

CHESAPEAKE

# BAY JOURNAL

March 2022

Volume 32 Number 1

Independent environmental news for the Chesapeake region

## Oyster shells in Potomac River trigger debate

PAGE 16



### WOODLANDS OF WARD 8



Nonprofit work crew aims to  
make a difference **PAGE 15**

### 'NO CONFIDENCE'



EPA says Conowingo cleanup  
plan lacks funding **PAGE 11**

### BEAUTIFUL BARRED OWLS



Year-round residents of the  
Chesapeake region **PAGE 39**

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

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



CONTENTS



Kevin Yoder, right, a conservation forester with The Nature Conservancy, meets with a landowner in Pennsylvania to assess the health of the woods and its potential to capture carbon dioxide. Read the article on page 10. (Courtesy of the American Forest Foundation)

NEWS

- 8 Marine heat waves could become more common in the Bay
- 9 New data show less progress toward Bay cleanup goals
- 10 Money grows on trees for owners who save small forests
- 11 EPA declares ‘no confidence’ in Conowingo cleanup plan
- 12 Norfolk faces criticism over flood-protection plan
- 14 Stalled Maryland oyster restoration project gets a break
- 15 Nonprofit steps into gap for DC woodland stewardship
- 16 Trove of oyster shells discovered in Potomac. Now what?
- 18 Federal funding to tackle abandoned coal mine pollution
- 20 Dominion Energy plans coal ash landfill near Potomac River
- 21 MDE chief put on defense for enforcement lapses
- 22 Centuries later, gold mine pollution poses problems in VA
- 24 Scientists to study ins and outs of plastic pollution in Choptank

TRAVEL

- 26 Learn birds by listening: There’s an app for that

FORUM

- 32 Chesapeake Born | The case for a Chesapeake ‘style’ Bay
- 34 War on pollution extends to its deniers, deflectors
- 35 Cleanup deadline is near, the Bay needs action now

QUIZZES | EVENTS | RESOURCES

- 25 Chesapeake Challenge | Pollination: Posies with a purpose
- 36 Bulletin Board | Volunteer | Events | Programs | Resources

COLUMNS

- 38 Steward’s Corner | Building bonds through Project Clean Stream
- 39 On the Wing | Who cooks for you? The barred owl, that’s who
- 40 Bay Naturalist | Yellow perch: an early-spawning favorite

EDITOR’S NOTE



Welcome to our new readers

Many readers have been with us for years. But this just might be your first official issue. If so, there’s a good chance you’re among the nearly 600 people who have responded so far to our recent readership drive. We’re so glad you did! Welcome to the *Bay Journal* community of readers — you are in good company. Surveys tell us that *Bay Journal* readers are curious, passionate and engaged. They often share the *Bay Journal* with others, and I hope you’ll do the same, helping to spread environmental news across the Chesapeake region. Be sure to check out our podcast, *Chesapeake Uncharted*, and explore the films and videos on our website and YouTube channel.

In the pages of this issue, you’ll learn that challenges for the Bay restoration just keep coming. A plan to address the pollution washing past Conowingo Dam is in doubt because it lacks funding. And updated data in the Bay Program computer models suggests the region has made even less cleanup progress than previously thought. Columnist Tom Horton challenges us to rethink our approach.

Other articles show the importance of local level actions. A nonprofit work crew in the District of Columbia has taken on stewardship of public woodlands. Elsewhere, two programs are rewarding owners of small, private forests for helping to combat climate change.

You’ll also find articles about the ecosystem, including a big surprise in the Potomac River (beds of valuable oyster shells where no one expected to find them). You’ll learn about gorgeous yellow perch and barred owls, and you might be tempted to try the bird ID app highlighted in the travel article.

Sometimes, there’s seemingly no end to environmental challenges in the Bay region. But we hope the *Bay Journal* reminds you that there is an endless variety of beauty and inspiration here, too.

— Lara Lutz



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.

ON THE COVER

Waterman Pete Springer dredges oyster shells from the Potomac River. (Dave Harp)

Bottom photos: Left and center by Dave Harp, right by Joseph Oliver/ CC BY-NC 2.0

bayjournal.com



## BY THE numbers

5

Number of eyes in a bee

80,000

Approximate number of trips that bees must make to gather enough nectar for a 12-ounce jar of honey

94.5 million

Pounds of nitrogen pollution reaching the Chesapeake Bay from wastewater treatment plants in 1985

29.1 million

Pounds of nitrogen pollution reaching the Chesapeake Bay from wastewater treatment plants in 2020

60%

Amount of forest in Pennsylvania that is privately owned

76%

Amount of forest in Maryland that is privately owned

80%

Amount of forest in Virginia that is privately owned

## Yellow perch are on the move

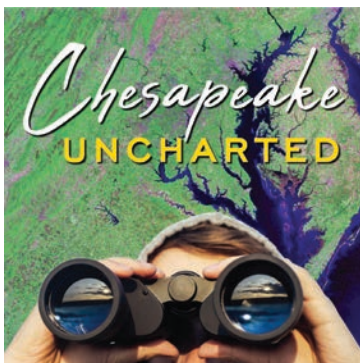


### Brush up on some yellow perch facts

- Spawning runs in the Bay region typically take place from late February to early March.
- They produce large quantities of eggs to compensate for low survival rates.
- Eggs collect in a long, ribbonlike mass.
- The larval fish begin feeding on microscopic aquatic organisms after about four days.
- Yellow perch are usually about 7.5 inches long and have a typical lifespan of 13 years.
- They rarely leave the river system in which they hatch.

*An adult yellow perch.  
(USDA photo by Robert Colletta)*

In the Chesapeake Bay region, the movement of yellow perch is a sign of spring. These brightly colored fish spend most of the year in brackish water near the mouths of rivers flowing into the Bay. But as the weather warms up, they are among the first fish to start swimming upstream toward freshwater, where they release and fertilize eggs. They usually travel in schools and are popular with anglers. The historic population in the Bay region is depleted. Although some localized populations are healthy, others suffer from degraded water quality, including warm water, low levels of oxygen and sediment that smothers egg masses.



[bayjournal.com/podcast](http://bayjournal.com/podcast)

## LOOKING BACK

### 30 years ago

#### VA to combine four agencies into one

A move was under way to create a single Department of Environmental Quality in Virginia by merging the Water Control Board, Air Pollution Control Board, Department of Waste Management and Council on the Environment. ■

— *Bay Journal*, March 1992

### 20 years ago

#### National Academy might study nonnative oysters

With growing interest in rearing nonnative oysters, the National Academy of Sciences considered reviewing the risks and benefits of using the Asian oyster, *Crassostrea ariakensis*, in the Bay. ■

— *Bay Journal*, March 2002

### 10 years ago

#### Study confirms arsenic in chicken feed enters water

A report commissioned by the Hughes Center for Agro-Ecology concluded that arsenic added to chicken feed does run off into local waterways after chicken manure is applied to fields as fertilizer.

— *Bay Journal*, March 2012



# ABOUT US

The *Chesapeake Bay Journal* is published by Bay Journal Media, an independent nonprofit news organization dedicated to environmental reporting in the Chesapeake Bay region. *Bay Journal* reporting reaches well over 250,000 people each month through news articles, columns, films and the *Chesapeake Uncharted* podcast.

The *Bay Journal* is available in print and by email and is distributed free of charge. The print edition is published 10 times a year, and bundles are available for distribution at offices, libraries, schools, etc.

The Bay Journal News Service distributes *Bay Journal* articles and opinion columns for free use in hundreds of newspapers across 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.

Material may be reproduced, with permission and attribution.

Policies on editorial independence, gift acceptance and advertising are available at bayjournal.com/about.

## STAFF

**Lara Lutz**, Editor / Executive Director (llutz@bayjournal.com)  
**Karl Blankenship**, Editor-at-Large (kblankenship@bayjournal.com)  
**T. F. Sayles**, Managing Editor / News Service Editor (tsayles@bayjournal.com)  
**Timothy B. Wheeler**, Associate Editor / Senior Writer (twheeler@bayjournal.com)  
**Kathleen A. Gaskell**, Copy Editor (kgaskell@bayjournal.com)  
**Jeremy Cox**, Staff Writer (jcox@bayjournal.com)  
**Ad Crable**, Staff Writer (acrable@bayjournal.com)  
**Khristna Paysour**, Administrative Assistant (kpaysour@bayjournal.com)  
**Whitney Pipkin**, Staff Writer (wpipkin@bayjournal.com)  
**Dave Harp**, Photographer (dharp@chesapeakephotos.com)  
**Jacqui Caine**, Marketing & Advertising Director (jcaine@bayjournal.com)

*Editorial content and oversight is managed solely by Bay Journal staff.*

## BOARD OF DIRECTORS

<b>Mary Barber</b> , President	<b>Donald Boesch</b>
<b>Bill Eichbaum</b> , Vice President	<b>Mary Gregory</b>
<b>Don Luzzatto</b> , Secretary	<b>Mark Platts</b>
<b>Kim Coble</b> , Treasurer	<b>Lara Lutz</b> , Ex-Officio

## SCIENCE ADVISORY COMMITTEE

**Rich Batiuk** | U.S. EPA Chesapeake Bay Program (retired)  
**Donald Boesch** | UMD Center for Environmental Science (retired)  
**Marji Friedrichs** | Virginia Institute of Marine Science  
**Marjorie Mulholland** | Old Dominion University  
**Ray Najjar** | Penn State University  
**Michael Paolisso** | University of Maryland  
**Kurt Stephenson** | Virginia Tech  
**Jeremy Testa** | UMD Center for Environmental Science  
**Lisa Wainger** | UMD Center for Environmental Science  
**Claire Welty** | University of Maryland - Baltimore

## ADVERTISING

Advertising space is available in print and online.  
Contact Jacqui Caine at 540-903-9298 or jcaine@bayjournal.com.

## CONTACT US

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

**subscriptions, donations or advertising:**  
jcaine@bayjournal.com or 540-903-9298

**opinion columns:**  
tsayles@bayjournal.com or 410-746-0519

**editor:**  
llutz@bayjournal.com or 410-798-9925

WE'RE JUST  
A CLICK AWAY



BAYJOURNAL.COM

## BAY JOURNAL NOTEBOOK



*This image of the Rebecca T. Ruark is part of an exhibit by Bay Journal photographer Dave Harp, open to the public through June 5 at Salisbury University on Maryland's Eastern Shore. (Dave Harp)*

## In class, on screen, on the river

In January, editor-at-large **Karl Blankenship** joined a panel for an environmental science class at the University of Maryland, discussing whether scientists should be expected to explain the results of their work and its implications to the public. The response from the panel, which also included *Bay Journal* columnist Tom Horton, former *Bay Journal* reporter Rona Kobell and Patuxent Riverkeeper Fred Tutman, was a resounding “yes.” They noted that the willingness of scientists to spend time engaging with the public (and reporters) has been critical for moving the Bay restoration forward.

Several *Bay Journal* films were included in the Richmond Environmental Film Festival, which ran Feb. 18 through March 4. We hope they introduced still more people to the *Bay Journal*. Among the festival's other offerings were *Headwaters Down*, which follows a paddle down the James River, and films focused on bird life and urban forests in Richmond.

And there's still time to catch an exhibit by *Bay Journal* photographer **Dave Harp**. *Where Land and Water Meet: the Chesapeake Bay Photography of David W. Harp* is at Salisbury University in Maryland through June 5. Admission is free, but COVID protocols apply. You should reserve a free parking pass in advance. For information, call 410-543-6312 or search the university's website for Nabb Center exhibits.

Recently, Dave and *Bay Journal* writer **Tim Wheeler** confronted the elements while reporting on Potomac River oyster shells. Finding an available captain who could dredge the shells to the surface was the first challenge. Weather was the second. They took to the water on a gray February morning, courtesy of waterman Pete Springer and his open skiff. As they set out from Malloys Bay, cruising past part of its “ghost fleet” of abandoned ships, the deep chill and light rain was followed by a dense fog that obscured most of their surroundings. Springer guided the boat to a promising spot, and the treasure hunt began.

“The tide was running so strongly that in the seconds it took Springer to grab his oyster tongs and put them overboard to scoop up some shells, we kept drifting off the crest of the lump into deep water,” Tim said. “You could hear the steel tines of the tongs scraping over shells on the bottom.” After several tries, Springer was able to grab a batch and pull them aboard for Dave to photograph. “All in all, an eerie experience,” Tim said.

— Lara Lutz



### Funds approved to restore two Bay islands

Plans to restore two vanishing Chesapeake Bay islands are now on firmer ground. The U.S. Army Corps of Engineers has allocated \$37.5 million for the upcoming year to launch the reconstruction of James and Barren islands in Maryland.

Maryland Sen. Ben Cardin, a Democrat, had previously succeeded in including that amount for the islands' restoration in fiscal year 2022 spending legislation, but Congress has yet to approve a budget. The Corps allocation, included in its supplemental work plan, improves prospects for the long-planned \$1.9 billion project, advocates say. The Corps tends to keep funding such work once it begins.

Called the Mid-Chesapeake Bay Island Ecosystem Restoration, the project aims to create 2,100 acres of new wildlife habitat on the two islands and help protect shorelines in Dorchester County from erosion and storm surges.

The project also benefits the Port of Baltimore because the islands are to be restored using sand and silt dredged from shipping channels in the

Bay. Dredged material has been used to rebuild Poplar Island, another Bay island that had nearly washed away. The new project is expected to be under way by the time the Poplar restoration is completed in 2032.

Initial restoration around Barren Island is slated to begin in September, while the more extensive work at James Island is projected to start in 2024.

— Timothy B. Wheeler

### PA reports increase in miles of impaired streams

More than 33% of Pennsylvania's 85,000 miles of streams and rivers have impaired water quality, according to the latest assessment by the state Department of Environmental Protection.

The statewide surveys are required every other year by the federal Clean Water Act. Waters are considered impaired if they fail to meet standards for water supply use, aquatic life and recreation, or if their fish are unsafe to eat.

The number of polluted stream miles increased by 2,418 since the 2020 assessment.

"That the latest report includes over 2,400 [more] miles of impaired waters and streams than in 2020 is a sad reminder that Pennsylvania must accelerate its rate of installing practices that reduce pollution to waters," said Shannon Gority, Pennsylvania executive director of the Chesapeake Bay Foundation.

But DEP officials said the increase was mainly because of better assessment methods for some streams and does not represent a backslide on stream restoration.

"The overall information is better for us because we know where to target our efforts to clean up waterways," said DEP spokesman Jamar Thrasher.

The leading cause of impairments is acid mine drainage, followed closely by pollution from agricultural runoff. Stormwater runoff is a distant third. The most common impairment is a lack of healthy aquatic life.

Heavily farmed Lancaster County faces the greatest challenge, with 1,286 miles of impaired streams.

DEP reported that 120 miles of streams around the state are no longer on the impaired list.

— Ad Crable

### MD files suit seeking cleanup of Baltimore sewage plants

Just a few days after being accused of lax oversight of polluters, the Maryland Department of the Environment filed suit against the city of Baltimore, alleging numerous and ongoing discharge violations at the state's two largest wastewater treatment plants.

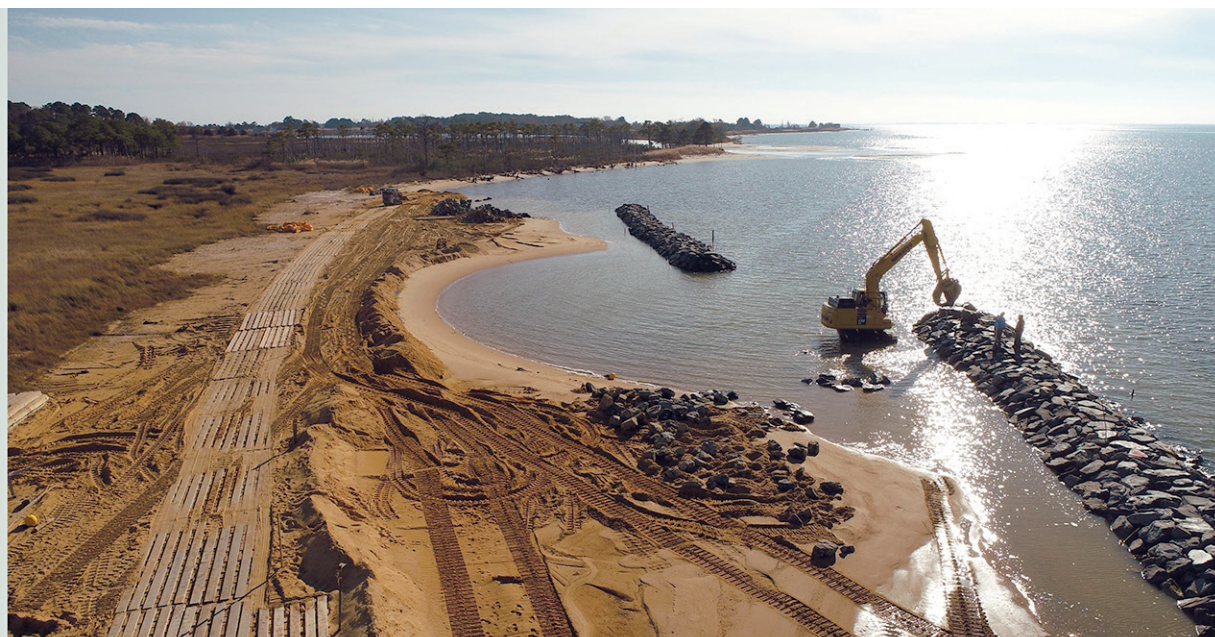
The lawsuit, filed Jan. 21 in Baltimore Circuit Court, seeks civil penalties and an injunction requiring the city to take "all steps necessary" to come into compliance with its state-issued permits. The Back River and Patapsco River plants together discharge about 250 million gallons of treated sewage daily into the rivers, both tributaries of the Chesapeake Bay.

The state's court filings charge the plants with exceeding discharge limits repeatedly — some as far back as 2017 — for nitrogen, phosphorus, bacteria and other pollutants. They also accuse the city of failing to report sampling results, failing to provide adequate operating staff and failing to run the plants efficiently or conduct needed maintenance.

See **BRIEFS**, page 6



Design  
Permitting  
Construction  
Maintenance  
Living Shorelines  
Stormwater Management  
Bank Stabilization  
Stream Restoration



unitylandscape.com | 410-556-6010 | Licensed MDE Marine Contractor #086(E) | Licensed MHIC Contractor #79963



**SPRING  
OPEN  
HOUSE**

**Come celebrate spring with us at our first open weekend of 2022!**

**WHEN** 8am-4pm Saturday, March 19th

**WHERE** 3621 Church Hill Rd.

**WHAT** Double Rewards, Coffee, Pastries, River Birch Raffle

unitychurchhillnursery.com | 410-556-6010 | 3621 Church Hill Rd, Church Hill, MD



SCAN ME  
Connect with us!



# briefs

From page 5

"Wastewater treatment plants are critical in our efforts to improve the health of the Bay, and they must adhere to state permits and environmental laws," said Maryland Attorney General Brian Frosh, whose office filed the suit on behalf of MDE.

State action comes after water quality monitoring last spring by Blue Water Baltimore found elevated bacteria levels and floating fats, oil and grease near the outfall for the Patapsco wastewater treatment plant. The watchdog group reported its findings to MDE which, through a series of inspections from May through December, observed extensive violations of both plants' discharge permits as well as serious maintenance and staffing problems at both facilities.

The problems came to light on Aug. 30 when Blue Water released MDE inspection reports for both plants along with an MDE letter to the city demanding immediate corrective action.

MDE Secretary Ben Grumbles said in a press release that the lawsuit is a top enforcement priority for "getting the city's world-class treatment plants back into compliance immediately, so we stay on track with the 2025 Chesapeake Bay restoration goal."

— Timothy B. Wheeler

## Habitat, health project slated for national forest in Virginia

The George Washington and Jefferson National Forest will benefit from approximately \$1.7 million in federal funds aimed at restoring forest health, wildlife habitat and water quality.

The three-year project will focus on public and private lands in Virginia's Botetourt, Craig, Roanoke, Giles, Bland, Pulaski, Wythe, Tazewell and Montgomery counties.

"This important funding enables us to work across boundaries to improve forest health and wildlife habitat in an important ecosystem," said Joby Timm, forest supervisor.

The area contains parts of four major watersheds in Virginia (James, Roanoke, New and Clinch Powell rivers), including 559 miles of coldwater trout habitat. The Virginia Department of Conservation and Recreation-Natural Heritage Division tracks 56 species of rare, threatened and endangered species in the project area, including 32 federally endangered species. Of the 32 federally endangered and threatened species, 28 are fish or mollusks.

The work will include prescribed burns, timber stand improvements and vegetation management that create and promote early successional and open woodland habitat. This habitat is critical for forest bats, grouse, wild turkey, deer, wood turtles and early successional birds such as the golden-winged warbler.

The funds were awarded by the Joint Chiefs' Landscape Restoration Partnership, which enables the Natural Resources Conservation Service and Forest Service, both agencies under the U.S. Department of Agriculture, to collaborate with agricultural producers and forest land-owners on large-scale conservation and restoration projects.

Other project partners include the Virginia Wildlife Habitat Coalition, Rocky Mountain Elk Foundation, Virginia State Leadership Team, The Nature Conservancy, Virginia Department of Conservation and Recreation-Natural Heritage, Virginia Chapter-Society of American Foresters and Virginia Forestry Association.

— Lara Lutz

## Chessie the manatee found no worse for wear

Chessie, the manatee that gained fame for making sporadic visits to the Chesapeake Bay over three decades, has made yet another reappearance, easing fears that an alligator attack last summer had done him in.

When his satellite tag stopped transmitting last June in waters near Jacksonville, FL, scientists suspected that an alligator or a boat had either killed Chessie or damaged the transmitter. For more than six months, Chessie's whereabouts were unknown.

But on Jan. 25, an underwater microphone deployed by the Clearwater Marine Aquarium detected a separate — and apparently still operative — tracking device attached to the 1,500-pound mammal. The sonic transmitter showed that Chessie was basking in the warm discharge from a power plant in Fort Lauderdale, more than 300 miles south of his last known location.

The aquarium's staff hurried to the canal. They located the manatee and fastened a fresh satellite tag to him, according to the nonprofit's press release. The tag allows researchers and the public to track Chessie's movements remotely.

Scientists estimate the manatee to be at least 35 years old. His lifetime has been marked by a dramatic series of appearances and disappearances, beginning with his sighting in the Chesapeake Bay in 1994. That was the first time a manatee had been spotted in Maryland waters. He bypassed the Bay during his northward trek the next year, to Rhode Island, adding another first to his ledger.

He popped up in the Bay again in 2001 and 2011. Then he was off the grid until he was found again and rescued in February 2021, emaciated and suffering from pneumonia. Unlike hundreds of Florida manatees that have died of starvation amid a recent mass die-off of seagrass, Chessie survived.

After rehabilitating at SeaWorld Orlando, he was released in May. He then swam up the coast to Jacksonville, mimicking earlier northward journeys.

— Jeremy Cox



Quality,  
Native Plants,  
Locally Grown  
[www.greenlandingnursery.com](http://www.greenlandingnursery.com)



**F&R Environmental Services**

- Phase I and II Environmental Site Assessments
- Asbestos and Lead Surveys
- Property Condition Surveys
- Cost to Cure Evaluations
- Hazardous Waste Characterization and Disposal Planning
- Stormwater Compliance Assessments and Monitoring
- Spill Prevention and Contamination Control Planning
- Wetland Delineations and Permitting
- Brownfields Eligibility Evaluations

**F&R FROEHLING & ROBERTSON**

Stephanie Golembeski  
Business Development Director  
804.591.2749  
[sgolembeski@fandr.com](mailto:sgolembeski@fandr.com)

*F&R is a Virginia SWaM Minority Owned Business*



# briefs

## NASA-owned forest gets reprieve

A Maryland forest tract owned by NASA at risk of being sold to a developer has won a reprieve for now.

The White House Office of Management and Budget in January rejected a list of federal properties recommended for sale or transfer, which included a 105-acre parcel near the Goddard Space Flight Center in Greenbelt. It directed the Public Buildings Reform Board, which had assembled the list, to resubmit its recommendations by Feb. 27 after gathering more information to justify the disposal of the properties.

NASA has declared the mostly wooded tract, known as Area 400, to be "underutilized" and proposed that it be fast-tracked for sale. The space agency had tested rocket propulsion there decades ago but lately has been using the cluster of small buildings on site for "storage and support," according to a spokesperson.

The proposed sale drew protests from conservationists, who argue that the federal government should be preserving, not selling, forested land. Members of Congress as well as state and even other federal agencies also have voiced concern.

The U.S. Fish and Wildlife Service has expressed interest in adding the land to the adjoining Patuxent

Research Refuge, a 12,800 acre expanse of forest, meadow and woodlands that is used for wildlife research and is open to the public.

The Public Buildings Reform Board had recommended that Area 400 be transferred to the wildlife service for inclusion in the refuge but said that NASA should either sell the land to the service at "fair market value" or put it up for public sale.

Refuge manager Jennifer Greiner said the wildlife service doesn't have the money to purchase Area 400, which she estimated could be worth about \$2 million.

The Friends of Patuxent Wildlife Research Center and Patuxent Research Refuge urged the board to recommend a no-fee transfer of Area 400 and pointed out that the land is already owned by the federal government, saying, "we do not believe that there is any public benefit to be gained by requiring the U.S. Fish and Wildlife Service to pay NASA fair market value for the land."

— Timothy B. Wheeler

## Riverkeeper joins talks to end Harrisburg sewage overflows

Expressing impatience at the lack of progress, a federal judge has inserted the Lower Susquehanna Riverkeeper into negotiations between state and federal regulators and the city of Harrisburg on stopping raw sewage from flowing into the Susquehanna River at the capital city.

U.S. Middle District Judge Christopher Connor in December granted the group's request to be a player in negotiations between the Pennsylvania Department of Environmental Protection, U.S. Environmental Protection Agency and Harrisburg Capital Region Water. The Riverkeeper organization is represented by the Environmental Integrity Project, a Washington DC-based nonprofit that seeks the enforcement of environmental laws.

The EPA and DEP sued the Harrisburg water utility in 2015 to seek a workable plan that would end the annual flow of hundreds of millions of gallons of untreated sewage into the Susquehanna during heavy rainfalls.

Like many older cities in the U.S., Harrisburg has a combined sewage and stormwater piping system that can't handle high flows. As a result, untreated sewage mixes with stormwater runoff and flows directly into waterways.

— Ad Crable

## Company halts plans for natural gas pipeline in central VA

A power company has suspended plans to build a natural gas pipeline across five counties in central Virginia, signaling another win for environmental groups that have increasingly opposed new natural gas infrastructure projects in the state.

Chickahominy Power, LLC, described the change as pressing "pause" on an effort that would also entail

getting a beleaguered power station up and running.


The announcement came after PJM, manager of the regional electric grid, pulled the Chickahominy Power Station from its planning queue when the facility failed to meet deadlines for development. The power station would be the only end user for the Chickahominy Pipeline. Environmental groups cheered the development as a potential end to another natural gas project in the state.

"The Chickahominy Pipeline would have carved right through the heart of Virginia," said Catharine Tucker of Hanover Citizens Against a Pipeline. "We are glad to see it suspended and will remain vigilant about any further plans with the potential to harm communities like ours."

The Virginia Air Pollution Control Board in 2021 denied a permit to another compressor station that would have supported an extension of the Mountain Valley Pipeline. In 2020, Dominion Energy canceled its Atlantic Coast Pipeline, another natural gas project that was contested by environmental groups all the way to the U.S. Supreme Court.

The Chickahominy station was until recently one of two new power plants planned for Charles City County. "Charles City County residents have been demanding more accountability and transparency for years, and we are very glad to see this project finally suspended," said Wanda Roberts of Concerned Citizens of Charles City County, a group that opposed the pair of projects.

— Whitney Pipkin




## RESOURCE RESTORATION GROUP, LLC




Providing innovative solutions to conserve, restore, and enhance our natural resources.



CONSERVE

RESTORE

ENHANCE

Ecological Design & Construction  
Stream • Wetland • Shoreline • Stormwater BMPs

[www.RRGroup.us](http://www.RRGroup.us) 

## Double the Use of Your Deck.




DEK Drain's proprietary TOPSIDE® system protects your elevated deck from moisture and delivers dry, functional space below.

Installation is simple • Customization is endless • Lifetime Warranty

**SHIPS THE DAY AFTER YOU ORDER!**

Call us today at 1-866-335-3724 to schedule your free estimate.

[www.dekdrain.com](http://www.dekdrain.com) | [info@dekdrain.com](mailto:info@dekdrain.com)



## Clyde's SPORTS SHOP

[www.clydessports.com](http://www.clydessports.com)

Since 1957

Open 7 Days

(410) 242-6108

**FISHING TACKLE - LIVE BAIT**

**GUNS - AMMUNITION - Guns Bought, Sold, Traded**

**HUNTING EQUIPMENT - ARCHERY**

2307 Hammonds Ferry Rd.  
Halethorpe, MD 21227  
Exit 9 off I-695

**24 HOUR**  
**Fishing Info:**  
**(410) 247-FISH**



# Marine heat waves could become more common in the Bay

## Warmer water could have serious impacts

By Jeremy Cox

**M**arine heat waves could lay siege to the Chesapeake Bay for more than half of a typical year by 2100, pushing its ecosystem “past a dangerous tipping point,” warns a new study by researchers at the Virginia Institute of Marine Sciences.

The findings, published in *Frontiers in Marine Science*, present a new concern for scientists and officials engaged in efforts to improve Bay water quality.

A warming climate has already raised the Bay’s average water temperature by 2 degrees Fahrenheit over the past 30 years, prior research shows. Marine heat waves, which last for at least five consecutive days and increase temperatures by as much as 14 degrees above normal, compound the problem.

“These drastic changes can be really harmful and impact [living] things in an acute way,” said VIMS oceanographer

Piero Mazzini, the paper’s co-author. “When you have an extreme event that kills a large amount of organisms, it can be hard to recover.”

Analyzing temperature statistics from six monitoring stations around the Bay, Mazzini and fellow VIMS researcher Cassia Pianca found that episodes of extreme heat are happening more often. From 1986 to 2010, the Chesapeake averaged four to five heat waves per year. Since then, there have typically been six to eight events per year.

If that trend continues, they predict, heat waves will plague the Bay an average of once per month within 50 years — and by the end of the century, its waters will be in a “semipermanent” heat wave state, with days of abnormally high temperatures springing up about half of the year.

A separate study at VIMS recently explored what’s driving up temperatures. That research, led by doctorate student Kyle Hinson, ruled out warm water flowing from rivers into the Bay because the effects were too local. The study also cast doubt on tidal incursions from the Atlantic Ocean because they only seemed to warm

the mouth of the Bay. The most likely cause is the warmth in the atmosphere transferring heat to the water below, the researchers found.

“There’s very little we can do to stop that” at the regional level, Mazzini said. “It’s already happening. It’s not something we can stop suddenly. It’s a global issue.”

When a heat wave strikes the Bay, ecological troubles follow, scientists say. Extreme heat enhances the temperature divide between the upper and bottom waters, promotes the rapid growth of harmful algae blooms and worsens the flow of nutrients from the land to the water. Combined, those factors rob the Bay’s depths of oxygen, creating “dead zones” where aquatic life is likely to suffocate and die.

If heat waves strike at regular intervals, Mazzini and Pianca warn that die-offs and other heat-related changes could send the Bay’s ecosystem into a tailspin. For instance, the hot water could accelerate the expected shift from cool-tolerant species to those that prefer warmth.

Eelgrass, an underwater grass in the Lower Bay that provides important habitat

for young blue crabs, is already in decline because of warming temperatures and could be all but pushed out of the estuary, Pianca said.

The Bay’s scientific community has become increasingly alarmed by the overall warming of its waters. In January, the scientific panel that helps guide the Bay restoration hosted a daylong virtual workshop about the warming trend. Most of the participants agreed that much more research needs to be done.

“An increase in the duration, frequency and intensity of these extreme marine heat events year to year could stress living things beyond a point where they can recover,” said Julie Reichert-Nguyen, a natural resources specialist with the National Oceanic and Atmospheric Administration’s Chesapeake Bay Office in Annapolis.

“They could also more drastically affect the water quality needed to support healthy fish habitat afterward,” she said. “To make informed management decisions, we need a better understanding of these marine heat waves and the tolerance of different species when exposed to them.” ■



**Restoring the native landscape**



<https://bit.ly/ErnstCBNative>

**ERNST SEEDS** (800) 873-3321  
sales@ernstseed.com



**Join Us!**

Support independent journalism  
with your donation to

**THE BAY JOURNAL**

Ask your tax advisor about the tax benefits from  
a gift of stock. Contact jacqui caine for details:  
[jcaine@bayjournal.com](mailto:jcaine@bayjournal.com) or 540-903-9298



# New data show less progress toward Bay cleanup goals

## Analysis suggests achievements are less than previously estimated

By Karl Blankenship

The Chesapeake region may be further away from meeting its 2025 Bay cleanup goals than previously estimated.

The state-federal Bay Program recently presented to watershed states a series of data revisions that, when incorporated into its computer models, suggest that the region has made significantly less progress in reducing nutrient pollution than earlier numbers indicated. The nutrients nitrogen and phosphorus are the main source of the Bay's water quality woes, triggering algae blooms and oxygen-starved "dead zones."

The finding makes attainment of the region's 2025 cleanup goals, already behind schedule, even more difficult.

The changes, part of a model update submitted to states for review in February, increase the estimated amount of nitrogen reaching the Bay by 6.2 million pounds a year and phosphorus by 600,000 pounds.

Together, that negates more than a fifth of the estimated nutrient reductions the

region has made since cleanup goals were set in 2010.

Most of the change stemmed from a recent discovery that a large amount of fertilizer data had been accidentally excluded from information fed into the model, causing it to underestimate the amount of nutrients being applied to the land. Most of the other changes resulted from incorporating more recent information about farm animals and crops.

Because the data revisions mostly affect agriculture, the changes largely offset the amount of model-estimated progress made in reducing nutrient pollution from farmland in Maryland, Pennsylvania, Delaware and Virginia.

The Bay Program has made data adjustments in the past that also reduced estimated progress. But the new changes, both because of their magnitude and the closeness to its 2025 cleanup deadline, are especially problematic.

The revisions mean the region would need to reduce nitrogen by almost 10

million pounds a year from 2021 to 2025 to reach the goal, compared with an average rate of approximately 2 million pounds a year during the past decade. That's nearly a fivefold increase.

Even more problematic, the region is counting on making 80% of the reductions from agricultural lands, the largest single source of nutrients to the Bay. But nutrient reductions from agriculture, along with those from urban stormwater runoff, have been especially difficult to achieve.

Most reductions to date have come from wastewater treatment plant upgrades, but little of that work remains to be done.

The computer models, approved by the Bay Program partnership, use a vast amount of data about land use, farms, discharges from wastewater treatment plants, impacts from air pollution and other factors to estimate the amount of water-fouling nutrients that reach the Bay.

The models also use state-generated information about pollution control actions taken each year, such as wastewater

treatment plant upgrades, stream buffer plantings and the use of cover crops, to calculate reductions to those estimated nutrient "loads."

The U.S. Environmental Protection Agency uses those annual estimates to evaluate each state's performance toward meeting the region's 2025 Bay cleanup goals. The new data were not available in time to affect the most recent official report, which was released last year and based on 2020 data.

Still, whether the models fully represent what is happening on the land is a matter of debate. Water quality monitoring does not always align with modeled nutrient trends. The states have long contended that the complex system used to account for and track agricultural pollution control practices results in undercounts of computer-estimated progress. Changes to that system are being considered. ■

30 Years of Stewardship

A REAL FORCE FOR NATURE



ENVIRONMENTAL QUALITY RESOURCES, LLC

www.eqrllc.com 410-923-8680

A Bay Journal podcast

SEASON 1: CLIMATE CHANGE



Chesapeake UNCHARTED

Listen at [ChesapeakeUncharted.com](https://ChesapeakeUncharted.com)

Download from your podcast service

Sponsored by



Green Fin Studio



# Money grows on trees for owners who save small forests

## Programs offer incentives to private landowners in Bay states

By Ad Crable

In an effort to combat climate change, some owners of small forests in Chesapeake Bay drainage states are being paid to either delay harvesting trees or take other steps to make their woods better at capturing carbon dioxide from the air.

Until recently, owners of the nation's largest forests — paper companies and others with 3,000 acres or more — are the ones most likely to benefit from exploding private carbon markets that pay owners to keep forests intact.

Now, two separate programs are targeting owners of smaller forests to enhance the considerable carbon-capturing abilities of trees.

The program's pitch: Improve your forest's health, aid wildlife, improve water quality and discourage wildfires, all while fighting climate change.

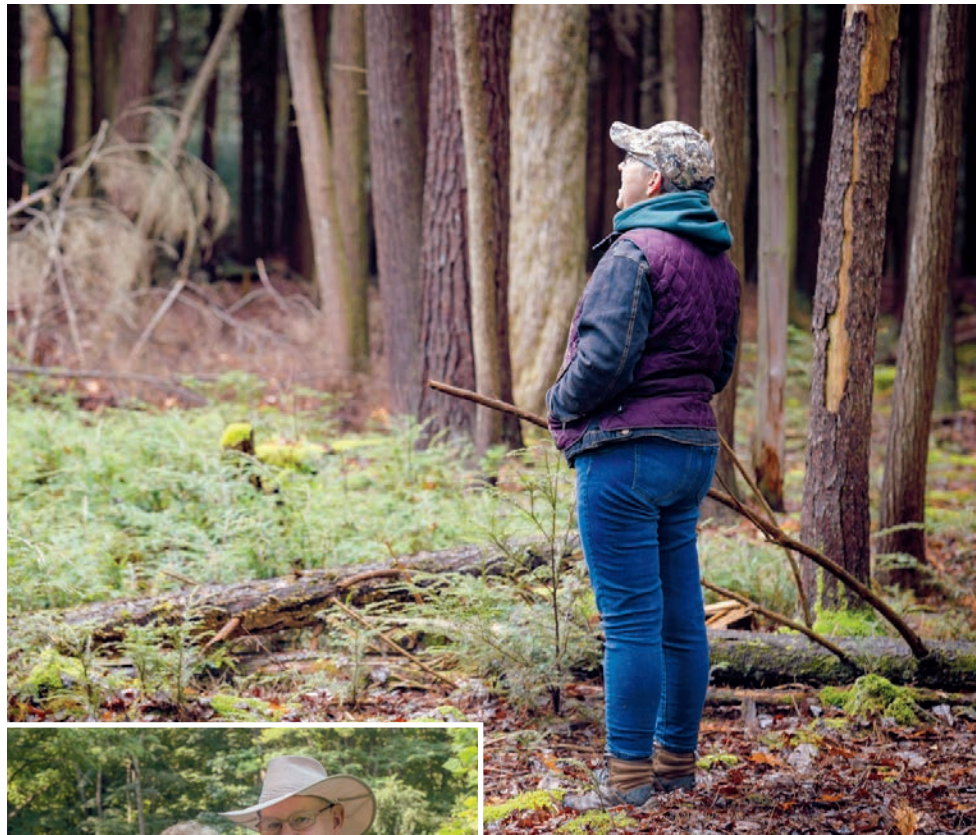
In terms of ecosystem solutions to limit climate change, management of privately held forests in the United States is second only to reforestation in reducing the carbon dioxide piling up in the atmosphere, according to a 2018 study funded by NASA and private foundations.

Reaching owners of smaller forests is especially important in the Chesapeake region, where the majority of each state's forests are held privately, often in small tracts and often by families or individuals.

"It's an incredible time to be a small forest landowner. They're starting to get the recognition and value that they've always deserved," said Elizabeth Greener of the American Forest Foundation.

The Family Forest Carbon Program, run by the foundation and The Nature Conservancy, recently expanded into all of Pennsylvania and West Virginia, as well as five counties in western and central Maryland: Garrett, Allegany, Washington, Frederick and Carroll. The program is expected to offer enrollment in Virginia this fall as part of a mission to go nationwide.

The expansion follows a 2020–21 pilot effort in 29 counties in Pennsylvania. Approximately 2,000 private forest landowners, collectively owning more than 26,000 acres, inquired about participating. Sixty of them, together owning nearly



*Susan Benedict, the owner of a small forest in Centre County, PA, takes in her woods. Owners of privately owned forests in Pennsylvania, West Virginia and western Maryland can now get paid to refrain from cutting their woods or to improve the forest's ability to capture carbon dioxide, a greenhouse gas. (American Forest Foundation)*



*Laura and Mike Jackson, landowners in south-central Pennsylvania, have been paid to improve their forest's ability to capture carbon dioxide, a greenhouse gas. (Submitted photo)*

10,000 acres, qualified for the program in the first year.

An approved forest management plan, written by a certified forester, is required. The program provides a forester to help those who don't have a plan.

Payments are offered for commitments to either 10-year or 20-year stewardship plans. It gives those who own forests of 30–2,400 acres a one-time upfront payment of \$100–\$230 per acre to restrict timber harvests over the next 20 years. Timber removal that creates a healthier forest is allowed. Or, it pays \$50–\$280 per acre, depending on the size of the woods, to landowners who "enhance" their woods over a 10-year period. That can mean removing invasive plants that strangle

new trees and native plants, taking out lower-quality trees left behind from previous timber cuts and other practices that increase forest growth that will, in turn, absorb more carbon.

"Our program is more than just carbon," said Kevin Yoder, a conservation forester with the conservancy. "We are looking at helping the landowner steward that property. That sets our program apart."

That's exactly what appealed to Laura and Mike Jackson when they enrolled 113 acres in southcentral Pennsylvania into the program. When Laura inherited the family farm, she knew that two past timber cuttings had removed only commercially valuable trees and left the woods in bad shape. So had a gypsy moth infestation.

"The first thing we did was cry," Laura said. Then, with payments under both parts of the program, the Jacksons removed invasives, reforested gaps in the canopy and even managed 29 acres to attract ground-nesting golden-winged warblers and American woodcocks.

"So many landowners don't value their forests because of economics," she said. "They value their well-being when they're in the forests. This way, landowners get money without cutting the trees. It gives landowners something to understand how important their forests are to alleviate climate change."

The Natural Capital Exchange started a different nationwide initiative in 2021, allowing entry into carbon markets by all forest owners, whether they own 2 or 2 million acres. Six counties in Pennsylvania were the test market.

So far, it has paid 240 landowners in Pennsylvania, Maryland, Virginia, West Virginia and New York, with a collective ownership of 222,000 forested acres, for one-year agreements to not harvest timber. At a recent carbon auction, eligible Pennsylvania forest owners received from \$5–\$10 per acre, depending on such variables as tree species, stand density and maturity.

"At NCX, we help forests and communities thrive by democratizing the benefits of carbon-removing incentives," said Zack Parisa, co-founder of the San Francisco-based company.

One big difference between the two programs is that the Family Forest Carbon Program seeks to consult with landowners in the long-term to create a healthier forest, while the exchange focuses on connecting forest landowners to carbon markets where they can sell credits to companies with a net-zero carbon pledge.

The family forest program pays landowners directly, hoping to recoup those costs once carbon credits are sold to Amazon, REI Co-op, The North Face and other Fortune 500 companies that have signed on to the effort.

Under the exchange, landowners accepted into the program — often those who actively harvest timber — are paid only after the carbon credits are sold at auction. The exchange has sold customers' carbon credits to companies such as Royal Dutch Shell and Microsoft.

Managers of both programs say landowners should do their homework and learn which program best fits their needs and goals. Each has restrictions that prevent a landowner from participating in both efforts simultaneously. ■

*Information about the programs can be found at [familyforestcarbon.org](http://familyforestcarbon.org) and [ncx.com/landowners](http://ncx.com/landowners).*



# EPA declares ‘no confidence’ in Conowingo cleanup plan

## Agency gives states 60 days to respond

By Karl Blankenship

Citing a lack of funding, the U.S. Environmental Protection Agency says it has “no confidence” in a pollution reduction plan written to offset the impact of the Conowingo Dam.

In a Jan. 24 letter to environmental officials in Chesapeake Bay watershed states, the agency said it would scrap what was supposed to be an innovative cleanup plan unless states come up with a way to pay for it within 60 days. The estimated cost of the plan is more than \$50 million a year.

If the plan is scrapped, the agency will replace the proposed cooperative regional approach to the vexing issue — addressing increased pollution flowing past the Susquehanna River dam — with a plan that instead requires each state to do more on its own. That approach would likely be even more costly.

“We must bring this effort to closure and ensure that we have an implementable path forward to address the pollutant loads from the Conowingo,” Adam Ortiz, EPA administrator for the mid-Atlantic region, wrote in the letter.

At a legislative hearing in February, Maryland Environment Secretary Ben Grumbles said the Hogan Administration was proposing \$25 million in bond financing to help implement the plan, though it is unclear whether other Bay states — many of which have expressed reluctance — or the Maryland General Assembly would agree to do the same. “We’ll put our money where our mouth is and hope others will match,” Grumbles said.

Figuring out how to resolve the Conowingo issue has bedeviled policymakers for decades. Sediment and nutrients have been building up behind the 94-foot-high dam, located just 10 miles upstream from the Bay, since it was completed in 1928.

For many years, the dam kept huge amounts of those pollutants from reaching the Chesapeake. But studies since the early 1990s warned that the reservoir would eventually fill, at which point more nutrients and sediment would flow past the dam and into the Bay.

When the EPA and the states agreed on a new Bay cleanup plan in 2010, they thought the reservoir wouldn’t fill until after 2025, when all pollution actions



*Conowingo was built in 1928 to generate electricity, and it inadvertently acted as a trap for nutrient and sediment pollution flowing downstream to the Chesapeake Bay. Over the years, sediment buildup behind the dam has reduced its pollution-trapping capacity. (Dave Harp)*

needed to restore Chesapeake water quality are supposed to be in place.

But after the EPA had assigned pollution reduction goals to each state, new research indicated the reservoir was already failing to trap pollutants and greater amounts were reaching the Bay.

With the states struggling to meet their own nutrient reduction goals, they agreed in 2018 to support the development of a separate cleanup strategy aimed at offsetting the Conowingo impact and finding a way to pay for it.

The EPA awarded a contract to several groups, led by the nonprofit Center for Watershed Protection, to write the strategy. They concluded that the most cost-effective approach was to focus on reducing nutrient and sediment loads in the Susquehanna basin, which is mostly in Pennsylvania. About 90% of the nutrient reductions would come from agriculture and most of the rest from developed lands.

The EPA agreed that actions outlined in the plan would achieve the goal of reducing nitrogen by 6 million pounds a year and phosphorus by 260,000 pounds. But the plan’s main shortcoming, according to the EPA, is the lack of funding. The plan estimates it would cost \$53 million a year to implement, plus roughly \$13 million a year for additional technical and administrative support.

“Without a ... financing strategy in place and dedicated funding sources to support [the Conowingo plan], there is little

confidence that the plan will be implemented, and the Conowingo pollutant load will be reduced by 2025,” the EPA review said.

When agreeing to create the Conowingo plan, the Bay states had hoped that Exelon Corp., which owned the hydroelectric dam, would foot much of the bill as part of the new licensing agreement. But Maryland and Exelon negotiated an agreement that does not include significant financing for the plan. That means the states — which are ultimately responsible for meeting Bay cleanup goals — would have to come up with the money.

“Maryland’s decision to not require Exelon to pay its fair share of the pollution reduction costs was a missed opportunity that leaves all the Bay jurisdictions liable for that funding,” said Beth McGee, director of science and agricultural policy for the Chesapeake Bay Foundation. “Maryland, and the other Bay states, are now forced to step up to the plate and fund these measures.”

Several environmental groups, led by Waterkeepers Chesapeake, have filed suit challenging the Federal Energy Regulatory Commission’s approval of a new operating license for the dam, saying Maryland’s agreement with the utility did not adequately protect the environment.

“What we have been saying for years has now been made clear by the EPA, [that] Maryland and other Bay state taxpayers are going to end up paying billions of dollars to clean up Conowingo Dam’s mess because Maryland and FERC both failed to hold

Exelon accountable,” said Betsy Nicholas, executive director of Waterkeepers Chesapeake. “This failure will be Governor Hogan’s legacy.”

In his letter, Ortiz urged states to “review and evaluate federal and state funding sources” that might be applied to the Conowingo plan. Most states have been getting influxes of money from COVID relief and infrastructure funding bills, some of which could be applied to Bay cleanup efforts, including Conowingo.

If that doesn’t happen, the EPA would redistribute responsibility for reducing an equivalent amount of pollution among the states in the watershed. That would still meet the overall Bay water quality goals, but it would do so by requiring places with less impact on the Chesapeake to do more.

The rationale is that all Bay states benefited when Conowingo was helping to improve Bay water quality by trapping nutrients and sediments. That, in turn, lessened the pollution reductions they were assigned in the 2010 cleanup plan, formally known as the Bay’s total maximum daily load, or TMDL.

“[Had] the reservoir reached trapping capacity prior to the Bay TMDL being established,” the EPA review stated, “the Bay jurisdictions would have had a greater lift to meet their respective Bay TMDL allocations.” ■

*Bay Journal associate editor Timothy B. Wheeler contributed to this report.*





# In danger of drowning, Norfolk faces criticism over flood-protection plan

## Army Corps, conservation groups debate 'gray' versus 'green' infrastructure

By Jeremy Cox

Facing a greater degree of sea level rise than almost any other part of the country, Norfolk is on the verge of launching a \$1.6 billion counterattack.

If fully funded, a flurry of construction will add about 8 miles of floodwalls, nearly a dozen tide gates and several pump stations to the aging stormwater system in Virginia's fourth most populous city. Outside this ring of protection, the government will bankroll buyouts of dozens of homes and elevate hundreds more.

The project, led by the U.S. Army Corps of Engineers, will transform Norfolk into a fortress when hurricanes and strong storms threaten to send surrounding waters surging into the city.

But the project isn't designed to handle standing water generated by rainfall or unusually high tides. That's a problem, critics say, because a changing climate is increasing the frequency and severity of both.

As the Norfolk Coastal Storm Risk Management Study enters a critical new phase — triggered in January when the Corps announced it is giving the city \$250 million from last year's infrastructure law to start construction — calls are growing louder to reimagine the effort.

"It's all predicated on, 'Hey, we're going to protect you during a storm event,'" said Skip Stiles, executive director of Wetlands Watch, a Norfolk-based advocacy group. "But the stuff that's nailing us on a day-to-day basis is nuisance flooding and constant sea level rise."

Experts say that southeastern Virginia is second only to Louisiana as the hottest spot for climate change in the United States. Around Norfolk, perched on a spit of land between the Elizabeth River and the mouth of Chesapeake Bay, water is rising at a faster rate than in most other places, and

the land is sinking. As a result, sea level in the region is expected to be 1.5 feet higher by 2075, spreading coastal flooding woes farther inland.

Besides taking issue with the project's largely one-sided approach to the flooding problem, Stiles and other environmentalists object to its overwhelming reliance on steel, concrete and other types of "gray" infrastructure. They warn that such measures will be too costly, potentially degrade water quality and possibly make flooding worse elsewhere.

The city and the Army Corps can address those concerns and relieve more types of flooding, environmentalists say, by adopting nature-based tactics, such as creating artificial oyster reefs to knock down storm surges and giving floodwater places to collect during heavy rains.

On the project's current trajectory, said Jay Ford, an outreach coordinator for the Chesapeake Bay Foundation's Virginia office, "you are going to continue pouring money down this structural-armoring hole instead of designing for how your community can coexist with the water."

### Gray versus green

The question of how to tackle coastal flood protection is gaining urgency across the country. In addition to Norfolk, the Army Corps has prepared or is in the process of preparing multibillion-dollar storm-defense plans for San Francisco, New York/New Jersey, coastal Texas and Miami-Dade County in south Florida. And in 2020, Congress authorized studies in several more regions, including Virginia Beach and North Carolina.

The Army Corps' longstanding line of attack toward flooding — codified in its funding formulas and ingrained in its work culture — has been to pinpoint vulnerable localities with the highest economic value and wall them off. Having created what are essentially giant bathtubs, engineers build pump stations to prevent them from filling up with rainwater.

A growing body of research, though, suggests that nature-based alternatives can do the job just as well, if not better. In a widely cited 2021 report, the International Institute for Sustainable Development, a Canadian think tank, reported that 11% of the global infrastructure needed over the next 20 years could be met by green solutions. Because natural strategies often offer secondary benefits, such as providing open space for water infiltration, they deliver 28% more economic value compared with gray infrastructure, according to the paper.

Under pressure from environmentalists and racial justice advocates, the infamously slow-moving agency has taken small steps in recent years toward considering greener flood-control solutions and giving more weight in its project-ranking system to less-affluent communities. But with so many consequential projects nearing construction, many advocates are losing patience.

Last November, nearly 100 environmental groups and climate experts signed onto a letter calling on the Army Corps to implement more-comprehensive, nature-oriented strategies toward fighting climate change in its work overall. The letter also urged officials to rethink the cost-benefit method of selecting projects for funding, a process that critics say intensifies existing inequalities.

"It is a hard ship to turn," said Emily Steinhilber, a Virginia representative with the Environmental Defense Fund, which initiated the push. Groups backing the letter with ties to the Norfolk area include the Bay Foundation, the Chesapeake Climate Action Network, the James River Association, Lynnhaven River NOW, the Virginia Conservation Network and Wetlands Watch.

*Above: During threats of storm surge, workers in Norfolk attempt to deflect floodwaters by opening and closing gates in the city's seawall along the Elizabeth River. This one helps to protect downtown Norfolk. (Dave Harp)*





This floodgate in Norfolk's seawall along the Elizabeth River looks out on Nauticus, a maritime discovery center on the city's waterfront, which features the battleship U.S.S. Wisconsin. (Jeremy Cox)



Kyle Spencer, Norfolk's acting chief resilience officer, and City Councilwoman Andria McClellan stroll on a boardwalk along the floodwall in the city's downtown. (Jeremy Cox)

Steinhilber, though, sees hope in places like Miami, where pushback from residents over a Corps-designed seawall drove local officials to lobby the federal government for natural solutions.

### Tensions persist over design

So far, the city of Norfolk is taking a measured approach to the issue — diligently supporting design work on the first phase of its flooding overhaul while working behind the scenes with the Army Corps to integrate nature, where possible, into the overarching plan.

"Where we have that space, we will design and plan with the Corps those kinds of features as well," said Kyle Spencer, the city's acting chief resilience officer.

Finding that space may not be easy. The city is about 95% built out, leaving little room on land for nature to be recreated or reshaped.

A top Corps official for the region said that green alternatives, which the agency calls natural or nature-based features (NNBF), appear to have a limited ability to lessen flooding from storm surges.

"On its own, NNBF does not provide the same level of risk reduction as gray infrastructure," Michelle Hamor, Norfolk District Planning and Policy Branch chief,

said in a statement. "While NNBF may reduce wave energy and slow water, it will not stop it from inundating the land behind it."

Andria McClellan, the City Council's most vocal member on environmental issues, said she will be watching the Army Corps closely. "They need to take the environment and equity into consideration as they score projects, something they haven't prioritized in the past," she said.

One of the first challenges that the city needs to overcome is funding its share of the cost.

The first segment of the citywide project will replace the existing 2,674-foot-long floodwall that prevents the Elizabeth River from overflowing its northern bank into the downtown area. Completed by the Corps in 1971, the structure mostly consists of a stern-looking gray wall backed by slightly darker gray stones.

Spencer said the city is looking to construct a new wall about 5 feet higher to account for the latest sea level rise projections. And it will be extended about 1.5 miles to the east to the Campestella Road bridge, protecting important sites such as the St. Paul Area public housing redevelopment project and Harbor Park, home of Norfolk's AAA baseball team.

The project also seeks to install two or three additional pump stations, depending on the availability of funds.

The Corps' recently announced outlay only covers 65% of the total \$383 million price tag. The city is on the hook for the remaining \$134 million.

McClellan said the city can't afford that tab for now. The city has a dedicated climate tax, known as the "resilience penny." But the fund only raises about \$1.5 million per year, and most of those proceeds are already spoken for by other projects, she said. The councilwoman has set her sights on efforts in Virginia's ongoing legislative session to create a statewide or coastal flood authority with its own funding purse.

"This is one project within this [\$1.6 billion] plan," McClellan said. "So, not only do we need to find \$134 million for the nonfederal match for this project, we have to find a similar match for all the remaining practices."

### An island of art

Spencer said the city will try to extend the wall westward, as far as Sentara Norfolk General Hospital. But with inflation and the rising costs of construction materials, officials won't know until later in the design process whether that's in the budget.

Erik Neil is rooting for the city to find the money. He is the director of the Chrysler Museum, an impressive showcase of ancient and contemporary art housed in a 200,000-square-foot Renaissance Revival structure. The building overlooks The Hague, an inlet that chronically overflows its banks.

Among its current exhibitions are two related to climate-induced changes: a collection of photographs taken in Florida and a display, dubbed *Waters Rising*, of local flooding scenes, including a large satellite

photograph of the museum altered to depict it under a blue swath of water by the century's end.

So far, Neil said, "we've never had water come up here into the museum, but what it does is it isolates you, and you become something of an island. Obviously, you can't have visitors. And if you have staff here at a moment like that, you could have people stuck here in the museum. So, we keep an eye on the tides."

### Potential for ill side effects

Stiles, the head of Wetlands Watch, worries that new walls along shorelines and floodgates across streams may have unintended consequences.

Trapping water inside massive flood structures after strong storms has been shown to cause potentially lasting water-quality problems, experts say. The resulting stagnation can cause pollutants to build up in streams and other waterways. And the burst of freshwater can upset the fragile balance of salinity, causing fish kills.

Spencer said he's working with the Army Corps to keep that from happening. Where long floodgates restrict the passage of water in and out of streams, they will consider adding smaller openings along the gate's length, called sluice gates, to improve flushing.

Environmentalists, joined by at least one local climate scientist, are raising questions about what will happen to the floodwater that is deflected by Norfolk's longer, taller floodwall.

"It will protect Norfolk, but where does the water go from there?" asked Michael Allen, an Old Dominion State University researcher.

The city and the Army Corps insist it will be absorbed by the vastness of the Chesapeake Bay, a mere drop in its 200-mile-long bucket. Still, Hamor said that on a smaller scale, wave interaction with floodwalls will be evaluated during the ongoing preconstruction engineering and design phase.

For his part, Allen is most concerned about a scenario in which the water rebounds directly southward toward the Black-majority city of Portsmouth. To him, the situation is a reminder that climate adaptation shouldn't be reserved only for people and places with the financial means to afford it.

"Those that are able and have the most capacity can adapt and mitigate those consequences," he said. "But there are communities that won't have that." ■



# Stalled MD oyster restoration project gets a break

## Court lifts order barring work on construction of new reefs in Manokin River

By Timothy B. Wheeler

The legal cloud over oyster restoration work on Maryland's Lower Eastern Shore may be dissipating. The state's second highest court has overruled a Somerset County judge who for three months had blocked the state from building new reefs in the Manokin River.

Seeding of the river with hatchery-reared oysters began last year, but the start of reef construction has been held up since fall. On Nov. 9, Somerset Circuit Court Judge Mickey J. Norman issued a temporary restraining order barring the state Department of Natural Resources from proceeding with the work. He renewed the order on Jan. 5 pending a March 18 hearing on a lawsuit brought by Somerset County challenging the state's authority over the river.

The attorney general's office, representing DNR, appealed the judge's decisions to the Court of Special Appeals. On Feb. 15, a three-judge panel issued a short order overruling the lower court judge and granted a stay of the restraining order. It declared that the judge's action violated state rules limiting the duration of such orders to no more than 10 days.

Chris Judy, director of DNR's shellfish division, had said in an affidavit that the open-ended restraining order from the Somerset judge "substantially jeopardizes" the state's ability to meet its 2025 deadline for completing large-scale oyster restoration projects on five Bay tributaries.

DNR plans to rebuild reefs and plant hatchery-spawned oysters across 421 acres of river bottom in the Manokin, a \$30 million project that's the largest such restoration Baywide.

The Manokin is the last of five Maryland tributaries targeted for large-scale oyster restoration under the 2014 *Chesapeake Bay Watershed Agreement*, which commits Maryland and Virginia to restore oysters in 10 tributaries by 2025, five in each state. Initial work is complete in six of those tributaries.

The Somerset board of commissioners filed the suit on Oct. 28 at the behest of local watermen opposed to the planned restoration in the Manokin. In their complaint, county officials argued that the state's plans to use stone to build reefs would make it

"impracticable, bordering on impossible" to harvest oysters in the river and would likewise disrupt crabbing and other fishing.

Lawyers for DNR countered that the restoration won't affect wild oyster harvesting because it hasn't been allowed in the Manokin since 2010, when the state designated it a sanctuary. They said the county's claims that crabbing and fishing would be hurt are "speculative" and don't justify halting the project.

A key element in the county's lawsuit is its claim that the county, rather than the state, has jurisdiction over the river, so it should get to decide what happens there.

DNR's lawyers countered that, by law, the state owns "submerged lands" and has regulatory authority over the waters above those river bottoms.

The law and previous court rulings would seem to support the state's case, according to Sarah Everhart, a senior research associate and legal specialist with the University of Maryland School of Law. A county can regulate some activities in waters within its boundaries, such as docks, piers and wharves, she said. But the county can't assert control over activities in the waters that the state is already regulating.

"I think it's going to be an uphill battle to try to claim that a county's jurisdiction



Rebuilding oyster reefs is an important part of the Chesapeake Bay restoration effort. This clump was pulled from the Harris Creek oyster sanctuary on Maryland's Eastern Shore as part of a University of Maryland research project in 2018. (Will Parson/Chesapeake Bay Program)

would trump a state's jurisdiction when the state has exercised that authority," she said.

The judge's orders skirted that question, but he decided that the risk of permanent, irreversible harm to fisheries from the state project was too great, so he blocked the reef work until he could hear arguments from both sides.

DNR officials have said they are forced to build reefs from stones because there is not enough old oyster shell to meet all of the needs. Stones would be deposited on 157 acres of river bottom, or a little more than one-third of the project. In response to the watermen's complaints, DNR Secretary Jeannie Haddaway-Riccio has said the stones would be smaller than those used in any previous restoration project.

The Manokin restoration project covers a 25-square-mile swath of the river, all of it off limits to commercial oyster harvesting since 2010. Watermen contend the river's sanctuary status has deprived them of access to once-productive oyster reefs, and they say the state once promised to return the river to the fishery after a few years.

More than 74 million hatchery-spawned juvenile oysters, known as "spat," were planted in the Manokin last spring on lightly populated existing reefs, according to DNR. The state issued a \$32 million contract in July to build reefs over the next five years in the Manokin and in the St. Mary's River across the Bay in southern Maryland. Reef work in the St. Mary's was completed last fall. ■



Oyster spat-on-shell, grown at the University of Maryland's Horn Point hatchery, was used at a reef restoration site in Harris Creek. (Steve Droter/Chesapeake Bay Program)



# Nonprofit steps into gap for DC woodland stewardship

## Ward 8 Woods works to spruce up woods, advocates for more trails through them

By Whitney Pipkin

Taking a walk in the woods isn't as simple as it should be for residents of Ward 8 in the District of Columbia.

Although the community in southeast DC has nearly 600 publicly owned acres of forests scattered across an otherwise urban landscape — more than some of the wealthier wards in a city known for its expansive tree canopy — few of them are truly accessible for recreation. Litter and a lack of trails make most of the woods uninviting, and low to no maintenance budgets for the local and federal agencies that own them leave some areas virtually entombed by invasive vines come summer.

But a scrappy nonprofit that's been picking up steam since 2018 has stepped into that gap. What began as a series of volunteer cleanups has morphed into Ward 8 Woods, a small organization that hires local residents to help maintain the woods while advocating for a future with more trails and more visitors.

Its founder and executive director, Nathan Harrington, sees the lack of care for and access to the ward's woods as a symptom of bigger problems for the neighborhood. But sprucing up these areas could be part of the larger solution, too.

"I think a lot of it has to do with systemic racial and class inequality. It's a case of people who don't have the financial and political capital to volunteer and

advocate" for the land, said Harrington, a former teacher who has lived in the community since 2009. "The wealthier the neighborhood, the better maintained the parks are."

Eighty-eight percent of Ward 8 residents are Black, and 33% live below the federal poverty line, according to census data. For the 573 acres of woodlands in the community, there are a mere 1.4 miles of trails winding through them. For comparison, the 1,754-acre Rock Creek Park in north-central DC has 36 miles of trails.

About 70% of Ward 8's woodlands are located on National Park Service land, originally set aside in part to preserve earthwork forts used for defenses during the Civil War. A parks plan for the city at one time envisioned the land around each of these hilltops becoming a greenway encircling the city, but the parks in Ward 8, so far, feature few amenities or trails.

The Suitland woods, on land owned by the DC Department of Transportation, is one of the places the nonprofit is advocating for a much longer trail, about 3.5 miles in all, that could wind through the trees along the busy road and give residents a safe place to walk.

But on a wintry Monday morning, four park stewards employed by the nonprofit had a full day's work ahead of them to clean it up.

"Today, we're gonna start right where that chair is," Harrington said as he handed out trash bags to the crew, pointing to a discarded armchair perched at the edge of a strip of woods behind apartment buildings.

The nonprofit's truck, which already held a discarded baby seat and a shopping cart from the previous cleanup, quickly filled up. Harrington said the truck hauls away, on a weekly basis, about 5,000 pounds of trash that's been illegally dumped or littered in woods like these. Some apartment buildings, he said, don't have adequate trash-hauling contracts, leaving residents challenged for ways to discard items that don't fit in the uni's dumpster (Now, they can call Ward 8 Woods for free help hauling things away).

"Some of the areas, we just keep coming back to. You'd be surprised that somebody takes the time to take some of this stuff deep into the woods," said Dalton Wilson,



Dalton Wilson, a member of the crew working with the nonprofit organization Ward 8 Woods, bags litter from a forested area in the District of Columbia. (Dave Harp)

a park steward and driver who makes several trips to the dump each day. Before this, he worked at Jimmy John's. "I like [the work], because we're cleaning the environment."

That day, crew members also found a driver's license, which they would try to return to its owner, and a duffel bag filled with family photos and Marine Corps records. As they focused on the edge of the woods, where trash thrown out car windows tends to accumulate, Harrington worked farther into the young forest, hacking at invasive multiflora rose and honeysuckle vines that were choking out its small trees.

Removing invasive plants threatening forest health goes hand in hand with removing the trash — and both are quick to return.

Another park steward who prefers to go only by "O.T." said he has a hard time watching someone litter now that he plays a role in cleaning it up.

"I'm not just doing this for the looks," he said, holding a plastic bottle in his trash-fetching tongs, "so I'm not gonna let nobody destroy it."

Research indicates one reason people litter is because they feel a lack of connection to the environment around them. To tackle that, Ward 8 Woods has a "Don't Trash DC" campaign that encourages residents to feel a sense of stewardship for woods near them. Signs promoting the program say,

"Don't mess with DC" and "Trash doesn't Go-Go on the ground," a reference to the popular genre of music that originated in the District.

Chuck Jenkins, Jr., a park steward and spokesman for Ward 8 Woods, said he's learned more about the outdoors during his 14 months with the organization. He's started to pass it on to his almost 7-year-old son.

"I teach him what's invasive, like the English ivy," Jenkins said, "and I show him what can harm you — like poison ivy — and what can't."

Walking through forests can reduce anxiety and depression, improve immunity and boost healthy antioxidants, research shows. Doing so became even more vital during the COVID pandemic, as city dwellers sought refuge on trails in the nearest stand of trees.

Trash-strewn as they often are — with traffic whirring by and helicopters thundering overhead — it might be hard to imagine some of Ward 8's woods having the same ameliorative effect. But Harrington points to their inherent value.

"Even in their neglected and degraded state, these woods still serve an important function. They're a buffer for noise, they soak up water runoff and break up heat islands," he said. "Yeah, this is not a wilderness. It's never going to be totally pristine, but what makes these woods special is the fact that tens of thousands of people live close to them." ■



A Ward 8 Woods crew member hauls discarded mattresses out of the woods near a busy street. (Dave Harp)





Maryland Department of Natural Resources.

# Trove of oyster shells discovered in Potomac. Now what?

## Debate ensues on future of historic reefs

By Timothy B. Wheeler

Hunting for sunken treasure evokes a sense of mystery. On a cold day in early February, there was plenty.

A misty rain chilled to the bone as Pete Springer guided his skiff past a rusting hulk, part of the Potomac River's abandoned "ghost fleet" in Mallows Bay. A dense fog closed in, obscuring the wreck, shoreline and most everything more than a few yards ahead. Only the GPS kept the boat safely headed downriver.

Springer, accompanied by Marty Gary of the Potomac River Fisheries Commission, was seeking something precious in the Chesapeake Bay region — a trove of oyster shells said to blanket the river bottom in an area where bivalves haven't lived for quite a while. Exactly how long, no one seems to know.

The "great shellfish bay," as the Chesapeake was known in earlier times, now suffers a severe shortage of both oysters and their shells. Historically, Bay oysters grew on great reefs made of older shell, and those shells are now in demand both for aquaculture and oyster restoration projects.

Nautical charts of the Potomac show about 30 "lumps" or knolls in a 10-mile stretch above the U.S. 301 bridge. That prompted speculation, as underwater hills in the Upper Bay mark one-time oyster reefs now smothered under thick layers of silt and sand.

Last summer, fisheries scientists sampled nearly half of the submerged knolls in the upper Potomac. They hit the jackpot, sort

of. Every haul of the dredge came up full of shells — but no live oysters.

On that murky February morning, Springer, a waterman who oysters downriver, likewise struck paydirt when he dropped hand tongs over the side of his skiff where the GPS showed a lump.

"Hear that?" he said, as the tongs' steel jaws produced clinking sounds from beneath the water. "There's plenty of shell here."

After repeated tries under tricky conditions, Springer finally pulled some aboard, festooned with bits of brown grass and encrusted with dead barnacles.

Chris Judy, shellfish division director for the Maryland Department of Natural Resources, estimates that the 13 lumps he helped sample last summer contain 750,000 bushels of shell. If other lumps are similar, he said the total could be 1 million bushels.

The discovery of such an extensive shell deposit raises questions about how the river has changed over time. The water where the shells are located is practically fresh, with salinity levels that periodically dip too low for oysters to survive for long, much less reproduce. When did oysters flourish there, when did they die out, and why?

It's also stirred interest in dredging those shells for use elsewhere. There's a clamor for oyster shells among watermen, who see them as crucial to maintaining and rebuilding the Bay's wild oyster fishery. Oyster farmers working leased patches of bottom also are desperate for shell on which juvenile oysters can grow. Government agencies and nonprofit groups working to restore the



Marty Gary of the Potomac River Fisheries Commission examines a handful of oyster shells tonged from the river by waterman Pete Springer. (Dave Harp)

Bay's depleted oyster population for ecological benefits want shell for that effort, too.

"Shell is in short supply, and it's expensive," said Gary, executive secretary of the Potomac River Fisheries Commission. The eight-person panel, with members from Maryland and Virginia, regulates fishing in the Potomac from the Bay to the District of Columbia.

Gary said that lately he's been unable to buy shell at any price. It's preventing the commission from replenishing oyster-bearing reefs in the lower Potomac.

## Shell to shell

Oysters produce their own shells. But to reproduce, their larvae need to attach to something hard, typically the shell of a live or dead oyster. Over eons, oyster larvae settled atop the shells of old oysters, building reefs in the Chesapeake and its rivers.

Today's population is a shadow of what it was 150 years ago, historically overharvested and ravaged for decades by diseases. With fewer oysters to replenish them, sediment



washing off the land buried many reefs, preventing new oyster larvae from finding homes.

Theoretically, those old shells could be reclaimed, but it's costly and often controversial. The Department of Natural Resources worked for years to get a permit from the U.S. Army Corps of Engineers to dredge 5 million bushels from Man o' War Shoal, a massive fossil shell deposit near the Patapsco River's mouth. But recreational anglers, environmentalists and even some watermen fought it, arguing that dredging would hurt water quality and degrade reef habitat for finfish. The state's Board of Public Works has not authorized the project.

Frustrated, watermen have urged Maryland to go after other shell deposits. One bill in this year's General Assembly would direct DNR to seek permits to dredge old shell from 27 locations, including the Potomac River. Another bill calls for a survey of Bay and river bottoms to better identify buried shell deposits.

Because oyster shells are in short supply, clam shells and granite have been used in the five large-scale oyster restoration projects Maryland has committed to under the 2014 *Chesapeake Bay Watershed Agreement*. Surveys have found hatchery-spawned oysters survived and reproduced on those substitutes, sometimes better than they have on oyster shell.

But shells are greatly preferred as substrate, especially by watermen, even when the reefs being created or enhanced are in a sanctuary.

Several years ago, DNR estimated that the Potomac harbors 34 million bushels of old shells. That's second in volume only to estimates of Man o' War's buried bounty, up to 100 million bushels.

But the shells in the upper Potomac are different from many other old reefs because they are not covered by silt and sand. They wouldn't require hydraulic dredging, the usual method for extracting buried shell deposits, which stirs up the bottom and clouds the water.

Their unusual condition and location have raised scientific interest. For those same reasons, some environmentalists caution against disturbing them.

"It's a very inhospitable place for oysters," said DNR's Judy, because the water is generally too fresh. Oysters need at least a little salt, 10 parts per thousand or more, to survive and reproduce.

Monitoring from the 1960s through mid-1980s shows that salinity at Maryland Point, the upper reach of the shell lumps, averaged between less than 1 ppt and a little more than 7 ppt. U.S. Geological Survey data going back to 1985 show



*These oyster shells are the remains of a reef in the upper Potomac River, where the water now lacks the salinity needed for oysters to thrive. (Dave Harp)*

salinity rarely got higher than 10 ppt and several freshets pushed levels close to zero in spring and summer, critical times for oysters to feed and reproduce.

Judging from the generally small size of the shells — many not much bigger than a quarter — Judy said the oysters either didn't live long or didn't have favorable growing conditions. Yet, given how completely the lumps are covered, he suggested the oysters must have been living and occasionally reproducing there for a long time, perhaps a century or more.

When Europeans first settled the region, brackish water reached farther upriver, said Claire Buchanan, a scientist with the Interstate Commission on the Potomac River Basin. But after the 1700s, she said, forest removal and farming practices led to rampant soil erosion, and the deluge of sediment altered the shape and volume of the Potomac, pushing saltier water downriver.

Others think the upper Potomac shells are more recent. Roger Mann, a shellfish researcher at the Virginia Institute of Marine Science, told a committee of the Potomac fisheries commission that they were likely several decades, not centuries, old.

Springer, 48, said he knew oyster shells were in that area because he and his father used to fish there and pull some up in their gill net.

A few older watermen recall tonging for oysters that far upriver or hearing of it decades ago. But in 1972, Tropical Storm



*Marty Gary of the Potomac River Fisheries Commission checks coordinates with waterman Pete Springer to locate mounds of oyster shell in the Potomac River. (Dave Harp)*

Agnes flooded the Bay and its tributaries with muddy freshwater, killing most oysters in the Potomac. Afterward, the only oysters that far upriver were on a single reef near the lumps — until 2019, when record rainfall wiped out the last survivors.

### Use them or leave them?

If conditions in the upper Potomac are unlikely to allow oysters to come back, watermen and some fisheries commission members wonder if they could put those shells to better use by moving them downriver to enhance active reefs in saltier areas.

"I say if they're there, take them and do something with them," Springer said, "because they're not doing anything up here."

But there are hurdles to tapping those shell lumps. Part of the area is an oyster sanctuary, and much of it also is a spawning reach for

striped bass, which supports a valuable commercial and recreational fishery.

The Potomac is also deemed critical habitat for Atlantic sturgeon, which are protected from disturbance under the federal Endangered Species Act. Endangered shortnose sturgeon have also been caught in that area.

Tom Miller, director of the Chesapeake Biological Laboratory of the University of Maryland Center for Environmental Science, said that to reproduce successfully, sturgeon need clean, hard river bottom to lay their eggs. That's the kind of habitat those shell lumps appear to present, he pointed out.

"This is a resource that's in very, very short supply, and the benefits of having access to 700,000 bushels of it are clear to all," Miller said during a fisheries commission committee meeting in January. "The challenge we face is that the costs aren't [clear]. I don't think we fully understand what [oyster reef] ecosystems are and what role they play."

Allison Colden, Maryland senior fisheries scientist with the Chesapeake Bay Foundation, suggested leaving the shell where it is, at least until it's been thoroughly studied.

"Obviously," she said, "it reflects a time when the hydrology of the waters of the Potomac and Chesapeake Bay [were different enough] to have oysters reproducing and depositing shell that far up the river." As such, she said, the shell-covered knolls are unique.

"This is a nonrenewable resource," she said. "As soon as we remove it, it's not coming back."

Further complicating the situation: Maryland owns the river bottom, so the state — not the fisheries commission — gets to decide what to do with the shells.

But DNR's Judy told some members of the commission that state officials would consider a pilot project that would skim shells off the tops of a few lumps. That's the only way to gauge the environmental impacts, he said.

The issue will come up for discussion March 10 at the quarterly meeting of the fisheries commission. If the panel wants to go ahead, Gary said he'd work with the advisory committee to develop options to submit to DNR, then to state and federal permitting agencies. It could take a year or longer, he said, but given the unknowns and complexity, there are good reasons to proceed deliberately.

"What's important now is they're there," Judy said. "Is there a way to potentially use them? Or is it best to leave them where they are?" ■





*This site treats acid mine drainage in Nanticoke Creek in Luzerne County, PA. (PA Department of Environmental Protection)*

# Federal funding to tackle abandoned coal mine pollution in 4 Bay watershed states

**Cleanup efforts could see \$6.4 billion from infrastructure bill**

**By Ad Crable**

**T**he \$1.2 trillion Infrastructure Investment and Jobs Act recently passed by Congress is sending an unprecedented \$6.4 billion for abandoned mine lands cleanup to Pennsylvania, Maryland, Virginia and West Virginia over the next 15 years.

The record cleanup money will enable a quantum leap in removing the readily visible scars that still harm the environment in the four states.

People like Ed Wytovich of the Catawissa Creek Restoration Association in Pennsylvania are giddy about the influx of funds.

Catawissa Creek is a 42-mile-long stream that drains into the Susquehanna River in eastern Pennsylvania. It is one of the most picturesque waterways in the state, all but untouched by roads. Its sand and gravel bottom, cobblestones and boulders should make it one of the best wild trout streams in the eastern United States. Sixteen of its tributaries have wild trout.

But it's dead. The stream suffers from high acidity and aluminum pollution draining from a 3-mile tunnel that dewatered coal mines long ago — poison to any fish and aquatic insects that should be there.

"I personally think it's one of prettiest screwed-up creeks east of the Mississippi," Wytovich said.

His group, as well as local conservation districts, Trout Unlimited and the state want to build a wetlands- and limestone-based treatment facility to bring back the Catawissa and unlock its potential.

Until now, federal funding has been restricted mainly to projects that pose a threat to public health, safety and property in populated areas, or those that boost economic development. Much of the other acid mine drainage, estimated to have contaminated 7,356 miles of streams in Pennsylvania alone, has taken a back seat.

But the federal funds from the new infrastructure bill can be spent directly on acid mine drainage, and officials in four Bay

watershed states are dusting off plans for hundreds of long-stymied reclamation efforts.

Included is a project to stop the mine drainage into Catawissa Creek.

Biden administration officials say the new money also will be used to reclaim abandoned mine lands, eliminate pollution and spur economic development in those blighted areas, all while creating jobs.

To understand the scale of the increase for the four states' 45-year effort to erase the blight from past coal mining, consider that Pennsylvania's estimated share of \$3.8 billion — the most in the country — is more than twice the total amount the state has received since annual federal cleanup aid began in 1977 under the Surface Mining Reclamation and Enforcement Act.

Of the 250,000 acres of abandoned mine lands still polluting and scarring Pennsylvania, almost half are in the Chesapeake Bay watershed. Although much of the pollution gets diluted by the time it reaches the Bay, mine lands are an unchecked source of sediment, nutrients and heavy metals washing downstream.

"It's an unprecedented level of funding," said Brian Bradley, director of the Bureau of Abandoned Mine Reclamation at the Pennsylvania Department of Environmental Protection. "We're looking at all angles. We're looking at how we can do more projects, bigger projects, and looking at problems we have set aside previously because they were thought to be too costly. Everything is fair game."

"Our community was stunned and thrilled at this windfall," added Andy



*Much of Catawissa Creek, a scenic 40-mile tributary of the Susquehanna River, is inhospitable to aquatic life because of pollution from abandoned coal mines. (Eastern PA Coalition for Abandoned Mine Reclamation)*





A huge coal waste pile looms over Ehrenfeld, PA, in 1956. The pile has since been cleaned up. New federal funding for Pennsylvania, Maryland, West Virginia and Virginia will enable more large-scale cleanups on abandoned mine lands. (Courtesy of Coalfields of the Appalachian Mountains)

McAllister, head of the Western Pennsylvania Coalition for Abandoned Mine Reclamation, an environmental group that has partnered with both the state and nonprofit organizations to clean up legacy coal problems.

### Elsewhere in the watershed

In Maryland, which will receive nearly \$75 million, the Department of the Environment is lining up new projects and adding staff to hit the ground running, said department spokesman Jay Apperson.

Maryland, with an estimated 450 miles of streams impaired by acid mine drainage, has a list of unfunded coal reclamation projects that total \$69.6 million. With nearly \$75 million coming in new federal aid, it would appear that the state could eliminate its legacy coal pollution, but Apperson said it's not quite that simple.

Each year, he said, the agency also has to fix landslides, mine subsidence and other pop-up problems that aren't on the official abandoned mine land list. Still, he added, "It's safe to say the money will be sufficient to reclaim the majority of the sites."

Maryland's coal lands are exclusively in the state's two westernmost counties — Allegheny and Garrett. A majority of high-priority projects are in the Chesapeake Bay watershed.

Virginia will get \$354 million, and its Department of Energy has prepared for the surge by beefing up staff capacity. But none of its unfunded inventory of \$425 million in projects is in the Chesapeake watershed.

West Virginia, where only 14% of the land mass drains into the Bay through the Potomac and James River basins, will get \$2.2 billion.



Coal waste is piled high at this site in western Pennsylvania. (PA Department of Environmental Protection)

The new infusion of federal money is in addition to funds the states have been getting since 1977 from fees collected from present-day coal mining companies. The Abandoned Mine Land Trust Fund has distributed nearly \$12 billion to states around the nation. The fund expired last fall but was renewed in the infrastructure bill with a 20% reduction in the fees, a concession to the struggling coal industry.

### Not just 'chasing landslides'

Cleanup advocates are not just excited about the record amount of aid about to be spent on legacy coal mining problems. They are also pleased that the funds have fewer strings attached so that a wider array of problems can be addressed.

Most importantly, the money is available for projects aimed solely at bringing impaired streams back to life, not just for public health and safety issues such as water supply remediation, removal of old coal slag piles or stabilizing abandoned "highwall" mines.

Now, instead of only "chasing landslides," as one environmental group characterized efforts to date, the federal money can go toward reviving dead or so-called "yellow-boy" streams — dramatically discolored by contaminants — with the sole

purpose of restoring their ecosystems. And, in the process, they can bring back fishing and recreational opportunities, too.

Fisheries and game managers from Bay drainage states recently wrote to the U.S. Department of the Interior, which will manage the new funds, urging that uses for the money be liberalized to allow more polluted streams to be restored. Interior Secretary Deb Haaland announced she was granting that request at a press conference in Pennsylvania on Jan. 24.

"We need to make sure those funds are broadened," said Mike Nerozzi of the Pennsylvania Fish and Boat Commission. "Oftentimes, these sites extend miles downstream and decimate everything in their path." He cited Catawissa Creek as a prime example.

The agency estimates that if the streams were again fishable, it could create \$29 million annually in angler-generated revenue.

U.S. Sen. Bob Casey of Pennsylvania promised, "I will continue pressing for more flexibility to use abandoned mine land funding to ensure Pennsylvania families have access to clean water, a right guaranteed by the Pennsylvania Constitution."

Another priority for state environmental agencies and advocacy groups is that new aid money be used to support the hundreds of aging acid mine drainage treatment systems that have been built but need rehabilitation or maintenance. Often, they are operated by volunteer watershed groups, conservation districts or municipalities with uncertain funding sources.

"These things don't last forever," McAllister said.

In Pennsylvania alone, there are 350 "passive" treatment systems for acid mine drainage that rely on wetlands and settling ponds to filter out harmful metals, in addition to infusing limestone to lower acidity. But larger-scale treatment facilities, similar to wastewater treatment plants, will be needed to fix high-volume mine discharges.

Haaland said the money could be used for such treatment plants, as well as to maintain and refurbish them as they age. ■



Acid mine drainage flows into a "dead" stream about 40 miles north of Harrisburg, near the town of Centralia, which was abandoned because of coal seams burning beneath it. (Kelly Michals)



New federal funding should allow for more mine drainage filtering systems like this engineered wetland in Luzerne County, PA. (PA Department of Environmental Protection)



# Dominion Energy plans coal ash landfill near Potomac River

## Disposal would keep waste near existing site at Possum Point

By Whitney Pipkin

Dominion Energy wants to create a permanent solution for a decades-long pileup of coal ash by building a new, lined landfill on its Possum Point property by the Potomac River. The Virginia utility company presented its plans to a small group of stakeholders during an online meeting in January.

The Possum Point Power Station burned coal for power from 1948 to 2002, creating expansive ponds throughout the property to store the resulting ash. The site's five ash ponds have over the last six years been consolidated into one that now holds 4 million cubic yards of coal ash — enough to fill the Capitol Rotunda 83 times.

Nationwide, coal ash sitting in ponds and pits has become a large industrial waste stream, leaving states and utilities grappling with strategies for safe disposal. The ash contains toxic chemicals and heavy metals such as arsenic, lead and mercury that pose health risks to people, fish and wildlife.

Virginia is among a handful of states with coal ash closure requirements that are stricter than federal standards at the time the state law was passed.

Spencer Adkins, director of power generation projects at Dominion, explained during the online meeting that the company's preferred method for handling the ash at Possum Point is to create a new lined landfill next to the existing storage pond.

Doing so would cost \$347 million, Dominion estimates. Recycling half of the ash to create building materials and removing the rest by truck would cost about twice as much. Recycling half and removing the rest by rail would cost about three times as much — as would removing all of the ash to an offsite lined landfill, the company says.

"In terms of impact, cost and permitting, we think this is a very attractive option. We think it is least impactful to the local neighborhood," Adkins said.

Dominion originally planned to permanently "cap" the coal ash in its current location in the clay-lined pond. The company took a similar approach to legacy coal ash pits at three other power stations located along Chesapeake Bay rivers in Virginia.

But a 2019 state law requires utilities to move piles of coal ash currently stored at a handful of power stations to landfills with



*The Possum Point Power Station, near the Virginia shore of the Potomac River at Quantico Creek, burned coal from 1948 to 2002, using expansive ponds to store the coal ash waste. (Courtesy of Dominion Energy)*

modern synthetic liners, or to recycle them. The law also requires that about 25% of the ash from at least two of the four affected sites be recycled.

Some environmentalists who've followed Dominion's coal ash decisions for years still oppose keeping the ash at Possum Point.

"My position is consistent," Potomac Riverkeeper Dean Naujoks said. "We want all the ash moved from the banks of the Potomac River, and we want as much recycled as possible and [the rest] put in a lined landfill so it doesn't threaten water quality. And we want it hauled out by rail. We haven't changed our position."

Those who prefer transporting the ash by rail say it would reduce the impact of truck traffic and emissions on the local community as well as the potential for coal ash spills on roads.

The landfill proposed for a northcentral section of the Possum Point property would also be close to a residential development called Potomac Shores, which has sprawled across the peninsula since coal ash discussions first started in 2016. Some homes that sold for more than \$500,000 in 2020 would be about 700 feet from the proposed landfill.

"Does Prince William County support landfilling coal ash 700 feet from residential properties? I just can't imagine," Naujoks said.

Prince William County Supervisor Andrea Bailey was cordial when she appeared onscreen at the end of the public presentation by Dominion. But later, she told local media that she was "very disappointed" in Dominion's plan to put the ash in an onsite landfill.

"I think Dominion is recommending this because it is the most inexpensive way to solve the problem," Bailey told *Inside Nova*. "Inexpensive is not always the best when you're talking about human lives."

Bailey did not return calls for comment. She also said at the close of Dominion's presentation that she plans to assemble a local taskforce to discuss options with Dominion.

The utility will need to seek a permit from the county to construct a landfill for the ash, and the State Corporation Commission must approve its plans and any additional costs to ratepayers. The new landfill would also need air and wetlands permits from the state, Dominion said.

Virginia Sen. Scott Surovell, a Democrat representing the 36th District, which includes Possum Point, and has been one of the most vocal opponents of storing coal ash in unlined pits near the Potomac. Now, he said, he sees Dominion's plan as in line with the law he helped to pass, and he thinks decisionmakers need to take a long-term view of the property.

"I think there's not going to be a power plant there in 20 years, and Prince William County needs to have a sense for their vision for that peninsula," said Surovell, citing the 2020 Virginia Clean Energy Act that requires Dominion to produce energy from entirely renewable sources by 2045. "I think that vision ought to drive the outcome."

County residents commenting on a Facebook post were skeptical of Dominion's cost estimates, particularly that it would cost more to carry the coal ash out by rail than by truck. They were also critical of Surovell, who will soon no longer represent the area under new redistricting lines and has received campaign donations from Dominion, his second-highest donor.

Dominion is working to dismantle longstanding coal ash piles and pits at three other power stations near Bay rivers in Virginia. It plans to recycle half of the coal ash from ponds at Chesterfield Power Station on the James River and to move the other half to a nearby existing, lined landfill. Ash from Bremon Power Station, also near the James River, would be placed in a new, lined landfill. All of the ash from Chesapeake Energy Center on the Elizabeth River would be recycled. ■



# MDE chief put on defense for enforcement lapses

## Staff shortage blamed for delays in acting on violations

By Jeremy Cox

Maryland's environmental chief vowed to make immediate reforms at his agency as he faced sharp questions Jan. 18 from state lawmakers frustrated with its performance over the last year.

Members of the Senate's Education, Health and Environmental Affairs Committee pressed Ben Grumbles, secretary of the Maryland Department of the Environment, for answers on the state's shortage of drinking-water system inspectors, the lack of penalties handed down to chicken farms that run afoul of pollution controls, the agency's failure last fall to warn of a sewage spill before more than two dozen people fell ill from eating contaminated oysters, and two separate instances in which major pollution violations went unnoticed until watchdog groups gathered evidence and reported their findings to the state.

Democratic Sen. Paul Pinsky, the committee's chair, said the revelations suggest a pattern of disregard for the public's well-being on par with the federal U.S. Food and Drug Administration's oversight failures that contributed to the nationwide opioid epidemic.

"One of the issues that comes out consistently [in the opioid crisis] is it wasn't an issue of the FDA controlling Big Pharma but Big Pharma controlling the FDA," Pinsky said. In Maryland's case, he said he wants to make sure that MDE is "controlling the sector that they are supposed to protect rather than that sector controlling them."

Grumbles pledged to push forward several changes, including hiring dozens of new staff members in the agency's Water Supply Program and significantly increasing the number of inspections conducted at chicken farms this year.

The MDE secretary also took personal blame for the agency's belated order in November to shut down shellfish harvesting in St. George Creek in St. Mary's County after a sewage spill. The local water and sewer utility followed protocol by immediately alerting MDE of the overflow of more than 25,000 gallons of diluted but untreated sewage, officials say. But the agency failed to formally act on the information for more than two weeks.

Because of that delay, a St. Mary's oyster farm unwittingly harvested more than

7,000 oysters from its leased bottom in the creek and sold them. As a result, 27 people in Virginia reported getting sick after eating the raw oysters.

"I accept responsibility for a breakdown, the failure in communication," Grumbles said. "Our enforcement people were aware of and noted the spill, [but] it didn't get properly communicated to the hard-working folks who run our Shellfish Sanitation Program."

The agency has since taken steps to make sure that a similar mistake doesn't happen again, he added.

Just three days after the hearing, MDE filed a lawsuit against the city of Baltimore, alleging repeated and ongoing discharge violations at the city's Back River and Patapsco wastewater treatment plants. The suit is seeking civil penalties for repeated and ongoing violations and an injunction requiring the city to bring the plants into compliance with their state-issued permits.

Less than two weeks later, on Feb. 2, MDE and a coalition of environmental groups filed separate lawsuits against a poultry rendering plant on the Eastern Shore, alleging dozens of water, air and hazardous waste violations in recent years.

The lawsuits — one brought in state court by the Maryland Department of the Environment and Attorney General Brian Frosh and the other in federal court by the nonprofits ShoreRivers, Dorchester Citizens for Planned Growth and the Chesapeake Bay Foundation — charge the Linkwood facility owned by Valley Proteins Inc. with repeated and continuing violations of environmental laws and regulations.

At the nearly two-hour hearing with Grumbles, a common refrain was that the agency's enforcement divisions are understaffed and overworked.

An analysis of MDE's workload, contracted by the U.S. Environmental Protection Agency, found that its drinking water inspectors each conduct approximately 240 inspections per year, nearly four times as many as their peers typically do in other states. At the time of the analysis, there were 27 vacancies out of a budgeted staff of 71 full-time inspectors.

Maryland Attorney General Brian Frosh contended that the lack of staff has contributed to another problem: a decline in the number of certified operators at the



At Valley Proteins' poultry rendering plant on Maryland's Eastern Shore, workers clean up sludge that was discovered in a stream leading to the Transquaking River. (MD Department of the Environment)

state's 3,300 public drinking water suppliers. The analysis, conducted by the business consulting firm Cadmus, found that 72% of water systems had certified operators in 2020, down from 84% in 2015.

The state was supposed to submit its response — which the EPA called a "resource investment plan" — in October. But Frosh said it has failed to do so, leaving the public in the dark about what measures the state agency intends to take. Grumbles later told the committee that MDE has turned in "phase one" of the plan and is working on the second.

Grumbles said that much of the decrease in staffing was caused by a "silver tsunami" of retirements during the COVID-19 lockdown. MDE has since brought the program's staffing level up to 68 people, he said, with the goal of reaching 102 in the coming months. Cadmus recommended 126.

A similar staffing shortage plagues the agency's oversight of the Eastern Shore's chicken industry, critics say. An Environmental Integrity Project report last year found that state inspectors are visiting fewer farms than they once did, falling from an average of 218 a year from 2013 through 2017 to 134 per year from 2018 through 2020, with that decrease predating the COVID-19 pandemic.

Grumbles promised to add two

inspectors to the current staff of three and increase the number of inspections by 50%.

One of the ways that MDE plans to increase inspections will be to conduct "video inspections," Grumbles said. Sen. Cheryl Kagan, a Montgomery County Democrat, questioned whether such a system would work, saying that farmers could simply "show what they want to show" with their cameras. Grumbles responded that MDE staff would direct farmers in real time on what to shoot.

Senators also sought explanations for why environmental groups — and not MDE inspectors — brought to light recent pollution violations at a pair of Baltimore sewage treatment plants and at a chicken-rendering facility in Dorchester County. "We have enough humility to recognize that we're not the only eyes and ears in the field," Grumbles told the committee.

But his detailed defense of his agency's recent actions rang hollow for at least one lawmaker.

"At the end of the day when we pass laws, it's the law-enforcement entity whose responsibility it is to enforce those laws," said Sen. Mary Washington, a Baltimore City Democrat. "We continue to hear these statements that seem to suggest that you have intention, that you're making best efforts and maybe you accept responsibility. But it's only after getting caught." ■



# Centuries later, gold mine pollution poses problems in VA

## Mercury used to mine gold lingers on land, water near Rapidan River

By Whitney Pipkin

A property in the northern corner of Orange County, VA, that borders the Rapidan River was once the center of a gold-mining boom in the state. Now, a new development project planned for the 2,600-acre property is dredging up some of that history — and fresh concerns over how to deal with an inherited legacy of contamination.

Developers asked county officials last year to consider rezoning the heavily forested property (part of the Germanna-Wilderness Area) to accommodate a mix of residential, commercial and light industrial development interspersed with parks and open spaces. Known as Wilderness Crossing, the development would happen in phases over the next 30 years.

The Piedmont Environmental Council, which serves as a land-use watchdog for the region, immediately opposed the project, describing it as the largest potential rezoning in the county's history. If developed to the fullest extent the zoning changes would allow, the proposal could eventually double the population of the largely rural county, currently home to about 36,000 people.

But when the council's director of state policy, Dan Holmes, began looking into the project, he found deeper concerns. A 1988 inspection of the largest of five abandoned gold mines on the property indicated significant mercury contamination.

The report by Virginia Energy (the state agency formerly called the Department of Mines, Minerals and Energy) noted that the site, known as the Vacluse Mine, should be investigated for a potential Superfund cleanup. The U.S. Environmental Protection Agency's Superfund program cleans up some of the nation's most contaminated lands.

The Virginia Energy report also noted that most of the gross tonnage of gold extracted in the state between 1832 and 1860 came from the Vacluse Mine. Mining records indicate Henry Ford bought the gold mine at one point just to get some of this machinery, which is now on display in a Michigan museum.

Gold mining along Virginia's pyrite belt looked a lot different from mining in California. The gold in this area is trapped inside the bedrock. Miners would harvest the rock and use a rock crusher to expose the embedded gold.



Dan Holmes, director of state policy for the Piedmont Environmental Council, talks to a local reporter in June 2021 on a road leading to a proposed new development site in Orange County, VA. The project, which would transform the 2,600-acre property along the Rapidan River, has run into concerns about mercury pollution left onsite from old gold mines. (Hugh Kenny/PEC)

Through a process called amalgamation, they added mercury, which binds to the gold. The mercury was burned off in an industrial boiler, causing some of the pollutant to be released into the air and some left behind as tailings to be reused or discarded.

Many residents know that gold mining took place as far back as the 1830s along the pyrite belt which runs through this corner of Orange County. The developer even nodded to that history by naming proposed roads "Goldmine Parkway" and labeling neighborhoods the "Goldmine Preserve" and "Goldmine Central." But no one seemed to be aware of — or at least talking about — the potential for remaining mercury contamination.

Holmes researched whether state or federal agencies had investigated the need for a cleanup at the site since the 1988 report, but he found nothing.

"At what point do we, as citizens in the commonwealth, have a right to say, 'What the hell's going on?'" Holmes asked.

### Mercury rising

Jon Steinbauer, a geological technician overseeing orphaned lands for Virginia Energy, said the 1988 report was triggered by fresh interest in permits to mine gold again at the site. Documents indicate several

mining companies were studying the site at the time, and Steinbauer said someone was also sifting through sediments in the nearby Rapidan River to look for gold.

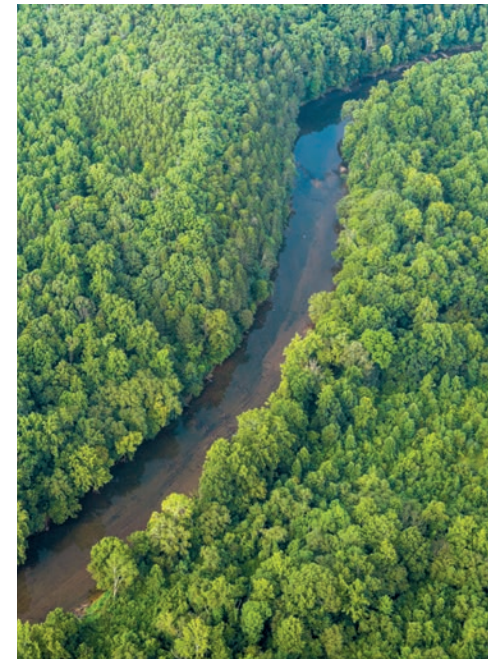
In a stream at the site, the inspector found what he initially thought was a beaver dam, but it turned out to be a pile of mercury tailings discarded from the mine operations, Steinbauer said.

"Tests were done on it, and that's when the concerns were raised from that initial inspection," he said.

Another 1988 document suggested rerouting a stream around the tailings pile, sealing it off "so that mercury cannot re-enter the surface waters." Other historic maps indicate that a tailings pond could be located in or along Shotgun Branch, which originates on the property and runs into the Rapidan.

Steinbauer said the Virginia Department of Environmental Quality followed up on the reports by testing the water quality and fish tissue in the river. While mercury was found, it was not present in levels high enough to trigger additional action.

Twenty-two years later, though, in 2010, a nearly 10-mile stretch of the Rapidan River that runs along the edge of the property was declared impaired because of mercury in fish tissue.



Virginia declared a nearly 10-mile stretch of the Rapidan River, which forms the northern boundary of the proposed development site, impaired for mercury in fish tissue in 2010. (Hugh Kenny/PEC)

Connor O'Loughlin, site assessment manager for EPA Region 3, searched the agency's database for information about the Vacluse Mine to see whether the EPA had ever investigated its potential as a Superfund site. He said there were no documents mentioning the site. In Virginia, DEQ coordinates with the EPA to assess whether sites should be cleaned up, and both agencies said they had no records from this location and no evidence of additional investigations.

"That inspection report [from Virginia Energy] was sent to me. I showed it to the Virginia DEQ folks, and they had never seen that before," O'Loughlin said.

Virginia's General Assembly passed reclamation laws in 1968 requiring mine companies to properly close and reclaim properties used for mining. But mines that were abandoned before then are considered "orphaned," leaving a vacuum of responsibility between the company that mined it and state and federal agencies.

In Virginia, the responsibility to reclaim an abandoned mine falls to the landowner. But, according to interviews with various agencies, there is no clear mechanism for requiring a landowner or developer to clean up contamination that began as far back as 190 years ago.





A historic photo shows the Vaucluse Mine in Orange County, VA, as it appeared when it was active in the mid-1800s. (Hudson Institute of Mineralogy)

Questions about how the discovery of gold mine pollution would impact the proposed development hung in the air after a November meeting of the Orange County Planning Commission. After talking to the Piedmont Environmental Council about its concerns, District 1 Commissioner Jason Capelle started a public conversation with the other commissioners about the questions that recent gold mine findings raised.

“I know the landowners are aware of the mines, but are they aware of the records? Who’s responsible for the cleanup? That’s a question that [is] hard to answer. Is it federal, state, the county or the landowner?” Capelle asked at the meeting, according to the *Orange County Review*. “Has the landowner already considered some mitigation?”

After that meeting, Holmes said, it seemed to have “stopped everything dead in its tracks.”

### Developer responds

At the end of January, an engineering firm representing the developer and landowner submitted a 55-page document detailing plans to address mine contamination if the rezoning is approved by the county’s Board of Supervisors.

“The landowner is committed to ensuring that the existing mine areas are accurately classified and properly evaluated in accordance with applicable laws

and requirements,” wrote Keith Oster, a principal at the engineering firm Sullivan Donahoe & Ingalls. “Once the evaluation process is completed, the landowner can better address any concerning areas and implement a mitigation plan in coordination with Virginia Energy to best address the same.”

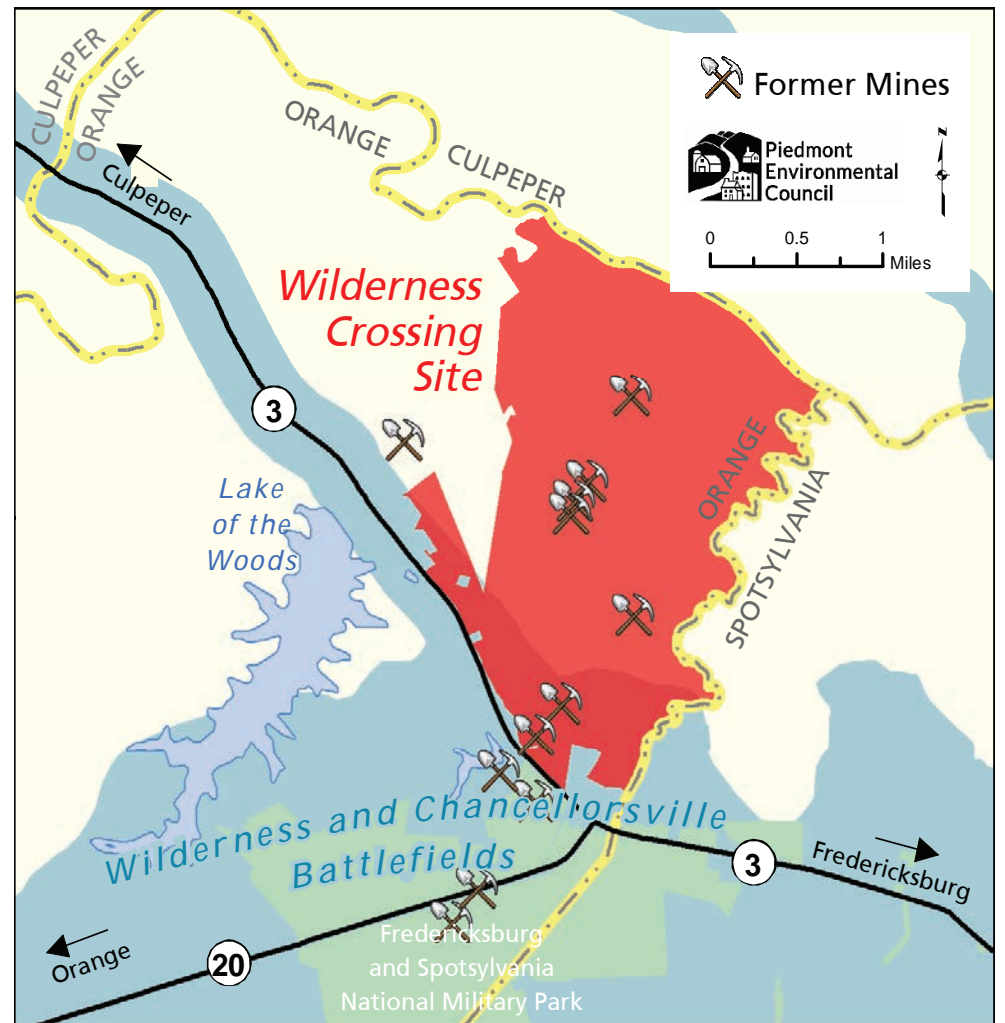
Oster represents both landowner Charles “Chip” King and developer KEG Associates III, LLC, run by Kenny Dotson, who applied for the rezoning. Oster’s document, submitted to the county’s director of planning, outlines three phases of potential investigation and remediation that would begin after the site has been rezoned.

In a telephone interview, Oster said that developing the property is not in conflict with remediating the remaining contamination. Rather, “rezoning is a mechanism for funding” it.

If the county approves a rezoning, “as part of that, we intend to proffer to deal with the mines in a manner consistent with what I wrote,” he said.

The document outlines where the gold mines were located along a strip down the center of the property. Topographical maps show impressions in the landscape left by the pits. Some of the mines also had vertical shafts for reaching underground gold deposits as deep as 220 feet.

One concern the plan addresses is the safety of building structures above underground shafts. The project would avoid



A developer is requesting rezoning to support the development of this property along the Rapidan River in Orange County, VA, but legacy pollution from past gold mining has raised more challenges for the proposed project. (Piedmont Environmental Council)

building roads or structures in those areas, intending instead to cap the shafts with concrete and post warning signs. These measures would be taken, the document states, despite the shafts posing no serious risk of collapse because they are bored into bedrock.

The plan would also be changed to avoid construction on “vast swaths of land” that include both environmentally sensitive areas and steep slopes where mining occurred. A map shows the former gold mine areas at the center of the development plan with orange buffers marked around them. The company would begin by testing those areas to determine if and where additional mitigation is needed. This phase would take place within a year of the proposed rezoning. Much of the remaining mitigation work would occur over the following years alongside construction.

Potential mitigation might include capping contaminated hot spots with an impervious plastic or clay liner. The plan acknowledges evidence of mercury

contamination, but it posits that most would be concentrated at the Vaucluse site. That’s where the heavy machinery used to extract gold from other minerals was located, according to descriptions of the mines in 1847.

After an initial review of the company’s updated plan, Don McCown, the environmental council’s Orange County field representative, was not reassured.

“What jumps off the page is that the first phase of the applicant’s ‘general’ evaluation of the mine sites would not start until *after* the project is rezoned,” McCown wrote in a post. “In other words, ‘Trust us, we’ll look into it later.’”

McCown instead suggested that the Orange County Board of Supervisors hold a public briefing with experts to learn how best to handle historic gold mining at the site. That board will ultimately decide whether to rezone the property and will set the terms. ■



# Scientists to study ins and outs of plastic pollution in Choptank

## Project will look at how pieces move through Bay waters

By Whitney Pipkin

Plastics swirling around in ocean gyres have garnered plenty of recent media and research attention. But what happens to the pieces that flow through rivers closer to home — or are trapped in marshes and washed up on shorelines along the way?

Scientists at the University of Maryland Center for Environmental Science aim to answer that question through a two-year research project kicking off in 2022. The National Oceanic and Atmospheric Administration's Marine Debris Program chose the project as one of five to receive funding out of a nationwide pool of 72 applicants.

The effort will focus on the Choptank River, the largest waterway on the Delmarva Peninsula, which runs through a relatively rural and agricultural region. With the university's Horn Point Laboratory sitting on its banks near Cambridge, on Maryland's Eastern Shore, the Choptank has been thoroughly studied, making it an ideal test case for understanding how microplastics move through river systems.

A different microplastics project based in the Chesapeake Bay region recently received a federal grant, too. Last year, the National Science Foundation's Historically Black Colleges and Universities Research Infrastructure in Science and Engineering program awarded \$1 million to Morgan State University to study the impact of microplastics on marine life. The work is based out of the university's estuarine lab in Calvert County, MD, with a focus on training students in microplastics research.

Microplastics have been found everywhere scientists have looked for them, including in the air over the Pyrenees mountains. That's true in the Chesapeake region, too, where the U.S. Geological Survey has detected the small plastic particles at sampling stations throughout the Bay and its tributaries.

The researchers in Cambridge want to know where they end up and what happens along the way.

"We're looking at how microplastics flow through the system and how they're affected by the system," said James Pierson, a biological oceanographer and associate



Researchers William Nardin, left, and Jamie Pierson examine a testing array of various types of plastics at the University of Maryland's Horn Point Lab on the Choptank River. (Dave Harp)

professor at Horn Point. "As the river is flowing, what happens when [microplastics] move past these marshes? How is that different from what happens in the middle of the channel?"

Other research in the region suggests that Bay grass beds could be serving as catch basins for microplastics. One study found the particles in significantly higher concentrations in grass beds than in an adjacent water column in the Potomac River. The beds are also a hotbed of ecological activity where species such as blue crabs could mistake the tiny plastic bits for food.

Working with fellow associate professor William Nardin, who specializes in hydrodynamic modeling at Horn Point, the Choptank researchers plan to use old and new tools to answer their questions. The \$167,155 federal grant will support the research that could apply to other rivers in the Bay watershed and beyond.

In addition to collecting microplastics with a net behind a boat, Nardin will use a drone with a special camera to locate larger plastic debris over a broad area. The work will analyze plastic samples of all sizes, from intact bottles and bags to pieces no larger than a pencil eraser.

The scientists will also use microscope and camera technology that's more widely

available — rather than what is only on hand in high-tech labs — to identify different types of microplastics gathered from the water. This could help set the stage for school groups or citizen scientists to participate in microplastics research if they can use equipment they have on hand to identify types of plastic.

Experiments will look at how a half-dozen types of plastic polymers degrade and move downriver. Are plastics more likely to be trapped in the marsh during summer, when grass beds are thicker, then rejoin the stream channel in the winter? Are more dense plastics likely to sink to bottom sediment while lighter pieces flow farther from the shore?

"This will help us make estimates of how the morphology of the river affects the flow of plastics through it," Pierson said.

All of the data will feed a hydrodynamic computer model to explain and predict how plastics flow through the river and what factors determine where they land. The hope is to make this information applicable to a wide range of water bodies, informing policy decisions aimed at curbing plastic pollution.

Matt Robinson, environmental protection specialist with the District of Columbia's Department of Energy &

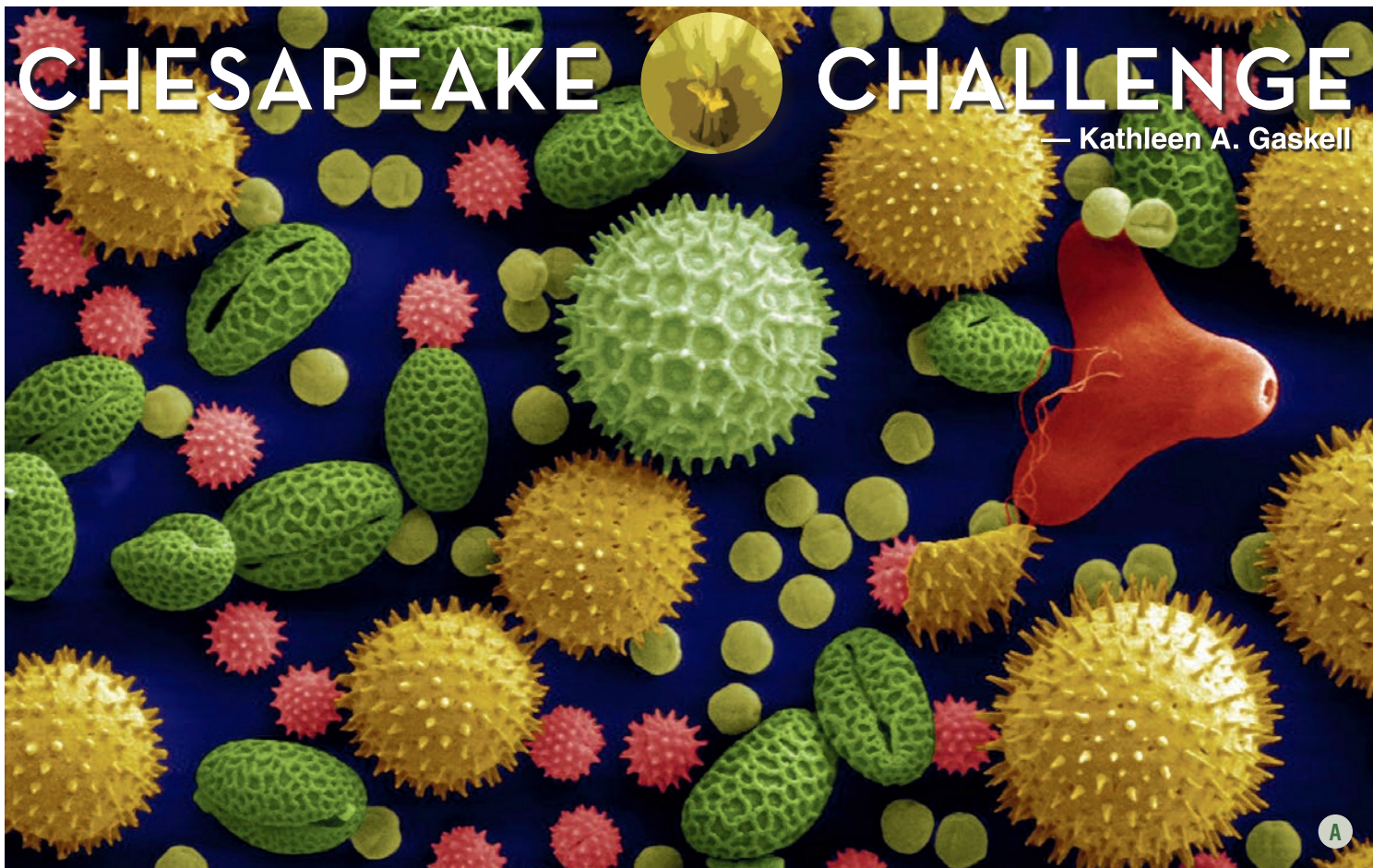


Plastic bottles like this one, filled with Choptank River water, are one of myriad types and sizes of plastic trash in the Bay. (Dave Harp)

Environment, said the work will help guide the Chesapeake Bay Program's Plastic Pollution Action Team, which he chairs.

"Research such as this is vital to understanding the impacts of plastic pollution on the Chesapeake Bay and its watershed," Robinson said. His team has pointed to the need for this type of research in Bay waters "to understand the ecological risk of plastic pollution and how these pollutants could impact restoration success." ■





# CHESAPEAKE CHALLENGE

— Kathleen A. Gaskell



## Pollen particulars

**Sneezes from breezes:** If you suffer from a pollen allergy, it is most likely from a wind-pollinated plant, which releases a profusion of pollen into the air to reach female flowers of the same species. Because these plants depend on wind, not animals, to disperse pollen, their flowers (if they have them) do not need nectar or a scent and tend to be small, with dull-hued petals.

**Bee-licious:** Bees and flying insects aren't the only pollen eaters. Birds, bats and even some mammals eat pollen. Spiders are known to eat pollen when it gets trapped in their webs. Indigenous Americans added cattail pollen, a source of protein, to flour to make cakes.

**Take a powder, pollen!** Some plants can be pollinated by pollen they themselves produce. Other plants must get pollen from a separate plant of the same species; their systems produce a toxin that poisons the pollen tube if the pollen and pistil are too closely related.

**Pollen primeval:** Pollen grains have a very durable outer coating that regularly shows up fossilized in sedimentary rocks. Because the grains are easily identifiable, they can reveal information about past climate and habitat conditions.

**It floats its boat:** The male wild celery plant, an aquatic species found in the Chesapeake region, launches its pollen in boatlike structures that float until they reach the female plant (unless a fish eats it first). In most aquatic plants, though, the flower emerges just above the water and attracts insect pollinators.

*A. This colorized 500x magnification shows the pollen from common plants: sunflower (pink spiky sphericals), morning glory (mint green sphericals with hexagonal cavities), hollyhock (yellow spiky sphericals), lily (dark green, bean-shaped), primrose (red tripod-shaped) and castor bean (small, light green, smooth sphericals). (Dartmouth College Electron Microscope Facility/Public domain)*

*B. A honey bee (Apis mellifera) with a full pollen basket or corbicula. They use the structure to harvest pollen and carry it to the hive. (Michele Danoff)*

*Icon: The pollen-covered center of a daffodil (Narcissus pseudonarcissus) stamen. (Michele Danoff)*

## Pollination: Posies with a purpose

Flowers exist to produce more flowers. This requires moving pollen from a male flower to the pistil of a female flower or from the male part of a flower to its female counterpart in the same flower. There, it fertilizes the seeds of the next generation.

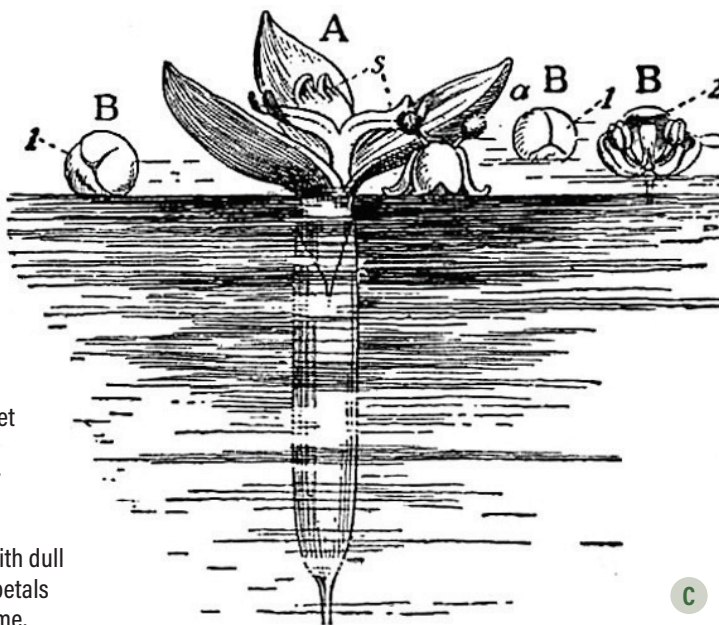
For many plants, pollen is transported by animals, and flowers have evolved to attract and reward the species best able to get the job done. For example, some plants produce appealing scents. But if a plant's favored pollinator lacks the sense of smell, the plant won't waste its energy producing a scent. Others make strategic use of colors (not every creature sees every hue). Plants also have shapes that ease access for specific pollinators. In some cases, plants also provide nectar guides: markings that map the route to the goodies.

Can you match these pollinators to the types of flowers most likely to attract them? Answers are on page 37.

Bats   Bees   Beetles   Birds  
Butterflies   Flies   Moths

1. Night-blooming, tubular, non-lipped flowers with pale red, purple, pink or white petals. Strongly sweet scent.
2. Large, bowl-like flowers with white or green petals. Scent ranges from fruity to fetid.

3. Flowers range from shallow or tubular to complex traplike structures with pale and dull-to-dark-brown or purple petals with flecked translucent areas. Putrid scent.
4. Shallow or tubular flowers, that may include a landing platform. Bright white, yellow, blue or ultraviolet petals that may feature nectar guides. Sweet or minty scent.
5. Bowl-shaped flowers with dull white, green or purple petals that are closed in daytime. Musty, fragrant or fruity scent.
6. Narrow, tubed flowers with a spur or large landing pad of bright red and purple petals that may include nectar guides. Fresh but faint scent.
7. Cup-shaped flowers that have a strong perch or funnel-shaped flowers with red, orange or white petals. Unscented.



*C. This illustration shows the pollination of wild celery. The female flower (A) is labeled to show its stigmas (s). The male flowers (B1 & B2) show the flowers before and after the spreading of its petals. A male flower also has floated alongside the female, and one of its anthers (a) has opened to set the pollen free while in contact with a stigma on the female plant. (Encyclopedia Britannica 11th Edition 1911/Public Domain)*





## Learn birds by listening: There's an app for that

By Jeremy Cox

When I'm walking to the mailbox, letting the dogs outside or otherwise outdoors with time on my hands, I bring up an app on my mobile phone and tap the "record" button. A black-and-white spectrogram materializes at the top half of my screen.

And so it begins.

The spectrogram turns into a running Rorschach Test of hazy, gray splotches. These visual representations of sounds travel across my screen from right to left, mapping whatever noises the microphone happens to detect: leaves rustling, dogs barking, leaf blowers.

The lower half of the screen remains a white blank, betraying the app's indifference toward such frivolous racket. Its true purpose isn't revealed until a soft song radiates from a nearby tree branch.

"Fee-bee-fee-bay. Fee-bee-fee-bay."

Informed by one of the world's premier

libraries of nature sounds and guided by machine learning, the app springs to life. The words "Carolina chickadee" flash onto the screen accompanied by a small photo of a chipper-looking bird with a black cap and white cheeks.

Move over, Wordle. I have a new digital obsession.

Using the Merlin Bird ID app is like having an ornithologist in your pocket. It's not quite ready to replace human experts. But for fledglings in the field who struggle to differentiate between red-tailed hawks and red-shouldered hawks or between chipping sparrows and song sparrows, it can give wing to a new hobby.

Especially for fledglings like me. I love nature, but I'm no naturalist. Some birds, of course, are relatively easy to identify by one attribute or another — the blazing red feathers of the male Northern cardinal or the plaintive cry of the mourning dove. But most, at least for me, are not.

Several apps have popped up in recent years to help users identify things in nature. A couple of years ago, I tried out some plant ID products, setting up an informal test to see whether the apps could agree on an answer when each was fed the same photograph. The results were mixed.

Developed by Cornell University's Lab of Ornithology, the Merlin app has taken a couple of key technological leaps forward. When it debuted in 2014, the app simply posed a series of questions ("What was the size of the bird?" "Was the bird on a fence or wire?") to help users narrow down the possibilities.

It added a photo ID component three years later. But many users found it difficult to capture clear closeups of birds with smartphones.

Meantime, the app's developers began working toward integrating sound into the app. Grant Van Horn, the lead developer on the project, said they considered it their "holy grail."

Top left photo: A red-headed woodpecker perches in Newport News Park, VA. (Bill Boeh)

Bottom left photo: Birder Jane Frigo checks off bird species on a pre-printed checklist. (Jeremy Cox)

Right photo: Melissa Freudenberg, foreground, and Jane Frigo, center, scan for birds along the edge of Lee Hall Reservoir at Newport News Park. (Jeremy Cox)





Emily Argo uses binoculars to spot birds along a boardwalk at Newport News Park as fellow members of the Hampton Roads Bird Club head toward the next location on their bird walk. (Jeremy Cox)

“The fact that birds vocalize is what makes them so special,” he said.

Merlin isn’t the first app promising to match songs and chirps to the right bird. But its developers assert that theirs is more accurate. Typically, bird ID programs pick out bird sounds from 30-second recordings that may contain noises made by birds other than the labeled species. This can cause the model to attribute all the sounds to the same bird, leading to erroneous results.

To counteract that effect, bird experts had to painstakingly listen to recordings — 140 hours of avian calls representing 458 species in the U.S. and Canada — to train the Merlin software to recognize the exact moment when a specific bird is vocalizing. The model also was fed 126 hours of non-bird ambient sounds to teach it what *not* to listen for. Cornell released the sound ID program to the public last June.

“It’s not meant to replace people,” Van Horn said. “It’s meant to be another engagement point to get people hooked on the natural world. We took this onerous or frustrating process of memorizing a bird call, and we’ve made it a heck of a lot more accessible.”

To test the app for myself, I attended one of the twice-monthly bird walks conducted by the Hampton Roads Bird Club at Newport News Park.

These people know their birds. The club was founded in 1951. Members have been patrolling this park on the first and third Sundays of

each month like clockwork for decades, keeping meticulous records of their sightings. They often arrive before sunrise and stay past noon.

Nine of us gathered behind the ranger station in the early morning gloom. Jane Frigo, a retired preschool teacher who brims with energy, went over the itinerary with the group. Suddenly, her attention was pulled toward the direction of a faint tweeting.

“That’s our titmouse,” Frigo said. The next moment, she is imitating the sound: “*Pee-ter, pee-ter, pee-ter.*”

I asked whether she ever uses Merlin or another bird sound app. No need, she replied. She can rely on one of her veteran fellow bird enthusiasts. But as the day progressed, it became apparent that Frigo hardly needs any help identifying bird calls. She is a walking encyclopedia herself.

My birding expertise, on the other hand, extends only to the edges of my phone. I opened the Merlin app and pressed the record button. The titmouse was still tittering from its nearby perch. Sure enough, its name popped up on my screen. A different name followed in quick succession.

“Look at that,” I said, chuckling while turning the screen in Frigo’s direction. “A tufted titmouse and an American crow right there.”

“See! That’s great,” she cheered.

The park provides an almost ideal setting for birdwatching. At 8,065 acres, it is one of the

largest city-maintained parks east of the Mississippi River, stretching nearly 10 times the size of New York’s Central Park. The terrain is almost uniformly flat, with hard walkways and wooden boardwalks lending access deep into a variety of bird habitats, ranging from swamps to stands of pine. The focal point is 230-acre Lee Hall Reservoir, the mirrorlike pond that serves as a source of drinking water for Newport News.

The temperatures were hovering around 30 degrees that morning, but it was good weather compared with the previous couple outings, Frigo cheerfully observed. The last was halted by sleet. Before that, a light rain was their constant companion. When the sun finally rose during my visit, the sky was clear and reverberating with the chatter of birds.

As we strolled from the edge of the reservoir to an ice-covered swamp, I kept testing the app. I noticed that the human experts have a distinct edge. Their ears can pick up sounds better than my phone. I found that several of the calls were too faint to be detected. It certainly had no chance hearing the bald eagle that breezed past well above our heads.

So, proximity matters.

But every once in a while, the app seemed to get the upper hand. During a 2-minute, 47-second recording session, the app identified four species: a titmouse, fish crow, brown-headed cowbird and white-breasted nuthatch. I announced the list to my bundled-up counterparts, and my voicing of the cowbird’s presence initially drew skeptical looks.

Within minutes, though, the app’s guess was corroborated when someone picked out the sound of a cowbird.

“I think Merlin’s working out pretty well,” Frigo announced at one point.

By the end of the morning, the group counted 55 unique bird species around the park. I switched on the Merlin app for only a fraction of the time, so I had no real hope of matching their spotting power. Even so, it sensed only 15 different bird species, a fraction of the total diversity.

In its current form, the app records for two minutes before a message appears, asking if you’d like to continue recording. Van Horn said he added the feature because he worried that older phones might have trouble saving the large sound files. He plans to drop it in the updated version due out later this spring.

The Merlin Bird ID app is free. But be prepared for it to consume a good chunk of your phone’s storage space. The app itself is only a little more than 100 megabytes. But the bird sound data you need to download is a gigabyte or more, depending on which region you select. The “pro” to this “con” is that the app can work anywhere without needing to fly into the cloud.

Like some kind of bird. ■



An osprey surveys its surroundings at Newport News Park. (Bill Boeh)

### Merlin Bird ID

- An app developed by the Cornell Lab of Ornithology
- Available for free on most phone platforms
- What’s in a name? “Merlin” refers to both the fabled magician and a small species of falcons.
- Data connection is unnecessary to run the app. But if you are connected, your location and information about the time of year can help the program suggest bird species with greater accuracy.





Kayakers enjoy an early morning paddle on Maryland's Choptank River. (Dave Harp)

# Your generosity lets us shed new light on Bay issues

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!*

## GUARANTOR

**Raymond C. Nichols**  
Annapolis, MD

**Donald Boesch**  
Annapolis, MD

## CHAMPION

**John & Sally Freeman**  
Bethesda, MD

**Dr. & Mrs. Clayton Moravec**  
Baltimore, MD

**Elizabeth Kemp Roszel**  
Cockeysville, MD

**Michael & Susan Sicuranza**  
Seven Valleys, PA

**Rudolph Zelger**  
Carlisle, PA

## BOOSTER

**Ted Delaplaine**  
Crownsville, MD

**Paula Dubberly**  
Alexandria, VA

**Koinonia Foundation**  
Rehoboth Beach, DE

**Victoria & Emory Tate**  
McDaniel, MD

## ADVOCATE

*In Memory  
of Patricia H. Phifer  
from Andrew & Debbie Hoover*  
Mifflinburg, PA

**Chris & Maria Koval**  
Landenberg, PA

**John & Marti Detweiler**  
Camp Hill, PA

**Cathy Dennis**  
Lewisburg, PA

**Barbara & John Franklin**  
Washington, DC

**Leo Knighton**  
Fallston, MD

**Dr. Richard Szarko**  
Manheim, PA

## BENEFACTOR

**Howard Danley**  
Mount Airy, MD

**Waldo Nelson**  
Waldorf, MD

**Katherine Sarfaty**  
Maidens, VA

**Marjorie & David Wellman**  
Washington, DC

**Jeffrey Wright**  
Oak Hill, VA

**James & Mary Campbell**  
Centreville, MD

**James Garner**  
Roanoke, VA

**Carlton M. Green**  
College Park, MD

**Bill Herrmann**  
Potomac, MD

**Paul Kratchman**  
North Beach, MD

**George Keen McLellan**  
Gloucester, VA

**Leslie B. Middleton  
& Pat Punch**  
Charlottesville, VA

**Sally Young**  
Yorktown, VA

## SPONSOR

**Robert & Laurie Bokulich**  
Columbia, MD

**James Sandison**  
Severna Park, MD

**John D. Beck**  
Towson, MD

**Joe Hickman**  
Chestertown, MD

**Jerry Alaxson**  
Downingtown, PA

**William W. Bley**  
Wilmington, DE

**Bryna Brennan**  
Heathsville, VA

**Christa Brusen**  
Ashburn, VA

**Richard & Jean Carmean**  
Suffolk, VA

**Peter & Karen Clendenin**  
Hallieford, VA

**Alice F. Dorshow**  
Catonsville, MD

**Eugenia & Thomas Elder**  
Sparks, MD

**Jason & Melinda Hancock**  
Virginia Beach, VA

**Bruce Henry**  
Alexandria, VA

**Robert Hirsch**  
Washington, DC

**William & Lynda Jeanes**  
Earleville, MD

**James Jones**  
Catonsville, MD

**Jeanette Kaufmann**  
Solomons, MD

**David Levy**  
Alexandria, VA

**Lower Shore Land Trust**  
Snow Hill, MD

**Keith & Sharon Malley**  
Arlington, VA

**Peter McChesney**  
Richmond, VA

**Matthew McKinnon**  
Tracys Landing, MD

**Karl & Marcia Mech**  
Baldwin, MD

**David F. Mitchell &  
Elizabeth A. Sellers**  
Lovettsville, VA

**Karen Nielsen**  
Baltimore, MD

**Rich Ordeman**  
Vienna, VA

**Pennsylvania Yacht Club**  
Bensalem, PA

**Brian Sanfelici**  
Rockville, MD

**Gretchen Schnee**  
Baltimore, MD

**Harold Schoeffler**  
Lafayette, LA

**Robert Seely**  
Annapolis, MD

**Steven Shriver**  
Manteo, NC

**Hugh Simmons**  
Phoenix, MD

**Cathy Smith**  
Frederick, MD

**William Smyth**  
Powhatan, VA

**Mrs. Sky Sneed**  
Midlothian, VA

**Jeff Stauffer**  
Chester, MD

**David Tower**  
Annapolis, MD

**U.S. Charitable Gift Trust**  
Indianapolis, IN

**Gail Williams Wertz  
& L. A. Ball**  
King George, VA

**Paula Wordtt &  
Richard Owen**  
Chestertown, MD

**Jeff Zalusky**  
Cobb Island, MD

## SUPPORTER

**Bruce Cumming**  
Bainbridge, NY

**Brian & Karen Czarnowski**  
Galesville, MD

**Rita D'Amico**  
Ashland, VA

**Becky Daiss**  
Arlington, VA

**Zou Dandan & Chris  
Donatelli**  
Port Republic, MD

**Sergio Kapfer Daphna Krim**  
Bethesda, MD

**Marion B. Davis III**  
Street, MD

**John Deatrlick**  
Leonardtown, MD

**Gerald Dietz**  
Loganville, PA

**John Dinges**  
Washington, DC

**Ray Dintaman**  
Queenstown, MD

**Bernie Dormer**  
Salisbury, MD

**Jeffrey Downes**  
Salisbury, MD

**Sara Dubberly**  
Wilmington, DE

**Ann Dukes**  
Silver Spring, MD

**Carol & Bill Durr**  
Pasadena, MD

**Perry B. Duryea III**  
Montauk, NY

**Michael Edwards**  
Horseheads, NY

**Shelah Egan**  
Easton, MD

**Vic Eilenfield**  
Stafford, VA

**Judy Eliason**  
Millsboro, DE

**Kathy Elliot**  
Wilmington, DE

**Charles Ellis**  
Hagerstown, MD

**Gary Ellis**  
Sparta, NJ

**Ed Enamait**  
Falling Waters, WV

**Lee Epstein**  
Silver Spring, MD

**Edward Epstein**  
West River, MD

**Frances Faylor**  
Catlett, VA

**Frank H. Felbaum**  
Ligonier, PA

**Thomas Filip**  
Ocala, FL

**Ed & Francoise Frost**  
Bent Mountain, VA

**Katherine Garbacik**  
Berwick, PA

**Ned Gerber**  
Chester, MD

**Jane Giles**  
Severna Park, MD

**Molly Glassman**  
Baltimore, MD

**Marcy Goldberg**  
Reading, PA

**Tim Goodfellow**  
Gaithersburg, MD

**Michael D. Grimes**  
Owings Mills, MD

**Beg Groenwold**  
Heathsville, VA

**Gutschick, Little  
& Weber, P. A.**  
Burtonsville, MD

**William & Bonnie Hallock**  
Havre De Grace, MD

**Henry Hansen**  
Fairfax, VA

**Catherine Harold**  
Richmond, VA

**Frank Harrell**  
Lottsburg, VA

**Verna Harrison  
& Robert Pelrine**  
Arnold, MD

**Frank Hart**  
Denver CO

**William Hartzell**  
Orrtanna, PA
















A great blue heron conserves energy on a cold day, waiting for something tasty to swim by. (Dave Harp)

<b>J. Larry Hawk</b> Littlestown, PA	<b>Tom Horton</b> Salisbury, MD	<b>Sergio Kapfer &amp; Daphna Krim</b> Bethesda, MD	<b>Dr. Lloyd Lewis</b> Edgewater, MD	<b>Joan C. Matthews</b> Bryans Road, MD	<b>Woody Morris</b> Harbeson, DE	<b>Charles &amp; Susan Planck</b> Hillsboro, VA
<b>Eric Hawkes</b> Silver Spring, MD	<b>Sam Hribal</b> Virginia Beach, VA	<b>Mary Jane Karp</b> Montclair, NJ	<b>Joseph A. Libassi</b> Manassas, VA	<b>Julie Maynard</b> Middletown, MD	<b>Karen Morrison</b> Washington, DC	<b>Jane Popko</b> Palmyra, PA
<b>Gordon Heidelberg</b> Waynesboro, PA	<b>Kenneth Huber</b> Kingsville, MD	<b>Van Kirstein</b> Leesburg, VA	<b>Faith &amp; Louis Libelo</b> Bethesda, MD	<b>Victoria McAndrews</b> Bozman, MD	<b>Ralph &amp; Lenore Naranjo</b> Annapolis, MD	<b>Tom Powers</b> Poquoson, VA
<b>Bob &amp; Carolyn Hicks</b> Richmond, VA	<b>Charles E. Huddleston</b> Denton, MD	<b>Barbara B. Knapp</b> Germantown, MD	<b>Donald Linzey</b> Blacksburg, VA	<b>Charles McCarty</b> Cobbs Creek, VA	<b>Nancy Neely</b> Worton, MD	<b>Roseanne Price</b> Silver Spring, MD
<b>James B. Higgins</b> Tilghman, MD	<b>David Hutton</b> Catonsville, MD	<b>Ivor Knight</b> Hagerstown, MD	<b>Joan Locastro</b> Silver Spring, MD	<b>Bernd McConnell</b> Colorado Springs, CO	<b>Andy Nichols</b> Frederick, MD	<b>Bernadine Prince</b> Georgetown, DE
<b>James Hilliard</b> Lancaster, PA	<b>Daniel A. Hyatt &amp; Portia Defilippes</b> Bethesda, MD	<b>Robert E. Knox III</b> Richmond, VA	<b>Michael Logothetis</b> Newark, DE	<b>Douglas McElrath</b> Riverdale, MD	<b>Robbin M. Nighswander</b> Grasonville, MD	<b>Grantley Pyke</b> Baltimore, MD
<b>Margaret Hindman</b> Frederick, MD	<b>Alexandra Ives</b> Annapolis, MD	<b>Kim &amp; Ben Kohl</b> Berterton, MD	<b>Frank Lombardi</b> Columbia, MD	<b>John Meile</b> Harrisburg, PA	<b>Gertrude O'Leary</b> Ambler, PA	<b>Michael &amp; Carolyn Quinlan</b> Bowie, MD
<b>Viktoria Hochschwender</b> Tyaskin, MD	<b>Ronald Jacoby</b> Baltimore, MD	<b>Dr. K. Jack Kooyoomjian</b> Woodbridge, VA	<b>Ted &amp; Judee Lyon</b> Jersey Shore, PA	<b>Darlene Melcher</b> Middle River, MD	<b>Dr. Frederick C. Oelrich</b> Stafford, VA	<b>William &amp; Joy Rains</b> Bethesda, MD
<b>Rebekah Hock</b> Chestertown, MD	<b>James R. Jarvis, Jr.</b> Glen Burnie, MD	<b>Carol Kramer</b> Chester, MD	<b>Janet Mackey &amp; Ronald Ketter</b> Easton, MD	<b>Ron Melchior</b> Nottingham, MD	<b>James Olsson</b> Edgewater, MD	<b>Elizabeth Randolph</b> Cochranville, PA
<b>Winona Hocutt</b> Salisbury, MD	<b>Kathleen Jenkins</b> La Plata, MD	<b>Candida Lancaster</b> Monkton, MD	<b>Laura Malick</b> Baltimore, MD	<b>David Mershon</b> Havre De Grace, MD	<b>Emily Parkhurst</b> Mayo, MD	<b>David Read</b> Plumas Lake, CA
<b>Wayne &amp; Denice Holin</b> Middle River, MD	<b>Charles S. Johns</b> Harrisburg, PA	<b>Joseph N. Larish</b> Mocanaqua, PA	<b>Sue Mangan</b> Norfolk, VA	<b>Thomas &amp; Mary Milan</b> Annapolis, MD	<b>Edward Paylor</b> Washington, DC	<b>Pamela Rice</b> Fredericksburg, VA
<b>Gregory Homer</b> Stevensville, MD	<b>Anne &amp; Robert Johnson</b> Cayuta, NY	<b>Len Lazarick</b> Columbia, MD	<b>Linda Mansell</b> Hebron, MD	<b>Ronald &amp; Catherine Miller</b> Jacobus, PA	<b>Jay Penick</b> Hayes, VA	<b>Greg Rider</b> Severna Park, MD
<b>Charlton Hook</b> Cambridge, MA	<b>Peter Johnson</b> Washington, DC	<b>Stanley Lehman</b> Ransom Township, PA	<b>Stephen Margerum</b> Davidsonville, MD	<b>Richard Miller</b> Annapolis, MD	<b>Jeff &amp; Ida Peterson</b> Falls Church, VA	<b>Jamie Ritter</b> Rehoboth Beach, DE
<b>Margareta Horiba</b> Baltimore, MD	<b>Mike Kadan</b> Adamstown, MD	<b>Ernie Lehman</b> Lancaster, PA	<b>Bradley L. Martin</b> Manchester, MD	<b>Wayne &amp; Delores Mills</b> Hutchinson Island, FL	<b>Paulding Phelps</b> Kennett Square, PA	<b>Mr. &amp; Mrs. Daniel Roff</b> Frederick, MD
<b>Johanna Horlick</b> Gaithersburg, MD	<b>Mike Kane</b> Port Crane, NY	<b>David Lenker</b> Camp Hill, PA	<b>David &amp; Debra Mattera</b> Heathsville, VA	<b>Brian Moores</b> Ashland, VA	<b>Natalie Pien</b> Leesburg, VA	<b>Judy Rose</b> Joppa, MD
<b>Sally G. Hornor &amp; Thomas J. Caperna</b> Arnold, MD		<b>Lynne &amp; Joe Lentz, Jr.</b> Catonsville, MD	<b>Susi Mattheisen</b> Falls Church, VA	<b>Rick Morani</b> Grasonville, MD	<b>Paul Pinsky</b> Annapolis, MD	<b>Garvin Rumberger</b> Carlisle, PA

See **DONORS**, page 30

# Thank You To These Philanthropic Donors







Watermen tend a pound net in Maryland's Nanticoke River.(Dave Harp)

**DONORS** from page 29

**Earl Robert Runde**  
Chestertown, MD

**Sheila Russian  
& Roger Marcus**  
Stevenson, MD

**Roberta & Ed Sabin**  
Pasadena, MD

**William Saley**  
Mount Holly, NJ

**Larry Sanford**  
Easton, MD

**Donald Sargent  
& Shannon Barrett**  
Owego, NY

**J. Thomas Savage**  
Cape Charles, VA

**Ed & Leigh Ann Schaefer**  
Claiborne, MD

**Michael Schaffer**  
Lewes, DE

**Henry Schlenker**  
Solomons, MD

**Kurt Schwarz**  
Columbia, MD

**Edward Sclichter**  
Trappe, MD

**Allen Seigel**  
Berlin, MD

**Charles A. Shaffer, Jr.**  
Mechanicsburg, PA

**Patrick Shea**  
Fairfax, VA

**Shaigh Sisk**  
Chestnut Hill Cove, MD

**Tanya Spano**  
Rockville, MD

**Camille Steenrod**  
Laurel, MD

**Evelyn & Clifford Stein**  
Annapolis, MD

**Harry Stephen**  
Baldwin, MD

**Clarinda Stevens**  
Chester, VA

**Donnan M. Stoicovy**  
Warriors Mark, PA

**Mark Stout**  
Ellicott City, MD

**Bruce Strathearn**  
Harpers Ferry, WV

**Judith Stribling**  
Nanticoke, MD

**Per Struck**  
Baltimore, MD

**Sara Szczurko**  
Salisbury, MD

**Norman Tadlock**  
Lancaster, VA

**Elizabeth Talbott**  
Williamsburg, VA

**Don Tate**  
Naples, FL

**Charlie Taylor**  
Herndon, VA

**Trip Thomas**  
Wallingford, PA

**Edwin & Anne Thomas**  
Pasadena, MD

**Richard & Ann Thomas**  
Annapolis, MD

**Sally Thomas**  
Charlottesville, VA

**Elvia Thompson**  
Annapolis, MD

**Leon Thompson, Jr.**  
Camden Wyoming, DE

**Sandra & Jim Thornton**  
Louisa, VA

**Neil Tillman**  
Accokeek, MD

**Susan Titus**  
Richardsville, VA

**L.T. & Dottie Truslow**  
Hague, VA

**Elizabeth Tweed**  
Lutherville Timonium, MD

**John Tyrrell**  
Crofton, MD

**Paul Van Rijn**  
Alexandria, VA

**Laura Van Scoyoc**  
Woodstock, MD

**Henry Clay Ver Valen**  
Towson, MD

**Gary Vine**  
Ophelia, VA

**James W. Voshell**  
Parkton, MD

**Valerie Walker**  
Portsmouth, VA

**Morris "Bud" Ward**  
White Stone, VA

**Ernest Watkins**  
Mifflinburg, PA

**Mr. & Mrs. Lee Weaver**  
East Springfield, PA

**Sandra K. Wenger**  
Strasburg, PA

**Darlene White**  
Virginia Beach, VA

**Chris Widmer**  
Virginia Beach, VA

**William Wilhelm**  
Machipongo, VA

**Jerry Williamson**  
Leesburg, VA

**Benjamin Wingfield**  
Ashburn, VA

**Allison Wright**  
Silver Spring, MD

**Maisy & W. Brooke Yeager**  
Wilkes Barre, PA

**James Young**  
Jarrettsville, MD

**Dennis & Susan Yurek**  
Kingsville, MD

**FRIEND**

*In Memory  
of Etta Miller  
from Michael Morhous*  
Lacey, WA

**Steve Bowman**  
White Hall, MD

**Donna R. Engle**  
Westminster, MD

**John Fusek**  
Newport News, VA

**Jack Hardy**  
Essex, MD

**John Kingscott**  
Cabin John, MD

**Steve Lay**  
Havre De Grace, MD

**Gus Lester**  
Queenstown, MD

**Paul Rogers**  
Cape Charles, VA

**Asmare Atalay**  
Hopewell, VA

**Philip Barber**  
McLean, VA

**Don & Kay Besom**  
Bethesda, MD

**Mark Bright**  
Baltimore, MD

**Mark Bright**  
Baltimore, MD

**Frank Buppert**  
Marriottsville, MD

**John Burfeind**  
St Michaels, MD

**Robert Byrd**  
Laurel, MD

**Candy Campbell**  
Gloucester Point, VA

**Sandra Canepa**  
Hampton, VA

**Carol Casperson**  
Washington, DC

**Jeffrey Catts**  
Washington, DC

**Ed Dunne**  
Washington, DC

**Edwin Elmore**  
Williamsburg, VA

**Patricia Farley**  
Towson, MD

**Helen Foster**  
Saint Paul MN

**Hugh C. Gardiner III**  
La Plata, MD

**Arthur G. Geigley**  
Mount Joy, PA

**Robert Geisler**  
Woolford, MD

**Mark M. Getz**  
Fleetwood, PA

**Joseph Handzerlia**  
Baltimore, MD

**Jay Hanger**  
Staunton, VA

**Dan Heacock**  
Marysville, PA

**James Holton**  
Chesapeake, VA

**David Kelsey**  
Hollywood, MD

**James Kopf**  
Lancaster, PA

**Richard Kurtz**  
Ithaca, NY

**Joann Lamphere**  
Arlington, VA

**Larry Lower**  
Parkville, MD

**John E. Mara**  
Easton, MD

**Gene Milgram  
& Vicky Owens**  
Annapolis, MD

**James Muscatello**  
Annapolis, MD

**Joseph L. Newell**  
Noxen, PA

**Marianne O'Leary**  
Ellicott City, MD

**Bryan Ortman**  
Parkville, MD

**Benson Payne**  
Towson, MD

**Joseph E. Pinhak**  
Havertown, PA

**David A. Prescott**  
Boiling Springs, PA

**Cyril & Caroline Reshetiloff**  
Annapolis, MD

**William F. Rienhoff III**  
Baltimore, MD

**Paul Sanborn**  
Berwyn, PA

**Susan Schaefer**  
Keedysville, MD

**Ted Scharf**  
Bradshaw, MD

**Jane Schlegel**  
Hydes, MD

**Kay Sedlak**  
Westminster, MD

**Bruce Setzer**  
Nazareth, PA

**Eric Smith**  
Red Lion, PA

**Denise Smrcina**  
Seaford, DE

**Kenny Stevenson**  
Hereford, MD

**Brian Treadwell**  
Saint Petersburg, FL

**John Walter**  
Millersburg, PA

**Sandra Ward**  
Baltimore, MD

**Mary Webber**  
Richmond, VA

**Allen W. Wooldridge**  
Orlando, FL

**Jean & James Wortman**  
Easton, MD

**Ned Longenecker**  
Lancaster, PA

**Michael Waltz  
& Cheryl Parrish**  
Lutherville, MD

**Carlton Abbott**  
Williamsburg, VA

**William C. Alley**  
Callao, VA

**Neilson Andrews**  
Towson, MD

**Philip S. Beacham III**  
New Windsor, MD

**Doug Bjornson**  
Henrico, NC

**Tim & Susie Brown**  
Greenbush, VA

**G. Bunn**  
Montross, VA

**Sylvia Colson**  
Silver Spring, MD

**Robert Declue**  
South New Berlin, NY

**Charles & Marjorie Elfman**  
Newport News, VA

**Ann-Marie Grady**  
McLean, VA

**Carol Hooker**  
Virginia Beach, VA

**Stuart Knudsen**  
Locust Hill, VA

**Raymond Leone**  
McLean, VA

**Anne Marigza**  
Greenbelt, MD

**Kenneth P. McBride**  
Lynchburg, VA

**Jim McMahon**  
Burtonsville, MD

**Melinda Paglierani**  
Valley Lee, MD

**Wayne Penczek**  
Perry Hall, MD

**Thomas Pettit**  
McGaheysville, VA

**Susan Pollack**  
Gloucester, MA

**Roger Rasnake**  
North Potomac, MD

**Haywood Rich**  
Colonial Beach, VA

**Linda Ann Steere**  
West Kingston, RI

**Kim Tayloe**  
Virginia Beach, VA

**Craig Turner**  
Dunkirk, MD

**Elizabeth Wade**  
Laurel, MD





A late snow blankets a budding pussy willow. (Michele Danoff)

<b>Thomas Williams</b> Newark, DE	<b>Michael Card</b> Annandale, VA	<b>George Grillon</b> Taneytown, MD	<b>Eugene Morton</b> CamSpringsbridge, PA	<b>Barry Sperling</b> Alexandria, VA	<b>Dennis Baker</b> Port Haywood, VA	<b>Robert Boger</b> Memphis TN
<b>Charles &amp; Hilda Wilson</b> Montross, VA	<b>Richard Carmine</b> Laurel, DE	<b>Peter &amp; Susan Hale</b> Stevensville, MD	<b>John Myers</b> Baltimore, MD	<b>Charles Stegman</b> Salisbury, MD	<b>Michael Barbour</b> Abell, MD	<b>Alma M. Boyer</b> Walkersville, MD
<b>Mark Zettler &amp; Rosemary Pauline</b> Annandale, VA	<b>Victor Clark</b> Wilmington, DE	<b>James Harwood</b> Olney, MD	<b>Douglas M. Olsen</b> Chestertown, MD	<b>John Streb</b> Pasadena, MD	<b>Chris Barnes</b> King George, VA	<b>Joan Brandt</b> Hummelstown, PA
<b>Ed &amp; Amber Zygmunt</b> Laceyville, PA	<b>John Current</b> Apalachin, NY	<b>Rachel Hexter-Fried</b> Port Republic, MD	<b>Robert B. Pieper</b> Essex, MD	<b>George Tarbert</b> Stewartstown, PA	<b>Michael Barreda</b> Upperville, VA	<b>Donald &amp; Susan Bratz</b> Mc Veytown, PA
<b>John Austin</b> Blacksburg, VA	<b>Pearl M. Delle Bovi</b> Columbia, MD	<b>John Jensen</b> Aylett, VA	<b>Risa Pine</b> Bowie, MD	<b>Barb Thomas</b> Floral City, FL	<b>Sadj &amp; Bob Bartolo</b> Columbia, MD	<b>Ronald Bridge</b> Shermans Dale, PA
<b>Ellen E. Baker</b> Sykesville, MD	<b>Jack Edson</b> Kennedyville, MD	<b>Margaret Kertess</b> Locust Grove, VA	<b>Glenn Pletcher, Sr.</b> Gap, PA	<b>Steve Turnage</b> Hague, VA	<b>Nicholas Belitsos</b> Stevensville, MD	<b>Kenneth E. Bright</b> Madison, MD
<b>Richard Benson</b> Highland, MD	<b>Neal Foster</b> Dutton, VA	<b>Chris Kidd</b> Vinton, VA	<b>Cheryl L. Querry</b> Pasadena, MD	<b>Loretta W. Wanman</b> Annandale, VA	<b>Ralph Bennett</b> Silver Spring, MD	<b>Terry W. Broadwater</b> Moneta, VA
<b>Mary Jo &amp; Thomas Bosley</b> Fishing Creek, MD	<b>George &amp; Christine Gaa</b> Baltimore, MD	<b>Charles Kropp</b> Vienna, MD	<b>Janice Radford</b> Gambrells, MD	<b>Ann Williams</b> Ware Neck, VA	<b>Charles Berry</b> Brookings SD	<b>Marilyn Brown</b> Pensacola, FL
<b>David Bourdon</b> Huntingtown, MD	<b>Ginger Gathings</b> Glen Burnie, MD	<b>Norman LaCroix</b> Jessup, MD	<b>Steve Retallick</b> Crewe, VA	<b>George Allen</b> Fort Howard, MD	<b>Robert Berryman</b> Morgantown, WV	<b>Walter Brown</b> Sparrows Point, MD
<b>Phillip R. Boyd</b> Saint Leonard, MD	<b>Vicky &amp; Terry George</b> Adamstown, MD	<b>Thomas &amp; Carol Larkin</b> Loretto, PA	<b>Henry Riely</b> White Stone, VA	<b>Gale Amezcua</b> Corriganville, MD	<b>Jesse BeVille</b> Mechanicsville, VA	<b>Beverly Browne</b> Arlington, VA
<b>George Britton</b> Washington, DC	<b>Ernest Glinka</b> Essex, MD	<b>Lee Linebaugh</b> Hanover, PA	<b>Bill Ritter</b> Millersville, MD	<b>Lance Arnold</b> Newport, PA	<b>Andrew Bidwell</b> Falls Church, VA	<b>Kurt Bruwelheide</b> Silver Spring, MD
<b>Clyde Bruce</b> Dublin, VA	<b>Douglas Gordon</b> Beaverdam, VA	<b>Helene Lisy</b> Secretary, MD	<b>Rudy Rohrbaugh</b> Dover, PA	<b>John Austin</b> Blacksburg, VA	<b>S. C. Blakeslee</b> Kirkwood, PA	<b>Richard Budden</b> Chestertown, MD
<b>Peter Brunk</b> Portsmouth, VA	<b>Wenrich H. Green</b> Easton, MD	<b>Jessica Millstead</b> Bowie, MD	<b>Price Shuler</b> Denton, MD	<b>Harry Azar</b> Queenstown, MD	<b>Mr. &amp; Mrs. William Boettinger</b> Annapolis, MD	<b>Robyn &amp; Klaus Burckhardt</b> Spring City, 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: \_\_\_\_\_

☐ 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

<input type="checkbox"/> \$15-\$49	<b>Friend</b>
<input type="checkbox"/> \$50-\$99	<b>Supporter</b>
<input type="checkbox"/> \$100-\$149	<b>Sponsor</b>
<input type="checkbox"/> \$150-\$249	<b>Benefactor</b>
<input type="checkbox"/> \$250-\$499	<b>Advocate</b>
<input type="checkbox"/> \$500-\$999	<b>Booster</b>
<input type="checkbox"/> \$1,000-\$2,499	<b>Champion</b>
<input type="checkbox"/> \$2,500-\$4,999	<b>Guarantor</b>
<input type="checkbox"/> \$5,000 & Up	<b>Philanthropist</b>

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



## Reality check: The case for a Chesapeake 'style' Bay



By Tom Horton

### The Bay is dead. Long live the Bay.

That declaration derives from 15th century England — “The king is dead, long live the king” — assuring the public an orderly succession. And reminding them that change is inevitable.

My late and treasured friend, Tom Wisner, Chesapeake poet, singer and conscience of this estuary, wanted to invoke it some two decades ago.

Tom sought a grant for us to gather a team of 20 black mules, black plumes nodding from their harnesses. They would pull a black-painted buckboard wagon through the towns and cities of the six-state Chesapeake watershed, bearing a plain, black coffin made of native pine.

At every stop we would grieve and celebrate the Bay we had known, acknowledge much of it was gone, irretrievably; then, we would begin the healing, getting on with the best Bay possible.

Tom, for all of his creative genius, was a master of un-fundable proposals, and our funeral mule team never made it out of the gate.

But he was on to something, which brings me to Jerry Schubel's new book, *The Future Chesapeake: Shaping the Future* (Archway Press, 2021). Schubel began his long and illustrious career in marine science at Johns Hopkins University, at the old Chesapeake Bay Institute, then he headed major institutions on Long Island Sound, Boston Harbor and the Pacific coast.

*The Future Chesapeake* elaborates on Tom's vision, steeped in science but also informed by the author's devotion to the humanities. Schubel's earlier book of essays



Trees along Parsons Creek in Dorchester County, MD, are dying due to erosion and rising water. (Dave Harp)

and photography, *The Living Chesapeake*, is required reading for my university classes.

Like this double-length *Chesapeake Born* column, Schubel's *Future* is no more than a starting point for a long-needed conversation: a complete rethinking of the current Bay restoration effort, which increasingly is banging its head against the wall, at risk of losing credibility and support.

The Bay of the future won't resemble even its recent past. Schubel argues that despite decades of honest effort and billions of dollars, progress in restoring the Bay to something like the health it displayed before the 1970s has been modest at best, graded by environmental groups mostly in the range of D's and C's.

Nor is our “student” likely to ever score B's, let alone A's, given the accelerating headwinds of climate change and a watershed population on its way to triple the 8 million who lived here when the Bay was healthier, Schubel believes:

“Restoration may be a fine [goal] for old cars, for some endangered species and maybe whole ecosystems in a slowly changing world. But our world is changing more rapidly than any time in 200,000 years of modern human history. ... We must try new ideas.”

“Restoration has not delivered ... except to keep things better than if we'd done nothing ... but forces already set loose, principally climate change ... are going to make the current trajectory less successful even as it gets more expensive,” he writes.

### Solving a wicked problem

Satisfactorily resolving the fate of the Chesapeake Bay, Schubel says, is an example of what has come to be known as a “wicked” problem. Wicked problems are so complex, often dealing with ever-shifting conditions from politics to climate, that they can be difficult to even define. Think less in terms of any solution at all, Schubel advises. Think in terms of “containment” of the Bay's declines; think “minimizing regret.”

The book is not so gloomy as I've just made it sound. Gloomy would be pressing down the same old paths, continuing to miss deadline after deadline, falsely hoping every short-term positive trend turns out to be long-term.

Nor is Schubel saying we should stop treating our sewage or requiring cleaner air, or that we should stop encouraging forests and wetlands. But we'd be better off, he writes, “investing in creating the

Chesapeake Bay for the future rather than in trying to return it to some previous condition. ... Perhaps, we should pause ... reboot and affirm the qualities we want the Bay to have in the future that are in sync with the population we expect, and with the prevailing natural processes, including sea level rise and [warmer waters] that climate change will bring.”

If we do, he would “expect our aspirations and strategies ... would be different from the strategies being pursued today.”

So, what might such a future Bay look like? What would it mean saying good-bye to what the “restoration” mindset lets us cling to?

### Picturing the future Bay

Decades ago, newly promoted to the *Baltimore Sun's* environmental beat, I understood I would have a front row seat to a grand experiment: In the Chesapeake, we had taken a world class natural resource, screwed it up royally — a world class screw-up, if you will — and were mounting a world class, literally unprecedented attempt to restore its health.

As the effort has dragged out, I confess reluctance to call an end to the experiment. But Schubel's book came at a propitious time, for I'd been drafting an essay of my own, with the working title, *The Chesapeake Style Bay*.

The title came from my visit to Tilghman Island to catch up with Capt. Wadey Murphy aboard his oyster skipjack, *Rebecca Ruark*. I'd spent many a day with Wadey, “drudgin'” oysters from the Choptank under sail, as generations of Murphys before had done. A thousand craft like *Rebecca* were working the Bay when she was launched in 1886. Now she's one of a handful left, and on the National Register of Historic Places.

*Rebecca* had never looked prettier, gleaming white decks lined with cushioned porch furniture, awaiting the day's paying tourists. Wadey the oysterman had become Wadey the performer.

“I loved drudgin' like ... life,” he said. “But tourism's comin', oysters are goin'.” I do marryin's and buryin's — scatter your ashes — I do sunset cruises, special charters, whatever people want.”



As I left, he dug out an iconic Chesapeake photo by Aubrey Bodine that you may have seen on the walls of seafood restaurants or in hotel lobbies. It's an old oysterman in his little skiff, using "nippers" — miniature tongs — to bring up individual oysters from the clear, calm shallows around Tilghman on a winter day in 1948.

Bodine, Wadey said, had asked Bill Page if he would he move his skiff just a bit, no doubt to compose the scene more artfully. Bill complied reluctantly, because there were no oysters below his new position. But the shot was a classic. "Bill was proud of that picture and he showed it 'til the day he died," Wadey said. "But he always told people, 'where he had me in that picture, there weren't no oysters down there.'"

What Wadey was saying didn't hit me until later that afternoon as I sipped beer at a waterfront bar on Tilghman amid a crowd there for a rockfish tournament. I'd asked for a crab cake and decided to pass when the waitress said it would be "Chesapeake style," code for not local, a different species of crab, from Vietnam, the Philippines, Indonesia.

Suddenly there was a rush to the deck railings, cameras snapping away, as Wadey and *Rebecca* drifted by on a freshening breeze under full sail, the Bay sparkling in the lowering sun. I realized it didn't matter now whether there were oysters (or oxygen) in the Bay below them. Like the crab cake, oysters don't have to come from the Chesapeake anymore, or they could come from aquaculture (as crabs soon may).

And those Chesapeake style crab cakes? I've tried them and they're darn good. Restaurants can even mix a paste squeezed from local crabs' inedible tissues to flavor them. And the beer is cold, and *Rebecca* and her captain are making a beautiful picture.

More and more of the fish in Bayside restaurants fly here from waters around the globe. Mallard ducks by the millions "migrate" by truck, from Midwest game farms, to be hunted in regulated shooting preserves — Chesapeake style waterfowling.

Chesapeake style restoration of the Bay has been heavy on technological solutions like advanced sewage treatment and storm-water controls — which allow us to *avoid* behavioral change, let us ignore climate change and the growing population. We have similar faith in oysters to cleanse the Bay (too much faith, Schubel notes).



Unlike some mainland communities, Tangier Island, VA, has no option for a "managed retreat" from rising sea level. (Dave Harp)

Chesapeake style environmentalism performs all manner of genuinely good works, but it treats symptoms, never questioning the endless-growth economic model that ensures our unsustainability.

Who actually needs a fully functioning estuary? Perhaps only watermen like Wadey used to be. And there are fewer of them every year.

It's not the Bay we say we want, but it's not so bad. Indeed, it's all that perhaps a majority of the 18 million citizens of the watershed have known. It's not trashy or smelly — a decent enough backdrop for our festivals and wade-ins and celebrations of all things Chesapeake. Perhaps it's the Bay we deserve.

Schubel thinks we can and must do better, as stresses from population and climate are guaranteed to build in coming decades, profoundly changing the Bay both chemically and physically. Success with what's essentially going to be a different animal won't come from doubling down on the current federal-state restoration program, he says.

## Thinking adaptively

A lot of hope, he thinks, lies in "adaptive management," hardly a new idea to Chesapeake managers, but seldom employed, as it's politically difficult and promotes thinking outside the box.

Adaptive management admits up front that we don't know for sure how to proceed,

that innovative new strategies may well fail or require sharp course corrections, with managers and regulators given lots of flexibility. It's not "loosey-goosey." It depends on rigorous science and carefully designed experiments, where one may learn much from "failure."

He argues that while environmental science must inform our choices of the best Bay future possible, it will be equally up to the social and behavioral sciences, as well as the arts and humanities, to arrive at goals.

While he wisely avoids specific prescriptions, Schubel makes some intriguing recommendations, like setting up a group of experts parallel and complementary to the existing Chesapeake Bay Program. They would have little or no attachment to, or even experience, of the Chesapeake. Any guesses as to what such a group might say if asked how much of the last 1% of our oysters we should harvest?

Rising sea levels will reset our notions of the Bay's extensive land-water edge from prime real estate to a zone of organized retreat. Sediment, which we think of only as a major Bay pollutant, will become "a scarce resource" as we seek to rebuild eroding marshes and shorelines. One could envision expanded access for some public uses and wildlife habitat from such a scenario.

More than most Bay environmentalists, Schubel likes "geo-engineering" and nuclear-power solutions to reduce carbon in the

atmosphere, but his arguments are sensible. The alternative is to continue haphazardly geo-engineering the planet to be hotter and quirkier. And to make a real difference, solar and wind would take an appalling amount of space from farms and natural habitats.

He'd think about whether some form of governance at the watershed scale would work better; he'd also much more vigorously pursue "smart growth," putting most development into the emptied-out Baltimores that are already built for it.

My own two cents: Reading between the lines of *The Future Chesapeake*, I can see learning to live with largish summertime "dead zones" and fewer seagrass meadows than current plans call for — even if that, along with a warmer Bay, does not bode well for striped bass and oysters and crabs, or for the wild harvesters who remain.

And a lot of what we're doing, from removing dams and planting forested buffers to promoting "beaver engineering," we should continue and ramp up — big-time.

It's a new world and a new Bay we're creating, like it or not (and I don't). It's no time to be shy about rejiggering the future.

My "grand experiment" is dead. Long live the grand experiment. ■

*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.*



## War on pollution extends to its deniers, deflectors

By Lynton S. Land

It is no longer possible to reject the fact that Earth's climate is warming and that burning fossil fuels is the primary cause. It must also be admitted that the Chesapeake Bay's abysmal water quality is due to receiving too much of the nutrients nitrogen and phosphorus, mostly from crop fertilization now that significant reductions in point-source pollution from wastewater facilities have been achieved.

But there are lessons to be learned for the Bay from the battle over climate change. While the "old war" of debating the cause of global warming is over, the strategy being used by inactivists (greenhouse gas polluters) tries to block action that would negatively impact their profits. In his book, *The New Climate War*, Michael Mann argues that in order to impede action against them, the polluters bamboozle the public using denial, disinformation, delay, doomsaying and deflection — key elements of the "tobacco strategy" as outlined by Erik Conway and Naomi Oreskes in the book, *Merchants of Doubt*.

It's the same for the agricultural pollution of the Chesapeake. Crop fertilization practices intended to maximize yields (profit) and provide cheap food cause most of the nutrient pollution that degrades Bay water quality. To continue to benefit from cost-free pollution, the polluters employ the same strategies that Mann outlines to ensure that little is done to reduce the pollution, such as:

- **Denial:** "Farmers use nutrients efficiently." Many do not. It is widely accepted among crop scientists that, depending on the practice, as much as half of the applied nutrients in chemical fertilizer are not removed from the field with the crop, so the rest contributes to water pollution.
- **Disinformation:** "Lawns are the problem; lawn fertilization needs to be regulated." Lawn fertilization is insignificant compared with nutrient pollution from crop fertilization. Or, "Grow and harvest oysters to remove the pollution." It is impossible to grow enough oysters to filter even a small fraction of agricultural pollution. Then, there is: "The Conowingo dam is the problem." It certainly is a

problem, but *the* problem is inefficient crop fertilization. Issues like this must always be quantified.

- **Delayism:** "We need time to impose regulations and change society's expectations." So "business as usual" continues, as does pollution.
- **Doomism:** "There is nothing we can do about it, so why try?" Nonsense! We can do something about it. Stop polluting.
- And, especially, **deflection:** "Individuals' lifestyles must change." True as that may be, it won't make a difference if we don't stop inefficient fertilization and burning fossil fuels. That is the only way to solve the problems.

As Mann outlines, the actions of individuals can be positive, but they are always quantitatively insufficient to solve the pollution problem. Shifting responsibility away from the polluters and onto individuals does little to reduce pollution, and the profits continue unabated. Beware if you are asked to change your behavior but the polluter is not!

Disposing of animal and human waste (poultry litter, manure or sewage sludge) by land application causes more nutrient pollution than even the worst kind of chemical crop fertilization. It is now the "lowest hanging fruit" and constitutes nearly 20%



Chemical fertilizer is stored at a facility in Queen Anne's County, MD. (Will Parson/Chesapeake Bay Program)



Corn is planted directly into a cover crop of wheat at a farm in Mercersburg, PA. Cover crops reduce erosion and the amount of sediment and nutrient pollution getting into waterways. (Will Parson/Chesapeake Bay Program)

of Bay nitrogen pollution and a quarter of its phosphorus pollution, according to the Chesapeake Bay Program.

To protect water quality, the disposal of animal waste by land application should be governed by one simple sentence instead of existing complex and permissive regulations: The land application of animal waste shall be limited to supplying the phosphorus needs of the next crop, based on a soil analysis for phosphorus. The technology to safely and economically produce natural gas from animal waste is advancing rapidly and should be encouraged.

In his book, Mann suggests several strategies to confront those who continue to advocate the burning of fossil fuels. These strategies also apply to the Bay.

- Identify and call out the deniers, deflectors and doomsayers. They are focused on protecting their profits and should be challenged forcefully at every opportunity.
- Focus on education, especially of children. They will inherit the mess we

are creating, and many of them know it. Focus adult education on citizens who are reachable, teachable and movable.

- Retool the capitalist system to account for all costs. The disposal of poultry litter by land application in the guise of "free fertilizer" certainly increases the profitability of the poultry industry, but does it save money for society if the cost of degraded water quality is honestly accounted?

Mann claims that societal behavioral change, enforced intergovernmental agreements and technological innovation — working together — are all needed. It remains to be seen if we can successfully address global warming, water quality and other challenges faced by our overpopulated planet. ■

*Lynton S. Land is emeritus professor of geological sciences at the University of Texas in Austin and now lives in Ophelia, VA.*



## Cleanup deadline is near, the Bay needs action now

By Alison Prost

The science has been clear for more than 35 years; we know what we need to do to restore the Chesapeake Bay. What's clear today is that we are not doing it nearly fast enough or at the scale necessary to succeed.

On their current trajectory, the Bay watershed states will fail to implement the practices necessary to reduce pollution and achieve clean water by 2025. That is the deadline for the multifaceted federal-state cleanup plan, which we at the Chesapeake Bay Foundation call the Chesapeake Clean Water Blueprint.

With less than four years left to the blueprint's deadline, more than half of the work to reduce pollution remains. The foundation's new assessment of progress in Maryland, Pennsylvania and Virginia, which together account for 90% of the pollution damaging the Bay, found no state completely on track. Pennsylvania remains far off track, threatening the success of the entire partnership and the health of its local waterways.

Time is running out. A massive, urgent acceleration of action by the states and federal government is imperative if we are to leave a legacy of clean water to future generations.

The Bay cannot afford anything less. The blueprint is working — over the long term, pollution and summer aquatic “dead zones” are decreasing in many areas.

But already we see the force of climate change and new development pushing back against the hard-won progress. Warming temperatures, increasingly severe storms and pollution levels that are still much too high are a devastating mix.

In the race against global climate change, we can help the Bay best by reducing the pollution we create. Fully implementing the blueprint, on time, is the only way we can give it a fighting chance.

The single largest challenge is polluted runoff from agricultural land. The Bay's restoration cannot succeed without getting Pennsylvania back on track to meet its pollution-reduction targets, and the state is relying on farms to make more than 90% of those remaining reductions.

Despite incredible efforts by local conservation districts, farmers and many others to



*This swale on a farm in Narvon, PA, collects water from the fields above and slowly releases it to a small tributary of Conestoga Creek. (Dave Harp)*

adopt conservation practices, their dedication cannot overcome the woefully inadequate state funding and assistance to date.

Unlike Maryland and Virginia, Pennsylvania does not have a dedicated cost-share program to provide technical and financial assistance to farmers wanting to implement conservation practices. Legislation introduced in the General Assembly, called the Pennsylvania Clean Streams Fund, would establish a cost-share program for the first time, and it should be expeditiously passed. Additionally, the federal government can and must amplify these efforts by directing much more funding to its agricultural conservation programs in the state, which historically has not received its fair share of federal dollars.

Maryland and Virginia aren't off the hook. Model projections indicate the states will be close to meeting their 2025 pollution-reduction targets overall, but their progress to date relies heavily on wastewater treatment upgrades. These upgrades are important, but they are not enough to finish the job.

Maryland and Virginia are not on track to reduce enough pollution from agriculture and urban/suburban runoff. In fact, pollution from developed areas is increasing as

forests are lost and more hard surfaces are built, in some cases offsetting the progress made in other sectors to reduce pollution.

Finally, the U.S. Environmental Protection Agency must hold states accountable to their pollution-reduction commitments and enforce the blueprint's 2025 deadline.

Historically, Pennsylvania has lagged significantly in meeting its commitments, and it initially submitted a plan to the EPA that would meet just 75% of its nitrogen reduction goal and was underfunded by more than \$300 million annually. It recently submitted a revised plan, but the fact remains that the state is far behind where it needs to be. Without the commitment of the governor and General Assembly to provide sufficient funding, there is no reasonable assurance that the needed practices will be put on the ground.

We have the science and the plans to save the Bay. We can achieve clean rivers and streams. We can make our farms and communities more resilient to climate change. But much work remains in a short amount of time. We must take action now. ■

*Alison Prost is vice president for Environmental Protection and Restoration at the Chesapeake Bay Foundation.*

### LETTER TO THE EDITOR

#### Jet training unlikely to create major disturbance

As an avid outdoorsman and waterfowl hunter on Maryland's Eastern Shore for over 40 years, I am fairly attuned to the effects of ambient conditions on wildlife when I am in the field.

Over these many, many days spent in a duck blind or goose pit, I have experienced quite a few low altitude flyovers by pairs of Maryland Air National Guard A-10s and occasional low-altitude flyovers by Navy F-16 Hornets out of the Patuxent River test center.

In every case, they are loud but very short-lived, and in no case have I witnessed the flyover disturb or scatter ducks or geese sitting on the water or in a field.

They may have looked up, as I did, but it never seemed to have bothered them in any appreciable way.

Therefore, based on my experience, the protests of those saying that the proposed low-altitude fly over training in Pennsylvania (*Low-altitude jet training protested as threat to PA Wilds*, Jan.-Feb. 2022) will disturb wildlife are unfounded.

*J. Matthew McGlone  
Towson, MD*

### SHARE YOUR THOUGHTS

The *Bay Journal* welcomes comments on environmental issues in the Chesapeake Bay region.

Letters to the editor should be 300 words or less. Submit your letter online at [bayjournal.com](http://bayjournal.com) by following a link in the Opinion section, or use the contact information 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 T.F. Sayles at [tsayles@bayjournal.com](mailto:tsayles@bayjournal.com) or 410-746-0519. You can also reach us at P.O. Box 300, Mayo, MD, 21106. Please include your phone number and/or email address.





# BULLETIN BOARD

## VOLUNTEER OPPORTUNITIES

### WATERSHEDWIDE

#### Citizen Science: Creek Critters

Use Audubon Naturalist's Creek Critters app to check a stream's health by identifying small organisms living in it, 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

#### Reedville Fishermen's Museum

The Reedville Fishermen's Museum is seeking volunteers for docents and crew and to work in its research library/collections, boat shop, gift shop. Info: rfmuseum.org, director@rfmuseum.org.

#### Pond cleanup program

The Prince William Soil and Water Conservation District in Manassas has added *One-Time-Pond Cleanup* to its programs. Volunteers can now join the PWS & WCD in the fall or spring to clean up a pond with no other commitments. The district is also working on getting kayaks to support the needs of this new program and its volunteers. Info: waterquality@pwsacd.org.

#### 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@pwsacd.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. Projects, 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 level. See a ghost forest? Contribute to a collaborative map by submitting observations to storymaps.arcgis.com/stories.

#### 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@iwl.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.

#### 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@pwsacd.org, pwsacd.org.

#### VA Master Naturalists

VA Master Naturalists is 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.

#### 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.

### MARYLAND

#### Chesapeake Bay Maritime Museum

The Chesapeake Bay Maritime Museum in St. Michaels is looking for volunteers to help with guided tours, programs, exhibitions and collections, as well as care for its grounds & gardens, or on-the-water & dockside with its Floating Fleet and working shipyard. Info: cbmm.org/support/volunteer.

#### Bread and Cheese Creek cleanup

Volunteers of all ages and abilities are needed 8 a.m.–2 p.m. April 2 to clean up Bread and Cheese Creek from Berkshire Road to North Point Road in Dundalk as part of the Alliance for the Chesapeake Bay's Project Clean Stream initiative. Trash bags, gloves, snacks, water, lunch provided. Volunteers are asked to bring tools if possible, as there is only a limited number of tools available to borrow. Service learning hours, community service hours available for students. Info: 410-285-1202, Clean\_Bread\_and\_Cheese\_Creek@yahoo.com.

#### Patapsco Valley State Park

Patapsco Valley State Park volunteer opportunities include: daily operations, leading hikes or nature crafts, mounted patrols, trail maintenance, photographers, nature center docents, graphic designers, marketing specialists, artists, carpenters, plumbers, stone masons, seamstresses. To search for volunteer opportunities at Patapsco or state parks, visit ec.samaritan.com/custom/1528, then click on "opportunity search" in the volunteer menu on the left side of the page. Patapsco-specific info: 410-461-5005, volunteerpatapsco.dnr@maryland.gov.

#### Delmarva Woodland Stewards

The U.S. Department of Agriculture's Forest Service and Maryland Forest Service are creating a training and outreach program, Delmarva Woodland Stewards. Funding from the federal Landscape Scale Restoration Grant program will be used by the partnership to demonstrate, educate, provide outreach that will enhance forest & wildlife management practices, promote the ecological benefits of prescribed fire, pursue tree planting opportunities for water quality, highlight the need for low grade/biomass markets in forest health, restoration, sustainability. The program provides direct training, outreach to landowners and volunteers who want to learn more about how to implement forest, wildlife management practices. Info: Matthew Hurd at matthew.hurd@maryland.gov.

#### Annapolis Maritime Museum

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

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

#### 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 March, April and May 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.

## 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.

April issue: March 11

May issue: April 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

## 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](mailto:info@severnriver.org). Put "volunteer" in the message box.

## 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.

## 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](mailto: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](mailto: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](http://dnr.maryland.gov/Fisheries/Pages/survey/index.aspx).

## Patuxent Research Refuge

Volunteer in the Wildlife Images Bookstore & Nature Shop inside the Visitor Center, on the South Tract of the U.S. Fish and Wildlife Service's Patuxent Research Refuge in Laurel. Help for a few hours or all day 11 a.m.-4 p.m. Wednesday through Saturday. Open/close the shop, help customers, restock, run the register. A future webstore may need volunteers. Training provided. Info: [wibookstore@friendsofpatuxent.org](mailto:wibookstore@friendsofpatuxent.org).

## VIRGINIA

### Owl Prowl

Meet and learn about owls rescued by Nature's Nanny Wildlife Rehabilitation 7-8:30 p.m. March 26 at Hoffer Creek's Wildlife Preserve in Portsmouth. Examine pellets for a better understanding of their diet. Later, hike the trails to search for owls. Fee: \$10. Registration required: [hofferlccreek.org/events](http://hofferlccreek.org/events), 757-686-8684.

## MARYLAND

### Chesapeake Bay Maritime Museum

- **Nameboard Basics Workshop:** 10 a.m.-4 p.m. March 19-20. Ages 16+ (younger w/adult). Shipyard Programs manager Jennifer Kuhn introduces experienced & beginning participants to the skills necessary to hand-carve their own nameboard. Bring lunch, water. Wear closed-toe shoes. Fee of \$135 includes tools, materials. Registration/info: [bit.ly/NameboardBasics](http://bit.ly/NameboardBasics).
- **Marine Welding Course:** 6-8:30 p.m. Tuesdays, March 29-May 10. All but the second session take place at Chesapeake College in Wye Mills; session two takes place at CBMM's working shipyard. No prior welding experience necessary. Gain a deep understanding of marine welding processes, as well as the environmental and process-based concerns associated with welding in a marine environment while exploring ferrous and non-ferrous metals, with a focus on steel, stainless steel, aluminum, and copper-based alloy. Learn about the galvanic scale and degradation above and below the waterline. Fee of \$675 includes all tools, materials. Pre-registration required: [bit.ly/MarineWelding](http://bit.ly/MarineWelding).
- **Island Life:** Through May 29. Van Lennep Auditorium. An exhibit of Chesapeake photographer Jay Fleming's work, *Island Life: Changing Culture, Changing Shorelines* marks the publication of his latest book, *Island Life*. Fleming's photographs reveal how the changing environment is affecting the cultures and shorelines of the Bay's inhabited and formerly inhabited offshore islands. Info: [bit.ly/FlemingArtistTalk](http://bit.ly/FlemingArtistTalk). Info: [cbmm.org](http://cbmm.org), 410-745-2916.

### Maryland Day

Celebrate the founding of Maryland 10 a.m.-5 p.m. March 25 at the state's birthplace at St. Clement's Island Museum in Colton's Point. This event commemorates the first landing of the colonists on St. Clement's Island and marks the meeting of the local native people — the Piscataway — and the English, as well as the beginning of what was a long, difficult relationship between the two cultures. A commemorative Mass will be offered at 11 a.m. A ceremony featuring guest speakers and a program is scheduled 2-3 p.m. A food truck will be present all day. Admission to the museum and water taxi rides are free.

Info: 301-769-2222, [Facebook.com/SCIMuseum](https://Facebook.com/SCIMuseum), [Museums.StMarysMD.com](https://Museums.StMarysMD.com).

### Ladew Spring Lecture Series

The Spring Lecture Series from Ladew Topiary Garden will take place virtually. All lectures will be recorded and available to all paid registrants to view on their own at another time. Fee: \$20. Info: Sheryl Pedrick at [spedrick@ladewgardens.com](mailto:spedrick@ladewgardens.com), 410-557-9570 x226. Two of the other include:

- **The Songs of Trees: Stories from Nature's Great Connectors:** 4 p.m. March 31. David Haskell, writer, biologist and professor, will describe how he has integrated contemplative, literary, scientific studies of the natural world and what might we learn by paying repeated attention to very small parts of our neighborhoods or forests? He has explored this question by returning again and again to the same one-square-meter of old growth forest in Tennessee, then by repeatedly visiting individual trees in locations around the world. His books, *The Forest Unseen* and *The Songs of Trees* are acclaimed for their integration of science, poetry, rich attention to the living world. Info: [dghaskell.com](http://dghaskell.com).

■ **Knockout Natives:** 4 p.m. April 14. Sam Hoadley, horticulture research manager at Mt. Cuba Center in northern Delaware, will highlight native species and cultivars from trial gardens at the center. Top performers for the mid-Atlantic region include coreopsis, baptisia, monarda, phlox, helenium, echinacea and wild hydrangea. Info: <https://mtcubacenter.org>.

## PENNSYLVANIA

### Nixon Park nature walks

Look for signs of wildlife, migrating birds and spring wildflowers on naturalist-led walks at Nixon Park in Jacobus. Walks are scheduled 2-3:30 p.m. March 13, 20, 27 & April 3. Free. Space is limited to ensure social distancing. Walks may be rescheduled if weather makes conditions unsafe. Registration required: 717-428-1961, [NixonCountyPark@YorkCountyPA.gov](mailto:NixonCountyPark@YorkCountyPA.gov). Include name, number of participants, children's ages, phone number. Info: [YorkCountyParks.org](http://YorkCountyParks.org).

## RESOURCES

### WATERSHEDWIDE

### 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, custom hiring. Farmers can submit a form that sets terms for the lending arrangement: fee charged; 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 & other. 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](mailto:Lisa@futureharvest.org).

### Chesapeake Network

Join the Alliance for the Chesapeake Bay's *Chesapeake Network* (web search those words) to learn about events and opportunities that protect or restore the Bay, including webinars, job postings and networking.

## PENNSYLVANIA

### PA trail guide

The Pennsylvania Department of Conservation and Natural Resources' online *Explore PA Trails* has information on more than 650 trails across 12,000 miles in the state. Users can search by trail name, zip code, or activity (ATV, biking, cross country skiing, equestrian, four-wheel drive, hiking, off-road motorcycling, snowmobile, water trail). Info: [trails.dcnr.pa.gov](http://trails.dcnr.pa.gov).

## MARYLAND

### 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.

### DNR educational resources

The Maryland Department of Natural Resources produces at-home learning resources on topics ranging from aquatic life and estuaries to fishing tips and ways to "green" your lifestyle. Visit: [dnr.maryland.gov/ccs/Pages/At-Home-Learning.aspx](http://dnr.maryland.gov/ccs/Pages/At-Home-Learning.aspx).



## CHESAPEAKE CHALLENGE

### ANSWERS TO

Pollination: Posies with a Purpose  
on page 25

1. Moths
2. Beetles
3. Flies
4. Bees
5. Bats
6. Butterflies
7. Birds



# Building neighborhood bonds through Project Clean Stream



## STEWARD'S CORNER

By Lucy Heller

In 2019, I was working at the Alliance for the Chesapeake Bay as a Chesapeake Conservation Corps member when I was suddenly handed a key role in coordinating the Alliance's annual Project Clean Stream. I had very little experience helping to lead multi-event programs and less than a year of nonprofit work under my belt, but I dived in headfirst and helped coordinate hundreds of stream cleanups around the watershed. I did it again in 2020 and 2021, the COVID years, and will again this year, for the last time.

Through three years of helping to manage the program, I have gained a whole new appreciation for picking up trash, forming relationships with communities and what it means when you bring those two things together.

March through June are my favorite months at the Alliance because it means I get to spend more of my time working outside with volunteers. After finishing winter planning and organizing these cleanup events, it's always nice to go out and experience a few in person. These in-person events remind me why I love my work.

A little background on Project Clean Stream: Now in its 19th year, it's a boots-on-the-ground effort that directly impacts our communities. Since its launch in 2004, we've seen the volunteer-powered program expand significantly. What started as a single-day event has turned into a year-round effort. Each year, the cleanups bring together thousands of volunteer conservationists from communities and companies throughout the Chesapeake Bay watershed.

Every year that I have worked at the Alliance, we have hosted a Project Clean Stream kick-off day on the first Friday of April out of our Annapolis headquarters — focusing efforts on Eastport neighborhood streets that drain into Back Creek. The event never fails to give our staff not only a hands-on understanding of the work



Four young volunteers wrestle a large piece of pipe into a dumpster during a 2015 Project Clean Stream event along Cat Branch Creek in Anne Arundel County, MD. (Will Parson/Chesapeake Bay Program)

involved, but also a boost of energy and motivation from meeting volunteers and hearing how meaningful and fulfilling the cleanup is for them.

"I enjoyed walking the streets of Eastport to pick up garbage," volunteer Chloe Obara said at last year's kickoff. "Many folks walking by smiled and thanked us for what we were doing. Having just moved to the area, it felt great to be making a difference in my community."

"Even though I'm not from the area," said Abri Segal, another young volunteer, "it felt great to be able to help clean up the neighborhood because every bit of trash that we collected helped the environment in the long run."

Each of the Project Clean Stream events around the Bay watershed has what we call a "site captain" — our main contact for the event and generally the person in charge of finding a cleanup site, coordinating supplies (we supply trash bags, gloves and trash grabbers) and organizing volunteers. The captain takes on the brunt of the work the day of the event.

In fall 2020, I had the pleasure of meeting John Long, one of our most dedicated site captains, who coordinates an annual stream cleanup in Dundalk, MD, just outside Baltimore. When I arrived at his "headquarters" on the day of the event (I was surprised to learn it was his own house), I received a warm welcome and tour of his well-outfitted sign-in tables, complete with

hand sanitizer, trash-collecting supplies and, most importantly, snacks!

John looked at my feet and noticed I was wearing sneakers (you would think I'd have known better), then told me to go around to the back, where I would find a trailer full of waders and boots. I didn't expect to find a group of teens ready to help. "What's your shoe size?" one asked.

These teenage neighbors of John's have been participating in cleanups for as long as they can remember. John later told me that he's watched them grow up. "My favorite part is either how streams or parks look after we leave, or it's the kids. It's a toss-up. I mean, I love seeing the kids. ... They are just so happy to be cleaning up. Both of those are just incredible."

That day, I joined a teacher, two students, a mom and some of the teens removing trash from the stream. We laughed at the sheer nastiness of some of the items we encountered, and we forged ahead cheerfully even after water came up over our boots, soaking our socks.

Though it wasn't my neighborhood, for that entire day I felt a part of the community, and I could see firsthand how the work formed bonds between neighbors, even if they'd never met before.

Since 2008, when John first got involved with Project Clean Stream, he has recruited a total of 6,045 volunteers at 80 different events and, he calculates, collected more than 286 tons of trash. John stands out as an



Volunteers collect trash along Annapolis's Back Creek in 2016. (Will Parson/Chesapeake Bay Program)

exceptional volunteer because of his passion for keeping his neighborhood clean, preventing trash from affecting his local waterway and ultimately having an impact on his neighbors. John is but one example of how Project Clean Stream spreads through communities and influences people throughout the watershed.

I grew up in the Baltimore County countryside. I loved having the space to run around and play in the backyard, but our closest neighbors were 10 acres away, and I had no idea who they were. I didn't have neighborhood hangouts, block parties, trash cleanups or children my age to hang out with just a couple of blocks away. I loved my childhood, but part of me feels I missed out a little on having neighbor kids to grow up with and learn from.

This spring will be my last time coordinating Project Clean Stream as I take on new responsibilities in our communications department. I wish it were possible to shake the hand of each of the volunteers and site captains and tell them how they helped form my own sense of community. My time with them has shown me the importance of getting your loved ones, your community and even strangers to form lasting relationships by, of all things, picking up trash. ■

*Lucy Heller is a communications specialist with the Alliance for the Chesapeake Bay, based in Annapolis.*



# Who cooks for you? The barred owl, that's who



By Mike Burke

**W**ho-cooks-for-you, who-cooks-for-you-all... The resonant notes filled the night sky. We turned slightly. The owl seemed to be high in a tree to our right, quite near the stream that runs through the bottomland forest. Scanning the branches again ended up being futile.

I was determined that we would see this barred owl (*Strix varia*). I had seen barred owls before, but this one was elusive. On several evenings, we heard its hooted call. Sightings, though, remained at zero. This March night, the moon was nearly full and the sky cloudless. Bundled up against the cold, our binoculars in hand, Pat and I were ready to stay until we were successful.

"Who-cooks-for-you, who-cooks-for-you-all," I hooted in my best barred owl imitation, even trailing off that last note. Just a moment later the call was returned!

Pat was first to spot the owl, bulky and erect on a branch near a tree trunk. It was about 25 feet up. These are big birds. They stand a foot and a half tall, have a wingspan of about 40 inches and weigh as much as 2.3 pounds. Despite their size, they can be maddeningly hard to see. They are most active at night, and their cryptic coloring provides excellent camouflage.

The owl was facing us. In the moonlight we could make out the pale facial disk and big dark eyes set in the round head. The small, yellow beak was indistinct in the gloaming. Browns streaked against a whitish background circle the throat laterally. These are the "bars" that give the owl its name. The breast and belly are pale white with extensive vertical streaks of dark brown. The dark tail, invisible from our vantage point, has five to six white bars, including the terminal band. The back would be brown with buff or white mottling. The sexes look alike, though the female can be noticeably bigger.

Barred owls don't migrate, so they are on their territory year-round. They inhabit

the eastern United States and southern Canada. They are well-established in the Pacific Northwest and have extended their range into northern California. A population is also found in Mexico.

Barred owls live in mature forests, especially those with easy access to a river or stream. The rich habitat provides ample food, and the big trees provide cavities large enough to accommodate nesting birds.

Living up to 24 years and being monogamous, a barred owl lives close to its mate on the pair's shared territory. During breeding season (starting in mid-March in Maryland), they will sometimes abandon their "who-cooks" vocalization. They substitute a cacophonous duet, calling back and forth in a series of hoots, hisses, whinnies and other sounds. The Cornell Lab of Ornithology's authoritative *Birds of the World* website describes the noisy songs as "caterwauling."

In the one brood the pair raises annually, the female lays one to five eggs, most commonly two or three. Only the female has a brood patch — a featherless area on the belly with blood vessels near the skin's surface to help warm the eggs — so she must stay on the nest for most of the one-month incubation period. Females are often 30–40 % heavier than males. She uses some of this "reserved energy" to produce eggs. The extra weight also helps sustain the mother through her prolonged period on the nest, even though her mate is feeding her. She can be expected to lose 30% of her body weight during breeding.

When the owlets hatch, they are helpless. Both parents feed them, a process that continues for a month. It is interesting that owlets leave the nest before they can fly. They crawl about on tree limbs and the trunk. Some fall, but they are rarely injured. Gradually, the fallen owlet makes its way back up the tree and keeps exploring.

It takes three to four months before the parental feeding stops and the young birds, now fully fledged, are finally on their own.

Adults feed their offspring the same diet they themselves consume. That means primarily mice, voles and the like. Parents bring the food to the nest and tear off strips to feed the youngsters. Small prey such as beetles are eaten whole. Barred owls also eat amphibians, reptiles and fish.

Eating prey whole, as adults do, presents some digestive problems. These owls have an evolutionary answer: two stomachs. In the first stomach, all of the digestible



A barred owl carries a freshly captured rodent in its talons. (Hal Trachtenberg/CC BY-NC 2.0)

matter is liquefied, then transported to the second, where digestion continues. The remaining bones and fur are reduced to a hard pellet. After each meal is digested, barred owls cough out the potato-shaped pellet. Depending on the size of the meal, pellets can be 3–4 inches long.

Look for the pellets on the forest floor, where they indicate a favorite roosting site is overhead. Scientists (and curious children) will pick the pellets apart, analyzing what was in the last meal. Some amateurs (e.g., me) have also been known to examine owl pellets in detail.

We had found our barred owl. You can do the same. Go on a guided "owl prow" at your favorite nature preserve or strike out on your own. Be sure to practice your barred owl call before you go. I guarantee that your housemate will let you know if you sound like an owl. You don't want to be accused of caterwauling. ■

Mike Burke, an amateur naturalist, lives in Mitchellville, MD.



The barred owl is far easier to spot in the daytime than at night, when it is most active. (Joseph Oliver/CC BY-NC 2.0)



# Yellow perch: early-spawning favorite of winter-weary anglers

## BAY NATURALIST

By Kathryn Reshetiloff

Ask any freshwater angler about yellow perch, and the first thing they might tell you is that these beautiful golden-yellow fish with dark vertical bands represent a brand-new fishing year. That's because they are the migratory "early birds" of the Chesapeake Bay region, with a spawning run ranging from late February to mid-March. After the long, dark months of winter, they are the first good reason for many anglers to break out the rods.

Anglers also might tell you how tasty they are; the yellow perch's delicate meat is a favorite Bay-to-table seasonal dish.

In the Bay watershed, yellow perch (*Perca flavescens*) are most common in the upper tributaries. They spend most of the year in brackish water and migrate to freshwater to spawn, never leaving the river system where they hatched — they merely move between brackish water and freshwater. The gradual warming of water triggers spawning.

The females deposit accordionlike chains of eggs in areas of a river or stream with ample amounts of organic debris covering the bottom. One egg chain may be fertilized by as many as 25 males. Once spawning is complete, adults leave the eggs and return to brackish water.

The egg chain often attaches to underwater vegetation or bottom debris. The unusual shape of the chain allows water to swirl gently around and through it, aerating the eggs. This is essential not only to supply



Yellow perch are among the catch in a fyke net on the Upper Chesapeake Bay. (Dave Harp)

dissolved oxygen, but also to prevent bacteria and fungi from growing on and killing the eggs.

Eggs hatch in two to three weeks. After a few days, the larval fish begin feeding on microscopic organisms. Later, as juveniles, they will make their way to brackish waters. Males reach sexual maturity in one to three years, and females in three to four.

Yellow perch are sensitive to different environmental factors at each stage of their lives. Agricultural and urban development increases the amount of sediment, nutrients and chemicals entering streams. This same development also reduces the amount of naturally vegetated areas surrounding rivers and streams that would absorb these substances.

Excessive sediment adheres to eggs, reducing the oxygen they receive. Sedimentation can reduce hatching success or delay hatching time. The survival of larvae is also

compromised when fine grains of sediment adhere to and damage sensitive gills.

A study conducted by the U.S. Geological Survey, Maryland Department of Natural Resources and U.S. Fish and Wildlife Service looked at the reproductive success of yellow perch from Bay tributaries with varying degrees of urbanization, ranked by the percentage of impervious surface, such as roads, roofs and parking lots.

The study documented abnormalities in yellow perch ovaries and testes at spawning time. The most frequent and severe problems occurred in yellow perch from the rivers within the most developed watersheds, lending credence to studies suggesting that reproductive abnormalities may be caused by contaminants in urban runoff.

Excessive nutrients affect all fish populations by altering physical characteristics of water. The main problem is increased algae growth, which robs the water of dissolved oxygen — which can retard the growth of fish and, in some cases, kill them.

Some fish may be driven from their preferred habitat by low dissolved oxygen and increased temperatures. The changes can also reduce the populations of benthic organisms that are prey for yellow perch.

Although adult yellow perch are somewhat acid tolerant, hatchlings are sensitive to acidic conditions. Chronic exposure to even moderately acidic water can inhibit their growth and damage body organs.



This juvenile yellow perch was already showing the species' distinctive dark vertical bands. (Matt Tillett/CC BY-NC-ND 2.0)

Young fish may even be killed outright when heavy rains result in a pulse of highly acidic water moving downstream.

Another serious problem for yellow perch — and all riverine migrators, for that matter — are barriers to spawning grounds, including dams, road culverts and gauging stations. If they are unable to get around blockages, adults will not spawn.

So, if your travels this month take you past a freshwater stream and you see a few hearty anglers along its banks or drifting along in a skiff, lines in the water, you can be all but certain they're after yellow perch. And you can safely assume it is, at least for some of them, a late-winter tradition.

For this tradition to continue and for yellow perch to thrive, our creeks and rivers need to be free of contaminants and excessive nutrients and sediments. They need aquatic habitat with organic matter for spawning and habitat that supports the invertebrates and smaller fish they eat. They need access to upstream spawning grounds, which means removing old dams and clearing or redesigning road culverts.

Yellow perch need all of those things to survive. And we need them for the tradition to live on. ■

Kathy Reshetiloff is with the U.S. Fish and Wildlife Service Field Office in Annapolis.



This yellow perch was collected from a stream in Anne Arundel County, MD, for a U.S. Fish & Wildlife Service study of toxic contaminants in fish. (Steve Droter/Chesapeake Bay Program)