture, one the state's largest environmental groups, had endorsed the Brookline Solar 1 project.

Almost all of the large solar projects in Pennsylvania have been built on farmland. Solar advocates and the solar industry have said that's a good arrangement because it provides another source of income for struggling farmers. Plus, when the contract for the solar project is over, usually after 30 years, the farmer has the option to return his fields to crop production or grazing. ■

Chesapeake's underwater grasses decline for 2nd year

Grass beds in Upper Bay, Lower Bay fared well

By Karl Blankenship

The acreage of underwater grasses in the Chesapeake Bay declined 7% in 2020, the second consecutive year that the amount of critical underwater meadows has dropped since peaking three years ago.

The grass beds, which provide habitat and food for everything from waterfowl and turtles to finfish and blue crabs, covered 62,169 acres last year. That is 40% less than the recent record of 108,077 acres reported in 2018, before months of heavy rainfall sent a flood of murky water into the Bay.

The decline was far from uniform, though. Underwater grasses at both ends of the Bay — the low-salinity areas at the top of the Bay and the high-salinity areas closer to its mouth — saw rebounds last year after suffering major setbacks in 2019.

But the mid-salinity areas in the middle of the Chesapeake, which contain the vast majority of potential underwater grass habitat, continued to be hammered. Large beds around Tangier Sound and the Choptank and Little Choptank rivers took especially hard hits.

Those areas are dominated by widgeon grass, a species notorious for disappearing when conditions turn bad, but often reappearing a few years later.

"A lot of the 2019 decline was the widgeon grass story," said Christopher Patrick, assistant professor of biology at the Virginia Institute of Marine Science, which conducts the annual aerial survey of the Bay's grass beds. "The decline in 2020 can be largely attributed to continuing smaller declines in the Mid Bay, and a lot of that is losing more widgeon grass."

The once-lush underwater meadows of Tangier Sound, which covered roughly 25,000 acres as recently as 2018, have since declined by three-quarters, to less than 7,000 acres, accounting for much of the Baywide loss.

Underwater grasses, also called submerged aquatic vegetation, are considered one of the most important indicators of Bay health because their survival depends on water clear enough to allow sufficient sunlight to penetrate.

Scientists estimate that anywhere from 200,000 to 600,000 acres of grasses were once found in the Bay. By 1984, that had fallen to just 38,227 acres. The state-federal Chesapeake Bay Program has a Baywide goal of getting that number up to 185,000 acres, a figure based on returning grasses to areas where they were actually observed in the last century.

Widgeon grass, shown here in Maryland's Honga River, can die back when conditions turn bad, but the seeds it leaves behind can lead to comebacks when water quality improves. (2016/Dave Harp)

Eelgrass is sensitive to heat, and warming water temperatures on top of continued poor water clarity have gradually caused it to decline. (Dave Harp)

Last year's acreage was 34% of the Baywide goal, and the lowest seen since 2013. But after 2013, good conditions led to a record surge of widgeon grass.

"It's important to keep in mind that last year's decrease, and the decrease in 2019, didn't represent a loss of a long-term abundance and distribution," noted Brooke Landry, a biologist with the Maryland Department of Natural Resources and chair of the Bay Program's SAV Workgroup.

"It was a decrease from a relatively recent expansion," she said. "This not only highlights the importance of protecting and maintaining our more stable underwater grass populations, but the vulnerability of our recently recovered populations."

Grass abundance and the Bay goal

But the story in 2020 varied from place to place.

- The tidal fresh waters at the head of the Bay and in the uppermost tidal reaches of most tributaries saw an increase in underwater grass coverage from 17,618 acres to 18,478. That amounted to 90% of the

restoration goal for those areas.

■ The slightly salty "oligohaline" waters, which occupy a relatively small portion of the Upper Bay and tidal tributaries, showed a decrease in coverage from 9,029 acres to 8,086 acres. That is 78% of the goal for that region.

■ The moderately salty "mesohaline" water — the Bay's largest area of potential underwater grass habitat, stretching from near Baltimore south to the Rappahannock River and Tangier Island, and including large sections of most tidal rivers — saw a decrease from 28,061 to 22,377 acres. That is just 19% of the underwater grass goal for that region.

■ The very salty "polyhaline" water in the Lower Bay — from the mouth of the Rappahannock and Tangier Island south, including the lower York and James rivers — had an increase from 11,975 acres to 13,228 acres. That brought it to 39% of the goal for that area.

Freshwater grasses faring better

Over recent decades, the amount of underwater grasses in the Chesapeake has increased overall, but the trajectories vary widely from one area to another.

Freshwater areas and grasses have generally been increasing over the decades, aided in part by the proliferation of grass beds consisting of multiple species that are better able to withstand poor conditions. Susquehanna Flats, the largest underwater grass bed in the Bay at more than 9,000 acres, accounts for about half the freshwater acreage.

But the story changes dramatically elsewhere. The mid-salinity areas are dominated by widgeon grass, which is the most widespread and abundant species in the Chesapeake. But it is often described as a boom-and-bust plant. It can dramatically die back when conditions turn bad, but the seeds it leaves behind can lead to comebacks when water quality improves.

Those boom-and-bust cycles of widgeon grass are largely responsible for wild fluctuations in the Bay's overall underwater grass abundance. Scientists are ramping up efforts to better understand the factors that drive such wide swings in widgeon grass abundance.

Meanwhile, the high-salinity areas of the Bay have been declining in underwater grass coverage for more than 20 years, largely because of the slow but steady disappearance of eelgrass, a salinity-tolerant species that historically has dominated that area.

Eelgrass is sensitive to heat, and warming water temperatures on top of continued poor water clarity have gradually caused it to disappear. Widgeon grass is the only other Bay species that grows in high-salinity water, but it cannot inhabit all of the areas once occupied by eelgrass. "The time series is full of ups and downs," Patrick said, "but the trajectory overall is not good."

Slightly cooler temperatures last year did allow some patches of eelgrass to reappear in places such as Mobjack Bay in Virginia, where it had been gone, and scientists have seen other beds during field work this spring.

"We did have one nice patch of eelgrass that looked beautiful and healthy," DNR's Landry said after a recent field survey off the Eastern Shore. "And it was absolutely full of terrapins. They were everywhere. Every direction I looked, I saw the little turtle heads watching me." ■

The Susquehanna Flats, the largest underwater grass bed in the Bay at more than 9,000 acres, accounts for about half of the freshwater acreage of grasses. (2010/Dave Harp)

The ABCs of SAV

Underwater grass beds, also called submerged aquatic vegetation or SAV, provides some of the most important habitat in the Chesapeake Bay. They are also one of the best indicators of its health. That's because they rely on clear water to get the sunlight they need to survive.

Algae blooms and sediment in the water block sunlight from reaching the leaves of the grasses. Also, nutrients can spur the growth of tiny organisms, called epiphytes, directly on the leaves of plants, which also block sunlight.

Underwater grasses need large amounts of sunlight because they are actually the descendants of terrestrial plants that "re-invaded" river and bay bottoms in the past 100 million years, taking root in soft sediment. Plants growing in that sediment found a rich source of nutrients, but there was a steep price to pay. The sediment was often oxygen-starved, creating toxic conditions for grasses.

A 'SNORKEL' SOLUTION

Over time, the grasses adapted by developing a mechanism to pump oxygen to their roots and into the soil, effectively making it habitable. When the plants receive energy in the form of light from the sun, they are able to draw carbon dioxide from the water and produce oxygen via photosynthesis. The oxygen is then transported through the plants down into the soil. That air also helps float the plants so they stand upright in the water. The process has been described as the plant equivalent of a snorkel.

That snorkel requires a huge amount of energy to operate. As a result, underwater grasses require more sunlight than almost any other plant on Earth. The amount of sunlight needed varies by species. But generally, freshwater grasses need to receive 13% of the sunlight that reaches the water surface, while medium- and high-salinity species need about 22%.

Only a few hundred plant species globally have developed the ability to live underwater. Marsh grasses and mangroves have developed similar survival techniques, but only SAV can survive totally underwater.

VALUE OF GRASS BEDS

Underwater grasses are so important for waterfowl that some grasses — such as redhead grass and widgeon grass — are named for some of the birds that dine on them. But as the grasses have dwindled, so have the waterfowl — unless, like the few canvasback ducks that remain, they were able to switch from being grass-eating herbivores to clam-eating carnivores.

But underwater grasses are much more than duck dinners. Their beds are a biological factory that churns out huge amounts of tiny organisms that serve as fish food. Studies show that such production is far greater in grass beds than in barren areas that may be only a few feet away. Grass beds have more kinds of organisms — and more organisms overall — because they have lots more to offer: roots, leaves, diverse soil conditions and more oxygen.

Lush underwater beds are important at some point in the lives of many common fish species: croaker, red drum, menhaden, spot, spotted sea trout, eel, black sea bass, tautog, bluefish, summer flounder, striped bass and more. Between 50–75% of all economically important fish species along the East Coast spend some phase of their life in grass beds. Studies show that juvenile blue crabs are at least 30 times more abundant in grass beds than in nearby unvegetated areas.

The benefits don't end there. The grasses soak up nutrients that would otherwise form algae blooms, and they filter sediment from the water. Large beds provide a living baffle that reduces the power of waves before they hit the beach, stemming shoreline erosion. Their roots stabilize sediment, keeping it from being resuspended in the water column.

Underwater grasses are also important for the planet, soaking up more carbon dioxide per acre than forests. Also, rising levels of atmospheric carbon dioxide can cause ocean and Bay waters to acidify, which harms the ability of clams, oysters and mussels to build shells. Recent studies, though, show that underwater grasses can neutralize the acidification process. ■

New camera method shows benefits of oyster restoration

GoPro surveys able to compare reef growth at different sites

By Jeremy Cox

Biologists with the Smithsonian Environmental Research Center used underwater cameras to survey oyster reefs, including the one shown here in Maryland's Tred Avon River. (Smithsonian Environmental Research Center)

A new study supplies more evidence that oyster restoration efforts are having the desired impact in Maryland's tidal rivers, forming better reefs than those set aside as sanctuaries or regularly maintained for commercial harvests.

The differences are visible to the naked eye — or, in this case, the camera lens. For the first time, researchers used videos and photos to analyze a broad swath of the bottom habitat.

The methods aren't intended to replace the labor-intensive diving and tonging techniques for surveying the Chesapeake Bay's oyster population, according to the study's authors. But they say their approach can be useful for obtaining a reef's "qualitative" attributes at a fraction of the time and cost.

"It's a really easy, fast method to go out and keep a tally on how the reefs are doing," said Keira Heggie, lead author of the study and a technician at the Smithsonian Environmental Research Center in Edgewater, MD.

Heggie and her research partner, Matthew Ogburn, assigned a score from zero to three to each of the 200 submerged sites they surveyed on Maryland's Eastern Shore. Higher scores were given to reefs with more height and broader oyster coverage along the sandy bottom.

"You basically just need a camera you can drop to the bottom and take a little picture, maybe a bit of video, and in a few seconds decide which category [the reefs] fit in," said Ogburn, a senior scientist at SERC. "It doesn't provide incredibly detailed information, but it allows you to survey a lot of sites really quickly."

The study adds to the growing evidence in the Chesapeake region that actively restored reefs are thriving while their unrestored counterparts continue to lag.

In Harris Creek, the only tributary in the study where oyster restoration had been completed at the time, nearly 75% of the restored sites scored a three on the researchers' scale. Although the unrestored reefs in the creek are also protected by a harvesting ban, none of them mustered a three.

"Restoration was effective and working in the many ways it was intended," Ogburn said. "There are a lot more oysters there. There's a lot more structure. It looks like there's a lot more vertical habitat, so it doesn't get sedimented over. It looks like it could last well into the future."

Maryland's current oyster management policy dates to 2010, when 9,000 acres of the "best" remaining oyster bars were designated off-limits to harvest. The other 27,000 acres' worth of productive oyster habitat remained in the public fishery.

Under the 2014 *Chesapeake Bay Watershed Agreement*, Maryland and Virginia pledged large-scale oyster restoration efforts in five waterways each. Maryland has selected the Little Choptank River and two tributaries of the Choptank River — Harris Creek and the Tred Avon River — as well as the Manokin River in Somerset County and St. Mary's River in St. Mary's County.

The Smithsonian paper was published in the journal *Marine Ecology Progress Series I* in June, arriving at another inflection point in Maryland's oyster strategy. A state law passed in 2020 requires a more consensus-based approach to managing the bivalves, which are at a fraction of their historic population. The law set a deadline of this Dec. 1 for the Oyster Advisory Commission to deliver its final report.

One of the biggest questions is what will become of the sanctuaries where no restoration has taken place but harvesting remains barred. Commercial watermen have long been skeptical of their ecological benefits, arguing that regular dredging would keep the bars from getting covered in sediment.

"It doesn't seem like the sanctuaries are doing much of anything," Robert Newberry, head of the Delmarva Fisheries Association, told the commission in May.

For their part, Heggie and Ogburn surveyed four streams: The Little Choptank, Harris Creek, the Tred Avon and Broad Creek (another Choptank tributary). In each, the researchers randomly studied 25 sites on restored reefs — including both sanctuaries and harvested areas — and another 25 on unrestored reefs designated as no-harvest sanctuaries.

The survey was conducted in November 2017, about two years after the 348-acre Harris Creek restoration was completed. The 358-acre Little Choptank restoration wasn't completed until last summer. The 130-acre Tred Avon restoration is scheduled to be wrapped up this year.

Harris Creek scored a 3 at 40% of its sites, with almost all of the high scores coming on restored reefs. There was a steep drop-off after that. The Little Choptank's reefs received a score of 3 at only 14% of its sites. The Tred Avon got top marks at 6% of sites, followed by Broad Creek (a heavily harvested tributary) at 2%.

Ogburn cautioned against interpreting his study as proof that unrestored sanctuaries aren't working. When they were set aside, only 26% of the so-called "best bar" area was included in them, well below the state's 50% goal, according to a Maryland Department of Natural Resources assessment.

"It's like planting corn in a desert and expecting it to grow," Ogburn said.

Ogburn said the findings suggest that more investment is needed to restore the state's oyster sanctuaries. An oyster reef monitoring report issued by the state-federal Chesapeake Bay Program's oyster workgroup in December showed that a "wide majority" of restored reefs were meeting their goals. On a much smaller scale, the new study confirms such conclusions, he said.

But his survey was much easier and faster to conduct than its predecessors. The protocol is simple. Researchers lower three GoPro cameras mounted on a PVC pipe frame into the water. Two cameras are aimed horizontally for shooting continuous video while one is pointed directly below and only shooting photographs of the bottom. After two minutes, researchers haul it back aboard the boat and motor off to their next site.

A two-person team, they found, was able to capture 50 videos in a day — about five or six times the amount that can be covered by a dive team or a tong survey.

Ogburn and Heggie conducted a wide survey using the same methods in 2019 and 2020 in all 10 oyster restoration waterways in Maryland and Virginia and are analyzing the results for a future paper. ■

To view a sample of the team's underwater video footage from the Harris Creek sanctuary, visit YouTube.com and search for "SERC Harris Creek oyster study."

With Patapsco's Bloede Dam gone, fish appear to be headed upstream

Two river herring, evidence of others found above demolished barrier

By Timothy B. Wheeler

This spring, William Harbold and his team of biologists with the Maryland Department of Natural Resources made a pair of thrilling discoveries in the Patapsco River southwest of Baltimore.

In late March, they retrieved an alewife, a thin silvery fish with a gray-green back and big eyes, near a railroad bridge at Ilchester Road in Howard County. Then in mid-May, they found a nearly identical-looking blueback herring near the old mill town of Ellicott City.

Those little fish, collectively known as river herring, may not seem much to get excited about. But they were the first physical specimens of their species to be found that far up the Patapsco in more than a century. From 1907 until three years ago, Bloede Dam had straddled the river 10 miles upstream from Baltimore, preventing migratory fish from getting farther upriver to spawn. American eels also were blocked.

"So that," Harbold said, "was pretty cool."

Physical structures like dams that hinder or block the movement of migratory fish to their historic spawning grounds are a major factor in the decline of river herring, American shad and other anadromous fish species, which spend most of their lives in saltwater but return to reproduce in fresh water. Restoring access to spawning habitat for migratory fish and eels is a goal of the 2014 *Chesapeake Bay Watershed Agreement,* though it's one that has a long way to go.

Bloede Dam, built in 1906–07 by a private company to supply electricity to Catonsville and Ellicott City, ceased generating power in the 1930s. A fish ladder installed at the dam later to help fish and eels get by proved ineffective. But its location in heavily used Patapsco Valley State Park made it attractive to swimmers — and dangerously so, with nine drowning deaths reported there since the 1980s, according to the DNR, which became the dam's owner.

Its removal was the linchpin in a long-term plan to restore 65 miles of fish and eel habitat in the Patapsco. Two smaller dams upriver had been taken out earlier — the Union Dam in 2010 and Simkins Dam in 2011.

So, in September 2018, a contractor breached Bloede Dam with an explosive

Biologist Mary Genovese holds a blueback herring found more than two miles upstream from the former site of Bloede Dam in Maryland's Patapsco River. Until its demolition in 2019, the dam blocked river herring and other migratory fish trying to swim upstream in search of spawning grounds. (William Harbold/ Maryland Department of Natural Resources)

charge. Over the next year, heavy equipment broke up and removed the rest of the concrete and steel structure that had at one time stood 34 feet high and 200 feet long.

The big question: After spending $17 million in mostly federal funds to un-build the dam, would the fish and eels come upriver?

There were plenty of river herring showing up every spring downriver of the dam before it was demolished. The DNR had for a few years stocked the lower Patapsco with hatchery-spawned river herring. But they stopped after seeing how many wild fish were returning each spring to spawn. "There were so many herring in the river that we weren't making any impact," said Chuck Stence, who runs the DNR's anadromous fish program.

> *"In 2019, we detected river herring [DNA] all the way up to the base of Daniels Dam."*
>
> — Matt Ogburn
> Smithsonian Environmental Research Center ecologist

The DNR team began checking for new arrivals upriver after the dam was removed. They used electrofishing gear, which stuns the fish long enough for them to float to the surface, where they can be identified and counted before they recover and swim off.

"We got proof [almost immediately] that at least fish could pass upstream," Harbold said. In 2019, even before all of the demolition work was finished, DNR biologists caught two other types of migratory fish — gizzard shad and white perch — at the base of Daniels Dam, about 8 miles upriver of the Bloede site and the last major obstacle to a free-flowing river.

But for the first two years after Bloede's removal, the DNR team did not spot river herring at any of the three sites they sampled. And this spring, the DNR team found only a single male alewife and blueback herring, without finding any females with which they could spawn.

"I kind of worried about that," Harbold said, "those poor lonely fish all by themselves up here."

But trying to count fish using nets or electrofishing is a challenge, because the gear's reach is so limited and the fish are so mobile that they can easily pass undetected. Harbold noted that electrofishing only covers a stretch of stream two to three meters long, and they do it only once a week.

However, biologists with the Smithsonian Environmental Research Center in Edgewater, MD, have picked up indirect evidence that river herring are starting to move upstream, though evidence of spawning is still lacking.

The SERC scientists began collecting water samples from the river and analyzing them for environmental DNA, or eDNA, which is genetic material unique to a given species that's shed into the water via blood, skin, mucus or feces.

"In 2019, we detected river herring [DNA] all the way up to the base of Daniels Dam," said Matt Ogburn, an ecologist at SERC. The concentrations weren't "super-high," he noted, and scientists haven't yet figured out how to translate eDNA levels into numbers of fish, so it's hard to say how many were getting that far upstream. But even so, Ogburn concluded, it's strong evidence that at least some herring were doing so.

To check for spawning activity, biologists have been deploying nets in the water to catch fish eggs and larvae drifting downriver. They didn't find any for river herring in 2019, Ogburn said, and data from 2020 and 2021 are still being analyzed.

"A lot of us feel like there's viable spawning habitat up there," he said of the Patapsco above Bloede. "The question is how much actual spawning is going on."

River herring have been seen lurking in deeper water and in riffles with cover, such as overhanging trees or logs. Biologists believe expanding spawning habitat should help rebuild the river herring population, but, at least at first, it may not help if the fish are more spread out. Ogburn said he thinks the fish will still manage to find each other, but that's one of the questions he hopes to keep studying in years to come.

Meanwhile, it's clear that other Bay-roaming fish also are taking advantage of the chance to swim upriver, including at least one unwelcome invasive species.

"We've seen northern snakeheads all the way up to Daniels Dam," Harbold said. "They're not the ones you want to pass, but you get the bad ones with the good ones." ■

‘Green amendment’ proposals surge in wake of PA court victories

Advocates in 4 Bay states seek similar changes in their constitutions

By Jeremy Cox

Maryland Del. Wanika Fisher plans to file a bill that, if passed, would add an environmental rights amendment to the state constitution. (Dave Harp)

For anyone who believes that Maryland’s laws adequately protect the environment and people’s health, state Del. Wanika Fisher has an invitation: Visit her legislative district.

In District 47B, which lies in Prince George’s County inside the DC Beltway, about 90% of the residents are Black or Hispanic. Many, she said, suffer from ailments related to pollutants legally emitted by the beltway’s traffic, nearby concrete plants and other industrial facilities.

Among them is Fisher, who has asthma. “I am a Black woman statistic in health,” said Fisher, a 33-year-old criminal defense and personal injury attorney who was first elected to the House as a Democrat in 2018.

The problem is too big to deal with at the statute level, as she sees it. That’s why Fisher is trying to rally her fellow lawmakers around changing the state constitution. Like the U.S. Constitution’s right to free speech or bear arms, an environmental rights amendment would treat clean air and water as a fundamental guarantee, supporters say.

“This bill allows an avenue for people to get justice,” said Fisher, who plans to refile the bill during next year’s legislative session after it was drowned out last spring by COVID-19 relief and police reform efforts. “When you put in the constitution that everyone has a right to a healthy environment, it’s a higher level [of legal power].”

A movement to pass environmental rights amendments, also known as green amendments, is gaining steam in state legislatures across the country. Since the start of 2020, the number of states considering amendments has surged from four to 13, according to Green Amendments for the Generations, a national advocacy group whose sole purpose is to advance environmental rights legislation.

Four of those states lie in the Chesapeake Bay watershed: Delaware, Maryland, New York and West Virginia. And one of those — New York — is poised to become the first state to adopt an amendment since the heyday of the national environmental movement in the early 1970s. The State Assembly passed the measure by broad majorities in February, sending it to a statewide voter referendum in November for final approval.

Pennsylvania, also in the Bay watershed, passed an environmental rights amendment in 1971. But it spent more than 40 years in the legal wilderness after being hobbled by a court ruling. Legal victories over the past decade have revived and solidified Pennsylvania’s amendment, and environmental rights advocates elsewhere largely attribute the new wave of legislative interest to that state’s success.

Now, it’s a primary model for a new generation of amendment proposals, said Maya van Rossum, the Delaware Riverkeeper and founder of the Green Amendments group.

“What we see is that the more people learn and become aware [of environmental rights amendments], the success is speeding up,” she said. “People are breathing contaminated air and drinking contaminated water. And the climate is changing. I think people have come to a place where they’re recognizing our current system of environmental laws is failing us.”

Despite the New York breakthrough, green amendments face daunting legislative battles in many state capitals, even in Democratic bastions such as Maryland.

There, some on the political left question whether a broadly worded amendment would have enough legal muscle to unstick the state’s most gummed-up environmental problems, from reversing environmental injustice to cleaning up the Chesapeake Bay. Meanwhile, heavy industries and local government groups have attacked the measure as a potential job-killer that would fan a gale of litigation against new factories and housing subdivisions.

“This gives unnecessary authority to courts,” Alex Butler, a policy associate with the Maryland Association of Counties, told a House panel in January. “We don’t see any need for vague language and are fearful of the results if this were to be enacted.”

More than ‘lovely language’

Dozens of states mention environmental protection in their constitutions. But according to legal scholars and environmental activists, only three — Hawaii, Montana and Pennsylvania — use language toothy enough to bite back at legal and legislative attempts to undermine their objectives.

Those states may make for odd bedfellows politically and geographically, but each took a critical leap beyond their counterparts when enacting their amendments, said John Dernbach, an environmental law expert at Widener University in Harrisburg. By placing the right to a clean environment in Article I of their constitutions as opposed to burying it somewhere below, lawmakers in those states made clear it was no trifle to be brushed aside or ignored.

“When you put an amendment in Article I, those are rights,” Dernbach said. “That is the key. That is what makes it different.”

The inclusion in Article I is as important politically as it is legally,

Rabbi Nina Beth Cardin is co-founder of the Maryland Campaign for Environmental Human Rights, which is working to gain support an environmental rights amendment to the state constitution. (Dave Harp)

said Martin Siegel, a Chesapeake Legal Alliance board member and former litigator with the Pennsylvania Department of Environmental Protection.

"It's an important policy statement that environmental rights are basic human rights just like freedom of religion or free speech or the right to bear arms," Siegel said. "Environmental statutes can be changed by whim of the legislature. It is much more difficult to change the constitution."

In most states, a bill ordinarily becomes law after garnering a simple majority vote in each chamber, followed by the governor's signature. Amendments almost always demand more effort.

In New York, for example, amendments must be passed twice by a majority vote in the legislature — once and then again after a new legislature has been seated in the next general election. Then, it must clear a voter referendum. In Maryland, it only needs to win the general assembly's approval once, but it must claim at least 60% of lawmakers' votes before heading to a referendum.

Van Rossum first articulated her vision in her 2017 book, *The Green Amendment: Securing Our Right to A Healthy Environment*, and founded Green Amendments for the Generations two years later to spread the message. According to her own unwritten rules, she will only step in to help with other states' amendment initiatives when invited. Still, she has consulted with leaders in nearly every state where environmental amendments are on the table and is widely seen as the overall champion of the movement.

She espouses strict criteria for environmental rights amendments: The language must appear in the "rights" section of the constitution, entitle "all people" to a clean environment and be legally enforceable on its own — without the need for follow-up legislation to interpret it.

To date, she said, only two states meet that bar: Montana and Pennsylvania. New York would be the third.

An environmental rights amendment must contain more than "lovely language," she added. Without specific provisions that hold a state's feet to the fire, van Rossum said, "what you'll see happen is what's happening to the voting rights legislation. As soon as one state finds a pathway [to gut the law], then all of the other legislatures in all the other states will see that that's the pathway to follow.

"I won't let that happen," she added, "because this is my life's work."

Mining damage leads to change

In Pennsylvania, the 1971 passage of its environmental rights amendment was the culmination of a 60-year fight to curb the excesses of the Industrial Revolution. And it marked the beginning of another battle for its relevancy.

For decades, Pennsylvania's coal, railroad and steel interests treated public waterways as their own private sewers. Even as lawmakers passed a "clean streams" law in 1905 and subsequently strengthened it three more times, coal companies continued to be allowed to discharge untreated, acid-laced water into so-called "unclean" waterways.

Legislators finally closed the loophole in 1965. But problems remained. In 1970, acid mine drainage broke free from a pool at a Barnes and Tucker Coal Co. mine in Cambria County, causing a massive fish kill along a 40-mile stretch of the West Branch of the Susquehanna River.

It was against this grim backdrop that a legislative revolution led to the passage of a dozen landmark environmental laws in the state in the late 1960s and early 1970s.

At its center was Franklin Kury, a Democrat representing Montour and Northumberland counties. But as the political tide began to turn in favor of the state's natural resources, Kury began to worry that future legislators could simply roll back those gains.

"I said, 'It's nice to have these bills, but they can be repealed or undermined,'" recalled Kury, now 84 and retired from politics but still an active author and orator. "We needed something more permanent."

In response, he drafted an environmental rights amendment and championed its enactment. The entire text of Article I, Section 27 consists of just 61 words.

"It just lays out three fundamental principles," Kury said. "First, the people have a right to a healthy environment. Second is that public natural resources like the rivers and the air belong to all people. And the third principle is the state is the trustee of these resources for future generations."

But before the amendment could tackle the state's waste problems, it ran headlong into a judicial roadblock.

"It was kind of given the hypodermic needle by the courts and put to sleep," Kury said.

Amendment brought back to life

The biggest legal blow to Pennsylvania's amendment came in 1973, when a state appeals court panel argued that judges must be "realistic and not merely legalistic" when weighing conflicts between environmental and social concerns.

In place of the legislature's actual wording, the ruling substituted a three-part test. A project had to comply with all laws and regulations. But environmental harm could still be allowed as long as polluters made a "reasonable effort" to minimize it. The state could step in to stop a project only when its harm "clearly outweighed" the project's benefits to society.

For the next 40 years, the environmental rights amendment was "effectively buried," Dernbach said. Whenever housing developers, road builders or natural gas companies faced a court challenge, they had little trouble passing the industry-friendly test.

See **RIGHTS**, *page 22*

Martin Siegel, a board member at the Chesapeake Legal Alliance and former litigator with the Pennsylvania Department of Environmental Protection, said addressing environmental rights in state constitutions is important. "Environmental statutes can be changed by whim of the legislature. It is much more difficult to change the constitution," he said. (Dave Harp)

RIGHTS *from page 21*

It was natural gas — not coal — that revived the amendment. As hydraulic fracturing, or fracking, turbocharged drilling operations in the state's Marcellus Shale formation, industry leaders lobbied state lawmakers to replace the jumble of local ordinances they had to follow with a uniform statewide framework. The law passed in 2012.

A group of opponents sued the next year, arguing that the state had pre-empted the power of local governments to protect their citizens' environmental rights. The state Supreme Court upheld their argument, overturning the new state law. The court's top opinion was partly anchored in arguments that Dernbach had put forward in a law journal in 1999.

"So, if you hear of law professors writing pointless articles for law journals, that's not always true," Dernbach said with a chuckle. "It was the first time really that the Pennsylvania Supreme Court looked at the [amendment's] text and tried to figure out what it meant."

For a technical reason, the amendment wasn't fully re-energized yet. Because only a plurality of justices had signed on to the environmental rights argument in the fracking case, it fell short of setting a legal precedent. So, it wasn't until a separate case garnered a full majority in 2017 that the amendment was once again the law of the land.

Almost overnight, the legal landscape changed, Dernbach said.

"It was as if Section 27 had just appeared in the constitution," he recalled. "Section 27 had been so marginalized that the effect was that dramatic."

Renewed interest in rights

Although the amendment was crafted at a time when coal mining was Pennsylvania's top environmental concern, Kury said its broad-strokes language ensures that its powers are applicable even today.

"Now, these three principles can be applied to climate change, oil and gas, and anything in the future," he said. "If it was too narrow, it wouldn't have been effective."

The Pennsylvania court victories have inspired amendment movements in several states across the country. In New York, those wins "breathed life" into an idea that was initially proposed in the legislature in 1997 and went nowhere, said Peter Iwanowicz, executive director of Environmental Advocates NY, the group leading the push there. This year, a measure to send the amendment to a statewide referendum passed by a 3-to-1 margin in the state Senate and a nearly 5-to-1 margin in the Assembly.

Maya van Rossum is the Delaware Riverkeeper and founder of Green Amendments for the Generations, a national advocacy group whose sole purpose is to advance environmental rights legislation. (Submitted photo)

"In the last 20-some years, people realized the value of this and have seen bad decisions being made," Iwanowicz said. "This is its time now."

Momentum hasn't ensured success elsewhere, though. Green amendment legislation has been introduced in Delaware and West Virginia but gained little traction. In Maryland, legislation has been filed in three consecutive sessions — and failed to get past the committee level each time.

"When something is fundamental and so essential and so necessary, you can't give up," said Rabbi Nina Beth Cardin, the co-founder of the Maryland Campaign for Environmental Human Rights, the amendment's primary promoter.

Cardin, the cousin of U.S. Sen. Ben Cardin of Maryland, sees brighter prospects for the amendment in 2022. It's an election year, so the referendum can be printed on the statewide ballot in November. And it will be about a year removed from the height of the COVID-19 pandemic, perhaps enabling legislators to concentrate on a broader raft of issues, she said.

New York's progress may help nudge Maryland forward as well, said Fisher, the Maryland state delegate. "I think this will help Maryland and create pressure to move and make constituents reach out that we want to see this on our ballot next year," Fisher said.

Industry interests fight back

If the green amendment gets another airing in Maryland in 2022, it is likely to face the same strains of criticism that downed it this year. Like this from Michael Powell, an energy and building sector lobbyist, at the Maryland House's Environment and Transportation Committee hearing: "This allows anyone to bring suit for just about any reason," he charged.

Not really, supporters counter. Green amendments define the state as the "trustee" of the environment, experts say. That way, a state doesn't devolve into a litigious free-for-all, with private parties taking private parties to court, she said. If a person or a group files a lawsuit to halt a new coal mine, for example, they must sue the state or local government that green-lighted its permits — not the coal company itself.

Another critique: Governments not only could be held accountable for the actions they take but also the actions they don't take. A state could be sued, Powell suggested, for neglecting to take a pesticide off the market: "If you fail to ban that chemical the farmers would use, then a citizen can bring action against the state by that inaction by the state that they claim harmed the environment."

Siegel, now living in Baltimore, testified on behalf of the amendment. In practice, the Pennsylvania version hasn't upended government or private industry, he said.

"I feel confident in saying no project will be banned simply because it has one isolated impact on the environment," he told the committee. "The [Pennsylvania] Supreme Court has made clear it's a balancing test. But since it's in the constitution, these environmental rights are fundamental rights, and they have to be treated accordingly by the courts."

Delegate Kumar Barve, the committee's chairman and a Montgomery County Democrat, appeared skeptical about the amendment's worth. In Pennsylvania, Maryland's neighbor north of the Mason-Dixon Line, fracking remains widespread while farms and urban areas continue to drain large amounts of pollution into waters that reach the Bay, he pointed out.

"I would have to assume that the amendment in Pennsylvania must be pretty weak" if those environmental problems persist, Barve suggested.

Siegel said in an interview that Pennsylvania's green amendment didn't shift regulations overnight. But after the courts reinstated its powers in the last decade, environmental officials conducted internal reviews and beefed up their reviews of projects. Project applicants have adjusted as well, doing more to avoid environmental impacts, such as filling in wetlands.

"What you see publicly are the big court decisions," Seigel said. "What you don't see are the day-to-day decisions like the Department of Environmental Protection doing a more in-depth environmental review."

For his part, Kury is looking beyond the state battles to a larger prize: the U.S. Constitution. A federal amendment would bring the benefits of his green principles to citizens in every state and help entrench environmental protections for generations to come, he said.

"We've got to put the government as responsible for a healthy environment," Kury said. "What's more fundamental than the right to a decent environment?" ■

Potomac Conservancy looks at local impacts of climate change

Heat, storms, pollution set to affect river's health, communities

By Whitney Pipkin

The Potomac Conservancy has released an analysis of the "new climate reality" that is already dawning on the Potomac River watershed, hoping to raise awareness and spur action.

The Potomac's watershed is home to more than 6 million people in parts of Pennsylvania, Maryland, Virginia, West Virginia and the District of Columbia. Here, torrential downpours interspersed with longer dry periods will make it harder to keep sediment out of waters that are already warming over time. Rising sea levels will worsen underlying conditions. And, by mid-century, summers could be excruciatingly hot, the report states.

The impacts detailed in the report reflect many of the changes occurring at a global scale. But climate change is hitting each region differently, and the Potomac Conservancy wants watershed residents to understand the nuances close to home, where policies and preparations take place.

"I think it's easier to get people to care about what's happening with the climate when they know about what's happening in their neighborhood," said Audrey Ramming, the climate science journalist who penned the report for the Potomac Conservancy.

Many solutions to pollution and flooding concerns can also pull double duty to reduce the full blow of predicted changes. To that end, engineers, water quality experts and residents are grappling with challenges of current and future impacts.

"We certainly want to use [the report] to help guide decision makers in policies going forward," conservancy President Hedrick Belin said. "I think there's a real opportunity to prepare people."

The conservancy is releasing the 111-page report to the public in bite-size pieces, with one of its six chapters emailed out every few weeks through the summer and into the fall. The full report is available on the group's website.

The first chapters cover how climate change hits the Potomac region differently from others and how the changes are fueling extreme weather and rising waters. Other chapters touch on public health impacts, environmental justice, agriculture, fisheries and different scenarios for the future, depending on the region's adaptations and actions.

Hedrick Belin, president of the Potomac Conservancy, says his organization's latest report focuses on how climate change will impact the Potomac River's watershed. "I think there's a real opportunity to prepare people," he said. (Dave Harp)

Demand is growing for locally focused reports like these, said atmospheric scientist Anne Stoner. Stoner specializes in localized climate studies as a senior scientist at ATMOS Research & Consulting and was a key source for the Potomac project. She also co-authored a 2015 paper that made climate projections specific to the DC area based on two scenarios.

> *"People will park their cars and the water will be past their tires when they come back."*
>
> — Audrey Ramming
> Climate science journalist

"This is a trend in the field because it's not always just an overview that's needed," Stoner said. "A lot of times, [these reports are] being used in engineering to figure out how they need to plan for the future with water rising and conservation needs, for example."

The Potomac study used readings from three weather stations in the region to map trends and projections. Climate, the report explains, is like the baseline of a song, and weather is the melody, getting all the attention with colorful ups and downs.

"Because weather, and therefore climate, are not uniform across the globe, each region's 'song' is a little different," the report states.

Though it can be hard to say for certain whether a particular storm was caused by climate change, one local scientist said that climate change is like "loading the dice" in favor of extreme weather events. In the Potomac watershed, a warming atmosphere is able to build up more moisture before it gushes out as rain, leading to more intense storms with more dry days in between. This phenomenon also makes blizzards more likely, even if the winters are milder. Hurricanes and nor'easters are also becoming more frequent and more intense, impacting local infrastructure.

Take, for example, a year like 2020, when the District of Columbia experienced seven rains that dumped at least 2 inches in one day — a record for a calendar year. This was just two years after the National Weather Service named 2018 the region's wettest year on record. Overall, the report finds that heavy precipitation in the region has increased by 71% from 1958 to 2012.

Even when it's not raining, parts of the Potomac watershed now experience "sunny day flooding" from high tides. Sea level is rising faster in the mid-Atlantic than elsewhere — by 1.5 feet since 1900, compared with a global average of 8 inches — and the land is sinking. Changes in the Atlantic Gulf Stream are also reducing how water is pulled away from the coast.

"DC is right on a tidal river, so you get a lot of twice-a-day flooding," Ramming said. In some places, especially around DC's popular Tidal Basin, "people will park their cars and the water will be past their tires when they come back."

The DC region is also coming off of its hottest decade on record. And the number of days when the heat index tops 95 degrees may double by mid-century and triple by 2080, according to the analysis. That affects people, wildlife and water quality. After a heat wave in July 2019, for example, water thermometers near Little Falls along the Potomac River reached 94 degrees.

"The number of heat waves [is] increasing … It's going to be something that the area will have to figure out how to deal with," Stoner said.

Belin said this summer is as good a time as any to have conversations about what a warmer future could look like and how the region can plan for it. Those concerned about the health of the Potomac River and the Chesapeake Bay will have to tweak their restoration plans to allow for such drastically different weather patterns.

He said programs like Maryland's recent commitment to plant 5 million trees over the next decade will both improve water quality and reduce urban heat islands, which are exacerbated by climate change. The same is true for Virginia's commitment to better fund pollution reduction measures on agricultural lands. Government incentives for green infrastructure will also reduce flash flooding in the region and pollution in its rivers.

"People are seeing this individually — the flooding that is happening in wet weather events. There are people who, in the past their basement never flooded, and now it is," Belin said. "So what are we going to do?" ■

Read the full climate report or sign up for email installments at Potomac.org.

As federal support emerges, PA wants to be carbon capture hub

Advocates say state is poised to capture, store carbon dioxide

By Ad Crable

Consol Energy's Pennsylvania Mining Complex, the largest underground coal-mining operation in the U.S., could be the site of a 300-megawatt power plant that would capture and bury carbon dioxide. (Consol Energy)

Pennsylvania is ideally suited to help the nation fight global warming by becoming a leader in the effort to capture and store emissions of carbon dioxide, state officials say.

Their quest has just received a jolt of legitimacy from President Joe Biden's massive climate plan, which calls on a greater nationwide effort to capture, store and reuse carbon dioxide.

In the battle to slow global warming, carbon dioxide is the chief target. Studies by the U.S. Environmental Protection Agency show that CO_2 accounts for the vast majority of heat-trapping greenhouse gases emitted by the U.S. from 1990–2019. Concentrations of CO_2 in the atmosphere have risen approximately 47% since 1750, mostly from the burning of fossil fuels for energy.

Strategies for capturing carbon from fossil fuel power plants, to prevent it from entering the atmosphere, have long lingered on the sidelines. But the concept has remained a source of hope for an increasingly marginalized coal industry struggling to sustain production.

To make the mass collection of CO_2 economically feasible, the U.S. would need to develop a vast network of pipelines to transport the gas, mainly in liquid form. It would also need industrial hubs where CO_2 could be stored underground or diverted to other uses.

Pennsylvania wants to be one of those hubs. Advocates say the state is well positioned for carbon storage, touting its deep underground, porous rock reservoirs as places to safely store large amounts of carbon. Those reservoirs are 2 or more miles underground in the state's western and northern reaches.

"There is no better place to do [both carbon capture and storage] than right here in Pennsylvania," Denise Brinley, executive director of the Pennsylvania Office of Energy, told state senators at a March meeting.

Critical questions

The practice of carbon storage is hotly debated.

Some scientists and energy experts say the U.S. can't wholly abandon fossil fuel as it ramps up renewable energy sources. Fossil fuel, they argue, will still be needed in the near term as a backstop for the intermittency of solar and wind power and to keep consumer power bills affordable. Carbon capture and storage could help lessen the environmental impact of the fossil fuel production that they say must continue.

> *"Injecting bad stuff inside the Earth isn't anything more than an experiment, and a very expensive one. We can't continue to alter the makeup of the Earth without consequences."*
>
> — Tamara Toles O'Laughlin
> National climate strategist

But some in Congress and some — not all — environmental groups see carbon capture as perpetuating the use of fossil fuels and prolonging the inevitable need to make a fundamental switch to renewable energy.

"Carbon capture, utilization and storage are all predicated on [continuing to do] a terrible thing. People are worried that it is a scam, that it is dangerous and will keep fossil fuels afloat," said Tamara Toles O'Laughlin, a national climate strategist from Baltimore who has worked for a number of environmental and human-health groups.

While there are 10 large-scale carbon capture operations in the U.S. — virtually all of them using liquefied carbon to force the last drops of oil out of nearly depleted deposits — the practicality and safety of indefinite underground storage has yet to be proven.

Environmentalists are concerned about the possible leakage of CO_2 stored underground. They also worry that the injections could touch off small earthquakes, similar to those that were triggered in Ohio and Texas by underground injections of wastewater from natural gas and oil drilling.

"Injecting bad stuff inside the Earth isn't anything more than an experiment, and a very expensive one," Toles O'Laughlin said. "We can't continue to alter the makeup of the Earth without consequences."

The pipeline network would have costs and environmental impacts, too.

Nevertheless, the belief that carbon capture is part of the climate solution is firmly embedded in Biden's climate change plan, which doesn't anticipate achieving a carbon-free electricity sector earlier than 2035.

"Because renewable energy may be variable or intermittent, dispatchable fossil energy with carbon capture, utilization and storage will continue to be necessary … during the energy transition," said Brian Anderson, director of the U.S. Department of Energy's National Energy Technology Laboratory.

Pennsylvania is banking on it. Gov. Tom Wolf in late 2019 created a task force to look at the state's potential for capturing, storing and using CO_2. Meanwhile, three state agencies, along with Penn State University, are busy doing research to support the prospects of Pennsylvania becoming a regional carbon-capture and storage hub.

What, where and how

Carbon dioxide can be captured from the

exhaust of power plants and other industries either before or after combustion.

Before natural gas is burned, hydrogen and CO_2 can be separated out. The hydrogen can then be burned without pollutants, and the CO_2 can be compressed for transport to storage sites or to make products, such as cement, plastics, pharmaceuticals and even hydrogen fuel.

In coal plants, the CO_2 can be captured as the gas exits the flue by pumping it through an ammonia-based solution.

The opportunities for carbon capture retrofits of all kinds abound in Pennsylvania. The state ranks fifth in the nation for total carbon emissions from industries and power plants.

In terms of underground storage, the Pennsylvania Geological Survey estimates the state could sequester 1.4 billion to 4.4 billion metric tons of CO_2 in its briny underground reservoirs. The saltwater absorbs and stores the gas. The high end of that estimate would be enough storage to offset nearly two years' worth of carbon pollution from cars in the United States.

Saline reservoirs also are found under the Chesapeake Bay, Great Lakes and Atlantic Ocean.

In Pennsylvania, billions of tons more capacity may lie in the cavities left by oil and gas extraction from deposits a mile or so below the surface. Much more storage may be found farther down, but it would take expensive remote sensing, deep drilling and coring to find out.

"Our focus is deep geology, because that's what we know the least about," said Kristen Carter, Pennsylvania's assistant state geologist. "You need to know the starting pressure in a [saline] reservoir and the stress regimen. You need to have a cap rock that serves as a seal. There is a certain amount of risk with that … You don't want to inject at a pressure higher than [that of the overlying rock layers]. You could have negative impacts … and perhaps cause seismic activity."

Several months ago, the state was the first to sign a memorandum of understanding with Maryland, Kansas, Louisiana, Oklahoma, Wyoming and Montana, joining forces to prepare for regional CO_2 storage hubs, including pipelines and underground storage.

In October, the group will announce an action plan for removing barriers to easy, cross-state movement of captured CO_2.

Potential PA showcases

Storing CO_2 probably will not be enough to make continued use of fossil fuels palatable for some. It will likely also require widespread use of the captured greenhouse gas in manufacturing chemicals, industrial products and even new energy production.

The Petra Nova coal-fired power plant in Texas was the world's largest carbon capture and storage operation until it was mothballed in 2020. (NRG Energy)

Here, too, Pennsylvania wants to be a front-runner, hoping to roll out two, high-priced demonstration projects in the next few years.

Consol Energy, which has the nation's largest underground coal mining complex in western Pennsylvania, hopes to begin construction in 2024 on a 300-megawatt power plant with "less-than-zero" CO_2 emissions.

The plant would produce power by burning low-quality coal left behind in waste piles, combined with grasses, woody crops and perhaps even waste from hemp grown on 25,000 acres of surrounding private land.

The facility would then capture and bury emitted carbon, likely in depleted natural gas wells, or sell it to oil and gas companies for use in nearly depleted deposits. The vegetation grown to partly fuel the plant would also remove CO_2 from the atmosphere, theoretically bringing the plant's footprint to a net reduction of the gas.

The project is one of four chosen to split $80 million from the U.S. Department of Energy to build "the coal plant of the future."

Another project is a proposed $400 million manufacturing plant in Clinton County that will use natural gas to make hydrogen fuel and other products, then bury unused CO_2 on site. The company, KeyState Natural Gas Synthesis, says the plant has a startup target of 2023 and would be the first in Pennsylvania to operate natural gas wells with onsite carbon capture and storage technology. The plant would annually store an amount of CO_2 equal to that emitted by 21,604 vehicles annually.

The plant would mix the captured CO_2 with ammonia to produce urea, which is used in diesel exhaust systems to reduce nitrogen oxide emissions. It would also capture and bury methane emissions from the wells, part of the equation for reaching net-zero greenhouse gas emissions.

So far, the project has received two federal economic development grants totaling $600,000.

A definite maybe

Biden's $2.2 trillion infrastructure plan includes a number of financial incentives for carbon capture. It calls for expanding tax credits for building underground storage and for retrofitting power plants and hard-to-decarbonize industries for carbon capture, as well as for technology that captures CO_2 directly from the air.

The plan also calls for financing 10 "pioneer" commercial-scale projects that would retrofit large steel, cement and chemical production facilities to capture, use and store CO_2.

It would provide $5 billion to fund the SCALE (Storing CO_2 and Lowering Emissions) Act, a bipartisan bill introduced in Congress in March to fund and offer tax incentives for pipeline construction and other infrastructure to transport captured carbon to storage sites.

"The president's plan effectively signals that carbon capture will be a major priority in any infrastructure package, and that it represents one of the most important areas of common ground on climate policy between Democrats and Republicans and the president and Congress," said Brad Crabtree of the Carbon Capture Coalition.

The bill has the support of a number of national environmental groups, as well as state groups like the Pennsylvania Environmental Council and The Nature Conservancy in Pennsylvania. "It's clear that a robust mix of climate strategies is needed," said Lori Brennan, executive director of the conservancy. "Carbon capture, storage and use need to be part of this conversation."

Despite the Biden administration's strong support, it's still far from certain whether those strategies will become a linchpin in the nation's move to a cleaner energy future.

An abiding tolerance for widespread carbon capture would require the broad policy shifts and subsidies that allowed solar and wind energy to get a foothold. But advocates are encouraged by the fact that they've seen support from both sides of the aisle in Congress. ■

Makeover aims to save Annapolis City Dock from flooding

High water a regular problem for tourism, recreation

By Jeremy Cox

This conceptual illustration shows how a flood resilience project could transform the Annapolis City Dock, a popular gathering place for both tourists and local residents. (Annapolis Mobility and Resilience Partners)

One of Maryland's most recognizable waterfront townscapes is getting harder to see. Portions of the Annapolis City Dock are underwater 50–60 days a year, up from three to four days a year a half-century ago.

The culprit: local tidal conditions, driven by one of the fastest growing rates of sea level rise in the country.

The solution: an ambitious $50 million project that would provide additional flood protection immediately adjacent to the town's long, narrow boat basin off Spa Creek (known locally as Ego Alley). A combination of raising the dock walkway, building a new flood wall and installing a retractable or transparent barrier would provide a total of 8 feet of protection above the current sea level.

Backflow preventers will be installed at storm outfalls, blocking water from the Chesapeake Bay from gushing upward through street drains. The asphalt parking lot that becomes a giant bathtub during major floods will be transformed into a grassy park, with parking transferred to a rebuilt garage nearby.

"What's happening here is not just a pilot for Maryland but also a demonstration project for the rest of the country," said Nicholas Redding, president and CEO of Preservation Maryland, a nonprofit group collaborating to save a historic building, called Burtis House, across the parking area from Ego Alley. "Anywhere you go in the world, historic resources sit at the water's edge. So, we have to figure out ways to protect those resources, particularly those affected by an ever-changing climate and sea level rise."

Climate change forecasts suggest that, without action, the City Dock will be inundated almost every day by 2080.

Fits and starts

The plan isn't the first to take on stubborn flooding problems in downtown Annapolis. More than a half-dozen studies have been conducted the past three decades. Some led to patchwork fixes. Others were strangled in their bureaucratic cradles by lack of funding or political support.

Why might this time be different? The most common answer given by the project's backers is that it can't wait any longer.

"There's a sense of urgency," said Eileen Fogarty, the land use expert and city planning professional who co-chairs the City Dock Action Committee. "The flooding is up to 52 days a year. Something has to be done."

That air of resolve led to the committee's formation in March 2019. The group of nearly 100 community members emerged seven months later with the most comprehensive plan yet to revitalize the area, weighing in at 122 pages.

There is a January 2022 target for the start of construction, beginning with replacing and enlarging a nearby parking garage to accommodate vehicles displaced from the dock's surface lot. The target date for completing the entire project is March 2024.

Unlike its predecessors, this flood-protection project is shaping up to be backed with real dollars — though it took some adroit legislative maneuvering just a few blocks uphill, beneath the state's capitol dome.

State Sen. Sarah K. Elfreth, D-Anne Arundel County, sponsored a bill in the 2020 session that enables cities and counties to establish finance authorities for climate resilience projects. Now a law, it allows those authorities to borrow money for infrastructure projects through municipal bonds. The city of Annapolis and Anne Arundel County are in talks to jointly launch the first such authority in the state for the City Dock project.

If not for the resilience authority, the city likely would have needed to save the money to fund the entire project before a single shovel could go into the ground, a process that could have taken years, Elfreth said. The city is prohibited from borrowing against future revenues unless that money is coming from a dedicated source, such as a resilience authority.

"We needed to create a mechanism to fund these projects," she added. A sum like $50 million is "not something the city has lying around in a couch somewhere and not even something the state has lying around."

With the cost of building materials soaring as world economies awaken from their COVID-induced dormancy, city officials fully expect the price tag to surpass the $50 million estimate.

After the resilience authority is set up, it will perform a study of potential revenue sources to pay off the debt created by the projects, said City Manager David Jarrell. For example, the hotel tax might be increased slightly. The authority would make recommendations to the city and county for approval by each governmental body.

Bad for business

Flooding is already hurting business near the City Dock, research shows. A 2019 study led by Stanford University suggested that current flooding is reducing visits to downtown Annapolis by about 2% per year. Another foot of sea level rise would cut the number of visitors by 24%, the study authors estimated.

One of the turning points in the City Dock conversation happened in 2019. That year, the Annapolis Boat Shows set attendance records during their two fall events, generating an estimated $112 million in local economic impact, organizers said. But those numbers could have been higher. A tidal flood during the Oct. 10–14 show swamped many of the booths and sent contractors scurrying to build makeshift walkways.

That civic misfortune helped to galvanize support for the City Dock Action Committee and its report, Fogarty said.

"The flooding has become a situation

that can't be ignored or kicked down the road," she said.

A climate change hot spot

The threat of tidal flooding in Annapolis is well-documented. A 2014 report by the National Oceanic and Atmospheric Administration, *Sea Level Rise and Nuisance Flood Frequency Changes Around the United States*, used a photo of the City Dock under water as its cover image.

Like much of the southern half of the Chesapeake Bay region, the land beneath the city has been slowly sinking since the end of the Ice Age. The mid-Atlantic may also be a hot spot for sea level rise because of the slowing of the offshore Gulf Stream, scientists say. The University of Maryland Center for Environmental Science has projected a 1.6-foot rise in sea level in the state by 2050 and up to 4.2 feet by 2100, compared with 2000 levels.

The City Dock's waterfront walkway is just 2.5 feet above the typical water level.

The yet-to-be-finalized plan is to raise the walkway to 5 feet above the water, bringing it to the same height as the bulkhead installed along the water in 2015, said Eivind Dueland of Amber Infrastructure, the city's lead contractor for the project. Blueprints show a foot-high flood wall being installed on the landward side of the raised walkway. Then, another 2 feet of protection could be added on top of that — without infringing on water views — with a retractable wall or a transparent barrier.

Those plans are subject to change, though, as the design process moves forward, he stressed.

"One of the keys to moving forward is nailing down what is the right level to design to," Dueland told the City Council in March. "What we want to do is to balance both the cost of the City Dock construction and the need for sea level protection. Creating something that goes to [8 feet above sea level], if it's not going to be needed for 30 years, isn't necessarily the best use of public funds."

Barriers designed to stop floodwaters can also block water going the other way — stormwater drainage — so a pumphouse will be fitted inside the new park to keep the area from becoming inundated by rainwater, Jarrell said. That water will be collected in a tank and pumped into the Bay.

Contrary to what some concerned residents have claimed, the efforts to de-water the City Dock won't raise the tide enough to cause flooding elsewhere, he said.

"There's so much water in the Chesapeake that the little that comes on board from here is so miniscule," Jarrell said.

Saving history from floodwaters

There's nothing historic about the City Dock structure itself; it has been built and rebuilt several times over the years. Still, its advocates frequently cite history as one of the main selling points for its rehabilitation.

Floodwaters swamp the bronze figures of the Kunta Kinte-Alex Haley Memorial, installed in 1999 at the head of the Annapolis boat basin known as Ego Alley. (Dave Harp)

They're not alone. In 2018, the National Trust for Historic Preservation, a national nonprofit organization based in Washington, DC, placed the City Dock on its list of the 11 "most endangered historic places."

The Annapolis harbor has been the centerpiece of the city's cultural and economic identity since its earliest days in the 1690s. For much of its history, lumber and grain mills, coal companies, watermen and other commercial entities jostled for space at the edge of the growing capital. But as cars supplanted boats as the primary transportation in the 1900s, industry gave way to tourism at the City Dock.

Today, financial transactions around the City Dock are more likely to involve a boat sightseeing tour or a painted landscape of the Chesapeake Bay than a bushel of crabs.

"It's really the heart of Annapolis here," Jarrell said. "Visitors always make this a destination when they come into town."

The dock area hosts several festivals and other large functions each year. In addition to the boat shows, it's a gathering place to enjoy regatta events, the finish line of the Race Across America bicycle race, the Annapolis Film Festival and a weekly farmers market.

Meanwhile, the National Park Service is partnering with Preservation Maryland on a project adjacent to the City Dock that could have a major impact on the landmark. The collaboration is working to preserve the city-owned Burtis House, a humble-looking home constructed in the 1800s when it was part of a community that made its living from the water.

Plans call for raising the building 9 feet to get it out of the water's reach, Redding said. Though the house is some 200 feet from Ego Alley, it's directly adjacent to a smaller docking basin at the southern corner of the U.S. Naval Academy grounds. The $320,000 project also will remove more recent additions to the structure, which briefly housed the National Sailing Hall of Fame, and restore it to its original footprint.

Some day, the old home could house exhibits about the Bay and serve as a hub for the proposed Chesapeake Bay National Recreation Area, an equivalent to a national park. The concept has gained additional traction recently, even in Congress.

"The City Dock has become much more recreational, and it's easy to overlook how critical the water and the Bay were to the development of Annapolis," Redding said. "This one humble little cottage helps connect those dots." ■

Pictured near the historic Burtis House at Annapolis City Dock are, left to right, Laura Houston, historic property redevelopment manager of Preservation Maryland; state Sen. Sarah Elfreth; and Nicholas Redding, president and CEO of Preservation Maryland. (Jeremy Cox)

MD DNR serves up 'Frankenfish' to food-insecure families

Invasive snakeheads caught at Conowingo donated to food banks

By Ad Crable

The invasive northern snakehead may not look terribly appetizing. To most people, it's a creepy, toothy fish worthy of its "frankenfish" nickname. It has a long reptilian head, blotchy skin and an untapered body that makes it look like a short but beefy eel.

But most who've tasted a snakehead fillet will tell you that it is a treat — mild, sweet-tasting with no fishy aftertaste. Some have compared it to such seafood gems as flounder and mahi-mahi.

So, instead of destroying snakeheads captured each spring at the Susquehanna River's Conowingo Dam in an effort to stop the successful invader's spread, the Maryland Department of Natural Resources decided to donate the fish to food banks and other organizations that feed food-insecure families.

At last check, more than 3,500 pounds of snakeheads had been captured from a fish lift at the dam — which is designed to capture native migrating fish such as American shad and river herring so they can be transported to spawning grounds upstream. But now that there's a steady "bycatch" of snakeheads, the agency turns them over to a local seafood wholesaler, where most of the fish are filleted, vacuumed-wrapped, frozen and distributed to nonprofits.

Workers sort through fish captured in the fish lift at Conowingo Dam. They sometimes discover snakeheads, an invasive species. (Maryland Department of Natural Resources)

A tub is filled with snakeheads collected from the fish lift at Conowingo Dam before they are processed and shared with food banks and other service organizations. (Maryland Department of Natural Resources)

"It's not often fish is made available. It's nutritious. We expect it will move pretty quickly," said Joanna Warner, director of the Baltimore-based Maryland Food Bank, which works with partners all over the state.

The DNR contacted the state Department of Agriculture, which oversees seafood marketing. They worked out an arrangement with J. J. McDonnell & Co., an Elkridge-based seafood wholesaler. The company fillets and packs the fish for distribution to the Maryland Food Bank and Maryland United Way. In return, the company gets to keep some of the snakeheads to sell on the wholesale market.

Will seeing a pack of 5-pound fillets stamped with "snakehead" give some food bank recipients pause?

"It's really unfortunate that it has that name," Warner conceded.

But Stephanie Pazzaglia, business development manager for J. J. McDonnell & Co., said the fish's unsavory name is quickly forgotten when people bite into a snakehead. "Snakehead is delicious," she said. "It is a very mild, almost sweet-tasting fish."

"Everything we bring in goes out the door," she said of the company's regular commercial market for snakeheads.

The Maryland Food Bank is considering including cooking and preparation tips along with the fish.

Though still in its infancy, the snakehead market is quickly expanding — finding a place on menus in restaurants and in seafood sections of retail stores. Sometimes they are labeled as Chesapeake channa (from the fish's taxonomic name, *Channa argus*) to make it sound … well, less serpentine.

That's legal. There are federal transparency rules on what you can and cannot call specific fish. The federal Food and Drug Administration has approved the term Chesapeake channa for snakeheads. (But you can't sell striped bass as rockfish.)

"Some people like to use snakehead as the name, and some people kind of steer away from it," Pazzaglia said.

Until now, most of the snakeheads the company has sold have come from people who have hunted them with bows and arrows, or guns, she said.

The snakehead invasion in the Chesapeake Bay region dates back to at least 2002, when some were found in a pond in Crofton, MD, in the upper Patuxent River watershed. Others soon popped up in the Potomac basin and other Bay tributaries. The source is believed to have been a combination of intentional and accidental releases by anglers and aquarium hobbyists.

The fish's discovery made state fishery managers break out in a sweat. With no natural enemies, it has been labeled an "apex predator." Many feared that the voracious fish would outmuscle native game fish and gobble all of their food. The snakehead's ability to breathe out of water and crawl over land for short distances added to the fears.

Eradication efforts have been futile. But if we can't beat them, fisheries managers say, we might as well eat them.

Two other recently embedded invasive species, blue catfish and flathead catfish, also are caught at the Conowingo fish lift, but they are kept for research by the DNR and Penn State University. Scientists are collecting data about age, growth rates, diet and genetics, with the aim of better managing those species and determining their impacts on other fish and aquatic ecosystems in general.

"This [food bank] initiative serves multiple goals, including controlling invasive fish species by harvesting them, [minimizing] their impacts on the Chesapeake Bay ecosystem and providing protein-rich meals to those in need," said DNR Secretary Jeannie Haddaway-Riccio. "We also improve our scientific data, which will help us better manage these invasives in the future."

A second fish lift that allows direct passage over the dam was not opened this year after an incident last spring in which about 35 snakeheads were seen passing into the Susquehanna River above the dam. Desperate netting activity captured 14 of them and two more were later recovered upriver. But nearly 20 of them got away, marking the first time that snakeheads were known to be in the Susquehanna above the dam. ■

CHESAPEAKE CHALLENGE

Celebrating 30 YEARS

— Kathleen A. Gaskell


A


B


C

It's time you got to know us

Celebrating 30 YEARS

This year, the *Bay Journal* celebrates its 30th anniversary. Over time, our team has grown to include 10 staff members working hard to bring you a continuous stream of environmental news and keep things at the *Bay Journal* running smoothly. Here's the story behind some of the bylines as well as a few staffers who work behind the scenes. Have fun figuring out who is who. Answers are on page 43.

Lara Lutz (editor)
Karl Blankenship (editor-at-large)
T.F. Sayles (managing editor)
Timothy B. Wheeler (associate editor/senior writer)
Kathleen A. Gaskell (copy/design editor)
Jeremy Cox (writer)
Ad Crable (writer)
Whitney Pipkin (writer)
David Harp (photographer)
Jacqui Caine (marketing & advertising director)

1. I'm a native of West Virginia and grew up eating oysters, then followed my taste buds to the Chesapeake Bay. (I wasn't so fond of crabs at first, because one pinched my finger when I was a tyke. Been getting revenge ever since.) Grew up in a chemical factory town and learned firsthand the environmental price of imprudent progress. Dreamed as a youth of going into space, but got hooked on journalism in college and never looked back. I enjoy exploring nature and history, good food, good company and good stories. Orioles fan, so prone to rooting for underdogs.

2. I've been on the *Bay Journal* reporting team since 2018 and host the *Chesapeake Uncharted* podcast. I live near Salisbury on Maryland's Eastern Shore. Not really big into Old Bay. Previous newspaper experience in Jacksonville and Naples, FL. Graduated from the University of Florida with a bachelor's in journalism. Was a Knight Foundation fellow and earned a master's degree at the University of Alabama. Once interviewed Bertie Higgins. I avoid the phrase "due to" at all costs. Married to Jennifer and "Dabby" to Charlie. Novice kayaker. Only saw Springsteen once in concert but hoping to rectify that.

3. I didn't know what a geoduck was until my first day of work at a newspaper in the Pacific Northwest. I hate Styrofoam, as much for the sound as the environmental impact. From a landlocked state and always in awe of waterfalls. I occasionally wear glasses to fit in with the *Bay Journal* staff.

4. I've been with the *Bay Journal* for an two years. Inspired by the outdoors despite a painful rash after being bitten on the buttocks by a hickory tussock moth caterpillar. I've lived in Pennsylvania Dutch country for 39 years but still don't like red beet eggs. I hold a journalism degree from West Virginia University and those country roads call me home regularly. First interaction with the Bay was catch-and-releasing huge striped bass on the Susquehanna Flats. Most people refuse to believe my first name is real and not short for something else. Once locked out of my office, I crawled through a window and then exited the same way, not thinking to use the door.

5. I've been writing and editing about the environment and history of the Bay region for more than 25 years. I've lived in three Bay states (PA, NY & MD) and in its Potomac, Susquehanna, South River and Rhode River watersheds. I often roam beyond the Bay watershed to old family land in Western Maryland to engage in snake and mice removals and battle burst pipes. I enjoy boating and history. An avid genealogist, messy gardener and amateur fiddler. Attempt to speak German but prone to making things up. Peak household animal population included three cats, a dog and four chickens.

6. I've had a camera (acquired by redeeming coupons from butter packages) in my hands since I was 10. Dad, a prolific amateur photographer, was managing editor of the *Hagerstown Morning Herald*. My degree from Ohio University says English literature, but I always wanted to be a journalist. Worked for the Morning Herald for a few years then became the photographer for the *Baltimore Sun Magazine*. Favorite platform for photography is a kayak, where I can get close to flora and fauna of the Bay (and one time too close to a mother otter).

7. I've been writing about the Chesapeake Bay for 31 years and with the *Bay Journal* since its inception in 1991. I enjoy camping in the mountains and bicycle riding, especially on gravel mountain roads. I have a journalism degree from Michigan State and worked for newspapers in Michigan, Arizona, Rhode Island and Pennsylvania. Being from the Great Lakes state, I assume when someone talks about a waterbody being a national treasure, they are referring to Lake Superior.

8. Prior to moving to Maryland's Eastern Shore, I lived in Virginia where I enjoyed a long career in newspaper advertising and print sales while raising two children with my spouse. Family trips forged a connection to the Bay, and I'm fortunate to now reside near its shores! Leisure time is filled with crabbing, fishing, swimming, boating, working out and chasing live music — though I cannot seem to get the ink out of my blood.

9. I've worked at the *Bay Journal* for almost 30 years. Attended Michigan State on creative writing (poetry) scholarship. Graduated with journalism, French degrees. Never met a herptile, wildflower, mushroom or bird that didn't fascinate me — I have to be told to look up while hiking. I participate in Project FeederWatch. In statewide high school competition, I was recognized for an essay on making environmental education mandatory. Honored in 1995 by York County, PA, Parks for volunteer service to promote environmental conservation and education. Reads grammar books for fun. Raised an outdoor enthusiast son! Owned by three cats. Three-foot plastic iguana, "Irene" (gift from spouse), lives in master bath.

10. Never met a cat I didn't like or a grandchild I don't want to squeeze the stuffing out of. (Although a nitpicky wordsmith, I'm fine with ending the foregoing sentence with a preposition.) I am also a decent baritone in four-part a cappella harmony, as well as a late-blooming community theater actor — the latter a development that my younger, more wallflower-ish self never would have predicted. Finally, while grudgingly accepting that the inexorable tide of usage has all but washed away the distinction between "lie" and "lay," you will never hear me say I'm going to "lay in the sun" — for several reasons. ■

A. Kathleen A. Gaskell, the Bay Journal*'s copy editor and design editor, also writes Chesapeake Challenge and compiles the* Bulletin Board.

B. T. F. Sayles, here with grandson Frankie, is the Bay Journal*'s managing editor and also oversees the Bay Journal News Service.*

C. Jacqui Caine is the Bay Journal*'s marketing and advertising director and manages the* Bay Journal*'s subscription list.*

Map credit: U.S. Geological Survey

A river less paddled: morning on the Upper Nanticoke

By Ashley Stimpson

The ospreys were the first to welcome us to the Nanticoke River.

As we piloted our kayaks out of the still water of the Seaford, DE, marina, their tea-kettle whistles filled the air, bouncing off the fiberglass and gleaming aluminum of the sailboats stationed nearby. Above, four brown and white birds rode thermals in ascending circles, their wings stretched taut as clothesline. Before that morning's adventure, I had read that the Nanticoke watershed is home to the largest population of bald eagles in the northeastern United States but, that morning, the ospreys seemed to be in charge.

I had read lots of enticing things about the Nanticoke. That it was the most pristine tributary of the Chesapeake Bay, a title it owes to a lack of development along its shores. In fact, 93% of the 530,000-acre watershed has been spared from the region's relentless chug of growth. Accordingly, the watershed also has some of the largest contiguous tracts of forest left standing on the Delmarva Peninsula, much of them owned and protected by local governments, nonprofits and other conservation outlets. According to the Chesapeake Conservancy, these forests and the adjacent wetlands harbor the highest rate of biodiversity in the Bay watershed. And because tourists — on their way to the peninsula's popular beach towns and wildlife refuges — have largely overlooked the Nanticoke as a place for recreation, it remains one of the least explored treasures in the area.

Jonathan Offen, owner of the Laurel-based Delmarva Adventure Sports, can attest to this. As he helped my boyfriend, Jeff, and I get our gear situated in the teal and camouflage kayaks he'd delivered for us, Offen said customers looking for a shuttle along the Nanticoke proper are rare; most of those he serves prefer narrower creeks with less boat traffic. But on a Friday morning paddle in late June, we passed only two jon boats and enjoyed the generous push of an outgoing tide.

Instead of boats, we were surrounded by birds before we even left Seaford. In addition to the osprey (Jeff, a Coast Guardsman who's logged years of his life on the water, said it was the most ospreys he'd ever seen in one place.) We marveled at great blue herons gliding from one bank to the other, laughing gulls cruising downstream, Eastern kingbirds hopscotching on pickerelweed, and yes, an impressive convocation of bald eagles soaring overhead. I watched their reflection in the water, which that morning was the color of coffee with the faintest hint of cream.

At the city limits, we paused to admire the juxtaposition of industry and wilderness, where a pair of cormorants was drying their wings on pilings in front of a noisy grain elevator. On the other side of the river, in a busy stone yard, a barge named Chesapeake was being loaded with sand. The panorama offers a microcosmic glimpse into the legacy of Seaford, a town that has long enjoyed a production-based economy amidst a rural backdrop. Seaford was once known as the "Nylon Capital of the World," thanks to the DuPont plant that opened there in 1939 and manufactured the world's first synthetic fiber. Visitors curious to learn more about the town's history should stop by the Seaford Museum, a former post office that has been restored, curated and is operated entirely by local volunteers.

Past Seaford, the Nanticoke meanders through dense forest and the yawning backyards of a few fortunate residents. As I paddled by their homes, I jealously imagined mornings with tea or evenings with wine on their back decks, admiring this secluded section of river.

But soon, anyone will be able to enjoy the same views, as the 41-acre Nanticoke Crossing Park inches closer to completion. The result of

Top photo: A paddler approaches a navigation marker on the Nanticoke River. According to the Chesapeake Conservancy, forests and wetlands adjacent to the Nanticoke have the highest rate of biodiversity in the Bay watershed.

Center photo: One of the river's ever-present ospreys surveys the landscape from its nest on top of a navigation marker.

(Photos/Jeffrey Irtenkauf)

a partnership between the Sussex County Land Trust and the Chesapeake Conservancy, the park will include 1,900 feet of shoreline and direct access to the river through an old lagoon that will be transformed into a public boat launch. Plans are also in the works for hiking trails and campsites.

Randall Larrimore, chair of the conservancy's board of directors, claims that with Nanticoke Crossing's new acreage on the tally sheet, 33% of the Nanticoke's watershed is now protected from development. (Upstream, the conservancy is also working on the Oyster House Park in Seaford, which will feature community amenities like an amphitheater and outdoor classroom, as well as practical upgrades such as erosion repair and sewage improvements.)

Nanticoke Crossing will also protect land surrounding the nation's oldest operating ferry service. When the Woodland Ferry opened in the 1740s, it carried horse-drawn carts and was known as Cannon's Ferry after the family that would own it for more than a century. Because of their shady business dealings and price gouging, the Cannons were despised in the area. According to the 1973 nomination to put the ferry on the National Register of Historic Places, one of those family members, "Jacob Cannon, Jr., was a bitter, lonely man whose fabled miserliness and sensational murder earned him a place in fiction as one of the villains of George Alfred Townsend's novel, *The Entailed Hat*." In 1843, Cannon was killed in broad daylight at the ferry landing he owned.

Today, the once-scandalous spot is sleepy and quaint, and the Delaware Department of Transportation operates the ferry, which was renamed to avoid invoking the memory of infamous slave runner and serial killer, Patty Cannon (who you can learn about in the Seaford Museum). There is no fee to use the six-vehicle cable ferry, which operates year-round from 7 a.m.–6:30 p.m.

According to DelDOT, 225 vehicles cross the Nanticoke via the Woodland Ferry on an average summer day. Every second Saturday in September, the Woodland Ferry Festival celebrates this piece of state history with music, games, and, of course, ferry rides.

For us, the ferry marks the halfway point of our paddle, and, thanks to the tide, we are way ahead of schedule. We stopped along the bank so that Jeff could get a few casts in on his flyrod and I could watch the boxy vessel zip back and forth across the river with enviable zest for a 300-year-old ferry (the boat was replaced in 2008).

After a rest (and no fish), we paddled on, admiring vast stands of spatterdock and meeting more birds along the way. A duck and a flashy yellowish warbler zoomed by before I could identify them, tree swallows twirled and whirled, and Canada geese splashed at the shore. Ospreys occupied just about every navigation marker we passed, perched on the edge of sprawling stick-pile nests. Sometimes, we could make out the very top of a nestling's curious head.

We passed the turnoff for Broad Creek, one of the most popular paddles in the area, according to Offen, because of its largemouth bass fishery. Our destination was Sharptown, just across the state line in Maryland. A century and a half ago, Sharptown was a bustling shipbuilding community. Eighteen U.S. Merchant ships were built there and the city's docks held the largest fleet of schooners on the Nanticoke. When we pulled our kayaks from the water, there was not another boat to be seen.

From Sharptown, the river flows another 55 miles or so, growing wider and wilder before it empties into the Tangier Sound near Deal Island. Altogether, the Nanticoke is punctuated by 25 public launches, boat ramps and fishing piers, and, remarkably, they're some of the least crowded on the Delmarva peninsula — for now. But I have a feeling that pretty soon everyone will be singing the river's praises, perhaps as loudly and enthusiastically as the ospreys that call it home. ■

Top photo: Shortly after launching at Seaford, DE, a paddler encounters a grain elevator. On the other side of the river, in a busy stone yard, a barge is being loaded with sand.

Bottom photo: Nanticoke Crossing Park, when complete, will also protect land surrounding the nation's oldest operating ferry service. When it opened in the 1740s, it was known as Cannon's Ferry after the family whose notorious members would own it for more than a century. It has since been renamed the Woodland Ferry. Every second Saturday in September, the Woodland Ferry Festival celebrates the site's history with music, games and ferry rides.

(Photos/Jeffrey Irtenkauf)

Visit French Azilum, where nobles fled to PA wilderness

By Ad Crable

One of the quirkiest chapters in Pennsylvania history lies inside a horseshoe bend in the Susquehanna River, plowed under by nicely spaced farm fields.

But 228 years ago, a strange little village rose from the wilderness of what is now called Pennsylvania's Endless Mountains. About 50 aristocratic families fleeing the French Revolution escaped the guillotine by settling in a pop-up town called French Azilum (pronounced Ahz-EYE-lum). They were joined by wealthy French run out of Saint-Domingue (now Haiti) when the people they had enslaved rebelled against them.

The refugees even designed a grand mansion intended to house Queen Marie Antoinette, wife of King Louie XVI, and their children, but she lost her head before the building began.

La Grande Maison rose forth anyway, a striking three-story building with marble floors, French windows and doors, and black walnut woodwork. In the queen's absence, it housed town managers and important guests, including Louis-Phillipe, who later became king of France. It was torn down in 1848.

About 50 far-from-rustic two-story homes were built on half-acre lots between 1793 and 1803, each with two reception rooms, two bedrooms, a wine cellar and dining room connected by a covered walkway to a cookhouse.

Though a modest community by aristocratic standards, it was almost the size of the county seat, Towanda.

Local German and English settlers dubbed French Azilum "the Versailles of the Susquehanna." They kept the reference to themselves because many of them were hired to work at the village and tend fields for the transplanted nobles. Some of the refugees from Saint-Domingue brought enslaved workers with them, who lived in a shantytown by the river.

Approximately 413 lots were planned on 300 acres of the 1,600-acre property, with straight, broad streets. The hope was for a self-sufficient town. But, after only a decade, French sources of money dried up and the Philadelphians who conceived the town went bankrupt.

When Napoleon Bonaparte rose to power and welcomed the expatriates back to France, most of the French families abandoned the town, selling their homes to the locals to use as building materials.

Many sailed back to France. Others headed for Southern cities in the U.S. with large French populations, such as New Orleans and Charleston. Only four families stayed and laid down roots: Homet, LaPorte, LeFevre and Brevost.

All but a single excavated wine cellar are gone, and if you visit French Azilum you will have to use your imagination to envision the scene, not unlike visiting a battlefield. Except for the 22 acres owned by the French Azilum nonprofit organization, almost all of the land is in a handful of large, handsome farms.

After just a decade of existence, this odd nugget of Pennsylvania lore quickly faded from sight and memory so thoroughly that even current historian Deborah DeBilly dit Courville — who traces her ancestry to medieval French King Louie VII — had never heard of French Azilum when she moved to the area 31 years ago from Massachusetts.

"It's the best-kept secret around," said Courville, now thoroughly enraptured and well-versed in all things French Azilum. She has written two historical novels set at the short-lived settlement and serves as the nonprofit's treasurer and events coordinator.

After a brief ownership by the state, the private, all-volunteer French Azilum, Inc., was formed in 1988 to resurrect awareness. They open the site for three tours a day, Fridays through Sunday from Memorial Day through Labor Day.

Creative living-history classes have included open-hearth cooking, themed teas and blacksmithing. There's even a French flag flying along

Top photo: A bend in the Susquehanna River harbored the village of French Azilum, which once stood on this site in Pennsylvania and gave refuge to families fleeing the violence of the French Revolution. (Ad Crable)

Bottom photo: French Azilum historian Deborah DeBilly dit Courville welcomes guests to the John LaPorte House. (Ad Crable)

the river to catch the eye of passing paddlers, with brochures for their edification.

Any tour of French Azilum should begin across the Susquehanna, high on a ridge where the group owns the Marie Antoinette Overlook, along U.S. Route 6. The wide overlook was built in the 1920s and improved in the 1930s by the Depression era Works Progress Administration.

Here, 500 feet above the river, you can see the entire horseshoe bend that the original Iroquois inhabitants called "the meadows." The Iroquois used the overlook site as a signaling point. Mountains rise gently to the southwest.

Though French Azilum was built in wilderness, it was strategically located with two sides fronting the curving Susquehanna, the main highway for moving and receiving goods at the time. Thus, the monied members of the village could have the furnishings and materials to which they were accustomed shipped by barge.

At the overlook is an expansive panel with a photo of the scene below, overlain with the locations of now-gone landmarks of French Azilum, including La Grande Maison and the market square, which included a Catholic church, small shops, schoolhouse and theater.

While it lasted, the town also supported a grist mill, blacksmith shop, distillery, gardens, orchards and farms.

After getting a lay of the land, visitors can make the 20-minute drive across the river to the French Azilum site and its grass parking area. The visitor's center is a small cabin — built at the same time as the village, but not originally located there and not architecturally representative of the homes of French Azilum.

Here you can watch a video of explaining the history of French Azilum and see some artifacts that were recovered in an archaeological dig.

You'll learn that the idea for the French refugee retreat was the brainchild of three prominent Philadelphia businessmen, Robert Morris, John Nicholson and Stephen Girard, who saw money to be made. Many Philadelphians thought the city was already overrun by the French, going back to America's own revolution, said Courville. "I think the feeling in Philadelphia was 'enough of these people, send them somewhere else.'" So they sent them up the Susquehanna.

At first, the entrepreneurs called the new retreat French "Asylum," but thought better of it and adopted the French spelling of the word — lest there be any confusion over what kind of a place they were building.

There was a culture gap between the French refugees and their neighbors. "[The local people] thought they were snobs and maybe that they were misplaced, but there was no animosity," according to Courville.

The visible focal point of the French Azilum grounds is LaPorte House, built in 1836 where La Grande Maison once stood. It was built by John LaPorte, the son of Bartholomew LaPorte, an original French Azilum resident and one of its leaders.

John LaPorte, who was born in La Grande Maison, became a leading citizen in the state, serving as banker, judge, lawyer, state senator and then a U.S. Congressman. A nearby town is named Laporte in his honor.

He had fond childhood memories of growing up in French Azilum. When he decided to build a summer home, he chose to build on the vacant site of the town. Generations of LaPortes lived there for more than 100 years. A small family cemetery fenced in wrought iron, which includes John LaPorte's resting place, sits just about where the center of the market square once stood. LaPortes' summer home with a white picket fence facing the river was meant to impress. From the riverfront entrance, guests were greeted by a butler and ushered into one of two reception rooms.

Though built well after French Azilum, here you will find furniture, including a gaming table and a fortepiano with inlaid wood, from the original settlement. There are artist's renderings of La Grande Maison and other homes, as well as a map showing all the town lots.

Sprinkled generously throughout the home are samples from Courville's extensive collection of original period garments. In the Marie Antoinette room, for instance, you may find lifelike figures of the queen and an attendant, both dressed in ball gowns from the late 1700s.

The LaPorte House is also stuffed with furnishings from the family's century of living there. On the grounds, you can visit a blacksmith shop, scale house, stable, smokehouse, wagon house and a display of farm equipment.

In the yard near the summer kitchen is an iron bell. It was used by French settler Joseph Homet, who lived outside French Azilum and ran a ferry and mill. The bell was used to signal the ferry's departures. A large grist millstone from the original village is also on the grounds.

French Azilum may have disappeared without a trace but there are still some visible reminders. The nearby towns of Laporte, Asylum and Dushore, as well as French Asylum Church and Homets Ferry Road — all have names recalling the town that time forgot. ■

Top photo: John LaPorte, who was born in French Azilum, PA, built this summer home in 1836 where the village once stood. (Ad Crable)

Bottom photo: Most of the land surrounding the site of French Azilum is now farmed. (Ad Crable)

IF YOU GO

French Azilum is located at 469 Queens Road, Towanda, PA.

INFORMATION

Visit thefrenchazilum.com, email thefrenchazilum@gmail.com or call 570-265-3376.

HOURS & ADMISSION

The site is open 11 a.m.–4 p.m. Friday through Sunday from Memorial Day through Labor Day weekend. Admission is $5 for adults; $3 for students; voluntary donation for ages 11 & younger. Admission includes a guided tour of LaPorte House and wandering the grounds.

FACILITIES & EVENTS

Facilities include a launch for paddle craft on the Susquehanna River, restrooms, a picnic area with open pavilion, visitor center and gift shop, benches along the river, and a nature trail along the river and through fields. Primitive camping is permitted for $3/night per person.

Pets are allowed anywhere except inside LaPorte House. Remaining summer events include Vino and VanGogh, Azilum Village Church Service, Civil War Day, Renaissance Day. Check the website for dates and availability.

A painted turtle peers out from a streamside wetland along Kings Creek, a tributary of Maryland's Choptank River. (Dave Harp)

We are turtle-y grateful for your generous donations

There's no greater sign of the *Bay Journal*'s success than the compliments and donations received from readers like you. Your gifts to the Bay Journal Fund continue to make our work possible, from coverage of the Bay restoration and the health of its rivers, to the impacts of climate change, toxics, growth and invasive species on the region's ecosystem. Our staff works every day to bring you the best reporting on environmental issues in the Bay region. We are grateful for your donations.
Please continue to support our success!

PHILANTHROPIST

Doug Lashley
Kiawah Island, SC

GUARANTOR

Alan & Penny Griffith
Centreville, MD

CHAMPION

Gary Knipling
Mason Neck, VA

BOOSTER

In Memory of Mike Kemp
from Walter & Mary Ellen Boynton
Prince Frederick, MD

In Memory of Kelly Phillips Cox Phillips Wharf Environmental Center
from Dr. & Mrs. Kenneth B. Lewis
Cockeysville, MD

Kathy Cornell
Nathalie, VA

Daniel Walz
Lexington, VA

Christopher F. Dungan
Trappe, MD

ADVOCATE

Jeffrey Smith
Crofton, MD

Jason Bauer
Alexandria, VA

Richard Hinds
Washington, DC

Donna & Dennis Treacy
Hanover, VA

FRIEND

In Memory of Tom Scanlan
from Janice Scanlan
Harrisonburg, VA

Shirley & Joseph Alloway, Sr.
Voorhees, NJ

David Barkdoll
York, PA

Philip Bowman
Hanover, PA

Tim Bradshaw
Tappahannock, VA

Christine Burris
Washington, DC

Jun Carag
Rising Sun, MD

Maria Cattell
Millersville, PA

William & Linda Colvin
Dunkirk, MD

Douglas Diedrick
Queenstown, MD

David Dressel
Keedysville, MD

Edwin Elmore
Williamsburg, VA

Thomas & Jeanne Ervin
Upper Chichester, PA

John & Susan Ford
Maryland, NY

Anne Forrest
Chestertown, MD

Ted Godfrey
Reisterstown, MD

Debra Gutenson
Lovettsville, VA

Anne Hairston-Strang
Tilghman, MD

Burch Harmon
Catonsville, MD

Lynda Hartzell
Felton, PA

Charles Hess
State College, PA

Ann & William Hewitt
Williamsburg, VA

Jerry Hopkins
Annapolis, MD

James Kopf
Lancaster, PA

Marta Kumer
Rock Hall, MD

Karen Lasley
Virginia Beach, VA

Marie Lerch
Kensington, MD

Ron Louzon
Woodstock, MD

Stephen & Marie Maltese
Baltimore, MD

Lloyd Mcallister
Salisbury, MD

Derek McGuirk
Bel Air, MD

Robert & Lynn McKinney
Sugar Grove, VA

Charles W. Megahan
Elkton, MD

Linda Merriken
Towson, MD

Clyde A. Miller
Falls Church, VA

Allen Moore
Edinburg, VA

Michael Mulvihill
Staunton, VA

Jeffrey Orndorff
Columbia, MD

Eric Peltosalo
Annapolis, MD

Mary Perkins
Glen Burnie, MD

Robert B. Pieper
Essex, MD

Larry Plazinski
Taneytown, MD

James J. Potter
Baltimore, MD

Alan Raflo
Blacksburg, VA

Montgomery Raimond
Baltimore, MD

Margaret Robinson
Marydel, MD

Frank Sanford
Chevy Chase, MD

Paul Scheibe
Kennett Square, PA

Mary Seidel
Pasadena, MD

W. Shellenberger
Centreville, MD

Bruce Sheppard
Winchester, VA

Laura Simms
Parkville, MD

Jack Smith
Bel Air, MD

Sandy Smith
Gardners, PA

Blake Sutherland
East New Market, MD

Catharine Tucker
Richmond, VA

Richard Urban
Signal Mountain, TN

James W. Voshell
Parkton, MD

Diana Wagner
Marion Station, MD

Frank Watson
Salisbury, MD

Mary Webber
Richmond, VA

David Wigginton
New Kent, VA

Ernie Willoughby
Solomons, MD

Tom Zeender
Washington, DC

Fran & Fred Adams
Virginia Beach, VA

Jean Adams & Patrick Hickey
Richmond, VA

Marilyn Comfort
Charlottesville, VA

Eddie Daniel
Orange, VA

Ellen Einstein
Marshall, VA

Walter Flora
Waynesboro, VA

Ann-Marie Grady
McLean, VA

Brian Higgins
McLean, VA

Connie Hummer
Williamsburg, VA

Rod & Pat Layton
Salisbury, MD

John E. Mara
Easton, MD

Glenn Morrison
Quarryville, PA

Alfred Petruccy
Severna Park, MD

Clay Sellers
Linville, VA

Mark Strassle
Lancaster, PA

Craig Turner
Dunkirk, MD

Mr. & Mrs. Robert Valliere
Laurel, MD

Paul G. Voelker
Timonium, MD

Susan Wilder
Mechanicsburg, PA

Charles & Hilda Wilson
Montross, VA

Donald Wingard
Millersburg, PA

John Wood, Jr.
Mechanicsville, MD

Robert Yurchuck
Virginia Beach, VA

Freeman G. Bagnall
Arnold, MD

Dr. & Mrs. Martin A. Barley
California, MD

Bedford Conservation District
Bedford, PA

James A. Belson
Annapolis, MD

Clyde Bruce
Dublin, VA

Carl Christiansen
Kilmarnock, VA

Stephen Clark
Bel Air, MD

Tom Cornwell
Tilghman, MD

Charlene Crable
Bradenton, FL

Bill Dieffenbach
Bradenton, FL

Patricia Doniger
Chesterfield, VA

Ruth E. Emery
Washington Boro, PA

Ed Gabsewics
York, PA

James R. Glover
Cambridge, MD

Robert Gorey
Catonsville, MD

Paul Gormley
Baltimore, MD

Barbara Hall
Endwell, NY

Roland Hromek
Dundalk, MD

Jason Jackson
Arnold, MD

Barry & Kathy Kwasny
Stroudsburg, PA

Letty Limbach
Washington, DC

Dudley Lindsley
California, MD

Lee Linebaugh
Hanover, PA

A bumblebee pollinates a redbud tree. (Dave Harp)

James P. Long & Nancy S. Reid
Ithaca, NY

James R. Lyle
Providence Forge, VA

Mr. & Mrs. David W. Martin
Lititz, PA

Holly Meyer
Silver Spring, MD

Douglas M. Olsen
Chestertown, MD

Tom Payne
Chesapeake City, MD

David Peterson
Media, PA

Steven Preston
Abingdon, MD

William Ragsdale
Williamsburg, VA

Scott Richardson
Baltimore, MD

Victor Riggio
Trappe, MD

Mr. & Mrs. Wayne Ross
Street, MD

David & Marion Royer
Newark, DE

John & Tracie Schmidt
Columbia, MD

Diane M. Shaw
Huntingtown, MD

Patricia M. Soltys
Hampton, VA

Stuart S. Speaker
Takoma Park, MD

Capt. William Story
Hudgins, VA

Charles A. Weigand
Virginia Beach, VA

Elizabeth White
Waynesboro, PA

Gaye Williams
Annapolis, MD

Anne Worthington
Flagstaff, AZ

Mr. & Mrs. Daniel Yocom
Millersville, PA

Daniel F. Zivi
Severna Park, MD

Carl Zulick
Deltaville, VA

Mrs. Clara J. Ailes
Springfield, VA

Kay J. Allen
Honolulu, HI

R. F. Ampula
Chestertown, MD

Armory Living Trust
Williamsburg, VA

John Arthur
Superior, WI

John Arthur
West Point, VA

William Ashby
Lexington Park, MD

Joan Atkins
Annapolis, MD

John Austin
Blacksburg, VA

Dennis Baker
Port Haywood, VA

Francis Baker
Chesapeake Beach, MD

John W. Banes
Towson, MD

Gloria Banz
Parkville, MD

Kevin Barber
Haddonfield, NJ

William Barnes
Catlett, VA

Kain Barnes
Silver Spring, MD

Sadj & Bob Bartolo
Columbia, MD

Susan Bauman
Middle River, MD

Elisa Haransky Beck
Monroeville, PA

Thomas R. Bender, Jr.
Bellefonte, PA

Patricia Benson
Berlin, MD

Robert Blama
Towson, MD

Cindy Blankenship
Virginia Beach, VA

Megan Bolcar
Columbia, MD

Michael & Cheryl Bosler
Arnold, MD

Jay Bower
Annapolis, MD

Clarke Bowie
Parkville, MD

Larry Bowles
Powhatan, VA

Mark L. Brabson
Peach Bottom, PA

Bill Branch
Hillsborough, NC

Caroline Braun
California, MD

Paul Brown
Pittsburgh, PA

Loretta & Carlyle Brown
Baltimore, MD

Walter Brown
Sparrows Point, MD

Ted Burkhardt
Jarrettsville, MD

Rita Buschman
Glen Rock, PA

Michael Byard
Annapolis, MD

Mr. & Mrs. John M. Carlock
Virginia Beach, VA

Richard Carmine
Laurel, DE

Jonathan Chapman
Annapolis, MD

John Chester
Jarrettsville, MD

Robert M. Choisser
Edgewater, MD

Kathleen Chow
Owings, MD

Tom Clark
Tappahannock, VA

George Clarke
Lexington Park, MD

Lynda Clary
Tangier, VA

Harry J. Cook
Baltimore, MD

Scott Corbin
Union Bridge, MD

Brad Crosby
Mechanicsville, VA

Neil Dampier
Phoenix, MD

Tom Daniels
Lancaster, PA

Joseph Dannenfelser
Edgewood, MD

Cliff Dean
Annapolis, MD

Nancy Dennis
Berwick, PA

Joe Dickens
Sebring, FL

Joseph V. Dipietro
Baltimore, MD

Lorraine & Charles Dixon, Jr.
Lancaster, VA

RIchard Dodds
Port Republic, MD

Stewart Doetzer
Goochland, VA

Susan Duke
Kensington, MD

Jeff Eastland
Garrisonville, VA

Craig England
Singers Glen, VA

Elsa Q. Falls
Henrico, VA

Trit Farley
Cockeysville, MD

Wayne & Cheryl Fisher
Milton, DE

Rachel & Craig Flanagan
Lusby, MD

Art Fletcher
Georgetown, DE

Mary & Paul Fletcher
Lexington Park, MD

Jim Foard
Rosedale, MD

Sharon Foley
Mount Crawford, VA

James Forrest
Lusby, MD

G. Chandler Fox
Falls Church, VA

Bill Garren
Greenbelt, MD

Jeffrey Gerhart
Robesonia, PA

Joseph Gibbons
Moseley, VA

Varlen & Phyllis Gibbs
York, PA

Judy Gifford
Kennedyville, MD

Lorie Gomez
Williamsburg, VA

Judy & Glen Graber, Jr.
Easton, MD

Marea Grant
Chevy Chase, MD

Gregory Greene
Blue Point, NY

David S. Gussman
Toano, VA

Will Hager
Prince Frederick, MD

Faye Hagerman
Baltimore, MD

David Haller
Hagerstown, MD

Ralph Hambrick
Richmond, VA

See **DONORS**, *page 36*

Thank You To These Philanthropic Donors

RAUCH FOUNDATION

ORC

THE CAMPBELL FOUNDATION

NOAA CHESAPEAKE BAY

Chesapeake Bay Program
A Watershed Partnership

WYE HALL
plant a tree, leave a legacy

Virginia Environmental Endowment

SHARED EARTH FOUNDATION

The Curtis and Edith Munson Foundation

The Sumner T. McKnight Foundation

A green heron perches on a snag at Blackwater National Wildlife Refuge as a cold front moves through Dorchester County, MD. (Dave Harp)

DONORS *from page 35*

Bill Hannegan
Lancaster, PA

Charlene Haskell
Alexandria, VA

Ebbe Hassl
Chesterfield, VA

Sam Hastings
Dogue, VA

Russell & Anna Heath
Centreville, VA

Ruth Heil
Schwenksville, PA

Eloise G. Hendrixson
Odenton, MD

Mr. & Mrs. James Hitchens
Georgetown, DE

Phil Holzinger
Lancaster, PA

Franklin Horstman
Columbia, MD

Leo F. Howard
Linthicum, MD

Robert Huffman, Jr.
Newport News, VA

Hobart Hughes
Salisbury, MD

Howard Hundley
Lewes, DE

Susan & Andy Hurst
Onley, VA

Eddie Hyle
Zionville, NC

Jon Ingersoll
Cambridge, MD

Peter Inskip
Rockville, MD

Ted M. Jenkins
Heathsville, VA

Carol A. Johanningsmeier
Suffolk, VA

Kari Johnson
Los Angeles, CA

Roberta Johnson
Annandale, VA

Steven Jones
Cambridge, MD

Karen A. Jones
Baltimore, MD

Steve Joslyn
Masontown, PA

Hall Jump
Cordova, MD

Joseph & Janet Juras
Niskayuna, NY

Mike Kadan
Adamstown, MD

Richard Kantor
Merry Point, VA

John & Mary Kapalka
New Kent, VA

Pamela Kemecsy
East Stroudsburg, PA

James Kepler
York, PA

Dr. Mohamed Khalequzzaman
Lock Haven, PA

David Kibler
Salem, VA

Joy Kim
Chestertown, MD

Leona Kimmel
Randallstown, MD

Lolita Kiorpes
Port Republic, MD

Jerome Klasmeier
Crownsville, MD

William Koch, Jr.
Hegins, PA

Kopel's Marina of Maryland
Coltons Point, MD

George Kopf
Drexel Hill, PA

Donald Kormann
Basye, VA

James Kosmides & Mignon Petrini
Annapolis, MD

Mr. & Mrs. Jeremiah F. Kratz
Centreville, MD

Patricia Krause
Fallston, MD

Mark Kromer
Owings, MD

Bob Krout
Virginia Beach, VA

Melissa Kuzma
Havre De Grace, MD

Joseph Landers
Baltimore, MD

Marie Larsen
Hummelstown, PA

Nancy Layfield
Chesterfield, VA

Joyce & David LeGrande
Moseley, VA

Donald Leisch
Arlington, VA

Mr. & Mrs. Tim Lemke
Dillsburg, PA

Dorothy Leonard
Stevensville, MD

Raymond Leone
McLean, VA

Suzanne & Fred Lepple
Alexandria, VA

Hans Leyer
Hilton Head Island, SC

Wayne Lipscomb & Amanda Greene
Clarksville, VA

Betsy Little
Catonsville, MD

Lorraine Long
Baltimore, MD

Steve Loomis
Cape Charles, VA

James H. Lovelady, Sr.
Hopewell, VA

Francis Glenn Lumpkins
Lusby, MD

Mary Lutz
Dryden, NY

Marge Mackey
Woodstock, MD

Steve Maczuga
Chambersburg, PA

Mike Malkiewicz
Dover, DE

Sue March
Marriottsville, MD

H. Mathews
North Chesterfield, VA

James Maucher
Bear, DE

Charles R. McClain
Severna Park, MD

Carol McCollough
St. Michaels, MD

Sandra McCormick
Baltimore, MD

H. Gordon McCoy, Jr.
Lexington, VA

Michael McDavit
Arlington, VA

Lucy McKean
Catonsville, MD

Chris Merryman
Whiteford, MD

Kathleen & Charles Miller
Cambridge, MD

James Miller
Williamsburg, VA

Chris Mills
Richmond, VA

Mike Molesevich
Lewisburg, PA

Ralph Montfort
Bethesda, MD

Robert J. Morgan
Virginia Beach, VA

Mr. & Mrs. John E. Murray, Sr.
McClure, PA

Stephen Nemphos
Baldwin, MD

Raymond C. Nichols
Annapolis, MD

Barbara Nickel
East Berlin, PA

John Nielson
Coatesville, PA

Steven Niethamer
Aydlett, NC

Cindy Nolan
Richmond, VA

Terrance L. O'Connor
Clearfield, PA

Marria O'Malley Walsh
Pottsville, PA

Carl Oplinger
Emmaus, PA

Bryan Ortman
Parkville, MD

Randy Packett
Warsaw, VA

Lori & Matthew Palagyi
Suffolk, VA

Michael Paul
Hopewell, NJ

Neal Payne
Chesapeake City, MD

Alan Peterson
Willow Street, PA

James Petitdemange
Sykesville, MD

Chris Pfeiffer
Alexandria, VA

Scott & Linda Phillips
Crownsville, MD

Thomas Plum
Greencastle, PA

Wayne Pollock
Kennett Square, PA

Doug Pool
Millsboro, DE

Bill Poulos
Kensington, MD

Janet Prewitt
Oxford, PA

Mr. & Mrs. Bob Priebe
Doswell, VA

Greg Ratke, Sr.
Cumberland, MD

Joan Ripley
Charlottesville, VA

Charles Robison
Norfolk, VA

Roger Rohrbaugh
Silver Spring, MD

John & Patricia Ruck
Annapolis, MD

Dale Sams
Cumberland, MD

Hildagarde Sanders
Baltimore, MD

Mark Sauer
Virginia Beach, VA

John Sauer
Afton, VA

James A. Sayler
Annapolis, MD

Ben & Dorothy Schaefer
Fairfax, VA

Henry Schaffer
Perry Hall, MD

Andrew & Angela Schatz
Hampstead, MD

Raymond & Virginia Scher
Staunton, VA

Charlie Schmidt
Glen Burnie, MD

Peter G. Schoettle
Rockville, MD

Dan Schwienteck
Shrewsbury, PA

Wendy Seifert
Mount Wolf, PA

Paul Servis
White Stone, VA

Mr. & Mrs. Richard Sharek
Indian Head, MD

Edward Shater
Mechanicsville, VA

Kathleen Sheridan
Manassas, VA

John Sheriff
Carlisle, PA

Jimmie Shipp
Winchester, VA

F. Sieling
Annapolis, MD

Jeanie Silver
Coatesville, PA

Ken Simmers
North East, MD

Linda Sinclair
Amherst, VA

Jane Smith
Linville, VA

Denise Smrcina
Seaford, DE

Joan L. Snyder
Lake Ariel, PA

Ted Snyder Jr.
Oley, PA

Margaret Southwick
Richmond, VA

Henry Spector
Annapolis, MD

Maurice Spector
Pungoteague, VA

David Staebler
New Columbia, PA

Amy Stalder
Columbia, MD

Mary & Chuck Stanley
St. Michaels, MD

Willie Staton
Landover, MD

Lynn Stauffer
Ephrata, PA

Steven Lee Stengler
Windsor Mill, MD

Philip A. Stevens
Silver Spring, MD

James C. Stine
Howard, PA

David & Margaret Sudekum
Delmar, MD

Supreme Seafood, Inc.
New Market, MD

Fireflies light up the marsh near Bloxom, VA. (Dave Harp)

Chris Surowiec
Gwynedd, PA

Joseph S. Sutton
Galeton, PA

Ronald Swicegood
Parrish, FL

Peter Swinehart
Boyds, MD

Shirley Teffeau
Hughesville, MD

Martin E. Tewksbury
Catonsville, MD

Barb Thomas
Floral City, FL

Jim Thompson
Hampton, VA

Rosemary Toohey
Baltimore, MD

Ronald & Angela Trivane
Annapolis, MD

Sharon Walker
Mount Airy, MD

Buren Walker
Mechanicsville, VA

Wyatt & Vivian Wallace
Perryville, MD

Sandra Ward
Baltimore, MD

Emily Webb
Harrisburg, PA

Mr. & Mrs. Robert M. Weekley
Lancaster, VA

Bill & Eileen P. Weldon
Williamsburg, VA

Lynn Wenger
Schaefferstown, PA

Sarah West
Cobbs Creek, VA

Sandy Wieland
Easton, MD

Lee W. Williams
Ocean City, MD

Jimmy Williamson
South Prince George, VA

Bob Wilson
Charlottesville, VA

Joan Winchester
Milford, DE

Jim Wortman
Easton, MD

Raymond Young
North Beach, MD

Carson Zake
Pasadena, MD

Gerald & Helen Abrecht
Washington, NC

Irene Allen
Washington, DC

Ron Ballew
Gettysburg, PA

Bayford Oyster Co.
Franktown, VA

Charles H. Blair
Pylesville, MD

Mary Jo & Thomas Bosley
Fishing Creek, MD

Caeser Butkiewicz
Mount Carmel, PA

Susan Christopher
Wicomico Church, VA

Franklin T. Clark
Silver Spring, MD

Perry & Katharine Conley
Parkville, MD

Roy & Deborah Cox
Baltimore, MD

Don Crook
Joppa, MD

Mickey & Sue Culp
Ellicott City, MD

Dan Dise
Tangier, VA

Carl & Rosalie Du Poldt
Edgemont, PA

Tony Edwards
Onley, VA

Rachel Fried
Port Republic, MD

Don & Lucy Gaskell
Eastport, MI

Lisa & Jim Golle
Lebanon, PA

Gary Graybeal
Conowingo, MD

Steven Gregory
Richmond, VA

Kathleen & Harry Hadd
Lancaster, VA

Jeffrey W. Hedtke
Norwood Young America, MN

Barbara S. Heistand
Elizabethtown, PA

Patricia Hendrix
White Hall, MD

Karen & Richard Hughes
South Chesterfield, VA

Barbara Kaehler
Worton, MD

David A. Karpa
Hampton, VA

Robert Keller
Crofton, MD

Dr. Gordon & Janet Kellett
Richmond, VA

Matthew Kershner
Jacksonville, FL

Frank Kovaloski
Blandburg, PA

Robert Leedy
Gettysburg, PA

Frank Little
Baltimore, MD

David G. Longacre
Sunbury, PA

Steve Luckman
Baltimore, MD

Barbara & Gerald Matacotta
Elmhurst, NY

William Meeks
Baltimore, MD

M. Miller
Eastville, VA

Mr. & Mrs. Christopher Norris
Selbyville, DE

John Pritts
Devon, PA

Janis E. Ranck
Powhatan, VA

Robert Andrew Reyda
Selinsgrove, PA

Jonathan Rogers
Lutherville, MD

Lori Romick
Milford, CT

Era Saunders
Hampton, VA

Roy K. Sedge & Sue Ann Erdman
Jensen Beach, FL

Anthony Sikorski
Fayetteville, PA

Larry & Louise Smith
Williamsburg, VA

Olivia Su
Wilmington, DE

Ann & Ted Taylor
Elverson, PA

Richard & Lisa Thomas
Hardyville, VA

Ket Troxell
North Potomac, MD

Christine Tucker
Harwood, MD

Evangeline VanTries
Waynesboro, PA

Yes! I want to help the *Bay Journal* maintain and expand coverage of issues related to the Chesapeake Bay and its watershed.

Enclosed is my tax-deductible gift of $_____

☐ **My check made payable to "Bay Journal Fund" is enclosed. OR** ☐ **Charge my Visa / MasterCard / Discover / AMEX.**

Card#:_____ Expires:_____ SecurityCode:_____

Name(s):_____

Address:_____

City:_____ State:_____ Zip:_____

Is this a memorial? Write name here:_____

Is this in someone's honor? Write name here:_____

☐ From time to time, the *Bay Journal* may include a list of its supporters in the print edition. Please check here if you would like your gift to remain anonymous and not be recognized in the *Bay Journal*.

Please mail your donation to the Bay Journal Fund, P.O. Box 300, Mayo, MD 21106

☐ **$15–$49**	**Friend**
☐ **$50–$99**	**Supporter**
☐ **$100–$149**	**Sponsor**
☐ **$150–$249**	**Benefactor**
☐ **$250–$499**	**Advocate**
☐ **$500–$999**	**Booster**
☐ **$1,000–$2,499**	**Champion**
☐ **$2,500–$4,999**	**Guarantor**
☐ **$5,000 & Up**	**Philanthropist**

The Bay Journal Fund does not share the names of its donors or their addresses with other organizations.

MD must do more to stop polluting overburdened communities

By Darya Minovi

Stormwater runoff carries a wide range of pollutants into streams, rivers and the Chesapeake Bay. (Matt Rath/Chesapeake Bay Program)

If you live near a chemical plant in Maryland, you might assume the state is taking the necessary steps to ensure the facility's operations aren't harming you or your family. But what if environmental permits — the state's primary tool to regulate pollution — don't take into account all pollution sources or aren't properly enforced?

These questions are especially pressing in many parts of Baltimore that, according to new research by the Chesapeake Accountability Project, are overburdened by industrial facilities releasing toxic chemicals via stormwater into adjacent communities. Furthermore, the research shows, stormwater polluters that are concentrated in overburdened neighborhoods are more likely to violate their permits.

Earlier this year, the Maryland Department of Environment revised its general industrial stormwater permit. The permit, which covers approximately 1,200 operations across the state, aims to limit the type and amount of heavy metals, chemicals and other toxic compounds that industrial facilities — like auto salvage yards, metal recyclers and landfills — can discharge into waterways via runoff from rain or snow.

Not only is the MDE proposing to roll back critical pollution limits in the revised permit, but the previous iterations have not substantively considered or addressed pollution impacts to communities. In addition to failing to adequately control contaminants that threaten public health and safety, the draft permit does not require the assessment of existing environmental and social stressors in affected communities and does not establish sufficient penalties or enforcement mechanisms for facilities that fail to comply with their permits.

While permit holders are required to implement some pollution controls and periodically monitor discharges, they're not doing enough. In Maryland, according to the state-federal Chesapeake Bay Program, stormwater is the fastest-growing source of pollution to streams and rivers, and toxic compounds are making their way into drinking water. Then there are air quality impacts. Metal recyclers that operate automobile shredders, for example, generate hazardous waste that has been detected in dust more than a half mile from these facilities, according to the Natural Resources Defense Council. The MDE's stormwater permit doesn't cover air emissions, so regulating stormwater discharges is one of the only tools we have to control pollution from these facilities.

Yet the MDE proposes to weaken existing pollution limits in the revised permit. Those who will be impacted first and worst are the people and families who live and work near industrial facilities.

To better understand who is most impacted by pollution from these facilities, we used a statewide environmental justice screening tool developed by Sacoby Wilson, associate professor with the Maryland Institute for Applied Environmental Health and Department of Epidemiology and Biostatistics in the University of Maryland, College Park School of Public Health. The tool combines data on 22 environmental pollution and demographic indicators and assigns a cumulative score to each census tract in the state to demonstrate its likely "environmental justice burden."

Our analysis, the details of which we have shared with the MDE in writing, focuses on Baltimore City and Baltimore County, where a large concentration of permit holders are located. Of the 300 facilities, we found that 41% are in "overburdened tracts," meaning they are among the communities with the greatest likely environmental justice burdens in the state. More than 100,000 Marylanders live in these tracts. The percentage is even higher in Baltimore City, where nearly 70% of facilities are in overburdened tracts.

We also found that facilities are clustered in low-income communities of color. One tract that encompasses parts of Curtis Bay in Baltimore (where approximately 4,200 people live) has a whopping 24 polluting facilities. Two of those — Curtis Bay Energy and the Quarantine Road Municipal Landfill — are on record as failing to comply with their permits multiple times in recent years.

Notably, we found that the census tracts with the greatest concentration of permitted facilities — potential polluters — were the same tracts where permit violations most frequently occurred. So, not only are nearby residents exposed to "business as usual" emissions from multiple facilities, but some of these facilities are simply not complying. They are not adequately controlling or monitoring their emissions.

To add insult to injury, violators aren't under a great deal of pressure to clean up their acts. Of the nearly 2,000 facility inspections between 2017 to 2020, the MDE took formal enforcement actions against only six permit holders. You read that right: six out of 2,000.

The MDE released an Environmental Justice Plan earlier this year, in which it vows to "implement environmental laws … in a manner that reduces existing inequities and avoids the creation of additional inequities in [overburdened] communities."

To make that commitment meaningful, MDE staff must consult with the state's environmental justice commission, environmental justice advocates and researchers, and overburdened communities before renewing a general permit, as well as all of the other pollution permits the agency issues. They should also address violations, particularly in overburdened communities, by issuing penalties and taking legal action when necessary.

If the MDE continues to fail to hold polluters accountable, Maryland's already vulnerable families will suffer most. ■

Darya Minovi is a policy analyst at the Center for Progressive Reform, which is a member of the Chesapeake Accountability Project.

Farm-focused funding is our best shot to reduce Bay pollution

By Denise Stranko

Managing cropland and pastures in ways that improve soil health benefits farmers and prevents pollution in waterways. (Brian Lutz)

The best strategy for meeting the pollution reduction goals in the Chesapeake Bay's Clean Water Blueprint (formally called the Bay's total maximum daily load) is to focus on farms. Providing more financial and technical support to help farmers implement conservation practices will not only improve water quality, but also reduce greenhouse gases and bolster the region's resilience to climate change.

Collectively, the Bay states, and especially Pennsylvania, are behind schedule in meeting their share of the targets. These targets outline the reductions in nitrogen, phosphorus and sediment pollution needed to remove the Bay from the federal "dirty waters" list. More than 80% of the remaining pollution reductions must come from agriculture.

A restored Bay is worth $130 billion annually in economic, public health and environmental benefits. In Pennsylvania, those benefits will approach $40 billion a year. How can we finish the job?

We know certain farming practices work both to reduce pollution and benefit farmers. Together, they form a type of farming called regenerative agriculture.

Regenerative agriculture is essentially a farm system designed to work in harmony with nature. It focuses on minimizing the physical, biological and chemical disturbance of the soil; keeping the soil covered with vegetation or natural material as much as possible; increasing plant and crop diversity; keeping living roots in the soil; and integrating animals into the farm. For example, farmers may rotate their grazing livestock through various pastures, plant forested buffers along streams or use diverse crop rotations and cover crops.

By improving soil health, regenerative farming increases the land's ability to filter and retain water and nutrients. In turn, polluted runoff decreases, benefiting water quality. Farmers benefit, too. Healthier soil can improve productivity, reduce the need for costly fertilizers and make farms more resilient during droughts and floods. Many regenerative practices also capture and store carbon in the soil, helping to mitigate climate change and the extreme weather that harms both farmers and the Bay.

Getting more of these practices on the ground — in areas of the watershed where they will have the greatest effect — is key to reaching the Bay states' pollution reduction requirements by 2025.

Up-front costs and a shortage of technical experts to assist with implementation create barriers for many farmers who want to adopt regenerative practices. While some Bay states and the federal government offer cost-share programs and assistance, historical funding levels are not nearly enough to meet the need.

In Pennsylvania alone, the agricultural funding need between now and 2025 is roughly $3 billion, and data indicate the state isn't getting its fair share of federal conservation dollars. A 2017 report by the U.S. Governmental Accountability Office suggested that Pennsylvania is shortchanged roughly $20 million each year by the Environmental Quality Incentives Program — a cost-sharing program for conservation practices — because the money is allocated based more on historical funding amounts than conservation needs. In addition, unlike Virginia and Maryland, Pennsylvania does not have a state agricultural cost-share program to help its farmers.

Federal lawmakers could help close the gap by adopting bipartisan solutions, including the Billion for the Bay Initiative and legislation such as Virginia Congressperson Abigail Spanberger's Climate Stewardship Act.

The Billion for the Bay proposal was recently presented to Congressional leadership by the governors of the six Chesapeake Bay states; the mayor of Washington, DC; and the chair of the Chesapeake Bay Commission. It would provide a new infusion of funding necessary to meet the 2025 Chesapeake Clean Water Blueprint.

The Climate Stewardship Act would provide tens of billions of dollars in investment in the U.S. Department of Agriculture's working lands conservation programs with funding directed toward climate stewardship practices.

The Chesapeake Bay Foundation believes that Congress should adopt both initiatives. It should also target the majority of the funding to a new U.S. Department of Agriculture program called the Chesapeake Resilient Farms Initiative. The initiative would provide additional technical and financial resources to basins within the watershed where regenerative farming practices are most effective at improving water quality — what the state-federal Bay Program partnership refers to as "most effective basins." Many are in Pennsylvania.

At the same time, the Pennsylvania legislature should pass the new Agricultural Conservation Assistance Program bill sponsored by Sen. Gene Yaw. This legislation would complement these additional federal resources by expanding on-farm conservation measures throughout Pennsylvania, including high-priority areas like the Chesapeake watershed.

There is little time left to meet the 2025 Chesapeake Clean Water Blueprint targets. Immediate action to get more financial and technical assistance to farmers for regenerative agriculture is the fastest, most efficient way we can make progress. ■

Denise Stranko is the federal executive director for the Chesapeake Bay Foundation.

Sen. John Warner: a Chesapeake champion remembered

By Joel Dunn

Retired Sen. John Warner testifies at the 2014 Senate confirmation hearing for Deputy Secretary of the Navy Robert O. Work. (Aaron Hostutler/U.S. Marine Corps)

The many recent tributes marking the passing of former U.S. Sen. John Warner are rightfully long on superlatives. Senator Warner has been described as an "unmatched leader," a "giant" and a "dear friend." To me, he was all that and more.

His reputation as a political maverick was well-documented in those articles. He was someone whose litmus test for taking a stand was his conscience — and his loyalty to country rather than party. His family life, military service, cabinet appointment as Secretary of the Navy and five terms as an influential and respected U.S. senator have all been well covered. Somewhat surprisingly, though, Senator Warner's credentials as one of Virginia's most significant conservationists have received scant attention.

As senator, he was instrumental in the establishment of Cedar Creek and Belle Grove National Historical Park in the Shenandoah Valley. He supported legislation to create and fund the Chesapeake Bay Program and was instrumental in the creation of the Captain John Smith Chesapeake National Historic Trail, our nation's first water trail. Sometimes referred to simply as the Chesapeake Trail, it extends over thousands of miles of the Bay and its tributaries, highlighting the explorer's travels and the indigenous cultures that Smith encountered in the early 1600s.

Senator Warner loved the Rappahannock River in particular. He talked of personally moving migrating fish from below the Embrey Dam near Fredericksburg and releasing them above the dam, allowing them to reach their upstream spawning grounds. Perhaps that is what led him to secure $10 million to have that same dam demolished in 2004 — as part of a military training exercise. Removing the dam opened up more than 100 miles of spawning habitat for American shad, striped bass, American eel and other migratory fish species.

During the late 1990s, the senator championed the newly established Rappahannock River Valley National Wildlife Refuge by helping to secure the first refuge appropriations from the Land and Water Conservation Fund. The vast area designated for refuge land acquisition was novel for its time; it extends across seven counties and includes more than 60 miles of Rappahannock River shoreline. Today, visitors can walk trails, launch canoes and kayaks, fish and hunt, and enjoy abundant wildlife, thanks to early advocates like Senator Warner.

His efforts on behalf of the Rappahannock River and its namesake refuge continued well past his 30-year stint in the Senate. He was fascinated by the convergence of bald eagles that occurs along the Rappahannock River, particularly at places like Fones Cliffs, a 4-mile formation along the tidal-fresh portion of the river in Richmond County. The forest-topped cliffs reach heights of 80–100 feet above the river and are composed of diatomaceous earth formed millions of years ago. Resident Chesapeake Bay bald eagles have a burgeoning nesting population along the Rappahannock, but what makes the area even more special is that it's an extraordinarily popular layover spot for migrating eagles flying north in the spring and south in the fall. It is a phenomenon unique to the Chesapeake Bay.

The senator was determined to help save this special place, and his commitment never wavered. His daughter Virginia joined him in that endeavor when she funded the purchase of an acre of land near Fones Cliffs, which the Chesapeake Conservancy then donated to the Rappahannock Tribe, the indigenous people for whom the river was named. For the tribe, this modest acquisition marked their formal return to the river's edge after an absence of more than 350 years. At a celebration of that event in 2017, John and Virginia Warner were featured guests of the tribe.

We were honored that Senator Warner agreed to serve on the Chesapeake Conservancy's Board of Directors for many years, and that he remained an honorary board member until his death in May. In 2016, he was presented with the Conservancy's Champions of the Chesapeake Award. During his acceptance speech, the senator said this about the effort to protect Fones Cliffs: "Like many of you, this is a place that I would like to see conserved for future generations. In fact, I told [the conservancy] that seeing to that would be one of my signature efforts. This is as important to me as my work to get rid of Embry Dam, also along the Rappahannock, which robbed many species from being able to migrate upstream. Well, we got that done. Embry dam is gone. And now we're going to get this done, too."

Rest in peace, Senator. You did your part; we will carry on. ■

Joel Dunn is president and CEO of the Chesapeake Conservancy. The original version of this article appeared in the June 8 edition of the Fredericksburg Free Lance-Star *and is reprinted here with permission.*

SHARE YOUR THOUGHTS

The *Bay Journal* welcomes comments and perspectives on environmental issues in the Chesapeake region.
Letters to the editor should be 300 words or less. Submit your letter online at bayjournal.com by following a link in the Opinion section, or use the contact information provided below.
Opinion columns are typically a maximum of 900 words and must be arranged in advance. Deadlines and space availability vary.
Text may be edited for clarity or length. Contact editor Lara Lutz at 410-798-9925 or llutz@bayjournal.com. You can also reach the *Bay Journal* by mail at P.O. Box 300, Mayo, MD, 21106. Please include your phone number or email address.

Wayne Gilchrest: outdoor teacher, congressman 'too good to be true'

By Tom Horton

Wayne Gilchrest undertakes an outing that has been part of his routine for 13 years: Leading Maryland eighth-graders on an educational paddle on the Sassafras River. (Dave Harp)

The Sassafras River, mid-May. Tulip poplars and black locusts in full and fragrant blossom. Local watermen offloading tons of catfish as hungry ospreys, eagles and herons soar close.

The little landing here on Turners Creek, just off the Sassafras in the Upper Chesapeake Bay, has been in constant human use for thousands of years — Tockwogh Indians for most of that time, then colonial tobacco trade, a granary, a tannery, shipbuilding, oystering.

And since 2009, there's been a new chapter. A mud-spattered old Toyota pickup rolls down to the creek and a wiry, grizzled man hops out and begins unloading ropes, nets, boots, bait and canoe paddles.

The Kent County eighth-graders arriving soon to fulfill Maryland's environmental literacy mandate will know the old guy simply as Wayne, little caring that their guide this morning was a nine-term member of Congress or Marine platoon leader seriously wounded in Vietnam.

Wayne Gilchrest "built" the spectacular classroom here — some 2-square-miles of forests and fields and high bluffs commanding a view of the Chesapeake for miles. As a Republican congressman representing Maryland's 1st District, which includes the whole Eastern Shore, he persuaded state officials to buy the land to protect it from development and gravel mining.

I met Wayne on a Monday, knowing that at 75, in his 13th year of hands-on environmental education trips for thousands of school kids since leaving Congress, he was retiring. His week had begun on Sunday, offering 26 parents and kids who are struggling with homelessness a chance to fish the creek and hike the bluffs — a program he began early in his congressional career.

I'd once proposed a piece on Wayne to *Audubon* magazine, and Roger Cohn, an editor there, turned it down. Years later Roger, who now runs the Yale 360 environmental website, said he'd made a mistake: "but at the time the guy you were describing just seemed too good to be true."

Indeed, when Wayne first entered politics, the *Baltimore Sun* drew comparisons to Jimmy Stewart in the 1939 classic, *Mr. Smith Goes to Washington*, about a small-town citizen who gets elected to fight corruption.

And, during 18 years on Capitol Hill, Wayne never changed, never became a professional politician. I did not always agree with his votes, like initially supporting war in Iraq; but it seemed to me there was never an issue he had not thoroughly examined from all sides, or a decision that wasn't based on the facts and what he felt was best for the people.

When he lost in 2009 to the far more conservative Andy Harris, it was called "a loss to the Congress and to the sort of comity that we try to create here" — that from Rep. Steny Hoyer, another Marylander and now the second-ranking Democrat in Congress.

As his own party shifted right, Gilchrest became a RINO (Republican in name only). He broke ranks over endangered species, wetlands protections, statehood for the District of Columbia, handgun laws and other issues.

He would say things like: "economic growth doesn't apply anymore if you want to have a good economy 100 years from now." Most economists and many environmental groups still haven't caught up to that.

The eighth-graders that Monday brought us to a little beach at the base of a cliff, shaded by a stalwart chestnut oak growing impossibly sideways, straight out of the eroding cliff face. We hiked uphill where, perched at socially distant intervals along a massive old log, "class" began with a minute of silence, closed eyes, just listening to the sounds of warblers and woodpeckers and the breeze off the water.

We are "Earthlings," Wayne begins. Scratch up some soil, he told them. Hold it, feel it, smell it. "Everything you have, everything you ever had, all you will ever have, derives from the soil … from the sun that feeds it the energy to grow green plants, from the rain that nourishes their roots."

We discussed the wonder of natural systems that remove carbon dioxide, release oxygen and produce food. "Protect these," he said, "emulate them in our agriculture, follow nature's principles."

It was over too soon, that marvelous little Sassafras sermon, teaching stuff that the Tockwogh knew in their bones.

Over lunch later, I reminisced with Wayne about the time a farmer asked him if he understood the wetlands protections he was supporting were "back door, land-use control."

"Absolutely," Wayne told the farmer.

He reminded me of his tough campaign in the 1990s against Democrat Tom McMillan, a former NBA star, when I told Wayne that as a journalist I could not endorse him. "But," I said, "I make it a rule never to vote for anyone taller than me." (I'm 6-foot-5, and big Tom was a good 6-foot-10).

I remembered a press conference where Wayne was trying to sell another ahead-of-his-time idea, a "conservation corridor" the length of the Delmarva Peninsula. "I want a black bear to be able to walk from Wilmington to Cape Charles," he said. (Congress enacted, but never funded that project — now expired but revived lately as a proposed Delmarva Oasis.)

Wayne said he might never have run for Congress if a bad fall from a packhorse in the Bitterroot Wilderness of Idaho hadn't brought him and his family back to Kent County for medical treatment.

And now that he's retiring, what's his next act?

"Oh, I might just go back West, looking for Bigfoot."

"You don't believe that Bigfoot stuff, do you?" I asked.

"Oh, no. But fun, huh?" ■

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

Citizen Science: Butterfly census

Friend of the Earth, an initiative of the World Sustainability Organization, has launched a *Global Butterflies Census* to raise awareness about butterflies and moths, their biodiversity; collect population data; better understand their behavior. To participate: When you see a butterfly or moth, take a close picture without disturbing it, then send it by WhatsApp message to Friend of the Earth along with your position's coordinates. The organization will reply with the species' name and file the info on the census' interactive map, database. Data will be used to design conservation measures to save these insects from extinction. Info: friendoftheearth.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 you find. 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.

VIRGINIA

Cleanup support & supplies

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

Goose Creek Association

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

Citizen Science: Ghosts of the coast

The Gedan Lab at George Washington University and the Virginia Coast Reserve Long-Term Ecological Research project are asking the public to help document the formation of ghost forests (dead forests created by rising sea levels). See a ghost forest? Contribute to a collaborative map by submitting observations to storymaps.arcgis.com/stories.

Check out cleanup supplies

Hampton Public Libraries have cleanup kits that can be checked out year-round, then returned after a cleanup. Call your local library branch for details.

Become a water quality monitor

Train online with the Izaak Walton League to volunteer or become a certified Save Our Streams water quality monitor. Follow up with field practicals, then adopt a site of your choice in Prince William County. Info: Rebecca Shoer at rshoer@iwla.org, 978-578-5238. Web search "water quality va iwla." Activities include:

- *Snap a Stream Selfie:* Collect trash data, take a photo at a local stream.
- *Become a Salt Watcher:* Use an easy test kit to check for excessive road salt in a stream.
- *Check the Chemistry:* Spend 30 minutes at a waterway with a handful of materials, downloadable instruction sheet.
- *Survey Stream Critters:* Use pictures in an app to identify stream inhabitants. The number, variety of creatures reveal how clean the water is.
- *Monitor Macros:* Become a certified Save Our Streams monitor with one day of training. Learn to identify aquatic macroinvertebrates, assess habitat, report findings, take action to improve water quality.

VA Master Naturalists

VA Master Naturalists are a corps of volunteers who help to manage, protect natural areas through plant & animal surveys; monitor streams; rehabilitate trails; teach in nature centers. Training covers ecology, geology, soils, native flora & fauna, habitat management. Info: virginiamasternaturalist.org.

Chemical water monitoring teams

Help the Prince William Soil and Water Conservation District and Department of Environmental Quality by joining a chemical water quality monitoring team. Participants collect data from local streams. Training provided. Monitoring sites are accessible. Info: waterquality@pwswcd.org, pwswcd.org.

PENNSYLVANIA

Middle Susquehanna River

Get involved with the Middle Susquehanna Riverkeeper Association. Contact Riverkeeper John Zaktansky at 570-768-6300, midsusriver@gmail.com.

- *HERYN (Helping Engage our River's Youth with Nature)*: Assist with youth outdoor activities.
- *Susquehanna Stewards:* Deliver programs, info to people in your region, help to develop new initiatives.

Info: middlesusquehannariverkeeper.org.

- *Water Reporter App:* Track the health of Middle Susquehanna watershed's fish species by sharing photos, info about catches via an app. Reports, interactive map available at middlesusquehannariverkeeper.org.

MARYLAND

Anita C. Leight Estuary Center

Volunteer at Anita C. Leight Estuary Center, Abingdon. Preregistration required for all programs. Ages 12 & younger must be with an adult. Info: 410-612-1688, 410-879-2000 x1688, otterpointcreek.org.

- *Invasinators:* 9–11 a.m. July 18 & Aug. 22. Ages 14+ Remove invasive plants, install native species. Training provided. Wear sturdy shoes, long sleeves, work gloves for field work, weather permitting.
- *Monarch Monitoring 101:* 3–4:30 p.m. Aug. 7. Ages 8+ Learn how to raise, tag, release these butterflies. Join a monarch monitoring team or monitor on your own.

Annapolis Maritime Museum

The Annapolis Maritime Museum & Park is seeking volunteers. Info: Ryan Linthicum at museum@amaritime.org.

Severn River Association

Join the Severn River Association's Water Quality Monitoring team. Volunteers help out on a three-hour cruise Wednesday, Thursday or Friday mornings through the first week in November. SRA provides training. Participants become certified water quality monitors using Chesapeake Monitoring Cooperative protocols. Data collected is shared with scientific, regulatory, academic communities via CMC's Chesapeake Data Explore sharing platform. Info: Info@severnriver.org. Put "WQ Team" in message box.

Cromwell Valley Park

Join Cromwell Valley Park's Habitat Restoration Team's *Weed Warrior Days* 10 a.m.–12 p.m. Aug. 7 & 21. Remove invasive species, plant natives, maintain restored habitat. Meet at Sherwood House parking lot. Ages 17 & younger w/adult. No walk-ins. Participants must sign Baltimore County liability and COVID-19 waivers. Info: Laurie Taylor-Mitchell: Ltmitchell4@comcast.net.

St. Mary's County museums

Become a member of the St. Mary's County Museum Division Volunteer Team or Teen Volunteer Team.

- *Adults:* Assist with student/group tours, special events, museum store operations at St. Clement's

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.

Submission Guidelines

SUBMISSIONS

Because of space limitations, the ***Bay Journal*** is not always able to print every submission. Priority goes to events or programs that most closely relate to the environmental health and resources of the Bay region.

DEADLINES

The ***Bulletin Board*** contains events that take place (or have registration deadlines) on or after the 11th of the month in which the item is published through the 11th of the next issue. Deadlines are posted at least two months in advance.
September issue: August 11
October issue: Month 11

FORMAT

Submissions to ***Bulletin Board*** must be sent as a Word or Pages document or as text in an e-mail. Other formats, including pdfs, Mailchimp or Constant Contact, ***will only be considered if space allows*** and type can be easily extracted.

CONTENT

You must include the title, time, date and place of the event or program, and a phone number (with area code) or e-mail address of a contact person. State if the program is free or has a fee; has an age requirement or other restrictions; or has a registration deadline or welcomes drop-ins.

CONTACT

Email your submission to kgaskell@bayjournal.com. Items sent to other addresses are not always forwarded before the deadline.

BULLETIN BOARD

Island Museum and Piney Point Lighthouse Museum & Historic Park. Work varies at each museum. Info: St. Clement's Island Museum 301-769-2222. Piney Point Lighthouse Museum & Historic Park 301-994-1471.

■ *Students:* (11 & older) Work in the museum's collections management area on artifacts that have been excavated in the county. Info: 301-769-2222.

Mount Harmon Plantation

Help with manor house student tours, colonial crafts, hearth cooking, guided nature walks, the herb garden at Mount Harmon Plantation in Earleville. Special event needs include 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 to Sundays, May to October. Info: 410-275-8819, info@mountharmon.org.

Report a fish kill

If you see a fish kill, call the Maryland Department of Environment's Fish Kill Investigation Section. Normal work hours: 443-224-2731, 800-285-8195. Evenings, weekends, holidays: Call the Chesapeake Bay Safety & Environmental Hotline at 877-224-7229.

Breeding Bird Atlas project

Help the Breeding Bird Atlas of Maryland & the District of Columbia — a project documenting the distribution, abundance of local breeding bird populations — by looking for nests. Data are used to manage habitat, sustain healthy ecosystems. Info: ebird.org/atlasmddc/about.

Severn River Association

The Severn River Association is looking for people to tell the Severn's story. Writers, photographers, reporters, memoirists, editors are needed to document the river's wildlife, people, forests, history, culture, sailing. SRA can create internships for journalists of all ages who want to tell a story, cover meetings, take pictures. Info: info@severnriver.org. Put "volunteer" in the message box.

Ruth Swann Park

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

Chesapeake Bay Environmental Center

Help the Chesapeake Bay Environmental Center in Grasonville. Drop in a few times a month or more frequently. Help with educational programs; guide kayak trips & hikes; staff the front desk; maintain trails, landscapes, pollinator garden; feed or handle captive birds of prey; maintain birds' living quarters; participate in CBEC's teams of wood duck box monitors, other wildlife initiatives. Other opportunities include 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

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

Citizen science: Angler survey

Use the Volunteer Angler Survey smartphone app to help the Department of Natural Resources collect species, location, size data. Information is used to develop management strategies. The artificial reef initiative, blue crab, freshwater fisheries, muskie, shad, striped bass programs also have mobile-friendly methods to record data. Win quarterly prizes. Info: dnr.maryland.gov/Fisheries/Pages/survey/index.aspx.

Patuxent Research Refuge

Volunteer at the Wildlife Images Bookstore at the National Wildlife Visitor Center of the U.S. Fish and Wildlife Service's Patuxent Research Refuge in Laurel. Open & close the store, help customers, operate the register. Training provided. Info: 301-497-5771, lindaleechilds@hotmail.com.

CONFERENCES/CLASSES

WATERSHEDWIDE

Enhancing soil health

The Sixth Soil Health Institute Annual Meeting, *Enriching Soil, Enhancing Life,* takes place virtually 10 a.m.–12 p.m./1–3 p.m. Aug. 11 & 12. The event features leading voices in soil science, agriculture industry who will share insights for advancing the adoption of soil health systems foundational for regenerative agriculture. Plenary sessions: *Farmers' Experiences with Adopting Soil Health Systems; Business Case for Regenerative Soil Health Systems; Agricultural Input Impacts on Soil Health; Climate Change Mitigation and Adaptation through Soil Health; Establishing Soil Health Interpretations for Farmers & Conservation Planners; Understanding & Managing the Soil Microbiome*. Registration is free but required: soilhealthinstitute.org.

VIRGINIA

VAEE virtual mini-conference series

Learn about the state's regions and seasonal changes at the 2021 Virginia Association for Environmental Education virtual mini-conference series scheduled 12 a.m.–11:59 p.m. July 17 (*Summer on the Shore*) and Oct. 23 (*Fall in the Piedmont)*. There is enough space to offer up to nine, 50-minute sessions each date. Each conference includes professional development, learning, collaboration, and environmental education efforts and resources in Virginia, beyond. For pricing details, registration (required) packet, scholarship opportunities, visit vaee.wildapricot.org. Click on "events" in the menu. Info: April Harper at events@virginiaee.org, 804-916-9302. The conference is also issuing requests for proposals for the Oct. 23 conference: forms.gle/XZyPcbVcTURhFCyVA. Deadline is Aug. 1.

MARYLAND

Virtual boater safety class

The Chesapeake Bay Maritime Museum in St. Michaels is offering Maryland Department of Natural Resources-approved boater safety courses via Zoom. A three-session course is offered 5–8 p.m. Aug. 25, Sept. 1 & 8. Learn how to operate a vessel on state waterways. Individuals, families welcome. Boaters born after July 1, 1972, are required to have a Certificate of Boating Safety Education. Participants must attend all sessions, pass the DNR exam to earn a certificate, which is good for life. Fee: $25/person. Participants must be 10 or older. Registration: cbmm.org/boatersafety. Info: dnr.maryland.gov/boating.

EVENTS / PROGRAMS

PENNSYLVANIA

York County parks

York County (PA) Department of Parks and Recreation is offering a variety of events. All programs take place at Nixon Park in Jacobus. Events are free and require registration unless noted otherwise. Registration/info: 717-428-1961, Nixon County park@YorkCountyPA.gov.

■ *Wild Edibles Lecture & Walk:* 10:30 a.m.–12 p.m. or 1–2:30 p.m. July 17. Debbie Naha-Koretzky will discuss foraging techniques and sign her new *Falcon Guide to Foraging in PA & NJ*. Fee: $10.

■ *Bat Walk:* 7–8:30 p.m. July 17. Short, level hike in low light will look for bats, discuss natives species, their benefits.

■ *Nature Watercolor Classes:* 12:30–2:30 p.m. July 18 & Aug. 15. All materials provided for outdoor class. $10 per session. Same class each date. Attend one or both sessions.

■ *Creature Corner Drop-ins:* 10:30 a.m.–3 p.m. July 22 (*deer*) & 29 (*salamanders*) and Aug. 5 (*snakes*), 12 (*butterflies*), 19 (*moths*) & 26 (*frogs*). Featured animal displays include touchable objects, trivia, expert to answer questions. No registration.

■ *Guided Nature Walk:* 2:30–4 p.m. July 25 & Aug. 1.

■ *Mothing & Blacklight Caterpillar Searches:* 7:30–10:30 p.m. Aug. 6 & 13. Meet at Rocky Ridge Park's Pheasant Pavilion, York; Aug. 20. Meet at Kain Park's Sparton Road parking lot in York; Aug. 2. Meet at Spring Valley Park's Animal Activity area in Springfield Township. Stay by the lights or take guided walk to look for what insects are out.

■ *Stream Investigations:* 10–11 a.m. Aug. 7; 1–2 p.m. Aug. 8; 10–11:30 a.m. Aug. 22. Ages 6+ w/adult. Look for aquatic insects in the stream. Stream bed is slippery — wear water shoes or rain boots. *Note: This program is the **only** time the public is allowed to walk in the stream or disturb its creatures*.

■ *Caterpillars:* Drop in, leave any time 2–4 p.m. Aug. 21. Meet live caterpillars, learn their habitat requirements. No registration.

■ *Nature Story Time / Insects:* 9:30–11 a.m. Aug. 24. Ages 2–3 w/family. Story, activities, insect hike to pond.

■ *Boardwalk Birding:* Drop in, leave any time 9–11 a.m. Aug. 28 & 29. Meet at Iron Stone Hill parking lot at Kain Park, York. Learn about birds living near shallow water habitats. No registration.

■ *Honey Bee Awareness - Understanding the Swarm:* 2–4 p.m. Sept. 12. Meet at Lake Redman Activity Area at Kain Park, York. See bees up close. Keepers will answer questions, explain why honey bee swarms are beneficial.

See **BULLETIN**, *page 44*

CHESAPEAKE CHALLENGE

ANSWERS TO It's time you got to know us on page 29

1. Timothy B. Wheeler 2. Jeremy Cox 3. Whitney Pipkin 4. Ad Crable 5. Lara Lutz 6. Dave Harp 7. Karl Blankenship 8. Jacqui Caine 9. Kathleen a. Gaskell 10. T.F. Sayles

BULLETIN BOARD

BULLETIN *from page 43*

VIRGINIA

Soil & Water photo contest

The Virginia Association of Soil and Water Conservation Districts is accepting entries for its photo contest, *Conservation through the Local Lens.* Participants can submit up to 10 photos. All photographs must be taken within Virginia. Deadline is July 30. Winners will be announced in September. Prizes will be determined by the VASWCD. Info: vaswcd.org/photocontest.

MARYLAND

Patapsco Valley State Park

Patapsco Valley State Park's *Park History Walk & Talk* rambles feature artifacts, history of a given area. Info: 410-461-5005.

- *Orange Grove Area, Halethorpe:* 9:30–11 a.m. July 14 & Aug. 12. Meet at picnic table next to bathroom. Topics include Native Americans who hunted here, Orange Grove Flour Mill, Swinging Bridge, Bloede Dam, Cascade Falls, local floods, B&O Railroad, the Civilian Conservation Corps.
- *Avalon Area, Halethorpe:* 9:30-11 a.m. Aug. 11. Meet at Shelter #104 parking lot. Topics include Native Americans who hunted here, the Thomas Viaduct, mills and iron forges along the river, Elkridge Landing Harbor, camping in the 1920s.

Concert to aid Annapolis museum

The Annapolis Maritime Museum is presenting a concert of Chesapeake-infused music by the Eastport Oyster Boys 7–9 p.m. Aug. 5. The concerts is free, although a $10 donation per person is appreciated. Proceeds support the museum's environmental education programs. Beer, wine, mixed drinks, food will be available for purchase. No coolers or outside alcohol permitted. Bring a blanket or lawn chairs for seating. Info: amaritime.org, 410-295-0104, x3. In case of inclement weather, check the museum's Facebook page after 5 p.m. to see if the concert is canceled.

Youth Fishing Derby

Youth throughout the Bay region are invited to the *15th Annual Kent Island Fishermen Youth Fishing Derby* Aug. 21 at the Romancoke Pier on Kent Island, MD. Trophies (only one per child) will be awarded for the largest, smallest, most unique and most fish caught in each age group: 3–5, 6–10, 11–16. Registration begins at 8 a.m.; fishing takes place 9–11 a.m.; refreshments and prize presentations (must be present to win) are scheduled 11:30 a.m.–1 p.m. at Kent Island American Legion, #278. Parent or adult must accompany each child. Youth are asked to bring their own rods; there are only a few loaner rods available. Bait is provided. The event is free. Info: wotwater@atlanticbb.net.

Ladew Topiary Gardens

Join ecologist John Canoles for leisurely nature walks at Ladew Topiary Gardens in Monkton. Participants, ages 13+, should wear hiking gear; the 1-mile trail can be muddy. Registration required. $20 fee includes admission to the gardens. Info: 410-557-9466, ladewgardens.com, information@ladewgardens.com. All walks are scheduled 9:30–11:30 a.m.

- *Old Fields, Meadows & Insects:* Aug. 10. Discover the diversity of insects, wildflowers, grasses in old meadows, fields at Ladew.
- *Fall Bird Count:* Sept. 14. Walk along the Nature Trail will identify fall warblers, possibly raptors.

Virtual Bay trivia night

The Chesapeake Bay Maritime Museum in St. Michael's, MD, invites people to put their Bay knowledge to the test during a virtual trivia night 8–9 p.m. July 26. Create a team or connect with friends virtually to join the game. Non-museum members are asked to pay what they can by adding a donation at checkout. Register: cbmm.org/virtualtrivia. For tech tips on how to run a trivia team: registration@cbmm.org.

Dee of St. Mary's public cruises

Take a two-hour sail aboard the Calvert Marine Museum's historic skipjack, *Dee of St. Mary's*, which is used in the museum's Chesapeake Bay Field Lab education programs. Guests will have an opportunity to help raise, lower the sail. Cruises run through October and are weather-dependent. Full schedule, fees: calvertmarinemuseum.com or contact Melissa McCormick at Melissa.Mccormick@calvertcountymd.gov.

MD Park Quest 2021

The Department of Natural Resources' *Maryland Park Quest 2021* for families runs through Oct. 31. More than 25 state parks are offering outdoor activities that feature the state's cultural, historical, natural resources on public lands, parks. This year's theme, *Spread Your Wings to Explore Maryland's State Parks*, highlights the state's birds. Adjustments related to the COVID-19 pandemic include:

- Ranger-led activities have been turned into do-it-yourself programs. Web search "MD park service" to download, print worksheets.
- Passport or registration is no longer required. Participants/teams completing at least 12 activities before Oct. 31 and the Quest form by Nov. 1 are eligible to win prizes (proof of completion via photos required). Drawings take place Nov. 2. Winners will be notified by email. Prizes range from stickers and bandanas to an Annual State Park & Trail Passport. Participants will need to pay day-use service charges at certain parks. (A list of service charges is found at: dnr.maryland.gov/Publiclands/Pages) There are no additional fees to participate; all materials are available online.

Downloading a copy of the *Maryland Bird List* at mdbirds.org/wp-content/uploads/md-bird-list.pdf or a *Checklist to Maryland Birds* mdbirds.org/wp-content/uploads/MOS_MD-Field-Checklist_Oct-2019.pdf will help with many of the quests. Bring binoculars, if possible, to see more birds. Info: Ranger Melissa Boyle Acuti (Monday-Friday) at melissa.boyle@maryland.gov.

Anita C. Leight Estuary Center

Participate in one of the programs at Anita C. Leight Estuary Center, Abingdon. Preregistration required for all programs. Ages 12 & younger must be with an adult. Info: 410-612-1688, 410-879-2000 x1688, otterpointcreek.org.

- *Meet a Critter:* 1 p.m. July 25 & Aug. 15. All ages. See a live animal up close, learn about it. Free.
- *Summoning Summer Showers:* 10:30—11:30 a.m. July 17. Ages 4+ Learn about rainsticks once used by Native tribes to make it rain. Make a rainstick. Fee: $10/project.
- *Kids & Canoes:* 2–4 p.m. July 17. Ages 5+ First-time paddlers receive safety and basic stroke instruction before venturing out on creek. Fee: $12.
- *Tails & Tots:* 1 p.m. July 18 & 2 p.m. Aug. 1. Ages 0–6. Stories, songs, animal movement. Free.
- *Synchronicity Kayak:* 7:30–10 p.m. July 23. Ages 8+ Fee: $15.
- *Pollinators & Wildflowers:* 1–2:30 p.m. July 24. Ages 6+ Learn which plants attract bees, butterflies, hummingbirds. Look for pollinators among nearby wildflowers. Fee: $10/family.
- *Moonlit Canoe:* 7:30—10 p.m. July 24. Ages 8+ (17 & younger w/adult) Cruise creek channels. Fee: $15.
- *Terrific Turtles:* 10:30 a.m.–12: p.m. July 31. Ages 5+ Meet live turtles, discover their secrets, hike to look for them, make a craft. Fee: $10/family.
- *Canoeing with Cormorants:* 1:30–4 p.m. July 31. Ages 8+ Look for these diving, fishing birds on the Bush River. Fee: $12.
- *Wildflower Wonders Pontoon:* 8:30—10 a.m. Aug. 7. Ages 2+ High tide cruise features wildflowers in full bloom. Binoculars available. Fee: $10.
- *Chesapeake Storytellers/Capt. John Smith Kayak:* 9:30 a.m.–12 p.m. Aug. 7. Adults. Meet at Flying Point Park. Paddle back in time to view site where Capt. John Smith once stood while mapping the Chesapeake. Fee: $12.
- *Physics of Flight:* 2–3:30 p.m. Aug. 8. Ages 8+ Conduct experiments to explore avian adaptations that make for aerial acrobatics. Fee: $7.
- *Estuary Foragers Kayak:* 1:30–4 p.m. Aug. 14. Ages 8+ Paddle highlights plants that have been used for food for generations. Fee: $12.
- *Good Morning Marsh Pontoon:* 8–9:30 a.m. Aug. 21. Ages 2+ Look for opening blossoms, awakening animals. Fee: $10.
- *Critter Dinner Time:* 1 p.m. Aug. 21. All ages. Learn about turtles, fish, snakes while watching them eat. Free.
- *Full Sturgeon Moon Canoe:* 7:30—10 p.m. Aug. 21. Ages 10+ Learn about this "dinosaur" fish still found in nearby waters. Fee: $15.
- *Insect Safari:* 2–3:30 p.m. Aug. 22. Ages 4+ Search for insects, explore their habitats. Fee: $10/family.
- *Broad Creek Kayak:* 10:30 a.m.—1 p.m. Aug. 28. Meet at Broad Creek Public Landing. Ages 8+ Explore this Susquehanna tributary. Fee: $15.
- *Wildlife Identification Hike:* 2–3:30 p.m. Aug. 28. Ages 7+ Learn to identify animals by looking for tracks, markings. Fee: $10/family.
- *Stream Strolling:* 12:30—2 p.m. Aug. 29. Ages 5+ Get your feet wet, hands dirty while exploring a stream valley with a bucket, net. Fee: $10/family.

Chesapeake Bay Maritime Museum

The Chesapeake Bay Maritime Museum in St. Michaels is offering cruises aboard the 1920 buyboat *Winnie Estelle*. Bring binoculars, cameras. Note: Facial coverings required for guests on cruises. To read more of CBMM's COVID-19 policies, visit welcome.cbmm.org.

- *Wednesday Night Racing Spectator Cruises:* 5:30–7:30 p.m. Aug. 4 (date of Annual James Wilson Round the Island Race — all boats race around Herring Island) and 5:15–7:15 p.m. Sept. 1. Watch sailboat races on the Miles River from the buyboat's deck. Fee: $20. Info/registration: cbmm.org/onthewater.
- *Log Canoe Races Cruise:* 9:30–11:30 a.m. Sept. 11 & 12. Enjoy a close, shady view of sailing log canoe races on Miles River. With long masts and large sails, these boats keep upright as they accelerate to speeds of 10 knots or more, and their crew climb to the ends of boards hanging off the side of the canoe. Cruises are dependent on marine conditions. Fee: $35. Info/registration: cbmm.org/onthewater.
- *Eco Cruises on the Miles River:* 10–11:30 a.m, July 15, 1–2 p.m. Aug. 17 and 2–3:30 p.m. Sept. 7. All ages. July & August cruises explore the river's habitat, ecology. Passengers test water, learn about oyster reef residents. September cruise discusses trees along the shore. Learn tree identification, ecology of forests, history, uses of trees in region. Fee: $20. Registration required: cbmm.org/onthewater.
- *Winnie Estelle Cruises:* 45-minute cruises are offered at 12:30 p.m., 1:30 p.m. and 2:30 p.m. Fridays, Saturdays & Sundays through October. Boarding passes, in addition to CBMM admission, are $10/ages 18+; $3/ages 6–17; free/ages 5 & younger. Purchase them at the Welcome Center upon arrival. All cruises are weather-dependent, subject to availability.
- *Private charters*: For adult events or youth education tours, visit cbmm.org/cruises.

Cromwell Valley Park

Take part in July and August events at Cromwell Valley Park's Nature Center in Cockeysville. Ages 17 & younger must be accompanied by an

adult. No walk-ins. Preregistration (online only) required for programs: cromwellvalleypark.campbrainregistration.com. Preregistration closes 4 p.m. Friday for weekend programs. Participants must sign Baltimore County liability and COVID-19 waivers when registering. Info: cromwellvalleypark.org, 410-887-2503, info@cromwellvalleypark.org. For disability-related accommodations, call 410-887-5370 or 410-887-5319 (TTY), giving as much notice as possible.

- *Ochre - Humanity's Paint:* 1–3 p.m. July 17. Primitive Technology Lab. Ages 8+ Hike to Minebank Run to collect, process rock into paint. Bring bandana or white shirt to paint. Shoes will get wet. Fee: $4.
- *Frog Roundup:* 1–3 p.m. July 18. All ages. Hike to Marble Springs to look for frogs. Shoes will get wet. Fee: $4.
- *Moths in the Moonlight:* 8–9:30 p.m. July 23. Ages 8+ Celebrate National Moth Week by learning about *Saturniid* moths. Fee: $4.
- *Not All Classrooms Have 4 Walls:* 1–2 p.m. July 24. Ages 2–10 w/adult. Short hike, story in the Outdoor Classroom. Fee: $4.
- *Caminata por el riachuelo/ Stream Stroll:* 1–3 p.m. July 25. All ages. Join Spanish-speaking naturalist on stroll through Minebank Run to investigate the stream's health. Shoes will get wet. Register: Laura at LPage@baltimorecountymd.gov.
- *Butterflies Like It HOT!* 1–3 p.m. July 31. Ages 8+ Observe, learn to identify butterflies. Bring binoculars, if possible. Fee: $4.
- *Top 10 Trees:* 1–2:30 p.m. Aug. 1. Ages 8+ Learn to identify Baltimore County's 10 most useful trees. Fee: $4.
- *Slate Pendants:* 1–3 p.m. Aug. 14. Primitive Technology Lab. Ages 13+ Learn to peck & grind a stone pendant only using stone tools. Fee: $4.
- *Cold-Blooded Creatures on a Hot Summer Day:* 1–2:30 p.m. Aug. 15. All ages. Observe the park's reptile collection, go on a snake hunt! Fee: $4.
- *Edible Insects:* 1–3 p.m. Aug. 21. Ages 5+ Join the "I Ate a Bug Club" while learning about edible insects. Fee: $4.
- *SHELL-abrate Turtles!* 1–2:30 p.m. Aug. 22. Ages 2–10 w/adult. Meet park's turtles, make turtle craft. Fee: $4.
- *Owl Prowl:* 8–9:30 p.m. Aug. 27. Ages 8+ Learn about owls during hike to listen for their calls. Wear dark clothing, sturdy shoes. Fee: $4.
- *Wingin' It - Maryland's Migrating Monarchs:* 1–3 p.m. Aug. 29. All ages. Learn how long it takes monarchs to migrate to Mexico. Help to tag, record them. Fee: $4.

African American schoolhouse

The Drayden (MD) African American Schoolhouse has scheduled open houses 11 a.m.–2 p.m. Aug. 7, Sept. 4, Oct. 2. Drayden, a one-room African American schoolhouses, played a major educational role in St. Mary's County. Learn about its students up until the mid-20th century. Staff, volunteers offer tours, answer questions. Info: 301-994-1471, Facebook.com/DraydenSchool.

VIRTUAL EXPERIENCES

Breakfast on the Bay

The Alliance for the Chesapeake Bay is presenting *Breakfast on the Bay,* a virtual, live talk series to learn about solutions for a healthier Chesapeake. Registration required. Web search "Alliance for the Chesapeake Bay." Topics include:

- *Tree Talk with Ryan Davis:* 10 a.m. July 15. Learn how the Alliance's Forest program has worked collaboratively to improve forest health, create new forests & tree canopy, support private woodland owners, inform the public about the benefits of trees in the landscape.
- *Brewery Tour at Alewerks:* 10 a.m. July 20. Clean water is the most important ingredient to brew beer. Learn about Alewerks' commitment to business sustainability.
- *Waste to Energy with Lancaster County Solid Waste Management Authority:* 9 a.m. July 27. Learn where trash goes and why solid waste management decisions have a lasting impact on the environment for many generations. Tour includes LCSWMA wind turbines and Chestnut Grove Nature Preserve.

Tour Maryland parks

Learn about history, nature highlights, Harriet Tubman's life, corn snakes, wildflower hikes by taking a virtual tour of Maryland's state parks. To view one of 29 videos, web search: MD DNR virtual park tour, go to DNR Offers Virtual State Park Tours LexLeader, follow instructions.

RESOURCES

WATERSHEDWIDE

Middle Susquehanna River podcasts

The Middle Susquehanna River Association's podcast library features the watershed's outdoor specialists. Web search: "Middle Susquehanna River podcasts." Speakers include:

- Hellbender expert Peter Petokas on the amphibian's dwindling population.
- The Foundation for Pennsylvania Watersheds' John Dawes on how his agency helps small watershed groups, the dangers of acid mine drainage, fracking, other waterway concerns.
- ProtectNorthernPA.org founder Diana Dakey on concerns about the production, transportation of liquefied natural gas.
- Teen kayaker/angler Lila Oast on how kayaking has opened doors for her.
- Outdoor educator Jon Beam & Audubon member Gary Metzger on threats to the watershed's duck species.
- Northcentral PA Conservancy's Renee Carey on the importance of preservation, public access.
- Bucknell University's Watershed Sciences & Engineering Program's director, Benjamin Hayes, on the Middle Susquehanna River's health.
- Salmon angler Steve Kurian on benefits of clean water.
- Educator Van Wagner on his *Eels in the Classroom* program.
- Waterkeeper Alliance Executive Director Marc Yaggi on growing up in the Middle Susquehanna watershed, his fight for clean water.
- Outdoor educator Jolene Connelly on the importance of getting youth, women on waterways.
- Diving instructor Rich Best on trends, treasures, underwater threats in the Susquehanna.
- Pennsylvania Organization for Watersheds & Rivers spokesperson Tali MacArthur on the importance of assisting a watershed group.
- Falconer Mike Dupuy on the Middle Susquehanna River's raptors.
- Wesley Forest Camp Director Emily Sliski on engaging young people with nature at a camp on the Penns Creek.
- Professional angler/YouTuber John Oast on how he got his start, what he has learned along the way, observations of the river.
- Biologist David Lieb on how nonnative crayfish are eradicating native species in the watershed.

Farm tool, equipment sharing forum

Future Harvest / Chesapeake Alliance for Sustainable Agriculture has created a tool & equipment sharing platform to set up farmer-to-farmer lending, renting or custom hiring. Farmers can fill out, submit a form that sets terms for the lending arrangement: fee charged; length of rental period; pick-up, delivery options; custom hire availability; other details. Equipment is listed under one of five categories: hand tools, tractors, implements, shop tools and other. Users can locate nearby equipment that meets their needs. Farmers who would like to try out equipment before buying are also encouraged to browse the list. The site is regularly updated, check for new listings. Info: Lisa Garfield at Lisa@futureharvest.org

Susquehanna River CD

The Middle Susquehanna Riverkeeper presents *Songs of the Susquehanna 2021*, a CD of 20 original river-inspired songs from 36 regional musicians and musical groups. The diverse mix highlights the environmental, recreational, historical, therapeutic aspects of the river, its tributaries. It also gives musicians a platform to share their skills, connect with audiences after a year of lost gigs. The cost is $15; all proceeds benefit the work of the Susquehanna Riverkeeper. CDs are available at the Riverkeeper office in Sunbury, PA, or can be ordered by mail. Info & lyrics: middlesusquehannariverkeeper.org/song-project. A 2022 CD is being planned with a Jan. 31 submission deadline. For help in finding a resource to create a polished recording, email Riverkeeper John Zaktansky at midsusriver@gmail.com.

Piney Point coloring pages

Learn about Piney Point Lighthouse Museum & Historic Park in Piney Point, MD, while coloring pages featuring an osprey, blue crab and terrapin at different parts of the site. The pages are samples from a coloring book designed by local artist Ellen C. Halbert. Visit visitstmarysmd.com/blog/online-museum-fun/.

Chesapeake Network

Join the Alliance for the Chesapeake Bay's Chesapeake Network (web search those terms) to learn about events and opportunities that protect or restore the Bay, including webinars, job postings and networking.

MARYLAND

Free streamside buffers

Stream-Link Education is looking for Frederick County residents who own streamside or riverside property on 2-plus acres of land and are interested in joining a large-scale reforestation effort to protect the Monocacy River, its tributaries. Stream-Link raises funds through grant awards, corporate sponsorships to take on buffer-planting projects at no cost to landowners and without restrictions (no easement required). Volunteers plant, maintain the forest for at least three years to ensure 85% survival rate. Fill out form at streamlinkeducation.org/landowners. Info: streamlinkeducation.org/about, 301-473-6844, lisa.streamlink@gmail.com.

Fishing report

The Department of Natural Resources' weekly *Fishing Report* includes fishing conditions across the state, species data, weather, techniques. Read it online or web search "MD DNR fishing report" to sign up for a weekly (Wednesday) email report.

Million Acre Challenge

Future Harvest's Million Acre Challenge is working to advance healthy soil on 1 million acres of Maryland farm land. Its website, millionacrechallenge.org, is a hub where farmers, consumers, service providers, researchers, funders can share data on soil health, take action. Site highlights include:

- *Resources:* Peer-reviewed research, articles, reports.
- *Farmer Spotlights:* Learn what others are doing.
- *Ways to Join the Challenge:* Learn how to get involved. Visit@soilchallenge on all social media platforms for updates. Info: Amanda Cather at amanda@millionacrechallenge.org

Chesapeake Conservation Corps: 'foot in the door' and more

By Rebecca Lauver

A training day brought together members of the 2020-2021 Chesapeake Conservation Corps to help increase the native biodiversity around several small ponds at Camp Puh'tok in Monkton, MD. (Erin Baggs)

The rolling hills and rocky streams of Lancaster County, PA — my hometown and current residence — may seem a world apart from the salty tidal wetlands of the Chesapeake Bay. But the two environments are inextricably connected by water and gravity.

Stream restoration work in Pennsylvania is crucial to the health of the Bay. Equally important are the benefits to the local waterways and wildlife. I've always loved hiking along small streams in the woods and observing the plants and animals that make their homes there. And I've always been eager to learn more about these natural spaces and work to protect them, or perhaps even create more of them.

So it probably came as a surprise to no one who knew me that in my junior year at Messiah College in Mechanicsburg, PA, I took on the job of biodiversity coordinator for the school's Office of Sustainability, working to promote native habitat and wildlife diversity on campus. Thanks to previous internships at the Stroud Water Research Center, I was familiar with the ecological importance of streamside buffers and wanted to reforest our campus's stream.

I reached out to Ryan Davis, the Pennsylvania forest projects manager at the Alliance for the Chesapeake Bay, to see if the Alliance would support a tree-planting effort at my college. They did. Within less than a year, we had planted 1.5 acres of new forest on campus, which grew to a total of 6.4 acres over the next two years.

That hands-on experience was crucial as I looked for post-college opportunities. Ultimately, I decided to join the Chesapeake Conservation Corps. This program has played an important role in helping young adults launch environmental careers.

Rebecca Lauver works at a native plant giveaway event in Pennsylvania, the final phase of her capstone project for the Chesapeake Conservation Corps. Her project focused on increasing native habitat for pollinators. (Brittany Smith)

The corps was established in 2010 by the Maryland General Assembly, spearheaded by the late Sen. Mike Miller. Under the aegis of the Chesapeake Bay Trust, it addresses environmental issues in the watershed while preparing young adults for green careers and increasing the effectiveness of nonprofit organizations.

Every year since the program's start, 35 to 40 recruits have been matched with environmental groups throughout the watershed to complete a yearlong stipend-paid position under the Trust's support and coordination.

The Alliance began participating in the Chesapeake Conservation Corps in 2012 and has hosted seven interns, including two this year: University of Virginia graduate Mel Throckmorton, who holds a degree in environmental science, and myself, with a biology degree from Messiah. Two of the Alliance's five previous interns are now on its staff.

Lucy Heller, a corps member in 2018-2019, is the organization's engagement specialist. "There is no doubt in my mind that I wouldn't be where I am today without the help from the Chesapeake Conservation Corps," said Lucy, who came to the corps after graduating from College of Wooster in Ohio. "The CCC program is a great way to get your foot in the door at [organizations] like the Alliance, while also allowing you the year to figure out what it is that you're interested in."

Amanda Bland, a Southern Marylander with an environmental studies degree from Washington College, was in the 2019–2020 cohort. She is now the Maryland projects associate. "The Chesapeake Conservation Corps gave me the opportunity to learn from professionals in the region, strengthen my skills … and work alongside staff at the Alliance to make a difference in the watershed," Amanda said.

Laura Cattell Noll was assigned to the National Aquarium in Baltimore during her time with the Chesapeake Conservation Corps in 2011–12. She said her work that year taught her the vital importance of collaborating with local governments. Laura is now the Alliance's local government project manager.

In August, I start my environmental career as Pennsylvania forest projects associate, based at the Alliance's Lancaster office. I am thrilled to continue with some of the projects I previously handled while taking on additional responsibilities.

As we work to improve the Chesapeake Bay watershed, it is very fulfilling to see the connections and partnerships that are formed to get this work done. Through the Chesapeake Conservation Corps and other initiatives, we can continue to partner across states and through various organizations to restore local ecosystems and beyond. ■

Rebecca Lauver is finishing her one-year stint with the Chesapeake Conservation Corps, assigned to the Alliance for the Chesapeake Bay. To learn about the program, visit cbtrust.org/chesapeake-conservation-corps.

If the song sparrow is singing, it has to be summer

By Mike Burke

Unlike other birds, which are most vocal in breeding season, the male song sparrow sings its distinctive tune well into the summer. (Becky Matsubara/CC-BY 2.0)

I hear summer calling. It lasts just three or four seconds, starting with a pair of loud, clear, almost metallic notes. A momentary pause, then a buzzy trill. The first two notes (sometimes three) are abrupt, but sharp and complete. The trill, in contrast, spills out — as if the bird can't get the notes out fast enough, the song cascading up and down, perhaps ending with a flourish of two or three additional notes.

The song sparrow is a wonderful summer companion. In most avian species, males sing only in the spring breeding season. The song sparrow shows off his vocal gifts for months. When I hear this bird, I know it's summertime.

Song sparrows (*Melospiza melodia*) are heavily streaked brown birds. Their body coloring is intricate: a blend primarily of browns, blacks and shades of white. They have a gray, patterned face with a narrow white crown stripe bordered in chocolate. A broad white eyebrow stretches from bill to nape. There is a patch of white on the throat. The bold streaks on the breast coalesce into a central spot of dark brown or black.

Sparrow species can be notoriously difficult to identify. Face patterns have a dizzying array of combinations. Is the face dirty white or pale gray? Is there a bit of gold, or would you call that yellow umber? Is that wood-brown or russet? Overall, is the bird dark or light? Is the head rounded or flat? To make matters infinitely more difficult, the song sparrow itself comes in 24 subspecies, each with its own peculiar palette. There are few perching birds that come in such variety.

The song I can hear every day is not the same as the ones sung across the country. There are numerous regional variations. Thankfully, the basic pattern is uniform: a few introductory notes followed by a buzz or trill. It is the same music, just transposed for a slightly different instrument.

Song sparrows are spread across the United States. In fact, they exist in an unbroken range from the Maine shoreline to the far ends of Alaska's Aleutian Islands (due south of Siberia). During the summer, some song sparrows migrate up into Canada to breed. In a phenomenon known as "leap-frog" migration, the populations that breed in the northernmost part of their range fly farthest south to overwinter. In between, a large section of the country that includes the entire Chesapeake Bay watershed has year-round populations of song sparrows. In keeping with its extreme variety of coloration and songs, this changeable bird exhibits every variation of seasonal travel: migratory, stationary and mixed.

Like many birds, song sparrows feast on insects and other invertebrates during the spring and early summer. This diet helps the sparrows ingest enough protein to breed successfully. As the weather cools and insects become less available, these sparrows effortlessly switch to seeds, fruits and berries.

The song sparrow I have been hearing this summer likes to perch on a lamppost when he's singing. Typically, though, you can more readily find these birds skulking in low bushes or on the ground, where they scratch through leaf litter, searching for their next meals. Song sparrows will come readily to platform bird feeders. They eat a wide variety of offerings, from black oil sunflower seeds to millet to mealworms.

Song sparrows build their cup nests either on the ground under a shrub or in a low bush. They have at least two clutches of one to six eggs each season. Incubation lasts 12–15 days, followed by a nestling period of 9–12 days. Although they are considered monogamous, song sparrow pairs seem to take that notion lightly. In 1998, a careful study demonstrated that more than 15% of 200 young birds were not sired by the mother's social mate.

Ornithologists have been studying song sparrows for decades. They are good subjects. The birds are nearly ubiquitous. Local populations to study are never far away. The birds are tolerant of humans, and their nests are readily accessible.

In 1937, American ornithologist Margaret Morse Nice published a landmark study of the species, *Studies in the Life History of the Song Sparrow*, followed by a second volume in 1943. Together, the works established a new standard, and not just for avian studies. Morse Nice identified individual birds in the field and then proceeded to study them in their natural habitat over time. Her careful integration of ecological and behavioral studies had never been done in such a rigorous fashion. Years later, the noted Nobel Laureate Konrad Lorenz remarked, "her paper on the song sparrow was, to the best of my knowledge, the first long-term field investigation of the individual life of any free-living wild animal."

Recognition came grudgingly in the male dominated field of avian science, but Morse Nice's reputation has grown over the years. The two-volume study has become the gold standard for biological ethnology (the science of studying individuals within their cultures). Her works are still widely cited, and the song sparrow has been a model species for ornithologists for generations.

I lack the patience and intellectual rigor to devote that kind of attention to my summer songster. I'll leave to others the intensive field work, the detailed note-taking and the careful construction of deductions. Instead, I simply enjoy the sounds of the song sparrow.

The next time you're outside, take a moment and listen. There's a song in the air: Summer's calling. ■

Mike Burke, an amateur naturalist, lives in Mitchellville, MD.

By Kathy Reshetiloff

Beetles and butterflies and bees! Oh my!

A white-lined sphinx hovers at a flower blossom to feed. It is one of a number of species in the Sphingidae *family commonly called hummingbird moths because of their size and flight characteristics. (Tom Koerner/U.S. Fish & Wildlife Service)*

Pollination is the moving of pollen from the male part of a flower, the anther, to the female part, the stigma. This transfer is necessary for the production of seeds and fruits, and it helps to ensure the genetic variability that is vital to healthy plant populations.

Plants can be pollinated by wind or water but are most commonly pollinated by animals. Some 75% of all flowering plants need animal pollinators. Without them, these plants could not produce seeds and fruit and would eventually disappear, as would other animals that depend on them.

Many of the fruits and vegetables we eat depend on animal pollinators.

What makes a good pollinator? They should be highly mobile and able to move rapidly among flowers and clusters of flowers. They need to have structures on which pollen can attach. Pollinating animals often have specialized adaptations to gather nectar or pollen: the tongue of a hummingbird, the proboscis of a butterfly, the "pollen baskets" of a bee.

Who are pollinators? The club includes at least one mammal — the bat. While most bats feed exclusively on flying insects, some species feed on nectar. The lesser long-nosed bat, found in Mexico, Arizona and New Mexico, is particularly important in pollinating agave and cactus plants. It uses its long muzzle and tongue to reach the nectar and pollen.

Hummingbirds are the most common of the bird pollinators. They feed on flowers with a wide variety of shapes and colors — not just tubular and red — but they do prefer larger, showier flowers with lots of nectar. The ruby-throated is the only hummingbird specie in the eastern United States. In Hawaii, honeycreepers are a critical bird for pollination.

Bees, of course, are the workhorses of the pollinating world. They possess excellent characteristics for this role. They're highly mobile, covered with pollen-collecting hairs and adapted to feeding on nectar and/or pollen. Some even have "baskets" attached to their hind legs for carrying pollen.

Honeybees and bumble bees are social insects that often live in colonies — though many other bee species do not. They are just as important in pollinating trees and plants. Some examples of solitary bees include the small, greenish-blue, metallic-looking sweat bee; the mason bee, which uses clay to seal its nest; and the leaf cutter bee, so-named because it lines its nest (either in the ground or in small cavities in wood) with leaves it has cut.

Another group of familiar pollinators are butterflies and moths. A long mouth part known as a probiscus (essentially a straw) allows these insects to easily collect nectar from flowers. The monarch, eastern tiger swallowtail and zebra swallowtail butterflies are easily identified by their large size and bright coloration. Smaller, less recognizable butterflies and moths are just as important. Members of the *Sphingidae* family are sometimes called hummingbird moths because of the way they hover while collecting nectar with their long proboscis.

Less familiar pollinators include certain species of flies, wasps, hornets and beetles. Pollinator flies often resemble bees, but do not bite or sting. This resemblance is believed to protect them from predators. Wasps and hornets mostly feed their young other insects but will also regularly visit flowers to collect nectar.

A garden flower attracts a soldier beetle, the common name (along with leatherwing) of the Cantharidae *family of beetles, which are prolific pollinators in their adult stage. (Sue Cro/CC BY-NC 2.0)*

Beetles are the most diverse group of insects, with millions of species worldwide. Some, such as soldier beetles (which are very common in mid– to late summer), are highly adapted to feed on flowers. Even mosquitoes feed on flowers occasionally to get nectar as an energy source.

How can you help pollinators?

There is increasing evidence that pollinators are in decline. This is due to habitat loss and fragmentation, which results in the loss of food and/or shelter. Pollinators can be impacted directly by insecticides and indirectly by herbicides that kill plants they need as food or habitat. Invasive plant species sometimes replace native plants that are food or habitat for pollinators or their larvae. Diseases, as well as parasites, are known to affect certain bees.

A well-planned pollinator garden will provide food for a variety of pollinating animals throughout the year. Native plants can be a food source for caterpillars, which, of course, become colorful butterflies and moths. Choose species that provide a steady source of nectar throughout the year. Install native nectar-producing plants in clumps.

Remember, a variety of plants will also result in a variety of pollinators. ■

To learn about native plants suited to where you live, visit pollinator.org. Under Resources, click on Planting Guides. You can then enter your zip code to find a regionally specific guide to download.

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